20.A

SECRETARIAT COPY ONLY – UPDATED 27 APRIL 2012

DHSSPS / HSC MEDICAL LEADERS' FORUM
30 APRIL 2012, 13.00 – 16.00
D2 LECTURE THEATRE, CASTLE BUILDINGS, BELFAST

AGENDA

Apologies

PART I **STRATEGIC ISSUES**

	Items	Papers
1.	Medical Leadership Programme Proposal – David Bingham	**5/12**
2.	HSC R&D Evaluation – Professor B Hannnigan- presentation	**6/12**
3.	Healthcare Associated Infections • Changing Epidemology – Dr J Johnston, Dr L Geoghegan • NI Regional Infection Control Manual – Dr Ciaran O'Gorman	 **Pres** **Pres**
4.	Trauma – Transfer of Patients to Royal Victoria Hospital Dr H Livingston – presentation	**7/12**
5.	Regional Fluid Balance Chart - Dr Julian Johnston	

PART II

6 Introduction

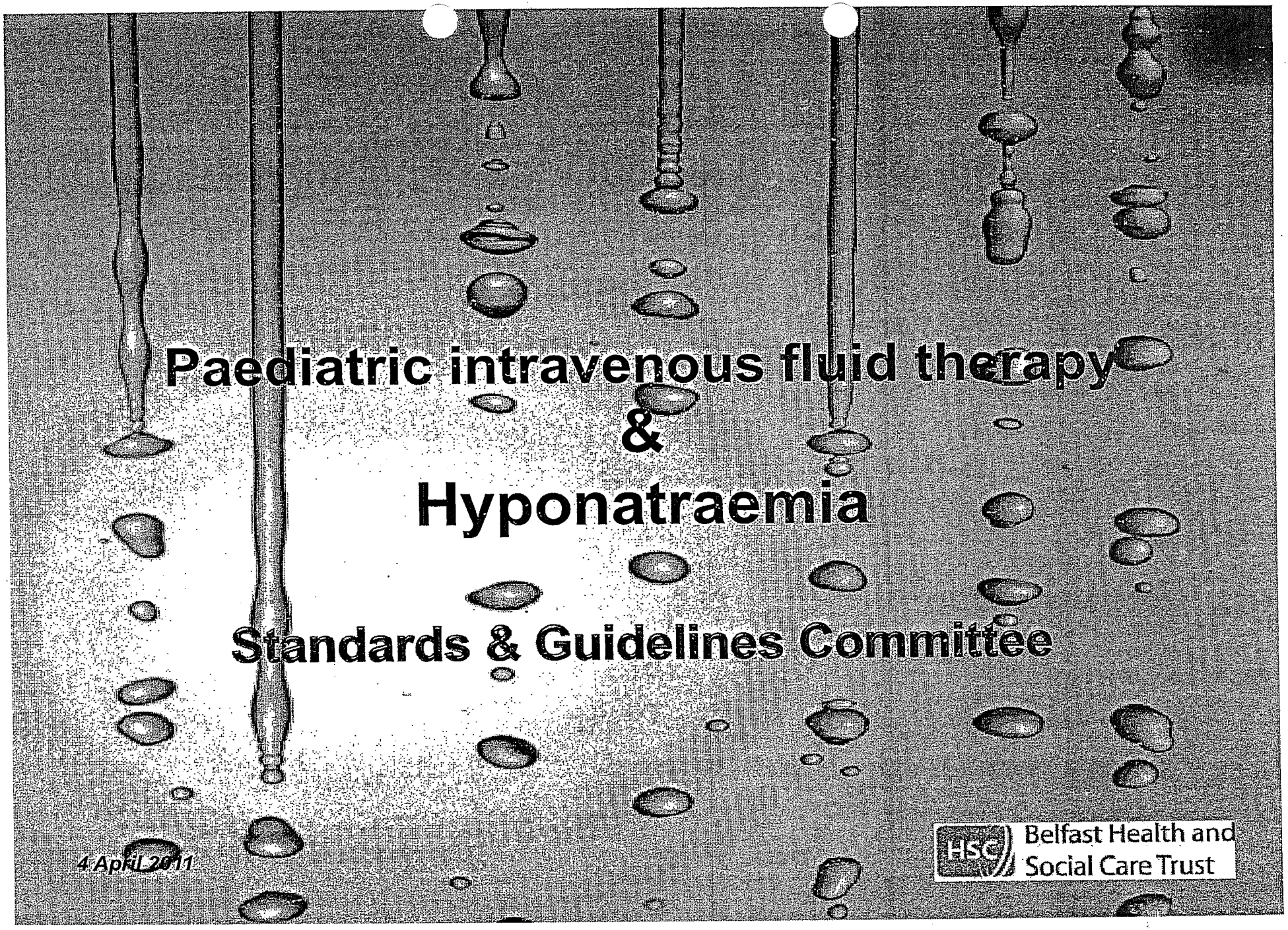
Chairman's Business

- Pseudomonas
  http://www.dhsspsni.gov.uk/index/pressoffice/iropinu.htm
- Guidance on Death, Stillbirth and Cremation Certification (HSS(MD)14 /12) – Re issue
  http://www.dhsspsni.gov.uk/hss-md-14-2012.pdf
- Radiology – Review Phase 2

7.	Minutes of previous meeting	**8/12**
8	Update on Outstanding Action Points	**9/12**
9	Any Other Business	

Diary Dates for 2012

25th June, 3rd September, 5th November

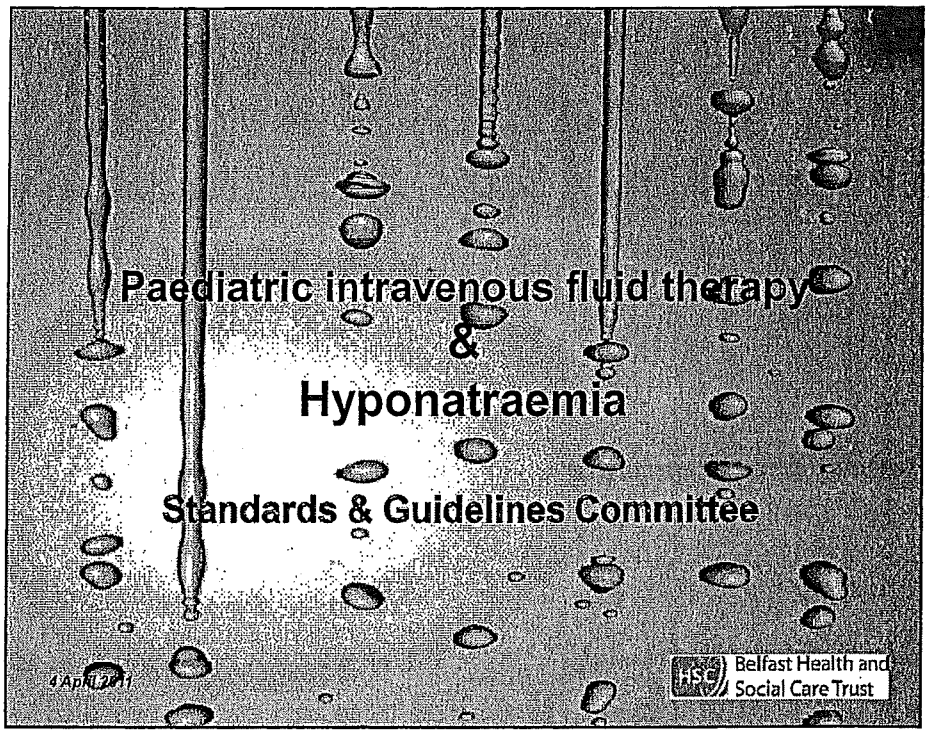


Paediatric intravenous fluid therapy & Hyponatraemia

Standards & Guidelines Committee

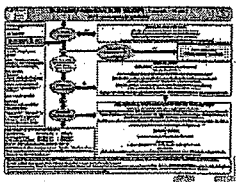
4 April 2011

Belfast Health and Social Care Trust



Warning !

- This presentation outlines the ***basics*** of paediatric fluid prescription.
- It is based on the Paediatric Parenteral Fluid Therapy wallchart.
- It will
  - make the reader aware of the changes required after NPSA alert 22.
  - outline the symptoms and signs of hyponatraemia
  - describe the principles of basic paediatric fluid management
  - introduce the new paediatric fluid prescription chart
  - indicate the criteria for local incident reporting
  - Provide the sources of help and advice



- Please refer to the wallchart for more ***detailed*** guidance.

- This advice does not override or replace the individual responsibility of health professionals to make appropriate decisions in the circumstances of their individual patients, in consultation with the patient and/or guardian or carer or for consultation with a more senior clinician.

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Background

- Paediatric deaths
- Inquests
- Public inquiries: O'Hara
- RQIA
- Chief Medical Officer
- GAIN
- NPSA Alert 22

NPSA alert 22

NHS National Patient Safety Agency

Patient safety alert 22

1 Remove sodium chloride 0.18% with glucose 4% intravenous infusions from stock and general use in areas that treat children. Suitable alternatives must be available. Restrict availability of these intravenous infusions to critical care and specialist wards such as renal, liver and cardiac units.

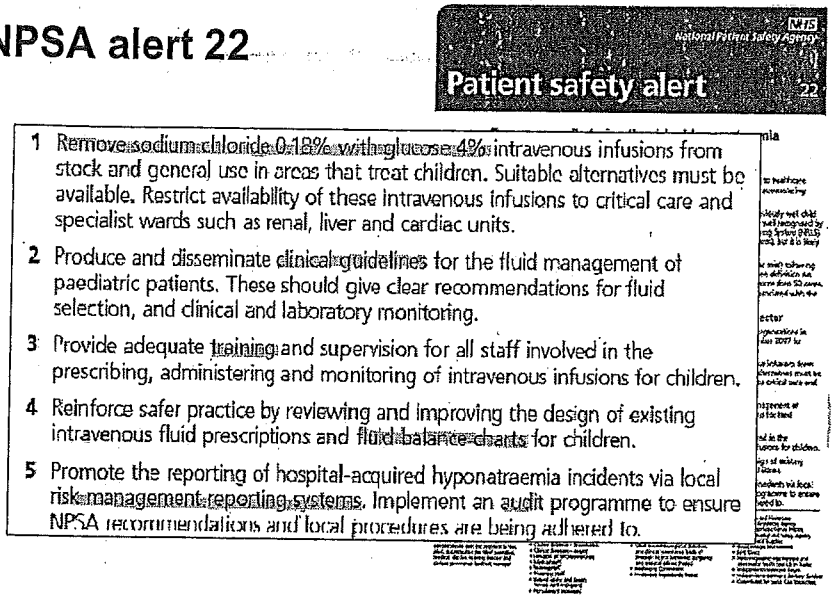
2 Produce and disseminate clinical guidelines for the fluid management of paediatric patients. These should give clear recommendations for fluid selection, and clinical and laboratory monitoring.

