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Stewarding Respiratory Tract Infections

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What duration of therapy is appropriate for treating community acquired pneumonia?

- 3-5 days
- 5-7 days
- 7-10 days
- 10-14 days

What drives duration of therapy?
History, the Solar System, and a Human hand

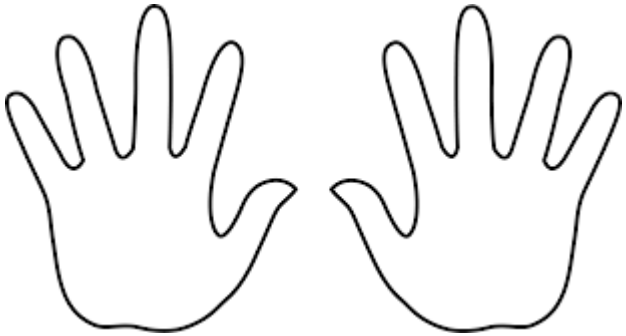
Constantine

-Babylonians held the number 7 in mystical significance

-Ancient Chinese and Japanese based 7-day cycles on celestial bodies (Sun, Moon, Mars, Mercury, Jupiter, Venus and Saturn)

-Judaism, the world was created in 7 days

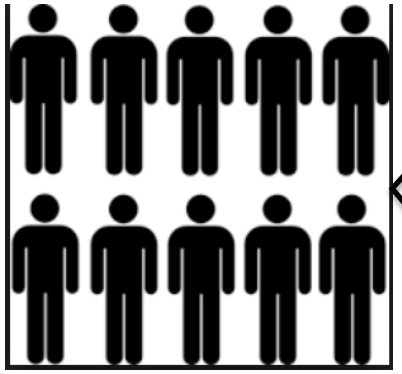
AD 321: 7-day week is formally codified by the Romans



JAMA Intern Med. 2016 Sep 1; 176(9): 1254–1255.
http://www.bbc.co.uk/religion/0/20394641

Symptom-guided duration

Adult hospitalized patients with CAP



	Day 5	Day 10	Day 30
CONTROL (N = 150) [MD-guided duration]		Clinical Success 48.6%	Clinical Success 88.9%
INTERVENTION (N = 162) [Symptom-guided duration]		56.3%	91.9%

INTERVENTION, antibiotics stopped if:

Afebrile x48h AND ≤1 CAP-associated sign of clinical instability:

[SBP < 90 | HR > 100 | RR>24 |O2 Sat < 90% |PaO2 < 60 on RA]

JAMA Intern Med. 2016 Sep 1;176(9):1257-65.

Symptom-guided duration, some caveats

- 30% of subjects in the intervention received >5 days of antibiotic therapy
- Excluded patients living in a nursing home or prior hospital stay within 14 days prior to admit
- Excluded immunosuppressed patients
- No differences in LOS or length or days of IV antibiotic
- 80% of antibiotics selected were fluoroquinolones

JAMA Intern Med. 2016 Sep 1;176(9):1257-65.

From Publication to Patient

Sticky Notes to Physicians

Comment

MD, IV fluids order was for 1 liter which is complete. Would you like to d/c the order now? Thank you, nursing.

2/1- Dr. Yuan, suggest d/c antibiotics after tomorrow's dose (2/2). Will have completed 5 days of abx which is non-inferior to longer duration for mild-moderate CAP. JAMA Int Med. 2016 Sep; 176(9): 1257-65. Thank you- Kevin S, PharmD x5636

Last edited by **Kevin Stock, PharmD** on 02/01/18 at 1206

View All

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3-step pathway to reduce duration of antibiotics and length of stay in patients with CAP

- ✓ **Early Mobilization**
  - -During 1st 24h of hospitalization
- ✓ **IV to PO Antibiotic**
  - -Clinically improved, vital signs stable, tolerate oral
- ✓ **Predefined criteria for hospital discharge**
  - -Baseline mental status & adequate oxygenation on room air

Carratala et al. Arch Intern Med 2012; 172(12):922

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Table 2. Outcomes for Study Patients by Treatment Group

