Witness Statement Ref. No. 006/3

NAME OF CHILD: Adam Strain

Name: Patrick Keane

Title: Consultant Urologist

Present position and institution:

Consultant Urologist, Belfast HSC Trust

Previous position and institution:
[Since your Witness Statement of 16th March 2011]

Membership of Advisory Panels and Committees:
[Identify by date and title all of those since your Witness Statement of 16th March 2011]

2005 to 2011 - Specialist Advisory Committee in Urology Now finished tenure
2008 to 2011 - Clinical lead for NICAN in Urology Now finished 3 year tenure

Previous Statements, Depositions and Reports:
[Identify by date and title all those since your Witness Statement of 16th March 2011]

OFFICIAL USE:
List of previous statements, depositions and reports attached:

Ref:	Date:	
011-003	11.12.1995	Statement
011-013	18.06.1996	Deposition at the Inquest on Adam Strain
006/1	20.06.2005	Inquiry Witness Statement
093-010	07.09.2006	Statement to PSNI
006/2	16.03.2011	Second Inquiry Witness Statement

IMPORTANT INSTRUCTIONS FOR ANSWERING:
Please identify clearly any document to which you refer or rely upon for your answer. If the document has an Inquiry reference number, e.g. Ref: 049-001-001 which is 'Chart No.1 Old Notes', then please provide that number. If the document does not have such a number then please provide a copy of the document.

I QUERIES ARISING OUT OF YOUR SUPPLEMENTAL WITNESS STATEMENT

With reference to your witness statement dated 16th March 2011, please provide clarification and/or further information in respect of the following:

(1) **Answer to Question 1(a) at p.2:**

"I had an Honorary Contract at RBHSC and had close working relationships with the surgeons there. I was involved in setting up the Stone Service for children and the continuing care through adolescence of the paediatric urological population. With reference to transplantation, I was involved in teaching the surgeons at the RBHC how to perform the procedure, hence Mr Brown's involvement. I lectured at the RBHSC and dealt with unusual cases and transplants."

(a) **Explain the connection between *"teaching the surgeons at the RBHC how to perform the procedure [transplantation]"* and *"Mr. Brown's involvement"*.**

The paediatric surgeons, as a group, were interested in providing the transplant service in the future and were keen to be involved. I believe, Mr Brown, a paediatric surgeon, was the surgeon on call and he wished to be involved in Adam's care. I believe that Mr Brown had operated on Adam on several previous occasions. I had not requested Mr Brown to be involved.

(b) **Explain what you mean by *"unusual cases and transplants"*.**

There were new techniques for stone surgery in adult urology and I was involved in the setting up of the Stone Service in RBHSC. I also gave advice and, in some cases, operated or re-operated on complex neuropathic disease. In 1995, paediatric transplants were performed by adult surgeons. The paediatric surgeons at the RBHSC wanted to be trained so, in future, they could provide a transplant service.

(c) **State the date when you became a consultant urologist.**

March 1994

(d) **State whether there has been any audit or assessment of renal transplant surgery at the RBHSC or of Belfast as a renal transplant centre.**

To my knowledge, there was no formal audit or assessment as we would now define them.

(i) state when such audits or assessments occurred (in both cases)
(ii) who conducted them
(iii) your role, if any, in them

(iv) identify any report resulting from such audits and assessments, and if available, provide a copy

(2) Answer to Question 2 at p.2:

"[My role was] to acquaint myself with the clinical situation and to make the necessary arrangements to get the team together"

(a) Describe the *"necessary arrangements to get the team together"* that you made, including identifying any personnel who did not ultimately form part of the *'team'*.

From my point of view, I wished to ensure that, as a minimum, there was an experienced nephrologist and a consultant paediatric anaesthetist and also that I would have a senior surgical assistant. I was confirming that there was a sufficient consultant level support. The hospital would supply all the ancillary staff. I cannot identify those who ultimately did not form part of the team. As Dr Savage was primarily responsible for organising the team this part of the question should be put to him.

(b) Identify the individuals in the *'team'* to which you refer.

Dr Savage, Dr Taylor and Mr Brown.

(3) Answer to Question 3(b) at p. 3:

"I discussed all of the above with Dr. Savage by telephone on 26 November 1995."

(a) State whether you made and retained any contemporaneous notes of your discussions with Dr. Savage. If so, please produce them.

I did not make a written record of the telephone conversations.

(b) If you did not make contemporaneous notes of your discussions with Dr. Savage, state whether you considered doing so. If you did consider doing so, please explain why you did not go on to make a note. If you did not consider it, please explain why.

I did not consider making notes about the issues I discussed with Dr Savage on the afternoon of Sunday, 26th November 1995 as these details would be documented in Adam's clinical notes (history, dialysis, cross match and blood tests).

(c) Explain what you would have regarded as relevant for you to know in relation to: (i) Adam's contemporaneous medical condition; (ii) cause of Adam's renal problems; (iii) Adam's medical history; (iv) planning and setting up of the transplant surgery; (v) preparation for and timing of the transplant surgery. Explain your reasons in relation to the matters at (i) to (v)

(i) Was there a medical contraindication to the procedure (that is, active infection, stone disease etc), (ii) infratrigonal obstruction would have significance for bladder management in the longterm, (iii) absence of stone disease and bladder management, (iv) wait till crossmatch was through to get go ahead, and (v) the real time start.

(d) Identify the factors which would affect the timing of the start of the transplant surgery.

Post dialysis bloods, crossmatch and surgical exhaustion.

(4) Answer to Question 3(c) at p. 3:

"I spoke with Mr. Brown by telephone on 26th November 1995"

(a) State whether you made and retained any contemporaneous notes of your discussions with Mr. Brown. If so, please produce them.

No.

(b) If you did not make contemporaneous notes of your discussions with Mr. Brown, state whether you considered doing so. If you did consider doing so, please explain why you did not go on to make a note. If you did not consider it, please explain why.

I did not consider making a note because we discussed Adam's medical history which, as previously stated, was in his notes.

(c) State what information you would have been seeking to cover with Mr. Brown in relation to Adam's case including the extent to which you would have considered it appropriate to discuss Mr. Brown's knowledge of Adam's previous surgery. If you would have considered it appropriate to discuss Mr. Brown's knowledge of Adam's previous surgery, state the reasons why. If you would not have considered it appropriate to discuss this, state the reasons why not.

I sought to know what type of surgery Adam had had previously to ascertain if there might be some unexpected issues. According to Mr Brown, there were not. If Mr Brown were not available, the operation would still have proceeded.

(d) State what information you would have been seeking to cover with Mr. Brown in relation to preparation for and timing of the transplant surgery.

None.

(5) Answer to Question 3(d) at p. 3:

"I spoke with Dr. Taylor by telephone on 26th November 1995."

(a) State whether you made and retained any contemporaneous notes of your discussions with Dr. Taylor. If so, please produce them.

I made no notes of my discussions with Dr Taylor on Sunday, 26th November 1995.

(b) If you did not make contemporaneous notes of your discussions with Dr. Taylor, state whether you considered doing so. If you did consider doing so, please explain why you did not go on to make a note. If you did not consider it, please explain why.

I did not consider doing so as I discussed the timing of the operation with him, which is a matter of record.

(c) **State what information you would have been seeking to cover with Dr. Taylor in relation to: Adam's surgery**

Timing of surgery and possible need for a bolus of fluids shortly before removal of the clamps.

(d) **State what information you would have been seeking to cover with Dr. Taylor in relation to preparation for and timing of the transplant surgery.**

The issues of exhaustion versus starting early in the morning.

(6) **Answer to Question 3(e) at p.3:**

"(e) Describe and explain "all relevant clinical information" that you sought from those clinicians ... and what you received in response.

I discussed the following [with Dr Savage, Dr Taylor and Mr. Brown]:
- *Adam's medical condition*
- *cause of Adam's renal problems*
- *Adam's medical history*
- *consent from Adam's mother*
- *planning and setting up the transplant surgery*
- *preparation for and timing of the transplant surgery*

These were telephone conversations and, at 16 years remove, I cannot remember specific details"

(a) **In addition to seeking *"all relevant clinical information ... from those clinicians"* state whether you examined Adam's medical notes and records prior to his renal transplant surgery. If so, state when, where, the reasons why you did so and the information you were seeking from those notes and records. If you did not examine Adam's medical notes and records before his transplant surgery, state the reasons why not.**

I read Adam's clinical notes in detail while waiting for him to be anaesthetised.

(7) **Answer to Question 3(f) at p.4:**

"The operation was scheduled for 6.00 am. I only operate when the patient is safely anaesthetised, which, in Adam's case, was at approximately 7 am"

(a) **Identify who agreed to schedule the operation for 06:00 and state when this was agreed.**
Myself Dr Savage and Dr Taylor.

I cannot accurately state when it was agreed, however, it was at some point on Sunday, 26th November 1995.

(b) **State the time you arrived at RBHSC on 27th November 1995.**

In and around 6.00am on Monday, 27th November 1995.

(c) **State where you were and what you were doing on 27th November 1995 between:**

(i) **Approximately 06:00 and 07:00.**

Reading Adam's notes waiting for Adam to be put to sleep. I cannot recall specific details/timings some 16 years after the operation.

(ii) **Approximately 07:00 and 08:00.**

Same as above and I would have scrubbed and prepared the kidney. I cannot recall specific details/timings some 16 years after the operation.

(8) **Answer to Question 4(a) at p.4:**

"As detailed above, I was teaching the paediatric surgeons at RBHSC about transplant surgery and had assisted Mr Boston in one procedure, Mr Brown was also interested in learning and had previously operated on Adam and, therefore, had a personal interest in his care."

(a) State whether the *"one procedure"* in which you had assisted Mr. Boston was a renal transplant.

The procedure I referred to was a renal transplant and I supervised (rather than assisted) Mr Boston.

(9) **Answer to Question 5(a) at p.5:**

"Surgeons do not record procedures in half hourly units of time. However, the steps in the procedure are as follows:

- *Incision, identification and exposure of the vessels which are to be used and the approach to same;*
- *Isolation of the vessels in preparation for clamping;*
- *Cleaning and preparation of the donor kidney;*
- *Vascular and ureteric anastomoses;*
- *Wound closure*

All technical parts of the operation were achieved and no surgical complications occurred."

(a) You have not adequately answered the question. Please describe and explain what you did throughout the period of surgery.

The surgery started at approximately 8.00 am. I made an incision in the right iliac fossa and opened the peritoneum where I found dense matted adhesions. I then exposed the retroperitoneal space and identified the vascular structures, Aorta, Vena Cava and Iliac vessels. I isolated and gained control of the iliac vessels and sutured the donor vessels to recipient vessels and then reimplanted the ureter. I closed the bladder and checked the kidney for perfusion in its orthotopic condition. All of these manoeuvres were performed without complication.

(b) State whether the vascular anastomoses were performed before the ureteric anastomosis.

Yes.

(c) **State the time taken for all the vascular anastomoses to have been completed.**
I cannot do this 16 years after the operation.

(d) **Describe what was done to 'prepare' the donor kidney and how long 'preparation' of the donor kidney took.**

The perinephic fat was excised. The artery and vein were cleared of all adventitia and the two arteries were conjoined in a single patch. This would have taken several minutes.

(e) **State if the preparation of the donor kidney was undertaken immediately before the vascular clamps were applied. If not, state when it was performed.**

It was my practice to prepare the kidney before the skin incision.

(f) **State when the 'warm ischaemia time' for the donor kidney started.**

The kidney is kept in swabs wrapped in slushed ice during the 'preparation' and returned to the ice water solution at the end of the preparation. I cannot state the time of the vascular anastomoses but the kidney is kept wrapped in ice soaked swabs during the time taken to perform the anastomoses. The true warm ischaemia time i.e. when the renal vein clamp is removed to removal of the arterial clamp was seconds as there was no need to reapply them.

(g) **State how long the donor kidney was out of its ice bath before being re-perfused – i.e. the total warm ischaemia time.**

I cannot.

(h) **Please provide a simple annotated diagram of:**

(i) **Adam's abdominal cavity prior to transplantation including the site of:**
- **the native kidneys**
- **the right iliac fossa**
- **spleen**
- **bladder**
- **colon**
- **ureter**
- **renal arteries**
- **aorta**
- **common iliac artery**
- **external iliac artery**
- **vena cava**
- **renal vein**
- **external iliac vein**
- **common iliac vein**
- **inferior vena cava**

(ii) **Adam's abdominal cavity following transplantation of the donor kidney including the site of:**
- **the native kidney**
- **the transplanted donor kidney**

- the right iliac fossa
- spleen
- bladder
- suprapubic catheter
- colon
- ureter
- renal arteries
- aorta
- common iliac artery
- external iliac artery
- vena cava
- renal vein
- external iliac vein
- common iliac vein
- inferior vena cava

(10) Answer to Question 5(b) at p.5:

"I am unable to do so, and this question should properly be directed to the RBHSC/Belfast HSC Trust."

(a) You have not adequately answered the question. Please explain who was responsible for the completion and accuracy of the accompanying 'Kidney Donor Information Form' (Ref: 058-009-027).

The retrieving transplant team.

(b) Explain the reason that you are *"unable"* to provide the identity of the person who amended the entry at Section II item 8 by deleting *'patch'* and adding *'arteries on 1 patch'*.

It is unsigned and I do not recognise the writing.

(11) Answer to Question 6(a) at p. 6:
"I inserted the catheters. The time was not recorded but was close to 10.00am."

(a) Your answer to Question 11(b) at p. 10 states: *"[the bladder was catheterised] Within a few minutes of 10.30am."* Please clarify at what time you say that you catheterised the bladder, and particularly if this was before or after the ureteric re-implantation.

I cannot state the precise time (although it was within a few minutes of 10.30am) but the catheter was inserted after the ureter was re-implanted and while the bladder was still open.

(12) Answer to Question 6(b) at p.6:

"[There was] no contraindication [to inserting a urinary catheter immediately after induction of anaesthesia]"

(a) Explain why a bladder catheter was not inserted immediately after induction of

anaesthesia.

Adam's urethra was very small and in my opinion urethral catheterisation was unnecessary. I wanted the bladder full.

(13) **Answer to Question 7(c) at p. 6:**

"I had finished the transplant, there was pulsatile flow in the artery and the kidney was reasonably perfused"

(a) **Explain what you mean by *"there was pulsatile flow in the artery"* and state what you consider to be its relevance to and significance for the perfusion of the kidney.**

There was no evidence of arterial thrombosis and when the kidney was placed inside Adam the artery pulsated normally. This meant there was no surgical, as distinct from immunological, problem with the kidney.

(14) **Answer to Question 7(d) at p.6:**

"Mr Brown and I discussed the colour of the kidney at the end of the transplant. We were both happy with the perfusion of the kidney at the end of the transplant procedure."

(a) **State whether you discussed with Mr. Brown the perfusion and *"the colour of the kidney"* prior to *"the end of the transplant"*. If so, state the nature of those discussions and whether you were *"both happy"* with the colour and perfusion of the donor kidney at all times.**

We were both happy with the colour and the perfusion of the kidney at the end of the transplant.

(b) **If you were not happy with the colour and perfusion of the donor kidney at all times, then: (i) identify the time or stage at which you were not happy with it; (ii) the reason for that; and (iii) what was done about it.**

Not applicable.

(15) **Answer to Question 8(a) at p.7:**

"From the start of the operation to after the successful transplant. I was absent for approximately 10-15 minutes required to close the wound."

(a) **State how much time is typically spent after wound closure in ensuring drains and catheters are securely fixed, applying dressings, removing drapes, confirming swab/instrument count, etc.**

5-10 minutes.

(16) **Answer to Question 8(e) at p. 7:**

"Close the wound."

(a) **State whether you left specific instructions with Mr Brown regarding the optimum positioning of the kidney during wound closure. If you did not do so, explain why.**

I had ensured the optimum position. The wound closure after that is routine.

(17) **Answer to Question 8(i) at p.7:**

"I would have, in accordance with my customary practice, spoken to Adam's family, if I had not been called away to an emergency at Belfast City Hospital. In my absence, I expected Mr Brown to speak to Adam's family."

(a) **When you were *"called away to an emergency at Belfast City Hospital"* state whether you intended to return to RBHSC at any time on 27th November 1995 to speak to Adam's family.**

I intended to return later that evening when I finished work in the Belfast City Hospital.

(b) **State whether you left specific instructions with Mr. Brown that he speak to Adam's family after the surgery. If so, state the reasons why. If not, state the reasons why not.**

I left no specific instructions. In the paediatric hospitals I worked in the parents were usually spoken to by a member of the surgical team as I could not, I expected Mr Brown would.

(c) **State the basis for your expectation that in your *"absence [you] expected Mr Brown to speak to Adam's family".***

Common practice.

(d) **State whether you think in all the circumstances you should have communicated with Adam's family about his death. If so, explain why you did not. If not, explain why not.**

I regret not having spoken to Adam's family about his death. I could contribute very little to the understanding of the cause and I received no request from Adam's family to speak with them.

(18) **Answer to Question 9(d) at p. 8:**

"... I do not believe that I was on call on 27th November 1995. I was contacted by Dr. Savage on 26th November with a request that I perform the transplant, as I understood that I was the only appropriately trained surgeon who was available and capable of performing the procedure."

(a) **State what you mean by *"appropriately trained surgeon".***

A surgeon trained in transplantation.

(b) **State what you mean by *"capable of performing the procedure".***

A surgeon capable of performing a renal transplant operation.

(c) **Identify any other surgeons who were *"appropriately trained"* at that time and were *"capable of performing the procedure"*.**

Mr Donaldson and Mr Kernohan but I believe they were on sick leave at that time.

(d) **State whether on 26th November 1995 there were any transplant surgeons who were on call, and if so, identify them.**

Not to my knowledge.

(e) **State whether on 26th November 1995 there were any *"appropriately trained [transplant] surgeon[s] ... capable of performing the procedure"* who were on call, and if so, identify them.**

See (d) above.

(f) **Explain what was the system, if any, in operation in November 1995 for arranging to have an *"appropriately trained surgeon... capable of performing the procedure"* for paediatric renal transplants in RBHSC. In particular, state whether this system included having an on call transplant surgeon who was *"appropriately trained... [and] capable of performing the procedure"*, or whether choice of surgeon was made by the Consultant Paediatric Nephrologist depending upon which surgeons were available .**

Urologists were on call on a rota. Only three did paediatric transplants. Two were sick. Had I been away, there would have been no one capable of doing the transplant.

(19) **Answer to Question 9(g) at p.8:**

"I am not aware of this information [who collected the kidney, when and from where] and, therefore, this question should be raised with the RBHSC/Belfast HSC Trust. However, I believe that the kidney was flown to Northern Ireland and transported by taxi to the RBHSC."

(a) **State whether *"I am not aware of this information"* means that: (i) you do not now remember those details; or (ii) you never had any knowledge of those details.**

I do not remember those details.

(b) **Explain the basis upon which you *"believe that the kidney was flown to Northern Ireland and transported by taxi to the RBHSC"*.**

It was the usual way this was done.

(c) **State whether you have ever collected a donor kidney for transplant and, if so, describe the circumstances in which you did so.**

When I retrieved kidneys from other local hospitals, I brought them back to the City Hospital.

(20) **Answer to Question 10(a) at p.9:**

"Perfusion started at 01.42am on Sunday, 26th November 1995. At 16 years remove, I have no recollection of the timing of discussions on ischaemic time."

(a) **You have not adequately answered the question. Please explain: (i) your understanding of the cold ischaemic time of the kidney at the time of your discussions with Dr. Savage and Dr. Taylor on 26th November 1995; and (ii) the basis of that understanding.**

(i) The cold ischaemic time starts the perfusion time at 01:42 26/11/1995
(ii) the information is from the transplant form accompanying the kidney.

(21) **Answer to Question 10(d) at p.9:**

"The kidney was still transplantable in terms of its cold ischaemia time ... [the date and time on/at which you first saw the donor kidney] At approximately 6am on the morning of the operation on Monday 27 November 1995 "

(a) **You have not adequately answered the question. Please explain the duration you would consider to constitute a *"normal time before surgery"* and the basis upon which you hold that view.**

We would have transplanted a kidney up to 36 hours as I had been trained to do in the Royal Postgraduate Medical School

(b) **Identify all those that were present when you first saw the donor kidney.**

I am unable to remember who was present.

(22) **Answer to Question 11(a) at p.10:**

"[The surgery 'knife to skin' started at] Approximately 7.15am."

(a) **Explain the basis of your claim that the surgery 'knife to skin' took place at *"Approximately 7.15am"*.**

Having reflected on this and considering the evidence, it would now appear that the surgery started at around 8.00am.

(23) **Answer to Question 12(a) at p.10:**

"[The blood loss of 1200cc contained] Approximately 600cc made up of urine, peritoneal dialysis fluid and slushed ice used to cool the kidney until the vascular anastomoses are complete."

(a) **Explain the basis for your claim that *"approximately 600"* ml of the 1200 ml was made up of *"urine, peritoneal dialysis fluid and slushed ice"*.**

These are rough estimates. Adam could make urine at up to 100 mls per hour, the swabs contained copious amounts of slushed ice to keep the kidney cold and there was residual peritoneal dialysis fluid in his abdomen.

(b) **State the relative proportions of the three fluids (*"urine, peritoneal dialysis fluid and*

slushed ice") and describe how you formulated those figures.

There is no accurate way to do this. These are estimates only.

(24) Answer to Question 13(b) at p.10:

"Generally patients are anuric or oliguric. To reimplant the ureter in adults, normally, 300 cc of water is instilled into the bladder to distend it. In Adam's case, we allowed the bladder to distend naturally and not measure his urine output but depended on his CVP measurements, which is the parameter of most value to a surgeon."

(a) State whether it was your decision not to insert a urethral catheter before commencement of surgery. If it was not your decision, state whose decision it was. State whether, in retrospect, you think it was the correct decision. Please explain your reasoning in both cases.

It was my decision not to catheterise and I believe was the correct decision. I decided to allow the bladder to distend naturally.

(b) State whether you would have had any objection to Dr Taylor inserting a urinary catheter into Adam at the start of the case. If yes, please give a detailed explanation. If not, explain why it was not done.

No. I did not think it was necessary.

(c) State whether you were informed by Dr. Taylor or the trainee anaesthetist during the transplant procedure of:

(i) any difficulties with the central venous line insertion - No
(ii) Dr. Taylor's view of the CVP readings - No

and if so, state exactly what information was given to you, by whom and when was it given and what was your understanding of it.

(d) Explain what you mean by *"depended on his CVP measurements"*. Identify the CVP measurements on which you *"depended"*.

Central venous pressure (CVP) was the most important parameter I would rely on. I would want his CVP to be 10 -12 when the clamps came off.

(e) State whether you were aware during the transplant surgery of Dr. Taylor's view that Adam's CVP readings from the outset could not be trusted as a true indicator of blood volume and could only be used as a general indicator of changing blood volume. If so, state how and when you first became aware of this and what you did as a result of it and the reasons why. If you did nothing as a result of it, state the reasons why.

I was not aware of the problem with the CVP measurement.

(f) State if you were informed about Adam having a CVP of 17mmHg at the start of surgery. If so, explain the significance you placed upon this. If not, explain if and how this would have affected your actions.

I was not aware of this. If true this reading may have been due to misplacement or kinking of the line or due to overhydration. Had I been aware, I would have asked the Anaesthetist to ensure the CVP reading was truly 17. It is normal to subtract 5 from the reading in a ventilated patient. If it was truly 17 then seek medical input (from Dr Savage). I would have checked the position and flow in the line and, if this was a true reading, restricted Adam's fluids and considered giving a diuretic.

(g) **Explain the significance you would place upon a CVP of 30 mmHg at any time during surgery.**

This would have caused alarm as any patient with a CVP of 30 would have been critically unwell.

(h) **Describe the appearance and size of Adam's bladder: (i) when it was exposed and (ii) at the time of anastomoses.**

(i) Adam had a large capacity bladder with evidence of trabeculation (indicating infratrigonal obstruction) and
(ii) Normal.

(25) **Answer to Question 13(e) at p.10:**

"[The urine produced by Adam's native kidneys was] Sucked into a bottle and soaked into swabs."

(a) **State at what point in surgery, the urine produced by Adam's native kidneys was *"sucked into a bottle and soaked into swabs"*. In particular, state whether this was before or after you inserted the suprapubic catheter.**

The bladder was opened via a stab incision and a sucker inserted to remove the native urine. Swabs would have isolated the bladder from the abdominal cavity. The suprapubic catheter was placed later.

(b) **Prior to the catheterisation of Adam's bladder, state whether the (opened) bladder was left to drain freely into the abdominal cavity. If so, state the reasons why. If not, state the reasons why not.**

Urine was not left to drain into his peritoneal cavity. Urine is an irritant and can be infective.

(26) **Answer to Question 16(a) at p. 11:**

"To change paediatric practice in relation to the use of Solution 18 and outline what measures should be taken when it hyponatraemia is detected."

(a) **State what changes in *"paediatric practice in relation to the use of Solution 18"* you consider ought to have been made arising out of Arieff's paper on hyponatraemia.**

This question is not the domain of an adult transplant surgeon who has not operated on young children after Adam.

(b) State *"what measures"* you consider *"should be taken when hyponatraemia is detected."* arising out of Arieff's paper on hyponatraemia.

Stop infusing Soln.18 give 1.8 or 2.7% saline, give mannitol, consider dialysis.

(27) Answer to Question 16(b) at p.11:

"[Arieff's paper on hyponatraemia] is not relevant to adult urological practice. All of the issues dealt with in the Arieff paper have been common knowledge in urology for 30 years."

(a) This is not an adequate answer to the question which follows on from question 16(a), which asks how Professor Arieff's paper ought to have been *"carefully considered in future surgery of a similar nature"*. This question seeks to know how the paper has actually been considered (emphasis added). Please provide the information requested.

This question is not the domain of an adult transplant surgeon who has not operated on young children after Adam.

(b) State whether you were consulted in relation to the development of any guidance, protocols, practice or policy arising out of Adam's case, and if so, state when, by whom and what you contributed.

I was not.

(28) Answer to Question 16(c) at p.12:

"[That the factors in Arieff's paper should be restricted to future surgery of a similar nature] is not my view. Arieff's paper applies to general paediatric practice."

(a) State whether it is your view that Professor Arieff's paper should also be *'carefully considered'* in relation to *"general paediatric practice"*. If not, explain why not.

It should.

(29) Answer to Question 17(a) at p.12:

"I believe that I had performed three paediatric renal transplants before Adam's, although I had assisted on a number of others."

(a) State when the *"three paediatric renal transplants"* you performed before Adam's transplant were performed.

I am not sure of the relevance of this question to an Inquiry into Hyponatraemia Related Deaths, however, I believe they were performed on 17th April 1993, 14th May 1993 and 11th December 1994.

(b) State how many of the *"three paediatric renal transplants"* you performed before Adam's transplant were performed on or after 1st April 1993.

I am not sure of the relevance of this question to an Inquiry into Hyponatraemia Related

Deaths, however, as above (three).

(c) **State whether Dr Taylor acted as the anaesthetist in any of the *"three paediatric renal transplants"* you performed before Adam's transplant and, if so, specify the number and the date of each surgery.**

I am not sure of the relevance of this question to an Inquiry into Hyponatraemia Related deaths, however, I do not believe that he was. I have, however, not seen the medical notes.

(d) **Please describe your experience, prior to 26th November 1995, of being involved in paediatric surgery where Dr Taylor was the anaesthetist.**

I cannot.

(30) **Answer to Question 18(a) at p.13:**

"[Adam's] sodium level was normal at the end of dialysis pre-operatively."

(a) **State what you knew of Adam's actual serum sodium levels on 26th November 1995 and on 27th November 1995 prior to his surgery.**

I knew the post dialysis level as it is recorded in his notes.

(b) **State the basis upon which you believed that Adam's serum sodium level had been tested *"at the end of dialysis pre-operatively"* and that the result was *"normal"*. If this arises out of information you were given, please state where this information is recorded, when you were informed, and identify the person who did so.**

I cannot remember when or by whom I was informed. The levels are in the notes.

(31) **Answer to Question 18(b) at p.13:**

"[Adam] was polyuric and his feeding regime had changed in preparation for the transplant. Once anaesthestised [sic] the difficulty in venesection would not arise."

(a) **You have not adequately answered the question. Please <u>explain</u> the reasons why you would have expected Adam's electrolyte levels to have been checked.**

I believe that Adam was difficult to venesect and got very upset. When he was anaesthetised he would have had a large catheter inserted in his neck from which it is easy to draw blood. He had been dialysed and given a large bolus of low sodium fluid overnight, he should have had his electrolytes checked at the time of insertion of the CVP line or shortly after the operation began.

(b) **Explain why Adam's polyuric condition and/or the fact that *"his feeding regime had been changed in preparation for the transplant"* led you to expect that his electrolyte levels would have been checked either just before or just after induction of anaesthesia.**

The sodium content of dioralyte is low. Checking his electrolytes at the start or early in the procedure would have been a routine task.

(32) **Answer to Question 19(a) at p. 13:**

"He did not."

(a) Explain the response you would have given to Dr. Taylor had he told you at approximately 09.32 that the serum sodium result from the blood gas analyser machine was 123 mmol/L (Ref: 058-003-003).

I am advised that such a hypothetical question should be answered only if Dr Taylor's evidence is that he imparted this information to me (which I do not believe he did).

(33) **Answer to Question 20(a) at p.14:**

"Approximately 15 minutes before I thought the vascular anastomoses would be complete, I would, in accordance with my customary practice, ask the anaesthetist what the CVP was and to preload the child if necessary. I do this in every case, however, I have no specific recollection in this particular case."

(a) Explain the response you would have given to Dr. Taylor had he told you that at *"approximately 15 minutes"* before the completion of the vascular anastomoses (i.e. between 10.00 and 10.15) the CVP reading was between 25mmHg and 20mmHg [Ref: 094-139-647].

I am advised that such a hypothetical question should be answered only if Dr Taylor's evidence is that he imparted this information to me (which I do not believe he did).

(b) State whether at any time during surgery you *"ask[ed] the anaesthetist what the CVP was"* and if so, state when and the response thereto. If you have no specific recollection, state what was your *"customary practice"* and the reasons why.

My customary practice is to ask if the CVP is up not specifically a number, as the anaesthetist may need time to give a bolus of fluid. I tell the anaesthetist when I anticipate taking the clamps off (10 -15 minutes before release).

(34) **Answer to Question 21(a) at p.14:**

"Surgeons are very aware of blood loss and will communicate concerns to the anaesthetist. There was no major bleeding in Adam's case. His Haemoglobin was 10 at the start and 10 at the end and he received between 250 and 350 cc blood."

(a) Provide your reasoned calculation for Adam's total blood loss during the transplant surgery bearing in mind the following facts:

(i) Adam's preoperative Hb (on 26th November 1995) was 10.5 gm/dl. (PCV=30%)
(ii) Adam's postoperative haematocrit (on 28th November 1995) was 14.4 gm/dl (PCV= 40%)
(iii) The only blood transfusion Adam received between those two dates was the 500 ml packed cells that was given intraoperatively.

Paediatric blood units contain anything from 180 to 250 cc. Adam may only have received 360 ml of blood and ended up with a Haemoglobin level 4 grams higher than

he started with. The blood loss can be estimated by the following formula.

$$\text{Estimated Blood Loss} = \text{Blood Volume} \times \frac{\text{Hct Start} - \text{HCT end}}{\text{HCT Start}}$$

There are two potential starting haematocrits because Adam was given 750 ml of Soln. 18 in the hour before the start of the operation. The haematocrit from the night before was 32 but by the start of the operation would have been lower, take 28 for example. The lower the haematocrit at the start the less the blood loss.
Using these values the haematocrit (32 or 28) from the night before and the end haematocrit written in the notes on the morning of the operation and a blood volume of 1500 cc the Estimated blood loss is 655 cc or 468. From a surgical perspective the lower figure would be more accurate.

(b) Explain what quantity of blood constitutes *"major bleeding"* in Adam's case.

There is no strict definition of this term. A commonly used one is bleeding requiring more than two units of blood to replace blood loss. By this definition, Adam did not have major bleeding.

(c) Explain the reasons for Adam's haemoglobin reading of 6.1 and haematocrit reading of 18 at 09.32 on the blood gas analyser, and the significance of each of these results.

There are only two possible causes bleeding or haemodilution. In Adam's case it is dilution.

(35) **Answer to Question 21(c) at p.14:**

"I had no discussion with Dr Taylor on fluid management during this procedure. I do not discuss fluid management, other than blood loss, when a consultant anaesthetist is involved in a case."

(a) In the interests of clarity, state whether you agreed or did not agree with Dr. Taylor on the administration of a second infusion of HPPF. If you did agree that with Dr. Taylor, then state when you did so.

I did not discuss the administration of any fluid with Dr Taylor.

(b) State whether you had a *"discussion with Dr Taylor"* regarding the impending or actual bleeding during Adam's surgery and, if so, the times at which this occurred, and what action was taken as a result of this communication.

No: as far as I was concerned the bleeding was within acceptable limits.

(c) Explain who you consider has the final say as to whether fluid is administered in a situation where the surgeon requests more fluid is given (e.g. to increase kidney perfusion) and the anaesthetist present believes this to be inappropriate.

I am advised that such a hypothetical question should be answered only if Dr Taylor's evidence is as set out above.

(d) **State whether you or Mr. Brown asked for more fluids, and if so, state at what time or at what stage in the surgery and for what reason.**

We did not ask for more fluids.

(36) **Answer to Question 25 (c) at p. 15:**

"Hyponatraemia is a very common problem in urology and its diagnosis and management were dealt with by me on multiple occasions and it is a continuing and important part of the urology curriculum."

(a) **State the content of the urology curriculum in relation to hyponatraemia prior to November 1995.**

I cannot.

(b) **State the content of the current urology curriculum in relation to hyponatraemia.**

Enclosed. Enclosed also is a review article on the management of TUR syndrome (acute dilutional hyponatraemia with glycine toxicity) which all urologists would be expected to know.

(c) **Describe and explain your role in the *"diagnosis and management"* of hyponatraemia during surgery, and also other than during surgery.**

Specifically during transurethral surgery the surgeon knows when large venous sinuses have been opened and can terminate the procedure and take action to treat hyponatraemia.

(37) **Answer to Question 26(a) at p. 16:**

"In my year in paediatric surgery..."

(a) **Explain what you mean by *"[i]n my year in paediatric surgery"* and identify the year to which you refer.**

I was a registrar in paediatric surgery in Temple Street Dublin in 1982-3

(38) **Answer to Question 28(d) at p.16:**

"Adam had very complicated medical issues to deal with. There were no surgical issues involved in his death. Adam died of hyponatraemia, which I believe was due to the administration of solution 18. I was part of a team but as a team we had had a catastrophic outcome. I decided to have no further part in provision of paediatric transplantation after Adam' death."

(a) **Clarify whether you believe Adam's hyponatraemia was due to: (i) the choice of solution type (Solution No. 18); (ii) the volume of Solution No. 18 administered; (iii) its rate of administration; (iv) some combination. Provide an explanation for your view.**

The hyponatraemia was due to the combination of the rate and volume of Solution 18 administered. The rate at which hyponatraemia occurs is important in the pathogenesis of

acute brain swelling.

II ADDITIONAL QUERIES

(39) **State why you did not see Ms Slavin once you knew that Adam was being considered for renal transplantation. State whether, in retrospect, you think that you should have seen her at that time and the reasons why. If not, explain why.**

The cross match did not come through until approximately 1 am and, the transplant would not go ahead until we knew the result. I would have expected Ms Slavin to be asleep at that time. Dr Savage had taken consent and confirmed to me that Ms Slavin was fully committed to the procedure and was not requesting to see me. If she had requested to speak to me I would have spoken to her.

(a) **State why you were not involved in the formal consent process.**

Dr Savage had taken consent as that was the practice at the time. The consent for transplantation is a prolonged process which begins when the patient is put on the transplant waiting list. Education about dialysis and transplantation is not the remit of the transplanting surgeon but of the nephrology team looking after the patient. It would be inconceivable that a patient would get so far into the process if there were any doubts in the mind of a patient or guardian about transplantation. Further, when I trained in transplantation it was considered that selection and consent for transplantation was better done by non surgeons who might apply pressure to consent to donation/transplantation.

(b) **State whether you think you should have been involved in the consent process. If so, state at what stage you think you should have been involved and the reasons why. If not, explain why.**

In 1995 it was not considered necessary for consultant surgeons to take consent as long as a doctor capable of explaining the risks and benefits of the procedure explained the issues to the patient. I had and have full confidence that Dr Savage could do that.

(c) **State what information you provided to Dr. Savage for the purpose of obtaining formal consent from Adam's mother about:**

(i) How the transplant surgery was going to be conducted
(ii) The risks of the transplant being unsuccessful
(iii) The risks to Adam

(i) Dr Savage was an experienced nephrologist and did not need to be told how a transplant was to be done. I could not know the technical details myself until I operated.
(ii) These are standard and Dr Savage would have more knowledge of the risks of paediatric transplantation than I did
(iii) There was no particular risk to Adam's life from the surgery other. Major complications were less than 1% incidence in my hands

In particular state when, where and by what means you provided this information and identify the document where this is recorded. If you did not provide this information to

Dr. Savage, explain the reasons why not. If you did not record in Adam's medical notes and records the provision of this information to Dr. Savage, state why not.

Dr Savage is a recognised expert in the management of renal transplants in children and did not require me to explain to him anything about renal transplantation. He is an expert in the field.

(d) **Describe and explain any effect on:**

(i) Adam's renal transplant surgery
(ii) the risk of Adam's transplant being unsuccessful
(iii) the risks to Adam

of the following factors:

- **Adam's age and size** (i-iii above) (i) Anatomical site of transplant (ii-iii) Nil
- **Adam's multiple previous operations** (i-iii above) The surgery would be slightly more complicated due to adhesions
- **The cold ischaemic time of the donor kidney** - Increased risk of immediate non function
- **The *"widely separated arteries on 1 patch"* (i-iii) (as compared to a single artery)** (i-iii) Nil
- **The half match of the donor kidney** - Please clarify
- **The size of the kidney from the 16 year old donor** (i-iii) Nil (difference in choice of vessel)

If there was no effect, state the reasons why.

There was no reason why Adam should not have had a successful transplant.

(e) **Explain what is meant by *"widely separated arteries on 1 patch"*.**

Two arteries on a patch which would have been too long to stitch on to Adam's arteries.

(f) **State whether you think that Adam had any particular risk factors. If so, state what they were.**

No and there were no surgical complications.

(g) **State whether you believe your fulfilled your duty as a surgeon to warn Mrs. Slavin of the risks inherent in the transplant procedure to enable her to make an informed decision as to whether or not to consent to the procedure.**

In terms of practice in 1995, Dr Savage was better equipped than I was to take consent. He knew all the common complications of transplantation and the results of transplantation in children. More importantly, he is expert in the medical care and management of immunosuppression in children of which I had little knowledge. I played no part in recommending or selecting Adam for the transplant. Dr Savage did that and he was ideally placed to take consent for the procedure as he knew Adam, his medical history and his family intimately. Dr Savage was more than competent to explain the common surgical problems to Adam's mother. Further, I asked Dr Savage if Adam's mum wished to speak to me and he confirmed that all had been explained, consent taken and Adam's mum was

not looking to speak to me. Finally, there were no surgical complications.

(h) **State if you were aware, as at the time of Adam's transplant surgery, of any guidance or procedure on the gaining of consent generally, and specifically in relation to renal transplantation. If so, identify it and state whether it had any impact on your actions in relation to Adam.**

No specific guidance but lots of renal education literature existed in relation to dialysis and transplantation. Dr Savage and his team would have educated Adam's mum about dialysis and transplantation long before the operation.

(40) **State the reasons why you did not see and assess Adam prior to transplant surgery.**

Cross match not through until 1 am. If there was a cross match issue then the operation would be cancelled. There was nothing to gain by me physically seeing Adam as I was capable of dealing with any surgical issue in transplantation. Everything I needed to know was in Adam's medical notes and I had extensive discussions about Adam with Dr Savage. Finally, no surgical complications occurred.

(41) **Explain how Mr. Brown came to act as assistant surgeon in Adam's renal transplant.**

I believe that he was on call.

(a) **State whether you discussed with Dr. Savage a number of Consultant Paediatric Surgeons who might assist in Adam's transplant surgery, and if so, state which of them would have been available to have assisted.**

I had no such discussions.

(b) **State the reasons why the surgeon assisting you in Adam's renal transplant was Mr. Brown.**

Please see above.

(c) **State whether you contacted Mr. Brown with a view to him acting as assistant surgeon in Adam's renal transplant. If you did not contact Mr. Brown, identify the person who did so.**

I did not. I do not know.

(d) **State when you first knew of:**

(i) The cold ischaemic time
(ii) The *"widely separated arteries on 1 patch"* (Ref: 058-009-030)
and the source of that knowledge.

I cannot recall. The information is on the transplant form and the transplant coordinator usually relays the information

(e) **State whether you discussed with Adam's mother the effect on:**

(i) Adam's renal transplant surgery
(ii) the risk of Adam's transplant being unsuccessful
(iii) the risks to Adam

of the following factors:
- Adam's age and size
- Adam's multiple previous operations
- The cold ischaemic time of the donor kidney
- The *"widely separated arteries on 1 patch"* (as compared to a single artery)
- The half match of the donor kidney
- The size of the kidney from the 16 year old donor

If so state when, where and for what purpose you discussed those factors with Ms. Slavin. If you did not do so, explain your reasons.

I did not. I asked if Ms Slavin wished to speak to me. Dr Savage confirmed he had gone through the procedure with her and obtained consent.

(f) State whether you discussed with Dr. Savage the effect on:

(i) Adam's renal transplant surgery
(ii) the risk of Adam's transplant being unsuccessful
(iii) the risks to Adam

of the following factors:
- Adam's age and size
- Adam's multiple previous operations
- The cold ischaemic time of the donor kidney
- The *"widely separated arteries on 1 patch"* (as compared to a single artery)
- The half match of the donor kidney
- The size of the kidney from the 16 year old donor

If so state when, where and for what purpose you discussed those factors with him. If you did not discuss them with Dr. Savage, explain your reasons.

Dr Savage is an expert in renal transplantation in children. He was aware, as I was, of these issues.

(g) State whether you recorded any such discussions with Ms. Slavin and Dr. Savage (as referred to above) in Adam's medical notes and records. If not, explain your reasons.

I did not have any discussion with Ms Slavin.

(42) State your involvement and input in any of the following decisions:

(a) That the match was acceptable for Adam

Nil.

(b) To accept the kidney from UK Transplant

Nil.

(c) **After the tissue cross-match, to confirm that Adam's renal transplant would proceed**

Joint decision with Dr Savage and Dr Taylor.

(d) **On inspection of the kidney, to confirm that Adam's renal transplant would proceed**

Mine alone.

(43) **Prior to each decision in which you were involved or had any input, state:**

(a) **What information you had about the kidney and the source of that information**

I knew the vascular anatomy and ischaemic time. The source is the transplant form.

(b) **What factors you considered**

Optimum time to transplant Adam.

(c) **Whether you discussed those factors with any person, and if so, state with whom and what you discussed.**

Dr Savage and Dr Taylor.

(44) **State at what time you first inspected the donor kidney.**
When I removed the kidney to clean it during preparation.

(a) **State when and how you were first made aware that the donor kidney had two arteries.**

From the transplant co-ordinator. I cannot state the time.

(b) **State at what time you started preparing the donor kidney and its blood vessels.**

I cannot state this precisely but believe it to be approximately between 7am and 8am.

(45) **State whether it would have been possible to carry out *"a pre-operative x-ray"* on 27th November 1995 *"to check line position"* in relation to the CVP. State if you think a chest X-ray should have been performed. If not, explain why not. State whose responsibility it would have been to arrange any such X-ray.**

An x-ray could have been done although this is within the surgeon's responsibilities.

(46) **Describe what, if any, knowledge you had in 1995 of the portering service available on 26th and 27th November 1995 to the theatre in RBHSC for tasks including the transporting of specimens to the laboratory.**

I cannot.

(47) **State whether or not you knew in 1995 if a pneumatic tube system was available in RBHSC on 27th November for samples from the theatre to be sent directly to the laboratory.**

I cannot.

(48) State whether, in November 1995, the RBHSC had, or had access to, any portable blood gas analyser machines e.g. iSTAT blood gas analyser to measure sodium, potassium, urea, and creatinine. If so:

(a) Identify the type of blood gas analyser that was available at that time

I cannot.

(b) State where it was located.

I cannot.

(c) State what arrangements would have been required for its use in Adam's transplant surgery.

I cannot.

