

# Guidelines for system and anaesthesia organisation in short stay surgery (ambulatory anaesthesia, anaesthesia in day case surgery)

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Since the dawn of civilisation, disease, an inevitable element of human life, has provoked searches for different ways of treatment. Evolving over the centuries, medical management has always focused on the deep-rooted need of an individual for a quick return home. This wish is encapsulated in a motto formulated thousands of years ago by Asclepiades of Bithynia, one of the first doctors. He based treatment on the principle *tuto, celeriter et iucunde* (safely, swiftly and gladly). The principle seems still applicable to a specific field of surgical management, whose main assumption is to reduce the duration of treatment by rationalising perioperative care [1, 2].

Attempts to shorten the perioperative period to one day go back to the beginning of the 20<sup>th</sup> century. Nicoll concentrated his efforts on children [3] and Waters on adults [2–4]. In 1962, the first modern facility promoting ‘day case surgery’, a new interdisciplinary field of medicine, was established at the University of California [2, 5, 6]. ‘Day surgery’ and ‘short stay surgery’ are synonymous terms used in literature and in the present paper.

The implementation of such activities into the structural solutions of medical management has been demonstrated to give considerable macroeconomic benefits, without increasing the risk of complications and adverse events [2, 5, 6, 7]. Over the last 20 years, the dynamic development of surgical treatment with shortened pre- and postoperative care has also been observed in Poland. Hence, faced with an amendment to the Ministry of Health regulations concerning the profession of an anaesthesiologist [8], it seems necessary to set out basic recommendations for such services in the reality of the Polish healthcare system, and provide them with an appropriate commentary.

## RECOMMENDATION NO. 1

Procedures with shortened perioperative periods (short stay surgery, day case surgery, ambulatory surgery) are a special system of patient care and medical management (both anaesthesiological and surgical) that limits a particular elective surgical procedure and all organisational and treatment activities related to it to a single day, (i.e. a period not exceeding 24 hours). In the light of Polish law, such procedures are still considered part of medical services administered by a health care unit (provider) or professional practice.

## COMMENTARY

This recommendation explicitly defines the terminology as well as general and organisational assumptions of the system. The Polish term, like its English equivalents ‘day case’ and ‘short stay surgery’, puts stress on the procedure’s duration [9]. Due to practical reasons, and a certain semantic universality, the term ‘day case surgery’ is used most frequently, also in the system of settlements with the national payer. The modified term ‘23-hour surgery’ is also commonly applied to stress the deadline for patient discharge [2, 6, 10–12]. Moreover, the term ‘working day’ is used to underline that the patient’s stay does not include the weekend [2, 7]. It should however be pointed out that the definition does not specify the minimum procedure time; thus, it includes procedures performed in treatment rooms and outpatient clinics as well as management of sedation and sedoanalgesia [2, 5, 7, 10, 11]. Differences in procedures used in treatment rooms and day surgery units concern both equipment and organisational issues (see below)

[7, 12–14]. Anaesthesia administered in treatment rooms is to some extent comparable to ambulatory anaesthesia or anaesthesia outside the operating theatre performed in a hospital setting; however, in this case the management of complications depends on organisational and infrastructural solutions of a given health care facility [2, 6, 7, 15].

A procedure can be defined as 'day case surgery' even when the planned stay in a hotel neighbouring the medical facility is prolonged, provided that the facility has no medical supervision, but that medical intervention is accessible almost immediately owing to the topographic vicinity of the buildings in question. This has an unquestionably beneficial effect on the psychological comfort and medical safety of patients during the first postoperative day [2, 6]. It seems that this management should be available to, or even obligatory for, patients anxious about their postoperative home stay and in the case of doubts as to the patient's postoperative condition which however are not serious enough to qualify the patient for hospital treatment.

#### **RECOMMENDATION NO. 2**

Procedures with planned shortened perioperative periods should be carried out in facilities of adequate architectural design and infrastructure as well as clearly defined principles of the therapeutic process, patient selection for a given procedure and guidelines for its termination, in particular.

