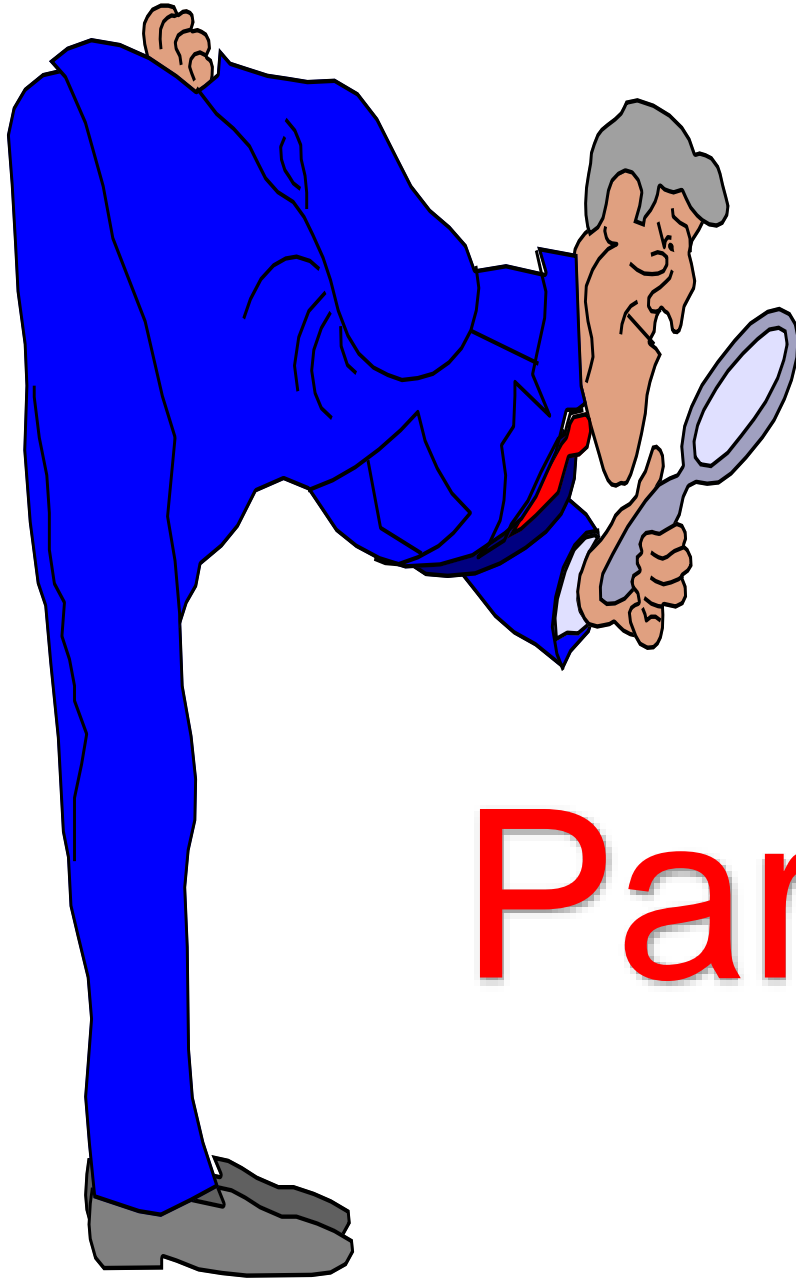


Změny paradigmat v anesteziologii a intenzivní medicíně

Michal Horáček

KARIM 2. LF UK v FN Motol

Praha



Paradigma?

Paradigma

- model nebo schéma, příklad, vzor

Paradigma



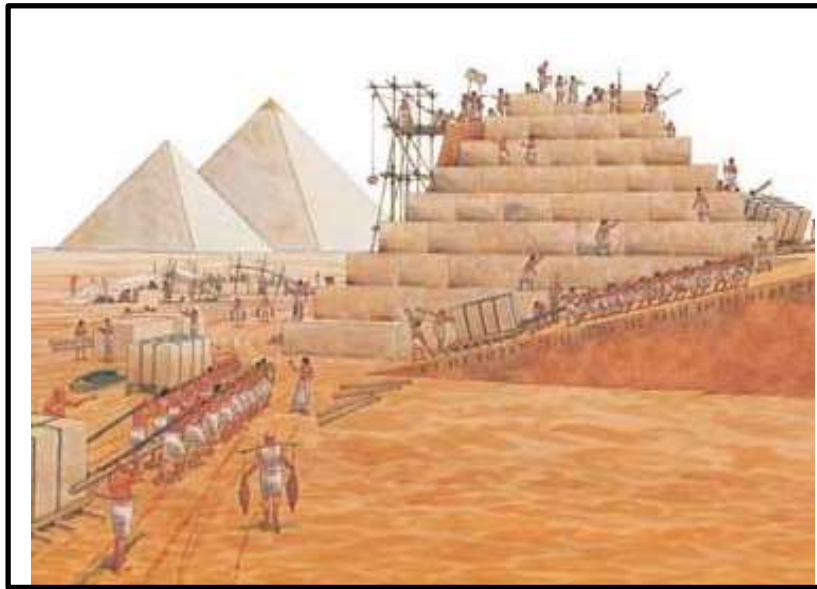
parà „vedle“, deiknymi „ukázat“, „vysvětlit“ (řec.) Thomas Samuel Kuhn

Struktura vědeckých revolucí (1962):

1922-1996

- „obecně uznávané a vědecké výsledky, které v dané chvíli představují pro společenství odborníků **model problémů** a **model jejich řešení**“
http://www.antropoweb.cz/media/webzin/webzin_01_2005/11_vanicek.pdf
- souhrn základních domněnek, předpokladů, představ dané skupiny vědců v určité době
- **Dogma** (pl. *dogmata*; řec. δόγμα *dogma* názor, učení; δοκεῖν *dokein* ukazovat se správným) výslovné tvrzení čili teze, o němž se v dané oblasti nebo v určitém společenství nepochybuje.

Vědecký pokrok



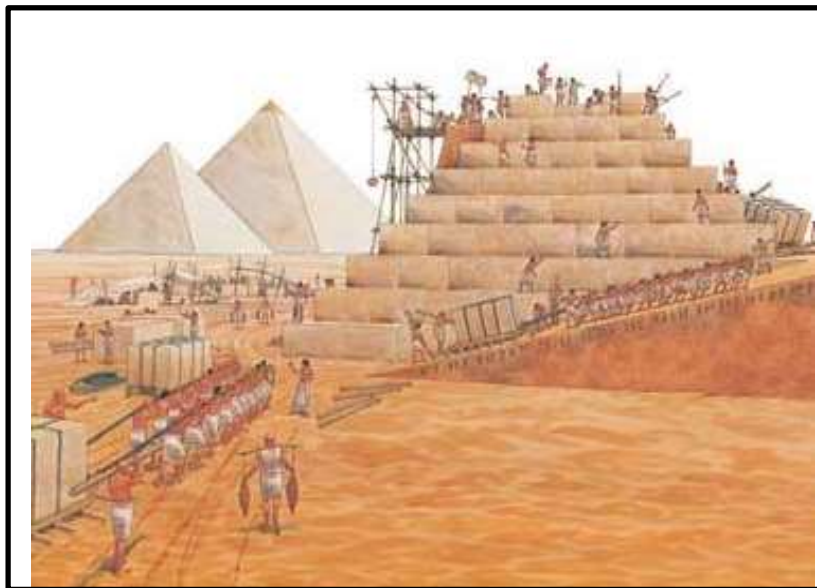
jako stavba pyramidy

Vědecký pokrok

Tomas Samuel Kuhn
1922-1996



Struktura vědeckých revolucí (1962):



jako stavba pyramidy



se děje změnami paradigmat
normální věda → anomálie →
krize → **vědecká revoluce** →
nové paradigma

Witamy Vítejte स्वागत

Willkommen Velkommen

환영 **Welcome** Malgayang

Bienvenido to the Bienvenu

REVOLUTION

Ústřední paradigma medicíny

je bio-psycho-socio-spirituální



Medicína pohlíží na pacienta a jeho chorobu jako na výslednici působení biologických (včetně ekologických), psychologických (včetně spirituálních) a sociálních faktorů.



