

Quality indicators in national registries

## How to select them? How to evaluate them?

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Conflicts of interest: Past chairman and board member of SIR

### Outline

- Selection of indicators
  - The standard procedure
  - Focus on outcomes
  - ICU care episode short part of a disease trajectory
- Evaluation of indicators
  - Data portal with open access http://portal.icuregswe.org/
  - Standard reports, individual selections possible
- Future developments
  - Disease specific indicators?
  - Tracking disease trajectories across different registries?

## National ICU quality indicators

	Sweden	Netherland	India	Spain	лк	ESICM	Joint Commision	Aus NZ	Sum
Year	2009	2007	2009	2005	2010	2011	2005	?	
Number of items	10	12	17	20	19	9	6	14	
SMR									7
VAP									5
Catheter related infections									5
QOL functional status/satisfaction									4
Unplanned readmission									4
Availability of intensivist 24/7									4
ICU LOS									4
Tranfer to another IVA (resource)									3
Bed occupancy rate									3
Unplanned extubations/reintubations									3
Adverse evente rate									3
Isolation patients with MRB									3
Prevention of thromboembolism									3
GI hemmorage prophylaxis (SUD)									3
Outcome ICU deaths									2
Nighttime discharge									2
Withold withdraw therapy									2
Patient : Nurse ratio									2
Prevention of medical error									2
Incidence of decubitus									2
Early EN									2
Hand wash compliance									2
Multidiciplinary ward round									2
Structured handover									2
Pain management									2
Inappropriate transfusion of RBC									2

Hans Flaatten, SIR 10 year anniversary, March 2011

**Role of the registry?** 

- To generate data available for comparison
- To develop shared definitions,
- To build systems for collection and analysis
- .....more fun working together



## Comparing number of ICU beds

Fig. 1 Numbers of critical care beds corrected for size of population (per 100,000 inhabitants) for European countries

Rhodes et al, Intensive Care Med 2012;38:1647-53

# How to select quality indicators?



Development of a common set of quality indicators in intensive care medicine

Starting point: ESICM Annual Congress Berlin 2007



1 Observed, predicted and Standardized mortality rate

- 2 Observed, predicted and Standardized use of resources (LOS)
- 3 Regular participation in a regional/national/international Case Mix Programme
- 4 Average (and median) length of stay for survivors and non-survivors
- 5 Average (and median) length of mechanical ventilation
- 6 Bed occupancy rate in the ICU
- 7 Rates of cancellation of scheduled surgery

49 Rate of ventilator associated pneumonia

- 50 Incidence of MRSA infections and colonizations
- 51 Early initiation of antibiotic therapy in severe sepsis
- 52 Incidence of clostridium difficile infection
- 53 Presence of antibiotic protocol to guide use of antimicrobials
- 54 Availability of isolation beds
- 55 Monitoring of sedation

95 Dravantian of contract indu

- 85 Prevention of contrast-induced nephropathy in coronary angiography
- 86 Monitoring of potential organ donors
- 87 Diagnosis of brain death
- 88 Number of organs harvested in organ donors
- 89 Blood transfusion and haemovigilance programs

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### The ESICM set of quality indicators

	Domain	Description	Consensus
1	Structure	ICU fulfils national requirements to provide Intensive Care	100 %
2	Structure	24-h availability of a consultant level Intensivist	94 %
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	100 %
7	Outcome	ICU re-admission rate within 48 h of ICU discharge.	94 %
8	Outcome	The rate of central venous catheter-related blood stream infection	100 %
9	Outcome	The rate of unplanned endotracheal extubations	100 %

## Avedis Donabedian's framework



### **Comparison of process and outcome measures**

	PROCESS	OUTCOME
Do patients care?	Not much/less important	Very important
Do providers care?	Yes, much	Yes, wary of confounding
Routinely collected data?	Yes, usually routine data	No, usually additional data
Need for risk adjustment?	No	Yes, models for each outcome
Easy to apply PDSA-cycle?	Provides clear feedback	Unclear where to target efforts
Time needed for measuring?	Less	More
Sample size requirement?	Smaller	Larger
Need for updating?	More often	Less often
Identifying risk population?	Difficult	Often easy, generic measures
Valid summary measures?	Difficult	Easy

## PDSA cycle:

Act—Adopt the change, abandon it or run through the cycle again. A Plan—Plan a change or test aimed at improvement. Study—Examine the results. What did we learn? What went wrong?

