# Anestezia in chirurgia majora colorectala

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CEEA, Targu Mures, 2017

# Date generale

- Pentru ce?
- Cancer
- Inflamatii
- Afectiuni vasculare, etc
- Ce tip de interventii/
- Rezectii colonice partiale/totale, colorectale
- Amputatii rectale
- TEM- Transanal endoscopic microsurgery
- Proctectomie
- Rezectii abdomino-perineale
- Rezectii multiorgan
- Exenteratii pelvice, etc

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# Particularitati/provocari perioperatorii

- Preoperator:

  - starea de nutritie/albuminele serice, evaluarea riscului

- Intraoperator:

  - respectarea recomandarilor: hTA, analgezie, inhalatorie vs TIVA
  - Laparoscopie vs open
  - Fast track

- Postoperator:

  - albuminele serice
  - Durerea ac/cr
  - Risc de fistula
  - Risc recidive
  - Fast track

# Perioada preoperatorie

- Electiva vs urgenta
- Alimentatie cu proteine pana la normalizarea prot/ albuminelor serice (temporizare)
- Pana la 80% din pacienti pot fi malnutriti,
- In studiul nostru 28.9% pacienti au fost hipoalbuminemici (3,5 g/dL)
- Atentie la hemoconcentratie preop!
- Nivelul proteinelor/albuminelor serice influenteaza semnificativ
  - incidenta fistulei postoperatorii
  - Morbiditatea/mortalitatea
  - LOS
  - Sepsisul
- Alti markeri Rap PNM/ limfocite, IL-6, prealbumina

Truong A, Hanna MH, Moghadamyeghaneh Z, Stamos MJ. Implications of preoperative hypoalbuminemia in colorectal surgery. *World Journal of Gastrointestinal Surgery*. 2016;8(5):353-362.
Ionescu D, Tibrea C, Puia C. Pre-operative hypoalbuminemia in colorectal cancer patients undergoing elective surgery - a major risk factor for postoperative outcome. Chirurgia (Bucur) 2013;108(6):822-8

# Perioada preoperatorie

- Discutare management perioperator mai ales fast track
- Alimentatie precoce
- Durerea si analgezia
- Mobilizarea precoce

- Evaluarea riscului anestezic/chirurgical → decizii anestezice, de ex analgezia peridurala la BPOC, varstnici cu risc
- Post preoperator: 2h preop lichide dulci (CH)
- Reabilitare preoperatorie- capacitatea de efort

Powell R, Scott NW, Manyande A, et al. Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. Cochrane Database Syst Rev. 2016 May 26; (5):CD008646.
Gillis C, Li C, Lee L, Awasthi R, et al. Prehabilitation versus rehabilitation: a randomized control trial in patients undergoing colorectal resection for cancer. Anesthesiology 2014;121(5):937-47.

# Perioada intraoperatorie

- TIVA vs inhalation: propofol vs agenti inhalatori
- Obs! Poate important in cancere digestive
- Analgezie: peridurala vs lidocaina i.v.
- Care mai este locul analgeziei peridurale?
- Open, high risk, laparo de durata (≥2h)

- Analgezie multimodala: opioide, AINS, paracetamol
- Evitare hTA

- Detalii de procedura chirurgicala
- Laparo vs open
- Durata interventiei

# Perioada intraoperatorie

- TIVA vs inhalation: propofol vs agenti inhalatori
  - -In prezent majoritatea anesteziilor sunt inhalatorii
  - -Sevofluran/izofluran
  - -Atentie la viitor!!!!
- Analgezie: peridurala vs lidocaina i.v.
- Peridurala: pacienti cu risc CV si resp mare
  - -Interv clasice
  - -Interv laparo de durata
  - -Poate fi aplicata si pe baze regulate, dar atentie la riscuri
- i.v. lidocaina: interv laparo, pacienti cu risc redus
  - - Interv clasice de scruta durata

Wigmore TJ, Mohammed K, Shaman Jhanji S. Long-term survival for patients undergoing volatile *vs* IV anesthesia for cancer surgery: a retrospective analysis. *Anesthesiology* 2016;124(1):69-79

Int J Physiol Pathophysiol Pharmacol 2013;5(1):1-10
www.ijppp.org /ISSN:1944-8171/IJPPP1212006

