

Anestezie v bariatrii. Jde to i jinak.

MUDr. Milan Hrobský

OBSAH

- **1. bla bla bla bla bla**

- **2. jak a proč**

- **3. tips & tricks**



STEJNOPIS

NOTÁŘSKÝ ZÁPIS

sepsaný **Mgr. Daliborem Novákem**, notářem se sídlem v Pardubicích, mimo notářskou kancelář v Praze, Smíchov, Kořenského 1025/7, dne dvacátého třetího září roku dva tisíce dvacet (23. 9. 2020).-----

Účastník pan **MUDr. Milan Hrobský**, narozený 5. 9. 1983, bytem Chlupáčova 1176/10, Hlubočepy, 152 00 Praha 5.-----

Totožnost účastníka mně byla prokázána.-----

Účastník prohlašuje, že je způsobilý samostatně právně jednat v rozsahu právního jednání, o kterém je tento notářský zápis.-----

Účastník zakládá společnost s ručením omezeným touto zakladatelskou listinou:-----

ZAKLADATELSKÁ LISTINA

článek I.
Obchodní firma

Anesthesia s.r.o.

článek II.
Sídlo společnosti

Sídlo společnosti je v Praze.-----

článek III.
Předmět podnikání

Předmětem podnikání společnosti je:-----
Poskytování zdravotních služeb v oboru anesteziologie.-----
Výroba, obchod a služby neuvedené v přílohách 1 až 3 živnostenského zákona.-----
Pronájem nemovitých věcí, bytů a nebytových prostor.-----

článek IV.
Společníci

Společníkem společnosti je pan **MUDr. Milan Hrobský**, narozený 5. 9. 1983, bytem Chlupáčova 1176/10, Hlubočepy, 152 00 Praha 5.-----

Zakladatelská listina

23.9.2020

OB klinika

- zdravotnické zařízení poskytující komplexní ambulantní i lůžkovou péči při léčbě a prevenci obezity a s ní spojených metabolických onemocnění.



ERAS protokol

opioid šetřící anestezie

Neuromonitorace

Hluboká svalová relaxace a její antagonizace

SCIENTIFIC REVIEW

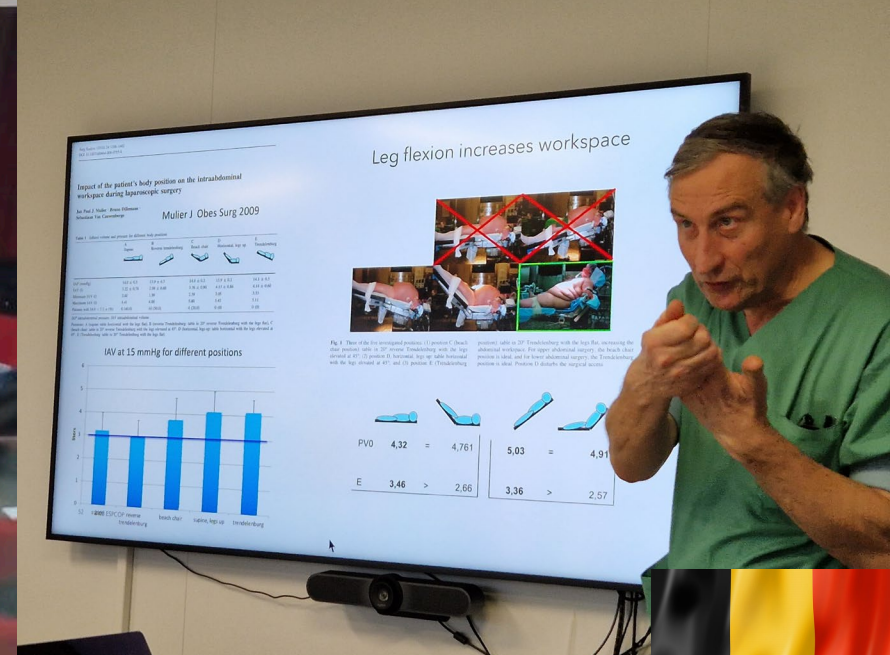
Guidelines for Perioperative Care in Bariatric Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: A 2021 Update

Erik Stenberg¹ · Luiz Fernando dos Reis Falcão² · Mary O'Kane³ · Ronald Liem^{4,5} · Dimitri J. Pournaras⁶ · Paulina Salminen^{7,8} · Richard D. Urman⁹ · Anupama Wadhwa¹⁰ · Ulf O. Gustafsson¹¹ · Anders Thorell^{12,13}

Accepted: 24 October 2021 / Published online: 4 January 2022
© The Author(s) 2021, corrected publication 2022

