Summary

When surgery is performed outside the conventional hospital, it can offer a number of advantages for patients, health care providers and even hospitals. Patients benefit from day surgery because it decreases their likelihood of contracting hospital acquired infections and reduces post-operative complications. Compared to traditional hospital admission, there is less pre-operative laboratory testing and reduced demand for post-operative medications following ambulatory surgery. Unlike inpatients surgery, ambulatory surgery dose not depend upon the availability of a hospital bed and may permit the patient greater flexibility in selecting the time of their operation.

Optimal pre-operative preparation of outpatients will make ambulatory surgery both safer and more acceptable for everyone involved. It is important to ensure that all patients are in optimal medical condition before their elective operation. The preparation process should be aimed at reducing the risks inherent in ambulatory surgery and in making the surgical experience more pleasant for the patient and their family. Preoperative preparation should be aimed at minimizing patient anxiety. The use of small doses of sedative-anxiolysis drugs for pre-medication has been found to improve the perioperative experience of patients without adversely affecting the recovery process.

Finally, preventative measures may be taken to reduce common post-operative side effects (e.g. nausea and pain) in high-risk patient populations (e.g. laparoscopic middle ear surgery) recent changes in NPO policies have allowed patients to continue taking chronic medications and avoid the

uncomfortable symptoms of dehydration, hypoglycaemia and caffeine withdrawal. In addition, oral premedication with preventative analgesics (e.g. rofecoxib 50 mg) can improve pain control during the post-operative period.

Ambulatory surgery may potentially be conducted using wide variety of general, regional and local anaesthetics techniques. The choice of anaesthetic technique depends upon both surgical and patient factors. In addition, sedation is commonly used to supplement local anaesthetic based techniques as part of a so called monitored anaesthetic care technique. For many procedures, general anaesthesia remains the most popular technique with both patients and hospital staff.

Although central neuro-axis blocks can delay discharge secondary to the effects of the residual sympathectomy, peripheral nerve block procedures can actually facilitate the recovery process. Not surprisingly, an increasing percentage of cases (up to 60% at some ambulatory centers) are being performed using a combination of local anaesthesia with intravenous sedation. The increasing availability of sedative, anaesthetic, analgesic and muscle relaxant drug with rapid onset of action, short and highly predictable durations of effect, lack of accumulation and minimal side effects, have made surgical procedures safer for outpatients and will permit even longer and more complex operations to be performed on an ambulatory basis in the future.

Intravenous agents are now routinely used for induction of anaesthesia in both adults and older children. Thiopental has long been the gold standard agent for IV induction. However, thiopental can impair fine motor skills for several hours and produce a “hangover” sensation even after short

outpatient procedures. Although methohexital had a shorter elimination half-life than thiopental, it is permitting a significantly faster awakening and earlier recovery. Etomidate has also been used for induction and maintenance of general anaesthesia for short outpatient procedures because of its favourable effects on the cardio-vascular and respiratory systems. However, use of etomidate was associated with post-operative nausea and vomiting in young outpatients. Propofol has recently become the IV induction agent of choice for outpatient anaesthesia. Its use is associated with rapid emergence and low incidence of post-operative nausea and vomiting. Emergence following induction with propofol is more rapid than with thiopental, methohexital or etomidate.

In spite of the increased interest in IV anaesthetic techniques, for maintenance of general anaesthesia volatile agents remain the most popular maintenance. The newer halogenated ether compounds (e.g. sevoflurane, desflurane) have significantly lower blood-gas solubility permitting a more rapid onset and termination of their clinical effects. In addition, the less soluble volatile agents provide a greater degree of intra-operative hemodynamic stability. The use of enflurane is associated with the most rapid recovery and lowest incidence of post-operative side effects. Desflurane has recently become available and has rapidly gained popularity for maintenance of ambulatory anaesthesia. Sevoflurane is associated with faster awakening times than isoflurane. Because it is non-irritating to the airway, sevoflurane can also be useful for induction of anaesthesia as an alternative to propofol in outpatients without venous access.

