

Meropenem prescribing: a service evaluation to assess correct indication, documentation and review of meropenem prescriptions to comply with AMR CQUIN 2016/17

Dr T. Harrison, Dr D. Pillay, Dr A. Hussain

Background

Carbapenem resistance is rising globally (1) resulting in a case of *K.pneumoniae* resistant to all available antimicrobials in the USA (2).

It has long been known that antimicrobials provide a selection pressure for resistant bacteria (3)

Antimicrobial stewardship is a key component of a multifaceted approach to preventing emergence of antimicrobial resistance (4)

One of the aims of the UK 5 year Antimicrobial Resistance (AMR) strategies is to 'conserve and steward the effectiveness of existing treatments'. (5)

This has been followed by a 2016/2017 CQUIN. This gives a financial incentive to NHS trusts to reduce their antimicrobial usage by 1%. (6)

- Part A—reduction in antibiotic consumption per 1000 admissions (particularly focussing on carbapenems)

- Part B— empiric review of antibiotic prescriptions

Objectives

To audit guideline compliance for meropenem prescriptions at a large Birmingham teaching hospital, Heart of England Teaching Hospital (HEFT).

Proposed standards:

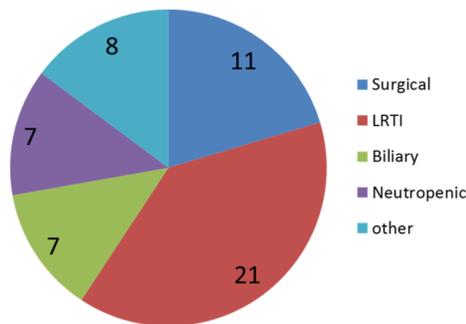
- 80% of our Meropenem prescriptions should be guideline compliant or started on micro/ID advice

80% of patients on meropenem should have:

- A documented indication
- A stop date
- A sample sent to the laboratory <72hrs
- A review at 72hrs

Demographics

50 Patients
Admitted 30/10/16-29/11/16
22 Male, 28 Female
Mean 69 years old (26-96yrs)



A Pie chart to show the indication for meropenem by number (n=50)

Method

A prospective review of 50 patients in the month of November 2016 was undertaken using electronic and paper records as per the standard operating procedure (SOP) below.

Active intervention allowed the changing of prescriptions if it was deemed not guideline compliant, with education of the physician involved.

Meropenem Stewardship SOP

This SOP has been designed for junior doctors. It can be used to facilitate decision making when screening meropenem use for guideline compliance.

Step 1 – use 'antibiotic warden' to find all those on Day 0-2 of meropenem

Step 2 – exclude all those on CF and ID wards

Step 3 – note and exclude those started on ID/Micro advice by looking at ladvice

Step 4 – use concerto/ring ward to find further clinical details:

Pt name	PID	Age	Allergy (and nature)	Diagnosis
BG				
PC				
Investigations				
Bloods	crp	wcc	Nt	gfr
Last fever	MEWS trend			
Previous Antibiotics				
Culture results				
Indwelling lines				

Step 5 – decide if the antibiotic is guideline compliant:

A= penicillin allergy	HAP+Risk factors+A	Nec. Fasciitis	Severe diabetic foot infection+A	Neutropenic sepsis +A	Acute cholecystitis/cholangitis +A	Severe pancreatitis +A	Necrotising otitis externa
Clearly compliant	Unsure	Clearly non-compliant					

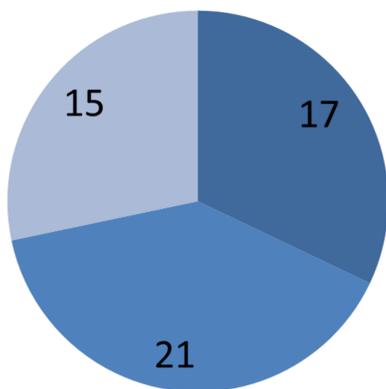
Step 6 – speak to microbiology consultant about 'unsure' or 'clearly non-compliant'

(If GHH speak to GHH consultant, if Solihull speak to the consultant doing the Solihull ward round on Tuesday and put on ladvice list)

What was the advice?