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Michael Porter: Outcomes-measurement paralysis

## National Quality Measures Clearinghouse

https://www.qualitymeasures.ahrq.gov/







#### Porter NEJM 2010;363:2477-81

#### **IDENTIFY of CHOM** International Consortium for Health Outcomes Measurement

ACUTE COMPLICATIONS SURVIVAL **CORONARY ARTERY DISEASE DATA COLLECTION REFERENCE GUIDE** MAJOR CARDIAC OVERALL SURGERY SURVIVAL COMPLICATIONS1 MAJOR INTERVENTIONAL NEED FOR CARDIOLOGY REVASCULARIZATION COMPLICATIONS<sub>2</sub> PROCEDURE CARDIOVASCULAR DISEASE PROGRESSION **RENAL FAILURE** ANGINA<sub>3</sub> HEART FAILURE DYSPNEA4 PATIENT REPORTED STROKE DEPRESSION<sub>5</sub> REINFARCTION FUNCTIONAL STATUS3 HEALTH-RELATED QUALITY OF LIFE3

## **COPD** disease trajectory





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  - Standard reports, individual selections possible
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### Svenska Intensivvårdsregistret

Logga in

#### Rapportverktyg

Start	Arkiv	Urval	Kvalitetsindikatorer	Rapp	orter	Avlidna-portalen	SIRI-portalen
		١	Svensk riktlinje för sven intensivvård	nsk	Inte	ensivvårdsregist	rets utdataportal.
			Riskjusterad mortalitet				
D	enna utdataı Iskrivna från	oortal prese och med 2	Isolering av bakt. multiresistens		ta för int	tensivvårdstillfällen	Konnig Bits Ann Opplang PM
R	esultat som	presenteras	Till annan IVA pga		efintliga	databasen i samband me	d total tota
a	tt respektive	rapport öp	resursbrist		as för va	arje găng du öppnar	- Mutana Marthan
U	nder menyn	Urval kan o	Oplanerad återinläggni	ng	bserve	ra då att "Detta är en	
m	odifierad rap	oport" står	Möjliga donatorer		t.		And I as a second secon
s	IR kan inte t	a ansvar fö	Behandlingsstrategi		rade urv	val ifrån originalrapporten.	
D	u är alltid vä	lkommen a	Sederingsskala och sederingsmål		orterna.		Sand South State and State

Kontakta webbansvarig | Support

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http://portal.icuregswe.org/



### **Unplanned readmission to same ICU**

Oplanerad återinläggning på samma IVA inom 72 timmar, inskrivningsperiod 2015-05-30 - 2016-05-30 5 Andel vårdtillfällen (%) 4 3 2 Nortzähe Nertähe Nertähe Skellefte Skellefte Skören Stallefte Stallefte Stallefte Su CIVA SU C Sverige Alingsås Arvika Bollnäs Borås Danderyd Gällivare Gävle Halmstad Malmö IVA Södertälje SÖS IVA SÖS MIVA BBIVA BBIVA NIVA NIVA Värnamo Västervik Västeräs eå IVA a BIVA BRIVA ₹₹ Eskilstuna alun Ē Lidköping Norrköping Visby Karlskoga (dgnuj. sköldsvik -ycksel Kung Kristianst Ing BR rebro sing **Carlskron**a Ē nköping K Solna 1 K Solna ş 2 cöping Ē ŝ å Avdelningar Detta är en originalrapport från SIR Svenska Intensivvårdsregistret 2016-05-30

