

# Acute pain management- experience from Ljubljana

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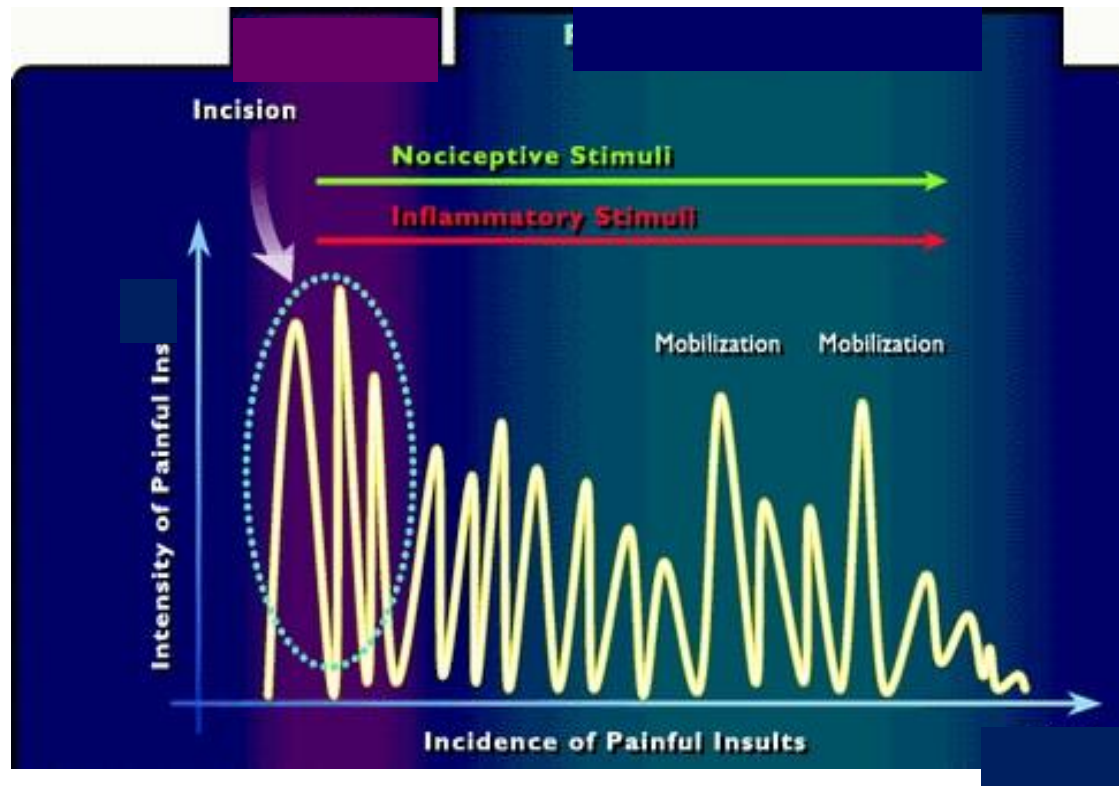
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## ACUTE PAIN DEFINITION

- Acute pain, such as that following trauma or surgery, constitutes a signal to a conscious brain about the presence of noxious stimuli and/or ongoing tissue damage.
- This acute pain signal is useful and adaptive, warning the individual of danger and the need to escape or seek help.
- Acute pain is a direct outcome of the noxious event, and is reasonably classified as a symptom of underlying tissue damage or disease.

## POSTOPERATIVE PAIN : ACUTE PAIN MODEL



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## POSTOPERATIVE PAIN: A WORLDWIDE SOLVED PROBLEM?

