

Acute Postoperative and Post Traumatic Pain Management

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Logo of your
organization

Lecture/10.12.2018.

Project number: 585927-EPP-1-2017-1-RS-EPPKA2-CBHE-JP (2017 – 3109 / 001 – 001)

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Бол - дефиниција

Бол представља индивидуално, субјективно искуство повезано са актуелним или потенцијалним оштећењем ткива, чија је манифестација резултат сложене интерреакције физиолошких и неурохемијских ефеката са психосоцијалним факторима.

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Акутни бол

- Акутни бол - бол у првих 7 дана од операције
- Хронични бол – бол који траје дуже од 3 месеца

- Акутни постоперативни бол – бол услед хируршке интервенције, као и процедурални бол (дренови, сонде, катетери).

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Патофизиологија постоперативног бола

болна сензација са места хируршке инцизије се разликује од других болних сензација

(неуропатски бол, бол као последица инфламације)

хипералгезија на месту хируршке инцизије: посредована Аδ и С влакнима

α -amino-3-hydroxy-5-methyl-4-isoxazole-propionate
(AMPA)/kainate

↓ pH ↑ [лактата] – исхемијски механизам може да утиче на настанак бола

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Предиктори постоперативног бола

Преоперативни бол

Млађе животно доба

Анксиозност

Гојазност

Страх од интервенције

Тип операције (абдоминалне, торакалне, ортопедске, дугог трајања)

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Посебне субпопулације болесника код којих бол може бити неадекватно третиран:

- педијатријски болесници
- геријатријски болесници
- критично оболели
- болесници са оштећеним когнитивним функцијама

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Акутни бол

- Акутни бол није само непријатно искуство

- Бол покреће стресни одговор на хируршку трауму:
 - Повећање симпатичке активности

 - Ослобађање стрес хормона

 - Оштећење имуне функције

 - Повећање коагулабилности

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Акутни бол

Повећање симпатичке активности:

Тахикардија

Хипертензија - повећана потрошња кисеоника -- ИМ

↑ SVR - смањује регионални крвни проток у кожи и поткожи – ремети зарастање рана и погодује развоју инфекције на месту хируршког рада

Имобилизација због бола + хиперкоагулабилност:

венски тромбоемболизам

плућна емболија

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Акутни бол

Бол (абдомен, грудни кош) ремети:

Дубоко дисање
Кашаљ
Искашљавање

} Ателектаза, хипоксемија, пнеумонија

Бол појачава катаболизам:

Стимулише разградњу протеина
Подиге ниво гликемије

} Ремети зарастање оперативне ране

Психолошке последице:

Ремећење сна
Психомоторна агитација

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Акутни постоперативни бол

- третман изузетно значајан у постоперативном лечењу болесника
- само 1 од 4 хируршка болесника добија адекватну постоперативну аналгетску терапију
- Холандија, 1420 болесника и поред протокола за постоп. Терапију бола 41% болесника имало на дан операције епизоду средњег до јаког бола
- САД, 250 болесника – 80% средњи до јак бол на дан операције
- 86% јак бол по отпусту из болнице
- Деца – након тонзилектомије и аденоидектомије: 86% значајан бол на дан први дан након операције

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Где је проблем ?

- Нејасно
- Мултифакторијелни проблем
- Бол се третира само на захтев
- Слаба комуникација са болесником
- Не процењује се интензитет бола
- Не придржавање протокола
- Не коришћење регионалних техника аналгезије (епидурал, нервни блокови...)

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Процена интензитета бола

Не пропорукује се коришћење виталних знакова (\uparrow Фр, \uparrow ТА) као самосталних показатеља присуства бола, већ само као знак-упозорење да треба бол проценити применом неке од наведених скала.

