European Society of Anaesthesiology ESA

HIRSLANDEN
KLINIK HIRSLANDEN

Perioperative Patient Safety and Quality – Workshop for Anaesthesiologists

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Vth CEEA course, 27.11.2019
Inštitúte vzdelávania veterinárnych lekárov IVVL, Košice, Slovakia

Competing interests

WHAT	DECLARATION
Grants/Research Support / P.I.	SGAR Research Grant (2008)
Employee	Hirslanden Clinic Zurich
No interests related to:	Consultation fees; Speakers bureau; Company sponsoring; Spouse/partner C.o.I.; Scientific Advisory Boards
Honoraria	University of Zurich; Z-INA Nursing School Zurich
Stock shareholder	UBS, Roche, Nestle, Swatch
Other (affiliations)	- Past Chair, ESA Patient Safety and Quality Committee - Member, Data and Quality Committee, SGAR - Associate lecturer, University of Zurich (Patient Safety)


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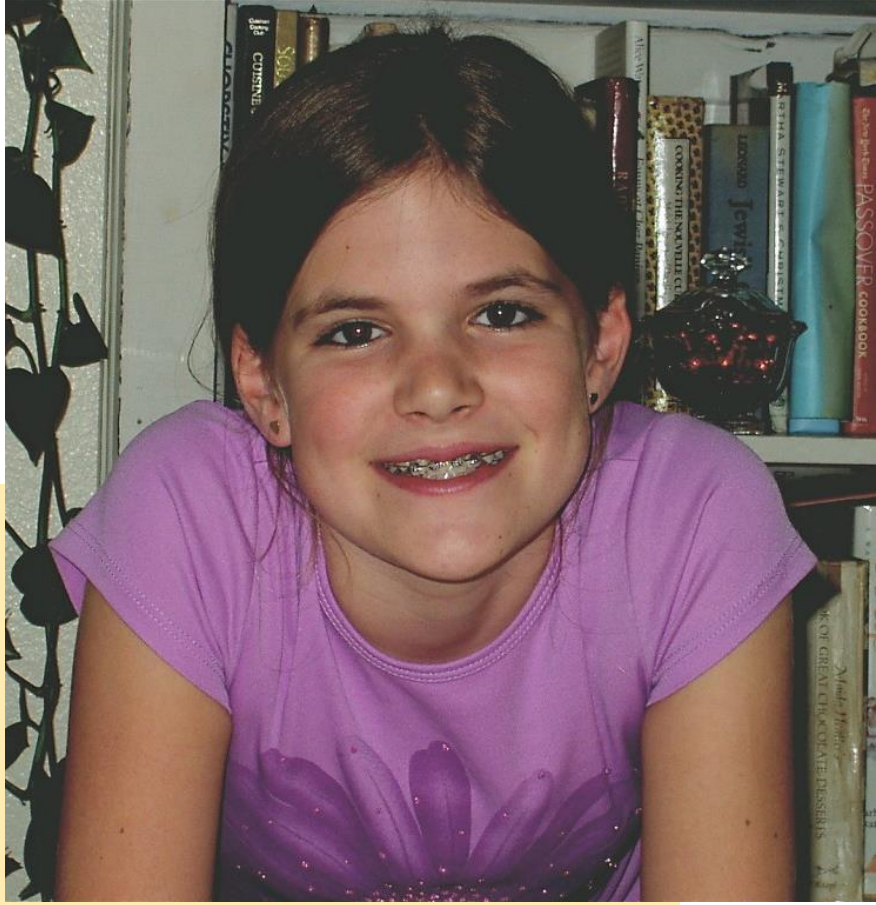
Leah Coufal, 11-year-old

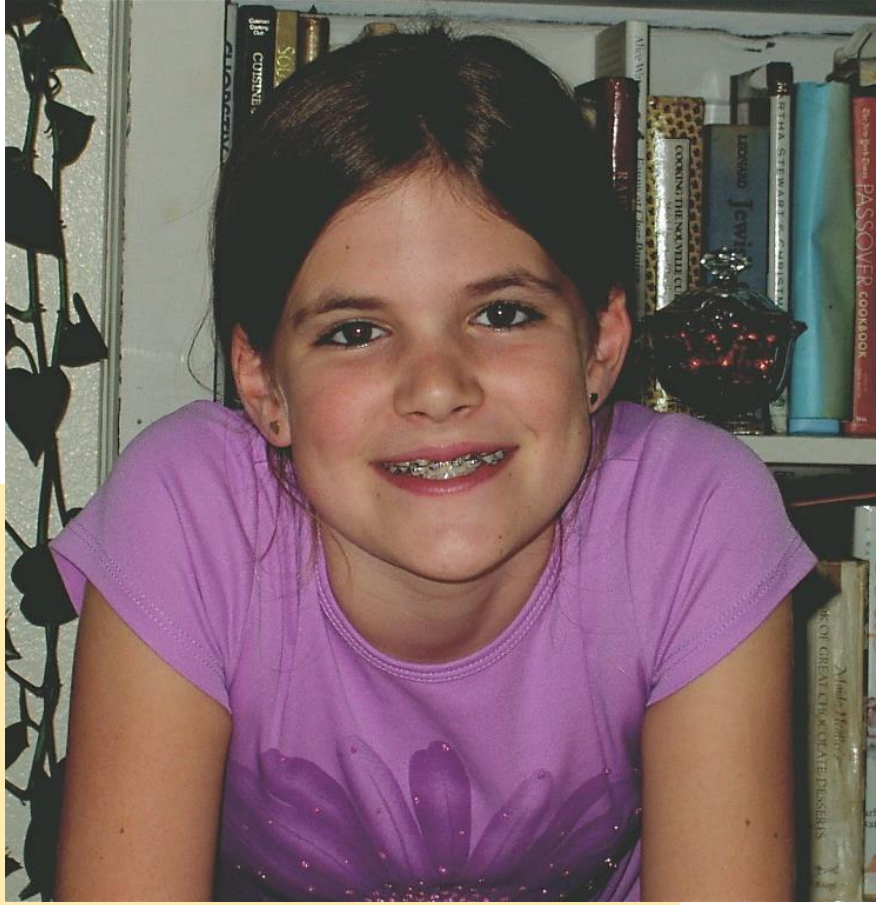


Elective surgery:
Pectus carinatum ("pigeon's chest")

- Persisting postoperative pain despite epidural with Fentanyl
- Seems overmedicated, but still in pain
- Resident orders 2mg Lorazepam every 2 hours "for anxiety"

With permission - **http://patientsafetymovement.org/patient-story/lenore-alexander/**

Leah Coufal, 11-year-old



Elective surgery:

Pectus carinatum ("pigeon's chest")

- Mother falls asleep, wakes up at 2 AM to find Leah dead in bed
- Autopsy: epidural catheter malpositioned in left intrapleural space
- 10 yrs later, mother promotes "Leah's Law" (cont. postop. monitoring)

With permission - **http://patientsafetymovement.org/patient-story/lenore-alexander/**

Patient safety issue - or „just a complication“?

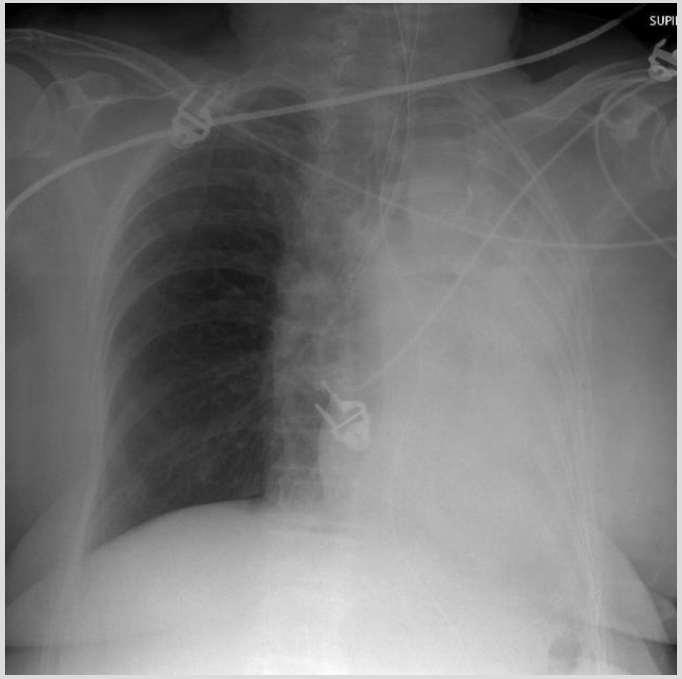
A definition of patient safety:

„The avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of healthcare.“

Charles Vincent, 2006[1]

1. Vincent C. Patient Safety. 2 ed. Oxford: BMJ Books; 2010

Perioperative outcomes...



© http://radiopaedia.org/cases/right-main-bronchial-intubation
http://www.molnlycke.com/Surgical-Site-Infections-SSI.aspx#confirm

The range of perioperative patient harm

Patient harm: Surgery **20%**, intensive care **34%** - about **50% preventable**[1]

Surg. in-hosp. mortality (EUR): **4%**[2]; CH: **no overall improvement** 1998-2014[3]

Mortality following complications: **„Failure to Rescue“ (FTR)**[4,5,6]

1. Panagioti M et al, BMJ 2019;366:l4185
2. Pearse R.M., Lancet 2012; 380: 1059 – 65
3. Wacker J et al, Swiss Med Wkly 2019;149:w20034
4. Portuondo JI et al. Anesthesiology 2019;131(2):426-437
5. Silber JH et al. Med Care. 1992;30(7):615-629
6. Ghaferi AA et al., NEJM 2009;361(14):1368-1375.

Leah Coufal – "Failure to Rescue"[1]

Leah's Mother Lenore Alexander:

"***a lot of things went wrong that day***"...

