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SPECIAL ARTICLE

Recommendations for non-anaesthesia providers in sedation and analgesia procedures

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Abstract Pain and the anxiety that it produces are the main sources of suffering in children managed in emergency departments, eliciting a growing interest in parents and health care providers in the adequate provision of sedation and analgesia.

In consequence, the number of diagnostic and therapeutic procedures that require sedation and/or analgesia in paediatric emergency departments has increased in recent years, which has generated a need to train non-anaesthesiologists on how to provide this care without affecting patient safety.

The objective of this document is to establish evidence-based recommendations, developed by consensus by the Working Group on Sedation and Analgesia of the Sociedad Española de Urgencias de Pediatría, regarding the competencies and training of staff who perform sedation or analgesia procedures to achieve the greatest possible quality in the management of paediatric patients before, during and after these procedures in the paediatric emergency care setting.

The consensus document has been structured in two parts: the first addresses the competencies of non-anaesthesiologists who perform sedoanalgesia procedures, and the second how to obtain the necessary training. A list of research questions was prepared, keywords defined and a literature search carried out to break down and summarise the available evidence. The results are presented in the form of conclusions, which were subjected to anonymous voting by each of the members of the working group. For each of the conclusions, we provide the percent agreement obtained in the voting

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PALABRAS CLAVE
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Recomendaciones para profesionales no anestesiólogos en procedimientos de sedoanalgesia

Resumen El dolor, y la ansiedad que éste produce, son las primeras causas de sufrimiento en los niños que acuden a los servicios de urgencias, motivando un aumento del interés de padres y sanitarios para proporcionar una adecuada analgesia y sedación.

Por ello, en los últimos años, se ha producido un incremento en el número de procedimientos diagnósticos y terapéuticos en niños que requieren sedoanalgesia en urgencias pediátricas, lo que ha originado una necesidad de formación de personal no anestesiólogo para cubrir ese requisito sin afectar a la seguridad del paciente.

El objetivo de este documento de consenso es establecer recomendaciones basadas en la evidencia científica, elaboradas y consensuadas por el Grupo de Trabajo de Sedoanalgesia de la Sociedad Española de Urgencias de Pediatría, sobre las competencias y la capacitación del personal que realiza procedimientos de sedoanalgesia para conseguir un óptimo manejo del paciente pediátrico antes, durante y después del procedimiento en los servicios de urgencias pediátricas.

El documento de consenso se ha estructurado en dos partes: la primera hace referencia a las competencias del personal no anestesiólogo que realiza procedimientos de sedoanalgesia, y la segunda a la forma de obtener la capacitación necesaria. Se ha elaborado un listado de preguntas de investigación, se han definido unas palabras clave y se ha realizado una búsqueda bibliográfica desglosando la evidencia disponible. Los resultados se muestran como conclusiones, sometidas a votación anónima por cada uno de los miembros del Grupo de Trabajo. En cada conclusión se indica el porcentaje obtenido en la votación.

Introduction

Pain and the anxiety that it produces are the main sources of suffering in children managed in emergency departments, eliciting a growing interest in parents and health care providers in the adequate provision of sedation and analgesia. In consequence, the number of diagnostic and therapeutic procedures that require sedation and/or analgesia in paediatric emergency departments has increased in recent years. Children are more vulnerable in this type of procedure, as they are at higher risk of complications.[1,2]

This increase in the volume of children who require sedation and analgesia outside the operating room has generated a need to train non-anaesthesiologists on how to meet this need without affecting patient safety.[1,3]

For this reason, working groups in institutions such as the American Academy of Paediatrics (AAP) or the American Society of Anesthesiologists (ASA) have developed clinical practice guidelines for the management of paediatric patients before, during and after procedural sedation and analgesia (PSA). Adherence to these recommendations does not guarantee the absence of adverse events (AEs), but minimises their occurrence, reducing morbidity. It is important that these guidelines be adapted to the characteristics and resources of each facility.[2,3]

The objective of this document is to provide recommendations based on the current scientific evidence and expert opinion, developed by consensus by the Working Group on Sedation and Analgesia (WGSA) of the Sociedad Española de Urgencias de Pediatría (SEUP, Spanish Society of Paediatric Emergency Medicine), regarding the competencies and training of staff who perform sedation or analgesia procedures to achieve the greatest possible quality in the management of paediatric patients before, during and after these procedures in the paediatric emergency care setting.

