

# The consensus statement on ambulatory anaesthesia of the Committee on Quality and Safety in Anaesthesia, Polish Society of Anaesthesiology and Intensive Therapy Guidelines for ambulatory anaesthesia

The Committee on Quality and Safety of Anaesthesia of the Polish Society of Anaesthesiology and Intensive Therapy

## ORGANISATIONAL PRINCIPLES

Organisational principles and functioning of ambulatory anaesthesia should be in line with the provisions of law. In Poland, two Acts are essential.

The rules for the provision of health care services are described in detail in the Act on Medical Activity [1] of April 15, 2011. The services provided are divided into the following:

1. inpatient, 24-hour health care (hospitals or other non-hospital facilities),
2. ambulatory health care.

Hospital health care includes comprehensive 24-hour services as well as those intended to be completed within 24 hours.

Inpatient and 24-hour non-hospital health care services are provided for patients whose health condition requires 24-hour or day health care in appropriately equipped, permanent premises.

Ambulatory health care services include basic or specialist care as well as rehabilitation provided in the non-inpatient setting. Such services can also involve diagnostic procedures to assess the patient's health status and determine further therapeutic management. In these circumstances, anaesthesia is administered as part of medical activity of a health care unit (provider) or medical practice.

The other Act, the Ministry of Health Regulation of December 20, 2012 on medical standards, which came into force 14 days after its publication, i.e. on January 22, 2013 [2], contains detailed legal regulations and medical standards for anaesthesiology and intensive therapy including ambulatory anaesthesia.

The Regulation sets out standards for medical management in anaesthesiology and intensive therapy in relation

to health care services concerning anaesthesia, intensive therapy, resuscitation, management of pain irrespective of its cause, and sedation provided by specialists in anaesthesiology and intensive therapy, anaesthesiologists and physicians specialising in the field in question. Furthermore, this Act provides a detailed description of medical equipment and devices the anaesthetic station should be equipped with, which are obligatory in each unit providing inpatient and ambulatory health care [2].

The Regulation is patient-oriented and does not focus on health care units carrying out individual or group medical practice.

It should be stressed that unlike numerous guidelines and recommendations of medical societies published in scientific journals and on the internet concerning anaesthesiology and/or intensive therapy, as well as expert opinions presented by medical authorities, both the Act on Medical Activity [1] and the Regulation of the Ministry of Health [2] are binding provisions of Polish law.

## MEDICAL PERSONNEL

Ambulatory anaesthesia requires special skills, qualifications and experience in teamwork on the part of medical personnel. Safety conditions provided for patients undergoing ambulatory anaesthesia have to be consistent with the generally accepted standards of management in anaesthesiology and intensive therapy [2].

In most cases, ambulatory anaesthesia and sedation should be organised and conducted by a specialist in anaesthesiology and intensive therapy with documented practical experience and skills necessary for their performance. An anaesthesiologist who is not a specialist can perform anaesthesia on his/her own only in ASA I, II or III patients aged  $\geq 3$  years. A physician in the process of specialisation is not allowed to perform any kind of anaesthesia unaided. An anaesthetist should always be accompanied by an ana-

esthesiology nurse with documented practical experience in ambulatory anaesthesiology and intensive therapy.

A patient undergoing ambulatory anaesthesia requires the continuous presence of a physician and a nurse during the procedure and post-anaesthesia supervision ensured by an anaesthetic nurse in contact with a specialist in anaesthesiology and intensive therapy. The prevention, and effective treatment, of ambulatory anaesthesia-related complications require knowledge and practical implementation of the guidelines set out in the Regulation of the Ministry of Health [2] and the Helsinki Declaration on Patient Safety in Anaesthesiology [3], including the practical application of procedures for checking equipment and drugs, preoperative assessment and preparation of a patient, syringe labelling, difficult/failed intubation, treatment of malignant hyperthermia, anaphylaxis, local anaesthetic toxicity or massive haemorrhage, infection control, postoperative care with pain relief included as well as cardio-pulmonary resuscitation and other written procedures, depending on the specificity of medical treatment provided.

