PROČ TO DĚLÁ NĚKDO JINAK, KDYŽ JÁ TO DĚLÁM NEJLÍP…?

JAN BLÁHA

KLINIKA ANESTEZIOLOGIE, RESUSCITACE
A INTENZIVNÍ MEDICÍNY

1. LÉKAŘSKÁ FAKULTA
Univerzita Karlova

VŠEOBECNÁ FAKULTNÍ NEMOCNICE V PRAZE

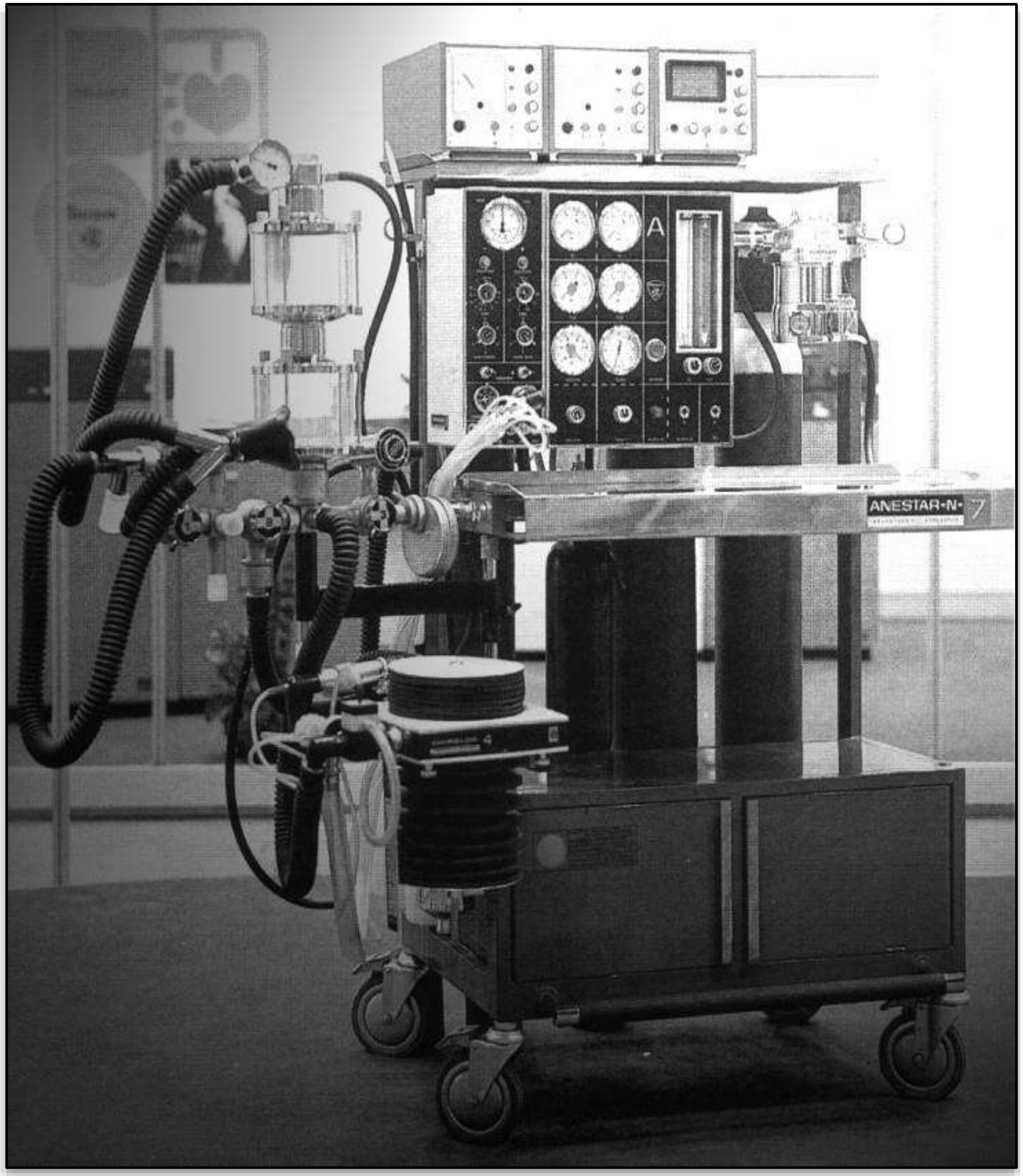
jan.blaha@vfn.cz

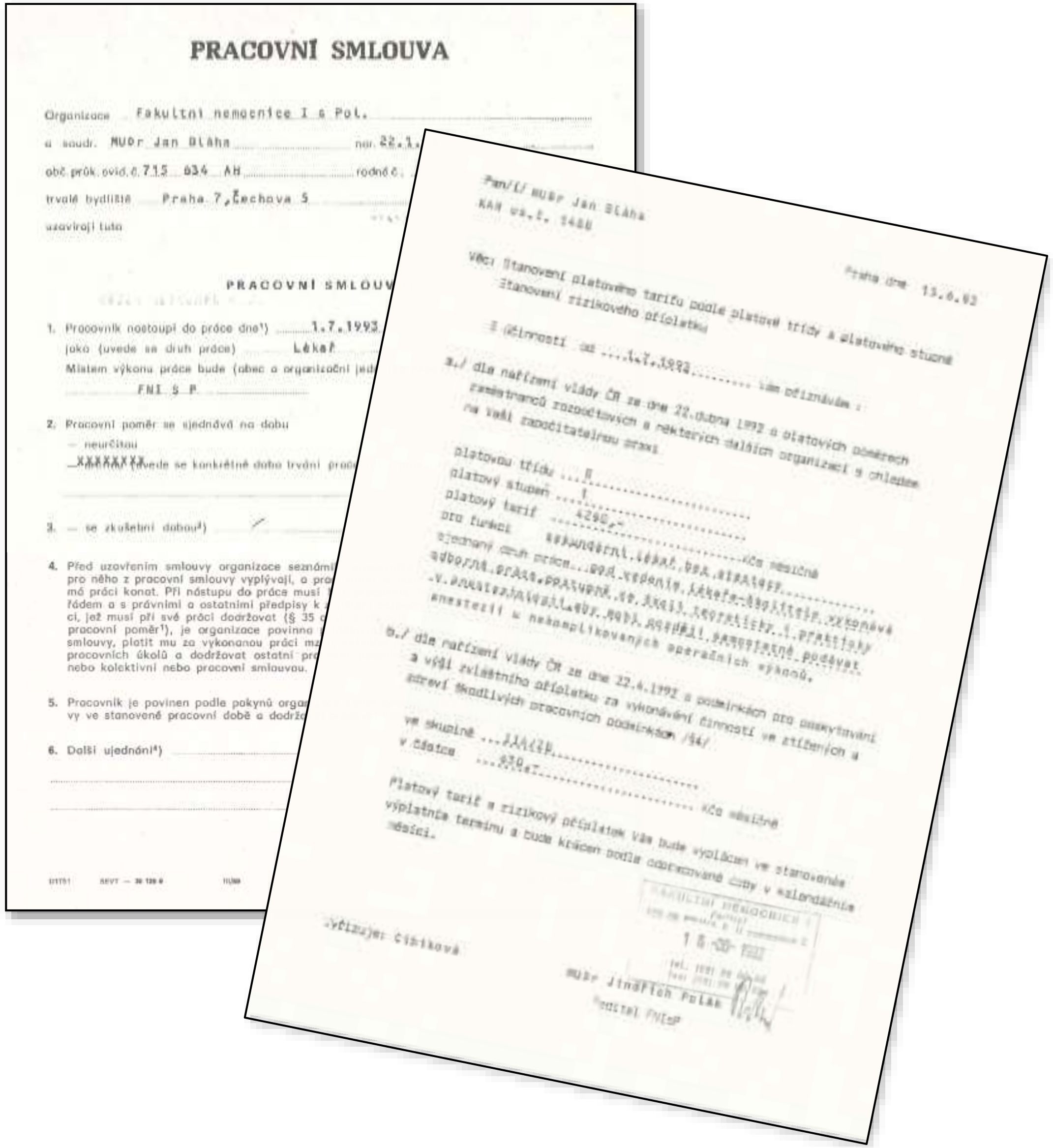
ÚVOD DO CELKOVÉ ANESTEZIE…

- je to první, co se jako anesteziologové naučíme
- je to první, co své nové kolegy učíme
- je to první, co si myslíme, že opravdu umíme

… tak proč o něm vůbec nemluvíme ?

Nemám konflikt zájmu





PRACOVNÍ SMLOUVA

Organizace Fakultní nemocnice I s Pol.

a soudr. MUDr Jan Bláha nar. 22.1.

obč. průk. evid. č. 715 634 AH rodné č.

trvalé bydliště Praha 7, Čechova 5

uzavírají tuto

PRACOVNÍ SMLOUV

1. Pracovník nastoupí do práce dne[1]) 1.7.1993
jako (uvede se druh práce) Lékař
Místem výkonu práce bude (obec a organizační jed
FNI § P

2. Pracovní poměr se sjednává na dobu
— neurčitou
— XXXXXXXX (uvede se konkrétně doba trvání prac

3. — se zkušební dobou[3])

4. Před uzavřením smlouvy organizace seznámí
pro něho z pracovní smlouvy vyplývají, a pra
má práci konat. Při nástupu do práce musí
řádem a s právními a ostatními předpisy k
ci, jež musí při své práci dodržovat (§ 35
pracovní poměr[1]), je organizace povinna
smlouvy, platit mu za vykonanou práci mz
pracovních úkolů a dodržovat ostatní pr
nebo kolektivní nebo pracovní smlouvou.

5. Pracovník je povinen podle pokynů orga
vy ve stanovené pracovní době a dodrž

6. Další ujednání[4])

Pan/í/ MUDr Jan Bláha
KAR vs.č. 1488

Praha dne 15.6.93

Věc: Stanovení platového tarifu podle platové třídy a platového stupně
Stanovení rizikového příplatku

S účinností od ....1.7.1993......... Vám přiznávám :

a./ dle nařízení vlády ČR ze dne 22.dubna 1992 o platových poměrech zaměstnanců rozpočtových a některých dalších organizací s ohledem na Vaši započitatelnou praxi

platovou třídu ... 8
platový stupeň ... 1
platový tarif ... 4290,-
pro funkci sekundární lékař bez atestace ... Kčs měsíčně
sjednaný druh práce ... pod vedením lékaře-špecialisty vykonává odborné práce postupně se školí teoreticky i prakticky v anesteziologii aby mohl později samostatně podávat anestezii u nekomplikovaných operačních výkonů.

b./ dle nařízení vlády ČR ze dne 22.4.1992 o podmínkách pro poskytování a výši zvláštního příplatku za vykonávání činnosti ve ztížených a zdraví škodlivých pracovních podmínkách /§4/

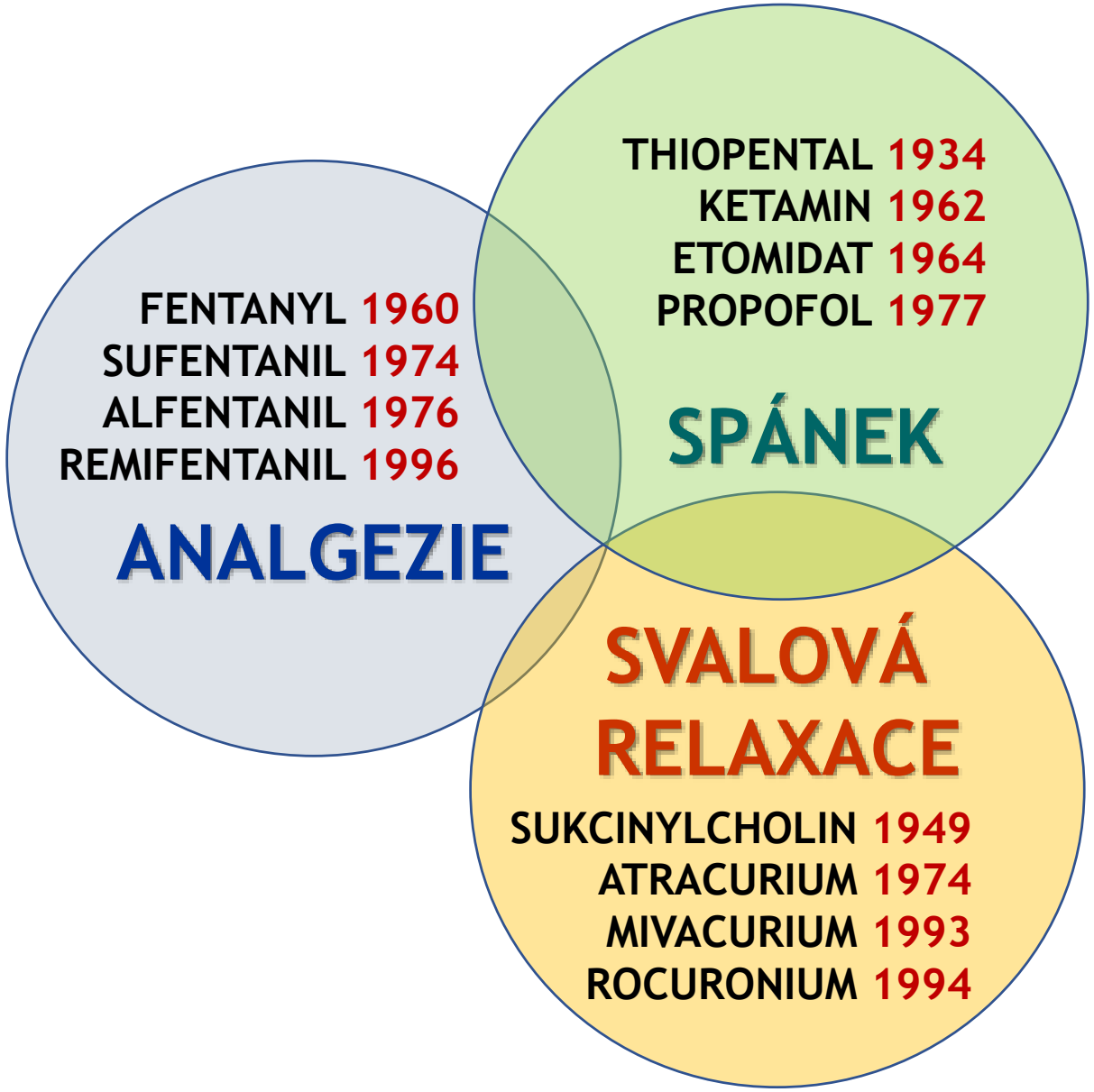
ve skupině ... II/2b
v částce ... 630,- ... Kčs měsíčně