(d) State the accuracy of the results for sodium compared to

(i) the static blood gas analyser.

I cannot.

(ii) laboratory blood tests.

I cannot.

(49) State the normal turnaround time for laboratory analysis of serum sodium on 27th November 1995 between dispatching the blood sample to the laboratory and receipt of the result during:

(a) Normal working hours (weekdays 09.00 to 17.00).

I cannot.

(b) Out of hours (weekdays 17.00 to 09.00 or at weekends/holidays).

I cannot.

(c) In urgent cases, whether or not they arise within working hours.

I cannot.

(50) Explain why you connected the arteries of the donor kidney to Adam's external iliac artery, including:

(a) Why you used the external iliac artery in preference to either the common iliac artery or the aorta. Whether you considered using the common iliac artery or the aorta. If you did not, explain your reasons. If you did consider it, explain why you nonetheless used the

external iliac artery.

I considered using aorta common iliac but it was my judgement that Adam's Iliac vessels were satisfactory in calibre. No surgical complication occurred.

(b) **Why you used the external iliac vein in preference to either the common iliac vein or the inferior vena cava. If you did not, explain your reasons. If you did consider it, explain why you nonetheless used the external iliac vein.**

I considered the common iliac and vena cava but my judgement was the external iliac vein was suitable. No surgical complication occurred.

(51) **State whether you were aware of any application by the RBHSC to be an accredited institution with the King's Fund Organisation Audit (KFOA) Programme and standards in 1995. If so, state whether you believe the care and treatment of Adam complied with the KFOA standards, and explain the basis for your belief. If not, explain the respects in which it did not comply.**

I was not.

(52) **State whether you were aware of any discussions relating to Adam's death and his inquest involving the Trust, clinical or managerial staff concerning the lessons that could be learned and/or action that should be taken.**

(a) **If so, state when those discussions took place, who participated in them and what the outcome was.**

There were discussions. I attended one meeting but because I am an adult surgeon I was not involved further. I cannot remember the date.

(b) **State, in particular, the extent to which you were involved in any such discussions and/or action whether in relation to RBHSC or Belfast City Hospital.**

Minimal.

(c) **If you were not involved in either discussions or action, explain why not.**

I do not routinely treat children.

(53) **State your involvement, if any, at any stage with the clinical negligence claim which was pursued following Adam's death.**

I was asked for a statement (011-003) which I believe was in relation to a clinical negligence claim.

(54) **Describe the procedure for clinical audit at RBHSC in November 1995 and identify any relevant documents**

I cannot.

(a) **Describe the current procedure for clinical audit at RBHSC and identify any relevant**

documents

I cannot.

(b) **Describe what you did in terms of a 'clinical audit' of Adam's case, and provide any relevant documents.**

I did not perform an audit, I ceased transplanting young children.

(c) **State whether your actions relating to a clinical audit of Adam's case would differ in 2011 and if so, how. If not, explain why not.**

In 2011 there would have been a critical incident meeting called about such a case.

(55) **Describe the procedure for discussions of deaths amongst medical personnel (e.g. 'death meetings' / 'morbidity and mortality meetings') at RBHSC in November 1995 and identify any relevant documents**

(a) **Describe the current procedure for discussions of deaths amongst medical personnel (e.g. 'death meetings' / 'morbidity and mortality meetings') at RBHSC and identify any relevant documents**

I did not and do not routinely work at RSHBC and therefore, I cannot.

(b) **Describe whether you participated in any such meetings in Adam's case, and if so, state when and provide any relevant documents**

I did not.

(56) **Attached is a table showing the various phases in Adam's renal transplant operation. Using the initials of each person or, in the event of not knowing the identity of the person, the job title, state under each phase the personnel who were:**

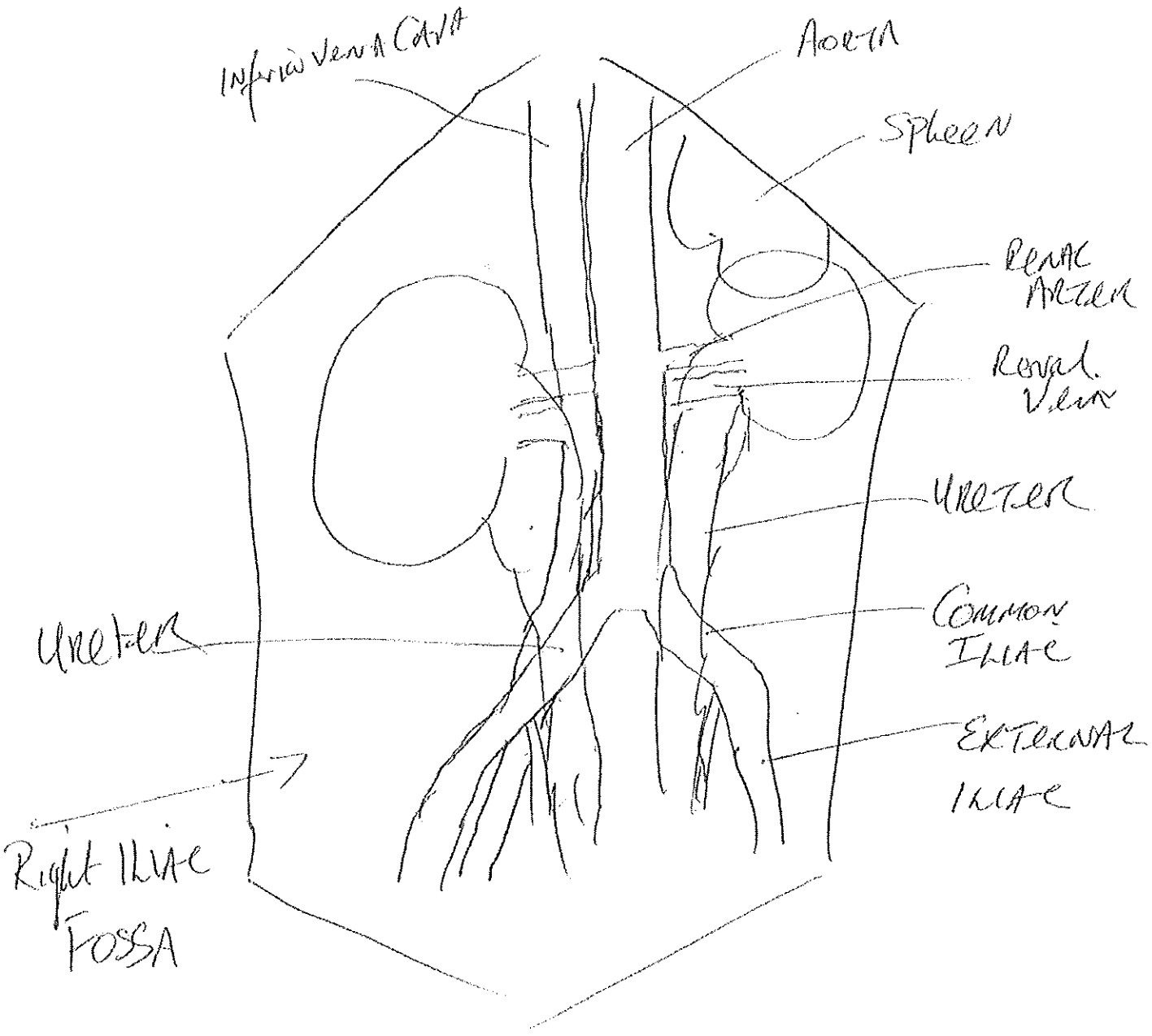
(a) **Present using the "+" symbol and**

(b) **Actively participating using the "++" symbol.**

THIS STATEMENT IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF

Signed: Fahmi Hearne **Dated:** 20.9.11

WS-006-3 9(h)(i)


Inferior Vena Cava
Aorta
Spleen
Renal Artery
Renal Vein
Ureter
Ureter
Common Iliac
External Iliac
Right Iliac Fossa

WS-006-3 9(h)(ii)

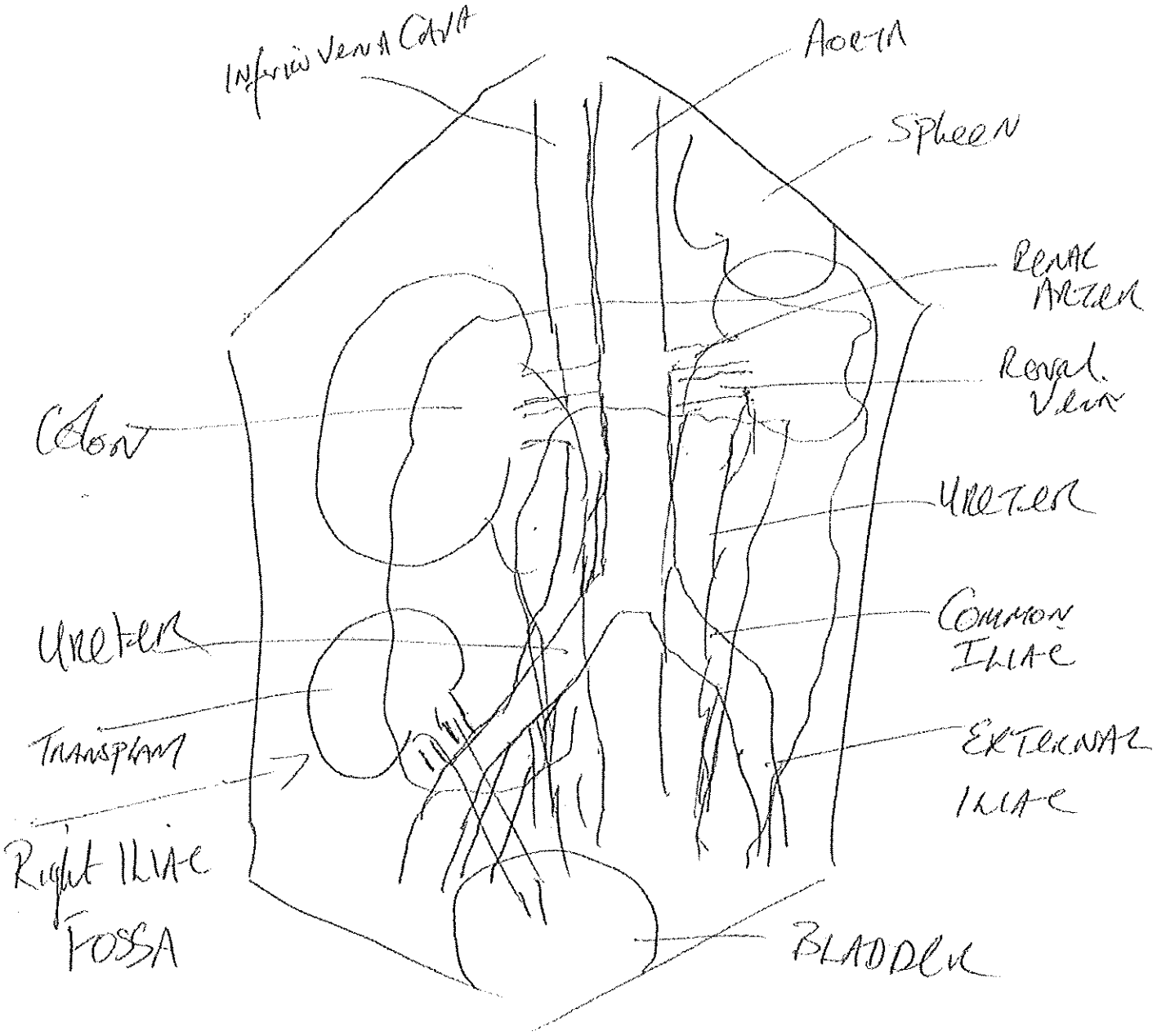

Inferior Vena Cava
Aorta
Spleen
Renal Artery
Renal Vein
Colon
Ureter
Ureter
Common Iliac
Transplant
External Iliac
Right Iliac Fossa
Bladder

TABLE FOR PAEDIATRIC RENAL TRANSPLANT
Showing the involvement of personnel in the various phases

Phase of the transplant process	Physicians/ ward staff/ ICU staff	Anaesthetists	ODA/ ODP/ MTO	Surgeons	Scrub nurse	Runner
1. Transplant option first mentioned to family	++					
2. Transplant surgery consent process started; risks/benefits explained	++					
3. Preoperative preparation on evening of admission; consent confirmed	++			+		
4. Preoperative preparation; fasting, i.v. fluids; blood tests; dialysis; ultra sound of neck re: CVP line	++	++	+			
5. Preparing theatre for start of surgery/check monitors & equipment			++		++	
6. Preparing donor kidney				++		
7. Patient arrival in operating theatre; i.v. inserted; anaesthesia induced		++	+		+	
8. Insertion epidural, arterial and CVP lines; x-ray of the CVP line and uretheral catheter inserted		++	++			
9. Pre-transplant phase of surgery **PLEASE CLARIFY**						
10. Vascular and ureteric anastomoses performed; ureteric and/or suprapubic catheter inserted	+	+	+	++	+	
11. Post-transplant phase of surgery including wound closure	+	+	+	++	+	
12. Post-surgery; anaesthesia stopped; drapes removed; drains connected	+	++	++			
13. Child transferred to ICU	++	++				
14. Communicating child's condition at end of surgery to parents	++	++		++		
15. Communicating child's death to parents	++	++		++ (IF SURGICAL CAUSE)		

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Year : 2001 | **Volume** : 17 | **Issue** : 2 | **Page** : 97-102

TURP syndrome - current concepts in the pathophysio

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Abstract

Trans Urethral Resection of Prostate (TURP) syndrome is one of the commonest and dread surgery. Even in the best of hands, the incidence of TURP syndrome is up to 20% and car-ri highlights the various pathophysiological mechanisms of TURP syndrome, steps to prevent/ treatment of established TURP syndrome.

Keywords: Trans Urethral Resection of Prostate Syndrome (TURP Syndrome); Glycine; Hy Saline; Water Intoxication.

How to cite this article:
Moorthy HK, Philip S. TURP syndrome - current concepts in the pathophysiology 102

How to cite this URL:
Moorthy HK, Philip S. TURP syndrome - current concepts in the pathophysiology online] 2001 [cited 2011 Sep 2];17:97-102. Available from: http://www.indianjurol.

Introduction

Trans Urethral Resection of Prostate (TURP) is the sec-ond most common surgical procedu the age of 65 years. Advancement in technology has enabled the urologists to reach all corn causing minimum trauma to the patient. Endoscopic procedures in the urinary system requir mucosal spaces, remove blood, cut tissue and debris from the operating field and enable be understand and prevent the various compli-cations of endoscopic procedures, incidence of s the same and still daunt the urologists. Aberrations in the Central Nervous Sys-tem (CNS), C which manifest due to the absorption of irrigating fluids during TURP are together known as Syndrome, this complication can occur during other endoscopic procedures also namely Ure Nephrolithotomy (PCNL), Trans Cervical Resection of Endometrium (TCRE), etc. Despite im

management, 2.5 - 20% of patients undergoing TURP show one or more manifestations of T perioperatively.

Signs and Symptoms

TURP syndrome may occur at any time perioperatively [1] and has been observed as early i late as several hours after surgery has been completed. When under regional anesthesia, th

- Dizziness
- Headache
- Nausea
- Tight feeling in the chest and throat
- Shortness of breath
- Restlessness
- Confusion
- Retching
- Abdominal pain

Both systolic and diastolic blood pressures rise and the heart rate decreases. If not treated p hypotensive and go in for cardiac arrest.

Some patients present with neurological symptoms. Ini-tially they become lethargic and then sluggishly to light. This may be fol-lowed by short episodes of tonic-clonic seizures leading t

Under General Anesthesia (GA), the diagnosis of TURP Syndrome is difficult and often dela then a fall in BP and refractory brady-cardia. ECG changes such as nodal rhythm, ST chang may be observed. Recovery from GA and muscle relaxants may be delayed.

Irrigation Solutions

Irrigating fluids are used during endourological procedures for better vision. Ideally the irriga electrically inert (so that diathermy can be used), non toxic, transparent, easy to sterilize an all these qualities is not yet available. Electrolyte solutions such as normal saline or Ringer circulation. However they cause disper-sion of high frequency current from the resectoscop irrigating fluids have been in use, each having its own merits and demerits.

Sterile water: Though sterile water has many qualities of an ideal irrigating fluid, the disadva hemolysis, dilutional hyponatremia, shock and renal failure.

Glycine 1.2%, 1.5%. 2.2%: Glycine, an endogenous amino acid has been suggested as a s advantages, including the low cost, [3] though not as cheap as sterile water. Glycine is isot but the side effects of glycine at this concentration are more. The os-molality of 1.5% glycin 290 mosm/l and hence cardiovascular and renal toxicities can occur at this concentration a can lead to more complications due to hypotonicity and hence can-not be used for irrigation

over sterile water is its tendency to cause less hemolysis and renal failure.

Mannitol 3%: Mannitol, though does not have the toxicities of glycine, drives water out of cell The cost of mannitol is also higher compared to glycine. The elimination of man-nitol through impaired renal function.

Glucose 2.5% - 4%: This is not a widely used irrigating fluid since glucose produces tissue c hyperglycemia produced when glucose is absorbed into the circulation. It also causes stickin

Cytal: Cytal, a mixture of sorbitol 2.7% and mannitol 0.54%[5] widely used in USA as an irri to its high cost and non-availability. In the body, sorbitol is metabolised to fructose, which ma hypersensi-tivity to fructose.

Urea 1%: This produces urea crystallisation on the in-struments during resection and hence

1.5% glycine and sterile water are the most widely used irrigating fluids in urological endosc

Pathophysiology

1. Circulatory Overload

The uptake of small amounts of irrigating fluids has been shown to occur during almost ever network of prostatic bed and endometrium respectively. Spontaneous leakage through *Fall* during TCRE. The fluid absorp-tion has been studied by the expired breath ethanol tests afte 1 % to the irrigating fluid. [9] The uptake of I litre of fluid within one hour, which corresponds concentration of 5-8 mmols/l, is the volume above which the risk of absorption related sympt average rate of fluid absorption during TURP is 20 ml/min. Due to circulatory overload, the b pressures increase and the heart may fail. The absorbed fluid dilutes the serum proteins anc concur-rent with the elevated blood pressure, drives fluid from the vascular to interstitial com edema. In addition to direct absorption into the cir-culation, a significant volume (upto 70%) accumulate interstitially, in the periprostatic and retroperitoneal spaces. For every 100 ml of meq of so-dium also moves with it.

Though the duration of surgery has not been conclu-sively proved to be the determinant for t mortality were found to be defi-nitely higher when surgery was prolonged over 90 min-utes. [the size of the prostate, while interstitial absorption depends primarily on the integrity of pros the weight of the gland is more than 45 grams. Another important factor that determines the pressure at the prostatic bed. This pressure depends on the height of irrigating fluid column surgery. The ideal height of irrigating fluid is 60 cm so that approximately 300 ml. of fluid is o vision.

2. Water Intoxication

Some patients with TURP syndrome present symptoms of water intoxication, [13] a neurolo of the brain. The patient becomes first somnolent and then incoherent and restless. Seizure decerebrate posi-tion. There will be clonus and positive Babinski responses. Papilloedema, The EEG will show low voltage, bilaterally. The symptoms of water intoxication appear wher

normal level.

3. Hyponatremia

Sodium is essential for proper function of excitatory cells, particularly those of heart and brai
TURP patients. [14]·[15]·[16]·[17]

- Dilution of serum sodium through excessive absorp-tion of irrigation solution.
- Loss of sodium into the stream of the irrigation fluid from the prostatic resection site.
- Loss of sodium into pockets of irrigation solution ac-cumulated in the periprostatic and retr
- Larger amounts of glycine stimulate the release of atrial natriuretic peptide in excess of tha promote natriuresis.

The symptoms of hyponatremia are restlessness, con-fusion, incoherence, coma and seizur hypotension and reduced inyocardial contractility occur. Below 115 meq/1, brady-cardia and and T wave inversion occur. Below 100 meq/1 generalised seizures, coma, respiratory arres Fibrillation (VF) and car-diac arrest occur. Sodium requirement is calculated by the following

Sodium Deficit = Normal serum Na - Estimated serum Na x Volume of body water (Body wa

4. Glycine Toxicity

Excess of glycine absorbed into circulation is toxic to heart and retina and may lead to hyper found to reduce the vitality and sur-vival of isolated cardiomyocytes. [18] In patients, glycine on the myocar-dium, manifested as depression or inversion of the T wave on the electrocard exceeding 500 ml has been shown to double the long-term risk of acute myocardial infarctio higher long-term mortality after transurethral versus open prostatectomy, which has been a c seems to depress myocar-dial function, particularly when the operative duration ex-ceeds 1 h temperature. [22] About 0.5% of patients develop acute myocardial infarction during TURP, h been detected during 20% of TURPs. Dilutional hypocalcemia has also been implicated as a when glycine is absorbed.[24]·[25] However calcium is restored more rapidly, probably due

Glycine is known to be a major inhibitory neurotrans-mitter in the spinal cord and in the brain gamma amino butyric acid on the chloride ion channel. Too high a concentration may theref and visual disturbances. Glycolic acid, formate and formaldehyde are other metabolites of gl disturbances. The signs of glycine toxicity [11] are nausea, vomiting, slow respiration, seizu oliguria, anuria and then death. When arginine, another nonessential amino acid is added to the heart is blunted. The mechanism by which arginine protects the heart is unknown. The n mg/l. Glycine toxicity is very uncommon in TURP patients probably because most of the abs retroperitoneal spaces, where it has no systemic effect.

5. Ammonia Toxicity

Ammonia is a major by-product of glycine metabolism." High ammonia concentration suppre brain. This causes the en-cephalopathy of TURP syndrome. Fortunately ammonia toxicity is oc-curs within one hour after surgey. [28] The patient develops nausea and vomiting and th 500 micromols/1 (normal value is 11-35 micromols/1). Hyperammonemia lasts for over ten h contin-ues to be absorbed from the periprostatic space.

It is not clear why hyperammonemia does not develop in all TURP patients. Hyperammonen glycine through the glycine cleavage system, [29] citric acid cycle [30] and conversion to gl possible ex-planation is arginine deficiency. Ammonia is normally con-verted to urea in the li intermediary products necessary for this cy-cle. When a patient has arginine deficiency, orni accumulates.

6. Hypovolemia, Hypotension

The classical hemodynamic signs of the TURP syn-drome, when glycine is used as irrigatin that may be absent if the bleeding is profuse, followed by more prolonged hypo-tension. [32] endotoxins into the circulation and associated metabolic acidosis might contribute to this hyp leads to hypovolemia, causing signifi-cant loss in oxygen carrying capacity leading to myoca correlates with the size of prostatic gland resected, duration of surgery and skill of the surge 10 m1/gram of prostate resected.

7. Visual Disturbances

One of the most alarming complications of TURP syndrome is transient blindness, foggy visi [33]·[37]·[38] The pupils may be dilated and unresponsive. The optic disc appears normal. TURP syndrome or can be an isolated symptom. The vision returns to normal in 8-48 hours retinal dysfunction probably due to glycine toxicity. [39] Hence perception of light and blink r light and accommodation are lost in TURP blindness, unlike in blindness due to cere-bral co

8. Perforations

Perforation of urinary bladder can occur during TURP due to surgical instrumentation, in diffi rarely explosion inside the bladder. Instrumental perforation of the prostatic capsule has bee TURP. [15]·[40] An early sign of perforation, which often goes unnoticed, is a decreased ret pain, distension, nausea and distress follow. Bradycardia and arterial hypotension are profou spontaneously. In intraperitoneal perforation, symptoms develop faster. Referred shoulder p are characteristic symptoms. [41]·[42] Pallor, diaphore-sis, abdominal rigidity, nausea, vomi perforation, reflex movements of lower limbs may occur.

Explosions inside the bladder are fortunately rare. Cau-terisation of prostatic tissue is believ enough oxygen will be available inside the bladder to permit an explosion. But when air en-t

9. Coagulopathies

Disseminated Intravascular Coagulation (DIC) or consump-tion coagulopathy [12] can occu thromboplastins into the circulation causing secondary fibrinolysis. Dilutional thrombocytope detected in the blood by a decrease in platelet count, high levels of fibrin degradation produ levels (400 mg/dl).

10. Bacteremia, Septicemia and Toxemia

About 30% of all TURP patients have infected urine preoperatively. When prostatic venous pressure irrigation is used, bacte-ria enter the circulation. In about 6% of patients, the bacte bacterial endotoxins and toxic byproducts of tissue co-agulation may lead to a toxic state in fever, capillary dilatation and hypotension can occur temporarily in these patients.

11. Hypothermia

Hypothermia is a frequent observation in patients un-dergoing TURP. A drop in the body tem results in shivering [43] and mark-edly increases oxygen consumption. Bladder irrigation is a irrigating fluids at room temperature results in a decrease in body temperature of 1-2° C. Thi temperature of operation theatre. Elderly pa-tients are particularly susceptible to hypothermia associated vaso-constriction and acidosis can adversely affect the heart and can contribute t enhance bleeding from the resection site.

Prophylaxis Against TURP Syndrome

Identification of early symptoms of TURP syndrome and prevention is essential to retard the patients undergoing endoscopic surgeries. [12] Pre-existing hyponatremia should be identi-f diuretics and low salt diet. Prophylactic antibiotics may have a role in the prevention of bacte (CVP) monitoring or pulmonary artery cath-eterisation is necessary in patients with cardiac il [44] The dura-tion of TURP should be restricted to 1 hour [39] , and in cases requiring more performed. Prostatic capsule should be preserved as far as possible and distension of bladd claimed to decrease fluid absorption, [45] whereas some authors have found no such reduc

Serum sodium should be estimated every 30 minutes and necessary corrections should be r maintain optimum hemodynamics. Prophylactic frusemide should be given to avoid fluid ove be preferred to whole blood for transfusion to avoid circulatory over-load. Increasing the atm warm blankets, mattresses and intravenous fluids and using irrigating fluids prewarmed to 3

General Anesthesia vs Regional Anesthesia in T

TURP performed under regional anesthesia without se-dation (Awake TURP) is preferable t

- Early manifestations of TURP syndrome are better detected in awake patients.
- Peripheral vasodilatation helps to minimize circula-tory overloading.
- Provides some degree of postoperative analgesia.
- Blood loss will be less.

However the possible sudden hemodynamic fluctuations of spinal or epidural anesthesia sh administering regional anesthesia.

Treatment

The treatment of TURP syndrome involves correction of various pathophysiological mechan [16] [24] [25] [47] [48] Ideally the treatment has to be instituted before serious CNS or car

When TURP syndrome is diagnosed, surgical proce-dure should be terminated as early as p dose of 1 mg/kg intravenously. However, the use of frusemide to treat TURP syndrome has sodium excre-tion. Hence 15% mannitol has been suggested as a better choice, due to its a tendency to increase extracellular osmolality. Oxy-gen should be administered by nasal cani tracheal intubation and posi-tive pressure ventilation with 100% oxygen.

Arterial blood gases, hemoglobin and serum sodium are to be estimated. Correction of hypo administration of 3-5% hyper-tonic saline at the rate of not more than 0.5 meq/1 per hour or hypertonic saline is needed for correction of hypo-natremia. Rapid administration of saline le myelinolysis. Two-thirds of the hypertonic saline restores serum sodium and osmo-lality, whi extracellular space, where it becomes available to diuretic treatment with frusemide.

Intravenous calcium may be used to treat acute cardiac disturbances during surgery. Seizur diazepam/midazolam/barbiturate/dilantin or a muscle relaxant depending on the severity.

Significant blood loss should be managed by adminis-tering packed red cells. In cases of DI intravenously followed by heparin infusion 2000 units bolus (and then 500 units per hour). Fr be used depending on the coagulation profile.

Surgical drainage of retroperitoneal fluid in cases of perforation can reduce the morbidity an

References

1. Norris HT, Aasheim GM, Sherrard DJ, Tremann JA. Symptoma-tology, pathophysiolc the prostate syndrome. Br J Urol 1973: 45: 420-427. †
2. Madsen PO, Madsen RE. Clinical and experimental evaluation of different irrigating fl 122-129. †
3. Nesbit RM, Glickman SI: The use of glycine solution as an irrigat-ing medium during 216. †
4. Godwin WE, Carson JF. Scott WW. Hemoglobinemia and lower nephron nephrosis f new non hemolytic irrigating solution - 3% mannitol as preventive. J Urol 1951; 65: 1
5. Schulte TL, Hammer HL Reynolds LR. Clinical use of cytal in urology. J Urol 1954: 7
6. Hoekstra PT, Kahnoski R, McCamish MA, Bergen W. Heetderks DR. Transurethral p encephalopathy with associated hyperammonaemia. J Urol 1983; 130: 704-707. †
7. Chuff PT, Short T. Leung AKL, Tan PE, Oh TE. Systemic absorp-tion of glycine irriga transcervical endometrial resection. Med J Aust. 1992; 157: 667--669. †
8. Olsson J, Hahn RG. Ethanol monitoring of irrigating fluid absorp-tion in transcervical Scand 1995; 39: 252-258. †
9. Hahn RG. Ethanol monitoring of irrigating fluid absorption (re-view). Eur J Anaesthes
10. Olsson J, Nilsson A. Hahn RG. Symptoms of the transurethral re-section syndrome u 128. †
11. Hahn RG, Ekengren JC. Patterns of irrigating fluid absorption dur-ing transurethral re Urol 1993; 149: 502-506. †
12. Mebust WK. Transurethral surgery. In Campbell's Urology. Walsh PC, Retik AB, Star Philadel-phia. 1992; 2900-2919. †
13. Henderson DJ. Middleton RG. Coma from hyponatremia follow-ing transurethral rese
14. Norris HT, Aasheim GM. Sherrard DJ, Tremann JA. Symptoma-tology, pathophysiol the prostate syndrome. Br J Urol 1973; 45: 420-427. †

15. Mebust WK, Holtgrewe HL. Cockett ATK et al.Transurethral pros-tatectomy: immedia study of 13 participating institutions evaluating 3885 patients. J Urol 1989; 141: 243-2
16. Bernstein GT, Loughlin KR, Gittes RE. The physiologic basis of the TUR syndrome.
17. Hahn RG. Stalberg H. Carlstrom K et al. Plasma atria] natriuretic peptide concentratic glycine solution in conscious sheep. Prostate 1994: 24: 55-61.
18. Zhang W, Andersson B, Hahn RG. Effect of irrigating fluids and prostatic tissue extra 821-824.
19. Hahn RG, Essen P. ECG and cardiac enzymes after glycine absorp-tion in transureth 1994; 38: 550-556.
20. Hahn RG, Nilsson A. Farahmand B, Ekengren J. Persson PG. Op-erative factors and transurethral resection of the prostate. Epidemiology 1996; 6: 93-95.
21. Garcias VA, Mallouh C. Park T et al. Depressed myocardial function after transurethr 427.
22. Evans JWH, Singer M, Coppinger SW V et al. Cardiovascular per-formance and core Urol 1994; 152: 2025-2029.
23. Ashton CM, Lahart CJ, Wray NP. The incidence of perioperative myocardial infarctior Geriatr Soc 1989; 37: 414-418.
24. Charlton AJ. Cardiac arrest during transurethral prostatectomy af-ter absorption of 1.! literature. Anaesthesia 1980; 35: 804-806.
25. Krohn JS. Dilutional hypocalcemia in association with dilutional hyponatremia. Anaes
26. Hahn RG, Stalberg HP, Gustafsson SA. Intravenous infusion of ir-rigating fluids conta J Urol 1989; 142: 1102-1105.
27. Roesch RP, Stoelting RK, Lingeman JE et al. Ammonia toxicity resulting from glycine prostate. Anesthesiology 1983; 58: 577-579.
28. Hahn RG, Stalberg HP. Ekengren J, Rundgren M. Effects of 1.5% glycine solution wi elderly men. Acta Anaesthesiol Scand 1991; 35: 725-730.
29. Yoshida T, Kikuchi G. Major pathways of glycine and serine ca-tabolism in rat liver. A
30. Hahn RG. Amino acid concentrations in serum and urine after in-travenous infusion c 1992; 21:173-181.
31. Perier C, Mahul P, Molliex S, Auboyer C, Frey J. Progressive changes in glycine and fluid after transurethral resection of the prostate. Clin Chem 1990; 36: 2152-2153.
32. Harrison RH, Boren JS, Robison JR. Dilutional hyponatremic shock - another concep Urol 1956; 75: 95-110.
33. Hahn RG. Fluid and electrolyte dynamics during development of the TURP syndrom
34. Hahn RG. Acid phosphatase levels in serum during transurethral prostatectomy. Br J
35. Sohn MH, Vogt C, Heinen G et al. Fluid absorption and circulating endotoxins during 1993; 72: 605-610.
36. Hahn RG. Acid base status following glycine absorption in transure-thral surgery. Fu
37. Wang JM, Won- KC, Creel DJ, Clark WM, Shahangina S. Effects of glycine on hemo the dog. Anesth Analg 1985; 64: 1071-1077.
38. Ovassapian A, Joshi CW, Brumer EA. Visual disturbances - An unusual symptom of Anesthesiology 1982; 57: 332-334.
39. Hahn RG. Irrigating fluids in endoscopic surgery. Br J Urol 1997; 79: 669-680.
40. Hahn RG. Transurethral resection syndrome from extravascular ab-sorption of irrigat 394.
41. Weber S, Acuff JH, Mazloomdoost'M, Kirimli BL. Transurethral prostatectomy compli fluid. Can J Anaesth 1987; 34: 193-195.
42. Hahn RG. Transurethral resection syndrome after transurethral re-section of bladder
43. Stjernstrom H, Henneberg S, Eklund A, Arturson G, Wiklund L. Thermal balance dur Anaesthesiol Scand 1985; 29: 743-749.

44. Ekengren J, Zhang W. Hahn RG. Effects of bladder capacity and height of fluid bag c re-section of the prostate. Fur Urol 1995; 27: 26-30.
45. Madsen PO, Frimodt-Moller PC. Transurethral prostatic resection with suprapubic tro
46. Ekengren J, Hahn RG. Continuous versus intermittent flow irriga-tion in transurethral 332.
47. Singer M, Patel M, Webb A, Bullen C. Management of the transure-thral prostate res Med 1990; 18: 1479-1480.
48. Hahn RG, Nilsson A, Hjelmqvist H, Zhang W, Rundgren M. Renal function during intr sheep. Acta Anaesthesiol Scand 1996; 40: 671-683.
49. Bodner H, Howard AH, Ross SC. Use of mannitol in transurethral prostatectomy. J U
50. Holtgrewe HL, Valk WL. Factors influencing the mortality and mor-bidity of transureth 1962; 87: 450-459.

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Urology Curriculum

Proposed for August 2010

Contents

Introduction

The intercollegiate surgical curriculum provides the framework for systematic training from completion of the foundation years through to consultant level in the UK. It achieves this through a syllabus that lays down the standards of specialty-based knowledge, clinical judgement, technical and operative skills and professional skills and behaviour, which must be acquired at each stage in order to progress. The curriculum is web based and is accessed through www.iscp.ac.uk. The website contains the most up to date version of the curriculum and each of the nine surgical specialty syllabuses. The nine specialities include General Surgery, Urology, Paediatric surgery, Cardiothoracic surgery, Trauma and Orthopaedic surgery, Oral and Maxillofacial surgery (OMFS), Plastic surgery, Neurosurgery and Otolaryngology (ENT). They all share many aspects of the early years of surgical training in common, but naturally become increasingly singular as training in each discipline becomes more advanced. Each syllabus will emphasise the commonalities and elucidate in detail the requirements for training in the different specialities.

Doctors who will become surgical trainees

After graduating from medical school doctors immediately move onto a mandatory two-year foundation programme in clinical practice. During their final year of medical school students are encouraged to identify the area of medicine they wish to pursue into specialist training. During the Foundation programme, the recently qualified doctor is under close supervision whilst gaining a wide range of clinical experience during their first opportunity to practise medicine whilst attaining a range of defined competencies. Entry into surgery is in open competition and requires applicants to understand, and provide evidence for, their suitability to become members of the surgical profession.

Selection into a surgical discipline

The responsibility for setting the standards for surgery rests with the Royal Colleges of Surgeons which operate through the Joint Committee on Surgical Training (JCST) and its nine Specialty Advisory Committees (SACs). Each SAC has developed the person specifications for selection into their specialty and the person specification for entry to ST1/CT1 in any discipline. Postgraduate Medical Deaneries and their Schools of Surgery are responsible for running training programmes and for the recruitment and selection at all levels of pre-CCT training.

The critical selection points for surgical training are at initial entry either directly into their chosen discipline (ST1) or into a generic training period referred to in this document as core (CT1). Those who enter core training then are selected into the discipline of their choice after two to three core years and join the speciality programme at a key competency point (ST3) after which stage transfer from one discipline to another would prove highly impractical.

Selection takes place via selection centres run either by individual Deaneries and Schools or in clusters arranged either by specialty or by locality. Some of these clusters aim for a national selection process for the whole of a discipline (for example, urology, cardiothoracic surgery and neurosurgery) and others through practical problems posed by size and volume to regionally orientated groups (for example General and Trauma and Orthopaedic surgery). The development of selection centres is part of ongoing work and evaluation.

Those who are selected into training programmes will then have to achieve agreed milestones in terms of College examinations and the local Annual Review of Competence Progression (ARCP) arrangements in Deaneries which will include the described work place based assessments.

Guidance about the recruitment process, application dates and deadlines and links to national person specifications by specialty are available from the Modernising Medical Careers website.

The Educational Principles of the Curriculum

The provision of excellent care for the surgical patient, delivered safely, is at the heart of the curriculum.

The aims of the curriculum are to ensure the highest standards of surgical practice in the UK by delivering high quality surgical training and to provide a programme of training from the completion of the foundation years through to the completion of specialist surgical training, culminating in the award of a CCT. The curriculum was founded on the following key principles that support the achievement of these aims:

- A common format and similar framework across all the specialties within surgery.
- Systematic progression from the end of the foundation years through to the exit from surgical specialist training.
- Curriculum standards that are underpinned by robust assessment processes, both of which conform to the standards specified by PMETB.
- Regulation of progression through training by the achievement of outcomes that are specified within the specialty curricula. These outcomes are competence-based rather than time-based.
- Delivery of the curriculum by surgeons who are appropriately qualified to deliver surgical training.
- Formulation and delivery of surgical care by surgeons working in a multidisciplinary environment.
- Collaboration with those charged with delivering health services and training at all levels.

The curriculum is broad based and blueprinted to the Good Medical Practice framework to ensure that surgeons completing the training programme are more than just technical experts.

Equality and diversity are integral to the rationale of the curriculum and underpin the professional behaviour and leadership skills syllabus. The ISCP encourages a diverse surgical workforce and therefore encourages policies and practices that:

- Ensure every individual is treated with dignity and respect irrespective of their age, disability, gender, religion, sex, sexual orientation and ethnic, national or racial origins;
- Promote equal opportunities and diversity in training and the development of a workplace environment in which colleagues, patients and their carers are treated fairly and are free from harassment and discrimination.

It is expected that these values will be realised through each individual hospital trust's equality and diversity management policies and procedures. This principle also underlies the Professional Behaviour and Leadership syllabus.

Who Should Use the Curriculum?

This version of the curriculum will apply to all trainees entering surgical training at CT1/ST1 level from August 2010 onwards. Trainees entering surgical training prior to that date will continue to use the curriculum that was in place at the time that they entered surgical training, although all surgical trainees will be given the opportunity to switch to the new curriculum. Trainees appointed into training programmes prior to 31 December 2006 (UK Calman system) will also be encouraged to use the new curriculum.

The curriculum is appropriate for trainees preparing to practice as consultant surgeons in the UK. It guides and supports training for a Certificate of Completion of Training (CCT) in a surgical specialty. The curriculum enables trainees to develop as generalists within their chosen surgical specialty, to be able to deliver an on-call emergency service; and to deliver more specialised services to a defined level.

Doctors applying for a Certificate of Eligibility for Specialist Registration (CESR) via Article 14(4) on or from 1 August 2010 will be required to demonstrate that they meet the standards required for a CCT as set out in the curriculum. Doctors applying for a CESR before that date will be required to demonstrate that they meet the standards set for a CCT according to the version of the curriculum that was current at the time of their application.

Components of the Curriculum

The surgical curriculum has been designed around four broad areas, which are common to all the surgical specialties:

- Syllabus - what trainees are expected to know, and be able to do, in the various stages of their training
- Teaching and learning - how the content is communicated and developed, how trainees are supervised
- Assessment - how the attainment of outcomes are measured/judged, feedback to support learning
- Training systems and resources - how the educational programme is organised, recorded and quality assured

In order to promote high quality, safe care of surgical patients, the curriculum specifies the parameters of knowledge, clinical skills, technical skills, professional behaviour and leadership skills that are considered necessary to ensure patient safety throughout the training process and specifically at the end of training. The curriculum therefore provides the framework for surgeons to develop their skills and judgement and a commitment to lifelong learning in line with the service they provide.

Length of training

A similar framework of stages and levels is used by all the specialties. Trainees progress through the curriculum by demonstrating competence to the required standard for the stage of training. Within this framework each specialty has defined its structure and indicative length of training. The individual specialty syllabuses provide details of how the curriculum is shaped to the stages of training.

In general terms, by the end of training, surgeons have to demonstrate:

- Theoretical and practical knowledge related to surgery in general and to their specialty practice;
- Technical and operative skills;
- Clinical skills and judgement
- Generic professional and leadership skills;
- An understanding of the values that underpin the profession of surgery and the responsibilities that come with being a member of the profession;
- The special attributes needed to be a surgeon;
- A commitment to their ongoing personal and professional development and practice using reflective practice and other educational processes;
- An understanding and respect for the multi-professional nature of healthcare and their role in it; and
- An understanding of the responsibilities of being an employee of an NHS trust, hospital and/or a private practitioner.

In the final stage of training, when the trainee has attained the knowledge and skills required for the essential aspects of the curriculum in their chosen speciality, there will be the opportunity to extend his/her skills and competences in one or two specific fields. The latter part of the Urology syllabus is modular in format, with content that covers the major areas of highly specialised practice. The syllabuses are intended to allow the CCT holder to develop a particular area of clinical interest and expertise within these modules upon appointment to a consultant post. Some will require further post CCT training in order to achieve the competences necessary for some of the rarer complex procedures.

Educational Framework

The educational framework is built on three key foundations that are interlinked:

- Stages in the development of competent practice
- Standards in the areas of specialty-based knowledge, clinical judgement, technical and operative skills, and professional behaviour and leadership
- Framework for Appraisal, Feedback and Assessment

Stages of training

The modular surgical curriculum framework has been designed to define stages in the development of competent surgical practice, with each stage underpinned by explicit outcome standards. This provides a means of charting progress through the various stages of surgical training in the domains of specialty-based knowledge, clinical and technical skills and professional behaviour and leadership (including judgement).

Each surgical specialty has adapted this approach to reflect their training pathway. Therefore, although the educational concept is the same for all specialties the composition of the stages will differ.

The initial stage reflects the early years of surgical training and the need for surgeons to gain competence in a range of knowledge and skills many of which will not be specialty specific. A syllabus, which is common to all the surgical specialties (*the common component of the syllabus*, which is founded in the applied surgical sciences) has been written for this stage. This is supplemented by the topics from the appropriate surgical specialty syllabus as defined in each training programme (*the specialty specific component of the syllabus*).

During the intermediate and final stages the scope of specialty practice increases with the expansion in case mix and case load and this is accompanied by the need for greater depth of knowledge and increasing skills and judgement. The content is therefore based on progression, increasing in both depth and complexity through to the completion of CCT.

Standards of training

Surgeons need to be able to perform in differing conditions and circumstances, respond to the unpredictable, and make decisions under pressure, frequently in the absence of all the desirable data. They use professional judgement, insight and leadership in everyday practice; working within multi-professional teams. Their conduct is guided by professional values and standards against which they are judged. These values and standards are laid down in the General Medical Council's Good Medical Practice and Good Surgical Practice.

The Professional Behaviour and Leadership Skills syllabus is mapped to the Leadership framework as laid out by the Academy of Medical Royal Colleges and the Framework for Appraisal and Assessment derived from Good Medical Practice. The Professional Behaviour and Leadership skills section of the syllabus is common to all surgical specialties and is based on Good Medical Practice

The syllabus lays down the standards of specialty-based knowledge, clinical judgement, technical and operative skills and professional skills and behaviour that must be acquired at each stage in order to progress. The syllabus comprises the following components:

- Specialty overview outlines which describe the following:
  - Details of the specialty as it practised in the UK
  - The scope of practice within the specialty
  - The key topics that a trainee will cover by the end of training
  - An overview of how, in general terms, training is shaped

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- Key topics that all trainees will cover by CCT and will be able to manage independently, including complications. These are also referred to as essential topics.