US National Library of Medicine
National Institutes of Health

PubMed paradigm

Search

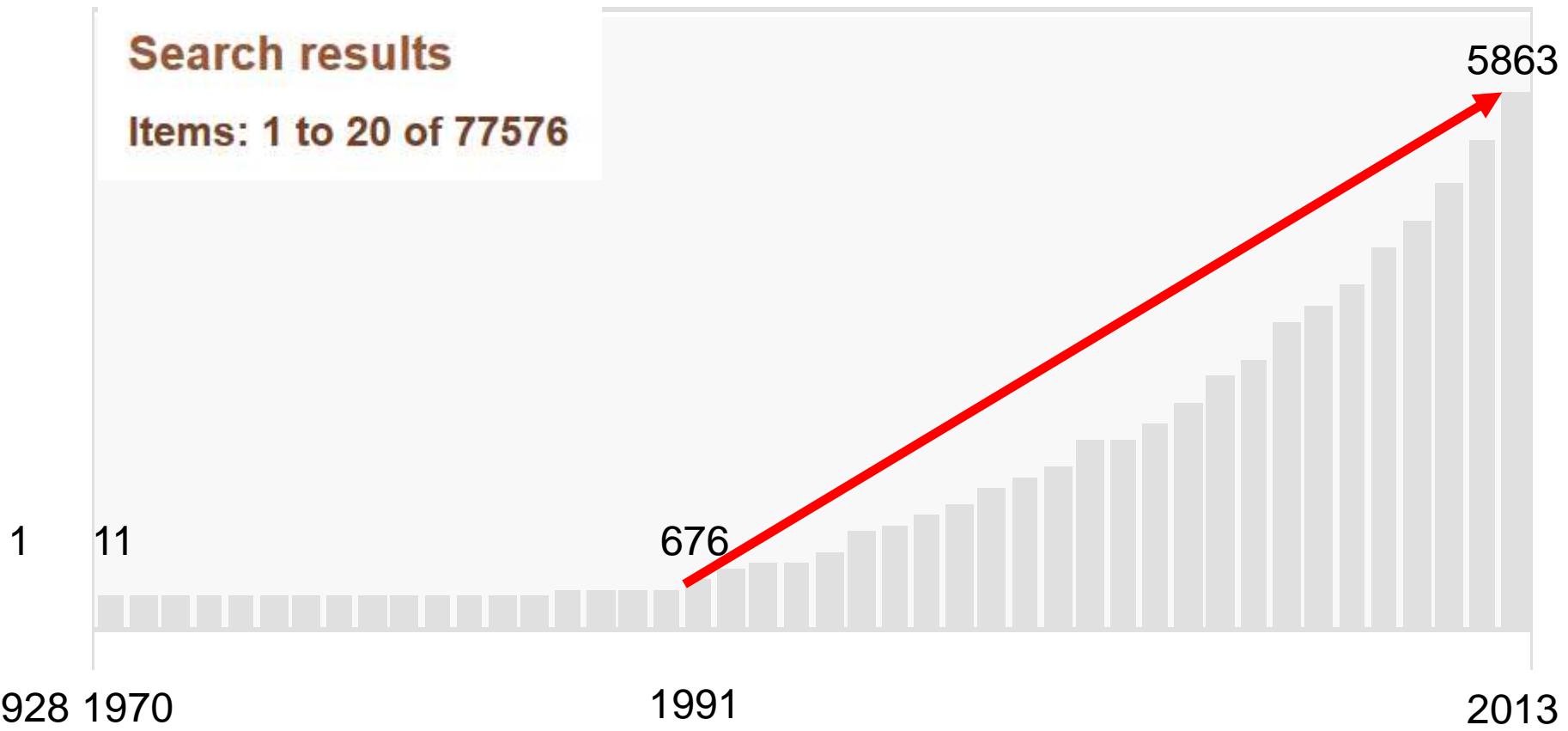
Create RSS Create alert Advanced

16.11.2015

Help

Search results

Items: 1 to 20 of 77576





PubMed paradigm and (anesthesia or intensive care)

Search

US National Library of Medicine
National Institutes of Health

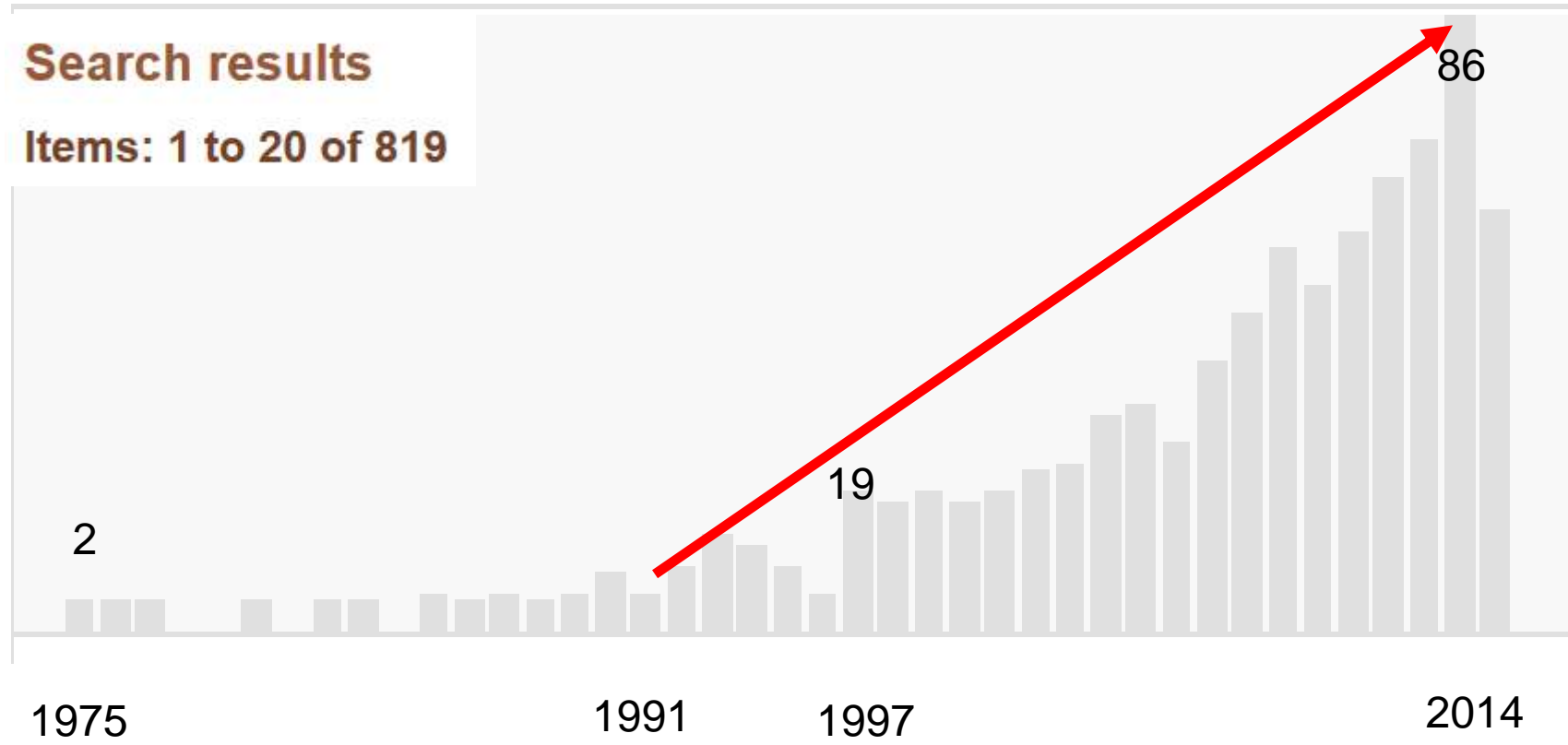
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16.11.2015

Help

Search results

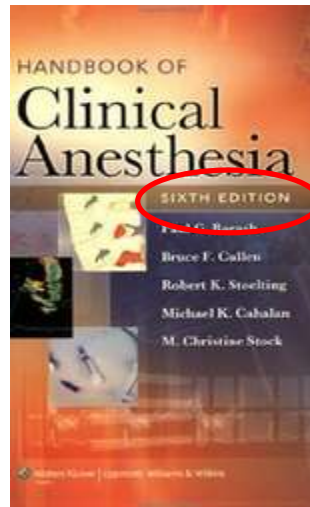
Items: 1 to 20 of 819



Kde hledat paradigmata a dogmata



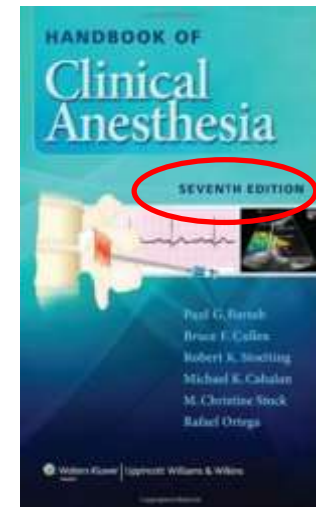
- učebnice
(zpoždění)



