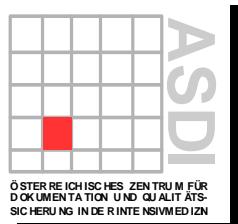


# **Qualitätsvergleiche in der Intensivmedizin**

**Chance für Patienten oder bürokratische Hürde?**

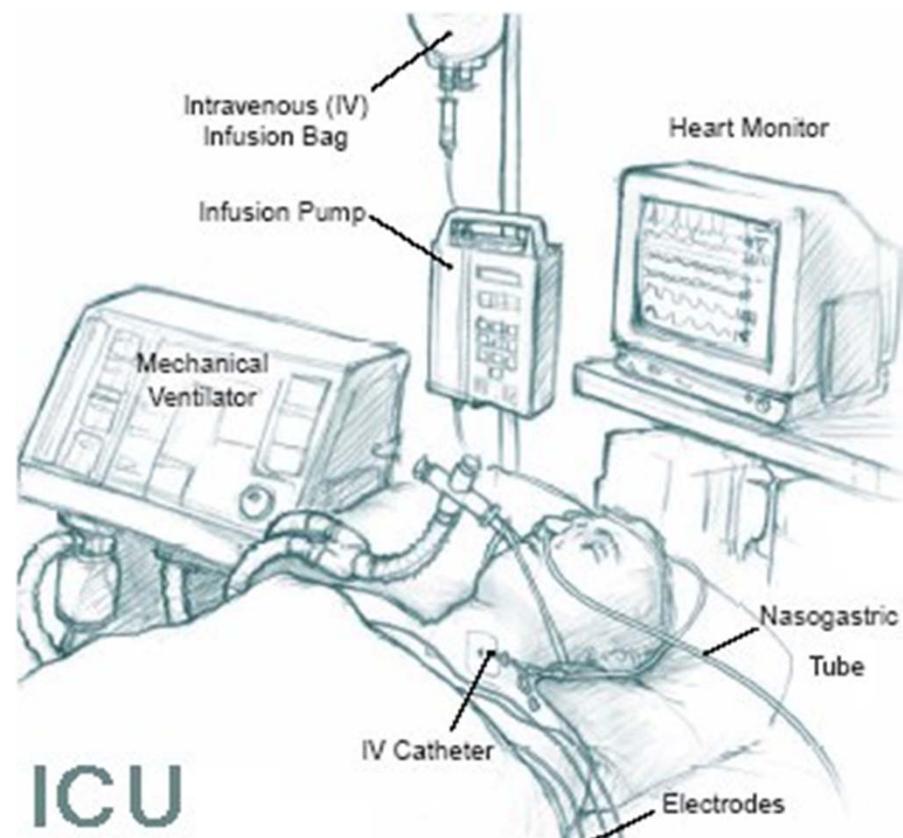
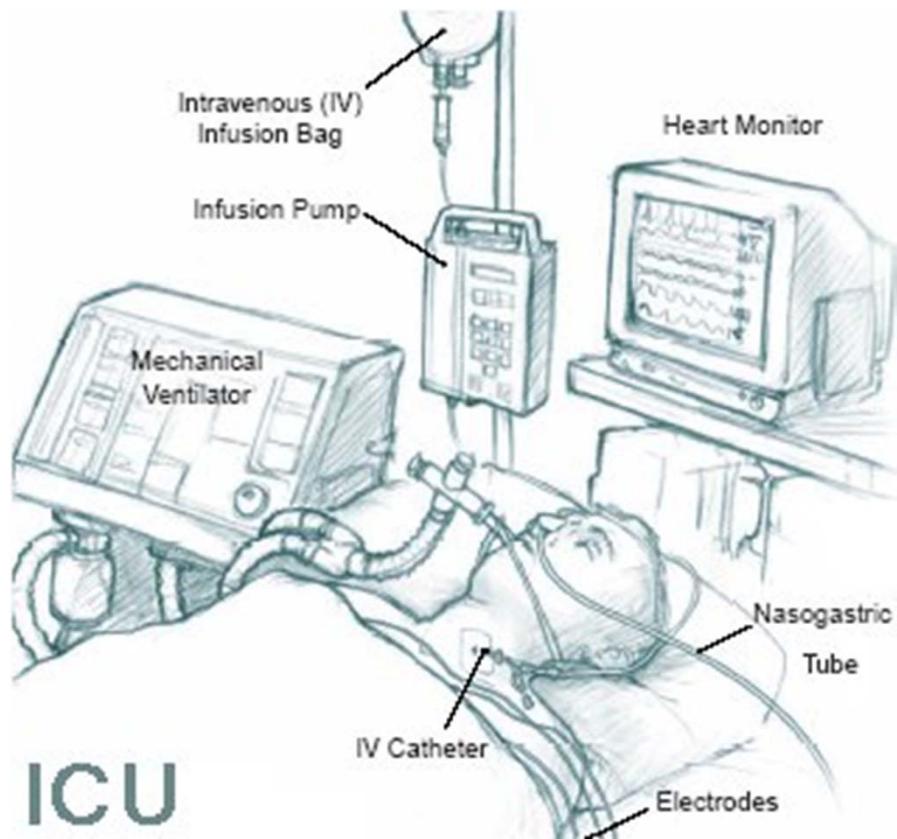
**Univ. Prof. Dr. A. Valentin, MBA  
Innere Medizin, KH Schwarzach, Salzburg  
[andreas.valentin@kh-schwarzach.at](mailto:andreas.valentin@kh-schwarzach.at)**



**KARDINAL  
SCHWARZENBERG'SCHES  
KRANKENHAUS** Betriebsgesellschaft m.b.H.



# Qualitätsvergleich



WOZU ?

# What is Quality ?

“the degree to which health services increase the likelihood of **desired health outcomes** and are consistent with current professional knowledge”

## Institute of Medicine, 1990

$$\text{Quality} = \frac{\text{Results}}{\text{Objectives}}$$

# Quality Indicators

# **Qualitätsanspruch an das Gesundheitssystem**

- Unabhängig von Zeitpunkt und Ort, sozialen Status, Geschlecht,.....
- Gewährleistung einer Behandlung
  - nach aktuellen Standards
  - zeitgerecht

# Quality Indicator Domains

- **Structure**  
**what you need** vs what is provided
- **Process**  
**what you should do** vs. what you do
- **Outcome**  
**what you expect** vs. what you find

# ESICM task force on safety and quality

	<b>Domain</b>	<b>Description</b>	<b>Standard</b>
1	Structure	ICU fulfils national requirements	Yes
2	Structure	Presence of a consultant level intensivist 24 h/day	100%
3	Structure	Adverse event reporting system	100%
4	Process	Presence of routine multidisciplinary clinical ward rounds	100%
5	Process	Standardized Handover procedure for discharging patients	100%
6	Outcome	Reporting and analysis of SMR	Yes
7	Outcome	Readmission rate within 48 h of ICU discharge	4%
8	Outcome	Rate of CVC related blood stream infections	4 per 1000 days CVC
9	Outcome	Rate of unplanned extubations	10 per 1000 days intubation

# Use of Quality indicators in eight countries

QI according to Pronovost et al. <sup>7</sup>	Germany	The Netherlands	India	United Kingdom	Sweden	Spain	Scotland	Austria
1. Standardised mortality rate (SMR)	X	X	X	X			X	X
2. Measurement of patient/family satisfaction	X	X		X	X	X		
3. Ventilator-associated pneumonia		X		X	X	X		X
4. Intensive care unit (ICU) readmission rate			X	X	X			X
5. Central venous line infection rate			X	X			X	X
6. Length of stay in ICU		X	X					X
7. Monitoring of sedation	X					X		
8. Monitoring of analgesia	X					X		
9. Duration of mechanical ventilation		X						X
10. Multiresistant bacteria in the ICU					X			
11. Occurrence of thromboembolism							X	
12. Inappropriate red blood cell transfusion							X	
13. Ulcus prophylaxis during mechanical ventilation							X	
14. Delayed ICU discharge								X
15. ICU length of stay $\geq$ 7 days								
16. Delayed ICU admissions								
17. Emergency department bypass hours								
18. Cancelled surgery								

Wahrnehmung des eigenen Tuns

Signalerkennung

Reflexion

# **Bridging the gap between perception and reality**

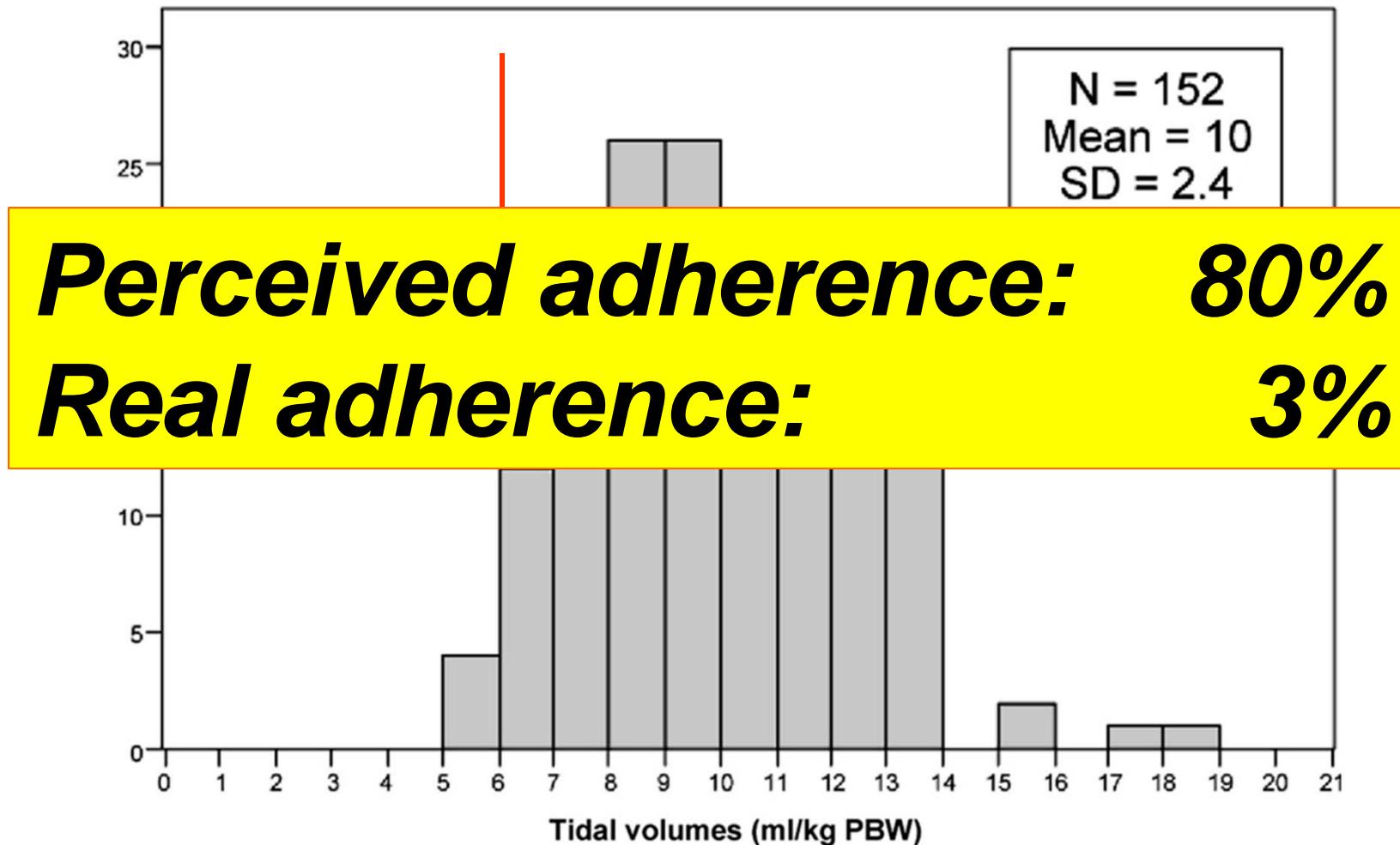


## Errors in administration of parenteral drugs in intensive care units: multinational prospective study

Andreas Valentin, associate professor<sup>1</sup>, director of intensive care unit,<sup>2</sup> Maurizia Capuzzo, consultant in anaesthesia and intensive care medicine,<sup>3</sup> Bertrand Guidet, professor,<sup>4<sup>5<sup>6</sup></sup></sup> Rui Moreno, professor,<sup>7</sup> Barbara Metnitz, statistician,<sup>8</sup> Peter Bauer, professor and head of core unit of medical statistics and informatics,<sup>8</sup> Philipp Metnitz, professor<sup>9</sup> on behalf of the Research Group on Quality Improvement of the European Society of Intensive Care Medicine (ESICM) and the Sentinel Events Evaluation (SEE) Study Investigators