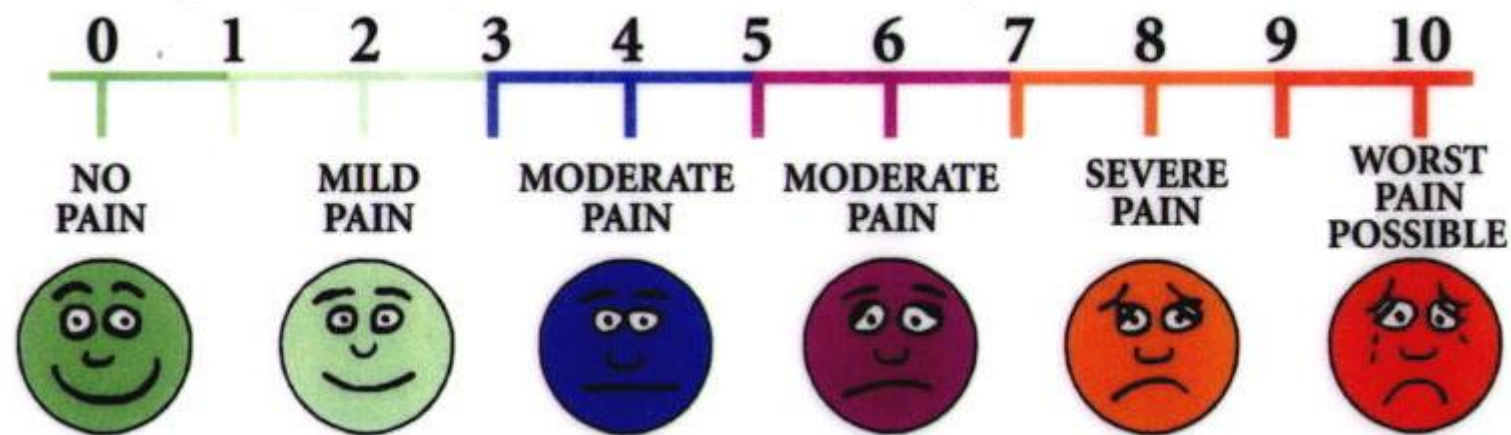
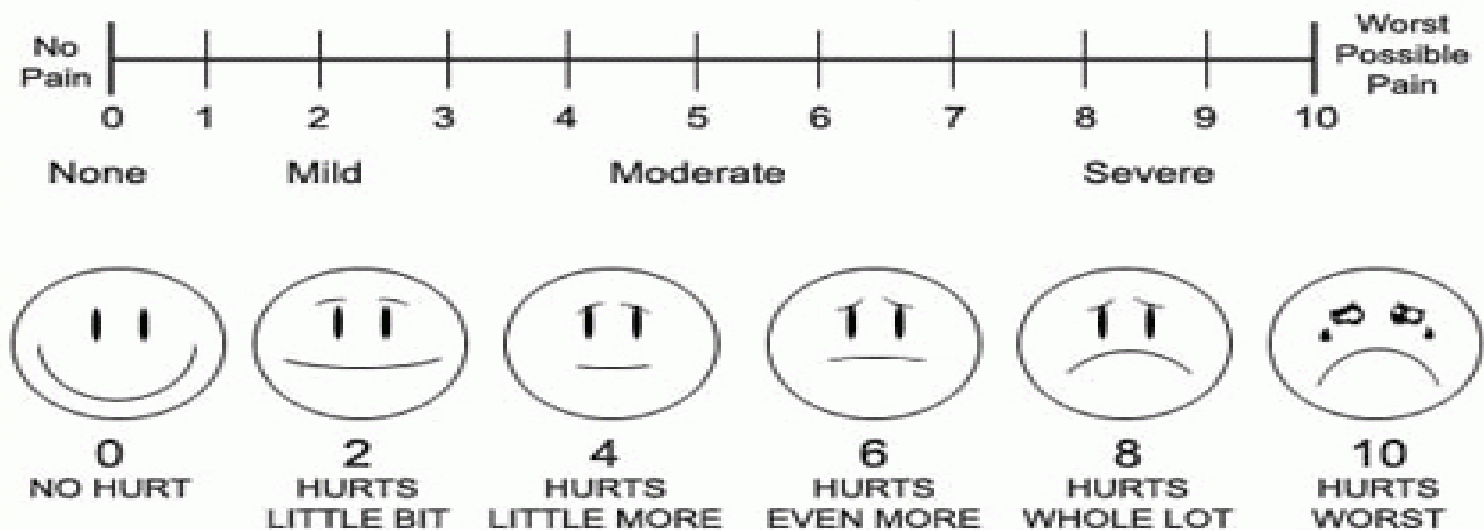
Скале: Behavioral pain scale (BPS) и Critical-Care Pain Observation Tool (CCPOT) су најверодостојније и најпоузданије скале за процену бола код не-вербалних болесника, односно нумеричка скала за вербалне болеснике.

