



CRM trainingen op de IC

Wat heeft het opgeleverd en hoe verder?

Alex Katinakis
Intensivist



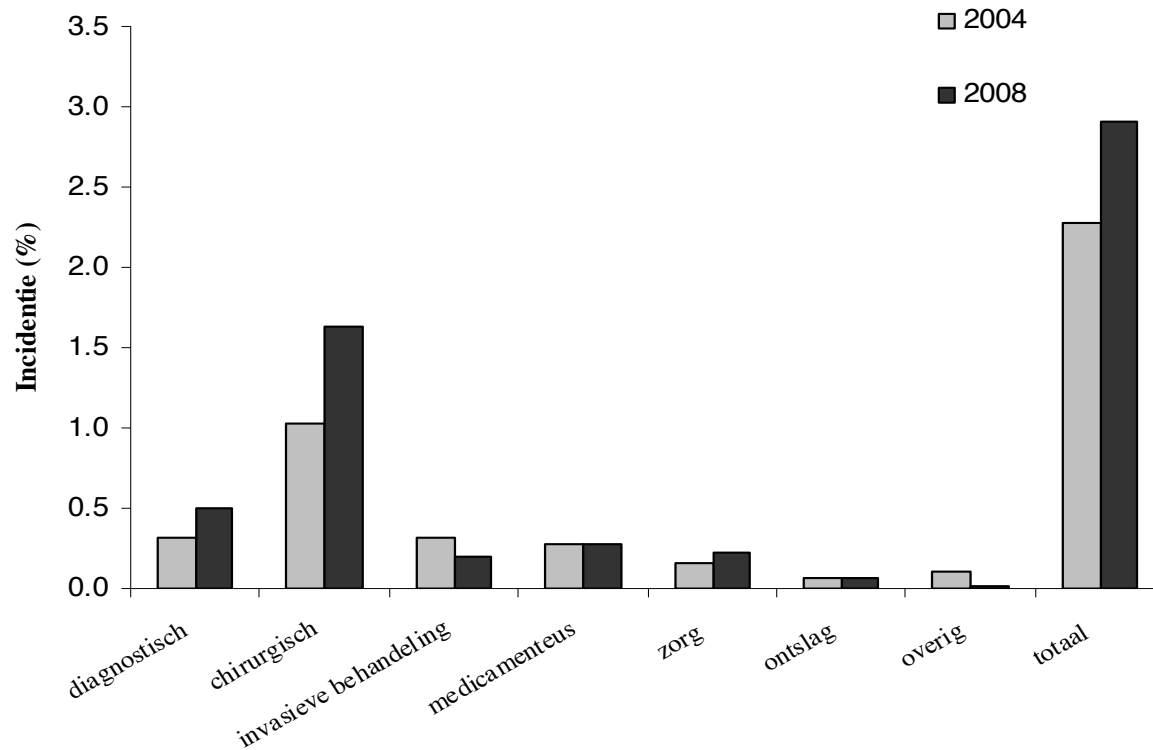
Cultuurladder Patiëntveiligheid



Bron: UMC Utrecht



Figuur 8.2 Incidentie potentieel vermijdbare schade per categorie en het totaal van alle categorieën



- 30.000 pt potentieel vermijdbare fouten
- 2000 overleden
- >70% door menselijke fouten veroorzaakt

