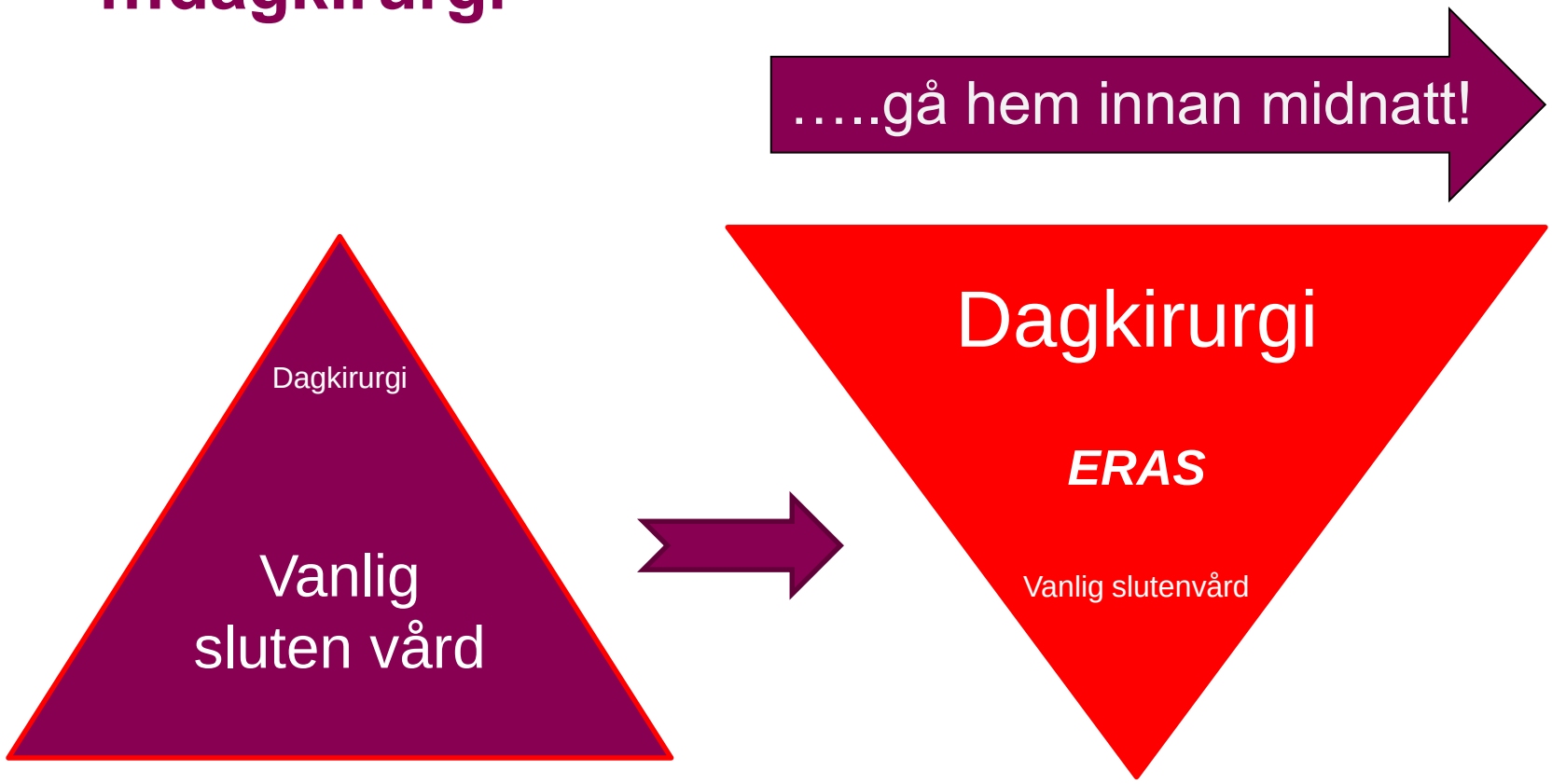
Opiatfri dagkirurgisk vård.
Är det möjligt eller önskvärt?

Jan G Jakobsson
Adjungerad Professor i Anestesi & Intensivvård

…dagkirurgi


…..gå hem innan midnatt!
Dagkirurgi
Vanlig
sluten vård
Dagkirurgi
ERAS
Vanlig slutenvård

Målstyrd Peroperativt Omhändertagande

ET 0.7 – 1.3 MAC & BIS 40 – 60

Multimodal analgesi

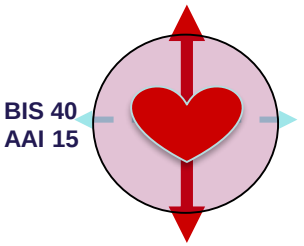
Riskbaserad PONV profylax

Normoxi, SpO_2 94-99
hyperoxi FiO2 .8 kolonkir???
Normocapni - Tv 6-8 ml/kg
PEEP 5-10 cmH_2O?

Adekvat Hb
Tillgodose syrgastransport
DO2
ASA 1 > 70, ASA 2 > 80, ASA 3 > 90

Normovolemi
/restriktiv
vätskebehandling

1.3 MAC



0.7 MAC

Minimerar risken för awarness
God kardiovaskulär stabilitet
Snabb återhämtning
Minskad anestesimedelsåtgång
Minskar riskerna för PONV
Minskar riskerna för neurokognitiva effekter

Normoventilation, EtCO2 4.5 - 6.5
Lungprotective ventilation
6-8** ml/kg + **PEEP

Normotemperatur

Bibehåll hjärtminutvolym

Medelblodtryck > 60 – 65 – 70? mmHg
Undvik svägningar
Undvik takykardi

Opioidfri?

…eller minsta effektiva dos?

Intraoperativt

Postoperativt

Smärtbehandling vid dagkirurgi:

Alltid

lokalbedövning;

- *Centralblockad*
- *Regionalblockad*
- *Periferblockad*
- *Lokalt*

Multi-modal smärtstillning

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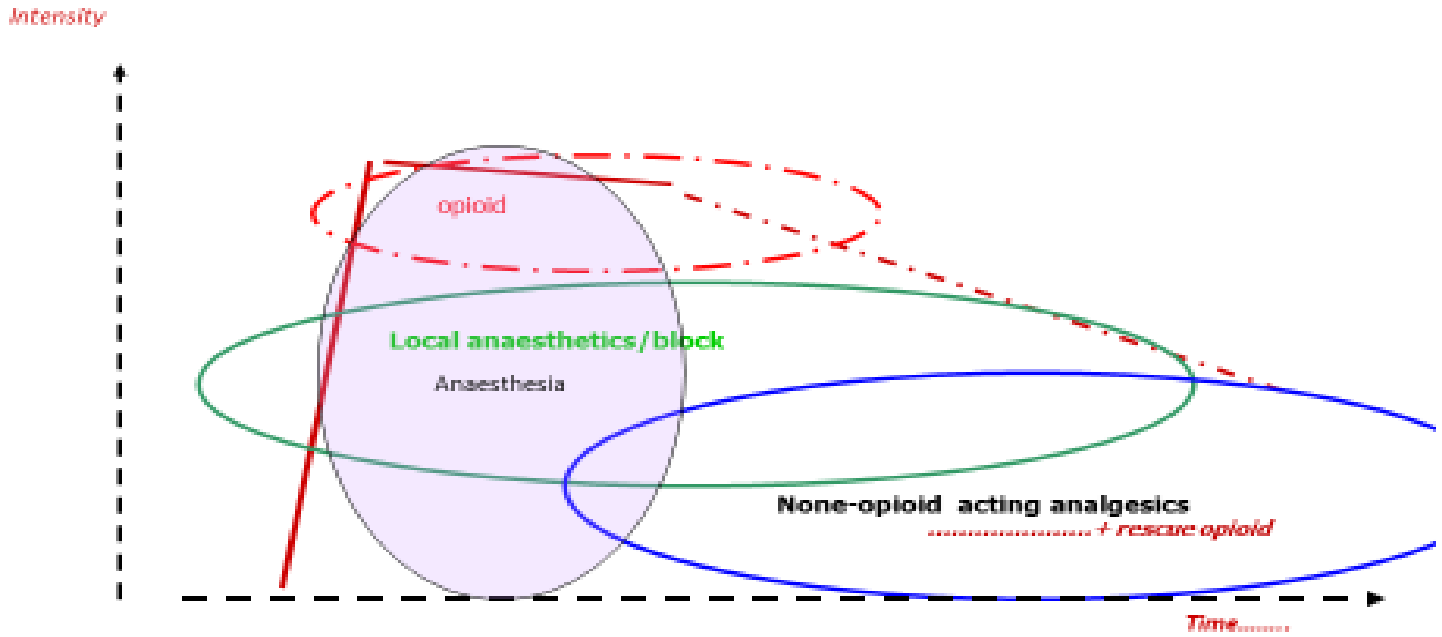
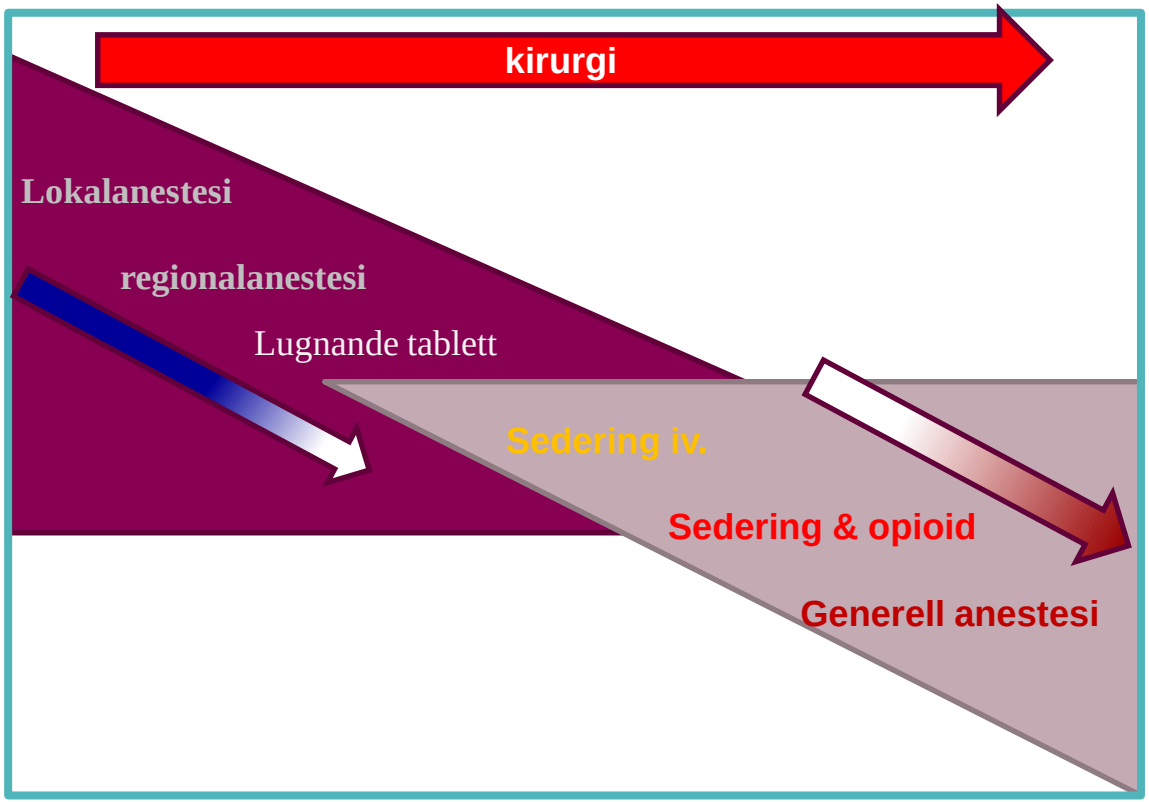


Dagkirurgi: *inte antingen eller utan både och ….*



….alltid lokalbedövning…….

