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Editorial

The time has come to promote true day surgery

Greed and threats are powerful forces for change. They are difficult to resist. Those who succumb hide their real motives for change behind a farrago of false justifications. But greed and threats have no part in the practice of medicine. They should be an anathema to health care professionals overarched by the Hippocratic oath. But doctors and healthcare managers are human and, as such, are prone to human frailties. Thus the original concept of day surgery is increasingly being distorted; in the private sector by greed and in the public sector by threats. Income and political targets, respectively, are increasingly dominating the quality of patient care and some of the fundamental benefits of true day surgery. This is evidenced in the move from day surgery to office-based surgery on the one hand and to 23-h stay surgery on the other.

The development of office-based surgery in the USA has come about purely for the financial benefit of surgeons. It allows them to collect both the operation and facility fees. Shrinking incomes as a result of being squeezed by health insurers or healthcare management organisations and increased fees charged by day unit facilities might well have driven them in this direction. But is it better for patients? Perhaps overall it is cheaper, yet this may be at the cost of safety. The back-up and resuscitation facilities in an office seldom match those of a good hospital attached or freestanding day unit. In the UK dental office-based general anaesthesia will be banned from 2001 because of the comparatively higher morbidity and mortality compared to dental anaesthesia in a hospital. But it must never be assumed that surgery under local anaesthesia, with or without sedation; is devoid of complications. In all but the most minor cases, problems may occur due to the local anasthetic or unexpected surgical pathology that require assistance or equipment beyond that of an office facility. To minimise these risks an office facility ought to be equipped and staffed to the level of a day unit. Then de facto it becomes a freestanding day unit. Yet in the USA there is now a growing Association for Office Based Anaesthetists separate from the Society of Ambulatory Anaesthetists.

Twenty-three-hour surgery has developed in the USA to maximise the profits of freestanding day units. The 23-h stay format has allowed these units to cream off straightforward short stay inpatient cases from inpatient hospitals. As a camouflage for the real motive these cases are still referred to as day or ambulatory cases. A similar sleight of hand is increasingly being used in the National Health Service in the UK. Targets are set for day surgery procedures. Hospitals that cannot reach these, either because consultants are unwilling to follow the disciplines of day surgery or adequate day surgery facilities are not provided, have taken to the definition of a day case as up to a 23-h stay in order to reach their targets and thus avoid financial penalties. On neither side of the Atlantic is there a cogent economic case for 23-h stay facilities. In the USA the overnight facilities attached to free-standing day units add to the already over provided inpatient facilities and drive up the unit cost in established inpatient hospitals. In the UK 23-h stays become an excuse for not undertaking true day surgery, i.e. admission, operation and discharge during the same working day. The cost savings of a move from inpatient to true day surgery are reduced, as is the quality of treatment for patients who, in the in the majority, prefer to go home to recover rather than stay in hospital.

There are certainly a group of patients at present that may require a 23-h stay for surgical or anaesthetic reasons. It might include those having bilateral inguinal hernia repair, carotid endarterectomy, aortic aneurysm stenting, thyroidectomy or middle ear surgery. With new techniques and improved day surgery management, some of these procedures are already being performed on a day basis. Indeed a period using a 23-h stay for a particular procedure as it is developed to be moved from full inpatient care to day surgery is often useful. Some patients with conditions suitable for day surgery, but ASA 3 or 4, may also benefit from an overnight inpatient admission. Social preclusion from day surgery is no reason for a 23-h inpatient stay. All these patients require is a hospital hotel with no nursing or

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medical staff. But is there a need for a 23-h stay unit and should patients remaining in hospital be managed in a day unit? In the context of elective surgery there can be no economic justification for subdividing inpatient beds into units catering for different lengths of stay. This will only lead to inflexibility. There will be times when one area is underused whilst another is full and cannot cope and vice versa. For cost effective management the less subdivisions in a hospital the better. The hospital of the future should be ring fenced in three areas only, namely emergency care, elective inpatient care and ambulatory care. The 23-h elective surgical cases should be managed as elective inpatients, which they are, and not as day cases in the day unit, which they are not. In fact a 23-h unit attached to a day unit can reduce the rate of true day surgery because of the ease of admission to such a facility. One hospital in the UK undertook a good percentage of laparoscopic cholecystectomies on a true day basis with good outcomes. It then developed a 23-h stay unit and the number of true day case cholecystectomies fell.

Over 80% of all elective surgery can be undertaken safely and with high patient satisfaction rates on a true day basis. A move to 23-h day surgery is economically retrograde and a move to office-based surgery a regression towards operating on the kitchen table. Major and minor complications may arise after day surgery performed in the best of units. All personnel practising office-based surgery and anaesthesia should be made aware of these problems. The obvious move should be from inpatient surgery (including 1 night stays) to true day surgery and from day surgery to non-surgical outpatient treatment. This has overall benefits to both patients and global health economics. Greed and political or healthcare management threats must not be allowed to cause a diversion to less satisfactory, higher risk or more costly approaches to treatment.

P.E.M. Jarrett,
Immediate Past President IAAS,
Kingston Hospital NHS Trust,
Galsworthy Road,
Kingston-upon-Thames,
Surrey KT2 7QB,
UK

C. De Lathouwer,
Past President IAAS
Nouv. Clinique Basilique,
Avenue du Duc Jean 71-73,
B-1083 Brussels,
Belgium

T.W. Ogg
President IAAS
11, Worts Causeway,
Cambridge,
CBI 8RJ,
UK

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Review

Laboratory tests in children undergoing ambulatory surgery: a review of clinical practice and scientific studies

Ramesh I. Patel *, Raafat S. Hannallah

Department of Anesthesiology, Children's National Medical Center and George Washington University Medicine Center, 111 Michigan Avenue, NW, Washington, DC, 20010, USA

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Abstract

The drive for cost containment in the United States has lead anesthesiologists to re-assess the benefits of routine pre-operative laboratory and radiological testing. The value of routine tests has been questioned not only by insurance companies but also by physicians. Common pre-operative laboratory and radiological tests are reviewed in the following analysis. Specifically, the use of such tests in children scheduled for ambulatory surgery is discussed. Current clinical practice patterns of pediatric anesthesiologists are included so that physicians may make conclusions on the basis of published literature and clinical practice of peers. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Anesthesia; Ambulatory laboratory tests; Children

1. Introduction

Preoperative evaluation of pediatric patients consists of a history, physical examination and appropriate laboratory and radiological tests. The laboratory tests should not be ordered for all patients scheduled for surgery but must be individualized. Such testing should be based on patient's history, physical examination and objective criteria for laboratory tests. Data from the Mayo Clinic indicate that patients undergoing minimally invasive surgery have little potential to benefit from additional laboratory testing, after a careful medical history was obtained and a physician had decided that no preoperative tests were required [1]. In general, history and physical examination of the patient are far more important than a battery of tests to make a diagnosis. About 85% of diagnosis depend on the history provided by the patient/parents, another 6% diagnosis are made by physical examination and tests add another 8% to the diagnosis in medical outpatients [2]. The practice of ordering batteries of tests unnecessarily has many disadvantages: it is not cost effective, decreases healthcare funds for others, may lead to inadequate or inappropriate care as a result of the time-consuming follow up of test results, increases risk to the patient and increases medico-legal risk to the healthcare provider [3]. Asymptomatic patients are more likely to be harmed by unwarranted tests and the physician's actions in response to the abnormal results of those tests. In spite of lack of evidence that routine preoperative testing of healthy children before elective surgery is warranted, this practice continues in many health-care facilities. State or institution mandated testing is far less prevalent than reported previously, but physicians recommended testing still comprise a large part of routine tests.

2. Indications for testing

Assuming that a history and physical examination have been performed, the possible reasons for preoperative investigations are:

* Corresponding author. Tel.: +1-202-8842025; fax: +1-202-8845999.

E-mail addresses: rpatel@cnmc.org (R.I. Patel), rhannall@cnmc.org (R.S. Hannallah).

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1. To detect unsuspected conditions: a finding of a new condition may alter the risk of surgery. The previously unidentified condition may be correctable or not correctable. If the condition is corrected preoperatively, it leads to a lower risk of surgery. If the condition is not modifiable, it is simply noted for the sake of completing medico-legal records [4].
2. To obtain baseline results that may be helpful in decision making during and after surgery (e.g. preoperative hemoglobin value to determine allowable blood loss during surgery) [4].
3. Screening for conditions unrelated to the planned surgery.
4. Satisfying institutional or legislative criteria.
5. Habit [5].

However, healthy children who are scheduled to undergo surgical procedures that are not associated with the possibility of extensive blood loss require only minimal preoperative laboratory testing. In some instances, such testing is governed by hospital or state policy.

3. Hemoglobin–hematocrit (Hb/Hct)

Until recently the routine measurement of blood hemoglobin concentration or hematocrit prior to elective surgery had been a widely accepted practice. It was assumed that routine preoperative Hb/Hct testing will detect a significant number of anemic children and that the risk of general anesthesia was increased in the presence of even mild anemia. It has been since noted that the incidence of anemia in otherwise healthy children is extremely low in most parts of the North America and Europe and mild degree of anemia does not require therapeutic intervention or modification of the anesthetic technique [6]. Most anesthesiologists now accept hematocrits in the mid-20's for elective surgical procedures, provided there are no other systemic problems. The most common reason to obtain a pre-operative Hb/Hct is to assess allowable blood loss during surgery.

The usefulness of routine preoperative hemoglobin and hematocrit determinations has been evaluated and the value of this test has been questioned [7–10]. Baron et al. on a retrospective review noted that only 1.1% of the 1863 children had Hct values of less than 30% or greater than 50% [11]. Roy et al. studied 2000 patients ages 1 month to 18 years scheduled for minor surgery [7]. Eleven patients (three <1 year, and eight 1–5 years old) had a Hb less than 10 g%. Of these, three patients had their surgery postponed and rescheduled following oral iron therapy; while the remaining eight underwent anesthesia and surgery without complications. These authors concluded that healthy pediatric patients 5 years and older scheduled for minor surgery do not require routine Hb determinations. Furthermore, the low incidence of anemia and low rate of deferral of surgery in anemic children, 1–5 years of age, lead them to question the value of routine preoperative Hb testing in this age group [7]. Hackmann, et al. noted anemia in 0.5% of the 2648 pediatric day-surgery patients studied [9]. Only two of the anemic patients had their surgery postponed (one of them also had a respiratory infection).

These authors made three observations from their study:

1. the incidence of anemia is rare but is more likely to occur in those <1 year of age
2. the presence of a mild degree of anemia does not alter the decision to proceed with day surgery, and
3. physicians could not reliably detect anemia clinically [9].

There are three groups of patients who are at increased risk of having anemia:

1. infants <1 year,
2. adolescent menstruating females,
3. children with chronic disease [12,13]

One of the common causes of anemia in adolescent females is heavy menstrual bleeding. The precise incidence of anemia in the pre-surgical patients of this age group is not known. Preoperative Hb/Hct may be indicated in such patients and those undergoing surgical procedures associated with considerable blood loss. A recent survey of more than 600 pediatric anesthesiologists of United States, indicated that, only 27% of pediatric anesthesiologists order routine hemoglobin/hematocrit [14] in healthy children between 1 and 12 years of age (Table 1). Less than 50% order routine Hb/Hct in infants <1 year of age and only 33% require routine Hb/Hct in adolescents [14] (Table 1).

Table 1
Hb/Hct stratified by age and ordering pattern [14]

	<1 year ($n=610$)	1–12 year ($n=613$)	Female >12 year ($n=602$)
Routinely required	292 (47.9%)*	166 (27.1%)	199 (33.1%)
By anesthesiologist/surgeon	264	139	177
By State/hospital	28	27	22
Not routinely required	318 (52.1%)	447 (72.9%)	403 (66.9%)

* $P<0.001$ (<1 year vs. older patients).

Table 2
PT/PTT prior to T&A [14]

(a)*	Teaching	Non-teaching	Total
Routine	135 (38.7%)	142 (49.7%)	277 (43.6%)
Non-Routine	214 (61.3%)	144 (50.3%)	358 (56.4%)
Total	349 (100%)	286 (100%)	635 (100%)
(b)**	Urban	Non-urban	
Routine	110 (41.2%)	167 (45.4%)	227 (43.6%)
Non-Routine	157 (58.8%)	201 (54.6%)	358 (56.4%)
Total	267 (100%)	368 (100%)	585 (100%)

* $X^2 = 7.69$; $P = 0.006$.
** $X^2 = 1.1$; $P = 0.29$

4. Complete blood count (CBC)

. The possible benefits of performing a CBC test routinely would be the detection of leukopaenia or leukocytosis reflecting hematological malignancies or infection [4]. O'Connor and Drasner noted abnormal WBC in 13 of 486 (2.7%) patients [8]. None of the children in the study had their surgeries canceled. One instance of elevated WBC was thought to be secondary to a chronic otitis media. The remaining 12 elevated WBC were unexplained with no documented follow-up. CBC is now rarely ordered before ambulatory surgery. Only ~20% of pediatric anesthesiologists order CBC as a routine pre-operative test [14].

5. Urine analysis: (U/A)

The rationale for performing routine urinalysis before surgery includes detecting, and treating children with unsuspected renal disease and urinary tract infections. However, O'Connor and Drasner noted clinically abnormal results of UA in 36/453 (8%) of the pre-surgical patients [8]. Of these abnormal results, 12 were related to known conditions and repeat studies in another 12 patients revealed normal UA. The remaining 12 patients had no documented follow-up. Surgeries were canceled in two children. One infant came back a week later for emergency surgery and the second infant was operated upon after treatment of urinary tract infection. They concluded that a routine U/A adds little to the preoperative evaluation of a healthy child and should be omitted. The survey of pediatric anesthesiologists indicates that the practices of most institutions reflect this recommendation in that routine U/A is ordered by only 15% of the physicians [14].

6. Coagulation testing

Intra-operative and postoperative bleeding is a concern during any surgery, but post-operative bleeding following adeoidectomy and/or tonsillectomy is particularly worrisome. The American Academy of Otolaryngology-Head and Neck surgery has recommended coagulation studies only in patients with positive histories and physical examinations [15]. In spite of this recommendation, ~45% of respondents to the questionnaire on hemostatic labs prior to tonsillectomy continue to obtain PT/PTT prior to tonsillectomy [14]. (Table 2a and b) The hemostatic evaluation of patients undergoing surgery, especially tonsillectomy has not been uniform because of the conflicting results of the studies and individual clinical experiences.

The incidence of post-tonsillectomy bleeding ranges from 0.28 to 2.15% [16,17]. It is arguable whether routine preoperative hemostatic (PT/PTT) tests should be performed in all children scheduled for tonsillectomy. Even if the hemostatic tests are performed for all such children, there is evidence that it will not predict all cases of post-tonsillectomy bleeding. Excessive bleeding associated with tonsillectomy is usually not a result of an identifiable coagulation disorder [16]. Close, et al. suggested that routine measurement of the activated partial thromboplastin time and prothrombin time in asymptomatic patients undergoing tonsillectomy is not useful for predicting postoperative bleeding [15]. Houry, et al. prospectively compared the results of four standard preoperative hemostatic screening tests (PT, APTT, platelet count and bleeding time) with history and clinical data in a multicenter study of 3242 patients [18]. Their results suggested that preoperative hemostatic screening tests should not be performed routinely, but only in patients with abnormal clinical data. Bolger et al. [19], however, reported that 21% of patients undergoing tonsillectomy had an abnormality of the activated partial thromboplastin time (APTT), prothrombin time (PT), or bleeding time (BT) and they suggested that these tests be performed in all patients to detect possible coagulation disorders.

7. Pregnancy test

Even though the overall pregnancy rate in the pre-surgical patient may be low, there are great social, ethical and medico-legal concerns when an adolescent scheduled for outpatient surgery is noted to have a positive pregnancy test just before surgery. Therefore, it is not surprising that pregnancy test is routinely required by ~45% of anesthesiologists [14] (Table 3).

The rate of teenage pregnancies in the United States is high, not only in urban populations, but also in non-urban areas. Teenage pregnancy represents 13–23% of total pregnancies in the United States [20]. Potential concerns over teratogenicity and miscarriages have led to the recommendation that elective surgery be postponed until the second trimester of pregnancy.

Therefore, it is important to know whether a patient scheduled for surgery is pregnant. An accurate history is often not obtained because adolescents may not believe that they could be pregnant and are reluctant to disclose their sexual behavior or pregnancy.

Azzam et al., retrospectively examined the results of 2 years of mandatory pregnancy testing in 412 adolescent surgical patients [21]. Pregnancy testing was performed without patient's or their parents' specific consent, as it was deemed a component of the preoperative evaluation and the practice had been approved by the medical staff bylaws. The overall incidence of positive tests was 1.2%. Five of 207 patients who were older than 15 years tested positive for pregnancy test, an incidence of 2.4% in that group. None of the 205 patients under the age of 15 years had a positive pregnancy test. In three subjects, the surgical procedure was postponed, in one it was performed under local anesthesia, and in another a general anesthesia without nitrous oxide was administered. The authors concluded that mandatory pregnancy testing is advisable in adolescent surgical patients aged 15 years and older [21]. In an editorial comment in response to the Azzam study, Duncan and Pope questioned the ethical, financial and legal grounds of performing pregnancy test without consent from each individual patient or her parents [22].

In contrast, Malviya et al., prospectively evaluated the reliability of the preoperative history obtained from adolescent patients in ruling out pregnancy [23]. Four hundred and forty-four adolescent patients who underwent 525 procedures were questioned preoperatively regarding the possibility of pregnancy. Regardless of the history, a urine pregnancy test was ordered. In 514 cases, patients or the parents denied the possibility of pregnancy. Seventeen patients were not tested due to patient/parental refusal. Eight patients stated that they might be pregnant. All pregnancy tests were negative. There was not a single patient who was pregnant. They concluded that adolescents educated about the potential risks of anesthetics might provide a reliable history regarding the possibility of pregnancy [23].

At Children's National Medical Center, we do not perform routine pregnancy testing in adolescent patients. Instead, we rely on the history provided by the patient. On the morning of surgery, the nursing staff of the outpatient surgical admissions unit escorts the adolescent away from the parents and confidentially elicits the history of sexual activity and the possibility of pregnancy. The patient is informed of the risks of anesthesia and surgery for a pregnant patient. The anesthesiologist or the operating room nursing staff again try to confirm the history just before induction of anesthesia. Whenever the history is suggestive of pregnancy or if the history is inconclusive, a urine pregnancy test is obtained. If this test is negative, no further action is necessary and the surgery proceeds without further delay. However, if the urine pregnancy test is positive, then, a blood pregnancy test is ordered with parental approval to verify the results of the urine test. If the blood test is positive, then the adolescent and the parents are informed and the plan for elective surgery modified.