2009



2015

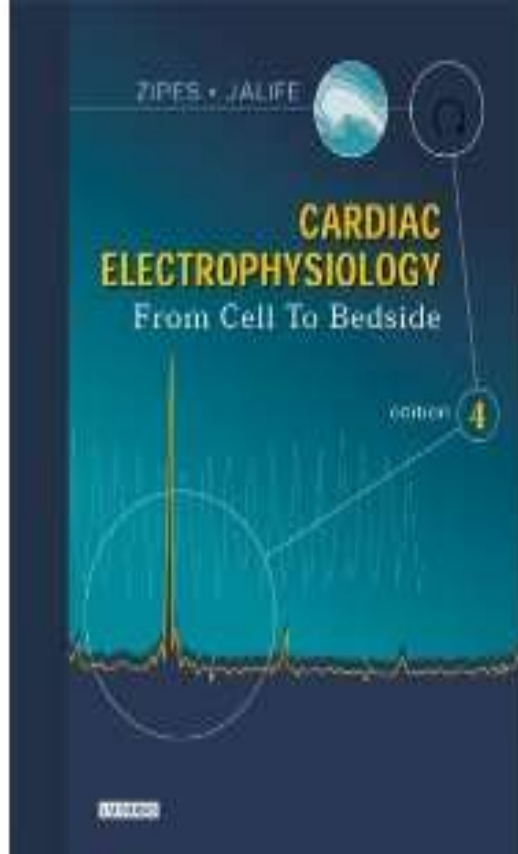


2013

Kde hledat paradigmata a dogmata



- učebnice (zpoždění)
- guidelines (zpoždění, slabá doporučení)
 - U.S. Department of Health & Human Services
National Guidelines Clearinghouse (guideline.gov) k 17.11.2015:
2434 doporučení (ASA 14) + 66 v tvorbě x ČSARIM 28
 - **trvanlivost doporučení třídy I** z posledních 2 verzí
11 guidelines ACC/AHA: **80 %!**
10 % downgraded, nebo reversed, 10 % vypuštěno
Neuman MD et al: *JAMA*. 2014 May; 311(20): 2092–2100
- systematické přehledy, metaanalýzy,
konsenzuální prohlášení



Book Review

Cardiac Electrophysiology: From Cell to Bedside, Fourth Edition

Douglas P. Zipes, Jose Jalife, eds.

1115 pp. Philadelphia, Pa: W.B. Saunders; 2004. \$259.00; ISBN 0721603238

This is the fourth edition of a book that has become *the* reference source for advanced cardiac electrophysiology. The first edition was published in 1990 with the intention of bridging the gap between investigators of basic cardiac electrophysiology and clinicians treating cardiac arrhythmias. At that time, the book had 109 chapters, 221 authors, and 1034 pages. The current edition has 120 chapters, 245 authors, and 1144 pages. It is interesting to note that only 48 (22%) of the authors from the first edition survived to the fourth (I am one of the 78% who did not). This illustrates that in cardiology not only does 50% of our knowledge change every 5 years but so do the people involved in these changes.



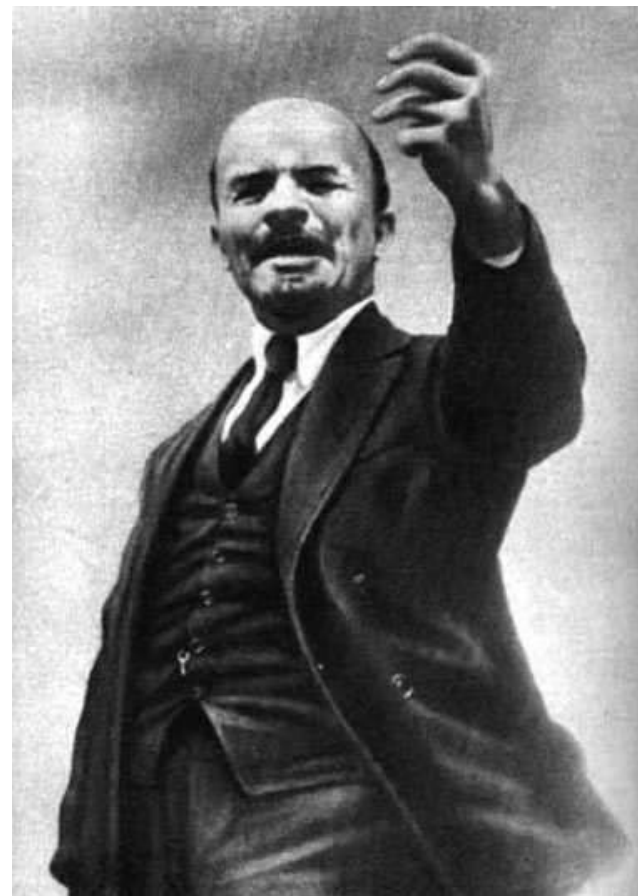
„V kardiologii se 50 % našich znalostí mění každých 5 let.“

dnes 6. vydání 2013, 1392 str. = +24,8 %

H.J. Wellens

Circulation **2004**, 110 (17 - 26.10.2004): e453

UČIT SE
UČIT SE
UČIT SE



Paradigmata v anestezií a intenzivní medicíně

[Neurosci Biobehav Rev.](#) 2013 Dec;37(10 Pt 2):2751-9. doi: 10.1016/j.neubiorev.2013.09.009. Epub 2013 Sep 26.

Cognitive unbinding: a neuroscientific paradigm of general anesthesia and related states of unconsciousness.

Free PMC Article

[Mashour GA](#)¹.

[Anesth Pain Med.](#) 2013 Sep;3(2):228-9. doi: 10.5812/aapm.13363. Epub 2013 Sep 1.

Ultrasound a new paradigm in regional anesthesia and pain management.

Free PMC Article

[Rahimzadeh P](#)¹, [Faiz SH](#).

[J Emerg Med.](#) 2015 Aug;49(2):e63-4. doi: 10.1016/j.jemermed.2015.02.045. Epub 2015 May 23.

A Traditional Paradigm vs. an Ultrasound-Supported Paradigm in Emergency and Critical Care Medicine: A Crisis of the Mind Is Needed.

[Blanco P](#)¹.

[Ann Pharmacother.](#) 2012 Apr;46(4):530-40. doi: 10.1345/aph.1Q525. Epub 2012 Apr 10.

Analgo-sedation: a paradigm shift in intensive care unit sedation practice.

[Devabhakthuni S](#)¹, [Armahizer MJ](#), [Dasta JF](#), [Kane-Gill SL](#).



**Tekutiny
a transfuze**

Kyslík

Císařský řez

Kyslík



Kyslíkové paradigma



- O₂ zaveden do praxe 1930, **strach z hypoxie!**
- „Ideální nemocný je při příjmu na zotavovací pokoj při vědomí, extubovaný, dýchá přes masku zvlhčovaný kyslík, dýchání a oběh jsou stabilní.“
R. Larsen: Anestezie, 7. vyd. **2004**
- asi 13,7 % hospitalizovaných pacientů je právě léčeno kyslíkem (rok 2011)
O'Driscoll BR et al: British Thoracic Society emergency oxygen audits. Thorax 2011;66:734-35.
- léčba všech pacientů hospitalizovaných s STEMI kyslíkem po dobu alespoň 24-48 hod. je běžná
Braunwald's Heart Disease, 9. vyd. **2012**, str. 1116

Kyslíkové paradigma se mění

- pulsní oxymetrie 1972, NIRS 1977
- negativní účinky kyslíku u CHOPN
- hyperoxie zvyšuje neurologické riziko po OHCA
- hyperoxie zvyšuje rozsah infarktu
- hyperoxie zvyšuje riziko plicních komplikací
- hyperoxie poškozuje trombo, zvyšuje krvácení
- hyperoxie nesnižuje riziko ranných infekcí

Změna kyslíkového paradigmatu

- přístup „*one size fits all*“ je neudržitelný
- přínos hyperoxie možný u sepse, poranění mozku, kolorektální chirurgie
- jinak:
 - prevence hyperoxie
 - **přesná kontrola arteriální oxygenace!**
 - uvážit permisivní hypoxemii

Ridler N et al.: Oxygen therapy in critical illness: friend or foe?
A review of oxygen therapy in selected acute illnesses.