Alltid en balans


Journal of Clinical Anesthesia and Pain Medicine
Scient Open Access
Research Article
A Randomized Controlled, Double-Blind Trial Evaluating the Effect of Opioid-Free Versus Opioid General Anaesthesia on Postoperative Pain and Discomfort Measured by the QoR-40
This article was published in the following Scient Open Access Journal:
Journal of Clinical Anesthesia and Pain Medicine
Received January 31, 2018; Accepted February 07, 2018; Published February 15, 2018
Abstract
Rev Bras Anestesiol. 2015;65(3):191–199
REVISTA BRASILEIRA DE ANESTESIOLOGIA
ELSEVIER
SCIENTIFIC ARTICLE
Opioid-free total intravenous anesthesia with
dexmedetomidine and lidocaine infusions for
laparoscopic cholecystectomy: a pro
randomized, double-blinded study
Mefkur Bakan, Tarik Umutoglu, Ufuk Topuz,
Mehmet Bayram, Huseyin Kadioglu, Ziya Salihc
OFA växande intresse!
Letter to the Editor
pISSN 2005-6419 · eISSN 2005-7563
free anesthesia using
inuous dexmedetomidine
nd lidocaine infusions in spine
surgery
Kim, Raheel Bengali, and T. Anthony Anderson
British Journal of Anaesthesia 112 (5): 906–11 (2014)
Advance Access publication 18 February 2014 · doi:10.1093/bja/aet551
BJA
Opioid-free total intravenous anaesthesia reduces postoperative nausea and vomiting in bariatric surgery beyond triple prophylaxis
P. Ziemann-Gimmel, A. A. Goldfarb, J. Koppman and R. T. Marema
Vi är en del av Stockholms läns landsting

Opioid-free total intravenous anesthesia with propofol, *dexmedetomidine and lidocaine infusions* for laparoscopic cholecystectomy: a prospective, randomized, double-blinded study.

Bakan M [et] al. Braz J Anesthesiol. 2015 May-Jun;65(3):191-9.

BACKGROUND AND OBJECTIVES: Intraoperative use of opioids may be associated with postoperative hyperalgesia and increased analgesic consumption. Side effects due to perioperative use of opio…rative nausea and vomiting may delay discharge. We hypothesized that total intravenous anesthe…caine and dexmedetomidine as an opioid substitute may be an alternative technique for lapar…omy and would be associated with lower fentanyl requirements in the postoperative period and less…erative nausea and vomiting.

METHODS: 80 Anesthesiologists I-II adults were scheduled for elective laparoscop… Patients were randomly allocated into two groups to have either **opioid-free anesthesia wit…ne, lidocaine, and propofol infusions (Group DL)** or opioid-based …propofol infusions (Group RF). All patients received a standard multimodal analgesia…esia device was set to deliver IV fentanyl for 6h after surgery. The primary outcome…ntanyl consumption.

RESULTS: Fentanyl consumption at postoperative 2nd hour was statistically signifi… DL, compared with Group RF, which were 75 ± 59 µg and 120 ± 94 µg respectively, while it was com…operative 6th hour. During anesthesia, there were more hypotensive events in Group RF, while there were n…tensive events in Group DL, which were both statistically significant. Despite higher recovery times, Group D… significantly lower pain scores, rescue analgesic and ondansetron need.

…men varför?

CONCLUSION: *Opioid-free anesthesia with dexmedetomidine, lidocaine and propofol infusions may be an alternative technique for laparoscopic cholecystectomy especially in patients with high risk for* ***postoperative nausea and vomiting.***

Opioid-free total intravenous anaesthesia reduces postoperative nausea and vomiting in bariatric surgery beyond triple prophylaxis.

…men varför?

- Ziemann-Gimmel P[1], Br J Anaesth. 2014 May;112(5):90
- **BACKGROUND:** Patients undergoing bariatric surgery … perative nausea and vomiting (PONV). Despite triple PONV prophylaxis, up to 42.7% … metic rescue medication (AERM).
- **METHODS:** This prospective, randomized study was co… r 2011 to October 2012. In the Classic group (n=59), patients underwent genera… olatile anaesthetics and opioids. **In the Total i.v. anaesthesia (TIV… =60), patients underwent opioid-free TIVA with prop… ine, and dexmedetomidine. The se… NV was assessed using a Likert scale (none, mild, m… d severe).**
- **RESULTS:** Patients in both groups had sim… gical procedure, and PONV risk scores and required similar amounts of postoperative opio… 22 patients (37.3%) reported PONV compared with 12 patients (20.0%) in the TIVA group [P=0.… 61)]. The absolute risk reduction was 17.3% (number-needed-to-treat=6). The severity of nausea… ly different in both groups (P=0.02). The severity of PONV was significantly worse in the Classic group. Th… o difference either in the number of patients requiring AERM in the postoperative period or in the number of AE… doses required.
- ***CONCLUSIONS:*** *This prospective randomized study demonstrates that opioid-free TIVA is associated with a* ***large reduction in relative risk of PONV compared with balanced anaesthesia.***

vinster

- **PONV**
- *Risk för tillvänjning*
- Andra biverkningar
  - Andningsdepression
  - Förstoppning
  - Yrsel
  - ..

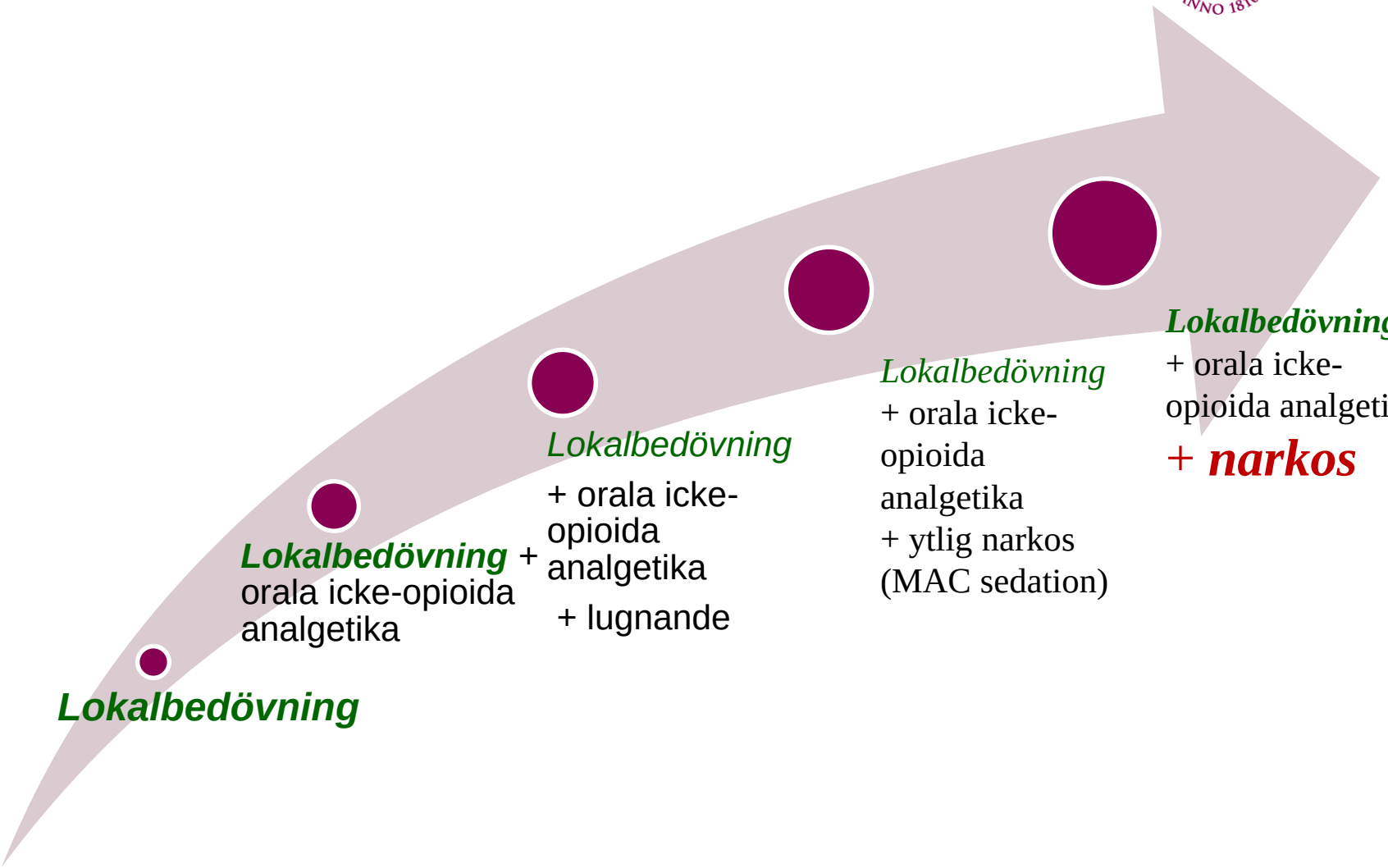
  → Hyperalgesi
  - Cancer – metastaser …

    → kognition

  → ….

