Appendix I. In- and exclusion criteria

Inclusion criteria

1. Age ≥ 18 years.
2. Community acquired pneumonia, defined as:
   a. A new or progressive infiltrate on a chest X-ray **AND**
   b. ≥ 2 of the following criteria:
      - Cough
      - Sputum production
      - Dyspnoea
      - Rectal temperature > 38°C or < 36.1°C
      - Auscultator findings consistent with pneumonia
      - Leucocytosis (>10.000/mm3, or >15% bands)
      - C-reactive protein >30 mg/L **AND**
   c. No hospital acquired pneumonia **nor** health care associated pneumonia**
3. Admission to internal medicine or lung disease ward.
4. Intravenous treatment with antibiotics.
5. Severe pneumonia defined as: PSI of >90 or CURB-65 >2, or pneumonia being the reason of admission.

Exclusion criteria

1. ICU admission with intravenous antibiotics.
2. Infections other than pneumonia that need immediate treatment with intravenous agents.

3. Cystic fibrosis or history of lung transplantation.

4. Neutropenia (leukocyte count <0,5*109 / l) or/and HIV infection with a CD4 count <200/mm3

** Hospital acquired pneumonia defined as hospital admission > 48 hours in the two weeks prior to inclusion.*

*** Health care associated pneumonia: non-hospitalized patient with extensive healthcare contact, as defined by one or more of the following:*

a. Intravenous therapy, wound care, or intravenous chemotherapy within the prior 30 days.

b. Residence in a nursing home or another long term care facility.

c. Hospitalization in an acute care hospital for ≥2 days within the prior 90 days.

d. Attendance to a hospital or hemodialysis clinic within the prior 30 days.

Appendix II. Questions in the patient specific questionnaire

Nr.	Subject	Data
1.	Is the patient clinically stable according to the resident?	Yes/No, because…
2.	Is the patient able to take oral medication?	Yes/No, because…
3.	Does the patient receive antibiotics intravenously or orally?	Yes/No, because…
4.	What factors are of influence on your choice to administer the antibiotics intravenously/orally?	

Factors	Qualitative answers
Medical specialist (supervisor)	
Resident	
Nursing staff	
Patient	
Other hospital staff	
Organisation	
Other	

End of questionnaire

Appendix III. Questions in the physician specific questionnaire

Nr.	Question
Physician	
1.	Name and job description.
2.	Hospital, department.
3.	Residents: years of working experience as a resident. Medical specialists: centre of training.
4a.	Years of research experience (if applicable).
4b.	Years of experience as a medical specialist (if applicable).
Antibiotic treatment in community acquired pneumonia	
5.	Theoretically speaking, what if the average patient with a CAP was admitted and intravenous antibiotics were administered, what would be an ideal time to switch to oral antibiotics in your perspective?
6.	Where did you pick this up?
7.	What factors are of influence on the timing of the switch from intravenous antibiotics to oral agents in patients with severe CAP in clinical practice? E.g. what factors might make you deviate from the ideal timing mentioned in question 5? When formulating your answer think of factors on the following levels: - Medical specialist (supervisor) - Resident - Nursing staff - Patient - Other hospital staff - Organisation - Other
8.	In your working environment, are there clear guidelines on the timing of the switch from intravenous antibiotics to oral agents in patients with (severe) CAP?
9.	If yes, which guidelines are they?
10.	Do you know if there are any published research results on this subject?

Feedback		
11.	What form of feedback is most efficient to your opinion?	
	- Presentation (lecture)	- Reminder (on desktop personal computer)
	- Presentation (interactive)	- Reminder (on patients chart)
	- Walk through presentation on the computer	- Reminder (though nursing staff)
	- Interactive computer program	- Reminder (through pharmacy)
	- Reminder (pocketsize laminated card)	- Other, namely…
Additional remarks:		
<u>End of questionnaire</u>		

Appendix IV. Characteristics of patients in whom a switch was possible on day 3 (n=69)****

