Thames PAG meeting May 2005
Summary of Meeting
Diabetes in Children and other topics…

Pain information after day surgery

Isabeau Walker
Consultant Anaesthetist
Great Ormond Street Hospital

The Thames PAG pain information leaflet for parents for use after day surgery has been further developed, based on:

- Examples of good practice from the group
- 'Ask about medicines', an NHS/pharmaceutical industry initiative to improve drug information for patients (www.askaboutmedicines.org)
- Pain scores for parents and children, including the Faces pain scale and the Parents Postoperative Pain Measure (Chambers CT, Finley GA, McGrath PJ. The parents' postoperative pain measure: replication and extension to 2-6 year-old children. *Pain* 2003; 105: 437-443)
- Comments from the GOSH health information and language manager, pharmacy and ward nurses, and a few parents…(to go out to parent consultation panel for formal comment)

It will be posted on the website in Word and PDF formats – please use/comment/modify as you wish and we will discuss again at the next meeting.

Diabetes in Children

Perioperative management of children with diabetes: the NCL guidelines

Professor Peter Hindmarsh
Professor of Paediatric Endocrinology
Institute of Child Health and Great Ormond Street Hospital

Rebecca Thompson
Diabetes Nurse Specialist
Child and Adolescent Services
University College Hospitals

Professor Hindmarsh presented an overview of diabetes in children and the North Central London Paediatric Diabetes Network guidance on the management of children with diabetes undergoing surgery that is currently under review.

Important points to note were:

- Diabetic complications must be avoided, namely hypoglycaemia and ketoacidosis
- It is important to plan the admission with the child, their parents, the diabetic team, surgical team and anaesthetist. There should be a clear management plan documented in the notes.
- The child's usual insulin regiment should be known and will dictate perioperative management. Examples include:
    - Multiple Dose Insulin regimen (MDI) - ultra short or short acting insulin three times daily with main meals, once daily long acting insulin such as glargine (24hour duration, no peaks of action) at bedtime.
    - Continuous subcutaneous insulin infusion (CSII) – these small beeper sized systems deliver basal insulin with separate bolus insulin given for meals or to correct high blood glucose. The systems deliver short acting insulins only and should not be stopped; disconnection for any period of time risks ketoacidosis.
    - Twice daily insulin mixtures (less commonly used) e.g. Mixtard30 or HumalogMix 25

Common types of insulin in use are as below:

Insulin type	**Onset (hr)**	**Peak (hr)**	**Duration (hr)**
Ultra short (Novo Rapid, Humalog)	<0.5	1	3-4
Short (Actrapid, Humulin S, velosulin)	0.5-1	2-6	3-8
Long Acting			
Insulatard /Humulin I	3-4	4-12	10-20
Glargine /Detemir	1	None	24

Useful reference:

Diabetes mellitus and the pediatric anaesthetist Chadwick V, Wilkinson K Pediatric Anesthesia 2004; 14: 716-723

Care of the Child with Diabetic Ketoacidosis

Dr Mark Peters
Consultant Paediatric Intensivist
Great Ormond Street Hospital

Diabetic ketoacidosis (DKA) is the leading cause of morbidity and mortality in children with Type 1 diabetes. It may be the presenting symptom of diabetes, especially in younger children, or it may occur in children with known diabetes due to insulin omission or treatment error (only 25% of cases of DKA are due to inadequate insulin therapy during an intercurrent illness).

Cerebral oedema is the most common cause of death related to DKA.

Treatment of DKA requires specialist advice and you must contact the PICU or transport services **early** (**CATS 0800 085 003, www.cats.nhs.uk , South Thames Retrieval Service for Children 020 7188 5000)**

There is no rush to treat - it takes weeks for a child to develop diabetic ketoacidosis:

- DO NOT bolus insulin: Low dose insulin IVI 0.05unit/kg/hr
- DO NOT give >20mls/kg fluid for resuscitation (even this much may not be necessary)
- DO NOT institute artificial ventilation for falling GCS alone (osmolar therapy is first line for management of cerebral oedema)
- DO NOT institute artificial ventilation unless impending or actual respiratory arrest.

IMPORTANT: If intubation is required, AIM TO MAINTAIN $PaCO_2$ at PREINTUBATION LEVELS

This is because:
CSF pH determines cerebral blood flow.
CSF pH is more dependent on $PaCO_2$ than is arterial pH.
Therefore anything that raises $PaCO_2$ rapidly ($NaHCO_3$ administration or artificial ventilation) has a disproportionate effect on CSF pH and can rapidly cause vasogenic cerebral oedema.
These effects are most important at low serum [HCO_3].

Useful references:
Tasker RC, Lutman D, Peters MJ Hyperventilation in severe diabetic ketoacidosis. Pediatric Critical Care Medicine. 2005; 6: 405-411

Dunger DB, Sperling MA, Acerni CL et al ESPE/LWPES consensus statement on diabetic ketoacidosis in children and adolescents Arch Dis Child 2004; 89: 188-194

Ketamine: coming soon to an A&E department near you?

Mike Sury
Consultant Anaesthetist
Great Ormond Street Hospital

Mike raised the issue of ketamine use by non-anaesthetists. There have been large case series reported in the literature, e.g. McGlone et al. The Lancaster experience of 2.0 - 2.5 mg/kg intramuscular ketamine for paediatric sedation: 501 cases and analysis. Emerg Med J 2004; 21: 271-272.

Paediatric anaesthetists need to be aware of what is happening in their hospitals locally. An anaesthetist should be involved in drawing up protocols and establishing clinical governance arrangements for sedation practice for children in their hospital. This will be a topic for a future meeting…

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Date for next meeting: Thursday November 17th
Topic: Regional Anaesthesia
Ultrasound and the Paediatric Anaesthetist