

# Peroperační hypotenze ?? vážný problém ?? *? a jak ho řešit ?*



Beneš Jan



Klinika anesteziologie, resuscitace a intenzivní medicíny,  
Fakultní nemocnice a Lékařská Fakulta v Plzni Univerzity Karlovy v Praze

... case ...

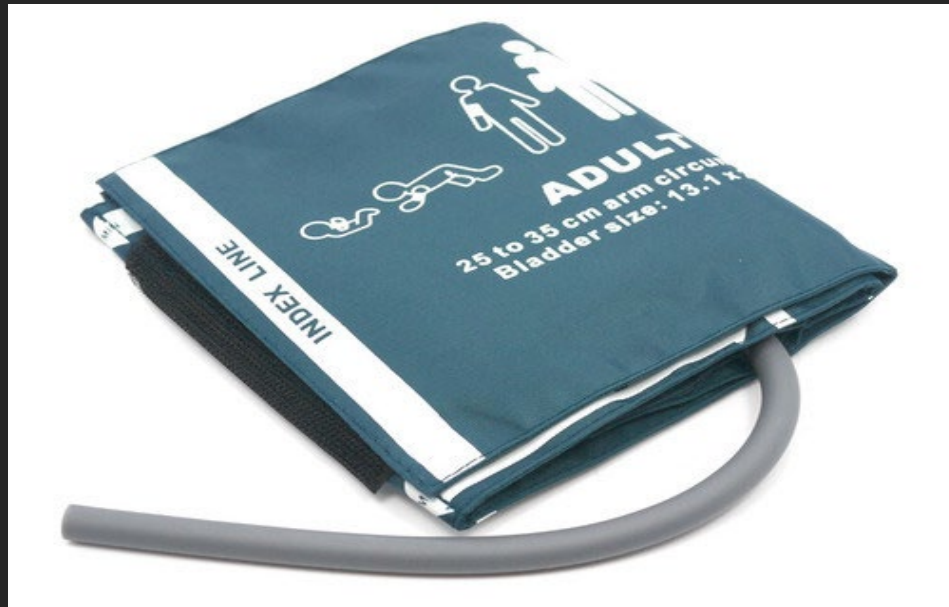
- **74letá pacientka indikovaná pro zlomeninu krčku femuru**
  - **Arteriální hypertenze (TK doma - 130/80)**
  - **Ischemická choroba srdeční (st.p.CABG)**
  - **Mírná chronická renální insuf.**
  - **Žije v domově důchodců – Clinical frailty score 5**

JAK

BUDETE

MONITOROVAT

KREVNÍ TLAK??



≈ 50 %

RESEARCH

Open Access

## Hemodynamic monitoring and management in patients undergoing high risk surgery: a survey among North American and European anesthesiologists

Maxime Cannesson<sup>1\*</sup>, Gunther Pestel<sup>2</sup>, Cameron Ricks<sup>1</sup>, Andreas Hoefft<sup>3</sup> and Azriel Perel<sup>4</sup>

**Table 1 Hemodynamic monitoring used for the management of high-risk surgery patients?.**

	ASA respondents (n = 237)	ESA respondents (n = 195)
Answer options	Response percent	Response percent
Invasive arterial pressure	95.4%	89.7%
Central venous pressure	72.6%	83.6%
Non-invasive arterial pressure	51.9%	53.8%
Cardiac output	35.4%	34.9%

150/90

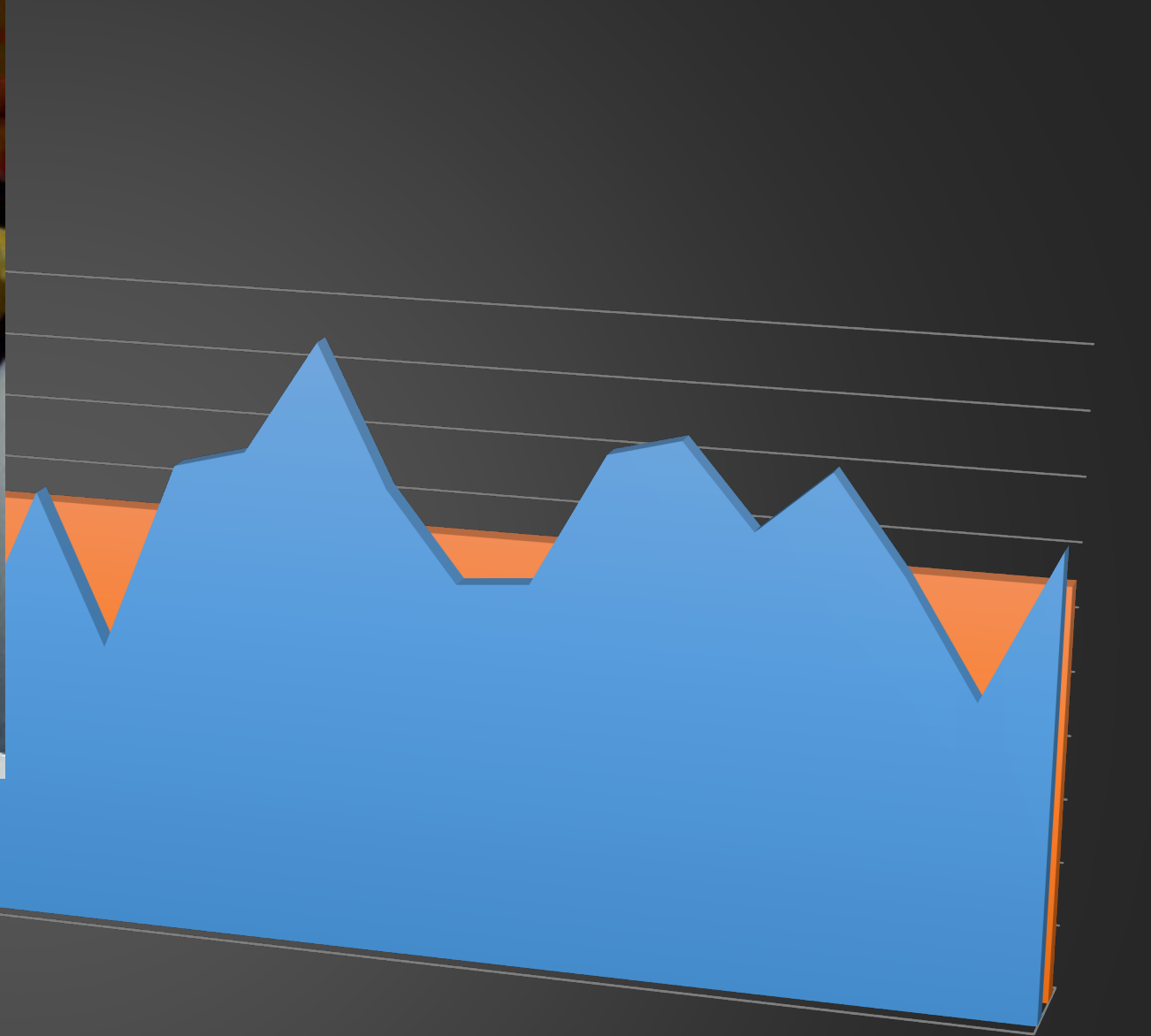
A scenic view of a mountain village. In the foreground, there are green fields and a few buildings, including a prominent church with a stone tower. The middle ground shows rolling green hills and dense evergreen forests. In the background, a massive, rugged mountain range with sharp peaks and rocky slopes dominates the landscape under a dramatic, cloudy sky. The text 'www.alpine-anesthesia.com' is overlaid in white, sans-serif font across the middle of the image.

[www.alpine-anesthesia.com](http://www.alpine-anesthesia.com)





**IS THIS REAL?**



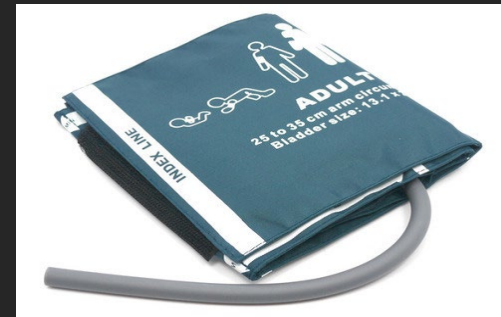
0,00





**IS THIS REAL?**

**JE HYPO  
MĚŘENÉ**



**OPRAVDU HYPO**

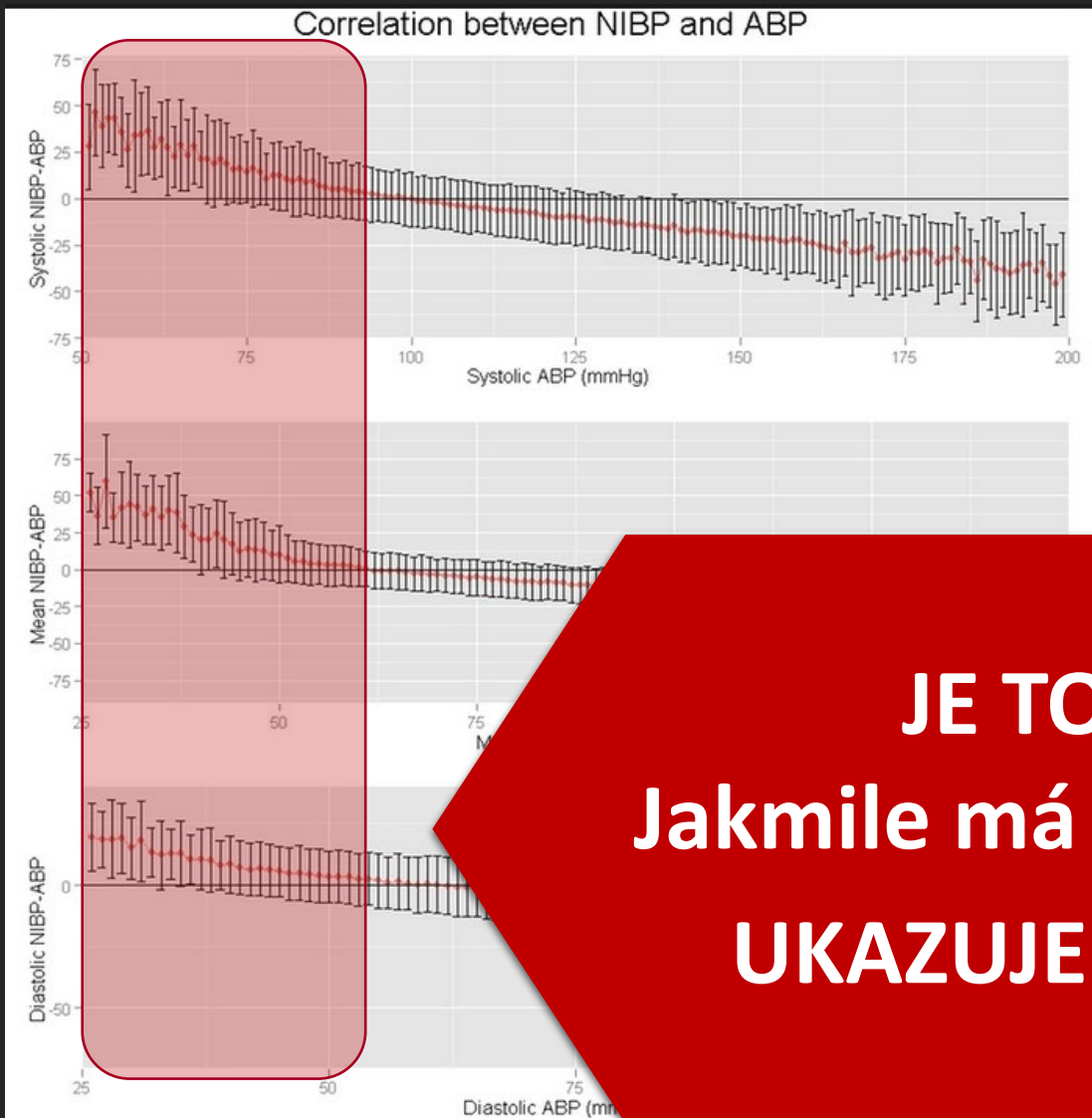


Figure 1

Graphical representation of the mean difference between NIBP and ABP across a physiologic range of systolic, mean, and diastolic blood pressures.