Publicaties

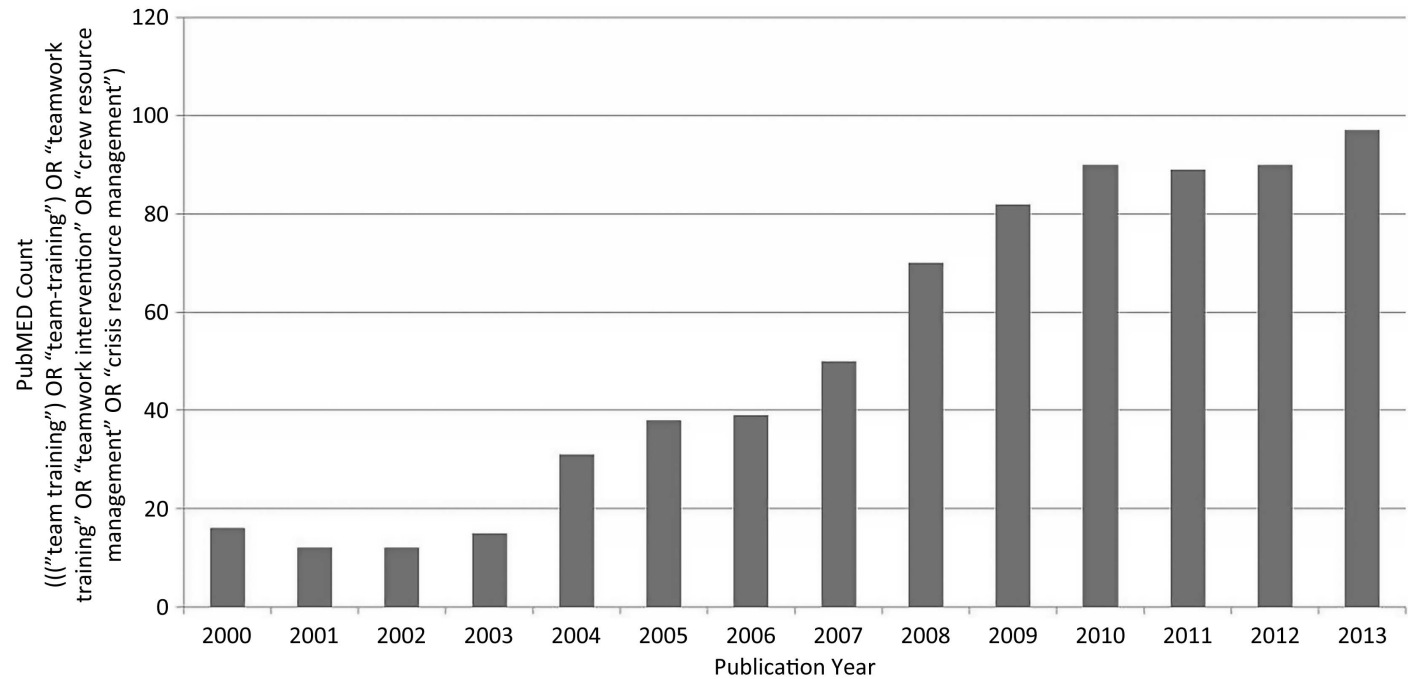


Figure 1 PubMed publication trends from 2000 through October 2013 for team-training and related concepts.

Effect van CRM

- Anesthesie
 - Cardiologie
 - Obstetrie
 - Verpleegkundigen- Artsen- Studenten
 - ... IC
-
- Pre-post design vs treatment-control
 - Klassikaal en/of simulatie- acteurs

Effect van CRM

Positieve studies:

- **Cardiosimulator** [Issenberg et al, 1999 en 2002]
- **Verbetering Apgar score** [Draycot et al, 2005],
- **Metastudie 23x, high fidelity simulatie en high learner satisfaction** [Laschiger et al, 2008]
- **Minder medicatiefouten vpgk** [Sears et al, 2009]
- **Daling chirurgische mortaliteit** [Nelly et al, 2010]
- **Iraq, daling med/transfusie fouten, prikaccidenten** [Deering et al, 2011]
- **Training leider bij CPR** [Fernandez Castelao et al, 2015]

RESEARCH ARTICLE

Open Access



Clinical performance and patient outcome after simulation-based training in prevention and management of postpartum haemorrhage: an educational intervention study in a low-resource setting


Ellen Nelissen^{1,2*} , Hege Ersdal^{1,3}, Estomih Mduma¹, Bjørn Evjen-Olsen^{4,5}, Jos Twisk^{6,7}, Jacqueline Broerse⁸, Jos van Roosmalen^{8,9} and Jelle Stekelenburg^{10,11}