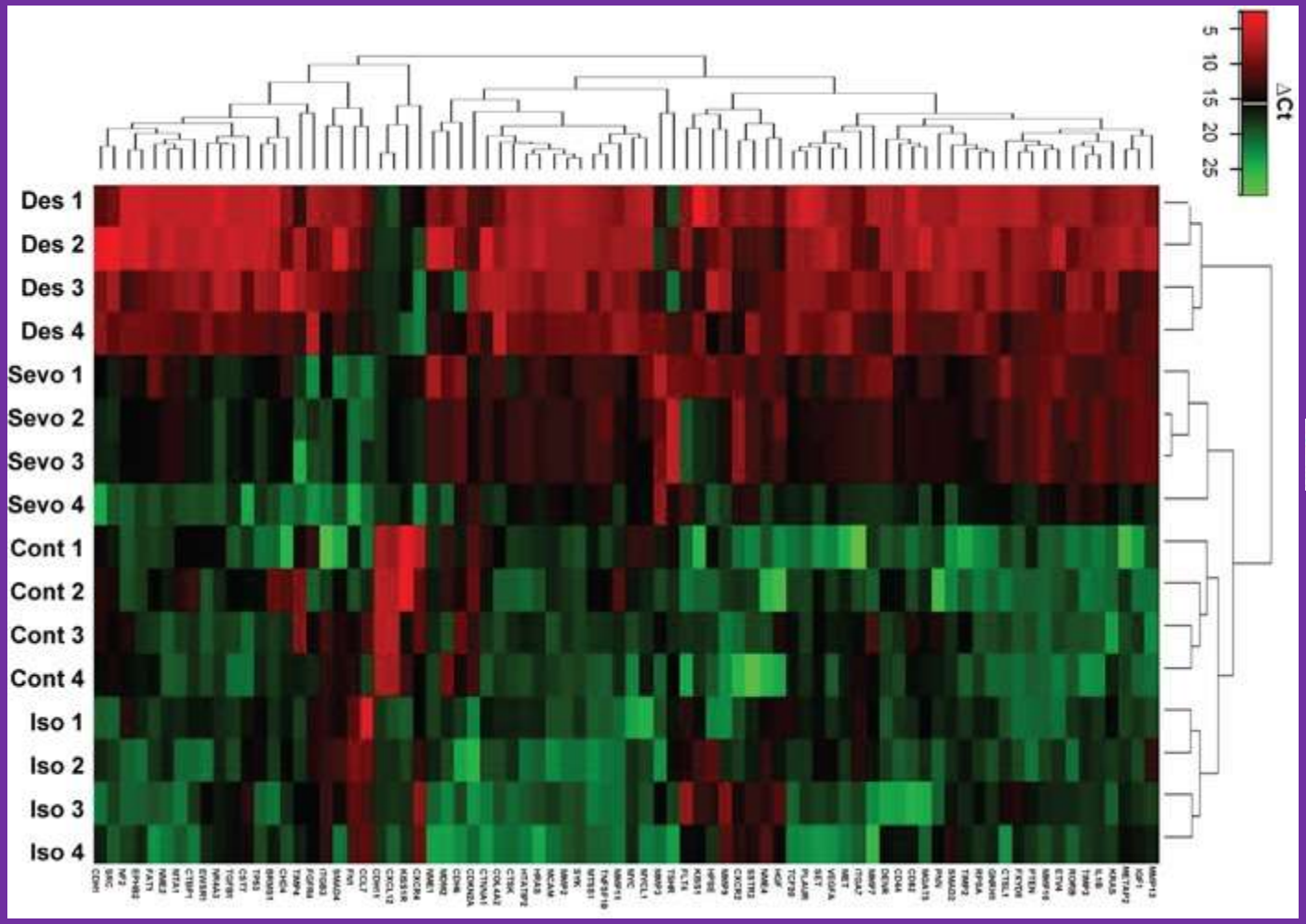
*Review Article*

**The effects of anesthetics on tumor progression**

Liliang Mao[2], Suzhen Lin[2], Jun Lin[1]

**Table 1.** Anesthesia Factors and Tumor Progression

| Anesthetic factors | Potential effects on tumors | Cell-mediate Immunity [7, 18] | Proposed Mechanisms |
|---|---|---|---|
| Regional anesthesia | Inhibition | Attenuate immuno-suppression | Decrease perioperative stress responses<br>Decrease systemic opioid use<br>Decrease the use of volatile agents |
| Local anesthetics | Inhibition | Attenuate immuno-suppression | Act through VGSC to inhibit metastasis [24-26]<br>Inhibit cell proliferation [27]<br>Inhibit motor machinery of cancer cells [28]<br>Inhibit Src signaling and cancer cell migration [29] |
| Opioids | Activation | Immuno-suppression | Promote angiogenesis [30]<br>Co-activate with EGFR [31]<br>Act through NET1 pathway for cell migration [32] |
| Volatile agents | Activation | Immuno-suppression | Activate HIF-1α [8, 33]<br>Inhibit TNF-induced apoptosis [34]<br>Inhibit antiapoptotic Bcl-2 down-regulation [35] |
| Propofol | Inhibition | None | Decrease MMP expression [36]<br>Modulate RhoA and stress fiber for cell migration [37] |




Volatile anaesthetics enhance the metastasis related cellular signalling including CXCR2 of ovarian cancer cells

Masae Iwasaki[1,2,*], Hailin Zhao[1,*], Tanweer Jaffer[1], Sandeep Unwith[1], Laura Benzonana[1], Qingquan Lian[1], Atsuhiro Sakamoto[1], Daqing Ma[1]