**JE HYPO  
MĚŘENÉ**



**JE TO JEŠTĚ HORŠÍ !!!  
Jakmile má pacient HYPO tak NIBP  
UKAZUJE VYŠŠÍ HODNOTY**

**PO**

**CO JE TO VLASTNĚ HYPO ???**



.. při bližším ohledání zjistíme,  
že odpověď není vůbec jednoduchá...

Weinberg et al. *BMC Anesthesiology* (2022) 22:69  
<https://doi.org/10.1186/s12871-022-01605-9>

BMC Anesthesiology

RESEARCH

Open Access

## Reported definitions of intraoperative hypotension in adults undergoing non-cardiac surgery under general anaesthesia: a review

Laurence Weinberg<sup>1,2,3\*</sup>, Stephanie Ying Li<sup>1</sup>, Maleck Louis<sup>1</sup>, Jadon Karp<sup>1</sup>, Nadia Poci<sup>1</sup>, Bradly Samuel Carp<sup>1</sup>, Lachlan Fraser Miles<sup>1,2</sup>, Patrick Tully<sup>1</sup>, Robert Hahn<sup>4,5</sup>, Dharshi Karalapillai<sup>1,2</sup> and Dong-Kyu Lee<sup>6</sup>

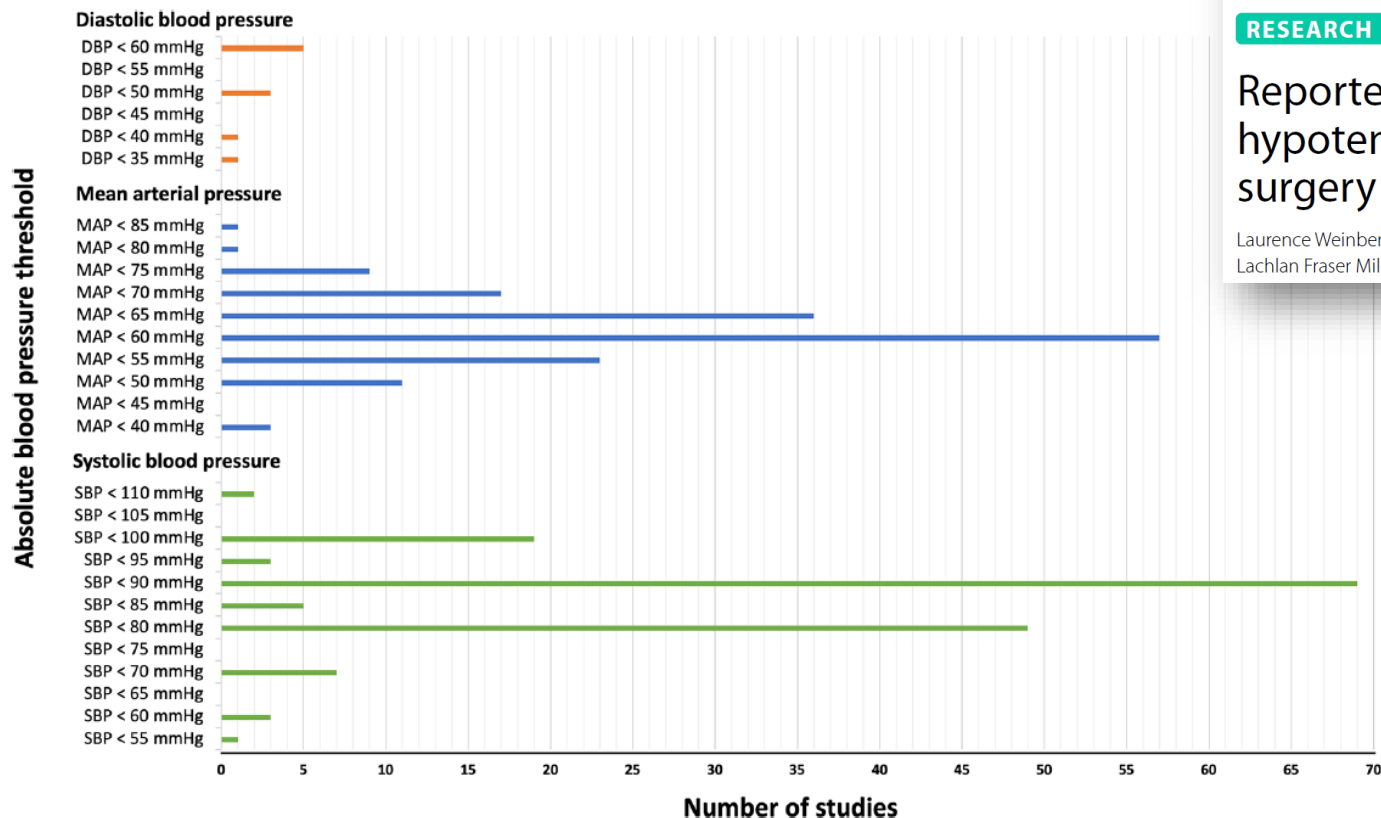


Fig. 2 Absolute numerical thresholds for intraoperative hypotension in the included studies. Several articles used more than one definition

.. při bližším ohledání zjistíme že odpověď není vůbec jednoduší

## ANESTHESIOLOGY

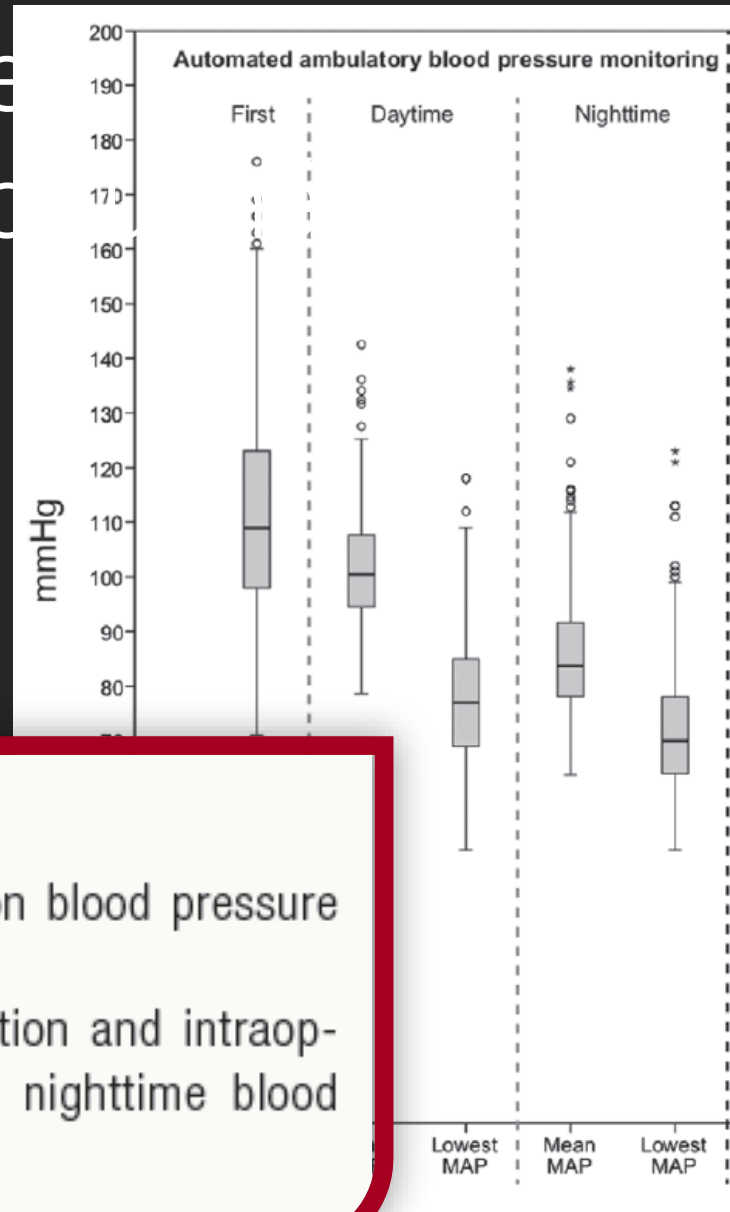
### Automated Ambulatory Blood Pressure Measurements and Intraoperative Hypotension in Patients Having Noncardiac Surgery Under General Anesthesia

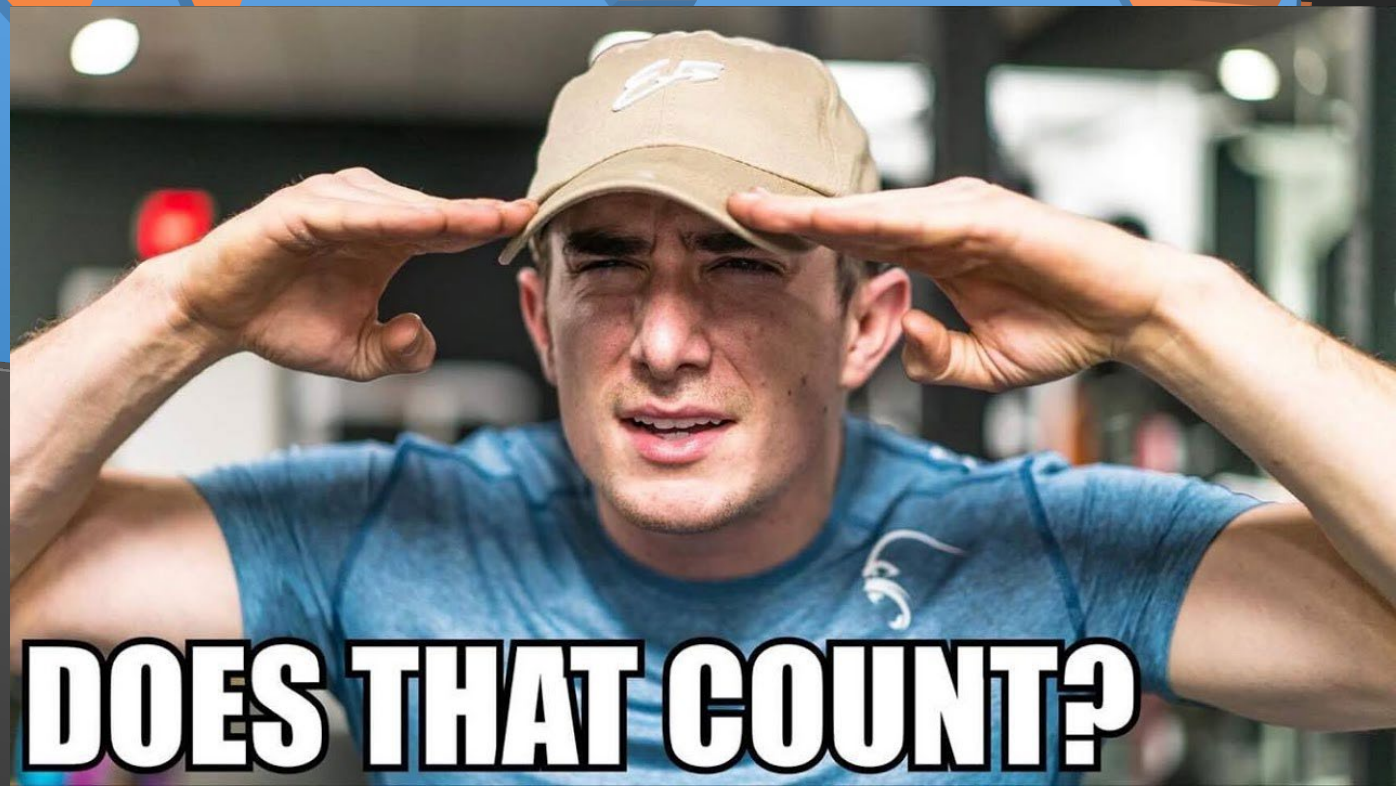
A Prospective Observational Study

Bernd Saugel, M.D., Philip  
Daniel I. Sessler, M.D., Chris  
Julia Y. Nicklas, M.D., Hans  
Daniel A. Reuter, M.D., Stef