3 Provide adequate training and supervision for all staff involved in the prescribing, administering and monitoring of intravenous infusions for children.

4 Reinforce safer practice by reviewing and improving the design of existing intravenous fluid prescriptions and fluid balance charts for children.

5 Promote the reporting of hospital-acquired hyponatraemia incidents via local risk management reporting systems. Implement an audit programme to ensure NPSA recommendations and local procedures are being adhered to.

NPSA alert 22



NHS National Patient Safety Agency

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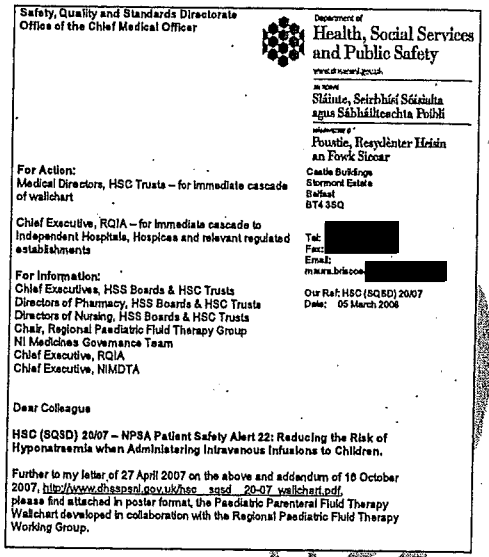
DHSSPSNI Wallchart



Safety, Quality and Standards Directorate
Office of the Chief Medical Officer

Department of Health, Social Services and Public Safety

Sláinte, Seirbhísí Sóisíalta agus Sábháilteachta Poiblí

Roinnse d'
Poustie, Resydènter Heisin an Fowk Siccar

Castle Buildings
Stormont Estate
Belfast
BT4 3SQ

Tel: [redacted]
Fax:
Email: [redacted]

Our Ref: HSC (SQSD) 20/07
Date: 05 March 2008

For Action:
Medical Directors, HSC Trusts – for immediate cascade of wallchart

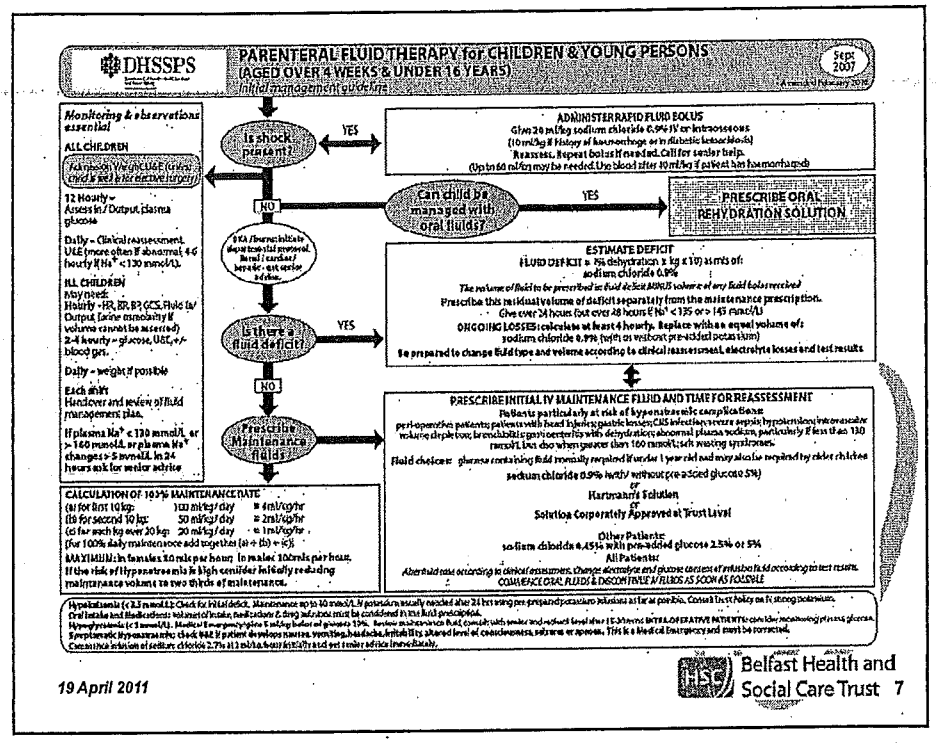
Chief Executive, RQIA – for immediate cascade to Independent Hospitals, Hospices and relevant regulated establishments

For Information:
Chief Executives, HSS Boards & HSC Trusts
Directors of Pharmacy, HSS Boards & HSC Trusts
Directors of Nursing, HSS Boards & HSC Trusts
Chair, Regional Paediatric Fluid Therapy Group
NI Medicines Governance Team
Chief Executive, RQIA
Chief Executive, NIMDTA

Dear Colleague

HSC (SQSD) 20/07 – NPSA Patient Safety Alert 22: Reducing the Risk of Hyponatraemia when Administering Intravenous Infusions to Children.

Further to my letter of 27 April 2007 on the above and addendum of 16 October 2007, http://www.dhsspsni.gov.uk/hsc_sqsd_20-07_wallchart.pdf, please find attached in poster format, the Paediatric Parenteral Fluid Therapy Wallchart developed in collaboration with the Regional Paediatric Fluid Therapy Working Group.


DHSSPS
PARENTERAL FLUID THERAPY for CHILDREN & YOUNG PERSONS (AGED OVER 4 WEEKS & UNDER 16 YEARS)
Sept 2007
Monitoring & observations essential
ALL CHILDREN
12 Hourly – Assess In / Output, plasma glucose
Daily – Clinical reassessment, U&E (more often if abnormal; 4-6 hourly if Na+ < 130 mmol/l).
ALL CHILDREN may need: Hourly - HR, RR, BP, GCS, Fluid In/Output, (urine monitoring if volume cannot be assessed) 2-4 hourly – glucose, U&E, +/- blood gas.
Daily – weight if possible
Each shift Handover and review of fluid management plan.
If plasma Na+ < 130 mmol/L or > 160 mmol/L or plasma Na+ changes > 5 mmol/L in 24 hours ask for senior advice
Is shock present?
YES
ADMINISTER RAPID FLUID BOLUS
Give 20 ml/kg sodium chloride 0.9% IV or intraosseous
(10 ml/kg if History of haemorrhage or in diabetic ketoacidosis)
Reassess. Repeat bolus if needed. Call for senior help.
(Up to 60 ml/kg may be needed. Use blood after 30 ml/kg if patient has haemorrhaged)
NO
Can child be managed with oral fluids?
YES
PRESCRIBE ORAL REHYDRATION SOLUTION
DKA / burns initiate departmental protocol. Renal / cardiac / hepatic - ask senior advice.
Is there a fluid deficit?
YES
ESTIMATE DEFICIT
FLUID DEFICIT = % dehydration x kg x 10) as ml's of: sodium chloride 0.9%
The volume of fluid to be prescribed as fluid deficit MINUS volume of any fluid bolus received
Prescribe this residual volume of deficit separately from the maintenance prescription.
Give over 24 hours (but over 48 hours if Na+ < 135 or > 145 mmol/l)
ONGOING LOSSES: calculate at least 4 hourly. Replace with an equal volume of: sodium chloride 0.9% (with or without pre-added potassium)
Be prepared to change fluid type and volume according to clinical reassessment, electrolyte losses and test results
NO
Prescribe Maintenance Fluids
PRESCRIBE INITIAL IV MAINTENANCE FLUID AND TIME FOR REASSESSMENT
Fluid choices: glucose containing fluid normally required if under 1 year old and may also be required by older children
sodium chloride 0.9% (with or without pre-added glucose 5%)
or
Hartmann's Solution
or
Solution Corporately Approved at Trust Level
Other Patients:
sodium chloride 0.45% with pre-added glucose 2.5% or 5%
All Patients:
CONVERT TO ORAL FLUIDS & DISCONTINUE IV FLUIDS AS SOON AS POSSIBLE
CALCULATION OF 100% MAINTENANCE RATE
(a) for first 10 kg: 100 ml/kg/ day = 4ml/kg/hr
(b) for second 10 kg: 50 ml/kg/ day = 2ml/kg/hr
(c) for each kg over 20 kg: 20 ml/kg/ day = 1ml/kg/hr
(for 100% daily maintenance add together (a) + (b) + (c))
MAXIMUM: in females ≥ 10 mls per hour; in males ≥ 120mls per hour.
If the risk of hyponatraemia is high consider initially reducing maintenance volume to two thirds of maintenance.
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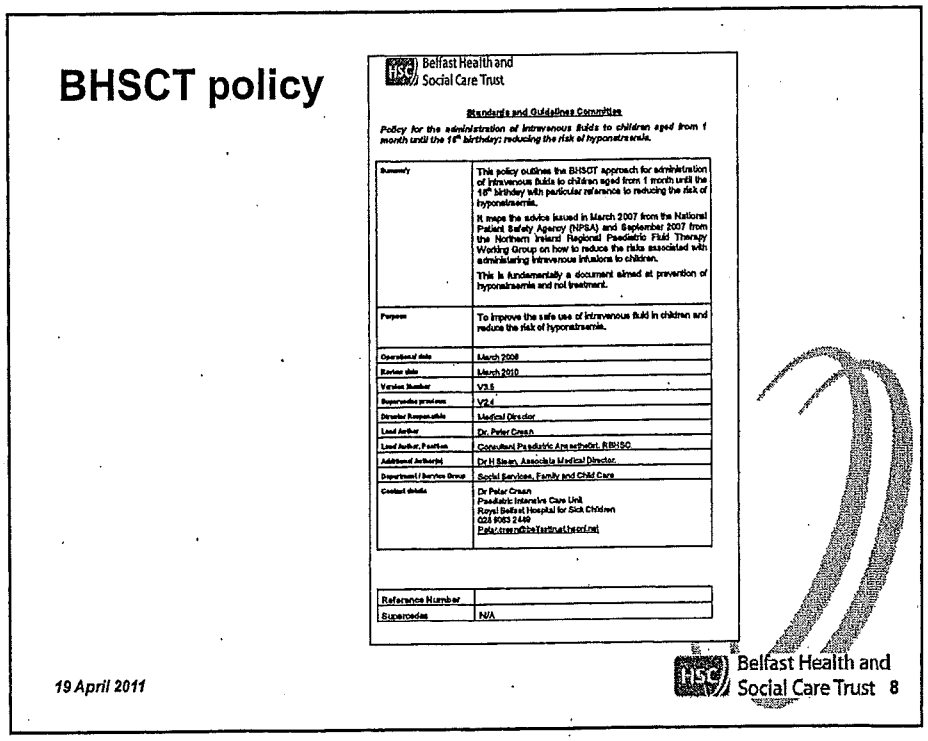
BHSCT policy
Belfast Health and Social Care Trust
Standards and Guidelines Committee
Policy for the administration of intravenous fluids to children aged from 1 month until the 16th birthday; reducing the risk of hyponatraemia.
Summary
This policy outlines the BHSCT approach for administration of intravenous fluids to children aged from 1 month until the 16th birthday with particular reference to reducing the risk of hyponatraemia.
It maps the advice issued in March 2007 from the National Patient Safety Agency (NPSA) and September 2007 from the Northern Ireland Regional Paediatric Fluid Therapy Working Group on how to reduce the risks associated with administering intravenous infusions to children.
This is fundamentally a document aimed at prevention of hyponatraemia and not treatment.
Purpose
To improve the safe use of intravenous fluid in children and reduce the risk of hyponatraemia.
Operational date March 2008
Review date March 2010
Version Number V3.5
Supersedes previous V2.4
Director Responsible Medical Director
Lead Author Dr. Peter Crean
Lead Author, Position Consultant Paediatric Anaesthetist, RBHSC
Additional Author(s) Dr H Swan, Associate Medical Director.
Department / Service Group Social Services, Family and Child Care
Contact details Dr Peter Crean
Paediatric Intensive Care Unit
Royal Belfast Hospital for Sick Children
028 9063 2449
Peter.crean@belfasttrust.hscni.net
Reference Number
Supersedes N/A
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Introduction