### PREOPERATIVE PERIOD

In accordance with Polish law [2], each anaesthetic procedure, including an ambulatory one, should be preceded by preoperative assessment of a patient at least 24 hours prior to the procedure. The time needed for assessment and its scope depend on various factors, especially on the nature and severity of the underlying disease, the presence of coexisting diseases as well as the extent and estimated duration of the surgical intervention. Preoperative consultation involves assessment of a patient's physical and psychological state, estimation of anaesthesia-related risks, selection of type and method of anaesthetic management, informing the patient of the procedure to be carried out and obtaining his/her consent, alleviating anxiety and fears as well as recommending premedication, if needed. The responsibility for qualifying the patient for anaesthesia (analgesedation, sedation) rests solely with the anaesthesiologist [4].

Advances in anaesthesiology and the increasing safety of anaesthetic procedures have encouraged surgeons to extend the range of surgeries performed under these conditions. Currently, basic limitations in the qualification of patients for ambulatory procedures resulting mostly from the type of procedure and the surgeon's skills mainly regard the lack of specialist equipment, risk of serious complications, and possible prolongation of the surgical procedure [5].

Prior to preoperative assessment involving history taking and physical examination, the anaesthesiologist should familiarise himself or herself with the patient's medical records. Special attention should be paid to previous hospitalisations, especially past anaesthetics.

On history taking, special questionnaires can be useful to make sure no significant information is overlooked. The general pattern of data collection includes the patient's current health problems, allergic diseases and drug allergies, present use of pharmaceutical agents, smoking and drinking alcohol, dental health and general health condition with reference to individual systems and organs. One should not forget to note down such basic data as the patient's height, weight, arterial blood pressure and pulse rates as well as particulars of the person who is going to accompany the patient on their way to and from the hospital.

Apart from standard bodily examination, the physical examination should always include the assessment of such important elements as the posterior pharyngeal wall visibility (Mallampati score), mentotarsal distance, hyomandibular distance, range of mouth opening, nostrils, dental health (teeth, gingivae, dentures), interior of the mouth (tonsils, uvula, palatal arches), selection of a proper face mask (e.g. face anatomy, chin), range of neck motion and degree of obesity, if any [4, 6, 7].

The scope of additional preoperative examinations is mainly determined by the patient's general health condition, age, type and extent of surgery as well as type and anticipated duration of anaesthesia. Additional tests should be carried out only if medical history and physical examination indicate likely abnormalities. Moreover, the reasons for usefulness of such tests and possible effects of their results on the course of anaesthetic management should be known. Although opinions on this matter vary, the routine extensive range of laboratory tests in all patients seems generally unjustified and costly.

Certain controversy of a medical, social and legal nature is also associated with routine pregnancy tests in premenopausal women. It seems that these cases require a more individual approach adjusted to the practices in a given unit where ambulatory anaesthesia is performed [4, 7–9].

Preoperative anaesthesiological consultation should end with the discussion regarding anaesthesia-related risks and possible side effects. Its extent should be dictated by the patient [4, 7].

Qualification for ambulatory anaesthesia does not differ from a routine pre-anaesthetic assessment carried out in the hospital setting. The decision on qualifying the patient for anaesthesia is based on all the data obtained during anaesthesiological consultation. If physical examination and the results of additional tests indicate that appropriate treatment may improve the patient's general condition, the surgical intervention should be postponed. Any acute diseases should be cured and chronic conditions optimally controlled.

Qualification for anaesthesia should be entered into medical records [7, 10, 11]. The type of planned anaesthesia

and surgical intervention as well as possible premedication-related instructions should be defined. Apart from proper psychological preparation, premedication may involve pharmaceutical agents. Their selection, doses and routes of administration depend on the patient's general health condition, age, weight, and the underlying disease. Drugs are usually administered at night prior to surgery and/or 60–90 minutes before the patient is wheeled to the operating theatre [4]. It should be remembered that recommendations regarding the preoperative intake of liquids and food, as well as pharmacotherapy of coexisting diseases, are the same as in the case of general anaesthesia provided in a hospital setting. It is necessary to obtain a patient's or guardian's written informed consent expressed in a suitable form [4, 6, 10].

Patients undergoing ambulatory surgery should not have any undiagnosed health problems or chronic diseases that could necessitate postoperative hospitalisation. Patients with chronic diseases should remain under continuous medical supervision. ASA III and IV patients may undergo ambulatory anaesthesia, provided that the disease is stable and the anaesthesia and surgery are adjusted to their health conditions. Preoperative assessment should reveal any medical reservations that could influence the course of anaesthesia and surgery or exclude the possibility of ambulatory treatment.