	Events / 100 pt days	lower 95% CI	upper 95% CI
All	74.5	69.5	79.4
Wrong time	33.4	30.1	36.7
Missed medication	22.4	19.7	25.1
Wrong dose	10.2	8.4	12.0
Wrong drug	5.3	4.0	6.6
Wrong route	3.2	2.2	4.2

# Tidalvolume $\leq$ 6ml PBW in ARDS/AI: Lungprotective Ventilation in Reality



Brunckhorst F, Crit Care Med 2008



# Benchmarking



# Qualitätsindikatoren für Intensivstationen

Version Oktober 2008



- Anwesenheit eines Intensivmediziners
- Frühe enterale Ernährung
- Milde, Therapeutische Hypothermie nach Reanimation
- Registrierung von kritischen Ereignissen
- Verzögerte Entlassung von der IBS
- Beatmungsassoziierte Pneumonie
- Durchschnittliche Dauer der mechanischen Beatmung
- Durchschnittliche Länge des Aufenthaltes an der IBS
- Infektionsrate Zentralvenöser Katheter
- Mortalität beim schweren Schädel Hirntrauma
- Reintubationsrate
- Standardisierte Mortalitätsrate
- Ungeplante Wiederaufnahmen

# Quality Indicator Domains

- **Structure**

**what you need** vs what is provided

- **Process**

what you should do vs. what you do

- **Outcome**

what you expect vs. what you find



Intensive Care Med (2011) 37:1575–1587  
DOI 10.1007/s00134-011-2300-7

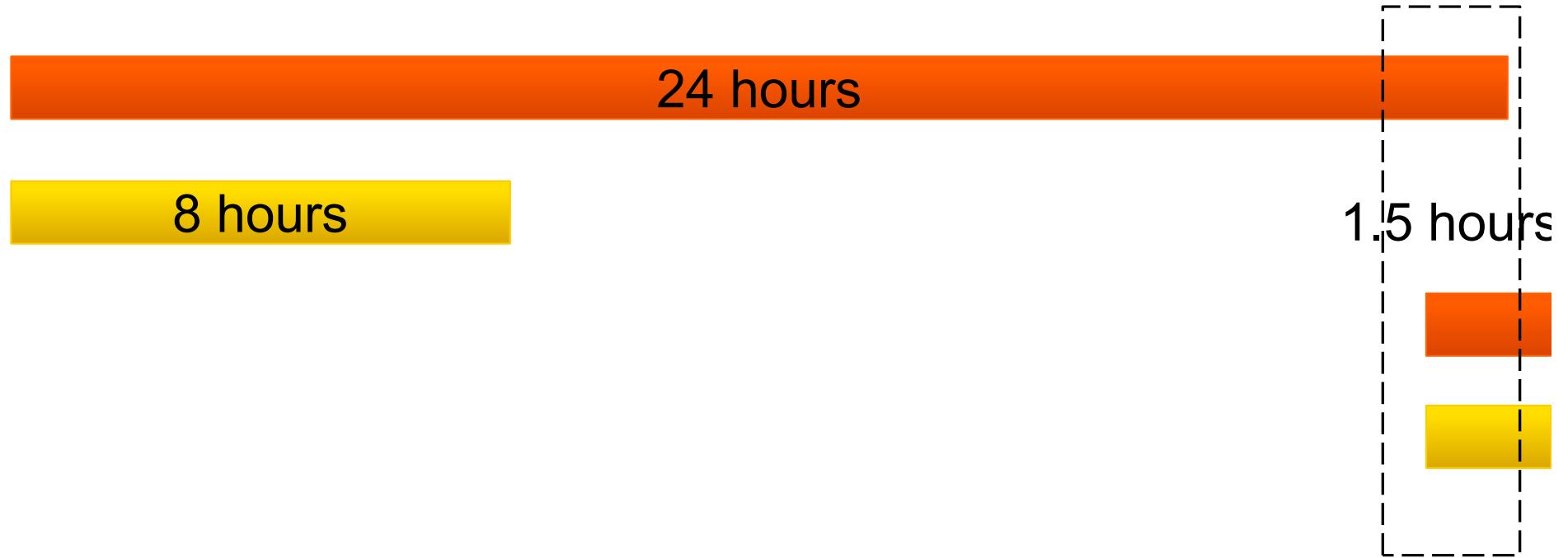
SPECIAL ARTICLE

Andreas Valentin  
Patrick Ferdinande  
ESICM Working Group  
on Quality Improvement

## **Recommendations on basic requirements for intensive care units: structural and organizational aspects**

Apostolos Armaganidis (Greece); Antonio Artigas (Spain); Simon V. Baudouin (UK); Geoff Bellingan (UK); Willehad Boemke (Germany); Jan Braun (Germany); Edoardo Calderini (Italy); Maurizia Capuzzo (Italy); Vladimir Cerny (Czech Republik); Akos Csomos (Hungary); Maria Deja (Germany); Ruth Endacott (UK); Kurt Espersen (Denmark); Patrick Ferdinande (Belgium); Armand R.J. Girbes (Netherlands); Bertrand Guidet (France); Kevin Gunning (UK); Anne B. Guttermosen (Norway); Moshe Hersch (Israel); Ken Hillman (Australia); Gaetano Iapichino (Italy); Michael Joannidis (Austria); Max Jonas (UK); Andrew Jones (UK); Nina Maguina (Greece); Paulo Maia (Portugal); Claude Martin (France); Paolo Merlani (Switzerland); Adam Mikstacki (Poland); Rui Moreno (Portugal); Pedro Navarrete-Navarro (Spain); Georg Ntoumenopoulos (UK); Roman Parežnik (Slovenia); Michael Pinsky (USA); Alessandro Protti (Italy); Christian Putensen (Germany); Michael Quintel (Germany); Radovan Radonic (Croatia); Andrew Rhodes (UK); Hans Ulrich Rothen (Switzerland); Esko Ruokonen (Finland); Michael Sander (Germany); Claudia Spiess (Germany); Dierk Vagts (Germany); Andreas Valentin (Austria); Dominique Vandijck (Belgium); Débora Feijó Vieira (Brasil);

# How many physicians do you need?

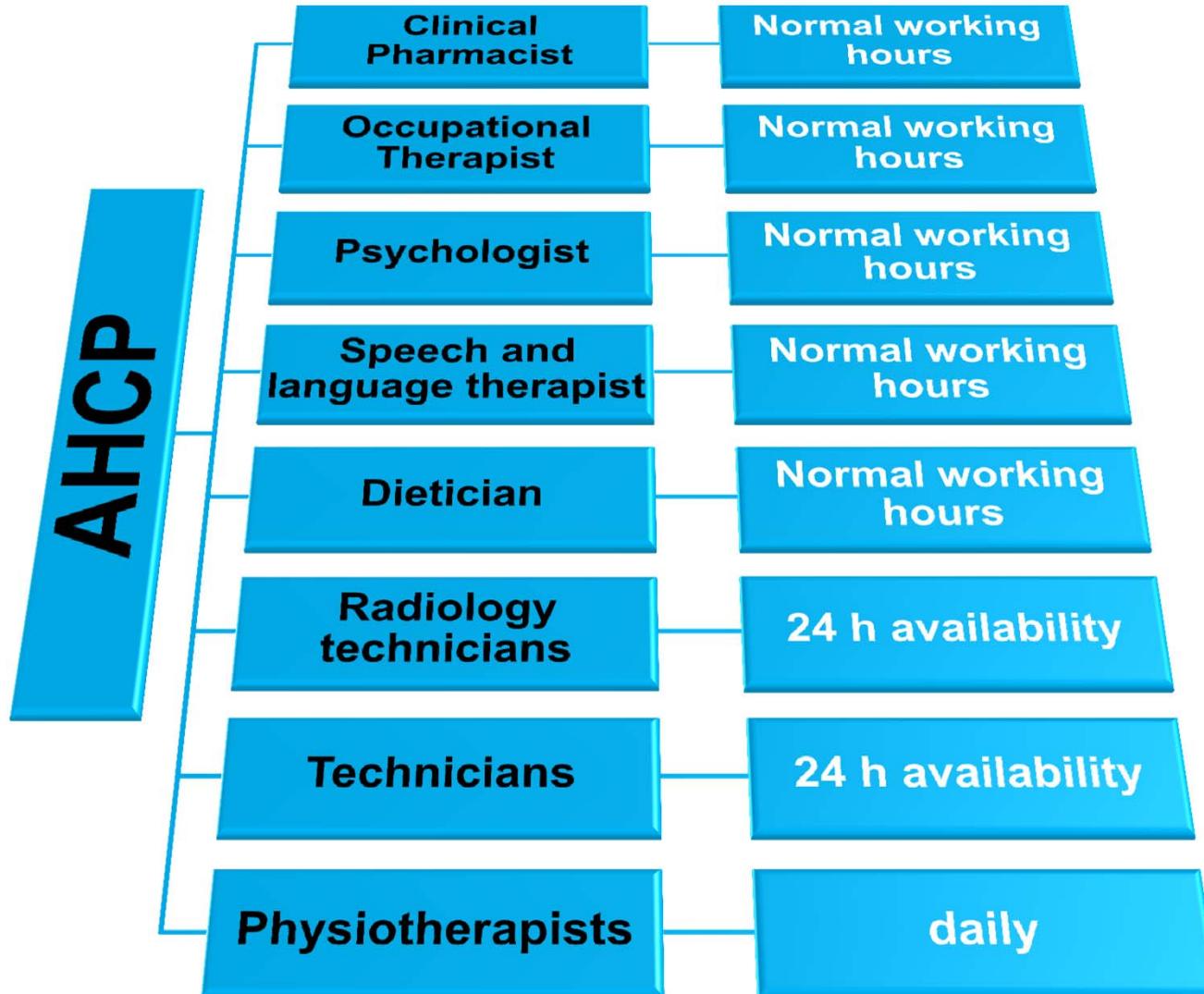


- Example for 6-8 bed ICU. Patients level II
- 33.5 working hours per day
- Physicians: 7.1 Full time equivalents