Table 2 Incidence of postpartum haemorrhage and patient outcome before and after intervention

	Before training, n (%) (n = 3622)	After training, n (%) (n = 5824)	P value
Blood loss			
< 500 ml	3529 (97.4)	5721 (98.2)	0.008
500–1000 ml	77 (2.1)	78 (1.3)	0.003
≥ 1000 ml	16 (0.4)	25 (0.4)	0.93
Method of estimating blood loss			
Visual			
Measured			
Both			
Maternal out			
Admitted discharged			
Admitted discharged			
Admitted < 24 h			
Death <24			
Perinatal out			
Normal	3125 (97.4)	5151 (98.2)	0.001
Any kind of difficulties	11 (0.3)	58 (1.0)	<.001
Died after birth	29 (0.8)	50 (0.9)	0.84
Stillbirth (fresh)	58 (1.6)	68 (1.2)	0.07
Stillbirth (macerated)	43 (1.2)	72 (1.2)	0.84
Missing	58 (1.6)	82 (1.4)	



MW Maternity Ward, ICU Intensive Care Unit

Effect van CRM

Negatieve studies:

- Geen effect perceptie stress studenten [Alinier et al, 2006],
- Geen verschil low vs high fidelity [Kardong-Edgren et al, 2007],
- Geen verbetering in performance, studenten overschatten competenties [Wenk et al, 2009],
- Metaanalyse, 20 studies, geen effect klinische outcome en lange termijn impact [O'Dea et al, 2014]



BJOG

An International Journal of
Obstetrics and Gynaecology

DOI: 10.1111/1471-0528.14369

www.bjog.org

Intrapartum care

Simulation-based team training for multi-professional obstetric care teams to improve patient outcome: a multicentre, cluster randomised controlled trial

AF Fransen,^{a,b} J van de Ven,^a E Schuit,^{c,d} AAC van Tetering,^a BW Mol,^e SG Oei^{a,f}

^a Department of Obstetrics and Gynaecology, Máxima Medical Centre, Eindhoven-Veldhoven, the Netherlands ^b Department of Obstetrics and Gynaecology, Maastricht University Medical Centre, Maastricht, the Netherlands ^c Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht, the Netherlands ^d Stanford Prevention Research Center, Stanford University, Stanford, California, USA ^e The Robinson Institute, School of Paediatrics and Reproductive Health University of Adelaide and the South Australian Health and Medical Research Institute, Adelaide, South Australia, Australia ^f Department of Electrotechnical Engineering, Eindhoven University of Technology, Eindhoven, the Netherlands

Correspondence: AF Fransen, Postbus 7777, 5500 MB Veldhoven, the Netherlands. Email annemariefransen@hotmail.com

Accepted 24 August 2016. Published Online 10 October 2016.

Table 3. Associations between intervention and patient outcome in singleton pregnancies beyond 24 weeks' of gestation

Primary and secondary outcomes	Pre-intervention		Post-intervention		Odds ratio (95% CI)	P-value
	Intervention group n = 13 971	Control group n = 13 538	Intervention group n = 14 500	Control group n = 14 157		
Composite of obstetric complications	273 (2.0%)	262 (2.2%)	287 (2.0%)	299 (2.1%)	1.0 (0.80–1.3)	0.90
Low Apgar Score				251 (1.8%)	0.96 (0.74–1.2)	0.72
Severe postpartum haemorrhage				19 (0.13%)	2.2 (1.2–3.9)	0.009
>4 packed cells				18 (0.13%)	2.1 (1.1–3.8)	0.021
Embolisation				3 (0.02%)	4.7 (1.3–17)	0.020
Hysterectomy				1 (0.01%)	10 (0.99–120)	0.051
Trauma due to shoulder dystocia				35 (0.25%)	0.50 (0.25–0.99)	0.048
Brachial plexus injury				6 (0.04%)	1.3 (0.39–4.3)	0.68
Clavicle fracture				26 (0.18%)	0.38 (0.15–0.93)	0.034
Humeral fracture				2 (0.01%)	1.5 (0.25–9.1)	0.65
Other injury				2 (0.01%)	NA	NA
Eclampsia				12 (0.08%)	0.67 (0.19–2.4)	0.54
HIE				4 (0.03%)	3.2 (0.77–13)	0.11
Perinatal mortality				78 (0.55%)	0.75 (0.53–1.07)	0.11
Maternal mortality				1 (0.01%)	NA	NA
Low Apgar score and arterial umbilical pH <7.05				355 (2.5%)	1.0 (0.77–1.3)	0.98