#### **COMMENTARY**

The health care entity should fulfil the following criteria: 1. have premises or equipment meeting the requirements specified in Article 22 of the Act on Medical Activity of April 15, 2011; 2. use products in line with the requirements of the Act of May 20, 2010 (Journal of Laws No. 107, Item 679); 3. provide healthcare services only by qualified medical staff and meet the healthcare requirements defined in separate regulations; 4. conclude a civil liability insurance agreement as provided by Article 25 paragraph 1 [16, 17].

Day surgery units differ in the degree of organisational affiliation with the premises, settlement and insurance systems, hospital personnel and equipment. They are divided into the following types:

##### **TYPE A**

One-stop clinics located outside the main body of healthcare facilities, which are managed by operators (surgeons) assisted by qualified anaesthesiologists who administer anaesthesia on demand [2]. Anaesthesiologists are equipped with portable equipment for sedation, short-term general anaesthesia and resuscitation. It is also desirable, though not mandatory, for such facilities to be equipped with devices for passive oxygen therapy, an oxygen source,

anaesthesia machine and additional set of drugs (see: Recommendation 3). A portable oxygen tank should ensure passive oxygen therapy for at least one hour [2, 5, 11].

Selection of patients for surgical management and assessment of their general health are carried out by an operator, sometimes ad hoc, whereas anaesthesiological evaluation takes place immediately before the administration of anaesthesia. The required imaging and laboratory tests are supplied by the patient usually following a telephone consultation with the anaesthesiologist or according to the set schedule.

The architectural structure of these facilities is simple, consisting usually of a waiting room and a treatment room, which is also used as a recovery room. This reduces the facility efficiency and provides limited intimacy during the post-anaesthesia period [13, 14].

Procedure-related insurance is based on individual agreements with each of the parties involved in therapeutic management. The treatment of potentially critical complications is usually based on ambulance/hospital interventions, but some treatment rooms may have co-operation agreements with the selected hospitals.

Despite the drawbacks mentioned above, the use of this type of anaesthesia has been dynamically growing in the majority of countries, e.g. in the USA, its rates increased from 8.5% in 1994 to 20% in 2001 [18, 19].

##### **TYPE B**

Freestanding units — operate independently, with no affiliation with other health care entities [2, 5, 7, 20, 21]. They employ their own medical and administrative personnel. Each unit has a reception with a waiting room, a pre-operative room, an operating theatre and two recovery rooms, the first of which allows the moving of a patient in the recumbent position (first stage recovery) whereas the other is used as a place of rest in the recumbent or semi-reclining position (second stage recovery). Additionally, the operating theatre may be used as a recovery room and the waiting room can become a second postoperative room. However, this slows down the system and limits patient privacy [2, 7].

The type B unit is able to manage treatment-related complications, although in the case of life-threatening ones, it usually relies on the hospital with which it has a co-operation agreement. Furthermore, financing is independent and formal liability for medical malpractice is secured with an insurance agreement.

##### **TYPE C**

Hospital-affiliated units — vary organisationally, and the degree of affiliation pertains to various elements of medical activity. They are usually located within the prem-

ises of a hospital, in a separate building [2, 7, 20, 21]. Their outlay provides conditions similar to those found in type B units. Service insurance is usually based on individual insurance agreements of the personnel. Unit insurance may be connected with hospital insurance or concluded for a specified type of activity. In the case of complications, the hospital may guarantee co-operation with no additional costs to be borne by the unit. Personnel remuneration can take into account individual elements of a surgical procedure or be regulated by a civil law agreement or in the form of bonus payments to the basic salary (budget relations).

Type C units can support the functioning of basic hospital structures (e.g. relieving the queues of patients awaiting treatment).

#### TYPE D

Hospital-segregated units — located in a separate part of the hospital. Both medical and administrative personnel come from the hospital staff. Moreover, the premises and equipment are owned by the hospital. The management staff usually reports to a hospital manager and has to adjust to general solutions imposed on the entire entity [2, 6, 21]. Such a ward is usually one of the ways of raising additional funds by the hospital, which provides insurance and medical resources in case of complications. Medical documentation is adjusted to hospital general healthcare regulations. Other conditions for functioning are the same as in type B units.

#### TYPE E

Hospital-integrated units. In most cases, integration means separating some group of beds within a surgical ward and signing an agreement for specific, narrow-scope services. The hospital offers a full range of possible treatments of complications. Creating such units is sometimes only an organisational manoeuvre, taken to reduce the number of patients awaiting treatment. The selection of patients is faster and they are discharged on the surgery day, which makes this system similar to the stationary one. Unit financing is integrated with the hospital system, and so is the personnel remuneration.