- More than 230 million people undergo surgery / year worldwide
- Pain management is a medical obligation
- Pain became the fifth vital sign
- **Undertreated postoperative pain remains a considerable problem**

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

### **POSTOPERATIVE PAIN IS NOT SUCCESSFULLY TREATED**

- No optimal postoperative pain control in Europe and USA
- Written protocols only in 60% teaching hospitals
- Nurses are not allowed to adjust the treatment
- Postoperative analgesia is most often prescribed by surgeons

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## SCIENTIFIC APPROACH TO POSTOPERATIVE PAIN MANAGEMENT

- First **clinical** study about postoperative pain: in 1932
- 30 publications/ year until 1960
- 300 publications in 1978
- 2700 publications in 2017
- Till now: more than 100.000 published papers altogether

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## EFFECTS OF INEFFECTIVE POSTOPERATIVE PAIN RELIEF

- increased morbidity
- development of chronic postoperative pain
- prolonged opioid use
- impaired mobility and recovery from surgery
- reduced quality of life
- increased medical costs

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## STANDARDIZED ANALGESIC PROTOCOLS ACCORDING TO LOCAL CLINICAL PRACTICE IN ANESTHESIA AND SURGERY

- STANDARDIZED OPERATING PROCEDURES (SOP) FOR POSTOPERATIVE ANALGESIA
- WRITTEN BY TEAM ANESTHESIOLOGISTS
- SPECIFICALLY FOR EACH SURGICAL SPECIALITY

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## HOW TO START WITH ACUTE PAIN SERVICE?

1. **Written protocols** for postoperative analgesia
2. New nurse profile: **pain nurse**
3. **Education** : ward nurses and patients
4. Regular pain assessment: **make pain visible**
5. **Recording** VAS and analgesic consumption
6. **Recording** side effects and complications
7. **Analysing**
8. **Audits** : regular meetings and improvement plans



Klinični oddelek za anesteziologijo in intenzivno terapijo operativnih strok

## ZAPLETI PRI ZDRAVLJENJU POOPERATIVNE BOLEČINE

VEDNO NAJPREJ KLIČI ODDELČNEGA ZDRAVNIKA!

### I. ZAPLETI, KI OGROŽAJO ŽIVLJENJE

Ravnaj se po navodilih v kvadratu, nato pokliči dežurnega anesteziologa po multitonu (MT) 511.



#### 1. DEPRESIJA DIHANJA

(frekvenca dihanja <10/min)

1. kisik 8l/min preko obrazne maske
2. dihalna podpora z masko in ambujem
3. 1 amp naloksona (Narcanti 0.4 mg) razredči z 10 ml fiziološke raztopine in dodajaj po 1 ml i. v. do učinka
4. kliči reanimacijo (21-12)

#### 2. HIPOTENZIJA

(padec tlaka za več kot 25%)

1. pospeši infuzijo 200ml/5 min
2. simpatikomimetik (Efedrin 0.5 % 2ml i. v.)
3. Suprarenin 1 amp razredči s fiziološko raztopino na 100 ml in titiraj i. v.
4. ob močnem padcu tlaka (pod 80 mm Hg) kliči reanimacijo

#### 3. EPILEPTIČNI NAPAD

1. kisik 8 l/min preko obrazne maske, ob zastoju dihanja ventilacija z ambujem
2. benzodiazepin (Apaurin 5-10 mg i. v., Dormicum titiraj i. v. po 2.5 mg do učinka)
3. kliči reanimacijo



### II. HUĐI ZAPLETI

(če je potrebno, se posvetuj z anesteziologom na MT 511)

#### 1. NEUROLOŠKI ZAPLETI

- močna bolečina ob injiciranju po epiduralnem katetru
- oslabelost v spodnjih okončinah
- mravljinčenje v spodnjih okončinah

1. kliči anesteziologa MT 511

#### 2. BRONHOSPAZEM

(bolnika duši)

1. kisik 8 l/min preko obrazne maske
2. bronhodilatator (Ventolin v prslu 1 vdih/min - 3 krat)

#### 3. SEDACIJA

(bolnika težko predramimo)

1. razredči 1 amp naloksona (Narcanti 0.4mg) z 10 ml fiziološke raztopine in dodajaj po 1ml i. v. do učinka

### III. OSTALI ZAPLETI

#### 1. SLABOST IN BRUHANJE

antiemetik (Torecan, Onilat, Zofran)  
1 amp i. v.