Table 3 ERAS recommendations for intraoperative care in bariatric surgery

Element	Recommendation	Level of evidence	Recommendation grade
8. Perioperative fluid management	<i>The goal of perioperative fluid management is to maintain normovolemia and optimize tissue perfusion and oxygenation. Individual goal-directed fluid therapy is the most effective strategy, avoiding both restrictive or liberal strategies</i>	Moderate	Strong
	<i>Colloid fluids do not improve intra- and postoperative tissue oxygen tension compared with crystalloid fluids and do not reduce postoperative complications</i>	Low	Weak
9. Standardized anaesthetic protocol	<i>The current evidence does not allow recommendation of specific anaesthetic agents or techniques</i>	Low	Weak
	<u><i>Opioid-sparing anaesthesia using a multimodal approach, including local anaesthetics, should be used in order to improve postoperative recovery</i></u>	High	Strong
	<i>Whenever possible, regional anaesthetic techniques should be performed to reduce opioid requirements. Thoracic epidural analgesia should be considered in laparotomy</i>	Low	Weak
	<u><i>BIS monitoring of anaesthetic depth should be considered where ETAG monitoring is not employed</i></u>	Low	Strong
10. Airway management	<i>Anaesthetists should recognize and be prepared to handle the specific challenges in airways in patients with obesity</i>	Moderate	Strong
	<i>Endotracheal intubation remains the main technique for intraoperative airway management</i>	Moderate	Strong
11. Ventilation strategies	<i>Lung protective ventilation should be adopted for all patients undergoing elective bariatric surgery with avoidance of high PEEP values</i>	Moderate	Strong
	<i>Increases in driving pressure resulting from adjustments in PEEP should ideally be avoided</i>	Low	Strong
	<i>PCV or VCV can be used for patients with obesity with inverse respiratory ratio (1.5:1)</i>	Low	Strong
	<i>Positioning in a reverse Trendelenburg, flexed hips, reverse- or beach chair positioning, particularly in the presence of pneumoperitoneum, improves pulmonary mechanics and gas exchange</i>	Low	Weak
	<u><i>Deep neuromuscular blockade improves surgical performance</i></u>	Low	Strong
12. Neuromuscular blockade	<i>Ensuring full reversal of neuromuscular blockade improves patient recovery</i>	Moderate	Strong
	<i>Objective qualitative monitoring of neuromuscular blockade improves patient recovery</i>	Moderate	Strong
	<i>Laparoscopic approach whenever possible</i>	High	Strong
14. Surgical technique, volume and training	<i>During the learning curve phase, all operations should be supervised by a senior surgeon with significant experience in bariatric surgery</i>	Training: Low	Strong
	<i>There is a strong association between hospital volume and surgical outcomes at least up to a threshold value</i>	Hospital volume: Low	Strong
	<i>Nasogastric tubes and abdominal drains should not be used routinely in bariatric surgery</i>	Weak	Strong



Protokol

1 premedikace	Neurontin 300mg tbl. p.o.
---------------	---------------------------

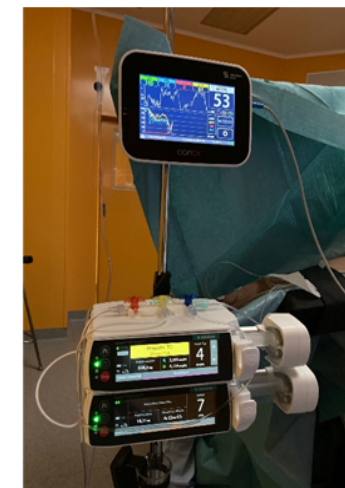
2 úvod do CA	OFA:	bolus 1ml/10kg ABW OFA směsi			
	TCI Propofol:	farm.model:	Schnider/Eleveld		
		indukce:	5-6ug/ml = bolus 2-3mg/kg		
	léky :	Dexamed 8mg i.v.			
		MgSO4	<100kg 1g	100-150kg 2g	>150kg 3g
	relaxace:	Rocuronium	0,6mg/kg IBW		