8. Sickle cell disease

Routine preoperative sickle cell testing is not performed. The incidence of sickle cell disease is estimated to be 0.2–0.5% among the African American population. The incidence of sickle cell trait is $\sim 8\%$ in the same population. Routine testing for sickle cell disease is often done by the neonatologist/pediatrician. The diagnosis is usually made in the first year of life and it is rare for an undiagnosed child to be scheduled for routine surgery. African/American children with low Hb/Hct should also be tested. We order Hemoglobin/Hematocrit and Hb-SS electropheresis for children known to have sickle cell disease. Frequently, the diagnosis of sickle cell disease is known prior to surgery but the child does not have any preoperative preparation. It is crucial that the severity of the sickle cell disease is known and that the hematologist has adequately prepared the child for the general anesthesia and surgery.

9. Chest radiograph

Of all the preoperative tests, the chest radiograph has been most objectively studied in adults. This was never a routine test in children prior to surgery. The American Academy of Pediatrics recommended elimination of

Table 3
Pregnancy testing [14]

	Teaching ($n = 354$)	Non-teaching ($n = 273$)	Total ($n = 627$)
Routinely required	151 (43%)	120 (44%)	271 (43%)
By anesthesiologist/surgeon	144	117	261
By State/hospital	7	3	10
Not routinely required	203 (57%)	153 (56%)	356 (57%)

this test as part of routine preoperative assessment as early as 1983. However, the increasing incidence of infections such as HIV and tuberculosis raises the question of protection of other patients who share the same playroom/holding area and health care workers.

10. Legislative mandate

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) which is responsible for accreditation of healthcare facilities in the United States only requires that any indicated laboratory or X-ray examination be completed preoperatively. There are no specifically mandated tests before surgery. Similarly the American Society of Anesthesiologists, the American College of Surgeons and the American Academy of Pediatrics do not have any guidelines recommending any specific routine preoperative laboratory tests [4]. Individual states and local requirements may vary.

In conclusion, routine laboratory tests and radiological should not be ordered. Tests should be ordered on the basis of history and physical examination of the patient and the results of such tests then should be followed and necessary action taken prior to ambulatory surgery.

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Anterior cruciate ligament reconstruction as a day case with extended recovery

Mogens Haug *, Lilli Sørensen, Ole Dichmann

Department of orthopaedics, Give/Hospital of Vejle, Vejle, Denmark

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Abstract

The aim of this study was to describe the procedures and the postoperative outcome of arthroscopic anterior cruciate ligament (ACL) reconstruction when carried out a day case with extended recovery. Between December 1995 and September 1998, 91 patients underwent surgery using bone-patellatendon-bone autografts and interference screw fixation. Additional surgical procedures were performed on 35 of the patients. The patient records were evaluated for a mean of 17 months (1–33 months) postoperatively. The course of treatment was. (1) Evaluation and KLT-arthrometer test 14 days preoperatively. (2) Surgery, cryocuff, bupivacain, paracetamol, NSAID and ketobemidon for postoperative pain control. (3) Discharge from hospital within 24 h. (4) Physiotherapy after 14 days. (5) Follow-up after 6 weeks with bandage removal and after 6 months. Eight patients required one further day of hospitalisation due to pain (four), nausea (one), haematoma (two) and prolonged anaesthesia (one). Five patients were readmitted to hospital for a mean of 8 (3–16) days postoperatively. Three patients underwent re-surgery due to haematoma/rupture of the scar. No deep infections were found. We concluded that this effective method of ACL-reconstruction can be carried out safely as a day case procedure with extended recovery to the benefit of the patients.

Keywords: Anterior cruciate ligament; Reconstruction; Day care

Cost containment issues have had a major impact on almost all hospital departments world-wide. Many surgical procedures previously performed in an inpatient setting are now being performed on an outpatient basis bringing down costs and benefiting patients who can enjoy earlier the comfort of a home environment. This development in surgical procedures is mainly due to advanced technology and more efficient pain control postoperatively.

In addition it seems as if the attitude towards day-surgery procedures has changed in recent years.

1. Materials and methods

Between December 1995 and September 1998, 91 patients underwent reconstruction of the anterior cruciate ligament (ACL) as an outpatient procedure in our department. The operations were undertaken by six surgeons of differing experience.

We have focused on the pre-/postoperative procedures and the follow up of the patients. There were 37 female and 34 male patients with a mean age of 26 years. (range 16–40 years). The patients records were evaluated, for a mean of 17 (1–33) months postoperatively. Starting 2 months before operation all patients went through a training course supported by physiotherpaists in order to stimulate the vastus musculature.

The patients underwent arthroscopically assisted ACL reconstruction. In 57 patients only ACL reconstruction was performed, 31 patients also had a meniscectomy and in three patients the meniscus was also reconstructed with meniscal arrows.

The operations were either under general anaesthesia (44 patients) or under spinal anaesthesia (47 patients). When harvesting the graft a tourniquet was used. Preoperatively meticillin or cefuoxim 2/1.5 g intravenously were given depending on allergies to penicillin. All

* Corresponding author. Present address: Havrevej 8, Engum, 7120 Vejle O, Denmark.

E-mail address: haug@dadlnet.dk (M. Haug).

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patients had marcain 0.25% with adrenalin injected intraarticularily and into the wound after the procedure and a cold compressive bandage was applied (Cryocuff) in the operating suite together with a knee immobilizer allowing 0–90° flexion. All patients were allowed normal weightbearing. The knee immobilizer was used for a period of 6 weeks. The patients had prolonged recovery and were discharged the next morning. This procedure seems to give the patients a good understanding of the procedure and the postoperative situation. As postoperative paincontrol paracetamol, NSAID and ketobemidon, were used. The patients had the stitches removed after 14 days. All patients were seen in the ambulatory unit again after 6 weeks and 6 months. The physiotherapist was involved actively after the stitches were removed. The overall procedure is summarised in Table 1.

2. Results

Eight patients required one further day of hospitalisation postoperatively due to pain (four), nausea (one), haematoma (two) and prolonged anaesthesia (one). Complications did occur in three patients who required surgical intervention for haematoma wound rupture. Three patients were readmitted a few days postoperatively for observation of possible infection. All three patients had non-infectious reaction in the knee. Cultures were negative. Two patients were reoperated due to unacceptable Lachmann looseness combined with a subjective feeling of continual instability.

Three patients had the interferrens-screw in the tibia removed due to pain and this had good results. No deep or intrarticular infections were found.

Table 1
Summary of outpatient procedure for anterior cruciate ligament reconstruction

Operative indication made either clinically or after arthroscopy performed earlier
Physiotherapy training course, 6 months
Patient meets surgeon 14 days preoperatively and knee-loosness is measured by KLT-1000 arthrometer. Conversation with anaesthetist and nurse
Arthroscopy and ACL-reconstruction including additional surgery. Bracing and cryotherpay at the end of surgery
Post-operatively observation and pain control. Overnight stay. Short conversation with physiotherapist before discharge
Stitch removal after 2 weeks. Afterwards physiotherapy
Brace removal after 6 weeks
Last control after 6 months.

3. Discussion

Postoperative planning is essential if outpatient ACL reconstruction is to be successful. All patients that had reconstruction of the ACL underwent a programme of exercise in order to strengthen the vastus musculature of the thigh. If the patient after ending this programme still had serious complaints, reconstruction of the ACL was considered. When the ACL is being reconstructed it is important that the patient is cooperative and motivated to cope with the postoperative longterm exercise and restrictions, which means that the surgeon during the preparations and discussions with the patient must get an impression of the patient as to whether he or she is able to live up to the posteraptive challenges concerning the program of exercise. Parameters that also must be taken into account are age, symptoms and whether the patient daily feels handicapped. Also important to discuss with patients are the goals of surgery and rehabiliation and how those goals are going to be met. The patient must be taught crutch training and it is vital that the patient has good support at home.

The mean age of our patients was 26 years (range 16–40 years). This age is important and one the reasons for the possibility of reconstructing ACL's on an outpatient basis. All patients requiring this operation are young and fit with low anaesthetic risks. Another necessity for successful treatment is sufficient paincontrol postoperatively. In our patients only four had to stay at hospital one extra day due to pain, which is acceptable.

Postoperative pain control can be undertaken in several ways. Ketoralac is most commonly used preoperatively either intravenously or intramuscularly in doses varying from 10 to 60 mg and bupivacain 0.25 to 0.5% 20 ml with or without adrenalin is injected into the knee postoperatively period [1–4]. At home; paracetamol and codein is observed to be sufficient [5]. In our patients paracetamol and NSAID have been sufficient pain treatment. Nausea and vomiting seems to be common cause of morbidity and have been shown to be a significant cause of unexpected hospital admission from the day case unit [6]. In our series only 2% were admitted for these reasons but almost 4.5% required one extra day of hospitalisation due to pain. Nausea and vomiting are generally caused by general anaesthesia. Femoral-sciatic nerve block is a safe and reliable alternative to general anaesthesia and can be used in the day unit [3]

The overall complication rate of 20% is not higher than other studies which report rates from 3.6 [7] to 50% [6]. If only surgical complications are taken into account the rate lowers to 9% which is no higher than other studies. One might question whether the complication rate could have been lower in our study, if a drainage tube had been used thus avoiding postoperative haematoma and rupture of the wound.

Intravenous antibiotics were used and we did not observe any deep infections.

In a study [8] comparing outpatients and inpatients ACL reconstruction, there was no significant difference between the time required to regain active range of motion. This study [8] describes the use of a continuous passive motion machine (CPM) which is used immediately postoperatively allowing initially 0–30° movement which is increased by 10° daily as tolerated until the patient achieves 120° flexion. The CPM is used at home too. These patients were allowed partial weight bearing.

All our patients were allowed total weight bearing immediately post-operativley together with flexion from 0–90°. This is not common. In some studies [8,5] full weightbearing is not allowed initially and knee-movement is gradually increased during the first 6 weeks.

4. Conclusion

When evaluating our material, we find that our procedure for reconstruction of the ACL is satisfactory, including the complication rate and postoperative pain control. We think that our patients are mobilised more easily — with knee flexion up to 90° immediately with full weight bearing — than in other studies to the benefit of our patients. ACL reconstruction can safely be carried out as a day case procedure with extended recovery.

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Anesthesia and surgical repair of aponeurotic hernias in ambulatory surgery

Miguel Angel García-Ureña [a,*], Miguel Velasco García [a], Vicente Vega Ruíz [a], Francisco Javier Carnero [a], David Portilla Huerta [b], María Sol Carrasco Jiménez [b]

[a] *Department of Surgery, School of Medicine, University Hospital of Puerto Real, Cádiz University, Cádiz, Spain*
[b] *Department of Anesthesia, School of Medicine, University Hospital of Puerto Real, Cádiz University, Cádiz, Spain*

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Abstract

The aim of this study was to evaluate our 5 year experience in the surgery of umbilical (UH) and epigastric hernias (EH) on an ambulatory basis. Sixty three point seven of UH (88/138) and 68.4% of EH (13/19) could be successfully operated in our ambulatory unit. Morbid obesity, ASA III-IV and insulin dependent diabetes were exclusion criteria. After a preoperative local anesthesia infiltration with 1% lidocaine a repair was undertaken in all 101 patients under monitored anesthesia care. Most patients underwent a mesh hernioplasty as definite treatment. Only three patients could not be discharged on the day of operation. There has been a 2% recurrence rate in long term follow-up. These results demonstrate that two thirds of primary aponeurotic hernias can be satisfactorily operated on ambulatory basis.

Keywords: Umbilical hernia; Epigastric hernia; Local anesthesia; Ambulatory surgery

1. Introduction

The umbilicus is a cutaneous scar attached to a fibrous ring. This area of the anterior abdominal wall is weak and a common site of acquired hernias, as a consequence of a rise in intraabdominal pressure and deterioration of connective tissue [1,2]. The estimated prevalence of umbilical hernias (UH) in the adult population is 2% [3]. Epigastric hernias (EH) arise in defects in the midline aponeurosis as a consequence of alterations in the fascial fibers decussations [4]. The risk of incarceration and strangulation in patients with midline primary hernias requires elective surgical repair to prevent these complications [5]. Although most of UH in these patients are thought to need general anesthesia and hospital admission, the introduction of new anesthetic agents (propofol, sevoflurane) and the advantageous application of tension-free repair to the inguinal defects suggested to us the possibility of operating on these patients in an ambulatory setting [6–8]. The aim of our present study was to evaluate the results of a protocol of local anesthesia and sedation for the surgical treatment of EH and UH in an ambulatory unit.

2. Patients and methods

Patients underwent routine preoperative evaluation consisting of blood test, chest X-ray and electrocardiogram. Exclusion criteria included ASA III-IV classification, morbid obesity, insulin-dependent diabetes and social or housing problems. All the patients were admitted on the day of operation. Discharge of patients after elective hernia repair was scheduled for the evening of the day of surgery. Comprehensive and consistent information is provided at first consultation and a signed informed consent is obtained.

Local anesthesia and sedation were used. Before infiltration the patient was monitored and a peripheral vein accessed. Antibiotic prophylaxis was started 30 min before anesthesia infiltration with 1 g cefazolin. Thromboembolism prophylaxis was performed with subcutaneous enoxaparin in patients at risk, starting

* Corresponding author. Present address: Avda de la Salinera 26, 11500 El Puerto de Santa María, Spain. Tel.: +34-956-560382.
E-mail address: mgarciau@meditex.es (M.A. García-Ureña).

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the night before surgery and for 7 postoperative days. The patient learned to self-administer this drug. Thirty millograms ketorolac was used as initial analgesia, 30 min before anesthetic injection. A maximum of 60 ml solution of 1% lidocaine was usually enough to achieve a complete block of the umbilical or epigastric area. Neither bicarbonate nor vasoconstrictor were used. About 80% of the solution was injected before the skin incision.

Under monitored anesthesia care a single dose of midazolam (0.1 mg/kg iv) was given before local anesthesia infiltration. When analgesia was not sufficient or there was patient restlessness a continuous perfusion of propofol was administered. A laryngeal mask was used if respiratory depression occured. Atropine was also usually utilized under anesthesia criteria, at normal doses.

Having approximately calculated the distance between skin and anterior fascia, progressive local anesthesia was performed from two points of injection (one above and one below the umbilicus). In order to avoid the needle introduction pain, ethyl cloride skin spray was used. Then an intraepidermal subumbilical wheal was infiltrated in the direction of the proposed line of the skin incision. With the help of a 20 or 22 G spinal needle, the dermal, subcutaneous tissue and fascia was progressively injected in an area surrounding the hernia defect. After 10 min the operation was started. The rest of the lidocaine solution was used to block the base of the sac and the border of the defect during the operation.

A semicircular subumbilical incision was preferred for UH and a short midline incision for EH. The content of the sac was usually reduced and only rarely resected. The sac was replaced in the abdominal cavity without resection when possible. This was performed in 64% of cases. When the sac was resected the peritoneum was closed with 2/0 absorbable poliglycolic acid sutures (Dexon®). The surgical repair techniques are shown in Table 1. Defects sized less than 1 cm diameter were surgically corrected with absorbable sutures (herniorrhaphy) in 16 (18.1%) of UH and in six (46.1%) of EH. Larger hernias were corrected with the application of a polypropylene (Premilene®) mesh. Most hernias were repaired with 'H hernioplasty' described elsewhere [9,10]. Subcutaneous tissue was closed with absorbable sutures (Dexon®) over a closed sump drain placed (in 38% of cases).

Table 1
Surgical techniques applied to hernia repair

	Umbilical (%)	Epigastric (%)
Herniorrhaphy		
Simple closure	11 (12.5)	5 (38.4)
Queno	1 (1.1)	1 (7.7)
Mayo	4 (4.6)	
	16 (18.1)	6 (46.1)
Hernioplasty		
H hernioplasty	69 (78.4)	6 (46.1)
Preperitoneal	1 (1.1)	1 (1.1)
Preaponeurotic (Onlay)	2 (2.2)	
	72 (81.8)	7 (53.8)

The patient was moved to a recovery room and a frozen dry plastic bag (ColdHot™, 3M) was applied over the wound dressing to diminish postoperative local inflammation. Oral intake was started after 2 h. Then, the patient was moved to an armchair in another room. After approximately 3–4 h the patient is invited to initiate walking. The patient's readiness for discharge was assessed using a postanesthesia discharge scoring system [11]. Before discharge, the patient was informed about possible postoperative complications and local wound care at home. The next morning the patient was telephoned to assure that the immediate postoperative outcome and the control of pain was satisfactory. A week later an ambulatory nurse visited the patient at home and removed the skin stitches and sump drain. The patients were followed up postoperatively at 6, 12, 24 and 36 months in the outpatient department.

3. Results

From January 1994 to January 1999, 157 patients with midline hernias have been operated in our department: 138 UH and 19 EH. Of these, 88 (63.7%) UH and 13 (68.4%) EH could be successfully operated on an ambulatory basis. Mean age was 46.1 ± 13.9 years (range: 18–86) and 43.6% ($n = 44$) were females. Mean body mass index (BMI) of patients included was 27.2 ± 0.75 (range: 17.3–41.5). There were several concomitant associated diseases in the patients undergoing ambulatory surgery: moderate obesity (BMI > 30) in 47 (46.5%), hypertension in 22 (21.1%), non-insulin dependent diabetes in ten (9.9%), chronic bronchitis in seven (6.9%) and cirrhosis in five (4.9%). Four of the patients with UH had a recurrent umbilical hernia (4.5%), and two had an umbilical hernia over a previous laparotomy scar.

There were no intraoperative surgical complications such as abdominal hemorrhage or evisceration. Vagal bradycardia was the most frequent anesthetic event (7.9%) successfully corrected with atropine iv. Five cases of intraoperative hypertension were recorded and treated with sublingual nifedipine. There was one case of local anesthetic toxicity with mild symptoms at the beginning of our study that was be successfully managed. Mean operative time was 49.7 min (range: 24–110).

There was no mortality. There were few postoperative complications: nine seromas (8.9%), two he-

matomas (1.9%), one wound infection (0.9%). All the seromas were treated by simple drainage on an ambulatory basis. Mean postoperative time before discharge was 7.2 h. Three patients could not be discharged on the day of operation (2.9%): one patient with social problems, one patient with nausea, vomiting and general discomfort and one patient with immediate postoperative hematoma that had to be surgically drained. All of them were finally discharged before the third postoperative day.

