

QUALITY

The following methods have been widely accepted to measure quality:

- Complication rate (quality assessment of outcome)
- Days of disability (time off work)
- Patient satisfaction

The most effective way to answer these questions is to use a patient questionnaire (PQ).

In Germany the quality assessment system AQS has proven to be an effective instrument for quality assurance in ambulatory surgery. For each procedure it uses diagnoses (ICD-10), type of procedure (OPS.), and complications judged by a) the surgeon, b) the anaesthesiologist and c) the patient (anonymous, separate questionnaire). It also offers to every participating day clinic a benchmarking for complication rates for every procedure and yearly reports on institutional performance, all at reasonable prices.

OPTIMIZING COSTS AND QUALITY

In order to optimize we must know the goals that we want to aim at. Below are listed possible goals and their probable favourites:

Goal	Favoured by
- high quality of work	- patient, physician
- low costs for procedure	- patient, insurance company, clinic owner
- high patient satisfaction	- patient, physician
- high income of doctors	- physician
- "inexpensive" public health	- governmental politics

From the patient's point of view the goals are:

- The problem of the patient shall be resolved quickly, if possible permanently.
- The function of organs should be restored as soon as possible (short disability).
- A low complication rate will increase the chance of fast recuperation.
- Results should cosmetically be acceptable.
- The patients should feel at ease in the surgical unit and possibly at home.

As the patient is the most important person during ambulatory surgery a patient questionnaire should be used to judge the outcome of procedures and management.

CONCLUSION

For many individuals the goals of "good" medicine will be: optimal medical cure in short time at fair prices.

But the goal for ambulatory surgery must not necessarily be the highest quality possible, because this may be linked to a higher complication rate or to higher prices. Medium quality at low complication rates and low costs may be preferable for many patients especially if they have to pay for themselves.

National insurance systems generally aim at the lowest prices. These, however, may force the doctors to produce low or medium quality or push

treatment from the ambulatory into the inpatient sector - at higher costs for the insurance system.

The goal of ambulatory surgery should not be high income of the surgeon, however.

An action list will be presented.

PARALLEL SESSION 2

CURRENT ISSUES IN PEDIATRIC AMBULATORY ANESTHESIA (CHILDREN IN AS)

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HOW TO AVOID LAST-MINUTE CANCELLATION

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The high safety record of pediatric anesthesia today is due in large part to the role of the anesthesiologist as the perioperative physician who bears the ultimate responsibility of ensuring that the child is properly evaluated and medically fit to undergo anesthesia and surgery. Early evaluation of the patient, and communication with the surgeon and referring pediatrician will ensure that most problems are solved ahead of the day of surgery, and therefore prevent the inconvenience and expense of last minute cancellations on the day of scheduled surgery.

THE FORMER PREMATURE INFANT (EX-PREEMIE)

The premature infant is not a suitable candidate for ambulatory surgery because of potential immaturity of respiratory center. Several studies have reported a high incidence of postoperative apnea in these infants. The age at which a former premature infant attains physiologic maturity and no longer presents an increased risk for postoperative apnea remains controversial, and is best considered individually. It is generally considered that infants younger than 50-55 weeks postconceptual age (PCA), extremely premature, anemic and/or have preoperative history of apnea are at greatest risk; and should not be scheduled for out-patient surgery.

THE CHILD WITH A RUNNY NOSE

A child who presents with a runny nose may have a benign, noninfectious condition (e.g., seasonal or vasomotor rhinitis), in which case elective surgery may safely be performed. On the other hand, the runny nose may be an infectious process (URI), in which case elective surgery may need to be postponed. Since an estimated 20-30% of all children have a runny nose a significant part of the year, every child with a runny nose must be evaluated on an individual basis. It is important to establish that the URI is not actually a prodroma to a more serious condition, e.g., small pox.

The preanesthetic assessment of these patients consists of a complete history, a physical examination, and occasionally, an interpretation of certain laboratory data. In most cases, the history is the most important factor in the differential diagnosis. Specifically, allergic problems should be actively sought. Parents can usually tell whether their child's runny nose is "the usual runny nose" or something different that may require cancellation of elective surgery. Parents of ambulatory patients can be instructed to call-in on the morning of surgery if the child develops URI symptoms so the findings can be reviewed and if a decision to cancel surgery is made, they are spared a wasted trip to the hospital.

If surgery is postponed because of simple nasopharyngitis, it can be usually re-scheduled in one to two weeks. If a flu-like syndrome that involves both upper and lower respiratory tract is present; surgery should be postponed until at least a month after the child has recovered.