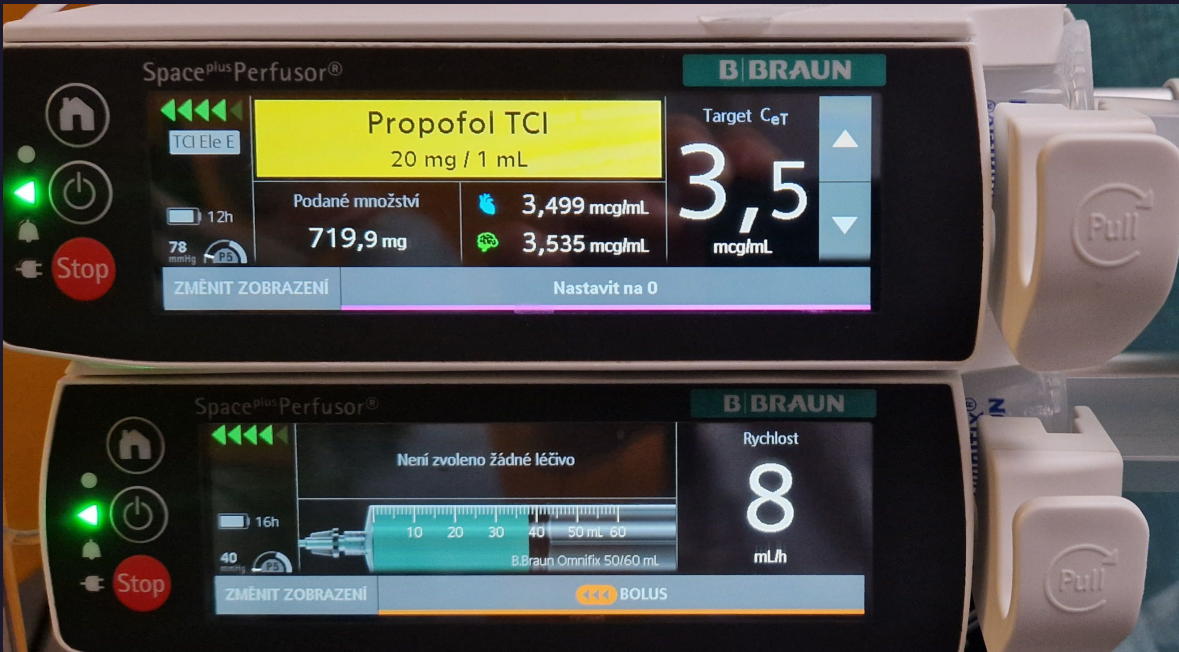
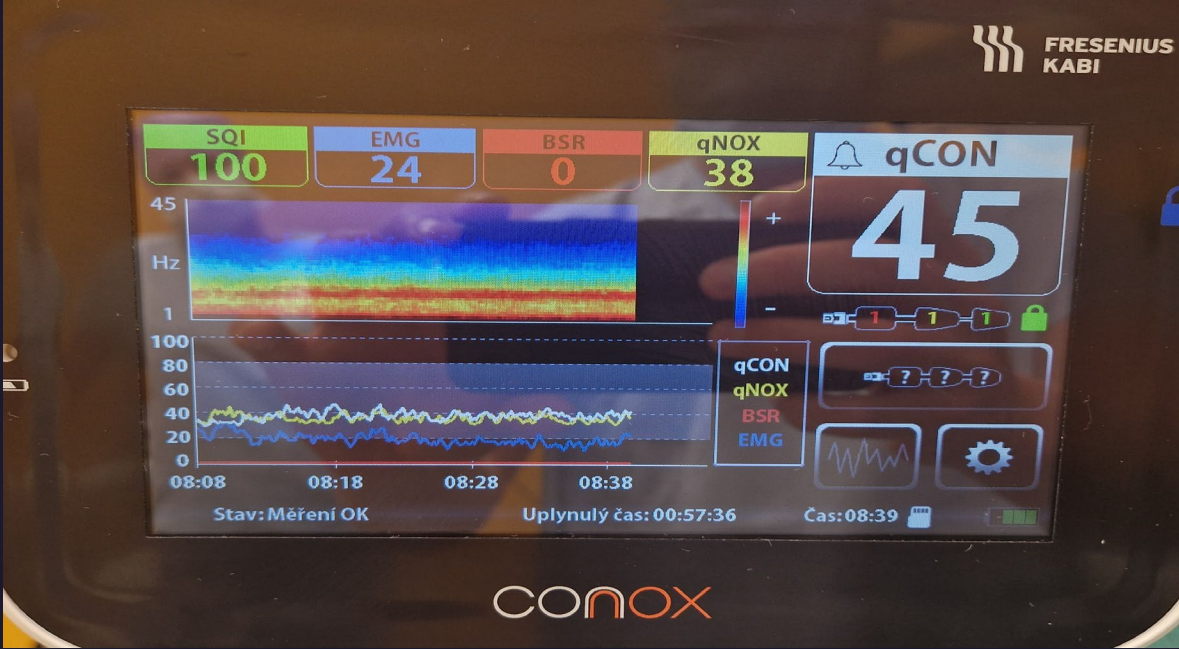
3 vedení CA	OFA:	kontinuální infuze rychlostí 1ml/10kg ABW/hod. OFA směsi		
	TCI Propofol:	vedení	2-3ug/ml	conox 40-50
	relaxace:	dle TOF držet 0 odpověď		
	léky :	Dipidolor 15mg s.c. 30 min. před koncem operace (u plikace začátek sutury 2.vrstvy)		

4 vyvedení z CA	OFA:	STOP 10 minut před koncem operace			
	TCI Propofol:	vyvedení	<1ug/ml	conox > 70	v kombinaci s OFA ukončujeme TCI s vytážením trokarů
	relaxace:	Bridion 50-200mg	TOF>90%		
	léky :	Paracetamol 1g/100ml + Ketonal 100mg v pomalé infuzi <u>Ondansetron 4mg</u>			

OFA směs	50mg Ketamin
	50ug Dexmedetomidin
	480mg Lidocain (12 amp.)
	ad 50 ml 0,9% NaCl

monitorace	EKG, NIBP, SpO2
	TOF
	Conox





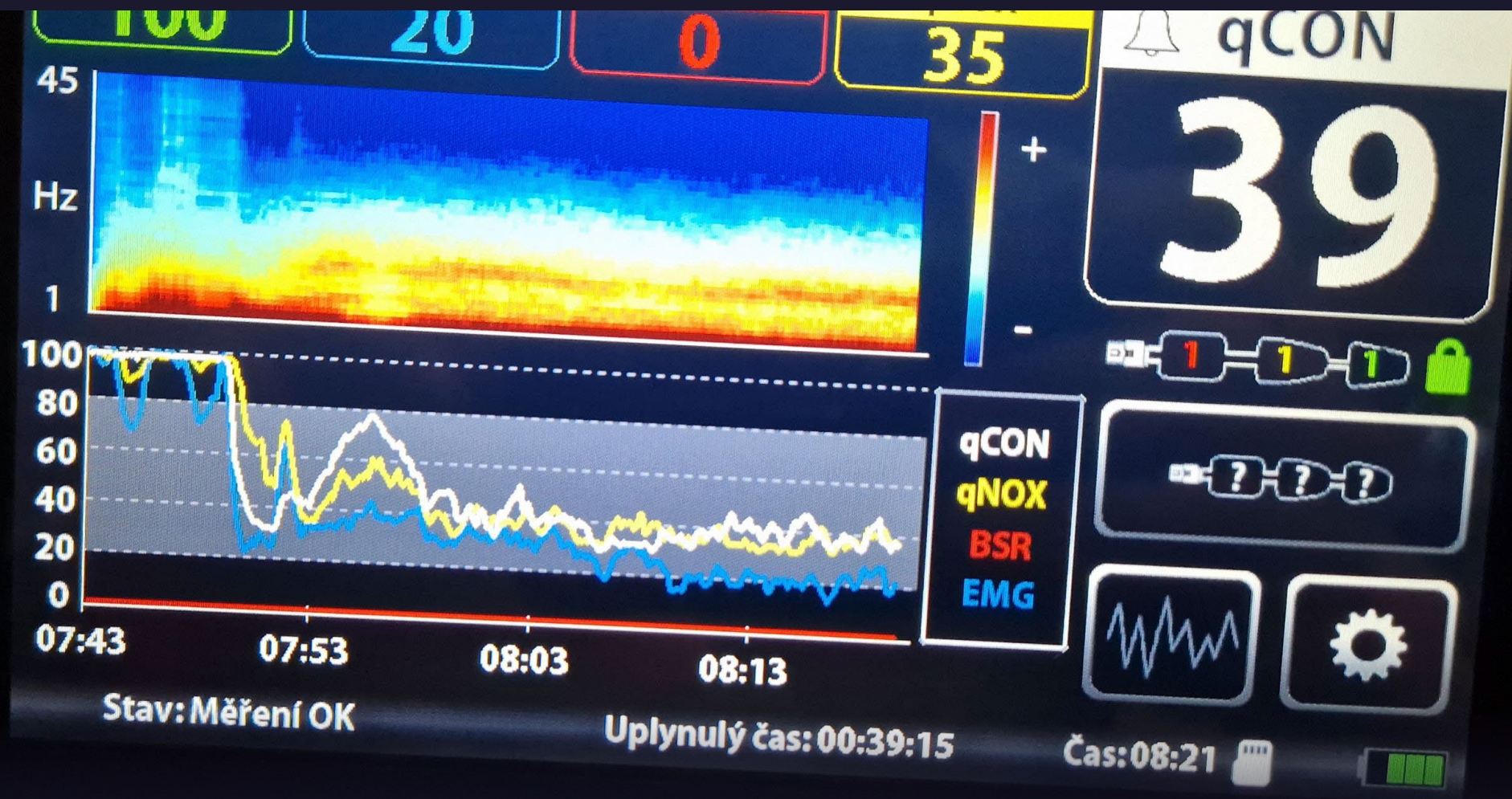
1 hour of surgery using
desflurane is equivalent to...



