

Review article

Challenges in Procedural Sedation and Analgesia

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SUMMARY

Introduction. There are several definitions given by various anesthesiology professional organizations that explain the term procedural sedation and analgesia (PSA). The International Committee for the Advancement of PSA has defined procedural sedation as the use of anxiolytics, sedatives, hypnotics, analgesics and/or dissociative drugs to alleviate anxiety, pain and/or movement. These agents are used to facilitate the attainment of amnesia or to reduce the consciousness and/or comfort and safety of the patient during diagnostic or therapeutic procedures. The first guidelines for sedation are based on the mandatory signing of informed consent, monitoring and measuring of vital parameters, implementing a fasting regimen before sedation, possessing the skills to establish and maintain the airway, and resuscitation measures. Since PSA is most often used outside the operating room, this type of anesthesia activity is known as NORA (Non-Operating Room Anesthesia Care).

Conclusion. Preprocedural evaluation and preparation, periprocedural management, monitoring and care of postprocedural recovery from PSA is similar to those of general or regional anesthesia. In conclusion, a number of logistical and practical difficulties should be noted, such as the availability of medicines and appropriate staff training, as well as the application of global guidelines on PSA.

Keywords: procedural sedation and analgesia, monitored anesthesia care, moderate sedation

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INTRODUCTION

Nowadays, it is considered that both the ethical imperative and the social imperative in medicine encompass the reduction of pain, anxiety alleviation, patient comfort enhancement throughout treatment and surgical procedures. All of these have led to the development and expansion of procedural sedation and analgesia (PSA) in recent decades.

Procedural sedation and analgesia as a term were introduced by the American College of Emergency Physicians (1) and are gradually replacing the term analgesia.

History of anesthesia outside the operating theatre

In the 1980s, Charles Cote and Theodore Striker published the first guidelines for sedation, in response to a report of the deaths of three patients in a dental office. These guidelines were written in collaboration with the American Society of Anesthesiologists (ASA) and the American Academy of Pediatric Dentists (AAPD), based on mandatory signature of informed consent, monitoring and measurement of vital parameters, and airway maintenance, as well as resuscitation measures (2). Three terms were defined: conscious sedation, deep sedation and general anesthesia.

In order to assess the perioperative risk, ASA adopted the ASA classification in 1941, which is still most often used in most countries. The 1992 guidelines emphasize increased caution during patient follow-up, and accordingly introduce pulse oximetry as a necessary part of monitoring a sedated patient outside the operating room. During 2002, the Committee on Medicines and the American Academy of Pediatrics (AAP) replaced the term "conscious sedation" with "moderate sedation" and introduced the term "minimum sedation" (2).

In October 2010, ASA introduced capnography as mandatory monitoring outside the operating room during moderate or deep sedation. This revision was based on the knowledge that in the last twenty years a higher percentage of complications outside the operating room has been recorded. It is noted that by better monitoring, 62% of cases might have been stopped as well as some respiratory complications which possibly might lead to the fatal outcome because they were twice as

common in patients sedating outside the operating theatre (3).

Defining PSA

There are several definitions given by various anesthesiology professional organizations that explain this term. PSA is a technique of applying sedatives or dissociative anesthetics, with or without analgesia, in order for the patient to be able to tolerate unpleasant procedures, while maintaining unchanged cardio-respiratory function (1, 4).

The Canadian Anesthesiologists Society 2018 defines: "Procedural sedation is defined as a technique for the safe use of short-term sedatives or dissociative, with or without analgesics, to reduce discomfort, anxiety and potentially unpleasant memories while minimizing cardiorespiratory depression. diagnostic and therapeutic procedures" (5). The definition of the European Society of Anesthesiology given in 2018 reads: "The terms procedural sedation and analgesia include the use of hypnotic and/or analgesic drugs to allow effective performance of diagnostic or therapeutic procedures, while the patient is closely monitored for possible side effects" (5).

The International Committee for the Advancement of PSA in its report (Tracking and Reporting Outcomes of Procedural Sedation (TROOPS)) defined procedural sedation as "the use of anxiolytics, sedatives, hypnotic, analgesic and/or dissociative drugs to alleviate anxiety, pain and/or motion. "These agents are used to facilitate the attainment of amnesia or to reduce the consciousness and/or comfort and safety of the patient during diagnostic or therapeutic procedures (6). This report also provides a definition of a sedation-related adverse event. They defined it as "an unexpected and unwanted response (i) to drugs and medical interventions used to alleviate procedural sedation and analgesia that threatens or causes patient injury or discomfort" (6). Examples in the literature include apnea > 30 s, oxygen desaturation < 90% lasting > 30, end-tidal CO₂ changes greater than 10 > mm Hg, and systolic blood pressure < 90 mm Hg or below the 5th percentile for children.