- Intravenous fluid-induced hyponatraemia in the previously well child undergoing elective surgery or with mild illness may not be well recognised by clinicians.
- This policy outlines the BHSCT policy approach for
  - administration of intravenous fluids
  - to children aged 1 month up to 16th birthday
  - especially reducing the risk of hyponatraemia.

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The Scope

- children more than 1 month and up to 16th birthday
- ***throughout*** the Belfast Health and Social Services Trust (BHSCT).
- It is relevant for *all general inpatient areas that treat patients from this age range (even if it is only occasionally)* and includes the post-operative scenario, accident and emergency, day case departments and the ambulance service.
- not intended to apply to
  - paediatric and neonatal intensive care units,
  - specialist areas such as renal, liver and cardiac units
  - those suffering from acute burns or diabetic keto-acidosis (DKA).
- based on National NPSA guidance

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Definition and background of the policy

- Hyponatraemia = plasma Na of less than 135 mmol/L.
- severe or significant if below 130 mmol/L.
- Significant acute hyponatraemia is defined as a decrease in plasma sodium from normal to less than 130 mmol/L in less than 48 hours.

Definition and background of the policy

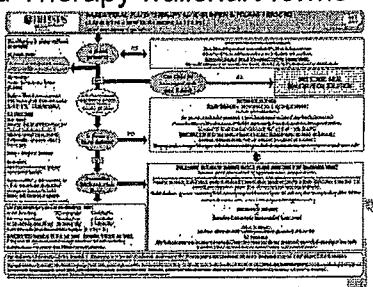
- Symptoms are likely with serum Na <125 mmol/L

or

- if the serum Na has fallen rapidly;
  - greater than 5 mmol/L decline in 24 hours.

Policy Statements

- The Paediatric Parenteral Fluid Therapy wallchart forms the basis of BHSCT guidance.



- Sodium chloride 0.18% with glucose 4% will be ***withdrawn*** from general use in all BHSCT ward areas that treat children and the availability of these fluids will be restricted to critical care areas and other specialist wards such as renal, liver and cardiac units.

Symptoms of Hyponatraemia

- Relate to its central nervous system effects;
  - Lethargy, anorexia, agitation, disorientation, cerebral oedema, seizures, death.
  - warning signs may be non-specific and include nausea, malaise and headache. (See BMJ e-learning module)
- All children are potentially at risk, even those not considered to be obviously 'sick'.
- Complications often occur because of inappropriate management on intravenous fluids but can also occur with inappropriately managed oral fluid regimes.

Children particularly at risk

- Those who are or have
  - Peri-operative,
  - Bronchiolitis,
  - CNS injuries,
  - CNS infection,
  - Burns,
  - Severe sepsis
  - Vomiting, gastric losses, gastroenteritis with dehydration.

Baseline Assessment

- Accurately measure the ***body weight*** in kilograms
- or failing this, to make an estimate.
- This should be cross-referenced with the child's age to minimise the risk of error.

- Measurement of ***electrolytes and urea*** should be made unless the child is healthy and scheduled for elective surgery when it may be considered unnecessary.

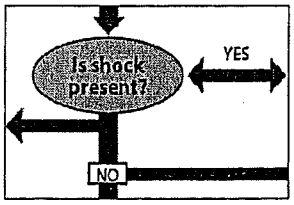
Policy/Guideline Description

- All children who are to receive parenteral fluid therapy should have the following assessments made of their fluid status:

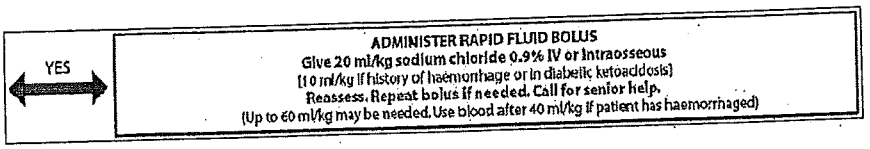
1. Haemodynamic check. Is Shock present?
2. Fluid deficit assessment.
3. Maintenance fluid requirement.

Include ongoing losses

1. Haemodynamic check. Is Shock present?

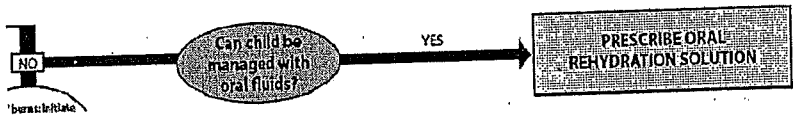


1. Haemodynamic check. Is Shock present?



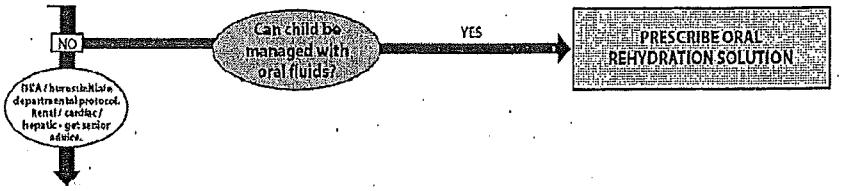
- If YES,
  - Administer Rapid fluid bolus
  - 20 ml/kg Sodium Chloride 0.9% intravenously = G mls
  - Reassess
  - Repeat if needed
  - Call for senior help

1. Haemodynamic check. Is Shock present?



- If No,
  - Can child be managed with oral fluids?

1. Haemodynamic check. Is Shock present?



- If No,
  - Can child be managed with oral fluids?
  - If DKA or burns – initiate appropriate protocols
  - If Renal, Cardiac or Hepatic – get senior advice.

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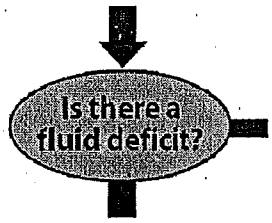
2. Fluid deficit assessment



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2. Fluid deficit assessment

YES →

ESTIMATE DEFICIT
FLUID DEFICIT = (% dehydration x kg x 10) as mls of:
sodium chloride 0.9%

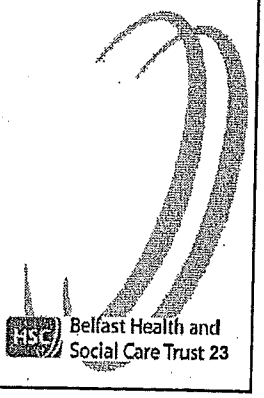
The volume of fluid to be prescribed is: fluid deficit MINUS volume of any fluid bolus received

Prescribe this residual volume of deficit separately from the maintenance prescription.
Give over 24 hours (but over 48 hours if Na^+ < 135 or > 145 mmol/L)

ONGOING LOSSES: calculate at least 4 hourly. Replace with an equal volume of:
sodium chloride 0.9% (with or without pre-added potassium)

Be prepared to change fluid type and volume according to clinical reassessment, electrolyte losses and test results

- If Yes,
  - Estimate deficit
  - = % dehydration x kg x 10 = **F** mls
  - as mls of 0.9% sodium chloride



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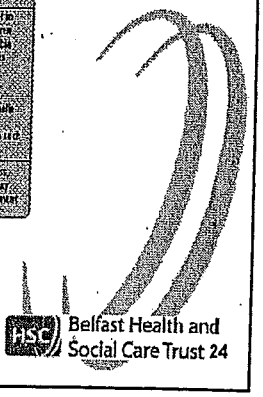
2. Fluid deficit assessment

Clinical signs of dehydration

Signs/symptoms	Mild < 5%	Moderate 5 - 10%	Severe > 10%	Notes/ caveats
Decreased urine output	+	+	+	Beware in early dehydration
Dry mouth	+/-	+	+	Mouth breathers may be dry, while fluid tongues may remain moist
Decreased skin turgor	-	+/-	+	Difficult to interpret in malnourished children. Particularly sensitive in but also in hypernatraemic dehydration
Sunken anterior fontanelle	-	+	+	Only useful if normally well palpable and in absence of diarrhoea and vomiting
Sunken eyes	-	+	+	Very difficult to assess, although recovery may give accurate assessment



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Be prepared to change fluid type and volume according to clinical reassessment, electrolyte losses and test results

- Volume to be prescribed (**H**) mls
  = Fluid deficit (**F**) – Fluid (shock) bolus (**G**)
- Give over 24 or 48 hours = (**I**) mls/hour

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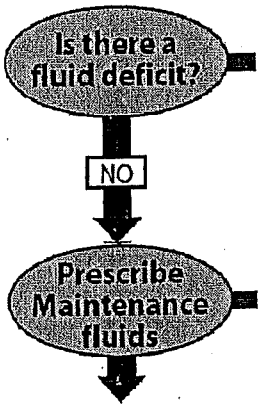
2. Fluid deficit assessment



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3. Maintenance fluid requirement

CALCULATION OF 100% MAINTENANCE RATE

(a) for first 10 kg:	100 ml/kg/ day	= A
(b) for second 10 kg:	50 ml/kg/ day	= B
(c) for each kg over 20 kg:	20 ml/kg/ day	= C

[for 100% daily maintenance add together (a) + (b) + (c)]

MAXIMUM: in females 80 mls per hour; in males 100 mls per hour
If risk of hyponatraemia is high consider initially reducing maintenance volume to two thirds of maintenance

- i.e.
- 1000 mls for the first 10 kg = **A** ml/day
- 500 mls for the next 10 kg = **B** ml/day
- 20 ml for each kg over 20 kg = **C** ml/day

3. Maintenance fluid requirement

CALCULATION OF 100% MAINTENANCE RATE

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MAXIMUM: in females 80 mls per hour; in males 100 mls per hour
If risk of hyponatraemia is high consider initially reducing maintenance volume to two thirds of maintenance

- Calculated as a total (**D**) mls/day = (**A + B + C**)
- Give over 24 hours = (**E**) mls/hour

3. Maintenance fluid requirement

- Ongoing losses
  - Vomiting, drainage, diarrhoea - estimated or measured
  - Calculate as mls/hour (**J**)
  - Replace with equal volume of (usually) 0.9% sodium chloride.