Journal of the Intensive Care Society 2014 (July);15: 190-198



Tekutiny

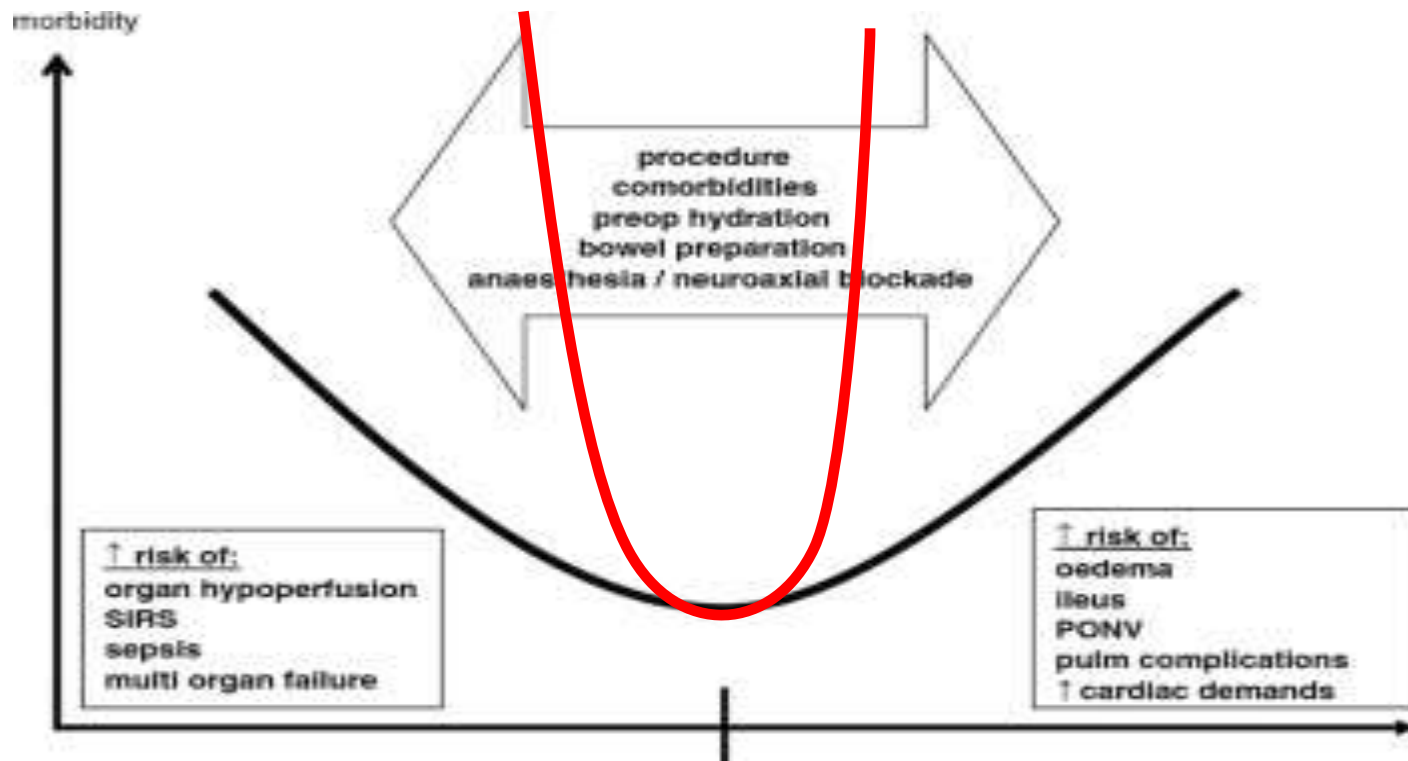


Současné paradigma

- Hypovolemie je u chirurgických, traumatologických a JIPových pacientů běžná.
- Hypovolemie je nejdůležitější příčinou hypotenze.
- léčba: zastavit ztráty a doplnit tekutiny
 - krystaloidy a/nebo koloidy, ev. transfuze
- **optimální strategie různá u různých pacientů**
- **„Ideální tekutina neexistuje!“**
Russell L, McLean AS: The ideal fluid Curr Opin Crit Care 2014,20:360–5

„Nějakou tekutinu, jakoukoliv tekutinu...prosím!“

Grocott MPV, Hamilton, MA: Resuscitation fluids. Vox sanguinis 2002:82:1-8



Hypovolemie

Normovolemie

Hypervolemie

Nebud'te příliš velkorysí při podávání tekutin!

Oh MS, Kim HJ: Basic rules of parenteral fluid therapy.
Nephron 2002:92 (suppl 1):56-59



- ✓ 50% pacientů na bolus tekutiny nereaguje!
- ✓ neindikované bolusy tekutin jsou škodlivé

Post Resuscitation Fluid Boluses in Severe Sepsis or Septic Shock:
Prevalence and Efficacy. Bihari S et al., Shock 2013; 40(1) 28-34



Užití HES

dle rozhodnutí EK 19.12.2013



„HES should only be used:

- ✓ for rapid volume replacement
 - ✓ due to acute blood loss
 - ✓ at the lowest effective dose
 - ✓ for the shortest period of time,
 - ✓ when crystalloids alone are not considered sufficient.
-
- ✓ Administration should be guided by cont. haemodynamic monitoring.
 - ✓ [HES] infusion should be stopped as soon as appropriate haemodynamic goals have been achieved.“

European Medicines Agency Press Release: Hydroxyethyl-starch solutions (HES) should no longer be used in patients with sepsis or burn injuries or in critically ill patients. CMDh endorses PRAC recommendations. EMA/640658/2013. <http://www.ema.europa.eu>

Comparison of hydroxyethyl starch colloids with crystalloids for surgical patients

A systematic review and meta-analysis

Mohamed Raiman, Colin G. Mitchell, Bruce M. Biccard and Reitze N. Rodseth



BACKGROUND Fluid therapy is one of the most ubiquitous medical therapeutic interventions. There is a debate over whether colloids or crystalloids are better for fluid resuscitation. Recent large trials and meta-analyses suggest no mortality benefit and possible harm with hydroxyethyl starch (HES) use. However, these trials were conducted in critically ill and septic patients and their applicability to perioperative patients has been challenged.

OBJECTIVE We aimed to evaluate the impact of HES use in scheduled and elective surgical patients.

DESIGN We conducted a systematic review and meta-analysis of randomised controlled trials (RCTs).

ELIGIBILITY CRITERIA Only RCTs comparing the use of the synthetic colloid HES with any crystalloid in adults undergoing noncardiac surgery (up to 24 h postop) were considered eligible. For each eligible trial, we extracted the outcomes of all-cause mortality within 90 days, length of hospital stay, major infectious complications, acute kidney injury (AKI) and renal replacement therapy (RRT).

RESULTS We identified 1555 citations, selected 90 for full-text evaluation, and identified 13 eligible RCTs. Trials were small ($n = 20$ to 202) with low event rates. There was a trend to increased mortality with HES within 90 days [13/373 vs. 3/368; risk ratio 2.97; 95% confidence interval (95% CI) 0.96 to 9.19; $I^2 = 0\%$], no difference in AKI and RRT (risk ratio 1.11; 95% CI 0.26 to 4.69; $I^2 = 34\%$), and no difference in major infectious complications (risk ratio 1.19; 95% CI 0.59 to 2.39; $I^2 = 0\%$). Patients resuscitated with HES had a shorter length of hospital stay (mean difference -1.52 days; 95% CI -2.87 to -0.18), although heterogeneity was high ($I^2 = 90\%$).

CONCLUSION This meta-analysis, based on small studies with low event rates, suggests that there are currently insufficient data to identify a difference in outcomes associated with crystalloids and HES in scheduled or elective noncardiac surgery.

Published online xx month 2015

publikováno elektronicky 8.9.2015



Effects of acute plasma volume expansion on renal perfusion, filtration, and oxygenation after cardiac surgery: a randomized study on crystalloid vs colloid

J. Skytte Larsson[†], G. Bragadottir[†], V. Krumbholz, B. Redfors, J. Sellgren and S.-E. Ricksten^{*}

British Journal of Anaesthesia, 115 (5): 736–42 (2015)

Abstract

Background: In the present randomized study, we evaluated the differential effects of a colloid and a crystalloid fluid on renal oxygen delivery (RD_{O_2}), glomerular filtration (GFR), renal oxygen consumption ($R\dot{V}O_2$), and the renal oxygen supply-demand relationship (i.e. renal oxygenation) after cardiac surgery with cardiopulmonary bypass.

Methods: Thirty patients with normal preoperative renal function, undergoing uncomplicated cardiac surgery, were studied in the intensive care unit in the early postoperative period. Patients were randomized to receive a bolus dose of either a crystalloid (Ringers-acetate[®] 20 ml kg⁻¹, n=15) or a colloid solution (Venofundin[®] 10 ml kg⁻¹, n=15). Systemic haemodynamics were measured via a pulmonary artery catheter. Renal blood flow and GFR were measured by the renal vein retrograde thermodilution technique and by renal extraction of ⁵¹Cr-EDTA (=filtration fraction). Arterial and renal vein blood samples were obtained for measurements of renal oxygen delivery (RD_{O_2}) and $R\dot{V}O_2$. Renal oxygenation was estimated from the renal oxygen extraction.

Results: Despite an increase in cardiac index and renal blood flow with both fluids, neither of the fluids improved RD_{O_2} , because they both induced haemodilution. The GFR increased in the crystalloid (28%) but not in the colloid group. The crystalloid increased the filtration fraction (24%) and renal oxygen extraction (23%), indicating that the increase in GFR, the major determinant of $R\dot{V}O_2$, was not matched by a proportional increase in RD_{O_2} .