Event	3-Step Critical Pathway Group (n = 200)	Usual Care Group (n = 201)	Difference (95% CI)[a]	*P* Value[b]
Primary end point: LOS, median (IQR), d				
Overall	3.9 (2.79 to 5.75)	6.0 (4.75 to 8.83)	−2.1 (−2.7 to −1.7)	<.001
IDIBELL–Hospital Universitari de Bellvitge	4.0 (2.83 to 5.75)	6.0 (4.62 to 8.88)	−2.0 (−2.7 to −1.3)	<.001
SCIAS–Hospital de Barcelona	3.7 (2.71 to 5.67)	6.3 (4.87 to 8.71)	−2.6 (−3.2 to −1.7)	<.001
Secondary end points				
Length of intravenous antibiotic therapy, median (IQR), d	2.0 (2.0 to 3.0)	4.0 (2.0 to 6.0)	−2.0 (−2.0 to −1.0)	<.001
Adverse drug reactions, No. (%)	9 (4.5)	32 (15.9)	−11.4 (−17.2 to −5.6)	<.001
Phlebitis	8 (4.0)	21 (10.4)	−6.4 (−11.5 to −1.4)	.02
Skin eruption	0	2 (1.0)	−1.0 (−2.4 to 0.4)	.50
Vomiting/diarrhea	0	4 (2.0)	−2.0 (−3.9 to −0.1)	.12
Allergy	1 (0.5)	1 (0.5)	0 (−1.4 to 1.4)	>.99
Transaminitis	0	3 (1.5)	−1.5 (−3.2 to 0.2)	.25
Medical complications, No. (%)	40 (20.0)	49 (24.4)	−4.4 (−12.6 to 3.8)	.34
Empyema	3 (1.5)	6 (3.0)	−1.5 (−4.4 to 1.4)	.50
Cardiac complication[c]	8 (4.0)	16 (8.0)	−4.0 (−8.6 to 0.7)	.14
Respiratory failure	15 (7.5)	8 (4.0)	3.5 (−1.0 to 8.1)	.14
Acute confusion	7 (3.5)	8 (4.0)	−0.5 (−4.2 to 3.2)	>.99
Renal failure	7 (3.5)	8 (4.0)	−0.5 (−4.2 to 3.2)	>.99
Nosocomial infection	2 (1.0)	3 (1.5)	−0.5 (−2.7 to 1.7)	>.99
Severe hyperglycemia	3 (1.5)	9 (4.5)	−3.0 (−6.3 to 0.3)	.14
Shock	2 (1.0)	3 (1.5)	−0.5 (−2.7 to 1.7)	>.99
Subsequent hospital admission (<30 d), No. (%)[d]	18 (9.1)	15 (7.5)	1.6 (−3.8 to 7.1)	.59
Overall case-fatality rate (<30 d), No. (%)	4 (2.0)	2 (1.0)	1.0 (−1.4 to 3.4)	.45

Pathway to Practice: The Devil is in the Implementation Details

Imagine if, for the cost of a single sheet of paper and the effort required to place it in the patient's medical chart, you could reduce length of stay by 2 days and save up to $4600 per patient yet have no impact on readmission rate. One might think a deal with the devil had been struck…."

Sharpe. Arch Intern Med 2012;172(12)928.

