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Earlier Switching from Intravenous to Oral Antibiotics Due to eReminders



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Early reassessments

- Two Swiss studies: University Hospitals Lausanne and Basel
- Paper-based interventions
- Systematic reassessments after three days of IV antibiotic therapy
- Reduced duration of IV administration by 14% to 19%

J Antimicrob Chemother. 2009 Jul;64(1):188-99.
J Antimicrob Chemother. 2004 Jun;53(6):1062-7.



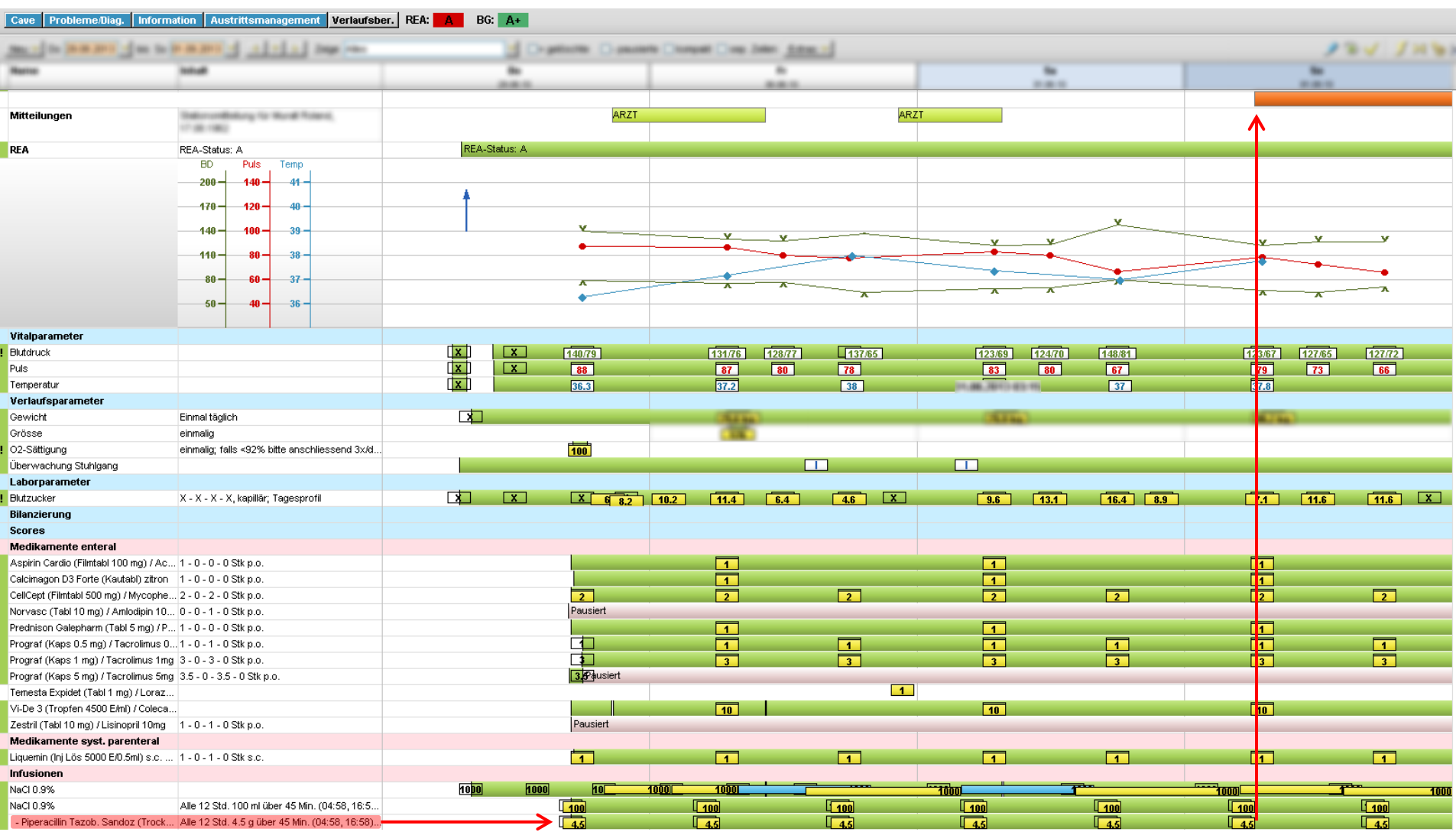
Advantages of early IV-PO switches

- Lower risk of catheter-associated infections
- Reduced nursing workload
- Decreased direct costs (most IV formulations are much more expensive than PO)
- Decreased indirect costs

Switch therapy – eReminders

Specific electronic reminders promoting early switches from IV administration to PO route of antimicrobial agents

IV Piperacillin since 60h



Hinweis antiinfektive Therapie

Verlauf zeigen | Schliessen

Erstellt 01.08.2012 11:00:00 | **Geändert** 01.08.2012 11:00:00
Beendet 01.08.2012 11:00:00 | **Von welchem Personal zur Handh. gemacht**
Patient **Werner, Lisa** | **USZ 124 255 - 124 255**
Betreff Hinweis zu i.v. Antiinfektiva

Hinweis zur Überprüfung der intravenösen antimikrobiellen Therapie

Weiterführende Informationen ?