HIE, hypoxic-ischemic encephalopathy. The components of the composite

include multiple components.



Effect van CRM

Er valt veel op de studies aan te merken...

- Heterogene groepen
- Veel verschillen in methodiek
- Kleine aantallen
- Geen standaard
- Geen keihard bewijs effect op “**outcome**”



Crew Resource Management in the Intensive Care Unit: a prospective 3-year cohort study

M. H. T. M. Haerrens¹, M. Kox^{1,2}, J. Lemson¹, S. Houterman³, J. G. van der Hoeven¹ and P. Pickkers¹

Acta Anaesthesiologica Scandinavica (2015)

Table 2 Complication incidence and outcome parameters.

	Baseline year	Implementation year	Post-implementation year	<i>P</i> value
Number of ICU patients	2295	2423	2553	
Line sepsis	3 (1.3)	7 (2.9)	3 (1.2)	0.29
Ventilator induced pneumonia	1 (0.4)	1 (0.4)	1 (0.4)	1.00
Decubitus (grade III/IV)	20 (8.7)	17 (7.0)	11 (4.3)	0.16
Total no. of complications	154 (67.1)	161 (66.4)	130 (50.9)	0.03
ICU-LOS (days)	1.0 (0.8–3.0)	1.1 (0.8–3.0)	1.0 (0.8–2.8)	0.008
Cardiac arrest	21 (9.2)	20 (8.3)	9 (3.5)	0.04
ICU mortality, <i>n</i> (%)	187 (8.1)	201 (8.3)	211 (8.3)	0.98
SMR	0.72 (95% CI 0.63–0.81)	0.69 (95% CI 0.61–0.78)	0.60 (95% CI 0.53–0.67)	0.04
Loss of airway during trachea canula-related procedure	1 (0.4)	0 (0.0)	0 (0.0)	0.34
Anatomical complications with tracheostomy	1 (0.4)	0 (0.0)	0 (0.0)	0.34
Vascular access problem	6 (2.6)	5 (2.1)	3 (1.2)	0.51
Gastrointestinal bleeding	5 (2.2)	4 (1.7)	1 (0.4)	0.22
Total no. of complications	154 (67.1)	161 (66.4)	130 (50.9)	0.03
ICU-LOS (days)	1.0 (0.8–3.0)	1.1 (0.8–3.0)	1.0 (0.8–2.8)	0.008
Hosp-LOS (days)	6.7 (3.7–15.2)	6.1 (3.1–13.8)	6.7 (3.5–13.4)	0.09
ICU mortality, <i>n</i> (%)	187 (8.1)	201 (8.3)	211 (8.3)	0.98
SMR	0.72 (95% CI 0.63–0.81)	0.69 (95% CI 0.61–0.78)	0.60 (95% CI 0.53–0.67)	0.04

Table 3 Safety Attitudes Questionnaire (SAQ) scores of ICU professionals.

			P value
Stress recognition			0.12
Teamwork climate			0.001
Safety climate			< 0.001
Perceptions of management			< 0.001
Working conditions	58 (17–86)	58 (11–90)	0.009
Job satisfaction	69 (43–90)	74 (43–95)	0.04



Data are represented as median (range). *P* value calculated by Mann–Whitney *U*-test. Response before and after CRM training was 72% and 51%, respectively. See Table S1 (Supplemental Digital Content) for SAQ scores per discipline.