Oncotarget, Vol. 7, No. 18

**All three volatile anaesthetics altered expression of 70 out of 81 metastasic related genes with significant increases in VEGF-A, MMP-11, CXCR2 and TGF-β genes and protein expression with a magnitude order of desflurane (greatest), sevoflurane and isoflurane. Scratch analysis revealed that exposure to these anesthetics increased migration, which was abolished by CXCR2 knockdown.**

**Volatile anaesthetics at clinically relevant concentrations have strong effects on cancer cell biology which in turn could enhance ovarian cancer metastatic potential. This work raises the urgency for further *in vivo* studies and clinical trials before any conclusions can be made in term of the alteration of clinical practice.**

# Perioada intraoperatorie

- Analgezie multimodala: opioide, AINS, paracetamol
- Obligatoriu nu uitati de analagezia multimodala!!!!

- Evitare
- hTA conform ghidurilor generale de best practice!
- Hipotermie
- FiO2 ≥0,6 (0,5)

# Perioada intraoperatorie

- Laparo vs open
- Modificari/cerinte anestezice:
- Durata interventiei
- Intensitatea durerii/analgezie
  - Multimodala
  - Peridurala vs i.v. lidocaina
  - TAP
- PONV

# Other effects

- Intestinal perfusion: in patients undergoing oesphagectomy, continuous EA (bupivacaine) without a bolus dose increased anastomotic mucosal blood flow compared with controls
- TEA appears to exert beneficial effects on intestinal perfusion as long as its haemodynamic consequences are adequately controlled (norepinephrine)
- Anastomotic leaks: TEA reduced anastomotic leaks after oesophageal anastomosis (70% risk reduction) or after GI surgery. Further studies needed.

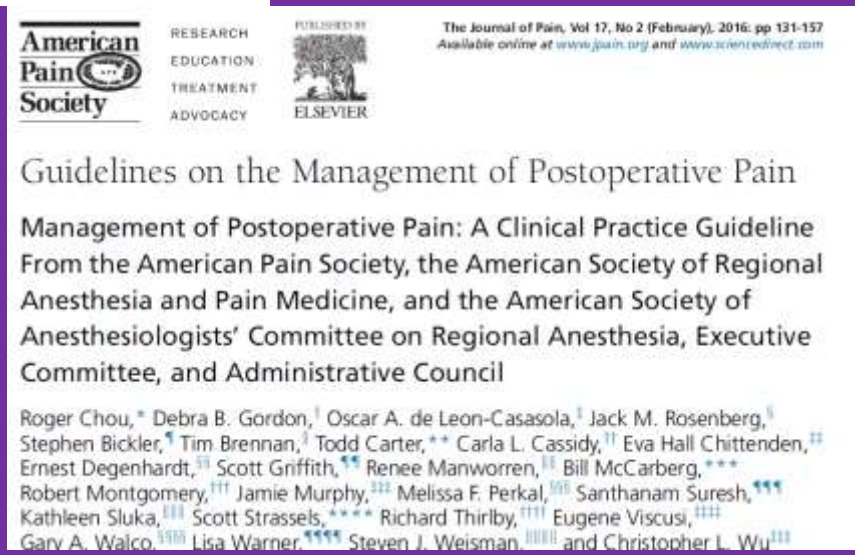
Michelet P, Roch A, D'Journo XB , et al. Acta Anaesthesiol Scand 2007; 51: 587-94
Freise H, Van Aken HK. BJA 2011; 107(6): 859–868.
Michelet P, D'Journo XB, Roch A, et al. Chest 2005;128:3461-6

# What surgery? What kind of patient? Recommendations

## *Use of Neuraxial Therapies*

### Recommendation 26

- The panel recommends that clinicians offer neuraxial analgesia for major thoracic and abdominal procedures, particularly in patients at risk for cardiac complications, pulmonary complications, or prolonged ileus (strong recommendation, high-quality evidence).



# What surgery? What kind of patient?

provide more specific recommendations on the dif components of multimodal analgesia. In genera use of local anesthetic-based regional anesthesia niques for surgical procedures of the extre abdomen, and thorax is encouraged, because of th tiple trials that showed their effectiveness in combi with systemic analgesics (see Recommendation 23).