... in addition to the lack of monitoring, among them:

- Friday night, Saturday: pain despite epidural – *no anaesthesiologist*
- *Unexperienced resident*
- *Medical staff seemed unconcerned, inattentive and disinterested*
- *No hospital staff had entered her room from 8 PM for about 6 hours*

1. Ghaferi AA et al., NEJM 2009;361(14):1368-1375

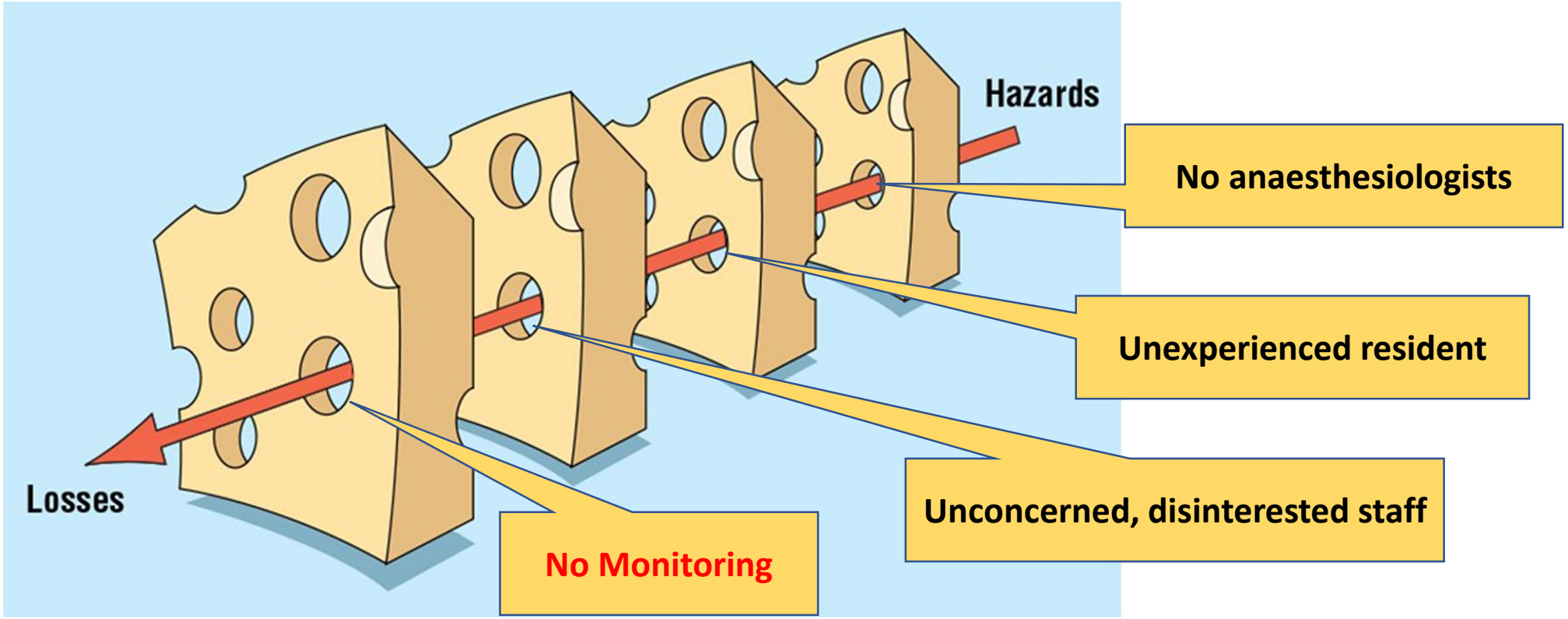
http://www.leahslegacy.org/leahs-story/ http://patientsafetymovement.org/patient-story/lenore-alexander/

Risk factors

- **APSF (US):** postop opioids -> monitoring![1] **Lacking!**
- **Acute Pain Service:** fewer adverse events[2] **Lacking!**
- **Nurse/patient** ratio, training level -> mortality, FTR[3,4] **Adequate? Unconcerned...**

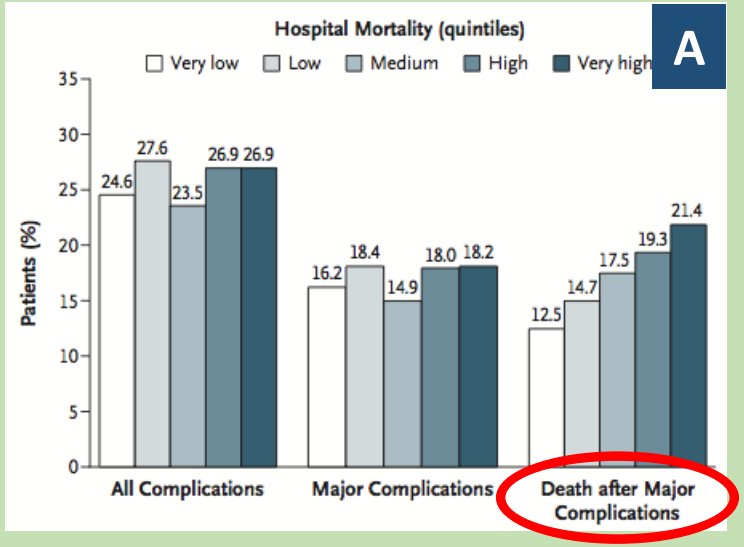
1. Weinger MB et al: apsf Newsletter.2011, 26(2):21-28
2. Kuusniemi K et al. J of Pain Research. 2016;9:25-36
3. Aiken LH, Lancet 2014;383(9931):1824-1830
4. Johnston MJ et al. Surgery. 2015;157(4):752-763
5. Whitlock EL et. Anesthesiology. 2015;123(6):1312-1321

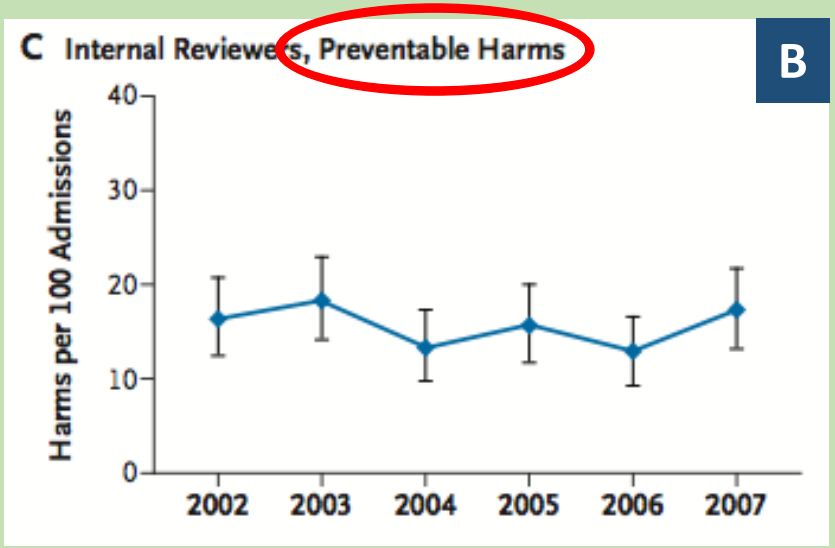
James Reason's "Swiss Cheese Model"



Seshia, Shashi S. et al. Journal of Evaluation in Clinical Practice. 2018;24(1):187-197

Safety/quality is local, and varies over time!



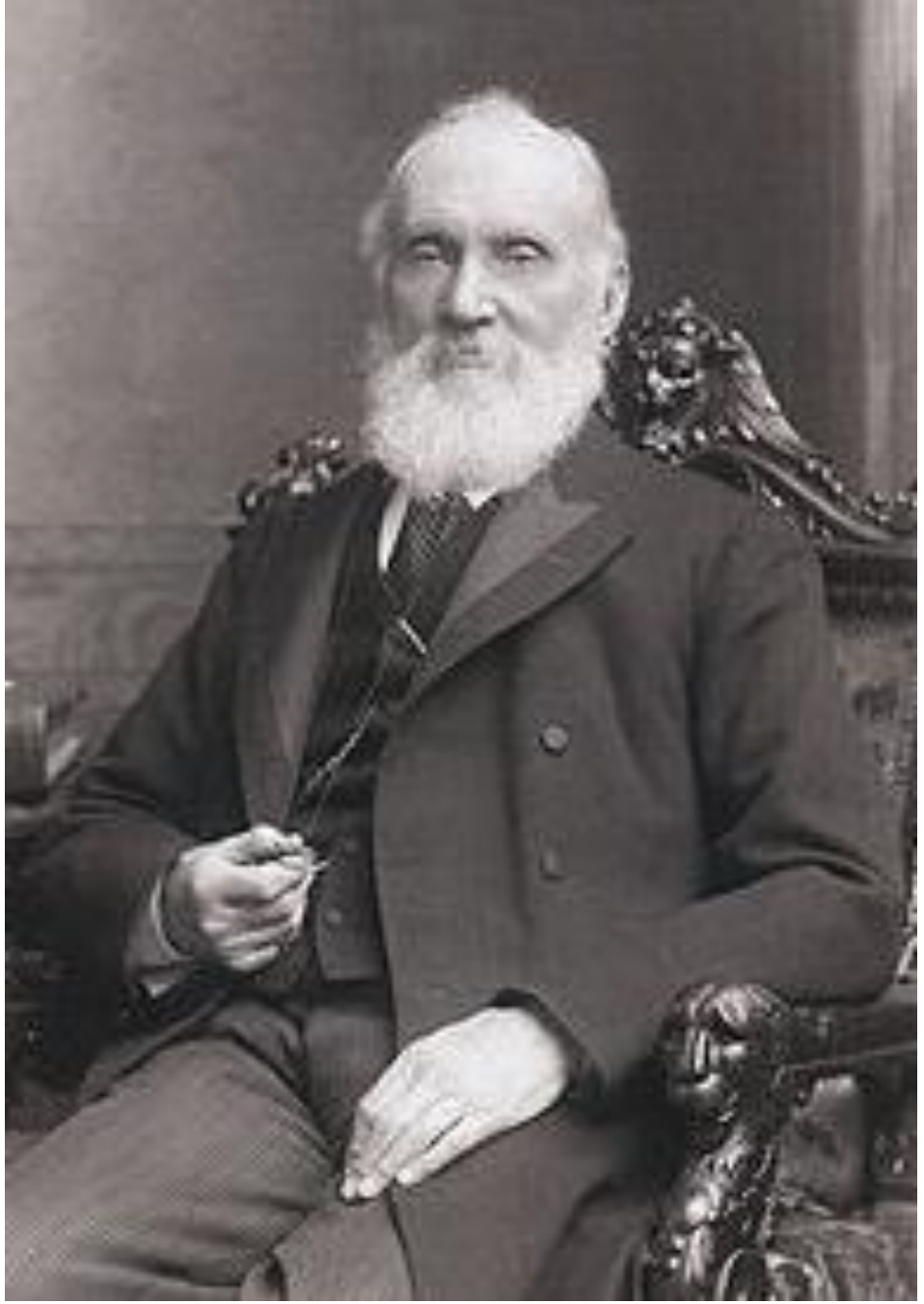


A. Ghaferi AA et al. NEJM 2009;361(14):1368-1375.
B. Landrigan CP et al. NEJM 2010;363(22):2124-2134.

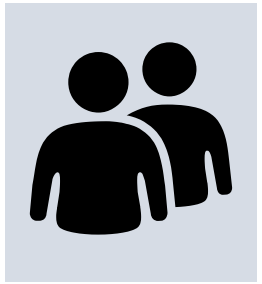
„If you can not measure it,

you can not improve it“

(Lord Kelvin)



