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Opioid Free Anesthesia (OFA) to optimize Enhanced Recovery After laparoscopic bariatric Surgery (ERAS) .

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Use of opioids during surgery

Patients will experience at least one adverse effect of opioids after surgery:

- itching; nausea; vomiting; muscle weakness; dizziness; somnolence

Concerns relate to the effects of opioids on

- the endocrine and immune systems and the risk of inducing a hyperalgesic syndrome.

Why opioid free in obese?

Obesity is a pro-inflammatory disease.

- **It is important for obese patients to**
  - **be full awake, pain free and to mobilize early.**
  - **avoid respiratory depression, atelectasis and obstructive breathing**
  - **avoid wound or pulmonary infections**

Recommendations in obesity?

Rec from OSAS (obstructive sleep apnoe syndrome society) and ASA.

1. **Minimize or avoid respiratory depressants (opioids) peri operative in OSAS to limit obstructive breathing.** Anesthesiology 2006;104:1081-1093

Rec from ERAS (enhanced reovery after surgery)

2. **Avoid opioids post operative to improve bowel function and enhance recovery after surgery.**

Rec from ASA task force on pain and from "pain free hospital"

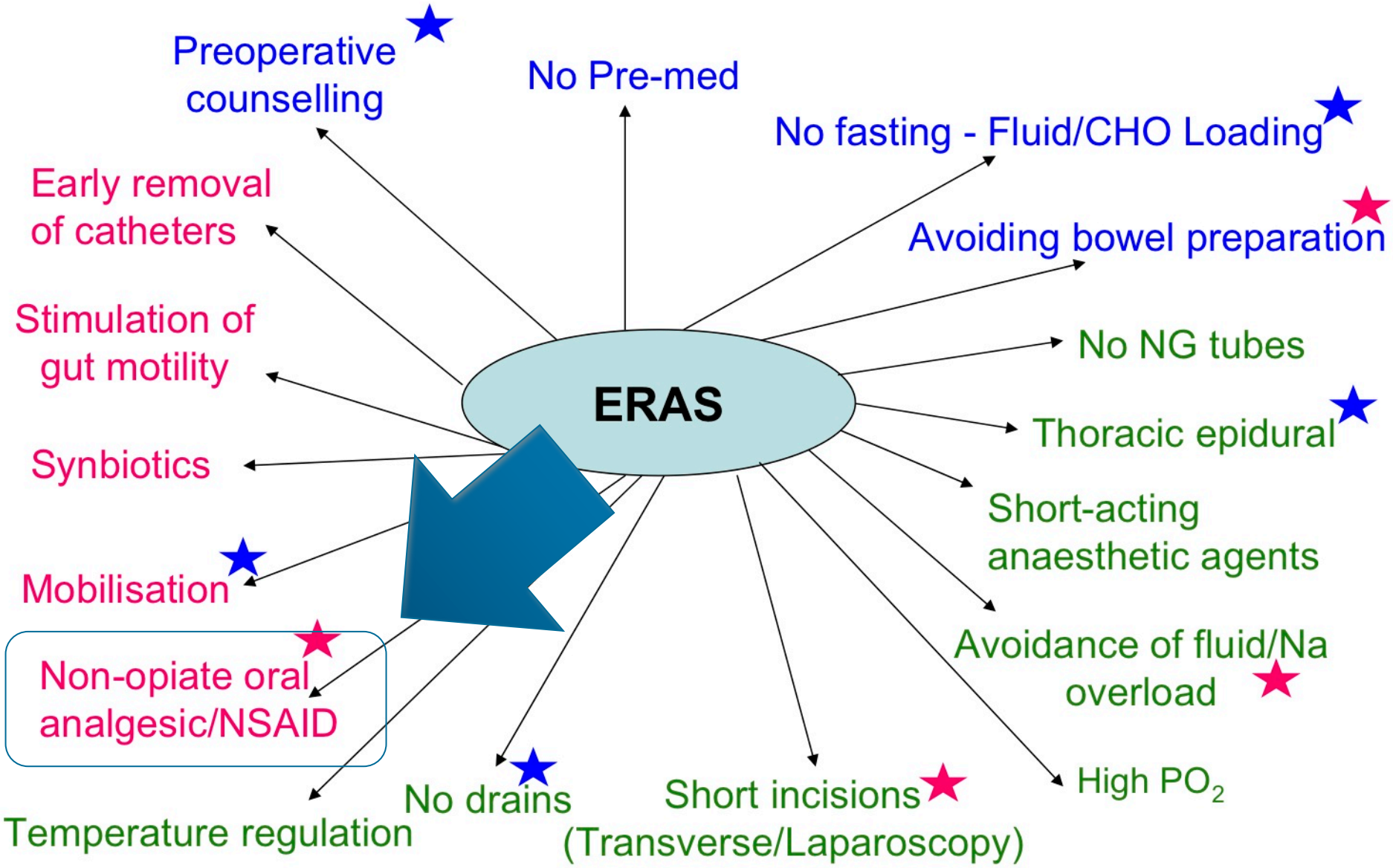
3. **Reduce opioids by using multimodal** techniques for pain management.

4. **Avoid induction of hyperalgesic syndrome by reducing the opioid use and adding NMDA blockers.**

Rec from immunology

4. Avoid opioids to reduce the immunosuppression (improve healing).

Main elements of ERAS

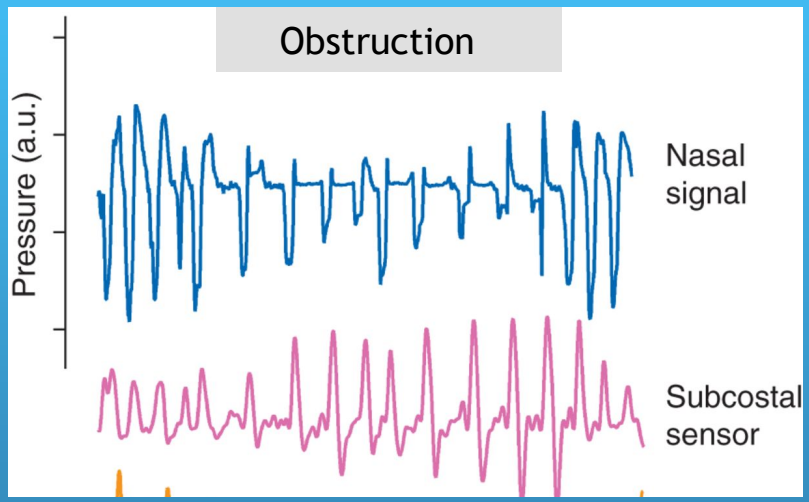


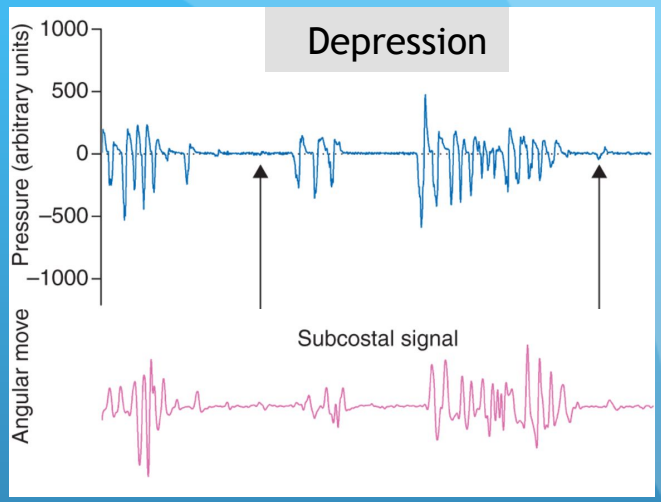
American Society of Anesthesiologists. Practice guidelines for the perioperative management of patients with obstructive sleep apnea. Anesthesiology 2006;104:1081-1093.

Recommendation:

- *Minimizing or avoiding* perioperative administration of respiratory depressants (opioids) to patients with obstructive sleepapnea

Characterization of breathing patterns during patient-controlled opioid analgesia





- In undisturbed subjects receiving patient-controlled **morphine** analgesia after surgery, abnormal breathing patterns **are extremely common**.
- Cyclical airway obstruction and respiratory depression are associated with a different pattern of chest wall movement.
  - *Drummond Br. J. Anaesth*. August 21, 2013

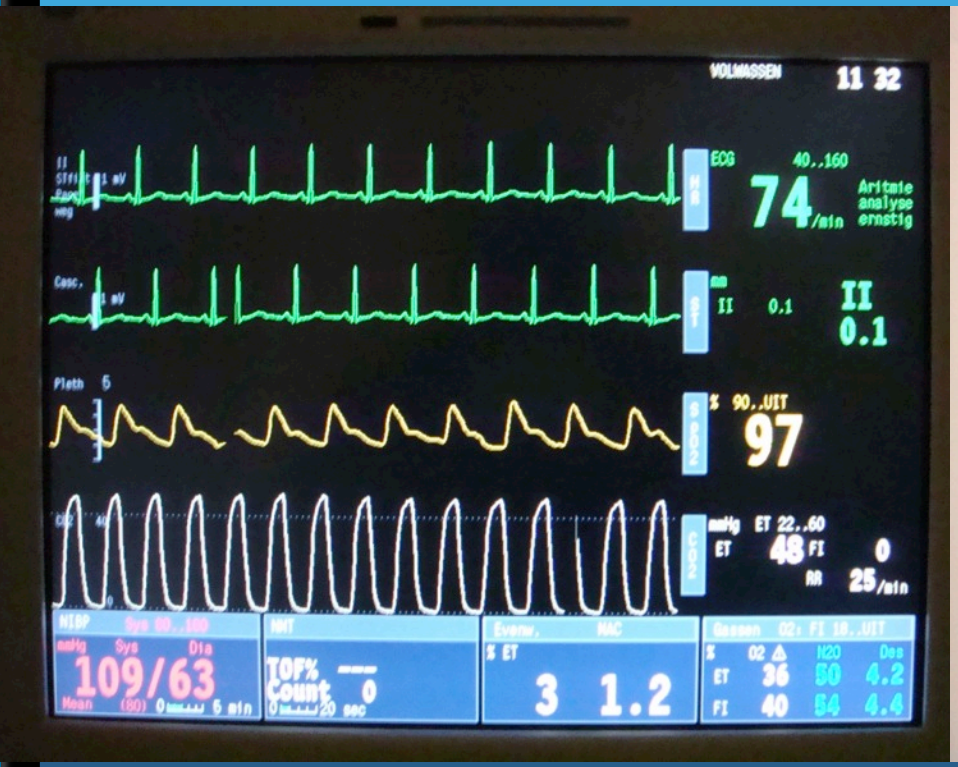
Respiratory center depression

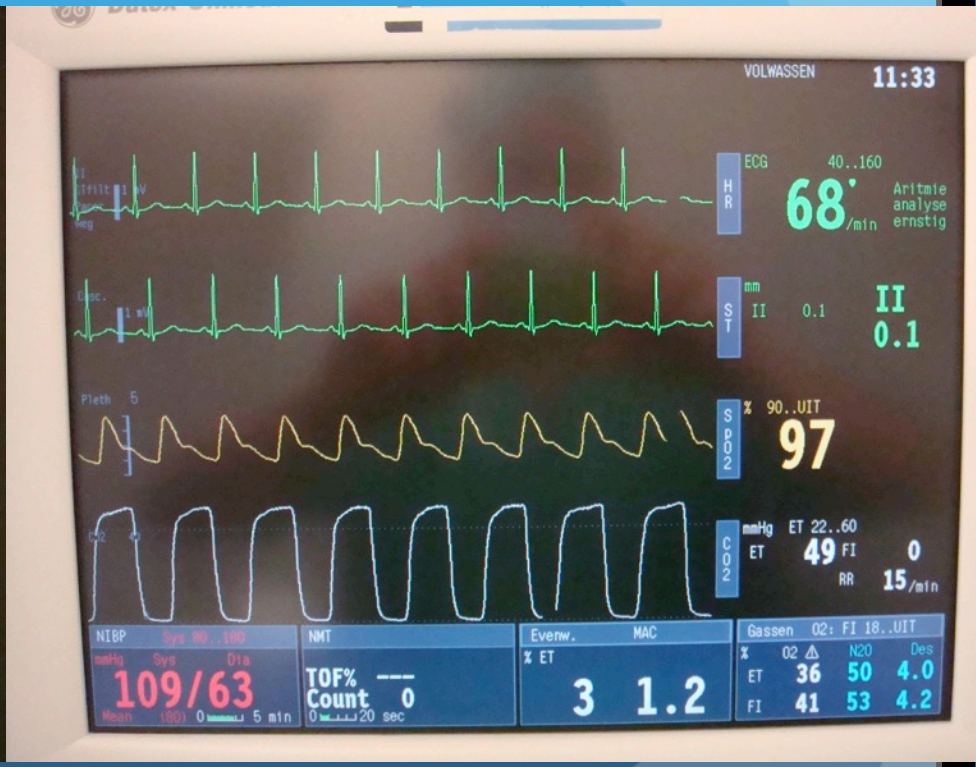
- Opioids reduce respiratory drive, certainly when combined with deep sedation.
- Avoid also hyperventilation during anesthesia: it reduces etCO2 but also BRAIN bicarbonate.
  - CO2 will rapidly return to normal but bicarbonate level drops fast but returns slowly? Only brain bicarbonate stimulates respiratory center.
  - Pain and awakening proces stimulates patient. However when pain-free in the PACU, low bicarbonate keeps respiratory drive low even causing hypercapnia.

Dosing sufentanil during Pressure support ventilation at end of surgery allows to avoid respiratory depression post operative?

- Before

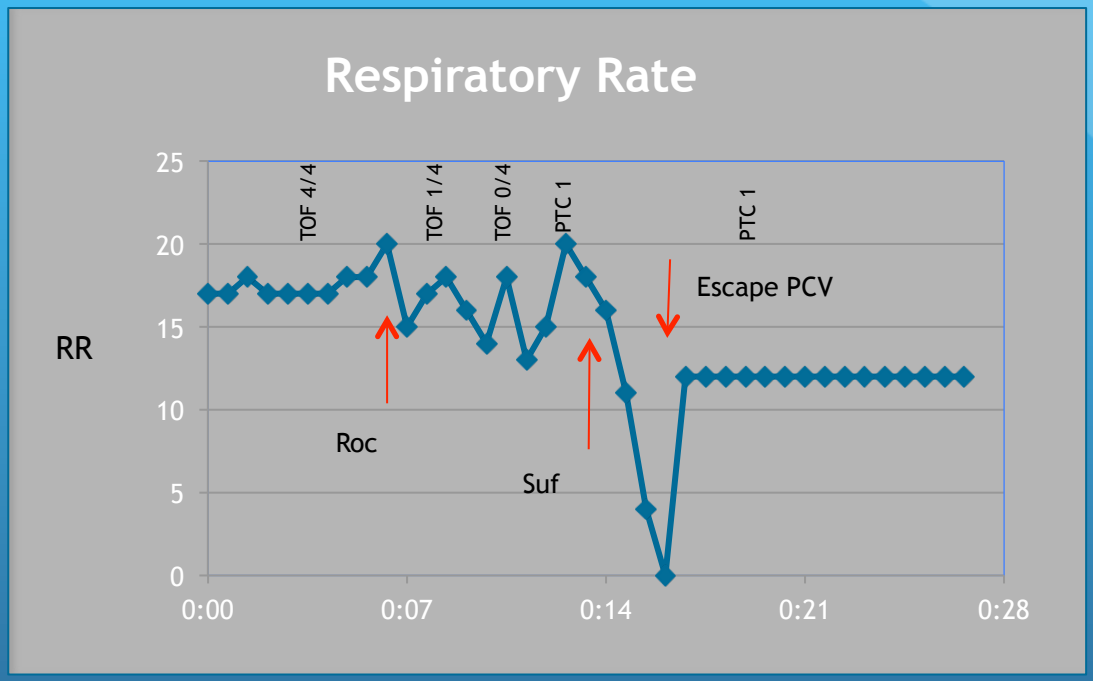
after 5 ug Sufentanil iv





I Casier, J Mulier ESA 2010

High dose sufenta (25 ug) blocks respiratory center making PSV impossible.



Casier I, Mulier JP ESA 2010

- Aestiva S/5 with a trigger sensitivity of less than 0.6 L/min. Backup ventilation mode was set to start after 30 second of no ventilation.
- Rocuronium infusion was given at 500mg/h till TOF and PTC were 0.
- Then Rocuronium infusion was stopped en Sufentanil 25µg was given.

Obstructive breathing post op

Osas

- Opioids inhibit the upper respiratory muscles,
- Opioids induce upper airway collapse ,
- Opioids exacerbate OSAS

- Isono S. Obesity and obstructive sleep apnoea: mechanisms for increased collapsibility of the passive pharyngeal airway. Respirology. 2012;17(1): 32-42.
- Wall H, Smith C. BMI and obstructive sleep apnoea in the UK: a crosssectional study of the over-50s. Prim Care Respir J. 2012;21.
- Hillman DR, Platt PR. The upper airway during anesthesia. Br. J Anaesth 2003;91:31-39.

