



The Regulation and
Quality Improvement
Authority

RQIA INDEPENDENT REVIEW

Reducing the risk of hyponatraemia when administering intravenous infusions to children

**Summary report following Validation Visits to Trusts and
Independent Hospitals throughout Northern Ireland**

April 2008

THE REGULATION AND QUALITY IMPROVEMENT AUTHORITY

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paediatric parenteral fluid wall chart which should be complemented by information about the availability of infusion fluids in individual Trusts.

RQIA was asked to carry out an independent review to provide assurance to the Minister with regards to implementation of recommended actions outlined within the NPSA Alert 22. In addition, the dissemination of the clinical guidelines and wall chart throughout HSC Trusts and independent hospitals was also reviewed.

The findings in this report are based on the information provided by Trusts in response to the NPSA audit proforma and on observations made by, and views expressed to, the members of the independent Review Team during the validation visits to HSC Trust hospitals and independent hospitals.

2. The Review Methodology

For this review, RQIA used information provided in the NPSA audit proformas relating to Patient Safety Alert 22 : *Reducing the risk of hyponatraemia when administering intravenous infusions to children*, that were completed by Trusts and returned to DHSSPS. Independent hospitals were also asked to complete the audit proformas. The distilled information from the completed audits was used as the basis for assessment by the review team during validation visits to the Trusts and independent hospitals.

The review team comprised a dedicated team of independent peer and lay reviewers with expertise in the areas of nursing, medicine and pharmacy. (Annex E).

Given the very specific nature of this review, RQIA used a methodology whereby reviewers visited all HSC Trusts and Independent Hospitals to review the arrangements in place to implement the recommended actions outlined within the NPSA Alert 22 (Annex A). These recommended actions relate to paediatric patients from one month to 16 years old and are not intended for paediatric or neonatal intensive care units or specialist areas such as renal, liver, and cardiac units where hypotonic solutions have specialist indications. This was taken into account when validation visits to hospitals were being scheduled.

3. The Validation Visit

Each validation visit included meetings with multi-disciplinary clinical teams from both paediatric and adult intensive care facilities, wards, and departments that provide treatment for children that includes the administration of intravenous infusions. Further validation was sought through



visits to the clinical areas - wards, theatres, accident and emergency and pharmacy departments.

The site visits concluded with the Review Team providing a summation of interim findings to the organisation. This was followed up with a written report setting out main issues that need to be considered and recommendations for improvement. (Annex D)

4. Hospitals visited by the review team

Trust	Hospitals Visited
Southern	Craigavon Area Hospital Daisy Hill Hospital
Western	Altnagelvin Area Hospital Erne Hospital
Northern	Antrim Area Hospital Causeway Hospital Mid Ulster Hospital
South Eastern	Ulster Hospital Representatives from Lagan Valley Hospital attended the discussion group
Belfast	Musgrave Park Hospital Royal Belfast Hospital for Sick Children Representatives from Royal Victoria Hospital, Mater Hospital and Belfast City Hospital attended the discussion group
Independent Hospitals	North West Independent Hospital Ulster Independent Clinic

5. Summary of Findings

The members of the review Team have assessed that all HSC Trusts and independent hospitals that were visited by the review team have undertaken considerable work to reduce the risks of hyponatraemia when administering intravenous fluids to children. There was evidence in all areas visited of commitment to achieve full compliance with the recommendations made in the NPSA Patient Safety Alert 22 and to disseminate the Paediatric Parenteral Fluid

Therapy clinical guidelines and wall charts. The Review Team was provided with many examples of local, good practice initiatives in relation to reducing hyponatraemia in children. The Review team consider that opportunities should be created to share good practice across the Northern Ireland.

Clinical practice

The Review Team met clinical staff in all hospitals that paediatric care and services. Within a number of hospitals, paediatric consultants have taken on the role of clinical champions to ensure the Trust-wide dissemination of the Paediatric Parenteral Fluid Therapy clinical guidelines and wall charts; and implementation of revised paediatric intravenous fluid prescription and fluid balance charts. The Review team considers that there is a need to ensure that these measures are consistently applied in adult wards where children are treated.

Use of sodium chloride 0.18% with glucose 4% intravenous infusions

Four hospitals have completely removed Sodium Chloride 0.18% with Glucose 4% (No. 18 solution) intravenous infusions from stock and general use on site therefore maximising the reduction in risk. Details of action taken by individual hospitals are set out in Annexe D of this report.

If No. 18 solution remains available on site, there is a degree of prevailing risk. This requires local management from the perspective of robust supply processes and clear labelling to be in place that was not evident at the time of this review. Retention for use in adult areas carries risk for the older child (13 to 16 years old) who may be treated in adult areas where the solution is available.

Staff Training

The provision of intravenous prescription and administration training for non-paediatric staff caring for older children on adult wards was poor across all organisations visited by the review team.

Reporting of hospital-acquired hyponatraemia

The reporting, analysing and monitoring of incidents relating to hospital acquired hyponatraemia is central to an organisation being able to assure itself of safe practice and that actions linked to NPSA Alert 22 have been embedded into practice. The Review Team is concerned that there was little evidence of a reporting culture for incidents relating to intravenous fluids and hyponatraemia

in all sites visited. Appropriate systems are not in place for hospital staff to easily report, analyse and learn from intravenous fluids and hyponatraemia related incidents. This is a potential barrier to patient safety improvement and robust risk management generally.

The overview of the findings of this review and recommendations for improvement are set out in the following sections.

The findings and recommendations for individual hospitals are set out in table format as annex D of this report.

6. Findings and recommendations

NPSA Recommendation 1:

Remove sodium chloride 0.18% with glucose 4% intravenous infusions from stock and general use in areas that treat children. Suitable alternatives must be available.

Restrict availability of these intravenous infusions to critical care and specialist wards such as renal, liver and cardiac units. Ensure that suitable alternatives are available for use.

- Sodium chloride 0.18% with Glucose 4% (No. 18 solution) has been removed completely from stock in Craigavon Area Hospital, Daisy Hill Hospital, Altnagelvin Hospital and the North West Independent Clinic.
- No. 18 Solution is only available through pharmacy in the Antrim Area Hospital, Causeway Hospital, Mid Ulster Hospital and the Ulster Independent Clinic where additional supply and labelling controls are in place.
- In the Royal Belfast Hospital for Sick Children No. 18 Solution is only available in the Paediatric Intensive Care Unit and specialist renal unit.