https://de.wikipedia.org/wiki/William_Thomson,_1._Baron_Kelvin

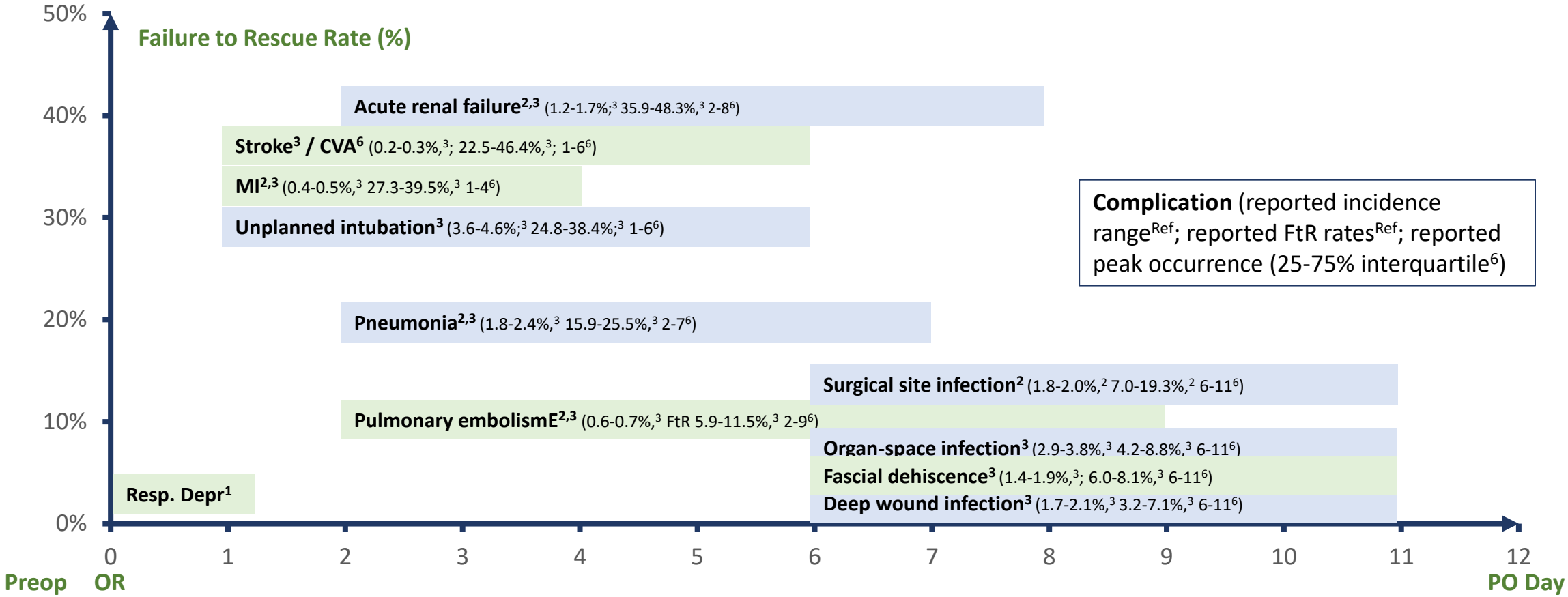


Complication rates, mortality rates:

- Do you know them for your department/hospital?
- Do *you* measure them? Or somebody else?
- If not, *what is the main problem*?

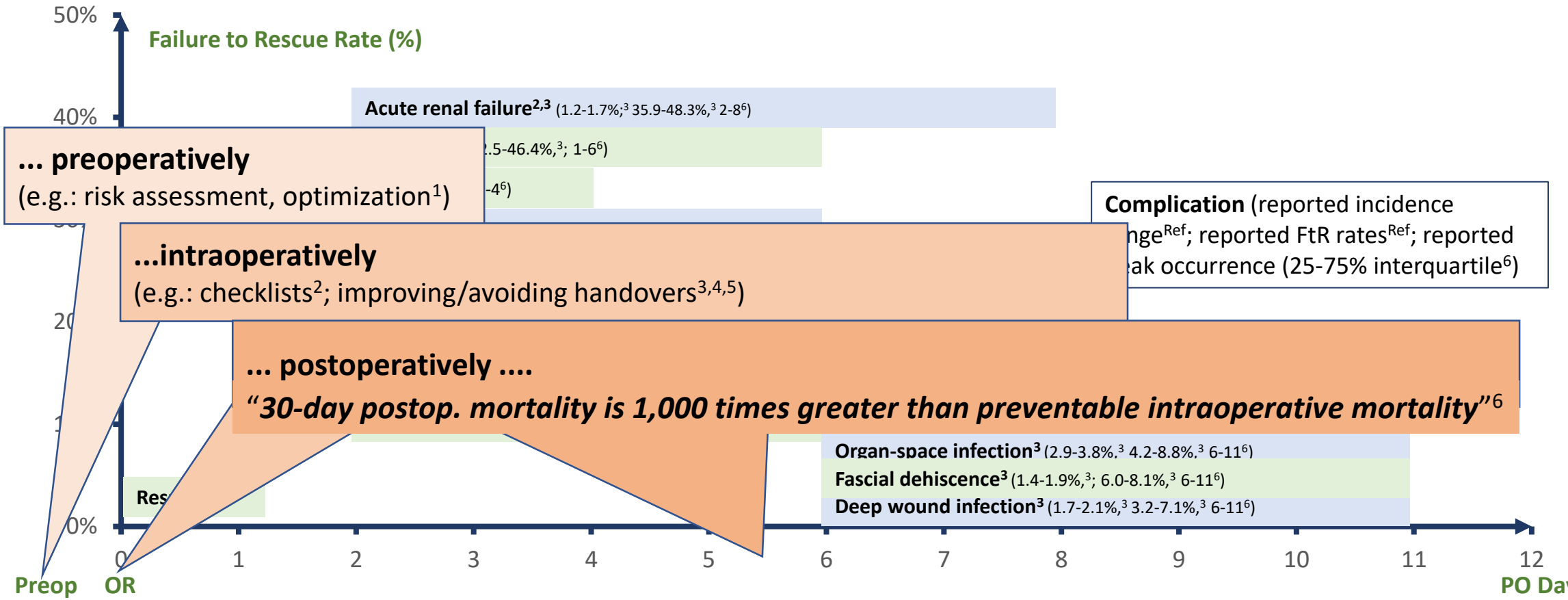
More on complications, mortality, and FTR

Complications - timing and "Failure to Rescue" rates



1. Cauley CE et al. Ann Surg. 2017;265(4):702-708; 2. Ghaferi AA et al. Ann Surg. 2009;250(6):1029-1034; 3. Ghaferi AA et al. NEJM 2009;361(14):1368-1375; 6. Wakeam E et al. J Surg Res 2015;193(1):77-87.

Reducing complications and FTR ...

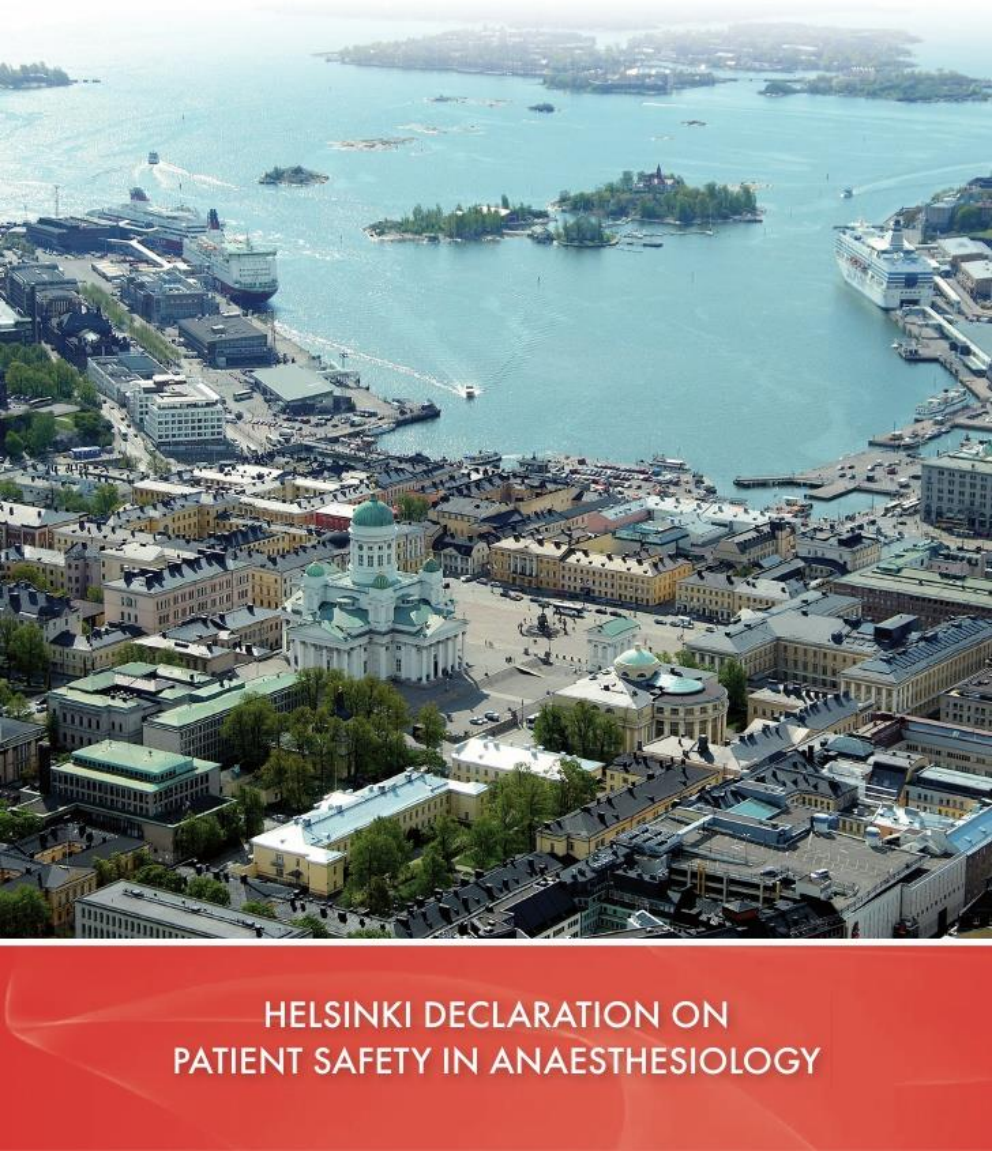


1. Portuondo JI et al. Anesthesiology. 2019 (Epub); 2. de Jager E et al.: World J Surg 2016;40(8):1842-1858; 3. Jones PM et al. JAMA 2018;319(2):143-153; 4. Saager L et al. Anesthesiology. 2014;121(4):695-706; 5. Hyder JA et al. Anesth Analg. 2016;122(1):134-144. 6. Sessler DI. 2017;126(6):995-1004

Promising concepts for reducing complications and FTR

Concepts, interventions - examples:	Effect on outcomes:	
Workforce: Nurse staffing↑,[1,2] Intensivist/hospitalist/resident staffing↑[3]		mort↓[1] FTR↓[2,3]
Hospital characteristics: hospital[2]/surgeon[4] volume↑, RRT,[3] APS[5]	AE/compl↓[4,5]	mort↓[4] FTR↓[2,4]
Continuous ward monitoring[6,7]	ICU transf.↓,[6,7]	mort↓[7]
Measuring/monitoring surgical outcomes:[8,9]	morbidity↓,[9]	mort↓[8,9]

1. Aiken LH, Lancet 2014;383(9931):1824-1830;
2. Johnston MJ et al. Surgery. 2015;157(4):752-763;
3. Ward ST et al. Ann Surg. 2018;
4. Buettner S et al. Surgery. 2016;159(4):1004-1012;
5. Kuusniemi K et al. J of Pain Research. 2016;9:25-36.
6. Lam T et al. Anesth Analg. 2017;125(6):2019-2029;
7. Vincent JL et al. EJA 2018;35(5):325-333;
8. Yuen WC et al. Hong Kong Med J. 2018;24(2):137-144;
9. Maggard-Gibbons M. AHRQ; 2013:140-157;
10. Stier G et al. Perioperative medicine. 2018;7:13.