The anesthesiologist is advised to bear in mind that desaturation, airway obstruction central respiratory depression or even aspiration may occur with sedatives and analgesics, because the patient's airway is not secured during PSA. Preprocedural

evaluation and preparation, periprocedural management, monitoring, and care of postprocedural recovery from PSA are alike to the ones which are applied in cases of general or regional anesthesia.

Goals of performing PSA can have a wide range of variations: patient safety, reduction of pain and anxiety (as a consequence of the procedure itself), quiet patient without movement, providing maximum conditions for performing the procedure with the fastest possible recovery to the pre-sedation state (4). Furthermore, the fact is that each diagnostic and therapeutic procedure is in need of a different degree of sedation and analgesia, and the amount of drug should be titrated with great care. Applying an appropriate dose of anxiolytics as a premedication can give the patient amnesia and comfort in a way that it does not disturb the function of cardiovascular system.

Procedures in which PSA is applied

PSA usage as a chosen technique for various diagnostic and therapeutic procedures means that it involves rapid postprocedural recovery process by using comparatively minimal quantities of sedatives and analgesics. Since PSA is most commonly administered outside the operating room, this type of anesthesia activity is known as NORA (Non-Operating Room Anesthesia Care) (7). Procedural sedation and analgesia (PSA) can be applied for non-invasive (radiological imaging, cardioversion) and invasive (percutaneous biopsies and aspirations, fracture repair, puncture or incision, cardiac catheterization and other angiography, dilatation, arterial stenting, endoscopic diagnostic and various dental procedures, during the transesophageal echocardiogram) diagnostic and therapeutic procedures that are often performed outside the operating theatre. In this way, we get a calm and cooperative patient, which provides comfort to the doctor to perform the procedure precisely (8).

Radiological imaging (scanner, multislice, scanner, magnetic resonance imaging, positron emission tomography) as a non-invasive diagnostic procedure has the use of PSA with the aim of bringing the patient to a calm state without movement. Magnetic resonance imaging as an imaging method is of inestimable importance for the correct and rapid diagnosis of various diseases of all age groups of patients. This diagnostic procedure can last from 15 minutes to an hour, and if necessary for some

diagnostics even longer (application of contrast agent, making special sections of importance, angio-diagnostics, spectrometric analysis) depending on the time required for the patient's rest. Sometimes, it is necessary to coordinate the natural movements of organs and/or structures (pulsation of the cerebrospinal space) that occur due to the pulsation of large blood vessels (ECG gating) or breathing (abdomen). Some categories of patients (pediatric, psychiatric, oncological) cannot fulfill absolute rest during the recording and require introduction to deep sedation or anesthesia. In the Anglo-Saxon literature, the name was introduced on this occasion: Monitored Anaesthesia Care, which means deep sedation in which protective reflexes are preserved, but very weakened (9). The method itself is painless, but there is a moderate to high noise when shooting in the camera. The space for accommodating the patient is cramped, and thus the space for the medical maneuver is cramped. The presence of a strong magnetic field means that objects with paramagnetic properties must not be in the recording room next to the patient. This requires very poor monitoring during imaging and limits the use of standard anesthesia equipment (laryngoscope, aspirator, anesthesia machine, oxygen bottle) (9).

Cardiac procedures in which sedation is necessary are transesophageal echocardiography, cardioversion, ablation, etc. Cardioversion, as a therapeutic procedure, also uses PSA, where in addition to an adequate degree of sedation, it is necessary to achieve appropriate analgesia.

Endoscopy as a routine diagnostic and important therapeutic method has suppressed surgical treatment in many segments. During the examination, it is possible to do a biopsy of the mucous membrane or changes in the mucous membrane and take a swab from certain areas for cytological or pathohistological analysis. Usually, upper endoscopy and colonoscopy for diagnostic and uncomplicated therapeutic purposes are performed in moderate sedation. The goal is to have a sedated patient, with preserved protective reflexes of the upper respiratory tract, adequate degree of spontaneous ventilation and cardiovascular stability (10).