- The Erne Hospital, Ulster Hospital and Musgrave Park Hospital have removed No. 18 solution from the clinical areas with the exception of adult intensive care units, high dependency units and theatre recovery. It is possible that these will be removed over time.
- The availability of No. 18 solution on site clearly retains some degree of prevailing risk, which requires local management from the perspective of robust supply processes, and clear labelling that was not evident at the time of this review. Additionally, retention for use in adult areas carries risk for the older child (13 to 16 years old) who may be treated in adult areas where the solution is available and where they may be treated by non paediatricians.

Local Good Practice initiatives

The removal of Sodium chloride 0.18% with Glucose 4% (No. 18 solution) completely from stock in Craigavon Area Hospital, Daisy Hill Hospital, Altnagelvin Hospital and the North West Independent Clinic.

Recommendations for Improvement

- REC 1** All hospitals should monitor the ongoing use of No. 18 solution to enable assurance that infusions are removed from stock and general use in areas that treat children.
- REC 2** Where appropriate, hospitals must be able to demonstrate that an active strategy is in place for minimising risk of use in clinical areas that continue to stock No 18 solution and where children are accommodated. For example, provision of additional labelling or separate storage for those No.18 solution bags still stocked in such clinical areas.

NPSA Recommendation 2:

Produce and disseminate clinical guidelines for the fluid management of paediatric patients. These should give clear recommendations for fluid selection, and clinical and laboratory monitoring.

Ensure that these are accessible to all healthcare staff involved in the delivery of care to children.

- All hospitals have reviewed local clinical guidelines for fluid management of paediatric patients.
- All hospitals have received and have displayed the Paediatric Parenteral Fluid Therapy wall-charts in areas that treat children. In Daisy Hill Hospital and the Erne Hospital staff had failed to remove previous wall-charts but this was rectified immediately and commitment given to checking all other areas. Altnagelvin Hospital had displayed a locally produced, modified version of the wall-chart. There were no clinical guidelines in the Ulster Independent Clinic for visiting doctors who may manage patients up to 16 years old.
- Raising staff awareness has taken place across all organisations, with Antrim Area Hospital, Altnagelvin Hospital and the Royal Belfast Hospital for Sick Children indicating exemplary action such as arranging awareness days and help desks in relation to raising the profile of this subject.
- All hospitals have used the opportunity to revise existing local written guidance in line with the regional guidelines and are in the process of disseminating these throughout all relevant clinical areas.
- Clinical champions in hospitals such as the Antrim Area Hospital, Altnagelvin Hospital, Ulster Hospital and RBHSC have taken the opportunity to share expertise in relation to the production of local written guidelines.

Local Good Practice initiatives

The provision of awareness days / sessions and help desks to raise the profile of clinical guidelines for paediatric intravenous infusion as indicated in Antrim Area Hospital, Altnagelvin Hospital and the Royal Belfast Hospital for Sick Children.

The use of Clinical champions in hospitals such as the Antrim Area Hospital, Altnagelvin Hospital, Ulster Hospital and RBHSC to share expertise in relation to the production of local written guidelines.



Recommendations for Improvement

- REC 3** All hospitals should continue with the ongoing work of disseminating clinical guidelines. This should be undertaken in conjunction with multidisciplinary awareness-raising and education on the use of the guidance and wall chart in all settings where children may be treated. This is particularly important in adult wards where older children are treated.
- REC 4** Independent hospitals must be assured that all visiting doctors who may manage patients up to 16 years old use the clinical guidelines when managing children being treated with intravenous infusions.
- REC 5** All hospitals should ensure that the DHSSPS Paediatric Parenteral Fluid Therapy wall-chart issued by DHSSPS in October 2007 is displayed in clinical areas where children may be treated, with a list of available local fluids available alongside it. All previous versions of the wall chart should be removed from clinical areas.

NPSA Recommendation 3

Provide training and supervision for all staff involved in the prescribing, administering and monitoring of intravenous infusions for children.

- There was evidence that the provision of intravenous prescription and administration training for non-paediatric staff caring for older children on adult wards was poor across all organisations visited by the review team.
- Junior doctors in specialties other than paediatrics do not attend intravenous prescription and administration training that is provided in paediatrics.
- The NPSA in association with BMJ learning have developed a e-learning module that gives information about safely prescribing, administering, and monitoring intravenous fluids for children. It highlights the main risks and key issues that should be considered and looks in detail at the risk of children developing acute hyponatraemia as a result of receiving intravenous fluids.

This module is free and can be accessed on the BMJ e-learning web-site at :
<http://learning.bmj.com/learning/search-result.html?moduleId=5003358>



- Reviewers discussed the use of this module with hospital staff. It was noted that 10 of the 12 hospitals had heard of the availability of the e-learning module and were making extensive use of it. Four hospitals had mandated that new staff (both doctors and nurses) complete the e-learning module before commencing practice and three had mandated completion of the e-learning module for all existing paediatric staff.

Local Good Practice initiatives

The requirement that relevant staff complete the BMJ e-learning module that covers areas such as safely prescribing, administering, and monitoring intravenous fluids for children in Antrim Area Hospital, Ulster Hospital, Royal Belfast Hospital for Sick Children, Causeway Hospital .

Recommendations for Improvement

- REC 6** Hospitals should assure themselves that staff have the appropriate skill and knowledge in this clinical area. Competency assessment tools in administration of intravenous infusion to children should be developed, formalised and implemented for all relevant, multi-professional staff.
- REC 7** Hospitals should continue to review, collaborate and implement organisation wide policy and guidelines, in relation to intravenous infusion for children.
- REC 8** All organisations should ensure the development and provision of multidisciplinary education opportunities in administration of intravenous infusion to children and that all relevant clinical staff uptake this education.
- REC 9** Organisations should develop mechanisms to identify the location of patients aged 14-16 years who are in adult wards and ensure staff who care for those children are provided with competency based, assessed education in administration of intravenous infusion to children.
- REC 10** All hospitals should make wider use of training sources available such as BMJ E-Learning Module on Hyponatraemia to address different learning styles and devise a mechanism to ensure 100% multi-professional uptake of such learning.