Material and methods

The consensus document has been structured in two parts: the first addresses the competencies of non-anaesthesiologists who perform PSA, and the second how to obtain the necessary training to achieve these competencies. Thus, the document offers recommendations based on expert opinion and the current scientific evidence. A list of research questions was prepared by consensus by part of the WGSA-SEUP based on the competencies of non-anaesthesiologists who perform PSA and how they are obtained (Appendix 1). Then, the group defined keywords to perform a literature search PubMed (MEDLINE), the Cochrane Library, EMBASE and CINAHL to answer the clinical questions, breaking down the evidence for each one. The keywords used in the search of the literature in English (MeSH terms) were: analgesia, anaesthesia AND analgesia, emergency, conscious sedation. The filters applied were: children aged 0-18 years and publication in the past 10 years.

After the literature search, the review of the selected articles and the answering of the research questions, we summarised the results in the form of conclusions. Each final conclusion was subject to an anonymous vote by 24 of the 48 members of the WGSA-SEUP, with the agreement with each conclusion expressed as one of the following 3 possibilities:

Table 1 ASA score. Source: American Society of Anesthesiologists Physical Status Classification. Anesthesiology 1963; 24: 111.

ASA	Patient status	Recommended provider
I	Healthy	Paediatrician/nurse (if support)
II	Mild systemic disease	Paediatrician
III	Severe systemic disease	Paediatrician/ Anaesthesiologist
IV	Life-threatening incapacitating disease	Anaesthesiologist
V	Moribund patient not expected to live with/without surgery	Anaesthesiologist
VI	Brain death	Anaesthesiologist

Table 2 Sedation levels defined by the ASA. Source: Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia. Committee of Origin: Quality Management and Departmental Administration (Approved by the ASA House of Delegates on October 13, 1999, and last amended on October 23, 2019).

Factor	Minimal sedation	Moderate sedation	Deep sedation	General anaesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response following repeated or painful stimulation	Unarousable (even with painful stimulus)
Airway	Unaffected	No intervention required	Intervention may be required	Intervention required
Spontaneous ventilation	Unaffected	Adequate	May be inadequate	Intervention required
Cardiovascular function	Unaffected	Usually maintained	May be inadequate	Intervention may be required

agreement, abstention, disagreement. For each conclusion, we present the percent agreement obtained in the vote.

The conclusions of this document could be extrapolated to any facility or unit in Spain, although there may be discrepancies in non-essential aspects, as they were not evaluated by professionals in other fields of paediatrics.

In fact, in the context of the limitations of the study, we ought to note that while each conclusion was only subjected to a vote by members of the WGSA-SEUP, in the future we may seek external consultation with paediatricians in other fields who frequently perform PSA but are not members of the WGSA-SEUP to further strengthen each of the conclusions.

Results

I. COMPETENCIES OF PERSONNEL PERFORMING PSA

1 What requisites must be met by non-anaesthesiologists who deliver PSA?

Non-anaesthesiologists who deliver PSA should meet the following requirements:

a Ability to identify and accurately assess patients eligible for PSA by non-anaesthesiologists.

The presedation evaluation is essential to identify patients at risk of AEs and determine whether the patient is a good candidate for PSA by a non-anaesthesiologist. This evaluation includes a focused history taking and physical examination.[4]

For the history, we recommend an interview applying the AMPLE mnemonic: A-known Allergies, M-current Medication of the patient, P-Personal history, including the ASA score (Table 1), L-Last intake (fasting status) and E-Events associated with analgesics, sedatives or anaesthetics.[4]

A full physical examination must be performed in any patient who is to undergo moderate or deep sedation (Table 2) to assess for predictors of a difficult airway and clinical signs of a high risk of upper airway obstruction or aspiration of gastric contents.[4]

After the evaluation, the health professional will decide whether the patient is suitable for delivery of PSA by a non-anaesthesiologist.

b Knowledge about levels of sedation and pharmacological sedation and analgesia strategies.

