



ESPA

European Society for Paediatric Anaesthesiology

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LECTURES INVITED SPEAKERS: DESCRIPTIONS AND KEAY LEARNING POINTS

MAIN ROOM THURSDAY SEPTEMBER 22ND 2011

13:30-15:00 **Origins of disease**

Genetics and genomics (John Van Den Anker)

Genetics and genomics have made a major impact on the safe and effective use of drugs in adults. However, in the paediatric population, there are currently only a few clear examples that show the importance of pharmacogenetics (-genomics) while using drugs in infants and children. In (preterm) neonates and young infants the link between genetics and developmental changes in drug metabolizing capacity is being investigated whereas for drugs that are substrates for cytochrome P450 enzymes (i.e., 2D6, 2C9, 2C19, etc.) the effect of mutations in the genes encoding these enzymes on safe and effective use of drugs are being elucidated. For several drugs used by the anaesthesiologist these cytochromes are involved and therefore the anaesthesiologist must be aware that for certain drugs individual patients might need a different dosing regimen based on their genetic background. Using several clinical examples this presentation will illustrate the importance of pharmacogenetics for optimizing pharmacotherapy. In addition it will emphasize the importance of a team (physician, pharmacist, pharmacologist, geneticist, etc.) approach to assure the appropriate translation of genetic knowledge into daily patient care. After this presentation participants will be better able to:

- Understand the link between genetics (genomics) and development during pharmacotherapy in neonates and young infants;
- Prevent therapeutic failure or serious adverse events while using drugs that are CYP2D6 substrates in infants and children.

John N. van den Anker, Paediatric Clinical Pharmacologist and Neonatologist, Children's National Medical Center, Washington, DC, USA

Obesity (Liam Brennan)

Obesity has reached epidemic proportions in all industrialised countries and is now becoming an increasing problem in childhood. 45 million children worldwide are obese and sadly 70% of these will go on to become obese adults.

The definition of childhood obesity has previously caused confusion and hampered research in this area. The well-established adult criteria for obesity of body mass index $> 30 \text{ kg.m}^{-2}$ is not appropriate in children as BMI changes as a function of age and gender. In response to these differences, age and gender-specific centile curves based on BMI data from a large multinational cohort of children have been produced.

More than 95% of childhood obesity cases are primary, caused by excessive calorie consumption. However, there is increasing evidence that genetic abnormalities of leptin production or function are associated with a human obese phenotype (Leptins are hypothalamic peptide hormones which regulate

satiety). Less than 5% of all obesity can be attributed to underlying causes such as cerebral damage, endocrine dysfunction or hereditary diseases.

Although there is an extensive adult literature on the problems of the obese adult in the perioperative period, research in the paediatric age group has been limited until very recently. We shall consider some of the latest literature on co-morbidities, perioperative complications and technical challenges when anaesthetising obese children.

We shall conclude by discussing the increasing demand for bariatric surgery in the paediatric population and finally consider the controversial question 'Should obesity be regarded as child abuse?'

After this session participants should have a better understanding of:

- Definitions of childhood obesity
- Aetiology
- Implications for anaesthesia

Liam Brennan, Consultant Paediatric Anaesthetist, Cambridge University Teaching Hospitals, Cambridge, UK

Respiratory disease (Karin Becke)

In childhood, respiratory diseases have a high prevalence: there are acute diseases like upper respiratory tract infections and chronic diseases like asthma bronchiale, bronchopulmonary dysplasia and cystic fibrosis. These are the most common reasons for the respiratory compromised child presenting for anaesthesia.

Asthma bronchiale is found in almost 5 % of all children with an increasing incidence.

Main symptoms are bronchospasm, mucosal edema and dyscriny. Main goals of general anaesthesia are to continue the medication, especially beta-mimetic agents and steroids. The paediatric anaesthetist should avoid agents which may lead to bronchospasm, e.g. thiopentone, desflurane, succinylcholine and morphine. Extubation of the trachea should be performed in deep anaesthesia without any unnecessary manipulation of the upper airway.