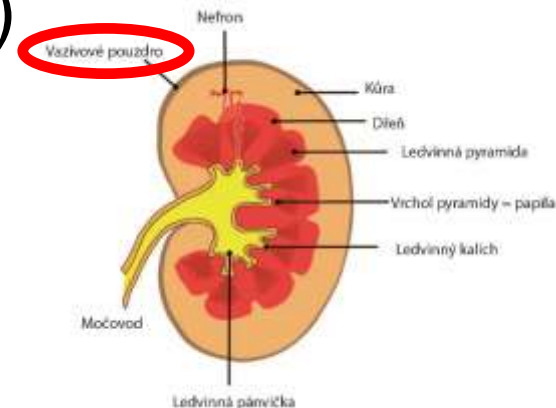
Conclusions: Neither the colloid nor the crystalloid improved RD_{O_2} when used for postoperative plasma volume expansion. The crystalloid-induced increase in GFR was associated with impaired renal oxygenation, which was not seen with the colloid.

Clinical trial registration: NCT01729364.

FLAKR = Fluid-induced acute kidney injury



- podávání tekutin významně ovlivňuje funkci ledvin
- nedostatečná, nebo opožděná náplň i.v. prostoru x přetížení tekutinami (edém ledvin)
- nefrotoxicita tekutin
 - vysoký obsah chloridů
 - osmotická nálož



Prowle JR, Bellomo R, Fluid administration and the kidney. *Curr Opin Crit Care* 2013,19:308–314

- k AKI může dojít i přes zvýšení průtoku krve ledvinou
Langenberg C et al.: Renal blood flow in experimental septic acute renal failure. *Kidney Int* 2006; 69:1996–2002

Objemová kinetika



- rychlost eliminace tekutin se výrazně u zdravých a u pacientů v anestezii
- objemový účinek krystaloidů podávaných Robert G. Hahn v hypotenzi je téměř 100 %
- do zástavy krvácení nutná permissivní hypotenze
- rychlá náhrada ztráty v poměru 3:1 vede k novému krvácení v důsledku hypervolemie
- „capillary refill“ 150-300 ml, počáteční objem 2/3-3/4 ztráty během 20-30 minut
- při krvácení rychlost infuze **ZPOMALIT!**

Literatura: pubmed.gov, search: Hahn RG

Císařský řez a hypotenze

- ✓ spinální anest. u plánovaného SC technikou volby
- ✓ nejvýznamnější komplikace hypotenze



Paradigma hypotenze u SC



- prevence
 - bandáž DK
 - vhodná poloha
 - objemová léčba (preload x koload, krystaloidy/koloidy)
- objemová terapie snižuje četnost hypotenze
- vhodné podat vazopresory:
léky volby efedrin (α , β), fenylefrin (α)
noradrenalin vazokonstrikcí uterinních cév sníží průtok placentou a dále zhorší hypoxii plodu!

Pařízek A. a kol: Analgezie a anestezie v porodnictví,
str. 320, 2. rozšířené vydání, Galén Praha 2012

Fluid and vasopressor management for Cesarean delivery under spinal anesthesia: continuing professional development.

[Article in English, French]

Loubert C¹.

+ Author information



2012

Abstract

PURPOSE: The purpose of this Continuing Professional Development module is to review the physiology of maternal hypotension induced by spinal anesthesia in pregnant women, and the effects of fluids and vasopressors.

PRINCIPAL FINDINGS: Maternal hypotension induced by spinal anesthesia is caused mainly by peripheral vasodilatation and is not usually associated with a decrease in cardiac output. Although the intravenous administration of fluids helps to increase cardiac output, it does not always prevent maternal hypotension. Three strategies of fluid administrations are equivalent for the prevention of maternal hypotension and a reduced need for vasopressors: (1) colloid preload; (2) colloid coload; and (3) crystalloid coload. Crystalloid preload is not as effective as any of those three strategies. Unlike phenylephrine, ephedrine can cause fetal acidosis. Therefore, phenylephrine is recommended as first line treatment of maternal hypotension. A phenylephrine infusion (25-50 $\mu\text{g} \times \text{min}^{-1}$) appears to be more effective than phenylephrine boluses to prevent hypotension, and nausea and vomiting. In pre-eclamptic patients, spinal anesthesia produces less hypotension than in normal pregnant women and fluid volumes up to 1,000 mL are usually well tolerated. Therefore mild to moderate intravascular volume loading is recommended, keeping in mind the increased risk for pulmonary edema in this population. In pre-eclamptic patients, hypotension can be treated either with ephedrine or phenylephrine, and phenylephrine infusions are not recommended.

CONCLUSION: A volume loading regimen other than crystalloid preload should be adopted. A phenylephrine infusion during elective Cesarean delivery is beneficial for the mother and safe for the newborn.

Randomized Double-blinded Comparison of Norepinephrine and Phenylephrine for Maintenance of Blood Pressure during Spinal Anesthesia for Cesarean Delivery

Anesthesiology 2015; 122:736-45

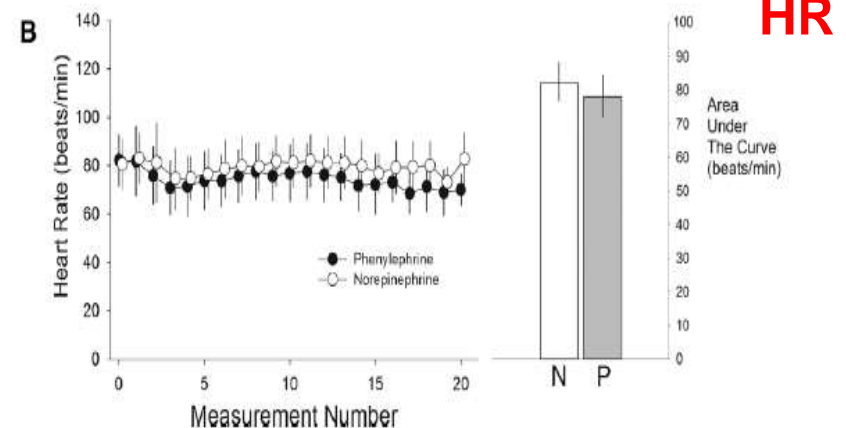
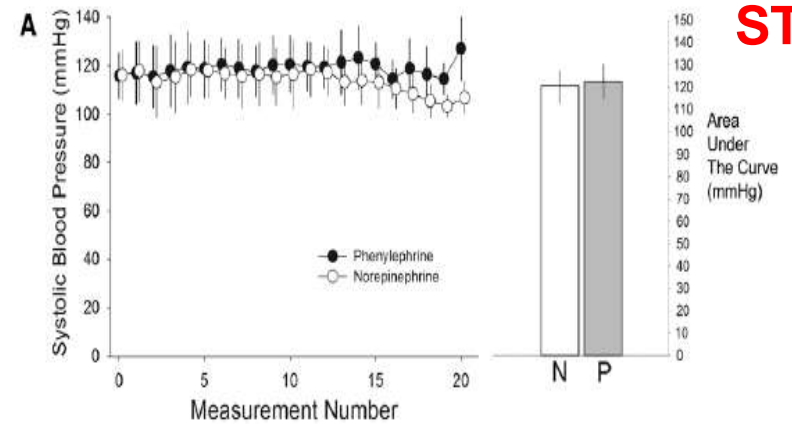
Warwick D. Ngan Kee, M.B.Ch.B., M.D., F.A.N.Z.C.A., F.H.K.A.M.,
Shara W. Y. Lee, B.Sc.(Hons.), M.Sc., Ph.D., Floria F. Ng, R.N., B.A.Sc.,
Perpetua E. Tan, B.Sc., M.Phil., Kim S. Khaw, M.B.B.S., M.D., F.R.C.A., F.H.K.A.M.

What We Already Know about This Topic

- Although norepinephrine has theoretical advantages over phenylephrine to treat spinal anesthesia-induced hypotension in obstetric patients, it has not been assessed in this setting

What This Article Tells Us That Is New

- In a randomized study of 104 healthy patients undergoing cesarean delivery under spinal anesthesia, maternal blood pressure and Apgar scores of neonates were similar whether norepinephrine or phenylephrine was administered
- Maternal cardiac output and heart rate were greater in women treated with norepinephrine compared with that in women treated with phenylephrine, but further work is needed to assess safety and efficacy of norepinephrine in this setting



Norepinephrine for Spinal Hypotension during Cesarean Delivery

Another Paradigm Shift?

Anesthesiology 2015; 122:728-30

Brendan Carvalho, M.B.B.Ch., F.R.C.A., Robert A. Dyer, F.C.A.(SA), Ph.D.

In summary, Ngan Kee *et al.* need to be commended for producing a superb study and continuing the search for the optimal vasopressor to prevent and treat spinal hypotension during cesarean delivery. The current study provides further confirmation of how effective an α -adrenergic receptor agonist, delivered as a prophylactic infusion in combination with crystalloid coload, can be in preventing maternal spinal hypotension.¹⁰ The findings of a lower incidence of bradycardia and a smaller decrease in cardiac output despite similar blood pressure maintenance with norepinephrine compared to phenylephrine are very encouraging. However, future research needs to address a number of questions before norepinephrine is considered preferable to phenylephrine for maintaining maternal hemodynamics. Anesthesia care providers will require much convincing before we are ready for another vasopressor paradigm shift in the management of spinal hypotension during cesarean delivery.