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- Index procedures that refer to some of the more commonly performed clinical interventions and operations in the specialty. They represent evidence of technical competence across the whole range of specialty procedures in supervised settings, ensuring the required elements of specialty practice are acquired and adequately assessed. Direct Observations of Procedural Skills (DOPS) and Procedure-

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based Assessments (PBAs) assess trainees carrying out index procedures (whole procedures or specific sections) to evidence learning.

- The stages of training, which comprise a number of topics to be completed during a notional period of training. Within each stage there is the syllabus content which contains the specialty topics that must be covered. Each of these topics includes one or more learning objectives and the level of performance / competence to be achieved at completion in the domains of:
    - Specialty-based knowledge
    - Clinical skills and judgement
    - Technical and operative skills

Standards for depth of knowledge during early years surgical training

In the early years of training, the appropriate depth and level of knowledge required can be found in exemplar texts tabulated below. We expect trainees to have mastery at the depth within the texts and to be able to make use of that knowledge in the context of surgical practice defined in the core surgical component of the curriculum above.

The curriculum requires a professional approach from surgical trainees who will be expected to have a deep understanding of the subjects, to the minimum standard outlaid below. It is expected that trainees will read beyond the texts below and to make critical use, where appropriate of original literature and peer scrutinised review articles in the related scientific and clinical literature such that they can aspire to an excellent standard in surgical practice.

The texts are not recommended as the sole source within their subject matter and there are alternative textbooks and web information which may better suit an individual's learning style. Over time it will be important for associated curriculum management systems to provide an expanded and critically reviewed list of supporting educational material.

Topic	Possible Textbooks or other Educational Sources
Anatomy	Last's Anatomy: Regional and Applied (MRCS Study Guides) by R.J. Last and Chummy S Netter's Atlas of Human Anatomy 4th Edition Saunders-Elsevier ISBN-13-978-1-4160-3385-1
Physiology	Ganong's Review of Medical Physiology, 23rd Edition (Lange Basic Science)
Pathology	Robbins Basic Pathology: by Vinay Kumar MBBS MD FRCPath, Abul K. Abbas MBBS, Nelson Fausto MD, and Richard Mitchell MD PhD
Pharmacology	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Microbiology	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Radiology	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Common surgical conditions	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MB ChB MD MBA

	FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Surgical skills	Basic surgical skills course and curriculum
Peri-operative care including critical care	ATLS course CriSP course Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Surgical care of children	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor) Jones Clinical Paediatric Surgery Diagnosis and Management Editors JM Hutson, M O'Brien, AA Woodward, SW Beasley 6th Edition 2008 Melbourne Blackwell
Care of the dying	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Organ transplantation	Principles and Practice of Surgery: by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)

In addition to these standard texts, we will also make available sample questions from the MRCS MCQ examination, which will demonstrate the level of knowledge required to be able to successfully pass the MRCS examination.

Standards for depth of knowledge during intermediate and final years surgical training

In the intermediate and final stages of surgical training the following methodology is used to define the relevant depth of knowledge required of the surgical trainee. Each topic within a stage has a competence level ascribed to it for knowledge ranging from 1 to 4 which indicates the depth of knowledge required:

1. knows of
2. knows basic concepts
3. knows generally
4. knows specifically and broadly

Standards for clinical and technical skills

The practical application of knowledge is evidenced through clinical and technical skills. Each topic within a stage has a competence level ascribed to it in the areas of clinical and technical skills ranging from 1 to 4:

1. Has observed

   Exit descriptor; at this level the trainee:
   - Has adequate knowledge of the steps through direct observation.
   - Demonstrates that he/she can handle instruments relevant to the procedure appropriately and safely.
   - Can perform some parts of the procedure with reasonable fluency.

2. Can do with assistance

   Exit descriptor; at this level the trainee:
   - Knows all the steps - and the reasons that lie behind the methodology.
   - Can carry out a straightforward procedure fluently from start to finish.
   - Knows and demonstrates when to call for assistance/advice from the supervisor (knows personal limitations).

3. Can do ~~whole~~ but may need assistance

   Exit descriptor; at this level the trainee:
   - Can adapt to well known variations in the procedure encountered, without direct input from the trainer.
   - Recognises and makes a correct assessment of common problems that are encountered.
   - Is able to deal with most of the common problems.
   - Knows and demonstrates when he/she needs help.
   - Requires advice rather than help that requires the trainer to scrub.

4. Competent to do without assistance, including complications

   Exit descriptor, at this level the trainee:
   - With regard to the common clinical situations in the specialty, can deal with straightforward and difficult cases to a satisfactory level and without the requirement for external input.
   - The level at which one would expect a UK consultant surgeon to function.
   - Is capable of supervising trainees.

The explicit standards form the basis for:

- Specifying the syllabus content;
- Organising workplace (on-the-job) training in terms of appropriate case mix and case load;
- Providing the basis for identifying relevant teaching and learning opportunities that are needed to support trainees' development at each particular stage of progress; and
- Informing competence-based assessment to provide evidence of what trainees know and can do.

Standards for the professional skills and leadership syllabus

The methodology used to define the standards for this component of the syllabus is through a series of descriptors that indicate the sorts of activities that trainees should be able to successfully undertake at two specific time points, namely the end of "early years" training (i.e. entry into ST3) and the end of surgical training (i.e. CCT).

The Framework for Appraisal, Feedback and Assessment

The curriculum is consistent with the four Good Medical Practice domains contained in the GMC's Framework for Appraisal and Assessment:
- Knowledge skills and performance
- Safety and quality
- Communication, partnership and teamworking
- Maintaining trust

The knowledge, skills and performance aspects are primarily found within the specialty specific syllabus. All domains are reflected within the professional behaviour and leadership syllabus, which also reflect the Academy's common competence and leadership competence frameworks.

The purpose and structure of the training programme

The curriculum is a competence based. It focuses on the trainee's ability to demonstrate the knowledge, skills and professional behaviours that they have acquired in their training (specified in the syllabus) through observable behaviours. Since it is competence based, it is not time-defined and accordingly it allows these competences to be acquired in different time frames according to variables such as the structure of the programme and the ability of the trainee. Any time points used are therefore merely indicative.

There are certain milestones or competence points which allow trainees to benchmark their progress:

- Entry to surgical training - CT1 (or ST1 for those specialties or localities with run through programmes)
- Entry to entirely specialised training - ST3*
- Exit at CCT

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*** A critical competence point is ST3 at which point, in practice, trainees will make a clear commitment to one of the nine SAC defined disciplines of surgery.**

Within the early years of training (defined as that period which is prior to entry into ST3), much of the content is common across all the surgical specialties. During this period, trainees will acquire the competences that are common to all surgical trainees (defined as common competences) together with a limited range of competences that are relevant to their chosen surgical specialty (defined as specialty specific competences).

- Those who have made a definitive choice of their desired surgical specialty, and who have been able to enter a "run-through" training programme, will be able to focus upon achieving the common competences and the specialty specific competences for their chosen specialty. This route is not currently available in Urology.

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- Those who have not yet made a definitive choice of their desired surgical specialty will obtain a range of extra competences in a variety of surgical specialties, while at the same time sampling those specialties, before focussing on the chosen specialty prior to entry into ST3.

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It is self evident that this latter route will usually take longer than the more direct route where the trainee is either in a specialty (e.g. Neurosurgery or T&O) or a locality (e.g. Scotland) which offers run-through training.

For those not in run-through programmes, within the early years, the trainee is not committed to a specific surgical specialty and can enter any of the relevant specialties at ST3 level provided they a) meet their educational milestones in the common surgical component of the curriculum and b) satisfy all the speciality requirements for entry in the specialty of their choice. The different training schemes offered by the Postgraduate Deaneries meet different educational needs and permit trainees to make earlier or later final career choices based on ability and preference.

It is essential that trainees must achieve both common and specialty specific competence to be eligible to compete at the ST3 specialist entry competence level. In the early years (initial stage), the common core component reflects the level of competence that all surgeons must demonstrate, while specialty-specific competence reflects the early competences relevant to an individual specialty. In particular the MRCS examination is a mandatory requirement to enter ST3 in any discipline, irrespective of candidates reaching all other educational requirements for ST3.

Following entry into ST3 (which in Urology will usually follow on from a second selection process), the trainee will typically undergo a period of training (of 5 indicative years) in the broad specialty of Urological Surgery as defined by the intermediate and final stages of the syllabus. In the final two years of training the trainee will be able to begin to develop an area of specialist interest, to allow some degree of sub-specialisation in his or her subsequent career.

Early Years Surgical Training

The purposes of early years (i.e. prior to ST3) training are:-

1. To provide a broad based initial training in surgery with attainment of knowledge, skills and professional behaviours relevant to the practice of surgery in any specialist surgical discipline. This is defined within the common component of the syllabus (which is also the syllabus of the MRCS).

2. In addition it will provide early speciality training such that trainees can demonstrate that they have the knowledge, skills and professional behaviours to enter specialty training at ST3 entry level in the surgical specialty, in this case Urology. The speciality element in the early years is not tested in the MRCS but through workplace-based assessments (WPBA) in the first instance, and subsequently through the Intercollegiate Specialty FRCS examinations, which are taken towards the end of specialty training.

Additionally trainees will be continuously assessed on the contents of the common component and their speciality specific slots through WPBA and structured reports from Assigned Educational Supervisors which in turn contribute to the Annual Review of Competence Progression (ARCP); this includes the level of competence expected of all doctors including surgeons to meet their obligations under Good Medical Practice (GMP) in order to remain licensed to practice.

Trainees who gain selection to ST3 despite some remediable and identified gaps in their speciality specific curriculum competences as demanded overall for ST3 progression must ensure these are dealt with expeditiously during ST3. All these gaps must be addressed by the time of a ST3 ARCP as part of their overall permission to progress to ST4. They must be specifically addressed through local learning agreements with educational supervisors. Trainees with identified gaps must be accountable to the training programme directors whom in turn must address this as part of their report to the ARCP process.

Intermediate and Final Years Specialty Training

The purposes of the intermediate and final years training are:

1. To provide training in Urology with attainment of knowledge, skills and professional behaviours relevant to the practice of Urology. This is defined within the Urology specialty specific component of the early years syllabus, and the intermediate and final stages of the Urology syllabus. These Urology specific syllabusesi are also the syllabus of the FRCS (Urol).

2. Competence to manage patients presenting either acutely or electively with a range of symptoms and conditions as specified in syllabus (which is also the syllabus of the FRCS (Urol).

3. Competence to manage an additional range of elective and emergency Urological conditions by virtue of appropriate training and assessment opportunities obtained during training as specified by the optional modular components of the final stage syllabus. This is not tested in the FRCS (Urol) but through WPBA.

4. Professional competences as specified in the syllabus and Good Medical Practice documents General Medical Council of the UK, respectively.

The Training Pathway

From the trainee's perspective, he or she will be able to undertake surgical training via differing routes depending on which training scheme they choose or are selected for, within a School of Surgery in one of the Postgraduate Deaneries in the United Kingdom.

1. Run through training (This route is not currently available in Urology

For those trainees who are certain of their specialty choice, and who choose to enter "run through" training, competitive entry into ST1 will be possible with run through training in their chosen specialty to CCT, where this is offered by the specialty. Such a route still demands that in addition to speciality specific competence, the level of competence common to all surgeons is attained before entering ST3 and these will be assessed through the MRCS, WPBAs and satisfactory ARCPs.

2. De coupled training (This route is currently the favoured route in Urology

For those trainees who are either uncertain of their chosen specialty, who are unable to gain entry to run-through training, or choose urological surgery as a career, a period of "Core" surgical training will be necessary. This period of training is designated CT1, CT2 and if appropriate CT3. During this period they will attain the common surgical knowledge and skills and generic professional behaviours, while sampling a number of surgical specialties and making a decision as to their preferred specialty or specialties. It will be necessary in addition to attaining common competences to ensure that they complete their speciality specific competences to make them eligible to enter ST3 in their chosen speciality. They will then seek to enter specialty training at the entry ST3 level by competitive entry. Open competition will test trainees against SAC defined competences for an entry ST3 trainee.

This model has a number of possible variants. Core training might sample several specialties, without any particular specialty focus. In such cases some speciality top up training may be needed later on in order to reach speciality entry ST3 level. Another variant would organise core training along a theme which supports progression to a specific specialty. In these situations many trainees may pass straight from CT2 to ST3 in their chosen discipline if selected. In practice, it is envisaged that core surgical training will run over an indicative timescale of up to 3 years (CT1-3) with some exiting at CT2 and others at CT3.

3. Academic training

Some early years trainees may wish to pursue an academic surgical career and will devote a significant proportion or their time to additional academic pursuits including research and teaching. For the majority this will lead (later in specialised training) to a period of time in dedicated research, resulting in the award of a higher degree in a scientific area related to their chosen specialty. For others who wish to revert to full time clinical training, this will also be possible, providing that the relevant clinical competences are achieved.

General information on academic pathways can be found using the following links:
www.mmc.nhs.uk/download_files/A-pocket-guide.pdf and www.nccrcd.nhs.uk and
www.mmc.nhs.uk/download/Gold_Guide290607.doc.

The JCST is keen to support academic careers within surgery and has ensured that the surgical curriculum is flexible enough to accommodate an academic pathway. The curriculum specifies that each individual trainee's training is planned and recorded through the learning agreement.

Academic Clinical Fellows (ACFs) are generally expected to achieve the same level of competence as other surgical trainees within the same time frame. In order to progress through training pathways the ACF, in addition to demonstrating competence in clinical aspects, will generally be required to have obtained a funded Research Training Fellowship in order to undertake a PhD or MD, which they will complete during an out of programme period.

Some trainees during their period of full-time research may want to carry out some clinics or on call, if they and their academic supervisor feel that it is in their best interests. On successful completion of a PhD or MD the ACF will either return to their clinical programme, apply for an Academic Clinical Lecturer (ACL) or Clinician Scientist post.

Academic trainees will need to satisfactorily complete all the essential elements of their specialty syllabus in order to be awarded a CCT. It is acknowledged that most Clinical Academics will almost certainly take somewhat longer in training to achieve competence at CCT level than trainees taking a clinical pathway;

however they will be supported fully and treated as individuals with their personal progress being matched to their learning agreement.

Moving from one discipline of surgery to another

In the early years it is possible that a trainee who had started to develop a portfolio consistent with a particular specialist discipline might wish to move to another. One of the strengths of the flexible early years programme is that it will be possible, depending on the local circumstances to make such changes with an identification of suitable educational competences that may be transferred. This is strictly conditional on a trainee achieving the educational milestones so far agreed for them. Moving from one discipline to another because of the need to remediate in the original discipline would not normally be permitted. All common requirements, for example, possession of the MRCS would be transferable. Those leaving ENT however could not use the DOHNS examination as equivalent to the common MRCS and would have to sit the Common part B of that examinations and for those wishing to enter ENT would be required to sit the part 2 DOHNS examination.

In order to be eligible to move from one discipline to another the following conditions therefore apply:-

1. They would need to achieve a satisfactory outcome in their ARCPs up to that point including all relevant WPBAs.
2. They would have to fulfil the minimum period in the new speciality of their choice in order to progress to ST3 in that discipline
3. They would have to obtain their new position either through open competition in the annual selection round or by an agreed local School or Deanery arrangement should an appropriate vacancy arise. Their right to move would be limited by the particular circumstances appertaining at the time – in particular availability of training positions in their chosen new discipline.
4. They must pass the MRCS (or DOHNS) examination

The process in practice would be subject to local negotiations between heads of training and designated training supervisors and the trainee making the request. If the decision to change theme in core programmes occurs early then the effective increase in training time may be minimal. If the decision occurs later or during run through then more time spent in the early years is almost inevitable. The progression to ST3 is in essence competence rather than time dependeant. Those spending longer having made a change may be subject to limitations on any subsequent period required for remediation, although this ultimately would be a Deanery decision.

Completion of training

Successful completion of the programme will result in a Certificate of Completion of Training (CCT) and placement on the GMC's Specialist Register. This will indicate that the surgeon has reached the required standards of competence to practice as a consultant surgeon in the UK. These standards are set by the SACs and the royal colleges and translate into the ability to manage a significant proportion of the elective work within the specialty and to undertake the primary management of emergencies. It is anticipated that where additional, well-recognised specialist skills are required by the service, these will be gained by the completion of additional modules before the completion of training and the award of the specialty CCT.

Doctors who wish to join the specialist register and have not followed a full PMETB approved training programme leading to a CCT but who may have gained the same level of skills and knowledge as CCT holders can apply under Article 14(4) of The General and Specialist Medical Practice Order for a Certificate confirming Eligibility for Specialist Registration (CESR).

The CCT holder on the specialist register as a surgeon, in common with all practising surgeons, will be expected to maintain his/her professional development in line with Good Surgical Practice and Good Medical Practice for the purpose of revalidation.

The Syllabus for Urology

Overview and objectives of the Urology curriculum

Trainees in urology will undergo core training (CT1-2/3) followed by a period of 5 indicative years of specialty training (ST3- ST7). The purpose of the curriculum is to train urologists who will be able to work independently and to the standard of a consultant with a general practicse, such as one who works in a District General Hospital or equivalent setting. As such, most of their skills will relate to the management of "everyday" general elective and emergency urology and this forms the basis of the main part of the curriculum, with the competences, both non-operative and operative being completed by the final year of training. This curriculum also allows a degree of flexibility to respond to the changing needs of our patients and the development of new models of healthcare delivery, and to incorporate technological advances.

However, it is usual for urologists in such circumstances to develop a clinical area of special interest appropriate to the needs of the population and an additional objective of this curriculum is to provide some additional expertise in one or more areas of urology. As such, the more complex areas of urology have been subdivided into a number of modules. These modules are not of equal size, and it is expected that most trainees will be able to undertake one or two of these modules in their final year of training. The choice of which module they take will be determined by choice and availability of appropriate training.

The Specialty of Urology

Adult urological surgery is that branch of medicine that deals with the diseases, trauma and malformations of the urogenital system from young adulthood onwards.

During recent years and in common with many other disciplines there has been a trend towards further specialisation within the specialty. These are referred to as 'Areas of Special Interest' within urology as they do not have separate specialty advisory committees (SACs) within the Surgical Royal Colleges' structure.

A shared syllabus and the ability at the completion of training to manage a range of elective and emergency conditions, provide a common purpose across the specialty of urology at the time of writing (2008).

The major areas of special interest associated with the specialty of urology are:

- Urological oncology: the assessment and treatment of patients with urological malignancy. The major urological malignancies are prostate, bladder, renal, testicular and penile cancer.
- Endourology: the use of endourological techniques to treat urinary tract disease. This primarily includes the treatment of urinary tract stone disease, but also includes the endourological treatment of other benign diseases of the upper urinary tract.
- Female and Reconstructive urology: the assessment and treatment of patients with urinary incontinence, patients with neurological disease and patients undergoing reconstruction of the urinary tract. The subdivisions of this area include female urology, pelvic reconstruction and neurourology.
- Andrology: the assessment and treatment of patients with conditions affecting sexual and reproductive function. Including male factor infertility, urethral reconstruction and other benign disorders of penile function. It may also include penile cancer.

Training in the Specialty of Urology

The syllabus may be considered in 3 stages. Satisfactory completion of the initial (early years), intermediate and final stages will lead to the award of a CCT and the title of Consultant Urologist (generalist). Included are the areas of diagnosis, investigation, operative and non-operative management for and communication with those in his/her care. In addition, the programme should allow the trainee to develop generic skills that allow effective interaction with other professionals (clinical and non-clinical) involved in the delivery of health care to patients.

Initial stage
In the initial stage (early years training), the urology trainee may not have even decided upon a urological career. They will undergo broad based surgical training, while being able to sample a range of surgical specialties. The objectives will be to attain the knowledge skills and behaviours required of all surgeons (ie the common competences), together with some initial competences relevant to the specialty of urology. At the end of this period of training, the trainee will have decided upon a career in Urology, and will seek to enter urological training.

Intermediate stage
In the intermediate and final stages of training, trainees will be exposed to pure urology and will progress from novice to competent practitioner to emerge as a Consultant Urologist. Essential knowledge and skills will be acquired both for urology and allied specialties (i.e. gynaecology, general surgery) to broaden career choice.

Final stage
In the final stage of training, when the trainee has attained the knowledge and skills required for the essential parts of the curriculum, all will have the opportunity to extend their skills and competences in one or two specific fields. The syllabus for this part of the curriculum is modular in format, with content that covers the major areas of sub-specialist urological practise, outlined above. These syllabusesi are intended to allow the CCT holder to develop an area of clinical interest and expertise upon appointment to a consultant post. It is not intended that this training will necessarily prepare the trainee for sub-specialist practise. Some will require further post CCT training, in order to achieve the competences necessary for some of the rarer complex urological procedures.

It is incumbent on the trainee that the levels of competence achieved are recorded in the appropriate log books together with relevant research, records of training courses and an audit of personal cases performed. This portfolio will continue into consultant practice.

Within the training programme there will be opportunities for exposure to a wide range of urological problems both of the medical and surgical nature.

Academic Urology

Academic surgery provides an exciting and challenging career for those who wish to combine clinical urology with a major commitment to research and undergraduate teaching.

Trainees interested in this career pathway will, in addition to completing clinical training in urology (and developing an area of special interest), acquire a high level of competence in research (and teaching).

After completing their clinical training those committed to an academic career will pursue a position in a university department as senior lecturer with a longer-term view to promotion to a chair.

The Scope and Standards of Urological Practice at CCT

This list defines, in general terms the essential skills and levels of clinical expertise expected of a Urologist emerging from training having completed the Urology specialty CCT. It is unlikely that their expertise will be confined to the descriptions that follow, as most urologists will have developed additional interests and competences by the time that they emerge from training. There is flexibility within the curricula to accommodate this.

There are several modular syllabi that are available to trainees in their final stage of training. These syllabi build on the core requirements of the basic CCT holder and cover clinical areas within Urological Oncology, Endourology, Andrology and Female and Reconstructive Urology.

It should be understood that as a surgical career develops following CCT, the range and levels of expertise will change in response to the demands of the service, personal aspirations, the needs of patients and the developments in the specialty.

Taking into account the present and future requirements of the service, the Urologist emerging from training at CCT level will expect to see patients who may present with a range of problems. As it is used here, the term 'manage' equates to diagnosis, assessment and treatment or referral as appropriate. The levels of expertise expected are further expressed within the detail of the syllabus.

At CCT, all Urologists will be able to:

Manage the patient presenting with stone disease

- Be familiar with the presentation of stone disease
- Able to recognise the patient presenting with acute ureteric colic, urinary obstruction and sepsis and manage appropriately
- Able to manage appropriate investigation (CT, IVU and ultrasound) in such situations, involving other specialists as appropriate.
- Able to treat straightforward ureteric stones safely and appropriately, referring more complicated cases to specialist colleagues as appropriate
- Able to treat straightforward bladder stones safely and effectively referring more complicated cases to specialist colleagues as appropriate.
- Able to treat straightforward renal stones, by means of extracorporeal shock wave lithotripsy referring more complicated cases to specialist colleagues as appropriate
- Able to undertake appropriate metabolic assessment and treatment of straightforward urinary tract calculi

Manage the patient presenting with acute or chronic abdominal pain referable to the urinary tract

- Diagnose the underlying cause of renal pain
- Manage the patient presenting with acute or chronic loin pain
- Refer onwards to other specialists if appropriate.
- Manage the patient presenting with upper urinary tract obstruction
- Be familiar with the modes of presentation of upper tract obstruction (retroperitoneal fibrosis, ureteric stricture) and manage appropriately, involving other specialists as appropriate.
- Be able to undertake cystoscopy and stenting when appropriate

Manage patients presenting with lower urinary tract symptoms (LUTS)

- Manage the patient presenting with LUTS from presentation to completion
- Manage the patient presenting with acute or chronic retention from presentation to completion
- Be competent in performing diagnostic cystoscopy, urodynamics, bladder neck incision and TURP in patients with bladder outflow obstruction.
- Be competent in inserting a suprapubic catheter, with ultrasound guidance as appropriate

Manage the patient presenting with haematuria

- Be able to diagnose and manage the common causes of haematuria using appropriate radiological and endoscopic techniques and supervise effective resuscitation.
- Be competent in performing, diagnostic cystoscopy, bladder biopsy and TURBT in patients with bladder lesions.
- Be competent in the evaluation and management of patients with ureteric obstruction
- Be familiar with the indications for referral to specialist units and other colleagues for patients with muscle invasive bladder cancer.

Manage the patient presenting with urethral stricture

- Evaluate and manage patients with urethral stricture and refer onwards to other specialists as appropriate
- Be competent in performing urethral dilatation and optical urethrotomy in patients with urethral stricture
- Be competent in inserting a suprapubic catheter, with ultrasound quidance as appropriate

Manage urinary tract infections

- Manage pyelonephritis, renal and peri-renal abscess from presentation to completion
- Manage patients presenting with recurrent UTI from presentation to completion
- Be competent to diagnose, assess and manage patients with different forms of cystitis (interstitial cystitis etc) and to refer onward where appropriate
- Be competent to diagnose, assess and manage men with different forms of prostatitis and epididymitis
- Be competent to diagnose, assess and manage men with different forms of gonococcal and non-gonococcal urethritis and other STDs seeking advice and onward referral as and when appropriate.

Manage benign & malignant lesions of male genitalia skin

- Recognise the common malignant and potentially malignant conditions of the penis, including phimosis, paraphimosis, viral lesions, squamous carcinoma and be familiar with current management protocols and their implications for early management.
- Diagnose and excise, biopsy or treat conservatively common swellings of the skin and subcutaneous tissues of the penis and genitalia
- Apply straightforward plastic surgical techniques for primary wound closure.
- Recognise the indications for and to perform a circumcision

Manage patients presenting with a scrotal swelling

- Diagnose and manage patients presenting with scrotal symptoms such as hydrocele, epididymal cyst, varicocele, post vasectomy pain, testicular torsion, abscess etc, involving other specialist colleagues appropriately.
- Dand manage initially, neoplastic conditions of the testis and refer onwards to other specialists as appropriate
- Diagnose, assess and manage serious infections such as acute necrotising fasciitis, seeking advice and onward referral as and when appropriate.
- Be competent to undertake surgery for benign and malignant scrotal conditions including hydrocele repair, excision of an epididymal cyst, ligation of a varicocele, treatment of testicular torsion, and to perform an orchidectomy for benign and malignant indications

Manage the patient presenting with urinary incontinence

- Be competent to diagnose investigate and manage patients presenting of urinary incontinence
- Be able to undertake urodynamic studies, where needed, to investigate patients with urinary incontinence
- Be able to treat straightforward patients with urinary incontinence including the provision of operative intervention including Botulinum toxin and mid-urethral tape insertion while referring more complex cases onward as and when appropriate.
- Be familiar with the presentation of voiding dysfunction and incontinence in patients with neurological disease

Manage the patient with prostate cancer

- Be competent to diagnose and manage patients presenting with an elevated PSA including the provision of trans-rectal ultrasound and biopsy
- Be competent in the evaluation and management of patients with organ confined, locally advanced and metastatic prostate cancer
- Be familiar with the indications for referral to specialist units and other colleagues for patients with prostate cancer
- Be competent in performing diagnostic cystoscopy, urodynamics and TURP in patients with prostate cancer.

Manage the patient with bladder cancer

- Be competent to diagnose, investigate and manage patients presenting with bladder cancer including the provision of cystoscopy, TURBT, intra-vesical chemotherapy etc
- Be familiar with the indications for referral to specialist units and other colleagues for patients with locally advanced bladder cancer

Manage the patient with renal cancer

- Be competent to diagnose and initially manage patients presenting with renal cancer
- Able to manage appropriate investigation (CT, MRI etc) in such situations, involving other specialists as appropriate.
- Be familiar with the indications for referral to specialist units and other colleagues for patients

Manage the patient presenting with infertility, ejaculatory disorders etc

- Be competent to diagnose, assess and manage couples with infertility appropriately and refer on to other specialist colleagues as appropriate.

Manage the patient presenting with erectile dysfunction

- Be competent to diagnose, assess and manage men with erectile dysfunction appropriately and refer on to other specialist colleagues as appropriate.

Manage the patient presenting with penile deformity, priapism, penile fracture etc

- Be competent to diagnose, assess and manage benign penile problems (including priapism and fracture) appropriately and refer on to other specialist colleagues as required

Manage the common urological conditions of childhood

- Be competent to diagnose, assess and manage appropriately children presenting with urinary tract infections and involving other specialist colleagues as the situation requires.
- Be competent to diagnose, assess and manage appropriately patients presenting with the common inguinoscrotal conditions of childhood (~~phimosis,~~ torsion of the testis, hernia, undescended testis), phimosis, referring and involving other specialist colleagues as the situation requires.
- Be aware of the important surgical conditions of childhood, their presentation as elective and emergency cases and the indications for urgent assessment and diagnosis by specialist colleagues (e.g. acute appendicitis, intussusceeption, volvulus)

Manage the patient presenting with renal failure

- Be competent to diagnose, assess and initially manage appropriately patients presenting with renal failure / anuria, involving other specialist colleagues as the situation requires
- Understand the indications for treatment with haemodialysis or peritoneal dialysis
- Competent to assess bladder function in those patients under consideration for renal transplantation

Manage the patient with multiple injuries.

- Assess and resuscitate the patient with multiple injuries in accordance with the ATLS standards current at the time.
- Work appropriately as part of the trauma team, participating at a level appropriate to the situation either as member or leader.
- Conduct the initial management of gun-shot and other penetrating wounds involving the urinary tract, calling in other expertise as necessary.
- Participate as an effective member of the major incident team as required.

Manage trauma of the renal tract according to accepted protocols.

- Diagnose and manage the patient with possible injury to the urogenital tract from blunt and penetrating renal trauma
- Diagnose, resuscitate and transfer to specialist units patients suffering from renal and other trauma calling in other expertise as necessary

All urologists will also possess the professional skills and behaviour associated with consultant surgical practice in the UK (including those outlined in Good Medical Practice).

Initial Stage Overview

The purpose of the initial stage (early years) (CT1 - 3) is to allow the trainee to develop the basic and fundamental surgical skills common to all surgical specialties, together with a few surgical skills relevant to Urology.

The outcome of early years training is to achieve the competences required of surgeons entering ST3. These competences include:

- Competence in the management of patients presenting with a range of symptoms and elective and emergency conditions as specified in the core syllabus for surgery.
- Competence in the management of patients presenting with an additional range of elective and emergency conditions, as specified by the Urology specialty component of the early years syllabus.
- Professional competences as specified in the syllabus and derived from Good Medical Practice documents of General Medical Council of the UK

By the end of CT2/3, trainees, (including those following an academic pathway), will have acquired to the defined level:

- Generic skills to allow team working and management of urological patients
- The ability to perform as a member of the team caring for surgical patients
- The ability to receive patients as emergencies and review patients in clinics and initiate management and diagnostic processes based on a reasonable differential diagnosis
- The ability to manage the perioperative care of their patients and recognise common complications and either be able to deal with them or know to whom to refer
- To be a safe and useful assistant in the operating room
- To perform some simple procedures under minimal supervision and perform more complex procedures under direct supervision

In addition they will have attained the knowledge, skills and behaviour as defined in the following (common) modules of the syllabus:

Module 1: Basic Science Knowledge relevant to surgical practice (These can all be contextualised within the list of presenting symptoms and conditions outlined in module 2)

- Anatomy
- Physiology
- Pharmacology - in particular safe prescribing
- Pathological principles underlying system specific pathology
- Microbiology
- Diagnostic and interventional radiology

Module 2: Common surgical conditions

- To assess and initiate investigation and management of common surgical conditions which may confront any patient whilst under the care of surgeons, irrespective of their speciality.
- To have sufficient understanding of these conditions so as to know what and to whom to refer in a way that an insightful discussion may take place with colleagues whom will be involved in the definitive management of these conditions.
- This defines the scope and depth of the topics in the generality of clinical surgery required of any surgeon irrespective of their ST3 defined speciality

Module 3 Basic surgical skills

- To prepare oneself for surgery
- To safely administer appropriate local anaesthetic agents
- To handle surgical instruments safely
- To handle tissues safely
- To incise and close superficial tissues accurately
- To tie secure knots
- To safely use surgical diathermy
- To achieve haemostasis of superficial vessels.
- To use a suitable surgical drain appropriately.
- To assist helpfully, even when the operation is not familiar.
- To understand the principles of anastomosis
- To understand the principles of endoscopy including laparoscopy

Module 4: The principles of assessment and management of the surgical patient

- To assess the surgical patient
- To elicit a history that is relevant, concise, accurate and appropriate to the patient's problem
- To produce timely, complete and legible clinical records.
- To assess the patient adequately prior to operation and manage any pre-operative problems appropriately.
- To propose and initiate surgical or non-surgical management as appropriate.
- To take informed consent for straightforward cases.

Module 5: Peri-operative care of the surgical patient

- To manage patient care in the peri-operative period.
- To assess and manage preoperative risk.
- To take part in the conduct of safe surgery in the operating theatre environment.
- To assess and manage bleeding including the use of blood products.
- To care for the patient in the post-operative period including the assessment of common complications.
- To assess and plan perioperative nutritional management.

Module 6: Assessment and early treatment of the patient with trauma

- To safely assess the multiply injured patient.
- To safely assess and initiate management of patients with
- traumatic skin and soft tissue injury
- chest trauma
- a head injury
- a spinal cord injury
- abdominal and urogenital trauma
- vascular trauma
- a single or multiple fractures or dislocations
- burns

Module 7: Surgical care of the paediatric patient

- To assess and manage children with surgical problems, understanding the similarities and differences from adult surgical patients.
- To understand common issues of child protection and to take action as appropriate.

Module 8: Management of the dying patient

- To manage the dying patient appropriately.
- To manage the dying patient in consultation with the palliative care team.

Module 9: Organ and tissue transplantation

- To understand the principles of organ and tissue transplantation.
- To assess brain stem death and understand its relevance to continued life support and organ donation.

Module 10: Professional behaviour

- To provide good clinical care
- To be a good communicator
- To teach and to train
- To keep up to date and know how to analyse data
- To understand and manage people and resources within the health environment
- To promote good Health
- To understand the ethical and legal obligations of a surgeon

In addition they will have attained the knowledge, skills and behaviour as defined in the following (urology specific) modules of the syllabus:

1. Urinary tract calculi

- To be able to provide the early care of a patient presenting with the symptoms suggestive of urinary tract calculi including onward referral

2. Functional urology

- To be able to provide the early care of a patient presenting with lower urinary tract symptoms and dysfunction including onward referral

- To be able to provide the early care of a patient presenting with urinary tract obstruction including onward referral
- To diagnose and initiate management of a patient presenting with acute or chronic urinary retention

3. Urinary tract infection
- To be able to provide the early care of a patient presenting with urinary tract infections including onward referral when appropriate
- To be able to provide the early care of a patient presenting with epididymitis and scrotal abscess including onward referral when appropriate

4. Urological oncology
- To be able to provide the early care of a patient with suspected urological cancer including onward referral

5. Treatment of renal failure
- To be able to provide the early care of a patient presenting with renal failure including onward referral when appropriate

6. Testicular pain and swelling
- To be able to provide the early care of a patients presenting with acute testicular pain or testicular swelling

Initial Stage Topics

Module 1	Basic sciences
Objective	• To acquire and demonstrate underpinning basic science knowledge appropriate for the practice of surgery, including:- • Applied anatomy: Knowledge of anatomy appropriate for surgery • Physiology: Knowledge of physiology relevant to surgical practice • Pharmacology: Knowledge of pharmacology relevant to surgical practice centred around safe prescribing of common drugs • Pathology: Knowledge of pathological principles underlying system specific pathology • Microbiology: Knowledge of microbiology relevant to surgical practice Imaging: • Knowledge of the principles, strengths and weaknesses of various diagnostic and interventional imaging methods
Knowledge	Applied anatomy: • Development and embryology • Gross and microscopic anatomy of the organs and other structures • Surface anatomy • Imaging anatomy This will include anatomy of thorax, abdomen, pelvis, perineum, limbs, spine, -head and neck as appropriate for surgical operations that the trainee will be involved with during core training (see Module 2). Physiology: General physiological principles including: • Homeostasis • Thermoregulation • Metabolic pathways and abnormalities • Blood loss and hypovolaemic shock • Sepsis and septic shock • Fluid balance and fluid replacement therapy • Acid base balance • Bleeding and coagulation • Nutrition This will include the physiology of specific organ systems relevant to surgical care including the cardiovascular, respiratory, gastrointestinal, urinary, endocrine and neurological systems. Pharmacology: • The pharmacology and safe prescribing of drugs used in the treatment of surgical diseases including analgesics, antibiotics, cardiovascular drugs, antiepileptics, anticoagulants, respiratory drugs, renal drugs, drugs used for the management of endocrine disorders (including diabetes) and local anaesthetics. • The principles of general anaesthesia • The principles of drugs used in the treatment of common malignancies Pathology: General pathological principles including: • Inflammation • Wound healing • Cellular injury • Tissue death including necrosis and apoptosis • Vascular disorders • Disorders of growth, differentiation and morphogenesis • Surgical immunology

	• Surgical haematology • Surgical biochemistry • Pathology of neoplasia • Classification of tumours • Tumour development and growth including metastasis • Principles of staging and grading of cancers • Principles of cancer therapy including surgery, radiotherapy, chemotherapy, immunotherapy and hormone therapy • Principles of cancer registration • Principles of cancer screening • The pathology of specific organ systems relevant to surgical care including cardiovascular pathology, respiratory pathology, gastrointestinal pathology, genitourinary disease, breast, exocrine and endocrine pathology, central and peripheral, neurological systems, skin, lymphoreticular and musculoskeletal systems Microbiology: • Surgically important micro organisms including blood borne viruses • Soft tissue infections including cellulitis, abscesses, necrotising fasciitis, gangrene • Sources of infection • Sepsis and septic shock • Asepsis and antisepsis • Principles of disinfection and sterilisation • Antibiotics including prophylaxis and resistance • Principles of high risk patient management • Hospital acquired infections Imaging: • Principles of diagnostic and interventional imaging including x-rays, ultrasound, CT, MRI. PET, radiounucleotide scanning

Module 2	**Common Surgical Conditions**	
Objective	This section assumes that trainees have general medical competences consistent with a doctor leaving Foundation in the UK. It also assumes an ongoing commitment to keeping these skills and knowledge up to date as laid out in GMP. It is predicated on the value that surgeons are doctors who carry our surgery and require competence. To demonstrate understanding of the relevant basic scientific principles for each of these surgical conditions and to be able to provide the relevant clinical care as defined in modules assessment and management as defined in Modules 1 and 4.	
Topics	Presenting symptoms or syndromes • Abdominal pain • Abdominal swelling • Change in bowel habit • Gastrointestinal haemorrhage • Rectal bleeding • Dysphagia • Dyspepsia • Jaundice	To include the following conditions • Appendicitis • Gastrointestinal malignancy • Inflammatory bowel disease • Diverticular disease • Intestinal obstruction • Adhesions • Abdominal hernias • Peritonitis • Intestinal perforation • Benign oesophageal disease • Peptic ulcer disease • Benign and malignant hepatic, gall bladder and pancreatic disease • Haemorrhoids and perianal disease • Abdominal wall stomata
	Breast disease • Breast lumps and nipple	To include the following conditions • Benign and malignant breast lumps

	discharge • Acute Breast pain	• Mastitis and breast abscess
	Peripheral vascular disease Presenting symptoms or syndrome • Chronic and acute limb ischaemia • Aneurysmal disease • Transient ischaemic attacks • Varicose veins • Leg ulceration	To include the following conditions • Atherosclerotic arterial disease • Embolic and thrombotic arterial disease • Venous insufficiency • Diabetic ulceration
	Cardiovascular and pulmonary disease	To include the following conditions • Coronary heart disease • Bronchial carcinoma • Obstructive airways disease • Space occupying lesions of the chest • Pulmonary embolus
	Genitourinary disease Presenting symptoms or syndrome • Loin pain • Haematuria • Lower urinary tract symptoms • Urinary retention • Renal failure • Scrotal swellings • Testicular pain	To include the following conditions • Genitourinary malignancy • Urinary calculus disease • Urinary tract infection • Benign prostatic hyperplasia • Obstructive uropathy
	Trauma and orthopaedics Presenting symptoms or syndrome • Traumatic limb and joint pain and deformity • Chronic limb and joint pain and deformity • Back pain	To include the following conditions • Simple fractures and joint dislocations • Fractures around the hip and ankle • Basic principles of Degenerative joint disease • Basic principles of inflammatory joint disease including bone and joint infection • Compartment syndrome • Spinal nerve root entrapment and spinal cord compression • Metastatic bone cancer • Common peripheral neuropathies and nerve injuries
	Disease of the Skin, Head and Neck Presenting symptoms or syndrome • Lumps in the neck • Epistaxis • Upper airway obstructions	To include the following conditions • Benign and malignant skin lesions • Benign and malignant lesions of the mouth and tongue
	Neurology and Neurosurgery Presenting symptoms or syndrome • Headache • Facial pain • Coma	To include the following conditions • Space occupying lesions from bleeding and tumour
	Endocrine Presenting symptoms or syndrome • Lumps in the neck • Acute endocrine crises	To include the following conditions • Thyroid and parathyroid disease • Adrenal gland disease • Diabetes

Module 3	Basic surgical skills
Objective	• Preparation of the surgeon for surgery • Safe administration of appropriate local anaesthetic agents • Acquisition of basic surgical skills in instrument and tissue handling. • Understanding of the formation and healing of surgical wounds • Incise superficial tissues accurately with suitable instruments. • Close superficial tissues accurately. • Tie secure knots. • Safely use surgical diathermy • Achieve haemostasis of superficial vessels. • Use suitable methods of retraction. • Knowledge of when to use a drain and which to choose. • Handle tissues gently with appropriate instruments. • Assist helpfully, even when the operation is not familiar. • Understand the principles of anastomosis • Understand the principles of endoscopy including laparoscopy
Knowledge	Principles of safe surgery • Preparation of the surgeon for surgery • Principles of hand washing, scrubbing and gowning • Immunisation protocols for surgeons and patients Administration of local anaesthesia • Choice of anaesthetic agent • Safe practise Surgical wounds • Classification of surgical wounds • Principles of wound management • Pathophysiology of wound healing • Scars and contractures • Incision of skin and subcutaneous tissue: o Langer's lines o Choice of instrument o Safe practice • Closure of skin and subcutaneous tissue: o Options for closure o Suture and needle choice • Safe practice • Knot tying o Range and choice of material for suture and ligation o Safe application of knots for surgical sutures and ligatures • Haemostasis: o Surgical techniques o Principles of diathermy • Tissue handling and retraction: o Choice of instruments • Biopsy techniques including fine needle aspiration cytology • Use of drains: o Indications o Types o Management/removal • Principles of anastomosis • Principles of surgical endoscopy including laparoscopy
Clinical Skills	4 Preparation of the surgeon for surgery • Effective and safe hand washing, gloving and gowning 4 Preparation of a patient for surgery

	• Creation of a sterile field • Antisepsis • Draping 4 Administration of local anaesthesia • Accurate and safe administration of local anaesthetic agent
Technical Skills and Procedures	4 Preparation of the surgeon for surgery • Effective and safe hand washing, gloving and gowning 4 Administration of local anaesthesia • Accurate and safe administration of local anaesthetic agent 4 Incision of skin and subcutaneous tissue: • Ability to use scalpel, diathermy and scissors 4 Closure of skin and subcutaneous tissue: • Accurate and tension free apposition of wound edges 4 Knot tying: • Single handed • Double handed • Instrument • Superficial • Deep 3 Haemostasis: • Control of bleeding vessel (superficial) • Diathermy • Suture ligation • Tie ligation • Clip application • Transfixion suture 4 Tissue retraction: • Tissue forceps • Placement of wound retractors 3 Use of drains: • Insertion • Fixation • Removal 3 Tissue handling: • Appropriate application of instruments and respect for tissues • Biopsy techniques 4 Skill as assistant: • Anticipation of needs of surgeon when assisting

Module 4	**The assessment and management of the surgical patient**
Objective	To demonstrate the relevant knowledge, skills and attitudes in assessing the patient and manage the patient, and propose surgical or non-surgical management.
Knowledge	The knowledge relevant to this section will be variable from patient to patient and is covered within the rest of the syllabus – see common surgical conditions in particular (Module 2). As a trainee develops an interest in a particular speciality then the principles of history taking and examination may be increasingly applied in that context.
Clinical Skills	4 Surgical history and examination (elective and emergency) 3 Construct a differential diagnosis