Параметар	Бодови (1-4)
Експресија лица	Релаксиран – 1 Делимично стегнут (набрано чело) -2 Изразито намрштен (жмури) -3 Гримасе – 4
Покрети горњих екстремитета	Без покрета – 1 Делимично савијен -2 Компл. савијен са флексијом прстију – 3 Перманентна ретракција- 4
Усклађеност са механичким вентилатором	Толерише – 1 Кашље, али углавном толерише вентилацију– 2 Бори се са вентилатором-3 Не може се контролисати вент - 4
Збир: 3 – нема бола 12- максимални бол	

Critical-Care Pain Observation Tool (CCPOT)

Индикатор	Бодови (0, 1, 2)
Експресија лица	Релаксиран – 0 Напет -1 Гримасе -2
Покрети тела	Без покрета – 0 Протективни покрети (додире болно место) -1 Немиран, чупа тубус-2
Мишићна тензија	Релаксиран – 0 Отпор на пасивне покрете -1 Изразита резистенција на покрет-2
Усклађеност са вентилатором / вокализација	Толерише (аларми се не укључују) -0 Кашље, али толерише-1 Бори се са вентилатором -2 Говори нормално-0 Уздише стење-1 Виче, јеца -2
Збир 0 – 8	

Процена интензитета бола



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Процена интензитета бола

Choice of assessment tool

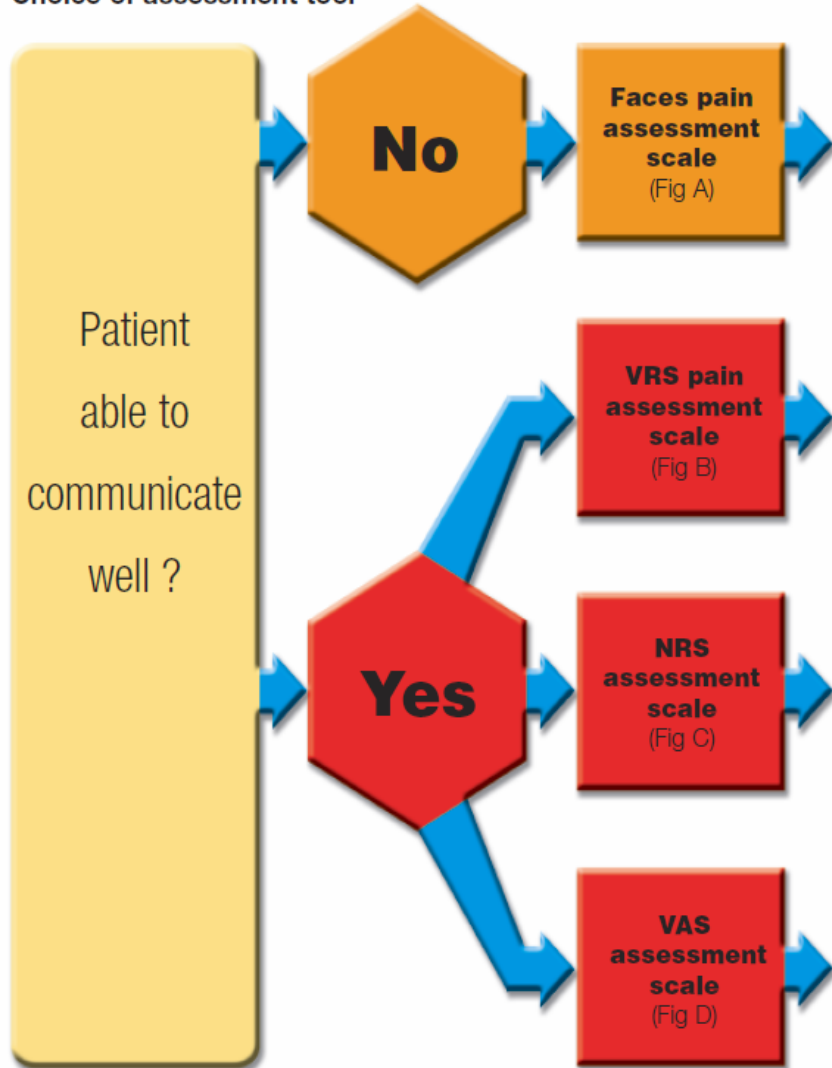


Fig A. Wong-Baker Faces Pain Rating Scale¹

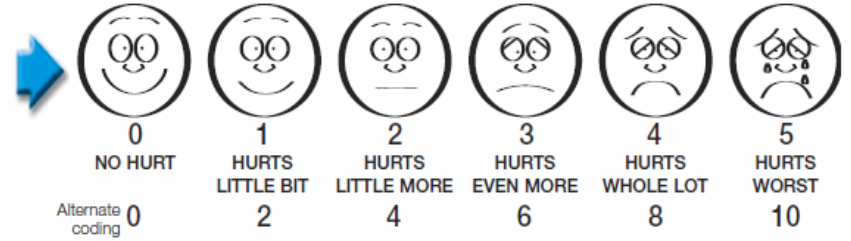


Fig B. VRS²

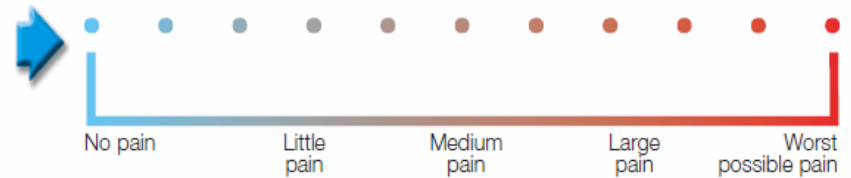


Fig C. NRS²

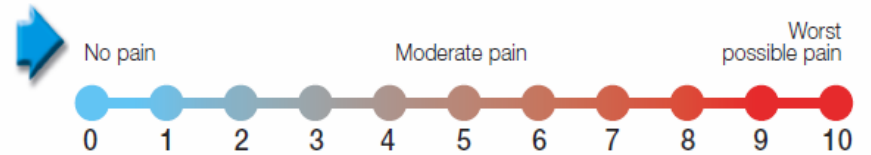
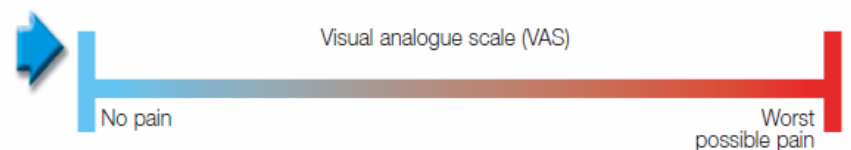


Fig D. VAS²



¹ With permission from Elsevier.

² Adapted from McCaffery M, Pasero C. Pain: Clinical Manual 1999 with permission from Elsevier.