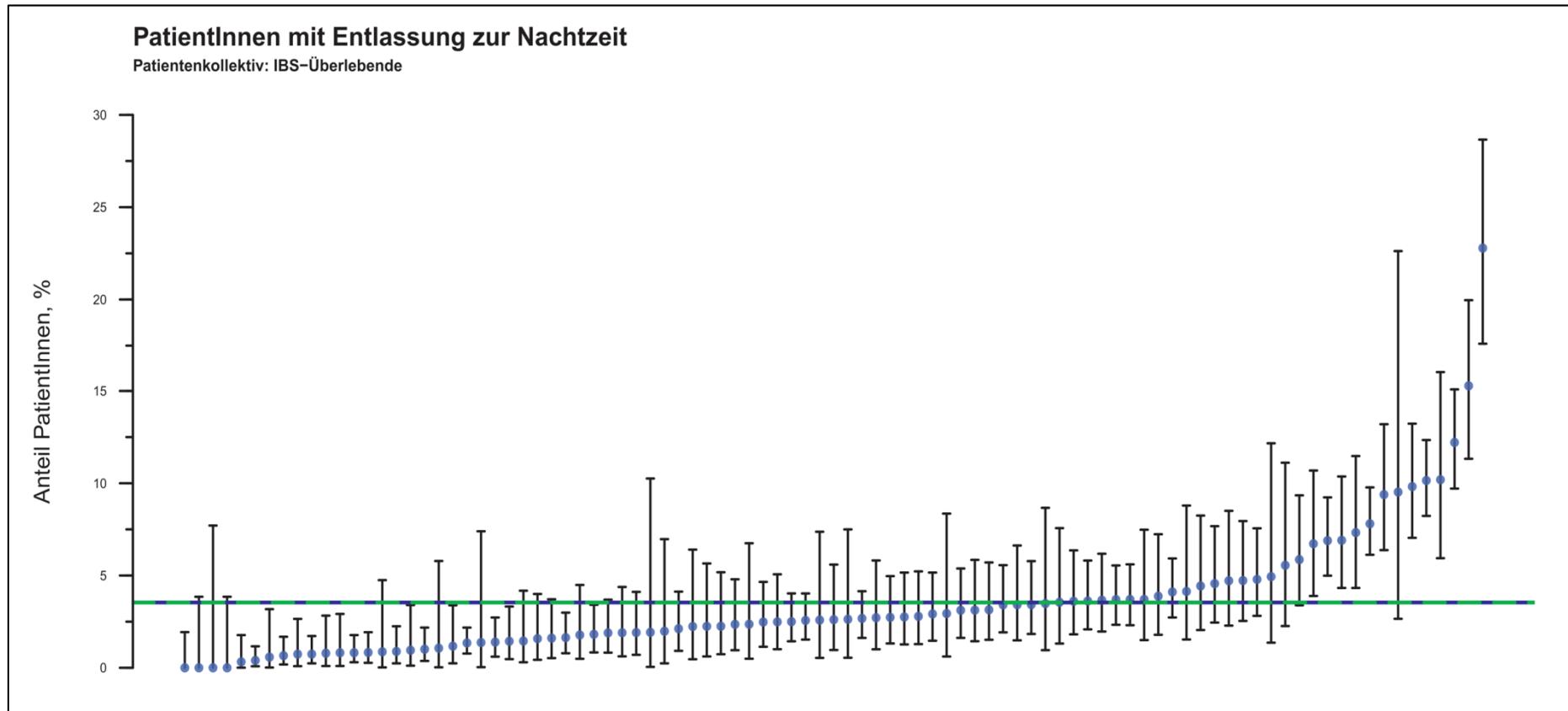
# Strukturkriterium: Anwesenheit Intensivmediziner

- Wo?
- Für wie viele Patienten?
- Welcher Schweregrad der Patienten?
- Arbeitszeit
- Kontinuität
- Informationsweitergabe
- .....

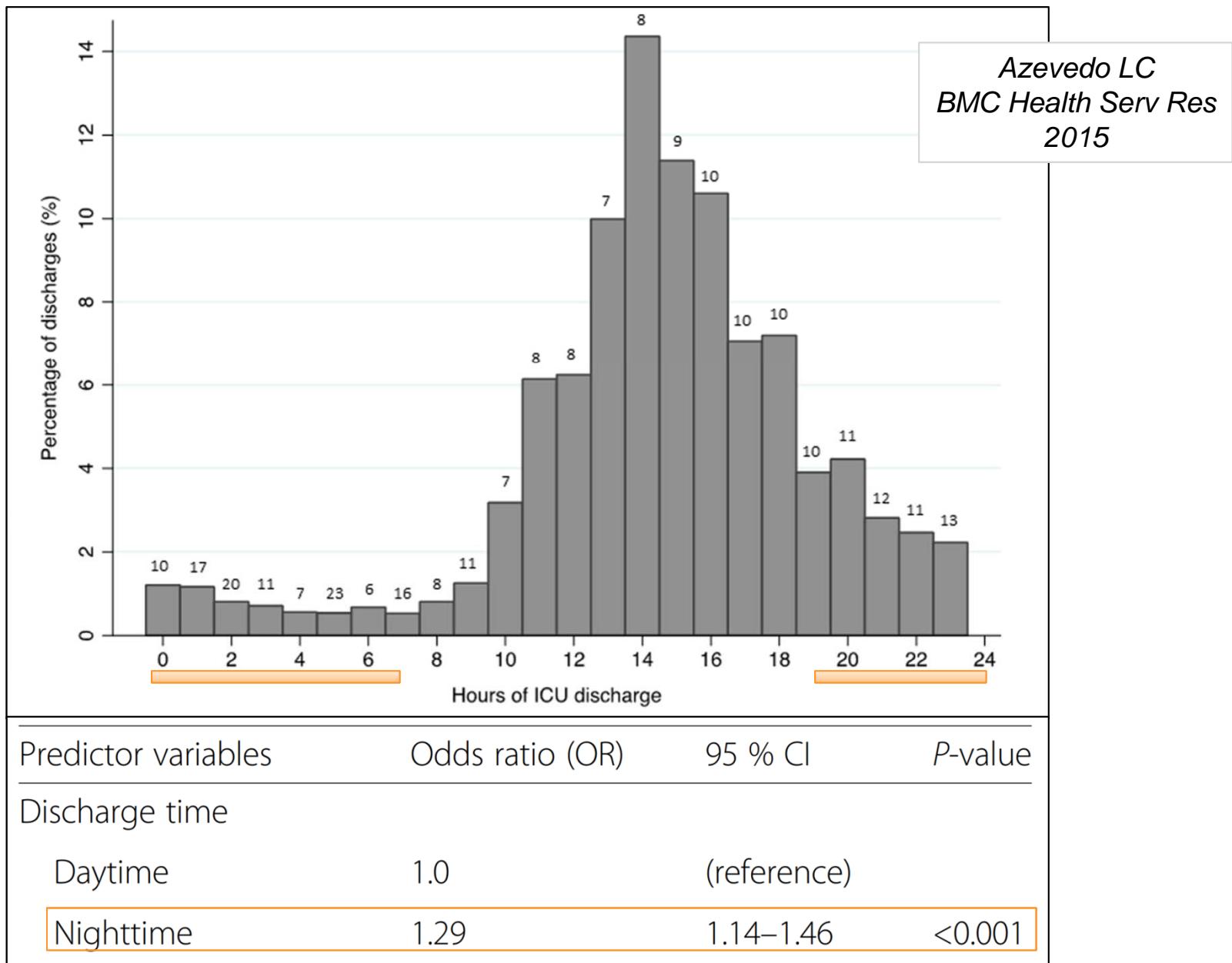
# Allied health care personnel



# Nächtliche ICU Entlassungen



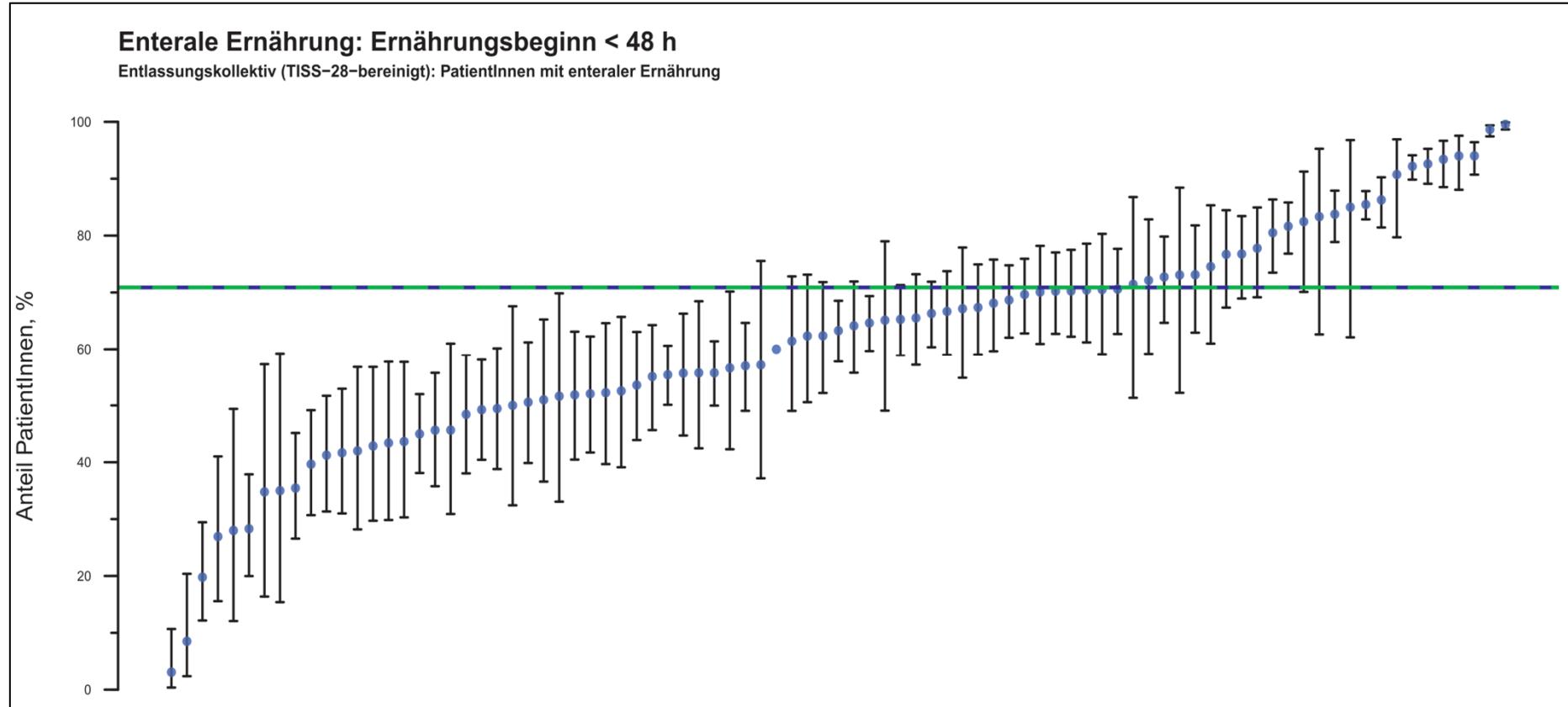
# Association Between Nighttime Discharge from the Intensive Care Unit and Hospital Mortality