Bronchopulmonary dysplasia is a typical disease of the premature baby after respirator therapy. Postnatal inflammation and cellular lesions lead to reversible fibrosis caused by dysfunction of repair processes, followed by hypoxia, hypercapnia and pulmonary hypertension. There are two strategies to handle a child with BPD: spinal/caudal anaesthesia without sedation, for example for inguinal herniorrhaphy, or general anaesthesia with short-acting agents and supplemental regional anaesthesia. Today there is no reliable evidence, which method is superior. The experience of the team seems to be the most crucial factor to avoid complications in this high-risk population.

Cystic fibrosis is the most common autosomal recessive disease with dysfunction of exocrine pulmonary and intestinal secretion. Children often suffer from pneumonia, the physical state depends on regular medication and physical therapy. Elective general anaesthesia should only be performed in times without super-infections, bronchoscopy during anaesthesia may help to clean the respiratory system and the complete return of neuromuscular function is mandatory.

After this session participants will be able to

- understand incidence, clinical features and anaesthetic risks of children with respiratory diseases
- the importance of a careful preoperative assessment and evaluation
- anticipate and develop an anaesthetic strategy for children with respiratory diseases

Karin Becke, head of the department for anaesthesiology and intensive care medicine, Children's Hospital Cnopf'sche Kinderklinik/Hospital Hallerwiese, Nürnberg, Germany

15:00-15:30 State of the art: Perioperative management of the child with diabetes (Martin Jöhr)

In the UK type 1 diabetes is with 1:450 a relatively common long term condition in children. An overall annual increase of 4% is observed. The role of insulin and the pathophysiology of type 1 diabetes will be discussed.

The different insulins: Regular insulin with the amino acid sequence of human insulin is widely used for intravenous administration in perioperative medicine. Today, technology allows to produce insulin analogous with altered pharmacokinetic properties: Lispro Insulin (Humalog®) and Aspart insulin (Novolog®); minimal changes lead to earlier onset, sharper peak and shorter duration of action after subcutaneous administration. Glargine insulin (Lantus®) is soluble in the packed acid solution but relatively insoluble at physiologic pH, this leads to delayed absorption into the systemic circulation. Today the majority of children with newly diagnosed diabetes will be treated with these new compounds, and/or with an insulin pump.

Three different scenarios have to be considered: 1. Minor superficial surgery allowing a rapid return to normal nutrition. 2. Minor superficial surgery in patients on an insulin pump. 3. Major surgery with an undetermined duration of postoperative fasting.

The aim is to maintain the glucose concentration at the upper normal level; targeting between 7 and 10 mmol/l will allow to avoid hypoglycaemia in most cases. The cornerstone of a safe practice is measuring blood glucose repeatedly. It is important not only to focus on glucose concentration but also to avoid catabolism; insulin and glucose have to be administered perioperatively.

After this lecture participants will be better able to:

- describe the different properties of the new “insulin analogous”
- give a prescription for a diabetic child
- avoid the most common mistakes

Martin Jöhr, Head Paediatric Anaesthesia, Department of Anaesthesia, Kantonsspital, CH-6000 Luzern 16, Switzerland

16:00-17:30 Standards for Care of the Critically Sick & Injured Child

Child presenting to a district hospital (Peter Crean)

Seriously ill or injured children can be admitted to hospitals where staff may have limited exposure to paediatric cases. High standards of care are required to improve survival and reduce morbidity in the critically ill, and structures should be in place to support best practice. Identifying the competent resuscitation team and highlighting the individuals’ roles and responsibilities within this team is essential. The acquisition and maintenance of appropriate skills and competencies is vital, with these needing to be kept up to date. Organisation of this provision of care is of paramount importance and examples of how this can be achieved will be reviewed.

After this session participants should:

- understand the clinical requirements for managing ill children;
- be aware of the organisational issues required in providing this care;
- understand the need for individuals to maintain skills and keep up to date, and how this can be achieved.

Peter Crean, Consultant Paediatric Anaesthetist, Royal Belfast Hospital for Sick Children, UK.

Retrieval & Transport (Dave Rowney)

The development of large, centralised paediatric intensive care units (PICUs) has resulted in a significant proportion of unplanned PICU admissions requiring retrieval/transport from the presenting hospital. Successful clinical outcome for these children requires seamless high-quality care to be delivered from the

time of initial admission to the presenting hospital through resuscitation, stabilisation, transport by a specialist team, intensive care episode and back-transport or discharge from hospital.

