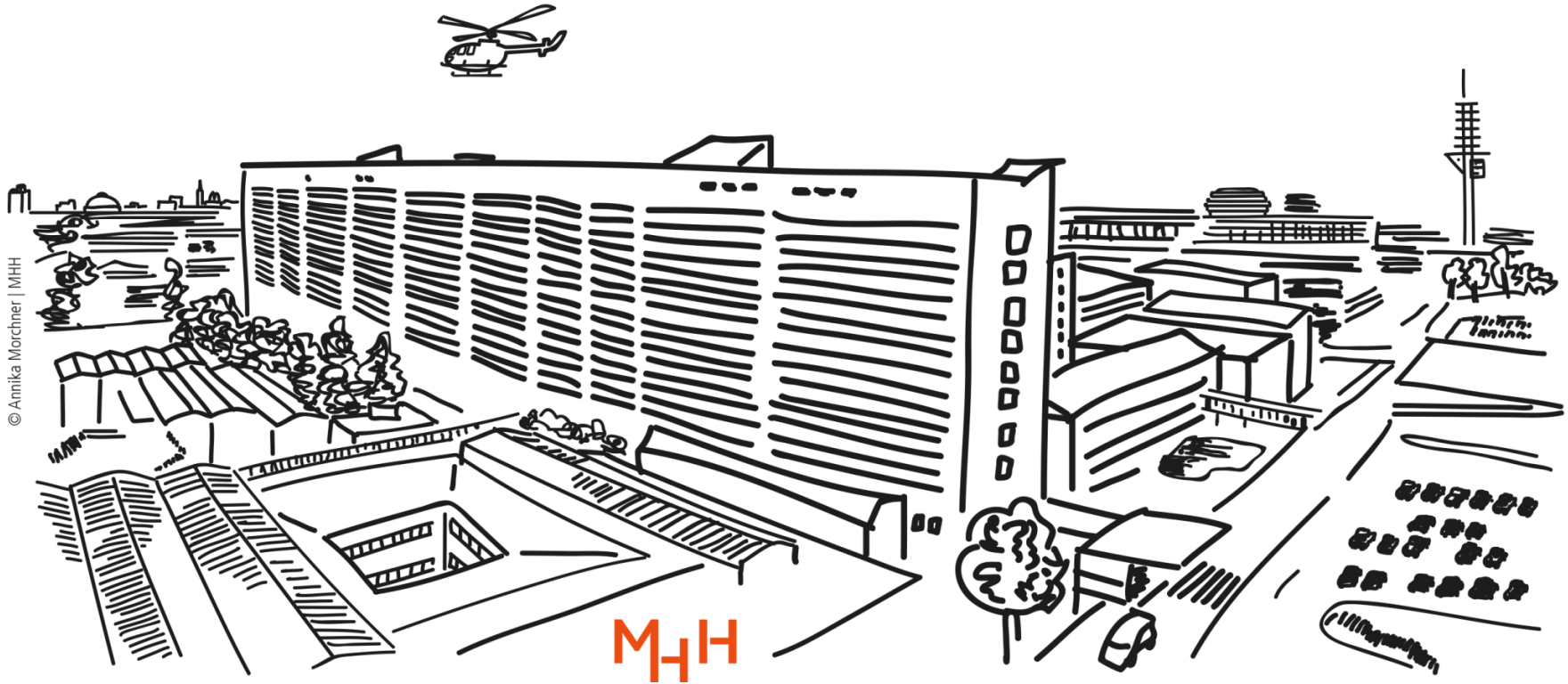


Medizinische Hochschule Hannover



© Annika Marchner | MHH

Interessenskonflikte

Keine

Mehr Sicherheit in der Arzneimitteltherapie durch Computerized Physician Order Entry (CPOE)?

RESEARCH

Open Access

The effectiveness of computerized order entry at

Implementing CPOE is associated with a greater than 50% decline in pADE rates in hospital related setting, although results vary.
Medication errors decline to a similar degree.

Teryl K Nuckols^{1,2*}, Crystal Smith-Spangler^{3,4}, Sally C Morton⁵, Steven M Asch^{3,4,2}, Vaspaan M Patel^{6,7},
Laura J Anderson⁷, Emily L Deichsel⁷ and Paul G Shekelle^{1,2,8}

Unexpected Increased Mortality After Implementation of a

Results. Among 1942 children who were referred and admitted for specialized care during the study period, 75 died, accounting for an overall mortality rate of 3.86%. Univariate analysis revealed that mortality rate significantly increased from 2.80% (39 of 1394) before CPOE implementation to 6.57% (36 of 548) after CPOE implementation. Multivariate analysis revealed that CPOE remained independently associated with increased odds of mortality (odds ratio: 3.28; 95% confidence interval: 1.94–5.55) after adjustment for other mortality covariables.