Obstructive breathing post op

- Existing OSAS (BANG questionaire)
- Induced OSAS by Muscle weakness due to
  - PORC post operative residual curarisation
    - Full reversal and objective control to achieve TOF > 90%
  - Opioids inhibit the upper respiratory muscles, inducing upper airway collapse
    - Avoid opioids duirng and after surgery
  - Deep sedation after anesthesia
    - Avoid long working anesthetics. Do not use benzodiazepines; no clonidine > 150 ug; reduce dexmedetomidine below 0,2 ug/kg/h; Sevoflurane MAC < 1 or desflurane
- Respiratory center depressed
  - PSV during surgery allows reduction of opioids keeping RR>14
- Isono S. Obesity and obstructive sleep apnoea: mechanisms for increased collapsibility of the passive pharyngeal airway. Respirology. 2012;17(1):32-42.
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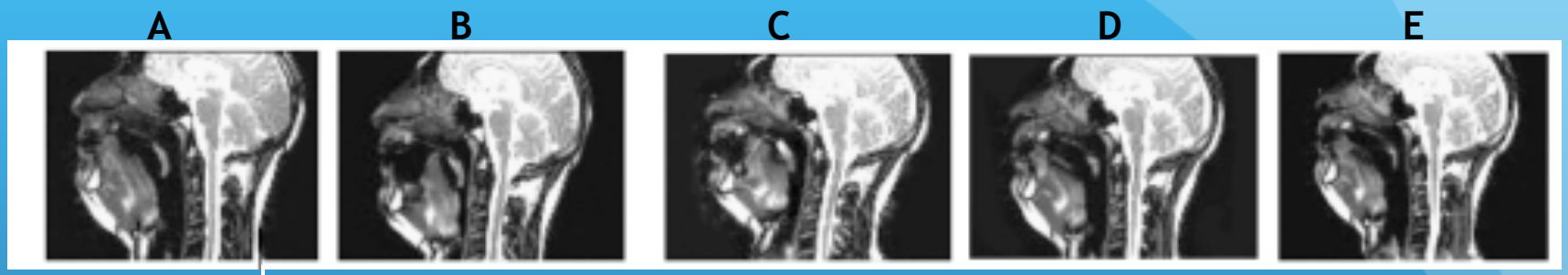
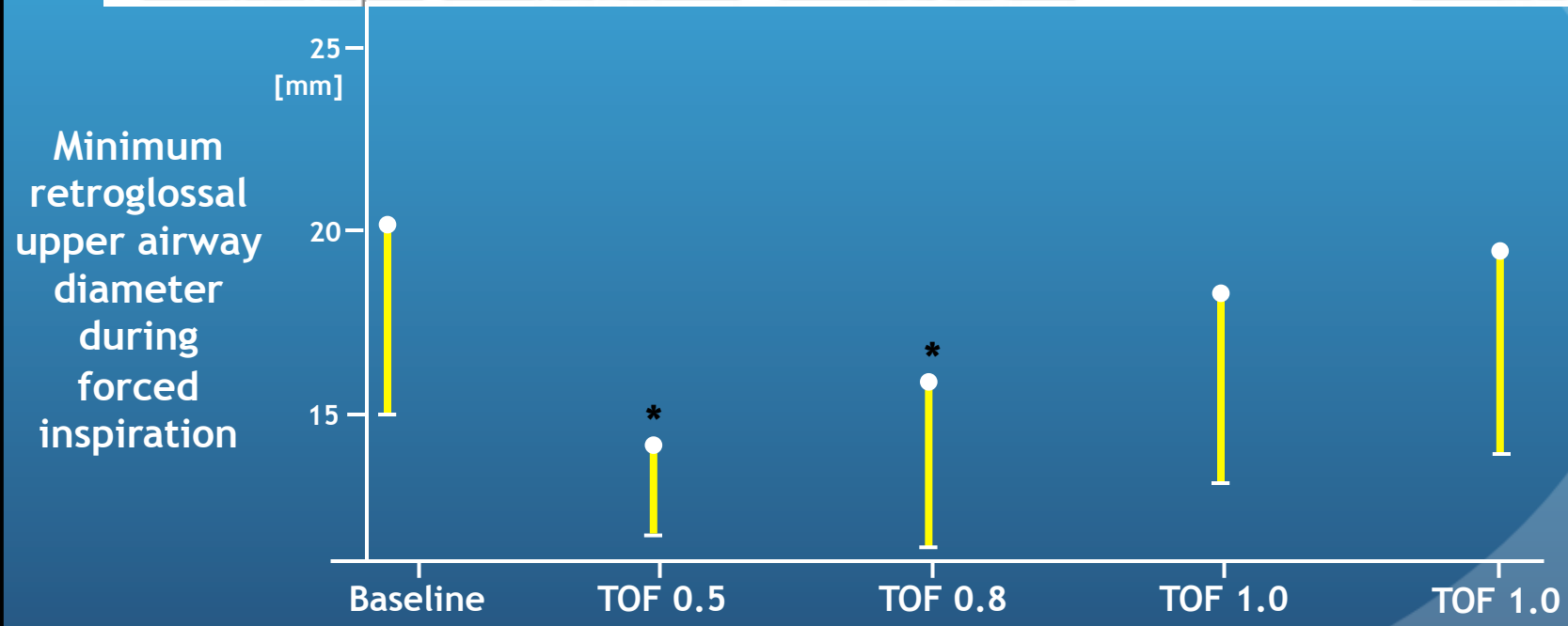
Importance of Achieving TOF ≥0.9

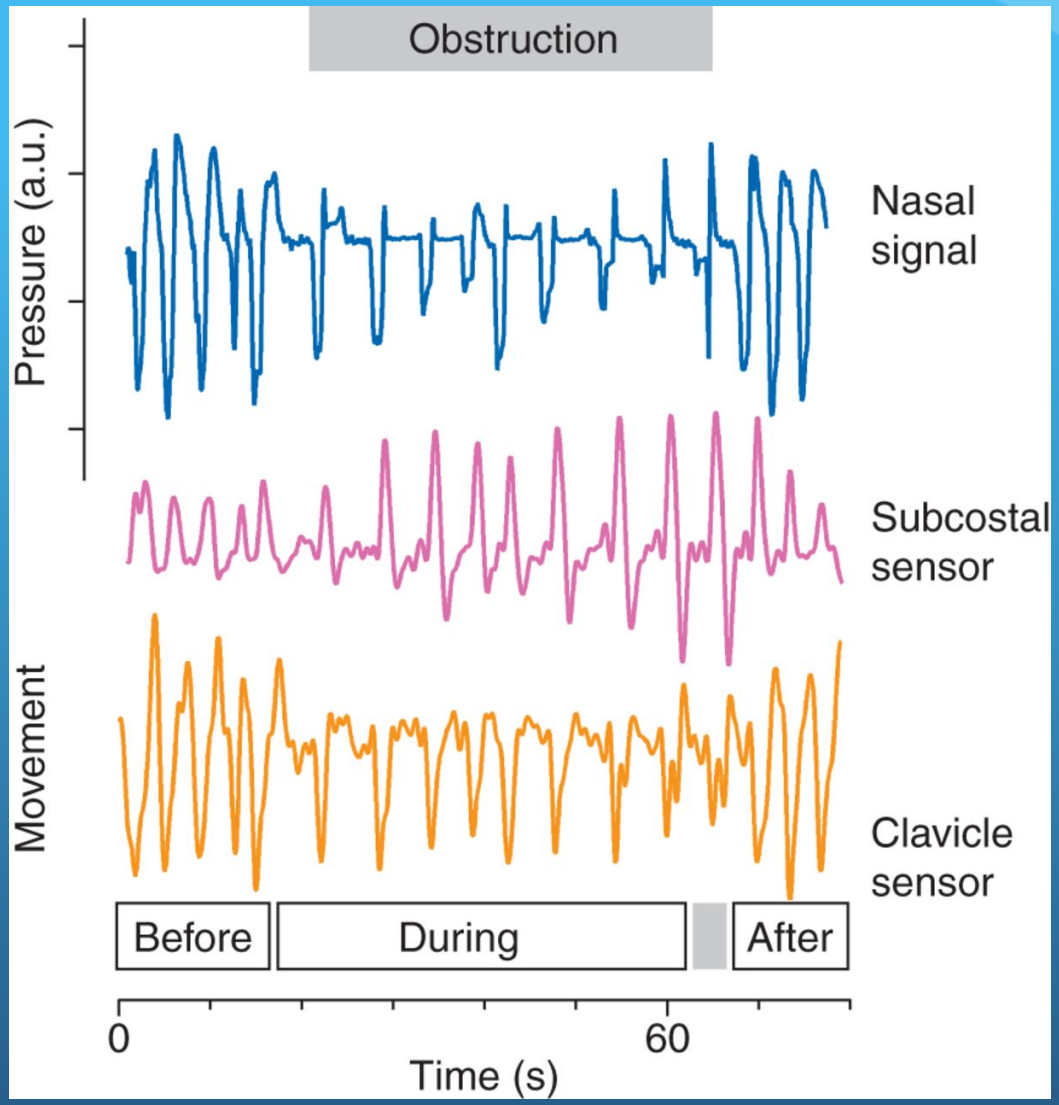




Eikermann, et al. *Am J Respir Crit Care Med*. 2007;175:9-15.

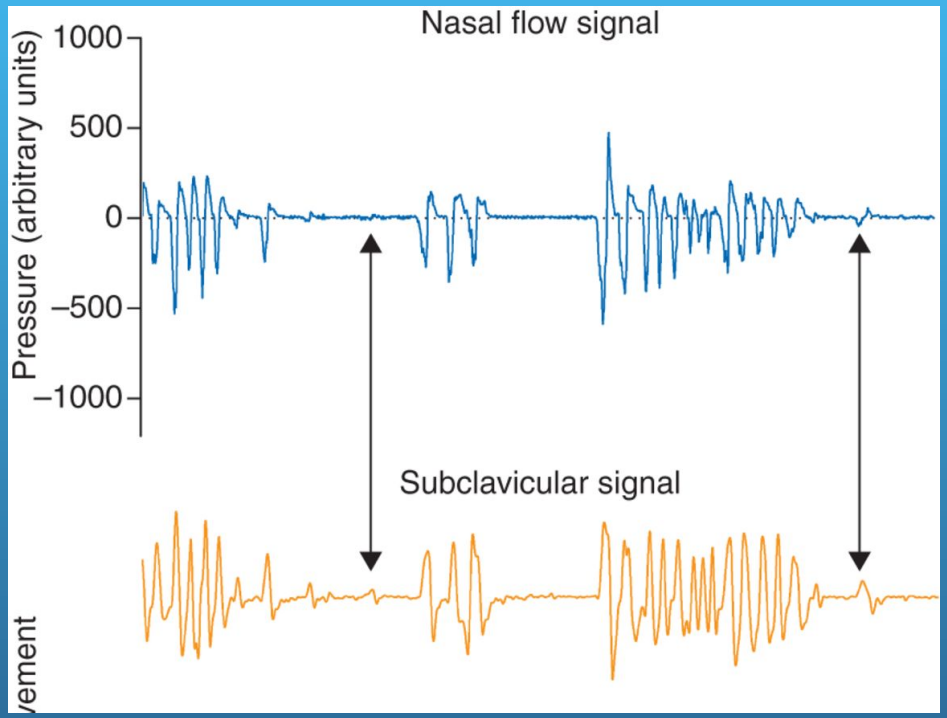
* *P*<0.05 versus baseline

An example of an episode of obstruction.



Drummond G B et al. Br. J. Anaesth. 2013;bja.aet259

Evidence that apparent apnoeic periods are associated with minimal chest wall and nasal flow changes in some patients with respiratory dysrhythmia, suggesting that airway patency is present and respiratory movements are very weak.



Drummond G B et al. Br. J. Anaesth. 2013;bja.aet259

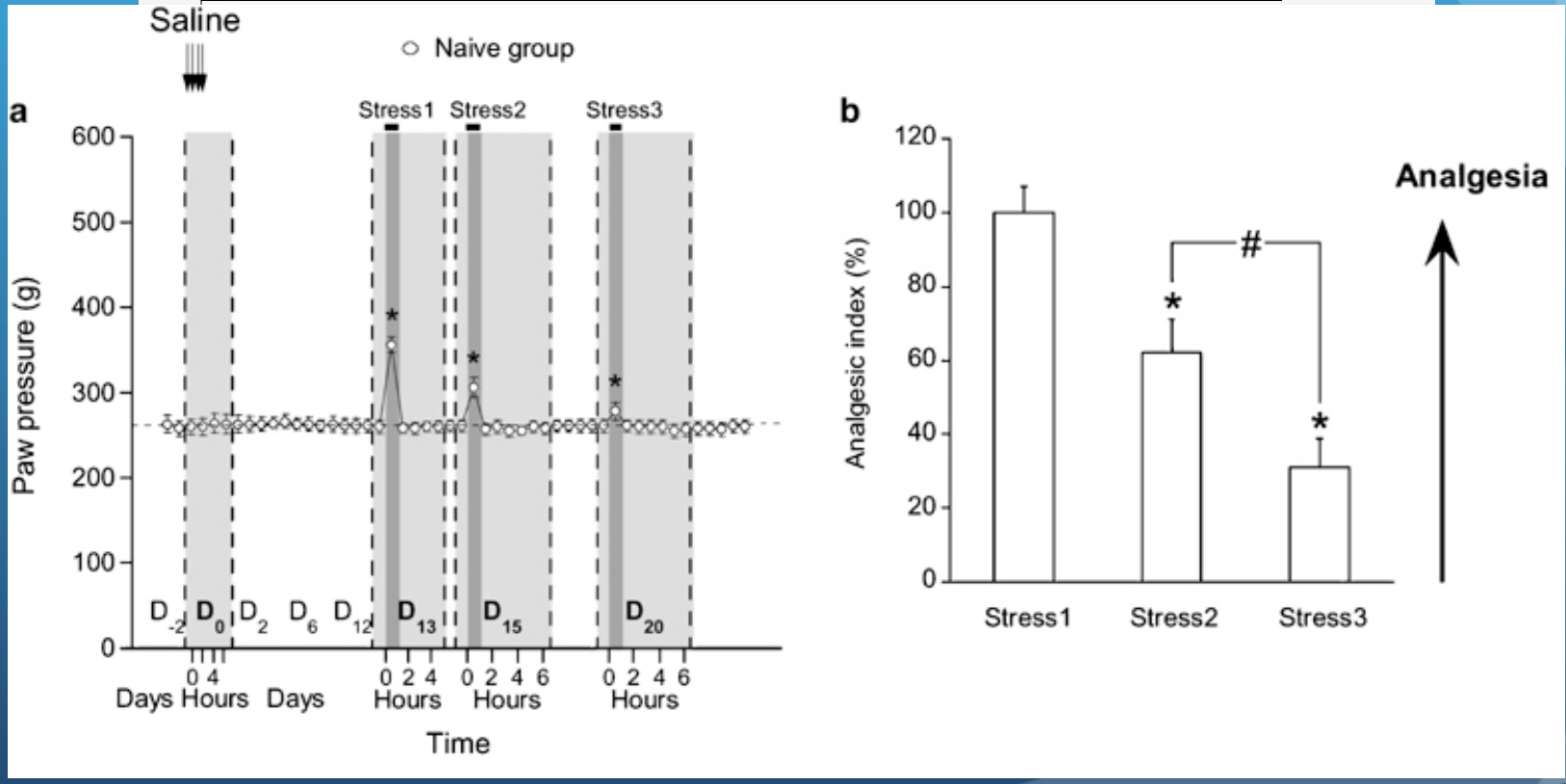
Neuropsychopharmacology (2007) 32, 2217–2228

www.neuropsychopharmacology.org

Non-Nociceptive Environmental Stress Induces Hyperalgesia, Not Analgesia, in Pain and Opioid-Experienced Rats

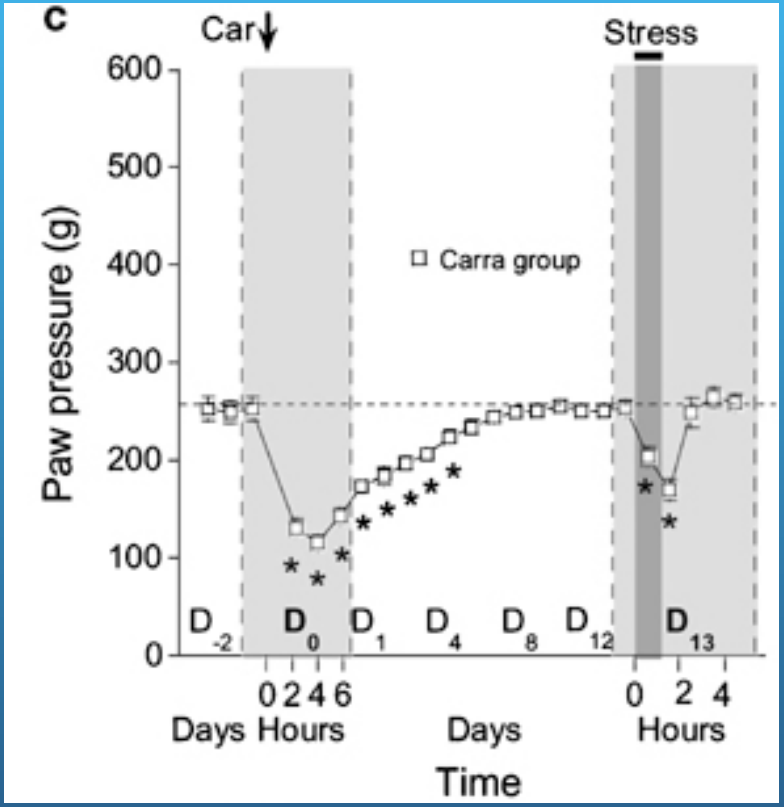
Cyril Rivat[1], Emilie Laboureyras[1], Jean-Paul Laulin[1,2], Chloé Le Roy[1], Philippe Richebé[1,3] and Guy Simonnet*[,1]

[1]Laboratoire 'Homéostasie-Allostasie-Pathologie', Université Victor Ségalen Bordeaux 2, Bordeaux, France; [2]Department of Cellular Biology and Physiology, Université Bordeaux 1, Talence, France; [3]Department of Anesthesia and Intensive Care II, Centre Hospitalier Universitaire de Bordeaux, Bordeaux, France



- Stress
  - Analgesia during stress
  - Hyperalgesia after stress
- Repeated stress
  - Analgetic effect during stress reduces after repetition

Inflammation blocks analgetic effects of stress !