	3 Plan investigations 3 Clinical decision making 3 Team working and planning 3 Case work up and evaluation; risk management 3 Active participation in clinical audit events 3 Appropriate prescribing 3 Taking consent for intermediate level intervention; emergency and elective 3 Written clinical communication skills 3 Interactive clinical communication skills: patients 3 Interactive clinical communication skills: colleagues

Module 5	**Peri-operative care**
Objective	To assess and manage preoperative risk To manage patient care in the peri-operative period To conduct safe surgery in the operating theatre environment To assess and manage bleeding including the use of blood products To care for the patient in the post-operative period including the assessment of common complications To assess and plan perioperative nutritional management
Knowledge	Pre-operative assessment and management: • Cardiorespiratory physiology • Diabetes mellitus and other relevant endocrine disorders • Fluid balance and homeostasis • Renal failure • Pathophysiology of sepsis – prevention and prophylaxis • Thromboprophylaxis • Laboratory testing and imaging • Risk factors for surgery and scoring systems • Pre-medication and other preoperative prescribing • Principles of day surgery Intraoperative care: • Safety in theatre including patient positioning and avoidance of nerve injuries • Sharps safety • Diathermy, laser use • Infection risks • Radiation use and risks • Tourniquet use including indications, effects and complications • Principles of local, regional and general anaesthesia • Principles of invasive and non-invasive monitoring • Prevention of venous thrombosis • Surgery in hepatitis and HIV carriers • Fluid balance and homeostasis Post-operative care: • Post-operative monitoring • Cardiorespiratory physiology • Fluid balance and homeostasis • Diabetes mellitus and other relevant endocrine disorders • Renal failure • Pathophysiology of blood loss • Pathophysiology of sepsis including SIRS and shock • Multi-organ dysfunction syndrome • Post-operative complications in general • Methods of postoperative analgesia To assess and plan nutritional management • Post-operative nutrition • Effects of malnutrition, both excess and depletion

	• Metabolic response to injury • Methods of screening and assessment of nutritional status • Methods of enteral and parenteral nutrition Haemostasis and Blood Products: • Mechanism of haemostasis including the clotting cascade • Pathology of impaired haemostasis e.g. haemophilia, liver disease, massive haemorrhage • Components of blood • Alternatives to use of blood products • Principles of administration of blood products • Patient safety with respect to blood products Coagulation, deep vein thrombosis and embolism: • Clotting mechanism (Virchow Triad) • Effect of surgery and trauma on coagulation • Tests for thrombophilia and other disorders of coagulation • Methods of investigation for suspected thromboembolic disease • Principles of treatment of venous thrombosis and pulmonary embolism including anticoagulation • Role of V/Q scanning, CTpulmonary angiography, D-dimer and thrombolysis • Place of pulmonary embolectomy • Prophylaxis of thromboembolism: • Risk classification and management of DVT • Knowledge of methods of prevention of DVT, mechanical and pharmacological Antibiotics: • Common pathogens in surgical patients • Antibiotic sensitivities • Antibiotic side-effects • Principles of prophylaxis and treatment Metabolic and endocrine disorders in relation to perioperative management • Pathophysiology of thyroid hormone excess and deficiency and associated risks from surgery • Causes and effects of hypercalcaemia and hypocalcaemia • Complications of corticosteroid therapy • Causes and consequences of Steroid insufficiency • Complications of diabetes mellitus • Causes and effects of hyponatraemia • Causes and effects of hyperkalaemia and hypokalaemia
Clinical Skills	3 Pre-operative assessment and management: • History and examination of a patient from a medical and surgical standpoint • Interpretation of pre-operative investigations • Management of co morbidity • Resuscitation • Appropriate preoperative prescribing including premedication 3 Intra-operative care: • Safe conduct of intraoperative care • Correct patient positioning • Avoidance of nerve injuries • Management of sharps injuries • Prevention of diathermy injury • Prevention of venous thrombosis 3 Post-operative care: • Writing of operation records • Assessment and monitoring of patient's condition • Post-operative analgesia • Fluid and electrolyte management

	• Detection of impending organ failure • Initial management of organ failure • Principles and indications for Dialysis • Recognition, prevention and treatment of post-operative complications 3 Haemostasis and Blood Products: • Recognition of conditions likely to lead to the diathesis • Recognition of abnormal bleeding during surgery • Appropriate use of blood products • Management of the complications of blood product transfusion 3 Coagulation, deep vein thrombosis and embolism • Recognition of patients at risk • Awareness and diagnosis of pulmonary embolism and DVT • Role of duplex scanning, venography and d-dimer measurement • Initiate and monitor treatment of venous thrombosis and pulmonary embolism • Initiation of prophylaxis 3 Antibiotics: • Appropriate prescription of antibiotics 3 Assess and plan preoperative nutritional management • Arrange access to suitable artificial nutritional support, preferably via a nutrition team including Dietary supplements, Enteral nutrition and Parenteral nutrition 3 Metabolic and endocrine disorders • History and examination in patients with endocrine and electrolyte disorders • Investigation and management of thyrotoxicosis and hypothyroidism • Investigation and management of hypercalcaemia and hypocalcaemia • Peri-operative management of patients on steroid therapy • Peri-operative management of diabetic patients • Investigation and management of hyponatraemia • Investigation and management of hyperkalaemia and hypokalaemia
Technical Skills and Procedures	2 Central venous line insertion 4 Urethral catheterisation

Module 6	**Assessment and management of patients with trauma (including the multiply injured patient)**
Objective	Assess and initiate management of patients • Who have sustained chest trauma • who have sustained a head injury • who have sustained a spinal cord injury • who have sustained abdominal and urogenital trauma • who have sustained vascular trauma • who have sustained a single or multiple fractures or dislocations • who have sustained traumatic skin and soft tissue injury • who have sustained burns • Safely assess the multiply injured patient. • Contextualise any combination of the above • Be able to prioritise management in such situation as defined by ATLS, APLS etc
Knowledge	General • Scoring systems for assessment of the injured patient • Major incident triage • Differences in children Shock • Pathogenesis of shock

	• Shock and cardiovascular physiology • Metabolic response to injury • Adult respiratory distress syndrome • Indications for using uncross matched blood Wounds and soft tissue injuries • Gunshot and blast injuries • Stab wounds • Human and animal bites • Nature and mechanism of soft tissue injury • Principles of management of soft tissue injuries • Principles of management of traumatic wounds • Compartment syndrome Burns • Classification of burns • Principle of management of burns Fractures • Classification of fractures • Pathophysiology of fractures • Principles of management of fractures • Complications of fractures • Joint injuries Organ specific trauma • Pathophysiology of thoracic trauma • Pneumothorax • Head injuries including traumatic intracranial haemorrhage and brain injury • Spinal cord injury • Peripheral nerve injuries • Blunt and penetrating abdominal trauma • Including spleen • Vascular injury including iatrogenic injuries and intravascular drug abuse • Crush injury • Principles of management of skin loss including use of skin grafts and skin flaps
Clinical Skills	**General** 4 History and examination 3 Investigation 3 Referral to appropriate surgical subspecialties 4 Resuscitation and early management of patient who has sustained thoracic, head, spinal, abdominal or limb injury according to ATLS and APLS guidelines 4 Resuscitation and early management of the multiply injured patient 3 Specific problems • Management of the unconscious patient • Initial management of skin loss • Initial management of burns • Prevention and early management of the compartment syndrome
Technical Skills and Procedures	2 Central venous line insertion 3 Chest drain insertion 2 Diagnostic peritoneal lavage 4 Urethral catheterisation 2 Suprapubic catheterisation

Module 7	**Surgical care of the Paediatric patient**

Objective	To assess and manage children with surgical problems, understanding the similarities and differences from adult surgical patients To understand the issues of child protection and to take action as appropriate
Knowledge	• Physiological and metabolic response to injury and surgery • Fluid and electrolyte balance • Thermoregulation Safe prescribing in children • Principles of vascular access in children • Working knowledge of trust and Local Safeguarding Children Boards (LSCBs) and Child Protection Procedures • Basic understanding of child protection law • Understanding of Children's rights • Working knowledge of types and categories of child maltreatment, presentations, signs and other features (primarily physical, emotional, sexual, neglect, professional) • Understanding of one personal role, responsibilities and appropriate referral patterns in child protection • Understanding of the challenges of working in partnership with children and families • Recognise the possibility of abuse or maltreatment • Recognise limitations of own knowledge and experience and seek appropriate expert advice • Urgently consult immediate senior in surgery to enable referral to paediatricians • Keep appropriate written documentation relating to child protection matters • Communicate effectively with those involved with child protection, including children and their families
Clinical Skills	3 f History and examination of paediatric surgical patient 3 Assessment of respiratory and cardiovascular status 3 Undertake consent for surgical procedures (appropriate to the level of training) in paediatric patients

Module 8	**Management of the dying patient**
Objective	Ability to manage the dying patient appropriately. Palliative Care: Good management of the dying patient in consultation with the palliative care team.
Knowledge	Palliative Care: • Care of the terminally ill • Appropriate use of analgesia, anti-emetics and laxatives Principles of organ donation: • Circumstances in which consideration of organ donation is appropriate • Principles of brain death Understanding the role of the coroner and the certification of death
Clinical Skills	3 Palliative Care: • Symptom control in the terminally ill patient 3 Principles of organ donation: • Assessment of brain stem death • Certification of death

Module 9	**Organ and Tissue transplantation**
Objective	To understand the principles of organ and tissue transplantation
Knowledge	• Principles of transplant immunology including tissue typing, acute, hyperactute and chronic rejection • Principles of immunosuppression • Tissue donation and procurement • Indications for whole organ transplantation

In addition, in the early years of training, trainees must address early years competencies of the Professional skills and Leadership curriculum on pages 107-129.

Requirement to meet the ST3 in Urology

In order to meet the job specifications of an ST3 trainee an early year's trainee must take a clear role in the Urology team, managing clinic and ward based patients under supervision, including the management of acute urological admissions. They will need to be able to take part in an outpatient clinic and see patients themselves with the consultant available for advice.

Therefore in early years training, in addition to the common competences for all surgeons, it is necessary to address the specifics of a developing interest in Urology during these years. This means spending 6-12 months in Urology in a service which gives trainees access to the appropriate learning opportunities. Also by the time a trainee enters ST3 they need to be familiar with the operating room environment both with respect to elective and emergency cases.

Trainees must attend MDT and other Departmental meetings and ward rounds, prepare elective operating lists (including inpatient, day-case and endoscopy), and actually perform some surgery under appropriate supervision. They must manage all patients in a Urology ward environment, preoperatively and post operatively. This includes recognising and initiating the management of common complications and emergencies, over and above those already laid out in the common surgical component of the curriculum, particularly module 2.

The range of conditions a trainee needs to manage is laid out below and in the depth demonstrated in a text book such as Blandy's Lecture notes in Urology include:

1. Urinary tract calculi
- To be able to provide the early care of a patient presenting with the symptoms suggestive of urinary tract calculi including onward referral

2. Functional urology
- To be able to provide the early care of a patient presenting with lower urinary tract symptoms and dysfunction including onward referral
- To be able to provide the early care of a patient presenting with urinary tract obstruction including onward referral
- To diagnose and initiate management of a patient presenting with acute or chronic urinary retention

3. Urinary tract infection
- To be able to provide the early care of a patient presenting with urinary tract infections including onward referral when appropriate
- To be able to provide the early care of a patient presenting with epididymitis and scrotal abscess including onward referral when appropriate

4. Urological oncology
- To be able to provide the early care of a patient with suspected urological cancer including onward referral

5. Treatment of renal failure
- To be able to provide the early care of a patient presenting with renal failure including onward referral when appropriate

6. Testicular pain and swelling
- To be able to provide the early care of a patients presenting with acute testicular pain or testicular swelling

Early Years training in Urology	
Objective	Provide experience in the early care of patients with common genitourinary problems: • The common emergency problems are urinary tract infection affecting the bladder and kidney, ureteric or renal colic, urinary retention, urinary tract obstruction, renal failure and acute testicular pain. • The common elective problems include lower urinary tract symptoms in men, urinary tract infection affecting the bladder and kidney, haematuria, testicular swelling and other patients in whom urological malignancy is suspected. Provide some operative experience of scrotal surgery and circumcision, together with some experience of straightforward lower urinary tract endoscopy.
Knowledge	Basic science relevant to the management of patients with the common elective and emergency genitourinary problems, (including anatomy, physiology, pharmacology, pathology and radiology) Principles of management of patients presenting with the common elective and emergency genitourinary problems Detailed initial management of patients presenting the common urological problems including onward referral
Clinical Skills	3 Assessment, investigation and initial management of patients presenting with common elective and emergency urological conditions
Technical Skills and Procedures	4 Urethral catheterisation 3 Suprapubic catheterisation 3 Flexible cystoscopy 2 Rigid cystoscopy 2 Rigid cystoscopy with biopsy and diathermy 2 Rigid cystoscopy and retrograde ureterogram 2 Rigid cyfstoscopy and insertion JJ stent 4 Testicular fixation for torsion of the testicle 2 Hydrocele surgery 2 Excision of epidiydymal cyst 2 Circumcision

Assessment

The speciality elements of the early years will all be assessed primarily in the workplace and then scrutinised in the Annual Review of Competence Progression. All these documents would be included in a portfolio which would contribute as evidence in subsequent applications to enter ST3.

Specific evidence includes

Assessment type	Subject
DOPS a selection of types and numbers of each type according to learning agreements	Urethral catheterisation Suprapubic catheterisation Flexible cystoscopy Testicular fixation for torsion of the testicle Rigid cystoscopy Circumcision Rigid cystoscopy with biopsy and diathermy Rigid cystoscopy and retrograde ureterogram Rigid cystoscopy and insertion JJ stent Hydrocele surgery Excision of epididymal cyst Circumcision
Case Based Discussion	One per attachment
CEX	Clinical assessment of patients with common urological conditions
PBAs	Hydrocele repairexcision
Training Supervisors report	Evidenced by the above WPBAs
ARCP for each specified training interval	As per local Deanery specifications
MRCS	Common syllabus

Intermediate Stage Overview

Clinical placements during the intermediate stage (ST3-6) will be purely in Urology. The purpose of the intermediate stage is to allow the trainee to develop further the skills necessary for independent urological practise. These will include skills in general urology and in emergency urology. They will also be an introduction to some specialist areas of Urology.

Entry into ST3

Entry into ST3 will usually involve a competitive selection process. The current person specifications for entry into ST3 in urology are shown below (for 2009). The essential components here are completion of the common component of the core surgical training programme (as evidenced by successful ARCP, WPBA and completion of the MRCS examination) and completion of the urology specific components of the early years training as evidenced by a successful ARCP and completion of the appropriate WPBA.

	Essential	When Evaluated[1]
Qualifications	• MBBS or equivalent medical qualification • Successful completion of MRCS or equivalent at time of application	Application form
Eligibility	• Eligible for full registration with the GMC at time of appointment	Application form
	• Evidence of achievement of **Foundation competences** by time of appointment in line with GMC standards/ Good Medical Practice including: o *Good clinical care* o *Maintaining good medical practice* o *Good relationships and communication with patients* o *Good working relationships with colleagues* o *Good teaching and training* o *Professional behaviour and probity* o *Delivery of good acute clinical care*	Application form Interview / Selection centre[2]
	• Evidence of achievement of **ST1 competences in surgery** at time of appointment & **ST2 competences** in surgery by August 2009	Application form Interview / Selection centre
	• Evidence of achievement of **ST1 & ST2 Urology competences** by August 2009	Application form Interview / Selection centre
	• Eligibility to work in the UK	Application form
Fitness To Practise	Is up to date and fit to practise safely	Application form References
Language Skills	All applicants to have demonstrable skills in written and spoken English adequate to enable effective communication about medical topics with patients and colleagues demonstrated by one of the following: o *a) that applicants have undertaken undergraduate medical training in English; or* o *b) have the following scores in the academic International English Language Testing System (IELTS) – Overall 7, Speaking 7, Listening 6, Reading 6, Writing 6.* • If applicants believe they have adequate communication skills but do not fit into one of these examples they must provide supporting evidence	Application form Interview / Selection centre

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[1] 'when evaluated' is indicative, but may be carried out at any time throughout the selection process

[2] A selection centre is a process not a place. It involves a number of selection activities that may be delivered within the Unit of Application.

Health	Meets professional health requirements (in line with GMC standards/Good Medical Practice)	Application form Pre-employment health screening
Career Progression	• *Ability to provide a complete employment history* • *At least 24 months' experience[3] in surgery (not including Foundation modules), of which at least 6 months has been spent in urology by August 2009*	Application form
Application Completion	*ALL sections of application form completed FULLY according to written guidelines*	Application form

SELECTION CRITERIA			
	Essential	**Desirable**	**When Evaluated[4]**
Clinical Skills	**Technical Knowledge & Clinical Expertise:** • Capacity to apply sound clinical knowledge & judgement & prioritise clinical need • Demonstrates appropriate technical competence & evidence of development of excellent diagnostic skills & judgement • Validated logbook documentation of surgical exposure to date	**Personal Attributes:** • Shows aptitude for practical skills, e.g. hand-eye co-ordination, dexterity, visuo-spatial awareness • Attendance at relevant courses, e.g. ATLS, Basic Surgical Skills or equivalent	Application form Interview / Selection centre References
Academic / Research Skills	**Research Skills:** • Demonstrates understanding of the basic principles of audit, clinical risk management & evidence-based practice • Understanding of research basic research principles, methodology & ethics, with potential to contribute to research **Teaching:** • Evidence of contributing to teaching & learning of others	• Evidence of relevant academic & research achievements, e.g. degrees, prizes, awards, distinctions, publications, presentations, other achievements • Evidence of active participation in audit • Evidence of participation in risk management and/or clinical/laboratory research	Application form Interview / Selection centre

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[3] Any time periods specified in this person specification refer to full time equivalent

[4] 'when evaluated' is indicative, but may be carried out at any time throughout the selection process

Personal Skills	**Judgement under Pressure:** • Capacity to operate effectively under pressure & remain objective in highly emotive/pressurised situations • Awareness of own limitations & when to ask for help **Communication Skills:** • Capacity to communicate effectively & sensitively with others, able to discuss treatment options with patients in a way they can understand **Problem Solving:** • Capacity to think beyond the obvious, with analytical and flexible mind • Capacity to bring a range of approaches to problem solving **Situation Awareness:** • Capacity to monitor and anticipate situations that may change rapidly **Decision Making:** • Demonstrates effective judgement and decision-making skills **Leadership & Team Involvement:** • Capacity to work effectively in a multi-disciplinary team & demonstrate leadership when appropriate • Capacity to establish good working relations with others **Organisation & Planning:** • Capacity to manage time and prioritise workload, balance urgent & important demands and follow instructions • Understands importance & impact of information systems •		Application form Interview / Selection centre References	**Formatted:** Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm **Formatted:** Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: -1.27 cm + Indent at: 0.5 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm
Probity	**Professional Integrity:** • Takes responsibility for own actions, demonstrates respect for the rights of all. • Demonstrates awareness of ethical principles, safety, confidentiality & consent • Aware of importance of being the patients' advocate, clinical governance & responsibilities of an NHS employee		Application form Interview / Selection centre References	

Commitment To Specialty	**Learning & Development:** • Shows realistic insight into urology and the demands of a surgical lifestyle • Demonstrates knowledge of training programme & commitment to own development • Shows critical & enquiring approach to knowledge acquisition, commitment to self-directed learning & reflective/analytical approach to practice	• Extracurricular activities / achievements relevant to urology	Application form Interview / Selection centre References

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Intermediate Stage Topics

Topic	Basic science
Objective	*The trainee should understand the basic anatomy that urologists will encounter during the daily management of urological patients, and basic embryology relevant to clinical practice* *To understand and apply physiological principles in the management of patient with urological problems.* *To understand normal physiological processes at different ages and understand the effects of disease and trauma on these processes* *To understand the pharmacological principles relevant to the genitourinary tract* *To understand pathological processes as applied to the organs of the urogenital system*
Knowledge	**Anatomy** 4 Macro anatomy and Micro anatomy of the urinary tract 4 Vascular anatomy of the urinary tract 4 Neurological supply including central connections 4 3-dimensional relationship to other organs 4 General knowledge of intra abdominal operative anatomy 4 Embryological development in relation to disorders affecting the urinary tract 3 Pathways of pain **Physiology** 4 Mechanism of endocrine homeostasis 4 Control of blood pressure 4 Mechanism of urine production 4 Mechanism of peristalsis initiation 4 Mechanisms of neuromuscular transmission 4 Anti-reflux mechanisms 4 Neuro-physiological control of filling/voiding cycles 4 Physiological properties of bladder musculature 4 Physiological properties of bladder mucosa 4 Bladder sensation 4 Neurophysiology of sphincter mechanisms in male and female 4 Physiology and molecular biology of prostate cell 4 Physiology of prostate secretion 4 Prostate specific antigen and related markers 3 Physiology of erection and ejaculation 3 Urological endocrinology 3 Interpretation of semen analysis 3 Mechanisms of spermatogenesis and mechanism of spermatic transport 3 Function of accessory genital organs 3 Effect of disease and drugs on normal genital function 3 Physiology of pain **Pharmacology** 4 Mechanisms of action of commonly used drugs in urology 4 Nephro-pharmacology 4 Cholinergic and Adrenergic mechanisms 4 Non-adrenergic, non-cholinergic (NANC) mechanisms 4 Pharmacology of coagulation 4 Pharmacology of inflammation 4 Pharmacology of neoplastic disease **Pathology** 3 Basic genetics of uropathological conditions 3 Common congenital disorders affecting the urinary tract (eg undescended testis and urinary tract reflux) 3 Changes related to congenital abnormalities 4 Basic principles of microbiology, resistance, cross infection relevant to the GU tract 4 Antibiotics including mechanism of action

	4 Acute and chronic inflammatory response 3 Chronic inflammatory mechanisms and diseases 3 Role of genetic and environmental factors in urological cancer 3 Mechanisms of tumour initiation/growth 4 TNM classification of common urological tumours 2 Oncogenes, growth factors and angiogenesis 2 Mechanisms of chemotherapy, immunotherapy and radiotherapy 3 Familial prostate cancer and renal oncology 3 Abnormalities resulting from trauma 4 Primary and secondary wound healing by anatomical site
Clinical Skills	**Anatomy** 4 Application of anatomical knowledge in clinical and operative setting **Physiology** 4 To understand the indications and theory of urodynamic studies 3 To understand the indications and theory of urodynamic studies in the neuropathic patient 4 Assessment of the normovolaemic patient 4 Assessment of the anuric patient 4 Assessment and management of the patient in renal failure 4 Management of post obstructive diuresis 4 Application of knowledge in clinical and operative setting 3 Assessment and early management of the infertile male 4 Application of knowledge in clinical and operative setting 4 Utilisation of PSA in the clinical setting 4 Understanding of PSA density and velocity **Pharmacology** 4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications **Pathology** 3 Recognition of possible genetic component to specified condition 3 Investigation and basic management of patients with congenital disorders of the GU tract 4 Appropriate investigation and management of urinary tract infection 4 Understand and apply principles of infection control 4 Management of multi-resistant organisms 3 Investigation and management of chronic inflammatory diseases affecting the urinary tract 3 Diagnosis, staging and early management of patients with urological malignancy 3 Diagnosis and early management of patients with trauma ATLS
Technical Skills and Procedures	4 Application of knowledge in operative setting 4 Urodynamic assessment 3 Urodynamic assessment of the neuropathic bladder

Topic	**Clinical pharmacology**
Objective	*To understand and apply pharmacological principles in the management of patients with urological disease.*
Knowledge	Clinical pharmacology of commonly used drugs including side-effects and complications of commonly used drugs for the following conditions: 4 Acute and chronic infection 4 Lower urinary tract dysfunction 4 Erectile dysfunction 4 Urinary incontinence 2 Systemic chemotherapy for urological malignancy 3 Intravesical chemotherapy for urological malignancy

	4 Anticoagulants 4 Drugs used for pain relief including post-operative pain relief 3 Immunosupressants 4 DVT prophylaxis in Urological surgery 4 Side effects upon the genitourinary tract of drugs used to treat common conditions (eg cardiovascular and respiratory disease)
Clinical Skills	4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications
Technical Skills and Procedures	N/A

Topic	**Common research methodology (dry science)**
Objective	*To understand statistical mechanisms and be able to critically assess evidence in the literature* *To understand the principles and practice of audit*
Knowledge	4 Understanding of statistical significance, relative risk, odds ratio, weighted mean difference and confidence intervals 4 Application of tests e.g. Parametric, Non-parametric, Multivariate and Chi-squared analysis 4 Principles of screening 4 Principles of audit 4 Hierarchy of evidence 4 Principles (including theory and design), applications and limitations of randomised controlled trials, observational studies and retrospective series 4 Methodology that underpin phase 1, 2, 3 and 4 trials 4 Understanding of Good Clinical Practice including importance of ethics in research and research governance 4 Basics of meta-analysis, systematic review and narrative review 4 Basics of qualitative research
Clinical Skills	4 Critical appraisal of scientific publications including quality assessment 4 Ability to interpret the relevance of trial / study outcomes to the care of patients 4 Application of research methodology to clinical setting 4 Audit 4 Systematic review 4 Observational study
Technical Skills and Procedures	N/A

Topic	**Stone Disease**
Objective	*To assess a patient presenting with a urinary stone in kidney, ureter or bladder* *To treat a patient presenting with a urinary stone in kidney, ureter or bladder including onward referral when appropriate*
Knowledge	4 Principles of management of stones in the urinary tract 4 Mechanisms of stone formation 4 Natural history and pathophysiology 4 Variable symptom complexes according to site 4 Complications of stone formation 4 Metabolic management of urinary stone disease **Renal calculi**

	4 Management of renal calculi **Ureteric calculi** 4 Mechanisms of ureteric colic 4 Renal adaptation to ureteric obstruction 4 The role of IVU/USS and CT in diagnosis 4 Management of ureteric calculi **Bladder calculi** 4 Management of bladder calculi
Clinical Skills	4 Requirements for emergency therapy 4 Appropriate multidisciplinary assessment and management 4 Investigation and management of patient with recurrent stone disease **Renal calculi** 4 Assessment of obstruction / sepsis 4 Appropriate management and treatment plans 4 Correct referral pathways 4 Medical management **Ureteric calculi** 4 Assessment of obstruction / sepsis 4 Appropriate management and treatment plans 4 Correct referral pathways 4 Medical management **Bladder calculi** 4 Assessment of obstruction / sepsis 4 Appropriate investigation and treatment plans
Technical Skills and Procedures	4 Cystoscopy and insertion JJ stent 3 ESWL for renal stone 2 ESWL for ureteric stone 3 Rigid ureteroscopy and therapeutic management lower 1/3 ureteric calculi 2 Rigid ureteroscopy and therapeutic management middle and upper 1/3 ureteric calculi 4 Cystoscopy and insertion JJ stent 4 Endoscopic fragmentation of bladder calculi 3 Open removal bladder calculi

Topic	**Urinary tract obstruction**
Objective	*To assess and treat a patient presenting with lower urinary tract symptoms and dysfunction* *To assess and treat a patient who has urinary tract obstruction including onward referral when appropriate* *To assess and treat a patient with urinary retention*
Knowledge	**Upper tract obstruction** 4 Anatomy, causes and pathophysiology of upper urinary tract obstruction 4 Aetiology, pathophysiology and management of ureteric stricture **Lower tract obstruction** 4 Anatomy, physiology, epidemiology and pathophysiology of lower urinary tract dysfunction in men and women 4 Investigative tools 4 Available treatment options for male and female LUTS 4 Causes and pathophysiology of urinary retention in men and women 4 Mechanisms of acute/chronic retention Aetiology, pathophysiology and management of urethral stricture

	Aetiology, pathophysiology and management of bladder neck stenosis **Male LUTS and BPH** 4 Epidemiology of BPH 4 Natural history and complications of BPH 4 Mechanisms of fluid balance 4 Urodynamic basis for symptoms 4 Non-urological causes of similar symptom complex 4 Utility of PSA 4 Detailed medical and surgical therapy for BPH
Clinical Skills	**Upper tract obstruction** 4 Appropriate assessment of unilateral and bilateral renal obstruction 4 Recognition and early management of sepsis 4 Appropriate management of upper urinary tract obstruction 4 Interpretation of IVU and diuresis renography 4 Management of post obstructive diuresis 4 Assessment of renal function and fluid loading 4 Assessment of fluid balance and renal function **Lower tract obstruction** 4 Interpretation of urinary flow rates 4 Appropriate clinical assessment and investigation of men and women with LUTS 4 Formulation of differential diagnosis for men and women with LUTS 4 Formulation of therapeutic plan for men and women with LUTS 4 Management of urethral stricture including onward referral as appropriate 4 Management of bladder neck stenosis including onward referral as appropriate **Male LUTS and BPH** 4 Appropriate assessment, investigation and management including - Interpretation of fluid charts - Interpretation of biochemistry (eg PSA) - Interpretation of urodynamic investigations (eg flow rate, residual urine) 4 Formulation of appropriate differential diagnosis 4 Formulation of appropriate plan of management 4 Medical therapy of BPH / LUTS
Technical Skills and Procedures	4 Cystoscopy and retrograde ureterogram 3 Cystoscopy and insertion JJ stent 4 Urodynamic testing 3 TURP 3 Bladder neck incision 4 Percutaneous insertion of suprapubic catheter 4 Urethrography 3 Optical urethrotomy

Topic	Urinary Tract Infections
Objective	*To understand the pathogenesis, natural history and complications of urinary tract infection.* *To be able to assess and manage patients presenting with common urinary tract infections,* *To be able to assess and manage patients presenting with genital infections*
Knowledge	**Basic Mechanisms** 4 Biological mechanisms of upper and lower urinary tract infection -- virulence 4 Host defence 4 Antibiotics - Mechanisms of action 4 Appropriate microbiological tests

	Pyelonephritis 4 Predisposing causes 4 Clinical presentation and management **Renal and peri-renal abscess** 4 Pathogenesis predisposing causes 4 Clinical presentation and management **Genito-urinary tuberculosis** 4 Pathogenesis, natural history and complications 4 Clinical presentation and management **Prostatitis** 4 Classification, pathogenesis, natural history and complications 4 Diagnosis and management 4 Role of segmented culture **Epididymitis** 4 Pathogenesis, natural history and complications 4 Clinical presentation and differential diagnosis 4 Treatment **Scrotal abscess** 4 Classification 4 Pathogenesis, natural history and complications 4 Diagnosis and management **Fournier's gangrene** 3 Pathophysiology and clinical features of Fournier's gangrene **Sexually transmitted diseases including Chlamydia trachomatis, Gonococcal and non-Gonococcal urethritis** 4 Pathogenesis, natural history and complications 4 Clinical presentation, differential diagnosis and management
Clinical Skills	**General** 4 Identification of significant infection and asymptomatic bacteriuria; 4 Correct antibiotic selection 4 Management of specific patient groups e.g adult females, children 4 Collection of appropriate samples and interpretation of results **Pyelonephritis** 4 Rapid and appropriate assessment of patient 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests 4 Indications for nephrostomy **Renal and peri-renal abscess** 4 Rapid and appropriate assessment 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests 4 Appropriate treatment **Genitourinary tuberculosis** 4 Rapid and appropriate assessment 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests **Prostatitis** 4 Appropriate assessment 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests 4 Medical management

	Epididymitis 4 Appropriate assessment of patient 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests 4 Medical management of patient **Scrotal abscess** 4 Appropriate assessment of patient 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests 4 Medical management of patient **Fournier's gangrene** 3 Appropriate management of Fournier's gangrene 4 Liaison with other teams as appropriate e.g. plastic and colorectal surgeons **Sexually transmitted diseases including Chlamydia trachomatis, Gonococcal and non-Gonococcal urethritis** 4 Appropriate assessment of patient 4 Correct interpretation of tests 4 Appropriate diagnostic and microbiological requests 4 Liaison with other teams as appropriate e.g Gynaecology, GUM
Technical Skills and Procedures	4 Rigid and flexible cystoscopy 4 Cystoscopy and retrograde ureterogram 3 Cystoscopy and JJ stent insertion 4 Surgical management of scrotal abscess

Topic	**Retroperitoneal fibrosis**
Objective	*To understand the pathogenesis, natural history and complications of urinary tract infection.* *To be able to assess and manage patients presenting with common urinary tract infections,* *To be able to assess and manage patients presenting with genital infections*
Knowledge	3 Pathogenesis, natural history and complications 3 Clinical presentation and management
Clinical Skills	3 Assessment of patient 3 Correct interpretation of tests 3 Medical management of patient
Technical Skills and Procedures	4 Cystoscopy and retrograde ureterogram 3 Cystoscopy and JJ stent insertion

Topic	**Interstitial cystitis**
Objective	*To understand the pathogenesis, natural history and complications of urinary tract infection.* *To be able to assess and manage patients presenting with common urinary tract infections,* *To be able to assess and manage patients presenting with genital infections*
Knowledge	3 Pathogenesis, natural history and complications

	3 Clinical presentation 3 NIH criteria for diagnosis 3 Management options
Clinical Skills	3 Assessment of patient 3 Correct interpretation of tests 3 Medical management of patient
Technical Skills and Procedures	4 Cystoscopy and biopsy

Topic	Urinary Incontinence
Objective	*To assess and manage a patient presenting with symptoms of urinary incontinence including onward referral when appropriate* *To assess and manage patients with neuropathic bladder dysfunction including onward referral when appropriate.*
Knowledge	4 Aetiology, epidemiology, pathophysiology and classification incontinence in men and women 4 Clinical presentation and differential diagnosis of urinary incontinence 4 Management of urinary incontinence 3 Aetiology, epidemiology, pathophysiology and classification of neuropathic bladder 3 Clinical presentation and differential diagnosis of urinary incontinence 3 Management of neuropathic incontinence
Clinical Skills	**Urinary incontinence** 4 Appropriate history and examination 4 Investigation including Interpretation of frequency volume chart 4 Appropriate liaison with multidisciplinary team 4 Appropriate referral for sub-specialist management and surgery 3 Formulation of a realistic treatment plan 4 Medical management of urinary incontinence **Neuropathic bladder** 3 Appropriate history and examination 3 Appropriate investigation 3 Interpretation of frequency volume chart 3 Appropriate liaison with multidisciplinary team (eg neurology and continence) 3 Appropriate referral for sub-specialist management and surgery 3 Formulation of a realistic treatment plan 4 Medical management
Technical Skills and Procedures	4 Urodynamic studies 4 Cystoscopy and injection of Botulinum Toxin 3 Cystoscopy and injection of urethral bulking agent 3 Surgical insertion of mid-urethral tape 4 Cystoscopy and insertion of suprapubic catheter

Topic	Urological Oncology
Objective	*To assess and manage patient with suspected urological cancer.* *To manage patients with a proven urological cancer including onward referral where necessary* *To treat the patient with empathy*

Knowledge	**Aetiology, epidemiology and pathophysiology** 3 Epidemiology of urological cancer 3 Role of genetic and environmental and factors in pathogenesis 2 Basic understanding of molecular biology of urological cancer 2 Knowledge of Oncogenes, growth factors and angiogenesis factors in relation to tumours **Clinical features** 3 Symptom complexes arising from urological malignancies kidney, ureter, bladder, prostate, testis and penis 3 Current standards for the investigation of common urological cancers 3 TNM classification of common urological tumours **Treatment** 4 Current standards of treatment for common urological Cancers 3 Principles of neo-adjuvant versus adjuvant therapy 3 Principles and application of radiotherapy 4 Terminal care **Screening** 4 Principles of screening 4 PSA and other markers as screening tools 4 Application of urine cytology to screening 4 Controversies in screening for urological cancers
Clinical Skills	3 High level empathetic and communication skills 3 Rapid and appropriate assessment of patient with possible malignancy 3 Role of PSA and other markers, urine cytology etc 3 Correct interpretation of tests 3 Appropriate liaison with multidisciplinary team 3 Appropriate management of urological malignancies 3 Appropriate referral for sub-specialist management and surgery 4 Care of the dying patient
Technical Skills and Procedures	4 Cystoscopy and biopsy 4 Cystoscopy and diathermy bladder lesion 3 TURBT 3 TURP 4 Cystoscopy and JJ stent insertion 3 Ureteroscopy 4 Cystoscopy and retrograde pyelogram 4 Inguinal Orchidectomy

Topic	**Andrology**
Objective	*To assess and manage a man with male factor infertility including onward referral as necessary* *To assess and manage a man with erectile dysfunction including onward referral as necessary* *To assess and manage a man with varicocele, ejaculatory disorders, penile deformity, penile fracture or prolonged erection including onward referral as necessary* *To assess and counsel a man requesting a vasectomy*
Knowledge	3 Anatomy, embryology and physiology of male reproductive system 3 Causes, assessment and management of male factor infertility 3 Modern methods of assisted fertilisation 4 Anatomy, physiology and pharmacology of erectile mechanism 4 Effects of concurrent pathology on erectile mechanism 4 Standards of assessment and investigation of erectile dysfunction 4 Therapeutic options including the pharmacological basis of modern therapy

	4 Penile deformity – anatomy, physiology and management 4 Prolonged erection – Causes, pathophysiology and management 4 Penile fracture – assessment and management 4 Contraception - Methods, results and complications of different methods of contraception 3 Ejaculatory disorders – anatomy, physiology and management 4 Varicocele – anatomy, physiology and management
Clinical Skills	**Male infertility** 3 Appropriate investigation and treatment plan 3 Liaison with multidisciplinary team and referral for sub-specialist management **Erectile dysfunction** 4 High level and empathetic communication skills 4 Appropriate investigation and treatment plan 4 Medical management of erectile dysfunction 4 Liaison with multidisciplinary team and referral for sub-specialist management **Andrology** Appropriate investigation and treatment plan and onward referral where appropriate for the following: 4 Penile deformity 4 Prolonged erection 3 Ejaculatory disorders 4 Varicocele 4 Penile fracture Appropriate referral for sub-specialist management and surgery 4 Contraception - Assess and counsel a man requesting contraceptive advice
Technical Skills and Procedures	2 Nesbit's procedure 2 Operative management 3 Operative management 4 Vasectomy 3 Operative management of varicocele

Topic	**Paediatric Urology**
Objective	*To assess and manage a child with a congenital disorder of the urogenital tract including onward referral as necessary* *To assess and manage a child with a enuresis, congenital neuropathic bladder or with intersex, including onward referral as necessary* *To assess and manage a child with an inguinoscrotal abnormality including onward referral as necessary* *To assess and manage a child with urinary infection, including onward referral as necessary*
Knowledge	4 Embryology and anatomy of common congenital abnormalities, e.g undescended testis, duplex systems, reflux and hydronephrosis 4 Principles of functional assessment of the genitourinary tract 2 Basic embryology, anatomy of abnormality and natural history of intersex, spina bifida and posterior urethral valves 4 Concise knowledge of inguino-scrotal anatomy 4 Bacteriology of UTI in childhood 4 Natural history and normal patterns of continence
Clinical Skills	**Common congenital urological disorders e.g undescended testis, duplex systems reflux and hydronephrosis** 4 Appreciation of prognostic possibilities 4 Appropriate investigation plans 4 Formulation of realistic treatment plan

	4 Appropriate referral for sub-specialist management and / or surgery 4 Family orientated communication skills **Spina bifida, intersex and posterior urethral valves** 2 Appreciation of prognostic possibilities 2 Formulation of realistic treatment plan 2 Appropriate referral for sub-specialist management and / or surgery **Inguinoscotal abnormalities (eg ~~phimosis,~~ undescended testes, hydrocele, testicular torsion) and phimosis.** 4 Appropriate tests to elicit differential diagnosis 4 Formulate appropriate treatment plan 4 Management of condition, including knowledge of indications, results and complications of surgery **Urinary tract infection** 4 Practical management of UTI 4 Appropriate investigation plans 4 Formulation of realistic treatment plan 4 Appropriate referral for sub-specialist management and / or surgery **Enuresis** 4 Practical management 4 Formulation of realistic treatment plan 4 Appropriate referral for sub-specialist management and / or surgery
Technical Skills and Procedures	4 Circumcision 3 Hydrocele 3 Orchidopexy 4 Surgical exploration for torsions of testis, with fixation

Topic	Renal function and Nephrology
Objective	*To have a good working knowledge of the assessment of renal function and the urological conditions that predispose to the development of renal failure.* *To understand the pathogenesis, natural history and complications of urological conditions that can lead to renal dysfunction and how urological intervention may prevent or delay the onset of renal failure.* *To understand the different methods of renal replacement including renal transplantation*
Knowledge	4 Physiology of renal function 4 GFR estimation techniques 4 Tubular function and dysfunction 4 Basic pathology of acute and chronic renal failure 4 Principles of dialysis, renal preservation 4 Control of blood pressure 4 Aetiology, diagnosis and early management of Acute tubular necrosis 4 Aetiology, diagnosis and early management of pre-renal failure 4 Mechanisms of obstructive uropathy 4 Causes and pathophysiology of bilateral and unilateral obstruction 4 Mechanisms of chronic retention and its relationship to obstructive uropathy 4 Principles of haemodialysis and peritoneal dialysis 4 Indwelling cannulae for haemodialysis 4 Continuous ambulatory peritoneal dialysis (CAPD) 3 Recipient selection and indications for transplantation 3 Tissue typing and cross matching for transplantation 3 Relative indications for haemodialysis or transplantation 3 Immunosuppression for transplantation 3 Complications of renal transplantation
Clinical Skills	4 Practical methods of GFR assessment

	Assessment of patients with the following: 4 Tubular disorders 4 Anuria 4 Renal failure 4 Obstructed uropathy 4 Liaison with other specialties (nephrology, transplantation) 4 Management of fluid/acid base balance 4 Assessment of fluid balance, renal function and fluid loading 4 Management of post obstructive diuresis 4 Ambulatory dialysis techniques 3 Evaluation of potential recipients for renal transplantation and timing of dialysis 3 Urinary tract workup of potential recipients prior to transplantation
Technical Skills and Procedures	4 Percutaneous supra-pubic catheterisation

Topic	Emergency Urology
Objective	*To assess and manage patients who present acutely with urological problems, including onward referral when necessary*
Knowledge	**Ureteric colic** 4 Pathophysiology of nephrolithiasis 4 Renal adaptation to ureteric obstruction 4 Presentation and clinical course of urinary tract calculi 4 The role of IVU/USS and CT in diagnosis 4 Management options 4 Complications of urinary tract calculi including urosepsis 4 Pharmacology of pain relief 3 Endoscopic management of ureteric calculi **Urinary tract infection and pyelonephritis** 4 Causes and pathophysiology of urinary tract infections, including the complications 4 Presentation of urinary tract infection 4 Renal function during infection 4 Antibiotics and their relevant pharmacology 4 Indications for further investigation of urinary tract infection **Urinary retention in men and women** 4 Causes, epidemiology and pathophysiology of acute and chronic urinary retention 4 Mechanisms of acute and chronic urinary retention 4 Risk factors and timing of treatment 4 Treatment options for acute and chronic urinary retention **Haematuria** 4 Causes and pathophysiology of haematuria 4 Causes and pathophysiology of disorders of coagulation 4 Tests for disorders of coagulation **Testicular pain** 4 Anatomy of the Scrotum and Testicle 4 Pathophysiology of testicular torsion 4 Pathophysiology of epididymo-orchitis 4 Pathophysiology of scrotal abscess 4 Clinical features and differential diagnosis 4 Appropriate management **Other emergencies** 3 Causes pathophysiology, clinical features and management of Fournier's Gangrene

	4 Causes, pathophysiology, clinical features and management of phimosis 4 Causes, pathophysiology, clinical features and management of paraphimosis 4 Causes, pathophysiology, clinical features and management of priapism 4 Causes, pathophysiology, clinical features and management of penile fracture
Clinical Skills	**Ureteric colic** 4 Emergency assessment and treatment of uncomplicated urinary tract calculi including analgesia 4 Appropriate definitive management of uncomplicated urinary tract calculi 4 Assessment and management of obstruction and sepsis 4 Detection of complications e.g. as obstructed kidney, renal failure, perinephric abscess **Urinary tract infection and pyelonephritis** 4 Diagnosis and management of urinary tract infection 4 Assessment and management of obstruction and sepsis 4 Appropriate relief as indicated 4 Appropriate action to relieve renal function **Urinary retention in men and women** 4 Assessment, investigation and formulation of a management plan for acute and chronic urinary retention 4 Assessment of fluid balance and renal function 4 Medical management of urinary retention 4 Management of post obstructive diuresis **Haematuria** 4 Assessment, investigation and management of patient with haematuria **Testicular pain** 4 Assessment, investigation and management of acute scrotal pain 4 Assessment, investigation and management of epididymo-orchitis 4 Assessment, investigation and management of scrotal abscess **Other emergencies** 3 Assessment, investigation and management of Fournier's gangrene including liaison with other teams as appropriate e.g. plastic and colorectal surgeons 4 Assessment, investigation and management of Phimosis 4 Assessment, investigation and management of Paraphimosis 4 Assessment, investigation and management of Priapism including onward referral where necessary 4 Assessment, investigation and management of Penile fracture including onward referral
Technical Skills and Procedures	3 Rigid ureteroscopy and therapeutic management lower 1/3 ureteric calculi 2 Rigid ureteroscopy and therapeutic management middle and upper 1/3 ureteric calculi 4 Cystoscopy and insertion JJ stent 4 Percutaneous suprapubic catheterisations 3 TURP 3 Bladder neck incision 4 Cystoscopy and bladder washout 3 TURBT 4 Surgical exploration for torsions of testis, with fixation 4 Surgical management of scrotal abscess 3 Surgical management of Fournier's gangrene 4 Reduction of paraphimosis ~~phimosis,~~ 4 Dorsal slit 4 Circumcision 2 Operative management of priapism 3 Operative management of penile fracture

Topic	Trauma to the Urinary Tract
Objective	*To assess and manage patients who present with genitourinary trauma, including onward referral when necessary*
Objective	*To assess and manage patients who present acutely with urological problems, including onward referral when necessary*
Knowledge	3 Causes, pathophysiology classification and management of renal trauma 3 Causes, pathophysiology classification and management of ureteric trauma 3 Causes, pathophysiology classification and management of bladder trauma 3 Causes, pathophysiology classification and management of urethral trauma 3 Causes, pathophysiology classification and management of genital trauma 4 Causes, pathophysiology classification and management of testicular trauma
Clinical Skills	4 Resuscitation, ATLS 3 Appropriate liaison with other relevant specialists in multiple trauma cases 3 Assessment and management of renal trauma 3 Assessment and management of ureteric trauma including appropriate onward referral 3 Assessment and management of bladder trauma including appropriate onward referral 3 Assessment and management of urethral trauma including appropriate onward referral 4 Assessment and management of testicular trauma 3 Assessment and management of genital trauma including appropriate onward referral
Technical Skills and Procedures	3 Cystoscopy and insertion JJ stent 4 Percutaneous suprapubic catheterisation 3 Testicular repair 4 Orchidectomy 4 Circumcision

Topic	Urological Radiology
Objective	*To understand the different radiological techniques used in the investigation of urological disease, including practical techniques, indications and safety issues* *To gain hands on experience in diagnostic and interventional radiology* *To develop technical skills in standard radiological techniques relevant to urology*
Knowledge	4 Principles of ionising radiation 4 Patient and physician protection 4 Investigation related radiation dose 3 Appreciation of aberrant anatomy 4 Appropriate use of radiological investigations 4 Principles of isotope and isotope imaging 4 Application of isotopes to functional assessment 3 Techniques of interventional radiology 4 Indications, limitations and complications of interventional radiology 4 IVP: Basic theory, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications 4 Ultrasound (including Doppler): Basic theory principles, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications 4 CT scanning: Basic theory principles, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications

	4 MR scanning: Basic theory, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications 2 PET scanning: Basic theory, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications 4 Renography: Basic theory, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications
Clinical Skills	4 Indications for use of ionising radiation in urological investigation 4 Application in clinical situation 4 Understand role of ultrasound in urological investigations 4 Resuscitation skills following complications 4 Selection of appropriate isotopic investigations 4 Interpretation of renograms 4 IVP: Therapeutic application, interpretation and limitations 4 Ultrasound (including Doppler): Therapeutic application, interpretation and limitations 4 CT scanning: Therapeutic application, interpretation and limitations 4 MR scanning: Therapeutic application, interpretation and limitations 2 PET scanning: Therapeutic application, interpretation and limitations 4 Renography: Therapeutic application, interpretation and limitations
Technical Skills and Procedures	4 IVU 4 Cystogram 4 Urethrogram 4 Retrograde Pyelogram 2 Renal ultrasound 2 Bladder ultrasound 2 Scrotal ultrasound 4 Transrectal ultrasound (TRUS) including biopsy 2 Ultrasound guided percutaneous puncture of kidney 3 Ultrasound guided percutaneous puncture of bladder

Final Stage Overview

The final stage of urological training (ST7) will have two separate components. By the end of the Final stage trainees will be competent to manage a range of general urological conditions including operative competences and emergency urological problems. These will be common to all trainees and will form the basis for the award of the CCT. In addition, trainees will be exposed to one or two specialist areas of urology and will develop competences relevant to that specialist area (see optional modules 1-14). The number and extent of this exposure will depend upon the aptitude of the trainee and the size of the specialist area.