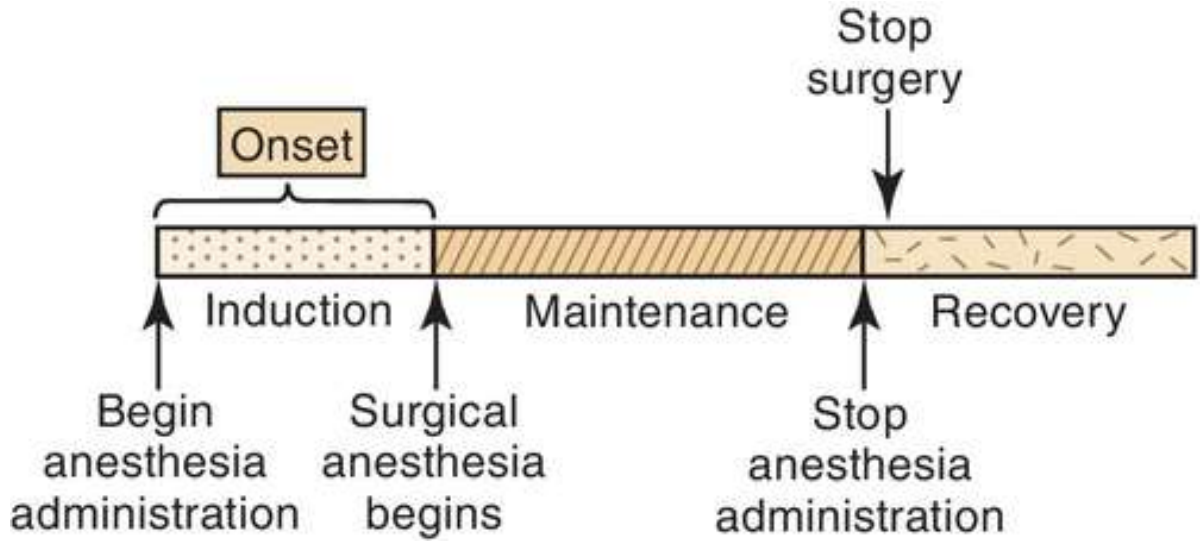
Platový tarif a rizikový příplatek Vám bude vyplácen ve stanoveném výplatním termínu a bude krácen podle odpracované doby v kalendářním měsíci.

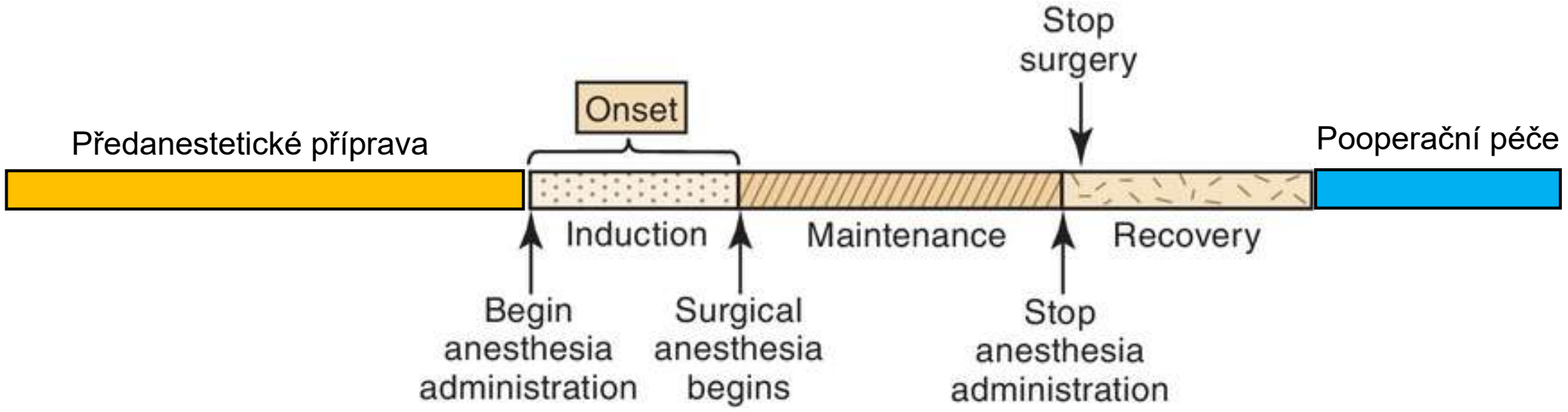
Vyřizuje: Čížková

MUDr Jindřich Polák
ředitel FNIsP

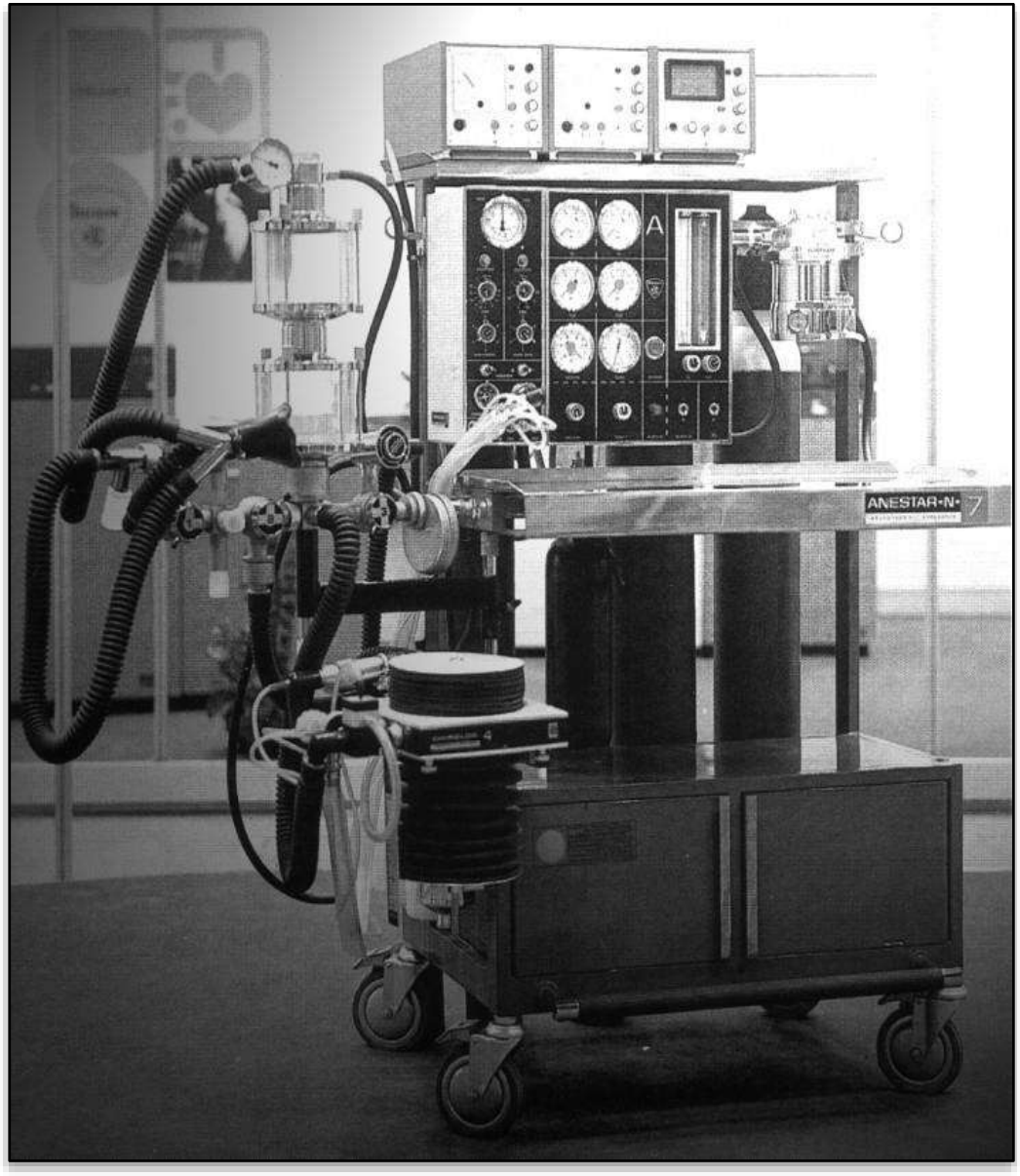

SPÁNEK
ANALGEZIE
VEGETATIVNÍ
STABILITA
SVALOVÁ
RELAXACE


FENTANYL 1960
SUFENTANIL 1974
ALFENTANIL 1976
REMIFENTANIL 1996
ANALGEZIE
THIOPENTAL 1934
KETAMIN 1962
ETOMIDAT 1964
PROPOFOL 1977
SPÁNEK
SVALOVÁ RELAXACE
SUKCINYLCHOLIN 1949
ATRACURIUM 1974
MIVACURIUM 1993
ROCURONIUM 1994


Stop
surgery
Onset
Induction
Maintenance
Recovery
Begin
anesthesia
administration
Surgical
anesthesia
begins
Stop
anesthesia
administration



ERAS = **netrápit pacienty více než je opravdu nezbytné**


ANESTAR·N· 7


76
1.1
100
135/ 68

JAK DĚLÁME ÚVOD DO ANESTEZIE...

JAN BLÁHA
KLINIKA ANESTEZIOLOGIE, RESUSCITACE A INTENZIVNÍ MEDICÍNY
VŠEOBECNÁ FAKULTNÍ NEMOCNICE V PRAZE
1. LÉKAŘSKÁ FAKULTA Univerzita Karlova
jan.blaha@vfn.cz

Plánovaný chirurgický výkon: LPSK oboustranná tříselná kýla

operuje průměrný chirurg...

Předanestetické vyšetření:

Pacientka 78 let
168 cm, 70 kg
TK 156/83 TF 76/'
Fyzikální nález přiměřený věku
Riziko obtížné intubace nízké až střední (M II)
Laboratoř: KO a ionty, vše v normě
EKG: SR 72/', neg. T v aVL a V5

AA: pollinosis, prach
OA: HTN na th
Sezónní astma, ale někdy i prach
Anestezie před 20 lety (LCHCE), bez komplikací

FA: Prestarium Neo Combi 5/1.25 mg 1-0-1
Ventolin při potížích (naposledy před 3 dny, uklízela)

SA: Učitelka v důchodu, soběstačná, žije sama

Preferuje celkovou anestezii

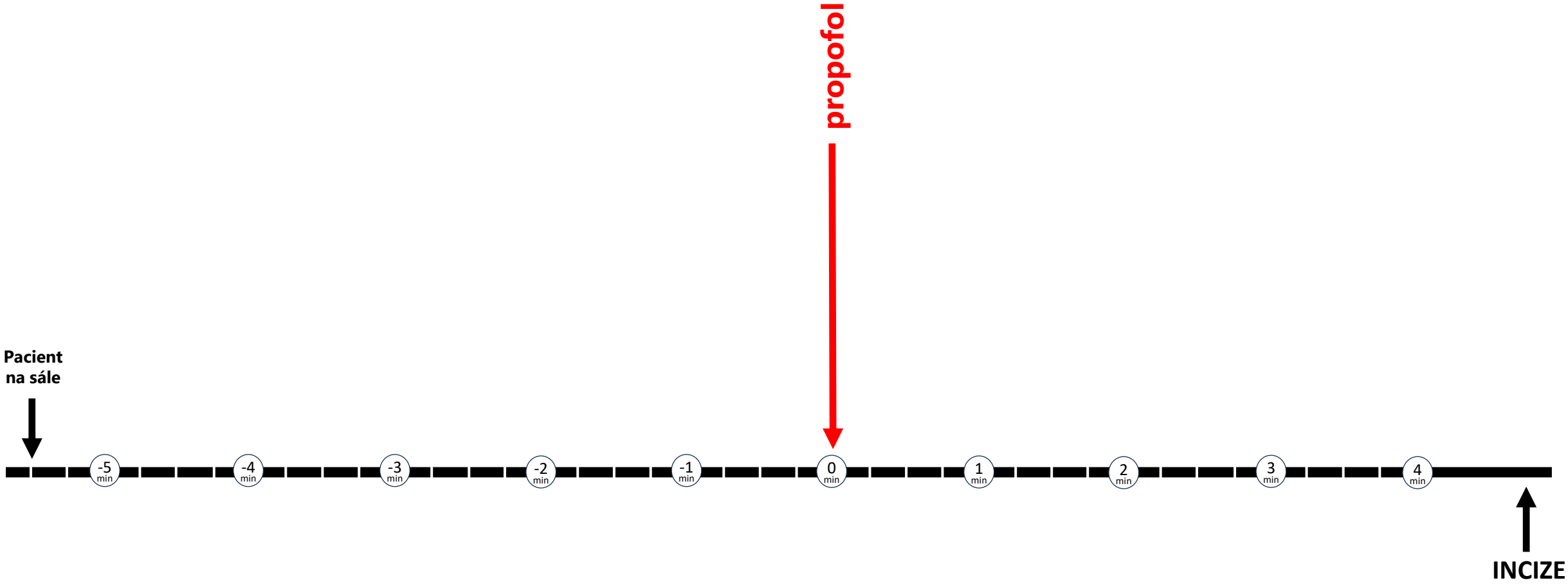
Aktuálně:

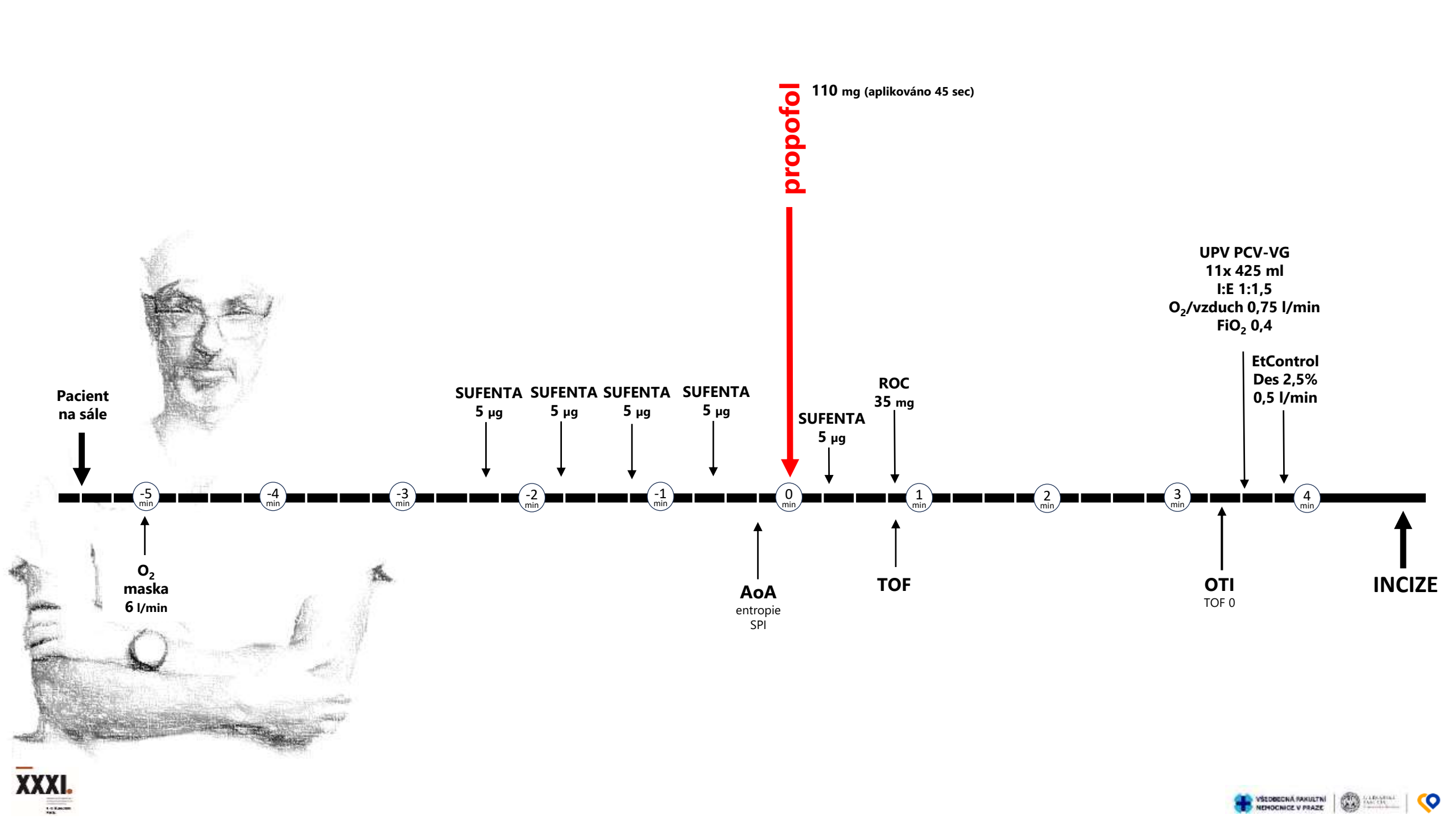
na OS

Stav odpovídá předanestetickému vyšetření
Premedikace Grandaxin 100 mg p.o. před 40 minutami
Ranní medikaci nedostala (TK 135/64)
TK 165/62, TF 92/', SR
$Sp0_2$ 94%, křivka "hezká vysoká"

Má zajištěnu iv. linku (dorsum LHK, 20G),
kape Isolyte 1000 ml
Monitorace: NIBP, EKG 3 svody, $Sp0_2$, TOF

Připraveno:
lehká kyslíková maska, obličejová maska 4, OTi kanyla č. 7,
laryngoskop s jednorázovou lžící


propofol
Pacient
na sále
-5 min
-4 min
-3 min
-2 min
-1 min
0 min
1 min
2 min
3 min
4 min
INCIZE


propofol
110 mg (aplikováno 45 sec)
UPV PCV-VG
11x 425 ml
I:E 1:1,5
O2/vzduch 0,75 l/min
FiO2 0,4
EtControl
Des 2,5%
0,5 l/min
Pacient
na sále
SUFENTA
5 µg
SUFENTA
5 µg
SUFENTA
5 µg
SUFENTA
5 µg
SUFENTA
5 µg
ROC
35 mg
-5 min
-4 min
-3 min
-2 min
-1 min
0 min
1 min
2 min
3 min
4 min
O2
maska
6 l/min
AoA
entropie
SPI
TOF
OTI
TOF 0
INCIZE

Pacient na sále

propofol
110 mg (45 sec)
130 mg
150 mg (15 sec)
100-120 mg (20 sec)
120 mg (10 sec)
150 mg (30 sec)
120 mg (20 sec)
150 mg (30 sec)
150 mg (60 sec)
160 mg (30 sec)

Sufenta 5 µg
Sufenta 10 µg 10 µg
Sufenta 10 µg
Sufenta 10 µg 10 µg
Sufenta 10 µg 10 µg
Sufenta 15 µg
ROC 30 mg
ROC 40 mg
SCHJ 70 mg
ROC 30 mg 35 mg 40 mg 30 mg
ROC 30 mg
ROC 30 mg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 10 µg 10 µg 10 µg

-5 min, -4 min, -3 min, -2 min, -1 min, 0 min, 1 min, 2 min, 3 min, 4 min

O_2 maska 6 l/min
O_2 maska 6 l/min
O_2 maska 6 l/min
O_2 maska 6 l/min
O_2 maska 6 l/min

AoA
entropie
SPI

OTI
RSI

TOF
TOF

TOF
TOF

TOF

OTI OTI OTI OTI OTI OTI

TOF

OTI
TOF 0

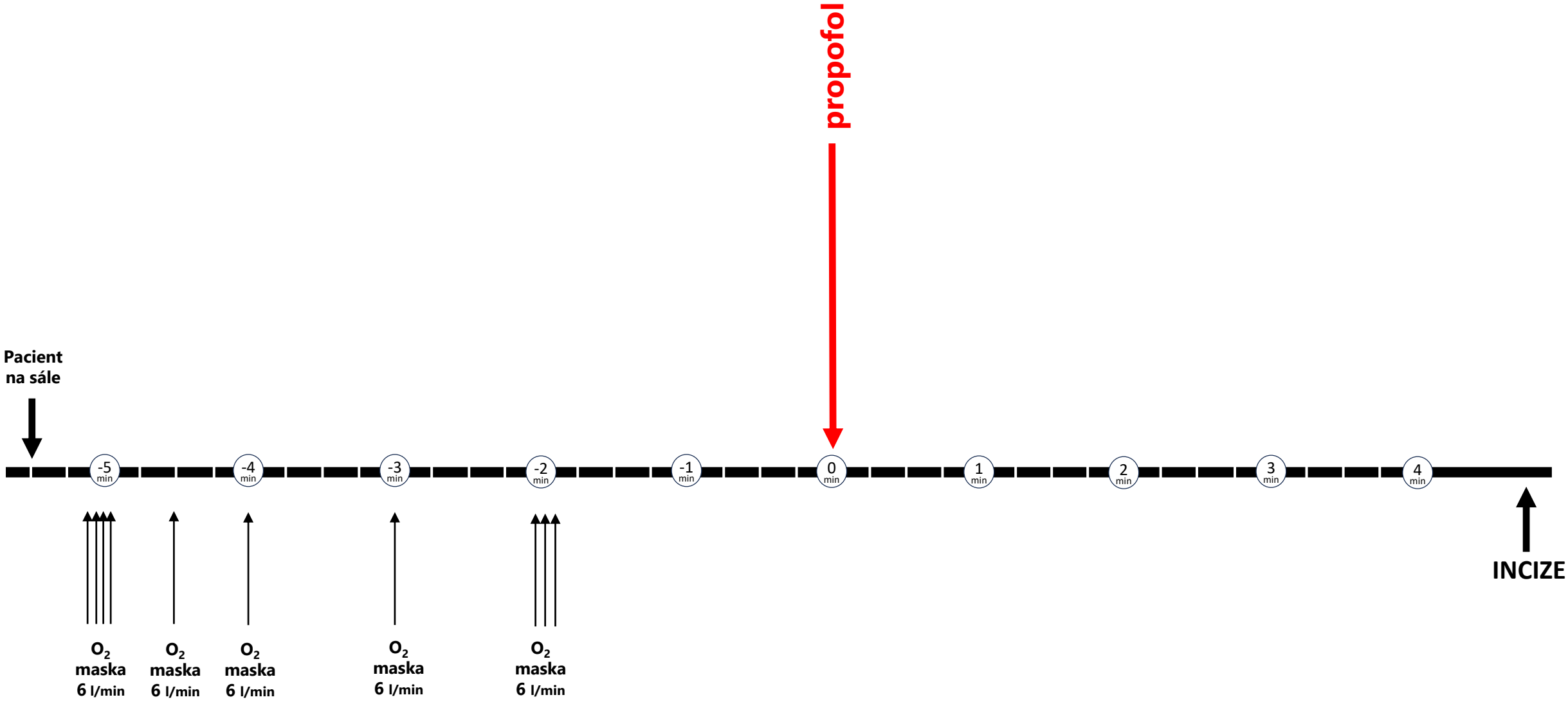
TOF

TOF

Conox

OTI

INCIZE



PREOXYGENACE

PREOXYGENACE

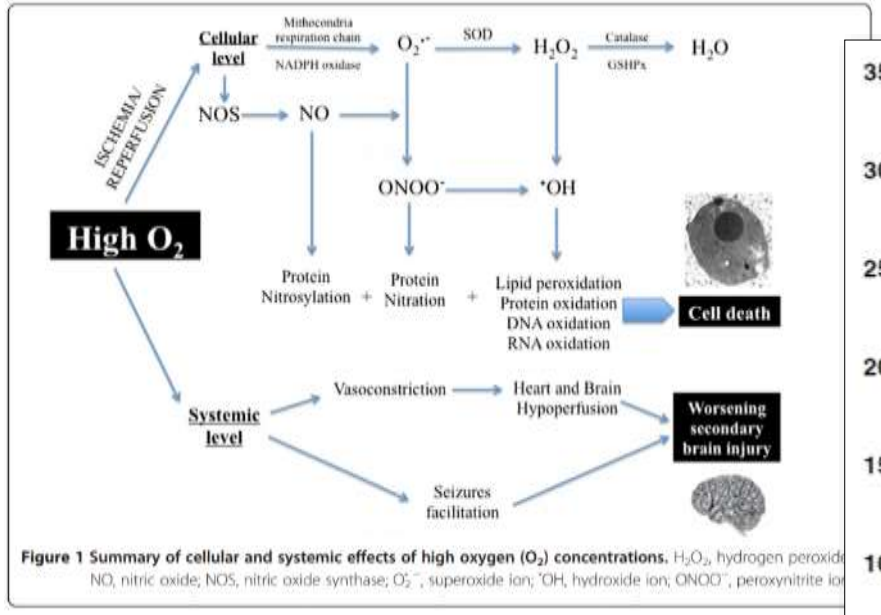
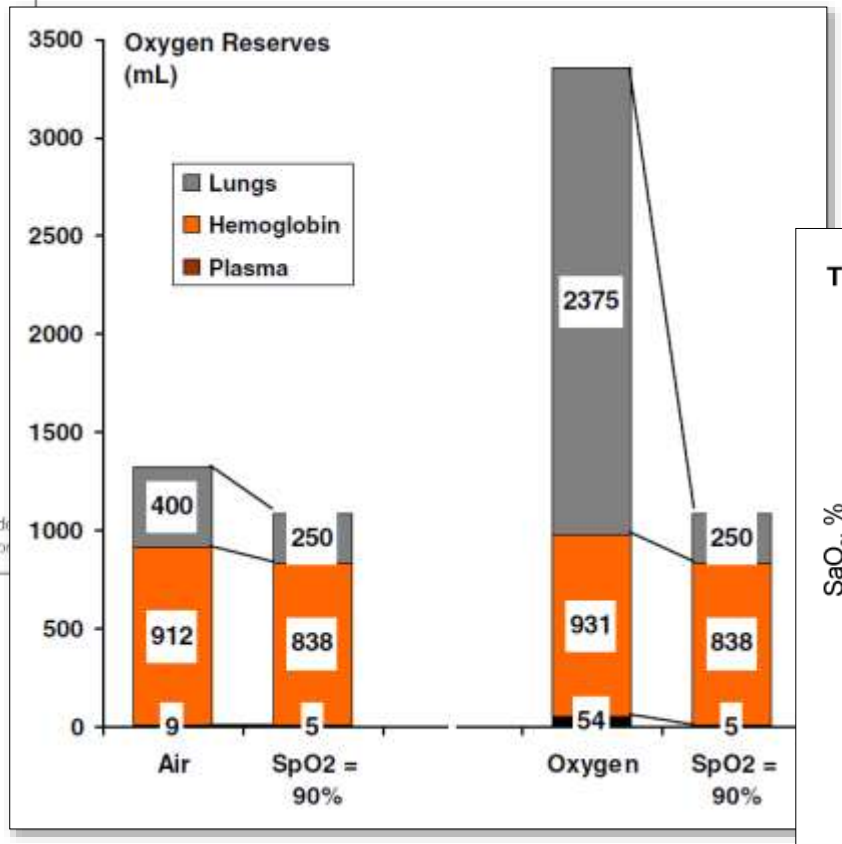
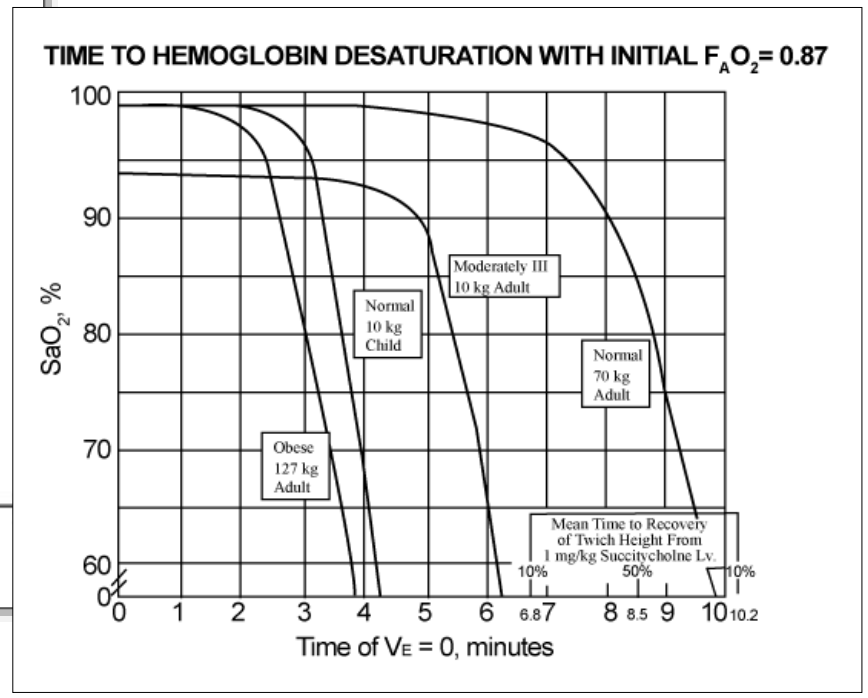