#### 2. SRBEŽ

1. Synopen 20 mg i. v.
2. razredči 1 amp naloksona (Narcanti 0.4 mg) z 10 ml fiziološke raztopine in dodajaj i. v. do učinka

#### 3. ZASTOJ URINA

(bolnik ima poln mehur, a ga ne more izprazniti)

1. Doril 1 amp i. v./i. m.
2. urinski kateter

#### 4. IZPAD EPIDURALNEGA KATETRA

1. kliči oddelčnega zdravnika
2. nadaluj z venskim zdravljenjem pooperativne bolečine

#### IV. TEHNIČNA NAPAKA/PORABLJENO ZDRAVILO

Kliči sestro (MT 775)!

## LAJŠANJE BOLEČINE PO OPERACIJI



### PROTOCOL FOR TREATMENT OF SIDE EFFECTS AND COMPLICATIONS OF POSTOPERATIVE ANALGESIA TECHNIQUES

#### SLABOST IN BRUHANJE

1. antiemetik i.v.
2. če čez 30 min ni izboljšanja, pretok analgetikov zmanjšaj ali ustavi za 2 uri

#### HIPOTENZIJA

- Padec KT za več kot 25% od izhodiščnega
1. i.v. infuzija kristaloidov 200 ml/5 min
  2. simpatikomimetik efedrinijev klorid 10 mg i.v.
  3. ob padcu KT za več kot 50% od izhodiščnega kliči reanimacijo

#### SRBEŽ

1. antihistaminik i.v.
2. epiduralne analgezije ne ustavimo, nadaljujemo z analgetsko mešanico brez morfina

#### SEDACIJA

1. stopnja 2 - izražena: pacient zaspan, zenice zožene na 2-3 mm - zmanjšaj analgezijo za 50%; ponovna ocena čez 15 min
2. stopnja 3 - pacient spi, ga težko predramimo, zenice so maksimalno zožene - ukrepi kot pri depresiji dihanja

#### DEPRESIJA DIHANJA

- Frekvenca dihanja < kot 8/min, plitvo dihanje/apnoične pavze, SpO<sub>2</sub> < kot 90%
1. analgezijo ustavi - stalen nadzor
  2. aplikacija O<sub>2</sub> 6L/min prek obrazne maske
  3. sprostitvev dihalne poti oz. predihavanje z masko in ročnim dihalnim balonom
  4. nalokson 1 amp (0,4 mg) razredči do 10 ml, nato daj po 1 ml do učinka
  5. kliči reanimacijo

### UKREPI PRI ZDRAVLJENJU NEŽELENIH UČINKOV IN ZAPLETOV POOPERATIVNE ANALGEZIJE

#### NEVROLOŠKI ZAPLETI

##### SENZORIČNE MOTNJE / MOTORIČNA BLOKADA / NEOBČUTLJIVOST OD TH4 NAVZGOR

1. ustavi epiduralno analgezijo
2. ponovna ocena motorike čez 2 uri
3. kliči SLAPB oz. nadzornega anesteziologa
4. zmanjšaj odmere/pretok po PCEA

##### Oslabelost v spodnjih okončinah narašča Močna bolečina v hrbtu narašča

Kliči anesteziologa na dect 7200,  
v času dežurstva 8842 ali MT 511

SLUŽBA ZA LAJŠANJE AKUTNE  
POOPERATIVNE BOLEČINE (SLAPB)  
anesteziolog **dect 7200**  
medicinske sestre **dect 8623, 7243, MT 775**  
popoldne/dežurstvo:  
nadzorni anesteziolog **dect 8842**  
nadzorna anestezijska medicinska sestra **8202**

#### SISTEMSKA TOKSIČNOST LOKALNIH ANESTETIKOV

##### Nevrotoksičnost:

metalni okus, otrpel jezik,  
zvenenje v ušesih,  
motnje vida, tonično klonični krči,  
izguba zavesti

##### Kardiotoksičnost:

hipertenzija, hipotenzija, tahikradija,  
bradikardija, motnje ritma, srčni zastoja

1. prekini dovajanje lokalnega anestetika
2. kliči reanimacijo
3. dodaj 100% O<sub>2</sub>, sprostitvev dihalne poti oz. predihavanje z obrazno masko in ročnim dihalnim balonom
4. zdravi krče: midazolam, propofol
5. zdravi motnje srčnega ritma, srčnega zastoja
6. intralipid 20% 1,5 ml / kg v bolusu, ponovi bolus čez 5 min, nato infuzija 0,25 – 0,5 ml / kg / min ob hipotenziji

