

Adam's typical daily fluid balance

	Daily (24 hr period)					
	Haynes	Gross	Coulthard	Sumner ¹	Taylor	Savage
Weight	20 kg	20 kg	19 kg		21 kg	20.2 kg
Surface area	0.8 m ²	0.8 m ²	0.8 m ²		0.75 m ²	0.8 m ²
Adam's usual daily intake (known)	Enteral intake = 2100ml per day ²					
Fluid losses						
a) Insensible losses	[400ml/m ²] 400x0.8 = 320 ml	[400ml/m ²] 400x0.8 = 320 ml	[300ml/day/m ²] 300*0.8= 240 ml	400-500ml	[300ml/day/m ²] 300x0.75 = 225 ml	~240ml
b) Urine output (assumption that = 2100ml - insensible loss - dialysis losses)	[1380ml/day] = 57.5 ml/h	[1350ml/day] =56.3 ml/h	[1500ml/day] = 62 ml/h	[≤75ml/kg/day = 1500 ml/day] = ≤62.5 ml/h	[1875ml/day] =78.1 ml/h	[1500ml/day] = 62 ml/h
c) Dialysis loss (15 cycles)	400 ml	290 ml	Up to 292 ml	100-200 ml		~300 ml
d) Faecal loss		100 ml	68 ml			~60 ml

¹ Ref: 059-054-114

² Ref: 057-068-128

Adam's perioperative fluid balance

	Time between ward admission & start of preoperative fasting 2200-0500 = 7 h				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	[400ml/m ² /day] (400x0.8)x7/24 = 93 ml	[1.05 ml/kg/h] = 147 ml	[300ml/day/m ²] (300*0.8)x7/24 = 70 ml	[300ml/day/m ²] (300x0.75)x7/24 70 ml	[10ml/h] 70 ml
b) Urine output (assumption that = 2100ml - insensible loss - dialysis losses)	[1380ml/day] = 57.5 ml/h 57.5 x 7 = 403 ml	[2.8 ml/kg/h] = 392 ml	[1500ml/day] = 62 ml/h 62 x 7 = 434 ml	[1875ml/day] =78.1 ml/h 78.1 x 7 = 547 ml	[1500ml/day] = 62 ml/h 62 x 7 = 434 ml
c) Dialysis loss (received 8 of usual 15 cycles)	8/15 x 400 = 213ml	154 ml	200 ml	0	50-250 ml
Total (cumulative) fluid losses	709 (709) ml	693 (693) ml	704 (704) ml	617 (617) ml	554-754 (554-754) ml
Actual (cumulative) fluid input	970 (970) ml	970 (970) ml	952 (952) ml	970 (970) ml	952 (952) ml
Estimated (cumulative) fluid excess	261 (261) ml	277 (277) ml	248 (248) ml	353 (353) ml	~300 (~300) ml
Comments + relevant information regarding Na⁺ content of: a) input fluids b) losses	Given as Dioralyte (60 mmol Na ⁺ /l) Urine Na ⁺ assumed 40 mmol/l Na ⁺ given= 57 mmol Na ⁺ content of losses: urine=16 mmol Dialysis=30 mmol	Na ⁺ content of fluids given: 59.5 mmol Na ⁺ content of losses:44.3 mmol	Input= Dioralyte 952ml = 57 mmol Na ⁺ Output= Insensible Na approx 0 + urine likely to be 75/l Total losses = 59 Na balance = -1 mmol	Na ⁺ content of fluids given: 0.18NaCl/4% Glucose: 30mmol/l Dioralyte=35 mmol/l Na ⁺ content of losses: Urine estimate= 30-40 mmol/l Insensible Loss= 0mmol/l	In positive fluid balance ~300ml in this period but received 500 ml less feed than normal night so Dialysis ultrafiltrate likely to be low. Na ⁺ content of fluids given: Enteral Dioralyte 60mmol/L Na ⁺ total 57 mmol Na ⁺ content of loss: Urine 434mls@70mmol/l = 30 mmol Dialysis loss 2.5mmol/l of dialysis fluid 6l dialysis overnight so loss is 2.5mmol x6 = 15 mmol Total Na loss 30+15=45 mmol Na balance 57-45 = +12mmol