Practice Guidelines for Acute Pain Management in the Perioperative Setting

An Updated Report by the American Society of Anesthesiologists Task Force on Acute Pain Management

PRACTICE Guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints and are not intended to replace local institutional policies. In addition, Practice Guidelines developed by the American Society of Anesthesiologists (ASA) are not intended as standards or absolute requirements, and their use cannot guarantee any specific outcome. Practice Guidelines are subject to revision as warranted by the evolution of medical knowledge, technology, and practice. They provide basic recommendations that are supported by a synthesis and analysis of

Updated by the American Society of Anesthesiologists (ASA) Committee on Standards and Practice Parameters, Jeffrey L. Apfelbaum, M.D. (Committee Chair), Chicago, Illinois; Michael A. Ashburn, M.D., M.P.H. (Task Force Chair), Philadelphia, Pennsylvania; Richard T. Connis, Ph.D., Woodinville, Washington; Tong J. Gan, M.D., Durham, North Carolina; and David G. Nickinovich, Ph.D., Bellevue, Washington. The previous update was developed by the ASA Task Force on Acute Pain Management: Michael A. Ashburn, M.D., M.P.H. (Chair), Salt Lake City, Utah; Robert A. Caplan, M.D., Seattle, Washington; Daniel B. Carr, M.D., Boston, Massachusetts; Richard T. Connis, Ph.D., Woodinville, Washington; Brian Ginsberg, M.D., Durham, North Carolina; Carmen R. Green, M.D., Ann Arbor, Michigan; Mark J. Lema, M.D., Ph.D., Buffalo, New York; David G. Nickinovich, Ph.D., Bellevue, Washington; and Linda Jo Rice, M.D., St. Petersburg, Florida.

Received from the American Society of Anesthesiologists, Park Ridge, Illinois. Submitted for publication October 20, 2011. Accepted for publication October 20, 2011. Supported by the American Society of Anesthesiologists and developed under the direction of the Committee on Standards and Practice Parameters, Jeffrey L. Apfelbaum, M.D. (Chair). Approved by the ASA House of Delegates on October 19, 2011. A complete list of references used to develop these updated Guidelines, arranged alphabetically by author, is available as Supplemental Digital Content 1, <http://links.lww.com/ALN/A780>.

Address correspondence to the American Society of Anesthesiologists: 520 North Northwest Highway, Park Ridge, Illinois 60068-2573. These Practice Guidelines, as well as all published ASA Practice Parameters, may be obtained at no cost through the Journal Web site, www.anesthesiology.org.

* American Society of Anesthesiologists Task Force on Acute Pain Management: Practice guidelines for acute pain management in the perioperative setting: An updated report by the American Society of Anesthesiologists Task Force on Acute Pain Management. *ANESTHESIOLOGY* 2004; 100:1573–81.

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- What other guideline statements are available on this topic?
 - These Practice Guidelines update the "Practice Guidelines for Acute Pain Management in the Perioperative Setting" adopted by the ASA in 2003 and published in 2004.
- Why was this guideline developed?
 - In October 2010, the Committee on Standards and Practice Parameters elected to collect new evidence to determine whether recommendations in the existing Practice Guidelines were supported by current evidence.
- How does this statement differ from existing guidelines?
 - New evidence presented includes an updated evidence synthesis of scientific literature and findings from surveys of a randomly selected ASA members. The new findings necessitate a change in recommendations.
- Why does this statement differ from existing guidelines?
 - The ASA guidelines differ from the existing guidelines because they provide new evidence obtained from scientific literature as well as findings from new expert consultants and randomly selected ASA members.

the current literature, expert and practitioner opinion, forum commentary, and clinical feasibility data.

This document updates the "Practice Guidelines for Acute Pain Management in the Perioperative Setting" Updated Report by the American Society of Anesthesiologists Task Force on Acute Pain Management," the ASA in 2003 and published in 2004.*

Methodology

A. Definition of Acute Pain Management in the Perioperative Setting

For these Guidelines, acute pain is defined as pain present in a surgical patient after a procedure. Such pain may be the result of trauma from the procedure or related complications. Pain management in the perioperative setting refers to actions before, during, and after

- Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are available in both the HTML and PDF versions of this article. Links to the digital files are provided in the HTML text of this article on the Journal's Web site (www.anesthesiology.org).