**Table 3. Options for Components of Multimodal Therapy for Commonly Performed Surgeries**

| Type of Surgery | Systemic Pharmacologic Therapy | Local, Intra-articular or Topical Techniques* | Regional Anesthetic Techniques* | Neuraxial Anesthetic Techniques* | Nonpharmacologic Therapies† |
|---|---|---|---|---|---|
| Thoracotomy | Opioids‡<br>NSAIDs§ and/or acetaminophen<br>Gabapentin or pregabalin§<br>i.v. ketamine¶ | | Paravertebral block | Epidural with local anesthetic (with or without opioid), or intrathecal opioid | Cognitive modalities<br>TENS |
| Open laparotomy | Opioids‡<br>NSAIDs§ and/or acetaminophen<br>Gabapentin or pregabalin§<br>i.v. ketamine¶<br>i.v. lidocaine | Local anesthetic at incision<br>i.v. lidocaine infusion | Transversus abdominis plane block | Epidural with local anesthetic (with or without opioid), or intrathecal opioid | Cognitive modalities<br>TENS |
| Total hip replacement | Opioids‡<br>NSAIDs§ and/or acetaminophen<br>Gabapentin or pregabalin§<br>i.v. ketamine¶ | Intra-articular local anesthetic and/or opioid | Site-specific regional anesthetic technique with local anesthetic | Epidural with local anesthetic (with or without opioid), or intrathecal opioid | Cognitive modalities<br>TENS |
| Total knee replacement | Opioids‡<br>NSAIDs§ and/or acetaminophen<br>Gabapentin or pregabalin§<br>i.v. ketamine¶ | Intra-articular local anesthetic and/or opioid | Site-specific regional anesthetic technique with local anesthetic | Epidural with local anesthetic (with or without opioid), or intrathecal opioid | Cognitive modalities<br>TENS |
| Spinal fusion | Opioids‡<br>Acetaminophen†<br>Gabapentin or pregabalin§<br>i.v. ketamine¶ | Local anesthetic at incision | | Epidural with local anesthetic (with or without opioid), or intrathecal opioid | Cognitive modalities<br>TENS |
| Cesarean section | Opioids‡<br>NSAIDs§ and/or acetaminophen | Local anesthetic at incision | Transversus abdominal plane block | Epidural with local anesthetic (with or without opioid), or intrathecal opioid | Cognitive modalities<br>TENS |
| CABG | Opioids‡<br>Acetaminophen<br>Gabapentin or pregabalin§<br>i.v. ketamine¶ | | | | Cognitive modalities<br>TENS |

# Concluzii asupra locului periduralei

**Table 3.** Benefits of Thoracic Epidural Analgesia

- Superior perioperative analgesia compared with systemic opioids
- Decreased pulmonary complications
- Decreased duration of mechanical ventilation
- Decreased duration of postoperative ileus after abdominal surgery
- Decreased postoperative protein catabolism
- Decreased mortality in patients with multiple rib fractures

**Thoracic Epidural Analgesia and Acute Pain Management**

Smith C. Manion, M.D.,* Timothy J. Brennan, Ph.D., M.D.†

 Anesthesiology 2011; 115:181–8

- EA should still be used…..

Can J Anesth/J Can Anesth (2011) 58:22–37
DOI 10.1007/s12630-010-9407-0

REPORTS OF ORIGINAL INVESTIGATIONS

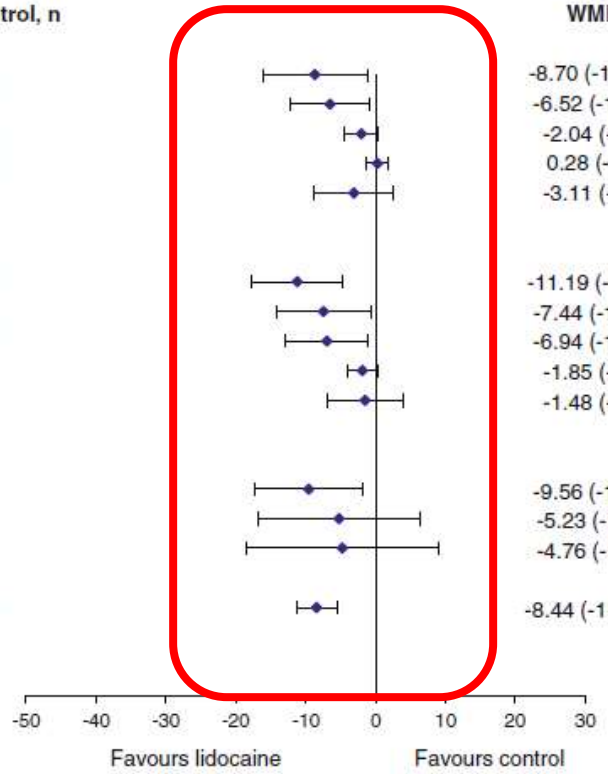
# Perioperative intravenous lidocaine infusion for postoperative pain control: a meta-analysis of randomized controlled trials

## Perfusion intraveineuse périopératoire de lidocaïne pour le contrôle de la douleur postopératoire: une méta-analyse d'études randomisées contrôlées

Louise Vigneault, MD · Alexis F. Turgeon, MD · Dany Côté, MD · François Lauzier, MD · Ryan Zarychanski, MD · Lynne Moore, PhD · Lauralyn A. McIntyre, MD · Pierre C. Nicole, MD · Dean A. Fergusson, PhD