Adam's perioperative fluid balance

	Time between start of preoperative fasting period & anaesthesia 0500-0700 = 2 h				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	27 ml	42 ml	20 ml	20 ml	20 ml
b) Urine output (assumption that = 2100ml - insensible loss - dialysis losses)	115 ml	112ml	124 ml	156 ml	124 ml
c) Dialysis loss (received 8 of usual 15 cycles)	0	0	0	0	
Total (cumulative) fluid losses	142 (851) ml	154 (847) ml	144 (848) ml	176 (793) ml	144 (798) ml
Actual (cumulative) fluid input	0 (970) ml	0 (970) ml	0 (952) ml	0 (970) ml	0 (952) ml
Estimated (cumulative) fluid excess	-142 (119) ml	-154 (123) ml	-144 (104) ml	-176 (177) ml	-144 (156) ml
Comments + relevant information regarding Na⁺ content of: a) input fluids b) losses	Na ⁺ content of fluids given: nil Na ⁺ content of losses: urine 4.6 mmol	Na ⁺ content of fluids given: 0 mmol Na ⁺ content of losses: 7.4 mmol	Input= 0 mmol Na ⁺ Output = Insensible Na approx 0 + urine likely to be 75/l = 9 Na loss Na balance = -9 Cumulative sodium balance = -11mmol	Na ⁺ content of fluids given: None given Na ⁺ content of losses: Urine estimate= 30-40 mmol/l Insensible Loss= 0mmol/l	Na ⁺ content of fluids given: 0 mmol Na ⁺ content of losses: 9mmol (urine @70mmol/l) Na balance -9. In approx Na balance pre-op (12-9=3)

Adam's perioperative fluid balance

	Time between induction of anaesthesia & start of surgery 0700-0800 = 1 h				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	14 ml	21 ml	10 ml	10 ml	10 ml
b) Urine output (assumption that= 2100ml-insensible loss-dialysis losses)	58 ml	56 ml	62 ml	78 ml	62 ml
c) Blood loss	0	0	0	0	0
Total (cumulative) fluid losses	72 (923) ml	77 (924) ml	72 (920) ml	88 (881) ml	72 (870) ml
Actual (cumulative) fluid input	750 (1720) ml	650 (1620) ml	750 (1702) ml	750 (1720) ml	750 (1702) ml
Estimated (cumulative) fluid excess	678 (797) ml	573 (696) ml	678 (782) ml	662 (839) ml	678 (834) ml
Comments + relevant information regarding Na⁺ content of : a) input fluids b) losses	Received 750 ml 0.18% saline/4% glucose Na ⁺ content of fluids given = 23 mmol Na ⁺ content of losses: urine:2.3 mmol	Na ⁺ content of fluids given:16 mmol Na ⁺ content of losses:3.4 mmol	Input = 31 mmol/l = 23 mmol Na ⁺ Output = Insensible Na approx 0, + urine likely to be 75/l = 5 Na loss Na balance = +19 mmol	Na ⁺ content of fluids given: 0.18NaCl/4% Glucose: 30mmol/l Dioralyte=35 mmol/l Na ⁺ content of losses: Urine estimate= 30-40 mmol/l Insensible Loss= 0mmol/l	Fluid balance from onset of anaesthesia +678 Na ⁺ content of fluids given: 750 ml 0.18NaCl/4% Glucose: 31mmol/l Total Na 23 mmol Na loss 62 ml urine @ 70mmol/l = 5 mmol Na Na balance 23-5 = 18mmol