NPSA Recommendation 4

Reinforce safer practice by reviewing and improving the design of existing intravenous fluid prescriptions and fluid balance charts for children.

- All hospitals have recently reviewed documentation for prescribing and monitoring IV fluid administration.
- Craigavon Area Hospital, Daisy Hill Hospital, Royal Belfast Hospital for Sick Children, the North West Independent Hospital have each carried out a revision of prescription charts prior to release of the NPSA Alert 22, and are now committed to auditing the success of the revisions as recommended in the NPSA document. The Antrim Area Hospital, Causeway Hospital, Mid Ulster Hospital and Ulster Hospital, Dundonald are each progressing the implementation of revised intravenous fluid prescription and fluid balance charts.

Recommendations for Improvement

- REC 11** **Priority must be given to the completion of a Trust-wide review, and implementation of revised paediatric intravenous fluid prescription and fluid balance charts in all settings where children may be treated including adult wards where children are treated.**

NPSA Recommendation 5

Promote the reporting of hospital-acquired hyponatraemia via local risk management systems and implement an audit programme to ensure NPSA recommendations and local procedures are being adhered to.

- Altnagelvin and Erne Hospitals submitted evidence that hyponatraemia or intravenous fluid related incidents were being reported. This lack of data from all other hospitals appeared to be linked to a general culture of under-reporting rather than a lack of this type of incident occurring.

- Craigavon Area Hospital and Daisy Hill Hospital are currently reviewing local general incident reporting arrangements following the RPA merger of legacy Trusts.
- In Antrim Area Hospital, 'trigger lists' have been developed to aid understanding of the types of incidents to be reported, this tool had been adopted more widely in the Causeway Hospital and the Royal Belfast Hospital for Sick Children which is an example of sharing good practice.
- Antrim Area Hospital and Altnagelvin Hospital have developed systems whereby biochemical results in a given range would prompt a proactive alert to clinical staff. Results are also being retrospectively reviewed/audited to support appropriate clinical activity.
- A proposal has been submitted to the Guidelines and Audit Implementation Network (GAIN) for a regional audit on the uptake of the Paediatric Parenteral Fluid Therapy guidance and potential unexpected clinical consequences of the guideline. The Review team welcomes this initiative in area of health care where there is a paucity of evidence.

Local Good Practice initiatives

The development of 'trigger lists' to aid understanding of the types of incidents to be reported in Antrim Area Hospital which has been adopted more widely in the Causeway Hospital and the Royal Belfast Hospital for Sick Children which is an example of sharing good practice.

In Antrim Area Hospital and Altnagelvin Hospital systems have been developed whereby biochemical results in a given range prompt a proactive alert to clinical staff. The results are retrospectively reviewed / audited to support appropriate clinical activity.

Recommendations for improvement

- REC 12** All hospitals should develop a culture of incident reporting, analysis and learning generally and specifically in respect of intravenous fluids and hyponatraemia.
- REC 13** Plans for development of systems for reporting, analysing and monitoring incidents to assure hospitals of safe practice and



that actions linked to NPSA Alert 22 should be implemented and regularly audited by all hospitals to ensure adherence to the process.

- REC 14** The development of 'trigger lists' that have been adopted by the Antrim Area Hospital to aid understanding of the types of incidents to be reported should be shared and taken up more widely .
- REC 15** The development of an audit tool which may include wider aspects but should address as a minimum aspects of NPSA Alert 22 should continue to be progressed and used at least annually.
- REC 16** Trusts should continue to seek approval and funding for a regional audit (GAIN proposal) on the uptake of the Paediatric Parenteral Fluid Therapy guideline and potential unexpected clinical consequences of the guideline.

Summary of Recommendations for Improvement

- REC 1** All hospitals should monitor the ongoing use of No. 18 solution to enable assurance that infusions are removed from stock and general use in areas that treat children.
- REC 2** Where appropriate, hospitals must be able to demonstrate that an active strategy is in place for minimising risk of use in clinical areas that continue to stock No 18 solution and where children are accommodated. For example, provision of additional labelling or separate storage for those No.18 solution bags still stocked in such clinical areas.
- REC 3** All hospitals should continue with the ongoing work of disseminating clinical guidelines. This should be undertaken in conjunction with multidisciplinary awareness-raising and education on the use of the guidance and wall chart in all settings where children may be treated. This is particularly important in adult wards where older children are treated.
- REC 4** Independent hospitals must be assured that all visiting doctors who may manage patients up to 16 years old use the clinical guidelines when managing children being treated with intravenous infusions.
- REC 5** All hospitals should ensure that the DHSSPS Paediatric Parenteral Fluid Therapy wall-chart *issued by DHSSPS in October 2007* is displayed in clinical areas where children may be treated, with a



list of available local fluids available alongside it. All previous versions of the wall chart should be removed from clinical areas.

- REC 6** Hospitals should assure themselves that staff have the appropriate skill and knowledge in this clinical area. Competency assessment tools in administration of intravenous infusion to children should be developed, formalised and implemented for all relevant, multi-professional staff.
- REC 7** Hospitals should continue to review, collaborate and implement organisation wide policy and guidelines, in relation to intravenous infusion for children.
- REC 8** All hospitals should ensure that the development and provision of multidisciplinary education opportunities in administration of intravenous infusion to children and that all relevant clinical staff uptake this education.
- REC 9** Hospitals should develop mechanisms to identify the location of patients aged 14-16 years who are in adult wards and ensure staff who care for those children are provided with competency based, assessed education in administration of intravenous infusion to children.
- REC 10** All hospitals should make wider use of training sources available such as BMJ E-Learning Module on Hyponatraemia to address different learning styles and devise a mechanism to ensure 100% multi-professional uptake of such learning.
- REC 11** Priority must be given to the completion of a Trust-wide review, and implementation of revised paediatric intravenous fluid prescription and fluid balance charts in all settings where children may be treated including adult wards where children are treated.
- REC 12** All hospitals should develop a culture of incident reporting, analysis and learning generally and specifically in respect of intravenous fluids and hyponatraemia.
- REC 13** Plans for development of systems for reporting, analysing and monitoring incidents to assure organisations of safe practice and that actions linked to NPSA Alert 22 should be implemented and regularly audited by all hospitals to ensure adherence to the process.
- REC 14** The development of 'trigger lists' that have been adopted by a the Antrim Area Hospital to aid understanding of the types of



incidents to be reported should be shared and taken up more widely .