Crew resource management training in the intensive care unit. A multisite controlled before–after study

Peter F Kemper,¹ Martine de Bruijne,¹ Cathy van Dyck,² Ralph L So,³
Peter Tangkau,⁴ Cordula Wagner^{1,5}



Table 3 Patient outcomes

	Intervention		Control		Interaction component
	Pre (n=2549)	Post (n=2370)	Pre (n=1536)	Post (n=1572)	
Female (%)	44	44	44	44	
Male (%)				56	
Age (M, SD)			(17)	65 (16)	
APACHE IV score (M, SD)			(33)	63 (32)	
Mechanical ventilation with admission			5%	32.8%	
Mechanical ventilation within the first 24 h			4%	38.9%	
Unplanned admissions*			1%	21.9%	
Outcome variables					β (95% CI)
Length of stay in hours* (M, SD)			(216)	97 (210)	-5.02 (-25.47 to 15.42)†
Readmissions within 24 h in this period			1%	1.6%	0.92 (0.43 to 1.96)‡
ICU deaths in this period (%)*			1%	10.1%	0.99 (0.70 to 1.04)§



Overview of the descriptive results of the intervention and control groups, along with the results of the logistic regression analysis. *The descriptive results of the outcome variables. †The linear regression analysis was adjusted for: APACHE IV severity score, use of mechanical ventilation with admission, use of mechanical ventilation within the first 24 h after admission, whether the admission was scheduled or not. ‡The logistic regression analysis was adjusted for: use of mechanical ventilation within the first 24 h after admission, whether the admission was scheduled or not. §The logistic regression analysis was adjusted for: APACHE IV severity score, use of mechanical ventilation with admission, use of mechanical ventilation within the first 24 h after admission, whether the admission was scheduled or not. CRM, crew resource management; ICU, intensive care unit.

Measurement period for the intervention and control groups. †Effect of the CRM training. ‡APACHE IV severity score. §Use of mechanical ventilation with admission, use of mechanical ventilation within the first 24 h after admission, whether the admission was scheduled or not.

ICU Gelre Apeldoorn



- 14 ICU bedden
- 75 verpleegkundigen
- 1 Onderzoeks vpk
- 1 Technisch vpk
- 1 PDMS
- 6 Intensivisten
- 2 assistenten

CRM/MTW in Gelre?