Some patients do not qualify for such procedures due to relative or absolute contraindications. These include: lack of the patient's informed consent, surgeries involving considerable blood loss and acute postoperative pain, coexistence of another acute disease, unstable or insufficiently diagnosed systemic disease, severe systemic disease that requires intensive care or therapy, unstable general health condition classified as ASA III or IV, complications and adverse or paradoxical reactions during previous anaesthetic procedures, history of malignant hyperthermia or clinical symptoms that could suggest being in the risk group of this pathology, extreme obesity ( $\text{BMI} > 40 \text{ kg m}^{-2}$ ), age  $< 3$  months (full-term children), advanced age, history of sleep apnoea, abuse of alcohol and addictive substances, serious emotional disorders, pregnancy, inability or unwillingness to comply with pre- and postoperative recommendations (including the language barrier), poor social conditions and lack of care following discharge home [4, 7, 19, 11].

## ANAESTHESIA

While performing ambulatory anaesthesia, one should take into account specific requirements of diagnostic and surgical procedures performed under ambulatory conditions. Considering basic guidelines for perioperative management, it can be assumed that the majority of techniques used in standard clinical anaesthesia (both general and regional) can be safely recommended for day surgery if

anaesthesiologists have adequate anaesthetic knowledge and skills.

In Poland, as in other European countries, a wide variety of ambulatory anaesthesiological procedures is used. Their choice is dictated by local preferences, mainly the guidelines applied in individual hospitals. In consequence, day surgeries are mainly performed using general anaesthesia [12].

## GENERAL ANAESTHESIA

The recognised methods of general anaesthesia include:

- total intravenous anaesthesia (TIVA),
- volatile induction and maintenance anaesthesia (VIMA),
- intravenous induction and volatile maintenance (combined).

All three methods are preceded by intravenous or volatile introduction of anaesthesia completed with airway instrumentation. Intravenous induction of general anaesthesia is most frequently performed using propofol. The other available intravenous anaesthetics are less popular, although they can be successfully used in ambulatory conditions. For instance, etomidate is recommended in patients with additional cardiovascular diseases.

In TIVA, maintenance with propofol, opioids and muscle relaxants is most efficient.

Intravenous induction and volatile maintenance often requires supplementation with an analgesic and a muscle relaxant.

The last decade has witnessed a true revival of VIMA, mainly due to new volatile anaesthetics, such as sevoflurane and desflurane [13]. VIMA can be conducted using high ( $> 4 \text{ L min}^{-1}$ ) or low ( $0.5\text{--}1 \text{ L min}^{-1}$ ) flows of fresh anaesthetic gases. Benefits from the supply of low flows of fresh anaesthetic gases in ambulatory conditions exceed the possible inconveniences and side effects related to this technique [14].

It is especially recommended to perform general anaesthesia using sevoflurane. This agent meets all the requirements asked of volatile anaesthesia in ambulatory patients. This concerns both volatile induction (useful in children) and intravenous induction anaesthesia.

## ANALGOSEDATION

Analgo-sedation is used to relieve pain and sedate patients through pharmacological depression of the central nervous system. It is the only autonomous procedure or element of complex anaesthetic management to be successfully used in patients undergoing interventional and invasive diagnostic or therapeutic procedures under ambulatory conditions. In recent years, its terminology and guidelines for its use have been formulated in detail [15].

Drugs used in analgo-sedation should satisfy the criteria established for ambulatory procedures aiming at rapid onset

and short duration of action, with no side effects. Basic drugs used in analgesedation include:

- sedatives (midazolam, together with its antagonist),
- analgesics (fentanyl, remifentanyl, paracetamol, non-steroidal anti-inflammatory drugs),
- anaesthetics (propofol, nitrous oxide, ketamine, S-ketamine).

Regardless of the agent used in general anaesthesia or analgesedation to provide the basic anaesthetic effect, it is an everyday practice to use additional drug adjuvants which often play an important clinical role and are necessary to ensure the optimal course of the procedure by maintaining homeostasis [16].

