Synergy satellite event

Good morning pharmacists!
Case studies on antimicrobial resistance

Case 1

Frances Kerr
NHS Scotland

Disclosure

Conflict of interest: Nothing to disclose

Presentation

- 70 year old male (5'8 , 92kg)
- Increased lower abdominal pain and dull ache in loin
- Feverish but no rigours
- Long Term catheter in situ (Bladder outflow obstruction)
- No radiation of pain, diarrhoea or change in bowel movements

On Examination:

- Temperature 36.7 ^{0}C
- Pulse 60
- Respiratory rate: 16
- Lying BP 150/80
- No confusion

- ECG - sinus rhythm
- CXR no acute changes

Past Medical History:

- Atrial fibrilation
- Type 2 diabetes mellitus (insulin dependent)
- Peripheral neuropathy with toe amputation
- Chronic kidney failure (Stage 4)
- Catheter for bladder outflow obstruction and hydronephrosis
- Macular degeneration

Medication On Admission

Allergy : Amiodarone , Flucloxacillin

- Furosemide 20mg in the morning
- Ranitidine 150mg twice a day
- Simvastatin 40mg at night
- Aspirin 75mg in the morning
- Bisoprolol 7.5mg in the morning
- Humulin M3 Quickpen – 18 units in the morning, 6 units pm
- Ferrous fumerate 210mg daily
- Paracetamol 1g Four times daily when required

Blood Results

	Baseline	On admission	Range
Urea (mmol/l)	38.7	23.6	2.5-7.8
Creatinine (µmol/L)	274	263	60-120
Creatinine clearance * (ml/min)	21	23	
C- Reactive protein CRP (mg/L)	<6	152	0 - 6
White Cell Count WCC ($x10^9$/L)	8.9	23.9	4-11
Neutrophils	6.0	21.0	2.0-7.5

* Based on calculation using Cockcroft Gault equation

Questions?

Does this patient have sepsis?

A	• Yes. IV Antibiotics should be administered within an hour
B	• No. Patient has infection and requires IV antibiotics but they are not required within an hour.
C	• No. Patient has minor infection and requires oral antibiotics
D	• No. Patient does not have an infection

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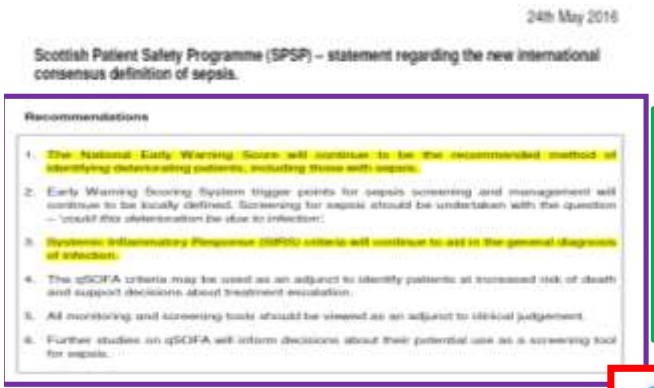

24th May 2016

Scottish Patient Safety Programme (SPSP) – statement regarding the new international consensus definition of sepsis.

Recommendations

1. The National Early Warning Score will continue to be the recommended method of identifying deteriorating patients, including those with sepsis.
2. Early Warning Scoring System trigger points for sepsis screening and management will continue to be locally defined. Screening for sepsis should be undertaken with the question – 'could this deterioration be due to infection'.
3. Systemic Inflammatory Response (SIRS) criteria will continue to aid in the general diagnosis of infection.
4. The qSOFA criteria may be used as an adjunct to identify patients at increased risk of death and support decisions about treatment escalation.
5. All monitoring and screening tools should be viewed as an adjunct to clinical judgement.
6. Further studies on qSOFA will inform decisions about their potential use as a screening tool for sepsis.