#### What This Article Tells Us That Is New

- There is a poor correlation between preinduction blood pressure and the usual blood pressure over 24 h
- In two thirds of patients, the lowest postinduction and intraoperative pressures were lower than the lowest nighttime blood pressure





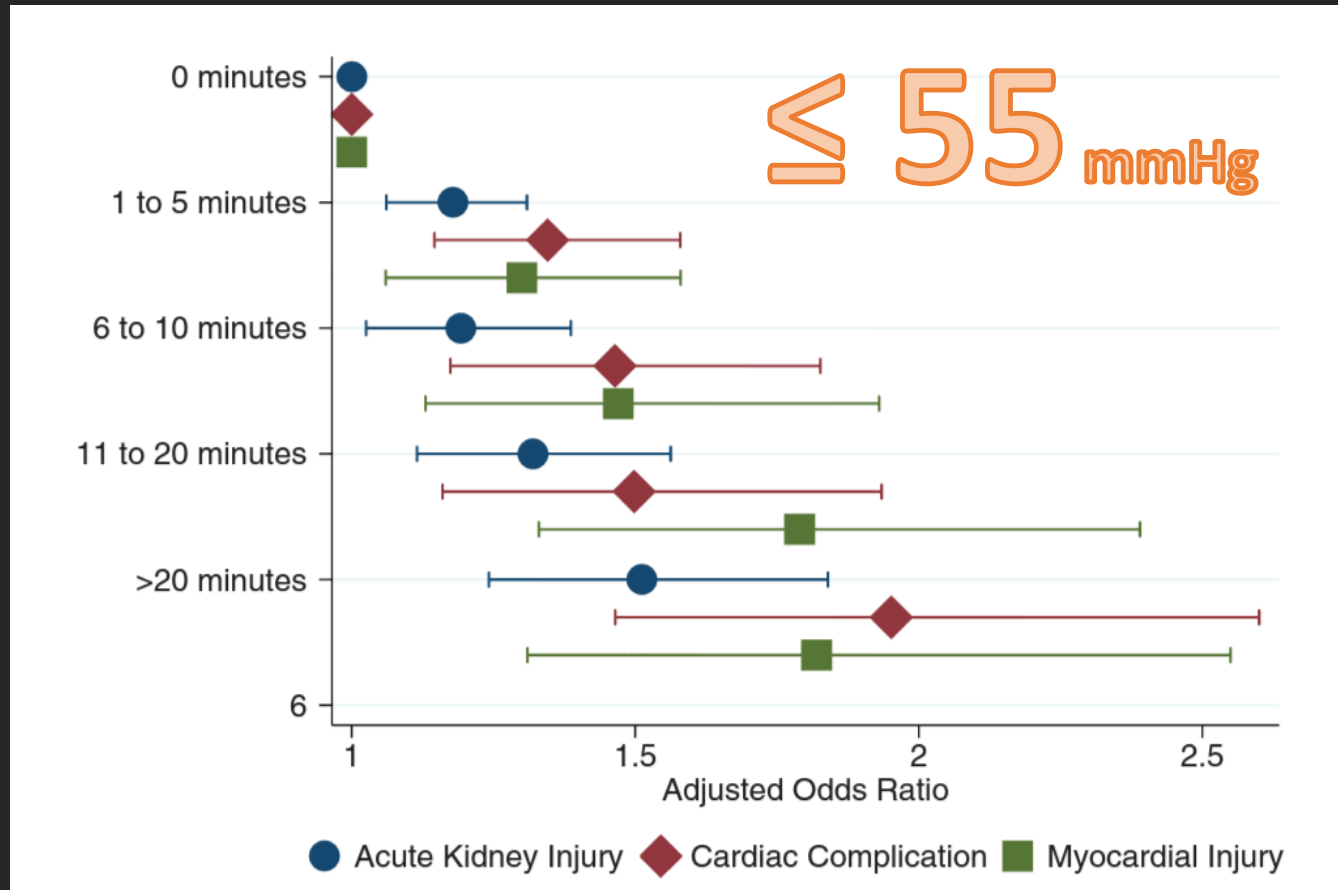
**DOES THAT COUNT?**

# 33 300 pts Nekardio operace

## Relationship between Intraoperative Mean Arterial Pressure and Clinical Outcomes after Noncardiac Surgery

### *Toward an Empirical Definition of Hypotension*

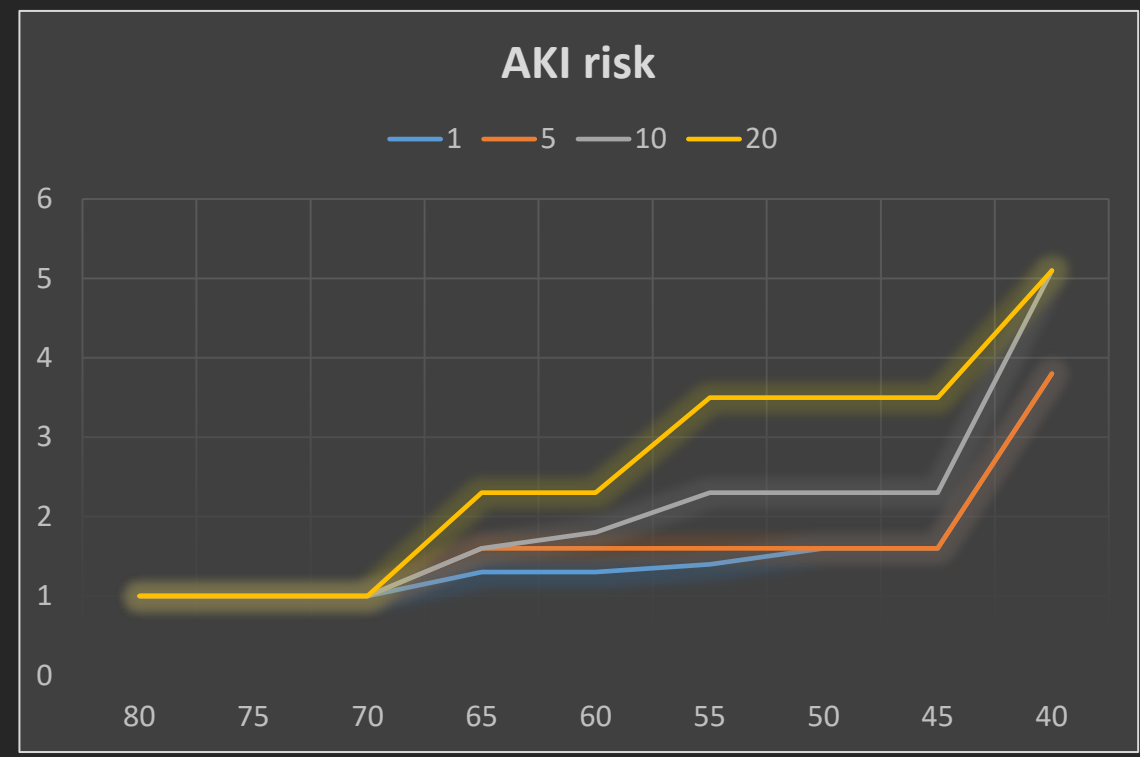
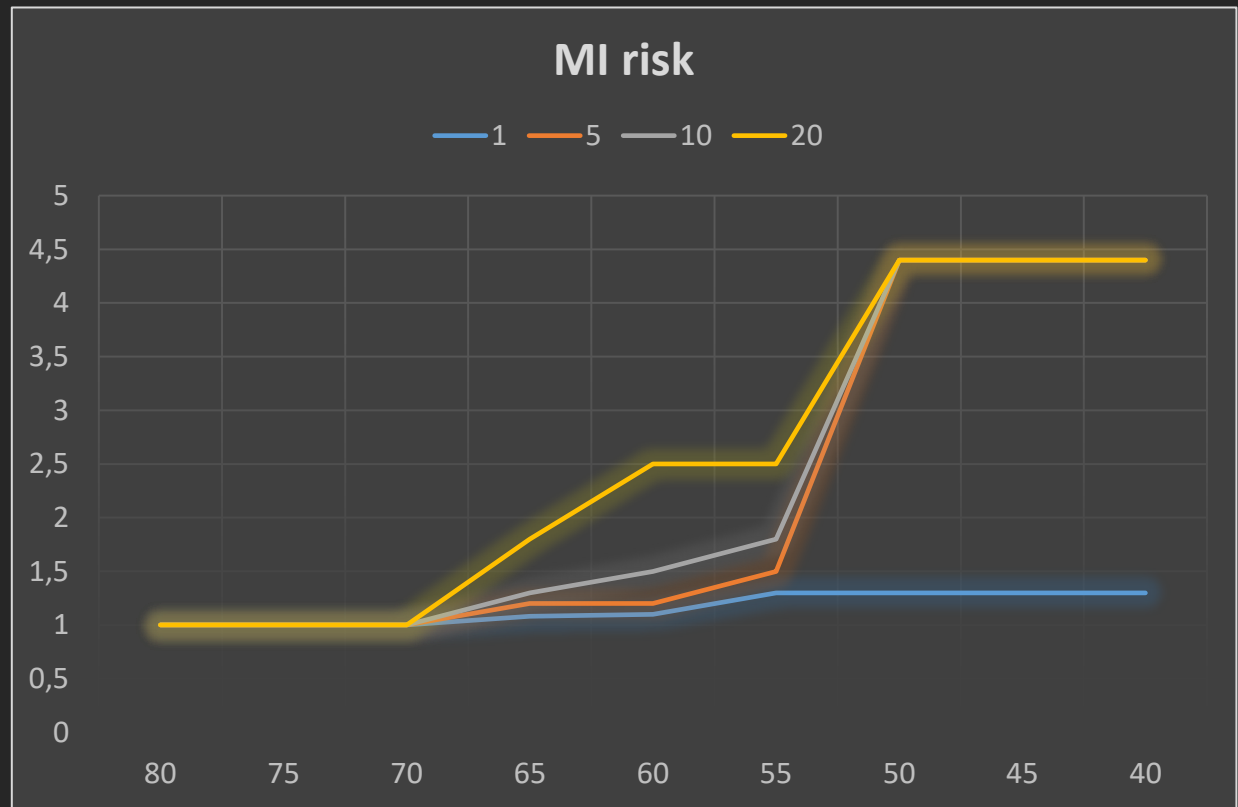
Michael Walsh, M.D.,\* Philip J. Devereaux, M.D., Ph.D.,† Amit X. Garg, M.D., Ph.D.,‡  
 Andrea Kurz, M.D.,§ Alparslan Turan, M.D.,|| Reitze N. Rodseth, M.D.,# Jacek Cywinski, M.D.,\*\*  
 Lehana Thabane, Ph.D.,†† Daniel I. Sessler, M.D.‡‡



