

# EFIKASNO UKLANJANJE BOLA JE KLJUČ USPEŠNOG HIRURŠKOG ISHODA

*Univerza v Ljubljani*



Neli Stošič Vintar  
Medicinski fakultet Univerziteteta u Ljubljani  
Univerzitetški klinički centar Ljubljana

univerzitetni  
klinični center ljubljana  
*University Medical Centre Ljubljana*



BANJA LUKA & TUZLA 28. / 29. novembar 2019

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

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## DEFINICIJA AKUTNOG BOLA

- Akutni bol kao što je bol nakon traume ili hirurškog zahvata predstavlja signal svesnom delu mozga o prisustvu štetnih draži i/ili aktuelnom oštećenju tkiva.
- Ovaj akutni bolni signal je koristan i adaptivne je prirode, upozorava jedinku na opasnost i potrebu za izbegavanjem ili traženjem pomoći.
- Akutni bol je neposredna posledica nokse i kao takav se klasifikuje kao simptom postojećeg oštećenja tkiva ili bolesti.

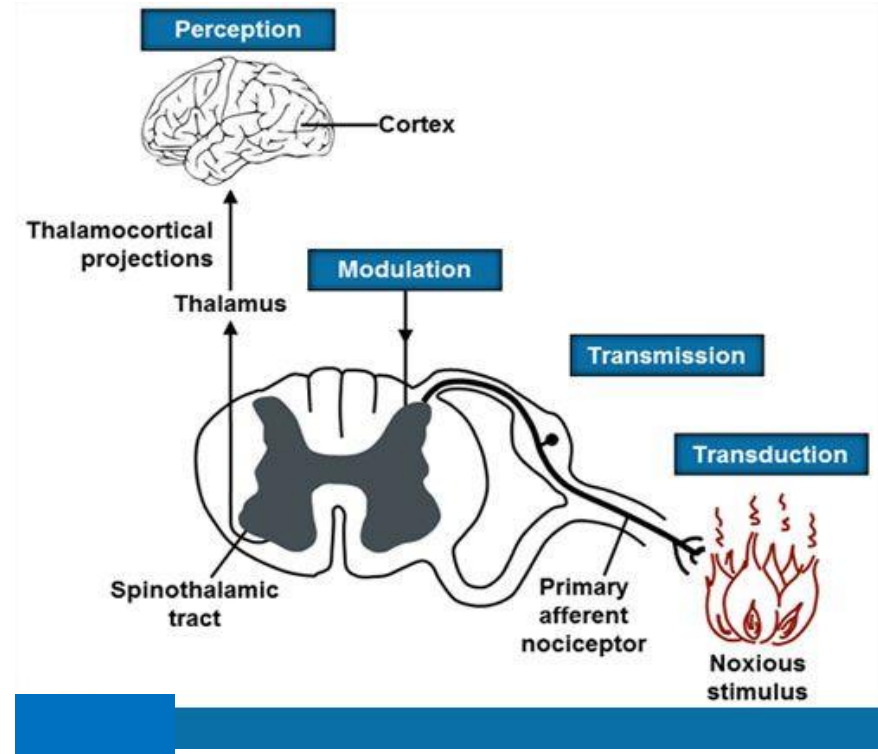
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## AKUTNI BOL

Akutni bol predstavlja signal svesnom delu mozga o prisustvu štetnih draži i/ili aktuelnom oštećenju tkiva.

Na percepciju bola utiče emotivna modulacija.



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Rawal N. Current issues in postoperative pain management.  
EJA 2016;33:160-71.

## **POSTOPERATIVNI BOL NIJE USPEŠNO LEČEN**

- Kontrola postoperativnog bola u Evropi i SAD nije optimalna
- Pismeni protokoli u samo 60% bolnica koje služe kao nastavne baze
- Medicinskim sestrama nije dozvoljeno da prilagođavaju terapiju
- Postoperativnu analgeziju propisuju najčešće hirurzi

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## EFEKTI NEUČINKOVITOG TRETMANA POSTOPERATIVNOG BOLA

- Povećan morbiditet
- Razvoj hroničnog postoperativnog bola
- Prolongirana upotreba opioida
- Narušena pokretljivost i postoperativni oporavak
- Smanjen kvalitet života
- Povećani zdravstveni troškovi

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## MORBIDITET

Loše kontrolisan postoperativni bol uzrokuje **poremećaj fizioloških funkcija:**

- kardiovaskularnih (koronarna ishemija, infarkt miokarda)
- pulmonalnih (hipoventilacija, smanjen vitalni kapacitet, plućne infekcije)
- gastrointestinalnih (smanjen motilitet, ileus, mučnina, povraćanje)
- renalnih (povećan tonus sfinktera i retencija urina, oligurija)
- imunske funkcije i zarastanje rana
- koagulacije (hiperkoagulabilnost: trombotične komplikacije)

Loše kontrolisan postoperativni bol može da **poremeti san** i ima negativne **psihološke efekte**, kao što su demoralizacija i anksioznost

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## PERZISTENTNI POSTOPERATIVNI BOL

bol koji nema drugih evidentnih uzroka i traje bar 2 meseca nakon operacije,  
nakon očekivanog perioda zarastanja rane

Loše tretiran akutni postoperativni bol:

prisustvo i intenzitet akutnog postoperativnog bola su signifikantni prediktivni faktori rizika za razvoj hroničnog bola.