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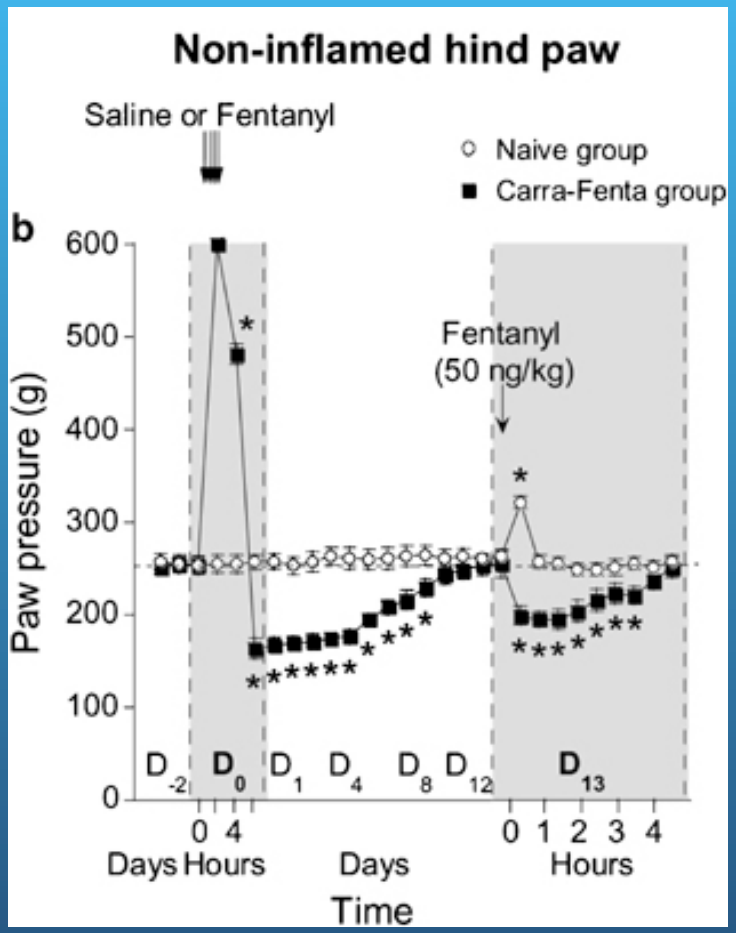
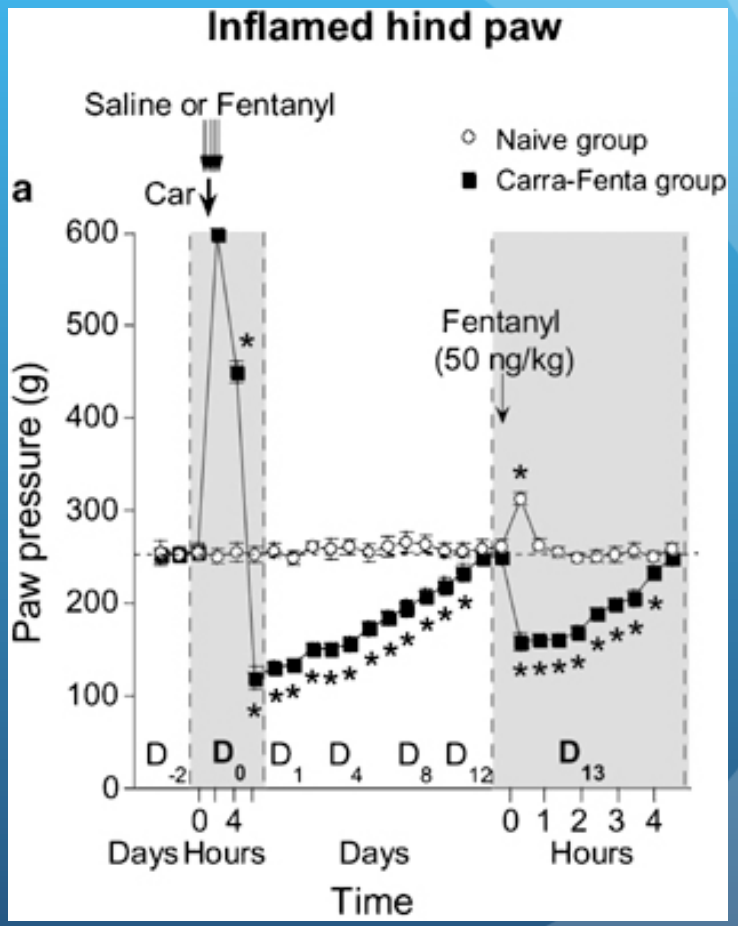
- Inflammation
  - Hyperalgesia during inflammation
  - Prolonged (2 weeks) Hyperalgesia after inflammation
- Stress and inflammation
  - Hyperalgesia during stress instead of analgesia

Low dose fentanyl after high dose fentanyl hyperalgesia and in inflammation even more hyperalgesia after low dose





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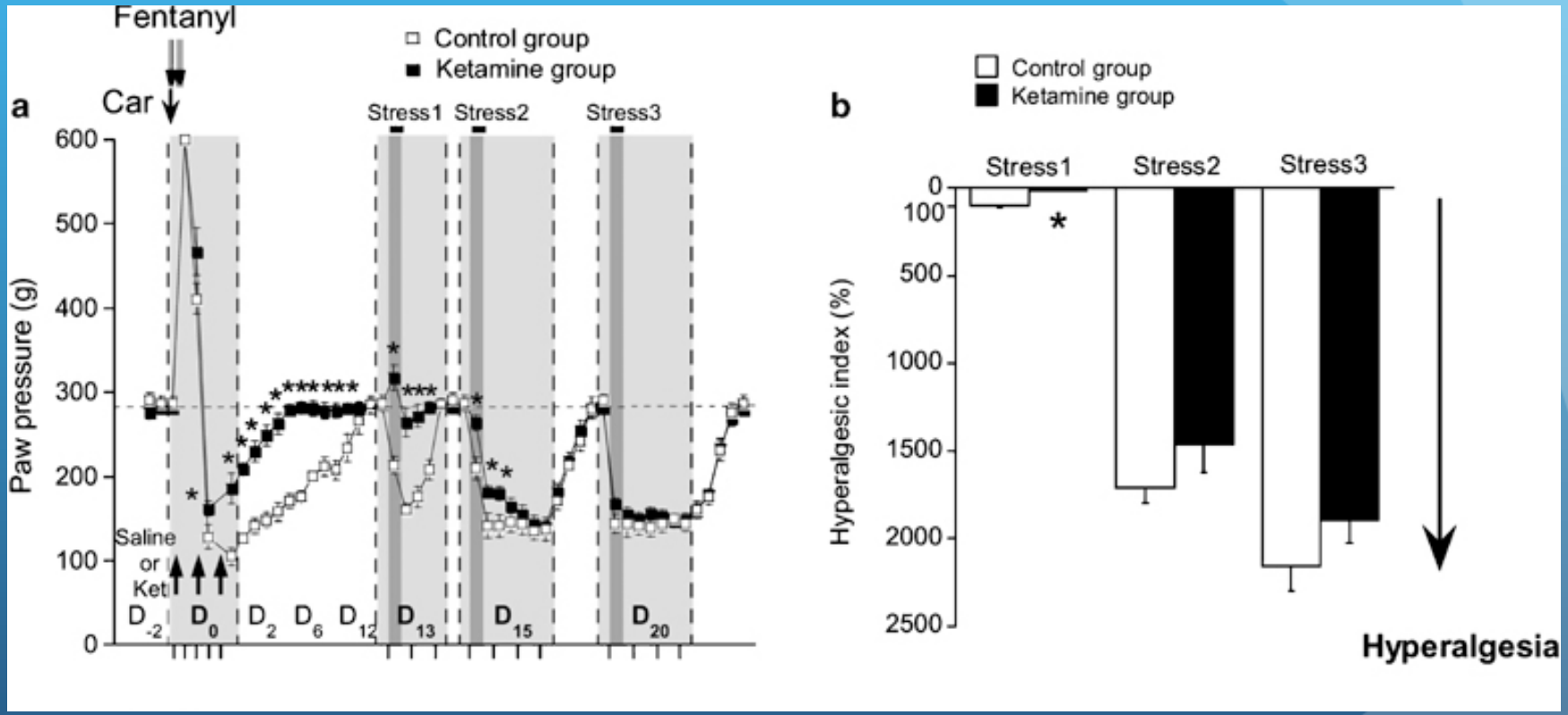
- Synthetic opioids
  - Analgesia during infusion
  - Hyperalgesia (2 weeks) after infusion
- Repeated synthetic opioids
  - Analgetic effect during infusion reduces after repetition
- Inflammation and synsthetic opioids
  - Stronger and longer hyperalgesia after combination
  - Stronger hyperalgesia for stress and repetitive stress later

Ketamine blocks the hyperalgesia due to fentanyl and inflammation.
only at first dose and first stress effect



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  - Reduces hyperalgesia after first stress (ket) repetitive stress (BN2572)

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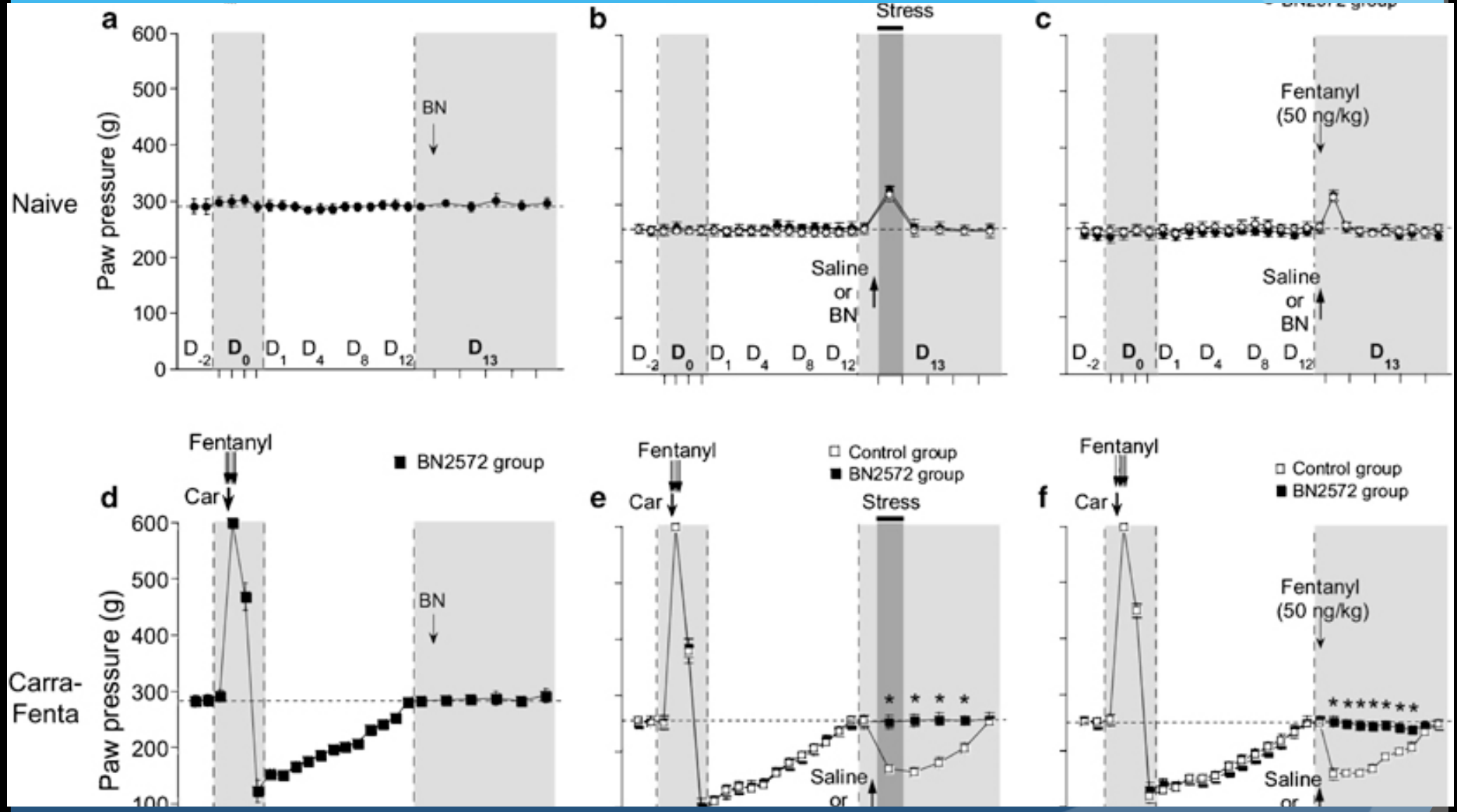
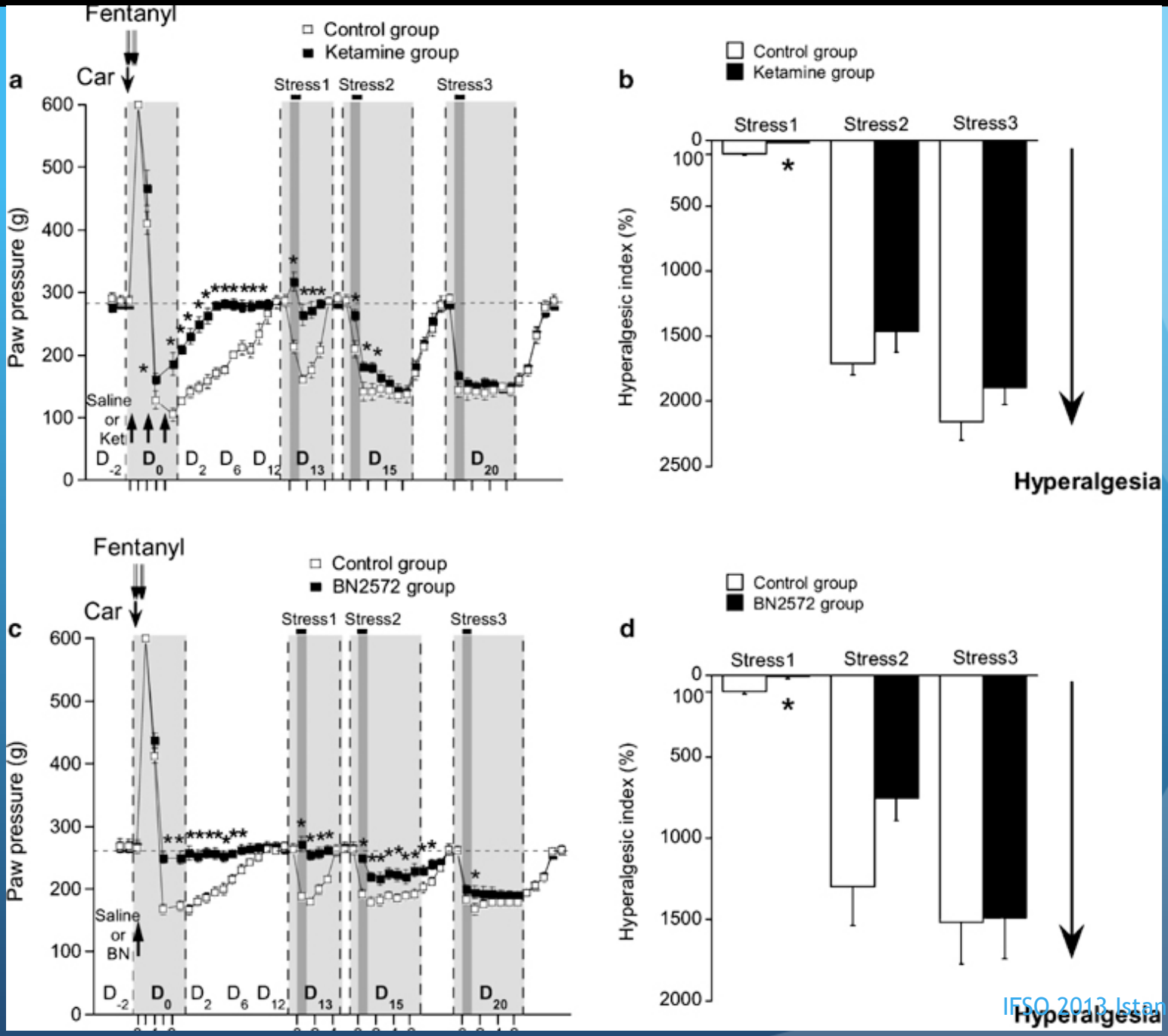
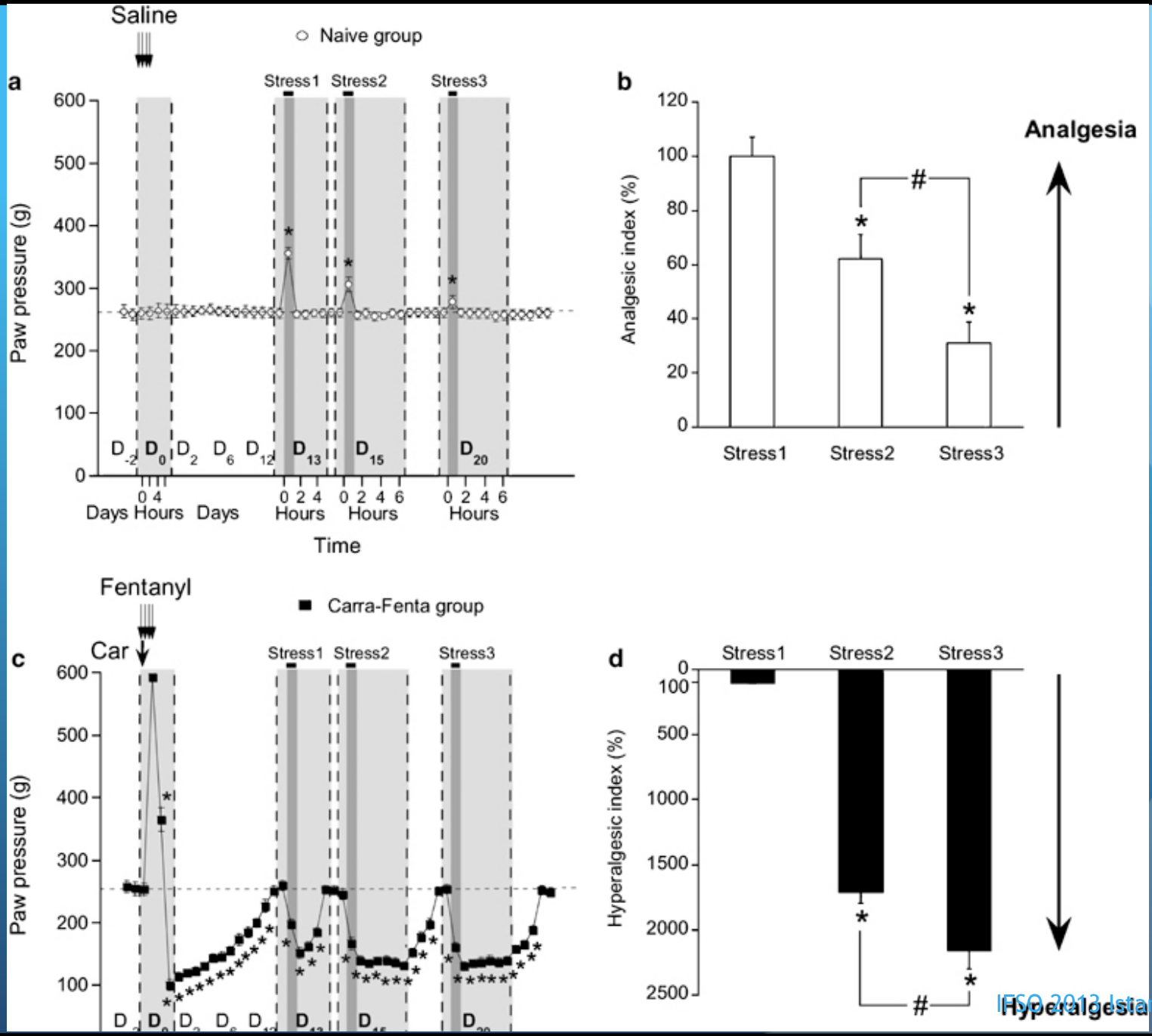
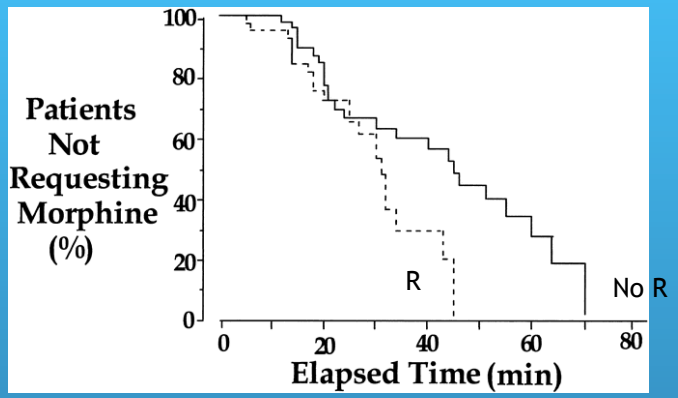