Mott F-6882/Box 0243, 1500 East Medical Center Dr, Ann Arbor, MI 48109. E-mail: yyhan@med.umich.edu

Pediatrics (2005) 116 (6): 1506–1512.

<https://doi.org/10.1542/peds.2005-1287> **Article history** 

Multicenter Study

Epub 2012 Jan 21

Impact of in community hospitals

Alexander A Leung,
Bismarck Cadet, MD,
David W Bates

Affiliations + expand
PMID: 22271271

We observed a reduction of 34.0% for preventable ADEs, but an increase of 29.5% in potential ADEs following implementation. The overall rate of ADEs increased

1012-1987-7.

der entry

Our findings support the use of vendor CPOE systems as a means to reduce drug related injury and harm. The potential ADE rate could be reduced by making refinements to the vendor applications and their associated decision support.

Lathan Kaufman,
Song,



Cochrane Database of Systematic Reviews

Reducing medication errors for adults in hospital settings (Review)

Ciapponi A, Fernandez Nievas SE, Seijo M, Rodríguez MB, Vietto V, García-Perdomo HA, Virgilio S, Fajreldines AV, Tost J, Rose CJ, García-Elorrio E

- 65 Studien
 - 51 RCT
 - 14 ITS

Authors' conclusions

Compared to usual care, medication reconciliation, electronic prescribing systems, barcoding and feedback to professionals may reduce ADEs or medication errors, or both. Nonetheless, the best modalities to deliver these interventions, and the effect of other interventions, are less clear.

Ciapponi A, Fernandez Nievas SE, Seijo M, Rodríguez MB, Vietto V, García-Perdomo HA, Virgilio S, Fajreldines AV, Tost J, Rose CJ, García-Elorrio E.
Reducing medication errors for adults in hospital settings.
Cochrane Database of Systematic Reviews 2021, Issue 11. Art. No.: CD009985.
DOI: 10.1002/14651858.CD009985.pub2.

www.cochranelibrary.com

Stepped-Wedge Cluster RCT to Assess the

We found no significant reduction in overall rates of medication administration errors in the first 70 days following EMS.

ON MEDICATION ADMINISTRATION ERRORS

Johanna I WESTBROOK^{a,1}, Ling LI^a, Amanda WOODS^a, Tim BADGERY-PARKER^a,
Virginia MUMFORD^a and Magdalena Z. RABAN^a

^a *Australian Institute of Health Innovation, Macquarie University, Australia*

ORCID ID: Johanna Westbrook <https://orcid.org/0000-0003-1083-8192>, Ling Li
<https://orcid.org/0000-0002-1642-142X>, Virginia Mumford <https://orcid.org/0000-0001-7915-0615>, Magdalena Raban <https://orcid.org/0000-0002-6995-2849>, Tim
Badgery-Parker <https://orcid.org/0000-0002-1275-1130>

Nurses' Medication Administration Workarounds when Using Electronic Systems: An Analysis of Safety Incident Reports

Hannah I ROBERTS^a, Madaline KINLAY^a, Deborah DEBONO^b,
Rosemary BURKE^c, Aaron JONES^c and Melissa T BAYSARI^{a,1}

^a*The University of Sydney, Australia*

^b*University of Technology Sydney, Australia*

^c*Sydney Local Health District, Australia*

ORCID ID: Melissa Baysari <https://orcid.org/0000-0003-1645-9126>

Table 1. EMMS design, user and organisational factors contributing to nurses' workarounds, as reported in incident reports.

Contributory factors	Number of incident reports with this factor reported*
EMMS design	Total: 13
Additional tasks required	5
Current configuration does not support work, is complex or is inflexible	5
Error	
Failure	
Use	
Con	
Tim	
Inte	
Mis	
Unsafe acts by other users	3
Infrastructure not used as intended	1
Organisation conditions	Total: 25
Inadequate training or education	18
System or infrastructure unavailable	6
Downtime	1

- Durch CPOE neue Fehler, Herausforderungen, Sicherheitsrisiken
- EMS stört Arbeitsablauf -> Workaround