With a mean follow-up of 70 months (range: 6–55) in 95% of patients, there has not been any case of chronic pain, foreign body reaction or infection after the use of a mesh. There were two cases of recurrent hernia, one after simple closure and one after H hernioplasty.

4. Discussion

Adult umbilical and epigastric hernias have not received so much attention in the recent literature as other defects of the abdominal wall. While inguinal and crural hernias are commonly repaired in one day surgery programs, ambulatory repair of aponeurotic hernias remains controversial. There is a serious risk of incarceration in umbilical hernias with a high associated morbidity and mortality [12,13]. Thus elective repair is nearly always indicated [5].

With experience our selection criteria in our series have become more flexible. This has allowed us to operate on 63.7% of UH and 68.4% of EH as day cases. This has been achieved by proper local anesthesia and surgical techniques by the surgeon and careful monitored care by the anesthetist.

Obesity may be defined as a body mass index over 27. This was the case in 54% of patients in our series. Obesity is frequent among patients with UH, especially middle-aged multiparous women [14]. Moderate obesity was an exclusion criterion at the beginning of our series, but later some patients with this were included. Those cases in which the distance between skin and fascia was felt to be shorter than 5 cm were selected to be operated on an outpatient basis. Patients with morbid obesity were always treated as inpatients.

Elderly patients were included. In our experience, this age group tolerates local anesthesia better than younger groups. Elective local anaesthetic surgical repair is particularly advantageous in patients older than 65 years [15].

Local anesthesia has several advantages: rapid recovery in the immediate postoperative period ('a painless patient is a quiet patient'), less surgical stress, and avoid general anesthesia like nausea, vomiting and severe sedation. Oral intake can be started early and the patients become autonomous sooner than following a general anesthetic. The main but infrequent disadvantages of local anesthesia are anxiety, toxicity and ineffective surgical repair. Only one case of mild toxicity was recorded in our series.

There are two possible local anesthetic techniques: a progressive complete anesthesia block that is achieved preoperatively [16,17], or administration following each operative step: skin, subcutaneous tissue, sac and rectus sheath [6]. In our group the first is our choice in order to avoid patient sensitivity to pain when a surgical area without infiltration might be entered. With either option, local anesthesia can be accomplished with confidence after sufficient experience [18]. Not only is this method useful for ambulatory surgery units but also for patients with diseases that contraindicate general or spinal anesthesia: dilated myocardiopathy, severe chronic bronchitis, cirrhosis etc. In our department even a patient with a strangulated umbilical hernia that required an intestinal resection was successfully operated with local anesthesia block.

Another important issue in the success of ambulatory surgery for EH and UH is the use of mesh. Simple closure of the defect with sutures or the use of overlapping procedures in large defects shorten the longitudinal diameter of the midline, generates tension and may seriously affect the mobility of the anterior abdominal wall [4]. The use of a mesh replacing the defect avoids tension sutures to approximate the separated borders and therefore, is suitable to be used in these midline hernias. This becomes more relevant when patients are programmed to be discharged on the day of operation.

There are different locations to lay on the mesh at the umbilical ring [19]. The surgical repair with mesh designed by Celdrán et al is our preferred choice for UH and EH [9]. With this method the anterior surface of the fascia 2 cm around the ring is explored in order to exclude other paraumbilical defects [4]. There is not an extensive dissection of the preperitoneum (only superior and inferior borders) and this is easily achieved under local anesthesia. Although there is lack of agreement in the scientific community about what kind of biomaterial should be used for hernia repairs [20], our results with the use of polypropylene mesh are encouraging.

Seromas are the result of the dissection of anterior fascia from the subcutaneous tissue and the application of the mesh. The high rate of seromas in the series is attributable to the infrequent use of drains in these patients. Now we almost routinely employ soft sump drains. Patients are properly instructed in care of the wound and drain at home. These drains, together with the skin staples, are usually removed at the eighth postoperative day.

Our 2% recurrence rate is a real success for these patients. Although there is a lack of evidence based surgery on UH and EH, the reported recurrence rates after herniorrhapies are as high as 27% [2,10].

In conclusion, almost two thirds of patients with UH and EH defects can be safely operated on an ambulatory basis using local anesthesia. This procedure avoids complications associated with general or spinal anesthesia and saves hospital admission costs. The application of tension-free hernioplasty, that has been successfully applied to the myopectineal ring, provides an excellent tool to repair these aponeurotic hernias on a day surgery basis.

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Fees for outpatient operations in Germany: development, evaluation and European comparison

Wolfgang Rulf [a,*], Richard Cowlard [b], Dirk De Jong [c], Claude De Lathouwer [d], Viktor Grablowitz [e], Andreas Halder [f], Juan Marin [g], Marc-Claude Marti [h], Jean-Patrick Sales [i]

[a] *Bergstrasse 9, D-40699; Erkrath, Germany*
[b] *The Old Cottage Hospital, Alexandra Road, Epsom KT17 4B1, UK*
[c] *Academisch Ziekenhuis Vrije Universiteit, PO Box 7057, NL-1007 MB Amsterdam, The Netherlands*
[d] *Avenue du Duc Jean 71–73, B-1083; Bruxelles, France*
[e] *Seilerstätte 7/3/7, A-1010 Wien, Germany*
[f] *Asklepios-Klinik Birkenwerder, Hubertusstr. 12, D-16547 Birkenwerder, Germany*
[g] *Avda. Ramon de Carranza, Edif. Presidente, Portal B-2, 4°BE-41011 Sevilla, Italy*
[h] *Hopital Cantonal, Rue Micheli-du-Crest 24, CH-1211 Geneve 14, Italy*
[i] *Centre Administratif Andre Benech, 191, Av. du Doyen Gaston Giraud, F-34295 Montpellier Cedex 5, France*

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Abstract

In Germany, discussions on the fees for statutory sickness insurance for ambulatory surgery has, in the last few years, become almost a symbol of dispute for the German health services. Outpatient surgeons complain about the fact that the fees do not cover their services. They see innovation severely threatened by bureaucracy, profitability by planned economy, rights by reasons of State, aggravated by the 'reform' attempts of the Greens and Socialist coalition Federal Government. On the other hand their opponents complain about the money mindedness of the doctors. Intentional panic or real disaster? The fundamental consideration to clarify this question is based on a comparison of the German statutory medical insurance fees and private fees with our neighbours. In Europe an economic area with similar prices for goods, services and wages, even 'outpatient operations' services with comparable cost rates should be paid for at a corresponding level. Any discrepancies would give cause to look for an explanation by analysing the historic development of fees and the question of a fair comparison between operations and the non-operative services.

Keywords: Sickness insurance; Planned economy; Medical insurance

1. European comparison

The medical insurance and private fees for three key operations, (non-laparoscopic inguinal hernia repair, orchidopexy [cryptorchidism] and male sterilisation operations) in England, the Netherlands, Belgium, France, Spain, Italy, Austria and Switzerland were compared with each other by way of example.

The majority of the European operation fees was given by the current presidents of the national associations for ambulatory surgery. Occasionally Internet contacts helped and once the author had to pretend to be a potential patient.

On the whole the fees could only be roughly compared because of the different health systems and fees that vary according not only to countries but also to regions (e.g. Switzerland and England). The operation costs are, where given, divided into doctor's fees and material expenses. Anaesthetic costs have not been considered. Unlike Germany, where ambulatory surgery is carried out in free standing units, outpatient operations in neighbouring countries are carried out almost exclusively by (private practice) doctors at hospitals.

* Corresponding author.

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Table 1
European outpatient operation fees in Euro

Country	Orchidopexy unilateral			Inguinal hernia repair unilateral			Vasectomy		
	Doctor's fee	Expense	Total	Doctor's fee	Expense	total	Doctor's fee	Expense	Total
D	?	?	180	?	?	255	?	?	55
GB	?	?	590	?	?	640	?	?	320
NL	97	534	631	82	534	616	53	122	175
B	164	300[a]	460[a]	260	300[a]	560[a]	85	160[a]	245[a]
SP[b]	?	?	843	?	?	843	?	?	216
F[c]	125	300[a]	425[a]	110	300[a]	410[a]	45	160[a]	205[a]
CH	?	?	525	?	?	540	not paid by social security		
I						931			
A	Not available as outpatient service unless privately paid total case lump sum for inpatient surgery (3 days) ca. 148 000						Does not exist as independent operation unless privately paid		

[a] As these costs were not reported or could not be specified in one amount, the estimated costs for operation room, post-operative nurse fee and material expenses have been taken according to the German KBV management calculation (see text).
[b] Total case lump sum for outpatient/inpatient surgery including anaesthetic costs.
[c] Privately operated hospitals.

Because of this a subtle comparison of the fees system is not possible, but the question of scale and thus finally the question of the reasonableness of the requests of German surgeons can be answered at any time.

The results are shattering from a German point of view: Although the medical insurance fees in neighbouring countries vary widely, the German rates are far below on the table (see Table 1).

The same applies to private fees which are sometimes even lower than the social medical insurance fees of neighbouring countries (see Table 2).

2. Conclusion

With fees which only amount to a quarter or at the most half of those of their European colleagues with rather higher costs and wages, this is an impressive description of the disastrous situation of German doctors. Add to this the fact that abroad surgeons usually operate in hospitals. Public medical insurance pays them a fee and costs are settled directly with the hospitals. The business risk of foreign colleagues must thus be ignored when comparing with the Germans in their own businesses.

3. Explanation — development and evaluation of the German fees for outpatient surgery

The reasons for these striking differences are to be found in the German statutory health system, to be precise

1. In the principle of the 'total reimbursement with releasing effect'.
2. In the assessment of a doctor's services according to 'political' interests and not according to a business management value assessment.

3.1. To 1: total reimbursement with releasing effect

The statutory medical insurance pays the regional association of medical insurance doctors in advance a specified lump sum for outpatient services according to the type of insurance and number of members (total reimbursement), which releases it from any further payment obligations for a given period. Periodic amendments are not done according to medical needs (e.g. shifting services from in-patient to outpatient), but according to strict political guidelines, the maxims of which are contribution stability. The doctors' fees in the statutory medical insurance are not expressed in DM but in points (in contrast to private insurances). The

Table 2
European/US private outpatient operation fees in Euro

Country	Inguinal hernia	Vasectomy
	Total fee	Total fee
D	370	250
GB	1.280	490
NL	770	?
SP	350	240
CH[a]	1.380	310
A	1.500	480
USA[b]	5.520	1.430

[a] Only doctor's fee.
[b] Total case lump sum Mayo clinic USA.

total reimbursement is divided by the sum of all the points charged by the doctors in the medical insurance association and thus a points' value is calculated. Inevitably the point value falls if the amount of services increases because the total reimbursement, as we have said, is not adapted to medical need.

Between 1992 and 1999 the points value dropped by about 30%.

Furthermore, the German health service is characterised by its bureaucratic, planned economic basic structure, by the strong division into an outpatient and inpatient supply sector with different reimbursement, financing and administration structures. Impermeable finance sectors prevent 'the money following the service' when services are transferred from in-patient to out-patient.

However, this cannot be the only reason. The second point has a more serious effect:

3.2. To 2: assessment of fees

Schedules of fees are basically, like all price lists, relative assessments. Common to all is the fact that, if the basic value has been calculated in a correct business-like way, and if all other services have also been assessed to see if they are in a fair ratio, whether in points or euros, then this must also lead to a positive result from a business management point of view — assuming sufficient demand. A good example is the fee reform attempted in 1997 by the Federal Association of statutory medical insurance physicians (KBV) for outpatient operations: the fee for a given operation is calculated from the product of the operation stopping time and a calculated basic value (the min rate).

This reform failed because of opposition from the social health insurance companies because, in spite of the most stringent calculation criteria, it would have led to considerably higher fees and other relative assessments for operations. But the in-patient case costs currently in force are still way above the outpatient fee requests that were denied. Because of the impermeable finance sectors this advantage cannot be realised immediately. Furthermore, fear of the statutory health insurance companies is enough to have to give up important bureaucratic principles (total reimbursement with releasing effect), to pay the higher inpatient costs that have already been calculated according to their planned management.

The current points evaluation system in force for outpatient operations is not based on any rational business calculation. Neither doctors in private practice (because of the risk of decreasing point value), nor the hospital doctors (because of the risk of a beds' surplus) were or are interested in shifting services from inpatients to outpatients. Therefore outpatient operations were clearly allotted a 'political' number of points, which bore no relationship to their real value, in order to avoid incentives. But most surgeons are still not aware of this procedure.

With few exceptions, regional promotions of outpatient operations served and serve, because of their size, as a front; the political promotion (1993) was in typically planned management fashion, catastrophically counter-productive.

Examination of the relative assessment of conservative and operative outpatient services is used to embody the points undervaluation of outpatient operations.

4. Methodology

As we have already said, in the actual schedule of fees of statutory medical insurance physicians (EBM), there is no basic value calculated by management which is comparable with the minute value of the KBV reform of 1997. Therefore, an alternative value must be found in the EBM which fulfils the criteria of an 'alternative unit value', correct absolute evaluation, basic medical services and basic cost rate. Paragraph 60 of the EBM (basic physical examination) practically fulfils these criteria. It is a basic service done by all doctors, requires the minimum conceivable cost rate and is assessed satisfactorily at 320 points (at about 0.035 Euros/point, 11.20 ?). All services whose points measurement is in a fair (correct) relative assessment to paragraph 60 will obtain-theoretically-the same-modest gain.

If you compare the points of a given operation with the 320 points in paragraph 60, you will get a relative value ratio, which can only be assessed intuitively for itself alone as fair or not. The fees of the KBV reform attempts mentioned at the beginning (in German marks (DM) not in points!) were referred to in order to quantify the fair relative assessment. These DM-fees produced a comparison in relation to the DM-value of paragraph 60 and using this the fair relative assessments of the valid EBM operation fees, expressed in percentages, were calculated.

If a given operation is assessed relative to paragraph 60, it would have a relative assessment of 100% in Table 3. Because of the still just positive basic calculation values, each operation with a fair assessment level of less than 100% is not a cost covering performance. (see Table 3).

Table 3
Relative value of some outpatient surgery fees in relation to the fee of the basic physical examination (BPE)

Basic physical examination/operation	Relative assessment EBM[a]	Relative assessment KBV 97[b]	% Fair assesment
BPE/hydrocele/spermatocele	1:6	1:20	30%
BPE/implantation DJ-splint	1:0.9	1:23	4%
BPE/extrauterine gravidity	1:17	1:40	42%
BPE/tonsillectomy	1:3	1:18	17%
BPE/cellulitis	1:6	1:22	28%
BPE/phimosis	1:4	1:19	21%
BPE/vasectomy	1:4.4	1:16	27%
BPE/inguinal hernia repair	1:19	1:33	59%
BPE/orchidopexy	1:13	1:36	36%

[a] EBM, actual fee order for statutory health insurance.
[b] Management calculated fees (KBV data).

Table 4
Relative value of examplary operations compared with each other

Op/Op	EBM[a]	KBV 97[b]	RBRVS[c]
Orchidopexy/inguinal hernia repair	0.65	1.1	1.0–1.22
Resectioning arthroscopy (30 min)/transurethral resection of a large bladder tumour	4.2	1.0	1.28

[a] EBM, actual fee order for statutory health insurances.
[b] Management calculated fees (KBV data).
[c] American resource based relative value scale.

Please note that this evaluation scheme does not claim to be a business management model, but is a logical starting point to embody the lack of assessment for outpatient operations in the EBM.

An evaluation 'off the top of one's head', also inevitably leads to an irrational relative assessment of operations compared with each other (Table 4). Objective reference points are on the one hand once again the KBV data and on the other hand the American resource based relative value scale, (RBRVS). (see Table 4).

5. Results

All operations examined in the spot check were seriously and completely irrationally undervalued (see Table 3). The 30% fair assessment of the hydrocele operation for example means that this operation would be correctly assessed at about 6000 points instead of the current 2000 points, tonsillectomies with 5900 points instead of 1000 points. The percentage of fair relative assessments in the sample ranges from 5% (putting on a DJ splint) up to a maximum of 60% (inguinal hernia).

This chaotic value measurement also continues when evaluating operations amongst themselves (see Table 4). And so urologists must be satisfied with a 75% lower fee for a resection of a large bladder tumour than their colleagues who do arthroscopy for the same expense (resectioning arthroscopy, operation time 30 min).

6. Analysis

Working on the premises that foreign colleagues cover their costs in operations, it was to be expected that operations that have a fair assessment of less than 100% in Germany, must inevitably be assessed higher abroad (or the logical approach was not correct). Surprisingly the level of undervaluation (percentage of fair assessments) is reflected in the fees' discrepancy again. (And so with a 25% fair assessment, our neighbours are paid on average four times more than the German fee).

It is also surprising that, for example, in the Netherlands, the costs settled for doctors fees that are paid from the public purse, are higher than the total private fee in Germany!

German private fees are generally lower than the level of fees for European public health systems.

And it is only logical that in a comparison of private fees, the Germans (and the Spanish) are a long way down at the bottom of the league. (Table 2).

The miserable state of fees complained about by the German outpatient surgeons is indicated by the information above. Its cause is the striking, politically intentional, relative undervaluation of outpatient operations. The drop in points' value is just the 'final straw'.

The fees of our neighbours are based on an acceptable framework around a middle value which represents a certain rationality of evaluation in spite of differing social systems. Although with private fees the range of variation is considerable.

In Germany, however, a fundamental reform is necessary, not only, but especially for operation fees, both with regard to the evaluation of the service and the description of the service.

A look at the new law coming into force on 1.1.2000 gives little encouragement. The red–green Federal coalition government is going full steam ahead into the past: bureaucracy and control instead of flexibility and competition, strict finance sectors instead of a free flow of money to where the work is done most economically. Outpatient operations in Germany…could possibly become a thing of the past.

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Fast tracking in ambulatory surgery

Girish P. Joshi [a,*], Rebecca S. Twersky [b]

[a] *Department of Anesthesiology and Pain Management, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX 75235-9068, USA*

[b] *SUNY Health Science Center at Brooklyn, Brooklyn, New York, NY, USA*

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Abstract

Fast tracking after ambulatory surgery is a new paradigm which involves transferring patients from the operating room to the phase II recovery unit (i.e. bypassing the postanaesthesia care unit). The success of fast tracking depends upon appropriate modification of the anaesthetic technique, which would allow rapid emergence from anaesthesia, and the prevention of common postoperative complications such as pain, nausea and vomiting using a multimodal approach. Implementation of a fast track program involves use of clinical pathways that would reduce hospital stay and ensure patient safety. Finally, the concept of fast tracking should be expanded to the overall postoperative recovery, not just bypassing the postanaesthesia care unit.