1 hour of surgery using
sevoflurane is equivalent to...



Spektrogram



Impact of opioid free Anesthesia versus opioid Anesthesia on post-operative oxygenation after bariatric surgery: an observational study

L. GEERTS (*), H. CARVALHO (**), E. JARAHYAN (***), J. MULIER (***)

Dexmedetomidin

Ketamin

Lidocain

MgSO4



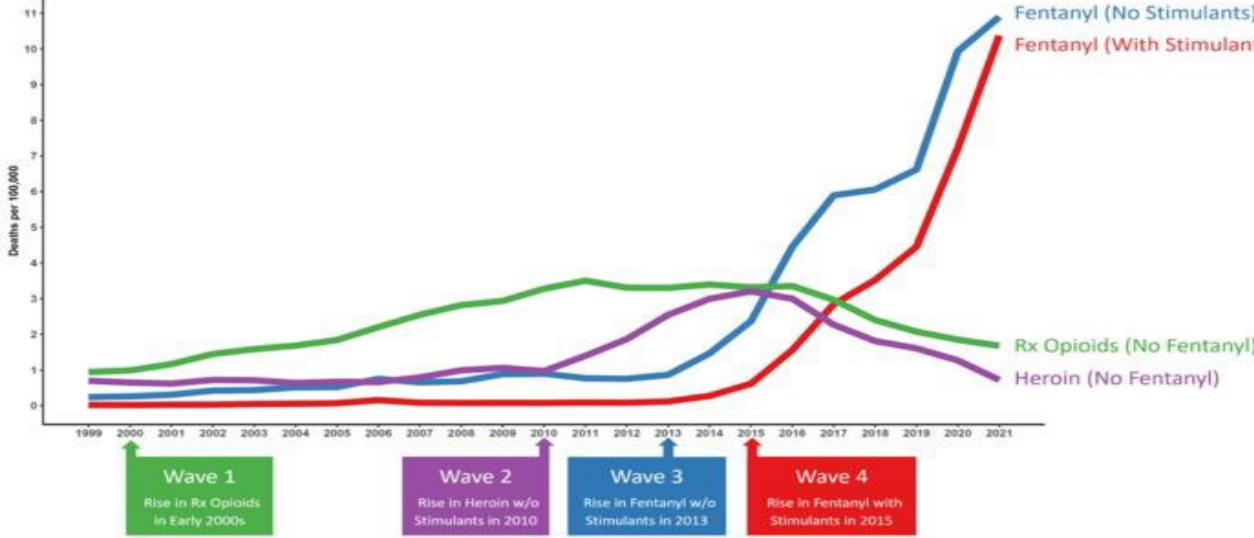
Table 3 ERAS recommendations for intraoperative care in bariatric surgery			
Element	Recommendation	Level of evidence	Recommendation grade
8. Perioperative fluid management	The goal of perioperative fluid management is to maintain normovolemia and optimize tissue perfusion and oxygenation. Individual goal-directed fluid therapy is the most effective strategy, avoiding both restrictive or liberal strategies	Moderate	Strong
	Colloid fluids do not improve intra- and postoperative tissue oxygen tension compared with crystalloid fluids and do not reduce postoperative complications	Low	Weak
9. Standardized anaesthetic protocol	The current evidence does not allow recommendation of specific anaesthetic agents or techniques	Low	Weak
	Opioid-sparing anaesthesia using a multimodal approach, including local anaesthetics, should be used in order to improve postoperative recovery	High	Strong
	Whenever possible, regional anaesthetic techniques should be performed to reduce opioid requirements. Thoracic epidural analgesia should be considered in laparotomy	Low	Weak
10 Airway management	BIS monitoring of anaesthetic depth should be considered where ETAG monitoring is not employed	Low	Strong
	Anaesthetists should recognize and be prepared to handle the specific challenges in airways in patients with bariatric anatomy	Moderate	Strong
	Endotracheal intubation remains the gold standard for intraoperative airway management	Moderate	Strong
11. Ventilation strategies	Lung protective ventilation should be employed in patients undergoing elective bariatric surgery	Moderate	Strong
	Increases in driving pressure should ideally be avoided	Low	Strong
	PCV or VC with PEEP should be used to improve respiratory ratio (1.5:1)	Low	Strong
12. Neuromuscular blockade	Positioning in a reverse- or beach chair position, padding the neuromuscular junction, improves pulmonary mechanics	Low	Weak
	Deep neuromuscular blockade improves surgical performance	Low	Strong
	Ensuring full reversal of neuromuscular blockade improves patient recovery	Moderate	Strong
14. Surgical technique, volume and training	Objective qualitative monitoring of neuromuscular blockade improves patient recovery	Moderate	Strong
	Laparoscopic approach whenever possible	High	Strong
	During the learning curve phase, all operations should be supervised by a senior surgeon with significant experience in bariatric surgery	Training: Low	Strong
15. Abdominal drainage and nasogastric decompression	There is a strong association between hospital volume and surgical outcomes at least up to a threshold value	Hospital volume: Low	Strong
	Nasogastric tubes and abdominal drains should not be used routinely in bariatric surgery	Weak	Strong