Interventional pulmonology (endobronchial ultrasound with transbronchial aspiration – bronchoalveolar lavage).

When interventional pulmonary procedures are applied, the patient should be in a position of neck hyperextension. Unstable cervical spine risk

factors (i.e. rheumatoid arthritis or maxillofacial trauma) should be assessed. The dilemma that may arise is whether or not to apply topical pharyngeal anesthesia (TFA). Lidocaine is commonly used for TFA. Given that there is no evidence that TFA alleviates the performance and tolerance of the procedure by patients in sedation, and that it, on the other hand, interferes with the protective reflexes of the respiratory system and may result in aspiration, the question arises whether it should be used in patients undergoing sedation (10). Moderate sedation is recommended for bronchoscopy, most often with midazolam, propofol and opioids used alone or in combination, in small doses. International guidelines for bronchoscopy, such as BTS (British Society of Quality Standards for Diagnostic Flexible Bronchoscopy in Adults) or ACCP (American College of Chest Physicians), recommend the use of a combination of two sedatives as safe options for patients. The most commonly used combination is fentanyl and midazolam (11).

In vitro fertilization brings together a number of procedures that include ultrasound-guided collection of eggs, fertilization and at the end a transfer to divide the embryo back into the uterus. While taking oocytes, women will usually experience pain occurred as a result of a puncture of the vaginal wall and ovaries. Therefore, it is important to maintain comfort while minimizing pain and anxiety of the patient (7). The potential adverse influence of anesthetics on *in vitro* fertilization has not been sufficiently investigated. Anesthetic agents like propofol, thiopental, midazolam, fentanyl, and alfentanil can be found in follicular fluid (7).

SPECTRUM OF SEDATION LEVEL

It is vital to have in mind that sedation is a continuum and the individual patient can go from one level to another in an easy way. That is why a physician who is in charge to apply PSA must recognize levels of sedation and feel the increased cardiopulmonary risk related to deeper sedation while being prepared for adequate treatment. Conversely, sedation or analgesia which are not appropriate can result in missing cooperation, injury or discomfort of the patient, or some unfavorable stress responses which can be either physiological or psychological.

To make the right choice of drugs and techniques in order to have an adequate sedation or analgesia, the physician has to relay on education, continuous training and his/her own preferences. On the other side, the needs or limitations forced by the patient's associated medical conditions or procedure itself have to be taken into account, as well as the possible threat of obtaining deeper levels of sedation than expected.

There are several different scales (Ramsay sedation scale, Modified vigilance-sedation rating scale, ASA) in assessing sedation levels. According to the ASA as the most commonly used scale, sedation levels are defined as follows: minimal/ anxiolysis, moderate sedation/analgesia (“conscious sedation”), deep sedation, anesthesia (12) (Table 1).

The following parameters are carefully considered in order to monitor sedation levels:

- Response to verbal or tactile stimulation;
- Preservation of protective reflexes of the upper respiratory tract;

Table 1. Sedation levels - ASA scale (12)

	Minimal sedation	Moderate sedation	Deep sedation	General sedation
Response for sedation	Normal response to verbal stimuli	Response to verbal and tactile stimuli	Response after repeated and painful stimuli	Impossible, even to a painful stimulus
Breathing route	Unchanged	No intervention needed	Intervention may be required	Intervention is often needed
Spontaneous breathing	Unchanged	Adequate	It may be inadequate	Often inadequate
Cardiovascular function	Unchanged	Usually maintained	It is usually maintained	It may be impaired

- Degree of spontaneous ventilation;
- Existence of cardiovascular stability.

Sedation-analgesia levels (13)

Moderate sedation/analgesia ("conscious sedation") - is a drug-induced depression of consciousness, with an adequate response to physical or verbal stimulation, retention of protective reflexes and spontaneous breathing. It is the gold standard for performing invasive procedures.

Deep sedation is a drug-induced depression of consciousness from which the patient can hardly be brought to a state of awakening by verbal or physical stimuli, whereby spontaneous breathing becomes insufficient. This level of sedation is dangerous, so oxygenation is mandatory, and sometimes intubation.

General anesthesia is a drug-induced depression of consciousness with insensitivity to painful stimuli, loss of reflexes and muscle relaxation. There is depression of spontaneous breathing and cardiovascular function with the necessary intubation.

One more sedation type known as dissociative sedation (cataleptic state) should be mentioned. This condition results in deep amnesia and cardiopulmonary stability with breathing which is spontaneous and airway reflexes remain intact. This sedation type is a result of ketamine usage.