* Incident reports could include more than one factor

+ Planung	Wirkstoffe	Stärke	Dosierung	AMTS	Konzentration	Applikation	Planungszeiten	Heute	Planungstage	Zuletzt bearbeitet	06.09.	07.09.
Tage seit Aufnahme (Station)											3	4
Tage seit Aufnahme (Fall)											6	7
Medikation											Flüssigkeit [mL]	Brennwert [kca]
IMMUNSUPPRESSIVA												
 	Kineret 100mg/0,67ml Injektionslösung g	Anakinra 100 mg	300 mg ± 2,01 mL 3 Spritze		300 mg auf 2,01 mL	FER / i.v.	08:00,20:00 täglich	2x	5	05.09. 15:17		4,02
CORTICOSTEROIDE ZUR SYSTEMISCHEN ANWENDUNG...												
	Dexa 40mg inject JENAPHARM	Dexamethason 21-dihydrogenphosphat	20 mg ± 2,5 mL 0,5 Amp.		20 mg auf 2,5 mL	AMP / i.v.	19:00 täglich	1x		04.09. 14:05	2,5	
ANTIBIOTIKA ZUR SYSTEMISCHEN ANWENDUNG												
	Meropenem_Perf. Meropenem Hikma 1g + Isotonische Kochsalzlösung 0,9% Fresenius	Meropenem 1000 mg + Natrium-Ion 7,7 mmol	1000 mg ± 1 Flasche + 7,7 mmol ± 0,05 L 1 Beutel		1000 mg + 7,7 mmol auf 50 mL	 TSS / i.v.	07:00,15:00,23:00 tä...	3x	6	03.09. 08:41		150
	Vancomycin_Inf. Vancomycin Noridem 1000mg Infusionslösung + Isotonische NaCl-Lösung 0,9% Easyflex+ + Aqua ad Injectabilia Miniplasco connect 20	Vancomycin-Standard 1000 mg + Natrium-Ion 77 mmol + Wasser für Injektionszwecke 20 mL	500 mg ± 0,5 Flasche + 77 mmol ± 0,5 L 1 Beutel + 40 mL ± 40 mL 2 Amp.		500 mg auf 540 mL	 TSS / i.v.	07:00,19:00 täglich	2x	5	06.09. 09:36		1080
	Cotrim K-ratiopharm 200mg/5ml+40mg/5ml	Co-trimoxazol 240 mg	480 mg ± 10 mL 2 Messlöffel		480 mg auf 10 mL	SAF / p.o.				06.09. 09:46		
	Cotrim-ratiopharm Ampullen 400mg/5ml+80mg/5ml	Co-trimoxazol 480 mg	480 mg ± 5 mL 1 Amp.		480 mg auf 5 mL	IFK / i.v.	07:00 täglich	1x	1	06.09. 09:46		5
ANTIMYKOTIKA ZUR SYSTEMISCHEN ANWENDUNG												
	Posaconazol_Inf. Noxafil 300mg + Isotonische Kochsalzlösung Baxter 9mg/ml	Posaconazol 300 mg + Natrium-Ion 38,5 mmol	300 mg ± 16,7 mL 1 Glasflasche + 38,5 mmol ± 0,25 L 1 Beutel		300 mg auf 266,7 mL	 IFK / i.v.	07:00,19:00 täglich	2x	2	06.09. 09:36		533,4
ANTIVIRALE MITTEL ZUR SYSTEMISCHEN ANWENDUNG...												
	Aciclovir_Inf. Aciclovir Hikma 500mg Pulver zur Herstellung + Isotone Kochsalz-Lösung 0,9% Braun Eco + Aqua ad Injectabilia Miniplasco connect 20	Aciclovir 500 mg + Natrium-Ion 15,4 mmol + Wasser für Injektionszwecke 20 mL	400 mg ± 0,8 Flasche + 15,4 mmol ± 0,1 L 1 Flasche + 20 mL ± 20 mL 1 Amp.		400 mg auf 120 mL	 TSS / i.v.	07:00 täglich	1x	3	06.09. 09:35		120
Katecholamine (Norepinephrin)												
	Norepinephrin_Perf. Arterenol 1mg/ml Injektionslösung 25ml + Isotonische NaCl-Lsg 0,9% DELTAMEDICA	(R)-Norepinephrin 25 mg + Natrium-Ion 7,7 mmol	5 mg ± 5 mL 0,2 Glasflasche + 6,93 mmol ± 45 mL 0,9 Glasflasche		5 mg auf 50 mL	 IFK / i.v.				02.09. 13:29		
ANALGETIKA												
	Hydromorphon_Perf. Hydromorphon-hamehl 10mg/ml 1ml Injektio + Isotonische Kochsalzlösung 0,9% Fresenius	Hydromorphon hydrochlorid 10 mg + Natrium-Ion 7,7 mmol	10 mg ± 1 mL 1 Amp. + 7,546 mmol ± 0,049 L 0,98 Beutel		10 mg auf 50 mL	 AMP / i.v.				05.09. 18:11		
	Hydromorphon-hamehl 10mg/ml 1ml Injektio	Hydromorphon hydrochlorid 10 mg	0,2 mg ± 0,02 mL 0,02 Amp.		0,2 mg auf 0,02 mL	AMP / i.v.				04.09. 15:51		
PSYCHOANALEPTIKA												
	Cipramil 20mg	Citalopram 20 mg	20 mg ± 0,5 mL 1 Amp.		20 mg auf 0,5 mL	IFK / i.v.				05.09. 08:57		
Andere Blutprodukte (B05AX)												
	Thrombozytenapharesekonzentrat (bestrahlt)	Thrombozytenapharesekonzentrat (bestrahlt)	200 ml		200 mL	 i.v.				07.09. 06:36		
ANTITHROMBOTISCHE MITTEL												
	Innohep 4500 Anti-Xa I.E. 0,45ml	Tinzaparin natrium 4500 I.E.	4500 I.E. ± 0,45 mL 1 Spritze		4500 I.E. auf 0,45 mL	FER / s.c.	07:00 täglich	1x		04.09. 14:08		0,45
ANTITHROMBOTISCHE MITTEL												