This lecture will examine the role of the specialist transport team in this continuum of care, focussing on:

1. communication, outreach education and the importance of critical care networks
2. logistics of safe transport of critically sick or injured children
 - a. mode of transport
 - b. equipment
 - c. team composition and training
 - d. future developments

David Rowney, Consultant in Paediatric Anaesthesia and Intensive Care, Royal Hospital for Sick Children, Edinburgh, Scotland. Lead Consultant Scottish Paediatric Retrieval Service.

High Dependency & Intensive Care PICS Standards (Ian Jenkins)

Many critically ill or injured children arrive at district hospitals some distance from the tertiary services they need: intensive care, cardiac, neurosurgery, specialist surgery, etc., and especially the expert transport teams.

Therefore it is vital that district hospitals can resuscitate and stabilise all such children while awaiting the transport team from the PICU service. Staff in district hospitals must work in HDU or ICU areas that are suitably equipped and organised and be given the opportunities to acquire and practice these skills.

Such skills in district hospitals may be on the increase but this is no cause for complacency. From the child & family's perspective it is important that district and tertiary services work well together as different parts of the same team with strong professional links. Such clinical networks should include common programmes of education, audit and research.

These aspects of a comprehensive clinical service will be described.

After this session, participants will be able to:

- recognise how the care of critically ill children is best addressed by a team approach, cutting across institutional & specialist boundaries, including anaesthetists, intensivists, paediatricians and nurses
- anticipate what needs to be developed personally and in their institutions to prepare to treat critically ill children
- understand the place of regional networks in education, audit and research.

Ian Jenkins, Paediatric Anaesthesia and Intensive Care, Bristol Royal Hospital for Children, UK. Immediate Past President of the Paediatric Intensive Care Society.

MAIN ROOM FRIDAY SEPTEMBER 23RD

09:00-10:00 State of the Art: The Ductus Arteriosus

Keeping it open (Joanna Dangel)

The ductus arteriosus (DA) is an important part of cardiovascular system during fetal life and in neonates with ductal dependent congenital heart defects. In premature neonates its DA patency can cause real problems, but in others is crucial for survival. The aim of this talk is to stress the benefit effect of DA patency.

It is well known, that some analgesic drugs, like non-steroidal anti-inflammatory (NSAID) substances, caused the constriction of the DA. The anesthesiologists must be aware, that if those drugs are administered to the pregnant women, DA can be restricted. In such circumstances the fetal right ventricle

is failing, and fetal hydrops can develop. Term neonates, who had prenatal DA restriction, are at risk for persistent pulmonary hypertension of the neonate (PPHN), condition which need specialized intensive care, quite commonly with nitrous oxide administration. This condition can even led to neonatal death in the most severe cases.

Heart defects are the most common congenital malformations and the main cause of death in the paediatric intensive care units. So keeping the DA open is the clue for survival in such conditions. The most common and the most difficult situation will be discussed.

And the third group in which DA can be kept open are premature babies who were weaned from the respirator or are improving on mechanical ventilation, but still had opened DA. Thoracotomy for all premature neonates is always a high risk operation. So careful clinical observations and systematic echo exams are necessary to make the best decision.

After this session the participants will be better able to:

- Understand the necessity of prenatal evaluation of the ductus arteriosus patency and remember drugs which can caused its prenatal closure.
- Distinguish between PPHN and ductal dependent congenital heart defects.
- Understand, why closing the ductus arteriosus is not always necessary even in premature infants.

Joanna Dangel, Consultant in Perinatal Cardiology, Perinatology and Perinatal Cardiology Clinic 2nd Department of Obstetrics and Gynecology, Medical University of Warsaw, Poland

Closing it (Jola Evens)

A delayed closure of the ductus can be diagnosed at any age (premature, neonate, children, infants and adolescents) and any age has his characteristic clinical features.