a
b
c
Naive
Paw pressure (g)
600
500
400
300
200
100
0
BN
Stress
Fentanyl
(50 ng/kg)
Saline
or
BN
D-2
D0
D1
D4
D8
D12
D13
Fentanyl
Car
BN2572 group
Control group
d
e
f
Carra-
Fenta


a
Fentanyl
Car
Control group
Ketamine group
Stress1
Stress2
Stress3
Paw pressure (g)
Saline or Ket
D-2
D0
D2
D6
D12
D13
D15
D20
b
Control group
Ketamine group
Stress1
Stress2
Stress3
Hyperalgesic index (%)
Hyperalgesia
c
Fentanyl
Car
Control group
BN2572 group
Stress1
Stress2
Stress3
Paw pressure (g)
Saline or BN
D-2
D0
D2
D6
D12
D13
D15
D20
d
Control group
BN2572 group
Stress1
Stress2
Stress3
Hyperalgesic index (%)
Hyperalgesia


Saline
Naive group
a
Stress1
Stress2
Stress3
Paw pressure (g)
Days
Hours
Time
b
Analgesia
Analgesic index (%)
Stress1
Stress2
Stress3
Fentanyl
Carra-Fenta group
Car
c
d
Hyperalgesic index (%)
Hyperalgesia

Hyperalgesia to opioids….



Intraoperative Remifentanil Increases Postoperative Pain and Morphine Requirements
(Guignard, Chauvin: Anesthesiology 2002)

Table 5. Independent Predictive Factors of Severe Postoperative Pain in the Postanesthesia Care Unit

	Odds ratio	95% Confidence interval	*P*
High sufentanil dose[a]	2.68	[1.68–4.29]	<0.001
General anesthesia (vs regional)	3.96	[1.14–13.81]	0.03
Preoperative analgesics	1.91	[1.15–3.18]	0.01

[a] High dose sufentanil = dose >0.6 μg/kg.

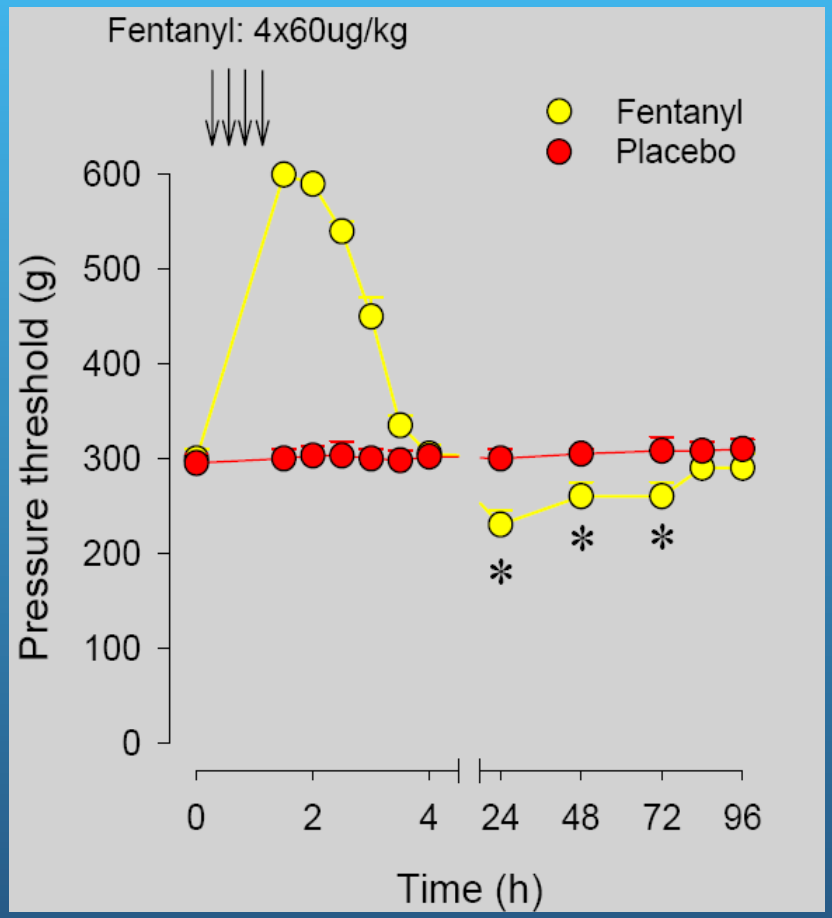
Independent Predictive Factors of Severe Postoperative Pain in the Postanesthesia Care Unit

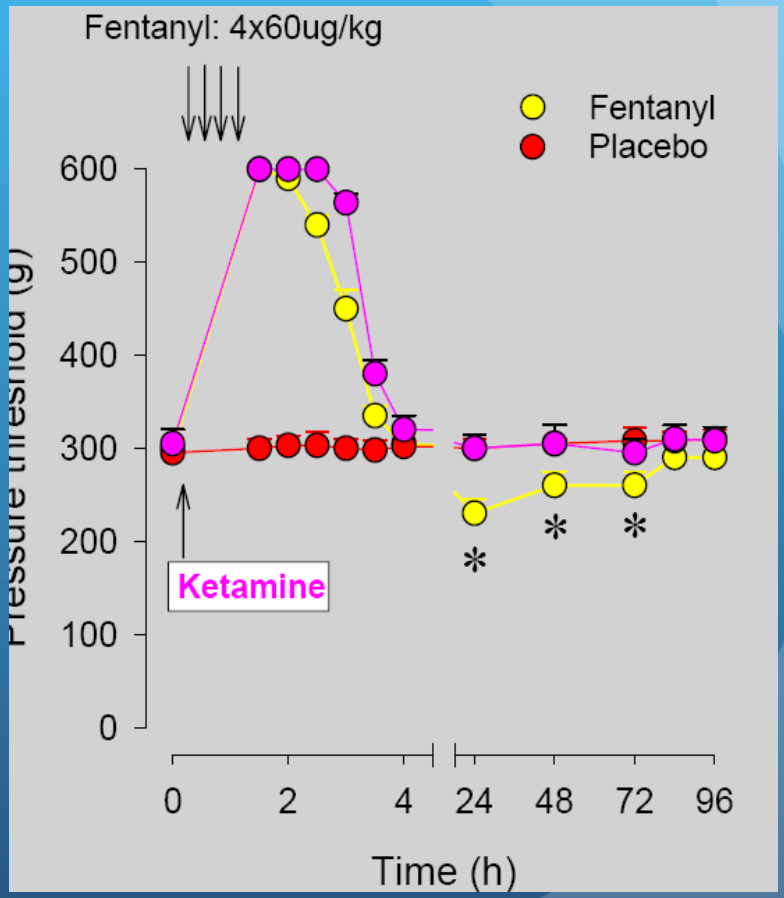
The dose of intraoperative opioid !!

(Aubrun, F. et al. Anesth Analg 2008;106:1535)

Intensity of post op pain is proportional to the dose of opioids given during anaesthesia.

Acute hyperalgesia after isolated exposure



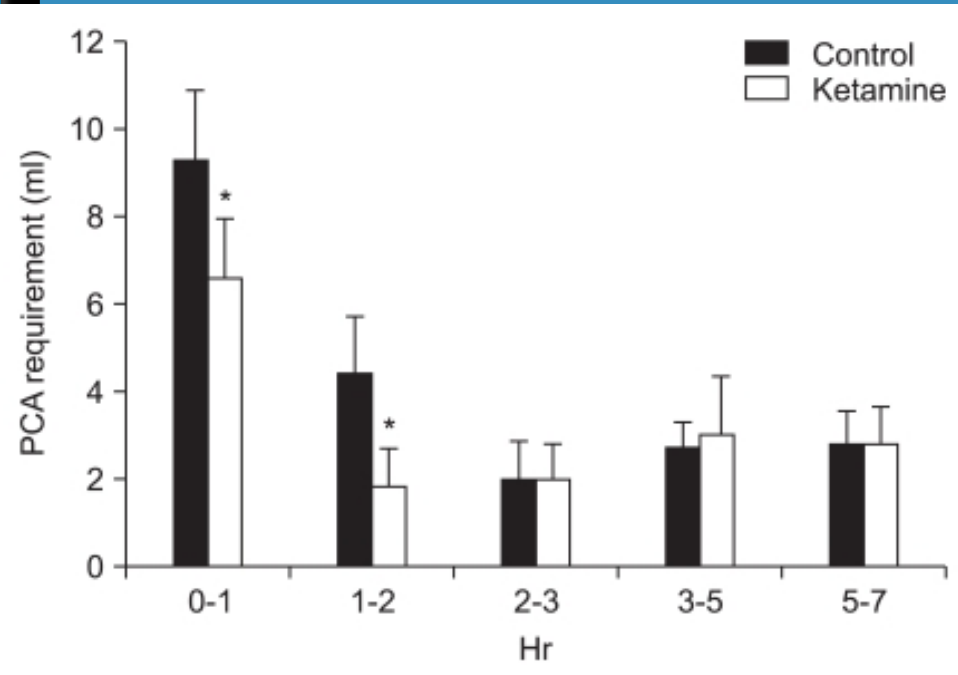


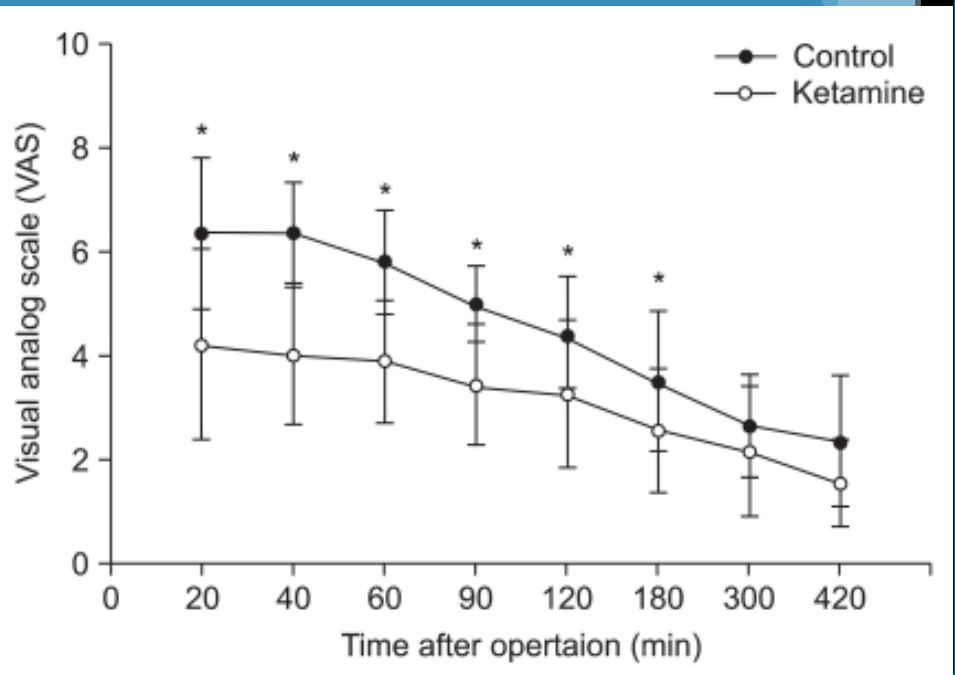
Celerier et al, Anes 2000

Angst (charts)

Ketamine reduces opioid induced hyperalgesia

- Boo Hwi Hong Effects of intraoperative low dose ketamine on remifentanil-induced hyperalgesia in gynecologic surgery with sevoflurane anesthesia. Korean J Anesthesiol. 2011; 61: 238.
- Same dose of remifentanyl with ketamine 25 mg vs without ketamine
- Ketamine 0,3 mg/kg followed by 3 ug/kg/min





Other NMDA blockers?

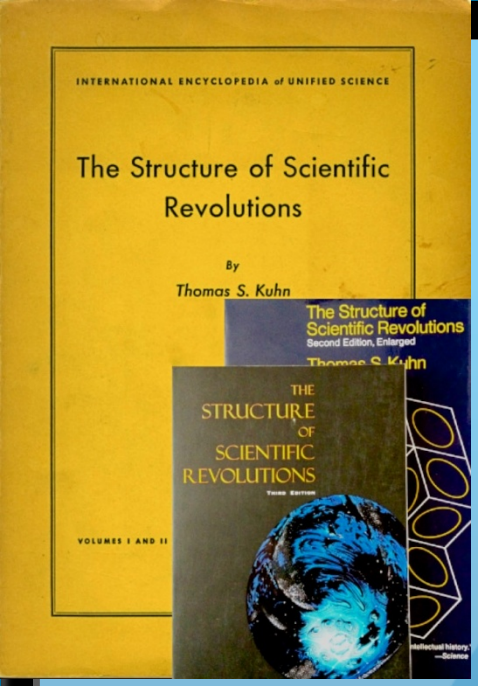
- Nitruous oxide is a weak NMD antagonists and might be usefull if no ketamine is used and opioids are given.
- Magnesium is a NMD antagonists but does not enter the brain? Why effective to reduce hyperalgesia?