Dagkirurgi


Ett bra omhändertagande
Lokalanestesi
Kirurgi
Betapred
Paracetamol
NSAIDs

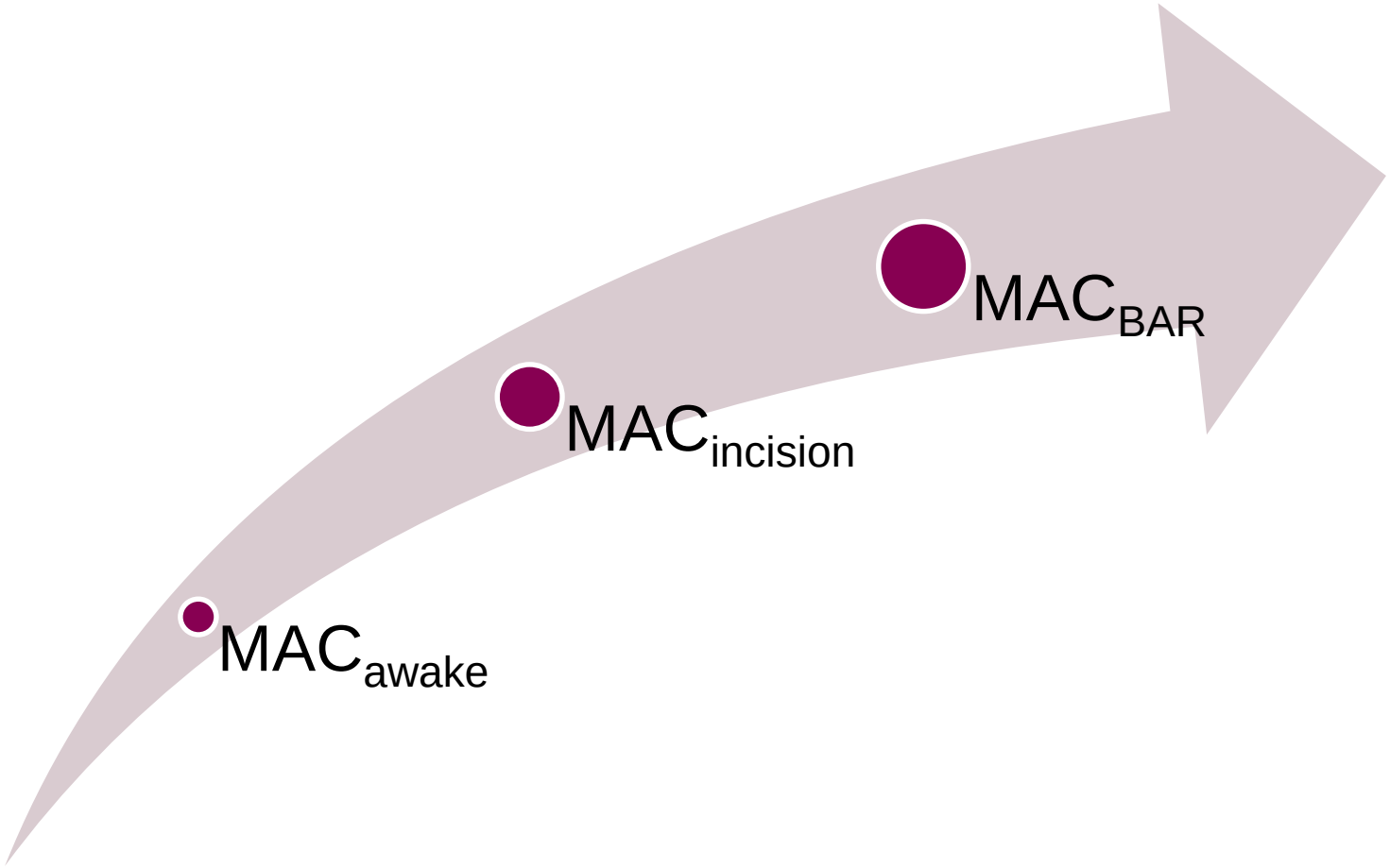

Lokalbedövning
Lokalbedövning + orala icke-opioida analgetika
Lokalbedövning + orala icke-opioida analgetika + lugnande
Lokalbedövning + orala icke-opioida analgetika + ytlig narkos (MAC sedation)
Lokalbedövning + orala icke-opioida analgetika + narkos

Alternativ?

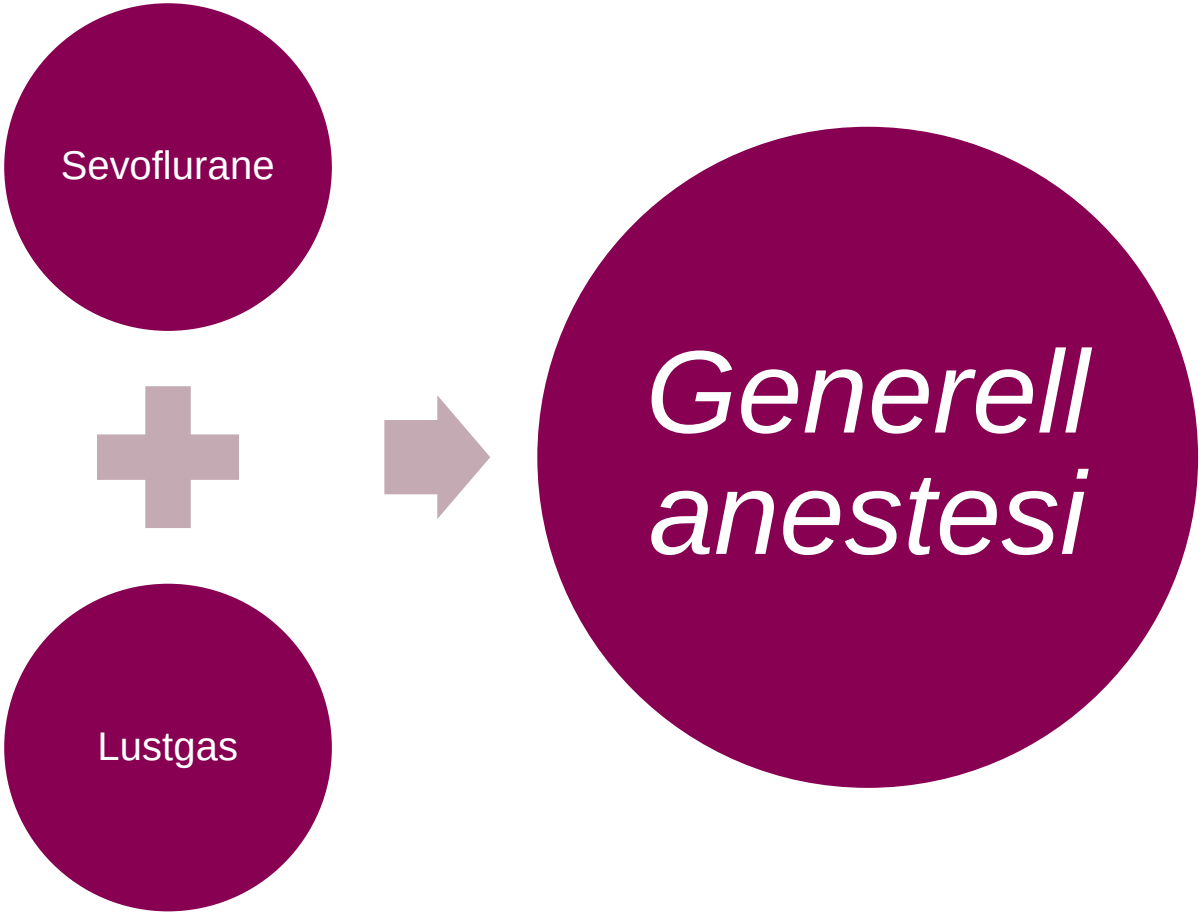
Opioidfri anestesi

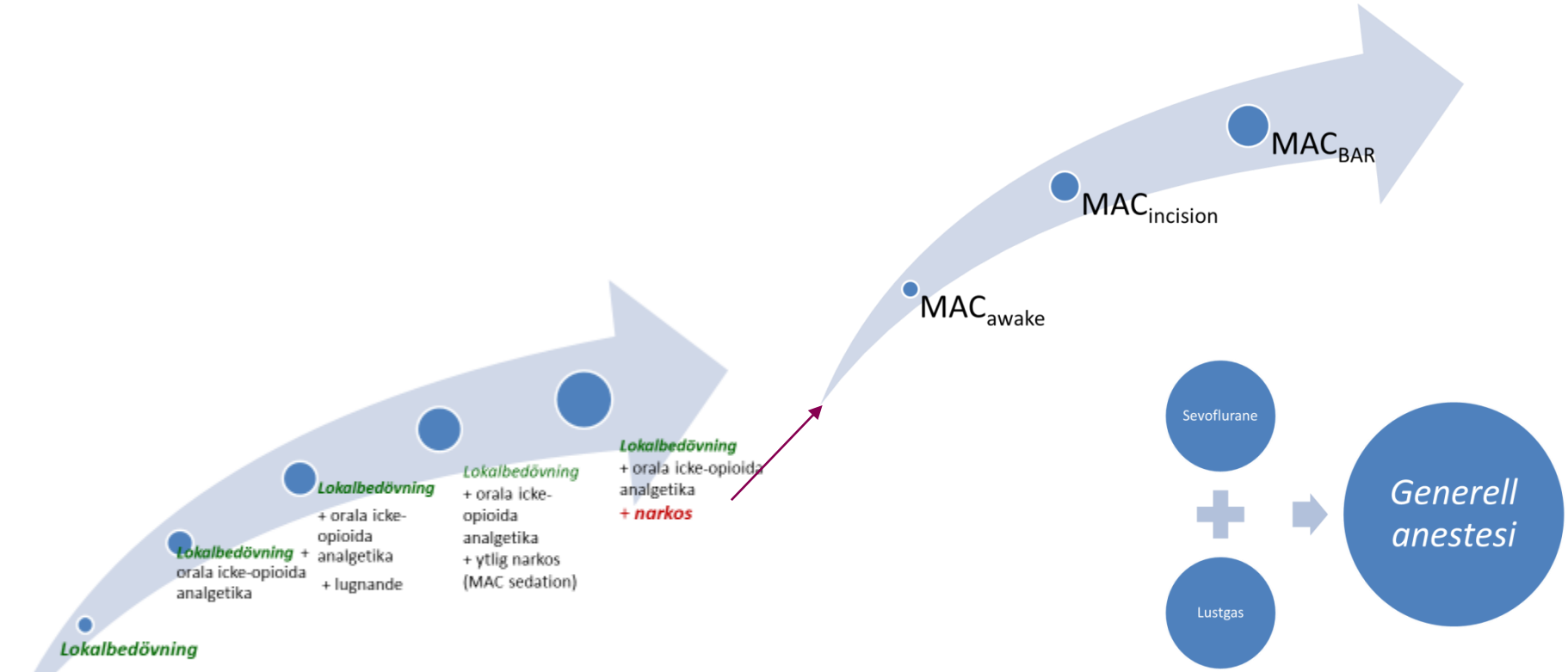
- *”inhalation”*
- *”intravenös”*
- *regional*