Total fluid per hour

- Maintenance + Residual deficit + ongoing losses
  = **E** + **I** + **J** mls/hour

- Alter fluid rate according to clinical assessment.
- Change electrolyte and glucose content of infusion fluid according to test results.
- Commence oral fluids & discontinue iv fluids as soon as possible

Fluid Prescription/Balance Chart

- A ***new*** paediatric fluid prescription/balance chart has been developed within RBHSC.
- It is being trialled in other areas that care for children.
- Ultimately, it will be used for the prescription of ***all*** fluids for ***all*** children treated throughout the BHSCT – except those
  - being cared for in specialist Units.
  - with acute burns
  - in diabetic ketoacidosis.
- A separate presentation is available regarding the new fluid prescription chart.

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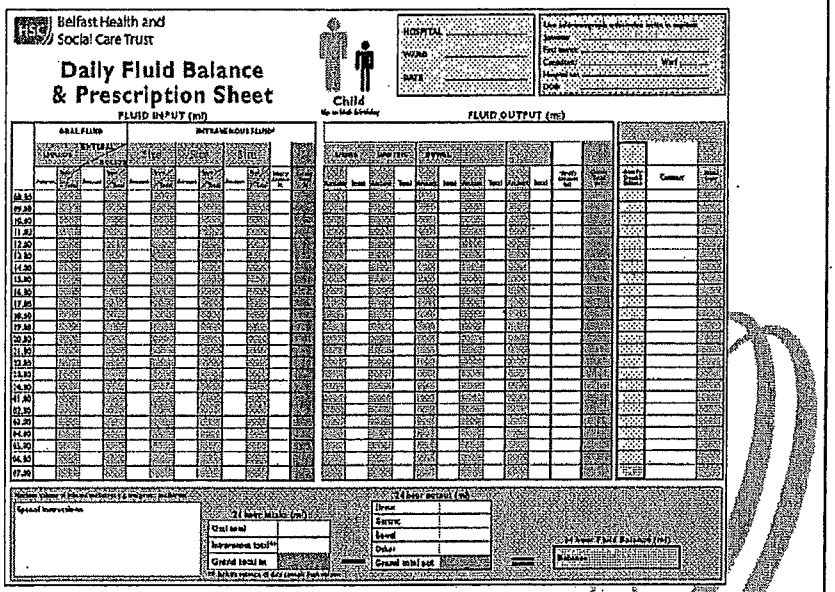

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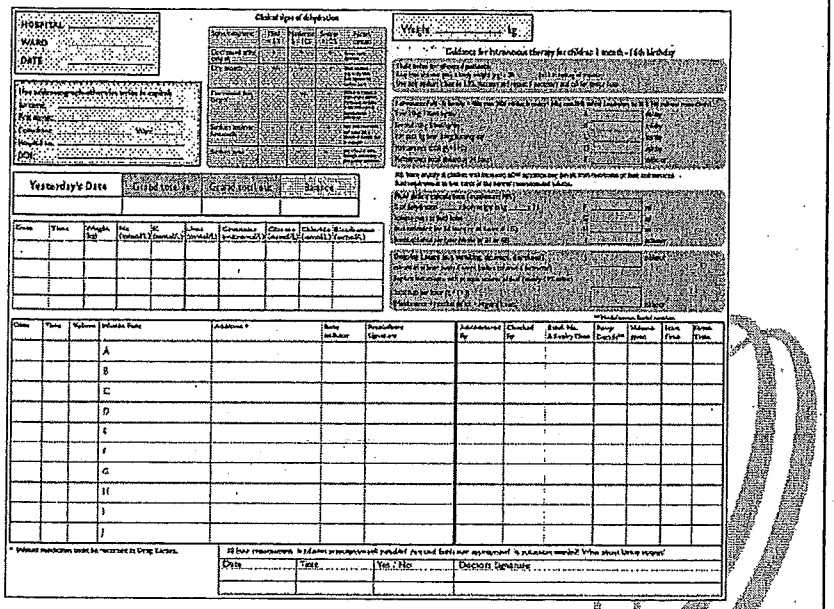

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Monitoring

- Body weight to be measured or assessed as a baseline and at least daily thereafter.
- All fluid intake of any kind (intravenous, oral and medicines) must be measured and recorded on the fluid balance chart.
- All fluid output must be assessed and, if clinically indicated, measured and recorded on the fluid balance chart.
- An assessment of
  - input/output
  - need for intravenous fluids
  - need for plasma glucose estimation
  - should be made and documented every 12 hours.

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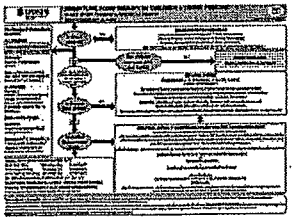
Monitoring

- Measurement of electrolytes, urea and blood glucose/BM should be made at least daily.
- If hyponatraemia exists, these measurements should be 4-6 hourly.
- Urinary osmolality and electrolytes measurements should be considered when dealing with hyponatraemia.
- The ill child will require more frequent and detailed investigations.

Roles and Responsibilities

- It is the professional responsibility of all who look after children to ensure that they have received adequate training in intravenous fluids appropriate to their role.
- Furthermore they should be familiar with the guidance on intravenous fluids for children outlined by the Regional Paediatric Fluid Therapy Group wallchart.
- http://www.dhsspsni.gov.uk/hsc__sqsd__20-07_wallchart.pdf



Training

- Intravenous therapy will be incorporated into all staff induction programmes. This will complement the teaching received in undergraduate medical and nursing curricula.
- Regarding postgraduate staff, all staff, and especially those prescribing fluids to children, will be encouraged to ensure they are conversant with the knowledge required to prescribe intravenous fluids to children and that it is within their scope of practice.

Training

- All staff are encouraged to use the BMJ learning module on hyponatraemia.
- http://learning.bmj.com/learning/search-result.html?moduleId=5003358
- The production of the certificate on completion of the above module will be sought at staff assessments, RITAs, performance review, personal development plans and appraisals.
- This presentation concludes with an assessment section.

Audit

- The following situations require a local incident report form (IR1) to be completed:
  - All children with a hospital acquired, [Na+] < 130mmol/l.
  - use of a solution with serum Na of <131mmol/L for treatment of shock, maintenance fluid in a peri-operative patient , deficit fluid.
  - episode of symptomatic hyponatraemia while in receipt of IV fluids.

Policy Statements

- Apart from boluses for shocked patients, fluids may only be administered by way of an infusion device.
- Children at or below the age of 13 years must not have electrolytes added to bags of intravenous fluids.
- Ordinarily children from 13 to 16 should also not have electrolytes added to bags of intravenous fluids; in certain, predominantly adult areas, children of this age group may have magnesium sulphate or phosphates added.

Sources of help

- For help and advice regarding management of fluid therapy
- especially to prevent and/or treat hyponatraemia
- in all children, but especially for those children aged 13 – 16 years old being managed in adult wards,
- please use the following sources of help and advice.
- Ordinarily, advice should be for
  - complex cases
  - and should be Consultant to Consultant discussions even though contact will often have to be made through trainee on-call rotas.

Sources of help

Team		Address	Extension
For patients within RBHSC			
RBHSC Paediatric ICU	Paediatric ICU		32449
RBHSC Paediatricians	Paediatric On Call	Allen Ward	Bleep 2277
For patients outside RBHSC.			
General Biochemistry	Clinical Biochemistry		
	Inside working hours	Outside working hours	
RVH Tie line:7222 Ext.33798	Ext.34714	Contact Medical doctor on call either via the laboratory or via switchboard.	
BCH Tie line:7111 Ext. 2625/2950/3448	Ext. 2625/2950/3448	Contact Medical doctor on call either via the laboratory or via switchboard	
MiH Tie line: 7231 Ext. 2391/2325.	Ext. 2391/2325	Contact Medical doctor on call either via the laboratory or via switchboard	
RBHSC Paediatric ICU	Paediatric ICU		32449
RBHSC Paediatricians	Paediatric On Call	Allen Ward	Bleep 2277
Musgrave Park	Orthopaedic theatre – Anaesthesia team during working hours.		
BCH Dufferin theatres	ENT theatre – Anaesthesia team during working hours.		

Sources of help

Other sources of help are:

APA consensus guideline on perioperative fluid management in Children
http://www.apagbi.org.uk/sites/apagbi.org.uk/files/Perioperative_Fluid_Management_2007.pdf

Royal Children's hospital Melbourne Clinical Practice Guidelines - Intravenous fluids
http://www.rch.org.au/clinicalguide/cpg.cfm?doc_id=5203#Other%20Resources

Royal Children's hospital Melbourne Clinical Practice Guidelines - Hyponatraemia
http://www.rch.org.au/clinicalguide/cpg.cfm?doc_id=8348

Remember

- If plasma Na+ < 130 mmol/L
  or
- > 160 mmol/L
  or
- plasma Na+ changes > 5 mmol/L in 24 hours
- **ask for senior advice.**

Symptomatic Hyponatraemia:

- check U&E if patient develops
  - nausea, vomiting,
  - headache,
  - irritability,
  - altered level of consciousness,
  - seizures
  - apnoea.
- This is a **Medical Emergency** and must be corrected.
- Commence infusion of sodium chloride 2.7% at 2 ml/kg/hour initially
- Get senior advice immediately.