After this sessions participants will know

- the indications for closing an open ductus arteriosus
- the different surgical techniques available (and experimental???) and their anaesthetic consequences

Jola Evens, congenital cardiothoracic surgeon. Department of Pediatric Cardiothoracic Surgery, Wilhelmina Children's Hospital, Hundlaan 6, 3584ea Utrecht, The Netherlands

10:00-10:30 Pro-Con: Closing PDAs in NICU v OR (Ian Jenkins, Ehrenfried Schindler)

Patent ductus arteriosus is an independent risk factor for the development of necrotizing enterocolitis in very low birth weight infants. The primary mode of treatment for PDA is pharmacological closure using cyclooxygenase inhibitors with closure rate reaching 80% (data from literature). Prophylactic treatment with Ibuprofen is discussed controversy because of its significant side effects.

Surgical closure of a PDA is even in very small preterm neonates a routine procedure in paediatric cardiac surgery. Blood loss is reaching zero and respiratory complication during preparation are minimal or could be treated by adjusting the ventilator. Additionally cardio circulatory problems immediately after closure of the duct could be anticipated and treated without major complications. Overall the operative procedure is standardized and without discussion. Remaining controversial is the place where this operation will be carried out. Advocates of NICU as the place for the operation are arguing that transporting a preemie will carry a variety of additional risks up to intracerebral bleeding due to scattering of the bed. On the other hand most of all ICUs are not made for sterile surgery, lack of sufficient climatisation, laminar air flow and have no staff air lock. The question where to do the operation still has to be answered.

After this session participants will be better able to:

- judge why a PDA should be closed in the OR
- build your own opinion about how institutional protocols, hospital architecture and organizational aspects can overrule medical needs

Ehrenfried Schindler, Paediatric Anaesthesiologist, head of department for paediatric anaesthesiology, Children's Hospital Sankt Augustin, Visiting Professor for paediatric anaesthesiology University of Belgrade Serbia

Ian Jenkins FRCPE FRCA FFICM. Consultant in Paediatric Anaesthesia & Intensive Care. Royal Hospital for Children. Bristol BS2 8BJ. United Kingdom

11:00-12:30 **Quality Improvement**

How to do it (Dean Kurth)

How to do quality improvement begins with a solid definition of quality and knowledge of improvement science. Quality is multidimensional. The Institute for Healthcare Improvement defined quality along six dimensions: patient centeredness, effectiveness, efficiency, timeliness, safety, and equity. Safety, patient centeredness and effectiveness correspond to the outcome of healthcare encounter with respect to the chief complaint. Efficiency, timeliness, and equity relate to the patient experience irrespective of culture and race. Over 50 years ago, Dr. Demings founded quality improvement science (QI) that underpins Six Sigma (GE) and Lean (Toyota). QI contains four principles: appreciation of a system, understanding variation, action learning, and psychology of change management. A system is a network of interdependent components that work together to try to accomplish a common aim. For example, the operating room is a system with nursing, surgery, anesthesia, equipment, rules, processes etc. To improve the system requires knowledge of these components and how they interact. Understanding variation of the system refers to the importance of measurement and statistics to determine if a change in the system is normal variation (common cause) or unusual variation (special cause). A special and sustained change to the proper direction represents true improvement. To actively achieve such improvements, QI organizations employ action learning and psychology of change management. Action learning involves conducting PDSA (Plan-Do-Study-Act) cycles to test if an intervention produces the desired response. Conducting such tests of change, and permanently embedding them if they work, requires leadership to use the psychology of change management, because systems by their nature tend to resist change. For example, consider the difficulty of getting surgeons, anesthesiologists, or nurses in the operating room to "try something new" much less "change practice permanently."

After this session, the participants will:

- Define quality and provide examples for pediatric anesthesia Distinguish quality improvement from quality assurance
- List the key ingredients to perform quality improvement
- Describe benchmarks, scorecards, run charts, control charts, and PDSA ramps
- Apply some of the ideas to their own practice

C. D. Kurth MD, Anesthesiologist-in-Chief, Cincinnati Children's Hospital, Professor of Anesthesia and Pediatrics, University of Cincinnati College of Medicine, USA.