# Intraoperative hypotension and the risk of postoperative adverse outcomes: a systematic review

E. M. Wesselink<sup>1,\*</sup>, T. H. Kappen<sup>1</sup>, H. M. Torn<sup>1</sup>, A. J. C. Slooter<sup>2</sup> and W. A. van Klei<sup>1</sup>

785 806 pts  
42 std

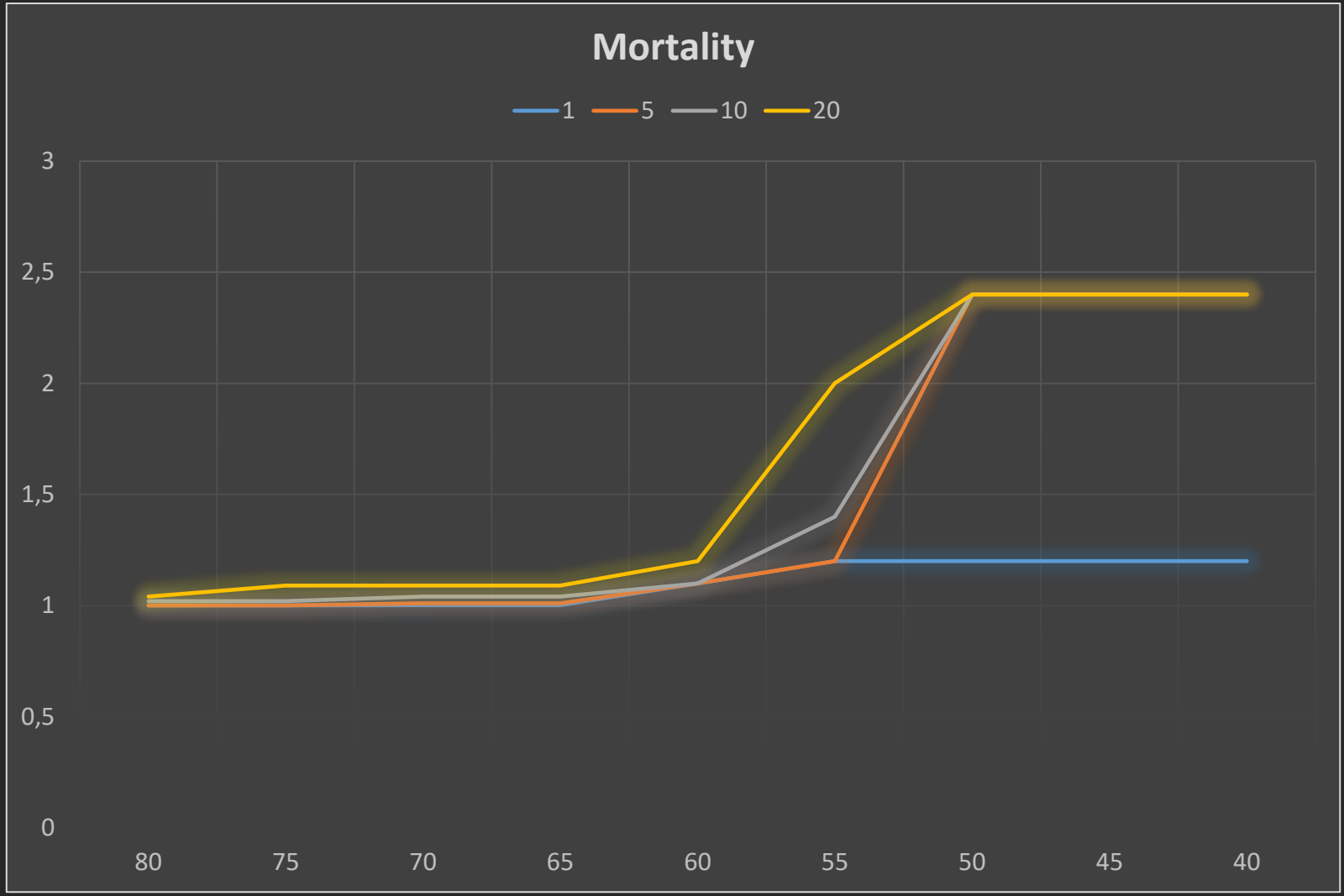


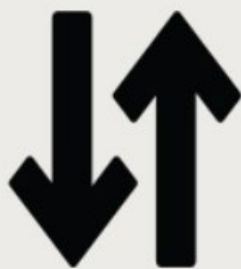


# Intraoperative hypotension and the risk of postoperative adverse outcomes: a systematic review

E. M. Wesselink<sup>1,\*</sup>, T. H. Kappen<sup>1</sup>, H. M. Torn<sup>1</sup>, A. J. C. Slooter<sup>2</sup> and W. A. van Klei<sup>1</sup>

785 806 pts  
42 std





## Rates of hypotension and hypertension by continuous monitoring

MAP threshold and duration in minutes	% patients (95% CI)
Less than 70 mmHg $\geq$ 30 min	24% (35% to 46%)
Greater than 110 mmHg $\geq$ 30 min	42% (37% to 42%)



## Routine vital-sign assessments missed

- 47% (27 of 57, 95% CI: 34% to 61%) of patients who had MAP < 65 mmHg for at least 15 min
- 98% (40 of 41; 95% CI, 87% to 99%) of patients with MAP > 130 mmHg for at least 30 min

Postoperative hypotension and hypertension were common, prolonged, profound, and largely undetected by routine vital-sign assessments in a cohort of adults recovering from abdominal surgery.

Turan, et al. ANESTHESIOLOGY. April 2019.

# ANESTHESIOLOGY

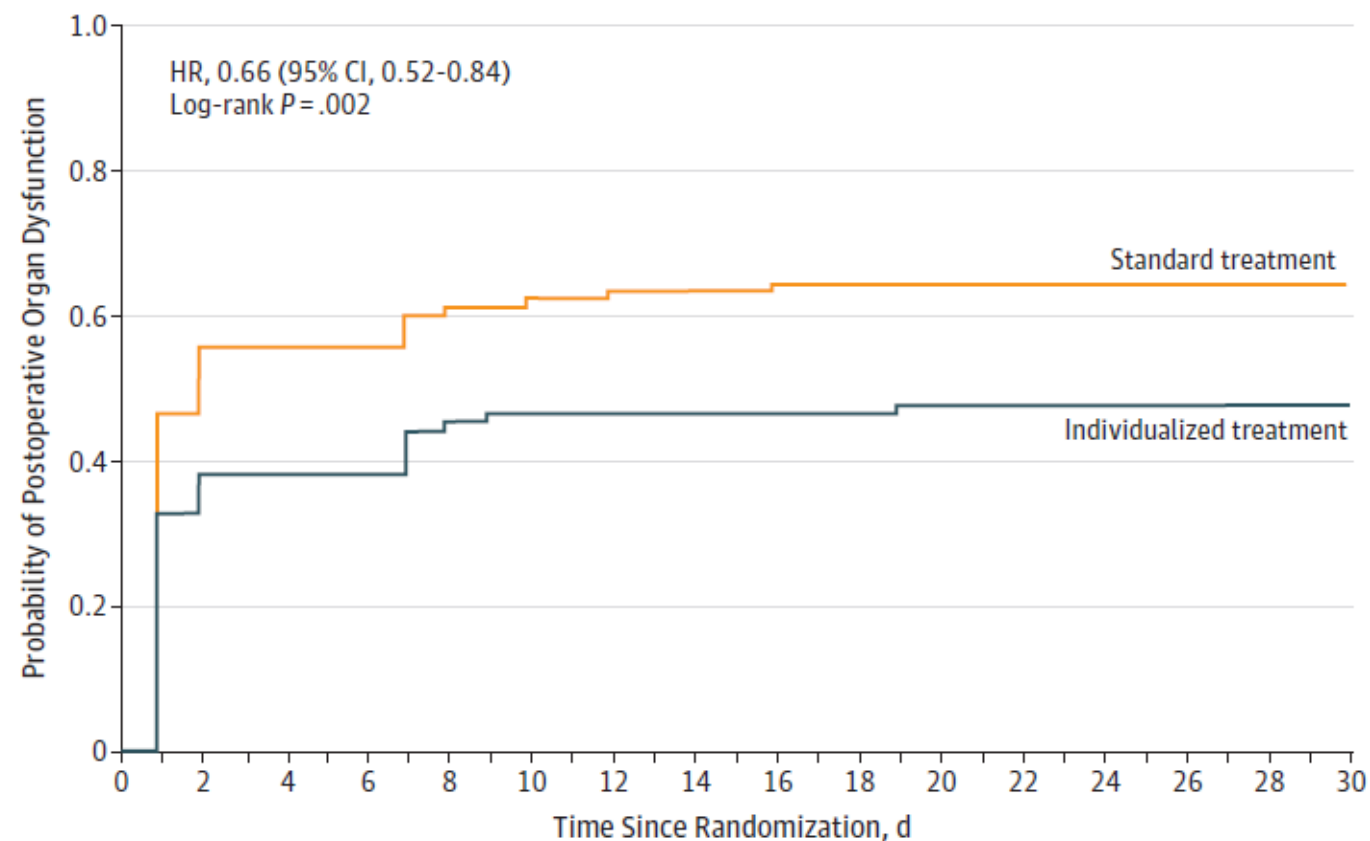
Trusted Evidence: Discovery to Practice

# Effect of Individualized vs Standard Blood Pressure Management Strategies on Postoperative Organ Dysfunction Among High-Risk Patients Undergoing Major Surgery

## A Randomized Clinical Trial

Emmanuel Futier, MD, PhD; Jean-Yves Lefrant, MD, PhD; Pierre-Gregoire Guinot, MD, PhD; Thomas Godet, MD, Philippe Cuvillon, MD, PhD; Sebastien Bertran, MD; Marc Leone, MD, PhD; Bruno Pastene, MD; Vincent Piriou, M Jacques Albanese, MD, PhD; Jean-Michel Julia, MD; Benoit Tavernier, MD, PhD; Etienne Imhoff, MD; Jean-Etien Jean-Michel Constantin, MD, PhD; Bruno Pereira, PhD; Samir Jaber, MD, PhD; for the INPRESS Study Group

**Figure 3. Kaplan-Meier Estimates of the Probability of Postoperative Organ Dysfunction by Day 30 After Surgery**



No. at risk	0	2	6	8	10	12	14	16	18	20	22	24	26	28	30
Standard treatment	145	78	65		58			54							53
Individualized treatment	147	99	91		82			80							79



## The role of intraoperative hypotension on the development of postoperative cognitive dysfunction: a systematic review

Mark L. van Zuylen, MD<sup>a</sup>, Annerixt Gribnau, BSc<sup>a</sup>, Manouk Admiraal, MD<sup>a</sup>, Werner ten Hoope, MD<sup>a,b</sup>, Denise P. Veelo, MD, Ph.D<sup>a</sup>, Markus W. Hollmann, MD, Ph.D<sup>a</sup>, Benedikt Preckel, MD, Ph.D<sup>a,\*</sup>, Jeroen Hermanides, MD, Ph.D<sup>a</sup>

<sup>a</sup> Department of Anaesthesiology, Amsterdam UMC, University of Amsterdam, Meibergdreef, Amsterdam, the Netherlands

<sup>b</sup> Department of Anaesthesiology, Rijnstate Hospital, Arnhem, the Netherlands

9 prací  
cca 1100 pac

**Conclusions:** This systematic review showed no conclusive association between intraoperative hypotension and the development of postoperative cognitive dysfunction. Given the vast methodological differences of the