The increasing use of various drugs, including combinations of propofol and strong opioids, suggests examination where deep sedation ends and general anesthesia begins. Few studies have been published to state the sedation level that describes in detail the condition of patients under sedation in order to determine the level of sedation. Many emergency procedures in intensive care units are performed under short-term general anesthesia rather than sedation. The difference between these two conditions is small, because patients can get in and out of a given condition fairly quickly, and there is no practical way to control this process. According to the ASA/JCAHO (Commission affiliated to the World Health Organization)/AAP criteria, the distinction of characteristics between the two entities is the presence or absence of a response to repeated painful stimuli.

PRE-PROCEDURAL EVALUATION

A strong correlation between adequately and qualitatively made anesthesia plan for performing the PSA procedure and the individual patient requirements have been found. One of the most important conditions for safe PSA is adequate medical evaluation and preparation of patients who are often with comorbidities (14). Each patient goes through an anesthesiology clinic, where they receive oral and written information about the procedure itself, preparations for it and instructions about the post-procedural course.

It is necessary to get to know the patient with (4):

- intake of food and liquids (oral intake of clear liquids is limited to a minimum of two hours before the procedure, and intake of light foods to 6 hours before the procedure);

- taking medication (with very little fluid, take the prescribed medication until the morning before the procedure: beta adrenergic blockers, ACE inhibitors, antihypertensives, antianginal drugs, antiarrhythmics; anticonvulsants, aminophylline, corticosteroids and H2 receptor blockers, psychiatric drugs).

- behavior after the intervention (occurrence of dizziness, orthostatic hypotension; it is especially emphasized that the patient does not drive motor vehicles on that day).

The received notification is signed and the patient also gives written consent for performing PSA.

The anamnesis has always been the crucial element of the pre-procedural patient assessment. It is advisable that it comprises anamnestic/hetero-anamnestic data about associated diseases, previous surgeries, as well as family and social anamnesis (4).

Using the information received from the anamnesis, the physical examination is organized. The total examination of the systems is carried out in order to detect any undiagnosed disease or inadequately treated existing disease. In general, pre-procedural evaluation and preparation aims to bring all possible comorbidities to a "stable state". As a minimum, as part of the anesthesia evaluation, the anesthesiologist should assess the airway, heart and lung condition (auscultation) and measure the vital parameters. Laboratory parameters should be based

on anamnestic data, physical examination and age of the patient. It is necessary to do the following from the laboratory findings: complete blood count, coagulation status, glycemia and ECG (15).

Patient evaluation recommendations (14)

- All previous medical records should be checked and an interview should be made with the patient or family members in order to find out any:
 - diseases of the main organ systems (cardiac, renal, pulmonary, neurological, sleep apnea, metabolic, endocrine, psychiatric);
 - unwanted experiences with sedation/analgesia, regional or general anesthesia;
 - drugs used, potential drug interactions (with special reference to anticoagulant therapy), drug allergies, contrast agents, medical aids and food;

- history of the use of tobacco, alcohol or psychoactive substances; regular or habitual sedation usage/analgesics.

- Target physical examination should be provided (e.g., vital signs, auscultation of the heart and lungs, assessment of the airways (possibility of difficult intubation Malampati 3 and 4).

From the findings follows the decision on:

- control of laboratory analyzes,
- additional tests.

- It is vital to use antibiotic prophylaxis for patients who are in the high-risk state as well as in some procedures (16).

Special attention is paid to patients on anti-platelet therapy and anticoagulant therapy. It is recommended that patients on low doses of aspirin may discontinue it for 4 days before the planned in-

Table 2. Assessment before sedation - risk factors (19)

Assessment before sedation - risk factors			
	Insignificant risk factor	Mild risk factors	Moderate risk factors
	Without risk factors	Patient <ul style="list-style-type: none"> • Severe systemic disease • Moderate obesity • Age - 12 months or less • Hiatal hernia Procedure/Sedation <ul style="list-style-type: none"> • Upper endoscopy • Bronchoscopy • The main sedative – propofol 	Patient <ul style="list-style-type: none"> • Severe systemic disease that is constantly life-threatening • Severe obesity, obstructive sleep apnea • Airway abnormalities • Hyperemesis, esophageal disorders, intestinal obstruction Procedure/Sedation <ul style="list-style-type: none"> • Predicted need for auxiliary ventilation or advanced airway management
Elective procedures			
	Insignificant risk aspiration	Mild risk aspiration (any of the above)	Moderate risk aspiration (any of the above)
Pure liquids	Unlimited	Unlimited	Fasting approximately 2 hours
Breast milk	Unlimited	Fasting approximately 2 hours	Fasting approximately 4 hours
Food, formula, inhumane milk	Fasting approximately 2 hours	Fasting approximately 4 hours	Fasting approximately 6 hours
Urgent procedures			
	No delays on the basis of fasting times	No delays on the basis of fasting times	No delays on the basis of fasting times. Consider ketamine as the only sedative.

