

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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Uvod

Brojne studije pokazuju lošu kontrolu bola nakon akutne traume

- ▶ 450 trauma pacijenata- bol meren na prijemu
- ▶ Prevalenca bola na prijemu- 91%
- ▶ Pri otpustu 86% – 2/3 umeren ili jak bol na otpustu

Berben et. al. Pain prevalence and pain relief in trauma patients in the Accident & Emergency department (2008) Injury; May;39(5):578-85

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Zašto?

Oslobađanje od bola je osnovno ljudsko pravo

(Association for the Study of Pain, European Federation of IASP Chapters and Human Rights Watch)

- Smanjiti negativne fiziološke efekte bola
- Smanjiti negativne psihološke efekte bola
- Smanjiti rizik pojave hroničnog bola
 - nelečen bol može dovesti strukturnih promena u nervnom sistemu
 - traumatsko oštećenje nerava, kompresija nerava usled kontrakture okolnog traumatizovanog tkiva...

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Zašto?

□ **Pravovremena i adekvatna analgezija**

- ubrzava proces isceljenja povreda
- Smanjuje stres odgovor
- Smanjuje dužinu i troškove bolničkog lečenja
- Smanjuje morbiditet i mortalitet

Cohen SP, Christo PJ, Moroz L.
Pain management in trauma patients.
Am J Phys Med Rehabil. 2004 Feb;83(2):142–61

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Bol nakon traume

- Intenzitet bola ukazuje na težinu i tip povrede
- Može dovesti do ozbiljnih komplikacija i pogoršati opšte stanje bolesnika
- Nije uvek proporcionalan stepenu oštećenja tkiva

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TRAUMA, BOL

Simpatički i neurohumoralni (metabolički)
odgovor


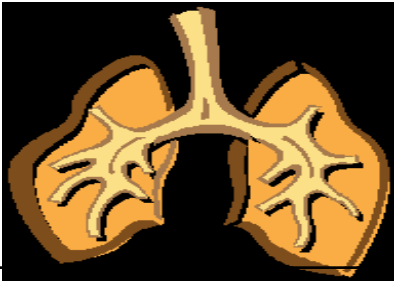

Povećanje nivoa **kortizola, kateholamina,**
antidiuretskog hormona- *lipoliza, proteinoliza,*
imunosupresija, hiperkoagulabilnost

hipertenzija, tahikardija, hiperglikemija,
tromboza, retencija soli i vode, povećanje
bazalnog metabolizma, infekcija

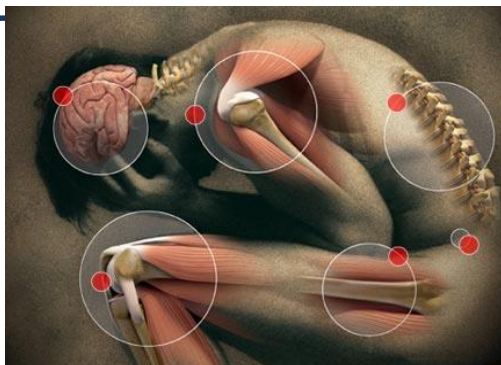
Manifestacija psihičkih simptoma u stresu
Doprinosе razvoju hroničnog bola

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Štetni efekti bola

	<p>↑frekvenca ↑Krvni pritisak ↑Povećane potrebe za O₂ Hiper- koagulabilnost</p>	<p>Nestabilna angina Infarkt miokarda DVT PE</p>
	<p>↓Disajni volumen ↓Snižen refleks kašlja</p>	<p>Atelektaze Pneumonia Hypoxemia</p>
	<p>↓Pražnjenje želudca ↓ crevni motilitet</p>	<p>Konstipacija Anorexia Ileus (muka, povraćanje)</p>

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Spazam mišića
Oštećenje mišićne
pokretljivost i
funkcije

Nepokretnost
slabost
Gubitak mišićne
mase



anksioznost
strah

Poremećaj spavanja
Poremećaj
rasuđivanja
post-traumatski
stres Sy

HRONIČNI BOLNI SY, HIPERALGEZIJA

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National Pharmaceutical Council (2001). Macintyre & Schug (2007).Cohen et al (2004)