Transfuze



Pravidlo 10/30

**Udržujte koncentraci hemoglobinu > 10 g/dl
a hematokrit > 30 %!**

Adams RC, Lundy JS.: Anesthesia in cases of poor surgical risk: some suggestions for decreasing the risk. Surg Gynecol Obstet. **1942**;74:1011-1019.

„...aby bylo po ruce dostatek krve“



**Poslední operace primáře Sovy – plánovaná TEP kyčelního kloubu
Nemocnice na kraji města, 1. série, 9. díl: Odchod, 21.12.1978**

The New England Journal of Medicine

1999

© Copyright, 1999, by the Massachusetts Medical Society

FEBRUARY 11, 1999

NUMBER 6



Paul C. Hébert



A MULTICENTER, RANDOMIZED, CONTROLLED CLINICAL TRIAL OF TRANSFUSION REQUIREMENTS IN CRITICAL CARE

PAUL C. HÉBERT, M.D., GEORGE WELLS, PH.D., MORRIS A. BLAJCHMAN, M.D., JOHN MARSHALL, M.D.,
CLAUDIO MARTIN, M.D., GIUSEPPE PAGLIARELLO, M.D., MARTIN TWEEDDALE, M.D., PH.D., IRWIN SCHWEITZER, M.Sc.,
ELIZABETH YETISIR, M.Sc., AND THE TRANSFUSION REQUIREMENTS IN CRITICAL CARE INVESTIGATORS
FOR THE CANADIAN CRITICAL CARE TRIALS GROUP*

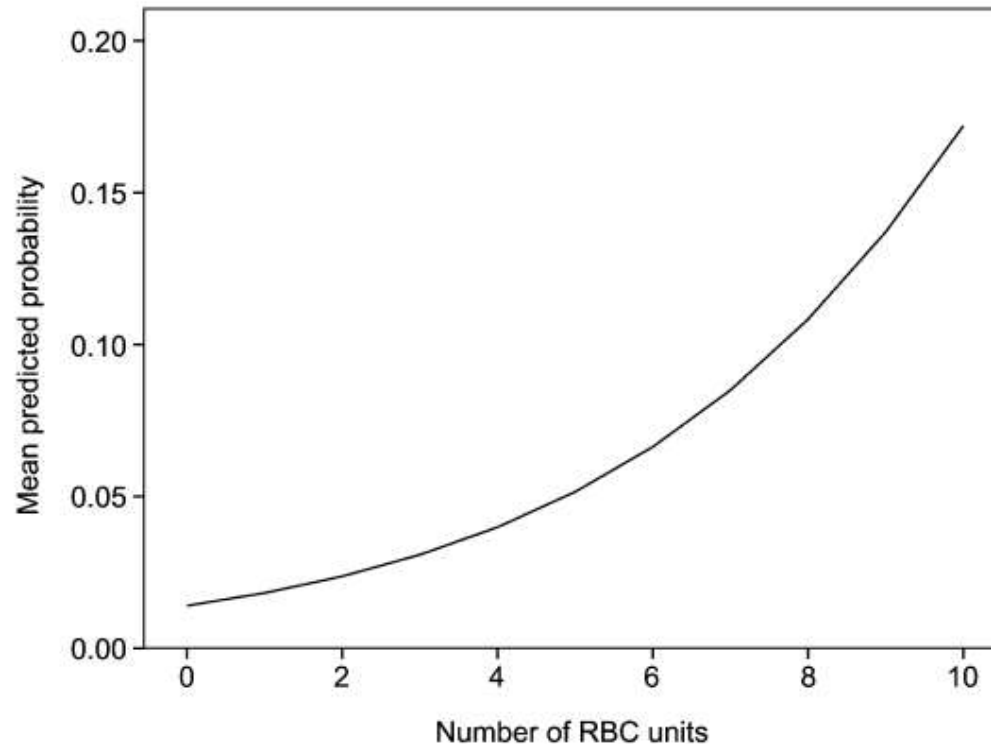
838 kriticky nemocných euvolemických pacientů

- restriktivní přístup: práh < 70 g/l, cíl 70-90 g/l
- liberální přístup: práh < 100 g/l, cíl 100-120 g/l

Conclusions A restrictive strategy of red-cell transfusion is at least as effective as and possibly superior to a liberal transfusion strategy in critically ill patients, with the possible exception of patients with acute myocardial infarction and unstable angina. (N Engl J Med 1999;340:409-17.)



...nedávejte krev!



CABG

Korelace mezi počtem jednotek erymasy a predikovanou mortalitou

Van Straten AMH et al.: **Transfusion of red blood cells: the impact on short-term and long-term survival after coronary artery bypass grafting, a ten-year follow-up** Interactive CardioVascular and Thoracic Surgery **2010**;10(1):37-42



...nedávejte krev!

J Trauma. 2003 May;54(5):908-14.

Allogeneic blood transfusion increases the risk of postoperative bacterial infection: a meta-analysis.

Hill GE¹, Frawley WH, Griffith KE, Forestner JE, Minei JP.

⊕ Author information

2003

Abstract

BACKGROUND: Immunosuppression is a consequence of allogeneic (homologous) blood transfusion (ABT) in humans and is associated with an increased risk in cancer recurrence rates after potentially curative surgery as well as an increase in the frequency of postoperative bacterial infections. Although a meta-analysis has been reported demonstrating the relationship between ABT and colon cancer recurrence, no meta-analysis has been reported demonstrating the relationship of ABT to postoperative bacterial infection.

METHODS: Twenty peer-reviewed articles published from 1986 to 2000 were included in a meta-analysis. Criteria for inclusion included a clearly defined control group (nontransfused) compared with a treated (transfused) group and statistical analysis of accumulated data that included stepwise multivariate logistic regression analysis. In addition, a subgroup of publications that included only the traumatically injured patient was included in a separate meta-analysis. A fixed effects analysis was conducted with odds ratios obtained by using the conditional maximum likelihood method and 95% confidence intervals on the obtained odds ratios were determined using the mid-p technique.

RESULTS: The total number of subjects included in this meta-analysis was 13,152 (5,215 in the transfused group and 7,937 in the nontransfused group). The common odds ratio for all articles included in this meta-analysis evaluating the association of ABT to the incidence of postoperative bacterial infection was 3.45 (range, 1.43-15.15), with 17 of the 20 studies demonstrating a value of $p < \text{or} = 0.05$. These results provide overwhelming evidence that ABT is associated with a significantly increased risk of postoperative bacterial infection in the surgical patient. The common odds ratio of the subgroup of trauma patients was 5.263 (range, 5.03-5.43), with all studies showing a value of $p < 0.05$ (0.005-0.0001). These results demonstrate that ABT is associated with a greater risk of postoperative bacterial infection in the trauma patient when compared with those patients receiving ABT during or after elective surgery.

CONCLUSION: These results demonstrate that ABT is an associated and apparently significant and frequently overlooked risk factor for the development of postoperative bacterial infection in the surgical patient. Allogeneic blood transfusion is a greater risk factor in the traumatically injured patient when compared with the elective surgical patient for the development of postoperative bacterial infection.



...nedávejte krev!

Int J Surg. 2015 Jan;13:102-10. doi: 10.1016/j.jisu.2014.11.044. Epub 2014 Dec 6.

Allogeneic blood transfusion and the prognosis of gastric cancer patients: systematic review and meta-analysis.

Sun C¹, Wang Y², Yao HS³, Hu ZQ⁴.

CONCLUSIONS: In GC patients undergoing curative surgeries, **ABTs are associated with a worse prognosis**, including all-cause mortality, cancer-related mortality and recurrence. Patient blood management should be investigated further to minimize use of ABT.

Ann Surg. 2012 Aug;256(2):235-44. doi: 10.1097/SLA.0b013e31825b35d5.

Effects of allogeneic red blood cell transfusions on clinical outcomes in patients undergoing colorectal cancer surgery: a systematic review and meta-analysis.

Acheson AG¹, Brookes MJ, Spahn DR.

CONCLUSIONS: In patients with colorectal cancer (CRC) undergoing surgery, **ABTs are associated with adverse clinical outcomes**, including increased mortality. Measures aimed at limiting the use of ABTs should be investigated further.

BMC Surg. 2014 May 23;14:34. doi: 10.1186/1471-2482-14-34.

Perioperative blood transfusion adversely affects prognosis after resection of lung cancer: a systematic review and a meta-analysis.

Luan H, Ye F, Wu L, Zhou Y¹, Jiang J.

CONCLUSIONS: **Perioperative blood transfusion appears be associated with a worse prognosis** in patients undergoing lung cancer resection. These data highlight the importance of minimizing blood transfusion during surgery.



...nedávejte krev!

Practice Guidelines for Perioperative Blood Management

*An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Blood Management**

- The determination of whether hemoglobin concentrations between 6 and 10 g/dl justify or require red blood cell transfusion should be based on potential or actual ongoing bleeding (rate and magnitude), intravascular volume status, signs of organ ischemia, and adequacy of cardiopulmonary reserve.
- Red blood cells should be administered unit-by-unit, when possible, with interval reevaluation.