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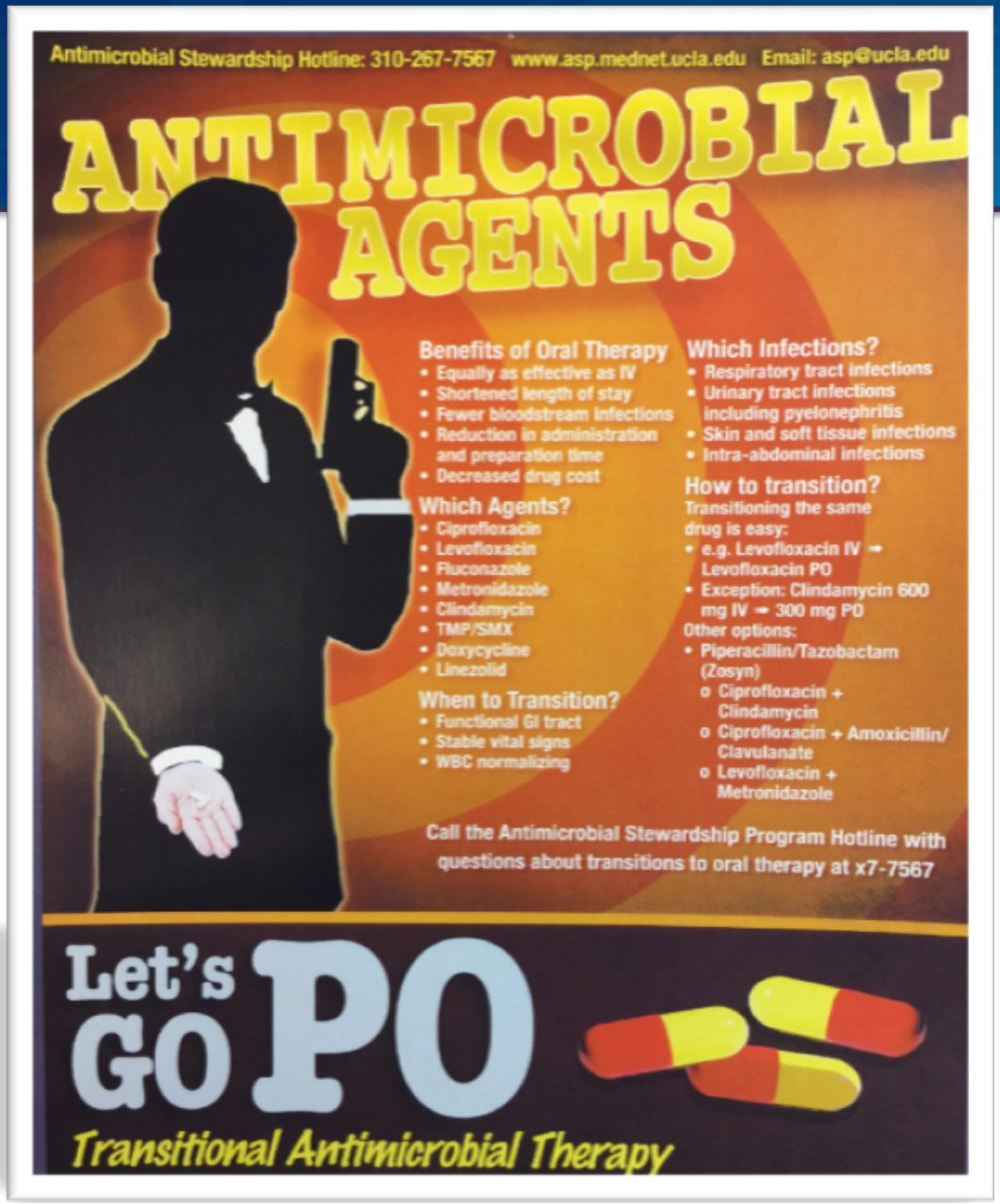

UCLA Antimicrobial Stewardship Program, Education materials.

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MRSA nasal swabs:
If it doesn't grow, just say no

- Retrospective study x2 years, 6 ICUs in a single center

12,215 adult ICU pts w/ MRSA surveillance swabs

MRSA-positive nasal swab
N = 441 (3.7%)
403 on admit

MRSA-neg nasal swab
N = 11,441 (96.3%)

MRSA-neg culture
N = 342 (77.6%)

MRSA-pos culture
N = 99 (22.4%)

MRSA-neg culture
N=11,392 (99.6%)

MRSA-pos culture
N=49 (0.4%)

Received empiric vancomycin
N=102 (29.8%)

Treated for MRSA infection
N=65 (14.7%)

Received empiric vancomycin
N=4,067 (35.7%)

Treated for MRSA infection
N=25 (0.22%)

RISK

STEWARDSHIP OPPORTUNITY

Infect Control Hosp Epidemiol 2018;1-7

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What duration of therapy is appropriate for treating community acquired pneumonia?

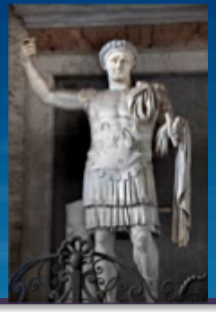
- 3-5 days

BUT….

Patient-specific factors may justify longer treatment durations

- 5-7 days
- 7-10 days
- 10-14 days

Duration of therapy:
Moving beyond Constantine, 1700 years in the making



- *Many signs and symptoms of bacterial infections result from the inflammatory response to the bacteria rather than the direct presence of viable bacteria. The persistence of symptoms for a few days does not necessarily mean that viable bacteria are still present.*

-Brad Spellberg, MD

The maturing antibiotic mantra: Shorter is *STILL* Better

Spellberg. Journal of Hospital Medicine, 2018

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My institution has procalcitonin testing

- Yes
- No. Considering getting it in the near future
- No. No plans to obtain this lab test
- Not sure