tervention (if it is an invasive procedure) (4). Patients on warfarin anticoagulant therapy should be switched to low molecular weight heparin or heparin 3 - 4 days before the intervention with INR control whose values should be less than 1.5 before any procedure (4, 17, 18). There are recommendations that require an assessment of anticoagulant discontinuation based on three factors before the endoscopic procedure: the types of antithrombotic drugs used and the risk of bleeding and thromboembolic events as recommended by the British and American Gastroenterologists Association (19, 20). The use of all anticoagulant drugs may be continued during low-risk procedures. Aspirin and other non-steroidal anti-inflammatory drugs should not be excluded regardless of the risk of thromboembolic events.

- Preparation by fasting: according to the recommendations of the European Association of Anesthesiologists, at least two hours before the procedure, the patient should not consume clear liquids, and six hours solid food to decrease the potential threat of aspiration of gastric contents under anesthesia (16). One of the possibly serious difficulties of the PSA procedure is pulmonary aspiration which is not so frequent. It is defined as "inhalation of oropharyngeal or gastric contents into the larynx and lower respiratory tract" (21). Hoping that it will reduce potential threat, a fasting interval is the best recommendation which should be followed if possible, when expecting these procedures.

By using an algorithm and according to the latest recommendations for the fasting interval before performing the PSA procedure and assessing the risk factors for aspiration, it is shown that there is a connection between the stratification of risk factors and the fasting period (Table 2) (21).

EQUIPMENT NEEDED FOR ANESTHESIA OUTSIDE THE OPERATING ROOM

Each area where PSA is performed must be fully equipped for anesthesia work and resuscitation measures according to the recommendations defined by the ASA (22).

In order to adequately perform PSA, it is necessary to provide appropriate monitoring that depends on the needs of the patient and the procedure itself (23).

Clinical monitoring is of great importance and the patient should be carefully monitored (verbal contact, respiratory movements of the patient's chest, especially in the absence of capnography, the presence of protective reflexes). Visual assessment is often not sufficient in detecting apnea throughout sedation, so the use of a capnograph is mandatory (4).

Standard monitoring - Monitoring of sedation levels (BIS), measurement of arterial tension, pulse and oxygen saturation of blood (pulse oximeter), capnography (4).

Pulse oximetry was introduced as well as capnography in mandatory monitoring of sedated patients outside the operating theatre (2) because respiratory depression in the time of sedation is the most frequent adverse event. It should be borne in mind that the level of saturation, when oxygen is supplemented, does not reflect ventilatory function and may camouflage CO₂ retention.

Capnometry - End-tidal carbon dioxide monitoring measures the concentration of carbon dioxide in exhaled air and if we compare it to the pulse oximetry which is used for early diagnostic of hypoventilation, it is more valid (24, 25). Capnographic monitoring of respiratory activity throughout sedation may result in rapid interventions, such as patient stimulation, discontinuation of medications, and/or oxygen supplementation. In this way, it decreases the incidence of hypoxemia, severe hypoxemia, and apnea (25).

For hemodynamic monitoring, the monitoring of blood pressure and pulse during sedation is recommended. ECG monitoring - for patients with significant cardiovascular disease or arrhythmia (26, 27).

Bispectral Index (BIS) - independent monitoring of sedation levels (EEG/EMG ratio) is monitoring the depth of anesthesia, created by bispectral analysis of electroencephalograms. This implies the measurement of the impact of anesthetics and sedatives straight on the brain, a new "vital sign" that allows clinicians to conduct anesthesia precision, to assess and respond more effectively to changes in the patient's clinical condition throughout surgery. Numerical values of BIS range from 100 to 0: BIS values between 90 and 100 for "awake", between 70 and 90 for "light to moderate sedation", between 60 and 70 for "surface anesthesia" and between 45 and 60 for "general anesthesia" (28).