Faktori udruženi sa pojavom hroničnog bola

- Mlađa dob
- Višestruke operacije
- Loše kontrolisan bol
- Povrede nerava
- Trajanje nesposobnosti za rad (dužina bolovanja)
- Psihološki momenti - ↑ anksioznost, depresija, stres

Macrae (2008), Keene et al (2011) , Sommer et al (2010)

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Incidenca hroničnog/perzistentnog bola nako traume

Povreda/terapijska op	Incidenca hroničnog bola
Amputacija	30-85%
Povrede grudnog koša/torakotomija	5-67%
Povrede kičmene moždine	>50%
Povrede moga	32-51%
Frakture kičmenih pršljenova	>25%
Opekotine	35-52%
Kompleksni regionalni bolni Sy	1-5%

Project number: 585927-EPP-1-Macintyre and Schrag (2007), Kerlet et al. (2006), Sinha & Cohen (2011), Nampiarampil (2008), Dauber et al. (2002), Singh & Cailliet (2011)

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Mitovi..

- Ako pacijent spava ne trpi velike bolove
- Pacijenti lažu o intenzitetu bola
- Bolje je pričekati da bol postane zaista jak pa dati lek...

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Analgezija, kada?

- **ODMAH** po inicijalnoj resuscitaciji (ABCDE princip) i stabilizaciji vitalnih parametara
- Nestabilnim pacijentima NE davati analgetike

Analgezija, kako?

Procena bola

- Ne postoji uređaj, test, niti biološki marker koji egzaktno meri bol
- Pitati pacijenta (nesvesnost, alkoholisanost, emocionalna trauma, psihosomatski distres- otežava procenu)
- Tražiti potencijalne uzroke bola
- Posmatrati ponašanje pacijenta
- Informacije od rodbine/staratelja
- Probati analgetsku Th

Moramo verovati bolesniku

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Procena intenziteta bola

- **OPQRST**- Onset of the event
 - Provocation or palliation
 - Quality of the pain
 - Region and radiation
 - Severity
 - Time (history)