Healthcare Improvement Scotland

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) – expert task force issued in Feb 2016 - SOFA, qSOFA scoring


NICE

Sepsis: recognition, diagnosis and early management


hcare improvement

Follow

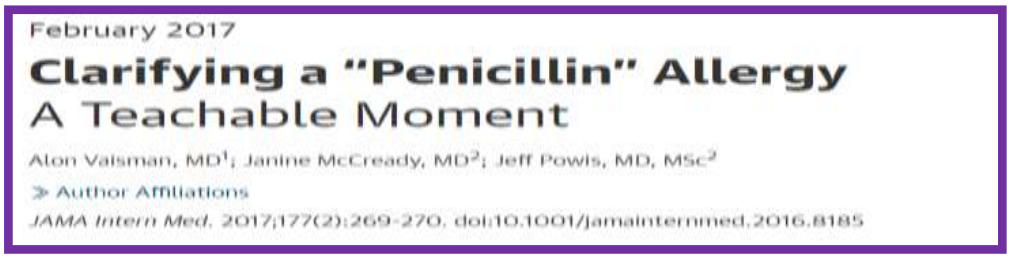
Robbie Pearson reacts to NHS Lanarkshire reducing hospital mortality by more than 20% bit.ly/25dJ2im

Which antibiotic can be used safely in a patient with history of anaphylaxis to penicillin?

A	• Co-amoxiclav
B	• Meropenem
C	• Cephalexin
D	• Gentamicin
E	• Piperacillin/Tazobactam

Which antibiotic can be used safely in a patient with history of anaphylaxis to penicillin?

A	• **Co-amoxiclav** • Avoid ,contains penicillin
B	• **Meropenem** • Avoid, cross over allergy reaction (approximately 1%)
C	• **Cephalexin** • Avoid, cross over allergy reaction (approximately 0.5-6.3%)
D	• **Gentamicin** • No cross over reaction with beta-lactam antibiotics
E	• **Piperacillin/Tazobactam** - • Avoid, contains penicillin

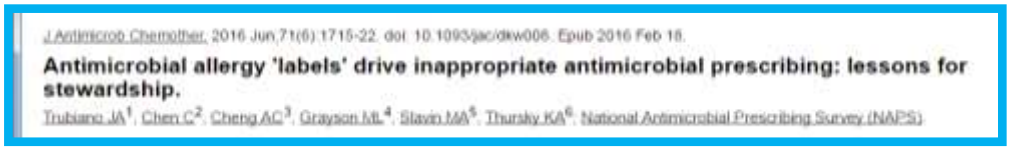


February 2017

Clarifying a "Penicillin" Allergy
A Teachable Moment

Alon Vaisman, MD[1]; Janine McCready, MD[2]; Jeff Powis, MD, MSc[2]
Author Affiliations

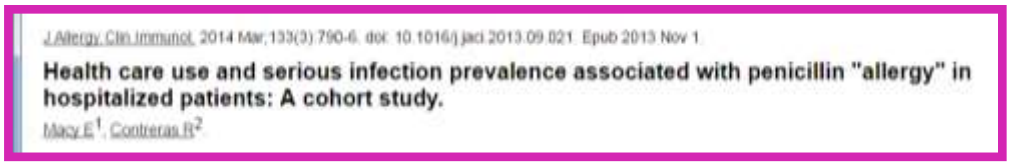
JAMA Intern Med. 2017;177(2):269-270. doi:10.1001/jamainternmed.2016.8185



J Antimicrob Chemother. 2016 Jun;71(6):1715-22. doi: 10.1093/jac/dkw006. Epub 2016 Feb 16.

Antimicrobial allergy 'labels' drive inappropriate antimicrobial prescribing: lessons for stewardship.

Trubiano JA[1], Chen C[2], Cheng AC[3], Grayson ML[4], Slavin MA[5], Thursky KA[6]; National Antimicrobial Prescribing Survey (NAPS)



J Allergy Clin Immunol. 2014 Mar;133(3):790-6. doi: 10.1016/j.jaci.2013.09.021. Epub 2013 Nov 1.

Health care use and serious infection prevalence associated with penicillin "allergy" in hospitalized patients: A cohort study.