# Xilina i.v.

| | Trials, N | Lidocaine, n | Control, n | WMD (95% CI) |
|---|---|---|---|---|
| **Postoperative pain at rest** | | | | |
| 6 hours | 9 | 289 | 290 | -8.70 (-16.19 to -1.21)* |
| 12 hours | 6 | 194 | 195 | -6.52 (-12.12 to -0.91) |
| 24 hours | 10 | 317 | 320 | -2.04 (-4.40 to 0.32) |
| 48 hours | 8 | 267 | 270 | 0.28 (-1.35 to 1.91) |
| 72 hours | 3 | 81 | 79 | -3.11 (-8.73 to 2.51) |
| **Pain during cough** | | | | |
| 6 hours | 7 | 211 | 209 | -11.19 (-17.73 to -4.65) |
| 12 hours | 4 | 140 | 140 | -7.44 (-14.24 to -0.63) |
| 24 hours | 6 | 191 | 189 | -6.94 (-12.87 to -1.01) |
| 48 hours | 5 | 151 | 149 | -1.85 (-4.05 to 0.35) |
| 72 hours | 3 | 81 | 79 | -1.48 (-7.02 to 4.06) |
| **Pain during movement** | | | | |
| 6 hours | 2 | 64 | 66 | -9.56 (-17.31 to -1.80) |
| 24 hours | 3 | 92 | 96 | -5.23 (-16.73 to 6.28) |
| 48 hours | 3 | 92 | 96 | -4.76 (-18.51 to 8.99) |
| **Postoperative morphine administration** | 12 | 344 | 346 | -8.44 (-11.32 to -5.56)** |