The ASA describes sedation as a continuum from minimal sedation to general anaesthesia (Table 2), and it is sometimes difficult to achieve the desired level, obtaining deeper or lesser sedation than intended. Depending on the level of sedation, established based on the ASA classification, a paediatrician or anaesthesiologist will be required to deliver PSA. The practitioner has to be able to choose the appropriate type of sedation and analgesia and drug dosage, and identify and manage potential complications or adverse drug reactions. Adequate training and familiarity with the pharmacological properties of the most commonly used agents increases the probability of satisfactory sedation and reduces the risk of AEs.[5]

c Knowledge of the necessary monitoring equipment and the appropriate equipment based on the level of sedation/analgesia.

Adverse events may occur during delivery of PSA, and the practitioner should be able to detect them. Ongoing clinical assessment and monitoring are necessary to this end. Ongoing clinical assessment is based on the physical examination of the patient (responsiveness, airway patency, quality of spontaneous ventilation and integrity of cardiovascular function). The skill of monitoring patients entails the selection of the appropriate monitoring modality and the constant evaluation of the vital signs and recordings obtained with the monitoring system (blood pressure, heart rate, respiratory rate, oxygen saturation, expired carbon dioxide, electrocardiogram, pulse oximetry waveform, respiratory waveform and capnography waveform) before, during and after the procedure, while the level of consciousness is decreased and until it is fully recovered. The goal of monitoring is to detect any deviation from normality to initiate corrective measures before morbidity develops. The monitoring and interpretation of these parameters requires the skill to diagnose and treat complications of sedation and analgesia, and multiple monitoring devices are available for this purpose.[6,7]

The AAP has published guidelines for the management and monitoring of paediatric patients during procedures that require sedation or analgesia, as different monitoring modalities are required depending on the type sedation or analgesia.[3,7]

Therefore, practitioners that deliver PSA (including the leading practitioner and any support personnel), must know when to initiate and maintain monitoring and the most suitable modality in each case.[3,8]

d Practical airway management and cardiopulmonary resuscitation (CPR) skills.

The most common severe complication of sedation is respiratory compromise, which may results from airway obstruction, hypoventilation, laryngospasm, hypoxaemia or apnoea. Therefore, it is an essential requirement for any non-anaesthesia professional that delivers PSA to have adequate airway management skills, including airway opening and positioning manoeuvres (head tilting and jaw-thrust manoeuvre), correct insertion of suction catheter and airway secretion suctioning technique, administration of continuous positive airway pressure (CPAP), bag-valve-mask ventilation, laryngeal mask airway (LMA) and tracheal intubation. It is also necessary to select the appropriate material for the patient's age: masks, cannulae, oropharyngeal catheter, self-inflating bag, endotracheal tube and laryngeal mask.[3,8,9]

Less frequently, hypotension and cardiac arrest (CA) may occur, usually associated with a failure to detect or adequately manage respiratory compromise. Therefore, it is essential for these practitioners to be skilled in resuscitation and the management of haemodynamically unstable patients, in addition to respiratory compromise.[3,7]

e Skills in the detection of complications of PSA and their resolution.

An AE is any adverse medical event in a patient that has received a pharmaceutical product, not necessarily caused by the pharmaceutical treatment. It may also be an unfavourable or unintended event, symptom or illness temporarily associated with the use of a pharmaceutical.[3,7]

Although the development of AEs in short sedation or analgesia procedures is infrequent in emergency departments that are adequately staffed and operate correctly, the consequences of an AE that is not immediately detected and treated may prove fatal. Thus, it is essential that any non-anaesthesiology professionals leading the delivery of PSA be aware of the potential AEs that may develop, know how to prevent and identify them and have the skills to resolve them (Table 3).[3,7]

If any complication develops, the practitioner must contemplate interrupting or foregoing the procedure depending on the severity and initiate the appropriate measures to resolve it.[3,7]