Dieser Patient / diese Patientin wird seit über 60 Std. intravenös antimikrobiell therapiert. Bitte überprüfen Sie folgende Optionen:

- Umstellen auf orale Therapie (mit gleichem oder anderem Wirkstoff)
- Umstellen auf Wirkstoff mit engerem Spektrum
- Stoppen der antimikrobiellen Therapie, falls nicht mehr indiziert
- Keine Änderung
- Ggf. Rücksprache mit OA oder Konsiliardienst Infektiologie

Umstellung von i.v. auf p.o.

Warum ggf. umstellen	<ul style="list-style-type: none"> • Serumkonzentrationen i.v. und p.o. bei einigen antimikrobiellen Substanzen vergleichbar • Katheterinfektion, Phlebitis vermeiden • Arbeitsaufwand für Pflege reduzieren • i.v. Produkte sind viel teurer als p.o.
Wann möglich	<ul style="list-style-type: none"> • Klinischer Zustand des/r Patienten/in hat sich stabilisiert und • Zustand des Magen-Darm-Trakts erlaubt p.o. Gabe
Wann kontraindiziert	<ul style="list-style-type: none"> • Neutropenie • Unkontrollierte Infektion • Infektion des Zentralnervensystems • Staphylokokken-Bakteriämie • Endokarditis; intravaskuläre Infektion (z.B. eitrige Thrombophlebitis) • Eingeschränkte gastrointestinale Absorption

Dienstsucher Infektiologie: 124 255

USZ Richtlinien Antiinfektiva ?

Hospital-wide controlled trial

- Before-after study design
- Intervention group (12 divisions), eReminders during 2012
- Control group (17 divisions), no reminders displayed

Comparison of intervention period (2012) with baseline (2011) using the log-rank test

Results – analyzed data

24,599 IV antimicrobials

6,410 (26%) were switched to PO administration

- Antibiotics (95% of switched agents)
- Antifungals (3%)
- Antivirals (2%)

Top 10 switched IV antibiotics

	Top 10 switched IV antibacterials	n	%
1	iv amoxicillin and enzyme inhibitor	2709	47.3
2	iv piperacillin and enzyme inhibitor	750	13.1
3	iv ceftriaxone	401	7.0
4	iv cefuroxime	337	5.9
5	iv ciprofloxacin	313	5.5
6	iv clindamycin	158	2.8
7	iv meropenem	150	2.6
8	iv vancomycin	128	2.2
9	iv metronidazole	106	1.9
10	iv cefazolin	84	1.5

Top 10 switched IV antibiotics

*

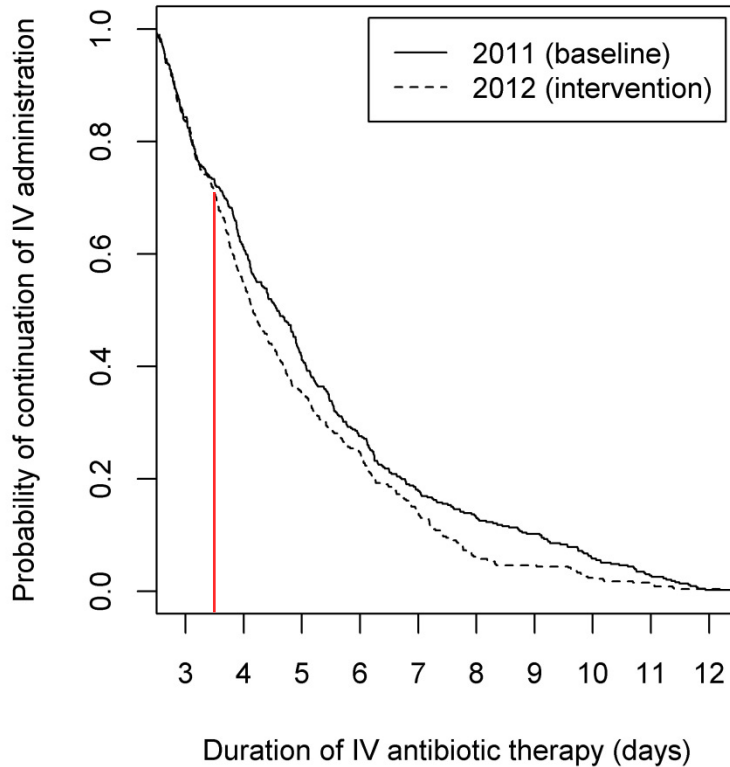
Top 10 switched IV antibacterials			n	%		most frequently switched to			n	%*
1	iv amoxicillin and enzyme inhibitor	2709	47.3	→	po amoxicillin and enzyme inhibitor	2554	94.3			
2	iv piperacillin and enzyme inhibitor	750	13.1	→	po amoxicillin and enzyme inhibitor	391	52.1			
3	iv ceftriaxone	401	7.0	→	po amoxicillin and enzyme inhibitor	178	44.4			
4	iv cefuroxime	337	5.9	→	po cefuroxime	319	94.7			
5	iv ciprofloxacin	313	5.5	→	po ciprofloxacin	292	93.3			
6	iv clindamycin	158	2.8	→	po clindamycin	135	85.4			
7	iv meropenem	150	2.6	→	po ciprofloxacin	48	32.0			
8	iv vancomycin	128	2.2	→	po ciprofloxacin	27	21.1			
9	iv metronidazole	106	1.9	→	po ciprofloxacin	53	50.0			
10	iv cefazolin	84	1.5	→	po amoxicillin and enzyme inhibitor	40	47.6			