ESPA and Quality Improvement (Neil Morton)

There is an opportunity for ESPA to help with Quality Improvement initiatives in a variety of ways. We could adopt existing topics eg. WHO Safe Surgery Checklist. Alternatively ESPA could tackle some new initiatives eg. pain at home after surgery, adverse event reporting, procedural sedation. ESPA could also facilitate Quality Improvements by creating a QI Toolkit, a QI Online Forum and providing resources for reporting successful QI projects. Funding may be required for some of these initiatives. I hope to discuss these ideas with the audience and with our visiting QI expert Professor Dean Kurth from Cincinnati. I hope to be able to describe some of the results from the ESPA member survey relevant to QI.

After this session participants will be better able to:

- Understand the potential role of ESPA in QI
- Apply some of the ideas to their own practice

Neil S. Morton, Reader in Paediatric Anaesthesia & Pain Management, University of Glasgow, Scotland; Chair ESPA Scientific Committee

12:30-13:00 State of the Art: Learning from audits of paediatric acute pain management (Claude Ecoffey)

Acute pain in children has historically been undertreated despite the publication of many studies on pain evaluation and pain treatment. Indeed, management of acute pain management is one of the clinical topics for which a lot of guidelines have been created. The different audits concluded that advances have been made in management of acute pain management in different countries, but that there is still much work for improvements.

This lecture reviews why postoperative pain is still undermanaged: healthcare professionals' education, patient and parents information, evaluation of pain, protocols, and finally common organizational obstacles to change, aggravated by the general downscaling of health care services and some psychological obstacle in the minds of health care providers; in addition, pain seemed to be a greater problem in units where children were treated along with adults and in departments where fewer children were treated. It is clear from the different audits that guidelines and directives are not enough: The physicians in charge of children in everyday practice must understand why optimal management of pain is so important: It is not only for humanitarian reasons, i.e. reducing suffering from acute pain for a few days. Undermanaged acute pain causes a major health care problem: indeed, chronic postoperative pain develops in 1 of 10 surgical patients. Fortunately, the audits have also demonstrated some changes, i.e., implementation of multimodal pain therapy including regional blocks, regular administration of analgesics, and pain is now regarded as being the "fifth vital sign".

After this review participants will be better able to:

- know the factors of undermanaged acute pain
- initialize rules to optimize acute pain treatment in children.

Claude Ecoffey, Service d'Anesthésie-Réanimation Chirurgicale 2, Hôpital Pontchaillou, Université de Rennes 1, France

16:00-16:30 Pro-Con Debate Pre-assessment (Wilton van Klei ,Jacob Katz)

Pro (Wilton van Klei)

Traditionally, preoperative evaluation and risk assessment was done by the anaesthesiologist on the ward in the late afternoon the day before surgery. During the last decade of the twentieth century, however, anaesthesiologists started providing the performance of preoperative evaluation in all elective surgical

patients well in advance of surgery (i.e. some weeks) in an outpatient clinic setting. This so called 'Outpatient Preoperative Evaluation' serves two important purposes.

Firstly, time is available to recognize and to optimize any comorbidity a patient may have well before the operation takes place. Secondly, such an out-patient setting gives the opportunity to be able to fully explain to the patient the proposed anesthetic interventions and to obtain informed consent. It can be argued that the alternative situation where risks and benefits of a certain anesthetic must be explained to a patient in the immediate preoperative setting, often with the patient in an extremely "dependent" situation, can never be fully understood and therefore truly consented to by the patient. These arguments especially hold true in pediatric anesthesia, where worried parents may need reassurance.

Outpatient preoperative evaluation has indeed been shown to reduce the number of last minute cancellations of operations for medical reasons. Furthermore, it facilitates same day admissions and day care surgery and it reduces the amount of additional (laboratory) testing.

Con (Jacob Katz)

Assertions by some that all patients need to have a preanaesthesia visit prior to the day of surgery are not supported by evidence. Today 60-80% of elective surgery in children can be performed on a day stay basis. There is recent evidence that patients of any age with no major comorbidity (ASA physical status 1 or 2) presenting for day surgery do not need pre-operative investigations. Healthy children undergoing procedures of minor or intermediate complexity may have their evaluation on the day of surgery.

Information about the patient is the key to triage, and it may be either paper- or computer-based questionnaire saving important staff time. An initial priority should be to develop mechanisms for getting information from patients before the day of their procedure without the need to come to the hospital and waste time and money. Telephone and web-based assessment can form part of a successful pre-operative anesthesia service. Incorporation of more anesthetic pre-operative assessment nurses as an integral part of the team working closely with anesthetists has been shown to be cost-effective, safe and effective at pre-operative screening.