Prema pregledu literature perzistentni bol pogađa između 10 i 60% pacijenata nakon rutinskih operacija.

## VODIČI DOBRE PRAKSE

- **uopštene preporuke** za upotrebu analgetičkih lekova i tehnika u **tretmanu bola**:  
**„jedna veličina odgovara svima“**
- **PROSPECT vodiči**: primer preporuka zasnovanih na sistematskim pregledima literature za određenu hiruršku proceduru [www.postoppain.org](http://www.postoppain.org)
- Schug SA et al. [Acute Pain Management: Scientific Evidence. 4th ed.](#) Melbourne: Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine; 2015.
- **svi vodiči se primenjuju u skladu sa intenzitetom bola**: **ocena bola je ključna!**
- **SLUŽBA ZA LEČENJE AKUTNOG BOLA**: **tim za terapiju bola – organizacija & edukacija**

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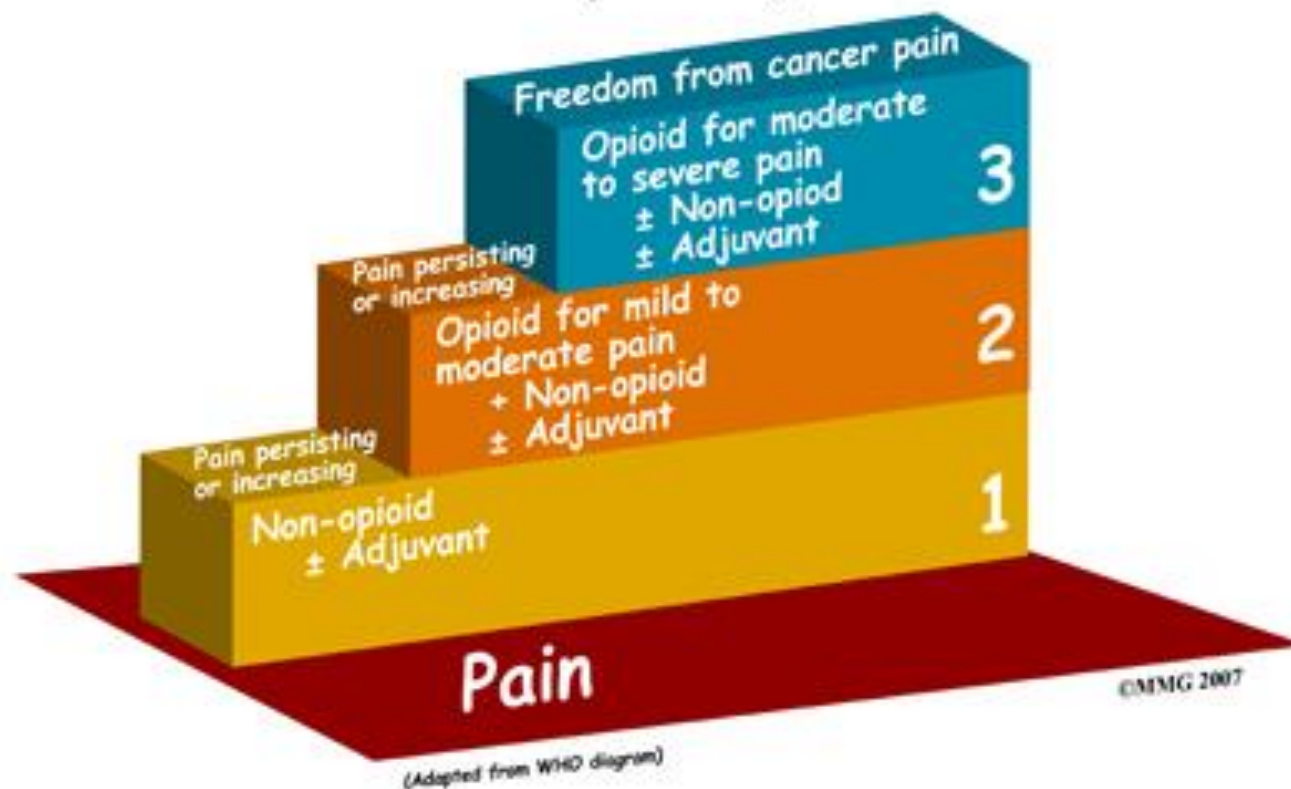
## STANDARDIZOVANI PROTOKOLI ANALGEZIJE U SKLADU SA **LOKALNOM KLINIČKOM PRAKSOM** U ANESTEZIJI I HIRURGIJI