Top 10 switched IV antibiotics

Top 10 switched IV antibacterials		days		most frequently switched to		days
1	iv amoxicillin and enzyme inhibitor	3.1	→	po amoxicillin and enzyme inhibitor	2.8	
2	iv piperacillin and enzyme inhibitor	6.4	→	po amoxicillin and enzyme inhibitor	2.6	
3	iv ceftriaxone	3.9	→	po amoxicillin and enzyme inhibitor	2.4	
4	iv cefuroxime	1.2	→	po cefuroxime	2.3	
5	iv ciprofloxacin	2.7	→	po ciprofloxacin	4.5	
6	iv clindamycin	3.2	→	po clindamycin	2.7	
7	iv meropenem	10.3	→	po ciprofloxacin	3.8	
8	iv vancomycin	10.9	→	po ciprofloxacin	5.9	
9	iv metronidazole	2.9	→	po ciprofloxacin	2.9	
10	iv cefazolin	1.9	→	po amoxicillin and enzyme inhibitor	3.0	

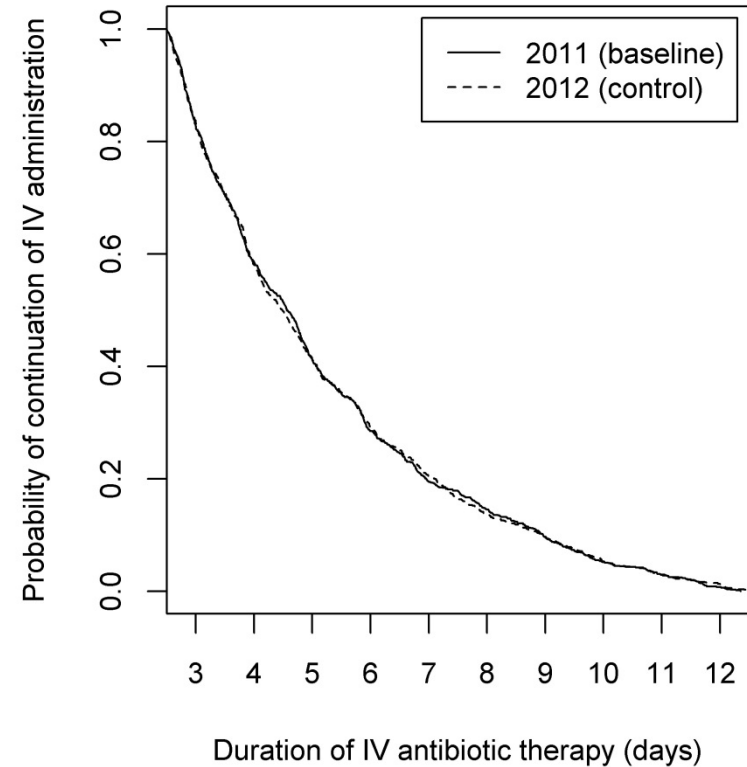
IV antibiotics until switch

Intervention group



$p=0.0059$

Control group



$p=0.88$

Switched agents

reduction by ≈ 1 day (17.5%)

		Baseline period (2011)		Intervention period (2012)		p
		Number of IV-PO switches	Mean duration of IV administration until switch to PO (days)	Number of IV-PO switches	Mean duration of IV administration until switch to PO (days)	(log-rank testing the durations 2012 vs. 2011)
Intervention	Antibiotics	757	5.42	794	4.47	0.0036
	Antifungals	9	0.78	16	3.46	0.29
	Antivirals	14	9.67	14	4.79	0.023
Control	Antibiotics	2240	3.96	2291	4.28	0.032
	Antifungals	71	9.59	81	7.69	0.21
	Antivirals	63	8.8	60	7.97	0.53

Strengths and weaknesses

- Hospital-wide controlled before-after study
- Large Sample
- 2 x entire year (seasonal influences)

- Arbitrary definition of study groups
- Clinical outcome was not assessed
- No economical end points

Co-authors

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Thank you!

Questions?