# Quality Indicator Domains

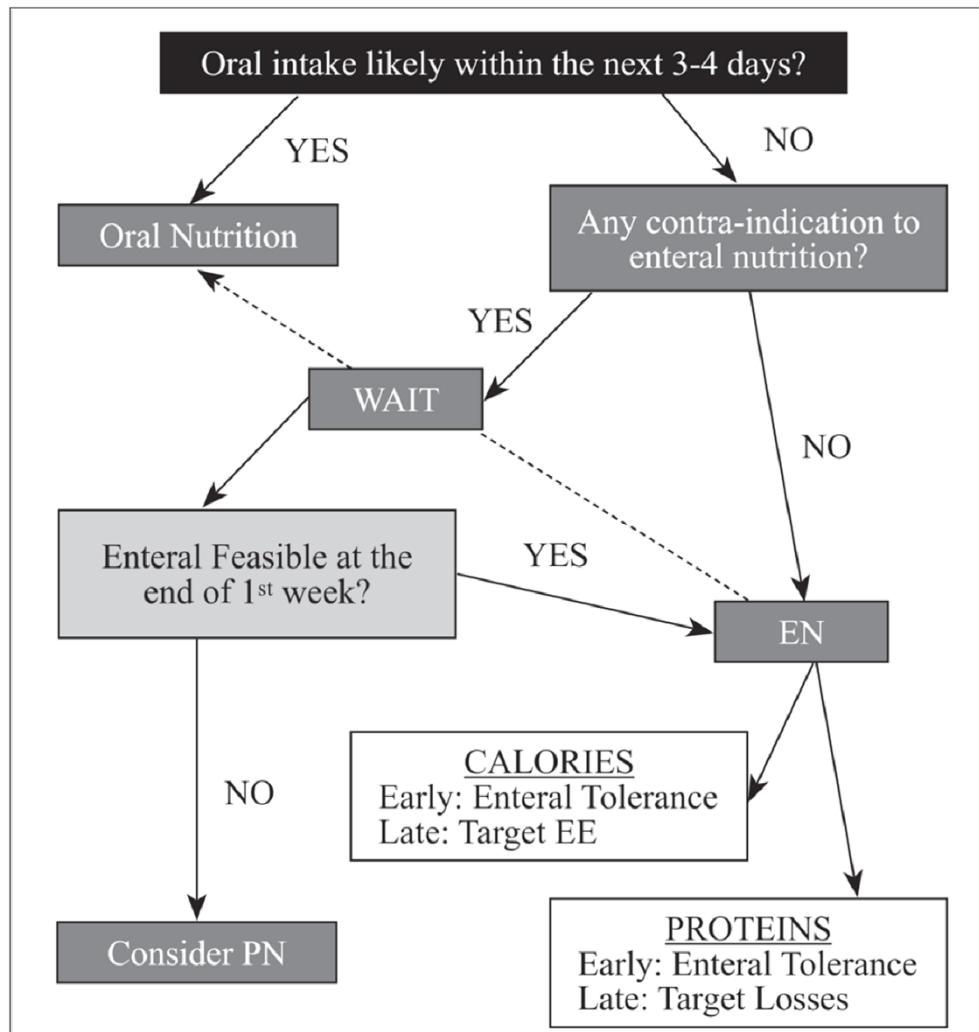
- **Structure**  
*what you need vs what is provided*
- **Process**  
*what you should do vs. what you do*
- **Outcome**  
*what you expect vs. what you find*

# Enterale Ernährung Ernährungsbeginn < 48h



# Nutrition in critically ill patients: where do we stand?

Preiser JC, Minerva Anestesiol 2016



## Key messages

- Patients unlikely to eat within a short (3-4 days) period should be fed enterally to protect gut mucosa.
- The endogenous production of calories matches more than half of the energy expenditure during the early phase after injury, and cannot be inhibited by nutrition.
- Hence, in case of contra-indication to enteral feeding, or of poor tolerance to enteral nutrition, there is no urgency to provide intravenous calories.
- Supplemental or exclusive parenteral nutrition should not be considered before day 5 after injury.
- Caloric and protein intakes should compensate the expenditure and losses during the late and recovery phases.

# Quality interactions in nosocomial infection

- **Structure**

- Room design
- Fixed installations
- Medical equipment
- Air conditioning
- Staffing
- Training level
- Funding

- **Process**

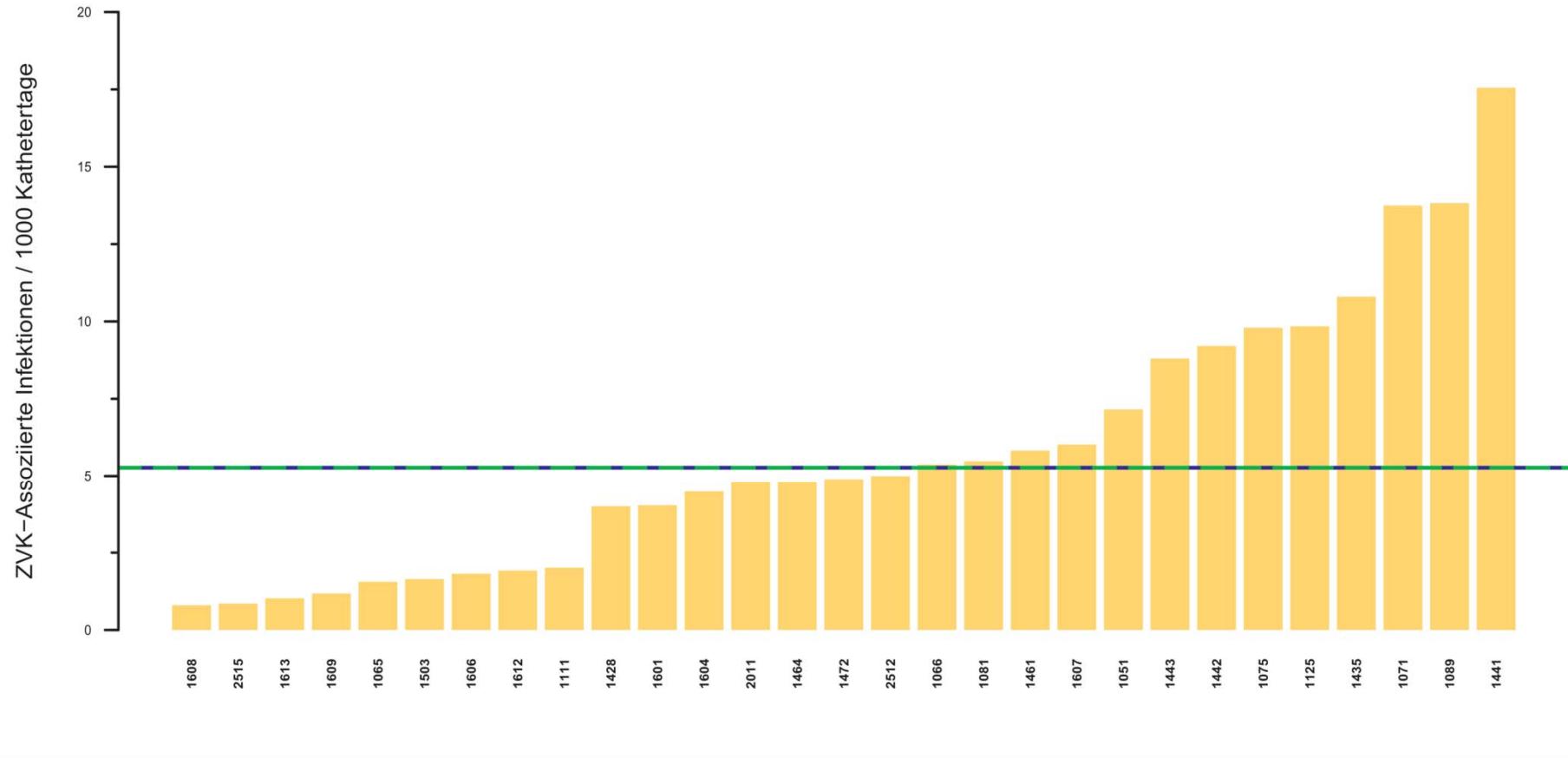
- Handwashing
- Isolation/infection precaution
- Infection reporting
- Room cleaning, disinfection
- Antibiotic use
- Communication

# Infektionsrate ZVK



## Infektionsrate ZVK: Inzidenz

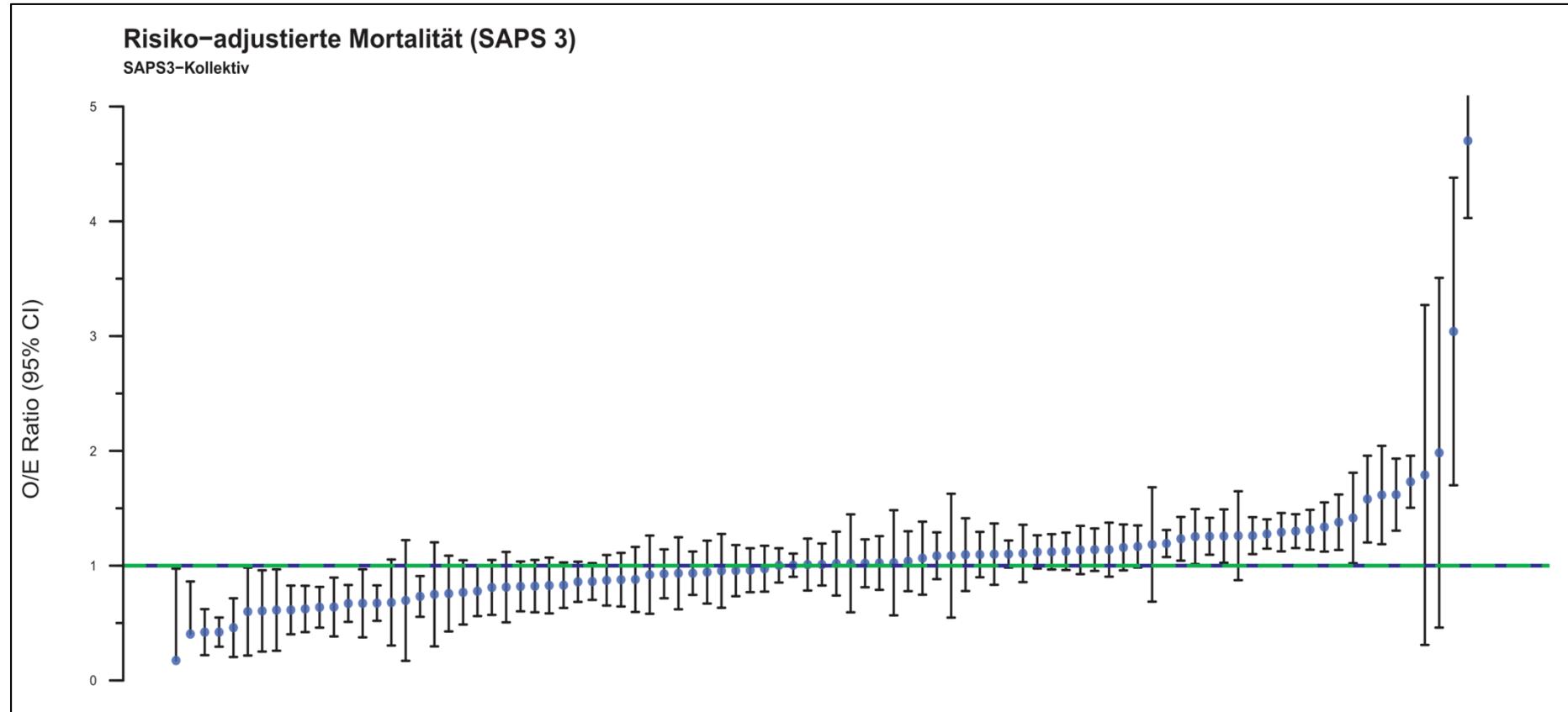
Patientenkollektiv (bereinigt): PatientInnen mit einem LOS an der IBS > 2 Tage und ZVK