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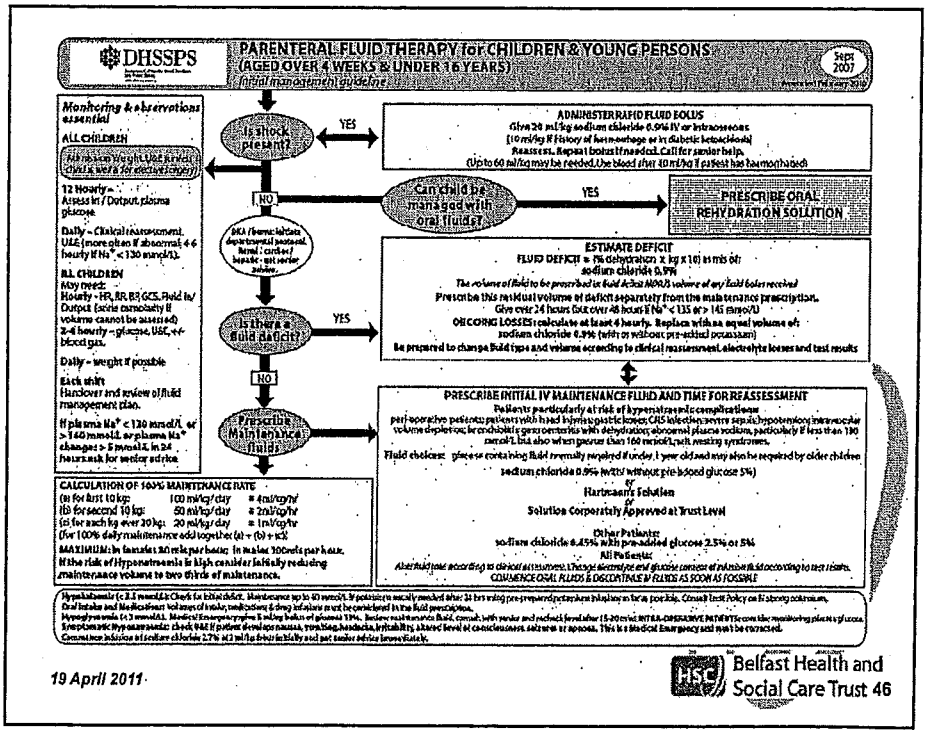

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Assessment

- Please complete the following questions.
- They are adapted from the eBMJ learning site
- http://learning.bmj.com/learning/search-result.html?moduleId=5003358
- This free module written by Dr. Stephen Playfor is named "Reducing the risk of hyponatraemia when administering intravenous fluids to children."
- It gives information about safely prescribing, administering, and monitoring intravenous fluids for children. It aims to highlight the main risks and key issues that you should consider. It looks in detail at the risk of children developing acute hyponatraemia as a result of receiving intravenous fluids.

Question 1

Which one of the following statements about children in hospital who are able to drink oral fluids is correct?

1. You can safely exclude volumes of oral fluids consumed from fluid balance calculations.
2. Hyponatraemia may develop even if no intravenous fluids are being administered.
3. You do not need to measure plasma electrolytes.
4. Fluid balance will be maintained because volumes of oral fluids consumed will be equalled by the urine output.

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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❖ Only click when you have you have picked an answer!

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Question 1

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❖ **Correct ✓**

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 1

Which one of the following statements about children in hospital who are able to drink oral fluids is correct?

1. You can safely exclude volumes of oral fluids consumed from fluid balance calculations.
   - ❖ You must include oral fluids in fluid balance calculations.
2. Hyponatraemia may develop even if no intravenous fluids are being administered.
   - ❖ **Correct ✓**
3. You do not need to measure plasma electrolytes.
   - ❖ You should measure plasma electrolytes every 24 hours while intravenous fluids are being administered or if there is clinical suspicion of an electrolyte abnormality.
4. Fluid balance will be maintained because volumes of oral fluids consumed will be equalled by the urine output.
   - ❖ You cannot assume that urine output equals the oral fluid intake.

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 2

Which one of the following groups of children is most at risk of developing acute symptomatic hyponatraemia while in hospital?

1. Children administered sodium chloride 0.9% with glucose 4% at standard maintenance fluid volumes.
2. Children administered oral fluids at standard maintenance fluid volumes.
3. Critically ill children admitted to paediatric intensive care units.
4. Previously well children admitted for elective surgery and administered hypotonic intravenous fluids.

❖ Only click when you have you have picked an answer!

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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4. Previously well children admitted for elective surgery and administered hypotonic intravenous fluids.

❖ **Correct ✓**

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 2

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2. Children administered oral fluids at standard maintenance fluid volumes.
3. Critically ill children admitted to paediatric intensive care units.
4. Previously well children admitted for elective surgery and administered hypotonic intravenous fluids.

❖ Although symptomatic hyponatraemia may occur as a complication of any fluid regime, including situations where there is uncontrolled intake of oral fluids, the children most at risk appear to be those admitted with gastroenteritis or for elective surgery and administered hypotonic intravenous fluids.

❖ **Correct ✓**

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 3

Which one of the following statements about monitoring children receiving intravenous fluids is correct?

1. You should measure plasma electrolytes every 24 hours while intravenous fluids are being administered.
2. Weighing children is rarely helpful.
3. You should measure plasma electrolytes before all elective surgery.
4. It is easy to document accurate fluid balance in most patients.

❖ Only click when you have you have picked an answer!

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 3

Which one of the following statements about monitoring children receiving intravenous fluids is correct?

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4. It is easy to document accurate fluid balance in most patients.

❖ **Correct ✓**

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 3

Which one of the following statements about monitoring children receiving intravenous fluids is correct?

1. You should measure plasma electrolytes every 24 hours while intravenous fluids are being administered.
   - ❖ **Correct ✓** You should measure plasma electrolytes every 24 hours while intravenous fluids are being administered. You should also check them before starting an infusion, except in most children undergoing elective surgery.
2. Weighing children is rarely helpful.
   - ❖ Where possible, you should weigh all children on intravenous fluids before starting therapy and then reweigh them each day.
3. You should measure plasma electrolytes before all elective surgery.
4. It is easy to document accurate fluid balance in most patients.
   - ❖ Accurate fluid balance is difficult, but you should monitor this daily.

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 4

A 9 year old boy weighing 27 kg is admitted for an elective hernia repair. He needs intravenous fluids. What volume of maintenance fluid should you prescribe over 24 hours?

1. 1240 ml
2. 1440 ml
3. 1640 ml
4. 1840 ml

❖ Only click when you have you have picked an answer!

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 4

A 9 year old boy weighing 27 kg is admitted for an elective hernia repair. He needs intravenous fluids. What volume of maintenance fluid should you prescribe over 24 hours?

1. 1240 ml
2. 1440 ml
3. 1640 ml ❖ Correct ✓
4. 1840 ml

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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Question 4

A 9 year old boy weighing 27 kg is admitted for an elective hernia repair. He needs intravenous fluids. What volume of maintenance fluid should you prescribe over 24 hours?

CALCULATION OF 100% MAINTENANCE RATE

(a) for first 10 kg:	100 ml/kg/ day	= A
(b) for second 10 kg:	50 ml/kg/ day	= B
(c) for each kg over 20 kg:	20 ml/kg/ day	= C

[for 100% daily maintenance add together (a) + (b) + (c)]

A 100 x 10 for the first 10 kg = 1000 ml
B 50 x 10 for the next 10 kg = 500 ml
C 20 x 7 for the next 7 kg = 140 ml
= 27 kg = 1640 ml **Correct ✓**

adapted from eBMJ learning site – "Reducing the risk of hyponatraemia when administering intravenous fluids to children" written by Dr. Stephen Playfor.

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If you have had difficulty with any of these answers you may get further information and help from the website as below.

- eBMJ learning site
- http://learning.bmj.com/learning/search-result.html?moduleId=5003358
- This free module written by Dr. Stephen Playfor is named "Reducing the risk of hyponatraemia when administering intravenous fluids to children."
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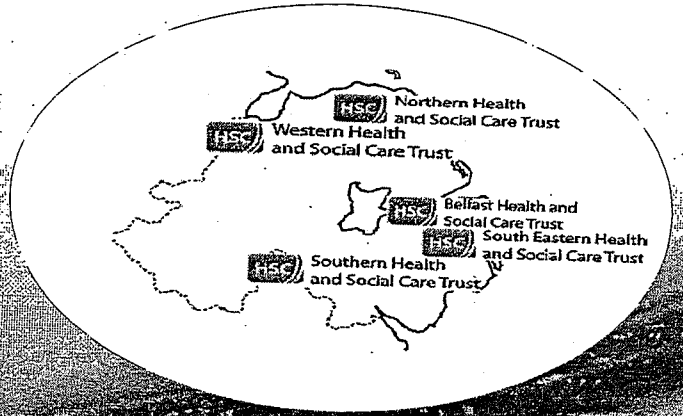
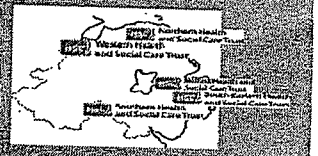
20.c

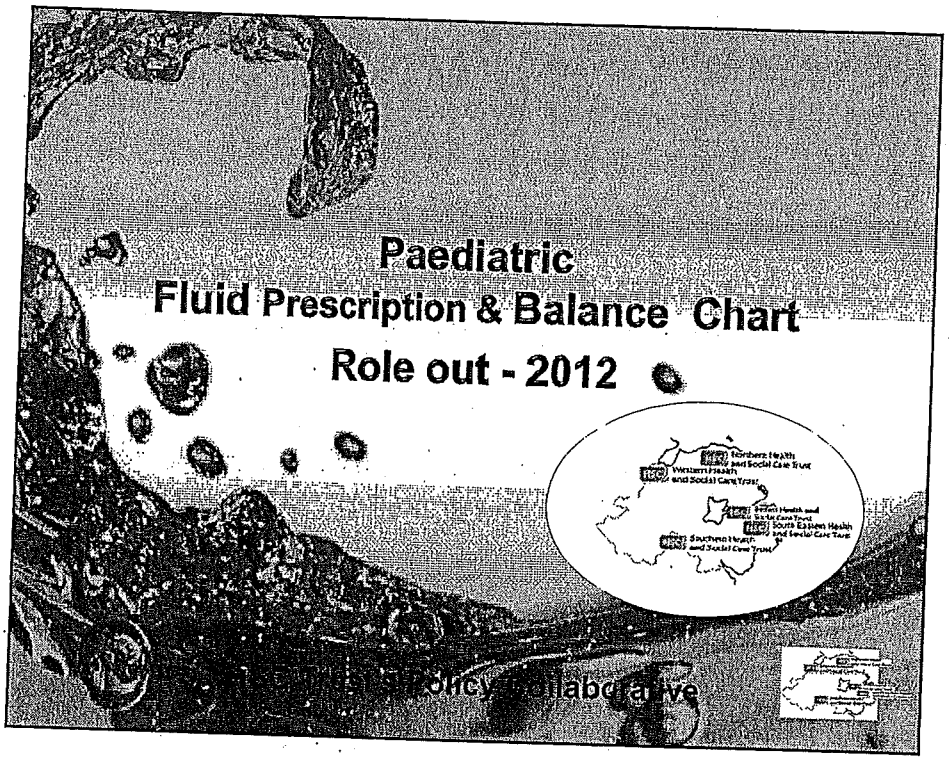
Paediatric Fluid Prescription & Balance Chart

Role out - 2012



HSC Trust's Policy Collaborative





Aims and outcomes of session.