Each of the units described has: 1) its reception with a waiting room, 2) preoperative room, 3) operating theatre or treatment room, 4) recovery area comprising two recovery rooms (first and second stage recovery).

The first stage recovery room provides all the elements of treatment necessary in the prolonged recovery period, including electrocardiographic monitoring, passive oxygen therapy, ventilation and resuscitation.

The second stage recovery room is the place of rest in the sitting, semi-reclining or recumbent position, where additional medical services are no longer required. Here,

it is possible for the patient to be visited by his/her family or friends and to be isolated from other patients (recommended, although not always feasible) [2, 5–7, 10, 14, 15, 20, 21].

#### RECOMMENDATION NO. 3

Medical units performing short stay surgeries have to be equipped with devices enabling efficient administrative services, surgical treatment and anaesthesia as well as be prepared to deal with complications at any stage of management, including cardiopulmonary resuscitation.

#### COMMENTARY

In accordance with the binding Regulation of the Ministry of Health of December 20, 2012, it is obligatory for the anaesthetic workstation in any facility delivering medical services to be equipped with an array of equipment, in total 26 various medical devices [8].

The equipment for units providing services with shortened perioperative management listed in the Regulation is in some systems perceived as controversial; however, the legislator does not envisage exceptions from the presented rules. Moreover, in type A units in particular (and to some extent in type B-E ones), the requirements of the Regulation contradict the basic assumptions of day case surgery and separate arrangements will probably have to be made. This is connected to the fact that the lawgiver acts on the basis of a rule qualifying patients for anaesthesia according to ASA physical status of I-IV and adjusts the equipment required at the anaesthetic workstation to the risk of critical complications. Furthermore, the law does not take into account a wide variety of anaesthetic procedures which are safe under shortened perioperative conditions and do not require a wide assortment of equipment [8, 14, 17]. The above relates particularly to anaesthesia on demand, discussed earlier. In the United States, the basic equipment for units in which anaesthesia is administered on demand is described with the acronym 'POSE MD' and involves the possibility of ventilation with a self-inflating bag (P — positive pressure), efficient oxygen source (O — oxygen), efficient suck (S — suction), medicines and devices for cardiopulmonary resuscitation (E — emergency equipment), adequate monitoring (M — monitoring), and a set of appropriate anaesthetics (D — drugs) [7, 10, 12].

#### RECOMMENDATION NO. 4

To be considered suitable for day case surgery, patients should meet the medical, psychological and social inclusion criteria. These are essential for their safety, the avoidance of complications, and the organisational stability of treatment with shortened perioperative care.

**COMMENTARY**

The selection of patients follows the following scheme: 1) the decision of a surgeon to perform surgery based on general assessment of a patient and the possibility of performing surgery; 2) full acceptance by the sufficiently informed patient of suggested options concerning organisation and manner of treatment; 3) selection of an appropriate anaesthesia by an anaesthesiologist; 4) performance of selected or necessary imaging and laboratory tests if required and resulting from the opinions of the surgeon and the anaesthesiologist; 5) setting the procedure date; 6) performing the procedure; 7) postoperative period; 8) audit and postoperative assessment [2, 5, 8, 11, 12, 20, 21].

Qualification for surgery should take into account standard procedures performed with well-mastered techniques and in predictable time that do not pose any specific risks of complications (bleeding, haemorrhage). Experimental and not clinically tested procedures, or those performed using new techniques, equipment or materials, the outcome of which may be unpredictable, should not be performed [10, 12]. To date, there are over 200 elective surgical procedures for day case surgery [2, 10–12, 22, 23].

Factors likely to disturb the patient condition in the postoperative period should be predictable and easy to deal with. The procedure should also allow unproblematic mobilisation of patients (albeit full mobilisation should not be expected). The other elements of management may be aimed at quick return to oral intake of drugs and liquids [2, 10, 11, 23].