* on a 100 points visual analog scale
** in milligrams

**Fig. 2** Postoperative pain and opioid requirement

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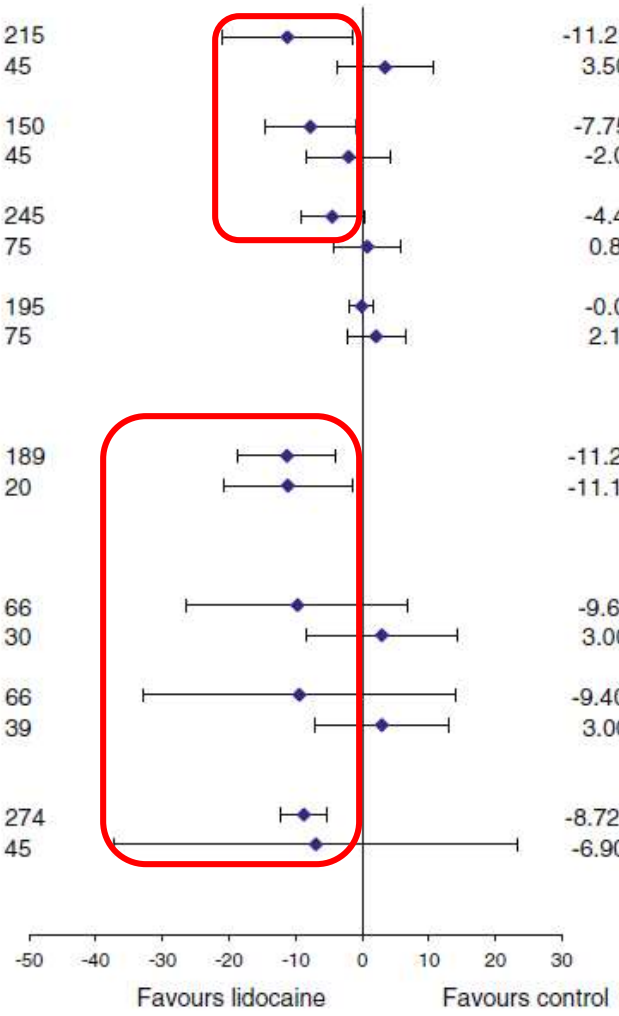
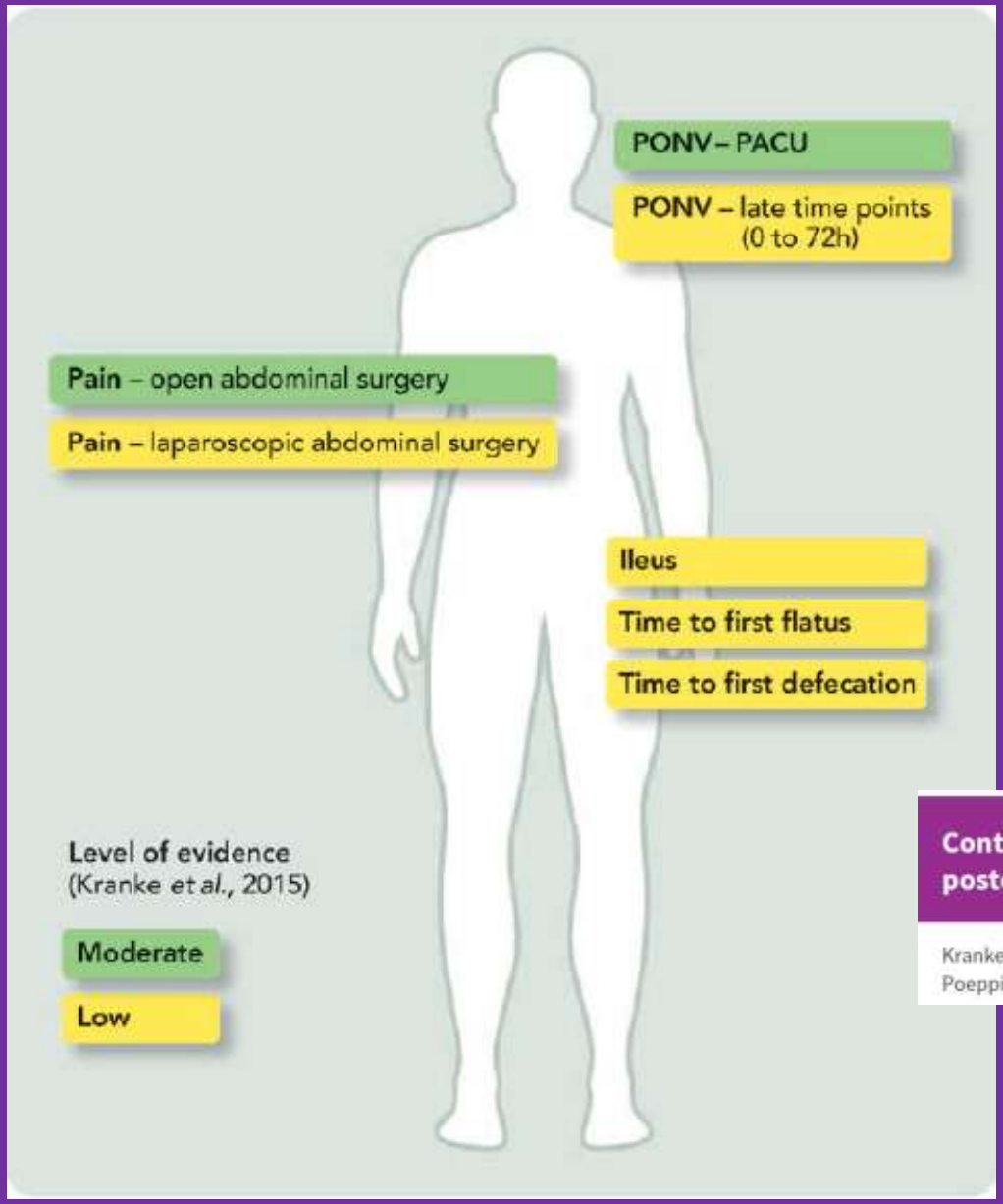
| | Trials, N | Lidocaine, n | Control, n | WMD (95% CI) |
|---|---|---|---|---|
| **Postoperative pain at rest** | | | | |
| *6 hours* | | | | |
| Abdominal surgery | 7 | 215 | 215 | -11.21 (-21.10 to -1.31)* |
| Non abdominal surgery | 1 | 44 | 45 | 3.50 (-3.83 to 10.83) |
| *12 hours* | | | | |
| Abdominal surgery | 5 | 150 | 150 | -7.75 (-14.68 to -0.83) |
| Non abdominal surgery | 1 | 44 | 45 | -2.00 (-8.30 to 4.30) |
| *24 hours* | | | | |
| Abdominal surgery | 8 | 245 | 245 | -4.44 (-9,22 to 0.33) |
| Non abdominal surgery | 2 | 72 | 75 | 0.81 (-4.20 to 5.83) |
| *48 hours* | | | | |
| Abdominal surgery | 6 | 195 | 195 | -0.02 (-1.78 to 1.74) |
| Non abdominal surgery | 2 | 72 | 75 | 2.12 (-2.25 to 6.48) |
| **Postoperative pain during cough** | | | | |
| *6 hours* | | | | |
| Abdominal surgery | 6 | 191 | 189 | -11.25 (-18.62 to -3.87) |
| Non abdominal surgery | 1 | 20 | 20 | -11.10 (-20.73 to -1.47) |
| **Pain during movement** | | | | |
| *24 hours* | | | | |
| Abdominal surgery | 2 | 64 | 66 | -9.69 (-26.27 to 6.90) |
| Non abdominal surgery | 1 | 28 | 30 | 3.00 (-8.32 to 14.32) |
| *48 hours* | | | | |
| Abdominal surgery | 2 | 64 | 66 | -9.40 (-32.90 to 14.09) |
| Non abdominal surgery | 1 | 28 | 39 | 3.00 (-7.04 to 13.04) |
| **Postoperative morphine administration** | | | | |
| Abdominal surgery | 10 | 271 | 274 | -8.72 (-12.22 to -5.23)** |
| Non abdominal surgery | 1 | 44 | 45 | -6.90 (-37.29 to 23.49) |




* on a 100 points visual analog scale
** in milligrams

Fig. 3 Sensitivity analyses by type of surgery




**Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery (Review)**

Kranke P, Jokinen J, Pace NL, Schnabel A, Hollmann MW, Hahnenkamp K, Eberhart LHJ, Poepping DM, Weibel S