Today the patient and the family can easily access, via the internet, information about what to expect: there is written material and video about the process of the anesthesia and surgery. If there are concerns not adequately dealt with by the team, the patient and his/her family should have access to a consultation with an anesthetist before the day of operation.

In conclusion, not all pediatric patients need to come for a pre operative visit! Every institution must decide the best approach to preoperative assessment based on its patient population, the types of procedures it performs, and the volume it handles.

Wilton van Klei, anaesthesiologist. Department of Perioperative Care and Emergency Medicine, University Medical Centre Utrecht, the Netherlands

Jacob Katz, anaesthesiologist. Department of Anesthesia, Schneider Children Medical Center of Israel, Petah-Tikva, Israel.

16:30-17:30 State of the Art: The Micropremie (Dean Kurth)

During the past 20 years, the birth rate and survival of very prematurely born infants, known as micropremies increased dramatically, many of whom suffer from complications requiring surgery. These include IVH for VP shunts; ROP for eye surgery; subglottic stenosis and tracheobronchial dysplasia (TBD)

and BPD for tracheostomy; CHF for PDA ligation; NEC for laparotomy; and inguinal hernias for repair. Neonatologists define micropremies as born <28 weeks gestation or birth weight <1200 grams. Synaptogenesis, neurogenesis, oligodendrocyte proliferation, and germinal matrix development occur in the micropremie, creating susceptibility to PVL, IVH, CP, anesthetic neurotoxicity, and impaired cognition. Because pain pathways are present by 20 weeks gestation, the micropremie experiences pain. Respiratory control mechanisms remain incompletely formed and episodes of apnea occur commonly in micropremies. Formation of surfactant and alveolar sacs begins at 24 weeks gestation and escalates the remainder of gestation to term. Consequently, respiratory insufficiency, oxygen toxicity, and volutrauma with mechanical ventilation predisposes to H-I, TBM, and BPD. Contractile elements and adrenergic receptors in the micropremie are less in the heart and vasculature which together flattens the Frank-Starling curve. Combined with patent ductus arteriosus, the micropremie risks low cardiac output and ischemia of kidney and gut. In the liver, gluconeogenesis, cytochrome oxidases, and biliary metabolism increases dramatically from 24 weeks to term. In the kidney, GFR and tubular function similarly increase dramatically. As a result, the micropremie remains at risk for hypoglycemia, hyponatremia, hyperbilirubinemia, and prolonged drug effects. Special yet routine anesthetic considerations for the micropremie include low volume ventilation for permissive hypercapnia, less oxygen for lower arterial saturation, dopamine infusion to maintain arterial pressure, normal saline and glucose infusion, “balanced” anesthesia to minimize neurotoxicity and a prolonged anesthesia state, and postoperative mechanical ventilation.

After this session, the participants will:

1. Define the micropremie along with the corresponding morbidity and mortality
2. Describe brain, lung, heart, GI, and kidney development from 24 weeks gestation to term.
3. List the key anesthetic issues for the micropremie

C. D. Kurth MD, Anesthesiologist-in-Chief, Cincinnati Children’s Hospital, Professor of Anesthesia and Pediatrics, University of Cincinnati College of Medicine, USA.

MAIN ROOM SATURDAY SEPTEMBER 24th

09:00-10:30 Competencies for paediatric anaesthesia

The Acquiring competencies (Tom Hansen)

The Scandinavian training programme in paediatric anaesthesia and intensive care is used as a role model to describe competency based education¹. Although poorly-defined competency based education focuses on learner performance (learning outcome) in reaching specific goals and objectives of the 6 core curricula according to the ACGME², i.e. medical knowledge, patients care, interpersonal and communication skills, professionalism, practice and learning and improvement and systems based practice). It shifts our main focus away from process-oriented measures of education (i.e. how many procedures or cases a trainee has completed) to become outcome-oriented education (i.e. how well the trainee completed the procedure or case). It is built on a strong curriculum, goals and objectives of the teaching process using various types of teaching strategies, as well as various methods for assessing these.