Anaesthesiological assessment should be based on standard documents (questionnaires) and encompass all the elements of history relevant to a given anaesthesia. The timing of assessment depends on the system of surgery organisation; in line with the Polish regulations, it should be performed 24 hours before the planned anaesthesia [8], which does not correspond in any way to the day surgery treatment, where in some cases the assessment may be carried out during the immediate preoperative period (one-stop clinics). Despite having been recently amended, the regulation is completely unadjusted to the type of treatment discussed above.

Generally, anaesthesiological assessment includes a discussion concerning the entire planned procedure as well as a description of possible complications and postoperative care. It is essential that the information is provided in such a way as to match the patient's intellectual level [5, 10–12, 22]. At times, in order to reduce anxiety, it is recommended that the patient visit the therapeutic facility prior to the procedure. This is known as psychological premedication and can be particularly useful in children. Actual premedication, if required, is usually administered orally immediately before the procedure. For formal reasons, it is important to obtain from the patient written confirmation that he/she

has been duly informed and received in-depth explanations concerning the broadly understood circumstances of the procedure in question [2, 10].

One of the most important elements of anaesthesiological assessment concerns information on nutrition in the preoperative period. Adult patients should stop taking solid foods six hours before the procedure and reduce the intake of clear fluids two hours prior to surgery. Drugs included in the treatment plan should be taken with clear fluids up to two hours before anaesthesia [2, 5, 7, 10, 23–25]. Healthy infants (over the age of six weeks) should be given a normal meal during the six hours prior to anaesthesia, whereas in the case of younger children, mother's milk should be given four hours before the procedure [9, 10–12, 23–26].

**RECOMMENDATION NO. 5**

Preparation of ASA I and II patients for day case surgery does not require any imaging and laboratory tests, unless dictated by medical history, physical examination, or complexity of surgery and anaesthesia.

**COMMENTARY**

Most day surgery units perform elective surgical procedures in patients with a documented medical history. When the medical history taken does not reveal additional diseases or health occurrences, and the patient is in good health, it may be assumed that additional tests are not necessary [2, 7, 10, 27]. If the patient is able to provide test results that are true copies of the GP documentation, these should be accepted as adequate even over the extended validity time. In some units, blood glucose tests and peripheral blood smears are performed in ASA II patients above 60 years of age (usually on the surgery day). In clinically stable ASA III and IV patients, ECG as well as serum sodium, potassium and creatinine determinations are additionally recommended [7, 27].

**RECOMMENDATION NO. 6**

Short stay procedures should not be performed in patients with absolute contraindications for such surgeries or in those suffering from diseases of which the pathogenesis may suggest the development of early or late surgery- and/or anaesthesia-related complications.

**COMMENTARY**

The guidelines of the American Society of Anesthesiologists and other anaesthesiological societies [9–12], as well as numerous literature reports and personal experiences of the author, confirm that absolute contraindications for day case anaesthesia and surgery include the following:

- significant problems and complications during previous anaesthesias regardless of their type; in particular, dif-

- difficult endotracheal intubation and adverse side effects of anaesthetic agents;
- family history of malignant hyperthermia or clinical suggestions implying its occurrence;
  - morbid obesity (BMI > 40 kg m<sup>-2</sup>);
  - sleep apnoea syndrome — obstructive and/or obesity-related, or its suspicion;
  - the use of monoamine oxidase inhibitors;
  - unstable chronic diseases — ASA physical status III or IV; stable and controlled ASA III or IV is not an absolute contraindication for the procedure;
  - substance dependence; however, some reports allow anaesthesia in patients taking derivatives of cannabinoids due to their pharmacokinetics and periodic therapeutic use. An absolute contraindication regards other groups of drugs, such as derivatives of  $\beta$ -phenethylamine (e.g. amphetamine);
  - lack of patient's informed consent;
  - age — the upper age limit is not clearly defined and depends on assessment of general condition and diseases present. The lower limit, on the other hand, is six weeks for full-term neonates and 55–60 weeks of postconceptional life for pre-term neonates (born before the 37<sup>th</sup> week). These limits result from the danger of apnoea in the post-anaesthesia period. Another contraindication is a family history of sudden infant death syndrome. It should be stressed that anaesthesia in children from the youngest age groups should be administered by doctor-nurse teams specialised in paediatric care, which is reflected in the guidelines of many anaesthesiological societies;
  - domestic circumstances that do not allow continuous, relatively comfortable care during the first 24 post-operative hours. Absolute contraindications also include: a considerable distance from the health care facility (above 50 km or a one-hour drive by car), difficult access to the place of residence and lack of reliable telephone communication with the unit where the procedure was carried out or any other health care facility. In most cases, at least two sources of communication are required (e.g. mobile phone plus landline telephone or two separate mobile network operators) [2, 5, 7, 9–12, 15, 21, 24, 26–28].