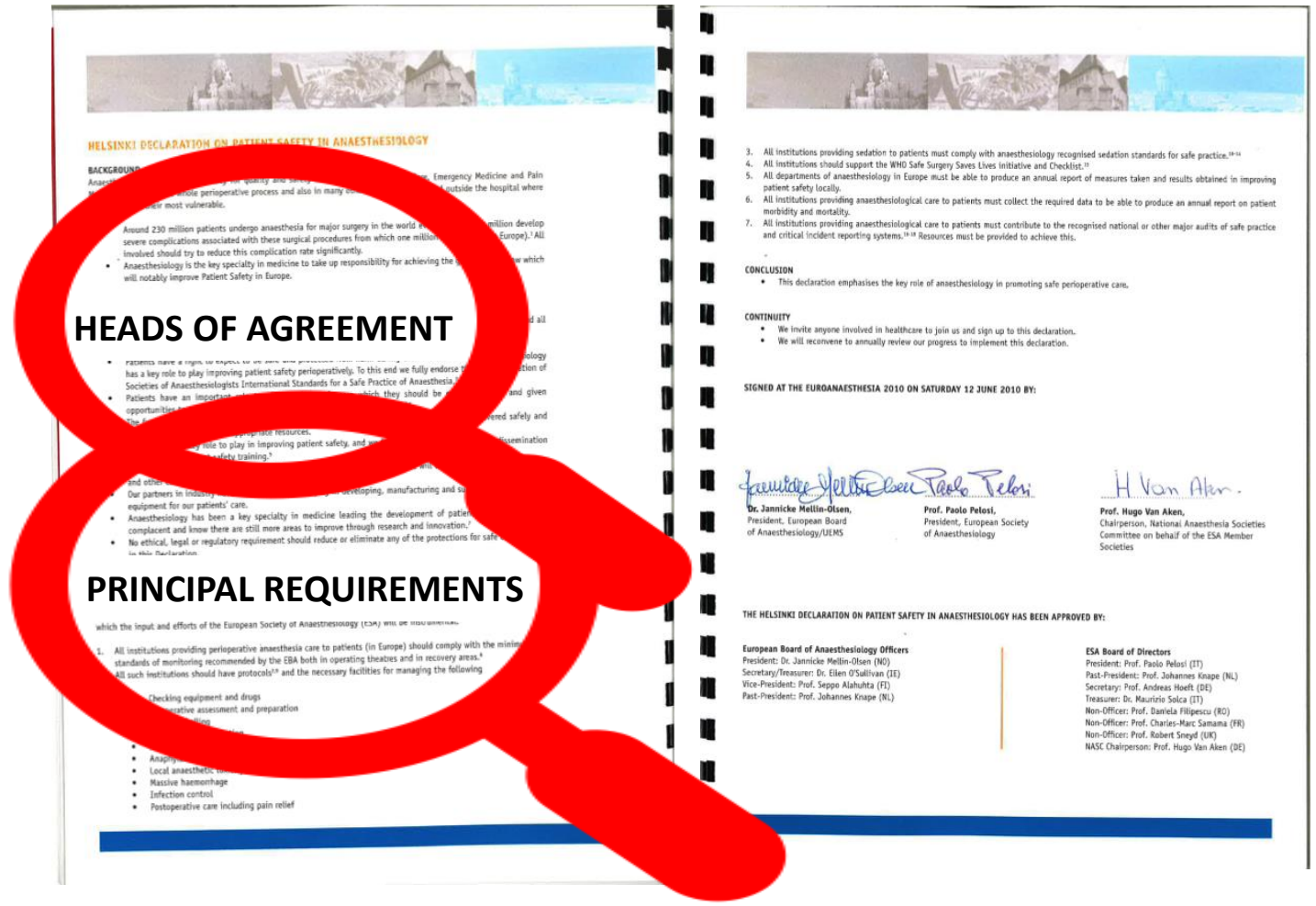


HELSINKI DECLARATION
on Patient Safety in Anaesthesiology

(Abbreviated in this presentation as "**HD**")

1. Mellin-Olsen J, et al. Eur J Anaesthesiol 2010;27(7):592-7.
2. https://www.esahq.org/patient-safety/patient-safety/helsinki-declaration/full-declaration/

Heads of Agreement - Principal Requirements



Principal Requirements – "Bundle of Practice Tools"

„**1**. All institutions providing perioperative anaesthesia care to patients (in Europe) should comply with the **minimum standards of monitoring** recommended by the **EBA** both in operating theatres and in recovery areas.“[1,18]

„**2**. All such institutions should have **protocols**[19,20] and the necessary **facilities** for managing the following

- **Preoperative assessment and preparation**
- **Checking Equipment and drugs**
- **Syringe labelling**
- **Difficult/failed intubation**
- **Malignant hyperpyrexia**
- **Anaphylaxis**
- **Local anaesthetic toxicity**
- **Massive haemorrhage**
- **Infection control**
- **Postoperative care including pain relief**“

„**3**. All institutions providing sedation to patients must comply with anaesthesiology recognised **sedation standards** for safe practice.[21-25]“

„**4**. All institutions should support the WHO Safe Surgery Saves Lives initiative and **Checklist**.[26]“

„**5**. All departments of anaesthesiology in Europe must be able to produce an **annual report** of measures taken and results obtained in **improving patient safety locally**.“

„**6**. All institutions providing anaesthesiological care to patients must **collect the required data** to be able to pro-duce an **annual report on patient morbidity and mortality**.“

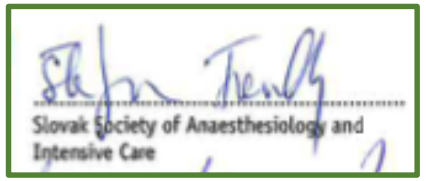
„**7**. All institutions providing anaesthesiological care to patients must contribute to the recognised national or other **major audits of safe practice** and critical incident **reporting systems**. Resources must be provided to achieve this.“

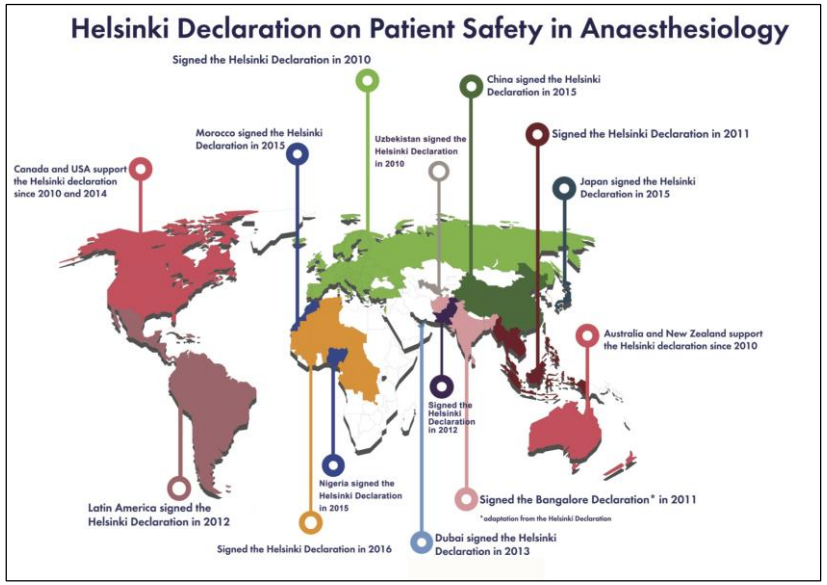
1. Mellin-Olsen J, et al. Eur J Anaesthesiol 2010;27(7):592-7.

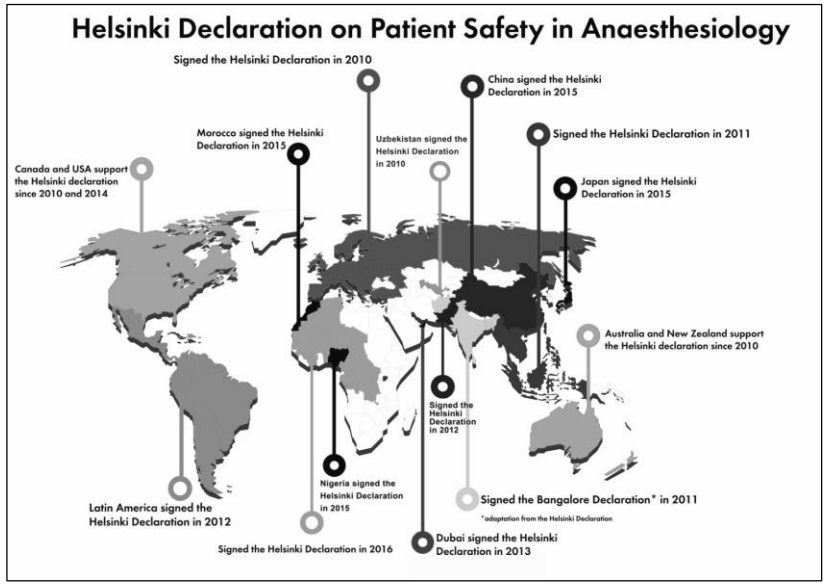
How well has the HD been adopted?

Has been signed, adopted and supported by national societies of anaesthesiology worldwide.

But has it also been implemented...?