Keywords: Surgery: ambulatory; Anaesthesia: recovery; Fast tracking

1. Introduction

In the United States, ambulatory surgery now accounts for 60–65% of all surgical procedures. In addition, an increasing number of surgical procedures are being performed in offices. It is estimated that office-based procedures will increase to 15% by the year 2001. With the increasing number of patients presenting for ambulatory surgery and emphasis on cost containment and efficient resource use, the ambulatory surgery facilities are forced to be high-volume and rapid-turnover settings. Therefore, one of the important factors in the success of ambulatory surgery is safe and expeditious recovery and shorter hospital stay.

Currently, most patients are transferred from the operating room to the postanaesthesia care unit (PACU) and then to the phase II (or step-down) recovery area before they are discharged home. However, the recovery care after ambulatory surgery is now in a state of flux [1]. Advances in surgical techniques (e.g. minimally invasive surgery) and the availability of newer shorter-acting anaesthetic, analgesic, and neuromuscular blocking drugs facilitate the early recovery process. It is now possible to have patients who are awake, alert, and comfortable in the operating room soon after discontinuation of anaesthesia [2]. Therefore, the need for transferring all patients to the labor-intensive PACU is in question. There is a trend towards transferring patients from the operating room directly to the phase II recovery area (i.e. bypassing the PACU). This paradigm is referred to as fast tracking in ambulatory surgery [3].

The PACU is a high dependency area and may account for a significant portion of the perioperative costs [4]. Changes in the recovery paradigm should not only improve efficiency of an ambulatory facility, but also reduce healthcare costs [5]. However, it is vital to ensure that if fast tracking is adopted we are not placing the patient at any additional risk and in fact improving the patient care by the rapid recovery process. This article reviews the techniques, which might be applied to facilitate fast tracking after ambulatory surgery. The process of implementation of a fast track program and the need for quality assurance (or audit) of such as program is also discussed.

* Corresponding author. Tel.: +1-214-5907259; fax: +1-214-5906945.

E-mail address: girish.joshi@email.swmed.edu (G.P. Joshi).

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2. Choice of anaesthetic techniques for fast tracking

Patients eligible for fast tracking must rapidly achieve PACU discharge criteria shortly after completion of the surgery. Therefore, the anaesthetic technique used needs to be modified to allow early recovery and reduce common postoperative complications, in particular pain, nausea, and vomiting. The choice of anaesthetic technique (i.e. general versus regional anaesthesia) is a major determinant of the recovery after ambulatory surgery [6,7].

Regional anaesthesia offers several advantages over procedures performed using general anaesthesia including the maintenance of alertness and cognitive function and a reduced incidence of postoperative pain, nausea, and vomiting [8]. Because of these advantages, use of regional anaesthesia techniques is increasing in popularity. A large observational study by Apfelbaum et al. [9] reported that 80% of patients receiving local anaesthesia and monitored anaesthesia care bypassed the PACU as compared with 14–42% of patients receiving general anaesthesia. Although patients receiving peripheral nerve blocks can safely bypass the PACU, those receiving spinal anaesthesia with conventional doses of intrathecal local anaesthetic usually need to be admitted to the PACU [10,11]. However, recent studies have shown that low-dose intrathecal local anaesthetic solution combined with lipophilic opioids (e.g. fentanyl and sufentanil) avoid high sympathetic blockade and allow early recovery and fast tracking [10]. Thus, it is necessary that the regional anaesthesia techniques used for ambulatory surgery be modified to achieve rapid and safe recovery [8].

An ideal general anaesthetic technique should be safe, simple, with a rapid onset of amnesia and analgesia, and a rapid recovery with minimal (if any) side effects. Because of its unique recovery profile, propofol is considered the sedative-hypnotic drug of choice for induction (and maintenance) of anaesthesia. Propofol's rapid metabolic clearance facilitates rapid emergence from anaesthesia and return to a baseline state. In addition, propofol offers an advantage over other intravenous anaesthetic drugs because of its antiemetic properties and associated euphoria on emergence. Although there is an increasing interest in total intravenous anaesthesia (TIVA), inhaled anaesthetics remain the most widely used maintenance drugs. Compared to propofol-based maintenance anaesthetic technique, inhaled anaesthetic technique may increase the incidence of PONV [12]. However, PONV after inhaled anaesthetics may be reduced by the use of prophylatic antiemetics [13]. In addition, intravenous anaesthetics (e.g. propofol) may be more difficult to titrate compared with inhaled anaesthetics. Furthermore, use of desflurane has been shown to provide a faster awakening and psychomotor recovery as compared to propofol [14]. The low tissue solubility of the newer inhaled anaesthetics (i.e. desflurane and sevoflurane) provide a rapid onset and recovery while allowing easy titrability of anaesthetic depth. Furthermore, recent studies report that, compared with propofol, use of these newer inhaled anaesthetics for maintenance of anaesthesia resulted in earlier emergence and higher percentage of patients being judged fast track eligible [2]. In addition, maintenance of anaesthesia with desflurane or sevoflurane may still be superior to propofol, even when PONV is considered [15].

Opioids continue to play an important role in anaesthesia practice. However, opioid-related side effects including nausea, vomiting, sedation, bladder dysfunction, and respiratory depression may contribute to a delayed recovery and interfere with the ability to fast track. Fentanyl is the most commonly used opioid for intraoperative analgesia. Remifentanil is a new ultra short-acting opioid with a rapid onset and offset regardless of the duration of its administration [16]. It provides profound intraoperative analgesia, hemodynamic stability, and reduces the requirements of inhaled anaesthetics [17]. However, because of the rapid offset of analgesic effect of remifentanil, patients may experience pain soon after emergence from general anaesthesia. Therefore, it is necessary that transitional analgesia (with fentanyl, nonsteroidal antiinflammatory drugs [NSAIDs] or local anaesthetics) be initiated before the remifentanil infusion is discontinued. Importantly, opioids should be used sparingly in patients undergoing ambulatory surgery [18].

Muscle relaxants are commonly used as a part of a balanced anaesthetic technique [19]. The choice of muscle relaxant is particularly crucial in the ambulatory setting. Recently, Kopman et al. [20] reported that even a minor degree of residual blockade could cause distressing residual symptoms of visual disturbances, inability to sit without assistance, facial weakness, and generalized weakness. These symptoms may be present despite the signs of clinical recovery from neuromuscular blockade. Importantly, these symptoms can prolong the recovery time and decrease the ability to fast track. Therefore, the use of muscle relaxants should be minimized in ambulatory anaesthesia. The use of newer airway devices such as the laryngeal mask airway may allow for the avoidance of muscle relaxants [21].

Shorter acting muscle relaxants (e.g. mivacurium and rapacuronium) have a rapid and predictable recovery, which may reduce the degree of residual neuromuscular blockade. Rapacuronium is a new muscle relaxant with a rapid onset and a short duration of action [22]. Use of these shorter-acting muscle relaxants also reduces the need for reversal drugs (e.g. neostigmine and edrophonium). Many practitioners avoid the use of reversal drugs because of their potential to increase the incidence of postoperative nausea and vomiting (PONV).

However, because of the potential detrimental effects of residual neuromuscular paralysis [20], particularly in an outpatient setting, it is necessary that reversal drugs be used (in appropriate doses) without hesitation. Recent studies reported that the incidence of PONV and the need for antiemetics did not increase with the use of neostigmine-glycopyrrolate for reversal of residual muscle paralysis [23,24].

3. Bispectral index monitoring

The electroencephalogram bispectral index (BIS) is a simple monitor of the depth of hypnosis that may improve the ability to titrate anaesthetic drugs and facilitate recovery from general anaesthesia. Song et al. [25] evaluated the ability of BIS monitoring to facilitate emergence from general (inhalational) anaesthesia. They found that titration of desflurane or sevoflurane to maintain a BIS value of 60 resulted in reduced times to awakening and tracheal extubation. Furthermore, compared with sevoflurane, desflurane had a faster emergence from anaesthesia. Similarly, use of BIS monitoring during propofol-alfentanil-nitrous oxide anaesthesia allowed faster emergence from anaesthesia and earlier discharge from the PACU [26]. The BIS monitoring has also been used to predict fast track eligibility after ambulatory anaesthesia. A recent study reported that all patients with BIS of more than 75 at the end of surgery were fast track eligible within 10 min [27].

4. Prevention of postoperative complications

In addition to early emergence from general anaesthesia, a major key to the success of fast tracking is prevention of postoperative complications. Although the overall incidence of complications in the immediate postoperative period after ambulatory surgery is very low, potential complications range from minor annoyances to potentially life-threatening situations. The most common postoperative complications which can significantly affect the recovery process include pain, nausea, and vomiting. Other postoperative complications that can impede fast tracking include cardiovascular alteration (e.g. hypotension, hypertension, rhythm disturbances), respiratory complications (e.g. airway obstruction, hypoventilation, bronchospasm, pulmonary aspiration), temperature abnormalities (primarily hypothermia), and surgical complications [28].

A relationship has been shown between respiratory complications in the PACU and decreased levels of consciousness on arrival in the recovery room [29]. The rapid awakening associated with the use of shorter acting anaesthetics may prove to reduce the incidence of airway obstruction and hemodynamic instability. In addition, judicious use of shorter acting muscle relaxants and reversal drugs should reduce the incidence of postoperative residual paralysis and associated complications such as hypoventilation and hypoxemia.

Our ability to manage postoperative pain is the cornerstone in the success of fast tracking [30]. Although opioids remain the most commonly used analgesic in the perioperative period, there is an increased emphasis on the use of NSAIDs (e.g. ketorolac) and local anaesthetic techniques (e.g. wound infiltration and peripheral nerve blocks) as a part of a multimodal approach to pain management. It has been increasingly apparent that the combinations of multiple analgesic drugs (e.g. opioids, NSAIDs, and local anaesthetics) that have different mechanisms of analgesia provide superior analgesia with fewer side effects as compared with individual analgesic drugs [31]. An increasing number of studies demonstrate the benefits of multimodal analgesic regimens in facilitating the early recovery process [32–34].

Another major postoperative problem which can delay recovery after ambulatory surgery is PONV [6,7]. A wide range of antiemetics is available, including droperidol, metoclopramide, dexamethasone, 5-HT_3 receptor antagonists (e.g. ondansetron and dolasetron) to prevent or treat PONV. The incidence of PONV can be minimized by using prophylactic antiemetics in patients 'at risk' for developing this complication [35–37]. Similar to multimodal analgesia techniques, it has been shown that multimodal antiemetic therapy including combinations of droperidol, 5-HT_3-receptor antagonists and dexamethasone, as well as use of nonpharmacologic techniques are highly effective in reducing the incidence and severity of PONV. In addition to optimal use of prophylactic antiemetic drugs, adequate preoperative and intraoperative hydration reduces postoperative postural hypotension, dizziness, drowsiness, and nausea [38].

5. Criteria for fast tracking

The first step in the improvement of patient flow in an ambulatory facility is to change from traditional time-based discharge to criteria-based discharge. Utilization of an appropriate scoring system which is simple, clear, objective and reproducible provide a reliable guide for safe discharge of patients from the PACU (or bypass the PACU). The Aldrete criteria are commonly utilized to determine if the patient is ready for discharge from the PACU to the phase II recovery unit [39]. If these discharge criteria were met in the operating room, it would be appropriate to consider bypassing the PACU and transferring the patient directly to the step-down unit. Recently, a fast track scoring system has been proposed that incorporates the essential

elements of the Aldrete criteria plus assessments for pain, nausea, and vomiting [15]. However, further large prospective studies need to be performed to validate this scoring system and substantiate its sensitivity. Each institution should modify the established criteria according to their patient population, surgical case mix, and availability of nursing care. Furthermore, discharge criteria should be regularly reviewed and changed, if necessary, based upon the current literature.

6. Implementation of a fast track program

Implementation of a fast track program requires interdisciplinary collaborative care and management. The project team should consist of members drawn from all departments that would have a major impact on patient care after ambulatory surgery (e.g. anaesthesiologists, surgeons, and nurses). The team leader (usually an anaesthesiologist) also serves as a facilitator. The first step is to define the goals of the fast track program which would include elimination of unnecessary aspects of care, reduction in hospital stay, improvement in the quality of care, as well as improvement in patient satisfaction.

This multidisciplinary team should examine all aspects of postoperative care. The policies and procedures regarding postoperative patient care including the transfer of patients from the PACU to the phase II unit and discharge home should be examined. In addition, the factors that affect the duration of stay in the PACU and the phase II recovery unit need to be considered. The factors that could impede the implementation of a fast track program should be examined. Some practitioners incorrectly interpret policy guidelines of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the American Society of Anesthesiologists (ASA) that supposedly do not allow for bypassing the PACU. The JCAHO states that either a licensed practitioner discharge each patient or formal criteria be applied according to institutional needs and that such policies should be documented. But specific items of policy are not listed. According to ASA 'Standards for Postanesthesia Care,' all patients receiving anaesthesia must go to a PACU except by specific order of the anaesthesiologist, and a PACU must be available. However, if the patients can be moved more quickly and safely through the recovery areas, then the policies may be changed accordingly.

The next step in implementation of a fast track program is to develop clinical pathways to facilitate patient flow in the postoperative period. These pathways take into account the variables that can influence both early and late recovery following ambulatory surgery including outpatients who would be eligible for fast tracking, as well as modifications in the anaesthetic techniques. It is necessary that modifications in anaesthetic techniques be based on prospectively conducted clinical investigations. Finally, physicians and nurses involved in postoperative patient care need to be educated regarding these clinical pathways.

There is also a need to develop an audit process that involves collection of appropriate outcome variables. It is important to monitor not only the hospital care but also the post hospital phase. There are number of potential benefits of an audit program. A well-designed program can minimize potential serious complications and ensure that we are not opting for substandard care. In addition, it will improve patient care and substantiate that a high level of care is being achieved. Audit programs also help to ensure compliance with regulatory and accreditation requirements and can reduce the risks of litigation. It serves an educational purpose while affording an opportunity to monitor the practices of individual physicians and clinical services. The information gathered from the audit process can be used to improve the clinical pathways.

There is obviously an optimum point beyond which there is negative benefit and a regimen is produced within which work becomes inefficient and potentially unsafe. The effect of fast tracking on the nursing workload in the PACU and the step-down unit should be examined which will allow us to achieve improvements in overall efficiency. Recently, Dexter et al. [40] used computer simulation to determine fast tracking affect upon staffing of an ambulatory surgery center. These authors found that the financial benefits from instituting fast tracking may not be realized unless changes are instituted in the use of nursing personnel. Benchmarking the data collected by the audit process can be used to compare practice between various departments and institutions [5]. As a result of these benefits, the audit process can help to reduce costs.

Apfelbaum et al. [9] designed a multicenter observational study to determine if policies and procedures could be developed that allow patients to safely bypass the PACU and if this practice would reduce total health care costs. These authors found that the PACU bypass rate after implementation of the fast track program was 14–42%, as compared with 0–2% before the implementation of the program. Significantly, there was no difference in patient outcomes between the baseline and the fast tracked groups. They concluded that a team approach to an educational intervention and paradigm implementation, and objective data-driven clinical decisions with continuing feedback to clinicians and administrators on patient and process outcomes were the key factors in the success of the fast track program.

7. Summary

Fast tracking after ambulatory surgery creates a paradigm shift in postanaesthesia care after ambulatory surgery. Even though economic incentives might have been the impetus for fast tracking in ambulatory surgery, it offers numerous benefits including improved efficiency and patient care. A clear and coordinated postoperative plan implemented as a distinct clinical pathway is necessary for a successful fast track program. To achieve optimal fast tracking the entire hospital course of the patient needs to be considered. The ultimate aim should be to eliminate unnecessary aspects of care, reduce hospital stay, and improve the quality of care and patient satisfaction. Implementation of a fast track program requires interdisciplinary collaborative care and management to ensure positive patient outcomes.

It is important that anaesthesiologists participate in the clinical pathway development and implementation so that management protocols reflect our knowledge in perioperative care. In addition to modification in the anaesthetic technique to achieve rapid emergence from anaesthesia, the success of a fast track protocol depends on the prevention of common postoperative complications including pain, nausea, and vomiting. It is mandatory that patient safety is not compromised as a result of implementing a fast tracking strategy. Although there are studies suggesting that fast tracking is feasible after ambulatory surgery, larger studies are necessary to show that fast track ambulatory can be safely achieved in varied patient populations undergoing various surgical procedures and that the accelerated postoperative course is cost-effective.

Currently, bypassing the PACU is commonly referred to as fast tracking. However, this definition is too narrow because it overlooks the importance of the overall postoperative recovery. The process of fast tracking can be further extended to the phase II unit stay resulting in an earlier discharge home. Finally, fast tracking should also include earlier return to routine daily activities.

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How much ambulatory surgery in the World in 1996–1997 and trends?

C. De Lathouwer [a,*], J.P. Poullier [b]

[a] *International Association for Ambulatory Surgery, Avenue du Duc Jean 71–73, 1083 Brussels, Belgium*
[b] *World Health Organization, Organizing Health System (OHS), Global Programme on Evidence for Health Policy (GPE), 20 Avenue Appia, 1211 Geneva 27, Switzerland*

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1. Introduction

Health professionals and public authorities no longer dispute that ambulatory surgery as an alternative to inpatient hospitalisation responds positively to patient and health care personnel expectations. It provides an opportunity to improve quality and a better use of available resources. Professional control and policy incentives to ensure equity, efficiency and effectiveness require a solid factual base. At national and at international levels the information available has been very limited and, at a comparative level particularly, often based on a single individual's sample based on fragmentary records, multiple definitions and crude, uninformative ratios. The success of the first survey [1] on prevalence and trends launched by the International Association for Ambulatory Surgery (IAAS) among its members and by the Organisation for Economic Cooperation and Development (OECD) through its Health Policy Unit network of correspondents invited a repeat of the survey on a recurrent basis.

2. Definition of ambulatory surgery

An ambulatory procedure is a non-emergency procedure, traditionally performed on an inpatient basis with overnight stay, which is undertaken with all its constituent elements (admission, operation and discharge home) during the period of a normal working day (not exceeding 12 h including post-surgical recovery). Ambulatory procedures may be undertaken in hospitals or other facilities which meet the criteria of medical safety.