Strengthening Capacities for Higher Education of Pain Medicine in Western Balkan countries – HEPMP

**SAFETY****STANDARDIZED ANALGESIC MIXTURES FOR REGIONAL ANALGESIA  
PREPARED BY UMC PHARMACY**

Substance	Analgesic mixture A	Analgesic mixture M	Analgesic mixture G	Analgesic mixture C
Levobupivakainijev klorid 0,125% (1,25 mg/ml)	200 ml	200 ml	200 ml	200 ml
Levobupivakainijev klorid 0,75% (7,5 mg/ml)	-	20 ml	40 ml	20 ml
Morfinijev klorid	4 mg	4 mg	-	-
Klonidinijev klorid	75 mcg	-	-	-
Total volume	200 ml	220 ml	240 ml	220 ml

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not

## PAIN NURSE

new nurse profile

- **DAILY VISITS OF PATIENTS WITH PCA PUMPS**  
(recording VAS scores, calculating analgesic consumption, adjusting PCA pumps programme to patient's needs, recording side effects)
- **DAILY VISITS OF PATIENTS WITH CATHETERS**  
(catheter nursing, recording complications, safe epidural catheter removal)
- **EDUCATION OF WARD NURSES: REGULAR EDUCATION PROGRAMS**
- **STATISTICAL ANALYSIS, ANNUAL REPORTS**



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## ANESTHESIOLOGIST FOR ACUTE PAIN SERVICE

### ON CALL FOR

- ANALGESIC PROTOCOL ADJUSTMENTS
- SOLVING PROBLEMS AND COMPLICATIONS
- *PALIATIVE CARE AND CHRONIC PAIN TREATMENT FOR PATIENTS AT ALL DEPARTMENTS IN THE HOSPITAL*
- RECORDING DAILY VISITS
- COMMUNICATION WITH TEAM ANESTHESIOLOGISTS

### RESPONSIBLE FOR

- STANDARDS AND PROTOCOLS
- COMMUNICATION WITH HOSPITAL PHARMACY
- ANNUAL MEETINGS WITH SURGEONS

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## MAKING PAIN VISIBLE

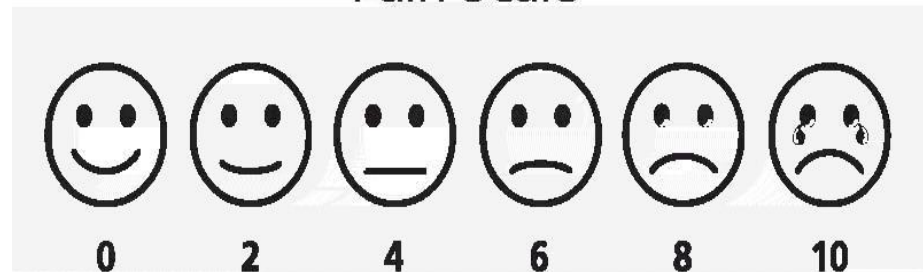
Ward nurses record VAS pain scores :

in intensive care units 1x / hr

on surgical wards: 1x / 3 hrs

**SEEPAIN**  
CAMPAIGN

Pain Scale



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## PATIENT CONTROLLED ANALGESIA (PCA) PUMPS

- Patient is actively involved
- Independent from staff members
- Continuous analgesic infusion / no continuous infusion plus boli within programmed safe limits
- Record given boli and attempted boli
- Daily analgesic consumption is calculated



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## ELASTOMERIC PUMPS



- DISPOSABLE
- CONTINUOUS FLOW 2ml/h OR 5 ml/h
- FOR PALIATIVE CARE
- FOR WOUND CATHETER ANALGESIA

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## MONTHLY STATISTICAL ANALYSIS QUALITY ASSESSMENT REPORTS 1 X PER YEAR

- Numbers of different techniques
- Numbers of daily VAS assessments
- Average daily VAS scores
- Numbers of side effects and complications  
altogether and separately for each surgical department