2 What requisites must be met by support personnel assisting in PSA?

The support personnel must be a doctor or nurse and be skilled in medication of paediatric patients, including the preparation of paediatric doses, drug dilution and the different routes of administration (oral, nasal, intravenous, intramuscular, subcutaneous), administration of sedative drugs, monitoring of vital signs and their interpretation according to age, practical kills in the resolution of potential complications and post-sedation observation and recovery, and be trained in basic paediatric life support. Properly trained and experienced personnel is required during and after the procedure to ensure adequate monitoring until the patient has fully recovered.[7]

3 What is the recommended number of personnel for delivery of PSA?

There is no consensus as to the number of practitioners required for PSA, but most guidelines and institutions recommend a minimum of 2 experienced professionals: a doctor as the leading practitioner and 1 support staff for delivery of moderate to deep sedation, who may be a doctor or nurse (ideally a nurse, if medication is going to be administered). Furthermore, the doctor responsible for the sedation and monitoring of the patient must not be the same doctor that is practicing the procedure.[3,4]

There are situations in which delivery of PSA by a single practitioner could be allowed, as long as another professional is accessible to assist if required. It would be those in which very low doses of a drug are administered, in which a low level of sedation (anxiolysis) is achieved with administration of nitrous oxide or a nasal/oral benzodiazepine and the condition of the patient allows.[4]

II. TRAINING OF PERSONNEL INVOLVED IN DELIVERY OF PSA

The competence of the physician that delivers PSA is an essential component in guaranteeing safety. At present, there is widespread consensus that competence requires acquisition of both theoretical knowledge and practical skills, but there are no objective methods to assess performance in the application of these skills. Studies have not

Table 3 Most frequent adverse events in sedation/analgesia procedures.

Adverse event	Detection/prevention	Response
Agitation	Determine whether AE is caused by drug, anxiety or pain	Discontinue or delay initiation of procedure until optimal circumstances are achieved.
Ineffective analgesia	Monitor respiratory and haemodynamic parameters, pain scales	Adjust analgesia. Discontinue or delay initiation of procedure until desired analgesia (and/or sedation) is achieved.
Apnoea or respiratory depression	Vital signs, pulse oximetry, capnography, chest auscultation, identify cause, check drugs, doses, preparation, association with AE.	Open airway, ventilatory support. Antidote if indicated. Secure airway (intubation) if indicated.
Bronchoaspiration	Verify fasting status. Risk factors.	Open airway. Respiratory support, oxygen therapy.
Bronchospasm	Vital signs, pulse oximetry, capnography, chest auscultation. Check history, previous treatments.	Oxygen therapy, salbutamol, steroid. Respiratory support.
Convulsive seizures	Vital signs, patient observation, check history, previous pharmaceutical treatment and associations with AE	Open airway, respiratory support, specific medication.
Emesis	Observation, history-taking including fasting status. Medication	Place patient in safe position, prevent aspiration.
Peripheral line extravasation	Observation of catheter, fixation with clear tape to allow monitoring, watch for absence of expected drug effect or irritability/pain at insertion site	Remove the line. Choose whether to reinsert catheter or continue procedure based on the situation and whether the desired analgesia has been achieved and there is no risk that vascular access will be needed. Contemplate intranasal/oral route
Laryngospasm	Vital signs, pulse oximetry, capnography, chest auscultation. Check history, previous treatments	Oxygen therapy, steroid. Adrenaline. Heliox.
Cardiac arrest	Vital signs, pulse oximetry, capnography, chest auscultation. Check history. Identify cause.	CPR.
Anaphylactic reaction	Vital signs, pulse oximetry, chest auscultation. History (full history with identification of potential food allergies that may contraindicate specific drugs) Assess shock.	Specific treatment (intramuscular adrenaline), suspend or discontinue drugs, treat shock (physiological saline and vasopressor drugs, if no response) and adjuvant treatment (bronchodilators, antihistamines)
Inadequate sedation	Vital signs, pulse oximetry, capnography, sedation scale	Discontinue procedure until situation is remedied and optimal sedation achieved.