Final Stage Topics for all Trainees

Topic	Basic science
Objective	*To understand and apply physiological principles in the management of patient with urological problems.* *To understand normal physiological processes at different ages and understand the effects of disease and trauma on these processes* *To understand pathological processes as applied to the organs of the urogenital system*
Knowledge	**Anatomy** 4 Pathways of pain **Physiology** 4 Physiology of erection and ejaculation 4 Urological endocrinology 4 Interpretation of semen analysis 4 Mechanisms of spermatogenesis and mechanism of spermatic transport 4 Function of accessory genital organs 4 Effect of disease and drugs on genital function 4 Physiology of pain **Pathology** 4 Common congenital disorders affecting the urinary tract (eg undescended testis and urinary tract reflux) 4 Changes related to congenital abnormalities 4 Chronic inflammatory mechanisms and diseases 3 Oncogenes, growth factors and angiogenesis 3 Mechanisms of chemotherapy, immunotherapy and radiotherapy 4 Abnormalities resulting from trauma
Clinical Skills	4 To understand the indications and theory of urodynamic studies in the neuropathic patient 4 Assessment and early management of the subfertile male 4 Investigation and management of chronic inflammatory diseases affecting the urinary tract
Technical Skills and Procedures	4 Urodynamic assessment of the neuropathic bladder

Topic	Clinical pharmacology
Objective	*Understand and apply pharmacological principles in the management of patients with urological disease.*
Knowledge	Pharmacology of commonly used drugs including side-effects and complications: 3 Systemic chemotherapy for urological malignancy 4 Intravesical chemotherapy for urological malignancy
Clinical Skills	Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications: 3 Systemic chemotherapy for urological malignancy 4 Intravesical chemotherapy for urological malignancy
Technical Skills and Procedures	N/A

Topic	Stone Disease
Objective	*To assess a patient presenting with a urinary stone in kidney, ureter or bladder* *To treat a patient presenting with a urinary stone in kidney, ureter or bladder including onward referral when appropriate*
Knowledge	N/A
Clinical Skills	N/A
Technical Skills and Procedures	4 ESWL for renal stone 3 ESWL for ureteric stone 4 Rigid ureteroscopy and therapeutic management lower 1/3 ureteric calculi 3 Rigid ureteroscopy and therapeutic management middle and upper 1/3 ureteric calculi 4 Open removal bladder calculi

Topic	Urinary tract obstruction
Objective	*To assess and treat a patient presenting with lower urinary tract symptoms and dysfunction* *To assess and treat a patient who has urinary tract obstruction including onward referral when appropriate* *To assess and treat a patient with urinary retention*
Knowledge	N/A
Clinical Skills	N/A
Technical Skills and Procedures	4 TURP 4 Bladder neck incision 4 Optical urethrotomy 4 Cystoscopy and insertion JJ stent

Topic	Urinary Tract Infections
Objective	*To understand the pathogenesis, natural history and complications of urinary tract infection.* *To be able to assess and manage patients presenting with common urinary tract infections,* *To be able to assess and manage patients presenting with genital infections*
Knowledge	4 Pathophysiology and clinical features of Fournier's gangrene
Clinical Skills	4 Appropriate management of Fournier's gangrene
Technical Skills and Procedures	4 Cystoscopy and JJ stent insertion 4 Surgical management of Fournier's gangrene

Topic	Retroperitoneal fibrosis
Objective	*To understand the pathogenesis, natural history and complications of urinary tract infection.* *To be able to assess and manage patients presenting with common urinary tract infections,* *To be able to assess and manage patients presenting with genital infections*

Knowledge	4 Pathogenesis, natural history and complications 4 Clinical presentation and management
Clinical Skills	4 Assessment of patient 4 Correct interpretation of tests 4 Medical management of patient
Technical Skills and Procedures	4 Cystoscopy and JJ stent insertion

Topic	**Interstitial cystitis**
Objective	*To understand the pathogenesis, natural history and complications of urinary tract infection.* *To be able to assess and manage patients presenting with common urinary tract infections,* *To be able to assess and manage patients presenting with genital infections*
Knowledge	4 Pathogenesis, natural history and complications 4 Clinical presentation 4 NIH criteria for diagnosis 4 Management options
Clinical Skills	4 Assessment of patient 4 Correct interpretation of tests 4 Medical management of patient
Technical Skills and Procedures	N/A

Topic	**Urinary incontinence**
Objective	*To assess and manage a patient presenting with symptoms of urinary incontinence including onward referral when appropriate* *To assess and manage patients with neuropathic bladder dysfunction including onward referral when appropriate.*
Knowledge	4 Basic anatomy physiology, pathophysiology, pharmacology of neuropathic bladder 4 Causes of neuropathic bladder 4 Types of neuropathic bladder presentation 4 Clinical presentation and differential diagnosis 4 Management of neuropathic incontinence
Clinical Skills	**Urinary incontinence** 4 Formulation of a realistic treatment plan **Neuropathic bladder** 4 Appropriate history and examination 4 Appropriate investigation 4 Interpretation of frequency volume chart 4 Appropriate liaison with multidisciplinary team (eg neurology and continence services) 4 Appropriate referral for sub-specialist management and surgery 4 Formulation of a realistic treatment plan
Technical Skills and Procedures	4 Cystoscopy and injection of urethral bulking agent 4 Surgical insertion of mid-urethral tape

Topic	Urological Oncology
Objective	*To assess and manage patient with suspected urological cancer.* *To manage patients with a proven urological cancer including onward referral where necessary* *To treat the patient with empathy*
Knowledge	4 Epidemiology of urological cancers 4 Role of genetic and environmental and factors 3 Basic understanding of molecular biology 3 Knowledge of Oncogenes, growth factors and angiogenesis in relation to tumours **Clinical presentation** 4 Symptom complexes arising from urological malignancies kidney, ureter, bladder, prostate, testis and penis 4 Current standards for the investigation of common urological cancers 4 TNM classification of common urological tumours **Therapy** 4 Current standards of treatment for common urological Cancers 4 Principles of neo-adjuvant versus adjuvant therapy 4 Principles and application of radiotherapy
Clinical Skills	4 High level empathetic and communication skills 4 Rapid and appropriate assessment of patient with possible malignancy 4 Appropriate investigation 4 Role of PSA and other markers, urine cytology etc 4 Correct interpretation of tests 4 Appropriate liaison with multidisciplinary team 4 High level/empathetic communication skills 4 Appropriate management of urological malignancies 4 Appropriate referral for sub-specialist management and surgery
Technical Skills and Procedures	4 TURBT 4 TURP 3 Ureteroscopy

Topic	Andrology
Objective	*To assess and manage a man with male factor infertility including onward referral as necessary*
Knowledge	4 Embryology and physiology of male reproductive system 4 Causes, assessment and management of male factor infertility 4 Modern methods of assisted fertilisation 4 Ejaculatory disorders – anatomy, physiology and management
Clinical Skills	**Male infertility** 4 Basic management of the subfertile male 4 Appropriate investigation/treatment plan 4 Appropriate liaison with multidisciplinary team and referral for sub-specialist management and / or surgery 4 Appropriate investigation and treatment plan and onward referral where appropriate for Ejaculatory disorders
Technical Skills and Procedures	3 Nesbit's procedure 3 Operative management of priapism 4 Operative management of varicocele

Topic	Paediatric Urology
Objective	*To assess and manage a child with a congenital disorder of the urogenital tract including onward referral as necessary* *To assess and manage a child with a enuresis, congenital neuropathic bladder or with intersex, including onward referral as necessary* *To assess and manage a child with an inguinoscrotal abnormality including onward referral as necessary* *To assess and manage a child with urinary infection, including onward referral as necessary*
Knowledge	3 Basic embryology, anatomy of abnormality and natural history of Spina bifida, intersex and posterior urethral valves
Clinical Skills	**Spina bifida, intersex and posterior urethral valves** 3 Appreciation of prognostic possibilities 3 Formulation of realistic treatment plan 3 Appropriate referral for sub-specialist management and / or surgery
Technical Skills and Procedures	N/A

Topic	Renal Function and Nephrology
Objective	*To have a good working knowledge of the assessment of renal function and the urological conditions that predispose to the development of renal failure.* *To understand the pathogenesis, natural history and complications of urological conditions that can lead to renal dysfunction and how urological intervention may prevent or delay the onset of renal failure.* *To understand the different methods of renal replacement including renal transplantation*
Knowledge	4 Recipient selection and indications for transplantation 4 Tissue typing and cross matching 4 Relative indications for haemodialysis or transplantation 4 Immunosuppression 4 Complications of renal transplantation
Clinical Skills	4 Evaluation of potential recipients and timing of dialysis 4 Urinary tract workup of potential recipients prior to transplantation 4 Appropriate liaison with other specialties
Technical Skills and Procedures	N/A

Topic	Emergency Urology
Objective	*To assess and manage patients who present acutely with urological problems, including onward referral when necessary*
Knowledge	4 Endoscopic management of ureteric calculi 4 Pathophysiology and clinical features of Fournier's Gangrene
Clinical Skills	4 Appropriate management of Fournier's gangrene

Technical Skills and Procedures	4 Rigid ureteroscopy and therapeutic management lower 1/3 ureteric calculi 3 Rigid ureteroscopy and therapeutic management middle and upper 1/3 ureteric calculi 4 TURP 4 Bladder neck incision 4 TURBT 4 Surgical management of Fournier's gangrene 3 Operative management of priapism 4 Operative management of penile fracture

Topic	**Trauma to the Urinary Tract**
Objective	*To assess and manage patients who present with genitourinary trauma, including onward referral when necessary*
Knowledge	4 Differences in children 4 Causes, pathophysiology, classification and management of renal trauma 4 Causes, pathophysiology, classification and management of ureteric trauma 4 Causes, pathophysiology, classification and management of bladder trauma 4 Causes, pathophysiology, classification and management of urethral trauma 4 Causes, pathophysiology, classification and management of genital trauma
Clinical Skills	4 Appropriate liaison with other relevant specialists in multiple trauma cases 4 Assessment and management of renal trauma including onward referral where appropriate 4 Assessment and management of ureteric trauma including onward referral where appropriate 4 Assessment and management of bladder trauma including onward referral where appropriate 4 Assessment and management of urethral trauma including onward referral where appropriate 4 Assessment and management of genital trauma including onward referral where appropriate
Technical Skills and Procedures	4 Cystoscopy and insertion JJ stent 4 Testicular repair

Topic	**Urological Radiology**
Objective	*To understand the different radiological techniques used in the investigation of urological disease, including practical techniques, indications and safety issues* *To gain hands on experience in diagnostic and interventional radiology* *To develop technical skills in standard radiological techniques relevant to urology*
Knowledge	4 Appreciation of aberrant anatomy 3 PET scanning: Basic theory, practical techniques (including contrast agents), indications, interpretation and limitations, safety issues and contraindications
Clinical Skills	3 PET scanning: Therapeutic application, interpretation and limitations
Technical Skills and Procedures	3 Renal ultrasound 3 Abdominal ultrasound 3 Testicular ultrasound

Final Stage modular curricula

During the final stage of training, trainees will have the opportunity to develop an area of specialist interest, which they may subsequently develop following the award of a CCT. The areas covered are defined by the following modular curricula, which describe the knowledge, skills and behaviours relevant to those areas of specialist practice.

As will be seen, the size of the different modules is highly variable, being defined by subject rather than size. Accordingly trainees will be able to undertake one or more of these modules, depending upon their aptitude and interest.

The modules are as follow:

1. Urinary tract stone disease
2. Benign disease of the upper urinary tract
3. Prostate cancer
4. Bladder cancer
5. Renal cancer
6. Penile cancer
7. Testicular cancer
8. Female urology
9. Reconstruction of the bladder and upper urinary tract
10. Urethral reconstruction
11. Neurourology
12. Male factor infertility
13. Benign disease of male sexual function
14. Paediatric urology
15. Renal transplantation

1. **Modular Curriculum for urinary tract stone disease**

Topic	Basic Science
Objective	*To develop advanced skills in the management of patients with urinary tract stone disease*
Knowledge	**Anatomy** 4 To understand the detailed anatomy that will be encountered during the management of patients with urinary tract stone disease 4 Embryology, macro and micro anatomy with specific reference to vascular anatomy and neurological anatomy, and its anomalies. **Physiology** 4 Mechanism of urine production 4 Mechanism of peristalsis initiation 4 Mechanisms of neuromuscular transmission 4 Anti-reflux mechanisms 4 Principles of isotope and isotope imaging **Pharmacology** 4 Pharmacology of commonly used drugs in the medical management of ureteric colic 4 Pharmacology of commonly used drugs in metabolic stone disease 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic and regional techniques 4 Pharmacology of commonly used drugs for sepsis of the urinary tract 4 Indications, contraindications and side effects **Pathology** 4 Pathophysiology or upper urinary tract obstruction 4 Pathophysiology of urolithiasis 4 Microbiology of sepsis of the urinary tract 4 Acute and chronic inflammatory response
Clinical Skills	4 Selection of appropriate isotopic investigations 4 Interpretation of renograms 4 Assessment of the normovolaemic patient 4 Assessment of the anuric patient 4 Assessment and management of the patient in renal failure 4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications 4 Appropriate use of imaging and other investigations 4 Appropriate management choices and operative skills 4 Prevention, diagnosis and management of urinary sepsis 4 Appropriate investigation and management of urinary tract infection 4 Recognition of risks and early diagnosis of sepsis
Technical Skills and Procedures	4 Access to the kidney and the retroperitoneum including percutaneous access 4 Instrumentation of the ureter

Topic	Renal calculi
Objective	*To develop advanced skills in the management of patients with urinary tract stone disease*
Knowledge	4 Assessment and investigation patients with renal calculi 4 Indications for different treatment modalities 4 Mechanisms of extracorporeal lithotripsy 4 Mechanisms of intracorporal lithotripsy 4 Complications of treatment including lithotripsy

	4 Results of stone treatment in different locations 4 Outcomes of treatment 4 Understanding of normal post-operative progress 4 Post treatment care 3 Imaging and access techniques for percutaneous access including supra-costal access 4 Operative management of renal calculi including choice of approach according to size, position etc.
Clinical Skills	4 Assessment and investigation of patients with renal calculi 4 MDT management of stones and ability to formulate management plan including issues of complications 4 Able to take informed consent and explain procedures and outcomes to patients 4 Team working with theatre staff 4 Post-op assessment and communication 4 Prioritisation of further investigation 4 Post-operative assessment 3 Able to vary access dependent on stone location 3 Appropriate intervention to deal with changing parameters 4 Appropriate use of intracorporal fragmentation devices including laser, EHL, lithoclast Advanced skills enabling safe treatment of complex renal calculi
Technical Skills and Procedures	3 ESWL 3 Percutaneous nephrolithotomy including intracorporal lithotripsy 3 Flexible ureteroscopy including intracorporal lithotripsy 3 Rigid ureteroscopy including intracorporal lithotripsy

Topic	**Ureteric calculi**
Objective	*To develop advanced skills in the management of patients with urinary tract stone disease*
Knowledge	4 Assessment and investigations of patients with ureteric calculi 4 Indications for different treatment modalities 4 Mechanisms of extracorporeal lithotripsy 4 Mechanisms of intracorporal lithotripsy 4 Complications of treatment including lithotripsy 4 Results of stone treatment in different locations 4 Outcomes of treatment 4 Understanding of normal post-operative progress 4 The role of stents 4 Post treatment care 3 Aware of range and appropriate use of different instruments 4 Operative management of ureteric calculi including choice of approach depending upon stone position, size etc
Clinical Skills	4 MDT management of stones and ability to formulate management plan including issues of complications 4 Ability to perform extracorporeal lithotripsy 4 Able to take informed consent and explain procedures and outcomes to patients 4 Team working with theatre staff 4 Post-op assessment and communication 4 Prioritisation of further investigation 4 Post-operative assessment 4 Appropriateness of investigation and interventions 3 Appropriate use of intracorporal fragmentation devices including laser, EHL, lithoclast 4 Advanced skills enabling safe treatment of complex urinary calculi
Technical Skills and	4 Rigid ureteroscopy including intracorporal lithotripsy

Procedures	3 Flexible ureteroscopy including intracorporal lithotripsy

Topic	**Bladder calculi**
Objective	*To develop advanced skills in the management of patients with urinary tract stone disease*
Knowledge	4 Assessment and investigations of patients with bladder calculi 4 Indications for different treatment modalities 4 Mechanisms of intracorporal lithotripsy 4 Complications of treatment 4 Results of treatment 4 Outcomes of treatment 4 Understanding of normal post-operative progress
Clinical Skills	4 Use of endourological techniques to deal with complex bladder calculi 4 Lower urinary tract endoscopic techniques e.g. cystolitholapaxy
Technical Skills and Procedures	4 Endoscopic litholopaxy

2. Modular curriculum in Benign Disease of the Upper Urinary Tract

Topic	Basic Science
Objective	*To develop advanced skills in the management of upper urinary tract obstruction, the surgery of renal failure and other benign conditions of the upper urinary tract*
Knowledge	4 To understand the detailed anatomy that will be encountered during the management of patients undergoing laparoscopy for renal disease 4 Embryology, macro and micro anatomy with specific reference to vascular anatomy and neurological anatomy, and its anomalies 4 Mechanism of urine production 4 Mechanism of peristalsis initiation 4 Mechanisms of neuro-muscular transmission 4 Principles of isotopes and isotope imaging. 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic and regional techniques 4 Pharmacology of commonly used drugs for sepsis of the urinary tract including indications, contraindications and side effects 4 Aetiology, investigation and treatment of acute and chronic urinary tract obstruction including PUJ stenosis and ureteric strictures 4 Pathophysiology or upper urinary tract obstruction 4 Microbiology of sepsis of the urinary tract 4 Acute and chronic inflammatory response
Clinical Skills	4 Selection of appropriate isotopic investigations 4 Assessment and management of the patient in renal failure 4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications 4 Appropriate use of imaging and other investigations 4 Appropriate management choices and operative skills 4 Prevention, diagnosis and management of urinary sepsis 4 Appropriate investigation and management of urinary tract infection 4 Recognition of risks and early diagnosis of sepsis
Technical Skills and Procedures	4 Access to the kidney and the retroperitoneum including percutaneous access 4 Instrumentation of the ureter

Topic	Upper tract obstruction
Objective	*To develop advanced skills in the management of upper urinary tract obstruction, the surgery of renal failure and other benign conditions of the upper urinary tract*
Knowledge	4 Causes and pathophysiology of upper urinary tract obstruction 4 Clinical features of upper urinary tract obstruction 4 Endoscopic management of upper urinary tract obstruction
Clinical Skills	4 Appropriate assessment including investigation and formulation of management plan 4 Formulate a differential diagnosis 4 Management of associated urosepsis 4 Management of post obstructive diuresis 4 Ability to choose appropriate surgical approach for the treatment of upper urinary tract obstruction
Technical Skills and Procedures	4 Cystoscopy and insertion JJ stent 4 Rigid diagnostic ureteroscopy 4 Flexible diagnostic ureteroscopy

Topic	Pelviureteric Junction Obstruction
Objective	*To develop advanced skills in the management of upper urinary tract obstruction, the surgery of renal failure and other benign conditions of the upper urinary tract*
Knowledge	4 Aetiology, pathophysiology and Clinical features 4 Investigation 4 Formulation of appropriate management of patient with PUJ obstruction 4 Indications, operative steps and complications of the different approaches to the treatment of PUJ obstruction, including: -Percutaneous approaches -Ureteroscopic approaches -Laparoscopic approaches -Open surgical approaches 3 Practical expertise in the surgical management of PUJ obstruction
Clinical Skills	4 Appropriate management of patient with PUJ obstruction 4 Interpretation of clinical findings and results of investigations 4 Ability to organise appropriate management plan 4 Ability to explain procedures and outcomes to patients and relatives and obtain informed consent 4 Knowledge and appropriate use of treatment options 3 Ability to choose appropriate surgical approach for the treatment of PUJ obstruction
Technical Skills and Procedures	3 Ureteroscopic treatment of PUJ obstruction 3 Percutaneous treatment of PUJ obstruction 2 Laparoscopic pyeloplasty 3 Laparoscopic nephrectomy 2 Open pyeloplasty

Topic	Ureteric strictures
Objective	*To develop advanced skills in the management of upper urinary tract obstruction, the surgery of renal failure and other benign conditions of the upper urinary tract*
Knowledge	4 Aetiology, pathophysiology and Clinical features 4 Investigation 4 Formulation of appropriate management of patient with ureteric stricture 4 Indications, operative steps and complications of the different approaches to the treatment of ureteric strictures including: -Ureteroscopic approaches -Laparoscopic approaches 4 Practical expertise in the surgical management of ureteric strictures
Clinical Skills	4 Appropriate management of patient with ureteric stricture 4 Interpretation of clinical findings and results of investigations 4 Ability to organise appropriate management plan 4 Ability to explain procedures and outcomes to patients and obtain informed consent 4 Knowledge of treatment options 4 Team working with other specialties e.g. radiologists, reconstructive surgeon 4 Ability to choose appropriate surgical approach for the treatment of ureteric strictures
Technical Skills and Procedures	4 Cystoscopy and insertion JJ stent 3 Ureteroscopic treatment 4 Extra-anatomical stent insertion 2 Open surgical procedures for correction of ureteric stricture

Topic	Renal Failure
Objective	*To develop advanced skills in the management of upper urinary tract obstruction, the surgery of renal failure and other benign conditions of the upper urinary tract*
Knowledge	4 Knowledge of available management pathways and role of nephrologists 4 Principles of dialysis 4 Indications for transplantation 4 Indications, operative steps and complications of surgery in the treatment of end stage renal failure 3 Practical expertise in the surgery in the treatment of end stage renal failure
Clinical Skills	4 Appropriate assessment and investigation of renal failure patients 4 Practical management of fluid/electrolyte/acid base balance 4 Temporary dialysis techniques 4 Team working with other specialties e.g. radiologists, renal physicians, transplant surgeons 3 Ability to choose appropriate surgical approach for the treatment of end stage renal failure
Technical Skills and Procedures	3 Laparoscopic nephrectomy 3 Open (simple) nephrectomy 1 Open donor nephrectomy 1 Laparoscopic donor nephrectomy

3. Modular curriculum in Prostate Cancer

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of men with prostate cancer*
Knowledge	**Anatomy** 4 Embryology and anatomy of the prostate and bladder and male genital sphincters 4 Lymphatic drainage of the pelvic organs **Physiology** 4 Physiology of the prostate 4 Physiology of micturition 4 Physiology of erection **Pharmacology** 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic and regional techniques 4 Pharmacology of endocrine drugs used in the treatment of prostate cancer 4 Pharmacology of cytotoxic drugs used in the treatment of prostate cancer 4 Pharmacology of other agents used in the treatment of men with prostate cancer **Pathology** 4 Relevance of congenital anomalies to subsequent malignant pre-disposition 4 Role of genetics in prostate cancer 4 Role of oncogenes and growth factors in the pathogenesis of prostate cancer 4 Role of environmental factors in malignancies 4 Current theories of tumour initiation and growth 4 Thorough understanding of current and previous systems for the staging and grading of prostate cancer 4 Understanding of the theoretical basis and techniques of radiotherapy for prostate cancer 4 Understanding of the theoretical basis and techniques of radiological and nuclear medicine imaging
Clinical Skills	4 Appropriate use of pharmacological agents in men with prostate cancer either for peri-operative, therapeutic or palliative reasons 4 Application of the indications, contraindications and side effects 4 Appropriate use of stage, grade and molecular markers in the management of an individual with prostate cancer 4 Appropriate use or radiotherapy in the treatment of men with prostate cancer 4 Appropriate imaging of men with prostate cancer
Technical Skills and Procedures	N/A

Topic	Locally confined prostate cancer (T1a-T2c)
Objective	*To develop advanced skills in the assessment and treatment of men with prostate cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for locally confined prostate cancer including: -Radical surgery -Radical radiotherapy -Radical brachytherapy -Adjuvant and neo-adjuvant hormones

	-Active surveillance 4 The rationale, role and limitations of new technology (eg cryotherapy and high intensity focussed ultrasound) 4 Understanding of the biology of prostate cancer 4 Understanding of the relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 3 Practical treatment of locally confined prostate cancer
Clinical Skills	4 Assessment of patients with locally confined prostate cancer 4 Indications for relevant radiological and pathological investigations. 4 Formulation of management policy after discussion at an MDT meeting 4 Obtaining informed consent for the relevant procedure offering patient the options of discussion of other therapies 4 Co-ordinating the role of non-medical professionals in patient management 4 Formulation of a relevant follow up plan including location of follow-up 3 Ability to choose appropriate therapeutic approach for the treatment of prostate cancer
Technical Skills and Procedures	3 Radical Prostatectomy (retro-pubic, perineal, laparoscopic procedure or robotic) 2 Brachytherapy

Topic	**Locally advanced (T3-T4) No Mo**
Objective	*To develop advanced skills in the assessment and treatment of men with prostate cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for locally advanced prostate cancer including: -Radical surgery -Radiotherapy -Brachytherapy -Hormone treatment -Active surveillance 4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial
Clinical Skills	4 Appropriate assessment of patients with locally advanced prostate cancer 4 Indication of the relevant radiological and pathological investigations. 4 Formulation of a best fit management policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant procedure offering patient the options of discussion of other therapies 4 Appropriate liaison with other specialties (radiation oncology, medical oncology etc) 4 Co-ordinating the role of non-medical professionals in the management of treatment 4 Formulation of a relevant follow up plan
Technical Skills and Procedures	N/A

Topic	**Metastatic disease (Any T, and N, M1)**
Objective	*To develop advanced skills in the assessment and treatment of men with prostate cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for metastatic prostate cancer including: -Hormone therapy -Radiotherapy

	-Chemotherapy -Novel therapy 4 Entry into the relevant clinical trials
Clinical Skills	4 Assessment of patients with metastatic prostate cancer 4 Formulations of best fit treatment plan following an MDT meeting 4 Indication of likely response, duration of that response and survival in the individual patient 4 Management of patient with metastatic prostate cancer 4 Liaison with other specialties (eg radiotherapy, medical oncology)
Technical Skills and Procedures	N/A

Topic	**Hormone refractory disease**
Objective	*To develop advanced skills in the assessment and treatment of men with prostate cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for hormone escape prostate cancer including: -Hormone therapy -Radiotherapy -Chemotherapy -Novel therapy 4 Entry into the relevant clinical trials
Clinical Skills	4 Assessment of patients with hormone escape prostate cancer 4 Formulations of best fit treatment plan following an MDT meeting 4 Indication of likely response, duration of that response and survival in the individual patient 4 Management of patient with hormone escape prostate cancer 4 Liaison with other specialties (eg radiotherapy, palliative care)
Technical Skills and Procedures	N/A

4. Modular curriculum in bladder cancer

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of men with bladder cancer*
Knowledge	**Anatomy** 4 Embryology and anatomy of the urinary tract 4 Lymphatic drainage of the pelvic organs **Physiology** 4 Physiology of micturition and continence 4 Physiology of erection **Pharmacology** 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic and regional techniques 4 Pharmacology of agents used for intravesical chemotherapy in men with bladder cancer 4 Immunology of agents used for intravesical therapy in bladder cancer 4 Pharmacology of cytotoxic drugs used in the treatment of bladder and other urothelial cancers **Pathology** 4 Pathology of the differing types of bladder cancer 4 Relevance of congenital anomalies to subsequent malignant pre-disposition 4 Role of genetics, oncogenes and growth factors in bladder cancer 4 Role of environmental factors in bladder cancer 4 Current theories of tumour initiation and growth 4 Thorough understanding of current and previous systems for the staging and grading of bladder cancer 4 The immunology of bladder cancer and bladder cancer therapy 4 Understanding of the theoretical basis and techniques of radiotherapy for bladder cancer 4 Understanding of the theoretical basis and techniques of radiological and nuclear medicine imaging
Clinical Skills	4 Appropriate use of pharmacological and biological agents in men with bladder cancer either for peri-operative, therapeutic or palliative reasons 4 Application of the indications, contraindications and side effects 4 Appropriate use of stage, grade and molecular markers in the management of an individual with bladder cancer 4 Appropriate use or radiotherapy in the treatment of men with bladder cancer 4 Appropriate imaging of men with bladder cancer
Technical Skills and Procedures	N/A

Topic	Superficial bladder cancer (pTis and pTa-1 G1-G3)
Objective	*To develop advanced skills in the assessment and treatment of men with bladder cancer*
Knowledge	4 Rationale for, indications, results, and complications of different therapies for superficial bladder cancer including: -Endoscopic therapy -Intravesical chemotherapy -Intravesical BCG

	-Radical surgery 4 The rationale, role and limitations of new technology in the diagnosis and therapy of superficial bladder cancer 4 Understanding of the biology of bladder cancer 4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 4 Practical treatment of superficial bladder cancer
Clinical Skills	4 Appropriate assessment of patients with superficial bladder cancer 4 Indication of the relevant radiological and pathological investigations. 4 Formulation of a best fit management policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant therapy following discussion of alternative therapies 4 Co-ordinating the role of non-medical professionals in the management of treatment 4 Formulation of a relevant follow up plan
Technical Skills and Procedures	4 Cystoscopy, biopsy and diathermy 4 TURBT

Topic	**Muscle invasive bladder cancer (pT2-4)**
Objective	*To develop advanced skills in the assessment and treatment of men with bladder cancer*
Knowledge	4 Rationale for, indications, results and complications of different therapies for muscle invasive bladder cancer including: -Endoscopic therapy -Radical surgery -Radical radiotherapy -Palliative radiotherapy -Systemic chemotherapy 4 Rationale, indications, results and complications of reconstructive surgery following cystectomy 4 The rationale, role and limitations of new technology in the diagnosis and therapy of muscle invasive bladder cancer 4 Understanding of the biology of bladder cancer 4 Understanding of the relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 4 Practical surgery of muscle invasive bladder cancer including indications, techniques, results, consequences and complications
Clinical Skills	4 Assessment of patients with muscle invasive bladder cancer 4 Indications for radiological and pathological investigations. 4 Formulation of management after discussion at an MDT meeting 4 Obtaining informed consent following discussion of alternative therapies 4 Obtaining informed consent for the relevant urinary diversion following cystectomy 4 Liaison with reconstructive surgeon, where appropriate 4 Co-ordinating the role of non-medical professionals in the management of treatment 4 Formulation of a relevant follow up plan 4 Ability to choose appropriate therapeutic approach for the treatment of bladder cancer
Technical Skills and Procedures	4 TURBT 2 Radical cystectomy, cystoprostatectomy, cystourethrectomy etc 3 Urethrectomy 3 Ileal conduit diversion 2 Orthotopic bladder reconstruction 1 Construction of a continent urinary diversion

Topic	**Metastatic bladder cancer**
Objective	*To develop advanced skills in the assessment and treatment of men with bladder cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for metastatic bladder cancer including: -Palliative surgery -Radiotherapy -Chemotherapy -Novel therapy 4 Entry into the relevant clinical trials
Clinical Skills	4 Assessment of patients with metastatic bladder cancer 4 Formulations of best fit treatment plan following an MDT meeting 4 Indication of likely response, duration of that response and survival in the individual patient 4 Management of patient with metastatic bladder cancer 4 Liaison with other specialties (eg radiotherapy, medical oncology)
Technical Skills and Procedures	N/A

Modular curriculum in Renal Cancer

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of men with renal cancer* *To develop advanced skills in the assessment and treatment of upper tract urothelial cancer*
Knowledge	**Anatomy** 4 Embryology and anatomy of the urinary tract **Physiology** 4 Physiology of urine production erection Pharmacology 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic and regional techniques 4 Pharmacology of agents used for systemic~~chemotherapy~~ therapy in men with renal cancer 4 Pharmacology of immunological agents used for therapy in renal cancer 4 Pharmacology of biological agents used in the treatment of renal **Pathology** 4 Pathology of the differing types of renal cancer and other benign and malignant tumours affecting the kidney 4 Role of genetics in renal cancer and upper tract TCC 4 Role of oncogenes and growth factors in renal cancer and upper tract TCC 4 Role of environmental factors in renal cancer and upper tract TCC 4 Current theories of tumour initiation and growth 4 Thorough understanding of current and previous systems for the staging and grading of renal cancer and upper tract TCC 4 Immune response and its relevance to the therapy of renal cancer and upper tract TCC 4 Understanding of the theoretical basis and techniques of radiological and nuclear medicine imaging
Clinical Skills	4 Appropriate use of pharmacological, immunological and biological agents in men with renal cancer 4 Application of the indications, contraindications and side effects 4 Appropriate use of stage, grade and molecular markers in the management of an individual with renal cancer 4 Appropriate imaging of men with bladder cancer
Technical Skills and Procedures	N/A

Topic	**Localised Renal cancer**
Objective	*To develop advanced skills in the assessment and treatment of men with renal cancer* *To develop advanced skills in the assessment and treatment of upper tract urothelial cancer*
Knowledge	4 Rationale for, indications, results, and complications of different therapies for localised renal cancer 4 Radical surgery 4 Nephron sparing surgery 4 Minimally invasive therapies 4 The rationale, role and limitations of new technology in the diagnosis and therapy of

	renal cancer 4 Understanding of the biology of renal cancer 4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 2 Practical treatment of localised renal cancer
Clinical Skills	4 Appropriate assessment of patients with renal cancer 4 Indication of the relevant radiological and pathological investigations. 4 Formulation of a best fit management policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant therapy following discussion of alternative therapies 4 Co-ordinating the role of non-medical professionals in the management of treatment 4 Formulation of a relevant follow up plan 2 Ability to choose appropriate therapeutic approach for the treatment of renal cancer
Technical Skills and Procedures	2 Radical nephrectomy 2 Partial nephrectomy 3 Laparoscopic nephrectomy 2 Laparoscopic partial nephrectomy

Topic	**Metastatic renal cancer**
Objective	*To develop advanced skills in the assessment and treatment of men with renal cancer* *To develop advanced skills in the assessment and treatment of upper tract urothelial cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for metastatic renalbladder cancer including: -Surgery -Chemotherapy -Biological therapy -Immunotherapy -Hormone therapy -Novel therapy 4 Entry into the relevant clinical trials
Clinical Skills	4 Assessment of patients with metastatic renal cancer 4 Formulations of best fit treatment plan following an MDT meeting 4 Indication of likely response, duration of that response and survival in the individual patient 4 Management of patient with metastatic renal cancer 4 Liaison with other specialties (eg radiotherapy, medical oncology)
Technical Skills and Procedures	N/A

Topic	**Upper Tract TCC**
Objective	*To develop advanced skills in the assessment and treatment of men with renal cancer* *To develop advanced skills in the assessment and treatment of upper tract urothelial cancer*
Knowledge	4 Rationale for, indications, results, and complications of different therapies for upper tract TCC 4 Radical surgery 4 Endoscopic therapy 4 The rationale, role and limitations of new technology in the diagnosis and therapy of

	upper tract TCC 4 Understanding of the biology of upper tract TCC 4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 3 Practical treatment of upper tract TCC
Clinical Skills	4 Assessment of patients with Upper tract TCC 4 Indications for radiological and pathological investigations 4 Formulation of a best fit management policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant therapy following discussion of alternative therapies 4 Liaison with reconstructive surgeon, where appropriate 4 Formulation of a relevant follow up plan 3 Ability to choose appropriate therapeutic approach for the treatment of upper tract TCC
Technical Skills and Procedures	3 Radical nephroureterectomy 2 Segmental ureterectomy and reconstruction 2 Laparoscopic nephroureterectomy 4 Rigid Ureteroscopy and endoscopic therapy to TCC

6. Modular Curriculum in Penile Cancer

Topic	Basic Science Anatomy
Objective	*To develop advanced skills in the assessment and treatment of men with penile cancer*
Knowledge	4 Embryology and anatomy of the male genitalia including Lymphatic drainage 4 Anatomy of the femoral triangle and upper thigh 4 Physiology of erection 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic and regional techniques 4 Pharmacology of agents used for chemotherapy in men with penile cancer 4 Pathology of the differing types of penile cancer and pre-malignant conditions 4 Role of genetics, oncogenes and growth factors in penile cancer 4 Role of environmental factors in penile cancer 4 Thorough understanding of current and previous systems for the staging and grading of penile 4 Understanding of the theoretical basis and techniques of radiological and nuclear medicine imaging 4 Understanding of the theoretical basis and techniques of radiotherapy for bladder cancer
Clinical Skills	4 Appropriate use of pharmacological, immunological and biological agents in men with penile cancer 4 Application of the indications, contraindications and side effects 4 Appropriate use of stage, grade and molecular markers in the management of an individual with penile cancer 4 Appropriate imaging of men with penile cancer 4 Appropriate use or radiotherapy in the treatment of men with penile cancer
Technical Skills and Procedures	N/A

Topic	Management of the primary cancer
Objective	*To develop advanced skills in the assessment and treatment of men with penile cancer*
Knowledge	4 Rationale for, indications, results, and complications of surgery and radiotherapy the treatment of penile cancer 4 The rationale, role and limitations of new technology in the diagnosis and therapy of penile cancer 4 Understanding of the biology of penile cancer 4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 4 Practical surgery of the primary tumour in penile cancer
Clinical Skills	4 Appropriate assessment of patients with penile cancer including radiological assessment 4 Formulation of a best fit management policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant therapy 4 Liaison with other specialties (eg plastic surgery, radiotherapy etc) 4 Formulation of a relevant follow up plan 4 Ability to choose appropriate therapeutic approach for the treatment of penile cancer
Technical Skills and Procedures	4 Circumcision and penile biopsy 4 Partial penectomy 3 Glansectomy and skin grafting 3 Total penectomy

Topic	**Management of the lymph nodes**
Objective	*To develop advanced skills in the assessment and treatment of men with penile cancer*
Knowledge	4 Rationale for, indications, results, and complications of surgery, chemotherapy and radiotherapy the treatment of lymphatic involvement 4 Understanding of the biology of penile cancer 4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 2 Practical aspects of surgery for lymphatic involvement
Clinical Skills	4 Assessment of patients with possible lymphatic involvement including radiological assessment 4 Formulation of treatment policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant therapy 4 Co-ordinating the role of non-medical professionals in the management 4 Formulation of a follow up plan 2 Ability to choose appropriate therapeutic approach for the treatment of penile cancer
Technical Skills and Procedures	2 Block dissection inguinal lymph nodes 2 Block dissection external iliac lymph nodes 2 Laparoscopic pelvic node dissection

Topic	**Metastatic penile cancer**
Objective	*To develop advanced skills in the assessment and treatment of men with penile cancer*
Knowledge	4 Rationale for, indications, complications of different therapies for metastatic penile cancer including: 4 Novel therapy 4 Entry into the relevant clinical trials
Clinical Skills	4 Assessment and treatment of patients with metastatic penile cancer 4 Formulations of best fit treatment plan following an MDT meeting 4 Liaison with other specialties (eg radiotherapy, medical oncology)
Technical Skills and Procedures	N/A

7. Modular curriculum in Testicular Cancer

Topic	Basic Science Anatomy
Objective	*To develop advanced skills in the assessment and treatment of men with testis cancer*
Knowledge	4 Embryology and anatomy of male genitalia including Lymphatic drainage 4 Anatomy of the retroperitoneum 4 Reproductive physiology 4 Pharmacology of pain prevention and relief 4 Use of local anaesthetic 4 Pharmacology of cytotoxic agents used in men with testis cancer 4 Pathology of the differing types of testis cancer and pre-malignant conditions 4 Role of genetics, oncogenes and growth factors in testis cancer 4 Role of environmental factors in testis cancer 4 Understanding of past and current systems for the staging and grading of testis cancer 4 Understanding of the theoretical basis and techniques of radiological and nuclear medicine imaging 4 Understanding of the theoretical basis and techniques of radiotherapy for bladder cancer
Clinical Skills	4 Appropriate use of pharmacological agents in men with testis cancer 4 Application of the indications, contraindications and side effects 4 Appropriate use of stage, grade and molecular markers in the management of an individual with testis cancer 4 Appropriate imaging of men with testis cancer 4 Appropriate use or radiotherapy in the treatment of men with testis cancer
Technical Skills and Procedures	N/A