REC 15 The development of an audit tool which may include wider aspects but should address as a minimum aspects of NPSA Alert 22 should continue to be progressed and used at least annually.

REC 16 Trusts should continue to seek approval and funding for a regional audit (GAIN proposal) on the uptake of the Paediatric Parenteral Fluid Therapy guideline and potential unexpected clinical consequences of the guideline.



ANNEX A

NPSA PATIENT SAFETY ALERT 22: REDUCING THE RISK OF HYPONATREMIA WHEN ADMINISTERING INTRAVENOUS INFUSIONS TO CHILDREN

Patient safety alert

22



Alert

28 March 2007

Immediate action	<input type="checkbox"/>
Action	<input checked="" type="checkbox"/>
Update	<input type="checkbox"/>
Information request	<input type="checkbox"/>

Ref: NPSA/2007/22

Reducing the risk of hyponatraemia when administering intravenous infusions to children

The National Patient Safety Agency (NPSA) is issuing advice to healthcare organisations on how to minimise the risks associated with administering infusions to children.

The development of fluid-induced hyponatraemia in the previously well child undergoing elective surgery or with mild illness may not be well recognised by clinicians. To date, the NPSA's National Reporting and Learning System (NRLS) has received only one incident report (that resulted in no harm), but it is likely that incidents have gone unreported in the UK.

Since 2000, there have been four child deaths (and one near miss) following neurological injury from hospital-acquired hyponatraemia (see definition on page 7) reported in the UK.¹⁻³ International literature cites more than 50 cases of serious injury or child death from the same cause, and associated with the administration of hypotonic infusions.⁴

Action for the NHS and the independent sector

The NPSA recommends that NHS and independent sector organisations in England and Wales take the following actions by 30 September 2007 to minimise the risk of hyponatraemia in children:

- 1 Remove sodium chloride 0.18% with glucose 4% intravenous infusions from stock and general use in areas that treat children. Suitable alternatives must be available. Restrict availability of these intravenous infusions to critical care and specialist wards such as renal, liver and cardiac units.
- 2 Produce and disseminate clinical guidelines for the fluid management of paediatric patients. These should give clear recommendations for fluid selection, and clinical and laboratory monitoring.
- 3 Provide adequate training and supervision for all staff involved in the prescribing, administering and monitoring of intravenous infusions for children.
- 4 Reinforce safer practice by reviewing and improving the design of existing intravenous fluid prescriptions and fluid balance charts for children.
- 5 Promote the reporting of hospital-acquired hyponatraemia incidents via local risk management reporting systems. Implement an audit programme to ensure NPSA recommendations and local procedures are being adhered to.

For response by:
• All NHS and independent sector organisations in England and Wales

For action by:
• The chief pharmacist/pharmaceutical adviser should lead the response to this alert, supported by the chief executive, medical director, nursing director and clinical governance lead/risk manager

We also recommend you also inform:

- Clinical governance leads and risk managers
- Clinical directors – paediatrics and child health
- Clinical directors – anaesthetics
- Clinical directors – surgery
- Directors of NHS laboratories
- Medical staff
- Nursing staff
- Pharmacy staff
- Patient advice and liaison service staff in England
- Procurement managers

The NPSA has informed:

- Chief executives of acute trusts, primary care organisations, ambulance trusts, mental health trusts and local health boards in England and Wales
- Chief executives/regional directors and clinical governance leads of strategic health authorities (England) and regional offices (Wales)
- Healthcare Commission
- Healthcare Inspectorate Wales

- Medicines and Healthcare products Regulatory Agency
- Business Services Centre (Wales)
- NHS Purchasing and Supply Agency
- Welsh Health Supplies
- Royal colleges and societies
- NHS Direct
- Relevant patient organisations and community health councils in Wales
- Independent Healthcare Forum
- Independent Healthcare Advisory Services
- Commission for Social Care Inspection

ANNEX B

DHSSPS Circular HSC (SQS) 20/2007

NPSA PATIENT SAFETY ALERT 22: REDUCING THE RISK OF HYPONATRAEMIA WHEN ADMINISTERING INTRAVENOUS INFUSIONS TO CHILDREN

Safety, Quality and Standards Directorate
Office of the Chief Medical Officer



Department of
Health, Social Services
and Public Safety

As Páirtí
Sláinte, Seirbhísí Sóisialta
agus Sábháilteachta Poiblí

www.healthcare.gov.ie

For action:

Chief Executives of HSC Trusts
Chair - Regional Paediatric Fluid Therapy Working Group
NI Medicines Governance Team
Regulation and Quality Improvement Authority (for cascade to
independent hospitals, hospices and relevant regulated
establishments)

For information:

David Sissling, Chief Executive Designate, HSCA
Chief Executives HSC Boards
Medical Directors HSC Trusts
Medical Director NIAS
Directors of Public Health
Directors of Nursing HSC Boards/ HSC Trusts
Directors of Pharmacy HSC Boards/ HSC Trusts
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Professor James McElhany, Dean of Life and Health Science, UJ
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Circular HSC (SQS) 20/2007

27 April 2007

Dear Colleague

NPSA PATIENT SAFETY ALERT 22: REDUCING THE RISK OF HYPONATRAEMIA WHEN ADMINISTERING INTRAVENOUS INFUSIONS TO CHILDREN

Introduction

1. The National Patient Safety Agency (NPSA) has issued advice to the NHS on how to reduce the risks associated with administering infusions to children (see below). The recommendations made in the NPSA Patient Safety Alert relate to paediatric patients from one month to 16 years old. They are not intended for paediatric or neonatal intensive care units or specialist areas such as renal, liver, and cardiac units where hypotonic solutions have specialist indications.
2. HSC organisations are required to implement the actions identified in the Alert by 30 September 2007. Independent sector providers which administer intravenous fluids to children will also wish to ensure that the actions specified in the alert are implemented in their organisations within the same time scale.

