



Rigshospitalet

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# Blood testing in the ICU



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Less  
is More<sup>®</sup>

*“Don’t order diagnostic tests at regular intervals (such as every day), but rather in response to specific clinical questions.”*



Choosing  
Wisely<sup>®</sup>



Original article

## The daily cost of ICU patients: A micro-costing study in 23 French Intensive Care Units

Jean-Yves Lefrant<sup>a,\*</sup>, Bernard Garrigues<sup>b</sup>, Céline Pribil<sup>c</sup>, Isabelle Bardoulat<sup>d</sup>, Frédéric Courtial<sup>d</sup>, Frédérique Maurel<sup>d</sup>, Jean-Étienne Bazin<sup>e</sup>, the CRREA Study Group<sup>1</sup> with the collaboration of the AzuRea Group

**Table 5**  
Total daily cost per patient and its different components in euros (€). Values are expressed as means ± SDs and in medians with [inter-quartiles] and (ranges).

Parameters	Mean ± SD	Median, [I <sub>Q</sub> ], (range)
<b>Total daily cost</b>	<b>1425 ± 520</b>	<b>1263, [1062–1628], (684–3173)</b>
Medications (C)	125 ± 223	57, [25–137], (0–1692)
Consumables (D)	140 ± 230	60, [35–114], (13–1533)
<b>Laboratory tests (E)</b>	<b>139 ± 135</b>	<b>104, [60–162], (0–778)</b>
Sub-total patient-dependent expenses (A) + (C) + (D) + (E) + (F)	842 ± 521	668, [496–1021], (159–2729)
Administrative expenses assigned to ICU (G)	326 ± 104	313, [267–355], (174–613)
Structural costs	62 ± 32	64, [40–78], (14–133)
Amortization expenses	37 ± 29	30, [19–41], (7–146)
General logistics expenses	157 ± 95	168, [99–209], (8–400)
Medical logistics	70 ± 60	56, [40–68], (20–311)
Sub-total centre dependent expenses (B) + (G)	583 ± 113	554, [522–625], (384–833)

Lefrant. Anaesth Crit Care Pain Med 2015; 34:151-157

## Direct Cost Analysis of Intensive Care Unit Stay in Four European Countries: Applying a Standardized Costing Methodology

Siok Swan Tan, PhD<sup>1,\*</sup>, Jan Bakker, PhD, MD<sup>2</sup>, Marga E. Hoogendoorn, MSc<sup>3</sup>, Atul Kapila, PhD, MD<sup>4</sup>, Joerg Martin, PhD, MD<sup>5</sup>, Angelo Pezzi, PhD, MD<sup>6</sup>, Giovanni Pittoni, PhD, MD<sup>7</sup>, Peter E. Spronk, PhD, MD<sup>8</sup>, Robert Welte, PhD<sup>9</sup>, Leona Hakkaart-van Roijen, PhD<sup>1</sup>

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**Table 3 – The direct costs for an ICU day as determined by the standardized costing methodology<sup>23</sup>.**

	Department A (n = 400)	Department B (n = 448)	Department C (n = 756)	Department D (n = 242)	Department E (n = 304)	Department F (n = 30)	Department G (n = 549)	Total population Department sample (n = 7)
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	SD
<b>Laboratory services</b>	40 (4%)	45 (4%)	32 (2%)	60 (5%)	70 (5%)	124 (10%)	43 (2%)	60 (4%) 31
Disposables	74 (6%)	77 (7%)	39 (3%)	131 (11%)	146 (10%)	151 (12%)	117 (6%)	63 (5%) 36
Pharmaceutical and nutrition	80 (7%)	38 (3%)	25 (2%)	90 (8%)	86 (6%)	44 (3%)	11 (1%)	53 (4%) 32
ICU specialist	196 (16%)	257 (22%)	285 (21%)	150 (13%)	216 (15%)	256 (20%)	296 (15%)	237 (17%) 52
ICU nurse	445 (36%)	369 (32%)	561 (41%)	397 (33%)	562 (40%)	343 (27%)	1,123 (55%)	543 (39%) 270
Consulted specialist	80 (7%)	58 (5%)	33 (2%)	19 (2%)	20 (1%)	18 (1%)	210 (10%)	63 (5%) 69
Medical specialist	68	54	29	16	15	13	126	46 41
Pharmacist	1	0	0	1	1	0	6	1 2
Physiotherapist	6	4	4	0	1	1	55	10 20
Laboratory technician	4	0	0	1	3	3	18	4 6
Nutrition specialist	1	0	0	0	1	1	4	1 2
<b>Total</b>	<b>1.230</b>	<b>1.168</b>	<b>1.385</b>	<b>1.190</b>	<b>1.414</b>	<b>1.267</b>	<b>2.025</b>	<b>1.383</b> 298