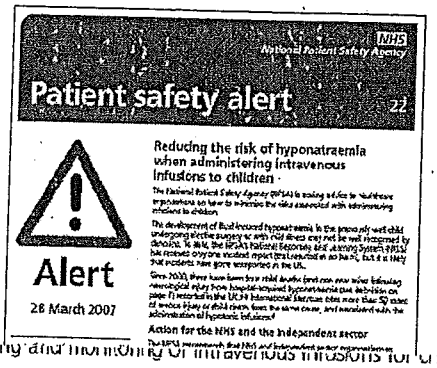
Aim:

- To instruct staff on the correct completion of the paediatric fluid prescription chart.

Outcomes:

- Demonstrate the ability to correctly complete and calculate a fluid balance chart.
- Used to explain correct and accurate completion to colleagues in the clinical environment.

NPSA alert 22


NHS National Patient Safety Agency

Patient safety alert 22

Alert

28 March 2007

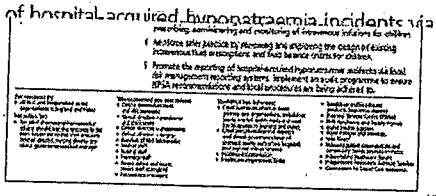
Reducing the risk of hyponatraemia when administering intravenous infusions to children

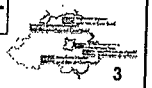
Action for the NHS and the independent sector

prescribing, administering and monitoring of intravenous infusions for children.

4 Reinforce safer practice by reviewing and improving the design of existing intravenous fluid prescriptions and fluid balance charts for children.

5 Promote the reporting of hospital-acquired hyponatraemia incidents via local





24 April 2012 Paediatric Fluid Prescription & Balance Chart 3

Front

Daily Fluid Balance & Prescription Sheet

Child

FLUID INPUT (ml)

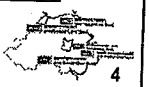
FLUID OUTPUT (ml)

INTAKE

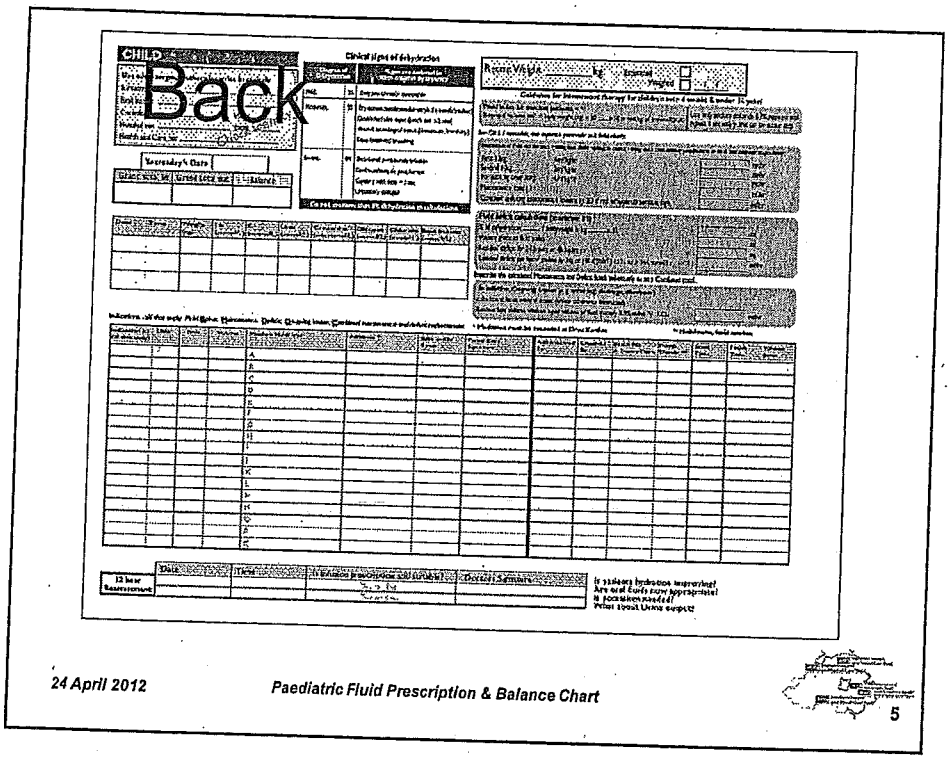
OUTPUT

Grand Total IN

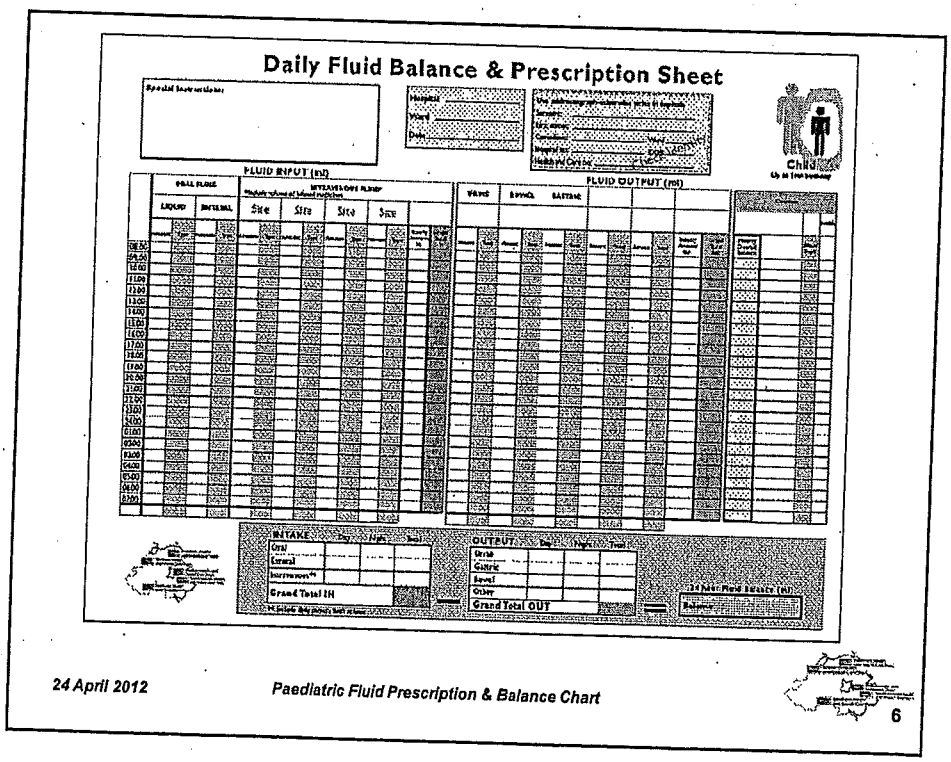
Grand Total OUT



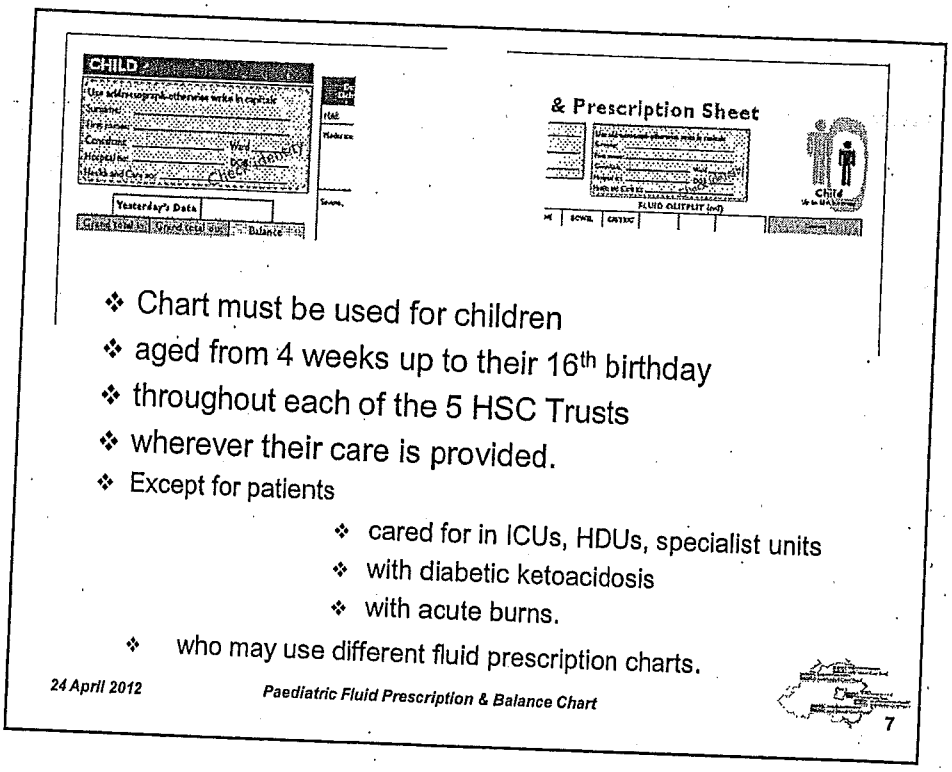
24 April 2012 Paediatric Fluid Prescription & Balance Chart 4