HEART MURMURS

A common problem in pediatric anesthesia is that of a child in whom a previously undiagnosed cardiac murmur is first heard during the preanesthetic examination. Even if the child appears healthy and shows no signs of cardiac disease, the cause of the murmur must be correctly diagnosed prior to anesthesia and surgery. The key to the proper preoperative evaluation of such a child is to determine whether the murmur is innocent, in which case there is no need to change the standard anesthetic management in any way or to administer antibiotic prophylaxis against subacute bacterial endocarditis (SBE), or whether it is an organic or a functional murmur, in which case the choice of anesthetic agents and techniques may be modified and SBE prophylaxis may be indicated.

NPO VIOLATIONS

The need for prolonged fasting before elective surgery in healthy pediatric outpatient patients has been challenged. Studies have shown that children who are allowed to drink clear liquids until 2 hours of anesthesia induction do not manifest increase in gastric volume or acidity over those who fast overnight. The American Society of Anesthesiologists (ASA) has put out Guidelines for

preoperative fasting in children and adults. The purpose of these guidelines is to enhance the quality and efficiency of anesthesia care and reduce the severity of complications related to the possibility of pulmonary aspiration of gastric contents. Avoidance of delays and cancellations, decreased risk of dehydration or hypoglycemia from prolonged fasting are additional benefits. Based on these guidelines the NPO period for infants and children are as follows:

- For clear liquids – 2 hours
- For Breast milk – 4 hours
- For infant formula – 6 hours
- For non- human milk – 6 hours
- For older children – solid food (toast) – 6 hours
- For older children – solid food (fried food) – 8 hours
- Solid food is still not allowed on the day of surgery.

Unfortunately, many pediatric outpatients still arrive to the facility on the morning of surgery with unnecessarily long periods of starvation. This is more frequently seen in those scheduled for morning surgery, where meeting the older guidelines of at least four hours fasting would have required the parents to awaken the child to offer fluids. In summary,

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PAIN CONTROL IN CHILDREN AFTER AMBULATORY SURGERY

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The need for analgesics following surgery depends upon the nature of the procedure and the pain threshold of the patient. It does not depend upon whether the child is an outpatient or an inpatient. Regional blocks or local infiltration should be used whenever possible to supplement general anesthesia and to limit the need for narcotics during recovery. Postoperative pain or discomfort can be managed by one or a combination of the following methods:

Acetaminophen (10-15 mg/kg PO) is the most commonly used mild analgesic for pediatric outpatient patients. For young children, the initial dose is often administered rectally (up to 45 mg/kg) prior to awakening from anesthesia.¹ Supplemental doses are given orally every 4-6 hours (not PRN) to maintain adequate blood level and therefore effective analgesia.² Acetaminophen can be combined with codeine for more effective control of moderately severe pain and/or discomfort. Acetaminophen with codeine elixir contains 120 mg acetaminophen and 12 mg codeine per 5 ml. The usual dose is 5 ml for children 3-6 years, and 10 ml for the 7-12 age group.

Non-Steroidal Anti-Inflammatory Drugs (NSAID): NSAIDs, e.g., ketorolac, have proved effective in relieving postoperative pain following minor operations in children. Ketorolac is an efficacious NSAID. Early administration immediately following induction seems to provide optimal postoperative analgesia. Several studies have demonstrated the analgesic and opioid-sparing effects of ketorolac, which may reduce the incidence of opioid-related adverse effects such as respiratory depression, nausea and vomiting. Ketorolac however, like many other NSAIDs, has some troubling side-effects; with reported instances of decreased bone repair after osteotomy, bronchospasm, acute renal failure and possibly increased surgical bleeding secondary to altered platelet function.³ Several recent articles reported an increased incidence of postoperative hemorrhage in patients who received ketorolac. Some, however, did not find increased bleeding when ketorolac was given at the end of the procedure. More studies are required to determine the optimal dose and route of administration of ketorolac, as well as its efficacy as an analgesic following more painful outpatient surgical procedures in children.

Potent Narcotic Analgesics: When narcotics are indicated in the recovery period, a short-acting drug should be chosen. Intravenous use allows more accurate titration of the dose and avoids the use of "standard" dosages based on weight, which may lead to a relative overdose. If remifentanyl is used intraoperatively, planning for postoperative analgesia must be started prior to awakening. Fentanyl, up to a dose of 2.0 mcg/kg, is our drug of choice for intravenous use. Meperidine (0.5 mg/kg) and codeine (1.0-1.5 mg/kg) can be used intramuscularly if an intravenous route is not established. IM codeine tends to result in less vomiting than other opioids, especially morphine.⁴ Nasal administration of fentanyl has been shown to result in an analgesic blood level comparable to that following IV use,⁵ which makes it useful for the use in children who do not have, or have lost, their IV access.⁶

Regional Analgesia: Regional anesthesia can

be combined with light general anesthesia to provide excellent postoperative pain relief and early ambulation, with minimal or no need for narcotics. By placing the block before surgery starts but after the child is asleep, one can reduce the requirement for general anesthetic agents during surgery, which in turn may result in a more rapid recovery, earlier discharge, more rapid return of normal appetite, and less nausea and vomiting.