- **Skale bola**

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Lečenje traumatskog bola

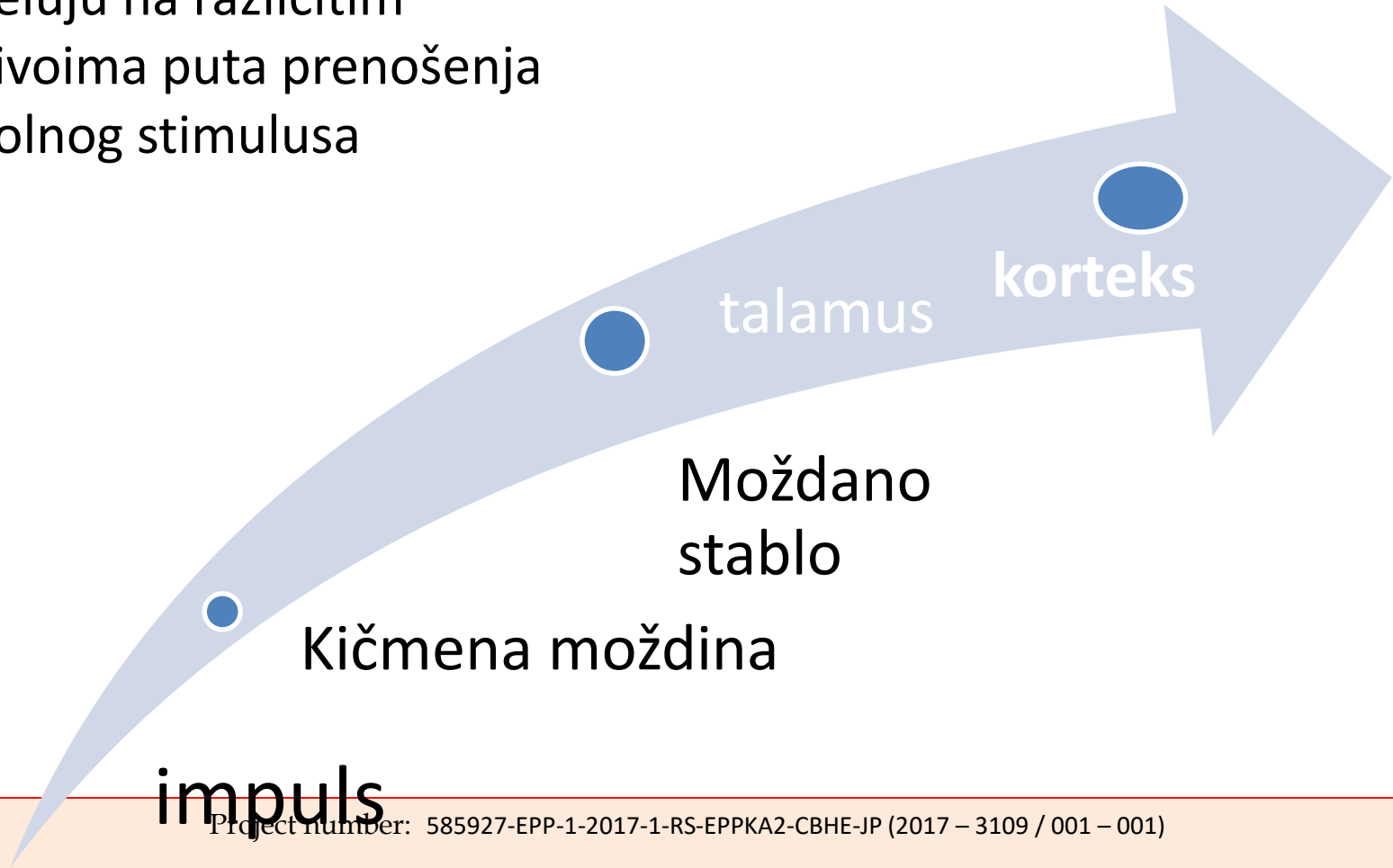
- **Psihološki tretman** (komunikacija, zadobiti poverenje, smanjiti strah, uliti sigurnost, emocionalna podrška)
- **Fizikalni tretman** (imobilizacija preloma, spoljašnje hlađenje mesta povrede, previjanje, sprečiti rashlađivanje i drhtanje, kasnije rana mobilizacija)
- **Farmakološka terapija bola**

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Lečenje bola

Različite tehnike i lekovi deluju na različitim nivoima puta prenošenja bolnog stimulusa



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Lečenje bola- lekovi sa perifernim dejstvom

- **Nesteroidni antiinflamatorni lekovi (NSAID)** –deluju na produkciju prostaglandina, koji izazivaju hiperalgeziju i inflamatorni odgovor
 - Jedina iv forma- keterolac, im, oralna, topikalna, rektalna

- **COX I i COX II inhibitori** (inhibiraju ciklooksigenazu- sintezu prostaglandina)

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NSAID neželjeni efekti

- Peptičke ulceracije (inhibiraju sintezu prostaglandina koji štite gastričnu mukozu)
- Antitrombocitni (antiagregacioni) efekat
- Renalna disfunkcija
- *Rizik kod astme –moguć težak bronhospazam*

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Lečenje bola-blokiranje prenosa nadražaja

- **LOKALNI ANESTETICI**- blokiraju prenos nadražaja na me-stu aplikacije (smanjenje transfera Na i K na nivou neurona)
- **Lokalna infiltracija** na mestu incizije (efekat 48 h)
- **Interkostalna** nervna blokada, **paravertebralna** n b,
- **Intrapleuralna** analgezija (lok anestetik)
- **Periferni nervni blokovi** (kontinuirani-insercija katetera)-
ultrazvuk

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Lečenje bola-blokiranje prenosa nadražaja