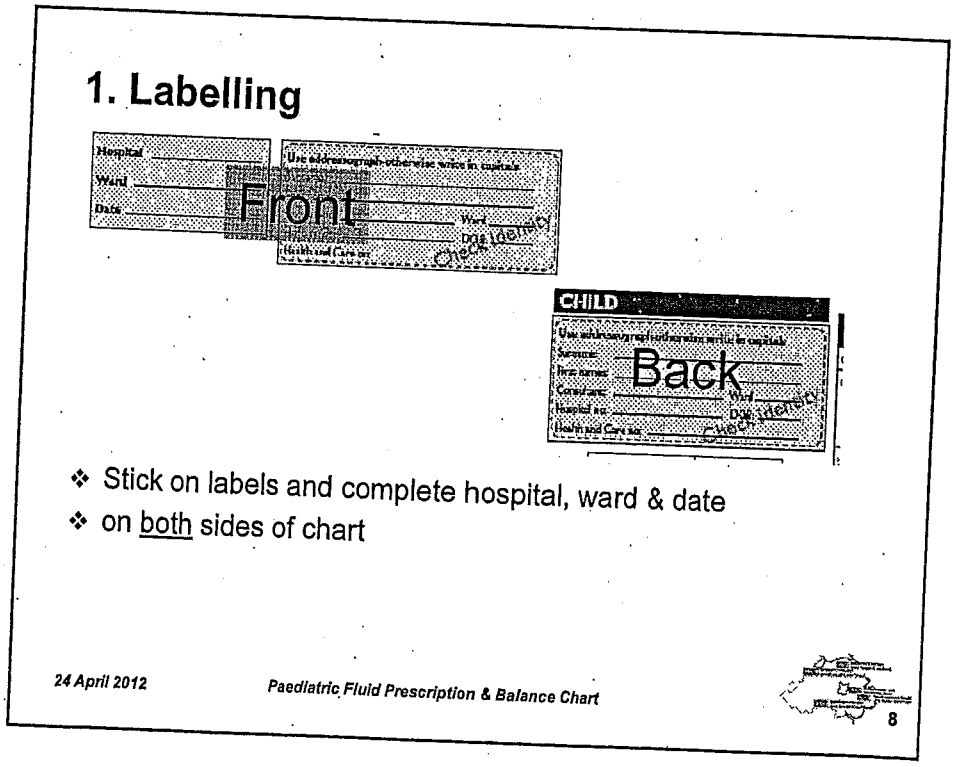
24 April 2012 Paediatric Fluid Prescription & Balance Chart 5



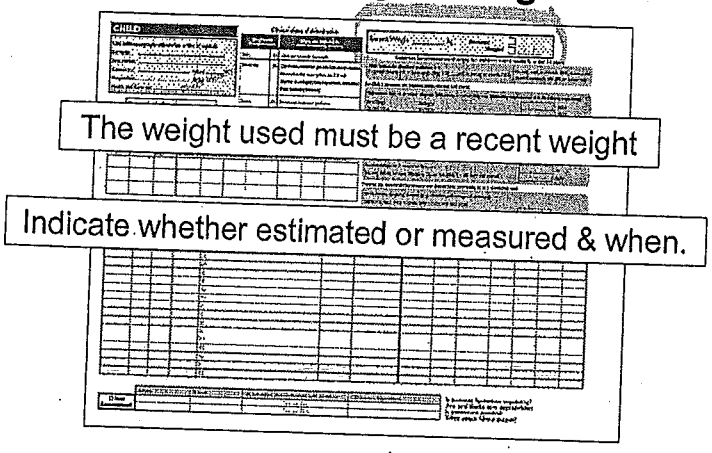
24 April 2012 Paediatric Fluid Prescription & Balance Chart 6



- Chart must be used for children
- aged from 4 weeks up to their 16th birthday
- throughout each of the 5 HSC Trusts
- wherever their care is provided.
- Except for patients
  - cared for in ICUs, HDUs, specialist units
  - with diabetic ketoacidosis
  - with acute burns.
- who may use different fluid prescription charts.



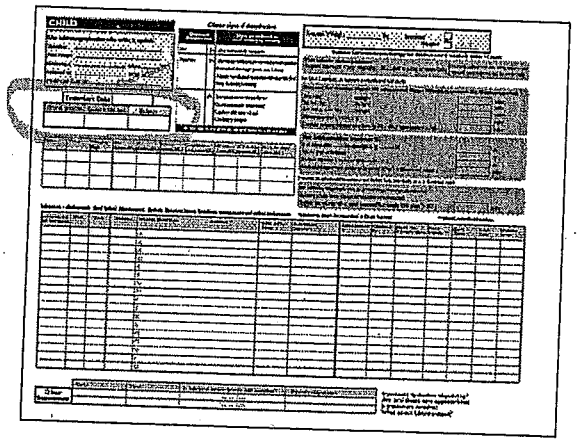
2. Insert patient's weight in kgs



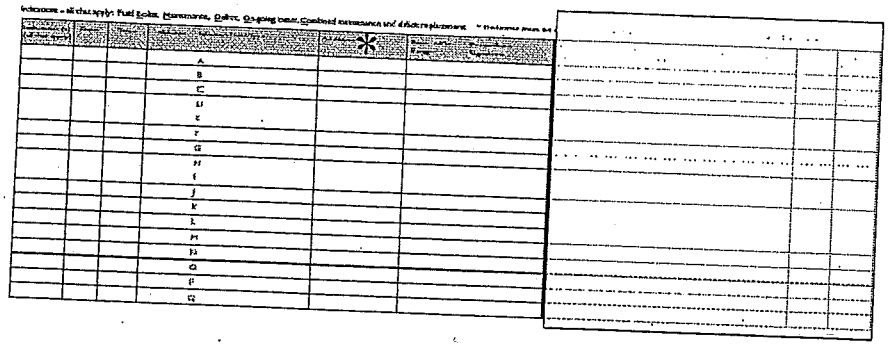
The weight used must be a recent weight

Indicate whether estimated or measured & when.

3. Complete previous days fluid volumes



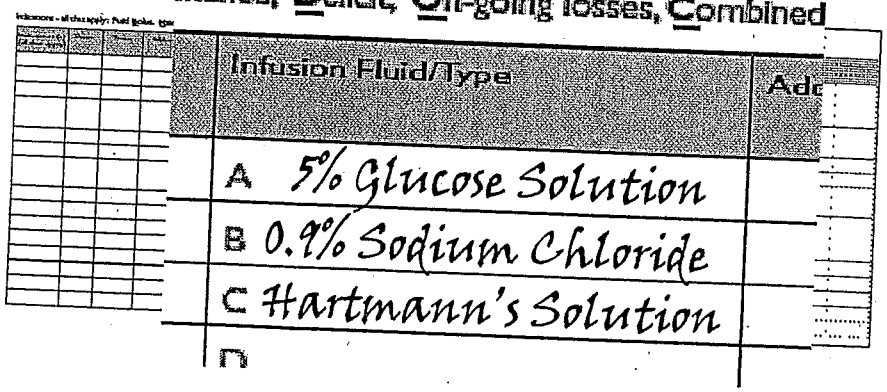
4. Prescribe fluids



* Medicines must be recorded in Drug Kardex

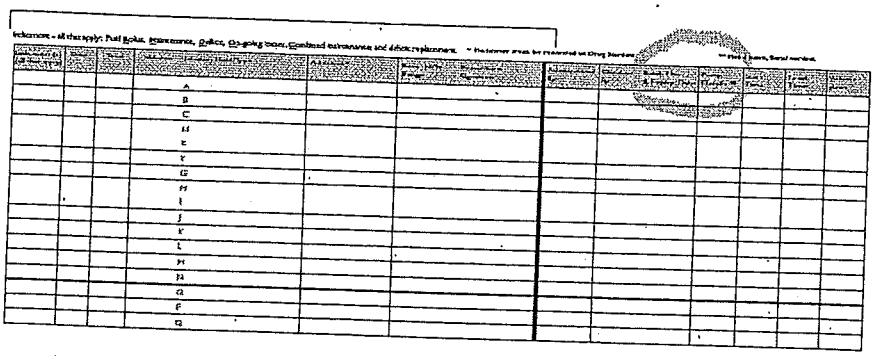
4. Prescribe fluids

...nance, Deficit, On-going losses, Combined



Infusion fluids can also be identified by their Letter

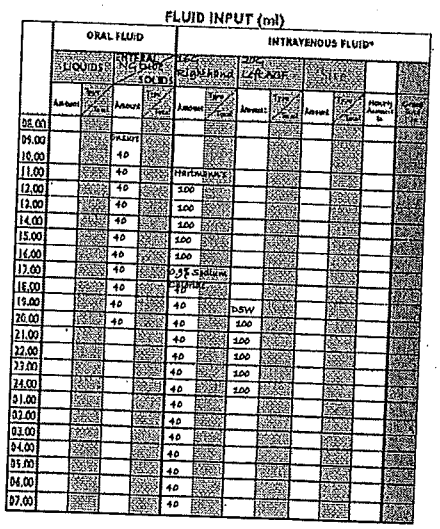
5. Administer fluids



The following items should be completed:-

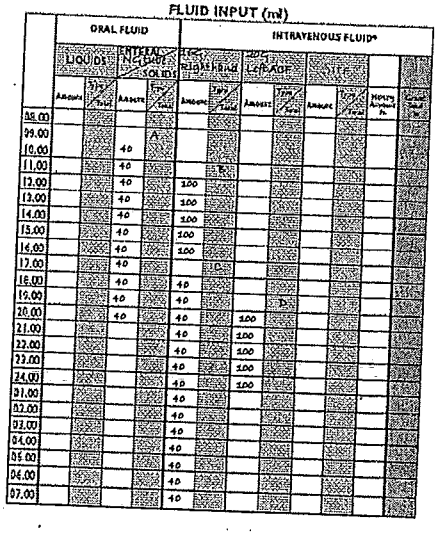
- Batch number & Expiry date
- Infusion pump details.

6. Record Intake



- Record
  - Site
  - Amount
  - Type
  - Total
- for each type of fluid
- every hour

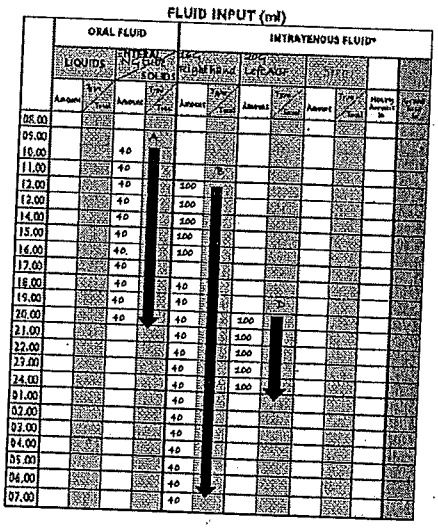
6. Record Intake



- Record
  - Site
  - Amount
  - Type*
  - Total
- for <u>each</u> type of fluid
- <u>every</u> hour

* = identify with letter if wish

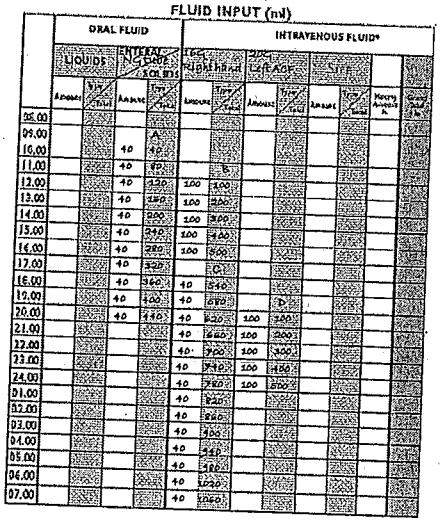
7. Intake – Cumulative total for each fluid