	Total*	**Timing switch***		
		≤ day 3	**> day 3**	**p-value (95% CI)**
	69 (100)	42 (60.9)	27 (39.1)	
Age	63.8 (18.7)	61.9 (20.5)	66.7 (15.6)	0.294 (-14.094 - 4.327)
Female	30 (43.4)	16 (38.1)	14 (51.9)	0.261
Comorbidity (≥1)	39 (56.5)	24 (57.1)	15 (55.6)	0.897
Malignancy**	9 (13.0)	-	-	-
Liver disease**	0	-	-	-
Congestive heart failure**	6 (8.7)	-	-	-
Cerebrovascular disease**	5 (7.2)	-	-	-
Kidney disease**	5 (7.2)	-	-	-
Lung disease	22 (31.9)	13 (31.0)	9 (33.3)	0.836
Other relevant comorbidities	15 (21.7)	8 (19.0)	7 (26.0)	0.499
CURB-65 at presentation (min)	1.2 (± 1.0)	1.05 (± 0.9)	1.48 (± 1.0)	0.073 (-.910 - 0.042)
Fine score at presentation (min)	79.0 (± 28.2)	76.2 (± 26.7)	83.5 (± 30.4)	0.299 (-21.186 - 6.604)
Follow up				
Clinical parameters (day 3)***				
Temperature (°C)	36.8 (± 0.5)	36.7(± 0.5)	36.9 (± 0 .5)	0.090 (-0.4814- 0.0357)
Oxygen saturation (%)	95.9 (± 1.9)	95.5(± 1.5)	96.2 (± 2.2)	0.151 (-1.759 - 0.279)
Oxygen administered (yes)	17 (25.0)	4 (14.3)	6 (25.0)	0.483
Respirtratory rate (per minute)	18.5 (± 2.1)	18.5 (± 1.5)	18.5 (± 2.5)	1.000 (-2.141 - 2.141)
Blood pressure (mmHg)	-	-	-	-
Diastolic	75.0 (± 10.4)	74.6 (± 10.7)	75.5 (± 10.2)	0.759 (-6.507 - 4.774)
Systolic	133.6 (± 18.8)	137.2 (± 19.7)	129.5 (± 17.1)	0.124 (-2.192 - 17.736)
Heart rate (BPM)	78.3 (± 9.3)	77.5 (± 10.1)	79.4 (± 8.5)	0.458 (-6.919 - 3.160)

Length of hospital stay	5,8 (± 3,4)	4,3 (± 2,6)	7,9 (± 3,3)	**0.000 (-5.036 - -2.182)**
Readmission (within 28 days)	5 (7.4)	3 (7.3)	2 (4.9)	0.989
Mortality (within 28 days)	0	-	-	-

** n (%) or mean (± standard deviation) using the Independent-samples T test for ratio variables and the Chi-quadrate or Fishers exact test for nominal variables.*

*** As defined in the Fine score.*

**** Missing data were not used in the calculation*

*****One patient died on day three and was left out of the comparison "day 3" and "follow up"*

Appendix V. Perceived barriers to an early switch strategy in theory (physician specific questionnaire (n=97). Answers provided by 3 physicians or less.

Factors		
Category	**Qualitative answers**	**Frequency***
Physician factors	Limited knowledge of the available evidence	1
	Physician has not treated this patient for long	2
Patient factors	**Patient characteristics**	
	Clinical course	
	Not clinically stable (unspecified)	2
	Signs of sepsis	2
	Coughing	1
	Recurrent pneumonia	2
	Biological availability not secure (by clinical judgement)	1
	Purulent sputum	1
	Poor lung function	1
	High Fine score	1
Other hospital staff factors	Delay due to nurses breaks and other activities	3
	Only a limited number of measurements is known	1
Organisation factors	Delay order-delivery medication	3
	Delay by specific dosing times on ward	2
	Work pressure delays communication physician-nurse	1
	Nurses are afraid to switch to oral agents	1
	Delay due to administration when prescribing manually	1
	Pro-activity nurses is limited	1
Other	**Antibiotics**	
	Various oral agents failed in primary care	1
	Amoxicillin and Augmentin are absorbed better per IV	1

	Initially unknown focus	1
	Microbiology	
	Causative pathogen is unknown	3
	Causative pathogen is viral (eg H. Influenza)	2
	Positive blood culture	1
	Admission related/ other	
	Needs one more day of (IV) antibiotics	1
	Bed bound patient	1

** Number of physicians that provided this answer.*