Преоперативни приступ

- Настављање преоп. terapije
- Третман за редукцију преоп. бола
- Премедикација и анксиолиза
- Едукација болесника и породице

Perioperativni pristup:

- centralna neuroaxijalna analgezija
- PCA – intravenska/epiduralna
- periferna regionalna analgezija

ASA preporuke:

- opioidi i.v., PCA, neuroaxialno
- ne i.m. na zahtev bolesnika

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Postoperative Pain Management – Good Clinical Practice



General recommendations
and principles for
successful pain management



Produced in consultation with the
European Society of Regional Anaesthesia
and Pain Therapy

Балансирана
мултимодална аналгезија

A2-CBHE-JP (2017 – 3109 / 001 – 001)

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Мултимодалне технике за постоперативну аналгезију

■ Мултимодална техника:
коришћење два или више аналгетика са различитим
механизмом аналгетског дејства.
аналгетици могу бити примењени истим путем или различитим

■ Мултимодална ASA препоруке:
кад год је могуће користити мултимодалну технику
размотрити примену централних неуроблокова/локални
анестетици

+

NSAIDs, COXIBs или ацетаминофен

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Аналгетице

Pharmacological options of pain management

Non-opioid analgesics

Paracetamol
NSAIDs, including COX-2 inhibitors*
Gabapentin, pregabalin²

Weak opioids

Codeine
Tramadol
Paracetamol combined with codeine
or tramadol

Strong opioids

Morphine
Diamorphine
Pethidine
Piritramide
Oxycodone

Adjuvants**

Ketamine
Clonidine

Мултимодалне технике за постоперативну аналгезију

Неураксијакно : morfin + LA
sufentanil + LA

Системски: opioidi (Mo, fentanil, sufentanil, tramadol)

+

NSAIDs

COX NSAIDs

Pregabalin

Gabapentin

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Treatment options in relation to magnitude of postoperative pain expected following different types of surgery¹

Mild intensity pain

For example:

Inguinal hernia
Varices
Laparoscopy

Moderate intensity pain

For example:

Hip replacement
Hysterectomy
Jaw surgery

Severe intensity pain

For example:

Thoracotomy
Upper abdominal surgery
Aortic surgery
Knee replacement

- (i) Paracetamol and wound infiltration with local anaesthetic
- (ii) NSAIDs (unless contraindicated) and
- (iii) Epidural local analgesia or major peripheral nerve or plexus block or opioid injection (IV PCA)

- (i) Paracetamol and wound infiltration with local anaesthetic
- (ii) NSAIDs (unless contraindicated) and
- (iii) Peripheral nerve block (single shot or continuous infusion) or opioid injection (IV PCA)

- (i) Paracetamol and wound infiltration with local anaesthetic
- (ii) NSAIDs (unless contraindicated) and
- (iii) Regional block analgesia
Add weak opioid or rescue analgesia with small increments of intravenous strong opioid if necessary

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Морфијум

Morphine

Administration

- (i) Intravenous.
- (ii) Subcutaneous by continuous infusion or intermittent boluses via indwelling cannula.
- (iii) Intramuscular (not recommended due to incidence of pain. 5-10 mg 3-4 hourly).

Dosage:

IV PCA

Bolus: 1-2 mg, lockout: 5-15 min (usually 7-8 min), no background infusion.

Subcutaneous

0.1-0.15 mg/kg 4-6 hourly, adapted in relation to pain score, sedation and respiratory rate.

Monitoring

Pain score, sedation, respiratory rate, side effects.

Comments

Side effects such as nausea, vomiting, sedation and apnoea.

No other opioid or sedative drug should be administered.

Трамадол

Tramadol	
Administration	<ul style="list-style-type: none"> (i) Intravenous: inject slowly (risk of high incidence of NV). (ii) Intramuscular. (iii) Oral administration as soon as possible.
Dosage	50-100 mg 6 hourly.
Monitoring	Pain score, sedation, respiratory rate, side effects.
Comments	<p>Tramadol reduces serotonin and norepinephrine reuptake and is a weak opioid agonist.</p> <p>In analgesic efficiency, 100 mg tramadol is equivalent to 5-15 mg morphine.</p> <p>Sedative drugs can have an additive effect.</p>

Парацетамол

Paracetamol

Administration

- (i) Intravenous: Start 30 min before the end of surgery.
 - (ii) Oral administration as soon as possible.
- Duration: as long as required.