Figure 1 Summary of cellular and systemic effects of high oxygen (O_2) concentrations. H_2O_2, hydrogen peroxide; NO, nitric oxide; NOS, nitric oxide synthase; $O_2^{\cdot-}$, superoxide ion; $^{\cdot}OH$, hydroxide ion; $ONOO^-$, peroxynitrite ion

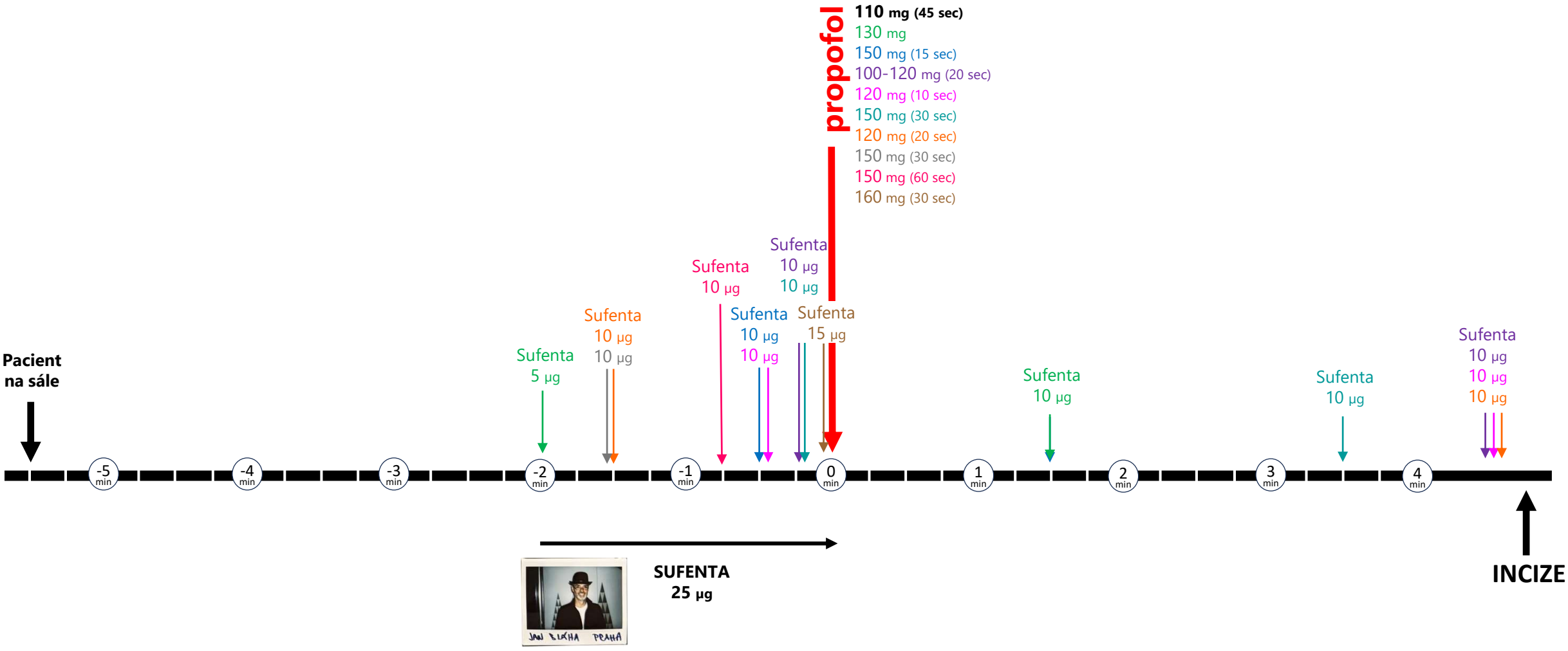
Dell'Anna et al. Critical Care 2014, 18:555

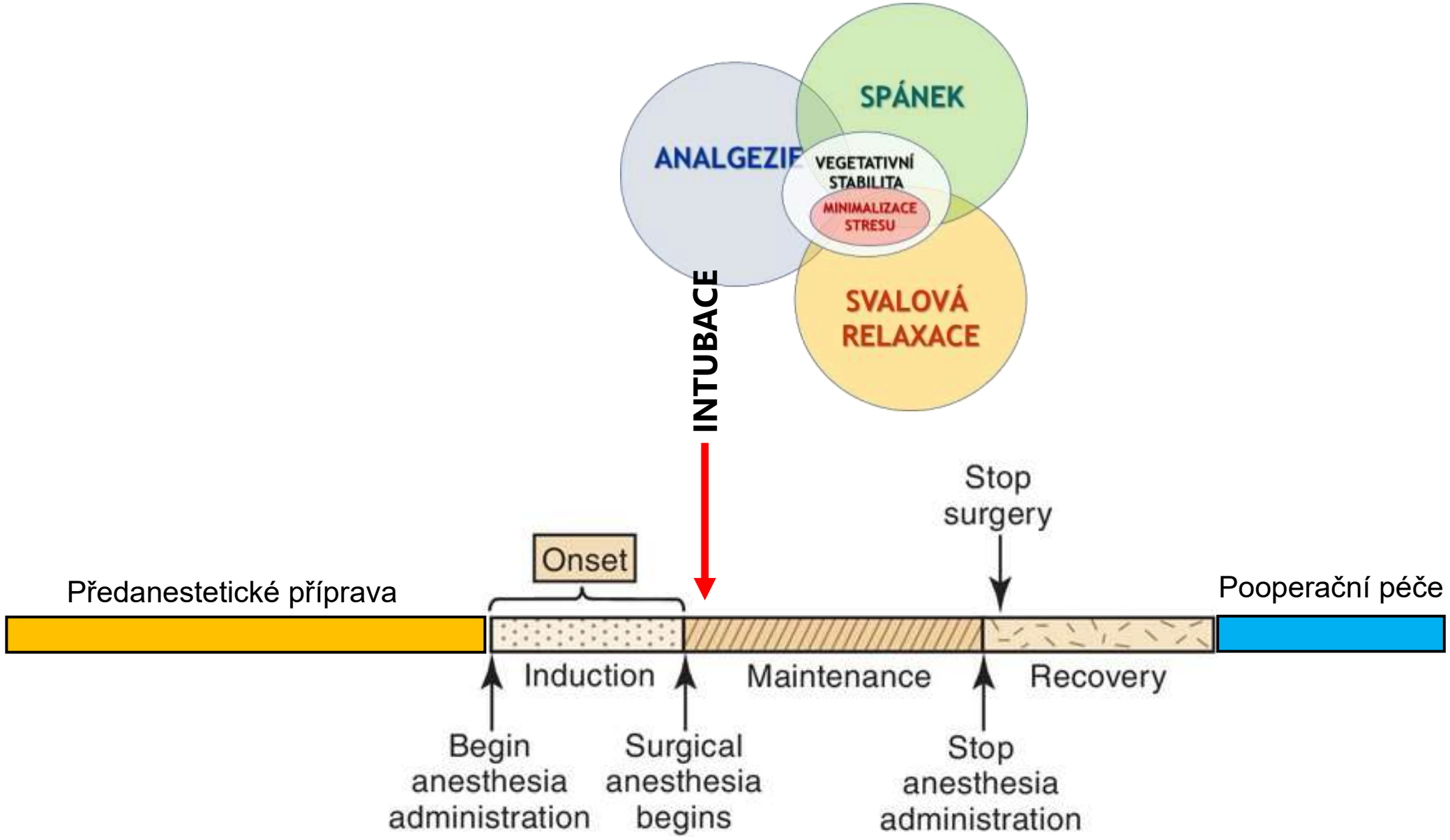


Tanoubi I. Can J Anesth/J Can Anesth (2009) 56:449–466



Benumof JL et al. Anesthesiology 1997; 87:979-82


propofol
110 mg (45 sec)
130 mg
150 mg (15 sec)
100-120 mg (20 sec)
120 mg (10 sec)
150 mg (30 sec)
120 mg (20 sec)
150 mg (30 sec)
150 mg (60 sec)
160 mg (30 sec)
Pacient na sále
Sufenta 5 µg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 15 µg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 10 µg
Sufenta 10 µg
-5 min
-4 min
-3 min
-2 min
-1 min
0 min
1 min
2 min
3 min
4 min
SUFENTA 25 µg
INCIZE


SPÁNEK
ANALGEZIE
VEGETATIVNÍ STABILITA
MINIMALIZACE STRESU
SVALOVÁ RELAXACE
INTUBACE
Stop surgery
Onset
Předanestetické příprava
Pooperační péče
Induction
Maintenance
Recovery
Begin anesthesia administration
Surgical anesthesia begins
Stop anesthesia administration

Anaesthesia, 1987, Volume 42, pages 382–386

The effect of sufentanil on the cardiovascular responses to tracheal intubation

B. KAY, D. NOLAN, R. MAYALL AND T. E. J. HEALY

Summary

The effects of sufentanil 0.5 or 1 μg/kg, given intravenously after induction of anaesthesia, on the cardiovascular responses to tracheal intubation were examined in a controlled, randomised, double-blind investigation. The control group of patients exhibited significant rises in arterial blood pressure and heart rate for 4 minutes after tracheal intubation. Heart rate exceeded 100 beats/minute and systolic pressure increased by over 20% in every patient. All patients moved or breathed within 10 minutes of the administration of suxamethonium. Sufentanil 0.5 μg/kg prevented increases in the mean values of heart rate and arterial blood pressure, although increases were observed in five patients. Significant falls in the mean values of heart rate and arterial pressure occurred from 4 minutes after intubation until observations ended 15 minutes after induction of anaesthesia. Two patients moved or breathed during this time, although movement in response to nerve stimulation occurred in all patients 10 minutes after administration of suxamethonium. Sufentanil 1 μg/kg was effective in suppressing a rise in heart rate or arterial pressure in every patient. Significant falls in these variables occurred from 2 minutes after tracheal intubation onwards. No patient moved or breathed for 15 minutes after induction of anaesthesia, although neuromuscular transmission was present 10 minutes after giving suxamethonium in each case.

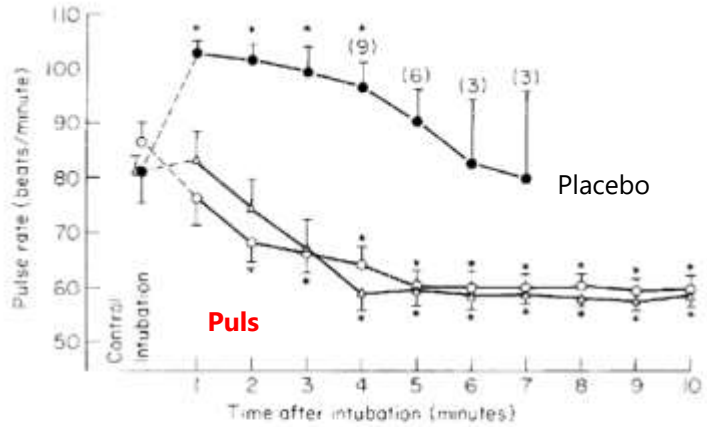


Fig. 1. Changes in pulse rate following tracheal intubation. The mean and SEM changes in pulse rate following tracheal intubation are displayed for three groups of ten patients, who received intravenous saline (●), sufentanil 0.5 μg/kg (△) or sufentanil 1 μg/kg (○) after induction of anaesthesia. *$p < 0.01$ compared with control (pre-anaesthetic) values (paired *t*-test). Figures in parentheses indicate n when less than 10.

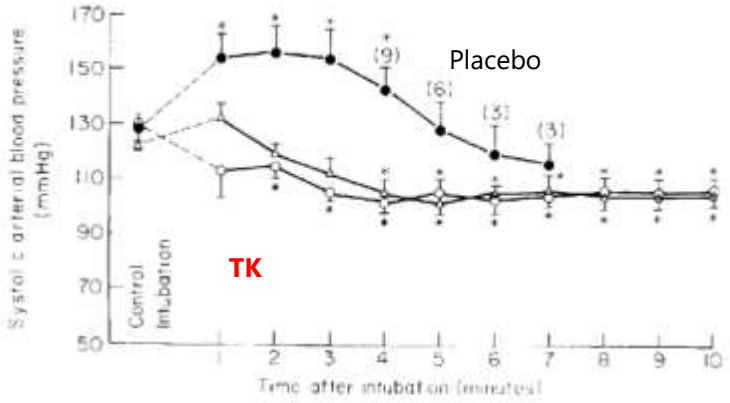
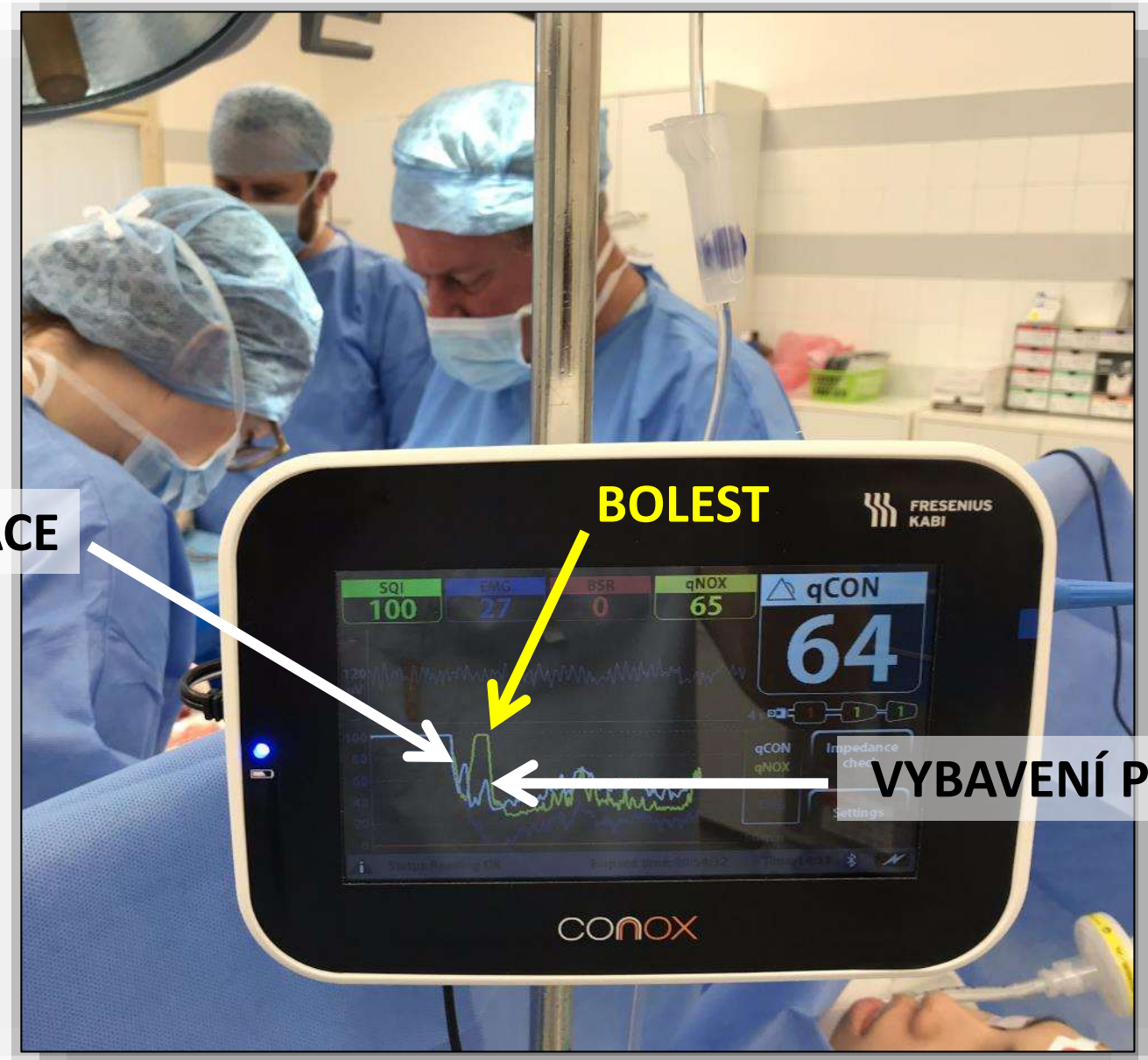