## Impact of intraoperative hypotension and blood pressure fluctuations on early postoperative delirium after non-cardiac surgery<sup>†,‡</sup>

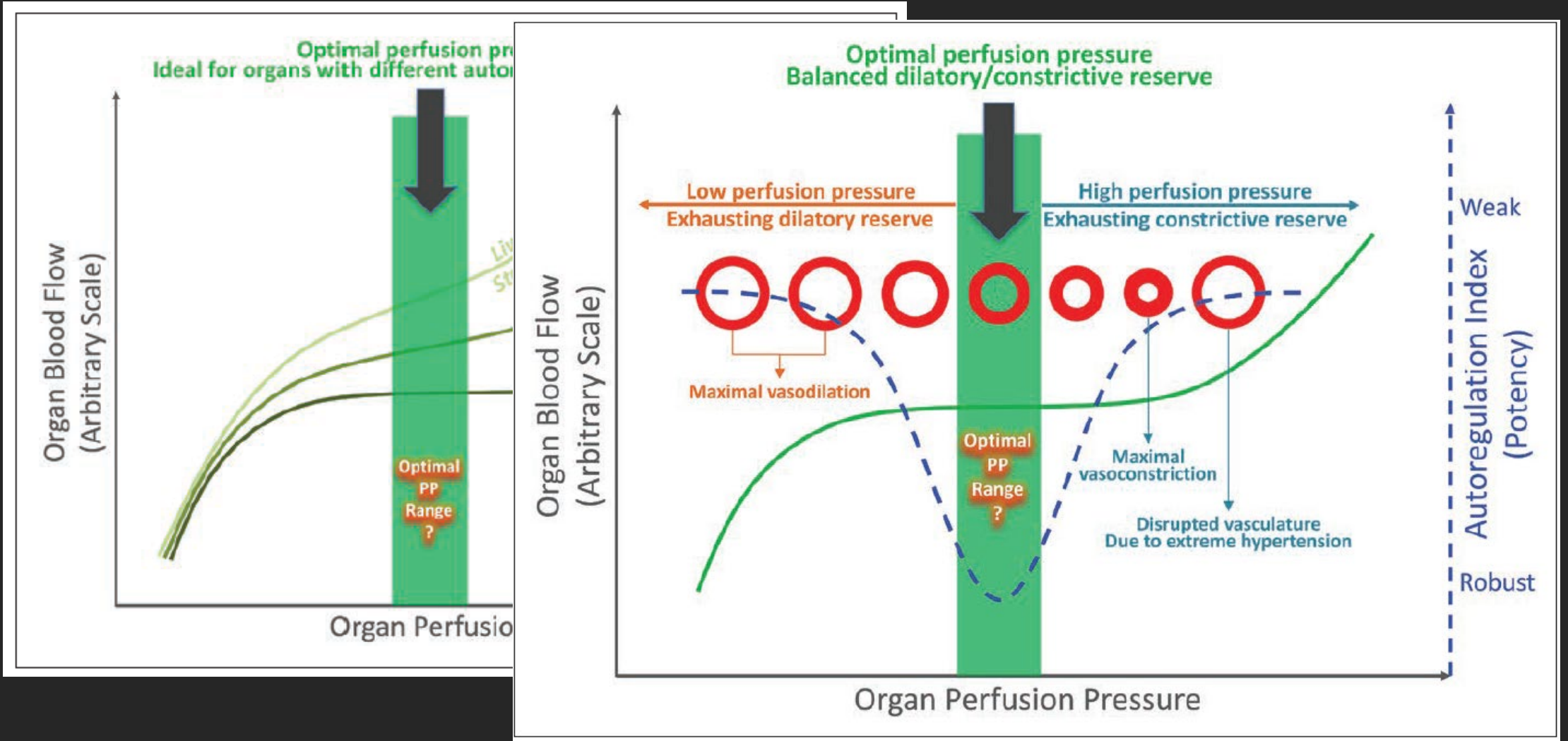
J. Hirsch<sup>1,\*</sup>, G. DePalma<sup>2</sup>, T. T. Tsai<sup>1</sup>, L. P. Sands<sup>2</sup> and J. M. Leung<sup>1</sup>

1 observace  
594 pacientů

- Although postoperative delirium is associated with adverse outcomes, its pathophysiology remains poorly understood.
- In particular, the role of intraoperative hypotension is controversial.
- The authors analysed blood pressure records from patients enrolled in a large prospective observational trial.
- Blood pressure variability, rather than the severity and duration of hypotension, was predictive of delirium.

# Heterogeneity and Variability in Pressure Autoregulation of Organ Blood Flow: Lessons Learned Over 100+ Years

Lingzhong Meng, MD<sup>1</sup>; Yingwei Wang, MD, PhD<sup>2</sup>; Lina Zhang, MD<sup>3</sup>; David L. McDonagh, MD<sup>4</sup>



# VÁŽNÝ PROBLÉM ???

- There are strong associations between intraoperative hypotension and myocardial injury, kidney injury, and death.
- Maintaining systolic arterial pressure above 100 mm Hg and mean arterial pressure above 60–70 mm Hg may reduce risk.

Perioperative Quality Initiative consensus statement on intraoperative blood pressure, risk and outcomes for elective surgery

Daniel I. Sessler<sup>1,\*†</sup>, Joshua A. Bloomstone<sup>2,3,4,9,†</sup>, Solomon Aronson<sup>5</sup>, Colin Berry<sup>6</sup>, Tong J. Gan<sup>7</sup>, John A. Kellum<sup>8</sup>, James Plumb<sup>11,12,13</sup>, Monty G. Mythen<sup>9,10</sup>, Michael P. W. Grocott<sup>9,11,12,13</sup>, Mark R. Edwards<sup>11,12,13</sup>, Timothy E. Miller<sup>5,9</sup>, the Perioperative Quality Initiative-3 workgroup<sup>†</sup>

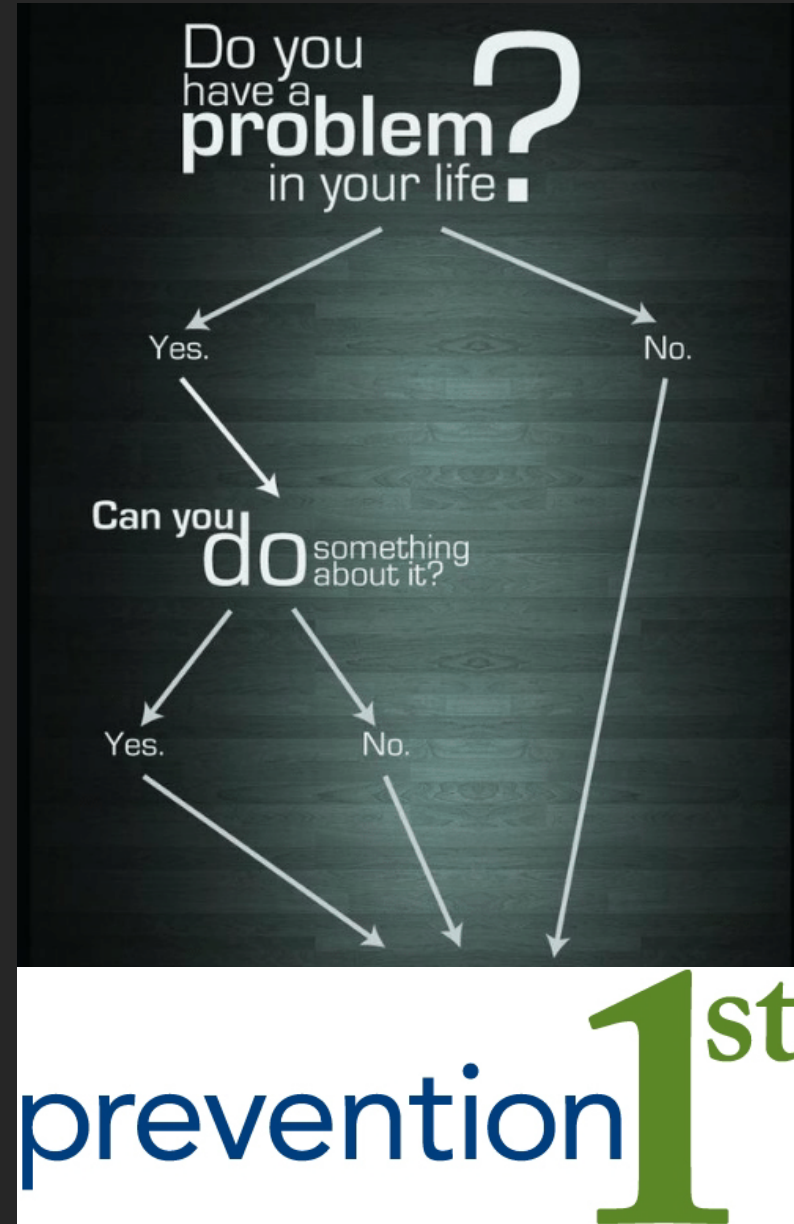
British Journal of Anaesthesia, 122 (5): 563–574 (2019)

doi: [10.1016/j.bja.2019.01.013](https://doi.org/10.1016/j.bja.2019.01.013)

Advance Access Publication Date: 27 February 2019

Special Article

# CO S TÍM ???



## Post-induction hypotension and early intraoperative hypotension associated with general anaesthesia

S. Südfeld<sup>1,†</sup>, S. Brechnitz<sup>1,†</sup>, J. Y. Wagner<sup>1</sup>, P. C. Reese<sup>1</sup>, H. O. Pinnschmidt<sup>2</sup>, D. A. Reuter<sup>1</sup> and B. Saugel<sup>1,\*</sup>

- Pre-induction blood pressure, age, and emergency surgery were associated with both post-induction hypotension and early intraoperative hypotension.
- However, early intraoperative hypotension was also associated with other factors, including neuraxial anaesthesia, ASA status, and male sex.