Evaluation of the extent of implementation of the Helsinki Declaration for Patient Safety in anaesthesiology: a mixed-methods action research project

HELSINKI DECLARATION
on Patient Safety in Anaesthesiology

Lancaster Patient Safety Research Unit

University Hospitals of Morecambe Bay NHS Foundation Trust

Industry Partner Support

- **Fresenius-Kabi**
- **Masimo**
- **Philips**
- **Nihon-Kohden**

- Phase I
  - Online survey of ESA members about HD implementation (submitted to EJA)
  - Telephone interviews with national leaders in anaesthesiology
- Phase II
  - On-site visits: Documentary analysis; focused, in-depth interviews

EJA

Eur J Anaesthesiol 2019; **36:**946–954

ORIGINAL ARTICLE

Patient safety and the role of the Helsinki Declaration on Patient Safety in Anaesthesiology

A European survey

Henry H.L. Wu, Sharon R. Lewis, Mirka Čikkelová, Johannes Wacker and Andrew F. Smith

1589 responses (33.4% response rate; 38 countries)

Monitoring (SaO2/NIPM/ECG/Capno)	**96-99.6%**
CIRS	**78.7%**
WHO Safe Surgery checklist	**78.4%**
Protocols	**72-93%**
Morbidity and mortality reports	**55.7%**
Annual safety reports	**37.3%**

Wu HHL et al. Eur J Anaesthesiol. 2019;36(12):946-954.

A "HD – Checklist" for anaesthesiologists...

- HD requirements – implemented?
- "HD checklist" – walk your department

Checklist HD PRINCIPAL REQUIREMENTS

Hospital Check without reading 60 pages of references!!	Protocols	Facilities	Comments: local/ESA
(Heads of Agreement:WFSA International Standards for a Safe Practice of Anaesthesia.[1])			What is "required"? Update Reference[2]
01 Comply with minimum standards of monitoring recommended by the EBA (OR / recovery).[3] 1. Anaesthesia: SpO2, NIBP, ECG, O2/CO2/vapour analyzers, Airway pressure, nerve stim, Temp, Stethoscope 2. Recovery: SpO2, NIBP, ECG, (CO2), nerve stim., Temp	✓ (✓)	✓ (✓)	EBA reference: Update EBA reference (planned 2018) No nerve stim.: Recov
02 Should have protocols[3,4], and the necessary facilities for managing the following	Protocols	Facilities	Vague ; update ref. Tiring to find (intranet)
2.1. Preoperative assessment and preparation	✓	✓	Details?
2.2. Checking Equipment and drugs	✓	(✓)	Details? Cardio; revision
2.3. Syringe labelling	✓	✗	Details? Cardio; revision
2.4. Difficult/failed intubation	✓	✓	Details?
2.5. Malignant hyperpyrexia	✓	(✓)	Details? Dantrolen stocks
2.6. Anaphylaxis	✓	✓	Details?
2.7. Local anaesthetic toxicity	✓	✓	Details?
2.8. Massive haemorrhage	✓	✓	Details?
2.9. Infection control	✓	✗	Details? Only preop AB
2.10. Postoperative care including pain relief	✗	(✓)	Details? Definition POC?
03 Instit. providing sedation: comply with anaesth. recognised sedation standards for safe practice.[5-9]	(✓)	(✓)	Update! Instituted; Documentation?
04 Support WHO SSSL initiative and Checklist.[10]	✓	✓	
05 Annual safety report: measures taken and results obtained in improving patient safety locally.	✗	✗	E.g., ESA Report Template[a)]
06 Collect the required data to be able to produce an Annual report on patient morbidity and mortality.	✗	✗	Definition? Definition?
07 Contribute to recognised Audits of safe practice and Critical incident reporting systems. Resources must be provided to achieve this.	✓	✓	Why "or"? Different instruments

[a)] ESA Safety Report Template: https://www.esahq.org/patient-safety/patient-safety/safety-report

A case from the Spanish SENSAR reporting system

Case: inadequate difficult airway management

Spanish Incident Reporting System SENSAR[1]:

- Woman planned for parathyreoidectomy
- Preanaesthesia assessment: fiberoptic intubation recommended!
- *Obese, OSAS/CPAP, Mall. IV, arthrodesis C6-7, history difficult airway...*
- OR: direct laryngoscopy chosen – difficult (Cormack & Lehane grad IV)!
- Videolaryngoscopy: Difficult, several attempts, eventually successful...

1. [Inadequate management of a difficult airway] Rev Esp Anestesiol 2015;62(6):e1-4.
2. Mellin-Olsen J, et al. Eur J Anaesthesiol 2010;27(7):592-7. 3. https://www.esahq.org/

Case, SENSAR[1]:

- mucosal injuries to tongue
- Sutured before extubation
- Factors: (...) no difficult airway protocols!
- Actions: implementation of difficult airway protocol, staff information, airway training

1. [Inadequate management of a difficult airway] Rev Esp Anestesiol 2015;62(6):e1-4.

Case: inadequate difficult airway management

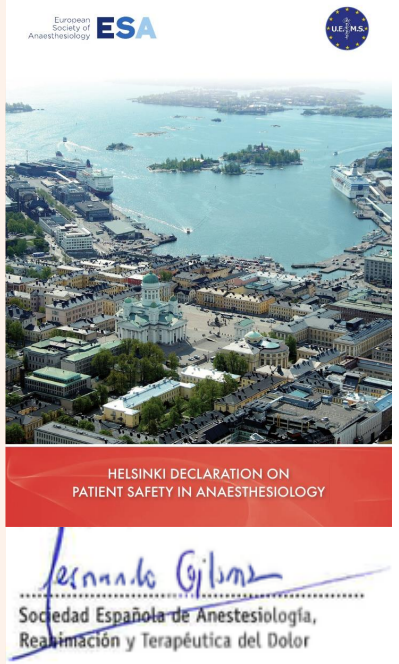
The HD[2] - signed by SEDAR on June 12, 2010! Requirements:

Contribution to CIRS[2]	(✓)[1]
Protocols - preop. assessment/preparation[2]	(✓)[1]
Medical record/form of preoperative risks[2,4]	(✗)[1]
Protocols for difficult/failed intubation[2]	✗[1]
Training/verification: equipment use[2,4]	(✗)[1]??

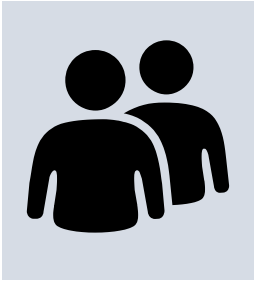
Inexperience,[1] inadequate size of videolaryngoscope[1]

Feedback <u>from</u> patient[2] (patient-centeredness) (✗)[1]

only <u>to</u> patient: lesions "minor"[1]



1. [Inadequate management of a difficult airway] Rev Esp Anestesiol 2015;62(6):e1-4.
2. Mellin-Olsen J, et al. Eur J Anaesthesiol 2010;27(7):592-7
3. https://www.esahq.org/ 4. Merry AF et al. Can J Anaesth. 2010;57(11):1027-1034



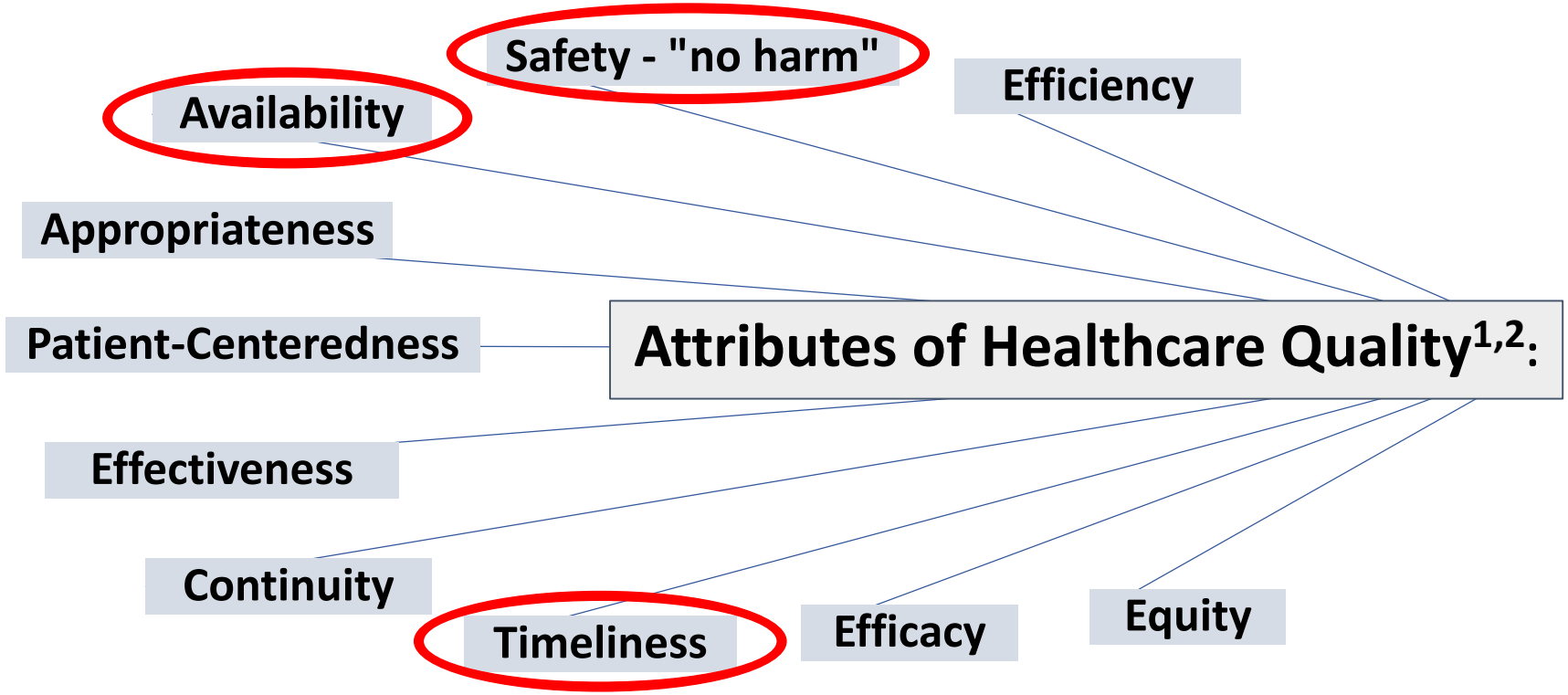
How to improve...??

- What else would you do if this was your department?
- Would you collect data to monitor success? Which?

A problem of ... safety?

A problem of ... quality??

