

Stafford, Anne

From: Garrett, Elizabeth  
Sent: 10 January 2002 12:00  
To: Darragh, Paul (Dr)  
Subject: FW: HYPONATRAEMIA

DEC 20 2001  
12:00 PM

-----Original Message-----

From: McCarthy, Miriam  
Sent: 10 January 2002 11:39  
To: McCarthy, Miriam; 'john.jenkins'; 'lizmcelkerney'; 'peter.crean'; 'clodagh.loughrey'; 'jarlath.mcaloon'; 'bob.taylor'; 'gnesbitt'; 'tracey.erskine'  
Cc: Garrett, Elizabeth  
Subject: RE: HYPONATRAEMIA

Latest draft attached. I have made further ammendmants in light of comments received. The section **Choice of Fluid** contains a number of changes that reflect recent suggestions. Reference to specific preparations have been removed. These would be best included in locally agreed protocols that would complement the guidance.

In particular I draw your attention to the bullet referring to 1/5 Normal saline. There is not a sound evidence base to suggest that this fluid carries an intrinsic risk in itself. When CSM commented recently they emphasised the risk of hyponatraemia with any fluid and did not feel it appropriate to ammend product information.

Whatever we produce must be supported by evidence and it light of that may I suggest we consider deleting the bullet on 1/5 normal and rely on the preceding bullet to stress the requirement for adequate sodium.

It is important to finalise the document and I appreciate your response as soon as possible. If you are content with current draft ( subject to deletion of bullet point on 1/5th normal) please confirm. Happy to discuss by telephone

Many thanks for your input



hypo10jan.doc

Miriam

-----Original Message-----

From: McCarthy, Miriam  
Sent: 20 December 2001 09:28  
To: 'john.jenkins'; 'lizmcelkerney'; 'peter.crean'; 'clodagh.loughrey'; 'jarlath.mcaloon'; 'bob.taylor'; 'gnesbitt'; 'tracey.erskine'  
Subject: HYPONATRAEMIA

Miriam << File: WallChar.pdf >>

Dr. Mc Carthy

To see

Dr. Darragh's  
comments

Awe  
!!!

Just 1/5<sup>th</sup> Norm is not  
mentioned directly  
on guidance.

PRESCRIBED

## ANY CHILD RECEIVING FLUIDS IS AT RISK OF HYPONATRAEMIA

### INTRODUCTION

- Hyponatraemia most often reflects failure to excrete water. Stress, pain and nausea are all potent stimulators of anti-diuretic hormone (ADH), which inhibits water excretion.
- Hyponatraemia is potentially extremely serious, a rapid fall in sodium leading to cerebral oedema, seizures and death. Warning signs of hyponatraemia may be non-specific and include nausea, malaise and headache.
- Complications of hyponatraemia most often occur due to the administration of excess or inappropriate fluid to a sick child, usually intravenously.
- Hyponatraemia may also occur in a child receiving excess or inappropriate oral rehydration fluids.
- Hyponatraemia can occur in a variety of clinical situations, even in a child who is not overtly "sick". Particular risks include:
  - Post-operative patients.
  - CNS injuries
  - Bronchiolitis
  - Burns
  - Vomiting

### BASELINE ASSESSMENT :

Before starting IV fluids, the following must be measured and recorded:

- **Weight:** accurately in kg. [In a bed-bound child use best estimate.] Plot on centile chart or refer to normal range.
- **U&E:** take serum sodium into consideration.
- **Fluid needs:** should be assessed by a doctor competent in determining a child's fluid requirement. Accurate calculation is essential and includes:

Maintenance Fluid      100mls/kg for first 10kg body weight plus  
50mls/kg for the next 10kg body weight plus  
20mls/kg for each kg thereafter, up to max of 70kg  
[This provides the total 24 hr calculation; divide by 24  
to get the mls/hr].

Replacement Fluid      Must always be considered and prescribed separately.  
Must reflect fluid loss in both volume and composition  
(lab analysis of the Na content of fluid loss may be  
helpful).

DHSSPS

## CHOICE OF FLUID

Fluid and electrolyte requirements vary as a function of metabolic activity.

- The choice of maintenance fluids must take account of anticipated sodium, potassium and glucose requirements.
- Replacement fluids must reflect fluid lost. In most situations this implies a minimum sodium content of 130mmol/l. The glucose requirements, particularly of very young children, must be met.
- The risk of hyponatraemia may be increased in a child receiving 4% glucose/0.18% saline as replacement fluid.
- In the resuscitation of a child with clinical signs of shock, if a decision is made to administer a crystalloid, normal (0.9%) saline is an appropriate choice, while awaiting the serum sodium.
- The composition of oral rehydration fluids should also be carefully considered.

**Hyponatraemia may occur in any child receiving any IV fluids or oral rehydration. Vigilance is needed for all children receiving fluids.**

## MONITOR

- **Clinical state:** including hydrational status. Pain, vomiting and general well-being should be documented.
- **Fluid balance:** must be assessed at least daily by an experienced member of clinical staff.

Intake: All oral fluids (including medicines) must be recorded and IV intake reduced by equivalent amount.

Output: Measure and record all losses (urine, vomiting, diarrhoea, etc.) as accurately as possible.

- **Biochemistry:** Regular blood sampling for U&E may be difficult but remains **essential** at least once a day - more often if there are significant fluid losses or if clinical course is not as expected.

The rate at which  $\text{Na}^+$  falls is as important as the actual plasma level. A  $\text{Na}^+$  that falls quickly may be accompanied by rapid fluid shifts with major clinical consequences.

Consider using an indwelling heparinised cannula to facilitate repeat U&Es.

Do not take samples from the same limb as the IV infusion.

Capillary samples are adequate if venous sampling is not practical.

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Urine osmolarity/Na: Very useful in hyponatraemia. Compare to plasma osmolarity and consult a senior paediatrician or a chemical pathologist in interpreting results.

**SEEK ADVICE**

Advice and clinical input may be obtained readily from a senior member of medical staff including:

Consultant Paediatrician  
Consultant Anaesthetist  
Consultant Chemical Pathologist

- In the event of problems that cannot be resolved locally, help should be sought from consultant paediatricians/anaesthetists at the PICU, RBHSC.

**DHSSPS**