Necessary equipment for sedation outside the operating room (22):

- oxygen source, oxygen masks;
- patient monitoring (pulse oximetry, ECG, ETCO₂, arterial blood pressure);
- aspirator, airway establishment and resuscitation equipment (endotracheal intubation equipment, mask balloon ambu, defibrillator, resuscitation drugs, sedation and antagonists).

POST-PROCEDURAL RECOVERY

The high-quality standard is considered to maintain postoperative evaluation at NORA. It is considered to be a great assistance in stopping some unfavorable results and guaranteeing a secure discharge plan for every individual patient. Postoperative treatment should be conducted in a similar way as after general anesthesia. Postoperative follow-up requires the monitoring of the patient's state of consciousness, vital signs, mental status, pain control and airway protection (7).

The focus of post-anesthesia treatment is on the physiological criteria and it comprises two phases. The focus of Phase 1 is on the patient's full state of recovery from anesthesia. The Post-Anesthetic Recover Scoring System is usually applied in order to estimate whether or not is the patient ready to be discharged (level of consciousness, respiration, circulation, saturation and level of activity). Thereafter, the focus of phase 2 is on preparing patients and their families/carers to be discharged into a home or extended care environment (7). Phase 2 comprises having conversation and understanding given postoperative instruction, medication changes, and follow-up until scheduled appointments (7).

The full follow-up procedure should continue until the patient meets the criteria for safe discharge (29):

- vital signs are back to normal;
- the patient is awake with intact protective reflexes and is no longer at risk of reduced levels of

consciousness;

- nausea, vomiting and pain are adequately resolved.

Perioperative pain management

One of the harmful occurrences is inappropriate control of pain (29, 30). The fact is that traditional pharmacotherapy is organized in a way that it influences pain perception, transduction, transmission and modulation. Multimodal analgesia is proven to be very effective in postoperative pain management in several clinical situations (31, 32). This pain control management have an impact on a large number of transmission pathways in order to create a synergistic effect at lower analgesic dose levels.

- Early phase - the patient renews his activity and consciousness;

- Intermediate phase starts from the arrival of the patient to the waking room to his departure and lasts about 2 hours;

- Late phase begins with the patient's departure home and ends with complete functional recovery.

CONCLUSION

The agents of PSA (anxiolytics, sedatives, hypnotics, analgesics and/or dissociative drugs) are used to facilitate the attainment of amnesia or to reduce the consciousness and/or comfort and safety of the patient when some diagnostic or therapeutic procedures are to be carried out. It is strongly advised that characteristics and side effects of them should be carefully considered. One should always bear in mind that if you increase the depth of sedation, the respiratory risks of depression and cardiovascular suppression are also increased. Clinicians should concentrate on precautions which, using adequate monitoring systems, are to be carried out.

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Izazovi u proceduralnoj sedaciji i analgeziji

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SAŽETAK

Uvod. Postoji nekoliko definicija koje su dale različite anesteziološke profesionalne organizacije sa objašnjenjima pojama proceduralne sedacije i analgezije (PSA). Međunarodni komitet za unapređenje PSA definisao je proceduralnu sedaciju kao upotrebu anksiolitika, sedativa, hipnotika, analgetika i/ili disocijativnih lekova za ublažavanje anksioznosti, bola i/ili kretanja. Ovi agensi se koriste da olakšaju postizanje amnezije ili da smanje svest i/ili udobnost i bezbednost bolesnika tokom dijagnostičkih ili terapijskih procedura. Prve smernice za sedaciju zasnivaju se na obaveznom potpisivanju informisanog pristanka, praćenju i merenju vitalnih parametara, sprovođenju režima gladovanja pre sedacije, posedovanju veština uspostavljanja i održavanja disajnih puteva i merama reanimacije. Pošto se PSA najčešće primenjuje van operacione sale, ova vrsta anesteziološke delatnosti je poznata kao NORA (*Non Operating Room Anesthesia Care*).

Zaključak. Preproceduralna procena i priprema, periproceduralno upravljanje, praćenje i briga o postproceduralnom oporavku od PSA slični su onima kod opšte ili regionalne anestezije. Na kraju, treba istaći niz logističkih i praktičnih poteškoća, kao što su dostupnost lekova i odgovarajuća obuka osoblja, kao i primena globalnih smernica o PSA.

Ključne reči: proceduralna sedacija i analgezija, nadgledana anestezija, umerena sedacija