

ANGAL - ST. LUKE'S HOSPITAL

08/05/2010

PRE AND POST OPERATIVE MANAGEMENT OF PATIENTS

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Case Presentation

- DOA: 02/03/10
- Name: K.J.
- Sex: Female
- Age: 6 years
- Tribe: Alur
- NOK: Mother, Father e.t.c
- HPC: abdominal distention, not passing stool x2/7.
- O/E (on admission):
 - afebrile, chest negative, no visible signs of dehydration
 - P/A: abdominal distention with mild pain at pressure and no clear rebound tenderness, reduced bowel sounds.

Working Diagnosis

- Fecal impaction

Initial Management

- Warm soap enema given with good result
- Oral metronidazole

2^o day at 8.30 am

- Still c/o abdominal pain and distention.
- O/E: Fever (38,2°C), sweating, P/A: distended with rebound tenderness and high tone bowel sounds

Management

INVESTIGATIONS

- WBC 5500/mmc, N51, L38, B2, M5, E6
- Sickling Test: NEG
- Abd X-Ray: no air-fluid levels, no signs of free air

Management

TREATMENT

- IV fluids (N/S 1 l)
- IV Abx (Flagyl, Cipro, Ampicilline)
- IV QNN

2° day at 11.00 am

- Child was sitting up and eating; moderate abdominal distension, chest clear.
- O/E: Fever (37,8°C)
- →RV in the afternoon

2° day at 5.30 pm

- Increasing fever, child crying of abdominal pain, not passing stool or flatus
- O/E: P/A distended with diffuse tenderness, no clear bowel sounds.

Emergency Laparotomy 7.40-8.55 pm

- Found pyoperitoneum (500 ml), lavaged. Perforation at 7 cm from ileo-cecal junction and mesenteric lymphonode abscess. I&D done and closed, perforation repaired. Closed in layers.

Dx: POSSIBLE SALMONELLOSIS

Post Operative Management

- NPO
- IV fluids (N/S: Dx 5% 1:2 1,5 liters)
- IV Antibiotics
- Monitoring from duty room

At 10.30 pm:

- Difficult breathing with bilateral crackles at chest
- →airways suction
- →Oxygen
- → IV lasix 5 mg stat
- → IV Dx 25% bolus 8 hy

1° Post Operative Day

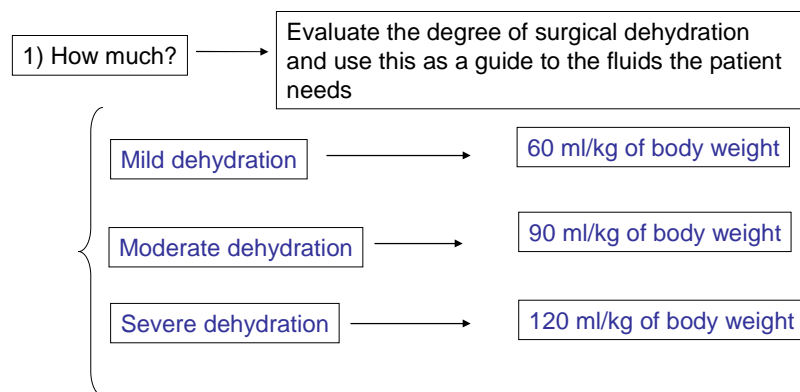
- At 8.30 am
- Child had a restless night
- Fully awake, afebrile, but still difficult breathing, bilateral crackles at lungs
- P/A: distended; NGT not draining; urinary output 700 ml
- At 1.30 pm
- Awake and responsive, still fast breathing

1° Post Operative Day

- At 6.15 pm
- Child restless, in pain, sweating
- Mild reduction of respiratory distress compared with the morning but still with bilateral crackles.
- Soft abdominal distention
- → im diclophenac stat
- At 9.25 pm child died