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NPSA Alert 22

3. The NPSA Alert 22 is available on http://www.npsa.nhs.uk/site/media/documents/2449_PaediatricInfusionsPSAFINAL.pdf

A number of resources have been developed by NPSA to support implementation of the Alert. All materials are available on www.npsa.nhs.uk/health/alerts. These include:

- A **guideline template** to assist with the production of local clinical guidelines;
- A **prescription template** providing ideas on how local prescriptions for intravenous fluids can be improved;
- An **e-learning module** for clinical staff prescribing paediatric infusion therapy;
- A **practice competence statement** for the prescribing and monitoring of intravenous infusions;
- An **audit checklist** to assist organisations with an annual audit process to ensure that the recommendations are embedded and maintained within practice; and
- A **patient briefing**.

Local Development of Clinical Guidelines

4. It should be noted that one of the actions in the NPSA Alert is for each NHS organisation to produce and disseminate local clinical guidelines for the fluid management of paediatric patients based on the suggested NPSA guidelines template. As The Northern Ireland Regional Paediatric Fluid Therapy Working Group and the NI Medicines Governance Team were part of the NPSA external reference group, the Department has asked both of these groups to work collaboratively to produce an intravenous fluid clinical guideline in accordance with NPSA guidance, by **31 July 2007**. This will then be disseminated to each HSC Trust for local implementation and monitoring.

ACTION

5. HSC Trust Chief Executives are responsible for implementation of NPSA Alert 22. All Trusts should:
- a. Develop an action plan and ensure that action is underway by **2 July 2007**;
 - b. Complete actions by **30 September 2007**; and
 - c. Return the audit template, by **31 October 2007**: www.npsa.nhs.uk/site/media/documents/2452_Paediatric_audit_checklist.doc to the Safety, Quality and Standards Directorate in DHSSPS at [qualityandsafety](#). The purpose of this return is to ensure full implementation of the actions as set out in the Alert.
6. The return of the audit proforma should be accompanied by an endorsement by the Chief Executive to confirm that the named HSC Trust has undertaken an internal audit in line with the audit tool, and that the recommended actions have been fully implemented.
7. The audit proforma should also be copied to the Regulation and Quality Improvement Authority who may wish to incorporate the Trust's evidence as part of their clinical and social care governance reviews in 2007/08. RQIA will also wish to ensure that **relevant independent establishments are compliant with this Alert.**

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The Regulation and
Quality Improvement
Authority

Conclusion

8. Much work has already been done in HSC organisations to promote the safe and effective care of children receiving intravenous fluid. The NPSA Alert 22 builds on the experience gained locally and seeks to promote a consistent approach across provider organisations. You are asked to ensure that this circular is widely communicated to staff.

Yours sincerely

DR MICHAEL McBRIDE
Chief Medical Officer

DR NORMAN MORROW
Chief Pharmaceutical Officer

MR MARTIN BRADLEY
Chief Nursing Officer

Working for a Healthier People

ANNEX C

DHSSPS Circular HSC (SQS) 20/2007 Addendum

NPSA PATIENT SAFETY ALERT 22: REDUCING THE RISK OF HYPONATRAEMIA WHEN ADMINISTERING INTRAVENOUS INFUSION TO CHILDREN – REGIONAL CLINICAL GUIDELINES



Department of
**Health, Social Services
and Public Safety**
An Roinn
**Sláinte, Seirbhísí Sóisialta
agus Sábháilteachta Poiblí**
www.hssps.gov.uk

Safety, Quality and Standards Directorate
Office of the Chief Medical Officer

For action:

Chief Executives of HSC Trusts
Regulation and Quality Improvement Authority (for cascade to
independent hospitals, hospices and relevant regulated
establishments)

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For information:

Chair -Regional Paediatric Fluid Therapy Working Group
NI Medicines Governance Team
David Sissling, Chief Executive (designate) HSCA
Regional Director Public Health
Chief Executives HSS Boards
Directors of Pharmacy HSC Boards/ HSC Trusts
Medical Directors HSC Trusts
Medical Director NIAS
Directors of Public Health
Directors of Nursing HSC Boards/ HSC Trusts
Chair – GAIN
Northern Ireland Clinical & Social Care Governance Support
Team
Head of School of Medicine and Dentistry, QUB
Professor Hugh McKenna, Dean of Life and Health Science, UU
Professor Jean Orr CBE, Head of School of Nursing and
Midwifery, QUB
Dr Carol Curran, Head of School of Nursing, UU
Ms Donna Gallagher, Staff Tutor of Nursing, Open Nursing
Professor David Cousins NPSA
Chief Executive NIMDTA, NICPPET, NIPEC

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**Circular HSC (SQS) 20/2007 -
Addendum**

16 October 2007

Dear Colleague

NPSA PATIENT SAFETY ALERT 22: REDUCING THE RISK OF HYPONATRAEMIA WHEN ADMINISTERING INTRAVENOUS INFUSIONS TO CHILDREN – REGIONAL CLINICAL GUIDELINES

Introduction

Circular HSC(SQS) 20/2007 informed you about the National Patient Safety Agency alert on
administering infusions to children aged from 1 month to 16 years.

The NPSA alert is to be implemented by 30 September 2007, and an audit template
completed and returned to DHSSPS by 31 October 2007.

The Northern Ireland Regional Paediatric Fluid Therapy Working Group and the Northern Ireland Medicines Governance Team were asked to develop a clinical fluid guideline in accordance with NPSA guidance, to be disseminated to HSC Trusts for local implementation and monitoring. A regional paediatric fluid guideline, which has been endorsed by the Department, is attached.

The Regional Paediatric Fluid Guideline

The fundamental layout selected for this guideline complements a structured approach to patient clinical assessment. A sequence of questions is offered that prompts the clinician to assess for the presence of shock and guides treatment, if required; further assessment of whether there is also a deficit to be considered and then the calculation and prescribing for maintenance requirements, is also included.

The guideline emphasises that assessment of each patient should include a decision on whether oral fluid therapy could be appropriately initiated instead of intravenous therapy and further prompts reconsideration of this question when IV therapy is reviewed. *The guidance is not a replacement for individual patient assessment, treatment and reassessment or for consultation with a senior clinician.*

Promoting Safe Use of Injectable Medicines

Organisations should also note that the NPSA Patient Safety Alert 20 on Promoting Safe Use of Injectable Medicines was issued on 4 June 2007 for local implementation. Circular HSC(SQSD)28/2007 refers. Action included a risk assessment of injectable medicine procedures and products and the development of an action plan to minimise risk. As indicated in this circular, Chief Executives should have nominated Chief Pharmacists, Pharmaceutical Directors/Advisers and Heads of Pharmacy and Medicines Management in HSC organisations to lead the action required.