The concept does not consider as ambulatory surgery procedures those that do not generally require the sophisticated facilities of a hospital operating theatre.

Operations and procedures requiring extended recovery, that is more than the usual time frame of a working day before discharge, should not be included. The so-called 23 h stays or operations followed by a stay in a recovery inn or in a medicalised hostel warrant distinct statistical treatment but do not qualify for inclusion in this survey.

Equivalent names used in some countries are same day surgery, day surgery, and ambulatory anaesthesia.

3. Method

Following an informal international consultation on the type of surgery frequently performed on an ambulatory basis, a limited but indicative list of reference procedures was adopted in 1997 to launch a survey on the prevalence of ambulatory surgery amongst participating countries (or changes in the prevalence when several observations were available). The multiplicity of recording procedures in use in the countries informally consulted induced a choice between three classifications for the international survey, intersecting at a broad level of aggregation : ICD9-CM, DRG, and nation-specific.

* Corresponding author. Tel.: +32-2-4224271; fax: +32-2-4257076.

E-mail addresses: c.delathouwer@baas.be (C. De Lathouwer), poullierj@who.ch (J.P. Poullier).

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Table 1
IAAS International Survey, Australia

		Survey 1997				Survey 1999				National Trend			
	Year:	1995–1996				1996–1997				1995–1996 → 1996–1997			
	Codification:	ICD9CM				ICD9CM				ICD9CM			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	29920	15913	45833	65.3	30053	13803	43856	68.5	0.4	−13.3	−4.3	3.2
2	Extraction of teeth	39190	16249	55439	70.7	45367	13395	58762	77.2	15.8	−17.6	6.0	6.5
3	Cataract surgery	44957	37788	82745	54.3	59280	33540	92820	63.9	31.9	−11.2	12.2	9.5
4	Hernia repair	8474	41216	49690	17.1	9415	41603	51018	18.5	11.1	0.9	2.7	1.4
5	Dilatation and curettage uterus	37094	7244	44338	83.7	33847	4943	38790	87.3	−8.8	−31.8	−12.5	3.6
6	Vein ligation and stripping	2415	16992	19407	12.4	2425	16569	18994	12.8	0.4	−2.5	−2.1	0.3
7	Tonsillectomy w or w/o ad	530	31723	32253	1.6	394	30963	31357	1.3	−25.7	−2.4	−2.8	−0.4
	Adenoitectomy	2922	2663	5585	52.3	3738	2616	6354	58.8	27.9	−1.8	13.8	6.5
8	Myringotomy	27202	2915	30117	90.3	30038	2429	32467	92.5	10.4	−16.7	7.8	2.2
9	Laparoscopic sterilization	12163	3045	15208	80.0	12225	2298	14523	84.2	0.5	−24.5	−4.5	4.2
10	Squint surgery												
11	Submucous resection (ENT)	193	3302	3495	5.5	186	2997	3183	5.8	−3.6	−9.2	−8.9	0.3
12	Excision of breast lump	12690	8094	20784	61.1	11551	6624	18175	63.6	−9.0	−18.2	−12.6	2.5
13	Anal procedures	8847	15079	23926	37.0	9879	14481	24360	40.6	11.7	−4.0	1.8	3.6
14	Circumcision	12107	3091	15198	79.7	12092	4629	16721	72.3	−0.1	49.8	10.0	−7.3
15	Dupuytren	1247	2682	3929	31.7	1428	2589	4017	35.5	14.5	−3.5	2.2	3.8
16	Carpal tunnel decompression	13416	6403	19819	67.7	12632	4884	17516	72.1	−5.8	−23.7	−11.6	4.4
17	Orchidopexy-varicocoele	3607	3410	7017	51.4	3579	3184	6763	52.9	−0.8	−6.6	−3.6	1.5
18	Implanted devices	10741	9629	20370	52.7	12006	9250	21256	56.5	11.8	−3.9	4.3	3.8
	Total 1–18	267715	227438	495153	54.1	290135	210797	500932	57.9	8.4	−7.3	1.2	3.9
19	Cholecystectomy laparoscopic	197	31340	31537	0.6	277	32837	33114	0.8	40.6	4.8	5.0	0.2
20	Vaginal hysterectomy	8	14120	14128	0.1	10	15147	15157	0.1	25.0	7.3	7.3	0.0
	Total 19–20	205	45460	45665	0.4	287	47984	48271	0.6	40.0	5.6	5.7	0.1

Table 2
IAAS International Survey, Belgium

		Survey 1997				Survey 1999				National trend			
	Year:	1995				1996				1995 → 1996			
	Codification:	ICD9CM				ICD9CM				ICD9CM			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	19618	44590	64208	30.6	28720	42366	71086	40.4	46.4	−5.0	10.7	9.8
2	Extraction of teeth	18197	11885	30082	60.5	25793	10790	36583	70.5	41.7	−9.2	21.6	10.0
3	Cataract surgery	18913	47996	66909	28.3	28973	48543	77516	37.4	53.2	1.1	15.9	9.1
4	Hernia repair	1724	29785	31509	5.5	2180	29473	31653	6.9	26.5	−1.0	0.5	1.4
5	Dilatation and curettage uterus	9874	13227	23101	42.7	11571	11613	23184	49.9	17.2	−12.2	0.4	7.2
6	Vein ligation and stripping	4600	16127	20727	22.2	6115	16387	22502	27.2	32.9	1.6	8.6	5.0
7	Tonsillectomy w or w/o ad	8549	17802	26351	32.4	9485	16214	25699	36.9	10.9	−8.9	−2.5	4.5
	Adenoitectomy	17409	6212	23621	73.7	18631	4845	23476	79.4	7.0	−22.0	−0.6	5.7
8	Myringotomy	20867	7480	28347	73.6	23509	6220	29729	79.1	12.7	−16.8	4.9	5.5
9	Laparoscopic sterilization	4063	7526	11589	35.1	5514	6800	12314	44.8	35.7	−9.6	6.3	9.7
10	Squint surgery												
11	Submucous resection (ENT)	234	5197	5431	4.3	270	6025	6295	4.3	15.4	15.9	15.9	0.0
12	Excision of breast lump	977	5389	6366	15.3	1130	5868	6998	16.1	15.7	8.9	9.9	0.8
13	Anal procedures	1755	8887	10642	16.5	2154	9776	11930	18.1	22.7	10.0	12.1	1.6
14	Circumcision	8442	5300	13742	61.4	9773	4680	14453	67.6	15.8	−11.7	5.2	6.2
15	Dupuytren	628	1133	1761	35.7	766	1125	1891	40.5	22.0	−0.7	7.4	4.8
16	Carpal tunnel decompression	8284	3947	12231	67.7	10346	3472	13818	74.9	24.9	−12.0	13.0	7.1
17	Orchidopexy-varicocoele	1463	4509	5972	24.5	1715	4218	5933	28.9	17.2	−6.5	−0.7	4.4
18	Implanted devices	8970	13766	22736	39.5	10580	13236	23816	44.4	17.9	−3.9	4.8	5.0
	Total 1–18	154567	250758	405325	38.1	197225	241651	438876	44.9	27.6	−3.6	8.3	6.8
19	Cholecystectomy laparoscopic	36	11493	11529	0.3	6	12996	13002	0.0	−83.3	13.1	12.8	−0.3
20	Vaginal hysterectomy	1	7141	7142	0.0	4	7268	7272	0.1	300.0	1.8	1.8	0.0
	Total 19–20	37	18634	18671	0.2	10	20264	20274	0.0	−73.0	8.7	8.6	−0.1

Table 3
IAAS International Survey, Quebec, Canada

		Survey 1997				Survey 1999				National trend			
	Year:	1995-1996				1996-1997				1995–1996 → 1996–1997			
	Codification:	DRG				DRG				DRG			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	8478	2395	10873	78.0	8800	1812	10612	82.9	3.8	−24.3	−2.4	5.0
2	Extraction of teeth	7869	293	8162	96.4	7294	191	7485	97.4	−7.3	−34.8	−8.3	1.0
3	Cataract surgery	25863	6012	31875	81.1	28827	3567	32394	89.0	11.5	−40.7	1.6	7.8
4	Hernia repair	7311	7702	15013	48.7	9113	5186	14299	63.7	24.6	−32.7	−4.8	15.0
5	Dilatation and curettage uterus	6292	849	7141	88.1	5731	513	6244	91.8	−8.9	−39.6	−12.6	3.7
6	Vein ligation and stripping	3278	2059	5337	61.4	3132	1180	4312	72.6	−4.5	−42.7	−19.2	11.2
7	Tonsillectomy w or w/o ad Adenoitectomy	11519	1509	13028	88.4	10459	838	11297	92.6	−9.2	−44.5	−13.3	4.2
8	Myringotomy	7887	249	8136	96.9	7172	153	7325	97.9	−9.1	−38.6	−10.0	1.0
9	Laparoscopic sterilization	4840	335	5175	93.5	4080	616	4696	86.9	−15.7	83.9	−9.3	−6.6
10	Squint surgery												
11	Submucous resection (ENT)	9358	3177	12535	74.7	9180	2210	11390	80.6	−1.9	−30.4	−9.1	5.9
12	Excision of breast lump	4844	558	5402	89.7	4550	285	4835	94.1	−6.1	−48.9	−10.5	4.4
13	Anal procedures	4008	3778	7786	51.5	3895	2921	6816	57.1	−2.8	−22.7	−12.5	5.7
14	Circumcision	3477	171	3648	95.3	3337	82	3419	97.6	−4.0	−52.0	−6.3	2.3
15	Dupuytren	6782	1131	7913	85.7	7031	879	7910	88.9	3.7	−22.3	0.0	3.2
16	Carpal tunnel decompression	7058	156	7214	97.8	7264	84	7348	98.9	2.9	−46.2	1.9	1.0
17	Orchidopexy-varicocoele	2838	874	3712	76.5	2985	621	3606	82.8	5.2	−28.9	−2.9	6.3
18	Implanted devices	6478	2146	8624	75.1	6546	1780	8326	78.6	1.0	−17.1	−3.5	3.5
	Total 1–18	128180	33394	161574	79.3	129396	22918	152314	85.0	0.9	−31.4	−5.7	5.6
19	Cholecystectomy laparoscopic	1598	13539	15137	10.6	2707	11730	14437	18.8	69.4	−13.4	−4.6	8.2
20	Vaginal hysterectomy	22	1080	1102	2.0	20	1004	1024	2.0	−9.1	−7.0	−7.1	0.0
	Total 19–20	1620	14619	16239	10.0	2727	12734	15461	17.6	68.3	−12.9	−4.8	7.7

Table 4
IAAS International Survey, Four Provinces, Canada

		Survey 1997				Survey 1999				National trend			
	Year:	1995–1996				1997–1998				1995–1996 → 1997–1998			
	Codification:	CCP				CCP				CCP			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	27403	1007	28410	96.5	24609	488	25097	98.1	−10.2	−51.5	−11.7	1.6
2	Extraction of teeth	21857	1397	23254	94.0	22483	731	23214	96.9	2.9	−47.7	−0.2	2.9
3	Cataract surgery	175154	5595	180749	96.9	117203	2475	119678	97.9	−33.1	−55.8	−33.8	1.0
4	Hernia repair	21119	28086	49205	42.9	23719	12831	36550	64.9	12.3	−54.3	−25.7	22.0
5	Dilatation and curettage uterus	4904	355	5259	93.2	21260	1309	22569	94.2	333.5	268.7	329.2	1.0
6	Vein ligation and stripping	5677	3007	8684	65.4	5327	1606	6933	76.8	−6.2	−46.6	−20.2	11.5
7	Tonsillectomy w or w/o ad	17388	18218	35606	48.8	19758	10548	30306	65.2	13.6	−42.1	−14.9	16.4
	Adenoitectomy	5368	934	6302	85.2								
8	Myringotomy	29453	311	29764	99.0	24518	218	24736	99.1	−16.8	−29.9	−16.9	0.2
9	Laparoscopic sterilization	16599	3361	19960	83.2	22008	373	22381	98.3	32.6	−88.9	12.1	15.2
10	Squint surgery												
11	Submucous resection (ENT)	2726	1229	3955	68.9	1462	442	1904	76.8	−46.4	−64.0	−51.9	7.9
12	Excision of breast lump	18989	2639	21628	87.8	18778	2208	20986	89.5	−1.1	−16.3	−3.0	1.7
13	Anal procedures	8710	5613	14323	60.8	8337	4026	12363	67.4	−4.3	−28.3	−13.7	6.6
14	Circumcision	11071	29483	40554	27.3	8320	19692	28012	29.7	−24.8	−33.2	−30.9	2.4
15	Dupuytren	3379	308	3687	91.6	3273	158	3431	95.4	−3.1	−48.7	−6.9	3.7
16	Carpal tunnel decompression	19103	572	19675	97.1	17290	337	17627	98.1	−9.5	−41.1	−10.4	1.0
17	Orchidopexy-varicocoele	2428	1342	3770	64.4	2435	972	3407	71.5	0.3	−27.6	−9.6	7.1
18	Implanted devices	9030	2647	11677	77.3	8444	1809	10253	82.4	−6.5	−31.7	−12.2	5.0
	Total 1–18	400358	106104	506462	79.0	349224	60223	409447	85.3	−12.8	−43.2	−19.2	6.2
19	Cholecystectomy laparoscopic	6468	31373	37841	17.1	12449	22518	34967	35.6	92.5	−28.2	−7.6	18.5
20	Vaginal hysterectomy	5	9604	9609	0.1	29	8644	8673	0.3	480.0	−10.0	−9.7	0.3
	Total 19–20	6473	40977	47450	13.6	12478	31162	43640	28.6	92.8	−24.0	−8.0	15.0

The first two surveys reveal that ICD9-CM is the most used survey (nine responses out of 15). Only one response used DRG. Other classifications, including another international classification : NOMESCO (shared by five Nordic countries, potentially also the three Baltic countries), were used by the remaining third of respondents.

Two distinct lists of reference groups and procedures were proposed:

List 1: procedures eligible as ambulatory surgery.
This list has been established taking into account practice differences, which are at times sizeable, across the spectrum of countries for which data have already been obtained. It integrates 18 groups of interventions (1–18) which are still mostly performed in hospital inpatient settings in some countries and mostly in ambulatory surgery units or private practice offices in other countries.

List 2: intermediate and non eligible procedures.
This list includes two groups of procedures (19–20) which are only seldom undertaken as ambulatory surgery at present in most countries but which appear likely to join the first list before long.

The groups have been designed sui generis as providing a level at which ICD9-CM and other nomenclatures examined appear to best intersect. The reference groups do not designate the surgical procedures which are performed and do thus not correspond to the level at which procedures are coded and observed.

4. Results

The questionnaire was sent to the 29 OECD member countries. Twelve replies have been received : Australia, Belgium, Canada, Denmark, UK, Finland, France, Ireland, the Netherlands, New Zealand, Portugal, and USA. Two additional responses received relate to a region only : Veneto (Italy) and Andalucia (Spain) (Tables 1–15).

The analysis of the data from the two surveys (1997 and 1999) when available, allows assessment of the position of a country and comparison of countries and trends in surgical practice within each country.

In some countries modifications in the coding system between the two surveys weaken some of the comparisons and even makes some of them impossible (Den-

Table 5
IAAS International Survey, Denmark

		Survey 1999			
	Year:	1997			
	Codification:	NCSP			
	Mode:	A	I	Total	%
1	Knee arthroscopy	14550	3226	17776	81.9
2	Extraction of teeth	2766	592	3358	82.4
3	Cataract surgery	23144	4221	27365	84.6
4	Hernia repair	7844	6826	14670	53.5
5	Dilatation and curettage uterus	19845	3459	23304	85.2
6	Vein ligation and stripping	41594	2428	44022	94.5
7	Tonsillectomy w or w/o ad	1790	6113	7903	22.6
	Adenoitectomy	419	398	817	51.3
8	Myringotomy	1526	292	1818	83.9
9	Laparoscopic sterilization	3179	1169	4348	73.1
10	Squint surgery				
11	Submucous resection (ENT)				
12	Excision of breast lump	4122	2603	6725	61.3
13	Anal procedures	11120	2864	13984	79.5
14	Circumcision	3076	432	3508	87.7
15	Dupuytren	2781	851	3632	76.6
16	Carpal tunnel decompression				
17	Orchidopexy-varicocoele	615	537	1152	53.4
18	Implanted devices	5512	3507	9019	61.1
	Total 1–18	143883	39518	183401	78.5
19	Cholecystectomy laparoscopic	131	3754	3885	3.4
20	Vaginal hysterectomy	8	630	638	1.3
	Total 19–20	139	4384	4523	3.1

Table 6
IAAS International Survey, Finland

		Survey 1999			
	Year:	1997			
	Codification:	NOMESCO			
	Mode:	A	I	Total	%
1	Knee arthroscopy	3761	3499	7260	51.8
2	Extraction of teeth				
3	Cataract surgery	17913	12279	30192	59.3
4	Hernia repair	3779	8570	12349	30.6
5	Dilatation and curettage uterus	5185	879	6064	85.5
6	Vein ligation and stripping	2195	330	2525	86.9
7	Tonsillectomy w or w/o ad	1298	9411	10709	12.1
	Adenoitectomy	11927	945	12872	92.7
8	Myringotomy				
9	Laparoscopic sterilization	4973	2128	7101	70.0
10	Squint surgery				
11	Submucous resection (ENT)				
12	Excision of breast lump	650	2553	3203	20.3
13	Anal procedures	254	2662	2916	8.7
14	Circumcision	1781	307	2088	85.3
15	Dupuytren	833	670	1503	55.4
16	Carpal tunnel decompression	2640	870	3510	75.2
17	Orchidopexy-varicocoele	165	389	554	29.8
18	Implanted devices	3941	1952	5893	66.9
	Total 1–18	61295	47444	108739	56.4
19	Cholecystectomy laparoscopic	7	5822	5829	0.1
20	Vaginal hysterectomy	3	3968	3971	0.1
	Total 19–20	10	9790	9800	0.1

mark and Finland). This has resulted in an abandonment of the data extracted from the first survey for these countries.

The data from the first survey have been corrected in full for Australia (a transcription error had occurred) or partially after a new check of the codes used for the various reference groupings in the case of Belgium, the Netherlands and the USA.