- Cumulative totals for
  - each type of fluid

7. Intake – Cumulative total for each fluid

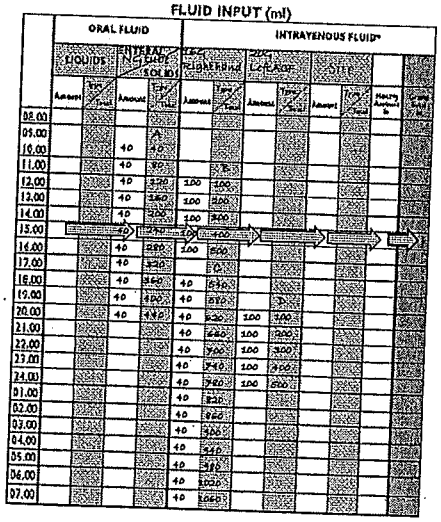
FLUID INPUT (ml)



- Cumulative totals for
  - each type of fluid

8. Intake – Hourly cumulative totals

FLUID INPUT (ml)

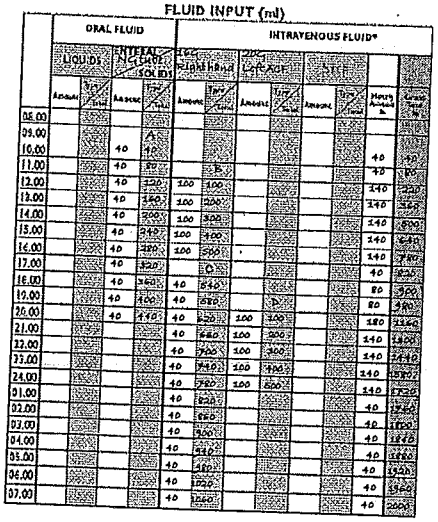


- Then,
- Cumulative totals to be calculated
  - each hour
  - to get an

Hourly amount in and then **Grand Total in**

8. Intake

FLUID INPUT (ml)



- Worked example

24 April 2012 Paediatric Fluid Prescription & Balance Chart 19

9. Record intake totals

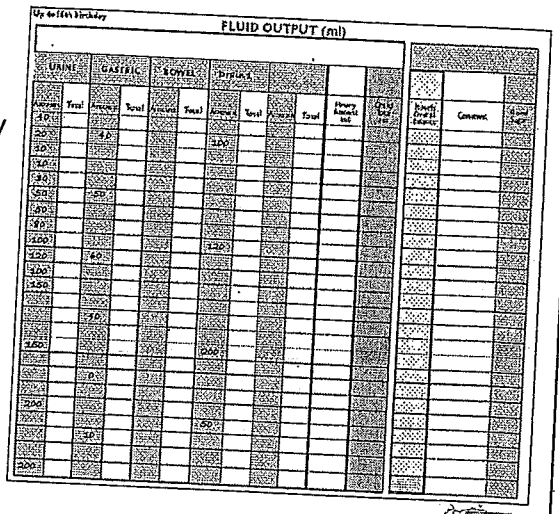
24 hour intake (ml)	
Oral total	440
Intravenous total**	1560
Grand total in	2000

** Include estimate of daily cannula flush volume

24 April 2012 Paediatric Fluid Prescription & Balance Chart 20

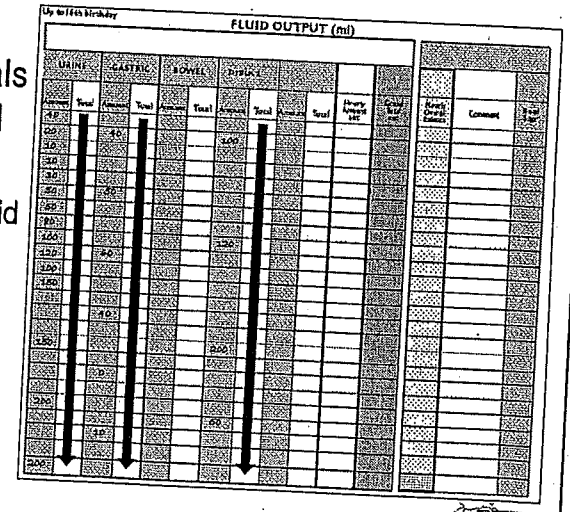
10. Record outputs

- Record
  - Site if necessary
  - Amount
  - Type
- for each type of fluid.



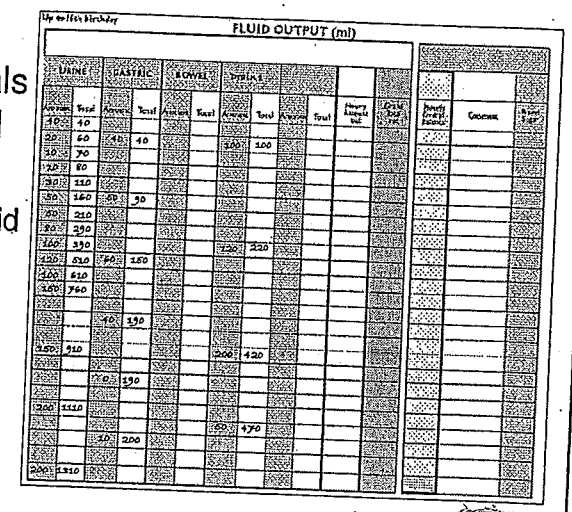
11. Output – Cumulative total for each fluid

- Cumulative totals to be calculated for
  - each type of fluid



11. Output – Cumulative total for each fluid

- Cumulative totals to be calculated for
  - each type of fluid

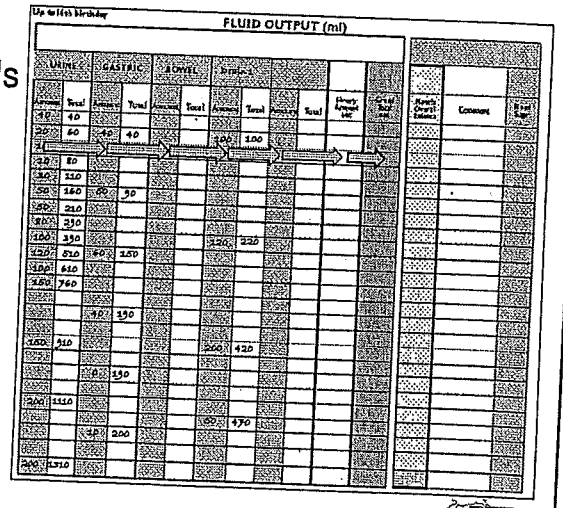


24 April 2012 Paediatric Fluid Prescription & Balance Chart 23

12. Output – Hourly Cumulative totals

- Cumulative totals to be calculated for
  - each hour
  - to get an

Hourly amount out and then **Grand Total out**



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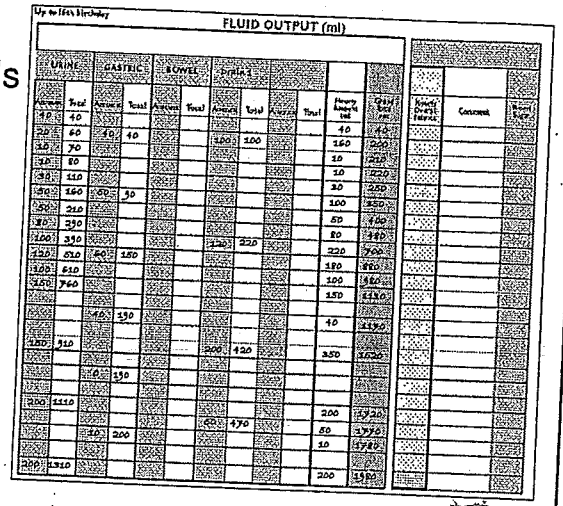
12. Output – Hourly Cumulative totals

- Cumulative totals to be calculated for
  - each hour
  - to get an

Hourly amount out

and then

Grand Total out

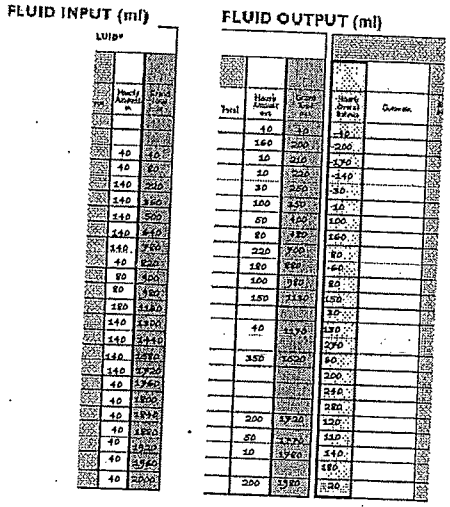


13. Record output totals

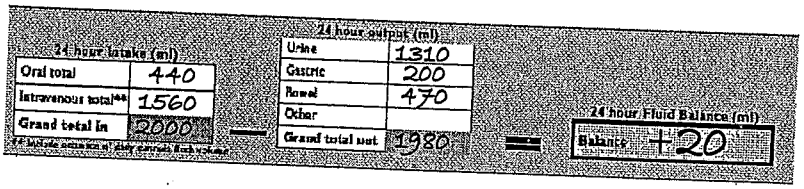
24 hour output (ml)	
Urine	1310
Gastric	200
Bowel	470
Other	
Grand total out	1980

14. Calculate overall hourly balance

- Calculate the overall balance
  - each hour



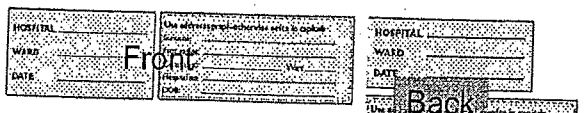
15. Complete overall 24 hour balance



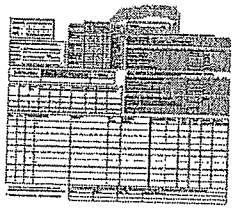
These boxes must be completed on every patient.

16. Start next day's chart

i. Labelling



ii. Weight



iii. Volumes

Yesterday's Date	Grand total in	Grand total out	Balance
	2000	1980	+20

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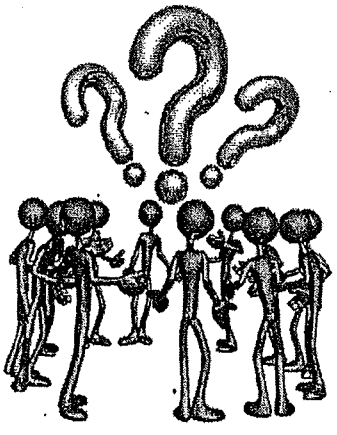
Fluid Prescription/Balance Chart



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