# Quality Indicator Domains

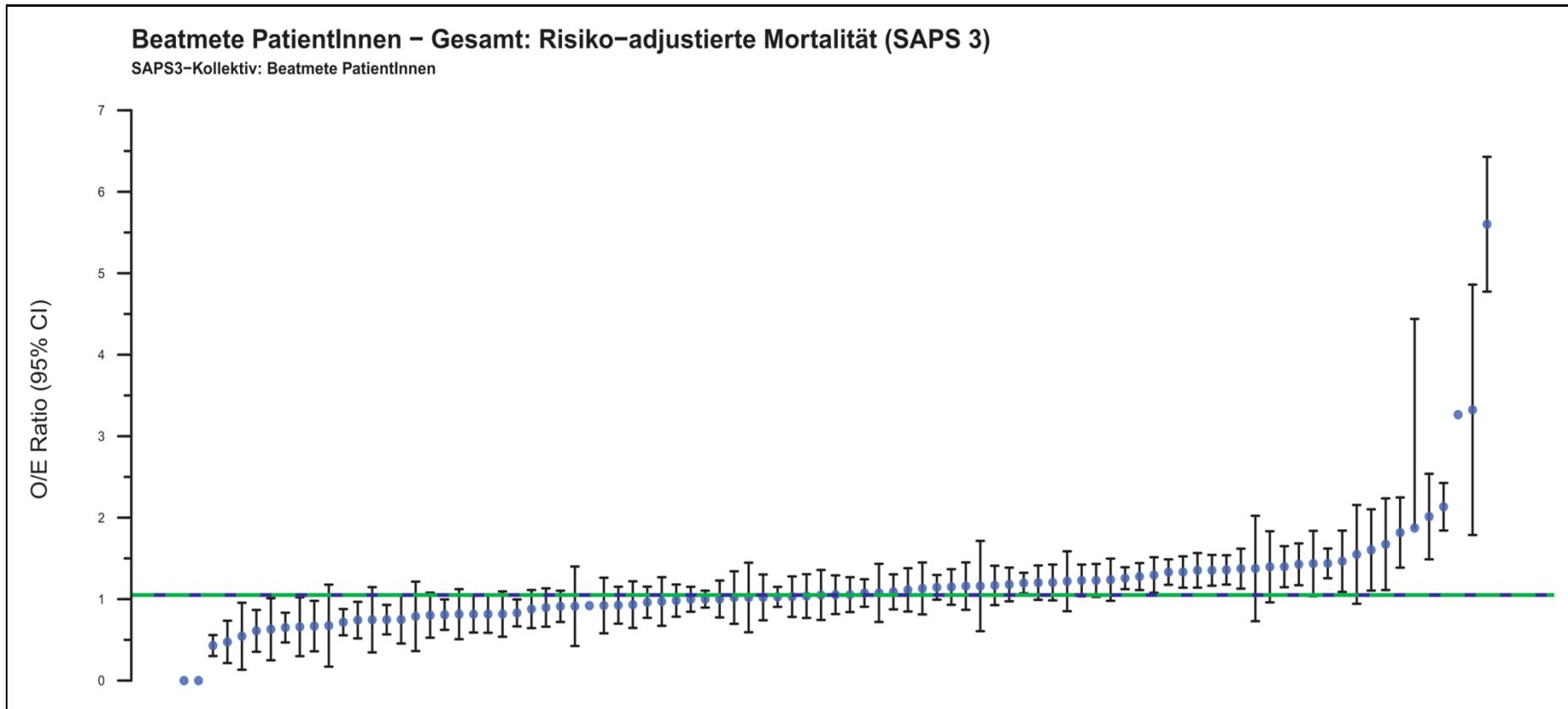
- **Structure**  
what you need vs what is provided
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# Risiko-adjustierte Mortalität

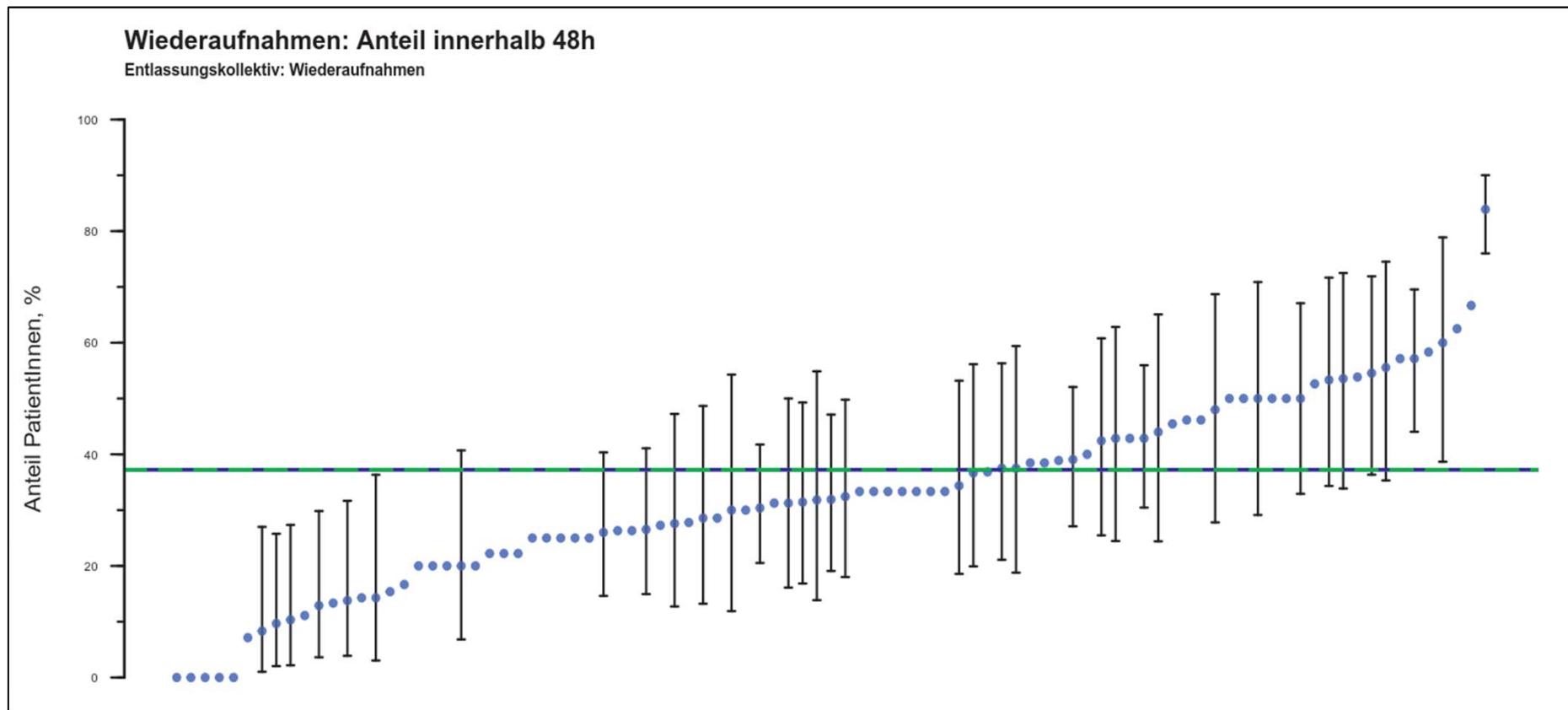


ASDI Kollektiv 2014; 33500 Patienten; 91 ICUs

# Risiko-adjustierte Mortalität Beatmete Patienten

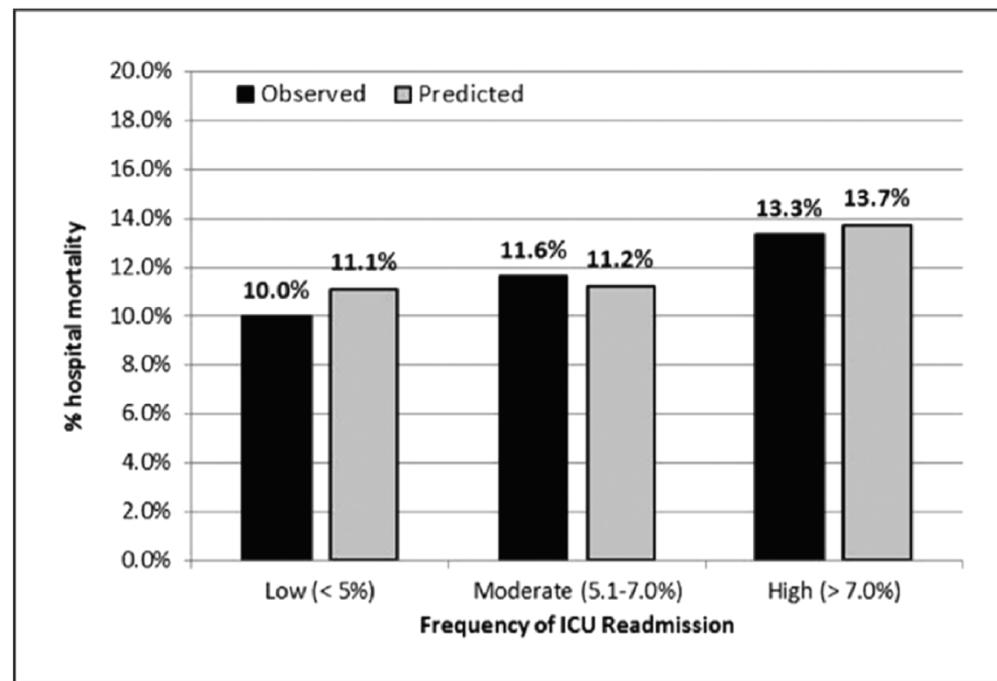
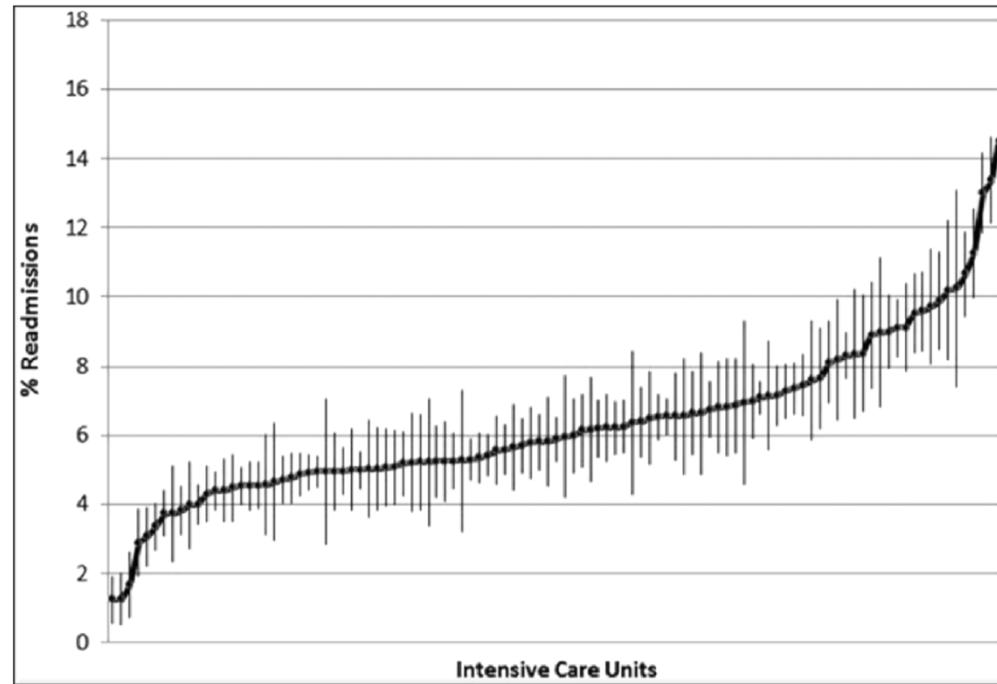


# Wiederaufnahmen innerhalb 48h



# Raw ICU readmission rates are of little value as an indicator of quality of care

- Influenced by case mix
- Discharge: premature vs too late
- No evidence how to alter adequately
- .....