Group 10 (squint surgery) has been deleted on account of inadequacies in the codings available for this group which became apparent after the 1997 survey.

5. Discussion

The analysis confirms persistent huge intercountry disparities in the prevalence of ambulatory surgery first highlighted in the 1997 survey (Table 16).

With the exception of Portugal (stagnation), a rising trend in ambulatory surgery may be perceived (Table 17). It is accompanied:

Type 1: in a few cases by a relative stability in the total number of surgical interventions (-1.2 to $+3.2\%$) with a transfer of hospital activity towards an ambulatory mode (Australia, the Netherlands, New Zealand);
Type 2: in other cases, by an increase in the total number of surgical interventions ($+3.2$ to $+8.3\%$) following mainly an increase in the number of ambulatory surgery cases ($+27.6$ to $+30.8\%$) and a relative stability of hospital activity (-3.6 to $+5.8\%$) (Belgium and Ireland);
Type 3: finally in other countries, by a great or lesser decrease in the total number of surgical interventions (-5.7 to -22.8%) at the expense mainly of hospital activity (-31.4 to 43.2%) combined with a stagnation (-0.1 to 0.9%) (Quebec, Canada, UK) or even a reduction (-12.8%) in the number of ambulatory surgery cases being registered (Canada, four Provinces).

The different scenarios observed above deserve further investigation given the divergent economic conditions liable to affect, on the one hand, the ambulatory surgery performance index and, on the other hand, varying trends in total surgical activity across countries.

5.1. Australia (Table 1)

The 1995–1996 data compiled in the first survey [1] included a transcription error that has been corrected in the current tables. The second survey exhibits a quasi aggregate stability: a 1.2% overall growth in activity masking a 7.3% slide in surgery with 'conventional' hospitalisation and an 8.4% increase in ambulatory surgery. The overall performance index gains 3.9%, above the average for the countries in this survey, but exhibits a mediocre level for tonsillectomies (1.3%).

Comprehensive case records covering public and private hospitals and freestanding centres.

Source: Australian Institute of Health and Welfare (Australian Hospital Statistics 1996–1997).

5.2. Belgium (Table 2)

The general increase in total surgical activity (+8.3%) reflects primarily a surge in ambulatory surgery (+27.6%) with a moderate decrease in traditional hospital activity (−3.6%). There is a general improvement in the performance of ambulatory surgery (+6.8%).

Comprehensive case records covering public and private hospitals. No freestanding centres.

A number of entries related to groups 4 (hernia repair) and 9 (laparoscopic sterilization) omitted in the first survey (statistics for 1995) have been corrected in this Table.

Source: Ministère des Affaires Sociales, de la Santé Publique et de l'Environnement (Commission RCM) (Ministry of Social Affairs, Public Health and Environment).

5.3. Canada — Province of Quebec (Table 3)

The reduction in total surgical activity (an aggregate decline in the number of operations of 5.7%) reflects primarily a reduction in surgical activity on hospitalised patients (a decline of 31%). The already high share of ambulatory surgery (85% for the procedures deemed eligible for day treatment) inched further upwards without a considerable increase in the number of ambulatory surgery procedures. The performance index surged particularly regarding cholecystectomies (18.8%).

Table 7
IAAS International Survey, France

		Survey 1999			
	Year:	1997			
	Codification:	PMSI			
	Mode:	A	I	Total	%
1	Knee arthroscopy	32488	128141	160629	20.2
2	Extraction of teeth	74741	128894	203635	36.7
3	Cataract surgery	59380	257824	317204	18.7
4	Hernia repair	9904	154212	164116	6.0
5	Dilatation and curettage uterus	26622	60553	87175	30.5
6	Vein ligation and stripping	20028	151289	171317	11.7
7	Tonsillectomy w or w/o ad	22135	77184	99319	22.3
	Adenoitectomy	123073	16964	140037	87.9
8	Myringotomy	65638	9284	74922	87.6
9	Laparoscopic sterilization	602	20832	21434	2.8
10	Squint surgery				
11	Submucous resection (ENT)	4564	51437	56001	8.1
12	Excision of breast lump	5689	65557	71246	8.0
13	Anal procedures	6150	67125	73275	8.4
14	Circumcision	42255	19642	61897	68.3
15	Dupuytren	5332	8107	13439	39.7
16	Carpal tunnel decompression	45789	24463	70252	65.2
17	Orchidopexy-varicocoele	3497	13190	16687	21.0
18	Implanted devices	26657	57912	84569	31.5
	Total 1–18	574544	1312610	1887154	30.4
19	Cholecystectomy laparoscopic	65	60490	60555	0.1
20	Vaginal hysterectomy	28	21300	21328	0.1
	Total 19–20	93	81790	81883	0.1

Table 8
IAAS International Survey, Ireland

		Survey 1997				Survey 1999				National trend			
	Year:	1994				1997				1994 → 1997			
	Codification:	ICD9CM				ICD9CM				ICD9CM			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	1629	1582	3211	50.7	1941	1493	3434	56.5	19.2	−5.6	6.9	5.8
2	Extraction of teeth	1546	828	2374	65.1	2456	699	3155	77.8	58.9	−15.6	32.9	12.7
3	Cataract surgery	292	2328	2620	11.1	788	2527	3315	23.8	169.9	8.5	26.5	12.6
4	Hernia repair	26	987	1013	2.6	657	4027	4684	14.0	2426.9	308.0	362.4	11.5
5	Dilatation and curettage uterus	2616	3937	6553	39.9	2893	3785	6678	43.3	10.6	−3.9	1.9	3.4
6	Vein ligation and stripping	577	3014	3591	16.1	641	2565	3206	20.0	11.1	−14.9	−10.7	3.9
7	Tonsillectomy w or w/o ad	22	5875	5897	0.4	38	5965	6003	0.6	72.7	1.5	1.8	0.3
	Adenoitectomy	27	1072	1099	2.5	46	803	849	5.4	70.4	−25.1	−22.7	3.0
8	Myringotomy	3562	993	4555	78.2	2921	638	3559	82.1	−18.0	−35.8	−21.9	3.9
9	Laparoscopic sterilization	873	640	1513	57.7	820	879	1699	48.3	−6.1	37.3	12.3	−9.4
10	Squint surgery												
11	Submucous resection (ENT)	19	297	316	6.0	14	271	285	4.9	−26.3	−8.8	−9.8	−1.1
12	Excision of breast lump	1682	1078	2760	60.9	1704	852	2556	66.7	1.3	−21.0	−7.4	5.7
13	Anal procedures	408	423	831	49.1	481	855	1336	36.0	17.9	102.1	60.8	−13.1
14	Circumcision	1287	1039	2326	55.3	1394	888	2282	61.1	8.3	−14.5	−1.9	5.8
15	Dupuytren	16	272	288	5.6	22	207	229	9.6	37.5	−23.9	−20.5	4.1
16	Carpal tunnel decompression	196	404	600	32.7	295	392	687	42.9	50.5	−3.0	14.5	10.3
17	Orchidopexy-varicocoele	469	1095	1564	30.0	457	896	1353	33.8	−2.6	−18.2	−13.5	3.8
18	Implanted devices	1379	1701	3080	44.8	1917	1416	3333	57.5	39.0	−16.8	8.2	12.7
	Total 1–18	16626	27565	44191	37.6	19485	29158	48643	40.1	17.2	5.8	10.1	2.4
19	Cholecystectomy laparoscopic	4	2272	2276	0.2	3	2436	2439	0.1	−25.0	7.2	7.2	−0.1
20	Vaginal hysterectomy	1	1060	1061	0.1	7	1075	1082	0.6	600.0	1.4	2.0	0.6
	Total 19–20	5	3332	3337	0.1	10	3511	3521	0.3	100.0	5.4	5.5	0.1

Table 9
IAAS International Survey, Italy-Veneto

		Survey 1999			
	Year:	1997			
	Codification:	ICD9CM			
	Mode:	A	I	Total	%
1	Knee arthroscopy	1269	8360	9629	13.2
2	Extraction of teeth				
3	Cataract surgery	3264	12536	15800	20.7
4	Hernia repair	3037	6994	10031	30.3
5	Dilatation and curettage uterus	995	3726	4721	21.1
6	Vein ligation and stripping	2251	5708	7959	28.3
7	Tonsillectomy w or w/o ad	776	3179	3955	19.6
	Adenoitectomy	1492	2471	3963	37.6
8	Myringotomy	107	77	184	58.2
9	Laparoscopic sterilization	0	29	29	0.0
10	Squint surgery				
11	Submucous resection (ENT)				
12	Excision of breast lump	1	631	632	0.2
13	Anal procedures	610	2545	3155	19.3
14	Circumcision	0	706	706	0.0
15	Dupuytren	213	403	616	34.6
16	Carpal tunnel decompression				
17	Orchidopexy-varicocoele	197	1647	1844	10.7
18	Implanted devices	265	2629	2894	9.2
	Total 1–18	14477	51641	66118	21.9
19	Cholecystectomy laparoscopic				
20	Vaginal hysterectomy				
	Total 19–20				

Comments of the correspondent (Pauline Begin-Brosseau):

> "According to our analysis, in a number of cases, it is possible to attribute the reductions observed to the existence of an alternative medical treatment approach (e.g. ulcers), to the transfer of certain types of interventions to freestanding centers (e.g. dilatation and curetage without benign tumour, to a questioning by specialists of the appropriateness of surgery in some instances, or to the adoption of new intervention techniques (e.g. varicose veins)."

Comprehensive case records covering public hospitals.

The data of the first survey [1] comprised the records of the Quebec Province (DRG) and those of four English speaking Provinces (CCP): Alberta, New Brunswick, Ontario, British Columbia.

Source: Ministère de la Santé et des Services Sociaux. Direction Générale de la Planification Stratégique et de l'Évaluation (Ministry of Health and Social Services, General Directorate of Strategic Planning and Evaluation).

5.4. Canada — Four Provinces (New Brunswick, Nova Scotia, Ontario, British Columbia) (Table 4)

The aggregate reduction in surgical activity (a year to year decline of 19.2%) translates into a massive drop in inpatient surgery (− 43.2%) and a sizeable reduction of ambulatory surgery (− 12.8%), enhancing the latter's 'performance' index. The overall reduction in surgical activity, particularly that of traditional hospitalisation begs questioning, all the more that some classes exhibit an opposite sharp increase: dilatations and curettage of uterus (group 5) shows an increase of 17 310 operations (+ 329.2%).

Requests to the correspondent in order to explain the large reductions in overall activity have remained unanswered.

In the first survey (years 1995–1996), the data related to the Provinces of Alberta – replaced in the second survey by Nova Scotia — New Brunswick, Ontario and British Colombia.

Table 10
IAAS International Survey, the Netherlands

		Survey 1997				Survey 1999				National trend			
	Year:	1995				1997				1995 → 1997			
	Codification:	CVV-codes				CVV-codes				CVV-codes			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	43736	12862	56598	77.3	46455	8926	55381	83.9	6.2	−30.6	−2.2	6.6
2	Extraction of teeth	1895	339	2234	84.8	2235	341	2576	86.8	17.9	0.6	15.3	1.9
3	Cataract surgery	18058	42876	60934	29.6	40018	33282	73300	54.6	121.6	−22.4	20.3	25.0
4	Hernia repair	8179	29296	37475	21.8	9346	28494	37840	24.7	14.3	−2.7	1.0	2.9
5	Dilatation and curettage uterus	16143	4502	20645	78.2	12666	3143	15809	80.1	−21.5	−30.2	−23.4	1.9
6	Vein ligation and stripping	7679	10582	18261	42.1	9400	10017	19417	48.4	22.4	−5.3	6.3	6.4
7	Tonsillectomy w or w/o ad	31152	17792	48944	63.6	28816	16591	45407	63.5	−7.5	−6.8	−7.2	−0.2
	Adenoitectomy	28553	921	29474	96.9	27089	859	27948	96.9	−5.1	−6.7	−5.2	0.1
8	Myringotomy	47152	743	47895	98.4	39675	638	40313	98.4	−15.9	−14.1	−15.8	0.0
9	Laparoscopic sterilization	13749	1356	15105	91.0	12465	1022	13487	92.4	−9.3	−24.6	−10.7	1.4
10	Squint surgery												
11	Submucous resection (ENT)	1093	9530	10623	10.3	1254	8555	9809	12.8	14.7	−10.2	−7.7	2.5
12	Excision of breast lump	5052	10330	15382	32.8	4948	9509	14457	34.2	−2.1	−7.9	−6.0	1.4
13	Anal procedures	2239	4024	6263	35.7	2263	4669	6932	32.6	1.1	16.0	10.7	−3.1
14	Circumcision	14713	1254	15967	92.1	14635	1024	15659	93.5	−0.5	−18.3	−1.9	1.3
15	Dupuytren	3076	1773	4849	63.4	3423	1480	4903	69.8	11.3	−16.5	1.1	6.4
16	Carpal tunnel decompression	10039	1572	11611	86.5	11927	1142	13069	91.3	18.8	−27.4	12.6	4.8
17	Orchidopexy-varicocoele	3048	2371	5419	56.2	3197	1952	5149	62.1	4.9	−17.7	−5.0	5.8
18	Implanted devices	8942	8488	17430	51.3	10075	8387	18462	54.6	12.7	−1.2	5.9	3.3
	Total 1–18	264498	160611	425109	62.2	279887	140031	419918	66.7	5.8	−12.8	−1.2	4.4
19	Cholecystectomy laparoscopic	3	10553	10556	0.0	56	11275	11331	0.5	1766.7	6.8	7.3	0.5
20	Vaginal hysterectomy	0	162	162	0.0	0	116	116	0.0		−28.4	−28.4	0.0
	Total 19–20	3	10715	10718	0.0	56	11391	11447	0.5	1766.7	6.3	6.8	0.5

Table 11
IAAS International Survey, New Zealand

		Survey 1997				Survey 1999				National trend			
	Year:	1995				1997				1995 → 1997			
	Codification:	ICD9CMA (1)				ICD9CMA (2)				ICD9CM			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	1547	1073	2620	59.0	2668	1167	3835	69.6	72.5	8.8	46.4	10.5
2	Extraction of teeth	789	371	1160	68.0	229	58	287	79.8	−71.0	−84.4	−75.3	11.8
3	Cataract surgery	4911	6428	11339	43.3	10691	2761	13452	79.5	117.7	−57.0	18.6	36.2
4	Hernia repair	1522	2621	4143	36.7	2070	3374	5444	38.0	36.0	28.7	31.4	1.3
5	Dilatation and curettage uterus	5975	4439	10414	57.4	4005	1151	5156	77.7	−33.0	−74.1	−50.5	20.3
6	Vein ligation and stripping	410	610	1020	40.2	329	661	990	33.2	−19.8	8.4	−2.9	−7.0
7	Tonsillectomy w. or w/o ad.	1059	3415	4474	23.7	1571	2966	4537	34.6	48.3	−13.1	1.4	11.0
	Adenoitectomy	1222	201	1423	85.9	1411	185	1596	88.4	15.5	−8.0	12.2	2.5
8	Myringotomy	8610	1308	9918	86.8	12260	1289	13549	90.5	42.4	−1.5	36.6	3.7
9	Laparoscopic sterilization	2388	539	2927	81.6	2688	398	3086	87.1	12.6	−26.2	5.4	5.5
10	Squint surgery												
11	Submucous resection (ENT)	6	186	192	3.1	12	179	191	6.3	100.0	−3.8	−0.5	3.2
12	Excision of breast lump	1139	930	2069	55.1	1237	757	1994	62.0	8.6	−18.6	−3.6	7.0
13	Anal procedures	688	2142	2830	24.3	373	992	1365	27.3	−45.8	−53.7	−51.8	3.0
14	Circumcision	552	240	792	69.7	614	170	784	78.3	11.2	−29.2	−1.0	8.6
15	Dupuytren	179	288	467	38.3	290	297	587	49.4	62.0	3.1	25.7	11.1
16	Carpal tunnel decompression	1255	415	1670	75.1	1629	348	1977	82.4	29.8	−16.1	18.4	7.2
17	Orchidopexy-varicocoele	377	593	970	38.9	609	585	1194	51.0	61.5	−1.3	23.1	12.1
18	Implanted devices	1290	1511	2801	46.1	1672	1517	3189	52.4	29.6	0.4	13.9	6.4
	Total 1–18	33919	27310	61229	55.4	44358	18855	63213	70.2	30.8	−31.0	3.2	14.8
	Cholecystectomy laparoscopic	5	1159	1164	0.4	16	2797	2813	0.6	220.0	141.3	141.7	0.1
20	Vaginal hysterectomy	3	1116	1119	0.3	1	1075	1076	0.1	−66.7	−3.7	−3.8	−0.2
	Total 19–20	8	2275	2283	0.4	17	3872	3889	0.4	112.5	70.2	70.3	0.1

Table 12
IAAS International Survey, Portugal

		Survey 1997				Survey 1999				National trend			
	Year:	1995				1998				1995 → 1998			
	Codification:	ICD9CM				ICD9CM				ICD9CM			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	54	2118	2172	2.5	64	3354	3418	1.9	18.5	58.4	57.4	−0.6
2	Extraction of teeth	190	257	447	42.5	269	308	577	46.6	41.6	19.8	29.1	4.1
3	Cataract surgery	46	15015	15061	0.3	531	16464	16995	3.1	1054.3	9.7	12.8	2.8
4	Hernia repair	877	13918	14795	5.9	1117	14805	15922	7.0	27.4	6.4	7.6	1.1
5	Dilatation and curettage uterus	2675	5257	7932	33.7	1965	4712	6677	29.4	−26.5	−10.4	−15.8	−4.3
6	Vein ligation and stripping	69	2912	2981	2.3	104	4101	4205	2.5	50.7	40.8	41.1	0.2
7	Tonsillectomy w or w/o ad	76	3689	3765	2.0	127	3894	4021	3.2	67.1	5.6	6.8	1.1
	Adenoitectomy	145	3269	3414	4.2	264	2422	2686	9.8	82.1	−25.9	−21.3	5.6
8	Myringotomy	66	1695	1761	3.7	265	2514	2779	9.5	301.5	48.3	57.8	5.8
9	Laparoscopic sterilization	322	1035	1357	23.7	220	1506	1726	12.7	−31.7	45.5	27.2	−11.0
10	Squint surgery												
11	Submucous resection (ENT)	11	166	177	6.2	6	134	140	4.3	−45.5	−19.3	−20.9	−1.9
12	Excision of breast lump	338	2011	2349	14.4	316	1984	2300	13.7	−6.5	−1.3	−2.1	−0.6
13	Anal procedures	160	1646	1806	8.9	156	1790	1946	8.0	−2.5	8.7	7.8	−0.8
14	Circumcision	1083	2182	3265	33.2	828	1882	2710	30.6	−23.5	−13.7	−17.0	−2.6
15	Dupuytren	122	375	497	24.5	118	805	923	12.8	−3.3	114.7	85.7	−11.8
16	Carpal tunnel decompression	399	1281	1680	23.8	688	2977	3665	18.8	72.4	132.4	118.2	−5.0
17	Orchidopexy-varicocoele	314	1501	1815	17.3	360	1797	2157	16.7	14.6	19.7	18.8	−0.6
18	Implanted devices	267	3996	4263	6.3	295	4252	4547	6.5	10.5	6.4	6.7	0.2
	Total 1–18	7214	62323	69537	10.4	7693	69701	77394	9.9	6.6	11.8	11.3	−0.4
19	Cholecystectomy laparoscopic	5	2601	2606	0.2	9	4220	4229	0.2	80.0	62.2	62.3	0.0
20	Vaginal hysterectomy	4	1270	1274	0.3	2	1179	1181	0.2	−50.0	−7.2	−7.3	−0.1
	Total 19–20	9	3871	3880	0.2	11	5399	5410	0.2	22.2	39.5	39.4	0.0

Comprehensive case records covering public hospitals.