VĚK  
BL - SYSTOLA  
ASA 4  
URGENTNÍ OPERACE  
NEUROAXIÁL

**Table 3** Independent variables and variable categories significantly associated with post-induction and early intraoperative hypotension. CI, confidence interval; OR, odds ratio; SAP, systolic arterial pressure

Variable	OR (95% CI)	P-value
Post-induction hypotension		
Emergency surgery	1.75 (1.20–2.56)	<0.01
Age (yr)	1.03 (1.02–1.04)	<0.01
Pre-induction SAP (mm Hg)	0.97 (0.97–0.98)	<0.01
Early intraoperative hypotension		
Emergency surgery	1.83 (1.28–2.62)	<0.01
Spinal or epidural anaesthesia (additional)	3.57 (2.41–5.29)	<0.01
Male sex	1.41 (1.12–1.79)	<0.01
Age (yr)	1.02 (1.02–1.03)	<0.01
Pre-induction SAP (mm Hg)	0.99 (0.98–0.99)	<0.01
ASA class IV	2.18 (1.19–3.99)	0.01



# A systematic review of risk factors for postinduction hypotension in surgical patients undergoing general anesthesia

B. CHEN, Q.-Y. PANG, R. AN, H.-L. LIU

VĚK  
BL - HYPOTENZE  
BL - HYPERTENZE  
ASA 3-4  
URGENTNÍ OPERACE  
ACEI/ARB MEDIKACE  
PROPOFOL

Risk factors	OR (95% CI)	References
Age		
Age $\geq$ 50 yr	2.25 (1.75-2.89)	Reich et al <sup>5</sup>
Age (increment in year)	1.03 (1.02-1.04)	Südfeld et al <sup>9</sup>
	1.35 (1.16-1.58)	Choi et al <sup>10</sup>
	1.02 (1.01-1.04)	Jor et al <sup>11</sup>
	1.08 (1.02-1.15)	Okamura et al <sup>12</sup>
	0.94 (0.89-0.99)	Kaydu et al <sup>13</sup>
	1.03 (1.01-1.04)	Lin et al <sup>17</sup>
Baseline MAP		
< 70 mmHg	5.00 (2.78-9.02)	Reich et al <sup>5</sup>
MAP (increment in mmHg)	1.55 (1.42-1.68)	Morley et al <sup>7</sup>
	1.05 (1.01-1.11)	Zhang et al <sup>8</sup>
	0.91 (0.85-0.98)	Okamura et al <sup>12</sup>
	1.05 (1.00-1.09)	Kaydu et al <sup>13</sup>
Baseline SBP		
130-139 mmHg	2.67 (1.51-4.79)	Jor et al <sup>11</sup>
140-159 mmHg	2.13 (1.30-3.57)	Jor et al <sup>11</sup>
160-179 mmHg	4.09 (2.31-7.37)	Jor et al <sup>11</sup>
> 180 mmHg	6.24 (2.98-13.52)	Jor et al <sup>11</sup>
SBP (increment in mmHg)	0.97 (0.97-0.98)	Südfeld et al <sup>9</sup>
	1.08 (1.07-1.10)	Lin et al <sup>17</sup>
Gender		
Female	3.17 (1.89-9.88)	Tarao et al <sup>14</sup>
Male	1.44 (1.00-2.07)	Lin et al <sup>17</sup>
Weight		
Weight (increment in kg)	0.85 (0.79-0.91)	Morley et al <sup>17</sup>
	0.90 (0.82-0.98)	Juri et al <sup>16</sup>
ASA III-V	1.55 (1.22-1.99)	Reich et al <sup>5</sup>
Emergency surgery	1.75 (1.20-2.56)	Südfeld et al <sup>9</sup>
	2.35 (1.08-5.15)	Lin et al <sup>17</sup>
Baseline blood volume status		
SVV (%)	1.16 (1.00-1.34)	Juri et al <sup>16</sup>
IVC-CI	1.17 (1.09-1.26)	Zhang et al <sup>8</sup>
ACEI/ARB		
ACEI/ARB	29.3 (2.41-357.0)	Okamura et al <sup>12</sup>
ARB	3.61 (1.58-9.15)	Tarao et al <sup>14</sup>
General anesthetics		
Propofol induction	3.94 (2.42-6.43)	Reich et al <sup>5</sup>
Increasing fentanyl dosage	1.32 (1.13-1.56)	Reich et al <sup>5</sup>

UEFA CHAMPIONS LEAGUE  
**SLEDUJME LOS  
SPOLEČNĚ**



## UCL GROUP STAGE 2022-23 *GROUP C*



**FC BARCELONA**



**FC BAYERN**

**OH MY GOD**



**INTER MILAN**



**VIKTORIA PLZEŇ**

# Barcelona - Plzeň 5:1, na úvod Ligy mistrů debakl, hatrick má Lewandowski

© 7. září 2022 14:39, aktualizováno 23:03

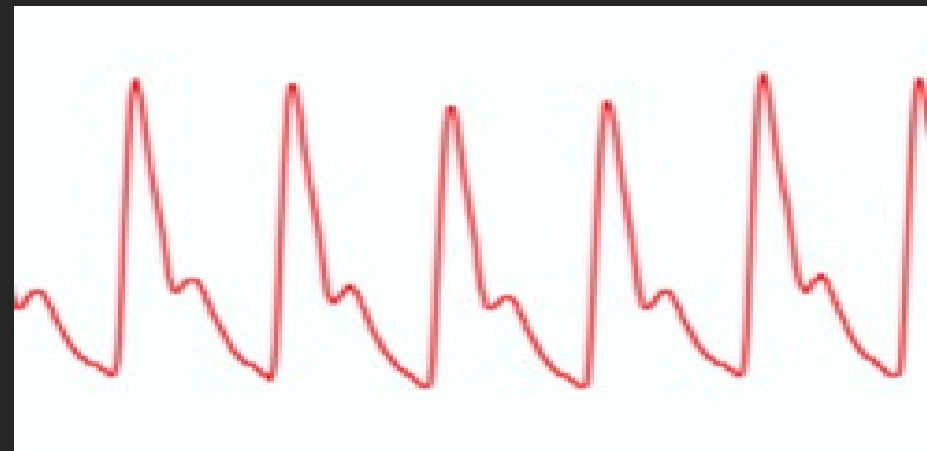
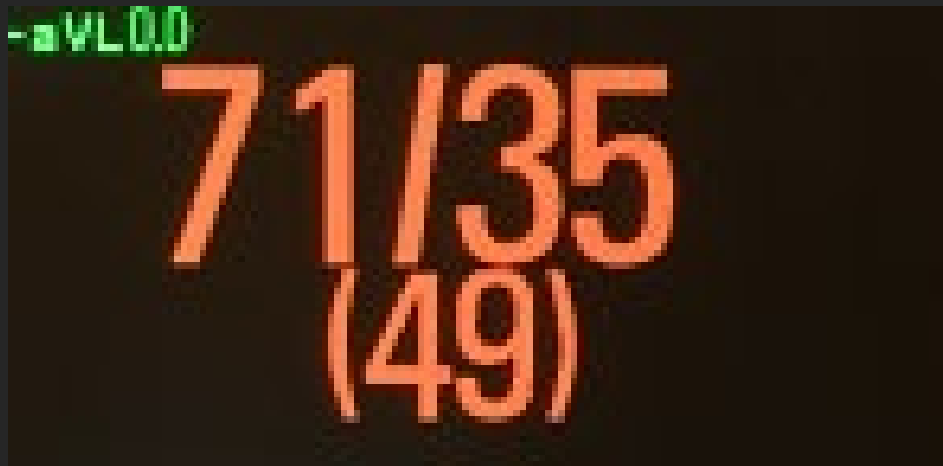


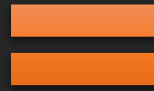
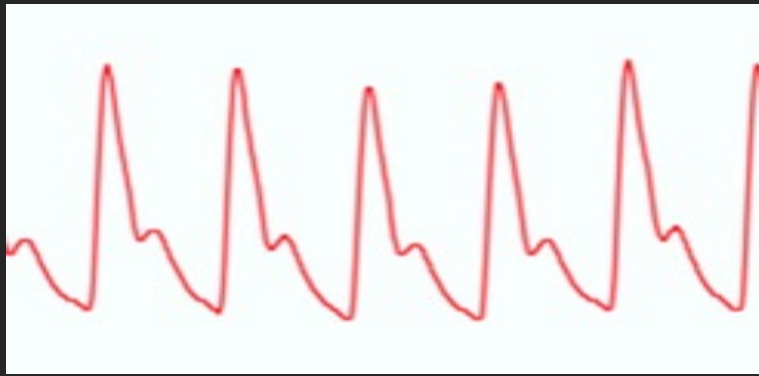
Plzeňští fotbalisté zaujali záblesky v útoku, ale na úvodní vystoupení ve skupinové fázi Ligy mistrů by nejráději zapomněli. Na Camp Nou proti Barceloně často nestihali a podlehlí vysoko 1:5, hatrickem se předvedl Lewandowski. Výše porážky je pro Viktorii ještě milosrdná.



## PROGRAM

FC Viktoria Plzeň	13. 9. 18:45
Inter Milán	
Sporting Lisabon	13. 9. 18:45
Tottenham Hotspur	
FC Viktoria Plzeň	13. 9. 18:45
Inter Milán	





**Clinical review: Complications and risk factors of peripheral arterial catheters used for haemodynamic monitoring in anaesthesia and intensive care medicine**

Bernd Volker Scheer<sup>1</sup>, Azriel Perel<sup>2</sup> and Ulrich J Pfeiffer<sup>3</sup> *Critical Care* June 2002 Vol 6 No 3

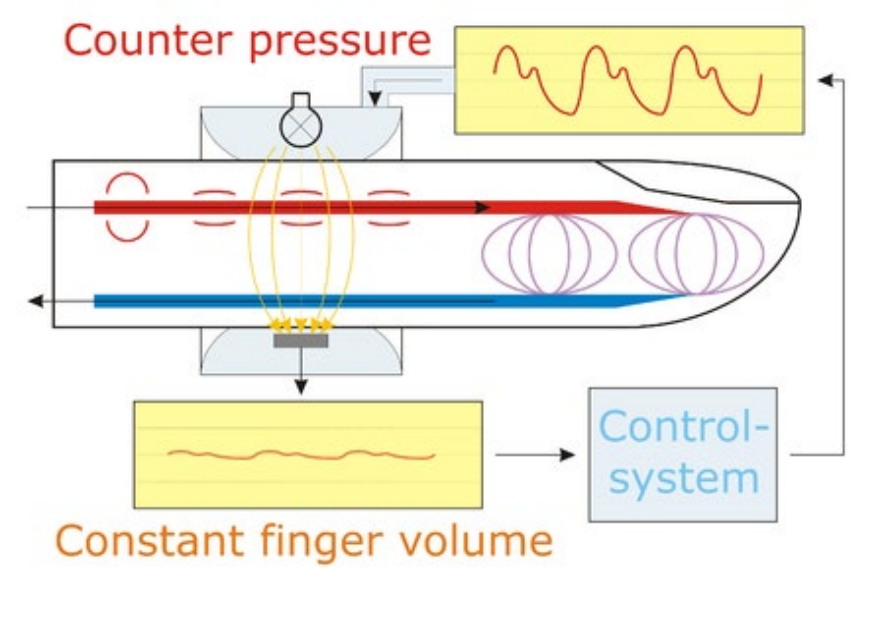
**Complications following radial artery cannulation**

Reference	Cases	Permanent ischaemic damage (n)	Temporary occlusion (n)	Sepsis (n)	Local infection (n)	Pseudoaneurysm (n)	Haematoma (n)	Bleeding (n)
Mean incidence (%)		0.09 (4/4217)	19.7 (831/4217)	0.13 (8/6245)	0.72 (45/6245)	0.09 (14/15,623)	14.40 (418/2903)	0.53 (2/375)