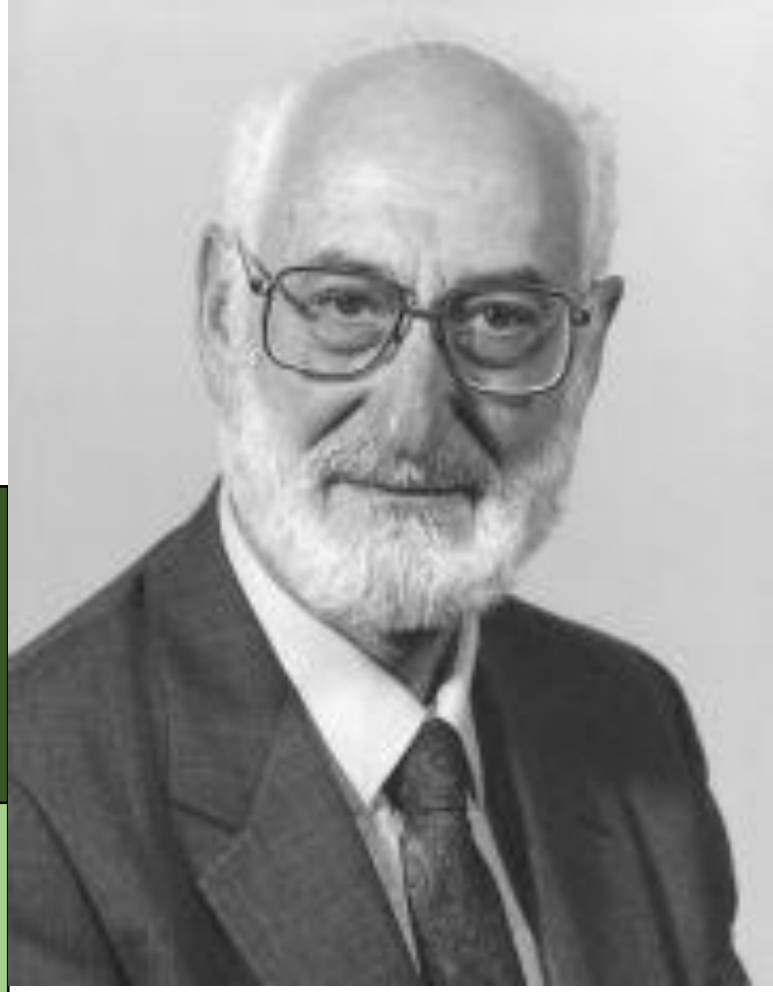
"Safety" is one attribute of "Quality"



1. IoM. Crossing the quality chasm. Washington, D.C.: National Academy Press; 2001
2. Haller G et al., Anesthesiology. 2009;110(5):1158-1175.

Dimensions of health care quality

Dimensions of Quality (A. Donabedian, 1966[1])		
Structure (Framework)	**Process** (Activities)	**Outcome** (Results)



Avedis Donabedian
1919 - 2000

1. Donabedian A., The Milbank Memorial Fund Quarterly. 1966;44(3):Suppl:166-206.
Picture: https://www.managedcaremag.com/archives/2017/1/missing-ingredient-quality-measurement

"Value" - importance of relevant patient outcomes

Michael E. Porter – „Value in Health Care“:

$$\text{Value} = \frac{\text{Health outcomes that matter to patients}}{\text{Costs of delivering those outcomes}}$$

"... outcomes that matter to patients..."[2]

1. Porter ME. NEJM 2010;363(26):2477-2481; 2. Porter ME et al. NEJM 2016;374(6):504-506.

http://www.pathreport.org/single-post/2015/08/09/Cost-Reduction-Opportunities-in-Health-Care-The-Pathologists-Role
http://asa-365.ascendeventmedia.com/anesthesiology-2016-daily/porter-focus-on-value-for-patients-will-transform-health-care

Measuring patient safety and quality

„Incident Reporting“ *(qualitative)*
*„**Nature** of problems“; anonymous; e.g., CIR[1,3,4]*

„Quality Reporting“ *(quantitative)*
*„**Extent** of problems“[1] – **outcomes that matter to patients**[2]*

„Safety Culture Survey“
*Quantitative „**staff perception**“; SC correlates with M&M[5-6]*

„Patient's safety-related reports (PSR) “
*„**Patient's perception**“; correlates with actual harm[7-8]*

1. Haller G et al., Anesthesiology. 2009;110(5):1158-1175. 2. Porter ME et al. NEJM 2016;374(6):504-506.
3. Pfeiffer Y et al. 2010;19 (6):e60. 4. Staender S, Best Pract Res Clin Anaesthesiol. 2011;25(2):207-214. 5.
Davenport DL et al. J. Am. Coll. Surg. 2007;205(6):778-784. 6. Birkmeyer NJ et al. Ann Surg. 2013;257(2):260-265.
7. Bjertnaes O et al.: J Int Soc Qua 2015;27(1):26-30. 8. Lawton R et al.: BMJ quality & safety. 2015;24(6):369-376.

ESA QUALITY INDICATOR PROJECT

Preliminary Analysis

Number	Question	YES	NO	%
1	Does your NAS provide a set of QI or a quality data collection system to its members?	11	24	31
2	Is the collection of quality data mandatory for anaesthesiologists in your country?	5	30	14

Two common pitfalls

1. Using CIR rates as trend marker for patient safety (lack of denominator)

2. Relying on self-reported data as safety marker (underreporting)

AQUA – Swiss anesthesia quality data collection system

A) Departmental structure data: number of services/year, facilities, staffing

B) Patient Data: services provided; preoperative risk, intraoperative/postop. events

http://www.sgar-ssar.ch/qualitaetsmanagement-inkl-a-qua-ch/kommission-fuer-daten-und-qualitaet-kdq-a-qua-ch/

Conclusions

- Patient safety activities target avoidable patient harm
- Perioperative patient harm is frequent – about 50% preventable
- FTR – increasingly regarded as perioperative quality indicator
- To improve PSQ locally, local measurement is needed
- The "Helsinki Declaration on PS in Anaesth." provides basic PSQ standards

Thank you for your attention!

jwac@gmx.net / johannes.wacker@hirslanden.ch

SAVE THE DATE

BARCELONA | MAY 29, 2020

The International Forum on Perioperative Safety & Quality (ISQ) supports and energizes the movement for health care improvement while bringing together leaders and practitioners committed to improving outcomes for patients and communities.

Keynote Speaker

Dr Jannicke Mellin-Olsen (Norway), President WFSA

"The global burden of perioperative patient harm – current priorities for action"

INTERNATIONAL FORUM ON PERIOPERATIVE SAFETY & QUALITY

BARCELONA | MAY 29, 2020

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American Society of Anesthesiologists™

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Can measurement & reporting improve care?

1. Monitor local variation:

   Failed plexus blocks[1]

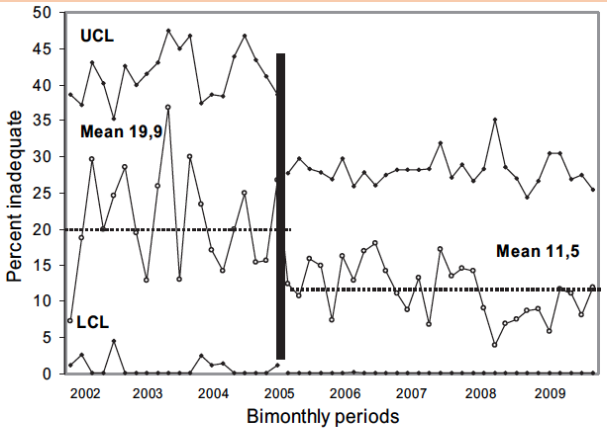


Fig. 2. Frequency of inadequate brachial plexus blocks. Data are presented with a new stable process after intervention (black vertical line) UCL = Upper Control Limit, LCL = Lower Control Limit.

2. Positive effect of reporting on perioperative M&M:

   Maintaining perioperative **normothermia** (quality metric)[2]

   Surgical outcome **reporting** (NSQIP)[3,4]

1. Gisvold (2011) Best Pract Res Clin Anaesth 25(2):109-22; 2. Scott AV et al.: Anesthesiology 2015, 123(1):116-125; 3. Maggard-Gibbons M., in: Making Health Care Safer II. AHRQ, 2013:140-157; 4. Shekelle PG et al. Ann Int Med 2013;158(5 Pt 2):365-368.