# Pts readmitted to the ICU have a more than fourfold risk of dying

Risk factors for readmission

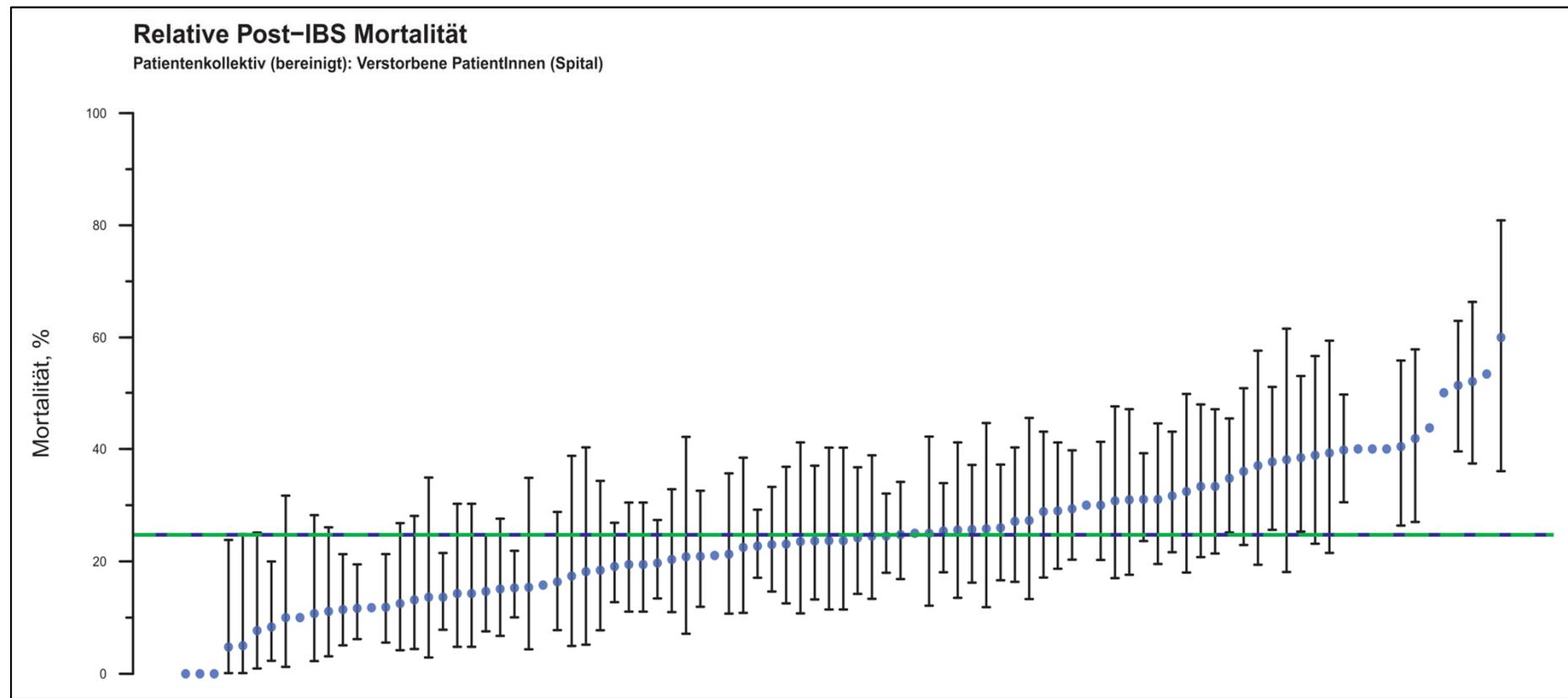
Last ICU day

Variable	p value	Odds ratio	95% CI
Age	<0.001	1.08	1.03–1.14
Male sex	<0.001	1.36	1.17–1.59
Number of organ failures at first admission	<0.001	1.11	1.04–1.18
Supplementary ventilatory support (last ICU day)	<0.001	1.72	1.43–2.06
Mechanical ventilation (last ICU day)	<0.001	3.00	2.31–3.89
Multiple vasoactive medications (last ICU day)	0.020	1.33	1.05–1.70
Active diuresis (last ICU day)	0.007	1.28	1.07–1.52

# Analyse-Ebenen

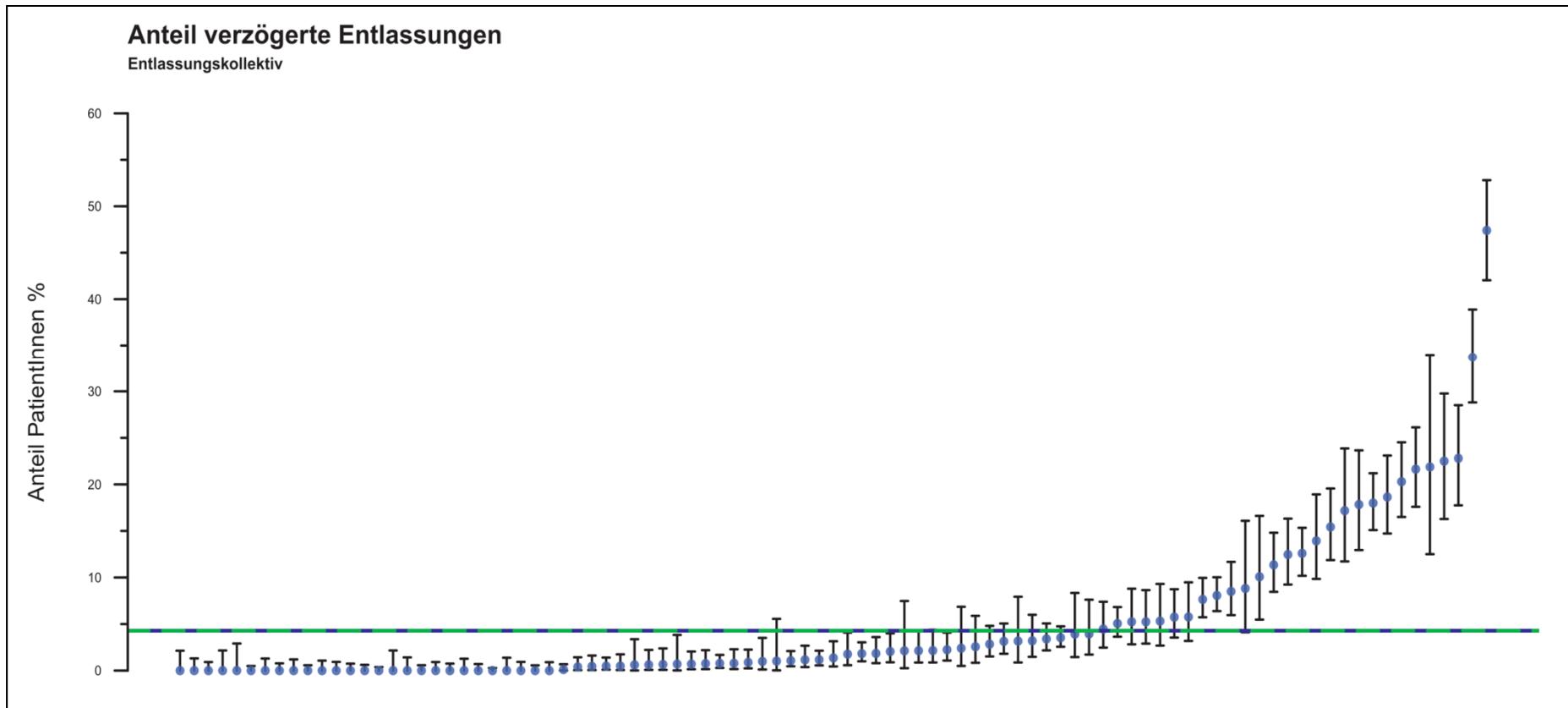


# Relative Post-ICU Mortalität



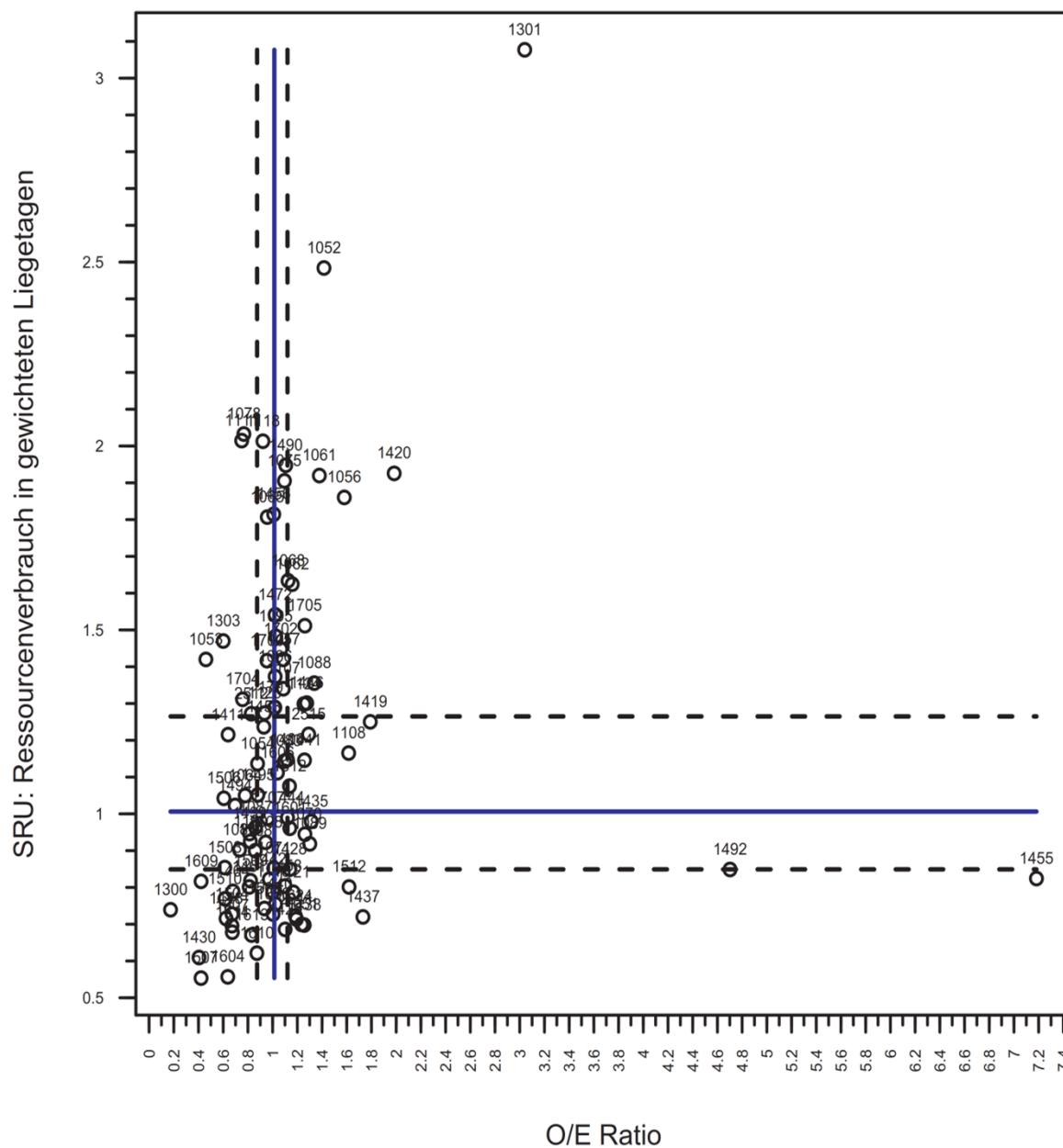
ASDI Kollektiv 2014; 33500 Patienten; 91 ICUs