Obesity and morphine

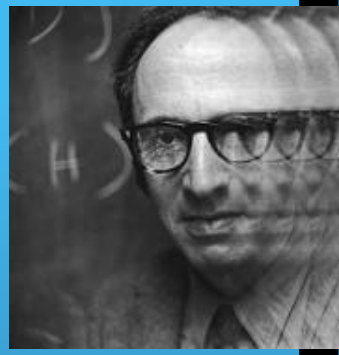
- Obesity is a chronic pro-inflammatory disease.
  - It exposes to chronic post surgical pain.
- Opioids are naturally hyperalgesic by direct interaction with the NMDA system.
  - Intense agonism of the u-excitatory receptors lead to overexpression of the NMDA nr2b receptors in the forebrain.
    - This is associated with increased inflammation and chronic pain.
- Immune suppression should be avoided in bariatric surgery

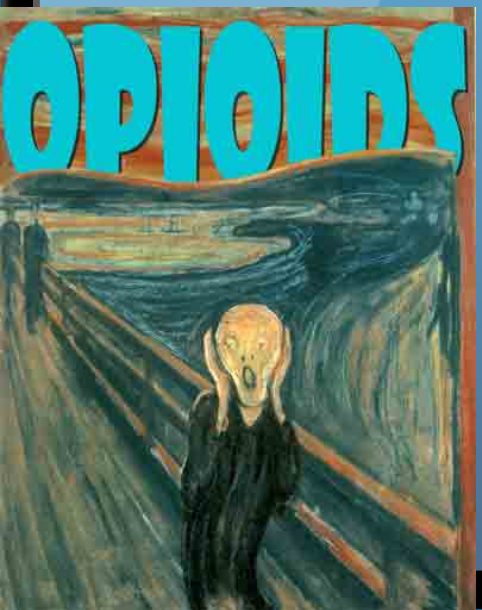
ERAS protocol for laparoscopic bariatric surgery

- 1. Pre op elements
  - No premedication no sedatives, No prolonged fasting
  - Antibiotic, trombo prophylaxis (beach chair)
  - Weight reduction > 10 kg by only high protein diet 3 weeks before
- 2. Per op elements
  - Short acting anesthetics, local infiltration and non opioid anesthesia
  - Provide sufficient surgical workspace to shorten surgical time and improve work
    - Abd compliance monitor, Deep NMB with ctu infusion, beach chair,
  - Avoid salt & water overload but cave rhabdomyolysis
  - Maintain normothermia loading up with sufficient non opiod analgesia
  - Avoid lung atelectasis, silent aspiration, volutrauma
    - Beach chair, CPAP, LRM, early PSV, permissive hypercapnia
  - Increase blood pressure above 140 mmHg to clip bleeding vessels to prevent post op bleeding
- 3. Post op elements
  - Full decurarisation to 90% and full awake before extubation.
  - Non opoid oral analgesia/NSAIDs
  - Prevent PONV
  - No nasogastric tube and stimulation of gut mobility
  - Early removal catheters, mobilisation legs and deep inspiration, oral nutrition



Non-opiate surgical anesthesia A Paradigm Shift?





Phil
Ruben Wouters

Dep of anaesthesiology Sint Jan Bruges, Belgium
In collaboration with M DeKock UCLeuven.

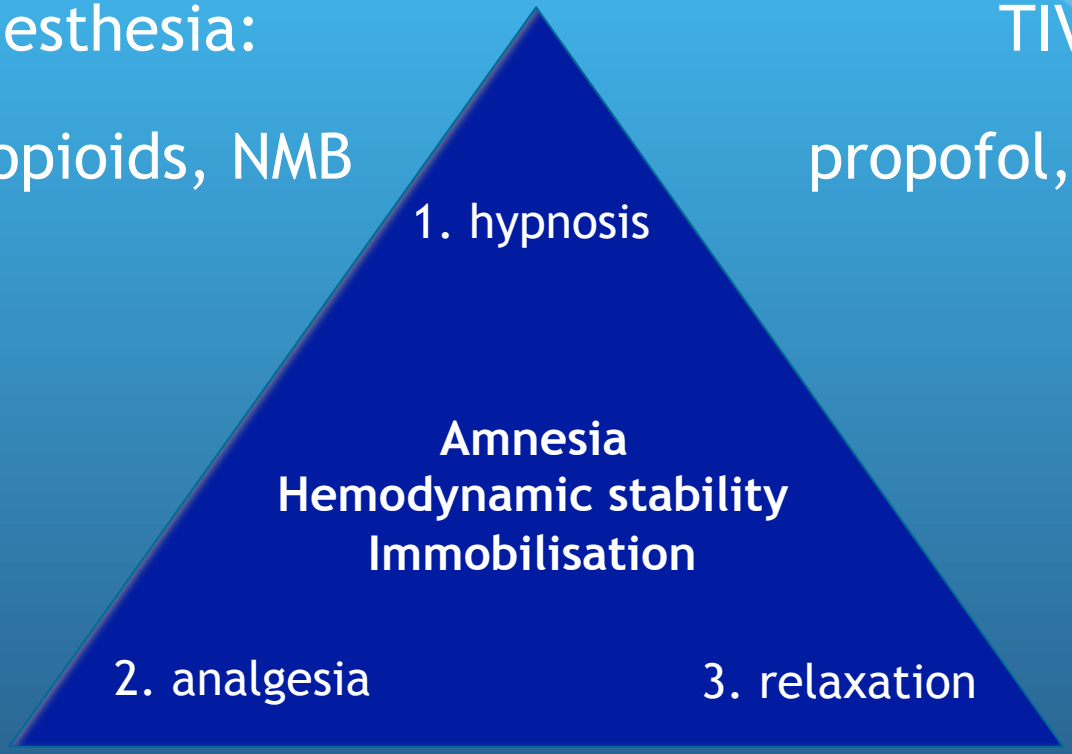
We learned that we need 1. 2. 3.

Balanced anesthesia:

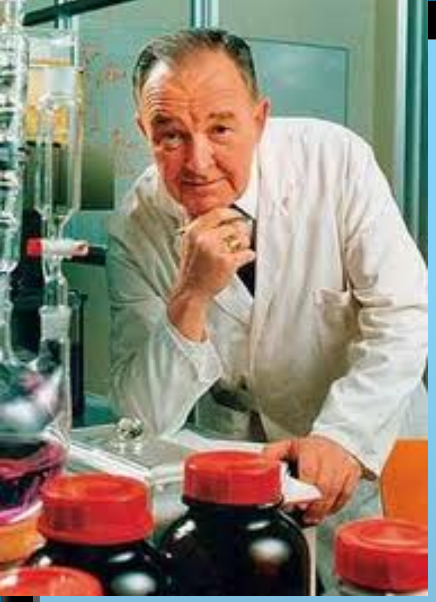
Inhalation, opioids, NMB

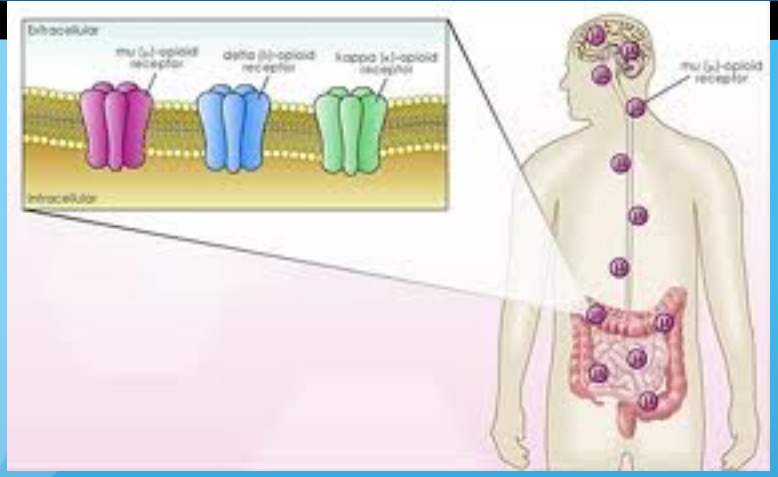
TIVA:

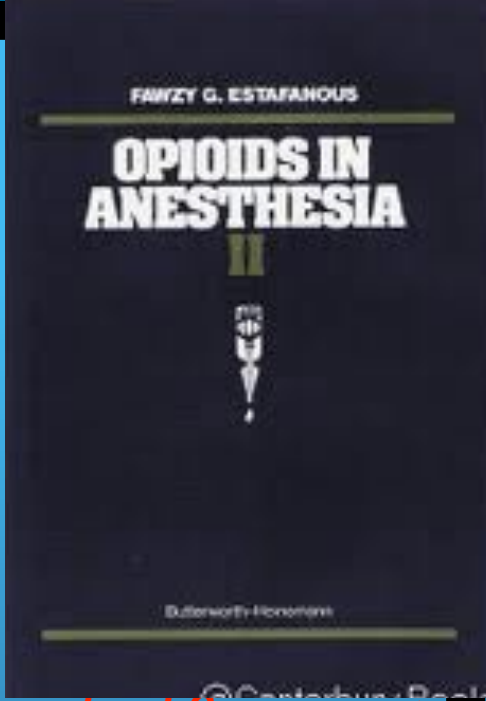
propofol, opioids, NMB



Do we need analgesia to achieve hemodyn stability?







Dr Paul Janssens, 1926 - 2003

A second paradigm took place, also 50 years ago:

1960 Dr P Janssens invented synthetic opiates; it changed anesthesia forever from inhalation to balanced anesthesia with opioids

- Perfect suppression of sympathetic system in balanced anesthesia
  - Without cardiovascular collaps or histamine release.
- High doses possible having hypnotic effects, relaxant effects?
  - Neurolept anesthesia; stress free anesthesia; sedation; locoregional ..

Why was opioid anesthesia successful?

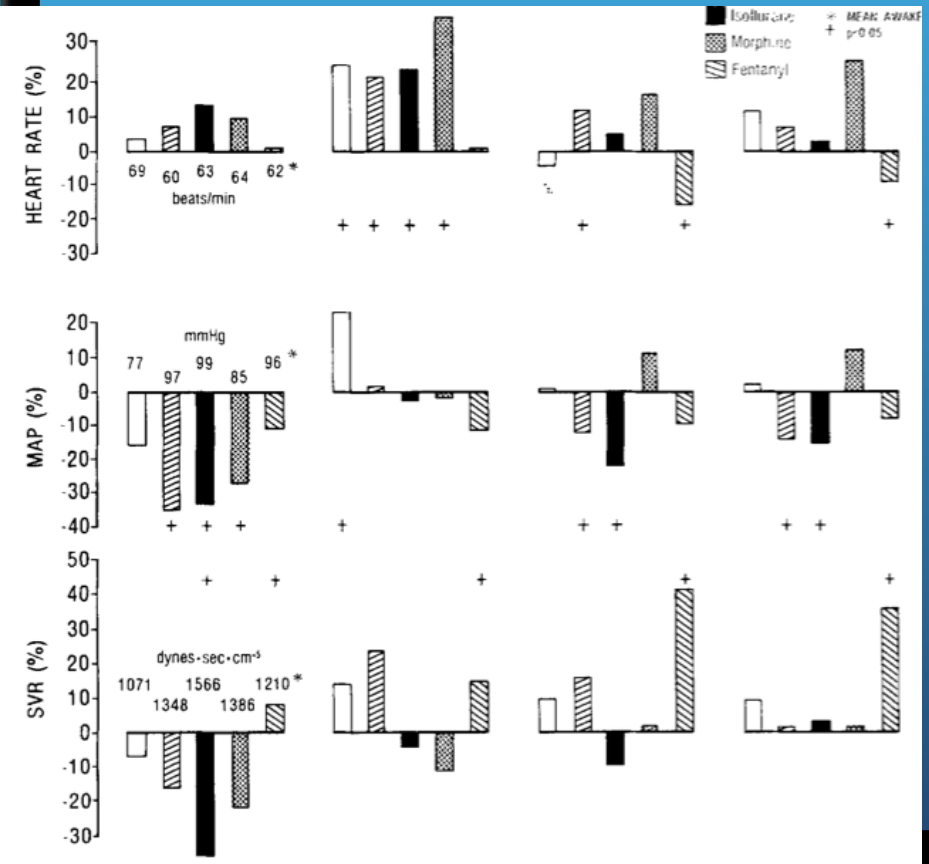
Fentanyl:

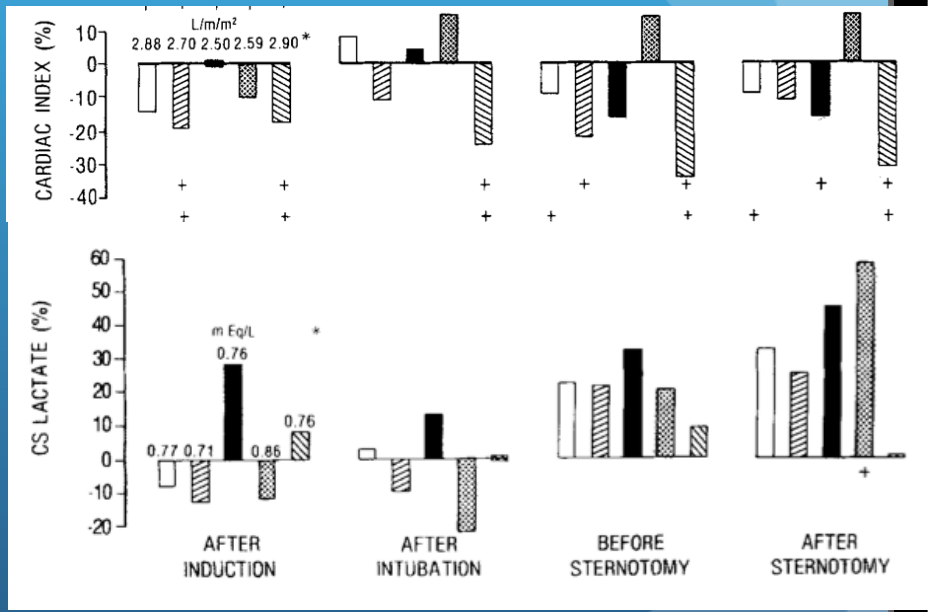
Decrease in cardiac output; Increase in SVR,

Slight decrease in HR – MAP and stable!

No lactate production

Moffitt E The Coronary Circulation and Myocardial Oxygenation in Coronary Artery Disease: Effects of Anesthesia Anesth-Analg 1986;65:395-410





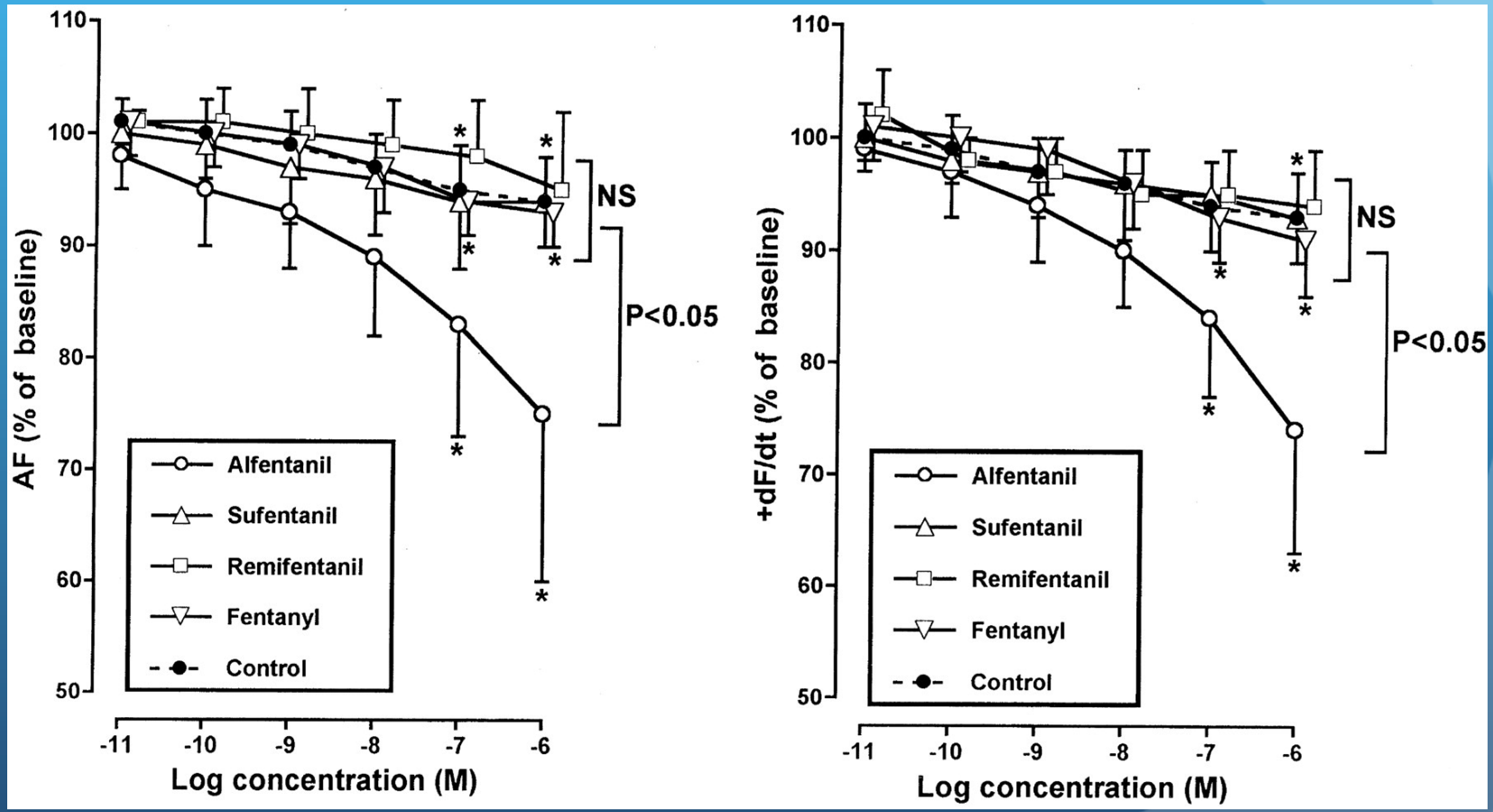
CHANGES FROM AWAKE STATE

Halothane
Enflurane
Isoflurane
Morphine
Fentanyl

* MEAN AWAKE LEVELS
\+ p<0.05

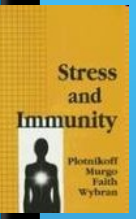
But
No negative inotropic effects of opioids (except alfentanyl)

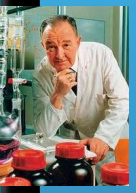
Effect of alfentanil, fentanyl, sufentanil, and remifentanil on maximum isometric active force (left panel) and the peak of the positive force derivative (right panel)



Hanouz J et al. Anesth Analg 2001;93:543-549

Why a new Paradigm today?