The types of blocks that can be used safely in the pediatric outpatient surgical patient are limited only by the skill and interest of the anesthesiologist. Generally, the techniques chosen should be simple to perform, have minimal or no side effects, and not interfere with motor function and early ambulation.

Ilioinguinal and iliohypogastric nerve block can be performed by infiltration of 0.25 percent bupivacaine solution (in doses up to 2 mg/kg) in the region medial to the anterior superior iliac spine. This block has been used successfully to provide excellent postoperative analgesia for pediatric outpatient patients following elective inguinal herniotomy or orchiopexy.

Dorsal nerve block of the penis can be performed by simple injection of 1-4 ml of 0.25 percent bupivacaine without epinephrine deep to Buck's fascia 1 cm from the midline. This has been shown to provide over 6 hours of analgesia following circumcision. Alternate approaches to penile block are a midline injection or subcutaneous infiltration (ring block), which presumably blocks the nerve after it has ramified into the subcutaneous tissue. Topical application of lidocaine on the incision site at the conclusion of surgery has also been shown to be effective.

Caudal block provides excellent postoperative analgesia following a wide variety of surgical procedures such as circumcision, hypospadias repair, orchiopexy, and herniotomy. By using bupivacaine, 0.25 percent solution in a dose of 0.5-0.7 ml/kg, no motor paralysis is produced. If a larger volume (1 - 1.5 ml/kg) is indicated, the use of a 0.125% bupivacaine or 0.2% ropivacaine are recommended to avoid motor weakness.⁷ Caudal block has been extensively used in our outpatient surgical unit, with most children discharged home free of pain between 1 and 2 hours postoperatively. Analgesia (as measured by subsequent need of a mild oral analgesic) lasts 4 to 6 hours with this technique. Although voiding may be slightly delayed in children who receive a caudal block, catheterization is never needed, and children can be allowed to go home before voiding.

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HOW, WHAT AND WHEN IS THE TIME TO ASSESS A CHILD?

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Perhaps the first question really ought to be, who? Who should assess a child for ambulatory surgery? In an era when medical care has become so subspecialized and fragmented, the presence of a "orchestra director" who evaluates the patient as a whole is obviously needed. As the concept of perioperative medical care expands, it is becoming increasingly evident that anesthesiologists are the logical "perioperative physicians" to assess the patient. It is not always possible to assume that a simple surgical procedure only requires a simple anesthetic procedure. It is the anesthesiologist's responsibility to evaluate each different case with its specific implications and to obtain the informed consent for the anesthesia.

HOW?

The anesthesiologist could directly assess the patients in a preoperative clinic like many other specialists who attend their patients on an outpatient basis. However, an outpatient consultation requires a level of economic expenditure that can only be justified for evaluating complex patients. On the other hand, technological advances now allow us to easily communicate with each other, so, in fact, the anesthesiologist need not physically meet with the child and his/her family. Very simple and well structured preoperative questionnaires can be answered by email, telephone or fax and have been shown to provide enough information about the child's health status to predict possible complications. These questionnaires can be forwarded to the other involved specialists, like the pediatric surgeon, and then all the specialists together will be able to decide on the candidates suitability for ambulatory surgery.

WHAT?

The normal preoperative assessment has three basic goals. First, to inform to the parents and the child about the specific available options for anesthetic techniques, explaining the characteristics of each of them, and in this way, to reduce the anxiety associated with the ignorance about anesthesia. This objective can be achieved through a personal meeting between the anesthesiologist, the parents and the child, but also by the use of educational media like video-tapes, web-pages, or printed explicatory brochures that can be complemented with a telephone consultation to clear up any lingering doubts. Second, to obtain the more detailed and exhaustive information on the patient's current health status,

looking for associated medical problems or diseases with anesthetic implications, and obtaining complementary laboratory analyses or radiological explorations as necessary. Uncomplicated patients (ASA I-II) or patients with medical conditions easily managed on an outpatient basis should be selected for scheduled ambulatory surgery, whereas, the more complicated patients could be orientated to an in-patient schedule. Third, to prepare the patient for the anesthesia and surgery in order to prevent unnecessary complications. In this sense, it is important to determine both the psychological as well as physical aspects of the preparation. Depending on the health status of the patient we might want to adjust the last dose of concomitant medications (anticonvulsant, antidiabetic, antiaggregant ...) or to ask the respective specialist for cooperation. We also might determine the exact timing for the preoperative fast to avoid exaggerated hunger. This last objective includes preparing the most adequate plan, including the possibility of parenteral presence during induction or alternative anxiolytic drugs to control symptoms like agitation, uncooperation, fear or nausea as required.