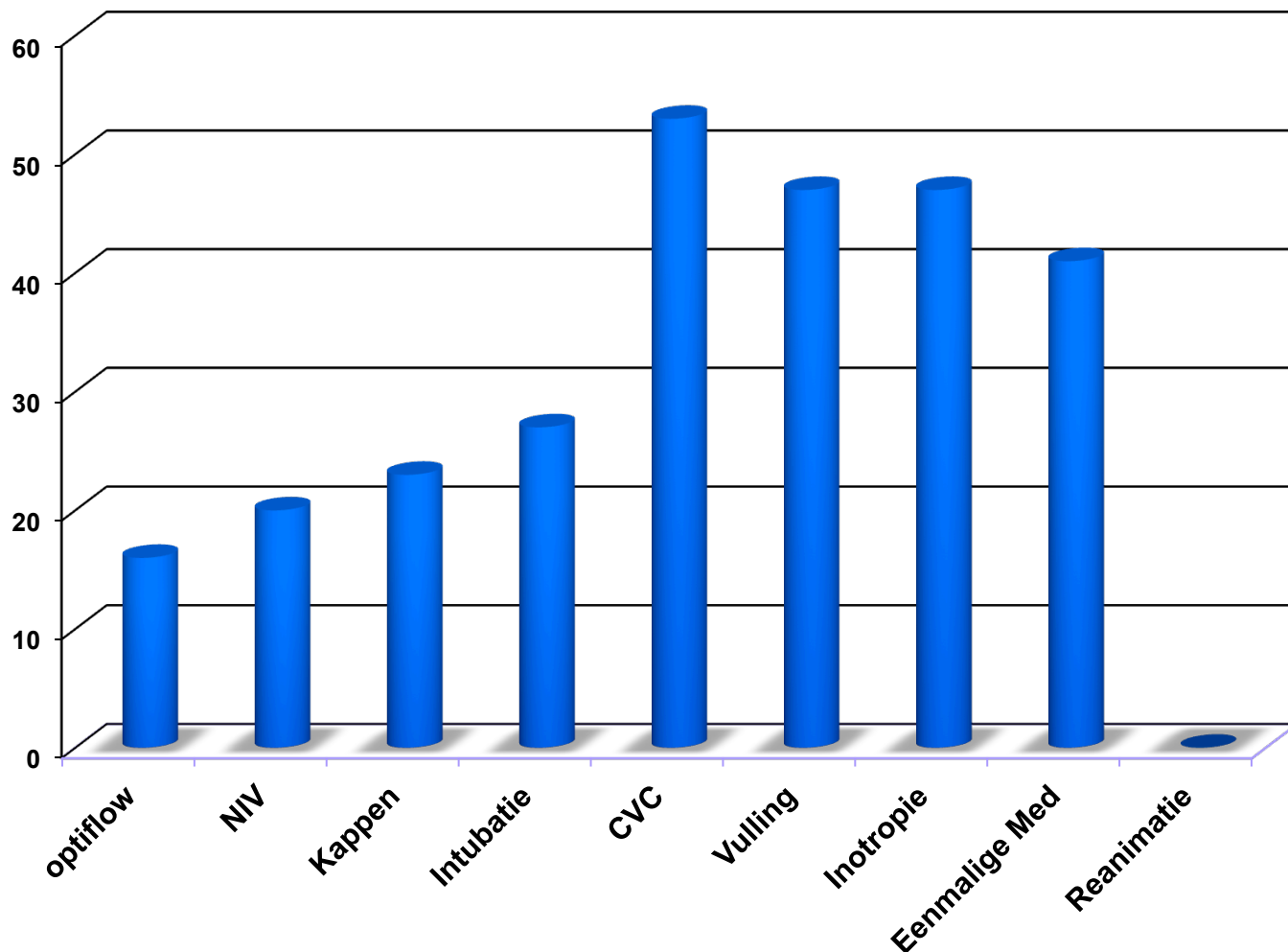
Medisch Team Work Impact en Evaluatie
(MTW*e*) studie



Onderzoeksvragen MTWie

1. Hoe is momenteel de situatie wat betreft de 4 MTW domeinen tijdens acute opnames op de intensive-care.
2. Wat is de invloed van een structurele MTW training tav:
 - het zelfvertrouwen van de deelnemers.
 - de kwaliteit van het samenwerkingsproces.

Types Interventie tijdens acute IC opname (N=133)



Resultaten Acute Opname

	Hele groep (N=133)	Intensivist (N=62)	IC vpk (N=69)	P-waarde
Overdracht				
Briefing				
Taakverdeling		Niet significant		
Leiding				
Rust op de werkplek	1 helemaal niet eens			10 helemaal mee eens
Check opdracht				
Samenvatting	6 (1-8)	4 (1-7)	6 (2.5-8)	0.052
Communicatie				
Vertaging		Niet significant		
Veilig				
Drukke				
Situatiebewustzijn				

MTWie-methode

Simulatietrainingen



t=0



t=1



Survey Survey

Survey Survey

N=15 teams

N=14 teams



Vaste scenario

- Patient S, 66 jr, HT, COPD onbekende klasse
- Gisteren opgenomen met dyspnoe op de longziekte verd. Exac. COPD
- Vanmorgen tijdens het wassen toenemend kortademig
- SIT oproep ivm hoog EWS
- Iom intensivist → IC

Teamleden

	Mean	SD	Range
Age (yrs)	39.6	4.9	31-49
Men (median)	1	0.5	0-2
Work percentage (fte)	80	14	54-100
Work experience (yrs)	12	5.4	2-24