#### RECOMMENDATION NO. 7

Anaesthesia under shortened perioperative care circumstances should aim at a reduction of patient stress, considerable controllability and adequacy of anaesthesia, absence of complications and possible avoidance of first stage recovery thanks to the use of appropriate drugs and anaesthetic techniques to limit early and late side effects of anaesthesia.

#### COMMENTARY

It is assumed that general anaesthesia should generate minimum stress for a patient. In some cases (e.g. children) it should be administered during premedication-induced sleep. Tranquilisation is induced with oral benzodiazepines, most frequently midazolam. The type of anaesthesia should be tailored to a given procedure and the qualifications and preferences of the anaesthesiologist, and discussed with the surgeon [2, 5, 7, 28]. Drugs and types of anaesthetic procedures should minimise first stage recovery [7, 28, 29]. The use of anaesthetic agents of short half-life increases the percent share of second stage recovery to 14–42% compared to 0–2% when they are not administered [30]. The therapeutic effect of analgesics used in pre-emptive analgesia should be experienced already during the early postoperative period [5, 7, 31, 32]. At this stage, it is important to reduce the risk of nausea. Its prevention and what to do in the event of its occurrence, including in the home setting, should be discussed with the patient thoroughly in advance [33–35]. Apart from pharmacological agents, adequate fluid therapy seems crucial, although opinions on its efficacy are divergent [2, 7, 35, 36].

The development of ultrasound techniques and other methods of identification of nerve plexi have increased the use of nerve blockades in day case surgery procedures. Their acceptance by patients is considerable, and so is the efficacy of prolonged analgesia with the use of continuous techniques [34, 37, 38], which also regards central blockades. The preferred technique is that of spinal anaesthesia, sometimes supplemented with sedatives. The most frequent complications of this method include post-dural-puncture headache, urinary retention and hypotension. The incidence of headaches drops below 1% when pencil-point 25 G type needles are used. In most cases, the supply of adequate amounts of fluids and/or use of low doses of opioids reduce side effects; however, the patient should not be discharged too quickly [2, 7, 37, 38]. It is believed that safe discharge criteria include the return of sensation in the perianal area, plantar flexion of the foot, and proprioception in the big toe [5, 7, 34, 38].

A separate form of management is monitored anaesthesia care (MAC) based on monitoring the patient's vital signs and dealing with intra- and postoperative complications. The usefulness of this method in day case surgery facilities rapidly increases [39, 40]. MAC is sometimes connected with planned administration of premedication and/or sedation. The fundamental part of surgery and anaesthesia (usually infiltrative) is performed by the surgeon. MAC is also essential in the case of unco-operative patients or time-consuming imaging tests carried out under special conditions (e.g. MRI).



**RECOMMENDATION NO. 8**

Regardless of the method of financing and system-related realities of surgical procedures with shortened perioperative periods, the treatment team and unit administrators are obliged to record all preparatory, operative and postoperative actions in accordance with the binding regulations and to provide the patient, in full confidentiality, with a copy of treatment records and postoperative instructions.

**COMMENTARY**

Documenting activities is the basic way of indemnifying the unit against any claims brought by patients. Moreover, the records are crucial in documenting proper organisational, medical and epidemiological activities and are used for financial settlements.

In Poland, a formalised set of documents needs to be completed. Details are included in the Regulation of the Ministry of Health of May 18, 2011, amended by the Regulation of December 12, 2012. In comparison with the forms used in other countries, not all items seem relevant to patient safety (e.g. epidemiological history). It is also essential to obtain confirmation that the patient is aware of the treatment method, possible complications and his decisions. Written informed consent for treatment signed by the patient protects the interests of the hospital and the medical staff. Other important documents include the anaesthetic chart, surgery record, report on the patient's postoperative condition, and patient confirmation of having been duly informed (e.g. of the set of analgesics). Copies of information cards on surgery and anaesthesia as well as of the postoperative management card with contact telephone numbers remain in the patient's medical records [6–8, 10–12, 15, 17].