WHEN?

With the advent of ambulatory surgery and same-day-admission status, most patients, even those with complex conditions, are not admitted to the hospital in advance of surgical or interventional procedures, and, as a result, evaluation must take place on an outpatient basis. The evaluation and preparation of complicated infants and children, as compared with adults, is made more difficult by the fact that the necessary medical information must be obtained not only from the patient directly, but also from many other sources, including parents, other caregivers, pediatricians, and neonatologists. It is obvious that a period of time longer than four weeks before surgery ought to invalidate the adequacy of the preoperative evaluation in these complicated patients. However, uncomplicated ASA I-II selected patients can be attended in One-Stop-Surgery, in which preoperative anesthetic and surgical evaluation followed by surgery are performed in the same day, with a high level of parental satisfaction and an important decrease in the economic cost of the ambulatory surgery program.

As ORs become busier and the production pressure increases, accurate and comprehensive preoperative preparation and preoperative planning are essential to the success of the facility. The evolving role of the anesthesiologist as perioperative physician suggests that anesthesiologists have the best background for overseeing these systems. A well organized preoperative program appropriately and sufficiently coordinated with parents, nurses, surgeons and other

pediatric specialists may well enhance the quality and profitability of the process.

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DOES THE IDEAL ANAESTHETIC TECHNIQUE EXIST FOR PAEDIATRIC AMBULATORY SURGERY?

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Development of new, short-acting anaesthetic drugs contributed enormously to the rapid expansion of day-case surgery during the past two decades. The sought-after features of an ideal ambulatory anaesthetic agent are the ability to provide rapid, smooth induction without pain

or pungency, optimal surgical conditions, and a rapid recovery that is accompanied by residual analgesia and is uncomplicated by side-effects. Other desirable attributes include haemodynamic stability, easy titratability, and lack of metabolism and toxicity. Finally, the agent should be inexpensive. Although no single anaesthetic agent completely satisfies all these requirements, pharmacologic progress during the past decades has brought us considerably closer to achieving these objectives.

Because most young children prefer to avoid needle-sticks, inhalation induction is popular for our paediatric patients. Premedication with oral midazolam or parenteral presence during induction in appropriate situations may contribute to a more pleasant experience for the child, the parents, and the anaesthesiologist. Splinter maintains that sevoflurane has become the "gold standard" for an inhaled anaesthetic in children,¹ owing in part to its lack of pronounced myocardial depression. Importantly, sevoflurane is nonirritating to the airway, in contrast to the highly irritating desflurane, and sevoflurane has an acceptably low solubility. Therefore, high inspired concentrations and rapid adjustments to the effect site concentration are, respectively, well tolerated and quickly accomplished, allowing anaesthetic depth to be titrated easily. Moreover, sevoflurane is associated with a low incidence of bradycardia and arrhythmias. Sevoflurane, however, is not an ideal anaesthetic and postoperative nausea and vomiting (PONV) may be one of its greatest limitations. Nonetheless, when sevoflurane is used exclusively for maintenance of anaesthesia, the incidence of PONV is generally similar to that seen after other inhaled anaesthetics and not dramatically increased compared with propofol.^{2,3} Moreover, judicious use of prophylactic antiemetic therapy can further minimize the incidence of PONV associated with all inhalation agents. Desflurane is even less soluble in blood than sevoflurane, thereby affording a more rapid washout. Nonetheless, the clinical significance of this, especially for brief cases, is questionable. However, desflurane can be used economically with lower flow rates than sevoflurane. Some clinicians, therefore, favor administering sevoflurane for induction and then using desflurane for maintenance, particularly if the procedure is of prolonged duration. Postoperative agitation may be problematic in children anaesthetized with agents such as desflurane and sevoflurane that provide rapid emergence. However, the incidence of emergence agitation in children can be reduced by such interventions as (arguably) oral premedication with midazolam,⁴ as well as by the intraoperative administration of intranasal fentanyl⁵ or intravenous ketorolac,⁶ clonidine⁷ or fentanyl.⁸

Neither inhalation agents nor total intrave-

nous anaesthesia with propofol provide satisfactory postoperative analgesia. The goal of pain management should be to minimize pain not only at rest but also during mobility or physical therapy. Multimodal analgesia techniques incorporating the use of local anaesthetics (as in caudal blocks), non-steroidal anti-inflammatory drugs, and limited amounts of opioids have much to offer our young patients. For maximal efficacy, this multimodal therapy should be initiated before surgical incision and continued until inflammation has resolved.