Organisations should use ready to administer preparations and, if possible, avoid the need for potassium chloride to be added in clinical settings. Staff should consult the local Trust policy on IV strong potassium. Information about the availability of infusion fluids in individual hospitals should be attached to the Regional Paediatric Fluid Guideline wall chart so that all prescribers are made aware of the infusion fluids available for use in the local hospital.

ACTION

1. *HSC Trusts (and other establishments) should ensure that the guideline is available and followed for fluid prescribing for children aged 1 month to 16 years. Children may be treated in adult wards and Accident and Emergency units, therefore, the guideline should be implemented in all settings where children aged 1 month to 16 years are treated.*

Certain groups of children such as those with renal, cardiac or hepatic conditions, or suffering from burns or diabetic keto-acidosis (DKA) or those treated in intensive care will require management under special protocols; however, this guideline will be helpful in their initial assessment and management.

2. *Where a senior clinician(s) considers that a "special" maintenance infusion fluid is required, then this alternative choice for fluid maintenance must be endorsed by the Chief Executive of the Trust with clear documentation of the reasons for that endorsement.*



3. **Information about the availability of infusion fluids in individual Trusts should be developed by Trust Directors of Pharmacy and attached to the regional paediatric fluid guideline wall chart locally.**
 4. **Medical directors, in collaboration with other Directors and educational providers, should ensure that all prescribers are made aware of this circular and wall chart, and that the contents are brought to the attention of new junior prescribers on an ongoing basis.** Educational material to support this guideline is available on <http://www.bmjlearning.com/planrecord/servlet/ResourceSearchServlet?keyWord=All&resourceId=5003358&viewResource>.
- In order to ensure the effective implementation of this guidance and to promote a user friendly version for the use by individual clinicians, the Department has asked the NI Medical and Dental Training Agency to work with Regional Paediatric Fluid therapy Group to produce wall and pocket charts appropriate to the needs of individuals and teams. These will be circulated in the near future. In addition, the NIMDTA should work with Trusts and other training agencies to ensure that the principles of paediatric fluid therapy and its potential risks, as highlighted in the National Patient Safety Agency Alert, are highlighted in postgraduate training programmes.
5. **Trust Directors of Pharmacy should develop a progress report on important supply issues in respect of all infusion fluids relevant to this regional paediatric fluid guideline and submit a report to the Pharmacy Contracting Evaluation Group and copied to the Regional Paediatric Fluid Therapy Working Group.**

Conclusion

This circular is an addendum to Circular HSC(SQS)20/2007 which informed you about implementation of the NPSA alert on reducing the risk of hyponatraemia when administering intravenous infusions to children. This Alert is applicable to HSC Trusts and other independent hospitals, hospices and regulated establishments.

A regional clinical guideline is attached to assist in implementation of Circular HSC(SQS)20/2007.

A commercially produced version of the wallchart and pocket version will be circulated by NIMDTA to HSC organisations when it becomes available. This should be complemented by information about the availability of infusion fluids in individual Trusts.

The Department expects HSC organisations to complete the NPSA audit template and return it to the Department by 31 October 2007, as outlined in Circular HSC(SQS)20/2007.

Yours sincerely

DR MICHAEL McBRIDE
Chief Medical Officer

DR NORMAN MORROW
Chief Pharmaceutical Officer

MR MARTIN BRADLEY
Chief Nursing
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ANNEX D

Circular HSC (SQS) 20 / 2007 was issued in June 2007, to inform organisations (HSC Trusts, and other independent hospitals, hospices and regulated establishments) about the NPSA Alert 22 on administering intravenous infusions to children aged from one month to sixteen years. The actions that organisations were asked to implement in this circular are listed as recommendations as follows:

NPSA recommendations

Recommendation 1:

Remove sodium chloride 0.18% with glucose 4% intravenous infusions from stock and general use in areas that treat children. Suitable alternatives must be available.

Restrict availability of these intravenous infusions to critical care and specialist wards such as renal, liver and cardiac units. Ensure that suitable alternatives are available for use.

Recommendation 2:

Produce and disseminate clinical guidelines for the fluid management of paediatric patients. These should give clear recommendations for fluid selection, and clinical and laboratory monitoring.

Ensure that these are accessible to all healthcare staff involved in the delivery of care to children.

Recommendation 3

Provide training and supervision for all staff involved in the prescribing, administering and monitoring of intravenous infusions for children.

Recommendation 4

Reinforce safer practice by reviewing and improving the design of existing intravenous fluid prescriptions and fluid balance charts for children.



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	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
Recommendations		<p>Continue with programme for rolling out and implementing paediatric clinical guidelines for the fluid management of paediatric patients in adult wards where children are treated.</p> <p>Develop mechanisms to ensure absolute clarity for the clinical responsibility of fluid management for 14-16 year olds from the perspective of prescribing, monitoring and reviewing on a daily basis.</p> <p>Remove all old versions of wall chart from clinical areas.</p>	<p>Make wider use of training sources available such as BMJ E-Learning Module on Hyponatraemia to address different learning styles.</p> <p>Develop a multidisciplinary structured approach to assessment of competences in relation to Hyponatraemia.</p>	<p>Continue to progress the introduction of paediatric prescription sheet for 14-16 year olds in adult wards.</p>	<p>Undertake planned audit of the system for paediatric fluid management.</p> <p>Devise and implement and integrated approach to risk management and audit in Daisy Hill Hospital.</p>