Topic	Management of the primary cancer
Objective	*To develop advanced skills in the assessment and treatment of men with testis cancer*
Knowledge	4 Rationale for, indications, results, and complications of surgery in the treatment of testis cancer 4 Understanding of the biology of testis cancer 4 Entry into the relevant clinical trial 4 Practical surgery of the primary tumour in testis cancer
Clinical Skills	4 Appropriate assessment of patients with testis cancer including radiological assessment 4 Show appropriate regard to future fertility prospects 4 Liaison with other specialties (eg medical oncology, radiotherapy etc) 4 Formulation of a relevant follow up plan
Technical Skills and Procedures	4 Radical orchidectomy 4 Insertion of testicular prosthesis

Topic	Metastatic testis cancer
Objective	*To develop advanced skills in the assessment and treatment of men with testis cancer*
Knowledge	4 Rationale for, indications, results, and complications of surgery, chemotherapy and radiotherapy in the treatment of metastatic testis cancer 4 Understanding of the biology of testis cancer

	4 Understanding of the extent and relevance of co-morbidity in the choice of therapy 4 Entry into the relevant clinical trial 2 Practical aspects of surgery for metastatic disease
Clinical Skills	4 Appropriate assessment of patients with possible metastatic testis cancer including assessment 4 Formulation of a best fit management policy following discussion at an MDT meeting 4 Obtaining informed consent for the relevant therapy 4 Liaison with other specialties (eg medical oncology, vascular surgery) 4 Formulation of a relevant follow up plan
Technical Skills and Procedures	2 Retroperitoneal lymph node dissection

8. Modular curriculum in Female Urology

Topic	Basic Science Anatomy
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	**Anatomy** 4 Detailed knowledge of abdomino-pelvic anatomy especially bony pelvis, all pelvic viscera, pelvic floor, pelvic side wall and the endopelvic fasciae 4 Embryology of the genitourinary tract including development of the cloaca, intestinal tract and omentum. 4 Neuroanatomy as it relates to normal and abnormal bladder, urethral and pelvic floor function **Physiology** 4 Physiology and neurophysiology of the bladder including the basis of micturition and continence 4 Physiology of bladder musculature 4 Physiology of bladder mucosa 4 Physiological basis of bladder sensation 4 Physiology of female reproduction 4 Understanding of normal female hormonal function 4 Normal female sexuality including genital function and orgasm **Pharmacology** 4 Pharmacology of the urogenital organs including cholinergic, adrenergic and other neurotransmitter systems 4 Pharmacology of drugs used in the management of lower urinary tract dysfunction side-effects and complications 4 Knowledge of the relevant supporting scientific literature 4 Pharmacological agents treating other systems and their side-effects on urogenital tract including side-effects and complications of commonly used drugs 4 The use of hormone replacement therapy in postmenopausal women and hormone manipulation in pre-menopausal women 4 Pharmacological agents treating ano-rectal dysfunction including the pharmacological methods of treating constipation and altering bowel activity **Pathology** 4 Pathophysiology of urinary incontinence in women 4 Pathophysiology of pelvic organ prolapse in women 4 Pathology of ageing in women 4 Pathophysiology of interstitial cystitis and other causes of painful bladder syndrome 4 Pathophysiology of urinary infection in women
Clinical Skills	4 Integrate issues of reproductive and sexual issues into the holistic management of women with lower urinary tract dysfunction 4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications 4 Appropriate assessment of women with lower urinary tract dysfunction
Technical Skills and Procedures	4 Undertake urodynamic studies to investigate lower urinary tract dysfunction

Topic	Management of continence problems in the elderly and the cognitively impaired
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 Specific needs of the elderly and cognitively impaired

Clinical Skills	4 Demonstrate an appreciation of the specific issues posed by old age on management
Technical Skills and Procedures	N/A

Topic	**Urinary frequency/urgency syndrome and urinary urge incontinence**
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 An understanding of the investigation, diagnosis and management 4 Clinical assessment techniques according to ICS standards. 4 The role of urodynamic, imaging, endoscopic and other investigative techniques. 4 Knowledge of conservative management techniques 4 Knowledge of surgical management techniques including indications, results and complications 4 Surgical interventions for urge urinary incontinence
Clinical Skills	4 Counsel patients for a range of therapeutic options 4 Plan investigation and treatment 4 Conservative management 4 Appropriate liaison with the multidisciplinary team 4 Ability to determine appropriate management of patient with resistant overactive bladder
Technical Skills and Procedures	4 Cystoscopy and injection Botulinum toxin 2 Detrusor myectomy 2 Augmentation and substitution cystoplasty 2 Sacral neuromodulation

Topic	**Bladder and pelvic pain syndromes (including "interstitial cystitis")**
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 Understand the various types of pain syndrome and underlying possible aetiologies and current terminology. 4 An understanding of the investigation, diagnosis and management 4 Clinical assessment techniques according to ICS standards. 4 The role of urodynamics, imaging, endoscopy and other investigations. 4 Knowledge of conservative management techniques 4 Knowledge of surgical management techniques including indications, results and complications 4 Practical intervention for painful bladder syndrome
Clinical Skills	4 Counsel patients for a range of therapeutic options 4 Plan investigation and treatment 4 Conservative management 4 Appropriate liaison with the multidisciplinary team 4 Ability to determine appropriate management of patient with resistant painful bladder syndrome
Technical Skills and Procedures	4 Cystoscopic assessment painful bladder 2 Augmentation and substitution cystoplasty 2 Simple cystectomy 2 Ileal conduit diversion

	2 Continent Urinary Diversion

Topic	Stress urinary incontinence and mixed urinary incontinence
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 An understanding of the investigation, diagnosis and management 4 Clinical assessment techniques according to ICS standards. 4 The role of urodynamic, imaging, endoscopic and other investigative techniques. 4 Knowledge of conservative management techniques 4 Knowledge of surgical management techniques including indications, results and complications 4 Surgical interventions for stress urinary incontinence
Clinical Skills	4 Counsel patients for a range of therapeutic options 4 Plan investigation and treatment 4 Conservative management 4 Appropriate liaison with the multidisciplinary team 4 Ability to determine appropriate surgical management of patient with stress urinary incontinence
Technical Skills and Procedures	4 Midurethral tapes 4 Injection of bulking agents into bladder neck 4 Colposuspension 3 Pubourethral slings 2 Artificial urinary sphincter

Topic	Female Urinary retention
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 Knowledge of the underlying causes and mechanisms
Clinical Skills	4 Be able and initiate appropriate investigation and management 4 Liaison with other specialties as appropriate
Technical Skills and Procedures	N/A

Topic	Genito-urinary prolapse (primary and recurrent)
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 Understanding of cause, pathophysiology and classification of pelvic organ prolapse 4 Understanding of female sexual function and dysfunction 4 Understanding of indications, techniques, results and complications of surgical and non-surgical therapies for pelvic organ prolapse 3 Surgical interventions for pelvic organ prolapse

Clinical Skills	4 Appropriate assessment of pelvic organ prolapse 4 Be able to identify and advise on the appropriateness of surgery or other conservative approaches. 4 Able to fit ring pessary 4 Be able to advise on the appropriateness of surgery 4 Liaison with other specialties as appropriate 3 Ability to determine appropriate management of patient with prolapse
Technical Skills and Procedures	3 Anterior repair 2 Paravaginal repair / Vagino-obturator shelf 2 Sacrocolpopexy 1 Vaginal hysterectomy

Topic	**Urinary fistula**
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	Causes, pathophysiology, presentation and complications of urinary fistulae Knowledge of appropriate management and diagnostic techniques including indications, results, complications 1 Surgical treatment of urinary fistula
Clinical Skills	Appropriate assessment of urinary fistulae Be able to advise on the appropriateness of surgery Liaise with appropriate specialty including pelvic reconstructive surgeon 1 Ability to determine appropriate management of patient with urinary fistula
Technical Skills and Procedures	1 Repair vesicovaginal fistula 2 Martius flap 2 Ileal conduit 1 Repair urethrovaginal fistula 2 Repair of uretero vaginal fistula 2 Simple cystectomy 1 Continent urinary diversion

Topic	**Urethral diverticulum**
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	4 Causes, pathophysiology, presentation and complications of urethral diverticulum 4 Knowledge of appropriate management and diagnostic techniques including indications, results, complications Knowledge of appropriate management and diagnostic techniques
Clinical Skills	4 Appropriate assessment of urethral diverticulum 4 Be able to advise on the appropriateness of surgery 4 Liaise with appropriate specialty including pelvic reconstructive surgeon
Technical Skills and Procedures	2 Surgical excision urethral diverticulum

Topic	**Trauma to the genito-urinary tract in women Effects of radiation and bowel or pelvic surgery on bladder, bowel and pelvic floor function**
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	2 Pathophysiology of congenital, inflammatory, traumatic and radiation damage to the genitourinary tract 2 Knowledge of management and diagnostic techniques 2 Awareness of possible techniques including inverted skin grafts, use of chorionic tissue, gracilis flaps and bowel interposition
Clinical Skills	2 Appropriate assessment of women with congenital, traumatic, inflammatory and radiation damage to the genitourinary tract 2 Be able to advise on the appropriateness of surgery 1 Practical surgical treatment congenital, inflammatory, traumatic and radiation damage to the genitourinary tract
Technical Skills and Procedures	1 Vaginal reconstruction 2 Martius flap 2 Ileal conduit 2 Simple cystectomy 1 Continent urinary diversion

Topic	**Defaecatory disorders and other lower gastrointestinal disorders Anorectal reconstruction**
Objective	*To develop advanced skills in the assessment and treatment of women with lower urinary tract dysfunction*
Knowledge	2 Understand the techniques of assessment and treatment of anorectal disorders including: -Anorectal physiology tests including manometry, proctography and endoanal US -Pelvic floor electromyography -Nerve conduction studies
Clinical Skills	2 Assessment of bowel dysfunction in women with lower tract dysfunction 2 Competence in use of dietary regimes, bowel medications and enemas
Technical Skills and Procedures	N/A

9. Modular Curriculum in Bladder and Upper urinary tract reconstruction

Topic	Basic Science
Objective	*To develop advanced skills in the reconstruction of the bladder and the upper urinary tract*
Knowledge	**Anatomy** 4 Detailed knowledge of abdomino-pelvic anatomy especially Bony pelvis, all pelvic and abdominal viscera, pelvic floor, pelvic side wall and the endopelvic fasciae 4 Embryology of the genitourinary tract including development of the cloaca, intestinal tract and omentum 4 Neuroanatomy as it relates to normal and abnormal bladder, urethral and pelvic floor function 4 Anatomy and vascular blood supply of intestine **Physiology** 4 Physiology and neurophysiology of the bladder including the basis of micturition and continence 4 Physiology of bladder musculature 4 Physiology of bladder mucosa 4 Physiological basis of bladder sensation 3 Physiology of gastrointestinal function **Pharmacology** 4 Pharmacology of the urogenital organs including cholinergic, adrenergic and other neurotransmitter systems 4 Pharmacology of drugs used in the management of lower urinary tract dysfunction side-effects and complications 4 Knowledge of the relevant supporting scientific literature 4 Pharmacological agents treating other systems and their side-effects on urogenital tract including side-effects and complications of commonly used drugs **Pathology** 4 Causes / pathophysiology of conditions that might require reconstruction of the bladder and ureter including; -Congenital and acquired conditions of the central nervous system -Congenital abnormalities of the urinary tract -Genitourinary tumours -Inflammatory conditions of the urinary tract -Iatrogenic damage -Trauma 4 Pathophysiology of urinary incontinence 4 Pathophysiology of pelvic organ prolapse in women 4 Pathophysiology of urinary infection
Clinical Skills	4 Appropriate assessment of patients with upper and lower urinary tract dysfunction who require urinary tract reconstruction
Technical Skills and Procedures	4 Undertake urodynamic studies to investigate lower urinary tract dysfunction

Topic	**Assessment and follow-up of patients requiring urinary tract reconstruction**
Objective	*To develop advanced skills in the reconstruction of the bladder and the upper urinary tract*
Knowledge	4 Causes and pathophysiology of conditions requiring bladder and ureteric reconstruction 4 Techniques of assessment for bladder and urinary tract reconstruction including

	urodynamics, radiology and nuclear medicine techniques 4 Metabolic effects of urinary tract reconstruction and interposition of intestine within the urinary tract 4 Complications of urinary tract reconstruction and interposition of intestine within the urinary tract 4 Knowledge of endourological techniques relevant to urinary tract reconstruction 3 Practical surgical techniques in reconstruction of the bladder and ureter
Clinical Skills	4 Appropriate assessment of patients requiring urinary tract reconstruction 4 Be able to advise on the surgical and non-surgical options and the appropriateness of surgery 4 Management of post-operative consequences of urinary tract reconstruction and interposition of intestine within the urinary tract 4 Arrange appropriate follow up of patients with urinary tract reconstruction and interposition of intestine within the urinary tract 4 Liaison with other specialties e.g. radiology, GI surgeons 3 Ability to determine appropriate choice of reconstructive technique
Technical Skills and Procedures	3 Intestinal anastomosis 3 Mobilisation omentum For the following the achievement will typically be 1-2 and the exact level of competence will largely depend upon casemix to which the trainee is exposed: Ureteric anastomosis Ureteric reimplantation Psoas hitch Boari flap Transuretero-ureterostomy Simple cystectomy Augmentation cystoplasty Substitution cystoplasty Ileal conduit diversion Continent urinary diversion Orthotopic bladder reconstruction Artificial urinary sphincter insertion Vaginal reconstruction

10. Modular Curriculum in Urethral Reconstruction

Topic	Basic Science
Objective	*To develop advanced skills in the reconstructive surgery of the urethra*
Knowledge	4 Knowledge of the pelvis, male genitalia and urethra including embryology of urethra including hypospadias and epispadias 4 Neuroanatomy as it relates to normal and abnormal bladder, urethral and pelvic floor function 4 Physiology and neurophysiology of micturition and continence 4 Physiology of erection and ejaculation 4 Reproductive physiology 4 Pharmacology of drugs used in the management of lower urinary tract dysfunction 4 Causes, pathophysiology and complications of urethral strictures 4 Pathophysiology of traumatic urethral injury
Clinical Skills	4 Appropriate assessment of men with urethral strictures 4 Appropriate use of commonly used drugs including side effects, interactions and contra-indications
Technical Skills and Procedures	N/A

Topic	Assessment and management of men requiring urethral reconstruction
Objective	*To develop advanced skills in the reconstructive surgery of the urethra*
Knowledge	4 Pathophysiology of congenital abnormalities including hypospadias and epispadias 4 Causes, pathophysiology and complications of urethral strictures 4 Pathophysiology of traumatic injury to the urethra 4 Techniques of assessment for bladder and urinary tract reconstruction including urodynamics, radiology and nuclear medicine techniques 4 Techniques and complications of urethral reconstruction 4 Knowledge of endourological techniques relevant to urethral 4 Surgery of urethral reconstruction
Clinical Skills	4 Appropriate assessment of patients requiring urethral 4 Be able to advise on the surgical options and the appropriateness of surgery 4 Management of post-operative consequences of urethral reconstruction 4 Arrange appropriate follow up of patients with urethral reconstruction 4 Liaison with other specialties e.g. radiology, orthopaedics, GI surgeons 4 Ability to determine appropriate surgical option for patients with urethral stricture
Technical Skills and Procedures	4 Optical urethrotomy 3 Harvesting buccal mucosa graft For the following the achievement will typically be 1-2 and the exact level of competence will largely depend upon casemix to which the trainee is exposed: Bulbar anastomotic urethroplasty Single stage substitution urethroplasty using flaps and grafts Two stage buccal graft urethroplasty Pelvic fracture urethral reconstruction

11. Modular Curriculum in Neurourology

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of patients with neuropathic bladder and genital dysfunction*
Knowledge	**Anatomy** 4 Anatomy of the genitourinary tract, including embryology 4 Neuroanatomy of the peripheral and central nervous system as it relates to normal and abnormal bladder, urethral and pelvic floor function **Physiology** 4 Physiology and neurophysiology of the bladder including the basis of micturition and continence 4 Physiology of bladder musculature 4 Physiology of bladder mucosa 4 Physiological basis of bladder sensation 4 Central nervous control of micturition and sexual function 4 Physiology and neurophysiology of sexual function in men and women 4 Reproductive physiology in men 3 Reproductive physiology in women **Pharmacology** 4 Pharmacology of the genitourinary organs including cholinergic, adrenergic and other neurotransmitter systems 4 Pharmacology of drugs used in the management of lower urinary tract dysfunction side-effects and complications 4 Pharmacology of drugs used to treat male and female sexual dysfunction 3 Pharmacology of drugs used in the management of diseases of the central nervous system (eg drugs used for treatment of Parkinson's disease, drugs used for neuropathic pain, drugs used to alleviate hypertonicity) 4 Pharmacological agents treating ano-rectal dysfunction including the pharmacological methods of treating constipation and altering bowel activity **Pathology** 4 Pathophysiology of neurogenic bladder dysfunction in congenital and acquired diseases of the central and peripheral nervous system 4 Effects of neurogenic bladder dysfunction upon renal function 4 Pathophysiology of sexual dysfunction in congenital and acquired diseases of the central and peripheral nervous system 4 Pathophysiology of traumatic spinal cord injury, including effects upon function of the genitourinary tract 4 Effects of neurological disease upon mobility, manual dexterity, vision and other bodily functions relevant to the management of bladder dysfunction 4 Pathophysiology of autonomic dysreflexia
Clinical Skills	4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications 4 Appropriate assessment of patients with neurological disease and bladder or sexual dysfunction including video-urodynamic studies
Technical Skills and Procedures	4 Undertake urodynamic studies to investigate lower urinary tract dysfunction

Topic	**Management of patients with neurogenic bladder or sexual dysfunction**
Objective	*To develop advanced skills in the assessment and treatment of patients with neuropathic bladder and genital dysfunction*
Knowledge	4 Understand the effects of neurological diseases on bladder and sexual function

	4 An understanding of the investigation, diagnosis and management of patients with neurogenic bladder or sexual dysfunction 4 Complications of neurogenic bladder dysfunction including renal impairment, urosepsis and calculus formation 4 Clinical assessment techniques according to ICS standards 4 The role of urodynamic, imaging, endoscopic and other investigative techniques. 4 Knowledge of conservative management techniques 4 Knowledge of surgical management techniques including indications, results and complications 4 Surgical treatment of neurogenic bladder dysfunction
Clinical Skills	4 Appropriate assessment of patients with neurogenic bladder or sexual dysfunction 4 Counsel patients for a range of therapeutic options 4 Plan investigation and treatment 4 Conservative management including medical therapy of urinary incontinence and sexual dysfunction 4 Appropriate liaison with the multidisciplinary team 4 Ability to determine appropriate management of patient with neurogenic bladder dysfunction
Technical Skills and Procedures	4 Perform urodynamic studies in patients with neurological disease 4 Cystoscopy and injection Botulinum toxin 4 Cystoscopy and insertion suprapubic catheter 4 Cystoscopy and fragmentation of bladder calculi 3 Cystoscopy and external sphincterotomy 3 Open removal bladder calculi 3 Intestinal anastomosis 2 Mobilisation omentum 2 Bladder neck closure 2 Ileal conduit For the following the achievement will typically be 1-2 and the exact level of competence will largely depend upon casemix to which the trainee is exposed: Augmentation cystoplasty Substitution cystoplasty Continent diversion Insertion artificial urinary sphincter Insertion spinal stimulator Neuromodulation

12. Modular curriculum in Male Factor Infertility

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of patients with male factor infertility*
Knowledge	**Anatomy** 4 A detailed knowledge of the anatomy and embryology of the genitalia and reproductive system 4 Knowledge of the vascular, lymphatic and nerve supply to the genitalia and reproductive system and abdominal/pelvic organs. 4 Embryology of the male genitalia with particular emphasis on congenital anomalies and their effects on male sexual function. 4 Micro/macroscopic anatomy of the reproductive system including their anatomical relationship to other genito-urinary organs 4 Micro/macroscopic anatomy of the male genitalia **Physiology** 4 Genetics and male sexual function (Normal sexual differentiation, Abnormal sexual differentiation, Intersex states Genetic anomalies and infertility) 4 The male reproductive axis (Hypothalamic- pituitary function, Endocrinology of the Testis, Testosterone metabolism, Effects of aging on male endocrinology) 4 Spermatogenesis (Genetic basis of spermatogenesis, Hormonal regulation of spermatogenesis, Sertoli cell function) 4 Physiology of male reproduction (Epididymal function, Physiology of the vas deferens, Physiology of the seminal vesicles, Ejaculation, Role of the prostate in sexual function) 4 Physiology of female sexual function 4 Physiology of female reproduction **Pharmacology** 4 Drugs / gonadotoxins and their effects on male reproduction and sexual function 4 The pharmacological treatment of male factor infertility **Pathology** 4 Aetiology and pathogenesis of male infertility 4 Anti-sperm anti-bodies and fertility 4 Varicocele and male fertility 4 Pathophysiology of testicular obstruction
Clinical Skills	4 Appropriate assessment and treatment of man or couple with male factor infertility 4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications
Technical Skills and Procedures	N/A

Topic	Male factor infertility
Objective	*To develop advanced skills in the assessment and treatment of patients with male factor infertility*
Knowledge	4 Causes of male factor infertility 4 Causes of female factor infertility 4 Appropriate investigation of male sub-fertility 4 Varicocele and male fertility 4 Endocrine disease and infertility 4 Causes of testicular obstruction

	4 The role of assisted conception techniques in the treatment of the infertile couple 4 Treatment of male factor infertility 4 Anti-sperm anti-bodies and fertility 4 Surgical treatment of male factor infertility 4 Indications for, methods, results and complications of sperm retrieval 4 Indications for, methods, results and complications of assisted conception 4 Regulatory rules relating to sperm storage and assisted conception 4 Microsurgical treatment of male factor infertility
Clinical Skills	4 Evaluation of the female 4 Clinical assessment of the sub-fertile male 4 Investigation of male sub-fertility 4 Treatment of male sub-fertility 4 Appropriate liaison with multidisciplinary team 4 Empathetic assessment of fertility issues 4 Ability to determine appropriate surgical plan for male factor infertility 4 Treatment of male sub-fertility 4 Appropriate liaison with multidisciplinary team and referral for assisted reproductive techniques 4 Empathetic assessment of fertility issues 4 Ability to determine appropriate surgical plan for male factor infertility
Technical Skills and Procedures	4 Varicocoele 3 Testicular exploration and Vasography ~~3 Vaso-vasostomy~~ 2 Transurethral resection of ejaculatory ducts 2 Electroejaculation 4 Vaso-vasostomy 2 Testicular exploration and sperm extraction (TESE) 2 Percutaneous sperm extraction (PESA) 2 Micro-epididymal sperm aspiration (MESA) 2 Tubulo-vasostomy

13. Modular curriculum in benign disorders of male sexual dysfunction

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	**Anatomy** 4 A detailed knowledge of the anatomy and embryology of the genitalia and reproductive system 4 Knowledge of the vascular, lymphatic and nerve supply to the genitalia and reproductive system and abdominal/pelvic organs. 4 Embryology of the male genitalia with particular emphasis on congenital anomalies and their effects on male sexual function. 4 Micro/macroscopic anatomy of the reproductive system including their anatomical relationship to other genito-urinary organs 4 Micro/macroscopic anatomy of the male genitalia **Physiology** 4 Functional anatomy (blood supply and venous/lymphatic drainage of the penis) 4 Physiology and neurophysiology of penile erection including neurotransmitters involved in penile erection 4 Cardiovascular function relevant to sexual dysfunction 4 Endocrinology of male sexual function (Hypothalamic- pituitary function, Endocrinology of the Testis, Testosterone metabolism) 4 Desire 4 Orgasm 4 Physiology of ejaculation (Physiology of the vas deferens, Physiology of the seminal vesicles, Role of the prostate in sexual function) 4 Physiology of female sexual function **Pharmacology** 4 Neuropharmacology and receptor pharmacology 4 Endothelial derived modulators of corporal smooth muscle 4 Oral pharmacotherapy for erectile dysfunction including basic pharmacokinetics and pharmacodynamics and adverse events/drug interactions of commonly used drugs 4 Novel oral agents for the treatment of MED 4 Intra-cavernosal, topical and intra-urethral treatments for MED 4 Pharmacological treatment of priapism 4 Pharmacological therapy of ejaculator disorders 4 Testosterone replacement therapy **Pathology** 4 Pathophysiology of Male Erectile Dysfunction (MED) 4 Risk factors and aetiology of MED 4 Sexual function and ageing 4 Cardiovascular disease and sexual function 4 Early ejaculation 4 Retrograde ejaculation 4 Delayed ejaculation 4 Hypogonadism 4 Androgen deficiency of ageing 4 Pathophysiology of penile deformity 4 Pathophysiology of priapism
Clinical Skills	4 Appropriate assessment of man with erectile dysfunction ,penile deformity or prolonged erection 4 Appropriate use of pharmacological agents for men with erectile dysfunction, priapism and ejaculatory dysfunction including indications, side effects, contraindications
Technical Skills and Procedures	N/A

Topic	Erectile dysfunction
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	4 Investigation of MED including the use and limitations of Doppler USS, cavernosography, cavernosometry, neurophysiological testing and nocturnal penile tumescence 4 Knowledge of range of therapies for treatment of MED 3 Surgical management of man with erectile dysfunction
Clinical Skills	4 Assessment of man with MED 4 Appropriate investigation of man with MED 4 Appropriate choice of pharmacological therapy 4 Technique of intracavernosal injection therapy 4 Empathetic assessment of male sexual difficulties 3 Ability to determine appropriate surgical management of patient with drug resistant erectile dysfunction
Technical Skills and Procedures	2 Ability to perform cavernosometry 2 Ability to perform Rigiscan assessment 3 Insertion of malleable penile prosthesis 2 Insertion of inflatable penile prosthesis 1 Penile revascularisation 1 Venous ligation

Topic	Penile deformity
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	4 Causes and pathophysiology of penile deformity 4 Knowledge of range of therapies 4 Surgical management of man with penile deformity
Clinical Skills	4 Appropriate assessment and medical management of man with penile deformity 4 Empathetic assessment of male sexual difficulties 4 Ability to determine choice of surgical approach for man with penile deformity
Technical Skills and Procedures	4 Nesbit's procedure 3 Lue procedure or equivalent 3 Insertion of malleable penile prosthesis 2 Insertion of inflatable penile prosthesis

Topic	Prolonged erection
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	4 Causes, classification, pathophysiology and complication of prolonged erection 4 Knowledge of range of therapies 3 Surgical management of man with prolonged erection
Clinical Skills	4 Appropriate assessment and medical management of man with prolonged erection 4 Liaison with relevant specialties (eg interventional radiology) 3 Ability to determine choice of surgical approach for man with prolonged erection

Technical Skills and Procedures	3 Insertion of malleable penile prosthesis 3 Shunting procedure 2 Insertion of inflatable penile prosthesis

Topic	**Rapid Ejaculation, Retrograde ejaculation, Delayed ejaculation, Orgasmic disorders, Desire disorders**
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	3 Causes and pathophysiology 3 Knowledge of range of therapies
Clinical Skills	3 Appropriate investigation and management of man with rapid ejaculation 3 Appropriate liaison with other specialties 3 Empathetic assessment of male sexual difficulties
Technical Skills and Procedures	N/A

Topic	**Penile dysmorphophobia**
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	2 Causes and classification 2 Knowledge of range of therapies 1 Surgical therapy of penile dysmorphophobia
Clinical Skills	2 Appropriate investigation and management of man with penile dysmorphophobia 2 Appropriate liaison with other specialties 2 Empathetic assessment of male sexual difficulties
Technical Skills and Procedures	1 Division of suspensory ligament 1 Repair of suspensory ligament

Topic	**Penile fracture**
Objective	*To develop advanced skills in the assessment and treatment of patients with benign disease of male sexual dysfunction*
Knowledge	4 Mechanisms of injury 4 Knowledge of range of therapies
Clinical Skills	4 Appropriate investigation and management of man with penile fracture
Technical Skills and Procedures	4 Surgical repair of penile fracture

14. Modular curriculum in Paediatric Urology

Topic	Basic Science
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Detailed knowledge of the pelvis, male genitalia and urethra including the embryology of urethra including hypospadias and epispadias 4 Neuroanatomy as it relates to normal and abnormal bladder, urethral and pelvic floor function 4 Physiology and neurophysiology of micturition and continence 4 Physiology of erection and ejaculation 4 Reproductive physiology 4 Pharmacology of drugs used in the management of lower urinary tract dysfunction side-effects and complications 4 Causes, pathophysiology and complications of urethral strictures 4 Pathophysiology of traumatic injury to the urethra
Clinical Skills	4 Appropriate assessment of children with hypospadias and epispadias 4 Appropriate use of commonly used drugs recognising common side effects, interactions and contra-indications
Technical Skills and Procedures	N/A

Topic	Congenital disorders affecting the urinary tract
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Common congenital disorders affecting the urinary tract (e.g undescended testis and urinary tract reflux) 4 Changes related to congenital abnormalities
Clinical Skills	4 Investigation and management of patients 4 Investigation and basic management of patients
Technical Skills and Procedures	4 Surgical Management of cryptorchidism Surgery for ureteric reflux See below

Topic	Principles of human genetics
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Basic genetics of uropathological conditions
Clinical Skills	4 Recognition of possible genetic component to specified condition
Technical Skills and Procedures	N/A

Topic	Urinary Tract Infections
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Biological mechanisms of upper and lower urinary tract infection – virulence 4 Host defence 4 Detailed knowledge of reflux 4 Antibiotics - Mechanisms of action
Clinical Skills	4 Identification of; - Significant infection - Asymptomatic bacteruria 4 Correct antibiotic selection 4 Management of children 4 Choice of surgical approach for vesicoureteric reflux
Technical Skills and Procedures	4 Endoscopic treatment of reflux disease 3 Open ureteric re-implantation

Topic	The acute scrotum
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Pathogenesis, natural history and complications 4 Clinical presentation and management
Clinical Skills	4 Assessment of patient 4 Correct interpretation of tests 4 Medical management of patient
Technical Skills and Procedures	4 Surgical management of the acute scrotum

Topic	Upper urinary tract obstruction
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Aetiology, pathophysiology and clinical features in childhood 4 Investigation 4 Formulation of appropriate management of children with Pelvi-ureteric junction obstruction (PUJ) obstruction 4 Indications, operative steps and complications of the different approaches to the treatment of PUJ obstruction, including: -Percutaneous approaches -Laparoscopic approaches -Open surgical approaches 3 Practical expertise in the surgical management of PUJ obstruction
Clinical Skills	4 Appropriate assessment of unilateral and bilateral renal obstruction 4 Recognition and early management of sepsis 4 Appropriate management of patient with PUJ obstruction 4 Interpretation of clinical findings and results of investigations 4 Ability to organise appropriate management plan 4 Ability to explain procedures and outcomes to parents and obtain informed consent

	3 Knowledge and appropriate use of treatment options
Technical Skills and Procedures	3 Percutaneous treatment of PUJ obstruction 2 Laparoscopic pyeloplasty 2 Laparoscopic nephrectomy 3 Open pyeloplasty

Topic	**Wilm's tumour and Neuroblastoma**
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 TNM classification 4 Pathology of the differing types of benign and malignant tumours affecting the kidney 4 Current theories of tumour initiation and growth 4 Thorough understanding of current and previous systems for staging
Clinical Skills	4 Appropriate use of stage, grade and molecular markers in the management of a child with renal cancer
Technical Skills and Procedures	N/A

Topic	**Radiology**
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Understanding of the theoretical basis and techniques of radiological and nuclear medicine imaging
Clinical Skills	4 Appropriate imaging of children with renal cancer
Technical Skills and Procedures	N/A

Topic	**Treatment**
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	4 Current standards of treatment for common urological cancers 4 Practical treatment of localised renal cancer
Clinical Skills	4 High level/empathetic communication skills 4 Appropriate management of urological malignancies 4 Appropriate referral for sub-specialist management and surgery
Technical Skills and Procedures	2 Radical nephrectomy 2 Laparoscopic nephrectomy

Topic	**Urinary incontinence and neuropathic bladder To include spina bifida, epispadias/ extrophy complex and posterior urethral valves**
Objective	N/A
Knowledge	4 Anatomy/physiology and pharmacology of bladder and sphincter mechanisms 4 Aetiology, epidemiology, pathophysiology and classification incontinence in childhood 4 Natural history of eneuresis 4 Causes of neuropathic bladder 4 Types of neuropathic bladder presentation 4 Clinical presentation and differential diagnosis 4 Management of neuropathic incontinence 4 Clinical presentation and differential diagnosis 4 Management of urinary incontinence
Clinical Skills	4 Appropriate history and examination 4 Investigation including interpretation of frequency volume chart 4 Appropriate liaison with multidisciplinary team (eg neurology and continence services) 4 Appropriate referral for sub-specialist management and surgery 4 Formulation of a realistic treatment plan 4 Medical management of urinary incontinence
Technical Skills and Procedures	4 Urodynamic studies

Topic	**Assessment of children requiring urinary tract reconstruction**
Objective	*To develop advanced skills in the assessment and treatment of urological disease in children*
Knowledge	3 Practical surgical techniques in reconstruction of the bladder and ureter
Clinical Skills	3 Appropriate choice of surgical procedure for a child requiring reconstruction
Technical Skills and Procedures	3 Intestinal anastomosis 3 Mobilisation omentum 1-2 (exact level of competence will depend upon casemix): Ureteric anastomosis Ureteric reimplantation Psoas hitch Boari flap Transuretero-ureterostomy Simple cystectomy Augmentation cystoplasty Substitution cystoplasty Ileal conduit diversion Continent urinary diversion Artificial urinary sphincter insertion Vaginal reconstruction

Topic	**Assessment and management of boys requiring urethral reconstruction**

Objective	N/A
Knowledge	4 Pathophysiology of congenital abnormalities including hypospadias and epispadias 4 Causes, pathophysiology and complications of urethral strictures 4 Pathophysiology of traumatic injury to the urethra 4 Techniques of assessment for bladder and urinary tract reconstruction including urodynamics, radiology and nuclear medicine techniques 4 Techniques and complications of urethral reconstruction
Clinical Skills	4 Appropriate assessment of patients requiring urethral 4 Be able to advise on the surgical options and the appropriateness of surgery 4 Management of post-operative consequences of urethral reconstruction 4 Arrange appropriate follow up of boys with urethral reconstruction 4 Liaison with other specialties e.g. radiology, orthopaedics, GI surgeons 3 Appropriate choice of surgical procedure for child with hypospadias
Technical Skills and Procedures	3 MAGPI repair 2 Harvesting buccal mucosa graft 2 Snodgrass repair 2 Two stage buccal graft urethroplasty 1-2 Surgery for epispadias

15. Modular Curriculum in Renal Transplantation

Topic	Renal Transplantation
Objective	*To develop advanced skills in renal transplantation and surgical aspects of renal replacement therapy*
Knowledge	**Anatomy** 4 Retroperitoneum and the great vessels 4 Embryology of the genitourinary tract including development of the kidney and the common variations in vascular supply to the kidney. 4 Anatomy and blood supply of the kidney, ureter and bladder. 4 Neuroanatomy as it relates to normal and abnormal bladder, urethral and pelvic floor function 4 Arterial supply and venous drainage of the upper and lower limbs. **Physiology** 4 Physiology of the kidney 4 Physiology of fluid balance 4 Physiology of the lower urinary tract **Pharmacology** 4 Pharmacology of drugs used in immunosuppression 4 Pharmacology of perfusion fluids and use of diuretics 4 Pharmacology of inotropes and blood pressure control and effects of drugs on renal blood flow. **Immunology** 4 HLA matching. 4 Cytotoxic cross match 4 Rejection 4 Immunosuppression **Renal failure** 4 Causes and classification 4 Pathophysiology 4 Clinical features 4 Treatment options for renaanl failure 4 Indications and contraindications for kidney transplantation 4 Indications and types of dialysis 4 Access for dialysis 4 complications of dialysis **Organ donation** 4 Criteria for brainstem death 4 Pathophysiology of brainstem death 4 Principles of donor management and organ preservation
Clinical Skills	3 Assess and manage organ donors (including live and NHB donors) **Vascular Access** 4 Assess patients referred for vascular access: 4 Identify appropriate access site 4 Manage complications including thrombosis, haemorrhage and vascular complications such as steal, venous hypertension, cardiac failure and aneurysm **Peritoneal dialysis** 4 Assess patients referred for peritoneal dialysis 4 Manage post-op care of patients with peritoneal dialysis catheter 4 manage complications including peritonitis **Renal transplantation**

	4 Select appropriate patient from the waiting list 4 Assessment of patients requiring renal transplantation or renal replacement therapy 4 Counsel patients regarding organ donation. 4 Manage transplant recipient perioperatively 4 Manage post-operative complications. 4 Follow up of patients with renal transplants. 4 Liaison with other specialties e.g. nephrology and radiology.
Technical Skills and Procedures	4 Peritoneal dialysis catheter-insert 4 Peritoneal dialysis catheter-removal 4 Central venous line insertion 3 Form arterio-venous fistula at wrist and elbow 4 Ligate arterio-venous fistula at wrist and elbow 4 Cadaveric donor nephrectomy for transplantation 3 Open donor nephrectomy for transplantation 2 Laparoscopic donor nephrectomy for transplantation 3 Renal transplantation including: 3 Preparation of kidney for transplant 3 End to end and end to side anastomosis of renal artery to recipient 3 End to side venous anastomosis and vein patch 4 Ureteric reimplantation 3 Transplant nephrectomy

Professional Behaviour and Leadership

Professional Behaviour and Leadership Syllabus

The Professional Behaviour and leadership elements are mapped to the leadership curriculum as laid out by the Academy of Medical Royal Colleges. The assessment of these areas is a thread running through the curriculum and this makes them common to all of the disciplines of surgery. For this reason, assessment techniques for this element of the curriculum are summarised in the final column.