FLUIDS MANAGEMENT IN SURGICAL PATIENTS

A) PREOPERATIVE FLUIDS

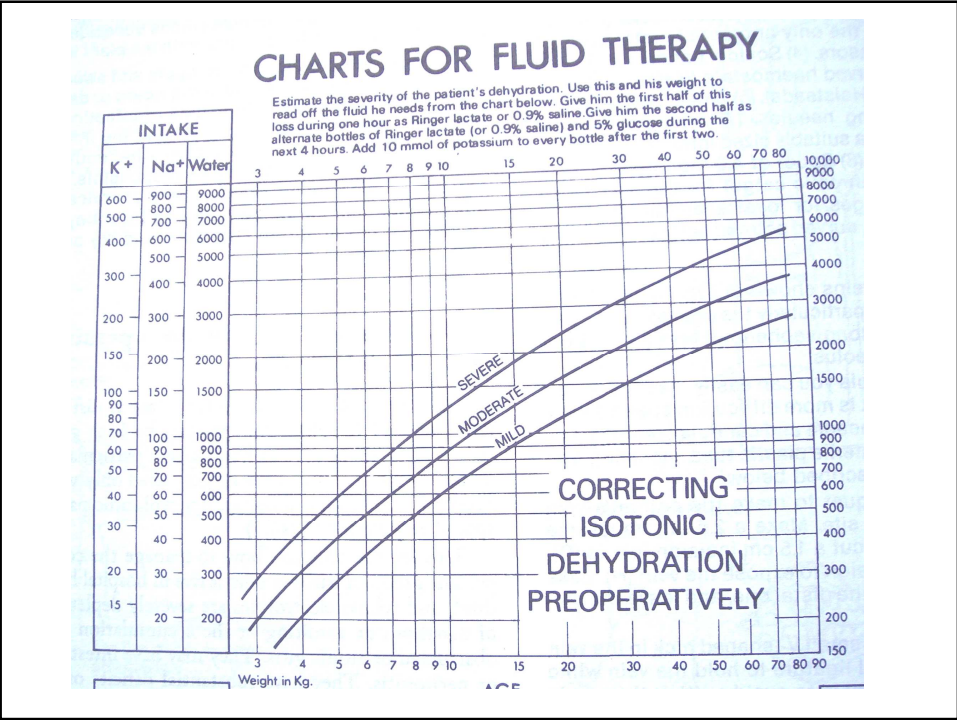


FLUIDS MANAGEMENT IN SURGICAL PATIENTS

Mild dehydration	H/O	Not taking fluids for	24 hours in adults
			12 hours in children
	SIGNS	NO clinical signs of dehydration	
	Loss of Body Weight	5%	
	AMOUNT OF FLUIDS TO BE GIVEN	60 ml/kg	

Moderate dehydration	H/O	Not taking fluids for	24 hours	in adults
			12 hours	in children
	SIGNS	Clinical signs of moderate dehydration	<ul style="list-style-type: none"> •PB reduced or normal, but systolic BP > 100 mmHg •Dry mouth, sunken eyes •moderate reduction in skin elasticity 	in adults
			Restlessness, irritability or drowsiness	in children
	Loss of Body Weight	8%		
	AMOUNT OF FLUIDS TO BE GIVEN	90 ml/kg		

Severe dehydration	H/O	Not taking fluids for more than	24 hours	in adults
			12 hours	in children
	SIGNS	Clinical signs of moderate dehydration	<ul style="list-style-type: none"> • very dry mouth, severely sunken eyes • Greatly reduced skin elasticity • Mental confusion 	in adults
			Child can be delirious, comatose or shocked	in children
	Loss of Body Weight	$\geq 10\%$		
AMOUNT OF FLUIDS TO BE GIVEN	120 ml/kg			



FLUIDS MANAGEMENT IN SURGICAL PATIENTS

A) PREOPERATIVE FLUIDS

	1/2 of the total amount	1/2 of the total amount
2) How fast	in 1 ^o hour	in the next 4 hours
3) Which fluid	as R/L or N/S	as alternate bottles of R/L (or N/S) and Dx 5% Add 10 mmol of K+ To every 500 ml after the first two bottles