Key learning points:

- Competency-based education should be applied in paediatric anaesthetic training programmes - modified according to local and global requirements
- A specific curriculum, faculty and portfolio should form the basis of the programme
- An assessment tool should be designed to measure the trainee's performance of specific objectives and goals

References

1. Hansen TG. Specialist training in pediatric anesthesia: the Scandinavian approach. *Pediatric Anesthesia* 2009; 15: 428-33
2. <http://www.acgme.org/acWebsite/home/home.asp>

Tom G. Hansen, associate Professor of Paediatric Anaesthesiology, University of Southern Denmark and Odense University Hospital, Odense, Denmark

Measuring competence (Martin Jöhr)

Competence is the ability to perform a job properly: it includes knowledge, skills and appropriate behaviour.

Knowledge can be easily measured by written (reproducible and comparable) or oral (less reproducible) tests. Skills can be evaluated and measured by simply looking at success and failure rates; these results can be presented graphically as a CUSUM analysis, which illustrates the quality of the individual performance over the time. The data of a group of anaesthesiologists can be used to produce an institutional learning curve. Another aspect is the time needed for performing an intervention; in addition, the focus should be on the accordance with accepted guidelines (e.g. sterility, safety checks) and the incidence of complications.

The most important, however, is the presence of a peer evaluating not only success rate and speed, but also the quality (how it is done, the real "art of giving anaesthesia"). Only a peer, a senior colleague and friend, will be able to comment correctly on behaviour and social skills. The real quality as well as the social skills can partly be described in words, but it is virtually impossible to measure these most important aspects numerically.

It has to be emphasized, that real competence of a practitioner also includes the ability to recognize his own limitations.

After this lecture participants will be better able to:

- acknowledge the role of tests for measuring knowledge
- discuss the graphical presentation of the performance in manual skills
- realize that only the presence of a peer will allow to evaluate the quality of the work.

Martin Jöhr, Head Paediatric Anaesthesia, Department of Anaesthesia, Kantonsspital, CH-6000 Luzern 16, Switzerland

Maintaining competencies (Liam Brennan)

A fundamental principle of good medical practice is a commitment to life-long learning which includes maintaining basic competencies, keeping up to date in the chosen field of practice and acquiring and developing new skills. High profile cases in the UK and elsewhere have politicised this process and put doctors under ever greater scrutiny. In the UK this has resulted in a movement away from self-regulation towards statutory revalidation and re-licensing on a periodic basis.

It is important to emphasise that competency is not just about acquiring and refreshing clinical knowledge and skills (continuing medical education) but should include areas such as patient safety, team working and human factors, education and training, healthcare management and legal aspects of practice. This added dimension of non-technical skills is fundamental to a continuing professional development programme (CPD).

In this presentation I shall explore some important themes in CPD and place them in context for paediatric anaesthetic practice with examples from the UK and Europe. By the end of the presentation participants should better understand the following aspects:

- Range of methods available to maintain and develop new competencies
- Selection of appropriate CPD activity
- Quality assurance of CPD activity
- Obstacles to maintaining competency

Finally the vision of a competent medical workforce that can move across Europe to tackle health challenges is attractive. The challenge is to harmonise Europe-wide CPD systems in pursuit of this aim which although achievable will require considerable professional as well as political effort to realise.

Liam Brennan, Consultant Paediatric Anaesthetist, Cambridge University Teaching Hospitals, Cambridge, UK; Council Member & CPD Adviser, Royal College of Anaesthetists, UK

11:00-12:00 **State of the Art: Fluid therapy**

Consensus Report (Karin Becke)

The intraoperative infusion of isotonic solutions with 1–2.5% glucose in children is considered well established use in Europe and other countries. Unfortunately, a European marketing authorisation of such a solution is currently missing and as a consequence paediatric anaesthetists tend to use suboptimal intravenous fluid strategies that may lead to serious morbidity and even mortality because of iatrogenic hyponatraemia, hyperglycaemia or medical errors. To address this issue, the German Scientific Working Group for Paediatric Anaesthesia suggests a European consensus statement on the composition of an appropriate intraoperative solution for infusion in children, which was discussed during a working session at the 2nd Congress of the European Society for Paediatric Anaesthesiology in Berlin in September 2010.