Klassisk inhalationsanestesi



Välkänd interaktion

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Lokalbedövning + orala icke-opioida analgetika + narkos
MAC awake
MAC incision
MAC BAR
Sevoflurane
Lustgas
Generell anestesi

Original Article

Omitting fentanyl reduces nausea and vomiting, without increasing pain, after sevoflurane for day surgery*

I. Smith[*], G. Walley[†], S. Bridgman[†]

University Hospital of North Staffordshire, Departments of [*]Anaesthesia, [†]Postgraduate Medicine, Stoke-on-Trent, Staffordshire, UK

All patients received prophylactic analgesia with our standard regimen of slow-release ibuprofen, 1600 mg, given by mouth about an hour before surgery. No other sedative or anxiolytic premedication was administered. Following the attachment of rou-

- *Immediately after LMA insertion, the fresh gas flow was reduced to 0.3L/min of oxygen and 0.4L/min of N2O and the sevoflurane vapourizer was turned off until the end-tidal sevoflurane concentration (ETsevo) had decreased towards 1.3–1.5% and/or the patient demonstrated signs of inadequate anaesthesia*.

- *For any episodes of patient movement or other signs of inadequate anaesthesia, the ETsevo concentration was rapidly increased using the '**inhaled bolus**' technique, whereby the vapourizer setting was increased to 8% and the fresh gas flow increased to 6L/min for a period of up to 1min, after which low fresh gas flow and lower vapourizer settings were restored.*

Karolinska Institutet

Table 1. Patient characteristics in the three study groups and in the combination of the two groups that received fentanyl.

	Group 1 (fentanyl) $n = 71$	Group 2 (fentanyl-dexamethasone) $n = 72$	Groups 1 and 2 combined $n = 143$	Group 3 (no supplement) $n = 73$
Age (yr)	44.5 ± 16.2	42.3 ± 13.5	43.4 ± 14.9	43.0 ± 15.5
Weight (kg)	78.9 ± 16.3	80.5 ± 16.4	79.7 ± 16.3	79.9 ± 16.2
ASA (I/II)	37/34	41/31	78/65	38/35
Received i.v. fluids	39	45	84	42
Surgical procedure				
Breast surgery	24	14	38	19
Hernia repair	17	19	36	20
Open urology	14	19	33	11
Circumcision	10	13	23	14
Other	6	7	13	9
Anaesthesia time (min)	40.5 ± 17.6	39.7 ± 17.4	40.1 ± 17.4	39.2 ± 17.3
Risk factors for PONV				
Female gender	23	21	44	26
Non-smoker	55	50	105	54
Previous PONV	11	13	24	17
Motion sickness	15	16	31	13
0 or 1 risk factors	42	43	85	44
2 or more risk factors	29	29	58	29

Table 2. Incidence, severity and requirement for treatment of postoperative nausea and vomiting in the three study groups and in the combination of the two groups that received fentanyl up to discharge from the day unit and during the entire first 24 h following surgery and patients' verbal rating of their satisfaction with the control of sickness assessed at 24 h.

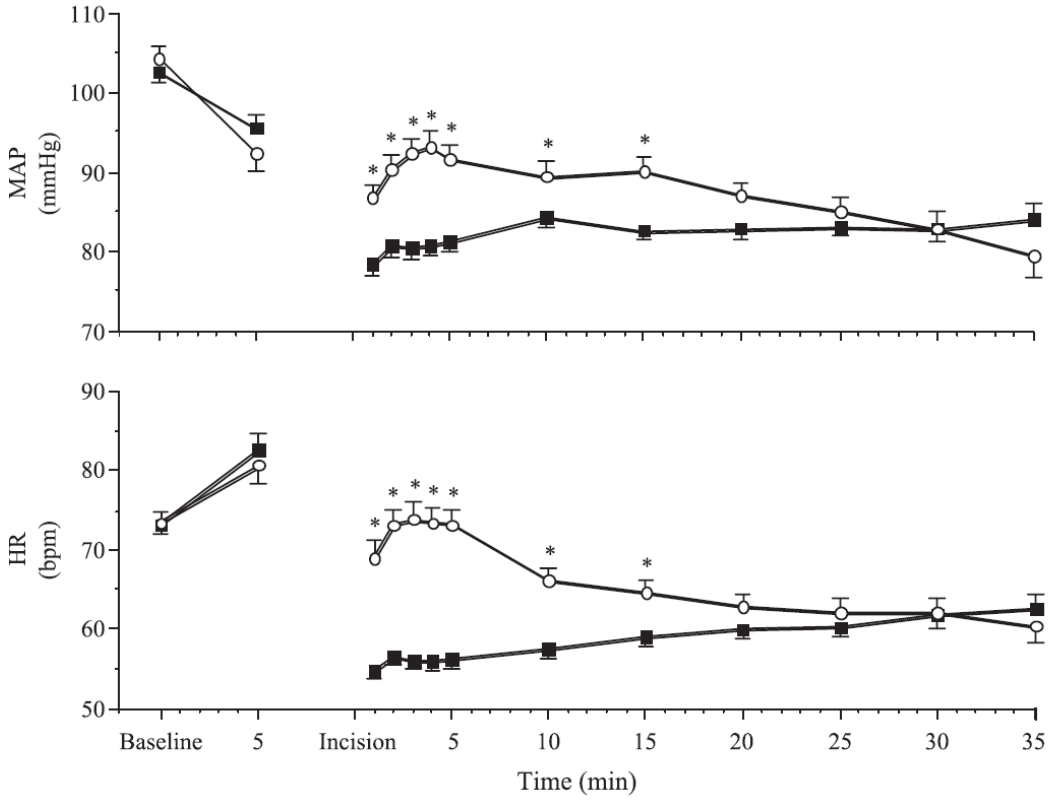
	Group 1 (fentanyl) $n = 71$	Group 2 (fentanyl-dexamethasone) $n = 72$	Groups 1 and 2 combined $n = 143$	Group 3 (no supplement) $n = 73$
PONV before discharge	21	29	50*	16
Nausea	21	26	47*	14
Vomiting	10	9	19	4
Moderate–severe nausea or vomiting	14*	12*	26*	4
Required antiemetics	17†	22†	39†	5
PONV within 24 h	31	32	63	23
Nausea	31	29	60*	20
Vomiting	14	10	24	11
Moderate–severe nausea or vomiting	20	13	33	12
Satisfaction with control of PONV	10 (9–10)	10 (9–10)	10 (9–10)	10 (10–10)
Satisfaction <8 out of 10	12	12	24	6

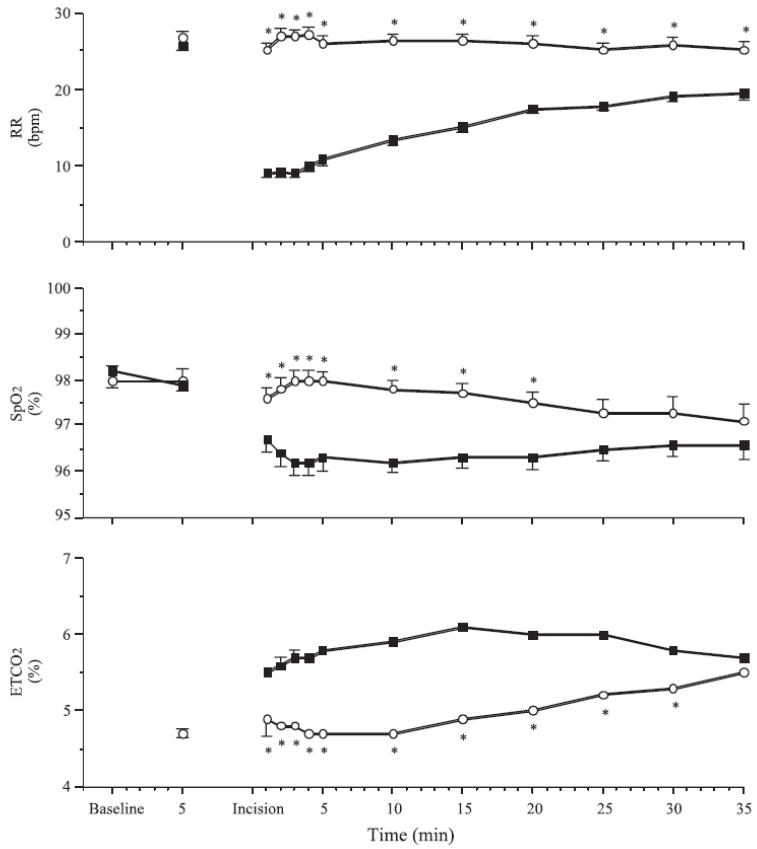
PONV

Table 3. Incidence, severity and requirement for treatment of postoperative pain in the three study groups up to discharge from the day unit and during the entire first 24 h following surgery and patients' verbal rating of their satisfaction with the control of pain and their overall day surgery experience assessed at 24 h.

