

**Craughwell, Eva**

From: McCarthy, Miriam  
Sent: 15 January 2002 12:44  
To: Campbell, Dr Henrietta; Craughwell, Eva  
Subject: HYPONATRAEMIA

CMO,

Many thanks for comments on the Hyponatraemia guidance

I have incorporated most of your comments and attach ammended draft. I have not however altered the final section to include refernce to experienced SpRs. Members of the group felt quite strongly that if difficulties arose consultants should be directly involved although they could in turn delegate that resposibility depending on the individual circumstances. Happy to discuss this with you in more detail

If you are content with ammendments I will circulate to the group once again for their endorsement before going to print



hypo15jan.doc

Miriam

*Dr Henrietta - Very content  
with these - I have merely  
shifted some of the text and  
changed a  
word or two.  
Well done.  
Hla phuu  
15.1.02*

15 JAN 2002  
CHM

human - apparently children under 1 yr of age are different - (I think because of ADH response). Do these guidelines then apply to children under 1 yr of age.

**ANY CHILD RECEIVING PRESCRIBED FLUIDS IS AT RISK OF HYPONATRAEMIA**

↑ might need a new title now eg. Fluid replacement in children - the risks of hyponatraemia

**INTRODUCTION**

- Every child on IV fluids or oral rehydration is potentially at risk of hyponatraemia.
- 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.
- 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.
- 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

↑ outline or write ved.

**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

007-007-011



## CHOICE OF FLUID

- **Maintenance** fluids must in all instances be dictated by the anticipated sodium and potassium requirements. The glucose requirements, particularly of very young children, must also be met.
- **Replacement** fluids must reflect fluid lost. In most situations this implies a minimum sodium content of 130mmol/l.
- In **resuscitating** 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 in light of the U&E analysis.

**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 every 12 hours 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.

If a child still needs prescribed fluids after 12 hours of starting, their requirements should be reassessed by a senior member of medical staff.

- **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 Na<sup>+</sup> falls is as important as the actual plasma level. A Na<sup>+</sup> 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.

DHSSPS

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

Capillary samples are adequate if venous sampling is not practical.

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 should be obtained from a senior member of medical staff including:

*or "such as" (in case they think it's all 3)*

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.