All information should ensure the patient's maximum anonymity within the system, in accordance with the Polish general provisions on medical records.

**RECOMMENDATION NO. 9**

Patients who have undergone anaesthesia in the shortened perioperative manner may be discharged from the therapeutic facility only when no early postoperative or anaesthesia-related complications have been detected, most of the anaesthesia-associated symptoms have subsided, and clinical assessment or formalised tests as well as instrumental assessment have been carried out.

**COMMENTARY**

Special guidelines aim at maximum reduction of first stage recovery through the use of appropriate surgical techniques and administration of anaesthesia with minimum im-

pact on the state of consciousness (e.g. regional anaesthesia) or agents of general anaesthesia with a controlled and short half-life, which guarantee quick restoration of full consciousness without residual neuromuscular blockade [2, 5, 7, 9, 20, 41]. This, together with special strategies of preoperative preparation, creates so-called fast-track surgical management [2, 7]. It also plays a crucial role in economising on the costs of procedures. During the second stage recovery, the patient should be calm and relaxed, experience no serious pain sensations, and have no postoperative complications (bleeding, nausea, airway constriction). Sometimes passive oxygen therapy is necessary.

Patients are ready to be discharged following 60-minute haemodynamic stability with no surgery- and anaesthesia-associated side effects. Some guidelines also mention unimpeded fluid intake. During the first 24 hours following discharge, patients should not consume alcohol, drive, operate machinery or take any important decisions of a formal/legal character. Elderly patients may have problems with space-time orientation but that does not mean their postoperative care or hospitalisation should be extended. At this stage of management, patients and their carers should confirm that they have been provided with oral and written information on possible postoperative complications and side effects, emergency telephone numbers and appropriate telephone numbers of the unit where the surgery was performed [7, 9–12, 20]. Additionally, patients or their carers should receive copies of anaesthesia and surgery protocols in case emergency or other assistance is needed.

The above-described methods of patient observation are presently the prerequisite of successful outcomes of short stay procedures. In some cases, however, for legal reasons, formalised patient assessment tests are still used, including point scales of patient readiness for discharge (e.g. the Aldrete scale or the Postanaesthetic Discharge Scoring System — PADS) [5, 7, 42–46]. Their use does not mean that clinical assessment can be neglected. Some units prefer bispectral monitoring of cortex activity.

**RECOMMENDATION NO. 10**

The treatment plan should assume avoidance of surgery-related morbidity, while focusing primarily on relieving postoperative pain, nausea and vomiting.

**COMMENTARY**

Postoperative pain is related to young age, preoperative pain sensations and fear of surgery. Preoperative management should focus on minimising the effects of these factors through psychotherapy and premedication [5, 7, 10, 11, 31, 32]. Alleviation of postoperative pain should be initiated intraoperatively through administration of non-opioid analgesics

(e.g. 1 g of intravenous paracetamol administered 30 minutes before the completion of surgery), wide use of regional anaesthesia and prevention of postoperative nausea and vomiting [32]. It is recommended to use opioid analgesics and non-opioid analgesics from the group of non-steroidal anti-inflammatory drugs (NSAIDs), metamizole and paracetamol. Their combined administration allows the doses of individual drugs to be reduced as well as their side effects, and achievement of the total analgesic effect. The use of opioids is controversial since one in three patients experiences postoperative nausea and vomiting. Opioids also influence the state of consciousness of patients [7, 32, 42]. This mostly concerns morphine and pethidine. On the other hand, ineffective pain management *per se* can induce nausea and vomiting.

Given reasonable planning and good surgical techniques, a large proportion of patients describe the postoperative pain as mild (1–4 according to the Numerical Rating Scale — NRS). Treatment is usually most effective with one analgesic e.g. paracetamol or metamizole (0.5–1 g administered orally every six hours). In cases of more severe pain (4–6 at NRS), it is recommended to administer metamizole, firstly intravenously (1 g every six hours) and subsequently orally (0.5–1 g every six hours) or to apply combined therapy and administer paracetamol 0.5–1 g intravenously or orally every six hours together with NSAIDs (e.g. ketoprofen 50 mg every six hours or dexketoprofen, 25 mg every 12 hours).