# Anteil verzögerter Entlassungen



## Ressourcenverbrauch vs. Mortalität (Risiko-adjustiert)

SAPS3-Kollektiv (n: 30106)



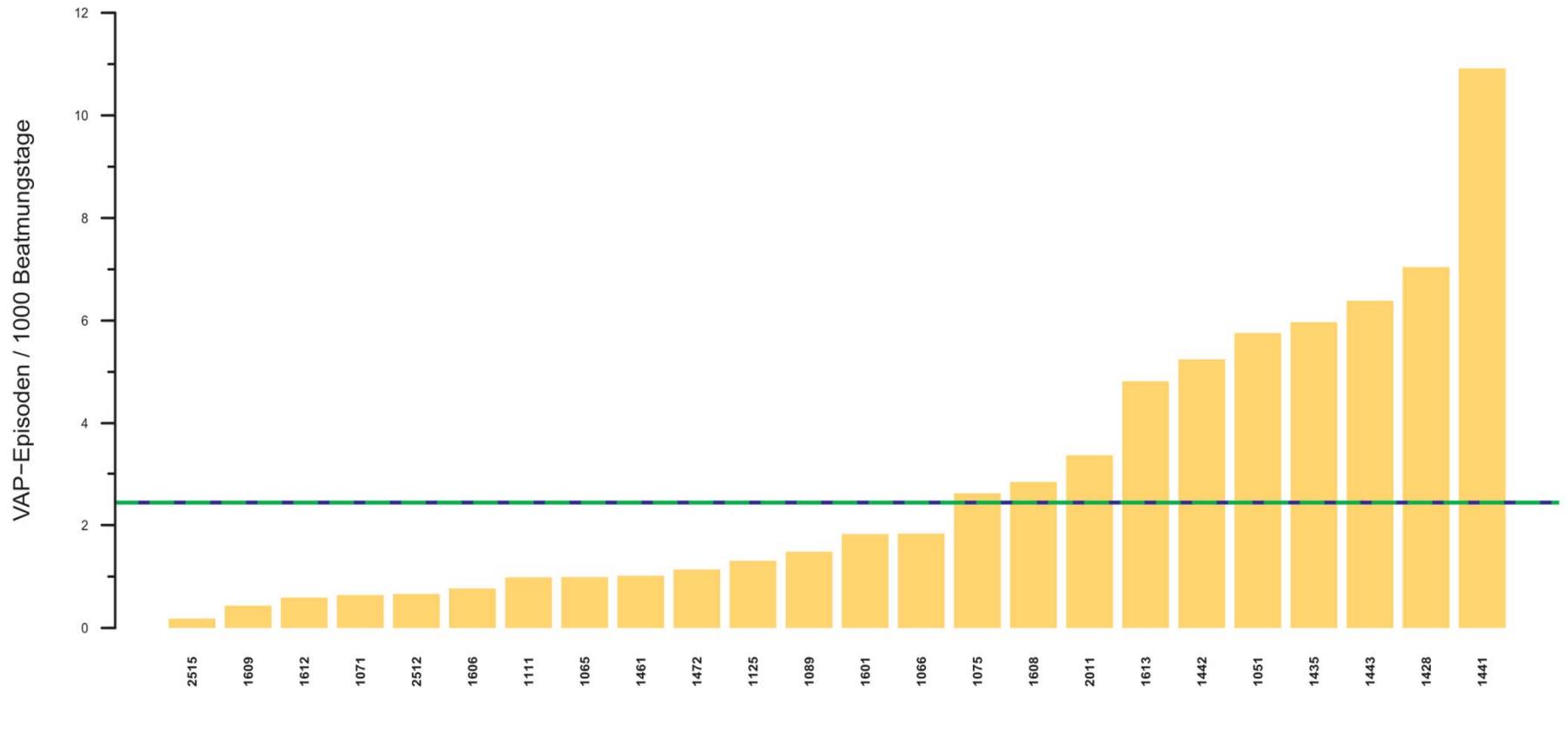
**Das Problem ist, dass nicht alles  
was zählt gezählt werden kann und  
nicht alles was gezählt werden kann  
zählt**

*Albert Einstein*

# Beatmungsassoziierte Pneumonie

## Beatmungsassoziierte Pneumonie: Inzidenz

Patientenkollektiv (bereinigt): PatientInnen mit einem LOS an der IBS > 2 Tage und Beatmung



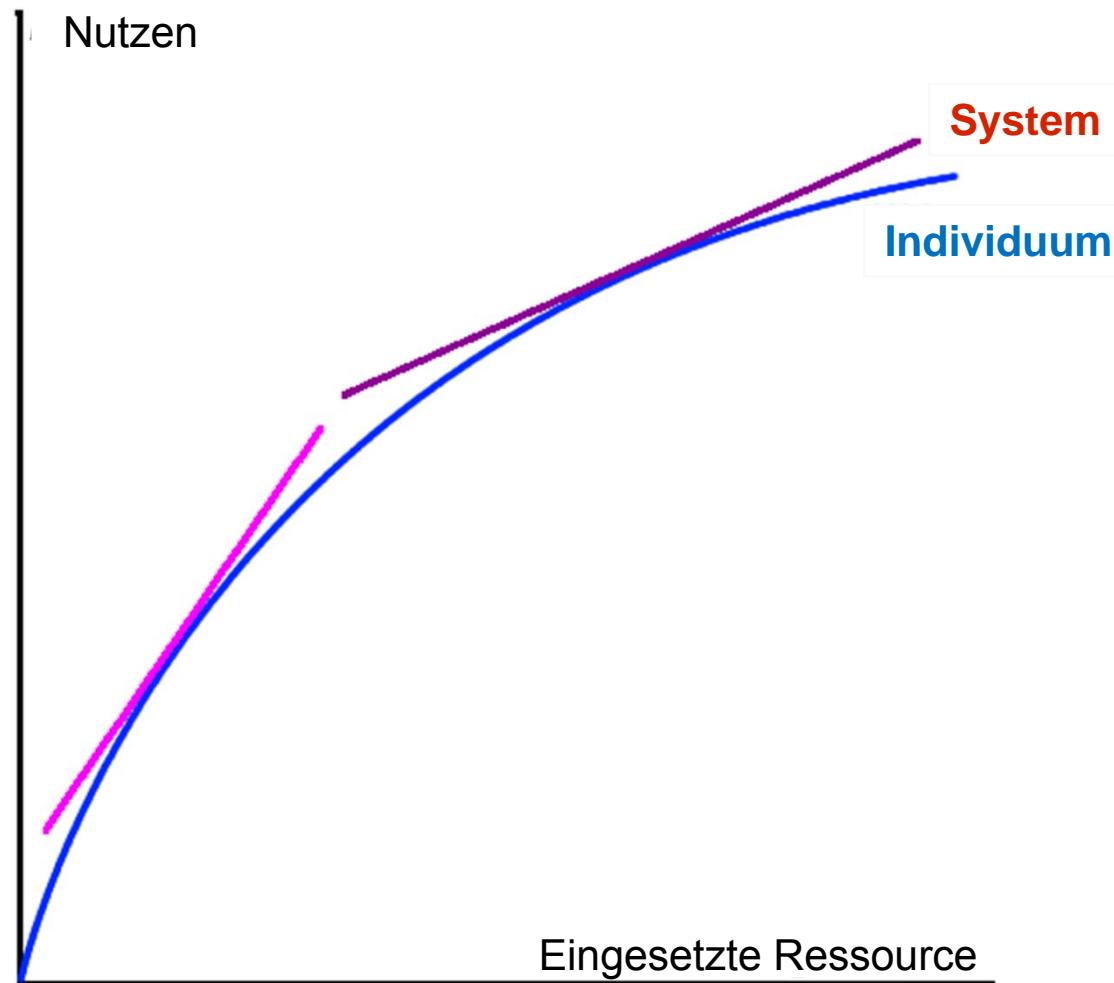
# VAP as quality indicator ?

- Definition ?
- Diagnosis difficult
- Complex, multifactorial causality
- Impact of patients characteristics ( $\leq 60\%$  ?)
- Partial conflicting evidence on preventive measures
- Paradox: until now only weak evidence for survival benefits through preventive measures

# Hürden für Qualitätsvergleiche

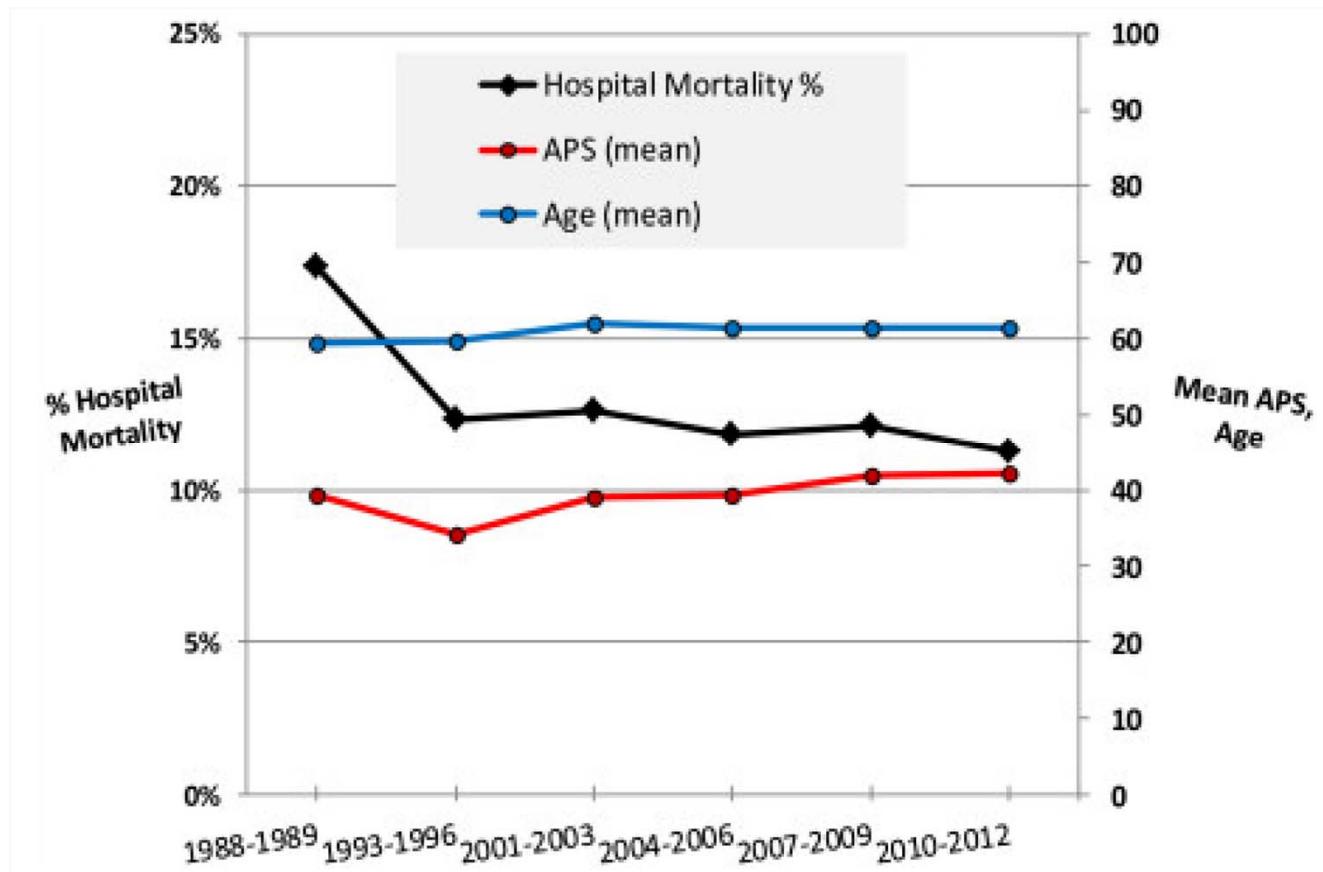
- Dokumentationsaufwand
- Kein direktes Feedback
- Bedeutung unklar
- Shame and blame culture
- Qualität des Vergleichs zweifelhaft
- .....