Survey Leiderschap

	Before p50 (p25-p75)	After p50 (p25-p75)	P-value
Leader was competent			Alle domeinen significant
Leadership of nurse			
Leader was motivated			
Tasks divided by leader			
Briefing given by leader			
Leadership style			
Leader summarized			

Survey Communicatie

	Before p50 (p25-p75)	After p50 (p25-p75)	P-value
Standard terminology			Alle domeinen significant
Communication procedures			
Clear communication			
Communication collaboration			
Communication feedbackloop			

Survey Situational awareness

	Before p50 (p25-p75)	After p50 (p25-p75)	P-value
Recognize stressfull situation			Alle domeinen significant
Effect varying team member			
Monitor team actions			
Speak up			

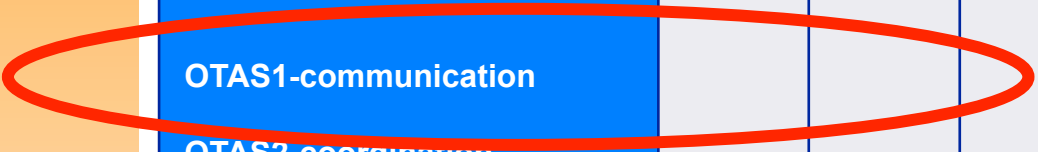
Met name significante verbetering van “Speaking up”



VUmc 

Behavioural observations

			Session 1			Session 2		
			Mean	SD	Range	Mean	SD	Range
Patient intubated (y/n)								
Patient intubation started (y/n)								
OTAS1-communication								
OTAS2-coordination								
OTAS3-cooperation/backup								
OTAS4-leadership								
OTAS5-team monitoring/SA								
Age (yrs)								
Experience (yrs)								
Work percentage (fte)								
Number of men per team								



Objectief verbetering in de communicatie, andere domeinen geen duidelijk verschil

Outcome

	Model 1	Model 2	Model 3	P value
	β	β	β	p
Trainingssession				
Age (yrs)				
Experience (yrs)				
FTE (%)				
Men per team (n)				
OTAS 1 communication				
OTAS 2 coordination				
OTAS 3 – cooperation/backup				
OTAS 4 - leadership				
OTAS 5 – team monitoring / SA				
R ²				
Significance F change				

Bij multiregressie analyse blijkt leiderschap en situational awareness significant te verbeteren!♪

Multinomial multivariate regression analysis



Conclusies

- CRM/MTW middel om communicatie te standaardiseren en te verbeteren
- Door training
 - meer zelfvertrouwen en eerder “speak up”
 - Je wordt er een betere leider van
 - Meer situatiebewustzijn
 - Minder stress
- Opzet verdient navolging op andere afdelingen



Patient
uitkomst?

MTWie voortgang...

- Video analyse; samenwerking VUMC
- EPOC tool, kijken naar de individu



Zorgprofessionals moeten stuur weer overnemen

Paul W.G. Elbers en Armand R.J. Girbes

+ GERELATEERD ARTIKEL Ned Tijdschr Geneeskd. 2017;161:D1089

ntv**g**

HOME NIEUWS BLOGS ACHTERGROND THEMA'S CONGRESSSEN ACADEMY MEER  

Het tekort aan uitkomstindicatoren

Value based healthcare vraagt om goede uitkomstindicatoren. De ontwikkeling daarvan gaat echter traag. Slechts 2 procent van de indicatoren gaat over uitkomsten van zorg, constateren onderzoekers van Prismant.



Lees ook

2 NOVEMBER 2017 | NIEUWS
Doodsoorzaken veranderen door nieuwe codering

2 NOVEMBER 2017 | NIEUWS
Aantal kwaliteitsindicatoren stijgt fors

2 OKTOBER 2017 | SPONSORED
Patiënt centraal? Voor 5,5 miljoen Britten een feit!

29 SEPTEMBER 2017 | NIEUWS
Europese samenwerking op zeldzame ziekten

Uw mening



MTW Gelre



????