EuSOS study, 2012

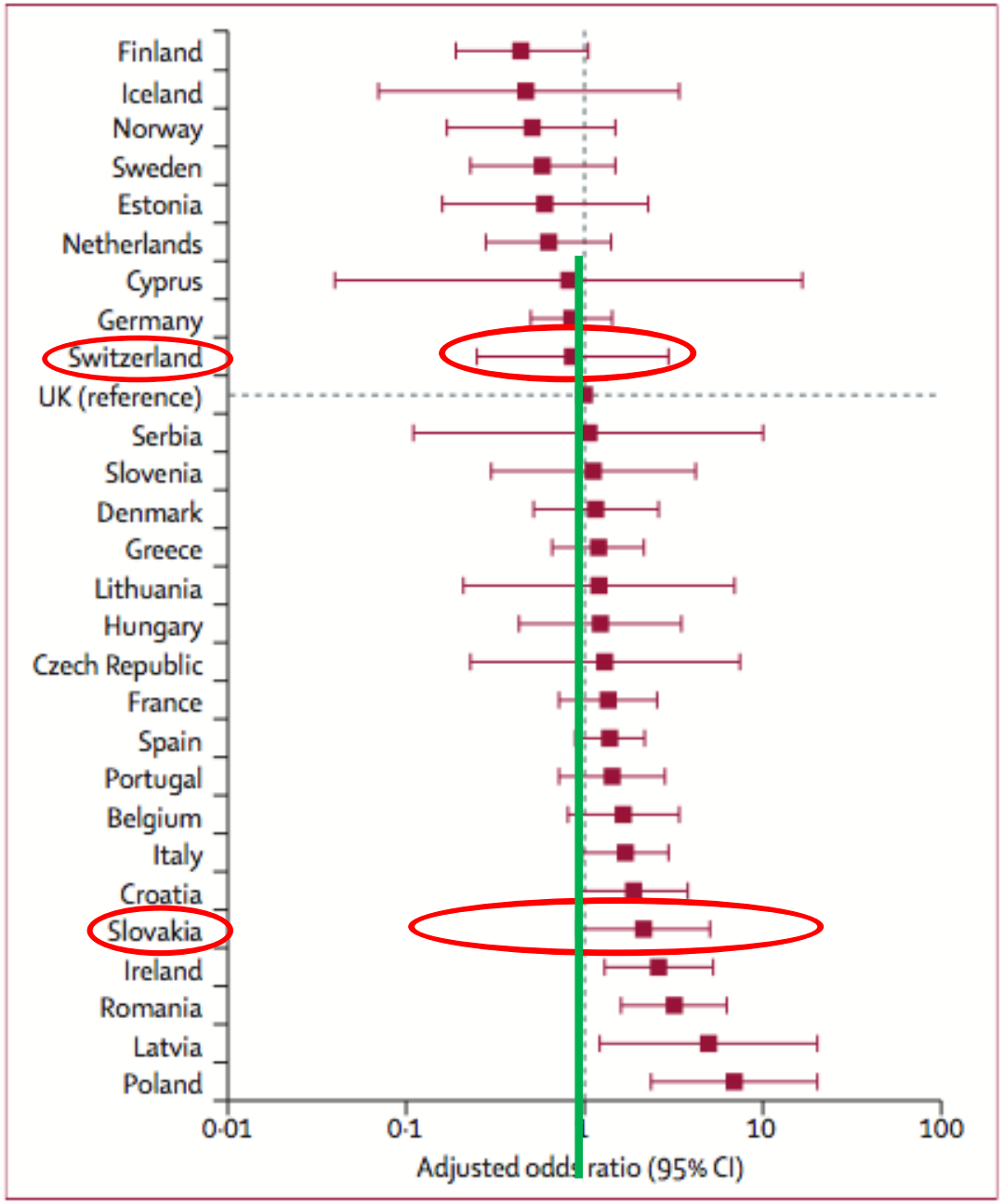
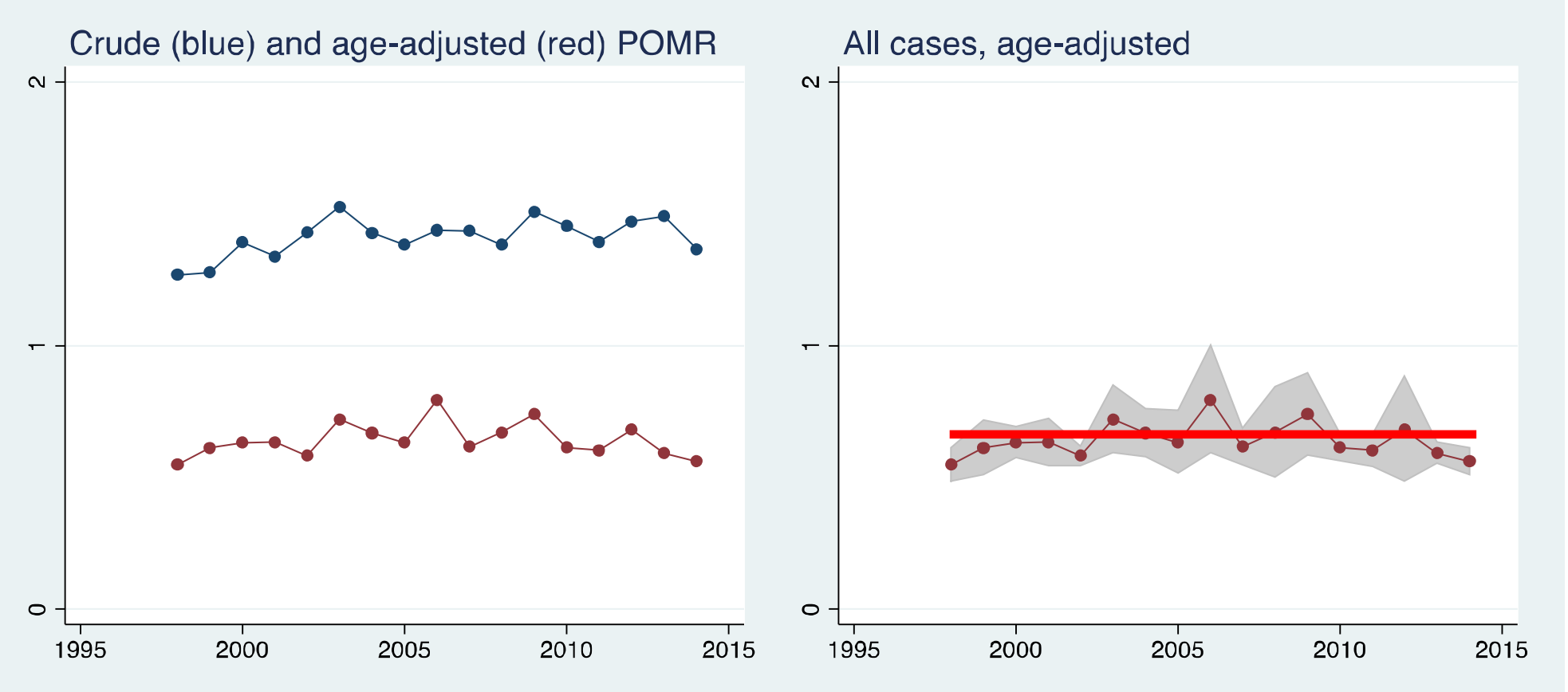


Figure 3: **Adjusted odds ratio for death in hospital after surgery for each country**

Pearse R.M. et al,
Lancet 2012; 380: 1059 - 65

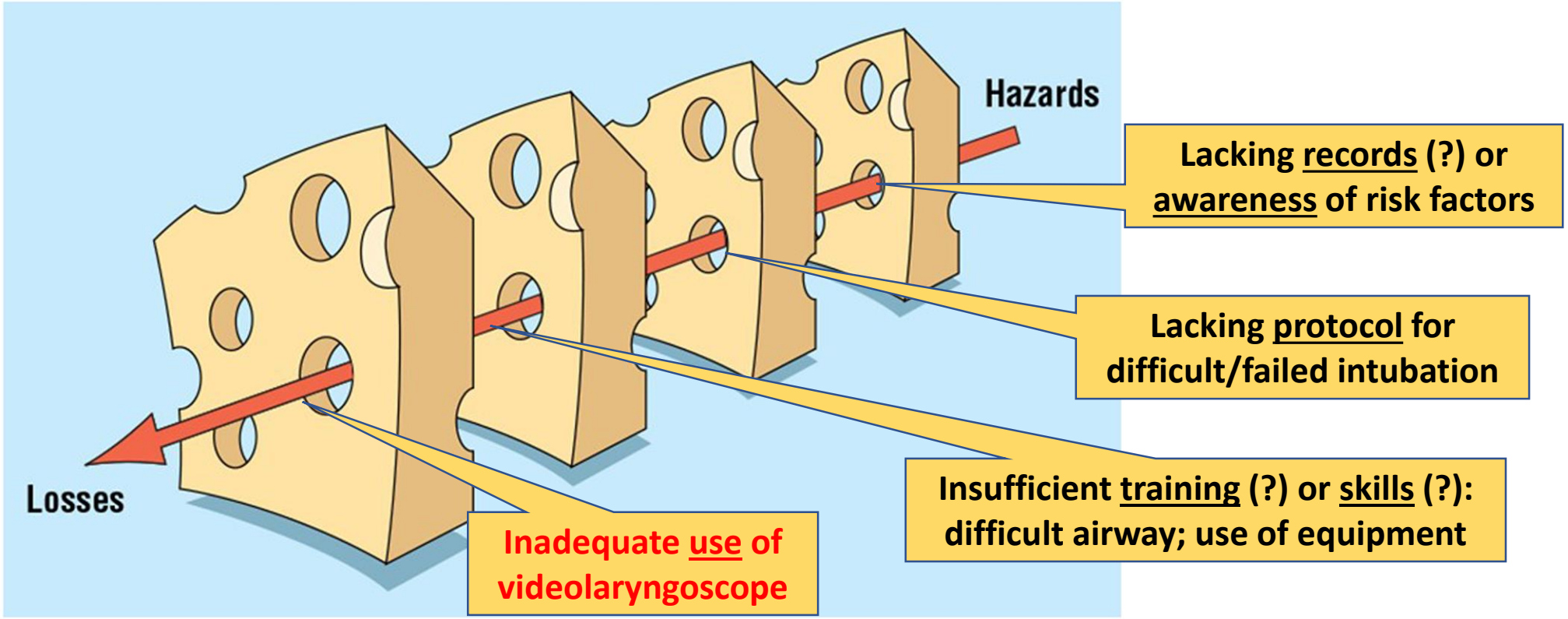
Perioperative mortality rates 1998-2014

Data: Swiss Federal Office of Public Health, 1'561'012 cases, 22 operation types



Based on: Wacker J, Zwahlen M, Swiss Med Wkly 2019;149:w20034

James Reason's "Swiss Cheese Model"



Seshia, Shashi S. et al. Journal of Evaluation in Clinical Practice. 2018;24(1):187-197

Three groups of barriers to PSQ reporting – and strategies to overcome them

1

Practical working conditions:

Systems complex, definitions not clear
Lack of time,[1,2,5] additional work,[1,2,5,6] interruptions/noise[2,7]

Unburden staff – delegate tasks!

Checks/data entry: 15-25hrs/week[14,15]
Automated data export: check![13.18]
Challenge: Workload, distractions

2

Instit. culture, data management:

Concerns of legal actions,[2,3] blame,[4,8] being assessed by data;[4,9]
No feedback about data/results[1,2,3,8,10,11]

Departmental culture, feedback!

Collaborative, non-punitive culture[18]
Use data in M&M meetings[8,16,17]
Check data quality!

3

General beliefs and attitudes:

Lacking belief that reporting actually improves PSQ
Physicians more sceptical than nurses[2,12]

Education, professional advocacy!

Education has impact on attitudes, duration?[19,20]
Profess. societies: Standards, support

1. Evans (2006) QSHC 15(1):39-43
2. Pfeiffer (2010) QSHC 19(6):e60
3. Mahajan (2010) BJA 105(1):69-75
4. Smith (2006) BJA 96(6):715-2
5. Haller (2011) BJA 107(2):171-9
6. Vincent (1999) J Ev Clin Pract 5(1):13-21
7. Wacker (2015) BMC Anesth 15:13
8. Heard (2012) Anesth Analg 114:604-14
9. Cohen (2000) BMJ 320:728-9
10. Benn (2012) BJA 109(1):80-91
11. Gaba (1994) Anesthesiology 81(2):488-500
12. Katz (2000) Anesth & Analg 90(2):344-50
13. Lesser (2003) Anesthesiology 2003;99:859-66
14. Gisvold (2011) BPR Clin Anae 25(2):109-22
15. Fasting (1996) Acta An Scand 40(10):1173-83
16. D'Lima (2015) J Health Serv R&P 20(1S):26-34
17. Fasting (2002) Can J Anesth 49(6):545-53
18. Grant (2008) Anaesth Int Care 2008;36:222-9
19. Jericho (2010) J Grad Med Ed 2:188-94
20. Coyle (2005) QSHC 2005;14:383-8.

QI overview – concepts and steps

Input – e.g., from **audit** (external evaluation)

PDCA:[1]
Plan: Recognize opportunity - plan a change.
Do: Test the change (small-scale study)
Check: Review test, analyze results - what have you learned?
Act: Take action based on what you learned in the study step.

