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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.**

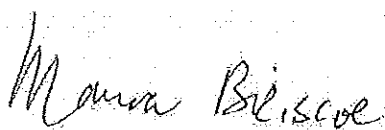
Further to my letter of 27 April 2007 on the above and addendum of 16 October
2007, http://www.dhsspsni.gov.uk/hsc_sqsd_20-07_wallchart.pdf,
please find attached in poster format, the Paediatric Parenteral Fluid Therapy
Wallchart developed in collaboration with the Regional Paediatric Fluid Therapy
Working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

This will replace the 2002 wallchart issued by CMO entitled "Any Child Receiving
Prescribed Fluids is at Risk of Hyponatraemia". **These should now be removed
from display.**

I should be grateful if you could ensure that these new posters are disseminated
within your Trust to all wards likely to accommodate children aged one month to 16
years old including A & E Departments, Adults Wards, Theatre & Intensive Care
Units.

It is vitally important that they are displayed as soon as possible and brought to the
attention of clinical staff.

Yours sincerely

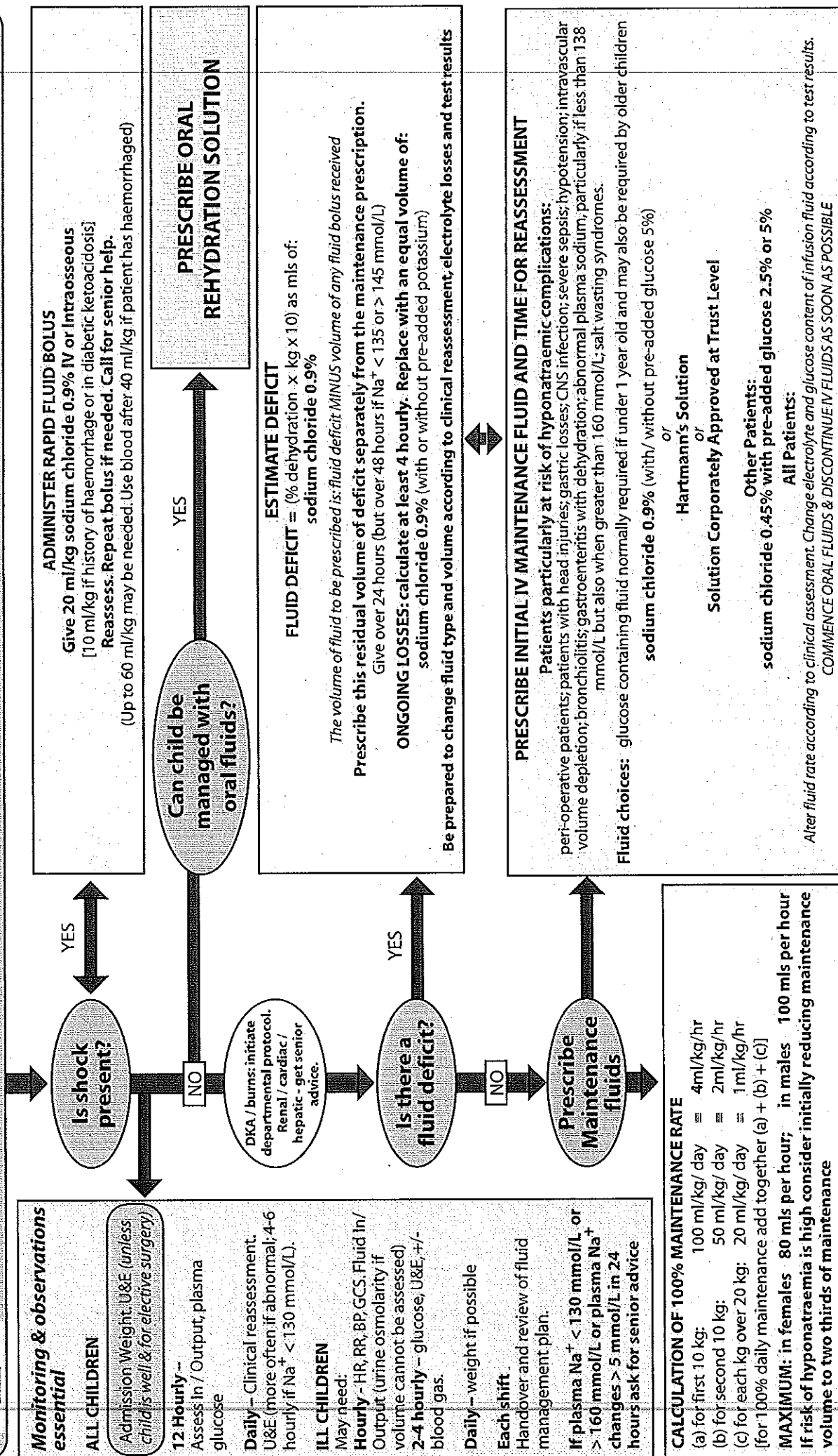
A handwritten signature in cursive script that reads "Maura Briscoe".