# Continuous Non-Invasive Arterial Pressure Assessment during Surgery to Improve Outcome

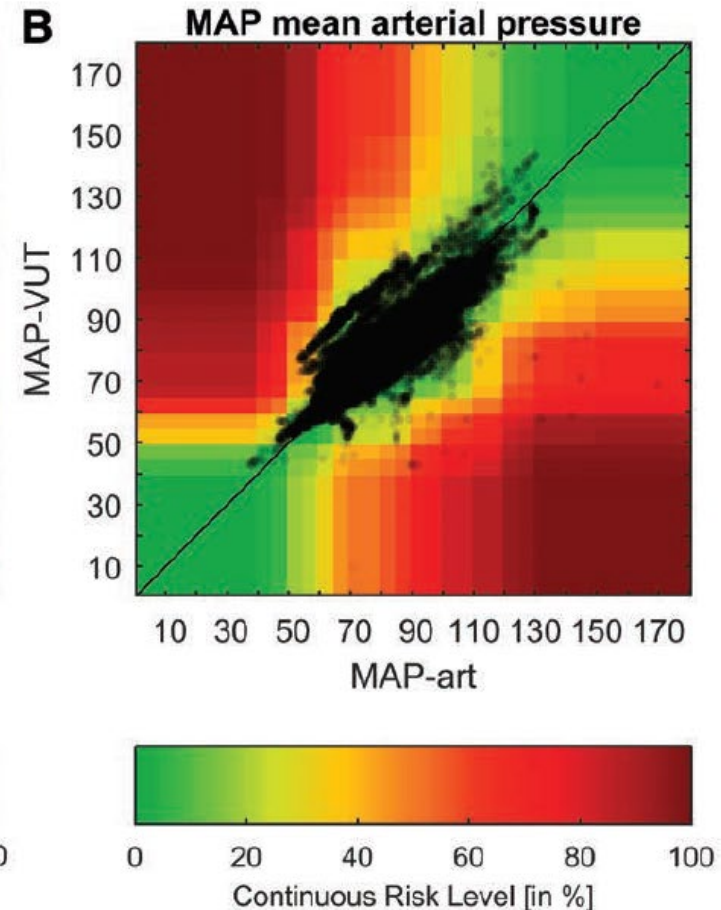
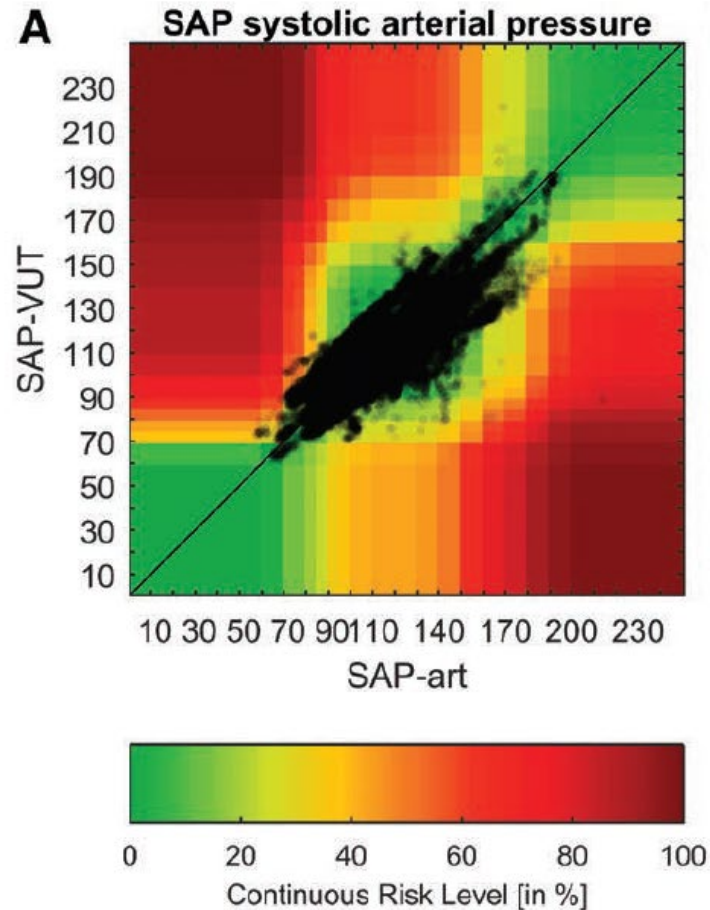
Alena Stenglóva<sup>1</sup> and Jan Benes<sup>1,2\*</sup>

<sup>1</sup> Department of Anesthesiology and Intensive Care Medicine, Faculty of Medicine in Plzen, Charles University, Plzen, Czechia, <sup>2</sup> Biomedical Centre, Faculty of Medicine in Plzen, Charles University, Plzen, Czechia



**CME** **Continuous Noninvasive Arterial Pressure Monitoring in Obese Patients During Bariatric Surgery: An Evaluation of the Vascular Unloading Technique (Clearsight system)**

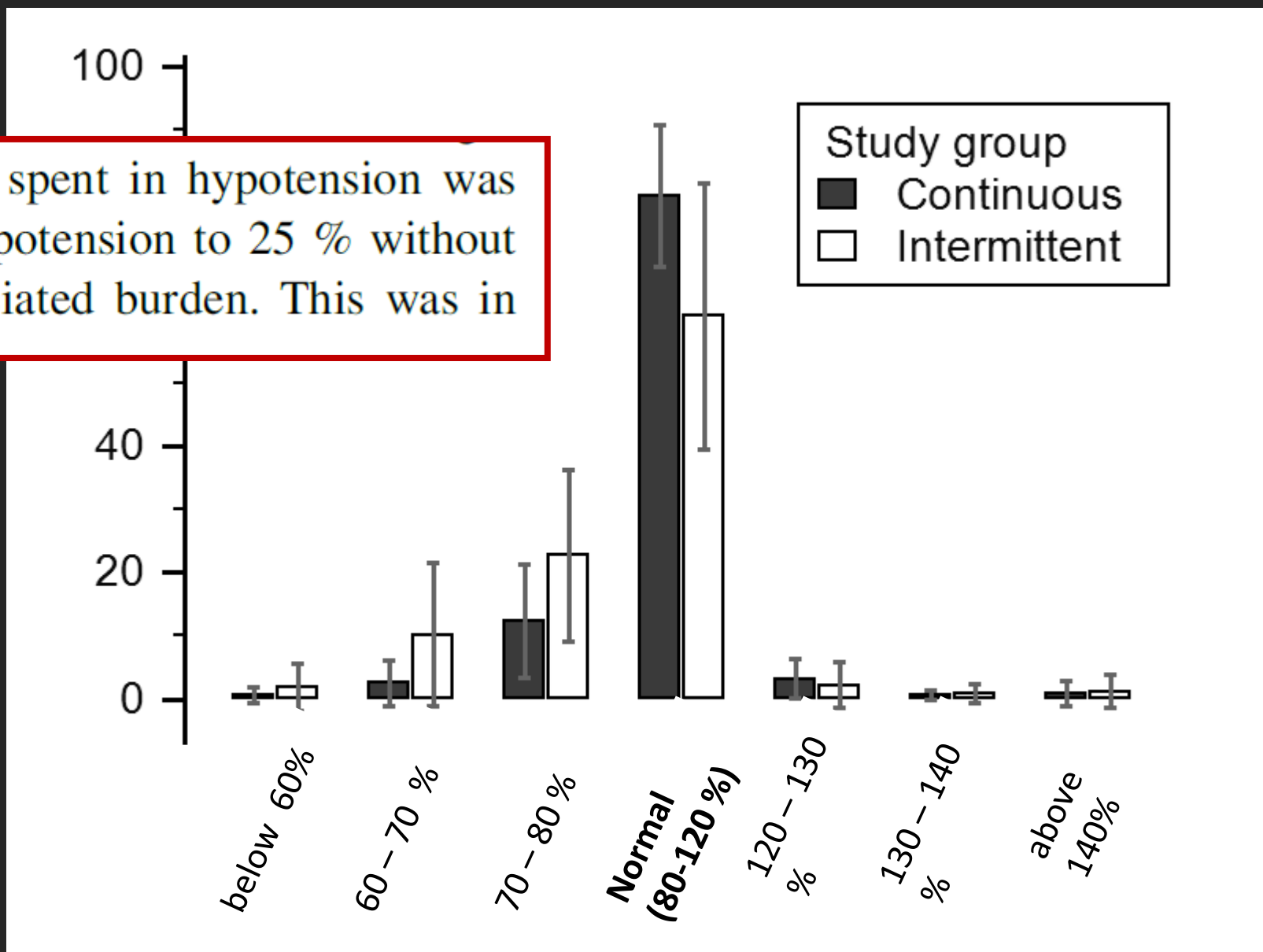
Dorothea E. Rogge, MD,\* Julia Y. Nicklas, MD,\* Gerhard Schön, MSc,† Oliver Grothe, PhD,‡  
Sebastian A. Haas, MD,\* Daniel A. Reuter, MD,\* and Bernd Saugel, MD\*



### Continuous non-invasive monitoring improves blood pressure stability in upright position: randomized controlled trial

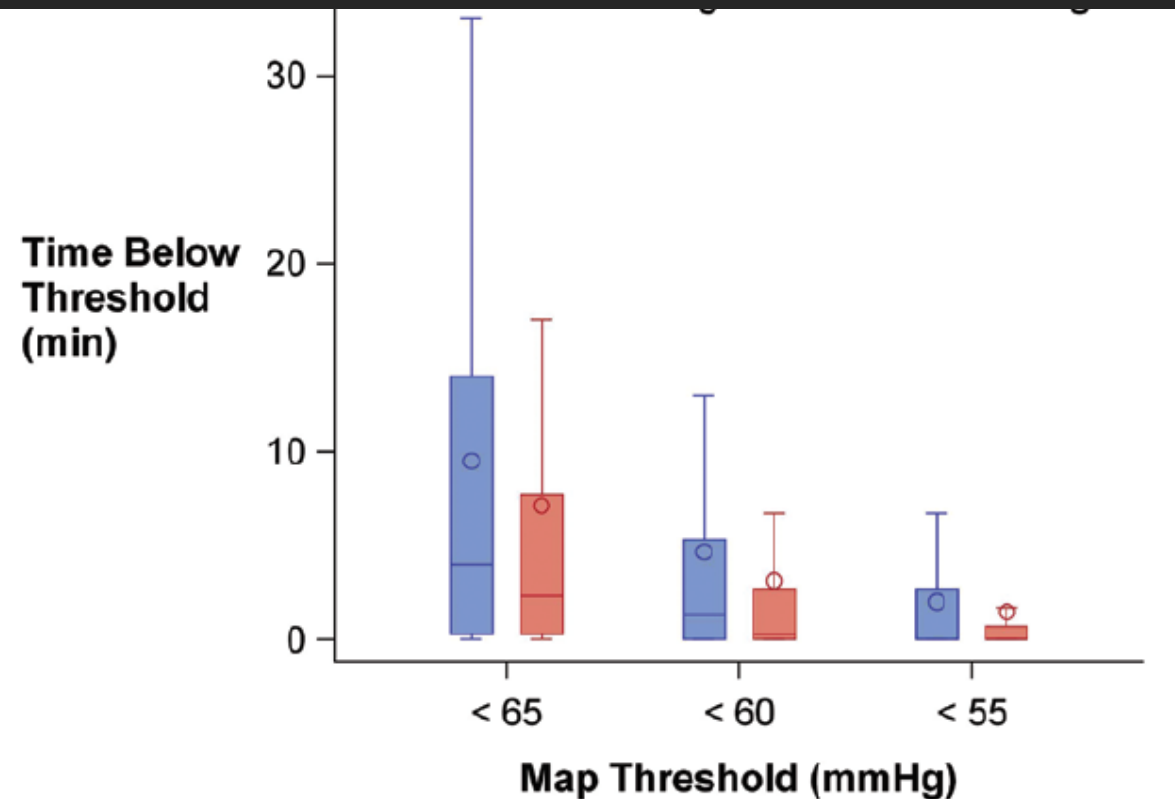
Jan Benes · Alena Simanova · Tereza Tovarnicka ·  
Silvie Sevcikova · Jakub Kletecka · Jan Zatloukal ·  
Richard Pradl · Ivan Chytra · Eduard Kasal

The absolute and relative time spent in hypotension was reduced to 50 % and severe hypotension to 25 % without increasing the monitoring-associated burden. This was in



**OPEN** **A Randomized Trial of Continuous Noninvasive Blood Pressure Monitoring During Noncardiac Surgery**

Kamal Maheshwari, MD, MPH,\*† Sandeep Khanna, MD,† Gausan Ratna Bajracharya, MD,\*  
Natalya Makarova, MS,‡ Quinton Riter, BS,\* Syed Raza, BS,\* Jacek B. Cywinski, MD,†  
Maged Argaliou, MD, MBA, MEd, FASE,† Andrea Kurz, MD,\*† and Daniel I. Sessler, MD\*