Survey Findings: The ASA members agree and the consultants strongly agree that a restrictive* red blood cell transfusion strategy may be used to reduce transfusion requirements.

* hemoglobin criteria for transfusion < 8 g/dl and hematocrit values < 25% are typically reported as restrictive.



...nedávejte krev!

Anesthesiology. 2015 Feb;122(2):241-75

Practice Guidelines for Perioperative Blood Management

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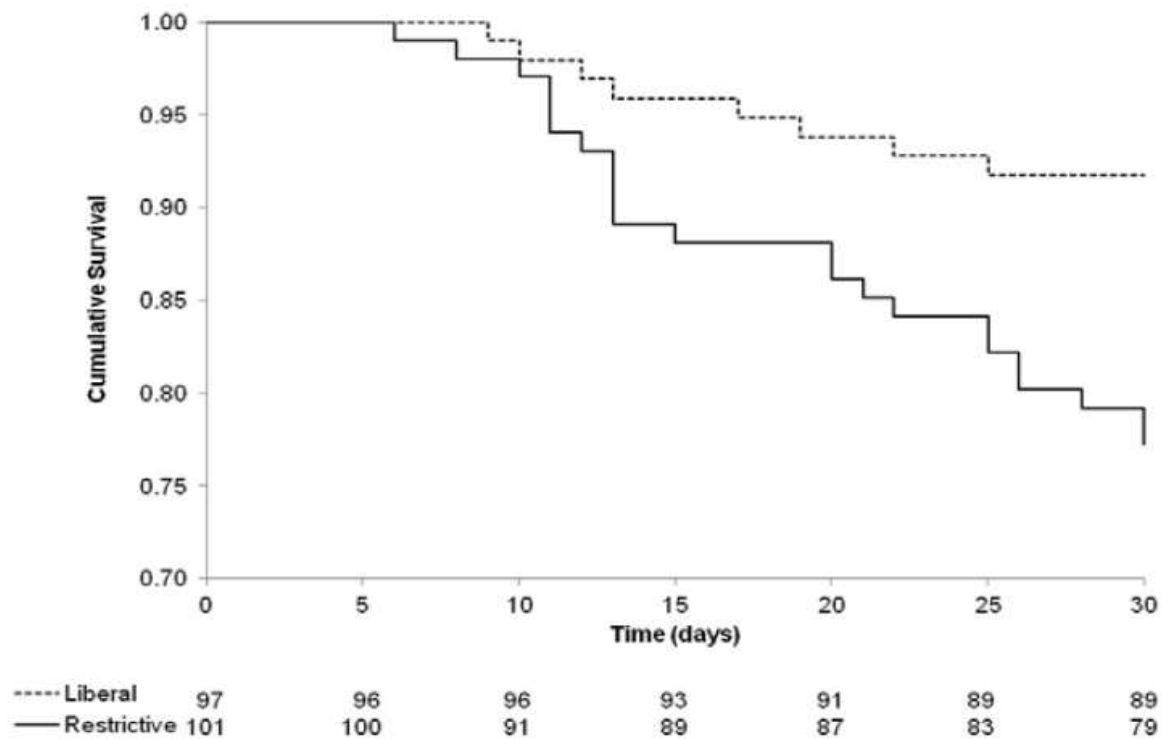
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Transfusion Requirements in Surgical Oncology Patients

A Prospective, Randomized Controlled Trial

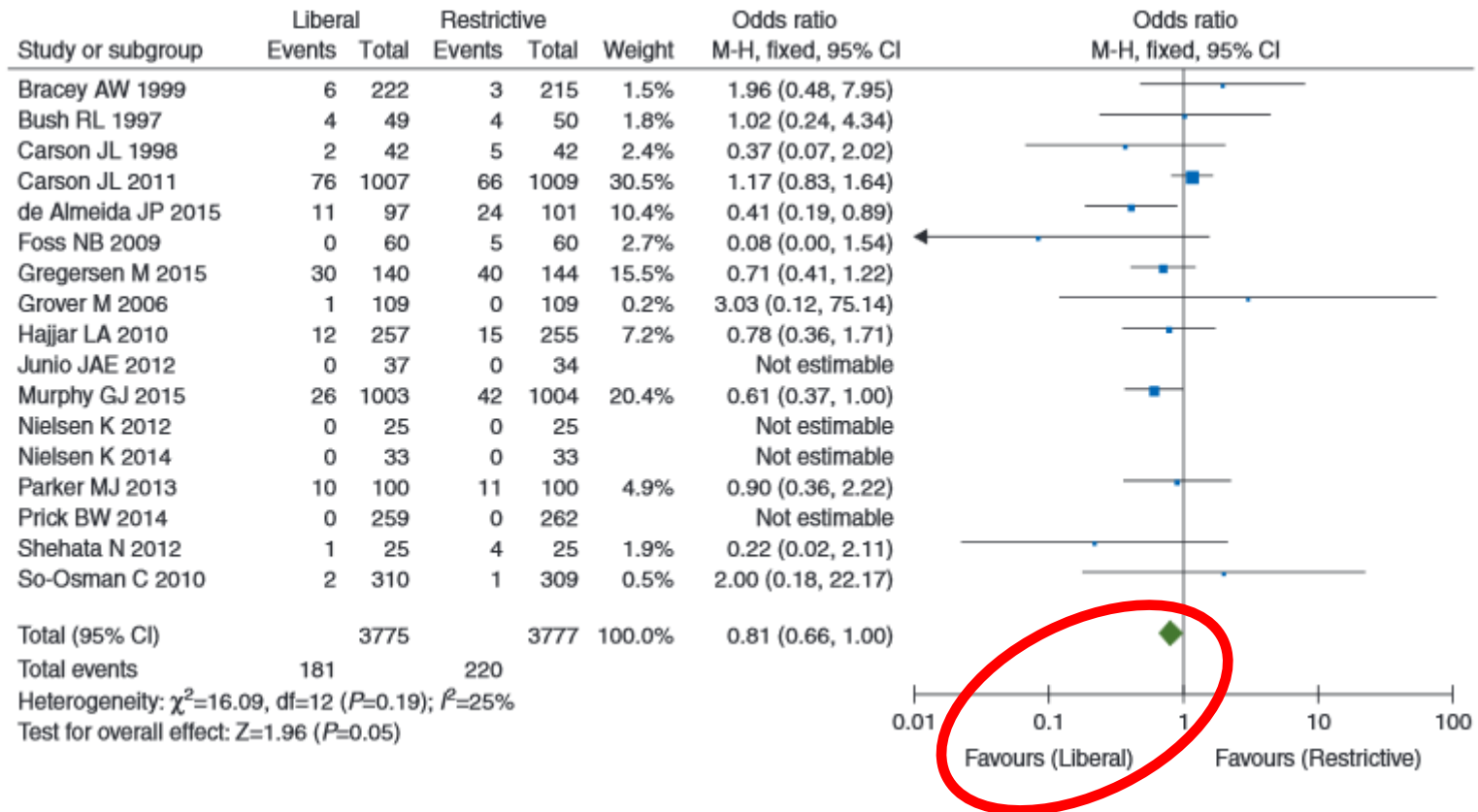
Juliano Pinheiro de Almeida, M.D., Jean-Louis Vincent, M.D., Ph.D.,
Filomena Regina Barbosa Gomes Galas, M.D., Ph.D., Elisangela Pinto Marinho de Almeida, M.D.,
Julia T. Fukushima, M.Sc., Eduardo A. Osawa, M.D., Fabricio Bergamin, M.D., Clarice Lee Park, M.D.,
Rosana Ely Nakamura, M.D., Silvia M. R. Fonseca, M.D., Guilherme Cutait, M.D.,
Joseane Inacio Alves, R.N., Mellik Bazan, P.T., Silvia Vieira, R.N., Ana C. Vieira Sandrini, L.D.N.,
Henrique Palomba, M.D., Ph.D., Ulysses Ribeiro, Jr., M.D., Ph.D., Alexandre Crippa, M.D.,
Marcos Dalloglio, M.D., Ph.D., Maria del Pilar Estevez Diz, M.D., Ph.D., Roberto Kalil Filho, M.D., Ph.D.,
Jose Otavio Costa Auler, Jr., M.D., Ph.D., Andrew Rhodes, M.B., B.S.,
Ludhmila Abrahao Hajjar, M.D., Ph.D.



Liberal transfusion strategy improves survival in perioperative but not in critically ill patients. A meta-analysis of randomised trials



E. Fominskiy^{1,2}, A. Putzu¹, F. Monaco¹, A. M. Scandroglio¹, A. Karaskov², F. R. B. G. Galas³, L. A. Hajjar³, A. Zangrillo^{1,4} and **G. Landoni^{1,4,*}**



The least of 3 evils: Exposure to red blood cell transfusion, anemia, or both?