Change management

QI charter (project plan)[2]

1.https://asq.org/quality-resources/pdca-cycle
2. http://canmeds.royalcollege.ca/en/tools

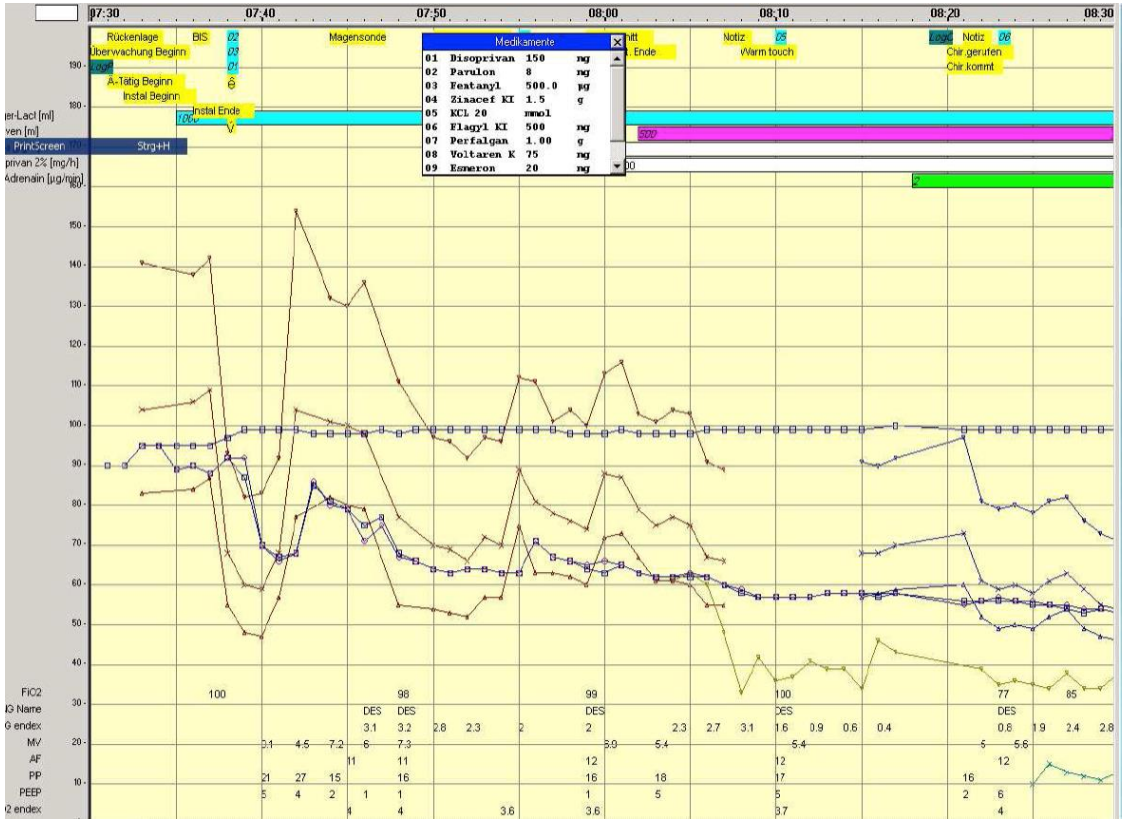
Perioperative quality indicators (QI)

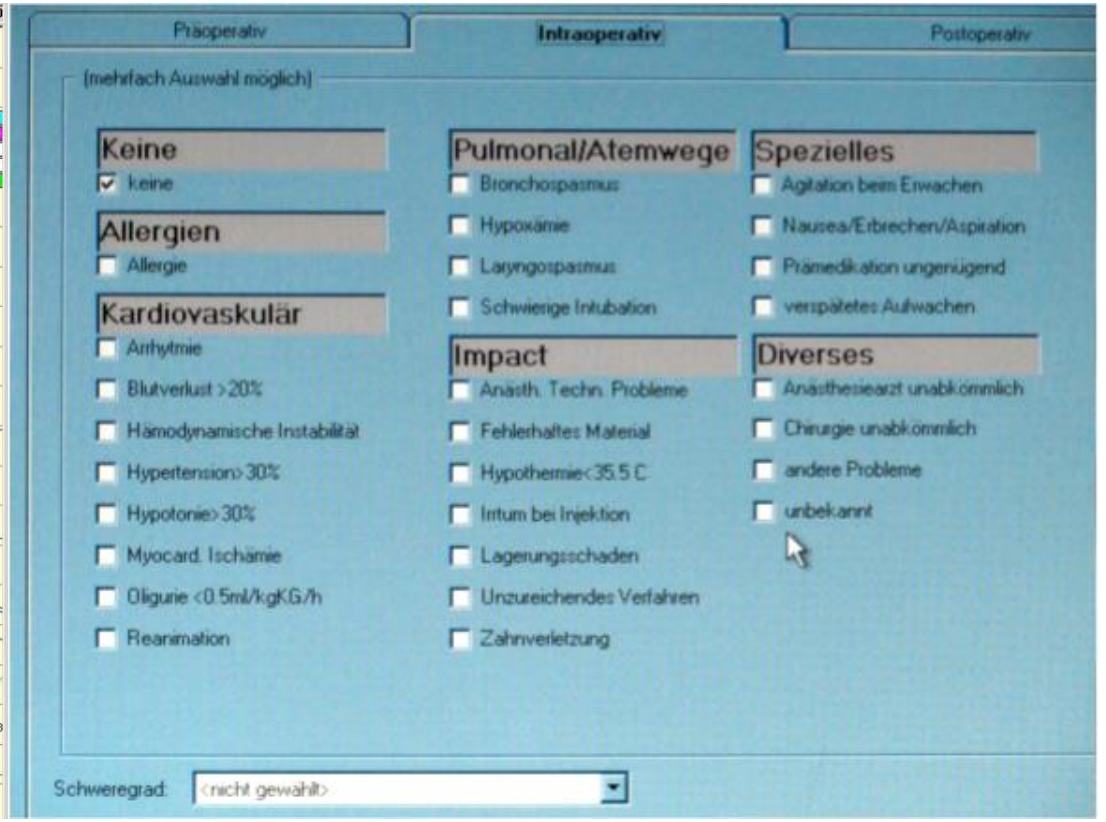
"*Measures are the lenses through which we quantitatively determine quality.*"[1]

- **Definition**: "...*explicit measure (defined by the developer) of some aspect of patient clinical care used to judge a particular clinical situation and indicate whether the care delivered was appropriate.*"[2]
- **No gold standard** to measure quality of care[2]
- Majority of perioperative Q/S indicators **not** supported by high grade evidence.

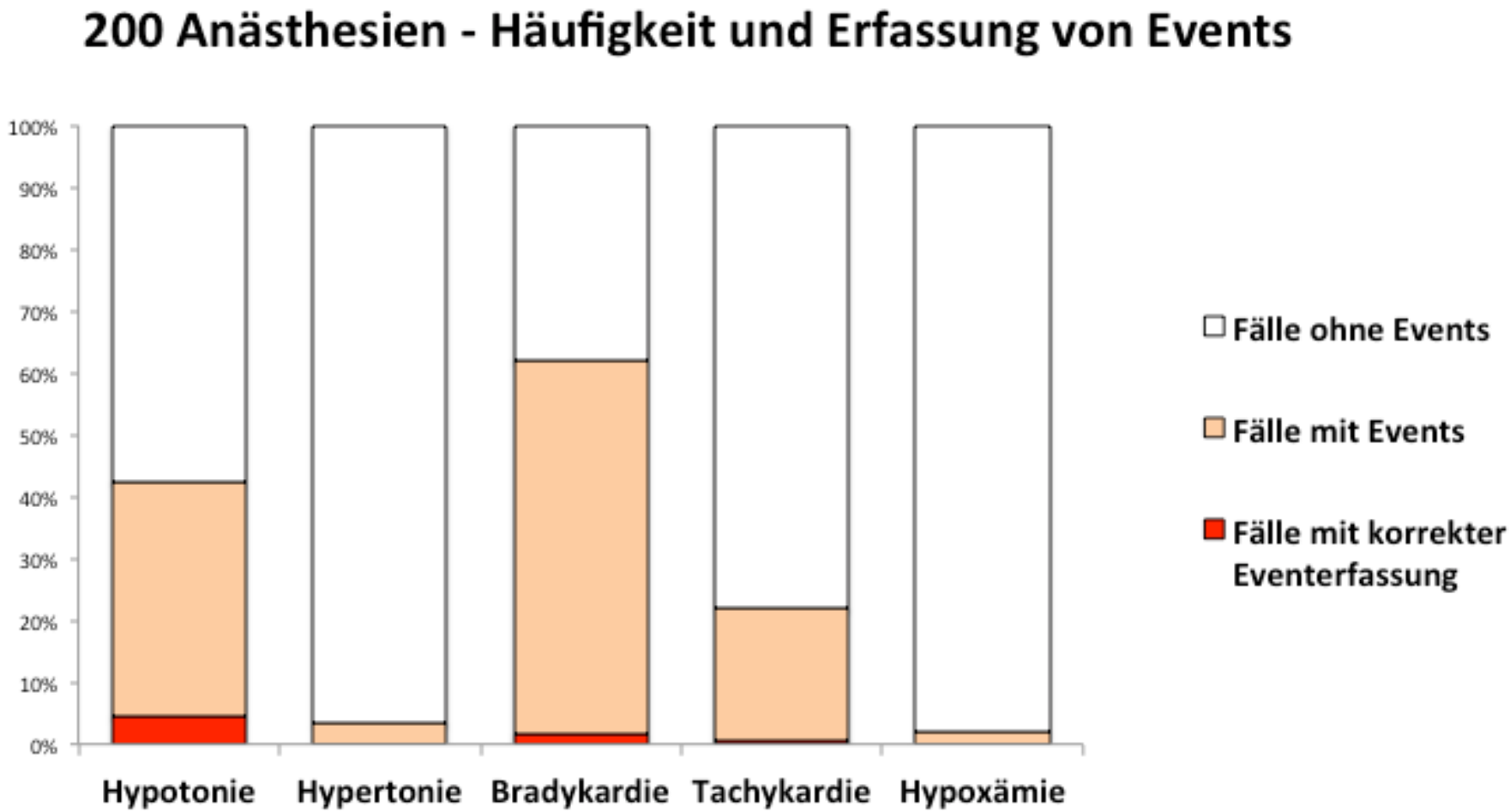
1. Pronovost PJ et al. Lancet 2004;363(9414):1061-1067.
2. Chazapis M et al. BJA 2018;120(1):51-66
3. Haller G et al., Anesthesiology. 2009;110(5):1158-1175

So where are the difficulties of reporting?





Kennerly (2014) Health Serv Res doi:10.1111/1475-6773.12163; 2. Rutberg (2014) BMJ open 4(5):e004879; 3. Benson (2000) J Clin Monit Comput 16:211-7; 4. Benson (2000) 77:925-9; 5. Pfeiffer (2010) QSHC 19(6):e60; 6. Wacker (2015) BMC Anesth 15:13



Wacker J et al. Conference Poster, 2011; Basel, Switzerland