	Group 1 (fentanyl) $n = 71$	Group 2 (fentanyl-dexamethasone) $n = 72$	Group 3 (no supplement) $n = 73$
Worst pain up to discharge			
None	28	27	32
Mild	31	26	29
Moderate	12	16	9
Severe	0	3	3
Analgesia before discharge			
None	45	39	42
Simple oral	3	6	8
Compound oral	22	25	22
Systemic opioid	1	2	1
Worst pain in first 24 h			
None	18	16	18
Mild	35	28	32
Moderate	15	23	17
Severe	3	5	6
Satisfaction with control of pain	10 (9–10)	10 (8–10)	10 (8–10)
Overall satisfaction	10 (10–10)	10 (9–10)	10 (9–10)

Smärta


MAP (mmHg)
110
100
90
80
70
HR (bpm)
90
80
70
60
50
Baseline
5
Incision
5
10
15
20
25
30
35
Time (min)


RR (bpm)
SpO2 (%)
ETCO2 (%)
Baseline
5
Incision
5
10
15
20
25
30
35
Time (min)

Opioid-free anesthesia for breast cancer surgery: An observational study

Variable	Gr NO	Gr O	*P*
Age (years)	52.7±20.5	55.4±18.8	>0.05
Body mass index (kg/m²)	23.3±4.8	22.5±3.8	>0.05
Duration of anesthesia (min)	95.8±25.4	96.7±20.5	>0.05
Duration of surgery (min)	70.8±28.5	74±26.8	>0.05

	Hemodynamic data					
	0 min	5 min	15 min	30 min	45 min	*P*
NIBP (mmHg)						
Gr O	84 (14.3)	74 (23.6)	69 (13.7)	74 (16.5)	74 (11.8)	>0.05
Gr NO	88 (12.6)	78 (24.6)	70 (18.3)	70 (14.4)	71 (12.6)	>0.05
HR (beats/min)						
Gr O	88 (12.6)	86 (28.8)	82 (18.4)	76 (21.8)	78 (18.0)	>0.05
Gr NO	86 (11.8)	78 (10.2)	74 (10.5)	70 (8.7)	72 (6.8)	>0.05

Data is presented as mean (standard deviation); NIBP (noninvasive blood pressure) and HR (heart rate) before (0) and 5, 15, 30, 45 min after induction of anesthesia in the two groups

J Anaesthesiol Clin Pharmacol. 2018 Jan-Mar; 34(1): 35–40.

Opioid-free anesthesia for breast cancer surgery: An observational study

- Twenty four adult American Society of Anesthesiologists grade I–III patients posted for modified radical mastectomy (MRM) with axillary dissection were induced
- After application of standard monitoring, including ECG, noninvasive blood pressure, and pulse oximetry, all patients were administered intravenous midazolam 1–2 mg and ondansetron 4 mg.
- In the patients of the nonopioid group (Gr NO);
  - → an i-gel was inserted after induction with intravenous propofol (2–3 mg/kg).
  - → patient was maintained on spontaneous ventilation (assisted if needed with pressure support to keep $EtCO_2$ 30–40 mm Hg).
  - → **Isoflurane was delivered to achieve 0.8–1.0 minimum alveolar concentration (MAC).**
- After LA infiltration under ultrasound guidance, PECS block was administered at the level of the fourth rib in the mid-axillary line.

J Anaesthesiol Clin Pharmacol. 2018 Jan-Mar; 34(1): 35–40.

- *If adjunct analgesia was required during anaesthesia, this was provided by i.v. fentanyl, alfentanil or remifentanil.*
- *Patients given intraoperative morphine were excluded from the study.*
- *Prophylatic anti-emetics were not employed.*

Opioid-free anesthesia for breast cancer surgery: An observational study

	No opioid	Opioid	RR (95% CI)	NNT (95% CI) Benefit	*P*
PONV	1	7	0.12 (0.17-0.9)	3.4 (2-11.8)	0.04
Early discharge	18	9	0.4 (0.18-0.85)	2.6 (1.6-8.7)	0.01
0/1 dose analgesia	10	0	0.58 (0.4-0.8)	2.4 (1.6-4.5)	0.002

PONV, Postoperative nausea and vomiting

	Group NO	Group O
Time in postoperative recovery room min (mean, SD)	72.6 (17.2)	137.3 (50.6)*
VAS score over 24 h median (*R*)	2.3 (2.5)	3.5 (2)*

**P*<0.001*

J Anaesthesiol Clin Pharmacol. 2018 Jan-Mar; 34(1): 35–40.

Efficacy of inhalational sevoflurane anesthesia induction on inhibiting the stress response to endotracheal intubation in children with congenital heart disease.

- Wang CH[1], Luo J, Li J, Zhang JZ, Huang SY, Shao W, Ma HS. Eur Rev Med Pharmacol Sci. **2018 Feb;22(4)**:1113-1117.

- **OBJECTIVE:** To investigate the efficacy of inhalational sevoflurane anesthesia induction on inhibiting the stress response to endotracheal intubation in pediatric patients with congenital heart disease (CHD).
- **PATIENTS AND METHODS:** Forty ASA physical status I/II pediatric patients scheduled for interventricular septal defect repair or interatrial septal defect repair, were randomly divided into two groups (20 each): intravenous induction group (Group C) and inhalational sevoflurane anesthesia induction group (Group D). In group C, anesthesia was induced with midazolam, pipecuronium bromide and fentanyl, and the children were examined by radial artery monitoring after the consciousness extinction, and 5 and 10 min after endotracheal intubation (T4), 1 and 3 min after intratracheal intubation (T5,6), HR and bispectral index (BIS) were monitored, and MAP of T2-T6 points was recorded. Ulnar vein blood samples were taken for determination of Endothelin (ET) and Thromboxane A2(TXA2) in the points of consciousness extinction, and 5 and 10 min after endotracheal.

…bara sevoflurane vid intubation av *hjärtbarn*……

- **RESULTS:** All the children were well examined by endotracheal intubation. Compared with the baseline value at T0, there was no significant difference of HR in group D, but the HR of group C was decreased at T2, T3, T4 and T6. The BIS of the two groups were decreased at T1-T6 ($p<0.05$). Compared with the values at T2, they were increased at T5 and T6 in group C, and increased at T6 in group D ($p<0.05$). Compared with group C, the MAP of group D was decreased at T5, and the BIS of the two groups was decreased at T2-T6 ($p<0.05$). There were no significant differences of ET and TXA2 between groups.
- *CONCLUSIONS: It is well inhibited the endotracheal intubation stress response in children with congenital heart diseases using sevoflurane inhalational anesthesia induction.*

Alternativ?

Opioidfri anestesi

- *”inhalation”*
- *”intravenös”*
- *regional*

”exprimentella tillägg”

- Clonidin - catapresan
- Gabapentin
  - → Pregabalin
  - → Dexmeditomidine - Dexdor
  - → Intravenöst xylokain
  - → Ketamin/Ketanest
  - → Magnesium
    - .....
      - → **Beta-blockerare**

”exprimentella tillägg”

- Clonidin - catapresan
- Gabapentin
  - → Pregabalin
  - → Dexmeditomidine - Dexdor
  - → Intravenöst xylokain
  - → Ketamin/Ketanest
    - .....
      - → Beta-blockerare

Anestesi protokol

OFA Induction from Mulier

- 10 minutes prior to induction
  - Sympathetic Block – Dexmedetomindine 0.3 mcg/kg IBW (20-30 mcg)
- 1 minute prior to induction
  - Hypnotic and rapid stress block – Lidocaine 1.5 mg /kg (100 mg)
- Induction
  - Hypnotic and stress block – Propofol 2.5 mg/kg IBM (200mg)
- Hemodynamic Stabilization
  - Rapid preload reduction – Magnesium Sulfate 40 mg / kg IBW (2.5 g)
  - Neuromuscular Blocker if needed for anesthesia or surgery
- Anti-inflammatory agents before surgery – Dexamethasone 10 mg/ Diclofenac 75 – 150 mg
- NMDA antagonist – Ketamine 10 – 25 mg (bolus / slow infusion / end of surgery)
- On standby
  - Beta-Blocker – metoprolol 1 – 5 mg
  - Calcium channel blocker – nicardipine 1 – 5 mg
  - Ephedrine 3 – 9 mg
  - Phenylephrine 10 – 30 mcg

Enköping ad modum Igor Zadonsky

OFA keep it simple 2018

Adjusted protocol for opioid free laparoscopic day case surgery

developed by Igor Zadonsky, MD

1. Premedication:

Consider: **Gabapentin** 300 mg, **Melatonin** 10 mg PO 1h before operation

2. Preinduction:

Dexmedethomidine: 0,2-0,25 mcg/kg *15-20 min before induction*.

Enköping ad modum Igor Zadonsky

3. Induction of anesthesia:

Lidocaine: 1 - 1,5 mg/kg iv bolus

Dexamethazone: 10 mg

Propofol: 2-3 mg/kg

Consider: **Magnesium sulfate:** 500 -750 mg (7,5-8 mg/kg) PRN only

Rocuronium: 0,9 mg/kg or as usually

Ketamine: 10–20 mg (about 0,2 mg/kg) iv 3 - 5 min **before incision**

Enköping ad modum Igor Zadonsky

4. Maintanence:

Sevoflurane or TCI with **Propofol** under Entropy /BIS monitoring

Lidocaine infusion 1-2 mg/kg/h.

Lidocain could instead be given as bolus max 1.5 mg/kg/h if needed. Calculate toxic dose!

Consider: Bolus **Magnesium sulfate:** 500 -750 mg if not got on induction PRN only

Paracetamol: 1gr and some **NSAID** (we use **Parecoxib sodium** 40 mg) before operation ends

Stop **Lidocaine** infusion about 15- 30 min before end of operation

Enköping ad modum Igor Zadonsky

5. Postoperative analgesia:

Continue analgesia with **Paracetamol:** 1 gr x 4 (ceiling effect) PO and **NSAID** as usual

Opioids in minimal dose only if not satisfactory effect from **NSAID** ex. 1 mg **Ketobemidone** iv or **Oxynorm** 5-10 mg sl.

At home: **Paracetamol/NSAID** on scheduled base.

 # Adjust doses like for older or frail patients. Base doses on IBW for obese patients

God luck and keep it simple!