been conducted to analyse the association between the skills of practitioners and the safety and efficacy of PSA, so recommendations are based on indirect evidence, expert opinion, common sense and accepted safety measures for general anaesthesia. Among these recommendations are those proposed by the Society for Pediatric Sedation based on studies conducted by the Sedation Pediatric Research Consortium on the AEs developed in the context of PSA and the need of CPR, after which a group of experts established the competencies required to prevent or appropriately manage these complications.[5,10,11]

At present, one of the most pressing challenges in paediatric sedation is the lack of standards for the education curriculum, training and accreditation of paediatrics PSA practitioners,[12] so the following points are proposed to establish guidelines to allow adequate development of competencies.

4 How can practitioners acquire the skill to identify candidates for PSA delivered by non-anaesthesiology personnel?

Several studies show that one of the key factors that increases the risk of complications during PSA is the incorrect assessment of the baseline status and health condition of the patient, and that the presence of qualified personnel decreases the risk of AEs and increases the likelihood that they are managed correctly. As noted above (section 1.a), an essential component of determining which patients are suitable candidates for PSA by non-anaesthesiologists is a

correct history-taking and physical examination, so the first step in developing competencies in PSA would be the completion of a medical residency programme in paediatrics or a paediatric subspeciality. In fact, many sedation and analgesia teams in hospitals are exclusively composed of intensive care and emergency care paediatricians. This is, however, not sufficient, as experts recommend completing training by different means, such as credentialing through a specific curriculum in sedation and analgesia within the medical residency programme or certification through the performance of a minimum number of sedation/analgesia procedures. Self-directed learning through clinical guidelines, articles or manuals is also required to supplement specific training courses, preferably including simulation and applying more than one educational strategy. As concerns renewing accreditation, the process should take into account the experience of each practitioner, as some authors consider performance of a minimum of 50 sedation/analgesia procedures a year, in addition to continuing education. It is also recommended that departments audit PSA services.[10,13]

5 How can practitioners acquire knowledge on pharmacological sedation and analgesia strategies?

Theoretical knowledge about drug dosage, indications, contraindications, AEs and levels of sedation can be acquired in different ways. On one hand, there is the conventional approach of reading articles, books or clinical guidelines, but participation in screen-based trainings that allow interactive simulation of clinical cases has proven more effective. The latter modality, for which there is a growing demand, allows participants to learn at their own pace, reinforces knowledge by having contents available at all times and offers a low-stress learning environment compared to clinical simulation.[14]

When it comes to gaining experience, the most effective tool is high-fidelity simulation, as it can be carried out in the actual work environment. Compared to screen-based simulation, it improves the confidence of the professional performing the procedure and crisis management skills. Another possibility is offering specific rotations in paediatric sedation and analgesia in which skills can be practiced under supervision.[14]

6 How can practitioners learn about monitoring systems and the interpretation of monitored parameters?

The ability to monitor patients during sedation is another requisite skill. Developing this skill requires specific training and personal experience: medical residency training, self-directed learning through clinical guidelines, scientific articles and manuals and participation in specific courses on sedation and analgesia including high-fidelity simulation with the devices that are actually used in clinical practice. Practitioners involved in PSA also need to accrue substantial personal experience.[5,6,11]

7 How can practitioners develop airway management skills?

The ASA has developed a training programme on sedation for non-anaesthesia providers detailing the required airway management skills. These skills include bag-valve-mask ventilation, insertion and the use of laryngeal mask airway, direct laryngoscopy and tracheal intubation. Many of these aspects are covered in advanced life support courses, but these do not provide the necessary practice, so specific training is required with high-fidelity simulation. To develop airway management skills, the ASA recommends simulation of procedures (in no fewer than 35 patients). Compared to no intervention, simulation is associated with improved knowledge, skills and learner satisfaction, although not with an improvement of patient outcomes. This could improve by adding training in the operating room under the supervision of airway management experts.[6]

Overall, simulation has proven superior to didactic training, video courses or unaccredited training. Acquiring these skills requires active learner participation and periodic refresher courses.[6]