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## Quality indicator overview 2010

#### Översikt Uppsala - Örebro

Uppsala- Örebro 2010	Livskvalitet	Riskjust mortalitet	Isolering/Bakt resist.	VAP	Överflytt resursbrist	Aterinläggning	Avlidna på IVA	Nattlig utskrivning	Behandlingsstrategi	Beläggning	Komplikationsreg.
Kvalitetsindikator	1	2	3	4	5	6	7	8	9	10	
Hudiksvall									Revision		
Bollnäs											
Gävle									Revision		
Mora											
Falun									Revision		
Torsby									Revision		
Arvika									Revision		
Karlstad									Revision		
Uppsala CIVA											
Uppsala TIVA									Revision		
Uppsala NIVA											
Uppsala BRIVA											
Västerås									Revision		
Lindesberg									Revision		
Karlskoga									Revision		
Örebro IVA									Revision		
Örebro TIVA									Revision		
Nyköping									Revision		
Eskilstuna									Revision		





## Quality index 2015

Quality indicator	0.5 points	1 point
	%	%
Reperfusion in STEMI	80	85
Reperfusion in STEMI within recommended time (PCI within 90 min and thrombolysis within 30 min)	75	90
Coronary angiography in NSTEMI	75	80
P2Y12 blockers in NSTEMI	85	90
ACEI/ARB in target group for MI	85	90
Proportion of patients (< 80 years) with MI as principal diagnosis included in RIKS-HIA	90	95
Proportion of patients with MI (< 75 years) in RIKS-HIA undergoing follow-up in SEPHIA	70	90
Proportion of smokers who have stopped smoking after 12–14 months	60	70
Proportion of patients who have participated in a physical exercise programme after 12–14 months	50	60
Proportion of patients with LDL-cholesterol < 1.8 mmol/L or 50 % reduction after 12–14 months	40	60
Proportion of patients with systolic blood pressure < 140 mmHg after 12–14 months	70	75

Table 1. The SWEDEHEART Quality Index.



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### DISEASE SPECIFIC INDICATORS

1 Early administration of ASA in patients with suspected/confirmed acute coronary syndrome



- 2 Early administration of beta-blockers in acute myocardial infarction
- 3 Cardiac catheterization in high-risk non-ST-elevation myocardial infarction
- 4 Risk stratification in non-ST-elevation myocardial infarction
- 5 Early reperfusion techniques in ST-elevation myocardial infarction
- 6 Therapeutic hypothermia after cardiac arrest
- 7 Perioperative myocardial infarction in heart surgery
- 8 Incidence of early complications in the implantation of permanent pacemakers
- 9 Early examination of potentially severe trauma (PST) patients by intensivists
- 10 Tracheal intubation within 8 hrs in pats with severe TBI and GCS < 9
- 11 Surgical intervention in TBI with subdural and/or epidural hematoma
- 12 Monitoring of intracranial pressure in severe TBI with pathologic CT findings
- 13 Early osteosynthesis in fractures of the femoral diaphysis
- 14 Early surgical fixation of open fractures
- 15 Early cerebral arteriography in subarachnoid haemorrhage
- 16 Administration of nimodipine in subarachnoid haemorrhage
- 17 Polyneuropathy in critical patients
- 18 Immediate CT examination in ischemic stroke
- 19 Intravenous fibrinolysis in acute ischemic stroke
- 20 Use of somatosensory evoked potentials in post-anoxic encephalopathy



THE SWEDISH INTENSIVE CARE REGISTRY

## Disease specific indicators?

### COPD 2014-2015 (N=5 292)

#### Survival



#### Unplanned readmission



### Proportion NIV



### HRQL at 2 mths



http://portal.icuregswe.org/



Registry

## HRQL (SF-36) at 2, 6 and 12 mths



## **COPD** disease trajectory





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