The Public Health Approach to the Worsening Opioid Crisis in the United States Calls for Harm Reduction Strategies to Mitigate the Harm From Opioid Addiction and Overdose Deaths

Yvon Yeo¹, Rosemary Johnson^{2 3}, Christine Heng^{2 4}

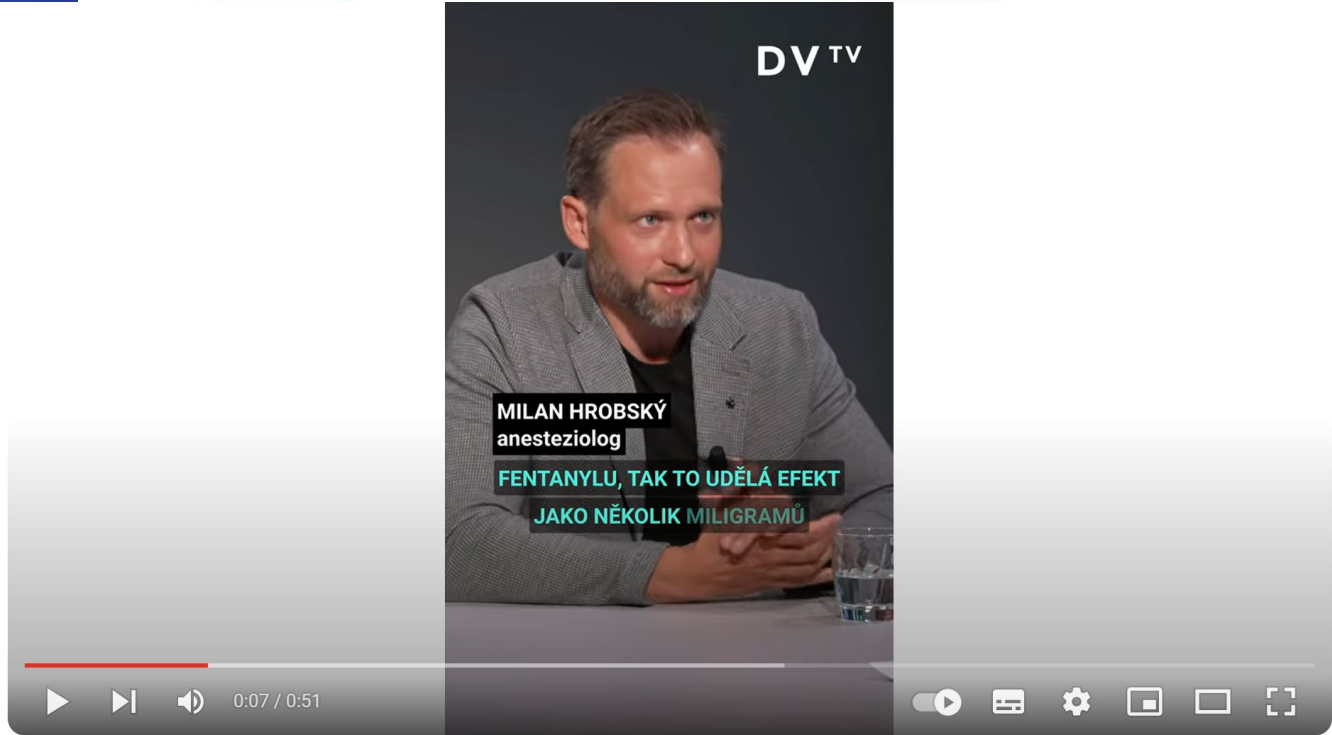
Affiliations + expand

PMID: 34908134 DOI: 10.1093/milmed/usab485



Opioidová krize v USA. Léky na bolest zabíjejí víc Američanů než zbraně nebo HIV

tev
20. 2. 2019 | Zdroj: ČT24



Fentanyl se do Čech asi dostane. Je to silná droga, ale strach z ní nemám, říká anesteziolog Hrobský



Multiple drugs in one syringe



Horizontal



Vertical



List

< Back

Multiple drugs in one syringe: is it a viable option? Pro-con



Programme



Chairs & Speakers



Favourites



Help

The programme is shown in CEST
(UTC+2)



Login

Session Types



Topics



Rooms



About this session

This session will outline the reasons why multiple drugs and which drugs are mixed in one syringe by some anaesthesiologists from around the world, and why this be considered an unsafe practice. Speakers will also address the possible circumstances allowing for multiple drugs to be used in a single syringe.