Adjunctive agents are often administrated during general anaesthesia. Midazolam has sedative, anxiolytic and amnesic properties make it popular adjunct during the pre-induction period. Fentanyl and its newer analogs (sufentanil, alfentanil and remifentanil) have potent anaesthetic-sparing

actions, improve intra-operative hemodynamic stability and anaesthetic conditions and provide a more rapid emergence from general anaesthesia
The muscle relaxants are also an essential component of a “balanced” anaesthetic technique. The more widespread use of the intermediate acting non-depolarizing muscle relaxants (e.g. atracurium and vecouronium) has minimized problems related to inadequate reversal after short day case procedures. Not surprisingly, the availability of a shorter acting non-depolarizing muscle relaxant mivacurium has decreased the need for reversal agents even after brief ambulatory procedures.

Facemasks and oral airways are frequently employed during brief ambulatory procedures. However, the use of tracheal intubation remains popular in the day surgery setting because it “frees up” the practitioners’ hands for other tasks. Although all types of ambulatory surgery can be managed with these airway techniques, both have disadvantages. Therefore, the laryngeal mask airway is now being employed insinuations where either a facemask or tracheal tube would have been used in the past.
The flexibility of ambulatory surgery can be greatly enhanced by the use of a wide variety of local and regional anaesthetic techniques to avoid common side effects of general anaesthesia (e.g. nausea, vomiting, dizziness, lethargy), the risk aspiration pneumonitis is minimized, nursing care may be decreased and residual analgesia is provided in early post-operative period. Simple surgical procedures can be performed with local wound infiltration whereas more extensive operations may be undertaken using field blocks and intravenous regional techniques. The use of a peripheral block technique with intravenous sedation is associated with improved recovery profile.

Spinal and epidural techniques are utilized, in general, subarachnoid blockade is preferable than epidural block because it is more readily performed and procedures more rapid and consist effects, thereby decreasing the need for adjunctive drugs.

Following outpatient surgery, pain should be controllable with conventional oral analgesics (e.g. acetaminophen with codeine) before patients are discharged from the ambulatory facility however; potent, rapid acting opioid analgesics (e.g. fentanyl, alfentanil, sufentanil) are commonly used to treat post-operative pain in the early recovery period. The primary concern regarding the use of opioid analgesics in the outpatient setting relates to their ability to increase the incidence of post-operative nausea and vomiting, which may contribute to a delayed discharge after ambulatory surgery. Recently, there has been an increased use of potent non-steroidal anti-inflammatory agents (e.g. diclofenac, ketrolac) which can effectively reduce the requirements for opioid analgesics after ambulatory surgery.

Nausea and vomiting is unpleasant at anytime, it is a common cause of delayed discharge and unanticipated hospital admission following ambulatory surgery. Both surgery and anaesthesia contribute to the high incidence of this side effect after ambulatory surgery. A wide variety of antiemetic drugs has been used as prophylactic and to treat post-operative nausea and vomiting (PONV).

Some degree of bleeding is expected post-operatively even following ambulatory surgical procedures. Most bleeding becomes self-limited unless sutures have become disrupted and rarely patients need to return to the operating room.

Many modern outpatient surgical facilities use two-phase system to observe patients after anaesthesia and surgery for recovery. The first phase takes place in traditional post-anaesthesia care unit (PACUI). During this phase close observation of the patient is important. The patient is monitored in PACUI unit. The vital signs are stable, he or she is awake, oriented and adequate pain relieve has been achieved. Once the above criteria are met and the patient is able to maintain a semi-setting position, the patient can be transferred to second phase post-anaesthesia care unit (PACUII). In the PACUII, the patient is seated in reclining chair. The family can participate in the patient care in PACUII. Once the criteria for "home readiness" are achieved, the patient can be discharged (including stable vital signs, minimal bleeding and pain and absence of intractable side effects). These criteria have recently been combined into post-anaesthesia discharge scoring system, which compares favourably with traditional out[atient discharge guidelines and may permit earlier discharge after ambulatory surgery.

Despite careful planning, patient screening and procedure selection, inevitably some patients may be unable to be discharged following ambulatory surgery. Unplanned hospital admissions rate has been reported to range from 0.09%-18%. The majority of reasons are related to surgical factors, less frequently to medical or anaesthesia complications. Ambulatory surgery facilities should regularly review the nature of hospital admissions and their impact on patient outcome.

The future challenge that all practitioners must face is to provide high quality ambulatory anaesthesia care at reduced cost.