Adam's perioperative fluid balance

	Time from start of surgery until vascular clamps on 0800-1000 = 2 hr				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	Basal losses = 27 ml Evaporative losses from wound = 4ml/kg/h = 160 ml	[0.5 ml/kg/h] = 20 ml	20 ml Evaporative losses from wound = 160 ml	2-4ml/kg/h = 84-168 ml	20 ml
b) Urine output (assumption that= 2100ml-insensible loss-dialysis losses)	115 ml	112 ml	46 ml	156 ml	124 ml
c) Blood loss	600 ml	518 ml	600 ml	Approx 800 ml	600 ml
Total (cumulative) fluid losses	902 (1825) ml	650 (1574) ml	826 (1746) ml	1040-1124 (1921-2005) ml	744 (1614) ml
Actual (cumulative) fluid input	2300 (4020) ml 750 ml 0.18% NaCl /4% Glucose, 500 ml Hartmann's 800 ml HPPF 250 ml Blood	1750 (3370) ml	2300 (4002) ml	1950 (3670) ml 400 ml 0.18% NaCl / 4% Glucose 500ml Hartmann's 800ml HPPF 250ml Blood	2050 (3752) ml
Estimated (cumulative) fluid excess	1398 (2195) ml	1100 (1796) ml	1474 (2256) ml	826-910 (1665-1749) ml	1306 (2140) ml
Comments + relevant information regarding Na⁺ content of : a) input fluids b) losses	Na ⁺ content of fluids given: 0.18% NaCl /4% Glucose: 30mmol/l Hartmann's: 131mmol/l HPPF: 130mmol/l Blood: 130 mmol/l Na ⁺ content of fluids given: 202 mmol Na ⁺ content of losses: 83 mmol	Na ⁺ content of fluids given: 173 mmol Na ⁺ content of losses: 71 mmol	Input = 235 mmol Na ⁺ Output = 87 mmol total. Na balance = +148 mmol	Na ⁺ content of fluids given: 0.18% NaCl /4% Glucose: 30mmol/l Hartmann's: 130mmol/l HPPF: 130-150mmol/l Blood: 135-145 mmol/l Na ⁺ content of losses: Urine estimate: 30-40 mmol/l	Cumulative fluid balance since onset of anaesthesia 678 +1306 = 1984 ml Na ⁺ content of fluids given over 2 hours: 800mls HPPF 140mmol/l = 112 500mls Hartmanns 131 mmol/l = 65 500mls 0.18% NaCl /4% Glucose: 31 mmol/l =16 mol 250ml Packed cells = 35 mmol Total Na ⁺ input = 228 mmol Na ⁺ content of losses: 600mls blood @134 mmol/l = 81 mmol, urine 9mmol total Na ⁺ los = 90 mmol. This period Na ⁺ balance +138 mmol

Adam's perioperative fluid balance

	Time while vascular clamps applied 1000-1030 = 0.5 hr				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	Basal losses = 7 ml Evaporative losses from wound = 40 ml	5 ml	5 ml Evaporative losses from wound = 40 ml	21-42 ml	5 ml
b) Urine output	29 ml	28 ml	0 ml	39 ml	31 ml
c) Blood loss	200 ml	130 ml	200 ml	Approx 200 ml	200 ml
Total (cumulative) fluid losses	276 (2101) ml	163 (1737) ml	245 (1991) ml	260-281 (2181-2286) ml	236 (1850) ml
Actual (cumulative) fluid input	200 (4220) ml 200 ml HPPF	200 (3570) ml	200 (4202) ml	100 (3770) ml 100ml 0.18% NaCl/4% Glucose	250 (4002) ml
Estimated (cumulative) fluid excess	-76 (2119) ml	37 (1833) ml	-45 (2211) ml	-160 - -181 (1484-1589)ml	14 (2154) ml
Comments + relevant information regarding Na⁺ content of : a) input fluids b) losses	Na ⁺ content of fluids given: 26 mmols Na ⁺ content of losses: 27.2 mmol	Na ⁺ content of fluids given: 15.8 mmol Na ⁺ content of losses: 18 mmol	Input = 28 mmol Na ⁺ Output = 28 mmol Na balance = 0	Na ⁺ content of fluids given: 0.18% NaCl / 4% Glucose: 30 mmol/l Na ⁺ content of losses: Urine estimate: 30-40 mmol/l	Cumulative fluid balance 1998 ml since induction. Na ⁺ content of fluids given: 250ml 0.18% NaCl / 4% Glucose = 8 mmol Na ⁺ Na ⁺ content of losses: blood 28 mmol + urine 2 mol Balance this period - 22mmol Na ⁺

Adam's perioperative fluid balance

	Time while vascular clamps applied 1000-1030 = 0.5 hr				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	Basal losses = 7 ml Evaporative losses from wound = 40 ml	5 ml	5 ml Evaporative losses from wound = 40 ml	21-42 ml	5 ml
b) Urine output	29 ml	28 ml	0 ml	39 ml	31 ml
c) Blood loss	200 ml	130 ml	200 ml	Approx 200 ml	200 ml
Total (cumulative) fluid losses	276 (2101) ml	163 (1737) ml	245 (1991) ml	260-281 (2181-2286) ml	236 (1850) ml
Actual (cumulative) fluid input	200 (4220) ml 200 ml HPPF	200 (3570) ml	200 (4202) ml	100 (3770) ml 100ml 0.18% NaCl/4% Glucose	250 (4002) ml
Estimated (cumulative) fluid excess	-76 (2119) ml	37 (1833) ml	-45 (2211) ml	-160 - -181 (1484-1589)ml	14 (2154) ml
Comments + relevant information regarding Na⁺ content of : a) input fluids b) losses	Na ⁺ content of fluids given: 26 mmols Na ⁺ content of losses: 27.2 mmol	Na ⁺ content of fluids given: 15.8 mmol Na ⁺ content of losses: 18 mmol	Input = 28 mmol Na ⁺ Output = 28 mmol Na balance = 0	Na ⁺ content of fluids given: 0.18% NaCl / 4% Glucose: 30 mmol/l Na ⁺ content of losses: Urine estimate: 30-40 mmol/l	Cumulative fluid balance 1998 ml since induction. Na ⁺ content of fluids given: 250ml 0.18% NaCl / 4% Glucose = 8 mmol Na ⁺ Na ⁺ content of losses: blood 28 mmol + urine 2 mol Balance this period - 22mmol Na ⁺