The data of the first survey [1] included the records of the Province of Quebec (DRG) and those of four English-speaking Provinces (CCP): Alberta, New Brunswick, Ontario, British Columbia.

Source: Canadian Institute for Health Information.

5.5. Denmark (Table 5)

The performance level is very high for all groups.

Comments from the correspondent (Claus Toftgaard):

"The Nordic Classification of Surgical Procedures (NCSP) has been used to answer the questionnaire. Dupuytren procedures and carpal tunnel decompression could not be identified separately and are lumped together. Many ENT surgeons are performing surgery in their office with the assistance of an anaesthesiologist, e.g. tonsillectomies. These cases are included in the data".

A comparison with the 1995 performance is difficult. In the former survey [1] so called DRG based data were submitted. There was, however, no DRG system in use in Denmark at that time.

Source: Ministry of Health.

5.6. Finland (Table 6)

Comments from the correspondents (Mikko Nenonen and Oleg Nikiforov):

A new classification (Finnish version of the Nomesco classification) has been adopted in 1997. The comparisons with data collated for earlier years [1] based on older classifications (FINDRG, Finnish Classification of Surgical Operations FCSO) are risky and have been abandoned.

The national data are special records established solely to monitor ambulatory surgery.

The data refer to the entire country and include all day surgery performed in institutions having beds. A small number of centres without established beds perform a little cataract surgery; these are not included in the figures shown.

Table 13
IAAS International Survey, Spain-Andalucia

		Survey 1999			
	Year:	1997			
	Codification:	ICD9CM			
	Mode:	A	I	Total	%
1	Knee arthroscopy	915	1832	2747	33.3
2	Extraction of teeth	0	413	413	0.0
3	Cataract surgery	4061	4948	9009	45.1
4	Hernia repair	2999	9684	12683	23.6
5	Dilatation and curettage uterus	1304	4146	5450	23.9
6	Vein ligation and stripping	301	1146	1447	20.8
7	Tonsillectomy w or w/o ad	493	3005	3498	14.1
	Adenoitectomy	3041	2319	5360	56.7
8	Myringotomy	0	331	331	0.0
9	Laparoscopic sterilization	770	702	1472	52.3
10	Squint surgery				
11	Submucous resection (ENT)	0	309	309	0.0
12	Excision of breast lump	613	1165	1778	34.5
13	Anal procedures	411	2541	2952	13.9
14	Circumcision	1571	940	2511	62.6
15	Dupuytren	217	286	503	43.1
16	Carpal tunnel decompression	597	558	1155	51.7
17	Orchidopexy-varicocoele	81	1486	1567	5.2
18	Implanted devices	1393	2249	3642	38.2
	Total 1–18	18767	38060	56827	33.0
19	Cholecystectomy laparoscopic	0	2567	2567	0.0
20	Vaginal hysterectomy	0	986	986	0.0
	Total 19–20	0	3553	3553	0.0

Table 14
IAAS International Survey, UK

		Survey 1997								Survey 1999				National trend			
	Year:	1994–1995				1996–1997				1997–1998				1994–1995 → 1997–1998			
	Codification:	OPCS				OPCS				OPCS				OPCS			
	Mode:	A	I	Total	%	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	45193	30395	75588	59.8	44679	21809	66488	67.2	43405	21749	65154	66.6	−4.0	−28.4	−13.8	6.8
2	Extraction of teeth	92771	44862	137633	67.4	98775	28367	127142	77.7	88142	24241	112383	78.4	−5.0	−46.0	−18.3	11.0
3	Cataract surgery	60435	102396	162831	37.1	97309	66422	163731	59.4	114332	55686	170018	67.2	89.2	−45.6	4.4	30.1
4	Hernia repair	23003	68000	91003	25.3	25302	45743	71045	35.6	25245	41890	67135	37.6	9.7	−38.4	−26.2	12.3
5	Dilatation and curettage uterus	50207	37003	87210	57.6	30979	12654	43633	71.0	21334	8260	29594	72.1	−57.5	−77.7	−66.1	14.5
6	Vein ligation and stripping	16023	30344	46367	34.6	21345	26050	47395	45.0	19346	23282	42628	45.4	20.7	−23.3	−8.1	10.8
7	Tonsillectomy w Adenoitectomy	5581	91712	97293	5.7	6699	75894	82593	8.1	6396	64917	71313	9.0	14.6	−29.2	−26.7	3.2
8	Myringotomy	42698	13836	56534	75.5	40463	9742	50205	80.6	37451	8355	45806	81.8	−12.3	−39.6	−19.0	6.2
9	Laparoscopic sterilization	37061	14404	51465	72.0	36468	8981	45449	80.2	31403	6972	38375	81.8	−15.3	−51.6	−25.4	9.8
10	Squint surgery																
11	Submucous resection (ENT)	512	12427	12939	4.0	663	8785	9448	7.0	571	6986	7557	7.6	11.5	−43.8	−41.6	3.6
12	Excision of breast lump	15251	16815	32066	47.6	13909	12726	26635	52.2	13098	12091	25189	52.0	−14.1	−28.1	−21.4	4.4
13	Anal procedures	21592	30360	51952	41.6	22727	21703	44430	51.2	22618	19825	42443	53.3	4.8	−34.7	−18.3	11.7
14	Circumcision	20145	10376	30521	66.0	17338	6427	23765	73.0	15922	5776	21698	73.4	−21.0	−44.3	−28.9	7.4
15	Dupuytren	2525	7693	10218	24.7	2844	6672	9516	29.9	2902	6337	9239	31.4	14.9	−17.6	−9.6	6.7
16	Carpal tunnel decompression	22404	7220	29624	75.6	22800	5060	27860	81.8	23234	5069	28303	82.1	3.7	−29.8	−4.5	6.5
17	Orchidopexy − varicocoele	6555	6225	12780	51.3	5525	3164	8689	63.6	4952	2662	7614	65.0	−24.5	−57.2	−40.4	13.7
18	Implanted devices	9047	20541	29588	30.6												
	Total 1–18	471003	544609	1015612	46.4	487825	360199	848024	57.5	470351	314098	784449	60.0	−0.1	−42.3	−22.8	13.6
19	Cholecystectomy laparoscopic	101	21207	21308	0.5	159	19234	19393	0.8	241	19723	19964	1.2	138.6	−7.0	−6.3	0.7
20	Vaginal hysterectomy	68	15460	15528	0.4	17	12903	12920	0.1	15	11519	11534	0.1	−77.9	−25.5	−25.7	−0.3
	Total 19–20	169	36667	36836	0.5	176	32137	32313	0.5	256	31242	31498	0.8	51.5	−14.8	−14.5	0.4

Table 15
IAAS International Survey, USA

		Survey 1997				Survey 1999				National trend			
	Year:	1994				1996				1994 → 1996			
	Codification:	ICD9CM				ICD9CM				ICD9CM			
	Mode:	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
1	Knee arthroscopy	947 266	110 531	1 057 797	89.6	1 084 292	51 736	1 136 028	95.4	14.5	−53.2	7.4	5.9
2	Extraction of teeth	34 331	16 713	51 044	67.3	32 371	15 731	48 102	67.3	−5.7		−5.8	0.0
3	Cataract surgery	3 230 133	111 058	3 341 191	96.7	3 785 715	47 386	3 833 101	98.8	17.2	−57.3	14.7	2.1
4	Hernia repair	594 465	156 622	751 087	79.1	672 829	133 797	806 626	83.4	13.2	−14.6	7.4	4.3
5	Dilatation and curettage uterus	509 151	63 926	573 077	88.8	469 372	43 321	512 693	91.6	−7.8	−32.2	−10.5	2.7
6	Vein ligation and stripping	34 469	9 594	44 063	78.2	45 372	6 360	51 732	87.7	31.6	−33.7	17.4	9.5
7	Tonsillectomy w or w/o ad	367 708	50 599	418 307	87.9	382 938	35 726	418 664	91.5	4.1	−29.4	0.1	3.6
	Adenoitectomy	149 972	5 249	155 221	96.6	132 391	3 233	135 624	97.6	−11.7		−12.6	1.0
8	Myringotomy	575 298	33 236	608 534	94.5	524 358	23 056	547 414	95.8	−8.9	−30.6	−10.0	1.2
9	Laparoscopic sterilization	227 147	16 867	244 014	93.1	310 268	18 528	328 796	94.4	36.6	9.8	34.7	1.3
10	Squint surgery												
11	Submucous resection (ENT)	71 861	6 684	78 545	91.5	58 690	6 905	65 595	89.5	−18.3		−16.5	−2.0
12	Excision of breast lump	353 233	29 405	382 638	92.3	340 747	24 973	365 720	93.2	−3.5	−15.1	−4.4	0.9
13	Anal procedures	134 670	41 825	176 495	76.3	180 008	28 503	208 511	86.3	33.7	−31.9	18.1	10.0
14	Circumcision	115 947	32 735	148 682	78.0	114 812	26 903	141 715	81.0	−1.0	−17.8	−4.7	3.0
15	Dupuytren	19 056	1 717	20 773	91.7	19 971	284	20 255	98.6	4.8		−2.5	6.9
16	Carpal tunnel decompression	346 541	12 236	358 777	96.6	358 111	7 772	365 883	97.9	3.3	−36.5	2.0	1.3
17	Orchidopexy-varicocoele	106 306	13 512	119 818	88.7	106 054	7 206	113 260	93.6	−0.2		−5.5	4.9
18	Implanted devices	163 128	66 384	229 512	71.1	170 547	60 002	230 549	74.0	4.5	−9.6	0.5	2.9
	Total 1–18	7 980 682	778 893	8 759 575	91.1	8 788 846	541 422	9 330 268	94.2	10.1	−30.5	6.5	3.1
19	Cholecystectomy laparoscopic	174 257	313 747	488 004	35.7	321 267	306 521	627 788	51.2	84.4	−2.3	28.6	15.5
20	Vaginal hysterectomy	8 799	177 774	186 573	4.7	11 942	183 323	195 265	6.1	35.7	3.1	4.7	1.4
	Total 19–20	183 056	491 521	674 577	27.1	333 209	489 844	823 053	40.5	82.0	−0.3	22.0	13.3

Table 16
Comparisons of national performances in ambulatory surgery (%)

	Country:	Australia	Belgium	CanadaQ	Canada4	Denmark	Finland	France	Ireland	Italy V	NL	NZ	Portugal	Spain V	UK	US
	Year:	1995–1996	1996	1996–1997	1997–1998	1997	1997	1997	1997	1997	1997	1997	1998	1997	1997–1998	1996
	Codification:	ICD9CM	ICD9CM	DRG	ICD9CM	NCSP	NOMESCO	PMSI	ICD9CM	ICD9CM	CVV-codes	ICD9CM	ICD9CM	ICD9CM	OPCS	ICD9CM
1	Knee arthroscopy	65.3	40.4	82.9	98.1	81.9	51.8	20.2	56.5	13.2	83.9	69.6	1.9	33.3	66.6	95.4
2	Extraction of teeth	70.7	70.5	97.4	96.9	82.4		36.7	77.8		86.8	79.8	46.6	0.0	78.4	67.3
3	Cataract surgery	54.3	37.4	89.0	97.9	84.6	59.3	18.7	23.8	20.7	54.6	79.5	3.1	45.1	67.2	98.8
4	Hernia repair	17.1	6.9	63.7	64.9	53.5	30.6	6.0	14.0	30.3	24.7	38.0	7.0	23.6	37.6	83.4
5	Dilatation and curettage uterus	83.7	49.9	91.8	94.2	85.2	85.5	30.5	43.3	21.1	80.1	77.7	29.4	23.9	72.1	91.6
6	Vein ligation and stripping	12.4	27.2	72.6	76.8	94.5	86.9	11.7	20.0	28.3	48.4	33.2	2.5	20.8	45.4	87.7
7	Tonsillectomy w or w/o ad	1.6	36.9	92.6	65.2	22.6	12.1	22.3	0.6	19.6	63.5	34.6	3.2	14.1	9.0	91.5
	Adenoitectomy	52.3	79.4			51.3	92.7	87.9	5.4	37.6	96.9	88.4	9.8	56.7		97.6
8	Myringotomy	90.3	79.1	97.9	99.1	83.9		87.6	82.1	58.2	98.4	90.5	9.5	0.0	81.8	95.8
9	Laparoscopic sterilization	80.0	44.8	86.9	98.3	73.1	70.0	2.8	48.3	0.0	92.4	87.1	12.7	52.3	81.8	94.4
10	Squint surgery															
11	Submucous resection (ENT)	5.5	4.3	80.6	76.8			8.1	4.9		12.8	6.3	4.3	0.0	7.6	89.5
12	Excision of breast lump	61.1	16.1	94.1	89.5	61.3	20.3	8.0	66.7	0.2	34.2	62.0	13.7	34.5	52.0	93.2
13	Anal procedures	37.0	18.1	57.1	67.4	79.5	8.7	8.4	36.0	19.3	32.6	27.3	8.0	13.9	53.3	86.3
14	Circumcision	79.7	67.6	97.6	29.7	87.7	85.3	68.3	61.1	0.0	93.5	78.3	30.6	62.6	73.4	81.0
15	Dupuytren	31.7	40.5	88.9	95.4	76.6	55.4	39.7	9.6	34.6	69.8	49.4	12.8	43.1	31.4	98.6
16	Carpal tunnel decompression	67.7	74.9	98.9	98.1		75.2	65.2	42.9		91.3	82.4	18.8	51.7	82.1	97.9
17	Orchidopexy-varicocoele	51.4	28.9	82.8	71.5	53.4	29.8	21.0	33.8	10.7	62.1	51.0	16.7	5.2	65.0	93.6
18	Implanted devices	52.7	44.4	78.6	82.4	61.1	66.9	31.5	57.5	9.2	54.6	52.4	6.5	38.2		74.0
	Total 1–18	54.1	44.9	85.0	85.3	78.5	56.4	30.4	40.1	21.9	66.7	70.2	9.9	33.0	60.0	94.2
19	Cholecystectomy laparoscopic	0.6	0.0	18.8	35.6	3.4	0.1	0.1	0.1		0.5	0.6	0.2	0.0	1.2	51.2
20	Vaginal hysterectomy	0.1	0.1	2.0	0.3	1.3	0.1	0.1	0.6		0.0	0.1	0.2	0.0	0.1	6.1
	Total 19–20	0.4	0.0	17.6	28.6	3.1	0.1	0.1	0.3		0.5	0.4	0.2	0.0	0.8	40.5

Table 17
Trends in total surgical ambulatory and inpatient activity

Total 1–18	1994–1995				1996–1997				National trend			
	A	I	Total	%	A	I	Total	%	A (%)	I (%)	Total (%)	%
Australia	267 715	227 438	495 153	54.1	290 135	210 797	500 932	57.9	8.4	−7.3	1.2	3.9
Belgium	154 567	250 758	405 325	38.1	197 225	241 651	438 876	44.9	27.6	−3.6	8.3	6.8
Canada Quebec	128 180	33 394	161 574	79.3	129 396	22 918	152 314	85.0	0.9	−31.4	−5.7	5.6
Canada, 4 provinces	400 358	106 104	506 462	79.0	349 224	60 223	409 447	85.3	−12.8	−43.2	−19.2	6.2
Denmark					143 883	39 518	183 401	78.5				
Finland					61 295	47 444	108 739	56.4				
France					574 544	1 312 610	1 887 154	30.4				
Ireland	16 626	27 565	44 191	37.6	19 485	29 158	48 643	40.1	17.2	5.8	10.1	2.4
Italy					14 477	51 641	66 118	21.9				
Netherlands	264 498	160 611	425 109	62.2	279 887	140 031	419 918	66.7	5.8	−12.8	−1.2	4.4
New Zealand	33 919	27 310	61 229	55.4	44 358	18 855	63 213	70.2	30.8	−31.0	3.2	14.8
Portugal	7 214	62 323	69 537	10.4	7 693	69 701	77 394	9.9	6.6	11.8	11.3	−0.4
Spain					18 767	38 060	56 827	33.0				
UK	471 003	544 609	1 015 612	46.4	470 351	314 098	784 449	60.0	−0.1	−42.3	−22.8	13.6
USA	7 980 682	778 893	8 759 575	91.1	8 788 846	541 422	9 330 268	94.2	10.1	−30.5	6.5	3.1

Extraction of teeth and submucuous resections are defined and performed in Finland mainly as office surgery. Data is collected as comprehensive discharge records (not case records, but structured and coded records).

Source: National Research and Development Centre for Welfare and Health.

5.7. France (Table 7)

Comprehensive case records.

Data covers public and private hospitals and some freestanding centres.

The records collated indicate a below international average performance.

Source: Centre de Traitement de l'Information du PMSI. Ministère de l'Emploi et de la Solidarité (Direction des Hôpitaux) et Caisse Nationale de l'Assurance Maladie (CNAMTS) (Hospital Activity Information Treatment Centre, Ministry of Labour and Solidarity (Hospital Directorate) and National Health Insurance Scheme).

5.8. Ireland (Table 8)

Over 3 years a light to moderate increase in the number of operations and ambulatory performances is perceptible, distributed across the groups.