ICU, intensive care unit.

Tan. Value Health 2012; 15:81-86

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## Variable costs of ICU patients: a multicenter prospective study

**Table 1** Variable costs for each diagnostic group, ICU mortality, and length of stay (LOS) (COPD chronic obstructive pulmonary disease, ALI/ARDS acute lung injury or acute respiratory distress syndrome)

	Variable cost €		COST structure (%)				Laboratory tests	ICU LOS median (Q1–Q3)			
	mean (SD)		Drugs	Nutrition	Infusions <sup>a</sup>	Consumables		Immunizations	Dead in ICU (%)	Patients alive	Patients dead
Multiple trauma ( <i>n</i> = 71)	4717 (3185)	16.9	5.9	27.3	8.9	15.3	22.9	12.1	10 (5–21)	8.5 (3–17.5)	
Major abdominal surgery, unscheduled ( <i>n</i> = 28)	3529 (3854)	11.9	3.9	30.2	9.5	6.3	37.3	25.9	2 (1–3)	5 (2–8)	
Major abdominal surgery, scheduled ( <i>n</i> = 37)	730 (647)	21.7	4.5	41.6	6.4	3.9	20.2	0.0	4 (2–10.5)	–	
Ischemic stroke ( <i>n</i> = 19)	904 (895)	15.7	6.3	3.0	10.8	18.3	42.2	42.1	5 (1–6)	2.5 (1–6.5)	
COPD ( <i>n</i> = 84)	1979 (1772)	16.4	7.4	11.4	17.6	8.3	35.8	22.8	8 (4–16)	9.5 (6–17)	
ALI/ARDS ( <i>n</i> = 73)	3946 (3071)	25.1	6.2	20.3	10.9	7.7	27.1	40.0	9 (5–18)	14 (8–20)	
Cardiac failure ( <i>n</i> = 44)	1376 (1576)	18.9	4.4	8.7	17.5	12.3	28.2	30.9	4 (3–7)	2 (1–6)	
Isolated head trauma ( <i>n</i> = 74)	3149 (2464)	14.3	5.1	13.5	18.6	17.7	26.3	18.3	8 (5–16)	3 (1–7)	
Nontraumatic intracranial hemorrhage ( <i>n</i> = 98)	2658 (2706)	17.4	7.5	7.7	17.1	20.3	26.3	47.8	7.5 (4.5–19)	5 (1.5–11.5)	
Coronary bypass ( <i>n</i> = 41)	576 (598)	6.1	1.6	27.6	11.6	12.3	39.7	0.0	1 (1–1)	–	
LOS <48 h, alive ( <i>n</i> = 395)	379 (396)	10.8	1.3	21.6	13.1	13.3	36.5	–	1 (1–1)	–	
LOS <48 h, dead ( <i>n</i> = 70)	903 (1012)	8.1	0.2	45.4	14.9	12.3	17.4	–	–	1 (1–1)	