Trust	Hospital	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
Western	ALT	No.18 solution is not stocked in the hospital	<p>The DHSSPS wall chart was not displayed. A modified version that includes local fluids available was on display.</p> <p>Pro-active dissemination of revised clinical guidelines is in place.</p>	<p>The management of paediatric IV infusion training needs of staff who work in adult wards where 14-16 year olds are treated are not always met.</p> <p>E-Learning has been considered, however staff are unable to access the site due difficulties with ICT systems in the Trust.</p> <p>Formal multidisciplinary structured approach to assessment of competencies in relation to hyponatraemia is not in evidence.</p>	<p>The Trust currently uses two separate charts across the two sites. A review of these charts is being carried out to produce a Trust wide chart for IV fluid prescribing and fluid balance chart is in progress.</p>	<p>General incident reporting is in place.</p> <p>No audit programmes are in place in relation to NPSA Alert 22.</p>
	ERNE	No 18 solution has been removed from all paediatric areas except ICU (where children are occasionally treated).	The published wall chart was not displayed in all relevant areas in the hospital.	<p>Multi-professional education and training in the management of paediatric iv infusions is provided for all grades of staff.</p> <p>Formal multidisciplinary structured approach to assessment of competencies in relation to hyponatraemia is not carried out.</p> <p>E-Learning has been considered, however staff are unable to access the site due difficulties with ICT systems in the Trust.</p>	<p>The Trust currently uses two separate charts across the two sites. A review of these charts is being carried out to produce a Trust wide chart for IV fluid prescribing and fluid balance chart is in progress.</p>	<p>There is no integrated system for risk management that encompasses incident reporting, analysis and learning of lessons.</p> <p>No audit programmes in relation to NPSA Alert 22.</p>



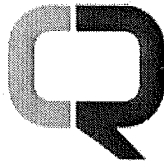
	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
Recommendations		The modified wall chart displayed in Alnagelvin Hospital should be replaced with the regional format, local fluids available displayed alongside it. Ensure all previous versions are removed.	<p>Ensure that training is undertaken by staff who care for patients in environments where 14-16 year olds are accommodated.</p> <p>Utilise a range of tools to appeal to different learning styles.</p> <p>Provide E-Learning opportunities where possible.</p> <p>Devise and Implement strategies to assess competencies in relation to intravenous administration.</p>	Revised IV fluid prescription and fluid balance charts should be implemented and monitored throughout the Trust.	Develop an improved focus on incident reporting throughout the Trust.

Trust	Hospital	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
Northern	AAH	Not stocked in any clinical areas (10 bags stored in emergency drug supply cupboard, administered by pharmacy).	Clinical guidelines disseminated to all departments in the Trust. Wall chart displayed in paediatric wards where all children up to 14 years 11 months are treated, A&E and theatres. Ongoing work raising awareness in adult wards with display and use of the algorithm for children up to 16 years.	Induction programmes for nurses and doctors include paediatric intravenous fluid administration. A multidisciplinary structured approach to assessment of competencies in relation to hyponatraemia is not formalised. Substantial uptake of e-learning by nursing and medical staff.	Revised paediatric iv infusion prescription and administration chart in use in paediatric ward.	A trigger list for critical incident reports is in use and available in the paediatric department and has been disseminated by the Medical Director to all other departments. Also since December 2007 the chemical pathology department has been providing details of all young people under 16 years with a Sodium of 130 mmol/l or less and this is part of the paediatric audit programme.
	CAUS	Held in controlled drug store in pharmacy only, consultants request if needed and pharmacist authorises.	Guidance has been reviewed and wall chart disseminated to all areas where children are managed including adult medical ward, surgical ward, obstetric department, A&E and theatre.	All medical staff in training are encouraged to complete e-learning module, all paediatric nurses have completed the e-learning module. A multidisciplinary structured approach to assessment of competencies in relation to hyponatraemia is not formalised.	A revised paediatric fluid balance chart is being developed - the chart in use in Antrim Area hospital has been offered as a model.	Trigger list for critical incidents produced and available in wards. Includes triggers around fluid management. Formalising audit tool in progress.
	MUH	Stored in emergency room in hospital, available if needed for non paediatric areas. Use is controlled -- no use since 06/07	Wall chart displayed in paediatric unit, A&E and adult ward areas. Dissemination and raising awareness of clinical guidelines in progress.	Some uptake of e-learning. A multidisciplinary structured approach to assessment of competencies in relation to hyponatraemia is not carried out.	The intravenous infusion fluid prescription sheet currently in use is being revised.	General incident reporting in place. Draft audit tool available but not yet finalised.

	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
Recommendations	Monitor ongoing use of No 18 solution.	<p>Continue ongoing work raising awareness and extend it to the adult wards with display and use of the algorithm for children up to 16 years.</p> <p>Consider formal roll out of education and training for non paediatric medical and nursing staff.</p> <p>Ensure that the wall chart is displayed in all areas where children are treated, including adult medicine and surgery.</p> <p>Develop mechanism to identify the location of 14-16 year olds and ensure management of intravenous infusions is in accordance with guidelines.</p>	<p>Ensure multidisciplinary uptake of e-learning opportunities provided.</p> <p>Further develop measures to assess competency in relation to intravenous fluid administration in children.</p>	<p>Continue to progress implementation of revised paediatric fluid intravenous infusion prescription charts Trust-wide.</p> <p>Ensure there are arrangements in place for monitoring the impact of the revised charts.</p>	<p>Continue to promote incident reporting generally and specifically in respect of intravenous fluids and hyponatraemia.</p> <p>Progress ratification of the draft audit tool that and implementation across the Trust.</p> <p>Further develop 'triggers' for incident reporting in prescribing fluids for children.</p> <p>Continue to seek approval and funding for a regional audit (GAIN proposal) on the uptake of the Paediatric Parenteral Fluid Therapy guideline and potential unexpected clinical consequences of the guideline.</p>

Trust	Hospital	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
South Eastern	UHD	No 18 solution is not stocked in areas that treat children, but is approved for stock in adult intensive care unit.	Clinical Guidelines reviewed in line with DHSSPS and disseminated to all areas where children are managed in the Trust, including settings outside the Ulster Hospital. Wall chart displayed in all paediatric areas.	Structured competency assessment methods in relation to hyponatraemia are in place. Some update of BMJ E-Learning module.	Review and implementation of revised charts is in progress.	A procedure is in place for the analysis of incidents where required. An audit tool in relation to NPSA Alert 22 has been developed and used within the past month. Dissemination of the audit tool across the trust is in progress.
Recommendations		Continue to monitor use of No 18 solution in adult intensive care unit. Review labelling arrangements of No 18 solution in intensive care unit, to include reference to patient groups whom it should not be used for i.e. 1 month – 16 years, in addition to the fact that it should not be supplied to other areas.	Continue ongoing work of disseminating the guidance and ensure multidisciplinary awareness and use of the guidance and wall chart in all settings where children may be treated, particularly in settings outside of the Ulster Hospital. Provide opportunities and ensure that all medical staff are aware and can implement the guidance contained in the intravenous guidance for children. Ensure maximum uptake of the BMJ e-learning module that is provided.	Further develop strategies that are in place to assess competencies in relation to intravenous administration. Devise a mechanism to ensure that all relevant areas across the Trust have staff who are trained in intravenous administration for children.	Progress the review, development and implementation of intravenous prescription and fluid balance chart to all paediatric areas across the Trust.	Progress plans for Trust wide audit.