1. Immuno suppression by opioids?

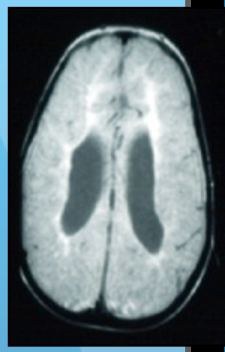
Wybran J. Suggestive evidence for receptors for morphine and methionine-enkephalin on normal human blood T lymphocytes. J Immunol. **1979**;123:1068-70

1992 Dr Paul Janssens invented Remifentanyl but refused to market Remifentanyl and sold it to Beecham afraid of unknown long-lasting effects of opioids…

Sacerdote P. Non-analgesic effects of opioids: mechanisms and potential clinical relevance of opioid-induced immunodepression. Curr Pharm Des. **2012**;18(37):6034-42.

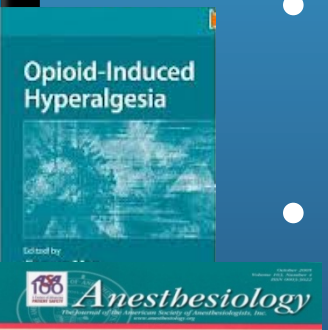
- **Morphine decreases natural and acquired immunity**, both directly and indirectly via the activation of central receptors.
- the immunological effects of opioid are receiving considerable attention because of concerns that opioid-induced changes in the immune system **may affect the outcome of surgery** or of variety of disease processes, **including bacterial and viral infections and cancer**.
- The impact of the opioid-mediated immune effects could be particularly **dangerous in selective vulnerable populations**, such as the elderly or immunocompromised patients.
- Choosing **anesthetic drugs without an effect on immune responses** may be an important consideration in anesthesia.

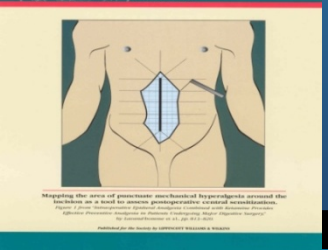
Why a new Paradigm today?



2. Fentanyl induces fixed **neurologic sequels?** (Periventricular Leucomalacia)
   - *Neonatal outcome and prolonged analgesia in neonates. Anand et al. Arch Pediat Adolesc Med 1999; 153: 331-8*

3. **Opioids induced hyperalgesia?**: Patients receiving opioids become *more sensitive to pain.*
   - Opioids are *short lasting analgesics* and *long-during hyperalgesics by upregulation of compensatory pronociceptive pathways*
   - Angst MS. Opioid-induced hyperalgesia: a qualitative systematic review. Anesthesiology. 2006;104:570-87





What do we need, peri-op?

Per operative we need:

- Hypnosis; hemodynamic stability; immobilisation
  - high dose **opioids were the simplest** method to reduce hypnotics; to keep **stable hemodynamics** and to block breathing
  - In very high dose no other drugs needed?
  - therefore we thought we needed **analgetics** and made them the third cornerstone of anesthesia

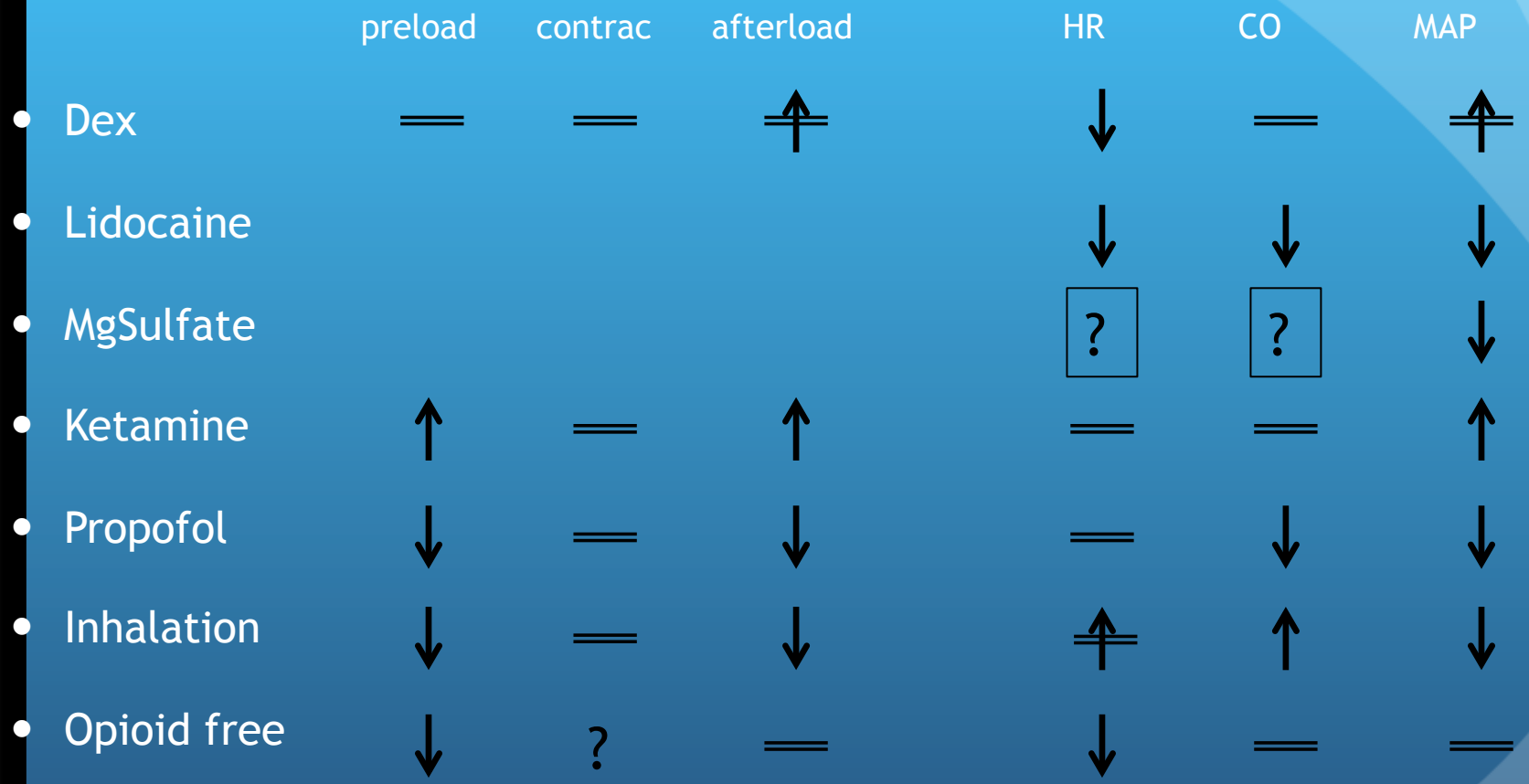
Post operative we need:

- Analgesia, no hypnosis, no muscle relaxation:
  - low dose opioids not always enough (due to high dose addiction per op)
    - Use PCIA PCEA … local, locoregional addition
  - avoid opioids side effects post operative: multimodal analgetics

How to avoid opioids?

- Direct sympathetic block central - peripheral
  - Clonidine, Dexmedetomidine, B blockers
- Indirect block of sympathetic effects
  - Nicardipine, lidocaine, Mg sulfate, inhalation vapor
- Multimodal analgetics (non opoids) loading up per operative to be active when waking up.
  - low dose ketamine, dexmedetomidine, lidocaine, diclofenac, paracetamol
- Epidural, plexus and local infiltration block
- Spinal anesthesia with higher sympathical nerve block. Epidural block.

Hemodynamic stability possible?

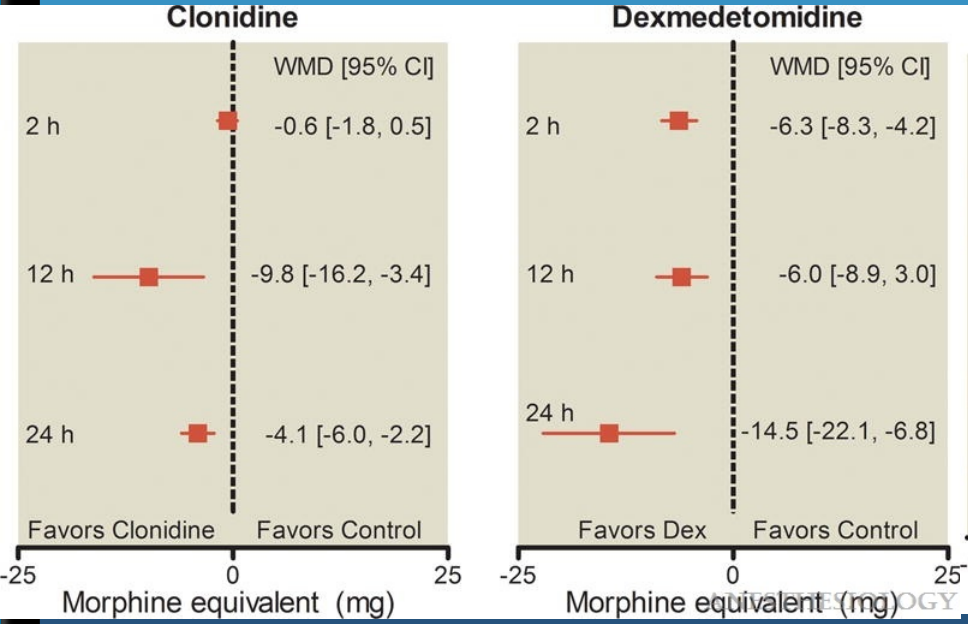


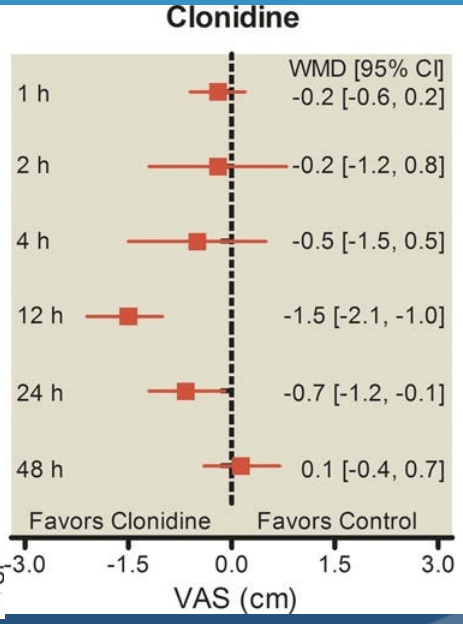
Effect of clonidine-dexmedetomidine on post-op opioid use

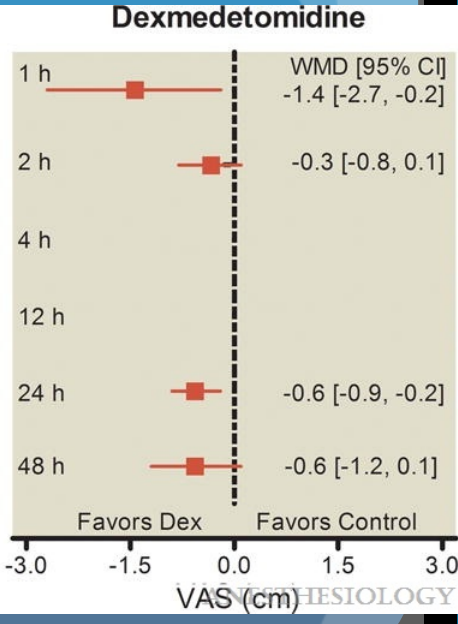
- Blaudszun G. Anesthesiology 2012 ; 116: 1312-22 Effect of systemic alpha2 agonists on post operative morphine consumption and pain intensity. Review and meta analysis.

Morphine post OP

VAS post OP



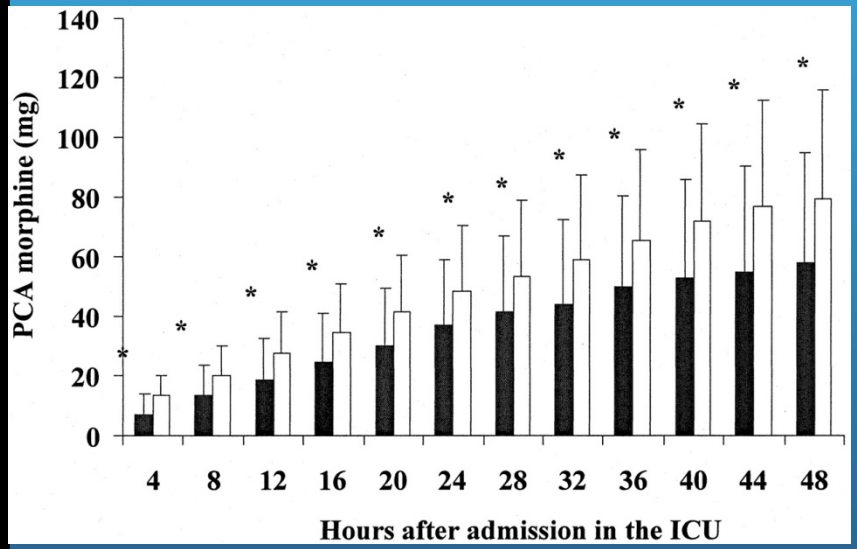




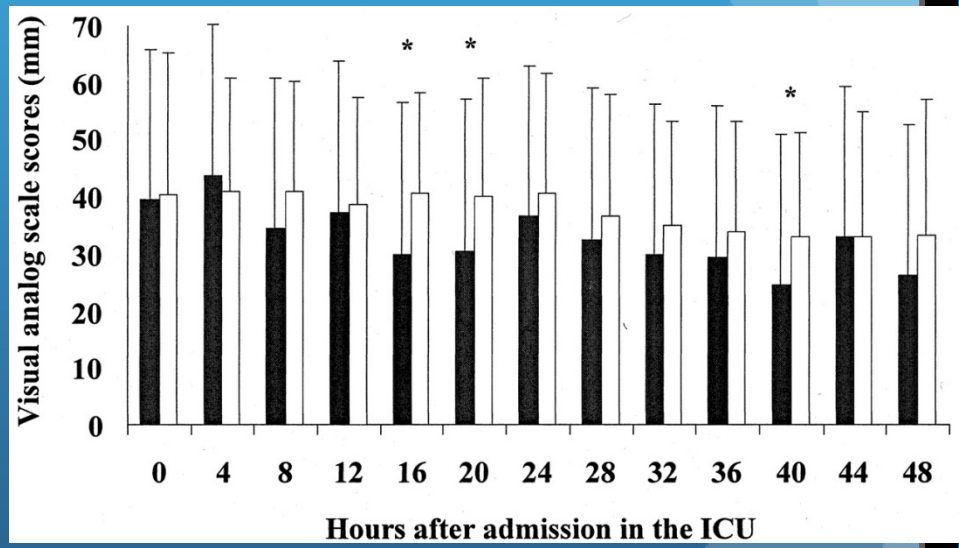
Effect of ketamine on post-operative opioid use

- Bell RF Perioperative Ketamine for acute post operative pain. the cochrane library 2010; 11

Cumulative postoperative patient-controlled analgesia (PCA) morphine consumption.



Visual analog scale score at mobilization during the 48-h study.



Ketamine per op
Placebo per op

Guillou N et al. Anesth Analg 2003;97:843-847

Effect of Mgsulfate on per-op opioids

- Kogler The analgesic effect of magnesium sulfate in patients undergoing thoracotomyJ Acta Clin Croat. 2009;48:19-26.

Thoracotomy patients received Fentanyl as required and 30-50 mg/kg MgSO4 followed by continuous infusion of 500 mg/h or placebo.

Fentanyl consumption during the operation was significantly lower in the Mg treated group versus placebo.

Effect of lidocaine on post-op opioid use

- McCarthy G. Drugs. 2010;70:1149-63. **Impact of intravenous lidocaine infusion on postoperative analgesia and recovery from surgery: a systematic review of randomized controlled trials.**
- 33% reduction vs placebo in opioid consumption postoperative.
  - when the lidocaine infusion was maintained for 1 hour
- 83% reduction vs placebo in opioid consumption postoperative.
  - when the lidocaine infusion was maintained for 24 hours.
- earlier return of bowel function, allowing for earlier rehabilitation and shorter duration of hospital stay. Duration of hospital stay was reduced by an average of 1.1 days in the lidocaine-treated patients.
- intravenous lidocaine did not result in toxicity or clinically adverse events.