Session highlight(s)***

Patient Safety

Chair: Hugo Vereecke (Groningen, Netherlands)

Presentation(s)

Pro

Speaker: Peter Brooks (London, United Kingdom)

14:00 – 14:20
20 mi

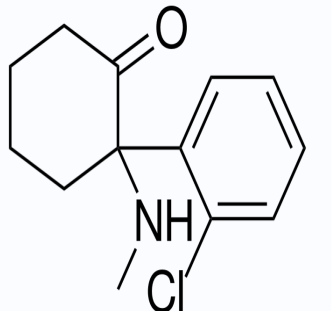
Con

Speaker: Michael Garnet Irwin (Hong Kong, China)

14:20 – 14:40
20 mi

Discussion and voting

14:40 – 15:00
20 mi



Ketamin

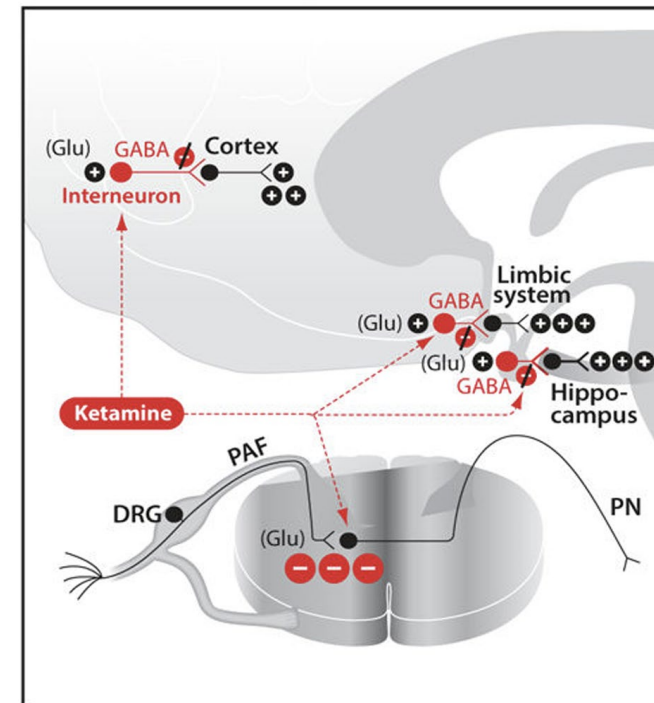
trvání účinku : 5-10 minut

mechanismus účinku :

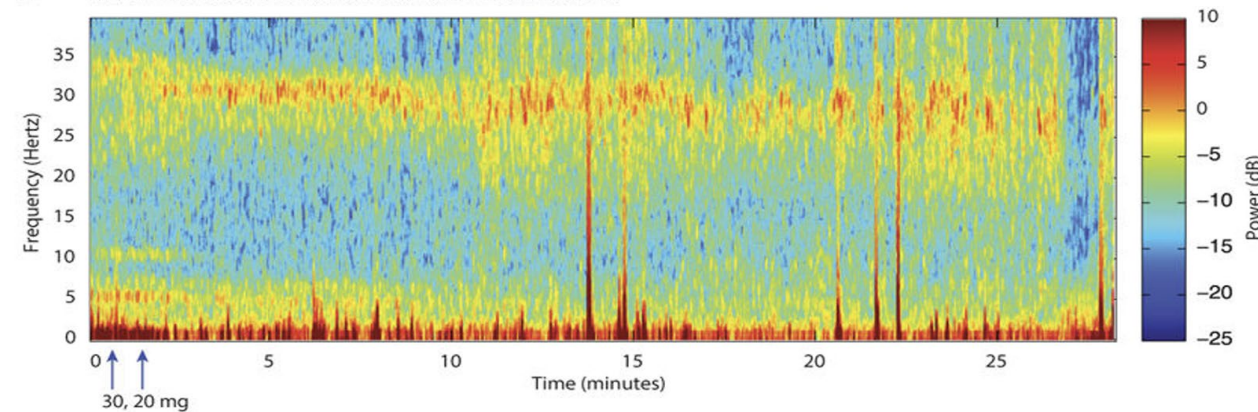
kompetitivně blokuje vazebné místo NMDA receptorů pro excitační aminokyseliny, navíc ovlivňuje i napěťové řízené sodíkové kanály nebo kanály draslíkové

Dávkování : 250ug/kg/hod. ABW

A



B Ketamine Sedation: Beta and Gamma Oscillations

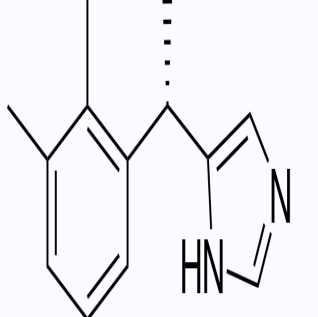


C



Clinical Electroencephalography for Anesthesiologists Part I: Background and Basic Signatures

Patrick L. Purdon, Ph.D.^{*}, Aaron Sampson, B.S.[§], Kara J. Pavone, B.S.[§], and Emery N. Brown, M.D., Ph.D.[#]



Dexmedetomidin

Nástup účinku : 5-10 minut

Peak : 15-30 minut

mechanismus účinku :

Agonisté presynaptických α_2 -receptorů mechanismem přímé blokády sympatického přenosu zastoupí opioidy v udržení hemodynamické stability během nociceptivní stimulace, postsynaptické ovlivnění gabaergního a glutamatergního přenosu vede k sedaci, anxiolýze, sympatikolýze a analgezi.