Dosage

4 x 1 g paracetamol/day (2 g propacetamol/day).
Dose to be reduced (e.g. 3 x 1 g/day) in case of hepatic insufficiency.

Monitoring

Pain scores.

Comments

Should be combined with NSAID and/or opioids or loco-regional analgesia for moderate to severe pain.

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Нестероидни антиинфламатори лекови

NSAIDs ¹	
Administration	<p>(i) Intravenous: administration should start at least 30-60 min before end of surgery.</p> <p>(ii) Oral administration should start as soon as possible.</p> <p>Duration: 3-5 days.</p>
Dosage examples	<p>(i) <i>Conventional NSAIDs include:</i> ketorolac: 3 x 30-40 mg/day (only IV form) diclofenac: 2 x 75 mg/day ketoprofen: 4 x 50 mg/day</p> <p>(ii) <i>Selective NSAIDs include:</i> meloxicam 15 mg once daily</p> <p>COX-2 inhibitors are now licensed for postoperative pain management. They are as efficient as ketorolac but reduce GI side effects. Examples include: parecoxib: 40 mg followed by 1-2 x 40 mg/day (IV form) or celecoxib: 200 mg/day. However, there is some debate due to cardiovascular risks in patients with arteriosclerosis. *See note below Table 2, page 17</p>
Monitoring	<p>Pain scores.</p> <p>Renal function in patients with renal or cardiac disease, elderly patients, or patients with episodes of severe hypotension. Gastrointestinal side effects. Non-selective NSAIDs would be combined with proton inhibitors (i.e. omeprazol) in patients at risk of gastrointestinal side effects.</p>
Comments	<p>Can be added to the pre-medication.</p> <p>Can be used in association with paracetamol and/or opioids or local regional analgesia for moderate to severe pain.</p>

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Аналгетици

Аналгетик	Начин примене	Доза	Временски интервал
Morfin	i.v.	1-2 mg	
Petidin (Meperidin)	i.v., i.m.	0.5-1.5 mg/kg	na 4-6 h
Tramadol	i.v., i.m., s.c.	50-100 mg	na 6 h
Paracetamol	i.v.	1 g	na 6 h
NSAIL-неселективни COX инхибитори			
Ketorolak	i.v.	30-40 mg	na 6 h
Diklofenak	i.v.	75 mg	na 12 h
Ketoprofen	i.v.	50 mg	na 6 h
NSAIL-селективни COX-2 инхибитори			
Celecoxib	Per os	200 mg	jednom dnevno
Meloxicam	Per os	15 mg	jednom dnevno
Parecoxib	i.v.	40 mg	1-2 puta dnevno

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РСА – i.v.

Концентрација лека	Болус	Сигурносни интервал	Континуирана инфузија
Morfin (1 mg/ml)	0.5-2.5 mg	5-10 minuta	0.01-0.03 mg/kg/h
Fentanil (0.01 mg/ml)	10-20 μ g	5-10 minuta	0.05-0.1 μ g/kg/h

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РСЕА

Лек	Потребна доза	Сигурносни интервал	Континуирана инфузија
Morfin	100–200 μg	10–15 minuta	300–600 $\mu\text{g}/\text{h}$
Fentanil	10–15 μg	6 minuta	80–120 $\mu\text{g}/\text{h}$
Bupivacain 0.125% + fentanil 4 μg /ml	2 ml	10 minuta	4 ml/h
Ropivacain 0.2% + fentanil 5 μg /ml	2 ml	20 minuta	5 ml/h

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Закључак

- Процена бола
- Документовање
- Мултимодална аналгезија
- Протокол за аналгезију
- Избор и дозу аналгетика прилагодити болеснику, оперативном захвату, присуству других обољења
- или болних синдрома

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