8 How can practitioners learn to identify and resolve complications of sedation/analgesia?

Numerous studies demonstrate that PSA delivered by non-anaesthesiologists trained with simulation is safer, improving patient safety and performance. Although most practitioners that perform PSA are certified in paediatric advanced life support (PALS), they have not been specifically trained to apply these skills in the resolution of AEs developed during PSA which, while infrequent, may have serious consequences.[3]

The most frequent sedation guidelines of the AAP promote the use of patient simulators with programmed AEs to improve provider competence and achieve a more appropriate and effective response to AEs. The patient simulators that are available today are very reliable and allow professionals to practice managing a variety of programmed AEs, such as apnoea, bronchospasm and laryngospasm.[3]

The few studies conducted in the field of paediatrics evince that simulation-trained paediatricians perform better in the delivery of PSA and the detection and management of AEs compared to those not trained with simulation.[11]

Practicing in exam rooms with actual monitors, suction systems and oxygen sources allows learners to experience the simulated scenario as being real, and provides the opportunity to assess their performance in the event of an AE in a simulation of PSA, which reliably approximates how they would act with a real patient. All learners must be instructed prior to the simulation to act as they would in a real-world situation. Ideally, simulation scenarios should reflect clinical scenarios that are common in PSA to assess the competencies of interest. Simulation sessions could be video recorded, if the option is available.[5,15,16]

9 How can practitioners acquire CPR knowledge and skills?

It is evident that providers that are to deliver PSA should be certified in CPR and have received additional, more thorough training on the management of critically ill patients, such as PALS.[1]

Resuscitation manoeuvres are rarely performed in paediatric care, which is why refresher courses and simulation-based training are essential in the paediatric emergency care setting, as there is evidence that acquired

Table 4 Conclusions of the consensus document developed based on expert opinion and the current scientific literature with the corresponding vote distribution and percent agreement.

Conclusions	Vote	Consensus
Conclusion 1. The presedation evaluation of the patient is essential to identify patients at risk of adverse events and determine whether the patient is a good candidate for PSA by non-anaesthesia personnel. It includes a targeted history (AMPLE mnemonic) and a thorough physical examination.	Agreed 24 Abstained 0 Disagreed 0	100%
Conclusion 2. Practitioners that deliver PSA must have theoretical and practical training, preferably with simulation, on: a Identification of indications and contraindications for PSA. b Levels of sedation and pharmacology: drug of choice, mechanism of action, half-life, drug interactions, dosage, preparation and routes of administration. Management/rescue of inadequate analgesia or sedation. c Necessary monitoring equipment, including which equipment is appropriate based on the level of sedation/analgesia. d Necessary supplies: identification of required supplies, selection of adequate sizes, correct placement and organization of resources in procedure room to minimise the probability of errors. e Skills in prevention and detection of complications during PSA and their management: airway management, respiratory support, CPR, use of antagonists, response to airway obstruction or bronchoaspiration and haemodynamic and neurologic adverse events.	Agreed 24 Abstained 0 Disagreed 0	100%
Conclusion 3. A minimum of 2 staff is required for moderate or deep sedation procedures. It is possible that a single member of the care team delivers PSA if minimal sedation is used (nitrous oxide, nasal/oral benzodiazepine) and the condition of the patient allows it.	Agreed 23 Abstained 1 Disagreed 0	95.8%
Conclusion 4. The effectiveness and safety of procedural sedation and analgesia in emergency care depend on the competence of the professionals that deliver it	Agreed 21 Abstained 2 Disagreed 1	87.5%
Conclusion 5. The creation of training programme is currently one of the most pressing challenges in the education of paediatric providers in sedation and analgesia, and could be one of the main goals to pursue in the near future.	Agreed 24 Abstained 0 Disagreed 0	100%

skills start declining in 3 to 6 months if they are not put to practice. There is no consensus as to how often advanced CPR courses should be taken for recertification, but it is widely accepted that they should be taken at least every 2 years.[17,18]

Given the importance of the competence of paediatricians and nurses in these skills, we consider that the educational curriculum for paediatric medical and nursing interns/residents should include the acquisition of knowledge and skills in PSA, and we recommend that PSA be incorporated in their residency programmes.