FLUIDS MANAGEMENT IN SURGICAL PATIENTS

B) Intraoperative fluids replacement

During laparotomy

- 15 ml/kg in 1^o hour
- 8 ml/kg in the following hours

} Alternate N/S or R/L with Dx 5%

Estimation of normal body blood: 80 ml/kg

Replace blood losses:

< 1 l	N/S X 1,5 volume of blood loss
> 1 l	BT

FLUIDS MANAGEMENT IN SURGICAL PATIENTS

C) POSTOPERATIVE FLUIDS

- Inadequate fluids and electrolytes equals reduced survival chances.
- Generally for the adults this amount is needed either by mouth or IV for any surgical patient

Type of loss	Volume
urine	1000 ml
lungs	400 ml
skin	900 ml
stools	200 ml
In hot climate add	500 ml
	3000 ml

FLUIDS MANAGEMENT IN SURGICAL PATIENTS

C) POSTOPERATIVE FLUIDS

- Correct any pre-operative losses which were not replaced
- Replace any continuing losses
 - Nasogastric suction
 - Fistulae
 - Bleeding
 - Abdominal drain
 - High fever
- In hot weather or during fever an adult can need 4 liters of fluids/day
- Inadequate fluids leads to reduced urinary excretion and uremia
 - Expected minimum urinary output $1 \text{ ml/kg/h} = 25 \text{ ml/kg/day}$ in adults

Replace potassium losses

- Special need for Potassium
 - Patient on IV fluids for $\geq 3/7$ and passing urine
 - After trauma
 - Major surgery
 - Is vomiting
 - Diarrhoea
 - Fistulae
- Signs of hypokalemia include
 - Weakness, confusion, ileus

Replace potassium losses

- Add 10 mmol (10 ml of 1mmol/ml solution) every 500 ml of N/S or Dx 5%**
- Do not exceed 80 mmol/day
- Do not give potassium if is not passing urine
- Do not give bolus IV injections
- For every 500 ml of nasogastric aspirate, replace with the same amount of N/S + 20 mmol of potassium

Starting oral fluids

- Start oral fluids immediately
 - If patient is conscious
 - No NGT
 - Non abdominal surgery
- If with NGT start when
 - stomach is empty
 - Bowel sounds return
 - Has passed flatus
 - Start with small volumes and increase gradually
 - Don't change abruptly from IV to oral rehydration
 - Reduce IV fluids while giving fluids by mouth

Difficulties with fluids replacement

signs	cause
Sacral oedema	Too much N/S
Tachycardia, prominent neck veins, crepitations at lungs,	Overloaded with fluids
Raised haematocrit, increased Hb	Haemoconcentration due to not enough fluids
Fever	Bacteriemia, pyogens
Not passing urine	Acute renal failure

CHILDREN

- Infants and children have significant physiological and anatomical differences
- Much smaller physiological reserves, minor deviations from normal levels require early attention
- More rapid metabolic rate
- High risk of becoming dehydrated and hypoglycaemic
- Rapid heat loss due to greater relative surface area and poor insulation

CHILDREN

- Children are especially prone to hypothermia in the operating room.
- Monitor fluid status, electrolytes and haemoglobin diligently and correct any abnormalities promptly
- Maintenance fluid requirements must be supplemented to compensate for all losses.