Dávkování :

0,1 – 0,2 $\mu\text{g/kg/hod. ABW}$

Clinical Electroencephalography for Anesthesiologists Part I: Background and Basic Signatures

Patrick L. Purdon, Ph.D.^{*}, Aaron Sampson, B.S.[§], Kara J. Pavone, B.S.[§], and Emery N. Brown, M.D., Ph.D.[#]

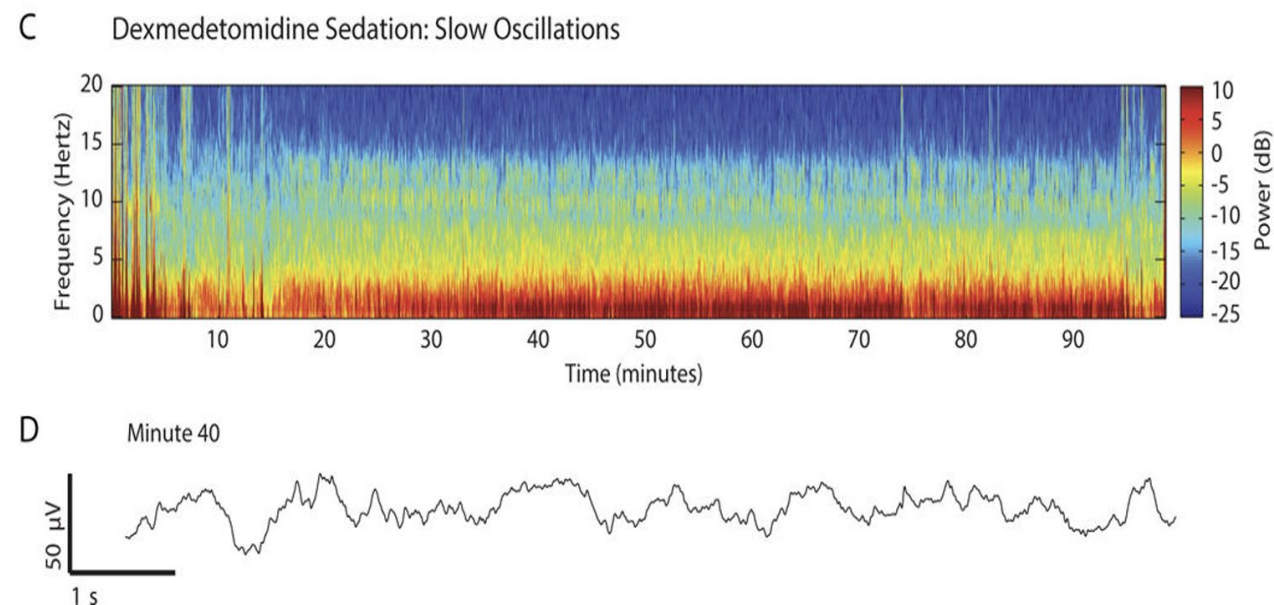
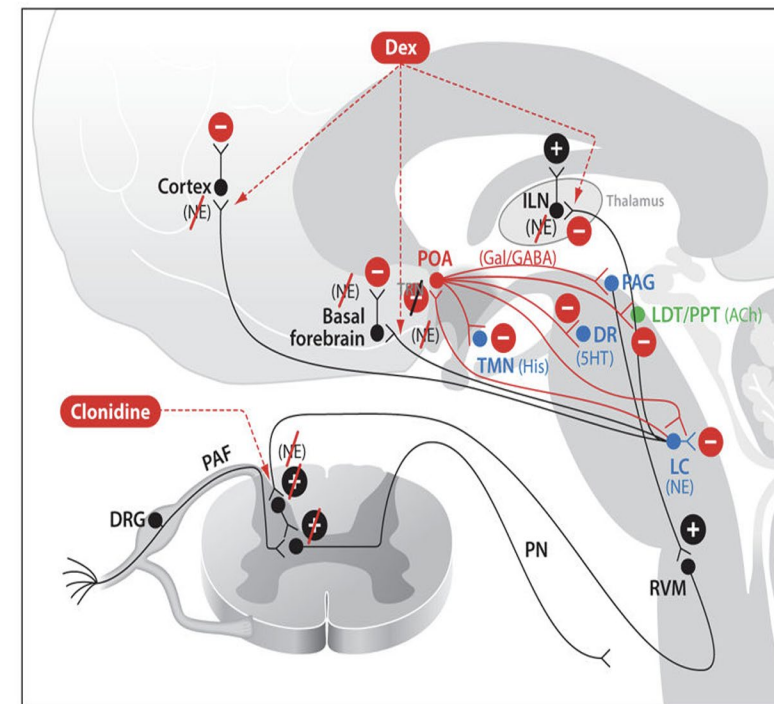