- **Centralni nervni blokovi**
- **Epiduralna i subarhnoidalna infuzija** anestetika i opioida (opioidi blokiraju oslobađanje neurotransmitera koji su neophodni za prenošenje bolnog impulsa od kičmene moždine ka mozgu); kontinuirano-kateter
- NE-kod masivnog krvarenja (hipotenzija, akutna traumatska koagulopatija)

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Lečenje bola- lekovi sa centralnim dejstvom

- Paracetamol
- Tramadol
- klonidin
- Ketamin, azot-oksidi
- Sistemski opioidi- i.m. s.c. i.v. transdermalno

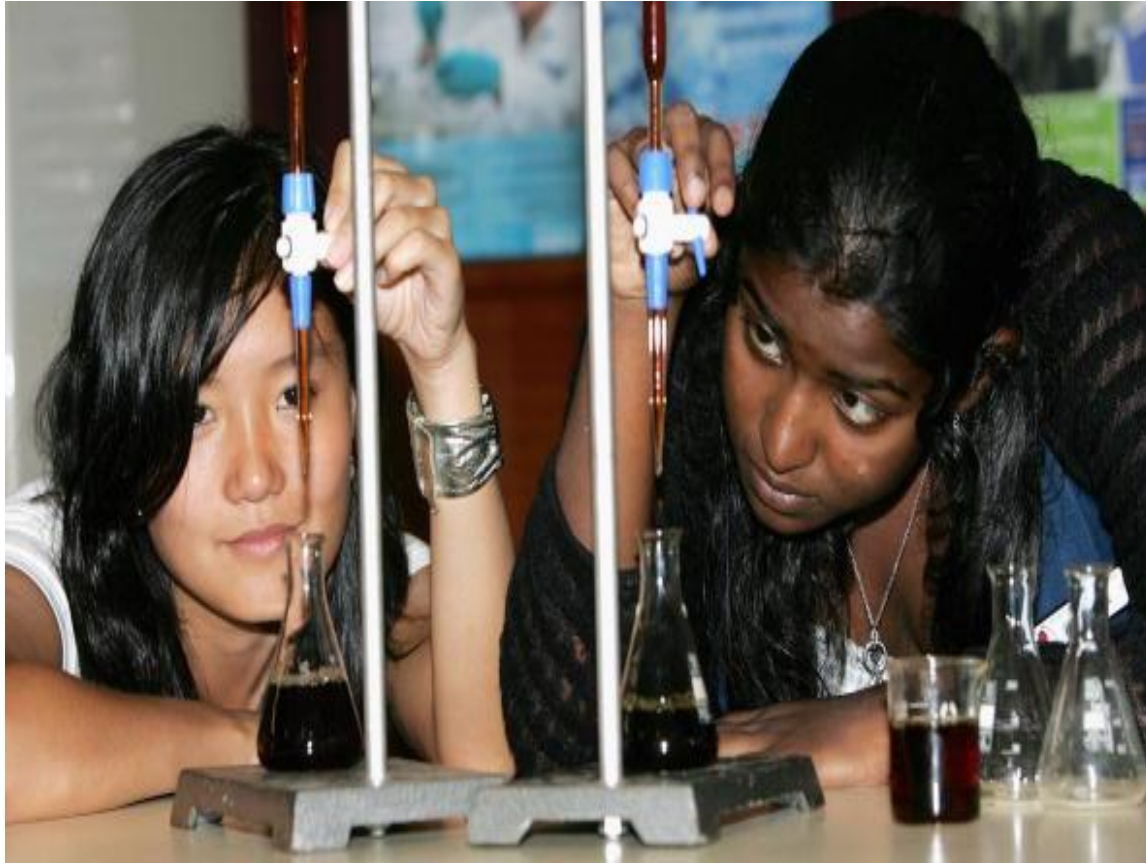
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Opioidi- zlatan standard

- **Morfin** spor početak dejstva (15-20min), dugo delovanje, akumulacija aktivnih metabolita kod renalne disf-je, histaminoliberator (obično se ne daje se u akutnoj fazi)
- **Fentanil**- nakon duže primene dugotrajnije dejstvo od morfina (dugo context-senzitivno polu vreme)
- **Remifentanil**- nespecifični esterazni metabolizam, brz početak i prestanak dejstva (context-senzitivno poluvreme 3 min) lako se titrira do efikasne doze

TITRIRAJ, TITRIRAJ....