CHILDREN PREOPERATIVE

- Do not starve them for too long 4 hours for major surgery
- Put i.v line/ drip
- Catheter
 - Catheter is usefull to monitor the urinary output which should be $\geq 1\text{ml/kg/h}$
 - Not always necessary
 - Usually is usefull for major surgery
 - Can be avoided in patients < 3 yrs

CHILDREN PREOPERATIVE

- Fluids:
 - Replace initial fluid and electrolytes deficit in the 3-6 hours prior to operation
 - Do not overload with fluids, give 30 ml/kg of body weight in the first 2 hours and then repeat in 3-4 hours if there is need
 - Do not give more than 100 ml/kg in 24 hours
 - Pay close attention to ongoing losses (e.g. nasogastric drainage)
 - monitor urine output, most sensitive indicator of fluid status in a child.
 - Normal urine output: infants 1-2ml/kg/hour; children 1 ml/kg/hour

Potassium in children

- Is needed
 - is not taking oral fluids by 24 hours
 - peritonitis
- Add 10 mmol of K⁺ to every 500 ml after the first two bottles
- If post-operatively is drowsy and there is ileus, these can be signs of hypokaliemia → give potassium

Children Post Op

- Postoperatively, children commonly require more than maintenance fluid. Children with abdominal operations typically require 150% of baseline requirements (see page 273) and even larger amounts if peritonitis is present. Preferred IV fluids are Ringer's lactate with 5% glucose or normal saline with 5% glucose or half-normal saline with 5% glucose. Note that normal saline and Ringer's lactate do not contain glucose and risk hypoglycaemia, and large amounts of 5% glucose contain no sodium and risk hyponatraemia

- Where possible give fluids need as half strength Darrow's solution in 5% dextrose
- Alternatively dilute 25 ml of dextrose 50% in 500 ml of half strength Darrow's solution → 2,5%
- Monitor fluid status closely.
 - Record inputs and outputs (intravenous fluids, nasogastric drainage, urine drain outputs) every 4–6 hours.

CHILDREN

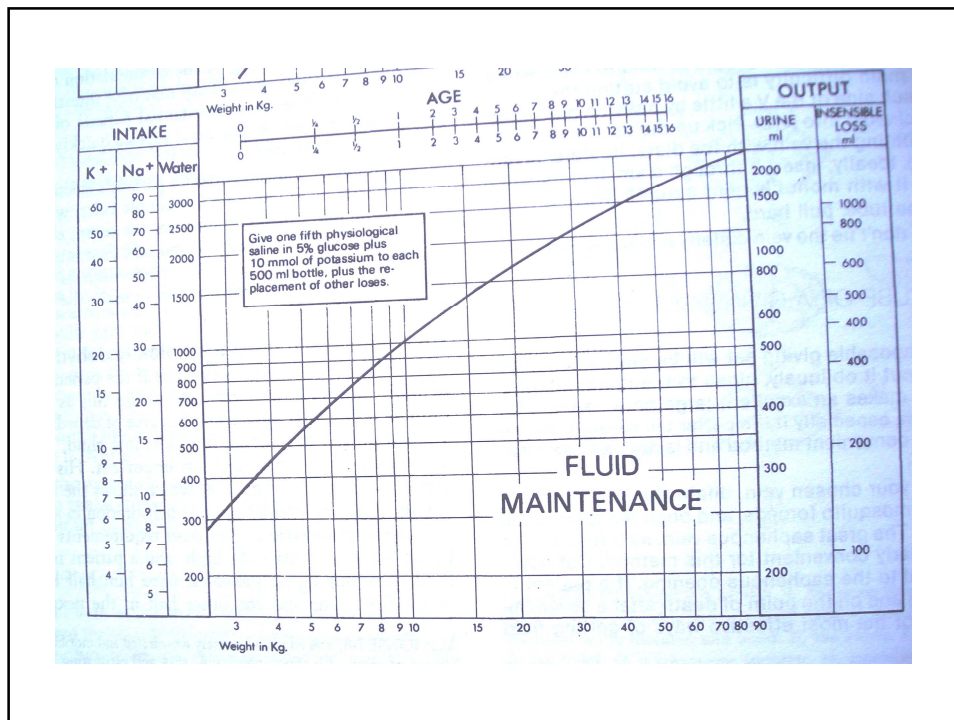
Table 32. Maintenance fluid requirements