Gabriel Loor, MD,^a Jeevanantham Rajeswaran, PhD,^b Liang Li, PhD,^b Joseph F. Sabik III, MD,^a Eugene H. Blackstone, MD,^{a,b} Keith R. McCrae, MD,^c and Colleen G. Koch, MD, MS, MBA^{d,e}

Background: Anemia and red blood cell (RBC) transfusions are both associated with morbidity and mortality after cardiac surgery. Patients with the lowest hematocrit (HCT) values during cardiopulmonary bypass (CPB) are the most likely to receive a transfusion, which results in a double-negative exposure. We aimed to clarify the effects of anemia, transfusion, and their combination to identify which imposes the greatest risk of end-organ dysfunction and mortality.

Methods: From November 1, 2004, to November 1, 2009, 7942 patients underwent procedures requiring CPB and did not receive intraoperative or postoperative RBC transfusion, and 1202 received intraoperative RBC transfusion alone. They were divided into 4 groups: intraoperative nadir HCT $\geq 25\%$ without RBC transfusion, $\geq 25\%$ with RBC transfusion, $< 25\%$ without RBC transfusion, and $< 25\%$ with RBC transfusion. The relationship among HCT, RBC, and outcomes was studied using generalized propensity-score analysis. Outcomes included estimated glomerular filtration rate (eGFR), troponin, ventilatory support time, length of stay, and mortality.

Results: After risk adjustment, comparison of all 4 groups showed that double exposure to anemia (HCT $< 25\%$) and RBC transfusion was associated with the highest risk: lowest eGFR ($P = .008$), highest troponin values ($P = .01$), longest ventilator requirement ($P < .001$), longest length of stay ($P < .001$), and highest mortality ($P = .007$). Single exposure to either HCT $< 25\%$ or RBC transfusion alone was associated with the next risk category, and the lowest morbidity risk was associated with neither exposure.

Conclusions: Although single exposure to anemia or RBC transfusion alone was associated with risk, it was generally lower than that of anemia and RBC exposure in combination. (J Thorac Cardiovasc Surg 2013;146:1480-7)

Volume 41, Issue 11, November 2015

ISSN: 0342-4642 (Print) 1432-1238 (Online)



Editorial

Should red cell transfusion be individualized? Yes

Yasser Sakr, Jean-Louis Vincent →

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Pages 1973-1976

Editorial

Should red blood cell transfusion be individualized? No

Lars B. Holst, Jeffrey L. Carson, Anders Perner →

» [Download PDF](#) (423KB)

» [View Article](#)



Pages 1977-1979

Editorial

Should blood transfusion be individualised? We are not sure

Annemarie Docherty, Timothy S. Walsh →

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Pages 1980-1982

Anesteziologie a intenzivní medicína



Ten 'short-lived' beliefs in intensive care medicine

2015

A. Perner

J. Myburgh

- X** albumin zvyšuje mortalitu (2004)
- X** časná, cíli léčená léčba (EGDT) zlepšuje výsledky u septického šoku (SS) (2014)
- X** akt. protein C zlepšuje výsledky SS s rizikem † (2012)
- X** steroidy v nízké dávce zlepšují výsledky u SS (2012)
- X** intenzivní kontrola glykemie zlepšuje výsledky u pacientů na JIP (2012)



Ten 'short-lived' beliefs in intensive care medicine

2015

A. Perner John Myburgh

- ✗ tetraštroby (HES) jsou bezpečné (Baroso, EK, 2013)
- ✗ dekompresivní kraniektomie zlepšuje výsledky u těžkého poranění mozku (2011)
- ✗ lehká hypotermie zlepšuje výsledky po OHCA (2013)
- ✗ transfuzní léčba podle biomarkerů je přínosem u SS (2014)
- ✗ intenzivní náhrada funkce ledvin zlepšuje přežití u pacientů se selháním ledvin (2009)

A Decade of Reversal: An Analysis of 146 Contradicted Medical Practices

Vinay Prasad, MD; Andrae Vandross, MD; Caitlin Toomey, MD; Michael Cheung, MD; Jason Rho, MD; Steven Quinn, MD; Satish Jacob Chacko, MD; Durga Borkar, MD; Victor Gall, MD; Senthil Selvaraj, MD; Nancy Ho, MD; and Adam Cifu, MD

Objective: To identify medical practices that offer no net benefits.

Methods: We reviewed all original articles published in 10 years (2001-2010) in one high-impact journal.

Articles were classified on the basis of whether they addressed a medical practice, whether they tested a new or existing therapy, and whether results were positive or negative. Articles were then classified as 1 of 4 types: replacement, when a new practice surpasses standard of care; back to the drawing board, when a new practice is no better than current practice; reaffirmation, when an existing practice is found to be better than a lesser standard; and reversal, when an existing practice is found to be no better than a lesser therapy. This study was conducted from August 1, 2011, through October 31, 2012.

Results: We reviewed 2044 original articles, 1344 of which concerned a medical practice. Of these, 981 articles (73.0%) examined a new medical practice, whereas 363 (27.0%) tested an established practice. A total of 947 studies (70.5%) had positive findings, whereas 397 (29.5%) reached a negative conclusion. A total of 756 articles addressing a medical practice constituted replacement, 165 were back to the drawing board, 146 were medical reversals, 138 were reaffirmations, and 139 were inconclusive. Of the 363 articles testing standard of care, 146 (40.2%) reversed that practice whereas 138 (38.0%) reaffirmed it.

Conclusion: The reversal of established medical practice is common and occurs across all classes of medical practice. This investigation sheds light on low-value practices and patterns of medical research.

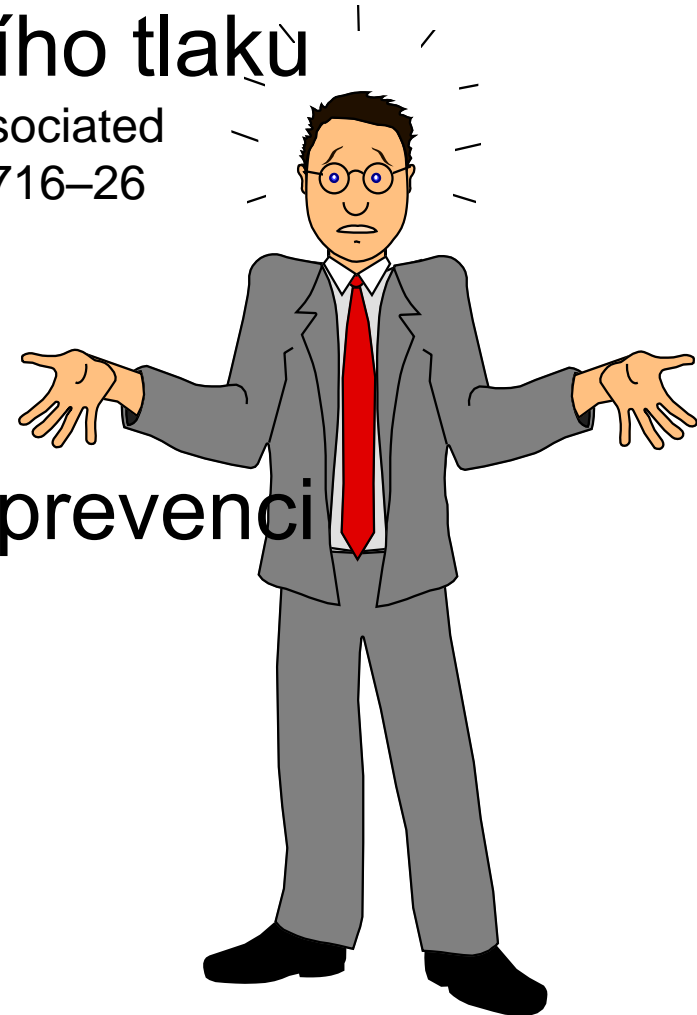
Budou změny dalších paradigmat?

- intraoperační kolísání krevního tlaku

Intraoperative arterial blood pressure lability is associated with improved 30 day survival! BJA 2015;115 (5):716–26

- aspirin, betablokátory
v perioperačním období

- podávání statinů v primární prevenci



Změny paradigmatu anestezie

- **„Celková anestezie je nebezpečná!“**

prof. August Bier 1899

- Anestezie dosáhla impresivní úrovně bezpečnosti!
- Dosáhla anestezie hranic bezpečnosti?
Staender SEA: Anesthesia and patient safety: have we reached our limits?
Curr Opin in Anesthesiology 2011, 24:349–353
- Anestezie iatrogenní farmakologicky navozené koma!
= intoxikace
Brown EN: General Anesthesia, Sleep and Coma. NEJM 2010;363:2638-50
- **Anestezie je iatrogenní poranění mozku!**
prof. Vladimír Černý, po návratu z International Symposium on Intensive Care and Emergency Medicine v Bruselu 2014



Bděte! Čtěte! Přemýšlejte!