As a result, it was recommended that an intraoperative fluid should have an osmolarity close to the physiologic range in children in order to avoid hyponatraemia, an addition of 1–2.5% instead of 5% glucose in order to avoid hypoglycaemia, lipolysis or hyperglycaemia and should also include metabolic anions (i.e. acetate, lactate or malate) as bicarbonate precursors to prevent hyperchloraemic acidosis. Thus, the underlying intention of this consensus statement is to facilitate the granting of a European marketing authorisation for such a solution with the ultimate goal of improving the safety and effectiveness of intraoperative fluid therapy in children (European consensus statement for intraoperative fluid therapy in children. Eur J Anaesthesiol 2011; 28: 000-000, published Ahead-of-Print, 06.06.2011)

After this lecture participants will be better able to:

- understand the requirements of intraoperative fluid solutions
- realize the disadvantages of the current used intraoperative fluid solutions
- learn about a European consensus statement for intraoperative fluid therapy in children

Karin Becke, head of the department for anaesthesiology and intensive care medicine, Children's Hospital Cnopf'sche Kinderklinik/Hospital Hallerwiese, Nürnberg, Germany

Update on Plasma Expanders (Bogumila Gebicka)

As infused fluids are composed primarily of water and electrolytes with or without added colloids, the physiological compartments containing water are apparently likely to correlate with the volumes of administered fluids. In 1997, kinetic modeling of fluids (volume kinetics) was introduced, describing peak effect and clearance of intravenously infused fluids in terms similar to those used in pharmacokinetics.

The lecture will cover the efficacy of crystalloids and colloids used as plasma expanders, as well as risks involved in the use of hypotonic solutions, normal saline and normal saline-based colloid solutions. Hyperchloraemic acidosis will be discussed, and the rational choice of the optimal colloid solution will be also covered.

Special attention will be paid to volume replacement in a child presenting with massive bleeding, with the focus on preservation/restoration of coagulation and oxygen carrying capacity.

After this session participants should be able

- to understand the principles of volume kinetics,
- to recognize possible side effects of volume expanders.

Bogumiła Woloszczuk-Gebicka, Director, Department of Paediatric Anaesthesiology and Intensive Care, Medical University of Warsaw, Marszalkowska 24, 00-576 Warsaw, Poland

12:00-12:30 New ways of learning

Simulation on the move: The Skills Bus (David Rowney)

Every year children become critically ill or injured in remote and rural Scotland and require stabilisation to prevent further injury prior to transfer for specialist paediatric care. It is therefore essential that health care practitioners working in remote areas have developed and can maintain the clinical skills required to manage such emergencies safely. The Scottish Mobile Skills Unit (Skills Bus) was developed as a pilot project to deliver high quality, multiprofessional, simulation-based education to remote and rural areas of Scotland ensuring equity of access across both geographical and professional boundaries. The unit is driven to locations in Scotland, chosen to ensure that clinical skills education facilities are available within 2 hours driving time of all of mainland Scotland, and on the Scottish islands.

The Skills Bus is equipped with Laerdal SimBaby, an integrated video debriefing suite (smots™) and a comprehensive range of paediatric equipment including manikins and part-task trainers. This provides standardised facilities for delivery of a one-day course focusing on the knowledge, skills and attitudes required by a multiprofessional team to be competent in the clinical assessment, resuscitation and stabilisation of critically ill children prior to the arrival of the intensive care transport team.

The lecture will outline the pilot project, course evaluation including the logistics of delivering the course in the mobile unit and the educational impact of the course.

Further information on the Mobile Skills Unit and the one-day course delivered by the Scottish Paediatric Retrieval Service can be found at www.csmen.ac.uk and www.paedsretrieval.com.

David Rowney, Consultant in Paediatric Anaesthesia and Intensive Care, Royal Hospital for Sick Children, Edinburgh, Scotland. Lead Consultant Scottish Paediatric Retrieval Service.

12:30-13:30 Presentation of ESPA Honorary Memberships

ESPA Guest Lecture: Quality Improvement in the Developing World. Prof. Adrian Bosenberg