Conclusion

Table 4 presents the conclusions of the consensus document.

As presented above, the WGSA-SEUP proposes a résumé profile that could guide the assessment of competencies and skills of practitioners performing PSA in paediatric emergency departments, based on whether they perform the role of the leading practitioner or support personnel, summarised in Table 5.

Table 5 Résumé profile to assess competencies and skills of providers who deliver PSA in paediatric emergency departments.

Requisites		Practitioner	Support personnel
Education	Physician, paediatrics specialist	M	R
	Nurse	M	R
Knowledge	Knowledge of paediatric disease	M	M
	Knowledge of signs and symptoms of pain and/or anxiety in each age group and in children with intellectual disability	M	M
	Pain scales for different age groups and levels of disability	M	M
	Sedation scales and identification of different levels of sedation	M	M
	Painful and painless procedures in paediatric emergency care	M	M
	Types of sedation, analgesia and combined sedation/analgesia	M	M
	Strategies based on the procedure	M	R
	Pharmacology of sedatives, analgesics and their antagonists, drugs required to manage side effects, contraindications, interactions, and adverse events	M	R
	Preparation, management, dilution and stability of drugs	M	M
	Routes of administration, doses and dose schedules	M	M
	Topical and local analgesia, inhaled sedation	M	M
	Nonpharmacological anxiolysis measures	M	M
	ASA classification	M	M
	Identification of risks and comorbidities	M	R
	Identification of potential difficult airway	M	R
	Identification of risk of aspiration of gastric contents	M	R
	Identification of adequate and inadequate respiratory function	M	M
	Basic life support skills	M	M
	Advanced life support skills	M	R
	Benefits and risks of supplemental oxygen administration	M	M
	Monitoring of pulse oximetry, capnography, heart rate, respiratory rate, electrocardiography, blood pressure and depth of sedation	M	M
	Monitoring required for each level of sedation	M	M
	Vascular access equipment and supplies	M	M
	Airway management equipment and supplies	M	M
	Legal aspects. Informed consent. Patient autonomy. Mature minors	M	NN

Table 5 (*Continued*)

Requisites		Practitioner	Support personnel
Skills	Interpersonal skills to communicate with children and parents	M	M
	Detection of pain in children of any age and with any level of disability	M	M
	Appropriate history-taking, physical examination and risk assessment of the patient	M	M
	Investigation of previous disease and ASA classification	M	M
	Identification of the ideal type and number of health care professionals to perform the sedation/analgesia procedure	M	R
	Determination of procedure to be performed and the type of sedation/analgesia indicated for it	M	R
	Preparation of necessary equipment, supplies and drugs for the procedure based on the required type of sedation/analgesia	M	M
	Management of any necessary drugs, catheters and devices	M	M
	Management and interpretation of monitoring	M	M
	Documentation of monitored physiological variables, sedation/analgesia measures and identification of abnormalities	M	M
	Identification of different levels of sedation	M	M
	Management of patients under deep sedation and skills to reverse sedation	M	NN
	Airway management: open airway, bag-valve-mask ventilation	M	M
	Placement of oropharyngeal catheters, early identification of need to secure airway, insertion of laryngeal mask, direct laryngoscopy, tracheal intubation	M	M
	Training and skills in basic life support	M	M
	Training and skills in advanced life support	M	R
	Ability to organize and lead the resuscitation team at a moment's notice	M	R
	Post-procedure monitoring and care	M	M
	Identification of discharge criteria	M	M
	Organization of debriefing after the procedure	M	NN
	Ability to train other professionals	M	M
Attitude	Teamwork	M	M
	Continuous improvement	M	M
	Learning	M	M
	Respect toward other professionals	M	M
	Respect toward the child and the family	M	M
	Ability to identify the need of help and request help	M	M
	Organization and collaboration in learning and team building activities	M	M

M, mandatory; NN, not necessary; R, recommended.

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