In summary, no single anaesthetic agent is ideal for paediatric ambulatory surgery. However, by judiciously applying our knowledge of physiology and pharmacology---and psychology---the anaesthesiologist is able to incorporate several drugs into an optimal perioperative plan.

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NURSING AND UNIT ORGANISATION-NEW CHALLENGES

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BACKGROUND

Although the further development of nursing roles plays a major part in the redesign of elective surgery, progressive and successful day surgery is based on teamwork which requires concerted effort and energy from all parties.

In the UK, the NHS has a culture of continual change which presents many challenges. By exploring these challenges, potential barriers and opportunities, it enables the multi-professional team to find new ways of working to further develop the surgical services. In the UK, due to devolved parliament, ministering of health varies in Scotland, England, Wales and Northern Ireland. For example, with specific reference to day surgery, there are variations in the targets set for the same procedures in Scotland and England and also variation in the type of procedures within the "baskets". Regardless of these facts, from the results of the Audit Commission report 2005 and Audit Scotland report 2004, it is clear that there is further scope to increase day surgery. There is commonality regarding the **barriers** and ways to overcome these challenges. Some of the barriers cited are clinicians preference for inpatient surgery, poor management and organisation and inappropriate and inadequate use of facilities.

POLITICAL DRIVERS

Following a recent review of all services within the NHS, the DH identified 10 key High Impact Changes of which day surgery is No.1. Day Surgery should be the default of all elective surgery with the aim to undertake 71.9% on a day case basis. This **pressure to deliver** is a result of The NHS Plan and the 2002 Planning and Priorities Framework (PPF) that set waiting times targets for 2005 including:

1. six months maximum wait for inpatient treatment
2. three months maximum wait for outpatient treatment
3. twenty-four hours maximum wait for a primary care professional and 48 hours maximum wait for access to a General Practitioner. In addition, the NHS Plan and the PPF set a further target of:

4. three months maximum wait for inpatient treatment by 2008.

These political drivers to increase efficiency and effectiveness include the **empowerment of patients** who, at initial consultation, can choose one of 4 or 5 hospitals based on the best waiting times and quality of care, Choose and Book Scheme. Therefore the impact of market forces pressurises the team to redesign the services in terms of capacity planning and quality improvement from referral to post-discharge support. Due to constant changes and progress, the design, **organisation and management** should reflect the ever changing needs and requirements of patients, staff and the service.

Technological advances such as increase in minimal access surgery, laser procedures, anaesthetic techniques and medications continue to revolutionise elective surgery, increasing the transfer of inpatients to day surgery, from day surgery to outpatients and Primary Care. By pushing the boundaries regarding type of procedure and complexity of patient, the multidisciplinary team requires not only the appropriate skills and expertise, but the appropriate systems to manage risk and stream line the service from referral to post-discharge follow-up. Training and education is essential and embedding evidence-based and best practice into the care pathways aims to improve patient outcome and standardise care.

DEVELOPING ROLES

More challenges are presented from the impact and implications of the European Working Time Directive(EWTD) which further diminishes the demarcation lines between doctors and nurses. Therefore there are more opportunities for the development of **new roles for nurses** and theatre practitioners. Nurse-led services, such as, pre-operative assessment and discharge already established in many units in the UK, may need to take it one step further. For example, more nurses will be trained to undertake physical examinations and provide post-operative follow-up clinics.

Nurses are already advancing practice as endoscopists, cystoscopists and minor operation nurse practitioners. There are now pilot sites in the UK where advanced scrub practitioners undertake varicose vein surgery and inguinal hernia repair. Over the past year, the Royal College of Anaesthetists(RCA) is piloting a training programme for nurse anaesthetists across certain sites in the UK. The impact of these developments has a twin edged sword. Positive impact provides nurses with the choice of a clinical career pathway rather than solely managerial. Negative impact is the slow draining of the nursing service as these practitioners take on the roles of the junior doctors. Therefore adding to the global problem of poor nurse recruitment and retention. But is this new? Over many decades, nurses have progressed the services and taken on roles previously under