	Professional Behaviour and Leadership	Mapping to Leadership Curriculum	Assessment technique
Category	Good Clinical Care, to include: • History taking (GMP Domains: 1, 3, 4) • Physical examination (GMP Domains: 1, 2,4) • Time management and decision making (GMP Domains: 1,2,3) • Clinical reasoning (GMP Domains: 1,2, 3, 4) • Therapeutics and safe prescribing (GMP Domains: 1, 2, 3) • Patient as a focus of clinical care (GMP Domains: 1, 3, 4) • Patient safety (GMP Domains: 1, 2, 3) • Infection control (GMP Domains: 1, 2, 3)	Area 4.1	
Objective	To achieve an excellent level of care for the individual patient • To elicit a relevant focused history (See modules 2, 3, 4,5) • To perform focused, relevant and accurate clinical examination (See modules 2,3,4,5) • To formulate a diagnostic and therapeutic plan for a patient based upon the clinic findings (See modules 2,3,4,5) • To prioritise the diagnostic and therapeutic plan (See modules 2,3,4,5) • To communicate a diagnostic and therapeutic plan appropriately (See modules 2,3,4,5) To produce timely, complete and legible clinical records to include case-note records, handover notes, and operation notes To prescribe, review and monitor appropriate therapeutic interventions relevant to clinical practice including non – medication based therapeutic and preventative indications (See module 1,2,3,4,5) To prioritise and organise clinical and clerical duties in order to optimise patient care To make appropriate clinical and clerical decisions in order to optimise the effectiveness of the clinical team resource. To prioritise the patient's agenda encompassing their beliefs, concerns expectations and needs To prioritise and maximise patient safety: • To understand that patient safety depends on o The effective and efficient organisation of care o Health care staff working well together o Safe systems, individual competency and safe practice • To understand the risks of treatments and to discuss these honestly and openly with patients • To systematic ways of assessing and minimising risk • To ensure that all staff are aware of risks and work together to minimise risk To manage and control infection in patients, including: • Controlling the risk of cross-infection • Appropriately managing infection in individual patients	Area 4.1	Mini CEX, CBD, Mini PAT, MRCS and Specialty FRCS

	• Working appropriately within the wider community to manage the risk posed by communicable diseases		
Knowledge	**Patient assessment** • Knows likely causes and risk factors for conditions relevant to mode of presentation • Understands the basis for clinical signs and the relevance of positive and negative physical signs • Recognises constraints and limitations of physical examination • Recognises the role of a chaperone is appropriate or required • Understand health needs of particular populations e.g. ethnic minorities • Recognises the impact of health beliefs, culture and ethnicity in presentations of physical and psychological conditions **Clinical reasoning** • Interpret history and clinical signs to generate hypothesis within context of clinical likelihood • Understands the psychological component of disease and illness presentation • Test, refine and verify hypotheses • Develop problem list and action plan • Recognise how to use expert advice, clinical guidelines and algorithms • Recognise and appropriately respond to sources of information accessed by patients • Recognises the need to determine the best value and most effective treatment both for the individual patient and for a patient cohort **Record keeping** • Understands local and national guidelines for the standards of clinical record keeping in all circumstances, including handover • Understanding of the importance of high quality and adequate clinical record keeping and relevance to patient safety and to litigation • Understand the primacy for confidentiality **Time management** • Understand that effective organisation is key to time management • Understand that some tasks are more urgent and/or more important than others • Understand the need to prioritise work according to urgency and importance • Maintains focus on individual patient needs whilst balancing multiple competing pressures • Outline techniques for improving time management **Patient safety** • Outline the features of a safe working environment • Outline the hazards of medical equipment in common use • Understand principles of risk assessment and management • Understanding the components of safe working practice in the personal, clinical and organisational settings • Outline local procedures and protocols for optimal practice e.g. GI bleed protocol, safe prescribing • Understands the investigation of significant events, serious untoward incidents and near misses **Infection control** • Understand the principles of infection control	**Area 4.1**	

	• Understands the principles of preventing infection in high risk groups • Understand the role of Notification of diseases within the UK • Understand the role of the Health Protection Agency and Consultants in Health Protection		
Skills	**Patient assessment** • Takes a history from a patient with appropriate use of standardised questionnaires and with appropriate input from other parties including family members, carers and other health professionals • Performs an examination relevant to the presentation and risk factors that is valid, targeted and time efficient and which actively elicits important clinical findings • Give adequate time for patients and carers to express their beliefs ideas, concerns and expectations • Respond to questions honestly and seek advice if unable to answer • Develop a self-management plan with the patient • Encourage patients to voice their preferences and personal choices about their care **Clinical reasoning** • Interpret clinical features, their reliability and relevance to clinical scenarios including recognition of the breadth of presentation of common disorders • Incorporates an understanding of the psychological and social elements of clinical scenarios into decision making through a robust process of clinical reasoning • Recognise critical illness and respond with due urgency • Generate plausible hypothesis(es) following patient assessment • Construct a concise and applicable problem list using available information • Construct an appropriate management plan in conjunction with the patient, carers and other members of the clinical team and communicate this effectively to the patient, parents and carers where relevant **Record keeping** • Producing legible, timely and comprehensive clinical notes relevant to the setting • Formulating and implementing care plans appropriate to the clinical situation, in collaboration with members of an interdisciplinary team, incorporating assessment, investigation, treatment and continuing care • Presenting well documented assessments and recommendations in written and/or verbal form **Time management** • Identifies clinical and clerical tasks requiring attention or predicted to arise • Group together tasks when this will be the most effective way of working • Organise, prioritise and manage both team-members and workload effectively and flexibly **Patient safety** • Recognise and practise within limits of own professional competence • Recognise when a patient is not responding to treatment, reassess the situation, and encourage others to do so • Ensure the correct and safe use of medical equipment • Improve patients' and colleagues' understanding of the side	**Area 4.1**	

	effects and contraindications of therapeutic intervention • Sensitively counsel a colleague following a significant untoward event, or near incident, to encourage improvement in practice of individual and unit • Recognise and respond to the manifestations of a patient's deterioration or lack of improvement (symptoms, signs, observations, and laboratory results) and support other members of the team to act similarly **Infection control** • Recognise the potential for infection within patients being cared for • Counsel patients on matters of infection risk, transmission and control • Actively engage in local infection control procedures • Prescribe antibiotics according to local guidelines and work with microbiological services where appropriate • Recognise potential for cross-infection in clinical settings • Practice aseptic technique whenever relevant		
Behaviour	• Shows respect and behaves in accordance with Good Medical Practice • Ensures that patient assessment, whilst clinically appropriate considers social, cultural and religious boundaries • Support patient self-management • Recognise the duty of the medical professional to act as patient advocate • Ability to work flexibly and deal with tasks in an effective and efficient fashion • Remain calm in stressful or high pressure situations and adopt a timely, rational approach • Show willingness to discuss intelligibly with a patient the notion and difficulties of prediction of future events, and benefit/risk balance of therapeutic intervention • Show willingness to adapt and adjust approaches according to the beliefs and preferences of the patient and/or carers • Be willing to facilitate patient choice • Demonstrate ability to identify one's own biases and inconsistencies in clinical reasoning • Continue to maintain a high level of safety awareness and consciousness • Encourage feedback from all members of the team on safety issues • Reports serious untoward incidents and near misses and co-operates with the investigation of the same. • Show willingness to take action when concerns are raised about performance of members of the healthcare team, and act appropriately when these concerns are voiced to you by others • Continue to be aware of one's own limitations, and operate within them • Encourage all staff, patients and relatives to observe infection control principles • Recognise the risk of personal ill-health as a risk to patients and colleagues in addition to its effect on performance		
Examples and descriptors for Core	**Patient assessment** • Obtains, records and presents accurate clinical history and physical examination relevant to the clinical presentation, including an indication of patient's views		

Surgical Training	• Uses and interprets findings adjuncts to basic examination appropriately e.g. internal examination, blood pressure measurement, pulse oximetry, peak flow
	• Responds honestly and promptly to patient questions
	• Knows when to refer for senior help
	• Is respectful to patients by
	  o Introducing self clearly to patients and indicates own place in team
	  o Checks that patients comfortable and willing to be seen
	  o Informs patients about elements of examination and any procedures that the patient will undergo
	
	Clinical reasoning
	• In a straightforward clinical case develops a provisional diagnosis and a differential diagnosis on the basis of the clinical evidence, institutes an appropriate investigative and therapeutic plan, seeks appropriate support from others and takes account of the patients wishes
	
	Record keeping
	• Is able to format notes in a logical way and writes legibly
	• Able to write timely, comprehensive, informative letters to patients and to GPs
	
	Time management
	• Works systematically through tasks and attempts to prioritise
	• Discusses the relative importance of tasks with more senior colleagues.
	• Understands importance of communicating progress with other team members
	
	Patient safety
	• Participates in clinical governance processes
	• Respects and follows local protocols and guidelines
	• Takes direction from the team members on patient safety
	• Discusses risks of treatments with patients and is able to help patients make decisions about their treatment
	• Ensures the safe use of equipment
	• Acts promptly when patient condition deteriorates
	• Always escalates concerns promptly
	
	Infection control
	• Performs simple clinical procedures whilst maintaining full aseptic precautions
	• Follows local infection control protocols
	• Explains infection control protocols to students and to patients and their relatives
	• Aware of the risks of nosocomial infections.
		Area 4.1	

Examples and descriptors for CCT	**Patient assessment**
	• Undertakes patient assessment (including history and examination) under difficult circumstances. Examples include:
	  o Limited time available (Emergency situations, Outpatients, ward referral),
	  o Severely ill patients
	  o Angry or distressed patients or relatives
	• Uses and interprets findings adjuncts to basic examination appropriately e.g. electrocardiography, spirometry, ankle brachial pressure index, fundoscopy, sigmoidoscopy
	• Recognises and deals with complex situations of communication, accommodates disparate needs and develops strategies to cope
	• Is sensitive to patients cultural concerns and norms		

	• Is able to explain diagnoses and medical procedures in ways that enable patients understand and make decisions about their own health care. **Clinical reasoning** • In a complex case, develops a provisional diagnosis and a differential diagnosis on the basis of the clinical evidence, institutes an appropriate investigative and therapeutic plan, seeks appropriate support from others and takes account of the patients wishes **Record keeping** • Produces comprehensive, focused and informative records which summarise complex cases accurately **Time management** • Organises, prioritises and manages daily work efficiently and effectively • Works with, guides, supervises and supports junior colleagues • Starting to lead and direct the clinical team in effective fashion **Patient safety** • Leads team discussion on risk assessment, risk management, clinical incidents • Works to make organisational changes that will reduce risk and improve safety • Promotes patients safety to more junior colleagues • Recognises and reports untoward or significant events • Undertakes a root cause analysis • Shows support for junior colleagues who are involved in untoward events **Infection control** • Performs complex clinical procedures whilst maintaining full aseptic precautions • Manages complex cases effectively in collaboration with infection control specialists	**Area 4.1**	

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	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**
Category	Being a good communicator To include: • Communication with patients (GMP Domains: 1, 3, 4) • Breaking bad news (GMP Domains: 1, 3, 4) • Communication with colleagues (GMP Domains: 1, 3)	N/A	
Objective	**Communication with patients** • To establish a doctor/patient relationship characterised by understanding, trust, respect, empathy and confidentiality • To communicate effectively by listening to patients, asking for and respecting their views about their health and responding to their concerns and preferences • To cooperate effectively with healthcare professionals involved in patient care • To provide appropriate and timely information to patients and their families **Breaking bad news** • To deliver bad news according to the needs of individual patients		PBA, DOPS, Mini CEX, Mini PAT and CBD

	Communication with Colleagues • To recognise and accept the responsibilities and role of the doctor in relation to other healthcare professionals. • To communicate succinctly and effectively with other professionals as appropriate • To present a clinical case in a clear, succinct and systematic manner		
Knowledge	**Communication with patients** • Understands questioning and listening techniques • Understanding that poor communication is a cause of complaints/ litigation **Breaking bad news** • In delivering bad news understand that: o The delivery of bad news affects the relationship with the patient o Patient have different responses to bad news o Bad news is confidential but the patient may wish to be accompanied o Once the news is given, patients are unlikely to take in anything else o Breaking bad news can be extremely stressful for both parties o It is important to prepare for breaking bad news **Communication and working with colleagues** • Understand the importance of working with colleagues, in particular: o The roles played by all members of a multi-disciplinary team o The features of good team dynamics o The principles of effective inter-professional collaboration o The principles of confidentiality		
Skills	**Communication with patients** • Establish a rapport with the patient and any relevant others (eg carers) • Listen actively and question sensitively to guide the patient and to clarify information • Identify and manage communication barriers, tailoring language to the individual patient and others and using interpreters when indicated • Deliver information compassionately, being alert to and managing their and your emotional response (anxiety, antipathy etc) • Use, and refer patients to appropriate written and other evidence based information sources • Check the patient's understanding, ensuring that all their concerns/questions have been covered • Make accurate contemporaneous records of the discussion • Manage follow-up effectively and safely utilising a variety if methods (eg phone call, email, letter) • Ensure appropriate referral and communications with other healthcare professional resulting from the consultation are made accurately and in a timely manner **Breaking bad news** • Demonstrate to others good practice in breaking bad news • Recognises the impact of the bad news on the patient, carer, supporters, staff members and self • Act with empathy, honesty and sensitivity avoiding undue optimism or pessimism		

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	Communication with colleagues • Communicate with colleagues accurately, clearly and promptly • Utilise the expertise of the whole multi-disciplinary team • Participate in, and co-ordinate, an effective hospital at night or hospital out of hours team • Communicate effectively with administrative bodies and support organisations • Prevent and resolve conflict and enhance collaboration		
Behaviour	**Communication with patients** • Approach the situation with courtesy, empathy, compassion and professionalism • Demonstrate and inclusive and patient centred approach with respect for the diversity of values in patients, carers and colleagues **Breaking bad news** • Behave with respect, honest ant empathy when breaking bad news • Respect the different ways people react to bad news **Communication with colleagues** • Be aware of the importance of, and take part in, multi-disciplinary teamwork, including adoption of a leadership role • Foster an environment that supports open and transparent communication between team members • Ensure confidentiality is maintained during communication with the team • Be prepared to accept additional duties in situations of unavoidable and unpredictable absence of colleagues		
Examples and descriptors for Core Surgical Training	• Conducts a simple consultation with due empathy and sensitivity and writes accurate records thereof • Recognises when bad news must be imparted. • Able to break bad news in planned settings following preparatory discussion with seniors • Accepts his/her role in the healthcare team and communicates appropriately with all relevant members thereof		
Examples and descriptors for CCT	• Shows mastery of patient communication in all situations, anticipating and managing any difficulties which may occur • Able to break bad news in both unexpected and planned settings • Fully recognises the role of, and communicates appropriately with, all relevant team members • Predicts and manages conflict between members of the healthcare team • Beginning to take leadership role as appropriate, fully respecting the skills, responsibilities and viewpoints of all team members		

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	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**
Category	• Teaching and Training (GMP Domains: 1, 3)	N/A	
Objective	• To teach to a variety of different audiences in a variety of different ways • To assess the quality of the teaching • To train a variety of different trainees in a variety of different		Mini PAT, Portfolio assessment at ARCP

	ways • To plan and deliver a training programme with appropriate assessments		
Knowledge	• Understand relevant educational theory and principles relevant to medical education • Understand the structure of an effective appraisal interview • Understand the roles to the bodies involved in medical education • Understand learning methods and effective learning objectives and outcomes • Differentiate between appraisal, assessment and performance review • Differentiate between formative and summative assessment • Understand the role, types and use of workplace-based assessments • Understand the appropriate course of action to assist a trainee in difficulty		
Skills	• Critically evaluate relevant educational literature • Vary teaching format and stimulus, appropriate to situation and subject • Provide effective feedback and promote reflection • Conduct developmental conversations as appropriate eg: appraisal, supervision, mentoring • Deliver effective lecture, presentation, small group and bed side teaching sessions • Participate in patient education • Lead departmental teaching programmes including journal clubs • Recognise the trainee in difficulty and take appropriate action • Be able to identify and plan learning activities in the workplace		
Behaviour	• In discharging educational duties respect the dignity and safety of patients at all times • Recognise the importance of the role of the physician as an educator • Balances the needs of service delivery with education • Demonstrate willingness to teach trainees and other health workers • Demonstrates consideration for learners • Acts to endure equality of opportunity for students, trainees, staff and professional colleagues • Encourage discussions with colleagues in clinical settings to share understanding • Maintains honesty, empathy and objectivity during appraisal and assessment		
Examples and descriptors for Core Surgical Training	• Prepares appropriate materials to support teaching episodes • Seeks and interprets simple feedback following teaching • Supervises a medical student, nurse or colleague through a simple procedure • Plans, develops and delivers small group teaching to medical students, nurses or colleagues		
Examples and descriptors for CCT	• Performs a workplace based assessment including giving appropriate feedback • Devises a variety of different assessments (eg MCQs, WPBAs) • Appraises a medical student, nurse or colleague • Acts as a mentor to a medical student, nurses or colleague • Plans, develops and delivers educational programmes with clear objectives and outcomes • Plans, develops and delivers an assessment programme to support educational activities		

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	Professional Behaviour and Leadership	Mapping to Leadership Curriculum	Assessment technique
Category	Keeping up to date and understanding how to analyse information including • *Ethical research* (GMP Domains: 1) • Evidence and guidelines (GMP Domains: 1) • Audit (GMP Domains: 1, 2) • Personal development	Area 1.3	
Objective	• To understand the results of research as they relate to medical practise • To participate in medical research • To use current best evidence in making decisions about the care of patients • To construct evidence based guidelines and protocols • To complete an audit of clinical practice • At actively seek opportunities for personal development • To participate in continuous professional development activities	Area 1.3 Area 1.3	Mini PAT, CBD, Portfolio assessment at ARCP, MRCS and specialty FRCS
Knowledge	• Understands GMC guidance on good practice in research • Understands the principles of research governance • Understands research methodology including qualitative, quantitative, bio-statistical and epidemiological research methods • Understands of the application of statistics as applied to medical practise • Outline sources of research funding • Understands the principles of critical appraisal • Understands levels of evidence and quality of evidence • Understands guideline development together with their roles and limitations • Understands the different methods of obtaining data for audit • Understands the role of audit in improving patient care and risk management • Understands the audit cycle • Understands the working and uses of national and local databases used for audit such as specialty data collection systems, cancer registries etc • To demonstrate knowledge of the importance of best practice, transparency and consistency	Area 1.3	
Skills	• Develops critical appraisal skills and applies these when reading literature • Devises a simple plan to test a hypothesis • Demonstrates the ability to write a scientific paper • Obtains appropriate ethical research approval • Uses literature databases • Contribute to the construction, review and updating of local (and national) guidelines of good practice using the principles of evidence based medicine • Designs, implements and completes audit cycles • Contribute to local and national audit projects as appropriate • To use a reflective approach to practice with an ability to learn from previous experience • To use assessment, appraisal, complaints and other feedback	Area 1.3	

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	to discuss and develop an understanding of own development needs	Area 1.3	
Behaviour	• Follows guidelines on ethical conduct in research and consent for research • Keep up to date with national reviews and guidelines of practice (e.g. NICE) • Aims for best clinical practice at all times, responding to evidence based medicine while recognising the occasional need to practise outside clinical guidelines • Recognise the need for audit in clinical practice to promote standard setting and quality assurance • To be prepared to accept responsibility • Show commitment to continuing professional development	Area 1.3 Area 1.3	
Examples and descriptors for Core Surgical Training	• Defines ethical research and demonstrates awareness of GMC guidelines • Differentiates audit and research and understands the different types of research approach e.g. qualitative and quantitative • Knows how to use literature databases • Demonstrates good presentation and writing skills • Participates in departmental or other local journal club • Critically reviews an article to identify the level of evidence • Attends departmental audit meetings • Contributes data to a local or national audit • Identifies a problem and develops standards for a local audit • Describes the audit cycle and take an audit through the first steps • Seeks feedback on performance from clinical supervisor/mentor/patients/carers/service users	Area 1.3 Area 1.3	
Examples and descriptors for CCT	• Demonstrates critical appraisal skills in relation to the published literature • Demonstrates ability to apply for appropriate ethical research approval • Demonstrates knowledge of research organisation and funding sources • Demonstrates ability to write a scientific paper • Leads in a departmental or other local journal club • Contributes to the development of local or national clinical guidelines or protocols • Organise or lead a departmental audit meeting • Lead a complete clinical audit cycle including development of conclusions, the changes needed for improvement, implementation of findings and re-audit to assess the effectiveness of the changes • Seeks opportunity to visit other departments and learn from other professionals	Area 1.3 Area 1.3	

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	Professional Behaviour and Leadership	Mapping to Leadership Curriculum	Assessment technique
Sub-category:	Manager including • Self Awareness and self management (GMP Domains: 1) • Team-working (GMP Domains: 1, 3) • Leadership (GMP Domains: 1, 2, 3) • Principles of quality and safety improvement (GMP Domains: 1,	Area 1.1 and 1.2 Area 2 Area 4.2,	

	3, 4) • Management and NHS structure (GMP Domains 1)	4.3, 4.4 Area 3	
Objective	**Self awareness and self management** • To recognise and articulate one's own values and principles, appreciating how these may differ from those of others • To identify one's own strengths, limitations and the impact of their behaviour • To identify their own emotions and prejudices and understand how these can affect their judgement and behaviour • To obtain, value and act on feedback from a variety of sources • To manage the impact of emotions on behaviour and actions • To be reliable in fulfilling responsibilities and commitments to a consistently high standard • To ensure that plans and actions are flexible, and take into account the needs and requirements of others • To plan workload and activities to fulfil work requirements and commitments with regard to their own personal health **Team working** • To identify opportunities where working with others can bring added benefits • To work well in a variety of different teams and team settings by listening to others, sharing information, seeking the views of others, empathising with others, communicating well, gaining trust, respecting roles and expertise of others, encouraging others, managing differences of opinion, adopting a team approach **Leadership** • To develop the leadership skills necessary to lead teams effectively. These include: • Identification of contexts for change • Application of knowledge and evidence to produce an evidence based challenge to systems and processes • Making decision by integrating values with evidence • Evaluating impact of change and taking corrective action where necessary **Principles of quality and safety improvement** • To recognise the desirability of monitoring performance, learning from mistakes and adopting no blame culture in order to ensure high standards of care and optimise patient safety • To critically evaluate services • To identify where services can be improved • To support and facilitate innovative service improvement **Management and NHS culture** • To organise a task where several competing priorities may be involved • To actively contribute to plans which achieve service goals • To manage resources effectively and safely • To manage people effectively and safely • To manage performance of themselves and others • To understand the structure of the NHS and the management of local healthcare systems in order to be able to participate fully in managing healthcare provision	**Area 1.1 and 1.2** **Area 2** **Area 5** **Area 4.2, 4.3 and 4.4** **Area 3**	Mini PAT and CBD Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP

Knowledge	**Self awareness and self management** • Demonstrate knowledge of ways in which individual behaviours impact on others; • Demonstrate knowledge of personality types, group dynamics, learning styles, leadership styles • Demonstrate knowledge of methods of obtaining feedback from others • Demonstrate knowledge of tools and techniques for managing stress • Demonstrate knowledge of the role and responsibility of occupational health and other support networks • Demonstrate knowledge of the limitations of self professional competence	**Areas 1.1 and 1.2**	
	Team working • Outline the components of effective collaboration and team working • Demonstrate knowledge of specific techniques and methods that facilitate effective and empathetic communication • Demonstrate knowledge of techniques to facilitate and resolve conflict • Describe the roles and responsibilities of members of the multidisciplinary team • Outline factors adversely affecting a doctor's and team performance and methods to rectify these • Demonstrate knowledge of different leadership styles	**Area 2**	
	Leadership • Understand the responsibilities of the various Executive Board members and Clinical Directors or leaders • Understand the function and responsibilities of national bodies such as DH, HCC, NICE, NPSA, NCAS; Royal Colleges and Faculties, specialty specific bodies, representative bodies; regulatory bodies; educational and training organisations • Demonstrate knowledge of patient outcome reporting systems within surgery, and the organisation and how these relate to national programmes. • Understand how decisions are made by individuals, teams and the organisation • Understand effective communication strategies within organisations • Demonstrate knowledge of impact mapping of service change, barriers to change, qualitative methods to gather the experience of patients and carers	**Area 5**	
	Quality and safety improvement • Understand the elements of clinical governance and its relevance to clinical care • Understands significant event reporting systems relevant to surgery • Understands the importance of evidence-based practice in relation to clinical effectiveness • Understand risks associated with the surgery including mechanisms to reduce risk • Outline the use of patient early warning systems to detect clinical deterioration • Keep abreast of national patient safety initiatives including National Patient Safety Agency , NCEPOD reports, NICE guidelines etc • Understand quality improvement methodologies including feedback from patients, public and staff • Understand the role of audit, research, guidelines and standard	**Area 4.2, 4.3, 4.4**	

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	setting in improving quality of care
	• Understand methodology of creating solutions for service improvement
	• Understand the implications of change
	
	Management and NHS Structure
	• Understand the guidance given on management and doctors by the GMC
	• Understand the structure of the NHS and its constituent organisation
	• Understand the structure and function of healthcare systems as they apply to surgery
	• Understand the principles of:
	  • Clinical coding
	  • Relevant legislation including Equality and Diversity, Health and Safety, Employment law, European Working Time Regulations
	  • National Service Frameworks
	  • Health regulatory agencies (e.g., NICE, Scottish Government)
	  • NHS Structure and relationships
	  • NHS finance and budgeting
	  • Consultant contract
	  • Commissioning, funding and contracting arrangements
	  • Resource allocation
	  • The role of the independent sector as providers of healthcare
	  • Patient and public involvement processes and role
	  • Understand the principles of recruitment and appointment procedures
	• Understand basic management techniques
		Area 3	

Skills	**Self awareness and self management**
	• Demonstrate the ability to maintain and routinely practice critical self awareness, including able to discuss strengths and weaknesses with supervisor, recognising external influences and changing behaviour accordingly
	• Demonstrate the ability to show awareness of and sensitivity to the way in which cultural and religious beliefs affect approaches and decisions, and to respond respectfully
	• Demonstrate the ability to recognise the manifestations of stress on self and others and know where and when to look for support
	• Demonstrate the ability to balance personal and professional roles and responsibilities, prioritise tasks, having realistic expectations of what can be completed by self and others
	
	Team working
	• Preparation of patient lists with clarification of problems and ongoing care plan
	• Detailed hand over between shifts and areas of care
	• Communicate effectively in the resolution of conflict, providing feedback
	• Develop effective working relationships with colleagues within the multidisciplinary team
	• Demonstrate leadership and management in the following areas:
	  o Education and training of junior colleagues and other members of the team
	  o Deteriorating performance of colleagues (e.g. stress, fatigue)
	  o Effective handover of care between shifts and teams
	• Lead and participate in interdisciplinary team meetings
		Area 1.2 and 1.2
		
		Area 2	

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	• Provide appropriate supervision to less experienced colleagues • Timely preparation of tasks which need to be completed to a deadline **Leadership** • Discuss the local, national and UK health priorities and how they impact on the delivery of health care relevant to surgery • Identify trends, future options and strategy relevant to surgery • Compare and benchmark healthcare services • Use a broad range of scientific and policy publications relating to delivering healthcare services • Prepare for meetings by reading agendas, understanding minutes, action points and background research on agenda items • Work collegiately and collaboratively with a wide range of people outside the immediate clinical setting • Evaluate outcomes and re-assess the solutions through research, audit and quality assurance activities • Understand the wider impact of implementing change in healthcare provision and the potential for opportunity costs **Quality and safety improvement** • Adopt strategies to reduce risk e.g. Safe surgery • Contribute to quality improvement processes e.g. o Audit of personal and departmental performance o Errors / discrepancy meetings o Critical incident and near miss reporting o Unit morbidity and mortality meetings o Local and national databases • Maintenance of a personal portfolio of information and evidence • Creatively question existing practise in order to improve service and propose solutions **Management and NHS Structures** • Manage time and resources effectively • Utilise and implement protocols and guidelines • Participate in managerial meetings • Take an active role in promoting the best use of healthcare resources • Work with stakeholders to create and sustain a patient-centred service • Employ new technologies appropriately, including information technology • Conduct an assessment of the community needs for specific health improvement measures	**Area 5** **Area 4.2, 4.3, 4.4** **Area 3**	
Behaviour	**Self awareness and self management** • To adopt a patient-focused approach to decisions that acknowledges the right, values and strengths of patients and the public • To recognise and show respect for diversity and • differences in others • To be conscientious, able to manage time and delegate • To recognise personal health as an important issue	**Area 1.1 and 1.2**	

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	Team working • Encourage an open environment to foster and explore concerns and issues about the functioning and safety of team working • Recognise limits of own professional competence and only practise within these. • Recognise and respect the skills and expertise of others • Recognise and respect the request for a second opinion • Recognise the importance of induction for new members of a team • Recognise the importance of prompt and accurate information sharing with Primary Care team following hospital discharge **Leadership** • Demonstrate compliance with national guidelines that influence healthcare provision • Articulate strategic ideas and use effective influencing skills • Understand issues and potential solutions before acting • Appreciate the importance of involving the public and communities in developing health services • Participate in decision making processes beyond the immediate clinical care setting • Demonstrate commitment to implementing proven improvements in clinical practice and services • Obtain the evidence base before declaring effectiveness of changes **Quality and safety improvement** • Participate in safety improvement strategies such as critical incident reporting • Develop reflection in order to achieve insight into own professional practice • Demonstrates personal commitment to improve own performance in the light of feedback and assessment • Engage with an open no blame culture • Respond positively to outcomes of audit and quality improvement • Co-operate with changes necessary to improve service quality and safety **Management and NHS Structures** • Recognise the importance of equitable allocation of healthcare resources and of commissioning • Recognise the role of doctors as active participants in healthcare systems • Respond appropriately to health service objectives and targets and take part in the development of services • Recognise the role of patients and carers as active participants in healthcare systems and service planning • Show willingness to improve managerial skills (e.g. management courses) and engage in management of the service	**Area 2** **Area 5** **Area 4.2, 4.3, 4.4** **Area 3**	
Examples and descriptors for Core Surgical Training	**Self awareness and self management** • Obtains 360° feedback as part of an assessment • Participates in peer learning and explores leadership styles and preferences • Timely completion of written clinical notes • Through feedback discusses and reflects on how a personally emotional situation affected communication with another person • Learns from a session on time management **Team working** • Works well within the multidisciplinary team and recognises	**Area 1.1 and 1.2** **Area 2**	

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	when assistance is required from the relevant team member • Invites and encourages feedback from patients • Demonstrates awareness of own contribution to patient safety within a team and is able to outline the roles of other team members. • Keeps records up-to-date and legible and relevant to the safe progress of the patient. • Hands over care in a precise, timely and effective manner • Supervises the process of finalising and submitting operating lists to the theatre suite **Leadership** • Complies with clinical governance requirements of organisation • Presents information to clinical and service managers (eg audit) • Contributes to discussions relating to relevant issues e.g. workload, cover arrangements using clear and concise evidence and information **Quality and safety improvement** • Understands that clinical governance is the over-arching framework that unites a range of quality improvement activities • Participates in local governance processes • Maintains personal portfolio • Engages in clinical audit • Questions current systems and processes **Management and NHS Structures** • Participates in audit to improve a clinical service • Works within corporate governance structures • Demonstrates ability to manage others by teaching and mentoring juniors, medical students and others, delegating work effectively, • Highlights areas of potential waste	**Area 5** **Area 4.2, 4.3, 4.4** **Area 3**	
Examples and descriptors for CCT	**Self awareness and self management** • Participates in case conferences as part of multidisciplinary and multi agency team • Responds to service pressures in a responsible and considered way • Liaises with colleagues in the planning and implementation of work rotas **Team working** • Discusses problems within a team and provides an analysis and plan for change • Works well in a variety of different teams • Shows the leadership skills necessary to lead the multidisciplinary team • Beginning to leads multidisciplinary team meetings o Promotes contribution from all team members o Fosters an atmosphere of collaboration o Ensures that team functioning is maintained at all times. o Recognises need for optimal team dynamics o Promotes conflict resolution • Recognises situations in which others are better equipped to lead or where delegation is appropriate **Leadership** • Shadows NHS managers • Attends multi-agency conference • Uses and interprets departments performance data and information to debate services	**Area 1.1 and 1.2** **Area 2** **Area 5**	

	• Participates in clinical committee structures within an organisation **Quality and safety improvement** • Able to define key elements of clinical governance • Demonstrates personal and service performance • Designs audit protocols and completes audit cycle • Identifies areas for improvement and initiates improvement projects • Supports and participates in the implementation of change • Leads in review of patient safety issue • Understands change management **Management and NHS Structure** • Can describe in outline the roles of primary care, including general practice, public health, community, mental health, secondary and tertiary care services within healthcare • Participates fully in clinical coding arrangements and other relevant local activities • Can describe the relationship between PCTs/Health Boards, General Practice and Trusts including relationships with local authorities and social services • Participate in team and clinical directorate meetings including discussions around service development • Discuss the most recent guidance from the relevant health regulatory agencies in relation to the surgical specialty • Describe the local structure for health services and how they relate to regional or devolved administration structures • Discusses funding allocation processes from central government in outline and how that might impact on the local health organisation	Area 4.2, 4.3, 4.4 Area 3	

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	Professional Behaviour and Leadership	Mapping to Leadership Curriculum	Assessment technique
Sub-category:	Promoting good health (GMP Domains: 1, 2, 3)		
Objective	• To demonstrate an understanding of the determinants of health and public policy in relation to individual patients • To promote supporting people with long term conditions to self-care • To develop the ability to work with individuals and communities to reduce levels of ill health and to remove inequalities in healthcare provision • To promote self care	N/A	MRCS, specialty FRCS, CBD, Mini PAT
Knowledge	• Understand guidance documents relevant to the support of self care • Recognises the agencies that can provide care and support out with the hospital • Understand the factors which influence the incidence and prevalence of common conditions including psychological, biological, social, cultural and economic factors • Understand the screening programmes currently available within the UK • Understand the possible positive and negative implications of health promotion activities • Demonstrate knowledge of the determinants of health worldwide and strategies to influence policy relating to health issues • Outline the major causes of global morbidity and mortality and effective, affordable interventions to reduce these		

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Skills	• Adapts assessment and management accordingly to the patients social circumstances • Assesses patient's ability to access various services in the health and social system and offers appropriate assistance • Ensures appropriate equipment and devices are discussed and where appropriate puts the patient in touch with the relevant agency • Facilitating access to appropriate training and skills to develop the patients' confidence and competence to self care • Identifies opportunities to promote change in lifestyle and to prevent ill health • Counsels patients appropriately on the benefits and risks of screening and health promotion activities		
Behaviour	• Recognises the impact of long term conditions on the patient, family and friends • Put patients in touch with the relevant agency including the voluntary sector from where they can access support or equipment relevant to their care • Show willingness to maintain a close working relationship with other members of the multi-disciplinary team, primary and community care • Recognise and respect the role of family, friends and carers in the management of the patient with a long term condition • Encourage where appropriate screening to facilitate early intervention		
Examples and descriptors for Core Surgical Training	• Understands that "quality of life" is an important goal of care and that this may have different meanings for each patient • Promotes patient self care and independence • Helps the patient to develop an active understanding of their condition and how they can be involved in self management • Discusses with patients those factors which could influence their health		
Examples and descriptors for CCT	• Demonstrates awareness of management of long term conditions • Develops management plans in partnership with the patient that are pertinent to the patients long term condition • Engages with relevant external agencies to promote improving patient care • Support small groups in a simple health promotion activity • Discuss with small groups the factors that have an influence on their health and describe steps they can undertake to address these • Provide information to an individual about a screening programme offering specific guidance in relation to their personal health and circumstances concerning the factors that would affect the risks and benefits of screening to them as an individual.		

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	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**
Sub-category:	*Probity and Ethics* To include • Acting with integrity • Medical Error • Medical ethics and confidentiality (GMP Domains: 1, 2, 3, 4) • Medical consent (GMP Domains: 1, 3, 4) • Legal framework for medical practise (GMP Domains: 1, 2, 3)	Area 1.4	
Objective	• To uphold personal, professional ethics and values, taking into	Area 1.4	Mini PAT

	account the values of the organisation and the culture and beliefs of individuals • To communicate openly, honestly and inclusively • To act as a positive role model in all aspects of communication • To take appropriate action where ethics and values are compromised • To recognise and respond the causes of medical error • To respond appropriately to complaints • To know, understand and apply appropriately the principles, guidance and laws regarding medical ethics and confidentiality as they apply to surgery • To understand the necessity of obtaining valid consent from the patient and how to obtain • To understand the legal framework within which healthcare is provided in the UK • To recognise, analyse and know how to deal with unprofessional behaviours in clinical practice, taking into account local and national regulations • Understand ethical obligations to patients and colleagues • To appreciate an obligation to be aware of personal good health		and CBD, PBA, DOPS, MRCS, specialty FRCS
Knowledge	• Understand local complaints procedure • Recognise factors likely to lead to complaints • Understands the differences between system and individual errors • Outline the principles of an effective apology • Knows and understand the professional, legal and ethical codes of the General Medical Council and any other codes to which the physician is bound • Understands of the principles of medical ethics • Understands the principles of confidentiality • Understands the Data Protection Act and Freedom of Information Act • Understands the principles of Information Governance and the role of the Caldicott Guardian • Understands the legal framework for patient consent in relation to medical practise • Recognises the factors influencing ethical decision making including religion, personal and moral beliefs, cultural practices • Understands the standards of practice defined by the GMC when deciding to withhold or withdraw life-prolonging treatment • Understands the UK legal framework and GMC guidelines for taking and using informed consent for invasive procedures including issues of patient incapacity	Area 1.4	
Skills	• To recognise, analyse and know how to deal with unprofessional behaviours in clinical practice taking into account local and national regulations • To create open and nondiscriminatory professional working relationships with colleagues awareness of the need to prevent bullying and harassment • Contribute to processes whereby complaints are reviewed and learned from • Explains comprehensibly to the patient the events leading up to a medical error or serious untoward incident, and sources of support for patients and their relatives • Deliver an appropriate apology and explanation relating to error • Use and share information with the highest regard for confidentiality both within the team and in relation to patients • Counsel patients, family, carers and advocates tactfully and effectively when making decisions about resuscitation status, and withholding or withdrawing treatment	Area 1.4 Area 1.4	

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	• Present all information to patients (and carers) in a format they understand, checking understanding and allowing time for reflection on the decision to give consent • Provide a balanced view of all care options • Applies the relevant legislation that relates to the health care system in order to guide one's clinical practice including reporting to the Coroner's/Procurator Officer, the Police or the proper officer of the local authority in relevant circumstances • Ability to prepare appropriate medical legal statements for submission to the Coroner's Court, Procurator Fiscal, Fatal Accident Inquiry and other legal proceedings • Be prepared to present such material in Court		
Behaviour	• To demonstrate acceptance of professional regulation • To promote professional attitudes and values • To demonstrate probity and the willingness to be truthful and to admit errors • Adopt behaviour likely to prevent causes for complaints • Deals appropriately with concerned or dissatisfied patients or relatives • Recognise the impact of complaints and medical error on staff, patients, and the National Health Service • Contribute to a fair and transparent culture around complaints and errors • Recognise the rights of patients to make a complaint • Identify sources of help and support for patients and yourself when a complaint is made about yourself or a colleague • Show willingness to seek advice of peers, legal bodies, and the GMC in the event of ethical dilemmas over disclosure and confidentiality • Share patient information as appropriate, and taking into account the wishes of the patient • Show willingness to seek the opinion of others when making decisions about resuscitation status, and withholding or withdrawing treatment • Seeks and uses consent from patients for procedures that they are competent to perform while o Respecting the patient's autonomy o Respecting personal, moral or religious beliefs o Not exceeding the scope of authority given by the patient o Not withholding relevant information • Seeks a second opinion, senior opinion, and legal advice in difficult situations of consent or capacity • Show willingness to seek advice from the employer, appropriate legal bodies (including defence societies), and the GMC on medico-legal matters	Area 1.4 Area 1.4 Area 1.4	
Examples and descriptors for Core Surgical Training	• Reports and rectifies an error if it occurs • Participates in significant event audits • Participates in ethics discussions and forums • Apologises to patient for any failure as soon as an error is recognised • Understands and describes the local complaints procedure • Recognises need for honesty in management of complaints • Learns from errors • Respect patients' confidentiality and their autonomy • Understand the Data Protection Act and Freedom of Information Act • Consult appropriately, including the patient, before sharing patient information • Participate in decisions about resuscitation status, withholding or withdrawing treatment	Area 1.4 Area 1.4 Area 1.4	

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	• Obtains consent for interventions that he/she is competent to undertake • Knows the limits of their own professional capabilities		
Examples and descriptors for CCT	• Recognises and responds to both system failure and individual error • Provides timely accurate written responses to complaints when required • Counsels patients on the need for information distribution within members of the immediate healthcare team • Seek patients' consent for disclosure of identifiable information • Discuss with patients with whom they would like information about their health to be shared • Understand the importance the possible need for ethical approval when patient information is to be used for any purpose • Understand the difference between confidentiality and anonymity • Know the process for gaining ethical approval for research • Able to assume a full role in making and implementing decisions about resuscitation status and withholding or withdrawing treatment • Able to support decision making on behalf of those who are not competent to make decisions about their own care • Obtains consent for interventions that he/she is competent to undertake, even when there are communication difficulties • Identifies cases which should be reported to external bodies • Identify situations where medical legal issues may be relevant • Work with external bodies around cases that should be reported to them. • Collaborating with external bodies by preparing and presenting reports as required		

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The Assessment System

Overview of the Assessment System

The curriculum adopts the following PMETB definitions:

Assessment: *A systematic procedure for measuring a trainee's progress or level of achievement, against defined criteria to make a judgement about a trainee.*

Assessment system: *An assessment system refers to an integrated set of assessments which is in place for the entire postgraduate training programme and which is blueprinted against and supports the approved curriculum.*

Purpose of the Assessment system

The purpose of the assessment system is to:

- Determine whether trainees are meeting the standards of competence and performance specified at various stages in the curriculum for surgical training.
- Provide systematic and comprehensive feedback as part of the learning cycle.
- Determine whether trainees have acquired the common and specialty-based knowledge, clinical judgement, operative and technical skills, and generic professional behaviour and leadership skills required to practice at the level of CCT in the designated surgical specialty.
- Address all the domains of Good Medical Practice and conform to the principles laid down by the Postgraduate Medical Education and Training Board.

Components of the Assessment system

The individual components of the assessment system are:

- Workplace based assessments covering knowledge, clinical judgement, technical skills and professional behaviour and attitudes together with the surgical logbook of procedures to support the assessment of operative skills
- Examinations held at key stages; during the early years of training and towards the end of specialist training
- The learning agreement and the assigned educational supervisors' report
- An annual review of competence progression (ARCP)

In order to be included in the assessment system, the assessments methods selected have to meet the following criteria. They have to be:

- **Valid** - To ensure face validity, the workplace based assessments comprise direct observations of workplace tasks. The complexity of the tasks increases in line with progression through the training programme. To ensure content validity all the assessment instruments have been blueprinted against all the Good Medical Practice.
- **Reliable** - In order to increase reliability, there will be multiple measures of outcomes. ISCP assessments make use of several observers' judgements, multiple assessment methods (triangulation) and take place frequently. The planned systematic and permanent programme of assessor training for trainers and Assigned Educational Supervisors (AESs) through the deaneries helps gain maximum reliability of placement reports.
- **Feasible** - The practicality of the assessments in the training and working environment has been taken into account. The assessment should not add a significant amount of time to the workplace task being assessed and assessors should be able to complete the scoring and feedback part of the assessment in 5-10 minutes.
- **Cost-effectiveness** – Once staff have been trained in the assessment process and are familiar with the ISCP website, the only significant additional costs should be any extra time taken for assessments and feedback and the induction of new Assigned Educational Supervisors. The most substantial extra time investment will be in the regular appraisal process for units that did not previously have such a system.
- **Opportunities for feedback** – All the assessments, both those for learning and of learning, include a feedback element.
- **Impact on learning** - The workplace based assessments are all designed to include immediate feedback as part of the process. A minimum number of three appraisals with the AES per clinical placement are built into the training system. The formal examinations all provide limited feedback as part of the summative process. The assessment process thus has a continuous developmental impact on learning. The emphasis given to reflective practice within the portfolio also impacts directly on learning.

The Assessment Framework

The Overarching Blueprint (PDF: 174Kb) demonstrates that the curriculum is consistent with the four Good Medical Practice domains contained in the GMC's *Framework for Appraisal and Assessment*. The specialty specific syllabuses specify the knowledge, skills and performance required for different stages of training and is underpinned by patient safety. The professional behaviour and leadership skills syllabus specifies the standards for patient safety; communication, partnership and team-working and maintaining trust. The standards have been informed by the Academy Common Competence Framework and the Academy and NHSII Leadership Competence Framework.

Curriculum assessment runs throughout training as illustrated in the Assessment Framework and is common to all disciplines of surgery.

Types of Assessment

Assessments can be categorised as *for* or *of* learning, although there is a link between the two.

Assessment *for* Learning - Is primarily aimed at aiding learning through constructive feedback that identifies areas for development. Alternative terms are Formative or Low-stakes assessment. Lower reliability is acceptable for individual assessments as they can and should be repeated frequently. This increases their overall net reliability and helps to document progress. Such assessments are ideally undertaken in the workplace. [PMETB].

Assessments for learning are used in the curriculum as part of a developmental or ongoing teaching and learning process and mainly comprise of workplace-based assessments. They provide the trainee with educational feedback from skilled clinicians that should result in reflection on practice and an improvement in the quality of care. Assessments are collated in the learning portfolio and are regularly reviewed during each placement, providing evidence for the judgement of the Assigned Educational Supervisors' (AES) reports to the Programme Director and the ARCP. Assessments for learning therefore contribute to summative judgements of the trainee's progress.

Assessment *of* Learning - Is primarily aimed at determining a level of competence to permit progression training or certification. Such assessments are undertaken infrequently (e.g. examinations) and must have high reliability as they often form the basis of decisions. Alternative terms are Summative or High-stakes assessment. [PMETB]

Assessments of learning in the curriculum are focussed on the waypoints in the specialty syllabuses. For the most part these comprise the examinations, structured AES's end of placement reports and some courses which, taken in the round, cover the important elements of the syllabus and ensure that no gaps in achievement are allowed to develop. They are collated at the ARCP panel, which determines progress or otherwise.

The balance between the two assessment approaches principally relates to the relationship between competence and performance. Competence (can do) is necessary but not sufficient for performance (does), and as trainees' experience increases so performance-based assessment in the workplace becomes more important.

Workplace Based Assessments

The purpose of workplace based assessment (WPBA)

The primary purpose of WPBA is of providing short loop feedback between trainers and their trainees – an assessment to support learning. They are designed to be mainly trainee driven but may be trainer triggered. The number of types and intensity of each type of WPBA in any one assessment cycle will be initially determined by the Learning Agreement fashioned at the beginning of a training placement and regularly reviewed. The intensity may be altered to reflect progression and trainee need. For example a trainee in difficulty would undertake more frequent assessments above an agreed baseline for all trainees. In that sense WPBAs meet the criterion of being adaptive.

These are designed to:

- **Provide feedback to trainers and trainees as part of the learning cycle.**

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The most important use of the workplace-based assessments is in providing trainees with feedback to inform and develop their practice. Each assessment is scored only for the purpose of providing meaningful feedback on that one particular encounter. The assessments should be viewed as part of a process throughout training, enabling trainees to build on assessor feedback and chart their own progress. Trainees should expect to complete more than the minimum number identified.

- **Provide formative guidance on practice.**

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Surgical trainees can use different methods to assess themselves against important criteria (especially that of clinical reasoning and decision-making) as they learn and perform practical tasks. The methods also encourage dialogue between the trainee and assigned educational supervisor (AES) and other clinical supervisors.

- **Encompass the assessment of skills, knowledge, behaviour and attitudes during day-to-day surgical practice.**

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Workplace-based assessment is trainee led; the trainee chooses the timing, the case and assessor under the guidance of the AES via the learning agreement. It is the trainee's responsibility to ensure completion of the required number of the agreed type of assessments by the end of each placement. However trainers may trigger assessments if they have particular concerns, especially if they consider patient safety may be at risk.

- **Provide a reference point on which current levels of competence can be compared with those at the end of a particular stage of training.**

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The primary aim is for trainees to use assessments throughout their training programmes to demonstrate their learning and development. At the start of a level it would be normal for trainees to have some assessments which are less than satisfactory because their performance is not yet at the standard for the completion of that level. In cases where assessments are less than satisfactory, trainees should repeat assessments as often as required to show progress.

- **Inform the (summative) assessment of the AES at the completion of each placement.**

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Although the principal role of workplace assessment is for learning the summary evidence will be used to inform the annual review process and will contribute to the decision made as to how well the trainee is progressing.

- **Contribute towards a body of evidence held in the learning portfolio and made available for the annual review of competence progression panel and planned educational reviews.**

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At the end of a period of training, the trainee's whole portfolio will be reviewed. The accumulation of assessments will be one of a range of indicators that inform the decision as to satisfactory completion of training at the annual review of competence progression. It is therefore normally to be expected that some WPBAs will demonstrate that trainees have not yet completed all their competencies during that particular WPBA exercise. It is important that ALL WPBAs undertaken are retained within a portfolio so that natural progression can be tracked.

Guidance on using workplace-based assessment

Guidance on workplace-based assessment; frequency, timing and use of assessments Feb 09 (PDF: 33Kb)
The workplace-based assessment methods used in the curriculum are:

- Mini-PAT (Peer Assessment Tool)

- Mini-CEX (mini Clinical Evaluation Exercise)
- CBD (Case Based Discussion)
- Surgical DOPS (Direct Observation of Procedural Skills in Surgery)
- PBA (Procedure-based Assessment)

Examinations

Examinations are held at two key stages: during initial training and towards the end of specialist training.

MRCS

Core surgical trainees will take the MRCS examination. The MRCS assesses knowledge and skills that are encompassed within the common surgical component of the "early years" syllabus and the early years components of the Professional Behaviour and Leadership syllabus to which the MRCS syllabus is blueprinted. Although the examination assesses the common surgical component of the curriculum, the assessment will take place within a choice of specialty contexts. The speciality contexts reflect in the round the types of surgery available in the latter years. The optional elements of the exam are confined to Head and Neck, Abdomen and Thorax, Limb and Spine and Neurology.

The purpose of the MRCS examination is to determine that trainees have acquired the knowledge, skills and attributes required for the early years of surgical training and, for trainees following the Intercollegiate Surgical Curriculum Programme, to determine their ability to progress to higher specialist training in surgery at ST3.

The MRCS examination consists of two parts, A & B. Although divided into two parts, the Intercollegiate MRCS is a single examination. The written component (Part A) consists of a MCQ and EMI (Extended matching item questions) combined into a single part A. These two components address knowledge and applied knowledge in the generality of surgery.