Comprehensive case records covering public hospitals.

Source: Department of Health and Children. Economic and Social Research Institute (ESRI).

5.9. Italy (Region of Veneto) (Table 9)

The data collated refer to the Veneto region whose population of 4.47 million inhabitants in 1997 represented 7.7% of the Italian population.

The overall performance is low, concerning total surgery as well as ambulatory surgery. No data is provided for several groups.

Comments of the correspondent (Carlo Castoro):

> "Ambulatory surgery is regulated since 1996, notably in respect of the procedures authorised to be performed in a day setting, the only ones for which records are included. A number of procedures have been added to the list since then."

Comprehensive case records covering all types of institution: public and private hospitals, freestanding centres, physician offices.

Source: Health Care Council. Veneto Region.

5.10. The Netherlands (Table 10)

Surgical activity has been declining slightly overall (1.2%) with a transfer of conventional hospital based surgery (−12.8%) in favour of ambulatory surgery

(+5.8%) and an improvement of an already high overall (66.7%) performance in ambulatory surgery (+4.4%). The improvement is particularly spectacular for cataract surgery (+25%).

The data related to the year 1995 [1] have been thoroughly revised given the omission of several procedure codes in the first survey.

Comprehensive case records covering public hospitals. Procedures performed in the few private hospitals, usually done under local anaesthesia are not included.

Source: S.I.G. Healthcare Information.:

5.11. New Zealand (Table 11)

The data related to groups 2 (extraction of teeth) and 3 (cataract surgery) for the year 1995 [1] published with the results of the first survey have been amended. Group 2 remains, however, overestimated for that year (use of code 231 instead of 2319).

The overall performance level in ambulatory surgery (70.2%) is high and increased (+14.5% in 2 years). A moderate increase in aggregate activity (+3.2%), with a distinct increase in ambulatory surgery activity (+30.8%) matches a distinct reduction in conventional hospitalisation (−31%).There are disparities between 1995 and 1997 for groups 5 (dilation and curetage of uterus), 8 (myringotomy) and 13 (anal procedures).

Comments from the correspondent (Rodney Butler):

> ''In general there has been an apparent rise in the number of procedures due to changes in the number of procedures recorded for each patient discharged. The introduction of a waiting times fund produced an increase in the number of procedures performed. A change of structure from Area Health Boards to Regional Health Authorities generated a different emphasis on the types of surgery funded. And, in September 1996, ICD9-CMA version 2 was implemented resulting in some additional ICD9 codes being used''.

Comprehensive case records covering public hospitals and publicly funded procedures in private hospitals.

Source: Ministry of Health. N.Z. Health Information Service.

5.12. Portugal (Table 12)

There is no progression in the performance of ambulatory surgery-the lowest in the sample studied. The figures representing general activity (ambulatory + hospitalised) appear to be very low: eight times lower than in Belgium and in The Netherlands for more or less the same population size.

Comprehensive case records covering public hospitals.

Source: Instituto de Gestao Informatica & Financeira da Saude (I.G.I.F.). (Institute of Health Management of Informatics and Finance).

5.13. Spain (Region of Andalusia) (Table 13)

The data supplied refer to 94% of the Region, approximately 8 million people subject to the National Health Service (Sistema Nacional de Salud).

The overall surgical activity level appears to be very low. The performance regarding ambulatory surgery varies according to groups but stands typically below the average international stance. The absence of records on ambulatory surgery in groups 2 (extraction of teeth), 8 (myringotomy) and 11 (submucous resection) requires complementary documentation.

Source: Unidad de Informacia. Servicios Centrales. Servicio Andaluz de Salud. Junta de Andalucia. (Information Unit. Central Administration. Health Department. Government of Andalucia).

5.14. UK (Table 14)

The general performance in ambulatory surgery shows a distinct growth from 46.4% (1994–1995) to 60.0% (1997–1998). However, the analysis of the raw results reveals that this improvement in performance results primarily from a considerable reduction in traditional hospital activity (−42.3%) while the activity in ambulatory surgery stagnates (−0.1%). There is a reduction in overall activity (ambulatory + hospitalised) of 22.8% in 3 years: 1 015 612 operations in 1994–1995 and 784 449 operations in 1997–1998.

Comments provided by P.E.M. Jarrett:

''The reasons for the changes in activity are multifactorial and include:

Elderly patients blocking inpatient surgical beds.

N.H.S. funding increases not matching health index inflation.

Increasing resources devoted to the process of healthcare management rather than actual patient treatment.

Dilatation and curettage uterus and arthroscopy being replaced by newer less invasive outpatient procedures.

Push by health authorities to reduce unnecessary 8th molar surgery and tonsillectomy.

Political target to reduce waiting list time for cataract surgery — hence increase.''

Comprehensive case records covering all public hospitals.

Source: Department of Health. Statistics Division. Hospital Episode Statistics (H.E.S.).The USA (Table 15)

The data related to the first survey [1] have been entirely reviewed and corrected by the correspondent.

In the 2 years elapsed, a moderate growth in the total number of procedures is observable (+7.6%) with sizeable variations depending on the category of procedures.

The exceptional ambulatory surgery performance level of 1994 (91.1%) records further gains (94.2%). The increase is noteworthy for laparascopic cholecystectomy with an increase in procedures of 28.6% mainly directed towards ambulatory surgery (+84.4%).

The comments made on the occasion of the first survey relating to the conformity of the American definition used with that adopted in this survey cannot be lifted, notably in respect of the length of stay in the surgical units or in auxiliary facilities before the patient's discharge to go home.

National probability samples covering all not federal hospitals and freestanding centres licensed for ambulatory surgery.

Source: Department of Health and Human Services, National Center for Health Statistics. National Survey of Ambulatory Surgery (N.S.A.S.) and National Hospital Discharge Survey (N.H.D.S.).

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Meeting Report

Society for Ambulatory Anesthesia 15th annual meeting

The 15th Annual SAMBA Meeting was held in Washington, DC on 4–7 May, 2000. There were panels on a wide variety of topics including: Office-Based Anesthesia, Complementary Medicine, Effective Strategies for Accessing Medical Information on the Internet, Lessons Learned from the ASA Closed Claims Project, Anesthetic Outcomes, and Post-operative Dilemmas. Below are highlights from selected presentations.

Rebecca Twersky, MD (Brooklyn, NY) presented an overview of the standards, regulations, guidelines and accreditation procedures for office-based practices. She emphasized that as compared with acute care hospitals and licensed surgery centers, office-based facilities have little to no regulation. Therefore, anesthesiologists may have to assume personal responsibility for facility construction, medications, supplies, equipment, etc. Anesthesiologists also need to be familiar with procedures regarding fire safety, power outage, staffing, unanticipated patient transfers, etc. The ASA has recently published ASA Guidelines for Office Based Anesthesia (www.asahq.org). Several agencies will accredit office-based practices including: Joint Commission on Accreditation of Healthcare Organizations, Accreditation Association for Ambulatory Health Care and the American Association for Accreditation of Ambulatory Surgery Facilities. Currently, state regulations vary tremendously regarding accreditation requirements. Some states, such as Connecticut, have no restrictions on office-based surgery. Others, such as California, require licensure and accreditation as delineated in California Senate Bill (SB) 595 which was effective July 1996. SB 450 which was adopted in August 1999 deems that liposuction of more than 5000 cm^3 total aspirate per procedure is unprofessional.

The California Cosmetic and Outpatient Surgery Protection Act, which was effective January 2000, delineates staffing, ACLS, and adverse event reporting requirements. While California has been on the forefront of developing office-based surgery guidelines and standards, other states are gradually adopting their own.

The next speaker was Dr Walter Maurer (Cleveland, OH) who spoke on Safe Anesthetic Techniques for the Office. Physicians need to be very familiar with the ASA Standards for Basic Anesthetic Monitoring, Pre and Post Anesthesia Care, Guidelines for Ambulatory Anesthesia and Surgery and Guidelines for Nonoperating Room Anesthetizing Locations. Facilities will vary greatly in terms of the physical plant (which is often retrofitted), adherence to fire safety, air handling and availability of back-up generators in the event of power failure. Simple issues such as the availability of a telephone in the procedure room (in the event an ambulance needs to be called) can pose problems if not dealt with before caring for patients. Some practitioners notify the local ambulance company in advance that they will be administering general anesthesia in the office on a particular day. Adherence to basic anesthesia standards and availability of appropriately trained personnel was stressed.

The next speaker on this panel was Dr Rudolph DeJong (Columbia, SC) who presented the anesthesiologist's perspective of office-based liposuction. Dr DeJong outlined the recent history of liposuction and reasons for this procedure attracting concern in the medical and regulatory communities. The major economic force driving this procedure is cash pay and lack of red-tape from insurance and other regulators. However, there have been five fatalities in New York City in recent years and the overall mortality following this procedure is estimated at 19 per 100 000. This contrasts with a 16 per 100 000 fatality rate for motor vehicle accidents in the United States in 1996. In 1987, the term tumescent liposuction was coined. This procedure involves subcutaneous infiltration of several liters of highly dilute lidocaine ($\leq 0.1\%$) with minute amounts of epinephrine (1 mcg/ml). This solution provides profound analgesia and a virtually bloodless aspirate. The doses of lidocaine used however, are enormous and approach 35–50 mg/kg. This is well beyond the FDA ceiling of 7 mg/kg and is possible because the tumescent solution is highly dilute and is bound in the subcutaneous tissue — up to a point. Dr DeJong had a useful analogy for this paradoxical situation: 'Envision the subcutaneous drug reservoir as a baby's cotton diaper that soaks up, and retains, a limited volume of liquid — any more liquid beyond that finite limit, however, spills over to cause instant soiling'. Indeed, post-lipo-

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suction deaths attributed to lidocaine toxicity seem to be due to slowly progressive depression of intra-cardiac conduction. Other potential complications with this technique include: pulmonary embolism, pulmonary edema, hypothermia, large third space fluid shifts, and epinephrine toxicity. He concluded by stating that, 'When all is said and done, liposuction may not be quite as benign a procedure as heretofore reputed'.

On Saturday 6 May, the panel 'Complementary/Alternative Medicine: Importance to Anesthesia Providers' was moderated by Dr Charles McLeskey (Chicago, IL). Dr McLeskey provided an overview and noted that one in five US adults taking prescription medications also report the simultaneous use of 'alternative' medications. Eisenberg (JAMA 1998) estimated that 15 million US adults may be at risk for unexpected adverse drug-alternative medicine interactions. The use of 'complementary' therapies has exploded over the past 5–10 years and has increased over three-fold from 1990 to 1997. Dr Jessie Leak (Houston, TX) then presented: 'Herbal Medicines: Perioperative Considerations for the Ambulatory Anesthesiologist'. She reminded the audience that herbal medicinals are exempt from FDA regulation and approval; the products are not considered drugs but rather diet supplements and therefore undergo the same level of scrutiny as food. Currently, the FDA does not have the authority to regulate herbal medicine purity, consistency or accuracy of labeling. The FDA can demand withdrawal of a product only if it is proven to be unsafe. Given this background, it was also emphasized that there are no randomized studies, as yet, that have definitively proven herbal medicinals to be harmful in the perioperative period. Most of the information comes from case reports and surveys. Nevertheless, the potential systemic properties of the more common herbal medicinals is worth noting.

Garlic, ginkgo, ginger and ginseng are known to be associated with alterations in platelet function and may increase bleeding especially among patients who are receiving drugs with anticoagulant properties, including heparin, aspirin, and non-steroidal anti-inflammatory agents.

Ephedra sinica (ma-huang) is used as a diet aid and several deaths associated with its use have been reported. This substance is estimated to be present in as much of 17% of commercially available herbal products. Adverse events associated with ephedra include: stroke, cerebral hemorrhages, palpitations, headache, and panic attacks. Ginseng may also cause tachycardia or hypertension.

Other herbal products such as valeriana officinalis (valerian), piper methysticum (kava-kava) and hypericum perforatum (St John's Wort) may be associated with prolongation of anesthesia.

In summary Dr Leak, as well as the ASA, recommend discontinuing herbal products two weeks prior to elective surgery. This recommendation is not supported by randomized clinical trials, but 'merely prudence'. She also emphasized that awareness of the issue is critical to safe management and patients need to be asked about use of herbal or 'natural' medicinals. The audience was referred to the ASA publication on possible side effects and drug interactions of herbal medicinals (www.asahq.org/ProfInfo/herb/list.html).The next speaker on this panel was Dr T.J. Gan (Durham, NC) who spoke on 'Use of Acupuncture in the Management of PONV'. Dr Gan acknowledged that the concept of acupuncture is difficult to comprehend in Western medicine however, many studies have demonstrated the efficacy of acupuncture in specific clinical situations. The NIH/OIM (Office of Alternative Medicine) Consensus Panel on Acupuncture stated in November 1997 that there is 'clear evidence for acupuncture's efficacy for treating postoperative and chemotherapy nausea and vomiting…'. Dr Gan emphasized that well controlled randomized trials were needed before acupuncture could be considered a routine component of Western clinical practice. He went on to describe the technique for acupuncture management of PONV including: acupressure, acupuncture needling, and electro-acupuncture and TENS. Most of these modalities involve stimulation over the P6 acupuncture point (Nei Guan) which is located between the tendons of the palmaris longus and the flexor carpi radialis of the forearm. The mechanism of action is not well defined. Several studies have shown acupuncture to be as effective as conventional antiemetics or better than placebo but its optimum role in management of PONV needs further investigation.

The following day, several panelists spoke on: 'Post-Operative Dilemmas'. Dr Terri Monk (Gainesville, FL) spoke on Post-Operative Cognitive Dysfunction. Features of this disorder, which is not uncommon in the elderly, range from mild forgetfulness to permanent cognitive impairment and loss of independence. Post-operative cognitive dysfunction encompasses three entities: post-operative delirium, mild neurocognitive disorder, and dementia. Post-operative delirium is an acute change in cognition, which is relatively common in the elderly and may last from a few days to a few weeks. Post-operative delirium can occur within 24 h after surgery, so called emergence delirium. This is more common in children. Interval delirium however, occurs after a lucid interval of one or more days. The distinguishing feature between emergence and interval delirium is time of appearance. Factors affecting the incidence of delirium include preoperative medical and cognitive status and age. The etiology is multifactorial and polypharmacy, intoxication, metabolic disturbance, hypoxia, sepsis, and hypercarbia are all possible cul-

prits. Treatment is directed at correcting any of these underlying disturbances and eliminating medications associated with delirium, if possible.

Mild neurocognitive dysfunction, which is a type of post-operative cognitive dysfunction, is detected days to weeks after surgery and can last for an indefinite period of time. Dysfunction ranges from mild memory loss to severe impairment. These patients do not meet criteria for dementia but are not functioning as expected for their age and preoperative status. Diagnosis is confirmed by neuropsychological testing. Although the causes of post-operative neurocognitive dysfunction are not known, identified risk factors include: advanced age, duration of anesthesia, low education level, need for second operation, post-operative infections, and respiratory complications. In a multinational study of patients having non-cardiac surgery, the incidence of late post-operative cognitive changes was 14% for patients older than 70 years and 7% for those between 60 and 70 years of age. Dr Monk emphasized the need for further studies to better elucidate the etiologies, mechanisms, and markers for the development of post-operative cognitive dysfunction.

The next speaker was Dr David Sinclair (Pittsburgh, PA). His talk, entitled 'Simulated Driving After Ambulatory Anesthesia' focused on how to use driving simulators to assess 'street fitness'. Although this technology is in its infancy and most of the studies to date have used volunteers, preliminary results are encouraging. Driving simulators measure several performance variables including response time, lane position, and number of collisions. Recent studies have been volunteer cross-over studies where subjects have either alcohol or a general anesthetic (propofol, N20, desflurane) and are then placed in a driving simulator. Driving performance was impaired as late as 4 h post-anesthetic but was back to baseline by 24 h. Dr Sinclair stressed that further studies using actual patients, interpretation of road data, impact of post-operative medications and rigorous evaluation will be necessary before incorporating simulators into actual clinical practice.

Next Dr Frances Chung (Toronto, Canada) spoke on 'Post-Operative Complications: Beyond PONV'. She reviewed the relatively low morbidity and mortality rates associated with ambulatory surgery and reported on the incidence of major adverse events, especially those relating to the cardiorespiratory systems. Hypertension and hypotension are the most common cardiovascular adverse events in the ambulatory setting and occur with an incidence of 2–16% depending on the study. Rhythm disorders occur in about 1–2% of ambulatory patients. The long term sequelae of these events is difficult to quantify, but the incidence of severe cardiovascular complications in a well screened ambulatory surgery population is less than in age matched controls. Certainly prolonged post-operative stays, which may be a surrogate for post-operative adverse events (or unrealistic expectations), is related to the type of anesthesia and the surgical procedure. General anesthesia is associated with a higher incidence of PONV (as compared with MAC or regional anesthesia) and certain ENT; orthopedic and urologic procedures may be especially painful, resulting in prolonged stays. Once discharged, the most common reasons for readmission are bleeding, fever, pain wound disruption and urinary retention. Patients undergoing urologic procedures are most likely to be readmitted. Although ambulatory surgery and anesthesia has an excellent safety record, Dr Chung concluded by noting that there is still room for improvement, especially by reducing the incidence of 'minor' adverse events since these events, while not life-threatening, affect patient satisfaction and post-operative function.

The last speaker, Dr Girish Joshi (Dallas, TX) addressed the topic: 'Fast Tracking: Lessons Learned'. Dr Joshi emphasized that the selection of the anesthetic technique (general vs. regional anesthesia) is a major determinant of recovery after ambulatory surgery. Furthermore, success of fast-tracking is critically dependent on preventing post-operative complications of all sorts — from airway obstruction to nausea. The use of short-acting muscle relaxants and anesthetics, multimodal pain management, and prophylaxis of PONV all help to set the stage for fast-tracking. However, the implementation and success of a fast track program requires interdisciplinary collaboration between anesthesiologists, surgeons, and nurses. He stressed that the goal of any fast track program should be to eliminate unnecessary aspects of care and improve the quality of care and patient satisfaction, without putting the patient at any additional risk. He concluded by noting that while fast tracking is feasible, more studies are needed to show that fast tracking can be accomplished safely and in a cost effective manner in varied patient populations.

Barbara Gold, MD
Department of Anesthesiology,
B515 Mayo Memorial Building,
University of Minnesota Medical School,
PO Box 294, 420 Delaware Street S.E.,
Minneapolis, MN 55455,
USA