The combined treatment described is currently the basic pain management in day case surgery. Patients reporting severe postoperative pain (6–7 according to NRS) usually require the supply of metamizole together with a weak (tramadol) or strong (oxycodone) opioid. Another combined therapy includes paracetamol, NSAIDs and an opioid analgesic (oxycodone or tramadol) [7, 31, 32]. Day surgery units should implement continuous NRS-based pain assessment and apply pain management depending on its findings [32]. It is also recommended to provide patients with take-home medications, i.e. analgesics in suitable quantities and anti-emetics, with detailed written instructions for their use [2, 31, 32, 42].

One of the commonest side effects of short stay surgery is postoperative nausea and vomiting [2, 5, 7, 9–11, 32–34]. The gag reflex is related to irritation of numerous CNS receptors, yet dopaminergic and serotonergic stimulation is essential [33, 47]. The tendency to such a reaction, despite following the above-mentioned instructions concerning food and fluid intake, is typically observed in young patients, especially women of reproductive age, overweight patients, non-smokers, patients suffering from motion sickness, gastrointestinal diseases, acute infections (often undiagnosed), metabolic disorders, diabetes, and those abusing alcohol and taking certain drugs (digitalis preparations, tetracyclines, ce-

phalosporins, cytostatics). The other risk factors include some surgeries, especially within the abdominal cavity. This is due to increased pressure in the abdominal compartment (laparoscopy) as well as stimulation of vagal nerve endings. The other triggering factors are prolonged intubation, long-term preoxygenation, gynaecological and laryngological surgeries (blood swallowing) [2, 5, 7, 11, 33, 34, 47]. Some agents used during general anaesthesia also increase the risk of vomiting (e.g. etomidate, halogen ethers, opioids, large doses of neostigmine). Vomiting can also be triggered by central blockades but only when they induce significant decreases in pressure. Adverse reactions during the postoperative period may also be caused by sudden position changes, premature mobilisation and premature fluid administration. Early vomiting, up to 24 hours following surgery, seems crucial as it may considerably contribute to the patient's negative assessment of the entire procedure. Nausea and vomiting cause haemodynamic disorders, more severe pain, increased intracranial and intraocular pressure, electrolyte disorders, hypochloraemic alkalosis and other serious systemic complications (0.02%) resulting from the mechanism of vomiting (e.g. aspiration or oesophagus rupture) [7, 33, 34].

For these reasons, regional anaesthesia should always be the first choice. In cases of general anaesthesia, it is recommended to apply the above-described dietary regime—administration of 200 mL of 5% glucose (orally, two hours prior to surgery), premedication and other forms of tranquilisation (e.g. music therapy) and optional use of anti-emetics [33]. The anaesthetic procedure should be carried out with the supply of anti-emetics; procedures and drugs increasing the risk of vomiting and nausea should be avoided. Total intravenous anaesthesia with the use of propofol may have an anti-emetic effect. Moreover, the beneficial effects of appropriate fluid therapy and gastric voiding during surgery are emphasised.

The most popular anti-emetic administered intravenously that has a parasympatholytic effect is atropine (0.2–0.5 mg). From among the neuroleptic drugs, chlorpromazine (12.5–25 mg) and its derivatives are used. Setron drugs, such as dolasetron, granisetron or ondansetron (2–8 mg) are also effective. Some positive effects are also attributed to prokinetics (metoclopramide). Moreover, recent reports demonstrate anti-emetic effects of single-dose steroids, especially dexamethasone (2–8 mg, sometimes more) [33, 34, 47].

#### RECOMMENDATION NO. 11

Short stay surgeries require suitable skills and experience on the part of surgical and nursing staff, abilities to counteract complications, teamwork in moments of unexpected complications and resuscitation, as well as the capacity to manage efficiently the administration system.