DS ad modum Piotr Harbut

OFA på DS

Premedicinering

- Paracetamol 1,5-2g
- Celebra 200-400mg
- Alt gabapentin 600-900mg

OFA på DS

Anestesi induktion

- Dexmedetomidin (Dexdor) bolus 20-30µg iv (ges tidigt)
- Lidokaine bolus 1mg/kg (ges efter uppkoppling av övervakning)
- Ketamin bolus 25mg (ges efter uppkoppling av övervakning)
- Betapred singel dos 0,1mg/kg
- Ev Magnesium singel dos 40-50mg/kg
- Propofol 2-3mg/kg, NMBA vb

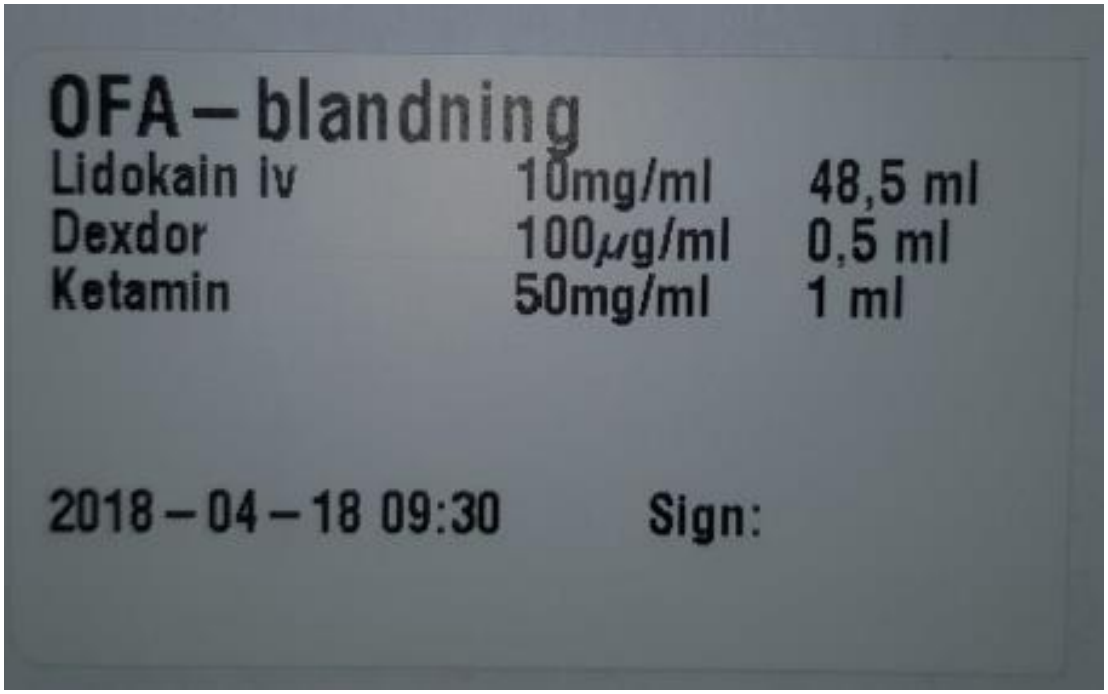
OFA på DS

OFA-blandning till infusion

ketamine1mg/ml+dexmedetomidine1µg/ml+lidokain10mg/ml

Anestesi underhållning - OFA-blandning Dos 0,1ml/kg/h (IBW)/Sevo(propofol)/NMBA

Anestesi avslutning - OFA-blandning fortsätter i halva dos till postop


OFA – blandning
Lidokain iv 10mg/ml 48,5 ml
Dexdor 100µg/ml 0,5 ml
Ketamin 50mg/ml 1 ml
2018 – 04 – 18 09:30 Sign:

Pilot för iv lidokain på Norrtälje sjukhus

- **Tillvägagångssätt**
  → Börja med bolusdos enligt nedan. Fortsätt därefter med infusion enligt nedan.
- **Bolusdos: *1,5 mg/kg*** under, infusionstakt ***4 minuter***.
- **Infusion:** Starta med ***1 mg/kg/h***. I normalfallet behöver de flesta patienter mellan 0,5 – 2 mg/kg/h. Den initiala dosen kan alltså behöva sänkas eller höjas beroende på svar.
  - Utan bolusdos tar det -8 timmar innan steady state nås. Detta betyder att man inte ska justera för mycket eller för ofta utan ge det en chans att verka.
    → **Vikt:** ska ställas in efter idealvikt.
    → **Övervakningsnivå:** Vid initiering kontrolleras puls, blodtryck, saturation var 5e min i 20min. Därefter varje halvtimme i 1 timme. Därefter NEWS x 2 om allt förflutit normalt. I annat fall ska såväl ordination som planering individualiseras av ansvarig narkosläkare.
    → Adminsitration: Späd Lidocain 10mg/ml till 4mg/ml genom att blanda 100 ml av Lidocain 10mg/ml med 150ml Natriumklordi 9mg/ml.

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8

Different protocols used today to achieve total opioid-free general anesthesia without locoregional blocks

Eckhard Mauermann, MD, MSc, Postdoctoral Research Fellow [a, b],
Wilhelm Ruppen, MD, Chair of the Pain Relief Unit [a],
Oliver Bandschapp, MD, Consultant Anaesthetist [a, *]

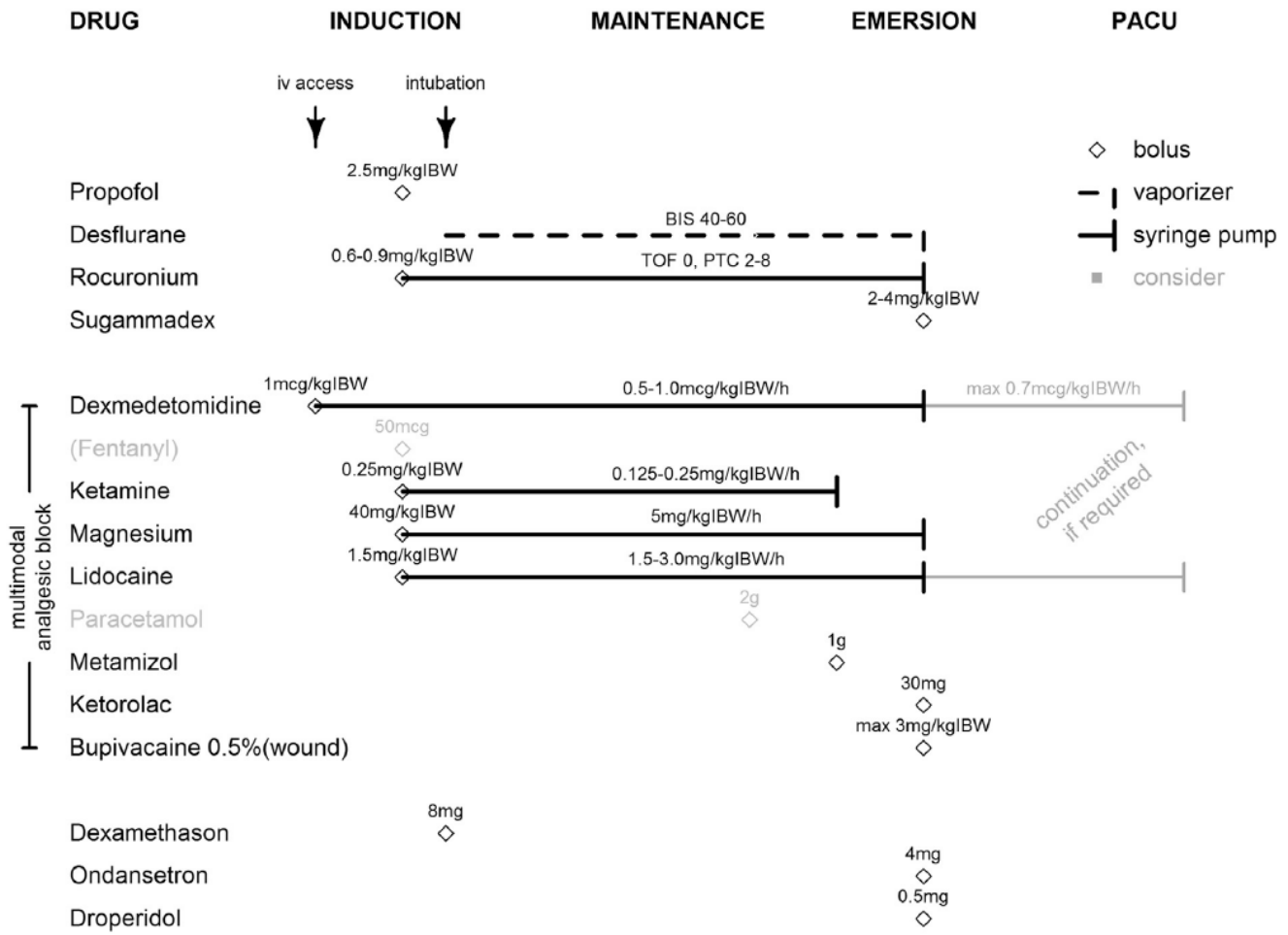
Practice points

- Opioid-free anesthesia is feasible and confers many benefits.
- A truly multimodal approach using several analgesic agents may improve both short- and long-term outcomes.
- We, as perioperative physicians, should take on a leading role in halting the opioid epidemic.

Research agenda

- More and larger clinical trials exploring the efficacy of multimodal, opioid-free analgesic regimens are required.
- A better understanding of potential interactions among non-opioid analgesics is needed.
- Further research is warranted on understanding how analgesic drugs may affect hyperalgesia and persisting pain.

Timing and Dosing of Multimodal Analgesia for Bariatric Surgery



CAVEAT: all dosages meant as clinical guidance only

Continuous intravenous perioperative lidocaine infusion for postoperative pain and recovery.

Kranke P[1], Jokinen J, Pace NL, Schnabel A, Hollmann MW, Hahnenkamp K, Eberhart LH, Poepping DM, Weibel S. Cochrane Database Syst Rev. 2015 Jul 16;(7):CD009642. doi: 10.1002/14651858.CD009642.pub2.

BACKGROUND: The management of postoperative pain and recovery is still unsatisfactory in clinical practice. Opioids used for postoperative analgesia are frequently associated with adverse effects including nausea and constipation. These adverse effects prevent smooth postoperative recovery. On the other hand not all patients may be suited to, and take benefit from, epidural analgesia used to enhance postoperative recovery. The non-opioid lidocaine was investigated in several studies for its use in multi-modal management strategies to reduce postoperative pain and enhance recovery.

OBJECTIVES: The aim of this review was to assess the effects (benefits and risks) of perioperative intravenous lidocaine infusion compared to placebo/no treatment or compared to epidural analgesia on postoperative pain and recovery in adults undergoing various surgical procedures.

SEARCH METHODS: We searched the Cochrane Central Register of Controlled Trials (CENTRAL, Issue 5 2014), MEDLINE (January 1966 to May 2014), EMBASE (1980 to May 2014), CINAHL (1982 to May 2014), and reference lists of articles. We searched the trial registry database ClinicalTrials.gov, contacted researchers in the field, and handsearched journals and congress proceedings. We did not apply any language restrictions.

SELECTION CRITERIA: We included randomized controlled trials comparing the effect of continuous perioperative intravenous lidocaine infusion either with placebo, or no treatment, or with epidural analgesia in adults undergoing elective or urgent surgery under general anaesthesia. The intravenous lidocaine infusion must have been started intraoperatively prior to incision and continued at least until the end of surgery.

DATA COLLECTION AND ANALYSIS: Trial quality was independently assessed by two authors according to the methodological procedures specified by the Cochrane Collaboration. Data were extracted by two independent authors. We collected trial data on postoperative pain, recovery of gastrointestinal function, length of hospital stay, postoperative nausea and vomiting (PONV), opioid consumption, patient satisfaction, surgical complication rates, and adverse effects of the intervention.