# Wo befindet sich die Intensivmedizin?



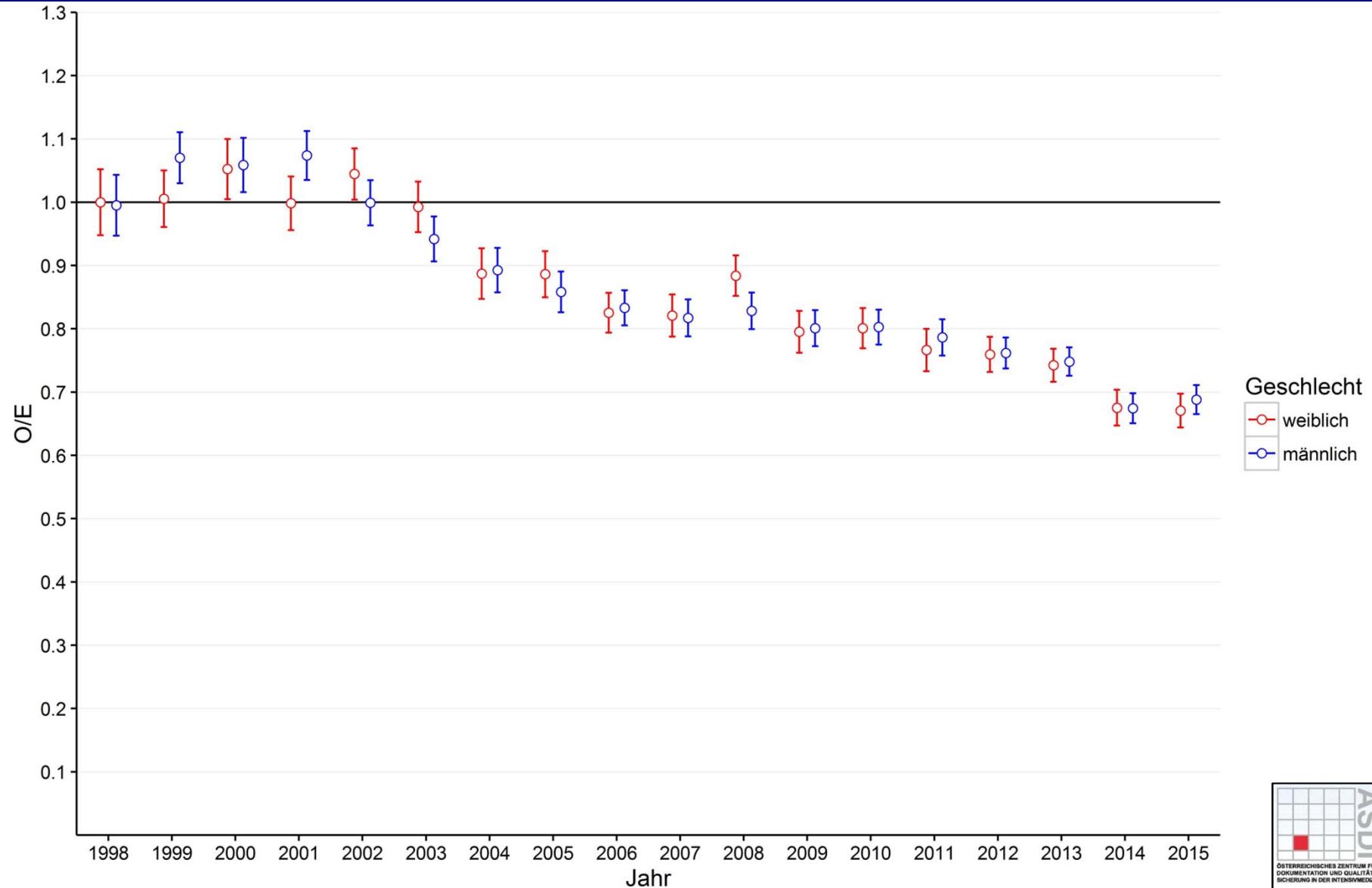
# 35% relative decrease in mortality for ICU admissions from 1988 to 2012

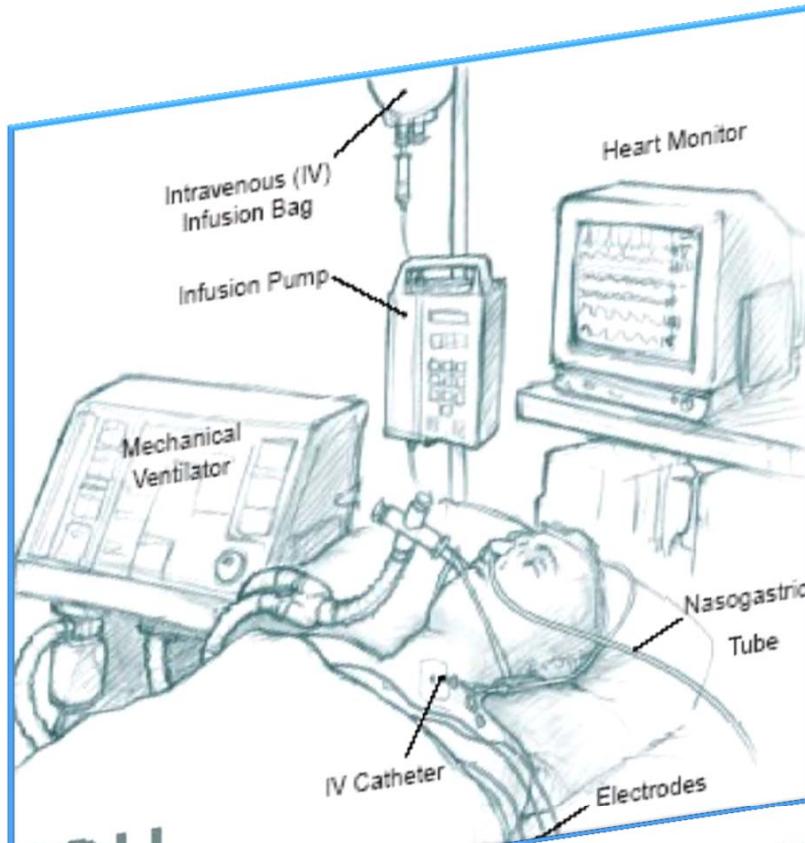
483.000 ICU admissions



Zimmermann JE, Crit Care 2013

# Risikoadjustierte KH-Mortalität 1998-2015

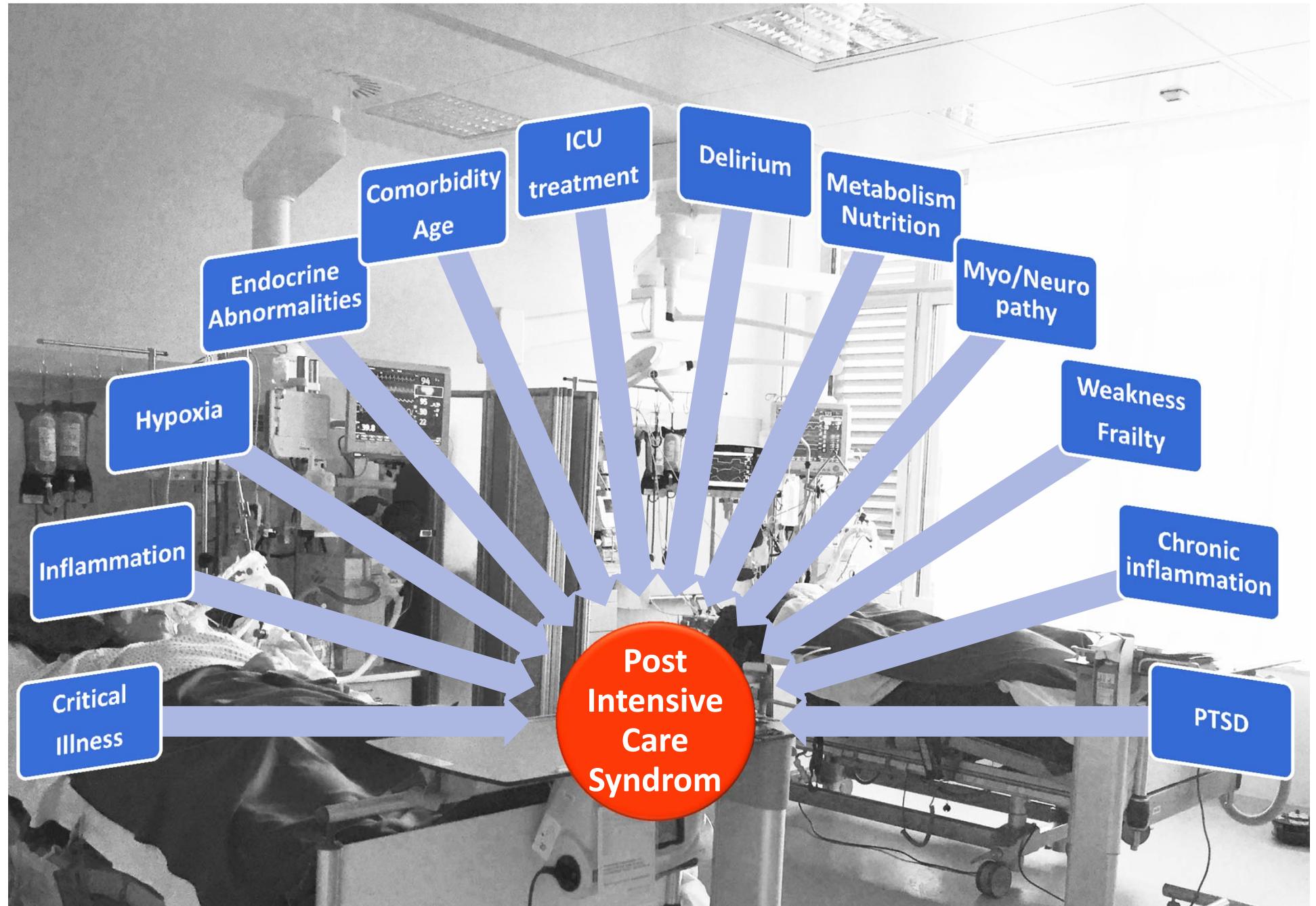




ICU

Krankenhaus  
Mortalität

Langzeitprognose  
Lebensperspektive



# FAZIT

- Qualitätsvergleiche sind Ausdruck eines Anspruchs der bestmöglichen Patientenbetreuung
- Detektor für Struktur- und Ressourcenmangel
- Prozessindikatoren als Spiegel der Realität
- Outcome-Messungen bedürfen einer sorgfältigen u. detaillierten Interpretation
- Frage zum Outcome: haben wir die richtigen Ziele?
- Qualitätsvergleiche sind Hilfsinstrumente aber noch nicht die Verbesserung