Macy E[1], Contreras R[2]

Antibiotic treatment

- Patient allergy to flucloxacillin - confirmed as intolerance , nausea and vomiting
- Patient recently prescribed amoxicillin by community doctor
- Patient initiated on gentamicin and amoxicillin as per local policy for pyelonephritis
  (Upper Urinary tract infection)

⇨ Patient monitored but no adverse reaction observed

Day 2 of Admission

- **Positive blood cultures identified Gram negative bacilli**
- **Positive urinalysis gram negative bacilli**

	On admission	Day 2 of admission	Range
Urea (mmol/l)	23.6	31.5	2.5-7.8
Creatinine (µmol/L)	263	337	60-120
Creatinine clearance * (ml/min)	23	17	
C- Reactive protein CRP (mg/L)	152	287	0 - 6
White Cell Count WCC ($x10^9$/L)	23.9	35.9	4-11
Neutrophils	21.0	33.8	2.0-7.5

⇨ **Amoxicillin changed to Piperacillin/ Tazobactam 4.5g 12 hourly (renal dose) . Gentamicin continues (48 hourly dosing)**

Blood cultures taken and urinalysis was done before antibiotics given

* Based on calculation using Cockcroft Gault equation

Day 3 : Sensitivity Profiles

Blood Culture

Antibiotic/Culture:	Org1	
Co-amoxiclav	R	
Amoxicillin	R	
Amikacin	I	NR
Aztreonam	R	NR
Ciprofloxacin	R	NR
Ertapenem	S	NR
Cefepime	R	NR
Cefoxitin	S	NR
Gentamicin	R	
Meropenem	S	NR
Cefuroxime	R	NR
Cefotaxime	R	NR
Ceftazidime	R	NR
Temocillin	S	
Tigecycline	S	NR
Trimethoprim	R	NR
Tobramycin	R	NR
Piperacillin/Tazobacta	S	

Urine Sample

Antibiotic/Culture:	Org1	
Co-amoxiclav	R	
Amoxicillin	R	
Ciprofloxacin	R	NR
Cefalexin	R	NR
Doxycycline	R	NR
Ertapenem	S	NR
Cefepime	R	NR
Fosfomycin	S	
Cefoxitin	S	NR
Nitrofurantoin	S	NR
Gentamicin	R	
Mecillinam	S	NR
Meropenem	S	NR
Cefuroxime	R	NR
Cefotaxime	R	NR
Ceftazidime	R	NR
Temocillin	S	
Trimethoprim	R	
Piperacillin/Tazobacta	R	NR

Blood Cultures:

Sensitive to :	**Ertapenem, Meropenem, Temocillin, Tigecycline, Piperacillin/Tazobactam**
Resistant to :	**Co-amoxiclav, amoxicillin, Aztreonam, Ciprofloxacin, Cefipime, Cefuroxime, Cefotaxime, Ceftazidime, Gentamicin, Trimethoprim, Tobramycin**
Intermediate :	**Amikacin**

Urine

Sensitive to :	**Ertapenem, Meropenem, Temocillin, Fosfomycin, Cefoxitin, Nitrofurantoin, Mecillinam**
Resistant to:	**Co-amoxiclav, Amoxicillin, Ciprofloxacin, Cefalexin, Cefipime, Cefuroxime , Cefotaxime, Ceftazidime, Doxycycline, Gentamicin, Trimethoprim, Piperacillin/Tazobactam**

Questions?

What is the most appropriate antibiotic choice for this patient?

A	• Temocillin
B	• Meropenem
C	• Piperacillin/Tazobactam
D	• Co-amoxiclav

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Which of the following interventions are part of the role of the pharmacist in the management of patient with infections ?

A	• Adjusting dose for renal function
B	• Checking for interactions with drugs and disease conditions
C	• Confirming allergy status
D	• Checking microbiology results to ensure effective antibiotic selected for infection
E	• All of the above

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Patient Infection

ESBL – Extended spectrum beta-lactamase producing E.coli

⇨**Patient commenced on Temocillin 1g Daily**

(Dose reduced for renal function, usual dose 2g TWICE DAILY in resistant infections)

Carbapenem sparing strategy

Patient completed 7 days of IV treatment as recommend by microbiologist for bacteraemia and was successfully discharged home