MAIN RESULTS: We included 45 trials involving 2802 participants. Two trials compared intravenous lidocaine versus epidural analgesia. In all the remaining trials placebo or no treatment was used as a comparator. Trials involved participants undergoing open abdominal (12), laparoscopic abdominal (13), or various other surgical procedures (20).The risk of bias was low with respect to selection bias (random sequence generation), performance bias, attrition bias, and detection bias in more than 50% of the included studies. For allocation concealment and selective reporting the quality assessment yielded low risk of bias for only approximately 20% of the included studies.We found evidence of effect for intravenous lidocaine on the reduction of postoperative pain (visual analogue scale, 0 to 10 cm) compared to placebo or no treatment at 'early time points (one to four hours)' (mean difference (MD) -0.84 cm, 95% confidence interval (CI) -1.10 to -0.59; low-quality evidence) and at 'intermediate time points (24 hours)' (MD -0.34 cm, 95% CI -0.57 to -0.11; low-quality evidence) after surgery. However, no evidence of effect was found for lidocaine to reduce pain at 'late time points (48 hours)' (MD -0.22 cm, 95% CI -0.47 to 0.03; low-quality evidence). Pain reduction was most obvious at 'early time points' in participants undergoing laparoscopic abdominal surgery (MD -1.14, 95% CI -1.51 to -0.78; low-quality evidence) and open abdominal surgery (MD -0.72, 95% CI -0.96 to -0.47; moderate-quality evidence). No evidence of effect was found for lidocaine to reduce pain in participants undergoing all other surgeries (MD -0.30, 95% CI -0.89 to 0.28; low-quality evidence). Quality of evidence is limited due to inconsistency and indirectness (small trial sizes).Evidence of effect was found for lidocaine on gastrointestinal recovery regarding the reduction of the time to first flatus (MD -5.49 hours, 95% CI -7.97 to -3.00; low-quality evidence), time to first bowel movement (MD -6.12 hours, 95% CI -7.36 to -4.89; low-quality evidence), and the risk of paralytic ileus (risk ratio (RR) 0.38, 95% CI 0.15 to 0.99; low-quality evidence). However, no evidence of effect was found for lidocaine on shortening the time to first defaecation (MD -9.52 hours, 95% CI -23.24 to 4.19; very low-quality evidence).Furthermore, we found evidence of positive effects for lidocaine administration on secondary outcomes such as reduction of length of hospital stay, postoperative nausea, intraoperative and postoperative opioid requirements. There was limited data on the effect of IV lidocaine on adverse effects (e.g. death, arrhythmias, other heart rate disorders or signs of lidocaine toxicity) compared to placebo treatment as only a limited number of studies systematically analysed the occurrence of adverse effects of the lidocaine intervention.The comparison of intravenous lidocaine versus epidural analgesia revealed no evidence of effect for lidocaine on relevant outcomes. However, the results have to be considered with caution due to imprecision of the effect estimates.

- ***AUTHORS' CONCLUSIONS:***
  - → *There is low to moderate evidence that this intervention, when compared to placebo, has an impact on pain scores, especially in the early postoperative phase, and on postoperative nausea.*
  - → *There is limited evidence that this has further impact on other relevant clinical outcomes, such as gastrointestinal recovery, length of hospital stay, and opioid requirements.*
  - → *So far there is a scarcity of studies that have systematically assessed the incidence of adverse effects; the optimal dose; timing (including the duration of the administration); and the effects when compared with epidural anaesthesia.*

Intravenous lidocaine.

- Estebe JP[1]. Best Pract Res Clin Anaesthesiol. 2017 Dec;31(4):513-521
- **Abstract**
- Lidocaine has analgesic effect and antihyperalgesic and anti-inflammatory properties, which enable its use as a general anesthetic adjuvant. Lidocaine can reduce nociception and/or cardiovascular responses to surgical stress, postoperative pain, and/or analgesic requirements. However, its mechanisms of action remain unclear, despite its different known properties. Although the exact mechanism of action remains uncertain, initial bolus followed by a continuous lidocaine infusion has clear analgesic benefits. ***Lidocaine is one of the major drugs for opioid-reduced anesthesia or opioid-free anesthesia procedures. It clearly improves the postoperative outcomes with increased patient satisfaction.*** Such procedures should be included wisely in the enhanced recovery after surgery protocols. By using the recommended protocols, a high safety and efficacy of lidocaine can be achieved.

Alternativ?

Opioidfri anestesi

- *”inhalation”*
- *”intravenös”*
- *regional*

Spinal anaesthesia with chloroprocaine 1% versus total intravenous anaesthesia for outpatient knee arthroscopy: A randomised controlled trial.

- Gebhardt V[1], Zawierucha V, Schöffski O, Schwarz A, Weiss C, Schmittner MD. Eur J Anaesthesiol. 2018 Mar 7. doi: 10.1097/EJA.0000000000000794. [Epub ahead of print]

- **BACKGROUND:** Both general and spinal anaesthesia with short-acting local anaesthetics are suitable and reliable for knee arthroscopy as an ambulatory procedure. Chloroprocaine (CP) 1% seems to be the ideal spinal local anaesthetic for this indication.
- **OBJECTIVE:** The aim of this study was to compare spinal anaesthesia using CP 1% with general for outpatient knee arthroscopy with regard to procedure times, occurrence of pain, patient satisfaction and recovery, and also costs.
- **DESIGN:** A randomised controlled single-centre trial.
- **SETTING:** University Medical Centre Mannheim, Department of Anaesthesiology and Surgical Intensive Care Medicine, Mannheim, Germany. April 2014 to August 2015.
- **PATIENTS:** A total of 50 patients (women/men, 18 to 80 years old, ASA I to III) undergoing outpatient knee arthroscopy were included. A contra-indication to an allocated anaesthetic technique or an allergy to medication required in the protocol led to exclusion.
- **INTERVENTIONS: Either general anaesthesia with sufentanil, propofol and a laryngeal mask for airway-management or spinal with 40-mg CP 1% were used. We noted procedure times, patient satisfaction/recovery and conducted a 7-day follow-up.**
- **MAIN OUTOMES:** Primary outcome was duration of stay in the day-surgery centre. Secondary outcomes were first occurrence of pain, patient satisfaction, quality of recovery and adverse effects. In addition, we analysed treatment costs.
- **RESULTS:** Spinal had faster recovery than general anaesthesia with patients reaching discharge criteria significantly earlier [117 min (66 to 167) versus 142 min (82 to 228), P = 0.0047]. Pain occurred significantly earlier in the general anaesthesia group (P = 0.0072). Costs were less with spinal anaesthesia (cost ratio spinal: general 0.57). Patients felt significantly more uncomfortable after general anaesthesia (P = 0.0096).
- ***CONCLUSION: Spinal anaesthesia with 40-mg CP 1% leads to a significantly earlier discharge and is cheaper compared with general.***

Prilocaine hydrochloride 2% hyperbaric solution for intrathecal injection: a clinical review.

- Manassero A[1], Fanelli A[2]. Local Reg Anesth. 2017 Mar 31;10:15-24.
- **Author information**
- **Abstract**
- Prilocaine is a local anesthetic characterized by intermediate potency and duration and fast onset of action. As hyperbaric formulation of 5% solution, it was introduced and has been successfully used for spinal anesthesia since 1960. A new formulation of 2% plain and hyperbaric solution is currently available in Europe. Because of its lower incidence of transient neurological symptoms, prilocaine is suggested as substitute to lidocaine and mepivacaine in spinal anesthesia for ambulatory surgery, as well as a suitable alternative to low doses of long-acting local anesthetics. The National Library of Medicine database, the Excerpta Medica database, the Cochrane Database of Systematic Reviews, and the Cochrane Central Register of Controlled Trials database, were searched for the period 1970 to September 2016, with the aim to identify studies evaluating the intrathecal use of 2% prilocaine. A total of 13 randomized clinical trials (RCTs), 1 observational study, 2 dose finding, and 4 systematic reviews has been used for this review. The studies evaluated showed that 2% hyperbaric prilocaine due to a favorable anesthetic and safety profile is an alternative drug to lidocaine and mepivacaine for spinal anesthesia of intermediate or short duration. In comparison with plain solutions, hyperbaricity remarkably accelerates the onset and offset times of intrathecal 2% prilocaine.
- ***Literature suggests a dose ranging between 40 and 60 mg of prilocaine for lower extremities and lower abdominal procedures lasting up to 90 min, whereas a dose ranging from 10 to 30 mg is appropriate for perineal surgery. Readiness for discharge occurs in ~4 h from spinal administration.***

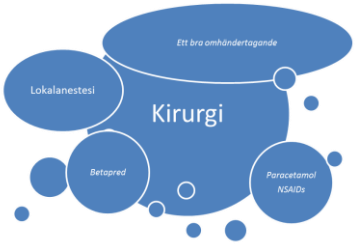
Benefits of pre-emptive analgesia by local infiltration at day-case general anaesthetic open inguinal hernioplasty.

Radwan RW[1], Gardner A[1], Jayamanne H[1], Stephenson BM[1]. Ann R Coll Surg Engl. 2018 Mar 15:1-4.

Abstract

Introduction The open prosthetic repair of inguinal hernias under local anaesthesia (LA) is well established, with the concept of intraoperative 'pre-emptive analgesia' evolving so that patients are as comfortable as possible. We used a peri-incisional LA solution in patients undergoing day-case inguinal hernioplasty under general anaesthesia (GA) and recorded use of analgesia in the immediate postoperative period. Methods In this observational cohort study, 100 consecutive unselected men underwent open inguinal hernia repair as a day case. Of these, 75 underwent repair under GA and 25 with peri-incisional LA solution (equal mixture of 0.5% bupivacaine and 1% lignocaine with 1:200,000 adrenaline). Analgesia prescribed at induction, for maintenance and after cessation of anaesthesia was scored in accordance with the World Health Organization (WHO) analgesic ladder. Results The median age in the GA group was 59 years (range: 25-89 years) and in the GA+LA group, it was 62 years (range: 27-88 years). Of the 100 patients, 82 underwent a mesh plug repair by seven surgeons whereas 18 underwent a flat (Lichtenstein) mesh repair by two surgeons. WHO analgesic induction and postoperative scores were significantly lower in the GA+LA group ($p=0.034$ and $p<0.001$ respectively). There was also a significant difference in use of postoperative antiemetics (23% vs 0% in the GA only and GA+LA cohorts respectively, $p=0.020$). Six patients (8%) in the GA group failed day-case discharge criteria.