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Opioidi- osnovna pravila

- U akutnoj fazi opioide primenjivati **I.V.** SC ili IM primena nije efikasna. Kasnije – oralno ili transdermalno
- **Odmah** startovati sa dozom koja će dati **oslobađanje od bola**
- Za konstantan bol- **regularan dozni interval-** omogućava održavanje stanja bez bola
- **PCA-** patient controlled analgesia

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Opioidi- zlatan standard

Ekstenzivne koštano-mišićne povrede

- Krvarenje, hipovolemija- prvo nadoknaditi cirkulat. volumen
- Opioidi imaju simpatolitički efekat-benefit
- Potreba za intenzivnom analgo-sedacijom nekoliko sati

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Opioidi- zlatan standard

Povrede grudnog koša

- Potreba za produženom mehaničkom ventilacijom
- Opioidi- smanjena potreba za sedativima
- Opioidi-smanjeno oslobađanje citokina (ARDS)

Epiduralna analgezija vs opioidi iv

- Bolja analgezija i plućni funkcionalni testovi (manja depresija disanja)
 - nisu pospani
- nema neželjenih gastrointestinalnih simptoma

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Tehničke poteškoće ?

- An Eastern Association for the Surgery of Trauma guideline: **Epidural analgesia is the optimal modality of pain relief for BBT (level1)**
- Epiduralna analgezija zastupljena samo kod 15-22% BBTpacijenata

Bulger EM. J Trauma 2000;48:1040-1047



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Opioidi- zlatan standard

Povrede mozga

❖ Opioidi

❑ Sprečavaju **sekundarna oštećenja**

➤ smanjuju **bazalni metabolizam** i potrebe za kiseonik

➤ Sprečavaju **skok ICP** prilikom aspiracije,
bronhoskopije i dr manipulacija, suprimiraju kašalj

❑ Omogućava regularnu evaluaciju neurološko statusa

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Neželjeni efekti opioida

- Muka
- Svrab
- Retencija urina
- Opstipacija
- **Respiratorna depresija-** rana (1 sat nakon davanja) ili kasna (posle 6-12 h)

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Najčešće dg. dileme koje prate primenu opioida

- Hiperadrenergičko stanje- kod mlađih može biti fiziološki odgovor na traumu, hipovolemiju, operaciju, a ne izraz **oligoanalgezije**- dobar prognostički znak
- Hipotenzija- može biti posledica hipovolemije, koju je odgovor organizma na bol maskirao, a ne **predoziranja** opioida