- STANDARDIZOVANI OPERATIVNI POSTUPCI (SOP) ZA POSTOPERATIVNU ANALGEZIJU
- NAPISANI OD STRANE ANESTEZIOLOGA TIMA
- POSEBNO ZA SVAKU HIRURŠKU SUBSPECIJALIZACIJU

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## WHO Three-Step Analgesic Ladder



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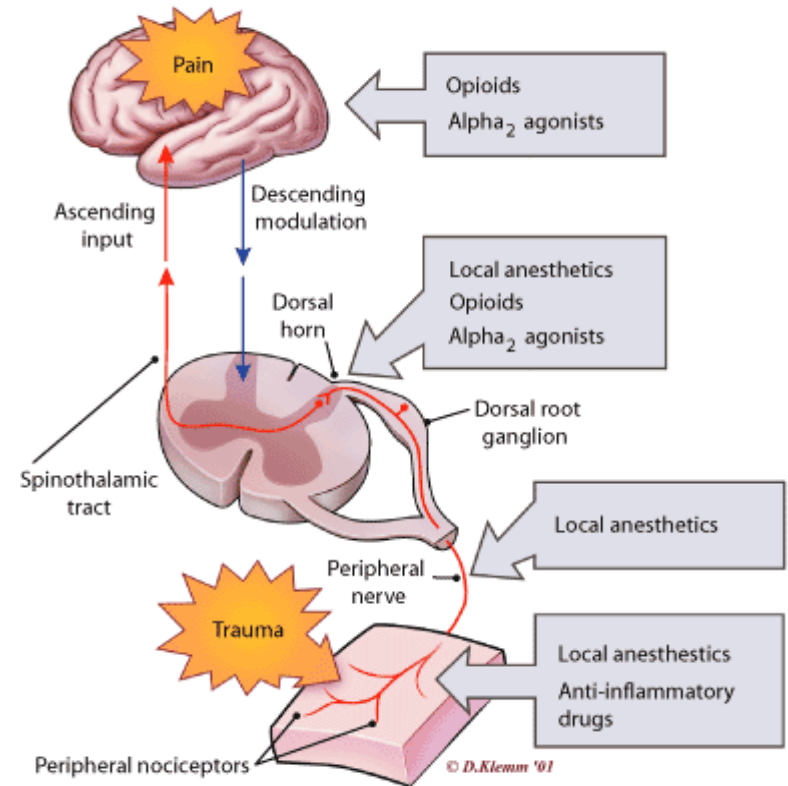
## TERAPIJA POSTOPERATIVNOG BOLA

### SISTEMSKE TEHNIKE

- IV analgezija
- Peroralna analgezija

### REGIONALNE TEHNIKE

- Kontinuirana epiduralna blokada
- Periferni nervni blokovi
- Analgezija kateterom u rani



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# MULTIMODALNA ANALGEZIJA kombinacija različitih tehnika i lekova

## REGIONALNA TEHNIKA

regionalni blok ili infiltracija rane

**PLUS**

## SISTEMSKA ANALGEZIJA

paracetamol / metamizol / NSAIL / opioid

**CILJ:**

**POBOLJŠATI EFEKTIVNOST, MINIMIZOVATI POTREBE ZA OPIOIDIMA**

Schug SA et al. *Acute Pain Management: Scientific Evidence*. 4th ed. Melbourne: Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine; 2015.

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## ŠTA MOŽEMO UČINITI

DA BI SMANJILI POSTOPERATIVNI BOL  
DA BI SMANJILI UPOTREBU OPIOIDA  
DA BI SMANJILI INCIDENCIJU HRONIČNOG POSTOPERATIVNOG BOLA

- **PREDOPERATIVNO: PREEMPTIVE ANALGEZIJA**
- **INTRAOPERATIVNO: MULTIMODALNA ANESTEZIJA**
- **POSTOPERATIVNO: MULTIMODALNA ANALGEZIJA**

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## PREDOPERATIVNO PRIMENJIVANJE ANALGETIKA UNAPRED: PREEMPTIVE ANALGEZIJA

- **I.V. PARACETAMOL PRE OPERACIJE:**

Zahn PK, Schug SA et al. **Paracetamol for perioperative analgesia. Old substance - new insights.** [Anaesthesist](#). 2010 Oct;59(10):940-52

Schug SA et al. 2019 In press

- **NSAR , GABAPENTIN PRE OPERACIJE:**

Nir RR et al. **Preoperative preemptive drug administration for acute postoperative pain: A systematic review and meta-analysis.** [Eur J Pain](#). 2016 Aug;20(7):1025-43.