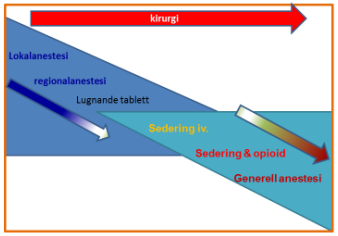
Conclusions Patients undergoing contemporary day-case GA inguinal hernioplasty with pre-emptive LA solution infiltration require lower levels of postoperative opioid analgesia and antiemetics. These cases are less likely to fail discharge criteria for planned day surgery.



Alltid en balans

Nytta *risk, biverkningar, oönskade effekter*

Dagkirurgi: *inte antingen eller utan både och ….*



….alltid lokalbedövning……

Målstyrd Anestesi

Induktion

ASA 1-2 var 5:e minut, ASA 3 var 2:an minut, ASA 3-5 artärnål

Avslut

	Åtgärda	Observation	Målvärde	Observation	Åtgärda
HR	< 50	10-20% BL	± 10 % BL	10-15% BL	> 20 % BL
SAP	< 90	10-20% BL	± 10 % BL	10-15% BL	> 20% BL
MAP	< 60	60-65	65-75		
SpO_2	< 88%	90-94	94-99		
Et_{CO2}	< 4,3	4,3-4,5	4,5 – 6,2	6,2-7,0	> 7.0
Et_{sevo}	< 0.5 MAC	0.5-0.7 MAC	0.7-1.3 MAC	1.3 – 1.8 MAC	
AF	<8	10 - 12	12 - 16	16 - 18	> 20
BIS/Entropy	< 35	35-40	40 - 55	55-65	> 65
HB	< 70/80	90 - 115	115 - 145		

HR hjärtfrekvens, SAP systoliskt blodtryck, MAP medelblotryck, AF andningsfrekvens, Et end-tidal, AF andningsfrekvens, BL baseline

Syrgasinnehåll i artärblod; $C(O_2) = 1,36 \quad SpO_2 \quad Hb + 0,2625 \quad PaO_2$ (kPa)

$DO_2 = C(O_2)$ x Cardiac Output

Cardiac Output = HR x Slagvolym

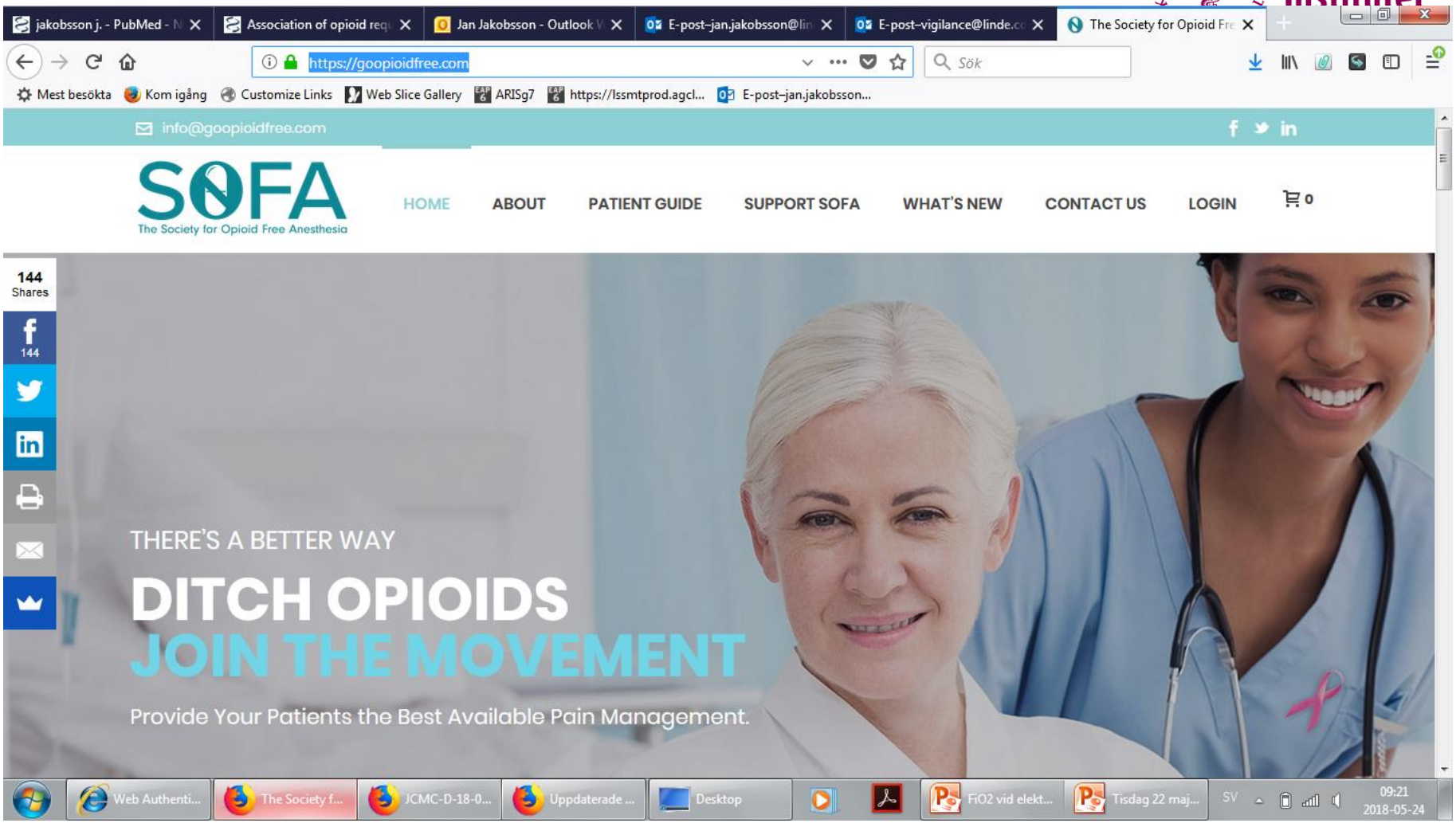
Opiatfri dagkirurgisk vår.
Är det möjligt eller önskvärt?

- **Ja** det är möjligt – Lokalbedöva
- **Ja** det är **önskvärt** om det går att genomföra ingreppet med god kvalitet för patient och kirurg utan opiat
  - De mer *komplexa* opiatfria intravenösa anestesierna bör fortfarande betraktas som experimentella

→*Att tänka efter om det finns bra alternativ till opioid är bra*

- → *Lokalbedövning*
- → *Blockad*
- → *Spinal*
- → *Inhalationsanestesi*

→ *…kom ihåg det gör ont efter kirurgi!*



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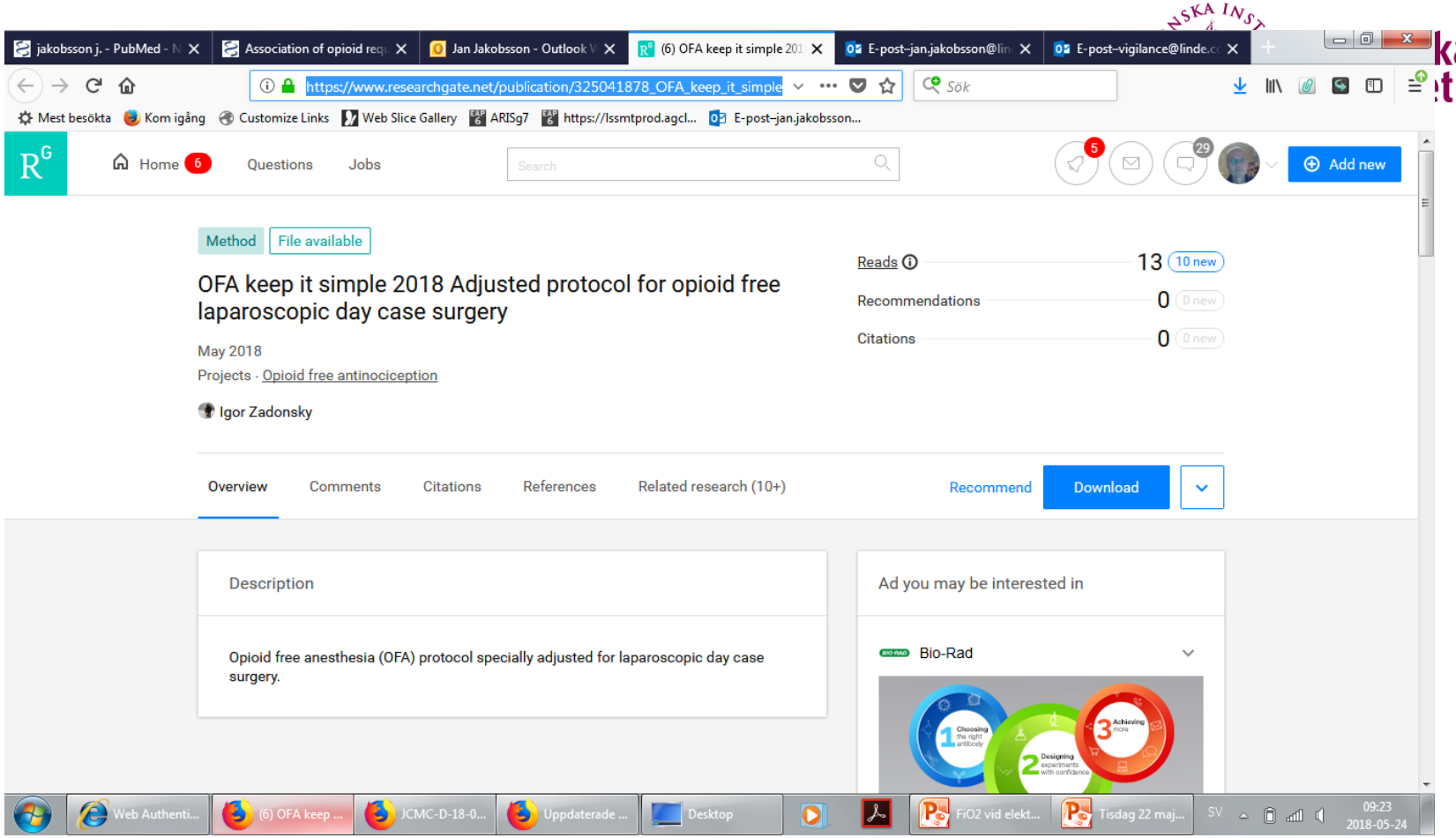

https://www.researchgate.net/publication/325041878_OFA_keep_it_simple_2018_Adjusted_protocol_for_opioid_free_laparoscopic_day_case_surgery?showFulltext=1&linkId=5af2eed9a6fdcc0c03053de1