Verlauf

☐ Historie ☒ Planung ☐ Durchführung

Start

Stopp

P 06.09.2025 10:00

Cotrim-ratiopharm Ampullen 400mg/5ml+80mg/5ml

Name	Wert
Geplant:	06.09.2025 09:46
Planungstage:	1
Bedingung:	je Gabe
Darreichungsform:	IFK
Applikationsform:	i.v.
Dosis n. Rücksprache:	
Dosis:	480 mg ± 5 mL 1 Amp.
Dosisbezug:	je Gabe
Dosis x 1:	480 mg 5 mL 1 Amp.
Bilanzierungsanteil:	100 %
Basismedikament:	Cotrim-ratiopharm Amp...
Wirkstoff:	Co-trimoxazol 480 mg
Planungszeiten:	07:00
Wochentage:	täglich
Startzeit:	06.09.25 10:00
Stoppzeit:	

Dr. Groß, Matthias (Ärztin/Arzt)	407 ms	Bett REA: 1068 ms	So. 07.09.25 14:55:01 MESZ	Logout in 14 Min.	XDV0001 (172.24.167.223) / PRIMARY@172.24.107.204:37000
----------------------------------	--------	-------------------	----------------------------	-------------------	---

Dosierung

Medikament

Bezeichnung
Co-trimoxazol_Perf., Cotrim-ratiopharm Ampullen 400mg/5ml+80mg/5ml

Berechnung nach
Gewicht = 22.00000 kg

Max. Dosis je Tag

Ausgangsdosis
15,0000 mg·kg⁻¹
☐ je Tag
☒ je Gabe

Werte

Alter
4 Jahre + 301 Tage
BMI
18,2 kg·m⁻²
☒ Werte aktuell

Größe
110 cm
LSG
24,8 kg
☒ Werte bei Aufnahme

Gewicht
22 kg
AIBW
kg
☒ Werte wie gespeichert

Percentilen

BMI/Alter
96,3
Größe/Alter
70,2

Gewicht/Alter
92,3
Gewicht/Größe
93,3

Dosis

manuelle Anpassung
100 %
GFR...
Zeiten...
1x

Wirkstoff

Dosis

Mixtur

OK
Abbrechen

Zusammenfassung

- Datenlage zur Beeinflussung von Fehlern in der Arzneimitteltherapie im Krankenhaus durch CPOE ist uneinheitlich
- Eine differenzierte Betrachtung nach Fehlertyp ist notwendig
- Elektronische Medikationssysteme sind komplex und bedürfen suffizienter Infrastruktur und Ausbildung

What does this paper add?

- ▶ We conducted a controlled before and after study at two major adult teaching hospitals to measure the effects of EMS on MAE rates.
- ▶ Overall, 30.2% of all administrations observed had one or more clinical error and 3.3% of errors were rated as potentially serious and likely to cause permanent harm.
- ▶ Implementation of EMS was associated with a significant but modest 14% overall reduction in MAE rate, with the greatest reduction observed in 'wrong timing' errors.
- ▶ However, the intervention wards experienced a 56% reduction in medication administrations with a potentially serious MAE, suggesting that EMS are effective in reducing safety risks during medication administration.

Open access

Original research

BMJ Health &
Care Informatics

Changes in medication administration error rates associated with the introduction of electronic medication systems in hospitals: a multisite controlled before and after study

Johanna I Westbrook , Neroli S Sunderland, Amanda Woods, Magdalena Z Raban , Peter Gates, Ling Li