Fig. 11

Propofol

Sevoflurane

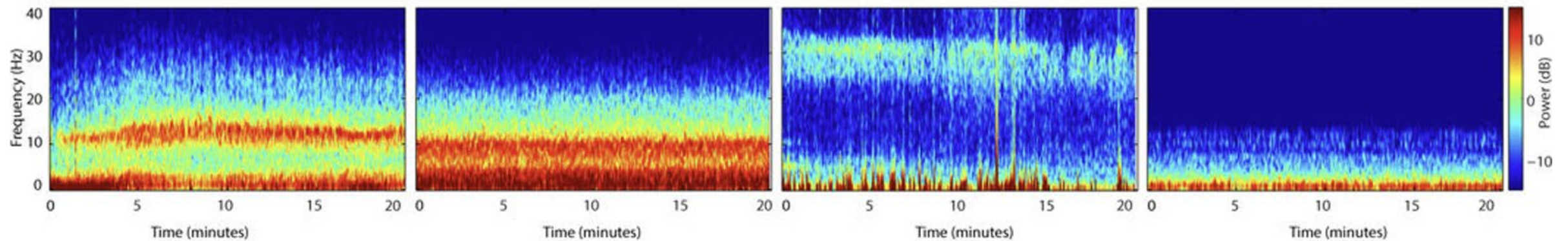
Ketamine

Dexmedetomidine

A



B



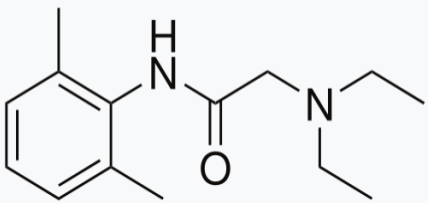
GABAergic Inhibition

GABAergic Inhibition + others

NMDA Inhibition

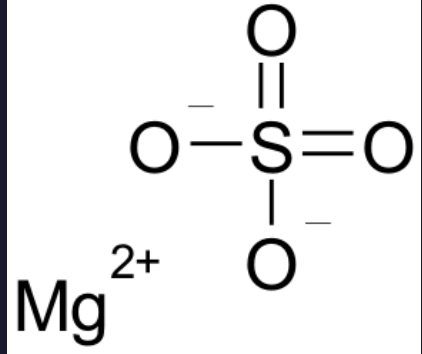
α_2 Adrenergic-mediated Inhibition

lidokain



2% Lidocain

- Nástup účinku : 2 - 5 minut
- Peak : 15-30 minut
- mechanizmus účinku :
- multifaktoriální.
- -spočívá v blokádě napětově řízených sodíkových kanálů na membránách periferních nociceptorů a inhibici kanálů pro dvojmocné kationty.
- -inhibice NMDA rec. a 5HT3 rec.
- Vedlejší pozitivní účinky :
- Bronchodilatační účinek, antiarytmikum,
- Dávkování :
- 2 mg/kg/hod. ABW



MgSO₄

- Nástup účinku: 1-2 minuty
- Peak: 30 minut
- mechanismus účinku:
 - -inhibice NMDA rec. a CA²⁺ rec.
- Vedlejší pozitivní účinky:
 - Myorelaxanční, antikonvulzivní
- Dávkování:
 - 4 mg/kg/hod. ABW

MULTIMODALNÍ vs. VOLATILNÍ ANESTEZIE

- TIVA TCI ELEVELD – PROPOFOL
- OFA (DEX, KET, LIDO, MgSO₄)
- Dipidolor 15mg s.c.
- NSAID
- **63 pacientů**
- průměrné BMI 44
- průměrná váha 120 kg
- PLIKACE ŽALUDKU

- DESFLURAN
- SUFENTANIL
- NSAID
- **67 pacientů**
- průměrné BMI 44
- průměrná váha 113kg
- PLIKACE ŽALUDKU

Výsledky

- Zvracení
- Bolest
- oxygenoterapie

Obesity Surgery

<https://doi.org/10.1007/s11695-019-03763-1>

ORIGINAL CONTRIBUTIONS

Anaesthetic Factors Affecting Outcome After Bariatric Surgery, a Retrospective Levelled Regression Analysis

Jan P. Mulier^{1,2,3}  Bruno Dillemans⁴

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

Jan P Mulier^{1 2 3*}, Ruben Wouters^{1 2}, Bruno Dillemans⁴, Marc Dekock⁵

¹Departement of Anaesthesiology, AZ Sint Jan Brugge-Oostende, B-8000 Brugge, Belgium

²KU Leuven - University of Leuven, B-3000 Leuven, Belgium

³UGent - University of Gent, B-9000 Gent, Belgium

⁴Department of general surgery AZ Sint Jan Brugge-Oostende, B-8000 Brugge, Belgium

⁵Department of anaesthesiology, CHWAPI, Tournai, B-7500 Belgium

Abstract

This study measured post-operative opioid consumption and quality of recovery after Opioid-Free Anaesthesia (OFA).

50 Patients undergoing elective laparoscopic bariatric surgery were randomised in two groups. Before induction, the Opioid Anaesthesia (OA) group received 0.5 mcg/kg sufentanil, while the OFA group received 0.5 mcg/kg dexmedetomidine, 0.25 mg/kg ketamine, and 1.5 mg/kg lidocaine. Anaesthesia was induced with propofol and rocuronium and the bispectral index was maintained in both groups between 40% and 60% by adapting end-tidal sevoflurane. Anaesthesia was further maintained with sufentanil or lidocaine and dexmedetomidine. Postoperative analgesia was achieved with 4 g/day paracetamol and with patient-controlled 2-mg morphine. Kalkman and APAIS were measured before anaesthesia. QoR-40, VAS, morphine consumption and cortisol levels were measured postoperatively.

The post-operative opioid consumption was lower in the PACU and quality of recovery was higher next day after OFA versus OA. There were no differences between the two groups regarding age, weight, height, body mass index, gender, information desire, and incidence of obstructive sleep apnoea syndrome, combined anxiety score, and Kalkman points. No differences were found in the number of patients having had one or more intra operative hemodynamic problems. Post-operative major adverse events, like hypertension and bleeding, were significant higher in the OA group.

Postoperative saturation in the post-anaesthesia care unit while giving a 6 l/min O₂ mask was lower in the OA group with a higher incidence of hypertension, postoperative nausea and vomiting, shivering or feeling cold and a higher VAS score. The following morning patients in the OFA group had higher QoR-40 scores and lower VAS scores cortisol levels.

Keywords: Opioid free general anaesthesia, Laparoscopic bariatric surgery, Randomized controlled clinical trial, Quality of recovery (QoR-40), Enhanced recovery after surgery (ERAS), Post-operative pain and discomfort



Take home message