Part B consists of an Objective Structured Clinical Examination (OSCE). The overall design of the OSCE tests skills and applied knowledge. It is innovative in that it has some optional elements which permit some choice in the contexts of which the common surgical skills and knowledge may be tested. In addition to the Part A anatomical assessments, the OSCE also provides candidates with the opportunity to demonstrate their three dimensional anatomical knowledge in the context of their likely future surgical career, without losing the vital need to ensure a thorough overall grip of generic three dimensional surgical anatomy.

Both Parts A and B must be completed to pass the MRCS.

Trainees will typically take the examination towards the end of the CT2/ST1 year. If the candidate is unsuccessful, there will be an opportunity to re-sit the examination during CT3/ST2, prior to entry to ST3. Progression to ST3 will not be possible unless the MRCS (or DOHNS) examination is achieved. Such timing will fit well with the timetable currently in place for selection into ST3.

The choice of speciality context stations is not delineated in the award of MRCS. Successful candidates all are awarded exactly the same diploma as a measure of their core surgical competences.

Feedback on outcomes in the examination is provided in the form of data regarding performance in each component and element of the examination irrespective whether the candidate passes or fails.

Further information can be obtained from www.intercollegiatemrcs.org.uk

Guidance regarding the requirement for MRCS and the ARCP Outcome

DOHNS

From August 2008 acquisition of Part A (written paper) of MRCS and acquisition of Part 1 and Part 2 of the DOHNS examination has allowed candidates to acquire an Intercollegiate MRCS which is ENT themed and this has been used as part of the essential criteria for recruitment into ST3 which takes place on a national basis (International equivalence is sought where this examination is not accessible).

From August 2010 Otolaryngology trainees at CT1/2 level in themed core surgical training posts should undertake Part A of MRCS and the Part 2 OSCE of the DOHNS examination which will allow equivalence to acquire the Intercollegiate MRCS Diploma which is ENT themed (in Part B). The DOHNS route allows for full assessment of the early years syllabus.

FRCS

The Intercollegiate Specialty Examinations (FRCS) are assessments of learning in each of the nine surgical specialties. They form an essential part of the overall assessment system for UK and Irish Surgical Trainees who have participated in a formal surgical training programme leading to a Certificate of Completion of Training (CCT).

The applicant must provide evidence of having reached the standard of clinical competence defined in the Intercollegiate Surgical Curriculum for the award of the (CCT) by the Postgraduate Medical Education and Training Board (PMETB).
Since January 1997, success in the FRCS examination has been a mandatory requirement for CCT and entry to the Specialist Register. Passing the examination provides evidence towards the award of a CCT.

Section 1 is a written test composed of two Multiple Choice Questions papers; Paper 1: Single Best Answer [SBA] and Paper 2: Extended Matching Items [EMI]. Candidates must meet the required standard in Section 1 in order to gain eligibility to proceed to Section 2.

Section 2 is the clinical component of the examination. It consists of discussions around a series of carefully designed and structured standardised case based scenarios.

Failing candidates are given feedback in the form of data as to their performance in each component and element of the examination

Further information can be obtained from www.intercollegiate.org.uk

Logbook

The surgical logbook is web-based and enables the trainee to record each surgical operative procedure undertaken. The logbook provides a record of the scope and volume of operative exposure and level of supervision required. It is seen as corroborative evidence of the experience of the trainee gained in carrying out surgical procedures when discussing progress with the assigned educational supervisor; at the ARCP and during the planned educational reviews.

ASGBI/ISCP Logbook
ISCP Logbook
FHI Logbook

All logbooks conform to the Data Protection Act.

Annual Review of Competence Progression (ARCP)

Purpose of the ARCP (adapted from the Gold Guide 2008):

The ARCP[1] is a formal deanery School of Surgery process which scrutinises each surgical trainee's suitability to progress to the next stage of, or complete, the training programme. It follows on from the appraisal process and bases its recommendations on the evidence that has been gathered in the trainee's learning portfolio during the period between ARCP reviews. The ARCP records that the required curriculum competences and experience are being acquired, and that this is at an appropriate rate. It also provides a coherent record of a trainee's progress. The ARCP is not in itself an assessment exercise of clinical or professional competence.

The ARCP should normally be undertaken on at least an annual basis for all trainees in surgical training. Some deaneries or Schools of Surgery plan to arrange two ARCPs each year in the early years of training. An ARCP panel may be convened more frequently if there is a need to deal with progression issues outside the normal schedule.

The Royal Colleges of Surgery use the opportunity afforded, through their representative on the panel, to monitor the quality of training being delivered by the programme and/or its components.

Further information on this process can be found in the Guide to Postgraduate Specialty Training in the UK, The Gold Guide June 2007, First Edition.

Preparation for the ARCP

The trainee's learning portfolio provides the evidence of progress. It is the trainee's responsibility to ensure that the documentary evidence is complete in good time for the ARCP. The Annual Review Checklist lists the components that should normally be completed in time for the panel meeting.

The ARCP Panel

Please note that during the time of the panel meeting, members of an ARCP panel will have access to the portfolios of the trainees they review. Panel members are appointed by the Deanery and are likely to include the following:

- Postgraduate Dean or deputy
- Programme Director
- Chair of the Specialty Training Committee
- College/Faculty representatives (e.g. from the specialty SAC)
- Assigned educational supervisors (including AESs who have not been directly responsible for the trainee's placements)
- Associate Directors/Deans
- Academic representatives (for academic programmes only)
- A representative from an employing authority

ARCP Outcomes

1. Trainee is achieving progress and competencies at the expected rate
2. Development of specific competencies required – additional training time not required
3. Inadequate progress by the trainee – additional training time required
4. Released from training programme with our without specified competencies
5. Incomplete evidence presented – additional training time may be required

. Gained all required competencies; will be recommended as having completed the training programme and for an award of a CCT or CESR

[1] Previously known as the Record of In-Training Assessment or RITA

Quality Assurance of the Curriculum

The Quality Assurance Framework of the ISCP provides a vehicle for quality enhancement of the curriculum. It is used to monitor the effectiveness of the curriculum by gathering evidence on the experience of those delivering and undertaking it.

The main areas of the framework are:

- Standards for postgraduate surgical education;
- The surgical trainee experience survey;
- Annual monitoring;
- Deanery/SAC Reviews.

Standards for Postgraduate Surgical Education

The foundations of the framework are the standards for postgraduate surgical education, established by the SACs and built on the PMETB generic standards for postgraduate medical education. PMTB Generic standards for training

These standards, specific to surgical disciplines, together with the indicative evidence requirements and judgements of specialists in the surgical disciplines provide a form of peer-assessment that can provide authoritative judgements on the quality of learning experiences for trainees. It is important to ensure that trainees' experience of the curriculum forms a major part of the approach to quality assurance and this will be undertaken by means of a sophisticated survey of trainee views.

One of the key determinants of the quality of a curriculum is the quality of those delivering it, and it is important that quality of training is evidenced. PMETB has produced its standards for trainers which are being developed into curriculum standards for surgical trainers to help confirm that Assigned Educational Supervisors and Clinical Supervisors meet these standards through ISCP website registration.

Surgical Trainee Experience Survey

This online survey is focussed on surgical training standards and trainees experience of the curriculum. Moreover, it enables analysis of individual surgical specialties and the extent to which the curriculum and standards for specialties are maintained at specific levels of training. It will produce comparative evidence at a number of levels, for example:

- Schools of surgery level, to allow cross-deanery benchmarking as specified by JACSTAG
- Inter-specialty level within Schools of Surgery, for internal benchmarking
- Specialty level within Schools of Surgery
- Specialty level nationally, for SACs, and importantly,
- Post level within specialties

The survey remains, however, an opinion survey and is a single source of evidence which must be triangulated. This is achieved, initially, through reports from Programme Directors and SAC members' participation in ARCP processes and will in future seek other quantitative measures, such as measures of surgical experience through logbooks.

Annual Monitoring

The annual monitoring process, carried out by the deanery/school of surgery, is an important reporting process that allows the programme(s) to periodically evaluate their delivery, operation and outcomes. The process is one of evidence based self-evaluation, utilising feedback from a range of key stakeholders that will result in ongoing action plans.

The process requires critical evaluation of main areas of activity and it is intended that these would correspond to the standards for postgraduate surgical education, which in turn reflect PMETB generic domains. The findings of the surgical trainee experience survey and ARCP outcomes are crucial qualitative measures of trainee perceptions and performance. These are supplemented by the programme directors' critical account of all the significant aspects of training.

Deanery/SAC Reviews

It is anticipated that where evidence from trainee evaluation and/or annual monitoring indicates specific concerns about the quality of training the deanery, with necessary specialist support provided by the SAC,

may initiate a review process. This process will be proportionate to the nature of the concern and may utilise a documentary analysis and/or visits, in line with the Joint Academy and COPMeD Specialty Training Advisory Group (JACSTAG) recommendations.

The Training System

Training Roles

Training roles will exist, with minor, locally agreed variation, in all deaneries/schools and are a requirement of the ISCP.

In accordance with PMETB and curriculum standards:

- There must be an adequate number of appropriately qualified and experienced staff in place to deliver an effective training programme.
- Training roles must have the time within their job plan to support the role.
- Subject areas of the curriculum must be taught by staff with relevant specialist expertise and knowledge.
- Individuals undertaking educational roles must undergo a formal programme of training and be subject to regular review. Training programmes should include practice exercises, an understanding of the curriculum, workplace-based assessment methodology and guidance on giving constructive feedback, equality and diversity training.

The main surgical training roles fall into one of two broad categories:

- Those to do with managing individual trainees (i.e. clinical supervisor, assigned educational supervisor, programme director)
- Those to do with managing the system. Included within this role would be important aspects such as the provision of common learning resources and quality control of the training being provided. Surgical College Tutors, Specialty Tutors and Departmental Educational Supervisors would fall into this category.

It may be entirely appropriate for a surgeon involved in training to hold more than one role (e.g. assigned educational supervisor and clinical supervisor/assessor) where the workload is manageable and the trainee continues to receive training input from several sources. The role of assessor is not intended to be used as a formal title, but describes a function that will be intrinsic to many of the roles described in the ISCP.

The ISCP requires adherence to a common nomenclature for the trainers who are working directly with the trainee and these are highlighted on the website. These roles are programme director (core surgical training), or programme director (specialty training), assigned educational supervisor, clinical supervisor, trainee and assessor. This is to support the interactive parts of the website, access levels, etc. Elsewhere it is strongly recommended that schools of surgery use the titles outlined here in the interests of uniformity between deaneries and schools i.e. surgical college tutor, departmental educational supervisor /specialty tutor, deputy programme director (specialty), deputy programme director (core surgical training).

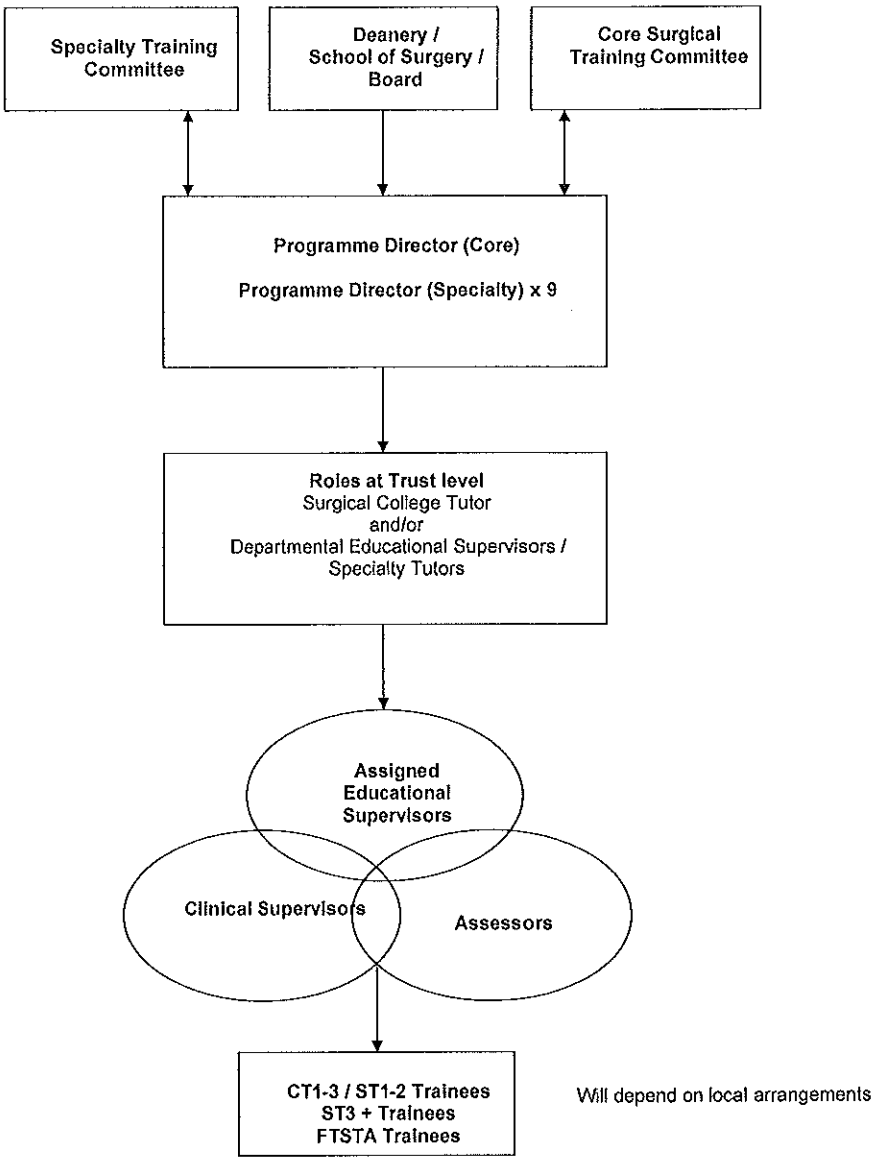
There is great variation in the number of trainees being managed at the various levels within schools of surgery. This is particularly the case during the early years of training. For this reason, many schools will find that programme director roles may have to be subdivided. It is recommended that the suffix or prefix 'deputy' is used in conjunction with the main title rather than devising a completely title. This will make clear the general area in which the surgeon is working and should help to avoid confusion.

Wherever possible these roles are harmonised with the new 'Gold Guide' but there may be minor variations in nomenclature and tasks that reflect the intercollegiate approach to surgical specialty training.

It is assumed that trainees in both run though programmes and those in fixed term specialty training appointment programmes (FTSTA) are included.

In some instances, a recommendation is made for the time that should be allocated to some of these roles. At the time of writing, these are estimations and will be refined in the light of experience.

ISCP Roles


Specialty Training Committee
Deanery / School of Surgery / Board
Core Surgical Training Committee
Programme Director (Core)
Programme Director (Specialty) x 9
Roles at Trust level
Surgical College Tutor
and/or
Departmental Educational Supervisors / Specialty Tutors
Assigned Educational Supervisors
Clinical Supervisors
Assessors
CT1-3 / ST1-2 Trainees
ST3 + Trainees
FTSTA Trainees
Will depend on local arrangements

Roles and Responsibilities

Schools of Surgery
Schools of Surgery have been created nationally within each Postgraduate Deanery and the Scottish Surgical Training Board (SSTB) within NHS Education for Scotland. They provide the structure for educational, corporate and financial governance and co-ordinate the educational, organisational and quality management activities of surgical training programmes. The Schools draw together the representatives and resources of Deaneries/SSTB, Colleges, Trusts and NHS service delivery and other relevant providers of training and stakeholders in postgraduate medical education. They ensure the implementation of curricula and assessment methodologies with associated training requirements for educational supervision.

Who is involved in training?
The key roles involved in teaching and learning are programme director, assigned educational supervisor, clinical supervisor, assessor and trainee.

Programme Director
The majority of programme directors (PDs) manage specialty programmes however there are a number of programme directors who manage core surgical training programmes PD(CST). They are responsible for:

- Organising, managing and directing the training programmes, ensuring the programmes meet curriculum requirements;
- Identifying, appointing and supporting local faculty (i.e. AES) including training where necessary; and
- Overseeing progress of individual trainees through the levels of the curriculum; ensuring learning objectives are set, appropriate assessments are being undertaken and that appropriate levels of supervision and support are in place.

Assigned Educational Supervisor
Assigned educational supervisors (AES) are responsible for between 1 and 4 trainees at any time. The number will depend on factors such as the size of the unit and the availability of support such as a Departmental Educational Supervisor (DES) or Specialty Tutor (ST). The AES is responsible for:

- Setting, agreeing, recording and monitoring the content and educational objectives of the placement using the learning agreement;
- Ensuring delivery of the training and education required to enable the trainee to fulfil the objectives of the placement, including the identification and delegation of training and assessment in other clinical areas;
- Overseeing the achievements and personal and professional development of the trainee and, in consultation with specialty colleagues, reflecting this in the formal report to the annual review process; and
- Ensuring patient safety in relation to trainee performance by the early recognition and management of those doctors in distress or difficulty.

Clinical Supervisor
Clinical supervisors (CS) are responsible for delivering teaching and training under the delegated authority of the AES. They:

- Carry out assessments of performance as requested by the AES or the trainee. This will include delivering feedback to the trainee.
- Liaise closely with other colleagues, including the AES, regarding the progress and performance of the trainees with whom he/she is working during the placement.

Assessor
Assessors will carry out a range of assessments and provide feedback to the trainee and the AES, which will support judgements made about a trainee's overall performance. Assessments during training will usually be carried out by clinical supervisors (consultants) but other members of the surgical team, including those who are not medically qualified, may be tasked with this role.

Those carrying out assessments must be appropriately qualified in the relevant professional discipline and trained in the methodology of workplace based assessment (WBA). This does not apply to mini-PAT raters.

Trainee
The trainee is required to take responsibility for his/her learning and to be proactive in initiating appointments to plan, undertake and receive feedback on learning opportunities. The trainee is responsible for ensuring that a learning agreement is put in place, that assessments are undertaken and that opportunities to discuss progress are identified.

Teaching
The detail of clinical placements will be determined locally by programme directors (PD). In order to provide sufficient teaching and learning opportunities, the placements need to be in units that:

- Are able to provide sufficient clinical resource;
- Have sufficient trainer capacity.

The PDs and Assigned Educational Supervisors define the parameters of practice and monitor the delivery of training to ensure that the trainee has exposure to:

- A sufficient range and number of cases in which to develop the necessary technical skills (according to the stage of training) and professional judgement (to know when to carry out the procedure and when to seek assistance);
- Managing the care of patients in the case of
- Common conditions that are straightforward,
- Patients who display well known variations to common conditions, and
- Patients with ill defined problems;
- Detailed feedback.

Development of professional practice can be supported by a wide variety of teaching and learning processes, including role modelling, coaching, mentoring, reflection, and the maximising of both formal and informal opportunities for the development of expertise on the job. Learning opportunities need to be related to changing patterns of healthcare delivery.

Curriculum review and evaluation

The Colleges, Faculties and Specialty Associations have responsibility and ownership of the curriculum and assessment system for each specialty and its associated special interest areas.

Deaneries, through their Schools of Surgery have responsibility for the delivery of the programmes based on the approved curriculum and assessment system. It is expected that training and delivery will be underpinned by the appropriate resources and infrastructure.

The intercollegiate surgical curriculum governance groups shown below were created to encourage collaboration across colleges, deaneries and specialty bodies on curriculum issues, and to provide advice and guidance on policy and services. The governance groups and/or mechanisms involve surgical leads, trainers, trainees, educationalists, patient representatives and other multi-professional lay persons.

The governance structure of the ISCP is in development according to the requirements of curriculum stakeholders.

ISCP Oversight and Quality Assurance Sub-Committee

- Oversees the ongoing implementation and development of the curriculum and advises JCST on the quality of training.
- Sets the curriculum priorities, undertakes the forward planning, review and evaluation of progress with regard to implementation.
- Coordinates the work of the following sub-committees:
    - Curriculum Development and Assessment Group
    - Curriculum Delivery Group
    - ISCP Data Governance Group
    - Programme Evaluation Group
- Ensures that the web platform continues to meet the needs of the curriculum and that data management and reporting arrangements are appropriate.
- Oversees the provision of appropriate levels of communication with internal and external stakeholders.
- Reports to the Joint Committee for Surgical Training

Curriculum Development and Assessment Group

- Oversees, reviews and develops curriculum content and works closely with examination committees (ICBSE and JCIE) to evaluate and further develop the summative examinations within the ISCP assessment system:
- Provides the framework for and oversees the process of reviewing, updating and developing the surgical curriculum framework.
- Ensures the curriculum can accommodate the needs of future of surgical training e.g. special interests
- Undertakes an annual review of the curriculum and assessment system and leads the annual submission of changes to PMETB including any subsequent submissions as may be required.
- Ensures that the curriculum complies with PMETB standards and regulations.
- Monitors the implementation of the ISCP assessment strategy and oversees the further development of that strategy.
- Ensure that the formative assessments conform to PMETB's standards for curricula and assessment systems.
- Works with ICBSE and JCIE to ensure that the summative examinations are fully integrated within the assessment system and conforms to PMETB's standards for curricula and assessment systems.
- Ensure all aspects of the e-portfolio work well in practice and inform end of placement and end of training year assessment.
- Ensures the web platform meets the needs of the workplace-based assessments.
- Undertakes the modification and development of workplace-based assessment tools in the light of ongoing feedback and interim evaluation.

Curriculum Delivery Group

- Receive feedback from users and advises on the practical delivery aspects of the curriculum and website, commissions web-site developments (within budgetary constraints) and respond to requirements for faculty development:
- Provides a forum where implementation and delivery issues can be discussed and resolved.
- Discusses feedback from users on the implementation of the curriculum and makes recommendations to the Oversight and QA Sub-Committee where changes are required.
- Discusses, agrees and commissions web developments to ensure that the web platform continues to meet the needs of the trainees, educational supervisors, programme directors and Schools of Surgery including the provision of appropriate data reports.
- Oversees the delivery of ongoing faculty development initiatives to support implementation of the curriculum.
- Establishes, receives and acts on feedback from a virtual user group of trainees and trainers.

ISCP Data Governance Group

- Oversees the implementation of the Information Governance Policy and keeps the issues relating to data management under review.
- Reviews and monitors compliance with statutory obligations, Caldicott principles and the ISCP stated policy on the obtaining, processing, use, access and disclosure of confidential personal information.
- Reviews and keeps up to date the ISCP Information Governance Policy
- Considers any complaints about the way in which the ISCP has handled, processed, used or disclosed confidential personal data

Programme Evaluation Group

- Oversees the development and delivery of a strategy for monitoring and evaluating the extent to which the aims and objectives of the ISCP are being met.
- Develop, in liaison with other committees and groups within the ISCP governance structure, a coherent strategy to monitor and evaluate the extent to which the aims and objectives the ISCP are being met.
- Commissions and undertakes work consistent with the agreed strategy.
- Report findings, contextualised in related work by other medical Royal Colleges and similar bodies, and makes recommendations for improvement to the ISCP.
- Disseminates and promotes examples of good practice.
- Identify sources of funding for the delivery of the agreed strategy and the dissemination of good practice including the preparation and submission of bids.

Selection Sub-Committee

- Develops and recommends to JCST the surgical selection strategy for disseminations to deaneries/Schools.
- Devises the framework for selection into surgery and surgical specialties.
- Develops a range of selection tools and associated guidance for dissemination to Deaneries / Schools of Surgery.
- Monitors implementation of the surgical selection strategy and performance of candidates chosen using the selection tools in order to validate the process and its component tools.
- Initiates research to validate new tools which may form part of the process in the future.

Registration

All trainees, consultants and other professionals who intend to act as assessors will register with the ISCP. Registration allows the individual access to the secure area of the site and gives them permissions to data and functions according to their role.

Programme directors are pre-registered on the site as they are key to the process. They have to validate trainees, set up placements and set global objectives for level of training (indicative year).

Trainees register so that they can:

- set up a learning agreement for their placement, completing with an end of placement report by the trainee's Assigned Educational Supervisor;
- record workplace-based assessments;
- maintain an electronic portfolio, documenting evidence of learning and progression;
- access their surgical logbook; and
- access their electronic Annual Review of Competence Progression

Consultants register so that they can take on the roles of assigned educational supervisor and/or clinical supervisor. They will then be able to access the same information as the trainee

Other professionals register can register as clinical supervisors.

Regulatory Bodies

The key bodies that regulate trainees and training are:
PMETB
GMC
the Healthcare Commission

Quality Assurance of Training System

PMETB Quality Assurance
PMETB has responsibility for the development of training, entry, curriculum and assessment standards and the approval of posts and programmes. In each of these areas it directly or indirectly seeks appropriate consultation from deaneries and colleges. The two key areas of PMETB quality assurance revolve around the survey and the deanery-wide visits.

The PMETB generic trainee survey, developed with COPMeD, currently covers all medical specialties and it is anticipated that it will operate on a biennial basis.

Deanery-wide visits are defined by PMETB as 'high level, light touch,' and focus on the quality management processes of deaneries. It is anticipated that the regional visits will review an individual deanery every five years. The visiting panel is selected from a pool of agreed PMETB visitors, which can include some SAC members. Where Deanery visits highlight serious training issues, PMETB has the facility to trigger smaller, focussed visits with trusts.

PMETB has published an Operational Guide for the PMETB Quality Framework

Deanery Quality Management
Postgraduate deaneries have been given responsibility for the quality assurance of training posts by PMETB. Each deanery, together with the corresponding SHA (or NES for Scotland) will be responsible for implementing processes to ensure that training across the deanery (foundation, run-through and fixed term) meets national standards. Both the deaneries and the health authorities will work in liaison to establish contracts with training providers, which should normally be reviewed and renewed annually.

Deaneries will ensure that training assessments are managed fairly and dealt with by trained assessors, and to provide evidence by which this may be verified processes.

As part of their quality Management systems, postgraduate deans can trigger reviews of hospitals where training issues have been highlighted.

Schools of surgery, within deaneries, provide a focus for the management and quality assurance of surgical education.

Colleges'/SACs' Quality Management
The Colleges and SACs involvement in quality management will be both indirectly and directly realised through the postgraduate deaneries. In addition, the colleges will continue their relationship with the health care commission to ensure high standards of clinical care.

The majority of colleges' involvement will come from the agreed quality assurance framework for the JCST as defined in the Quality Assurance (of curriculum). In addition, the JCST in conjunction with The Royal College of Surgeons of Ireland will continue to perform SAC visits for the Republic of Ireland. SACs will also consolidate their position on deanery regional training committees and on annual review of competence progression panels.

The Colleges will continue to collect information about individual trainees required to continuously monitor their fitness to practice and to prepare the evidence for submission to PMETB for an award of Certificate of Completion of Training (CCT).

In summary, the QA of Surgical Training involves:
- Considering and advising JCST on national policy and proposals in relation to the quality assurance of surgical education and training.
- Considering and providing an intercollegiate, pan-specialty view on quality assurance matters, including inspection visits to training providers by PMETB.
- Working closely with key stakeholders including PMETB and the Deaneries, through the Schools of Surgery, and relevant core surgical training forums, to ensure consistency in the quality of surgical training.
- Developing and monitoring the implementation of a strategy for quality assurance of the curriculum.
- Considering analysis of evaluations; developing processes to identify that the objectives of the curriculum are being met; developing provision of externality across surgical specialties; initiates visits where evidence indicates this is necessary; and monitors SAC responses to identified issues.

- Monitoring the registration of trainers and develops processes for the verification of the trainer standards in line with PMETB requirements.
- Assisting Schools of Surgery in all aspects of the quality assurance of surgical training, including the development and monitoring of a consistent approach to specialty specific externality.

Principles of Surgical Education

The balance between didactic teaching and learning in clinical practice will change as the trainee progresses through the training programme, with the former decreasing and the latter increasing.

A number of people from a range of professional groups will be involved in teaching. In accordance with PMETB standards, subject areas of the curriculum must be taught by staff with relevant specialist expertise and knowledge. Specialist skills and knowledge are usually taught by consultants and more advanced trainees; whereas the more generic aspects of practice can also be taught by the wider multidisciplinary team. The Assigned Educational Supervisor (AES) is key, as he/she agrees with each trainee how he/she can best achieve his or her learning objectives within a placement.

Establishing a learning partnership creates the professional relationship between the teacher (AES, CS or assessor) and the learner (trainee) that is essential to the success of the teaching and learning programme.

The learning partnership is enhanced when:

- The teacher understands:
    - Educational principles, values and practices and has been appropriately trained;
    - The role of professional judgement in the trainee's learning process;
    - The specialty component of the curriculum;
    - Assessment theory and methods.

- The learner:
    - Understands how to learn in the clinical practice setting, recognising that everything they see and do is educational;
    - Recognises that although observation has a key role to play in learning, action (doing) is essential;
    - Is able to translate theoretical knowledge into surgical practice and link surgical practice with the relevant theoretical context.
    - Uses refection to improve and develop practice;

- There is ongoing dialogue in the clinical setting between teacher and the learner;
- There are adequate resources to provide essential equipment and facilities;
- There is adequate time for teaching and learning;

Trainee-led learning

The ISCP encourages a learning partnership between the trainee and AES in which learning is trainee-led and trainer-guided. Trainees are expected to take a proactive approach to learning and development and towards working as a member of a multi-professional team. Trainees are responsible for:

- Utilising opportunities for learning throughout their training
- Triggering assessments and appraisal meetings with their trainers, identifying areas for observation and feedback throughout placements
- Maintaining an up to date learning portfolio
- Undertaking self and peer assessment
- Undertaking regular reflective practice

Learning Opportunities

There are many learning opportunities available to trainees to enable them to develop their knowledge, clinical and professional judgement, and technical and operative ability and conduct as a member of the profession of surgery. The opportunities broadly divide into three areas:

- Learning from practice otherwise known as learning on-the-job or in the workplace. This can be informal and opportunistic or planned and structured
- Learning from formal situations
- Self-directed learning

Learning from Practice

The workplace provides learning opportunities on a daily basis for surgical trainees, based on what they see and what they do. Whilst in the workplace the trainees will be involved in supervised clinical practice,

primarily in a hospital environment in wards, clinics or theatre. The trainees' role in these contexts will determine the nature of the learning experience.

Learning will start with observation of a trainer (not necessarily a doctor) and will progress to assisting a trainer; the trainer assisting/supervising the trainee and then the trainee managing a case independently but with access to expert help. The level of supervision will decrease and the level of complexity of cases will increase as trainees become proficient in the appropriate technical skills and are able to demonstrate satisfactory professional judgement. Continuous systematic feedback, both formal and informal, and reflection on practice are integral to learning from practice, and will be assisted by assessments for learning (formative assessment methods) such as surgical direct observation of procedural skills in surgery (surgical DOPS), procedure based assessment (PBA), mini-Clinical Evaluation Exercise (mini-CEX) and case based discussion (CBD), each of which have been developed for the purpose.

In the Workplace - Informal
Surgical learning is largely experiential in its nature with any interaction in the workplace having the potential to become a learning episode. The curriculum encourages trainees to manage their learning and to reflect on practice. Trainees are encouraged to take advantage of clinical cases, audit and the opportunities to shadow peers and consultants.

In the Workplace - Planned and Structured

Theatre (training) lists
Training lists on selected patients enable trainees to develop their surgical skills and experience under supervision. The lists can be carried out in a range of settings, including day case theatres, main theatres and minor injuries units.

Each surgical procedure can be considered an integrated learning experience and the formative workplace assessments provide feedback to the trainee on all aspects of their performance from pre-operative planning and preparation, to the procedure itself and subsequent post-operative management.

The syllabus is designed to ensure that teaching is systematic and based on progression. The level of supervision will decrease and the level of complexity of cases will increase as trainees become proficient in the appropriate technical skills and are able to demonstrate satisfactory professional judgement. By CCT trainees will have acquired the skills and judgement necessary to provide holistic care for patients normally presenting to their specialty and referral to other specialists as appropriate.
Feedback on progress is facilitated by surgical DOPS and PBA.

Clinics (Out Patients)
Trainees build on clinical examination skills developed during the Foundation Programme. There is a progression from observing expert clinical practice in clinics to assessing patients themselves, under direct observation initially and then independently, and presenting their findings to the trainer. Trainees will assess new patients and will review/follow up existing patients.

Feedback on performance will be obtained primarily from the mini-CEX and Case Based Discussion workplace assessments together with informal feedback from trainers and reflective practice.

Ward Rounds (In Patient)
As in the other areas, trainees will have the opportunity to take responsibility for the care of in-patients appropriate to their level of training and need for supervision. The objective is to develop surgeons as effective communicators both with patients and with other members of the team. This will involve taking consent, adhering to protocols, pre-operative planning and preparation and post operative management.

Progress will be assessed by mini PAT, CBD, mini-CEX, surgical DOPS and PBA.

Learning from Formal Situations
Work based practice is supplemented by courses, local postgraduate teaching sessions arranged by the specialty training committees or schools of surgery and regional, national and international meetings and courses. Courses have a role at all levels, for example basic surgical skills courses run by the colleges and locally through deaneries using skills centres and specialty skills programmes, which focus on developing specific skills using models or deceased donors, delivered by the colleges and specialty associations. Trainees will be able to further develop their skills using simulators (if available), tissue in skills labs and models and deceased donors as appropriate. It is recognised that there is a clear and increasingly prominent role for off the job learning through specific intensive courses to meet specific learning goals (e.g. Training

the Trainers, Breaking Bad News, Research Methodology) and these are encouraged as an integral and important part of the learning agreements.

Self Directed Learning
Self directed learning is encouraged. Trainees are encouraged to establish study groups, journal clubs and conduct peer review; there will be opportunities for trainees to learn with peers at a local level through postgraduate teaching and discussion sessions; and nationally with examination preparation courses. It is an expectation that trainees will undertake personal study in addition to formal and informal teaching. This will include using study materials and publications and reflective practice. Trainees are expected to use the developmental feedback they get from their trainers in appraisal meetings and from assessments to focus further research and practice.

Reflective practice is a very important part of self-directed learning and is a vital component of continuing professional development. It is an educational exercise that enables trainees to explore with rigour, the complexities and underpinning elements of their actions in surgical practice in order to refine and improve them.

Reflection in the oral form is very much an activity that surgeons engage in already and find it useful and developmental. Writing reflectively adds more to the oral process by deepening the understanding of surgeons about their practice. Written reflection offers different benefits to oral reflection which include: a record for later review, a reference point to demonstrate development and a starting point for shared discussion.

Some of this time will be taken as study leave. In addition there are the web based learning resources which are on the ISCP website and specialty association web sites.

Supervision
In accordance with the requirements of Good Medical Practice, the ultimate responsibility for the quality of patient care and the quality of training lies with the supervisor. Supervision is designed to ensure the safety of the patient by encouraging safe and effective practice and professional conduct. The level of supervision will change in line with the trainee's progression through the stages of the curriculum, enabling trainees to develop independent learning. Those involved in the supervision of trainees must undertake appropriate training.

Trainees will be placed in approved posts that will meet required training and educational standards. Individual trusts will have responsibility for ensuring that clinical governance and health and safety standards are met.

The syllabus content details the level of knowledge, clinical, technical/operative and professional skills expected of a trainee at any given stage of training, clearly indicating the level of supervision required. Trainees will work at a level commensurate with their experience and competence, and this should be explicitly set down by the Assigned Educational Supervisor in the learning agreement. There is a gradual reduction in the level of supervision required until the level of competence for independent practice is acquired. There is an expectation that supervision and feedback are part of the ongoing relationship between trainees and their trainers and assessors, and that it will take place informally on a daily basis.
In keeping with Good Medical Practice, Good Clinical Care, trainees have a responsibility to recognise and work within the limits of their professional competence and to consult with colleagues as appropriate. The development of good judgement in clinical practice is a key requirement of the curriculum. The content of the curriculum dealing with professional behaviour emphasises the responsibilities of the trainee to place the well-being and safety of patients above all other considerations. Throughout the curriculum, great emphasis is laid on the development of good judgement and this includes the ability to judge when to seek assistance and advice. Appropriate consultation with trainers and colleagues for advice and direct help is carefully monitored and assessed.

Creating a Learning Agreement and Building a Portfolio

Learning Agreement
The learning agreement is a written statement of the mutually agreed learning goals and strategies negotiated between a trainee (learner) and the trainee's Assigned Educational Supervisor (AES). It is agreed at the initial objective setting meeting and covers the period of the placement. The agreement is based on the learning needs of the individual trainee undertaking the learning as well as the formal requirements of the curriculum. The electronic learning agreement form is accessed through the secure area of the web site and is completed on-line. The AES and trainee complete the learning agreement together and are guided by the Programme Director's (PD) Global Objective.

Programme Director's Global Objective
The placement objectives will be based on the global objectives which the PD sets for the trainee's training year. These broad global objectives, derived from the syllabuses, are included in the learning agreement and highlight what the trainee should achieve during a period that may encompass several placements. They normally cover the period between the annual reviews.

The global objective for early years training would normally cover the following components:

- Run through programmes: the common surgical syllabus, speciality-specific competences in the chosen speciality and professional behaviour and leadership skills for the stage.
- Themed programmes: the common surgical syllabus, speciality-specific in a number of complementary specialties and professional behaviour and leadership skills for the stage.
- Unthemed, broad based programmes: Common surgical component of surgical training: the common surgical syllabus, sampling a number of specialties (topping up in specific specialties later in the stage) and generic professional behaviour and leadership skills for the stage.

For those wishing to pursue an academic surgical career, a proportion of competences might emphasise additional academic pursuits including research and teaching.

Together, the global and placement objectives are the means used by the PD, AES and trainee to ensure curriculum coverage.

The content of the learning agreement will be influenced by the:

- Requirements set by the surgical specialty in its syllabus for the stage of training;
- Learner's previous experience;
- Learner's knowledge and skills;
- Local circumstances of the placement.

Although the learning agreement is a statement of expected outcomes there is equal emphasis on learning opportunities and how the outcomes can be met. Trainees use it to keep track of which objectives have been completed and which have not; AESs use it to set down the educational strategies that are suited to the experiential learning appropriate to the placement, to monitor progress and ensure the correct training is delivered. PS use it to oversee the process and to ensure the duration of the training programme is appropriate to the achievement of learning outcomes.

Each stage in the process allows the trainee and the AES to make individual comments on the training and appraisal process and to sign it off. The trainee also has the right of appeal to the PD through the process. The trainee will meet the AES at the start of each placement to agree the learning and development plan and at mid point and end of placement to review and report on progress. The frequency of meetings can be increased if required. The learning agreement provides a mechanism for the trainee and AES to meet and discuss feedback and guidance.

Learning Agreement Stages

There are three stages to the learning agreement that should be completed in sequence: Objective Setting; Interim Review; and Final Review.

Objective Setting is where the trainee and the AES:

- Refine the Global Objective made by the PD according to the learning that can be delivered in the placement by focussing on particular learning objectives. The resultant list represents the target learning objectives for the placement.
- Agree on the workplace-based assessments that have been agreed for the placement to obtain feedback and demonstrate progress matched to syllabus objectives e.g. Surgical DOPS for central venous line insertion.
- Identify the resources required so that the trainee can achieve his/her learning objectives for example time slots, events, equipment.
- Identify learning opportunities, activities or events in the educational programme, that the trainee should attend e.g. seminars, presentations, peer reviews.
- Consider the examinations the trainee is required to take whilst in the placement and courses the trainee plans to attend.
- Consider the audit/research/projects opportunities.
- Once these aspects of the placement have been finalised and agreed, the trainee and the AES sign off the learning agreement.

Although the Objective Setting stage of the learning agreement is the agreed plan for the placement, it can be modified during training if circumstances change and this can be recorded during the interim or final review. Additionally the trainee can update information about resources, learning opportunities, examinations and courses attended and the self-directed learning undertaken.

The electronic learning agreement is automatically uploaded into the portfolio and links to the syllabus content and the workplace based assessments. A word version is available to download below. Workplace-based assessments are recorded on electronic forms which are automatically uploaded into the portfolio.

Interim Review occurs at the mid-point of the placement. This stage is encouraged even for 4-month placements to check that progress is in line with the placement objectives. In the event that difficulties are being experienced, focussed training and repeat assessments should be initiated. The objectives for progress and further action plans agreed at the meeting are recorded on the Interim Review form and are signed off by the trainee and AES.

Final Review occurs towards the end of the placement. The trainee and AES review what the trainee has learned in the placement against the placement objectives set down in the learning agreement. Evidence would typically include the following:

- Workplace-based assessments and feedback (trainees are encouraged to accumulate more than the minimum number and use a range of assessors).
- Examinations
- Surgical log book
- Audit and projects
- Research
- Outcomes of courses
- Reflective practice (includes self mini-PAT and other self-assessments, written accounts of CBDs and personal development plans)
- Case presentation / teaching
- Timetable and rota attendance

Each tool captures elements of judgment in action and maps to standards of Good Medical Practice. Over the training period they reveal the trainee's particular strengths, needs and areas for development.

The AES is responsible for synthesising the evidence at the end of the placement, although the process of judging the evidence would involve the team of clinical supervisors. The PD takes a holistic view of progress over the whole training period. The AES's evidence-based report is written in terms of the trainee's progress and specific learning outcomes which is facilitated by the learning portfolio.

Related downloads

Document	Type	Size
Blank Learning Agreement	PDF	37Kb
Example Learning Agreement - ST1/CT1	PDF	72Kb
Example Learning Agreement - Trainee in difficulty ST1/CT1	PDF	129Kb

Learning Portfolio

The portfolio has been designed to store evidence of the trainee's competence and fitness to practise. The trainee is solely responsible for the contents of the portfolio both in terms of quality and veracity. Submission of information known to be false, if discovered, will have very serious consequences. The trainees' portfolio includes their health and probity statements (PDF), educational contracts (PDF), learning agreements and a record of the assessments completed. The portfolio is supplemented by the logbook. The portfolio is available throughout the trainees' careers and is accessible to the trainee, the AES and the PD.

All entries to the portfolio must respect the confidentiality of colleagues and patients and should not contain names or numbers to identify patients or staff. Portfolio evidence must be collected and documented systematically by the trainee as they progress through each placement. Trainees must record all assessments that are part of the training period. Workplace-based assessments are considered to be formative and those that are less than satisfactory standard, if reflected upon appropriately, need not necessarily be seen as negative because they provide developmental feedback to drive learning and so improve practice. Where assessments have been unsatisfactory they should be repeated after focussed training until successful. The portfolio should enable the AES at the end of placement to assess the trainee in the round.

The portfolio is the vehicle used by the annual review to decide on the trainee's continuing training or award of the Certificate of Completion of Training (CCT). The AESs' reports are key to the annual review of training.

Learning Resources

Login to use the full online learning resources bank
The online learning resources bank provides registered users of ISCP website with links to publicly available online resources that complement the surgical syllabus. The subjects covered encompass all nine surgical specialties, the generality of surgery, and professional behaviour and leadership skills syllabus.

The following websites also provide valuable general background information.

Specialist Associations

- Association of Coloproctology of Great Britain and Ireland (ACPGBI)
- Association of Surgeons of Great Britain and Ireland (ASGBI)
- Australian Orthopaedic Association
- British Association of Aesthetic Plastic Surgeons (BAAPS)
- British Association of Oral and Maxillofacial Surgeons (BAOMS)
- British Association of Otolaryngologists/Head and Neck Surgeons (BAO-HNS)
- British Association of Paediatric Surgery (BAPS)
- British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS)
- British Association of Urology Surgeons (BAUS)
- British Orthopaedic Association (BOA)
- British Orthopaedic Trainees Association (BOTA)
- British Society for Surgery of the Hand (BSSH)
- British Association for Emergency Medicine (BAEM)
- Society of Academic and Research Surgery (SARS)
- Society of British Neurological Surgeons(SBNS)
- Society of Cardiothoracic Surgeons (SCTS)
- The Association for Cancer Surgery (BASO)

Royal Colleges

- Academy of Medical Royal Colleges
- Royal College of Surgeons of Edinburgh
- Royal College of Surgeons of England
- Royal College of Physicians and Surgeons of Glasgow
- Royal College of Surgeons in Ireland

General Links

- Association of Surgeons in Training
- Conference of Postgraduate Medical Deans (COPMeD)
- General Dental Council
- General Medical Council (GMC)
- Intercollegiate Specialty Boards Joint Committee on Intercollegiate Examinations
- Modernising Medical Careers for England
- Northern Ireland Medical and Dental Training Agency (MMC)
- Modernising Medical Careers for Scotland
- Modernising Medical Careers for Wales
- Postgraduate Medical Education and Training Board (PMETB)
- British Medical Association (BMA)
- British Orthopaedic Trainees Association
- Department of Health (DOH)
- Intercollegiate MRCS website
- Joint Committee on Surgical Training (JCST)

International Models

- The CanMEDS 2000 Project
- Accreditation Council for Graduate Medical Education (USA)
- American Board of Internal Medicine (ABIM)
- Australian Medical Council (AMC)