Cochrane Library

Cochrane Database of Systematic Reviews

# Lidocaina i.v. si recuperarea postoperatorie

| Type of Surgery | References | Bolus | Infusion | Duration | Results | Evidence |
|---|---|---|---|---|---|---|
| Open abdominal | Colorectal | | | | Decreased pain scores and opioid consumption; decreased nausea, duration of ileus, and length of hospitalization | Strong: benefit shown in multiple studies or meta-analyses |
| | Kuo *et al.* 2006[23] | 2 mg/kg | 3 mg · kg$^{-1}$ · h$^{-1}$ | 30 min before to end surgery | | |
| | Herroeder *et al.* 2007[24] | 1.5 mg/kg | 2 mg/min | Before induction to 4 h PO | | |
| | Swenson *et al.* 2010[21] | No bolus | 1–3 mg/min | Before induction to return of bowel function | | |
| | Abdominal | | | | | |
| | Koppert *et al.* 2004[25] | 1.5 mg/kg | 5 mg · kg$^{-1}$ · h$^{-1}$ | 30 min before incision to 1 h PO | | |
| | Baral *et al.* 2010[26] | 1.5 mg/kg | 1.5 mg · kg$^{-1}$ · h$^{-1}$ | 30 min before incision to 1 h PO | | |
| Laproscopic abdominal | Colectomy | | | | Decreased pain scores and opioid consumption; duration of ileus | Strong: benefit shown in multiple studies or meta-analyses |
| | Kaba *et al.* 2007[3] | 1.5 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ during surgery, 1.33 mg · kg$^{-1}$ · h$^{-1}$ PO | Induction to 24 h PO | | |
| | Wongyingsinn *et al.* 2011[27] | 1.5 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ during surgery, 1 mg · kg$^{-1}$ · h$^{-1}$ PO | Before induction to 48 h PO | | |
| | Tikuišis *et al.* 2014[28] | 1.5 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ during surgery, 1 mg · kg$^{-1}$ · h$^{-1}$ PO | Before induction to 24 h PO | | |
| | Cholecystectomy | | | | | |
| | Lauwick *et al.* 2008[29] | 1.5 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ | Induction to end of surgery | | |
| | Saadawy *et al.* 2010[30] | 2 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ | Before induction to end surgery | | |
| | Gastrectomy | | | | | |
| | Kim *et al.* 2013[31] | 1.5 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ | Preoperatively to end surgery | | |
| | De Oliveira *et al.* 2014[32] | 1.5 mg/kg | 2 mg · kg$^{-1}$ · h$^{-1}$ | Before induction to end surgery | | |

**Perioperative Use of Intravenous Lidocaine**

Lauren K. Dunn, M.D., Ph.D., Marcel E. Durieux, M.D., Ph.D.

Anesthesiology 2017; 126:729–37

# i.v. lidocaina si recuperarea postoperatorie

- PONV: the incidence was significantly ↓ in patients who received IVLI (25%) than in those who did not (35%)
- Postoperative ileus: most studies more rapid resumption of postoperative ileus with 5-11 hrs
- LOS: most of studies ↓ LOS in IVLI group (1-3 days); 3 studies no difference


Can J Anesth/J Can Anesth (2011) 58:22–37
DOI 10.1007/s12630-010-9407-0

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# Alte modalitati de analgezie

- TAP
- "TAP blocks are easily performed, cost-effective, and an opioid-sparing adjunct for laparoscopic colorectal surgery, with minimal procedure-related morbidity. The evidence is in concordance with several of the goals of ERAS pathways."

- "TAP block combined with an opioid-sparing analgesia in the setting of the laparoscopic colorectal surgery and ERAS program is feasible and effective in postoperative pain control"

- Infiltrarea plagii

Kim Alexander J., Yong Robert Jason, and Urman Richard D.. Journal of Laparoendoscopic & Advanced Surgical Techniques. September 2017, 27(9): 909-914.
Pirrera B, Alagna V, Lucchi A, et al. Transversus abdominis plane (TAP) block versus thoracic epidural analgesia (TEA) in laparoscopic colon surgery in the ERAS program. Surg Endosc. 2017 Jul 1. doi: 10.1007/s00464-017-5686-7. [Epub ahead of print]

# Perioada postoperatorie

- Abordare fast track unde este posibil si chirurgul agreeaza:

- Analgezie multimodala: peridurala/xilina (48-72 h)+ AINS+Paracetamol+ opioid (morfina)PCA

  Obs!AINS si incidenta fistulelor digestive!?

- Alimentare/mobilizare precoce: ziua interventiei
- Drenuri minime/fara
- Sonda vezicala? Daca da, scoasa rapid

Ionescu D, Iancu C, Ion D, et al. Implementing fast-track protocol for colorectal surgery: a prospective randomized clinical trial. World J Surg 2009;33(11):2433-8.
Wang LH, Fang F, Lu CM ,et al. Safety of fast-track rehabilitation after gastrointestinal surgery: systematic review and meta-analysis. World J Gastroenterol. 2014;20(41):15423-39.