#### REGIONAL ANAESTHESIA

Considering the choice of anaesthesia for different ambulatory procedures, regional techniques of analgesia and anaesthesia should be ranked among the most important ones. This view is supported by the unquestionable advantages of regional anaesthesia, i.e. effective analgesia without adjuvants, circulatory and respiratory stability, postoperative mental efficiency, minimal risks of nausea and vomiting, satisfactory postoperative analgesia and overall cost-effectiveness of the procedure.

On the other hand, there has been criticism questioning the usefulness of, and indications for, regional anaesthesia in the discussed circumstances. The most frequent objections are as follows: most anaesthetic techniques are time-consuming, the duration of nerve block is difficult to assess, urination-related disorders and urine retention develop in the postoperative period, prolonged nerve block impairs the patient's mobility and self-reliance. The majority of these reservations are relative and can be easily eliminated by experienced anaesthesiologists.

In Poland, the two simplest methods of regional anaesthesia — infiltration and intravenous regional anaesthesia — are the least popular. Only the tumescent technique has been fully embraced by plastic surgeons. Intraoperative anaesthesia, infiltrative intra-articular anaesthesia, and infiltration analgesia, which are becoming popular in other countries, do not find favour among Polish anaesthesiologists working in ambulatory settings, although these methods can be successfully applied under these conditions.

Intravenous regional anaesthesia (IVRA), particularly useful in forearm and palm procedures, constitutes a small percentage of all techniques of regional analgesia. After more than 100 years of use, it still has its place in modern ambulatory anaesthesia, although numerous surgical and general contraindications have to be taken into account [17].

There is increasing interest in peripheral blocks, especially the brachial plexus one, performed in ambulatory con-

ditions. The favourable situation undoubtedly results from the introduction of techniques of ultrasound stimulation and identification of nerves. The combination of diagnostics based on ultrasound stimulation and imaging enables the introduction of precise techniques of intraoperative and postoperative pain management, which can be also successfully used in the home setting thanks to catheters left in the perineural space [18].

The most common ambulatory regional anaesthesia is spinal blockade. This has several reasons, including [19]:

- the usefulness of spinal anaesthesia in relation to the requirements of present-day ambulatory surgery,
- the concept of selective spinal anaesthesia (SSA),
- the use of small doses of local anaesthetics with adjuvants,
- the introduction of thin, atraumatic needles, size 25, 27 G.

In Poland, selective epidural block is rarely performed in ambulatory conditions. The same tendency is confirmed by the results of epidemiologic studies conducted in Great Britain.

#### POSTOPERATIVE PERIOD

The postoperative period is crucial for ambulatory anaesthesia. While qualifying a patient for anaesthesia, an anaesthesiologist has to choose the procedure that would ensure the patient's safe and speedy return home; moreover, the procedure should enable him or her to anticipate and thus counteract any critical events and postoperative complications [10, 20–22].

The most important criteria for patient discharge are as follows:

- stable postoperative vital parameters observed for at least one hour,
- no symptoms of respiratory failure,
- the patient oriented to time, place and person (or the preoperative condition restored),
- the patient tolerating oral fluids,
- urination restored (especially following block anaesthesia),
- the patient able to get dressed unaided (as before surgery),
- the patient able to walk (as before surgery),
- no or minimal pain reported,
- no or minimal nausea and vomiting reported,
- no or minimal surgical bleeding,
- a responsible person available to escort the patient home,
- written postoperative care instructions provided to the patient.

Objectification of patient clinical assessment following ambulatory anaesthesia involves formalised psychomotor

**Table 1.** Patient assessment scoring system prior to discharge

Parameter	Assessment	Score
Vital parameters	up to 20% of preoperative values	2
	20–40% of preoperative values	1
	over 40% of preoperative values	0
Activity/Recovery from anaesthesia	Oriented (tested three times) and stable gait	2
	Oriented (tested three times) or stable gait	1
	Neither	0
Pain/Nausea/Vomiting	Slight	2
	Moderate, treatment possibly required	1
	Severe, treatment necessary	0
Surgical bleeding	Slight	2
	Moderate	1
	Severe	0
Fluid intake and urination	Tolerates fluids and urinates	2
	Tolerates fluids, does not urinate	1
	Neither	0

Result  $\geq 8$  — the patient ready for discharge,  $< 8$  — further observation, postoperative instructions

tests, questionnaires and point scales [23, 24]. The psychomotor tests are nowadays of little practical importance, and therefore some point scales, such as the Aldrete scoring system and post-anaesthesia discharge scoring system (PADSS), are more frequently used. The post-anaesthesia care required after ambulatory procedures can be easily assessed using a scale taking into account five basic parameters ensuring the patient's post-anaesthesia safety (Table 1).