Adam's perioperative fluid balance

	Time from when clamps released until end of surgery 1030-1130 = 1 hr				
	Haynes ³	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	Basal losses = 14 ml Evaporative losses from wound = 80 ml	10ml	10 ml Evaporative losses from wound = 80 ml	42-84 ml	10 ml
b) Urine output	58 ml	56 ml	0 ml	78 ml	62 ml
c) Blood loss	328 ml	259 ml	328 ml	Approx 211 ml (1211 ml total)	~ 300 mls
Total (cumulative) fluid losses	480 (2581) ml	325 (2062) ml	418 (2409) ml	331-373 (2512-2659) ml	372 (2222) ml
Actual (cumulative) fluid input	250 (4470) ml 250 ml Blood	400 (3970) ml	250 (4452) ml	400 (4170) ml 150ml 0.18% NaCl / 4% Glucose 250ml Blood	450 (4452) ml
Estimated (cumulative) fluid excess	-230 (1889) ml	75 (1908) ml	-168 (2043) ml	27-69 (1511-1658)ml	78 (2232) ml
Comments + relevant information regarding Na⁺ content of : a) input fluids b) losses	Na ⁺ content of fluids given: 35 mmols Na ⁺ content of losses: 47 mmols	Na ⁺ content of fluids given: 44.8 mmol Na ⁺ content of losses: 36 mmol	Input = 35 mmol Na ⁺ Output = 46 mmol Na balance = -11	Na ⁺ content of fluids given: 0.18% NaCl / 4% Glucose: 30mmol/l Blood: 135-145 mmol/l Na ⁺ content of losses: Urine estimate: 30-40 mmol/l	Cumulative fluid total +2076 mls since induction Na ⁺ content of fluids given: 250ml packed cells = 35 mmol Na ⁺ 200ml Hartmanns = 26 mmol Na ⁺ content of fluids given 35+26 = 61 Na ⁺ content of losses: Urine 4 mmol + blood 40 mmol Total Na loss = 44 mmol Na ⁺ balance this period 61-44 = +17

³ Note that Haynes uses time period 1030-1100 and 1100-1215 – the numbers are therefore extrapolated from his periods. The most affected figure by this is the evaporative losses which doubles when using Taylor's time periods.

Adam's postoperative fluid balance

	Time from end of surgery until arrival in ICU 1130-1215 = 0.75 hr				
	Haynes	Gross	Coulthard	Taylor	Savage
Fluid losses					
a) Insensible losses	Basal losses = 10ml	16 ml	8 ml	7.5 ml	7.5 ml
b) Urine output	43 ml	42 ml	0 ml	59 ml	45 ml
c) Blood loss	0 ml	0 ml	0 ml	0 ml	0 ml
Total (cumulative) fluid losses	53 (2634) ml	58 (2120) ml	8 (2417) ml	66.5 (2578.5-2725.5) ml	52 (2274) ml
Actual (cumulative) fluid input	0(4470) ml Nil	25 (3995) ml	0 (4452) ml	100 ml 0.18 NaCL/4% Glucose 100 (4270) ml	0? (4452) ml
Estimated (cumulative) fluid excess	-53 (1836) ml	-33 (1875) ml	-8 (2036) ml	43.5 (1544.5-1691.5)ml	-52 (2180) ml
Comments + relevant information regarding Na⁺ content of: a) input fluids b) losses	Na ⁺ content of fluids given: nil Na ⁺ content of losses: 2.9 mmol	Na ⁺ content of fluids given:3.5 mmol Na ⁺ content of losses:2.6 mmol	Input = 0 mmol Na ⁺ Output = approx 0 mmol Na balance = 0	Na ⁺ content of fluids given: 0.18% NaCl /4% Glucose: Na ⁺ content of losses: Urine estimate: 30-40 mmol/l	Cumulative fluid balance since onset of anaesthesia approx 2024mls Na ⁺ content of fluids given: 0 Na ⁺ content of losses: 3 mmol