J Med Syst (2014) 38:51
DOI 10.1007/s10916-014-0051-z

SYSTEMS-LEVEL QUALITY IMPROVEMENT

Comment on Research Article Entitled "Variability of Subspecialty-Specific Anesthesia-Controlled Times at Two Academic Institutions" as published in J Med Syst 2014; 38 (11)

Elizabeth van Veen-Berkx · J. Bitter · S. G. Elkhuizen · W. F. Buhre · C. J. Kalkman · H. G. Gooszen · G. Kazemier · for the Dutch Operating Room Benchmarking Collaborative

Received: 6 February 2014 / Accepted: 31 March 2014

Dear Dr. Ehrenfeld,

With profound interest we read the article written by Kodali, Kim, Flanagan, Urman and you in the February 2014 issue of the Journal of Medical Systems [1]. The article dealt with a large dataset retrieved from two American academic institutions and analyzed anesthesia-controlled times (ACT) per subspecialty service, thereafter compared them to previously published ACT data. The authors concluded that individual specialty-specific ACT should be used to improve operating room (OR) scheduling and to benchmark anesthesia performance.

We could not agree more with the content and conclusions of this interesting and well-executed study. The publication stated that little work has been done to establish ACT benchmarks for heterogeneous tertiary care centers. This is an accurate statement, however, we would like to provide additional benchmark data concerning ACT. In the Netherlands, OR departments of all eight University Medical Centers (UMCs) established a nationwide benchmarking collaborative in 2005, which is still active today [2, 3, 4]. The objective is to improve OR performance by learning from each other through exchanging good practices. Each UMC provides data records for all surgical cases performed to a central OR benchmark database. This extensive database, presently comprising more than one million records of surgical cases, is used to calculate key performance indicators related to the utilization of OR capacity.

This article is part of the Topical Collection on *Systems-Level Quality Improvement*

Electronic supplementary material The online version of this article (doi:10.1007/s10916-014-0051-z) contains supplementary material, which is available to authorized users.

E. van Veen-Berkx (✉)
Department of Operating Rooms, Erasmus University Medical Center Rotterdam, Room number: Hs-324, 's-Gravendijkwal 230, 3015 CE Rotterdam, The Netherlands
e-mail: e.berkx@erasmusmc.nl

E. van Veen-Berkx
e-mail: lizetteberkx@gmail.com

J. Bitter
Department of Operating Rooms, Bernhoven Hospital, Nistelrodeseweg 10, 5406 PT Uden, The Netherlands

S. G. Elkhuizen
Health Policy and Management, Erasmus University Rotterdam, Burgemeester Oudlaan 50, 3062 PA Rotterdam, The Netherlands

W. F. Buhre
Department of Anesthesiology and Pain Medicine, University Medical Center Maastricht, P. Debyelaan 25, 6229 HX Maastricht, The Netherlands

C. J. Kalkman
Department of Anesthesiology, University Medical Center Utrecht, Heidelberglaan 100, 3584 CX Utrecht, The Netherlands

H. G. Gooszen
Department of Operating Rooms, Radboud University Medical Center, Geert Grooteplein-Zuid 10, 6525 GA Nijmegen, The Netherlands

G. Kazemier
Department of Surgery, VU University Medical Center, Amsterdam, Room number: ZH7F011, De Boelelaan 1117, 1081 HV Amsterdam, The Netherlands

Published online: 13 May 2014

Table 1 (Table 2 in the CJA article) descriptive statistics of actual total procedure time, actual anesthesia-controlled time and actual surgeon-controlled time (all in minutes), as registered in the central OR benchmark database

UMC	*N*	Total procedure time			Anesthesia-Controlled time			Surgeon-Controlled time		
		Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
UMC1	34,316	160	109	131	34	18	30	126	101	100
UMC2	52,329	181	126	142	43	24	36	138	112	104
UMC3	70,264	178	123	146	44	24	39	134	110	104
UMC4	41,266	152	121	113	32	17	27	120	112	84
UMC5	45,955	162	120	130	36	20	31	126	108	96
UMC6	86,128	127	104	92	30	20	26	97	92	65
Total	330,258	158	119	124	37	22	31	121	106	90

Table 2 (Table 3 in the CJA article) descriptive statistics of actual total procedure time, actual anesthesia-controlled time and actual surgeon-controlled time (all in minutes), as registered in the central OR benchmark database, differentiated per surgical department using the data of all six UMCs

	Actual total procedure time				Anesthesia-Controlled time			Surgeon-Controlled time		
	N	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Cardiothoracic surgery	29,408	264	115	261	59	25	56	205	106	201
General surgery	76,203	173	120	143	40	24	34	133	106	106
Ear-Nose-Throat surgery	41,551	129	113	93	31	16	29	98	105	61
Oral & Maxillofacial surgery	13,170	165	130	130	38	18	35	127	121	94
Neurosurgery	23,969	216	143	170	45	24	40	171	132	128
Ophthalmology	36,086	77	41	69	21	12	19	56	35	49
Orthopedic surgery	35,184	148	86	134	35	20	31	112	77	100
Plastic surgery	24,001	148	127	112	32	19	28	116	118	82
Urology	27,210	134	101	99	32	17	28	102	92	70
Obstetrics & Gynaecology	23,476	138	92	113	33	17	29	105	83	82
Total	330,258	158	119	124	37	22	31	121	106	90

The database is also used for multicenter research on OR scheduling topics and OR efficiency. Recently, our manuscript entitled "The Influence of Anesthesia-Controlled Time on Operating Room Scheduling in Dutch University Medical Centers [4]" was published in The Canadian Journal of Anesthesia/Journal canadien d'anesthésie. This publication also provides ACT benchmarks per surgical department based on an extensive multicenter dataset (N=330,258; 6 UMC's), see Tables 1 and 2 in this letter (Tables 2 and 3 of our article in The Canadian Journal of Anesthesia/ Journal canadien d'anesthésie). Correspondingly, we conclude that efficient OR scheduling demands the accurate prediction of surgeon-controlled time (SCT) as well as ACT. Based on our dataset, we advise grossing up the SCT by 33 % to account for ACT, as opposed to employing a fixed number of minutes methodology for ACT, which is the common practice in many hospitals in the Netherlands.

Yours sincerely

Appendix 1

Performance indicators Dutch Operating Room Benchmarking Collaborative

References

1. Kodali BS, Kim KD, Flanagan H, Ehrenfeld JM, Urman RD (2014) Variability of Subspecialty-Specific Anesthesia-Controlled Times at Two Academic Institutions. J Med Syst 38:11. doi:10.1007/s10916-014-0011-7
2. Kazemier G, Van Veen-Berkx E (2013) Comment on Identification and use of operating room efficiency indicators: the problem of definition. Can J Surg 56:E103–4. doi:10.1503/cjs.020813
3. Van Veen-Berkx E, Elkhuizen SG, Kalkman CJ, Buhre W F, and Kazemier G (2013) Successful Interventions to Reduce First-Case Tardiness in Dutch University Medical Centers: Results of a Nationwide Operating Room Benchmark Study. Am J Surg. doi:10.1016/j.amjsurg.2013.09.025.
4. Van Veen-Berkx E, Bitter J, Elkhuizen SG, Buhre WF, Kalkman CJ, Gooszen HG, Kazemier G (2014) The Influence of Anesthesia-Controlled Time on Operating Room Scheduling in Dutch University Medical Centers. Can J Anesth/J Can Anesth doi:10.1007/s12630-014-0134-9