Fig. 2. Changes in systolic arterial blood pressure following tracheal intubation. The mean and SEM changes in systolic arterial blood pressure following tracheal intubation are displayed for three groups of ten patients, who received intravenous saline (●), sufentanil 0.5 μg/kg (△) or sufentanil 1 μg/kg (○) after induction of anaesthesia. *$p < 0.01$ compared with control (pre-anaesthetic) values (paired *t*-test). Figures in parentheses indicate n when less than 10.

INTUBACE



VYBAVENÍ PLODU

sp. zn. sukls47255/2014

SOUHRN ÚDAJŮ O PŘÍPRAVKU

Tabulka 1. Nežádoucí účinky hlášené u ≥ 1 % subjektů léčených sufentanilem v 6 klinických studií sufentanilu

Třídy orgánových systémů Nežádoucí účinek	Sufentanil (n = 650) %
Poruchy nervového systému	
Sedace	19,5
Neonatální tremor	4,5
Závrať	1,4
Bolest hlavy	1,4
Srdeční poruchy	
Tachykardie	1,8
Cévní poruchy	
Hypertenze	4,9
Hypotenze	3,2
Bledost	1,4
Respirační, hrudní a mediastinální poruchy	
Neonatální cyanóza	2,0
Gastrointestinální poruchy	
Nauzea	9,8
Zvracení	5,7
Poruchy kůže a podkožní tkáně	
Pruritus	15,2
Změna zbarvení kůže	3,1
Poruchy svalové a kosterní soustavy a pojivové tkáně	
Svalové záškuby	2,0
Poruchy ledvin a močových cest	
Retence moče	3,2
Inkontinence moče	1,5
Celkové poruchy a reakce v místě aplikace	
Pyrexie	1,7

Další nežádoucí účinky, které se vyskytly u < 1 % subjektů léčených sufentanilem v 6 klinických studiích, jsou uvedeny v Tabulce 2.

The Effects of Different Doses of Sufentanil on Intraoperative Cardiovascular Response and Postoperative Recovery in Patients Undergoing Cardiac Surgery: A Retrospective Cohort Study

Meng Li, Xue Li, Yong Wu, Tianyu Zhang, Mengya Li, Ying Chen

Department of Anesthesiology, The Affiliated Lianyungang Hospital of Xuzhou Medical University, Lianyungang, Jiangsu, People's Republic of China

Objective: To investigate the correlation between the amount of sufentanil used during anesthesia and intraoperative hemodynamic fluctuation and postoperative recovery in patients undergoing cardiopulmonary bypass (CPB).

Materials and Methods: A retrospective analysis was performed on 454 patients undergoing elective heart surgery under CPB. Patients were divided into two groups according to the amount of sufentanil used during anesthesia: Group L (induced sufentanil 0.4–0.6 ug /kg, maintained sufentanil 0.01–0.02 ug/kg/min, n = 223) and Group H (induced sufentanil 4–6 ug/kg, maintained sufentanil 0.02–0.03 ug/kg/min, n = 231). Propensity score matching (PSM) was used at a 1:1 nearest-neighbor ratio to compare the two groups. Intraoperative use of vasoactive drugs, spontaneous heart rebound, secondary endotracheal intubation, postoperative mechanical ventilation time, the length of stay (LOS) in ICU, postoperative LOS in hospital, postoperative in-hospital mortality were analyzed.

Results: After matching, a total of 144 patients were included (72 patients in Group L, and 72 patients in Group H). Multivariate logistic regression analysis showed that the dosage of sufentanil during anesthesia was significantly correlated with the utilization rate of intraoperative vasoactive drugs ($P < 0.001$) and the success rate of spontaneous heart rebound ($p = 0.001$). The utilization rate of vasoactive drugs decreased significantly in Group H (OR, 0.062; 95% CI, 0.019–0.200) compared to that of Group L. The success rate of spontaneous heart rebound (OR, 0.187; 95% CI, 0.071–0.491) was higher in Group H. There were no differences on postoperative recovery outcomes between the two groups.

Conclusion: On the basis of our data, the use of high-dose sufentanil is beneficial to keep the cardiovascular response of patients in a stable state, but there is no significant effect on the quality of early postoperative recovery.

Drug Design, Development and Therapy 2024:18 535–547

0.4-0.6 µg/kg

4-6 µg/kg

Table 3 Comparison of Perioperative Indexes Between the Two Groups After PSM

Variables	Group L (N=72)	Group H (N=72)	P-value
Vasoactive drugs, n (%)			<0.001
None	4 (5.56%)	31 (43.06%)	
Yes	68 (94.44%)	41 (56.94%)	
Heart rebound mode, n (%)			0.005
Autonomous	45 (62.50%)	61 (84.72%)	
Defibrillator	27 (37.50%)	11 (15.28%)	
Secondary endotracheal intubation, n (%)			0.620
None	71 (98.61%)	69 (95.83%)	
Yes	1 (1.39%)	3 (4.17%)	
Mortality, n(%)			1.000
None	71 (98.61%)	72 (100.00%)	
Yes	1 (1.39%)	0 (0.00%)	
Postoperative mechanical ventilation time (min)	1641 ± 1436	1741 ± 1666	0.701
Postoperative LOS in hospital (days)	16.3 ± 6.58	16.7 ± 6.53	0.685
LOS in ICU (days)	2.68 ± 1.90	3.22 ± 2.35	0.128

Abbreviation: LOS, length of stay.

CAN J ANAESTH 1997 / 44: 1 / pp 19–25

Dose-response to anaesthetic induction with sufentanil: haemodynamic and electroencephalographic effects

Jitender Sareen MD, Robert J Hudson MD, Morley Rosenbloom BSC (Hon), Ian R Thomson MD

Purpose: To determine the effect of a five-fold variation in sufentanil dose on the haemodynamic and electroencephalo graphic (EEG) response to anaesthetic induction and tracheal intubation.

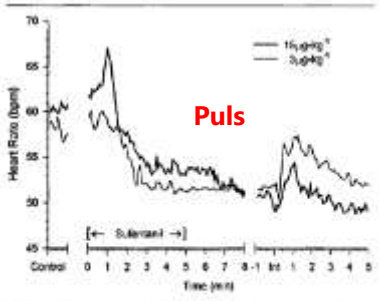


FIGURE 1 Heart rate in Groups L and H. Each point is the mean of all values in that group, plotted at five second intervals. Data from all patients were synchronized at the start of sufentanil infusion, and at intubation. No attempt is made to illustrate inter patient variability.
Ctrl = Control; Int = Intubation.

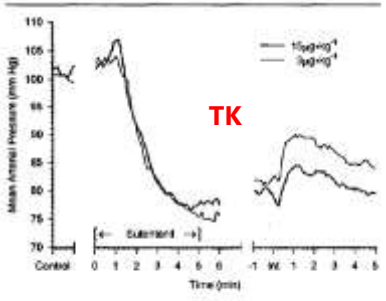


FIGURE 2 Mean arterial pressure in Groups L and H. Each point is the mean of all values in that group, plotted at five second intervals. Data from all patients were synchronized at the start of sufentanil infusion, and at intubation. No attempt is made to illustrate interpatient variability.

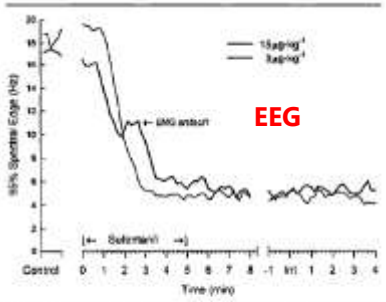


FIGURE 3 Electroencephalographic 95% spectral edge in Groups L and H. Each point is the mean of all values in that group, plotted at 10 sec intervals. Data from all patients were synchronized at the start of sufentanil infusion, and at intubation. No attempt is made to illustrate interpatient variability.
Ctrl = Control; Int = Intubation; EMG = electromyographic

Conclusion: Increasing sufentanil dose from 3 to 15 $\mu g \cdot kg^{-1}$ does not influence the ultimate haemodynamic response to induction. Combined with lorazepam premedication, 3 $\mu g \cdot kg^{-1}$ sufentanil produces near-maximal haemodynamic and EEG effects and is adequate for induction and tracheal intubation of patients undergoing CABG. Sufentanil 15 $\mu g \cdot kg^{-1}$ is no more efficacious, and causes transient cardiovascular stimulation.

Journal of International Medical Research 2021 49(3) 1–9

Recommended dose of sufentanil during induction of general anesthesia to avoid coughing and drastic hemodynamic fluctuations in patients undergoing surgery

Ping Chen*, Ping Zeng*, Yuan Gong* and Xiang Long

Background: Sufentanil-induced cough (SIC) is a common complication during anesthesia induction. We explored the recommended sufentanil dose that effectively avoids cough during general anesthesia using a clinical trial to analyze the effective dose (ED)50 and ED95 of sufentanil that avoids cough, hemodynamic fluctuations, and adverse reactions.

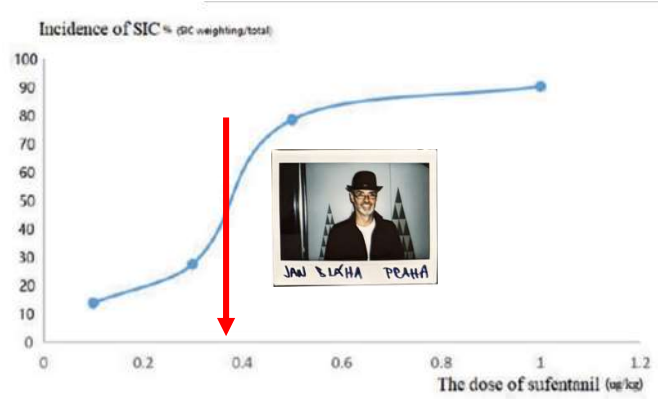


Figure 1. Dose–effect curve of the SIC incidence. SIC, sufentanil-induced cough.

Table 4. Hemodynamic evaluation.

Group	Sufentanil dose (μg/kg)	MAP fluctuation over 20%			Bradycardia			Tachycardia		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
I	0.1	6	10	9*	1	1	7	0	0	0
II	0.3	4	6	5	2	4	2	3	0	0
III	0.5	2	6	2	2	5	1	0	0	0
IV	1.0	5	7	3	1	2	1	1	0	1

*The incidence of MAP fluctuation over 20% in group I was higher than that in group III at T3 ($p<0.05$).

Results: The ED50 and ED95 of cough incidence induced by intravenous sufentanil in patients during general anesthesia induction was 0.332 μg/kg and 1.423 μg/kg, respectively. The cough rate in group I was lower than the other groups. The incidence of dizziness, panic, chest tightness, hypertension, bradycardia, and tachycardia were not significantly differenc.

TABLE 24-1 COMMON WEIGHT SCALARS

Name	Equations
Ideal body weight	Male: 50 kg + 2.3 kg for each 2.54 cm (1 in) over 152 cm (5 ft) Female: 45.5 kg + 2.3 kg for each 2.54 cm (1 in) over 152 cm (5 ft)
Lean body mass	Male: $1.1 \times TBW - 128 \times (TBW \div Ht)^2$ Female: $1.07 \times TBW - 148 \times (TBW \div Ht)^2$
Fat free mass[33]	Male: $(9.27 \times 10^3 \times TBW) \div (6.68 \times 10^3 + 216 \times BMI)$ Female: $(9.27 \times 10^3 \times TBW) \div (8.78 \times 10^3 + 244 \times BMI)$
Pharmacokinetic mass[36,37]	$52 \div [1 + (196.4 \times e^{-0.025\ TBW} - 53.66) \div 100]$ (fentanyl only)
Corrected body weight[38,39]	IBW + 0.4* (IBW − FFM)

BMI, Body mass index; *FFM*, fat-free mass; *Ht*, height in centimeters; *IBW*, ideal body weight; *LBM*, lean body mass; *MFFM*, modified fat-free mass; *TBW*, total body weight in kg.
*The dose/kg using IBW, TBW, or FFM in an obese person are all less than the dose/kg using TBW in a nonobese patient.