<sup>a</sup> Including blood and blood-products

Accepted

## Routine versus on-demand blood sampling in critically ill patients – a systematic review

Carl J S Hjortsø, Morten H Møller, Anders Perner, Anne C Brøchner

P: Critically ill patients

I: On-demand blood sampling

C: Routine blood sampling or none

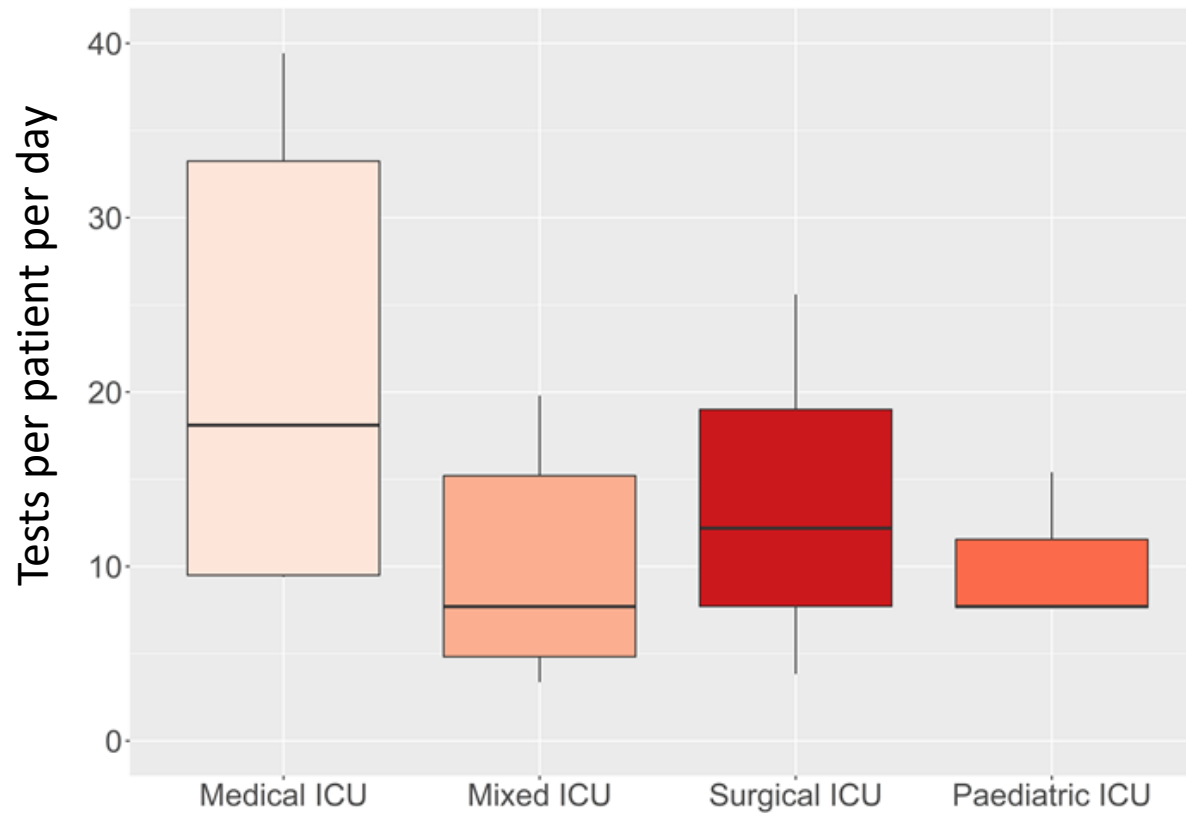
O: Patient-centred, test-centred, and resource-centred outcomes

S: All study designs

- 70 studies
- 20 observational studies
- 50 interventional studies
- 1985-2022
- Intensive care units
- North America, Europe and Australia



Frequency of routine blood testing



- Reported reduction in transfusion rate associated with reduced routine blood testing
- No reported difference in mortality, LOS, or adverse events
- Median cost reduction per bed per year was 35.000-150.000 DKK

*“Routine blood testing seemed common in critically ill patients and varied between settings.*

*A reduction in routine blood testing appeared to be associated with reduced transfusion rates and costs and no adverse events.*

*However, the certainty of the evidence was very low/low.”*

- Scoping review
- Survey
- RCT





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