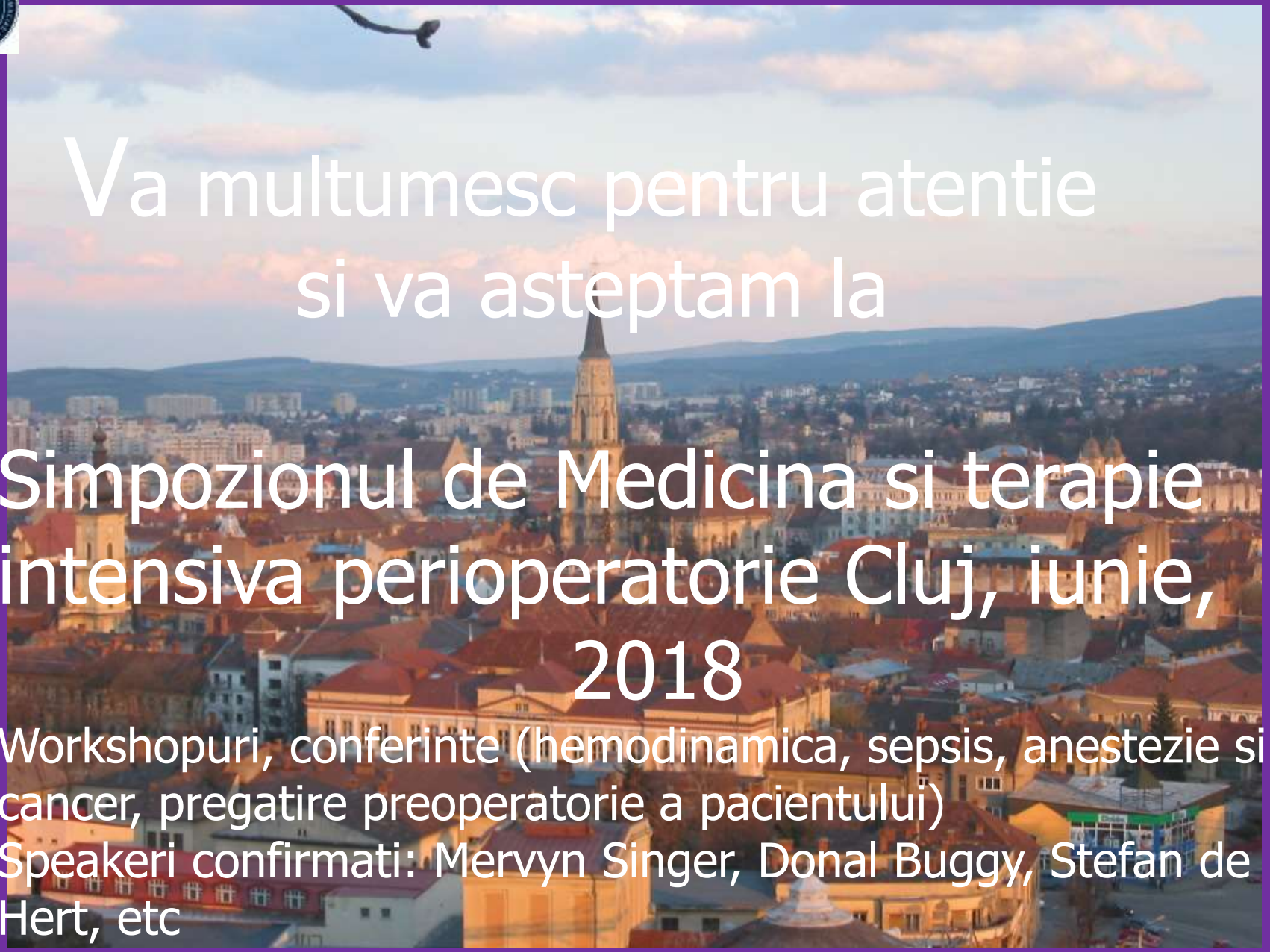
# Perioada postoperatorie

- Albuminele!!!
- Atentie la hipoalbuminemia de dilutie in ziua/prima zi postoperator !!!!

- A la longue:
- Durere cronica
- Recidiva

# In concluzie

- “Toate-s vechi si noua toate!!!”
- Exista cateva etape cheie in care putem influenta evolutia si poate chiar performanta chirurgicala
- Key points
- Albuminele
- Evaluarea riscului
- Terapia multimodala a durerii
- Vezi in viitor TIVA vs inhalation
- Lidocaina i.v./TAP
- Reevaluat locul periduralei
- Fast track
- Urmarire



# Va multumesc pentru atentie si va asteptam la

# Simpozionul de Medicina si terapie intensiva perioperatorie Cluj, iunie, 2018

Workshopuri, conferinte (hemodinamica, sepsis, anestezie si cancer, pregatire preoperatorie a pacientului)
Speakeri confirmati: Mervyn Singer, Donal Buggy, Stefan de Hert, etc