TABLE 24-2 DOSING WEIGHTS BASED ON VARIOUS DOSING SCALARS

	176-cm (6-ft) Male	
	68 kg (BMI = 22)	185 kg (BMI = 66)
Dosing Scalar	Dosing Weight (kg)	Dosing Weight (kg)
Total body weight (TBW)	68	185
Ideal body weight (IBW)	71	71
Lean body mass (LBM)	55	62
Fat-free mass (FFM)	55	87
Corrected body weight (CBW)	68	115

MI, Body mass index (kg/m2)

J Pharmacol Clin Toxicol 10(2): 1165 (2022)

Journal of Pharmacology & Clinical Toxicology

Review Article

Sufentanil: Pharmacolgy and Current Applications in Clinical Practice

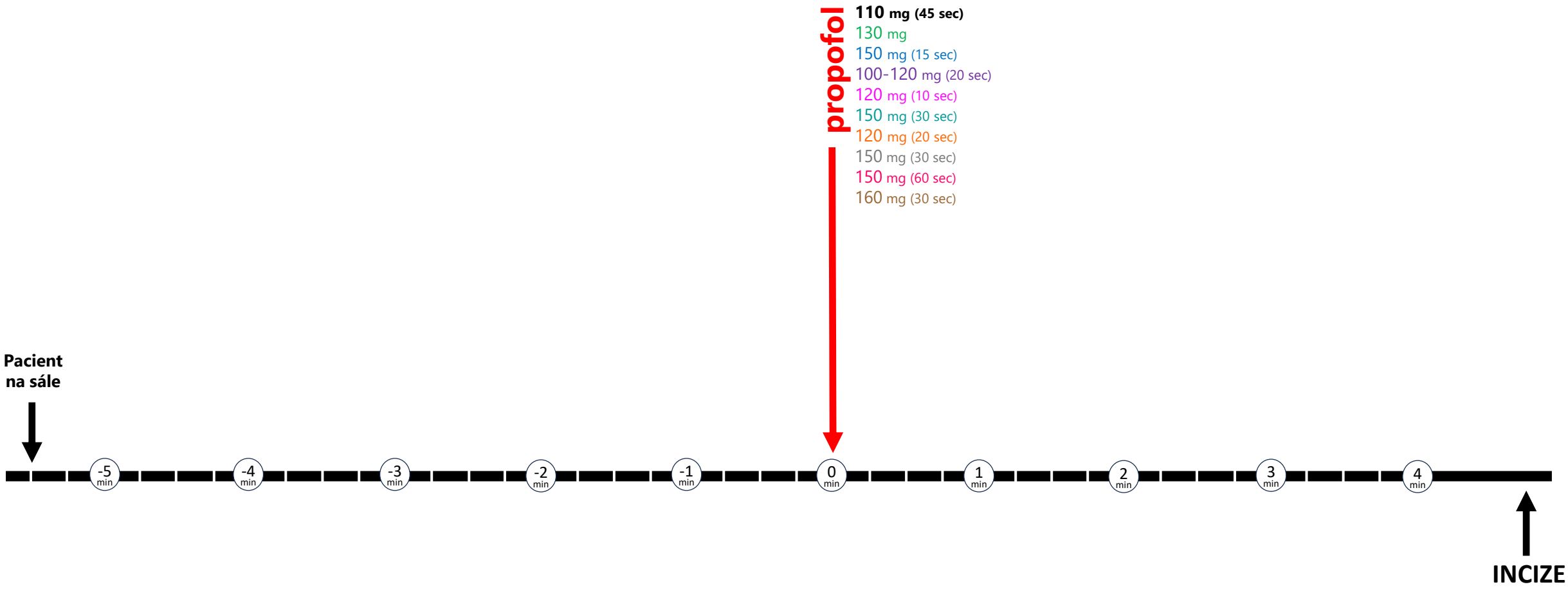
Sagir A[1,2], El-Hayek T[2], Raduka J[2], Budiansky A[3], Soliman A[4], Visos N[2], and Maurtua MA[2*]

[1]Department of Anesthesia, Critical Care and Pain Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA
[2]Department of Anesthesiology, Cleveland Clinic, OH, USA
[3]Department of Anesthesiology, The Ottawa Hospital, Canada
[4]Anesthesia Consultant, United Kingdom

Dosing

Sufentanil dosing should be calculated using the patient's lean body weight instead of total body weight. This fact is especially important when administering the drug to obese or morbidly obese patients. The infusion dose recommended in adults is 0.3 to 1.5 mcg/kg/hr [14,16,17].

Following intravenous administration, peak plasma concentration is achieved after 3 minutes, whereas the average onset of action, as defined by evidence of electroencephalographic (EEG) slowing, is approximately two minutes following injection [8,11].


propofol
110 mg (45 sec)
130 mg
150 mg (15 sec)
100-120 mg (20 sec)
120 mg (10 sec)
150 mg (30 sec)
120 mg (20 sec)
150 mg (30 sec)
150 mg (60 sec)
160 mg (30 sec)
Pacient na sále
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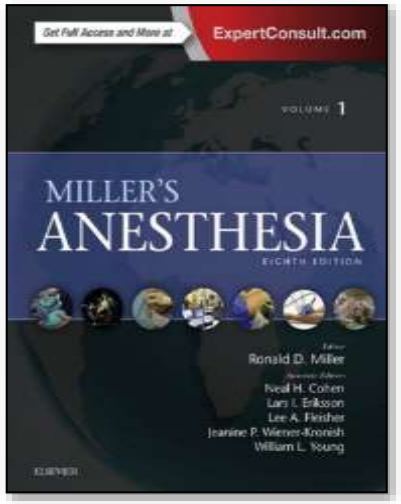
-3 min
-2 min
-1 min
0 min
1 min
2 min
3 min
4 min
INCIZE



Chapter 30

Intravenous Anesthetics

JAAP VUYK • ELSKE SITSEN • MARIJE REEKERS

Acknowledgment: The editors and publisher would like to thank Drs. J.G. Reves, Peter Glass, David A. Lubarsky, Matthew D. McEvoy, and Ricardo Martinez-Ruiz for contributing a chapter on this topic to the prior edition of this work. It has served as the foundation for the current chapter.

Key Points

- The introduction of thiopental into clinical practice in 1934 marked the beginning of modern intravenous (IV) anesthesia. Today, IV anesthetics are used for induction and maintenance of anesthesia and for sedation in a wide variety of circumstances.
- The most commonly used IV anesthetic is propofol, an alkylphenol currently formulated in a lipid emulsion. Propofol provides rapid onset and offset with context-sensitive decrement times of approximately 10 minutes when infused for less than 3 hours and of less than 40 minutes when infused for up to 8 hours. Its mechanism of action is likely the enhancement of γ-aminobutyric acid (GABA)-induced chloride currents. Propofol causes a dose-dependent decrease in arterial blood pressure through a decrease in cardiac output and systemic vascular resistance and produces moderate respiratory depression. A unique action of propofol is its antiemetic effect, even at concentrations less than those producing sedation.
- Barbiturates were the most commonly used IV drugs administered to induce anesthesia before the introduction of propofol. Thiopental provides rapid onset and offset when used as a single dose, but it accumulates rapidly with repeated or prolonged administration and thus postpones recovery from anesthesia.

TABLE 30-3 **HEMODYNAMIC CHANGES % AFTER INDUCTION OF ANESTHESIA WITH NONBARBITURATE HYPNOTICS**

	Diazepam	Droperidol	Etomidat*	Ketamine	Lorazepam	Midazolam	Propofol
HR	–9 ± 13	Unchanged	–5 ± 10	0-59	Unchanged	–14 ± 12	–10 ± 10
MBP	0-19	0-10	0-17	0 ± 40	–7-20	–12-26	–10-40
SVR	–22 ± 13	–5-15	–10 ± 14	0 ± 33	–10-35	0-20	–15-25
PAP	0-10	Unchanged	–9 ± 8	+44 ± 47	—	Unchanged	0-10
PVR	0-19	Unchanged	–18 ± 6	0 ± 33	Unchanged	Unchanged	0-10
PAO	Unchanged	+25 ± 50	Unchanged	Unchanged	—	0-25	Unchanged
RAP	Unchanged	Unchanged	Unchanged	+15 ± 33	Unchanged	Unchanged	0-10
CI	Unchanged	Unchanged	–20 ± 14	0 ± 42	0 ± 16	0-25	–10-30
SV	0-8	0-10	0-20	0-21	Unchanged	0-18	–10-25
LVSWI	0-36	Unchanged	0-33	0 ± 27	—	–28-42	–10-20
dP/dt	Unchanged	—	0-18	Unchanged	—	0-12	Decreased

From Reves JG, Glass P, Lubarsky DA, et al: Intravenous anesthetics. In Miller RD, Eriksson LI, Fleischer LA, et al, editors: Miller's anesthesia, *ed 7. Philadelphia, 2010, Churchill Livingstone, pp 719-768.*

CI, Cardiac index; *dP/dt,* first derivative of pressure measured over time; *HR,* heart rate; *LVSWI,* left ventricular stroke work index; *MBP,* mean blood pressure; *PAO,* pulmonary artery occluded pressure; *PAP,* pulmonary artery pressure; *PVR,* pulmonary vascular resistance; *RAP,* right atrial pressure; *SV,* stroke volume; *SVR,* systemic vascular resistance.

*The larger deviations are in patients with valvular disease.

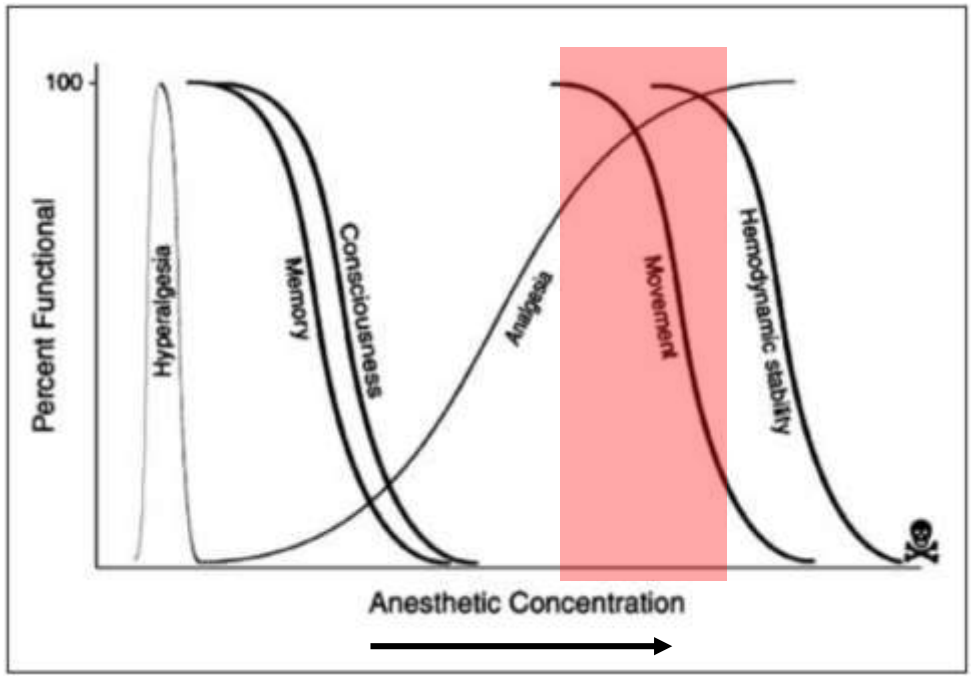


Figure 2. The dose-response curves for endpoints of anesthesia (Antognini and Carstens 2002). Higher anesthetic concentrations are toward the right. The key endpoint for relative anesthetic potency and the dose typically needed for anesthesia with surgery is that point where the minimum alveolar concentration (MAC) of an inhaled anesthetic prevents 50% of patients from moving in response to a surgical stimulus (Eger and others 1965). At very low doses of agents, typically around 0.1 MAC, a paradoxical hyperalgesia (pain-enhancing) effect occurs (Zhang and others 2000). Next, analgesia begins and increases with an increasing dose until, at much deeper levels, no movement occurs with any stimulation. The memory effects of anesthesia occur at around 0.1 to 0.3 MAC (Alkire and Gorski 2004) and deeper. Consciousness is typically lost at approximately 0.3 to 0.4 MAC, or at about 30% to 40% of the anesthetic dose actually needed for surgery. Doses much above those needed to prevent movement can cause a lethal collapse of the cardiovascular system. Adapted from Alkire and Miller (2005).

Nallasamy N. The Neuroscientist 2011. 17(1) 94–106

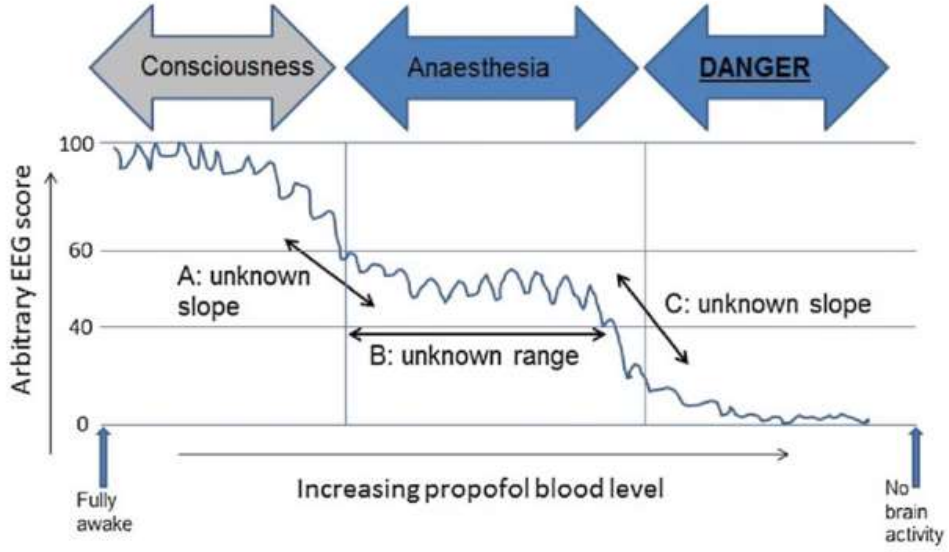


Fig. 19.5 Non-linear relationship between propofol blood level and EEG score. A probable relationship between increasing blood level of propofol and an arbitrary EEG score. For this construction it is proposed that the anaesthesia range of EEG score is between 60 and 40, and a score less than 25 may be dangerous. If these are accepted, the range of propofol blood level (B) capable of keeping an EEG score in the anaesthesia range is unknown: it may be narrow or very wide. The slopes at A and C represent the changes in EEG score leading into and out of the anaesthesia range, and these are also unknown. Similar ideas about variability of the dose response have been discussed by Escallier et al. [35]

Sury MRJ. EEG Monitoring of Depth of Anesthesia in , Total Intravenous Anesthesia and Target Controlled Infusions (2017

sp.zn. sukls249510/2019
a k sp.zn. sukls282250/2019

SOUHRN ÚDAJŮ O PŘÍPRAVKU

1. NÁZEV PŘÍPRAVKU

Propofol MCT/LCT Fresenius 20 mg/ml injekční/infuzní emulze

Celková anestezie u dospělých

Úvod do anestezie:

Pro úvod do anestezie má být přípravek Propofol MCT/LCT Fresenius titrován (přibližně 20-40 mg propofolu každých 10 sekund) podle klinické odpovědi pacienta až do klinických známek nástupu anestezie.