- **PREGABALIN PRE OPERACIJE:**

Mishriky MB et al. **Impact of pregabalin on acute and persistent postoperative pain: a systematic review and meta-analysis.** [Br J Anaesth](#). 2015 Jan;114(1):10-31

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## MULTIMODALNA ANESTEZIJA: MANJI BOL PO OPERACIJI

- **REGIONALNA ANESTEZIJA: kad god je moguće!**

Richman JM. Does continuous peripheral nerve block provide superior pain control to opioids? A meta-analysis. [Anesth Analg](#). 2006 Jan;102(1):248-57

- **KETAMIN u kontinuiranoj infuziji:**

**akutni nevropatski bol, opioidno tolerantni pacienti**

Laskowski K. A systematic review of intravenous ketamine for postoperative analgesia. [Can J Anaesth](#). 2011 Oct;58(10):911-23

- **LIDOKAIN u kontinuiranoj infuziji:**

**za velike abdominalne / torakalne operacije bez epiduralne anestezije/analgezije**

Sun Y. Perioperative systemic lidocaine for postoperative analgesia and recovery after abdominal surgery: a meta-analysis of randomized controlled trials. [Dis Colon Rectum](#). 2012 Nov;55(11):1183-94

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## PREDNOSTI REGIONALNIH TEHNIKA ANALGEZIJE

### POVEĆANJE BROJA KONTINUIRANIH PERIFERNIH NERVNIH BLOKOVA

Regionalna analgezija

**lišena neželjenih efekata opioida:**

sedacije, vrtoglavice, mučnine/povraćanja

**Omogućava ranu mobilizaciju:**

efikasna analgezija za fizioterapiju



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## BROJ PACIJENATA SA RAZLIČITIM VRSTAMA ANALGEZIJE:

promenio se sa razvojem novih tehnika analgezije i novih hirurških tehnika

<b>GODINA</b>	<b>i.v. opioidna PCA analgezija</b>	<b>epiduralna PCEA analgezija</b>	<b>Kontinuirane periferne kateterske tehnike</b>	<b>Jednokratni periferni nervni blokovi</b>	<b>Analgezija kateterom u rani</b>	<b>Analgezija u palijativnoj nezi – elastomerske pumpe</b>
<b>2009</b>	<b>3061</b>	<b>774</b>	<b>9</b>	<b>?</b>	<b>75</b>	<b>-</b>
<b>2012</b>	<b>2803</b>	<b>622</b>	<b>12</b>	<b>?</b>	<b>62</b>	<b>-</b>
<b>2014</b>	<b>3764</b>	<b>559</b>	<b>32</b>	<b>?</b>	<b>83</b>	<b>-</b>
<b>2016</b>	<b>4023</b>	<b>426</b>	<b>202</b>	<b>343</b>	<b>175</b>	<b>50</b>
<b>2017</b>	<b>4051</b>	<b>409</b>	<b>403</b>	<b>458</b>	<b>144</b>	<b>73</b>
<b>2018</b>	<b>4060</b>	<b>340</b>	<b>505</b>	<b>912</b>	<b>208</b>	<b>120</b>

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## EFIKASNO UKLANJANJE POSTOPERATIVNOG BOLA U UKC LJUBLJANA 2018

<b>Vrsta analgezije</b>	<b>VAS/NRS 0 – 3 BLAG BOL</b>	<b>VAS /NRS 4 – 7 UMEREN BOL</b>	<b>VAS/NRS 8 -10 JAK BOL</b>
<b>IV PCA</b>	<b>93,7%</b>	<b>6,2%</b>	<b>0,3%</b>
<b>Epiduralna PCEA</b>	<b>92,5%</b>	<b>7,2%</b>	<b>0,3%</b>
<b>Analgezija kateterom u rani</b>	<b>95,5%</b>	<b>4,5%</b>	<b>0,0%</b>
<b>Kontinuirani periferni nervni blokovi</b>	<b>87,7%</b>	<b>11,7%</b>	<b>0,4%</b>
<b>Jednokratni periferni nervni blokovi</b>	<b>84,8%</b>	<b>14,6%</b>	<b>0,6%</b>

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## CILJEVI TERAPIJE POSTOPERATIVNOG BOLA: DOSTIGNUTI?



- Zadovoljstvo pacijenta:  
dobrobit pacijenta  
dobar san i apetit
- Prevencija hroničnog postoperativnog bola
- Dobar hirurški ishod:  
rana mobilizacija  
dobro zarastanje rane  
kraća hospitalizacija

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