Steroids revival for post op analgesia?

- Massera G. Indications for steroid anesthesia.

Acta Anaesthesiol. 1959;10:541-9

- Tiippana E. Effect of paracetamol and coxib with or without dexamethasone after laparoscopic cholecystectomy.

Acta Anaesthesiol Scand. 2008;52:673-80

Conclusion

- Many studies show a reduction in opioid use per operative and post operative if a non opioid additive is added.

If these drugs are combined in a multimodal approach is it possible to avoid all opioids per operative???

- Marc de Kock (UCL Belgium) achieved this already several years before Dexmedetomidine became available in Europe using high dose clonidine –low dose ketamine and esmolol.

Case report 2005: Morbid obesity using dexmedetomidine without narcotics

- 433 kg morbidly obese patient with obstructive sleep apnea and pulmonary hypertension.
- 0.5 MAC inhalation. A continuous infusion of dexmedetomidine (0.7 ug/kg/h) per operative and a low infusion rate first postoperative day.
- 48 mg morphine by PCA first day with dex
- 148 mg morphine by PCA second day without dex.

Hofer R. Anesthesia for a patient with morbid obesity using dex-medetomidine without narcotics. Can J Anaesth. 2005; 52: 176-80.

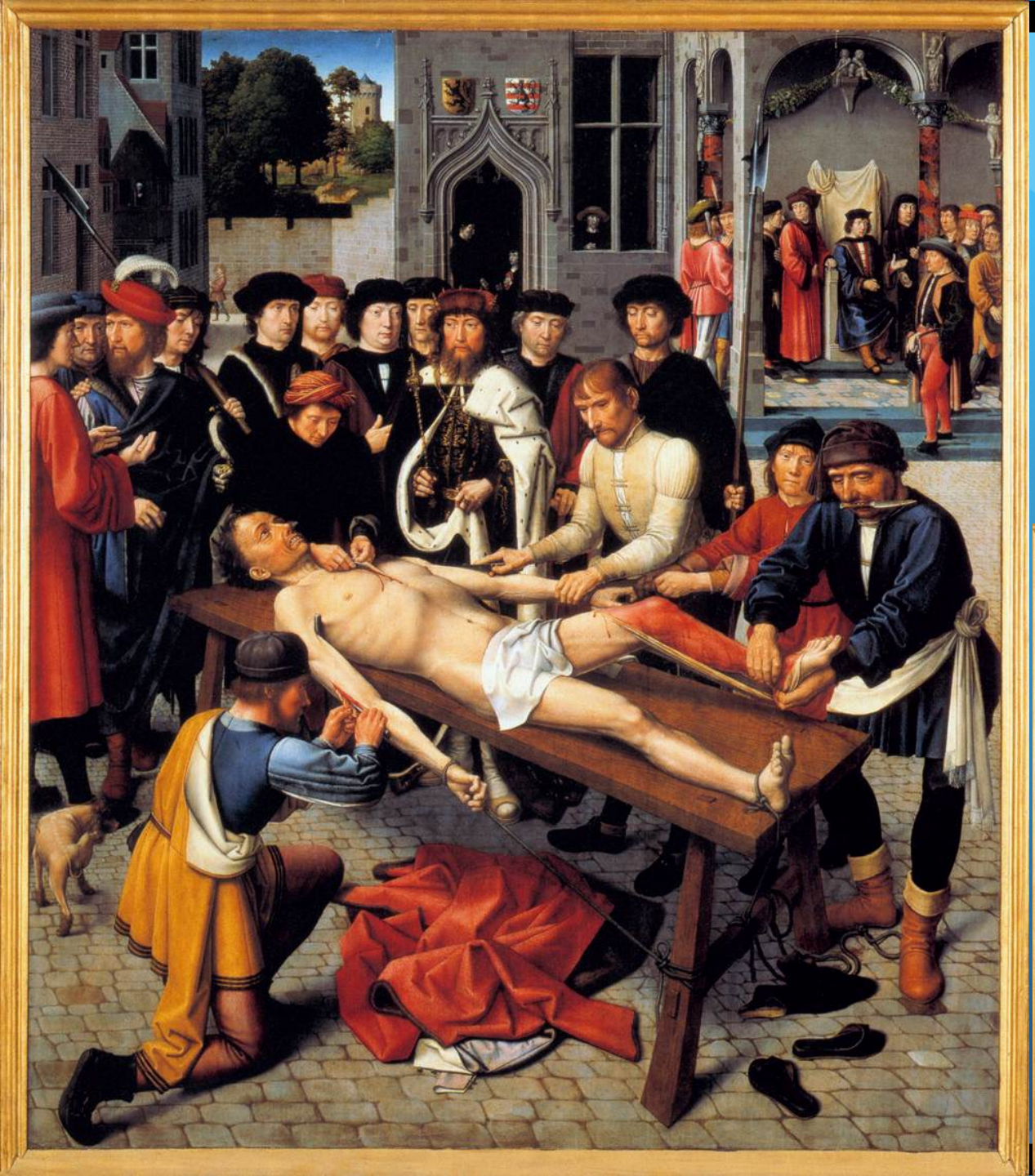
Anesthesia for a patient with morbid obesity using dexmedetomidine without narcotics

[L'anesthésie chez un patient obèse morbide avec la dexmédétomidine sans narcotiques]

Roger E. Hofer MD,* Juraj Sprung MD PhD,* Michael G. Sarr MD,† Denise J. Wedel MD*

IFSO 2013 Istanbul

OFA is not vivisection!



Start with opioid sparing anesthesia…

1. Stop remifentanyl infusions, use only 10 ug sufentanil at induction. Measure anesthesia depth, blood pressure, HR; give low dose opioids before extubation.
2. add an alpha agonist (central direct sympathetic block)
   - Clonidine, 150 - 300 ug at induction dexmedetomidine infusion 0,5 – 1 ug/kg/h after induction,
3. keep peripheral B blocker as escape if tachycard
4. Indirect block of sympathetic effects
   - lidocaine bolus before induction,
   - increase to 1,5 MAC inhalation vapor,
   - Keep Nicardipine or other vasodilator as escape
5. start non opioid analgetics per operative
   - Low dose ketamine 10 – 20 mg,
   - Diclofenac, keterolac or parecoxib
   - Paracetamol, dexamethasone, droperidol (PONV?).
6. Epidural, plexus and local infiltration block of pain nerves

How to monitor anesthesia depth during opioid free anesthesia?

- Ketamine given at a hypnotic dosis of 1,5 mg/kg rises the BIS value. (we give ketamine in OFA dosis of 0,25 mg/kg IBW far below an hypnotic dosis.)
  - Wu CC. EEG-bispectral index changes with ketamine versus thiamylal induction of anesthesia. Acta Anaesthesiol Sin. 2001;39:11-5.
- BIS values are elevated by a bolus dose of isoproterenol, ketamine, neostigmine or sugammadex above 60 % while patients have no recall.
  - Dahaba AA. Effect of sugammadex or neostigmine neuromuscular block reversal on bispectral index monitoring of propofol/remifentanil anaesthesia. Br J Anaesth. 2012 Apr;108(4):602-6
  - Matthews R. Isoproterenol induced elevated bispectral indexes while undergoing radiofrequency ablation. AANA J. 2006;74:193-5

No risk for awareness if you keep BIS below 60% during OFA.

OFA Protocol Sint Jan Brugge with Dex

- Three drugs (Dex 200ug, Ket 50 mg, Lid 300 mg, add H20 to 20 ml) given at 1 ml/10 kg IBW and followed by 1 ml/10 kg IBW/h adapt to HR/MAP
  - Dexmedetomidine 0,5 to 1 ug/kg IBW followed by 0,5 to 1 ug/kg IBW/h
  - Ketamine 0,125 to 0,25 mg/kg followed by 0,125 to 0,25 mg/kg IBW/h
  - Lidocaine 1,5 mg/kg IBW followed by 1,5 to 3 mg/kg IBW/h
- MgSulfate 40 mg/kg IBW followed by 10 mg/kg IBW/h
- Propofol is given at 2,5 mg/kg IBW followed by inhalation anesthesia at 0,6 – 0,8 MAC with BIS around 40%.
- Rocuronium 0,6 – 1 mg/kg IBW followed by infusion 1 mg/kg IBW/h and based on TOF PTC (if NMB is needed).

OFA Protocol Sint Jan Brugge with clonidine

- Three drugs (clonidine 300ug, Ket 50 mg, Lid 300 mg, add H20 to 20 ml) given at 1 ml/10 kg IBW and followed by 0,5 - 1 ml/10 kg IBW/h adapt to HR/MAP BIS
  - Clonidine 0,75 to 1,5 ug/kg IBW followed by 0,75 to 1,5 ug/kg IBW/h
  - Ketamine 0,125 to 0,25 mg/kg followed by 0,125 to 0,25 mg/kg IBW/h
  - Lidocaine 1,5 mg/kg IBW followed by 1,5 to 3 mg/kg IBW/h
- MgSulfate 40 mg/kg IBW followed by 10 mg/kg IBW/h
- Propofol is given at 2,5 mg/kg IBW followed by inhalation anesthesia at 1,0 – 1,5 MAC with BIS around 40%.
- Rocuronium 0,6 – 1 mg/kg IBW followed by infusion 1 mg/ kg IBW/h and based on TOF PTC (if NMB is needed).

- Have metoprolate and nicardipine available when

Start OFA Protocol Sint Jan Brugge with clonidine

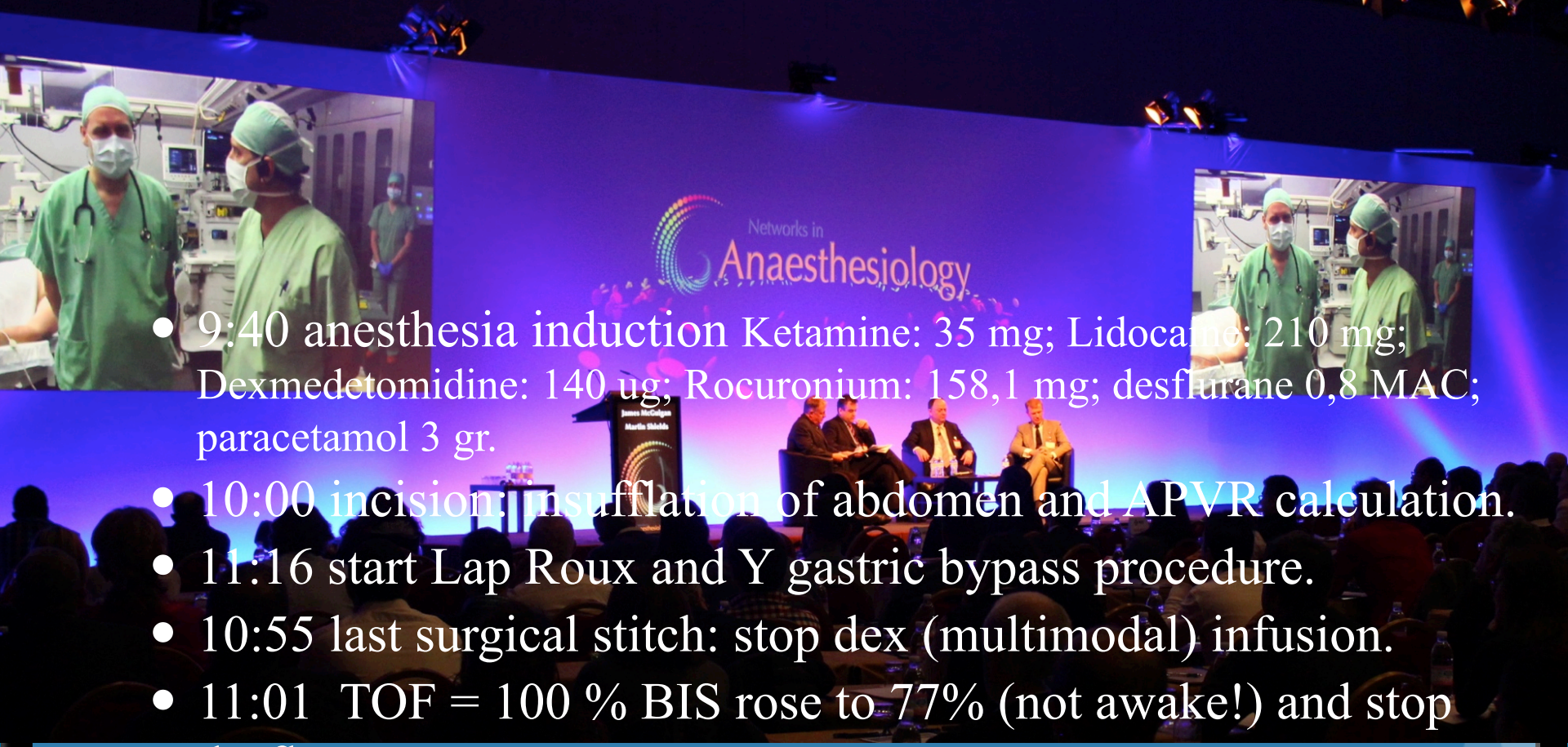
- Clonidine 1 amp (150 ug) slowly iv before induction
- Ketamine 12 - 25 mg iv before induction
- Lidocaine 1 - 1,5 mg/kg IBW at induction
- Sufentanyl 10 ug iv at induction
- Propofol is given at 2,5 mg/kg IBW followed by inhalation anesthesia at 1,0 – 1,5 MAC with BIS around 40%.
- MgSulfate 40 mg/kg IBW slowly iv/10 min
- Rocuronium 0,6 – 1 mg/kg IBW followed by infusion 1 mg/kg IBW/h and based on TOF PTC (if NMB is needed).
- Have metoprolate and nicardipine available when tachycard or hypertensive. (DHB 0,6 mg remain to prevent PONV)
- Wound infiltration with local anesthetics, reduce total dose LA.

Post operative analgesia

- non steroidal anti-inflammatory agents
  - Paracetamol 2 gr loading 1 gr/6h
  - Diclofenac 150 mg loading, 2x75 mg/day
  - Or Keterolac 40 mg loading, 3 x 10 mg/day
- Local wound infiltration (calculate toxic dose!)
- and choice between
  - give low dose morphine or
  - keep infusion of sympathicolytica (ket dex lido Mg) at low dose without deep sedation
    - Ketamine 0,05 mg/kg/h
    - Lidocaine 1 mg/kg/h
    - Mgsulfate 10 mg/kg/h
    - Dexmedetomidine 0,1 – 0,2 ug/kg/h

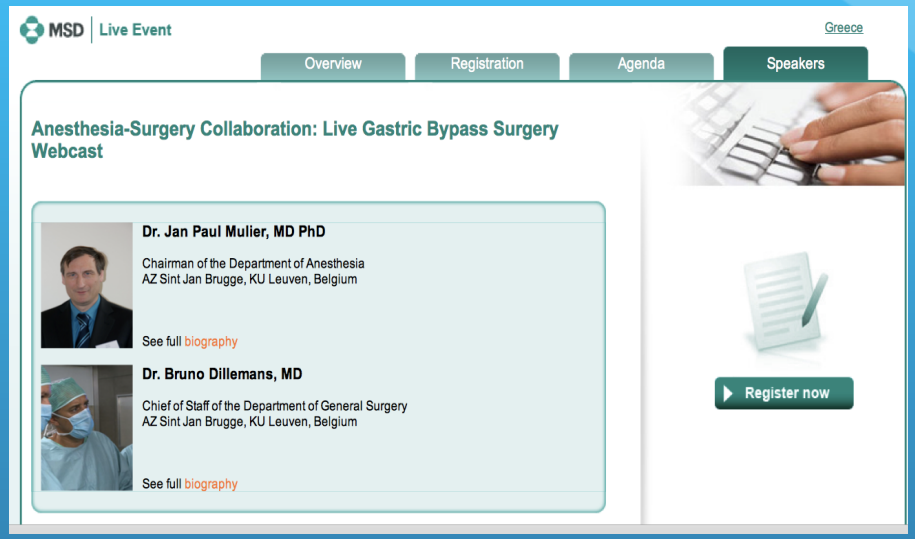
Personal experience

- 2008 (self) Hypnosis without any medication.
  - Perfect sympathetic block without pain is possible
- 2010 Clonidine 300 ug, ketamine 25 mg, metoprolaat 5 mg added to 10 ug Sufentanyl.
- 2011 Clonidine 150 ug, ket 12 mg, lidocaine 1 mg/kg, esmolol infusion and no sufentanyl, 1,5 MAC inhalation.
- 2012 Dexmedetomidine, ketamine, lidocaine 1,5 -3 mg/kg, Mg Sulfate, bolus and infusion with 0,7 MAC inhalation.
- 2013 90 % of my anesthesias today are OFA, 10 % opioid sparing.



- 9:40 anesthesia induction Ketamine: 35 mg; Lidocaine: 210 mg; Dexmedetomidine: 140 ug; Rocuronium: 158,1 mg; desflurane 0,8 MAC; paracetamol 3 gr.
- 10:00 incision; insufflation of abdomen and APVR calculation.
- 11:16 start Lap Roux and Y gastric bypass procedure.
- 10:55 last surgical stitch: stop dex (multimodal) infusion.
- 11:01 TOF = 100 % BIS rose to 77% (not awake!) and stop desflurane.
- 11:06 patient awake when called, extubation.
- 11:08 patient full awake, no pain, feels happy to hear that operation is finished and had sufficient force to move himself painfree in bed at 11:14.