Body weight of child	Fluid (ml/day)
2 kg	200 ml/day
4 kg	400 ml/day
6 kg	600 ml/day
8 kg	800 ml/day
10 kg	1000 ml/day
12 kg	1100 ml/day
14 kg	1200 ml/day
16 kg	1300 ml/day
18 kg	1400 ml/day
20 kg	1500 ml/day
22 kg	1550 ml/day
24 kg	1600 ml/day
26 kg	1650 ml/day

If there is fever increase by 10% for every 1°C of fever

The total daily fluids requirement for a child is calculated with the following formula:

- 100 ml/kg for the first 10 kg
- then 50 ml/kg for the next 10 kg,
- then 25 ml/kg for each subsequent kg.



POST OP NUTRITION

- High risk of nutritional problems due to higher caloric needs for growth.
- Poor nutrition reduces response to injury and ability to heal wounds
- Good nutrition helps healing
- Many surgical conditions, such as burns, increase caloric needs or prevent adequate intake of needed nutrition.
- Risk of hypoglycaemia due to limited ability to synthesize glucose from fat and protein (gluconeogenesis)
- If prolonged periods of fasting are anticipated (> 6 hours), give intravenous fluids that contain glucose.

POST OP NUTRITION

- If prolonged periods of fasting are anticipated (> 6 hours), give intravenous fluids that contain glucose.
- Interrupt feeding as little as possible
 - Don't starve for more than 4 hours
 - Start feeding again as soon as pt starts passing feaces or flatus
- A child's daily post-operative needs are:
 - Newborn: 45-50 cal/kg
 - 3-10 kg: 60-80 cal/kg
 - 10-25 kg: 45-65 cal/kg
 - 25-35 kg: 35-45 cal/kg
 - 35-50 kg: 30-35 cal/kg
- Remember 1 g = 4 cal; dextrose 5% 1 l = 200 cal

IV fluid	Composition						Calories /l
	Na ⁺ mmol/l	K ⁺ mmol/l	Cl ⁻ mmol/l	Ca ⁺⁺ mmol/l	Lactate mmol/l	Glucose g/l	
Ringer's lactate (Hartmann's)	130	5.4	112	1.8	27	-	-
Normal saline (0.9% NaCl)	154	-	154	-	-	-	-
5% Glucose	-	-	-	-	-	50	200
10% Glucose	-	-	-	-	-	100	400
0.45 NaCl / 5% glucose	77	-	77	-	-	50	200
0.18% NaCl / 4% glucose	31	-	31	-	-	40	160
Darrow's solution	121	35	103	-	53	-	-
Half-strength Darrow's with 5% glucose*	61	17	52	-	27	50	200
Half-strength Ringer's lactate with 5% glucose	65	2.7	56	1	14	50	200

* Please note that half-strength Darrow's solution often comes without glucose and glucose needs to be added before use.

Alternate:

-N/S or R/L + dx 50% 25 ml

-dx 5%

-IV bolus dx 25% 20 ml 8 hy

N/S 500 ml + Dx 50% 25 ml	Dx 2,5%	100 cal/l
Dx 5 %		200 cal/l
Bolus dx 25% 20 mls 8 hy		20 cal 8 hy

CHALLENGES

- Proper fluids management requires careful fluids balance monitoring
 - Fluids balance chart filling
 - Regular emptying of urinary bags, NGT suction, abdominal drains (6.00 am ?)
- Energy requirements
- Potassium supplementation
 - K
 - R/L
- Abdominal wounds infection rate*

Resolutions arising from the CME

- Inclusion of injectable Potassium in Hospital Formulary
- Regular supply of R/L to be used in dehydrated patients before and after abdominal surgery
- Regular emptying of urinary bags, NGT suction, abdominal drains (6.00 am ?) and detailed record on the medical form or fluid balance chart
- Proper care of surgical wounds in the wards:
 - Dressing to be changed on the 3^o day
 - Clean hospital clothes to be provided for post operative patients (especially in maternity) and to be washed in the laundry