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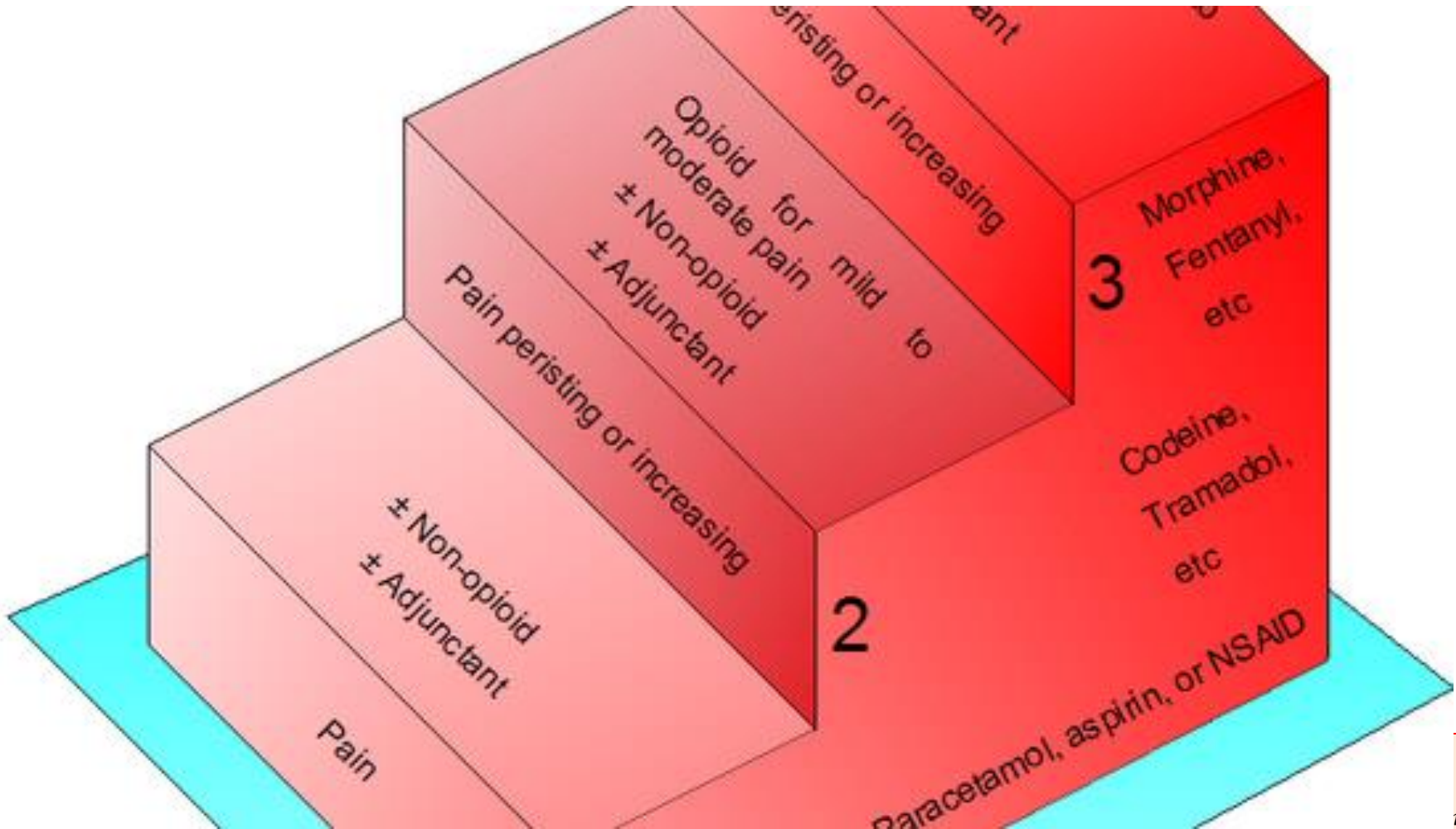
Najčešće *zablude o primeni* opioida

- **maskiraju kliničku sliku-** neosnovano, analgezija olakšava klinički pregled
- **Mioza** (rezultat cen.dejstva opioida) maskira razvoj pupilarnih abnormalnosti koje prate **neurotraumu-**netačno (unilateralno proširena zenica još izrazitija kod mioze druge)
- **Zavisnost-** ne javlja se kod kratkotrajne primene

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Koji je optimalan analgetik proceniti intenzitet bola



Važno: multi-modalna th

- Kominovati lekove sa drugačijim mehanizmom dejstva

- Dodatna Th
 - Triciklični antidepresivi, gabapentin, pregabalin (smanjuju pojavu hroničnog bola kao deo multi-modalne Th, kod rizičnih grupa)
 - Tretirati neželjene efekte terapije

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Zaključak

- Započeti terapiju rano još na terenu opioidi, ketamin
- Efikasna kontrola bola značajno doprinosi smanjenju mortaliteta i morbiditeta nakon traume i operacija
- Multimodalan pristup
- Titrijate analgeziju prema odgovoru, regularna re-evaluacija
- Procena i tretman psiho-socijalnih faktora koji mogu doprineti pojavi hroničnog bola

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