U většiny dospělých pacientů mladších 55 let je potřebná dávka přípravku 1,5-2,5 mg propofolu/kg těl. hm.

U starších pacientů a u pacientů se stupněm rizika III a IV dle ASA, zejména u těch s poruchou srdeční funkce, jsou třeba dávky obecně nižší a celková dávka přípravku Propofol MCT/LCT Fresenius může být snížena až na minimální dávku 1 mg propofolu/kg těl. hm.. Přípravek Propofol MCT/LCT Fresenius má být podáván nižší rychlostí (přibližně 1 ml emulze o koncentraci 20 mg/ml (20 mg propofolu) má být podáno každých 10 sekund).


54
0.2
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propofol
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67
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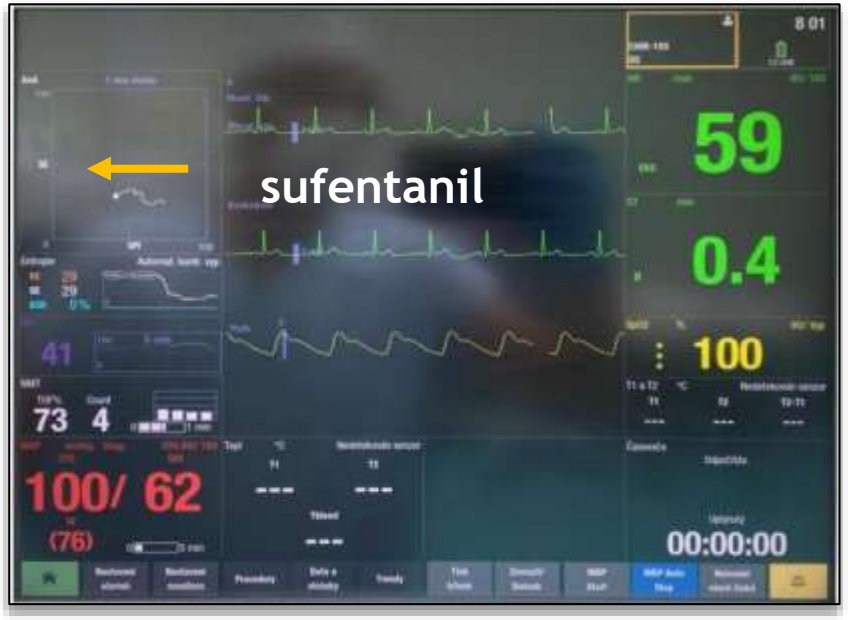
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propofol
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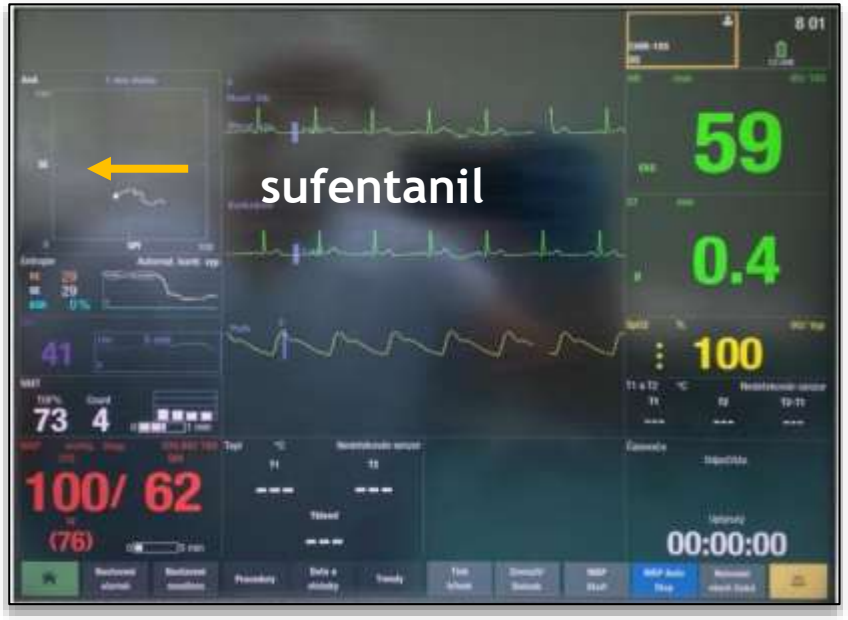
sufentanil
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100/ 62
(76)
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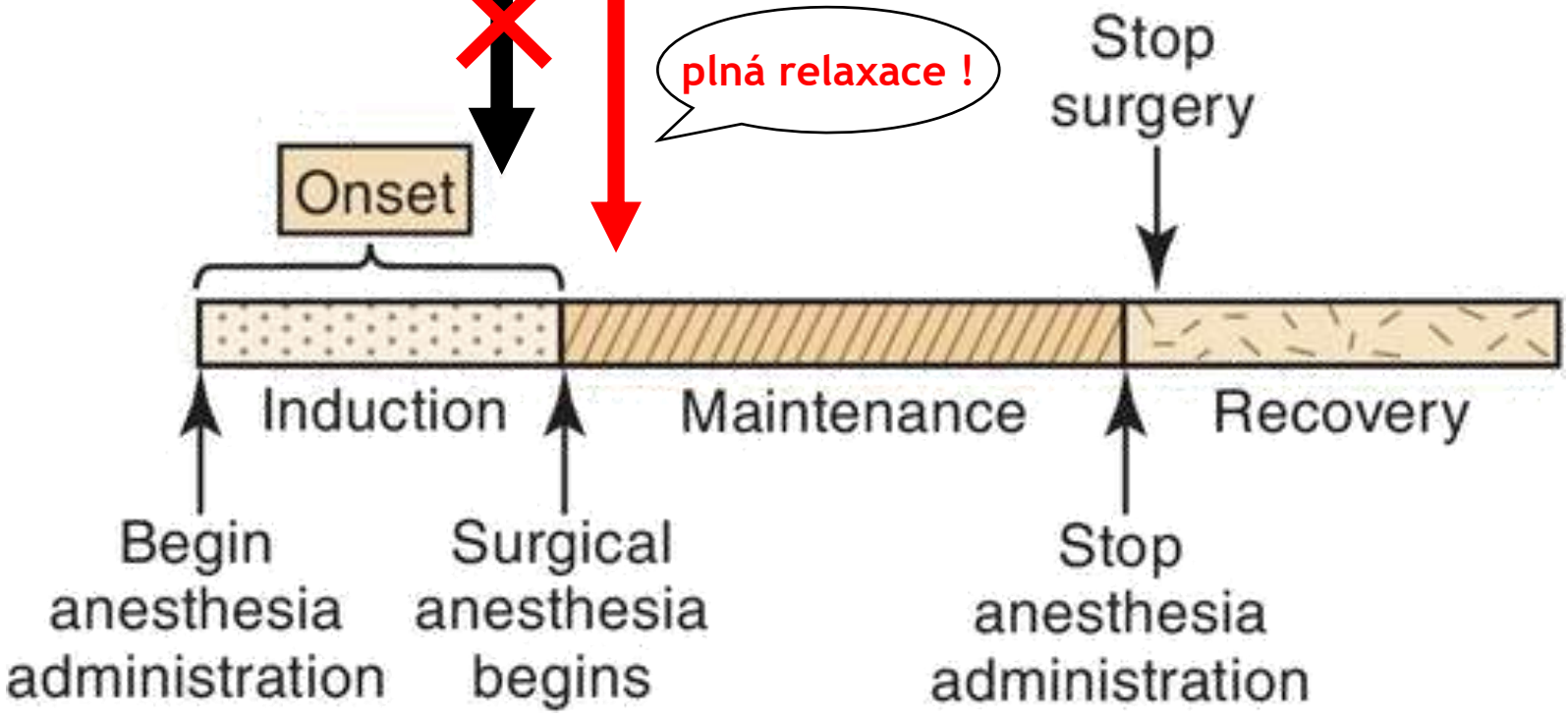
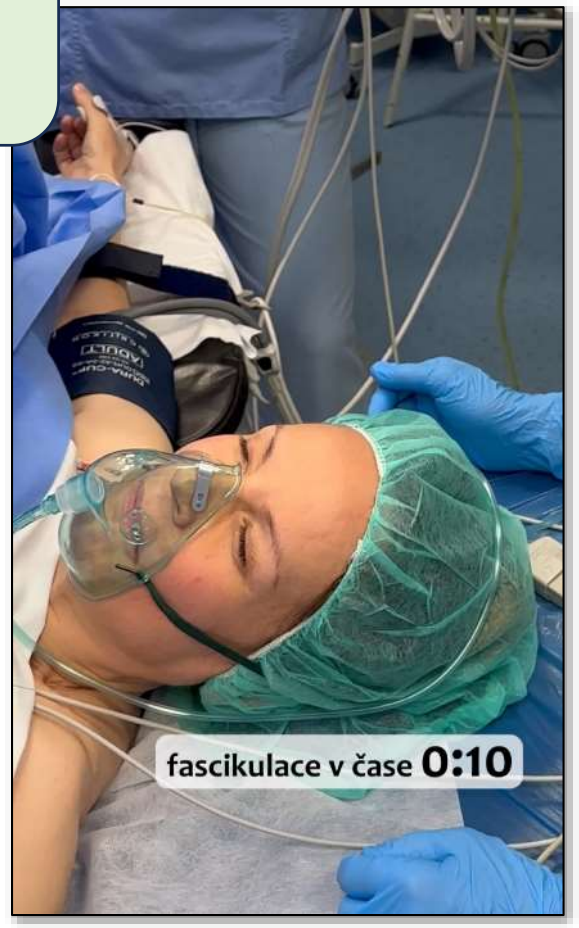
U těhotné je 10x vyšší riziko obtížné intubace,
tak si musíme vytvořit **OPTIMÁLNÍ PODMÍNKY**,
a ne **NEDOSTATEČNÉ** !

plná relaxace !





Doba nástupu účinku i čas do intubace jsou na dávce závislé !

International Journal of Obstetric Anesthesia (2019) xxx, xxx–xxx
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https://doi.org/10.1016/j.ijoa.2019.08.005

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www.obstetanesthesia.com

ORIGINAL ARTICLE

Surgical conditions with rocuronium versus suxamethonium in cesarean section: a randomized trial

J. Bláha,[a,†] P. Nosková,[a,†] K. Hlinecká,[b] V. Krakovská,[c] V. Fundová,[a] T. Bartošová,[a] P. Michálek,[a] M. Stříteský[a]

Table 2 Times from induction of anesthesia to end of surgery; and induction

	Rocuronium group	
	Mean	*Median*
Induction – delivery interval (s)	268.4 (72.9)	265 (223–330)
Induction – intubation interval (s)	105.8 (33.7)	108 (77–134)
Incision – delivery interval (s)	146.6 (68.3)	130 (99–179)
Intubation – incision interval (min)	15.8 (6.9)	15 (4–43)
Length of surgery (min)	39.3 (8.9)	39 (27–53)
End of surgery to extubation (min)	5.2 (4.6)	4 (0–13)
SRSD (points)	3.73 (0.53)	4 (3–5)
Blood loss (mL)	533 (76)	500 (500–600)
Thiopental (mg/kg)	4.7 (0.16)	4.7 (4.5–5.1)
Muscle relaxant dose (mL/kg)	0.092 (0.01)	0.093 (0.090–0.106)
Muscle relaxant dose (mg/kg)	0.55 (0.05)	0.56 (0.54–0.65)

Data are presented as mean (SD) or median (range). Difference between the groups is expresse

Sp. zn. sukls261117/2023

SOUHRN ÚDAJŮ O PŘÍPRAVKU

1. NÁZEV PŘÍPRAVKU

Rocuronium Fresenius Kabi 10 mg/ml injekční/infuzní roztok

Tracheální intubace

Standardní dávka pro intubaci v průběhu rutinní anestezie je 0,6 mg/kg těl. hm. rokuronium-bromidu. Dávka 1,0 mg/kg rokuronium-bromidu se doporučuje pro snadnější navození stavu vhodného pro intubaci při rychlé indukci anestezie, po této dávce je většina pacientů uvedena do stavu vhodného pro intubaci do 60 sekund. Pokud se použije dávka 0,6 mg/kg těl. hm. rokuronium-bromidu při rychlé indukci anestezie, pak se doporučuje intubovat pacienta 90 sekund po podání rokuronium-bromidu.