Dr Maura Briscoe
Safety, Quality and Standards Directorate

Encs: For Medical Directors & RQIA only

PAEDIATRIC PARENTERAL FLUID THERAPY (1 month – 16 yrs) Initial management guideline

Sept
2007



Hypokalaemia ($< 3.5 \text{ mmol/L}$): Check for initial deficit. Maintenance up to 40 mmol/L IV potassium usually needed after 24 hrs using pre-prepared potassium infusions as far as possible. Consult Trust Policy on IV strong potassium.

Oral intake and Medications: volumes of intake, medications & drug infusions must be considered in the fluid prescription.

Hypoglycaemia ($< 3 \text{ mmol/L}$): Medical Emergency: give 5 ml/kg bolus of glucose 10%. Review maintenance fluid, consult with senior and recheck level after 15-30 mins. **INTRA-OPERATIVE PATIENTS:** consider monitoring plasma glucose.

Symptomatic Hyponatraemia: check U&E if patient develops nausea, vomiting, headache, irritability, altered level of consciousness, seizures or apnoea. This is a Medical Emergency and must be corrected.

Commence infusion of sodium chloride 2.7% at 2 ml/kg/hour initially and get senior advice immediately.

Monitoring & observations essential

ALL CHILDREN

Admission Weight, U&E (unless child is well & for elective surgery)

12 Hourly –

Assess In / Output, plasma glucose

Daily – Clinical reassessment.

U&E (more often if abnormal; 4-6 hourly if $\text{Na}^+ < 130 \text{ mmol/L}$).

ILL CHILDREN

May need:

Hourly – HR, RR, BP, GCS; Fluid In/Output (urine osmolality 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 $\text{Na}^+ < 130 \text{ mmol/L}$ or $> 160 \text{ mmol/L}$ or plasma Na^+ changes $> 5 \text{ mmol/L}$ in 24 hours ask for senior advice

YES

Is shock present?

NO

DKA / burns: initiate departmental protocol. Renal / cardiac / hepatic - get senior advice.

YES

Is there a fluid deficit?

NO

Prescribe Maintenance fluids

CALCULATION OF 100% MAINTENANCE RATE

(a) for first 10 kg: $100 \text{ ml/kg/day} \equiv 4 \text{ ml/kg/hr}$
(b) for second 10 kg: $50 \text{ ml/kg/day} \equiv 2 \text{ ml/kg/hr}$
(c) for each kg over 20 kg: $20 \text{ ml/kg/day} \equiv 1 \text{ ml/kg/hr}$
[for 100% daily maintenance add together (a) + (b) + (c)]

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

ADMINISTER RAPID FLUID BOLUS

Give 20 ml/kg sodium chloride 0.9% IV or Intravenous [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 40 ml/kg if patient has haemorrhaged)

YES

Can child be managed with oral fluids?

PRESCRIBE ORAL REHYDRATION SOLUTION

ESTIMATE DEFICIT

FLUID DEFICIT = (% dehydration $\times \text{kg} \times 10$) 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 $\text{Na}^+ < 135$ or $> 145 \text{ mmol/L}$)

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



PRESCRIBE INITIAL IV MAINTENANCE FLUID AND TIME FOR REASSESSMENT

Patients particularly at risk of hyponatraemic complications:

peri-operative patients; patients with head injuries; gastric losses; CNS infection; severe sepsis; hypotension; intravascular volume depletion; bronchiolitis; gastroenteritis with dehydration; abnormal plasma sodium, particularly if less than 138 mmol/L but also when greater than 160 mmol/L ; salt wasting syndromes.

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/ 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:

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

Consult Trust Policy on IV strong potassium.

Review maintenance fluid; consult with senior and recheck level after 15-30 mins. INTRA-OPERATIVE PATIENTS: consider monitoring plasma glucose.

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