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## ANNUAL REPORTS

- Reports presented annually at quality assessment meetings of Clinical department for anaesthesiology and intensive care
- Analysis of effectiveness and safety
- Improvement suggestions

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## ANNUAL MEETINGS ON SURGICAL DEPARTMENTS WITH SURGEONS AND WARD NURSES

- PRESENTING THE ACHIEVEMENTS: effectiveness and side effects
- SUGGESTING SOME IMPROVEMENTS ACCORDING TO QUALITY ASSESSMENT STANDARDS

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# **MULTIMODAL ANALGESIA**

## **combination of different techniques and different drugs**

**REGIONAL TECHNIQUE**  
(WOUND INFILTRATION, large volume infiltration)  
**PLUS**  
**SYSTEMIC ANALGESIA**  
paracetamol / metamizol / NSAID / opioid

**AIM:**  
**IMPROVE EFFECTIVENESS, MINIMIZE OPIOID REQUIREMENTS**

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## NUMBER OF PATIENTS WITH DIFFERENT TYPES OF ANALGESIA:

changed with development of new techniques of analgesia and new surgical techniques

YEAR	i.v. opioid PCA analgesia	epidural PCEA analgesia	Peripheral catheter analgesia	Single shot peripheral blocks	Wound catheter analgesia	Paliative care analgesia  –elastomeric pumps
2009	3061	774	9	?	75	-
2012	2803	622	12	?	62	-
2014	3764	559	32	?	83	-
2016	4023	426	202	343	175	50
2017	3586	409	503	458	144	73

Strengthening Capacities for Higher Education of Pain Medicine in Western Balkan countries – HEPMP

## EFFECTIVE POSTOPERATIVE PAIN RELIEF IN UMC LJUBLJANA in 2017

Type of analgesia	VAS/NRS 0 – 3 MILD PAIN	VAS /NRS 4 – 7 MODERATE PAIN	VAS/NRS 8 -10 SEVERE PAIN
IV PCA	93,7%	6,2%	0,3%
Epidural PCEA	92,5%	7,2%	0,3%
Wound catheter analgesia	95,5%	4,5%	0,0%
Continuous peripheral blocks	87,7%	11,7%	0,4%
Single shot peripheral blocks	84,8%	14,6%	0,6%

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## Strengthening Capacities for Higher Education of Pain Medicine in Western Balkan countries – HEPMP

**FEW COMPLICATIONS OF EPIDURAL PCA ( PCEA 409) in 2017**

Complication	Number	%
Sensoric blockade	23	5,7
Motor blockade	21	5,1
Pain in the injection site	1	0,4
Tachnical problems: catheter fell out, not functioning..	25	6,2

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**FEW COMPLICATIONS OF IV PCA (3586)**  
PCA PIRITRAMID 0,5 MG / ML

Complication	number	%
nausea	150	4,2
vomiting	161	4,5
Sedation level 2-3	150	4,2

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INCREASING NUMBER OF  
CONTINUOUS PERIPHERAL  
NERVE BLOCKS



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## ACUTE PAIN SERVICE LJUBLJANA 1998 - 2018

### AFTER 20 YEARS:

DAILY 1 anesthesiologist on call (phone 7200)

DAILY 2 -4 pain nurses (phone 8623, 7243)

100 PCA pumps in use daily

Per 1 year:  $\geq 5000$  patients with

IV PCA, PCEA, peripheral catheters

Each patient PCA for 3 days:  $\geq 15000$  visits per year

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## ACHIEVEMENTS OF 20 YRS ACUTE PAIN SERVICE IN UMC LJUBLJANA

- Pain is **REGULARLY** assessed and recorded as **5<sup>th</sup>** vital sign on all surgical wards
- Effective postoperative pain relief in all recovery rooms and surgical wards: **VAS  $\leq$  3**
- There are few side effects and no serious complications: **about 5%**
- Regular monthly education programs for ward nurses : **obligatory attended, positive results**
- High patient satisfaction with quality of postoperative pain relief: results of regular inquiries  
**4,9points ( of 5 possible)**

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THANK YOU



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