This suggested point scale is very simple, yet it accurately reflects the patient's post-anaesthesia condition and lists possible complications.

Prior to discharge, patients should be informed of possible side effects that may occur during the first 24 postoperative hours. They should be provided with verbal and written instructions [25], information on restrictions concerning alcohol use, driving and meals during the first 24 hours. Moreover, appropriate analgesics should be supplied together with instructions for their use and a list of possible side effects.

Analgesics for pain management during the first 48 hours should be preferably administered at fixed intervals, depending on the drug's pharmacology [26, 27]. The administration of drugs on demand is not recommended. Postoperative pain relief should have already commenced intraoperatively with the use of multimodal analgesia and combined pharmacotherapy. Since postoperative pain is the most common complaint reported by ambulatory patients, it is important to inform them and their families of efficient methods of pain relief (including darting pain), suggesting the drugs and doses to be used. It is assumed that the standard method of postoperative pain relief should be based on oral drug administration [27]; in most cases,

a simple analgesic such as metamizole 1 g administered every 6 hours or paracetamol in similar doses is enough. A particular analgesic is chosen based on the assessment of pain intensity according to the 11-point numerical pain rating scale (NRS) and categorisation of procedures. Metamizole with a weak opioid (tramadol) or a strong opioid (oxycodone) should be administered only if the pain exceeds seven points on the NRS.

Moreover, it is essential to inform the patient of surgical aspects of the postoperative period (e.g. when to have sutures removed). Patients should also know where to seek advice and help following the procedure. If possible, recommendations should be given in the presence of the person who is to escort and care for the patient at home.

Prevention and treatment of postoperative nausea and vomiting (PONV) with respect to ambulatory procedures is essential, as these complications are the second most important adverse event reported by patients [28–32]. Based on the meta-analysis performed [33], a simple algorithm of PONV risk has been prepared, which takes into account the following risk factors:

- female sex,
- age  $< 50$  years,
- history of PONV,
- postoperative treatment with opioids and nausea immediately after the procedure.

The higher the number of factors, the higher the percentage of PONV risk: one factor — 10%, two factors — 20%, etc. Interestingly, the laparoscopic technique has not been shown to considerably affect the occurrence of PONV. Analysis of prevention and management of PONV has demonstrated that the supply of ondansetron is effective only in PONV



treatment and not in its prevention (e.g. by intraprocedural administration), whereas the supply of dexamethasone has no favourable effects on the frequency of early PONV, yet considerably reduces the number of late incidents.

Nausea and vomiting is prevented through the parasympatholytic effect of atropine (up to 0.5 mg i.v.), neuroleptic effect of chlorpromazine (up to 25 mg i.v.), metoclopramide or ondansetron (up to 8 mg i.v.) and dexamethasone (up to 8 mg i.v.).

This analysis of PONV risk factors enables early identification of patients at risk and the implementation of proper treatment.

Moreover, it is important to assess the patient's psychological/emotional state prior to discharge. Study findings show that many patients are afraid of imaginary postoperative complications that could occur back at home [24]. Therefore, mentally unstable patients undergoing ambulatory procedures should receive anxiolytic rather than traditional premedication. Anxiolytics in premedication improve their condition in the post-anaesthesia period and eliminate anxiety associated with their discharge.

## SUMMARY

Currently, Poland is far behind the countries with well-developed systems of ambulatory procedures. Nevertheless, we are undoubtedly facing a breakthrough and increased demands for this option of treatment.

Therefore, thorough consideration and specific actions have to be taken in order to strengthen the role played by ambulatory anaesthesia, which at times poses difficulties and is challenging even for specialists. Following in the footsteps of the leading countries, obligatory specialist courses and training in this particular field should be included in the specialisation curriculum in order to enhance the prestige of ambulatory anaesthesia and improve patient safety [25].

## CONFLICT OF INTEREST

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