Follow live an OPIOID FREE Anesthesia delivery for laparoscopic gastric bypass surgery

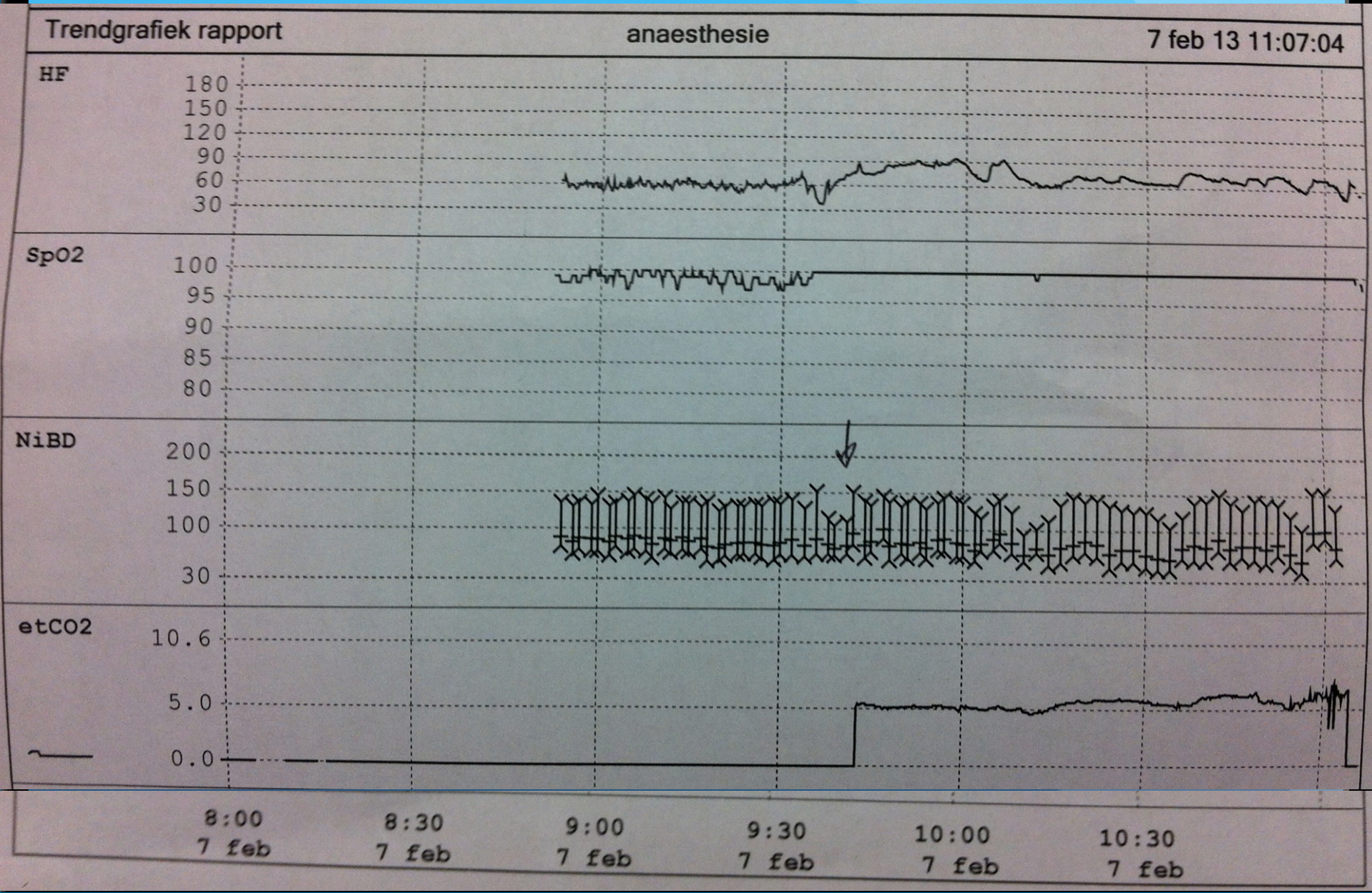


- http://anes-symposium3.2013.msd.com

- Ask your MSD representative for a login code
- On 5th of sept 2013 at 12:00 Brussels time (13:00 Istanbul time) weblive for 90 minutes.

Awakening after OFA

HR, Sat, NIBP, etCO2



02%, BIS, TOF, PTC, airw pres

Peak airway pressures in mmHg

Per-operative Problems

- Vasoconstriction during induction (dex loading)
  - Pale, white, hypertension, bradycardia
  - R/ nicardipine 1 mg , wait till prop/inhal is effective
- Insufficient sympathetic block
  - Tachycardia, hypertension
  - Betablocker, more inhalation, dex, lid extra
- Sympathetic block to strong
  - Bradycardia, hypotension
  - R/ Ephedrine
- Not enough vasoconstriction
  - Bloody surgical field
  - R/ beta blocker

Post-operative Problems

- Not waking up post operative
  - Lower dose clonidine / stop-reduce dex pump earlier
  - Stimulate patient who will suddenly open his eyes and want to go asleep again.
  - Wait 15 minutes (Dex) or several hours (Clonidine)
- Pain when wakening up
  - Add morphine 5 mg iv at end surgery
  - Switch from clonidine to dexmedetiomidine
  - Did you add keterolac or diclofenac?
  - Are all multimodal elements given sufficient?
- Bradycardia, hypotension
  - No problem, accept HR 45 and SAP 90.
  - Ephedrine extra

Good indications for OFA

- Obese patients, patients with obstructive sleep apnea syndrome (OSAS)
- Asthma, COPD and other pulmonary diseases.
- Acute and chronic opioid addiction.
  - Sufficient analgesia preferential with non-opioids is essential also in long-term abstinence to avoid relapses.
  - Huxtable 2011, Bryson 2010, Rundshagen 2010, Jage 2006, Stromer 2013
    - If heroine addict: substitution
    - If alcohol: use clonidine/benzo
    - If cocaine, amphetamines: avoid stress and craving
- Allergy, anaphylaxis for opioids? Histamine release.
  - Fentanyl-associated anaphylaxis (Fukuda 1986, Fischer 1991, Cummings 2007, Baldo B Anaesth Intensive Care 2012; 40: 216)
- Hyperalgesia problems. Is frequent but you have to ask.
- Complex regional pain syndromes (CRPS)
  - Causalgia, Suddeck's atrophy, Raynaud syndrome and reflex sympathetic dystrophy.
- Chronic Fatigue and Immune Dysfunction Syndrome?
  - Avoid histamine release, ponv prevention, Mg and K extra,
- Oncologic surgery?
  - Being pain free and stress free more important than immunosupression by morphine? Pro –contra opoids.
    - Imani B Morphine use in cancer surgery Front pharmacol 2011; 2: 46

Contra indications for OFA

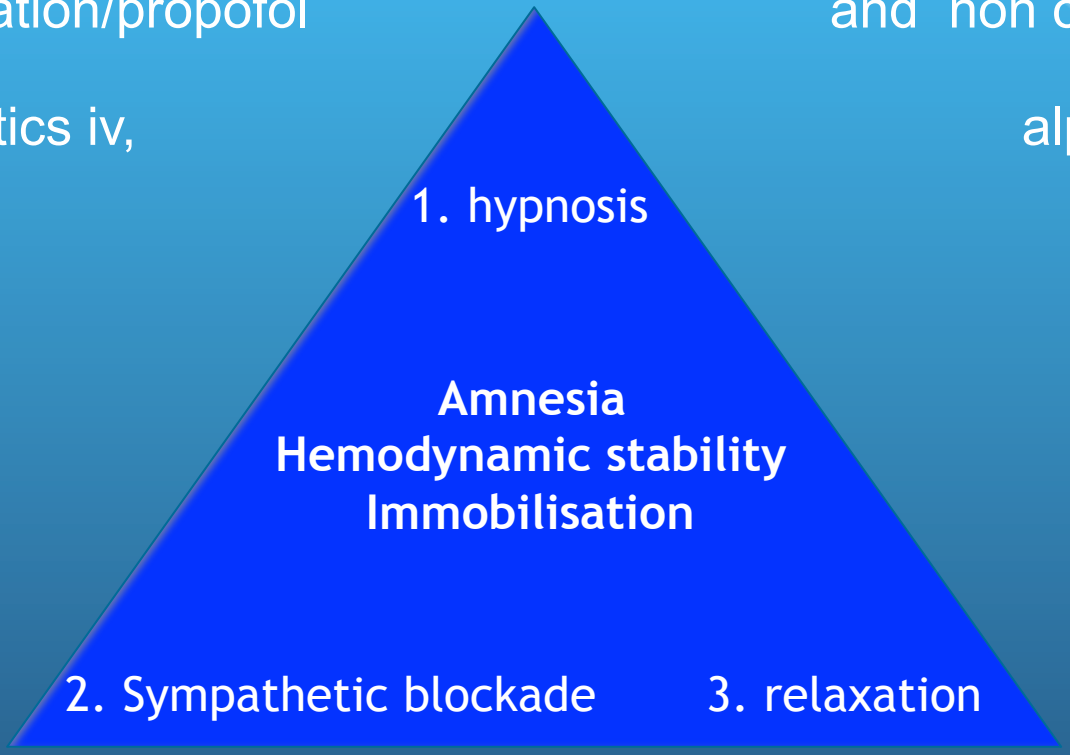
- Absolute CI
  - Allergy to one of the drugs.?, heart block, shock, extreme bradycardia
- Relative CI
  - Acute Ischemic problems due to coronary stenosis?
    - Add nicardipine to give Coronary vasodilation
    - Slower loading of dexmedetomidine to avoid hypertension and vasoconstriction.
  - Controlled hypotension with need for dry surgical field by a low cardiac output.
    - Add more beta blockers, Mgsulfate
  - Sympathetic dysfunctional syndromes with orthostatic hypotension.
    - Use less dexmedetomidine
  - Very old patients
    - Use lower dose dex

Today paradigm shift to OFA?

OFA: Inhalation/propofol and non opioid analgetics,

local anesthetics iv, alpha agonists,

B blockers ketamine



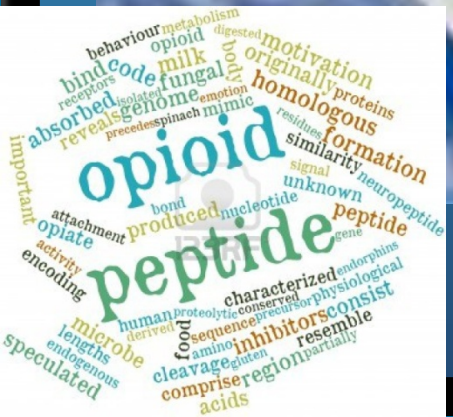
No analgesiais needed during anesthesia
We need sympathetic stability to avoid organ dysfunction or damage

Start with Opioid Sparing Anesthesia (OSA) continue to Opioid Free Anesthesia (OFA)

- OSA is a must for every patient.
- OFA is possible for many patients.
- Is an alternative for opioid anesthesia!
- Is better for a selective group of patients!!

OFA might be usefull for most patients?

More research is needed before becoming evidence based. Try it slowly and listen to your patients.



More info ?




More info

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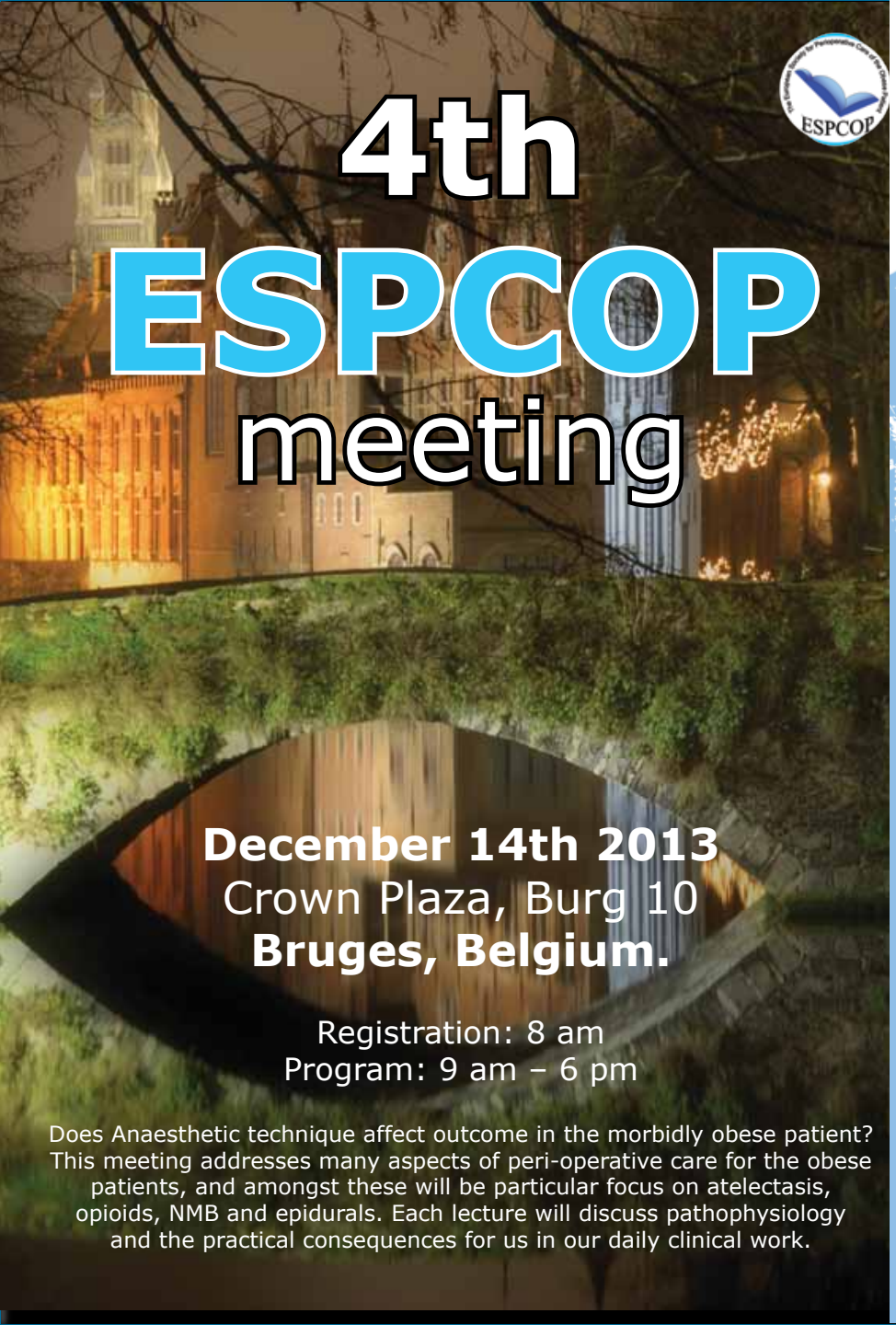

4th ESPCOP meeting

December 14th 2013
Crown Plaza, Burg 10
Bruges, Belgium.

Registration: 8 am
Program: 9 am – 6 pm

Does Anaesthetic technique affect outcome in the morbidly obese patient? This meeting addresses many aspects of peri-operative care for the obese patients, and amongst these will be particular focus on atelectasis, opioids, NMB and epidurals. Each lecture will discuss pathophysiology and the practical consequences for us in our daily clinical work.

The preliminary program and speakers:

What is new in the ventilation of the morbidly obese patient? **Paolo Pelosi**	Haemodynamic effects of lung recruitment in the morbidly obese patient. **Tomasz Gaszynski**
New practical tools to prevent peri-operative atelectasis in the morbidly obese patient. **Jan Paul Mulier**	Is there a place for respiratory stimulants in anaesthesia for the obese patient? **Luc De Baerdemaeker**
The impact of obesity on outcome in general ICU. The ICNARC study **Michael Margarson**	Variability and failings in the care for patients undergoing bariatric surgery, The NCEPOD Bariatric Surgery study. **Euan Shearer**
Opioid sensitivity and respiratory depression. Practical approaches to aid peri-operative opioid dosing strategies. **Michael Margarson**	The STOP-Bang questionnaire: What it is and how to use it. **Frances Chung**
Does obstructive sleep apnea increase the rate of postoperative complications and can we avoid this? **Frances Chung**	Advantages and challenges of opioid-free anaesthesia in the morbidly obese patient? **Marc Dekock**
Using an opioid-free anaesthesia protocol for bariatric surgery: Practical application. **Jan Paul Mulier**	How to improve the quality of Obstetric Anaesthesia for the morbidly obese parturient. **Yigal Leykin**
Practical aspects of epidural analgesia in obese patients. Do we need ultrasound and are long needles safe in morbidly obese parturients? **Marcel Vercauteren**	What I do as a bariatric surgeon when I do not have enough laparoscopic workspace. **Bruno Dillemans**
Update on muscle relaxant dosing requirements in morbid obese patients to achieve deep NMB. **Yigal Leykin**	Is Post-operative Residual Curarisation a significant problem in the morbid obese patient? How can we deal with it? **Tomasz Gaszynski**

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Abstracts related to obesity and anaesthesia or intensive care presented for the first time within the last year may be submitted for our scientific session. All selected abstracts will be presented as posters, and the best four or five will be selected for oral presentation. There will be prizes of 250, 500 and 1000 euro for the three best presentations.

CROWNE PLAZA
BRUGGE

Residency in anesthesia Bruges will learn you Opioid free as well as opioid sparing anesthesia

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