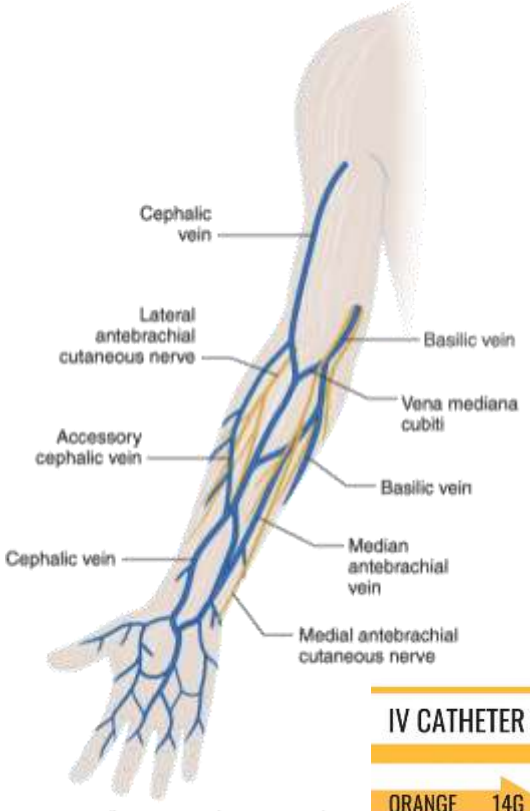
British Journal of Anaesthesia 1998; 80: 235–237

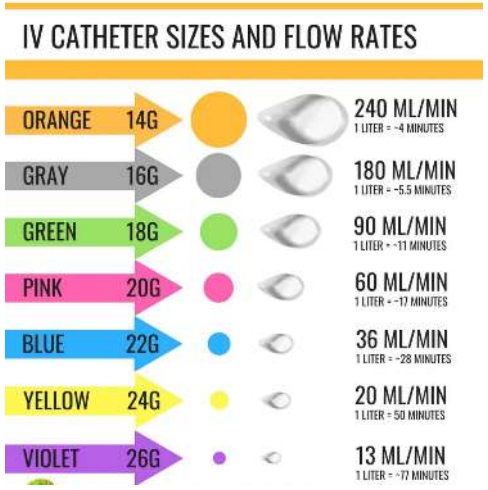
Comparison of intubating conditions after rocuronium or vecuronium when the timing of intubation is judged by clinical criteria

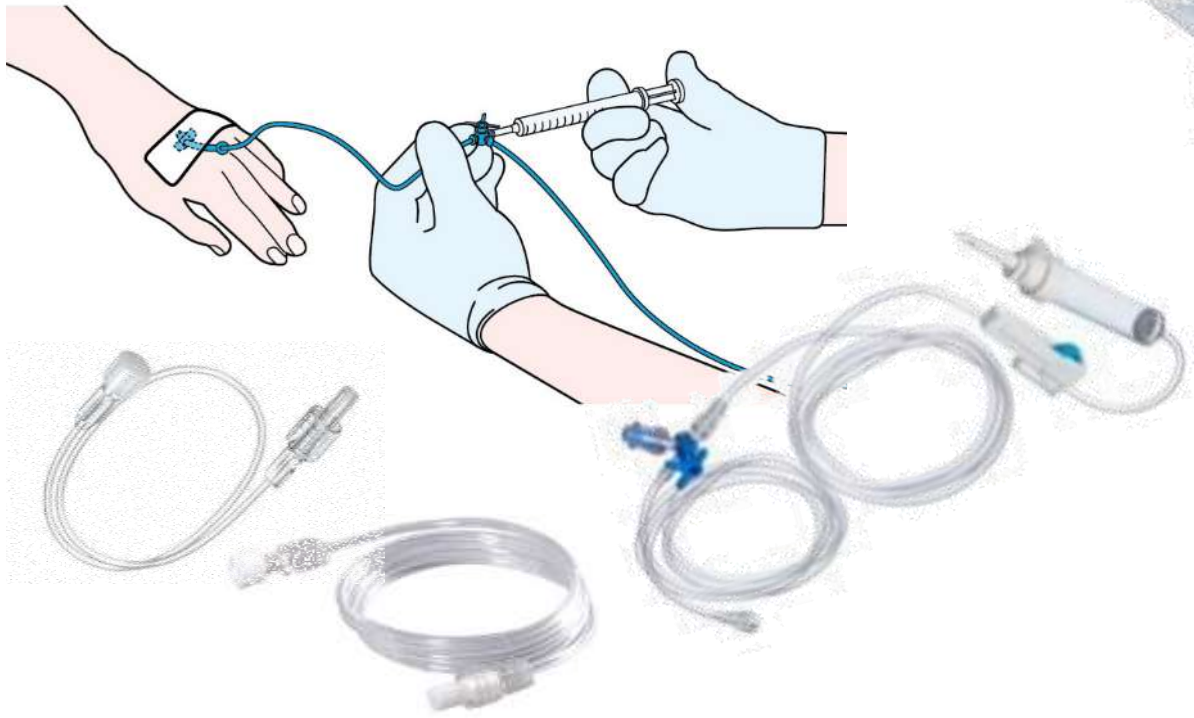
I. SMITH AND R. S. G. SAAD

	Vecuronium	Rocuronium
Mallampati class (1/2)	22/3	22/3
Neuromuscular blocking drug to Start of laryngoscopy (s)	110 (26) [70–189]	89 (20)* [60–135]
Completion of intubation (s)	142 (32) [106–215]	119 (28)* [68–200]

Doba nástupu účinku myorelaxancia záleží ale i na způsobu aplikace !!





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5a
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VCV
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447
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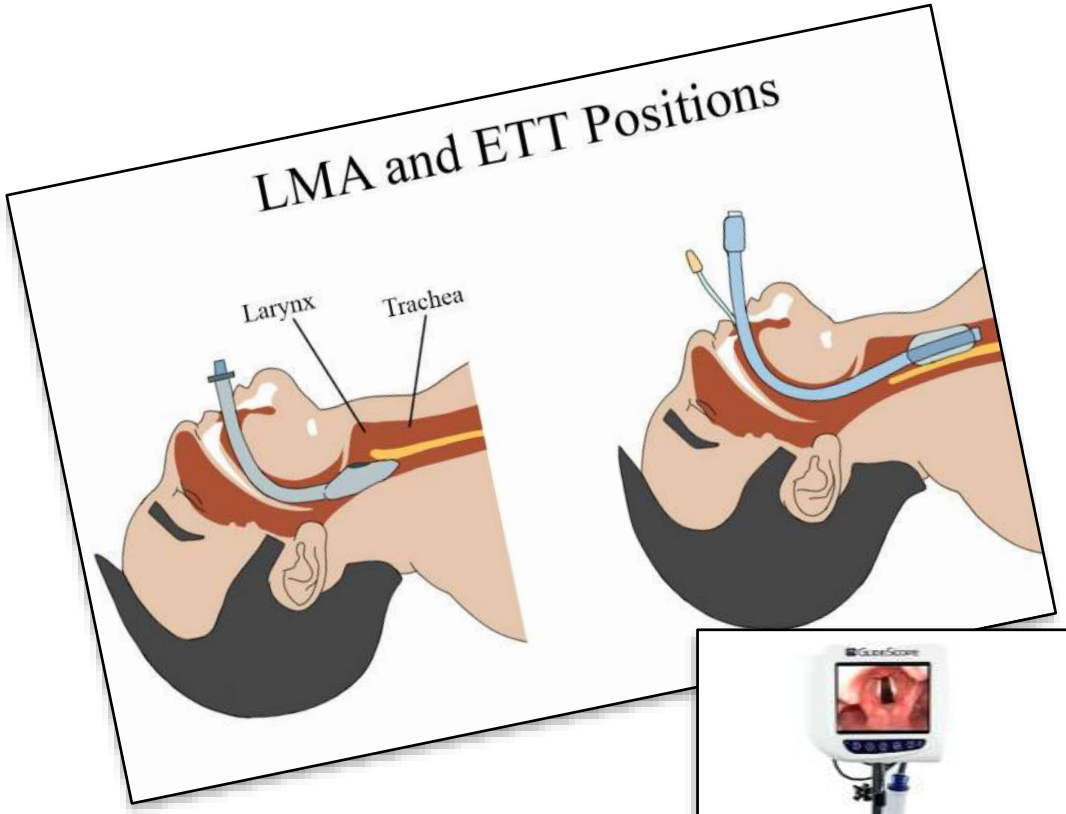
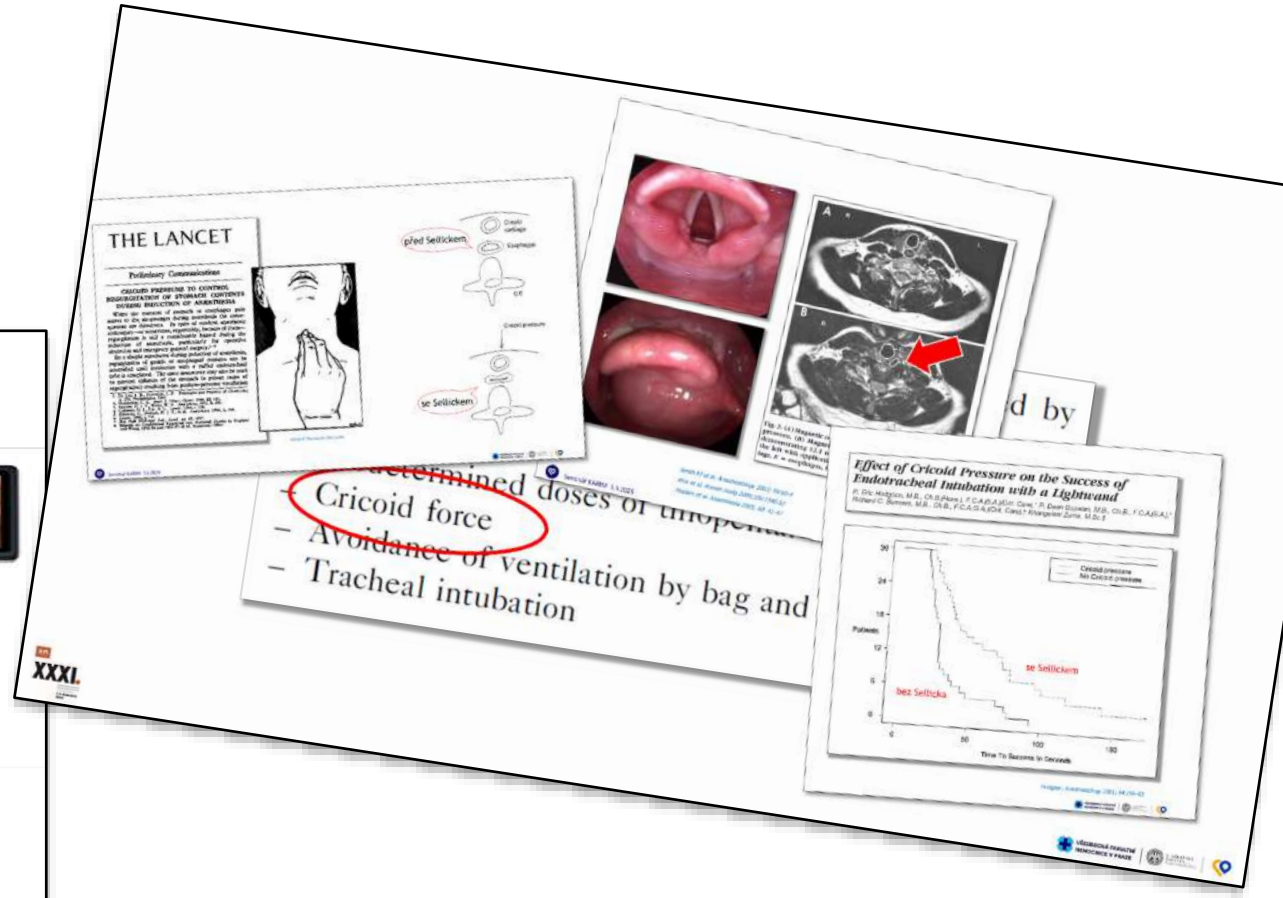
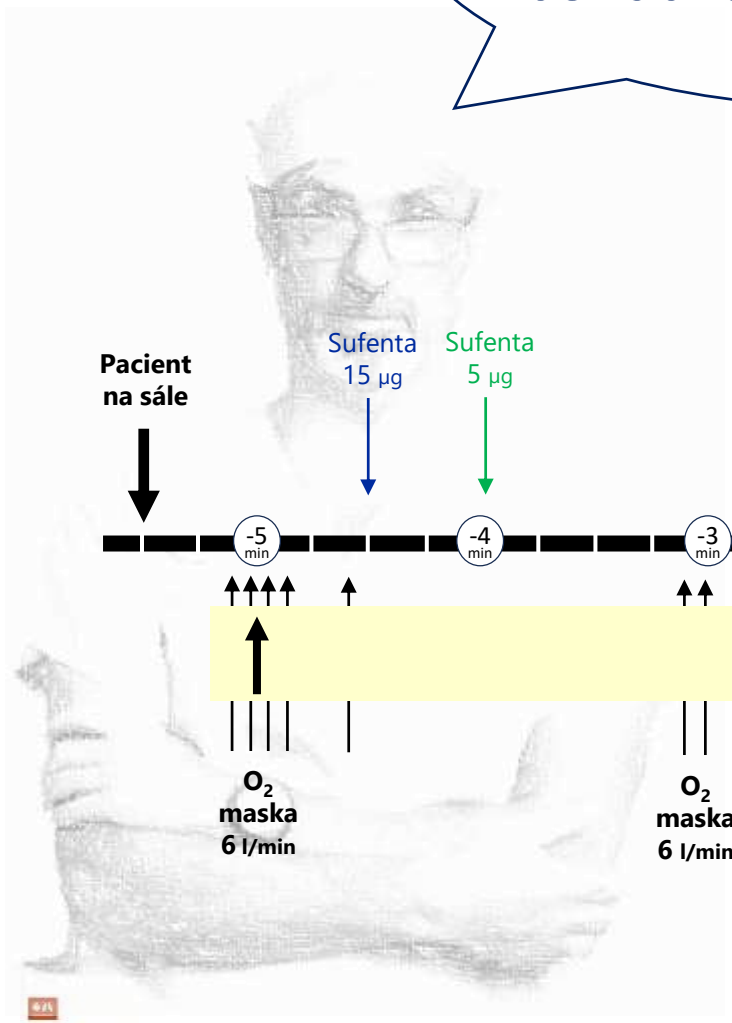

LMA and ETT Positions
Larynx
Trachea


THE LANCET
Preliminary Communications
CRICOID PRESSURE TO CONTROL REGURGITATION OF STOMACH CONTENTS DURING INDUCTION OF ANAESTHESIA
před Sellickem
se Sellickem
Cricoid force
– Avoidance of ventilation by bag and
– Tracheal intubation
Effect of Cricoid Pressure on the Success of Endotracheal Intubation with a Lightwand
se Sellickem
bez Sellicka

Ač mám k mladé generaci řadu výhrad, tak anestezii asi dávají lépe než my…

Ač mám k mladé generaci řadu výhrad, tak anestezii asi dávají lépe než my...



Pacient na sále

Sufenta 15 µg

Sufenta 5 µg

Sufenta 5 µg 20 µg

Sufenta 5 µg

Sufenta 5 µg

Sufenta 20 µg

Sufenta 10 µg

Sufenta 15

Sufenta 15 µg

Sufenta 15 µg

Sufenta 15 µg

propofol
100 mg (20 sec) (+30 mg)
150 mg (20 sec)
110 mg (60 sec)
130 mg (30 sec)
120 mg (60 sec dle SPI)
80+30+ mg (30 sec dle entropie)
170 mg (20 sec)
130 mg (40 sec)
100 mg (40 sec) +30 mg

Sufenta 5 µg

ROC 45 mg

ROC 40 mg 35 mg

ROC 30 mg 30 mg 40 mg 40 mg

ROC 35 mg 35 mg

-5 min | -4 min | -3 min | -2 min | -1 min | 0 min | 1 min | 2 min | 3 min | 4 min

SUFENTA 25 µg

ROC 35 mg

TOF

OTI TOF 0

OTI OTI OTI OTI OTI OTI OTI OTI OTI OTI

TOF TOF TOF TOF TOF TOF TOF TOF TOF TOF

O_2 maska 6 l/min

O_2 maska 6 l/min

těsná maska 15 l/min

INCIZE

XXXI.

jan.blaha@vfn.cz