**COMMENTARY**

It is assumed that a specialist in anaesthesiology and intensive therapy gains enough experience to work in a day surgery unit roughly five years following specialisation (i.e. 12 years after graduation from medical school) and this condition should be met before he or she starts administering anaesthesia independently. This time allows the gaining of experience in patient assessment, technical skills to perform various procedures used in day case surgery, and evaluation of patients before discharge [9–11]. A nurse should have at least five years of experience of working as an anaesthesiological nurse and should have completed a qualification course in anaesthesiology and intensive therapy, and preferably be specialised in this particular field [8, 17]. The surgical staff should have appropriate experience as to the scope and techniques of treatment. Guidelines for staff qualifications observed in other countries require additional courses and training in day surgery units and a licence for the administration of anaesthesia under the discussed conditions [11].

The Polish regulations do not define the time needed to gain necessary experience by physicians administering anaesthesia in day case surgery. It is assumed that in the therapeutic unit (but not in the medical practice) procedures may be performed, in accordance with the above suggestions, by physicians specialising in anaesthesiology and intensive therapy, with no detailed specification of their particular skills [8, 17]. Moreover, it is assumed that an anaesthesiologist without specialisation (or II degree specialisation) may administer anaesthesia without supervision in patients over the age of three and ASA I–III patients, which should not be allowed in the case of day surgery [8].

**RECOMMENDATION NO. 12**

Short stay surgery units should pay close attention to the rational selection of patients, analysis of surgery- and anaesthesia-related complications, prolonged postoperative periods and readmissions or hospitalisations during the immediate postoperative period.

**COMMENTARY**

Safety in day case surgery depends largely on the proper selection of patients for elective procedures [2, 5, 7, 22, 46–49]. Complications result from inadequate selection of patients, rather than the medical procedures performed. However, even when the management is appropriate, incidence rates of complications are affected by a combination of the surgeon's actions, the surgical and anaesthetic techniques applied, drugs, staff qualifications and health care unit organisation. Therefore, it can be stated that the number of complications in day case procedures is not higher than in

normal surgical procedures, but their list also includes clinical situations related to the patient's condition on the way home and in the home setting [2, 7].

Minor surgical complications (such as mild and moderate bleeding) are considered problematic in day case surgery, whereas in hospital conditions they are sometimes neglected. Moreover, physicians tend to overinterpret clinical symptoms, which results from the fear of complications during the postoperative stay at home, still regarded in Poland as something unusual, as well as the fear of negative public opinion (e.g. press coverage), loss of reputation and thus future profits.

A discharged patient is often oversensitive to the slightest symptoms of discomfort. At times, subjective interpretation of these symptoms does not find justification in the patient's actual health condition. According to theoreticians, the objective value for statistical purposes is the number of significant complications translated into hospitalisations after day case surgery or continuation of treatment in the unit where the surgery was performed. According to Tewfik et al. [50], 6.7% of all laryngological patients required hospitalisations. The most common causes of complications included impaired patency of airways (37.7%), profound perioperative bleeding (28.6%), pain (19.5%), anaesthesia-related problems (5.2%) and cardiovascular problems (3.9%). Moreover, a correlation has been found between the number of complications and the physical status of patients (ASA III or higher) as well as surgery duration (> 60 minutes). Lau and Brooks [51] reported that 3.4% of patients after day case laparoscopic cholecystectomy were hospitalised, complaining mostly of pain, nausea, vomiting and urine retention. Here as well, the risk factors included the procedure duration longer than 60 minutes. Coyle et al. [52] observed that the incidence of unscheduled visits in day surgery units was 5.7%; however, only 1.5% of them were justified. The majority of those patients underwent surgical interventions (3.2%), ENT procedures (3.1%) and urological ones (2.9%). The most frequent cause of unscheduled visits was pain (38%) developing predominantly after orthopaedic procedures. Furthermore, the authors highlighted the negative financial aspect of unscheduled visits and admissions of day case surgery patients.

To sum up, it should be stated that day case surgical procedures do not pose increased risks of complications compared to the same procedures performed in the hospital setting. The complications that develop after day case surgeries are however of a different nature and result from hyperreactivity of patients as to their conditions in the home setting. This causes difficulties in the objective assessment of actual incidence rates of complications resulting directly from the day case surgery system [53].



Nevertheless, attempts should be made to gather as much objective data as possible concerning the incidence of complications and to introduce necessary organisational and systemic changes to eliminate them, so that the maxim quoted at the beginning *'tuto, celeriter et iucunde'* can be fully realised.

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