Trust	Hospital	NPSA Rec 1 No. 18 sol	NPSA Rec 2 Clinical Guidelines	NPSA Rec 3 Staff training	NPSA Rec 4 Revision of paed. IV and FBC's charts	NPSA Rec 5 Incident reporting and audit
Independent Hospitals	UIC	No 18 solution has been removed from clinical areas.	<p>Clinical Guidelines reviewed and disseminated. Wall chart displayed in all clinical areas.</p> <p>No mechanism in place to ensure that visiting medical officers who may manage patients up to 16 years old are aware of the risks highlighted by NPSA Alert 22 and the revised clinical guidelines.</p>	<p>No evidence of formal training provided. Some awareness sessions have been provided.</p> <p>No access provided to e-learning module for any staff.</p> <p>There is no system to assess competency following intravenous training for all staff, (multi-professional).</p>	<p>The same fluid balance charts are used for adults and children.</p> <p>No formal review of prescription and fluid balance charts has been undertaken.</p>	<p>An incident reporting system is in place.</p> <p>An audit tool to audit actions in relation to implementation of recommendation in NPSA Alert 22 has not been developed.</p>
Recommendations		Continue to monitor the supply and use of No 18 solution.	The Clinic must assure itself that visiting medical personnel who manage children (up to the age of 16 years) are aware of the risks highlighted by NPSA Alert 22 and are aware of the clinical guidelines.	<p>Continue to raise awareness in relation to intravenous infusions for children for all staff.</p> <p>Provide training for all staff who may be involved in the administration of intravenous infusion with consideration being given to providing a range of learning opportunities for example, e-learning.</p> <p>Devise a system to assess competency following intravenous training for all clinical staff.</p>	Undertake a formal review of prescription and fluid balance charts and risk assess to ensure safe practice in the prescribing and monitoring of paediatric intravenous infusions.	<p>Continue with current activities in relation to incident reporting.</p> <p>Develop an audit tool which will assure the hospital of safe practice and embedding actions linked to NPSA Alert 22.</p>



ANNEX E

RQIA Independent Review “Scope of Review”

Management of Paediatric Intravenous infusions

In response to a request from the DHSSPS for independent assurance pertaining to circular (HSC(SQS)20/2007 - issued April 2007)), RQIA will review HSC Trusts, Agencies and Independent Hospitals and Hospices for evidence of implementation of the *National Patient Safety Agency (NPSA) Patient Safety Alert 22: Reducing the risk of Hyponatraemia when administering intravenous infusions to children* as follows:

1. Remove sodium chloride 0.18% with glucose 4% intravenous infusions from stock and general use in areas that treat children. Suitable alternatives must be available. Restrict availability of these intravenous infusions to critical care and specialist wards such as renal, liver and cardiac units. Ensure that suitable alternatives are available for use.
2. Produce and disseminate clinical guidelines for the fluid management of paediatric patients. These should give clear recommendations for fluid selection, and clinical and laboratory monitoring.
Ensure that these are accessible to all healthcare staff involved in the delivery of care to children.
3. Provide training and supervision for all staff involved in the prescribing, administering and monitoring of intravenous infusions for children.
4. Reinforce safer practice by reviewing and improving the design of existing intravenous fluid prescriptions and fluid balance charts for children.
5. Promote the reporting of hospital-acquired hyponatraemia via local risk management systems and implement an audit programme to ensure NPSA recommendations and local procedures are being adhered to.

An addendum to this circular was issued in October 2007 that included a regional clinical guideline as an attachment and the following listed the following recommendations for action:

1. HSC Trusts (and other establishments) should ensure that the guideline is available and followed for fluid prescribing for children aged 1 month to 16 years. Children may be treated in adult wards and Accident and Emergency units, therefore, the guideline should be implemented in all settings where children aged 1 month to 16 years are treated.
2. Where a senior clinician(s) considers that a “special” maintenance infusion fluid is required, then this alternative choice for fluid maintenance must be endorsed by the

Chief Executive of the Trust with clear documentation of the reasons for that endorsement.

3. Information about the availability of infusion fluids in individual Trusts should be developed by Trust Directors of Pharmacy and attached to the regional paediatric fluid guideline wall chart locally.

4. Medical directors, in collaboration with other Directors and educational providers, should ensure that all prescribers are made aware of this circular and wall chart, and that the contents are brought to the attention of new junior prescribers on an ongoing basis.

The Paediatric Parenteral Fluid Therapy Wallchart which was developed in collaboration with the Regional Paediatric Fluid Therapy Working Group should be disseminated within the 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.

This review will commence in November 2007 and conclude by June 2008 with visits to organisations planned for April 2008.

The review team :

Dr. Angela Bell is the Regional Coordinator for the Confidential Enquiry into Maternal and Child Health (CEMACH) since January 2006 following her appointment to the Health Protection Agency as Director of Maternal and Child Health. She worked as a consultant paediatrician with an interest in the newborn for 15 years at the Ulster Hospital, where she was also Clinical Director for Maternal and Child Health.

Miss Elizabeth Duffin is currently a lay reviewer for RQIA. She is a former nurse who has extensive senior healthcare management experience. She is also an assessor for CHKS.

Miss Linda Matthew is senior pharmacist, secondary care in the National Patient Safety Agency (NPSA), England. Prior to this role she was an executive director in an acute Trust in England where she was involved in commissioning, operational and risk management, governance and capability development to achieve the range of healthcare standards. She was a former Commission for Health Improvement reviewer until her appointment with the NPSA.

Mrs Valerie Morrison is a registered nurse with extensive experience in children's nursing. She is currently working as an Independent Professional Advisor with specific focus on education, professional regulation and quality assurance. This includes work with a range of regulators and other organisations in a national and international capacity.



Supported by:

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