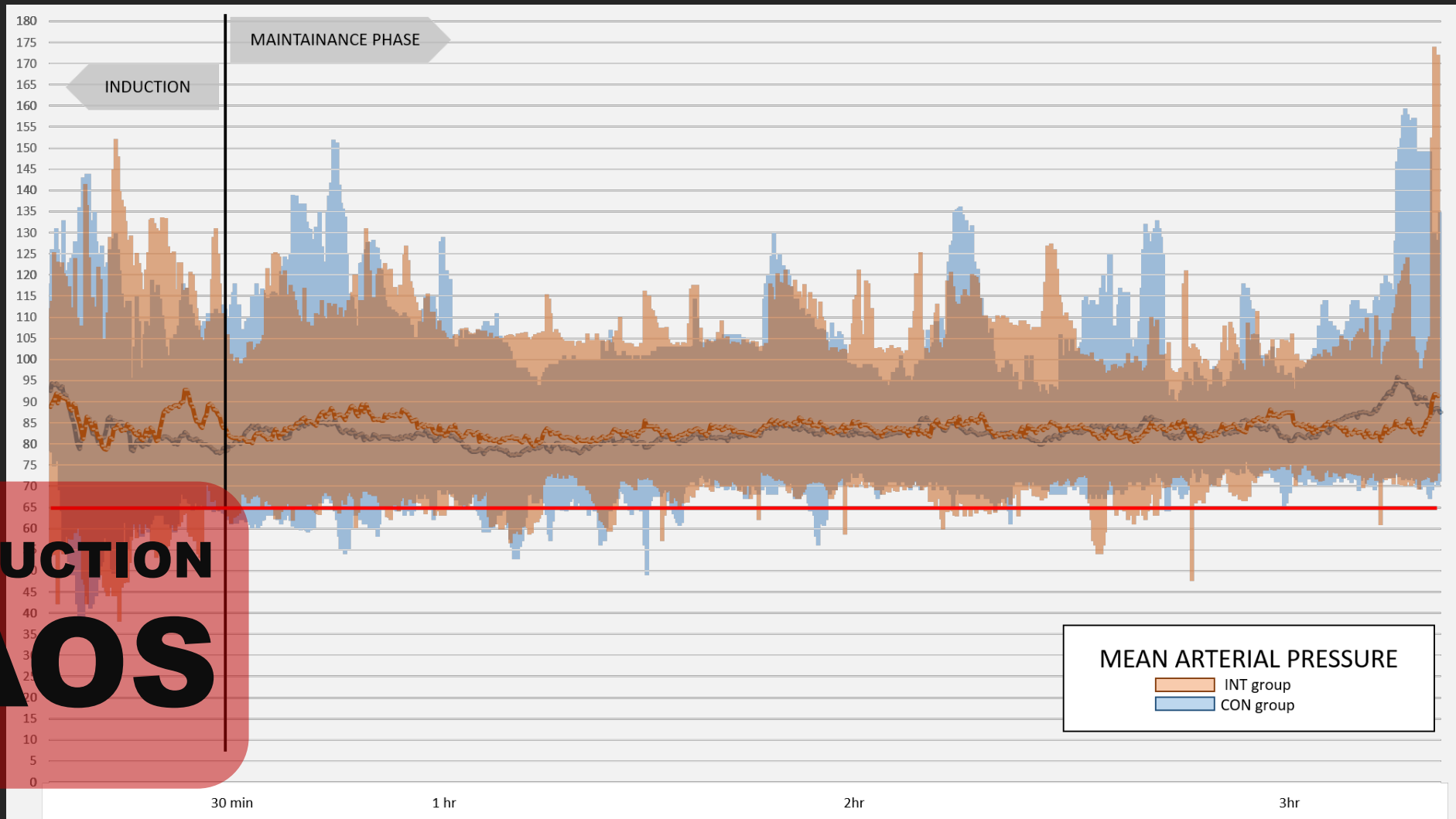
**Figure 3.** Intraoperative time patients spent below mean arterial pressure (MAP) thresholds of 65, 60, and 55 mm Hg.

**CONCLUSIONS:** Continuous noninvasive hemodynamic monitoring **nearly halved the** amount of intraoperative hypotension. Hypotension reduction with continuous monitoring, while statistically significant, is currently of uncertain clinical importance. (Anesth Analg 2018;127:424–31)





**POST-INDUCTION  
CHAOS**



*Pouska et al - submitted*

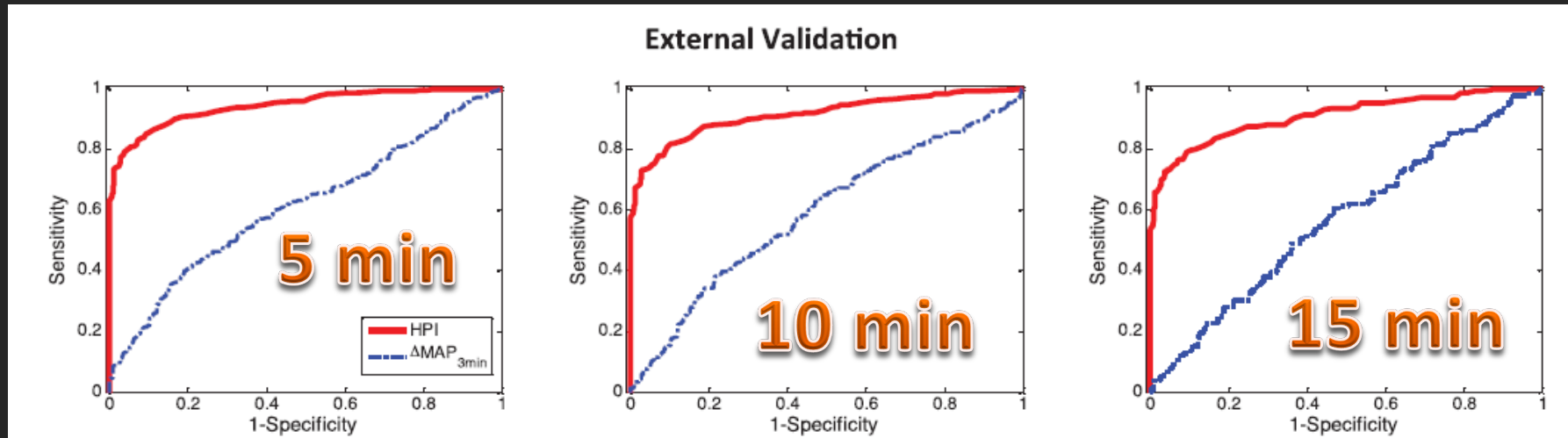


# Machine-learning Algorithm to Predict Hypotension Based on High-fidelity Arterial Pressure Waveform Analysis

Feras Hatib, Ph.D., Zhongping Jian, Ph.D., Sai Buddi, Ph.D., Christine Lee, M.S., Jos Settels, M.S., Karen Sibert, M.D., F.A.S.A., Joseph Rinehart, M.D., Maxime Cannesson, M.D., Ph.D.

## What This Article Tells Us That Is New

- A machine-learning algorithm based on thousands of arterial waveform features can identify an intraoperative hypotensive event 15 min before its occurrence with a sensitivity of 88% and specificity of 87%



# *Pouska et al - submitted*

**20** vs **20**  
**HPI+** **ctrl**

<b>50%*</b>	<b>80%</b>
<b>36</b> sec	<b>74</b> sec
<b>3</b> min	<b>7</b> min
<b>0,4</b> mmHg.min	<b>17,5</b> mmHg.min



Effect of a Machine Learning–Derived Early Warning System for Intraoperative Hypotension vs Standard Care on Depth and Duration of Intraoperative Hypotension During Elective Noncardiac Surgery  
The HYPE Randomized Clinical Trial

Marije Wijnberge, MD; Bart F. Geerts, MD, PhD, MSc, MBA; Liselotte Hol, MD; Nikki Lemmers, MD; Marijn P. Mulder, BSc; Patrick Berge, MD; Jimmy Schenk, MSc; Lotte E. Terwindt, MD; Markus W. Hollmann, MD, PhD; Alexander P. Vlaar, MD, PhD, MBA; Denise P. Veelo, MD, PhD



**Findings** In this single-center preliminary randomized clinical trial that included 68 patients undergoing elective noncardiac surgery, the time-weighted average of hypotension for those randomized to the early warning system vs those receiving standard care was 0.10 mm Hg vs 0.44 mm Hg, a difference that was statistically significant.

	Median (Interquartile Range) <sup>a</sup>	
	Intervention (n = 31)	Control (n = 29)
<b>Primary End Point</b>		
Time-weighted average of hypotension, mm Hg	0.10 (0.01-0.43)	0.44 (0.23-0.72)
<b>Secondary End Points</b>		
<b>Hypotension</b>		
Area under the threshold, mm Hg/min <sup>d</sup>	20.0 (2.2-148.3)	142.2 (64.67-258.92)
Incidence	3.0 (1.0-8.0)	8.0 (3.5-12.0)
Total time, min	8.0 (1.3-26.0)	32.7 (11.5-59.7)
Surgery time, %	2.8 (0.8-6.6)	10.3 (4.6-15.6)

**Hypotension Prediction Index for Prevention of Hypotension during Moderate- to High-risk Noncardiac Surgery**

A Pilot Randomized Trial

Kamal Maheshwari, M.D., M.P.H., Tetsuya Shimada, M.D., Ph.D.,



- Of 214 noncardiac surgical patients, 105 (49%) patients randomized to management with a hypotension prediction algorithm, intraoperative hypotension was not reduced compared with controls. A lower alert threshold enabling adequate warning time and a simpler treatment algorithm that emphasizes prompt treatment after alert may help.

	Index-guided* (N = 105)	Unguided† (N = 108)
<b>Primary outcome</b>		
Time-weighted average MAP < 65 mmHg, mmHg	0.14 (0.03, 0.37)	0.14 (0.03, 0.39)
AUC-MAP < 65 mmHg, mmHg · min	32.7 (6.3, 102.0)	34.2 (8.5, 112.7)
Duration of MAP < 65 mmHg, min	7.7 (2.0, 18.3)	9.3 (2.3, 23.5)

# CO SI ODNĚST...

- PERIOPERAČNÍ HYPOTENZE JE SPOJENÁ S HORŠÍM KLINICKÝM VÝSLEDKEM
- TLAK ZMĚŘENÝ PŘED ANESTEZIÍ NENÍ VHODNÁ NORMA A PŘIROZENÝ SPÁNEK NENÍ SPOJEN S VÝZNAMNÝM POKLESEM TLAKU
- OPTIMÁLNÍ JE UDRŽET +/- 20% PACIENTOVA DOMÁCÍHO NORMÁLU S MINIMÁLNÍ VARIABILITOU
- $STK < 100 \text{ mmHg}$  /  $MAP < 60-70 \text{ mmHg}$  = HYPOTENZE

# CO SI ODNĚST...

- **HLAVNÍ NEMODIFIKOVATELNÉ RF JSOU VĚK, URGENTNÍ OP., PŘEDOPERAČNÍ TLAK a ASA 3-4**
- **MODIFIKOVATELNÉ JSOU ACEI/ARB, VOLBA ANESTEZIE**
- **KONTINUÁLNÍ MONITORACE SNÍŽÍ EXPOZICI NEŽÁDOUCÍM FLUKTUACÍM TLAKU**
- **NEINVAZIVNÍ MONITORACE TLAKU JE USPOKOJIVĚ PŘESNÁ**
- **ROLE HPI JE ZATÍM NEJISTÁ...**



**Ale berte  
mne  
s rezervou...**

**DÍKY ZA  
POZORNOST**