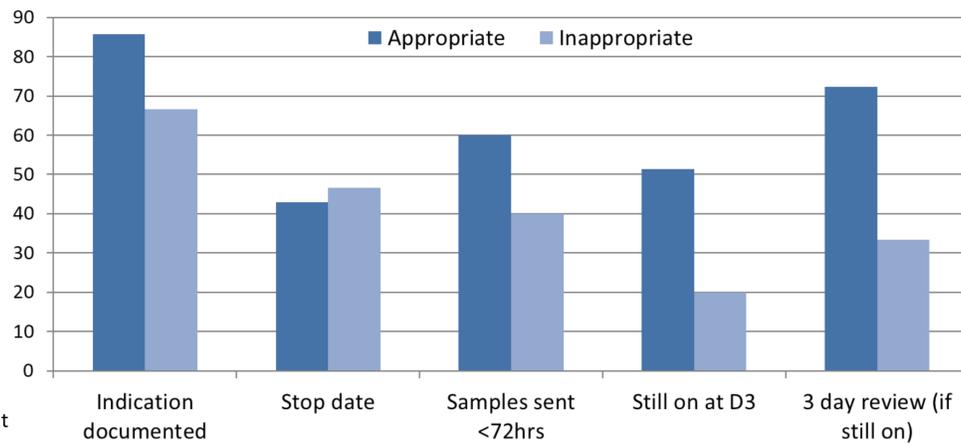
Step 7 – call ward and give advice, document on ladvice, file this sheet

Indication compliance



A Pie Chart to show the number (n=50) of prescriptions for meropenem that were compliant with guidelines

Documentation compliance

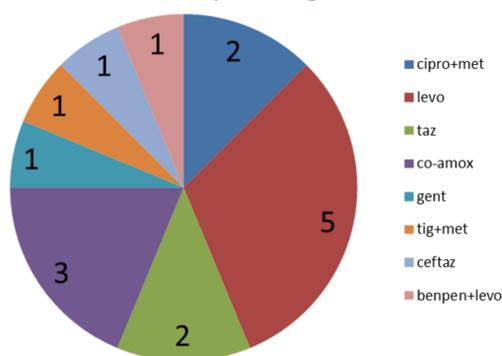


A Bar Chart to show the proportion (%) of prescriptions that had documented indication, documented stop date, sent relevant samples within 72hrs, and for those still on at D3 (n=23) if a 72hr review was documented

Discussion of results

- A high proportion of the 50 prescriptions monitored were not guideline compliant (30%)
- Indication compliance was up to standard, this corroborates other pharmacy audits.
- Other performance indicators such as stop dates and 72hr review were not as high
- There seems to be a positive correlation between guideline compliance and good clinical practice/documentation.

What were they changed to?



A Pie Chart to show the number (n=16) of alternative antibiotics that were used instead of meropenem

A more detailed review of each inappropriate case gave further information, helpfully showing areas that need to be further addressed:

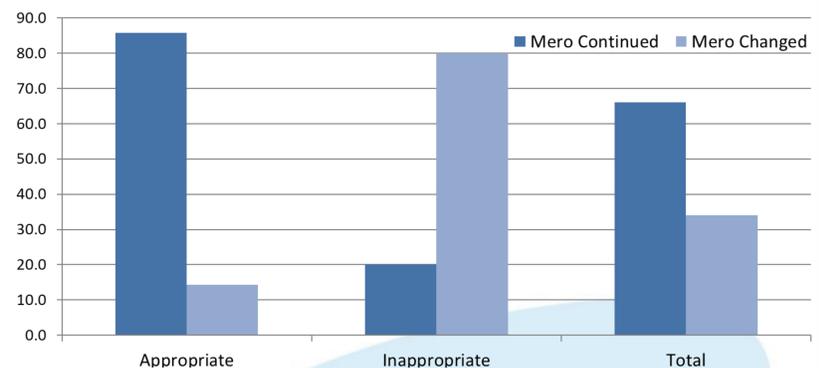
–Respiratory infections (8/15) were a large proportion of inappropriate prescriptions.

–It seems particularly difficult to stop carbapenems near end of life.

–Of the 3 inappropriate prescriptions that were still going by day 3, 2 had not been reviewed at 72 hours.

–Clinicians are unwilling to stop prescriptions that are started by other clinicians.

Active intervention



A Bar Chart to show the proportion (%) of prescriptions that were changed <24hrs after active intervention, in both the appropriate arm (n=35) and inappropriate arm (n=15)

Note: This review of 50 patients resulted in 16 (32%) of meropenem prescriptions stopped.

Interventions

- Consultant education at induction with PowerPoint slide produced to educate about carbapenem stewardship
- Microbiology team review of cases to discuss alternatives to carbapenems
- FY2 Monday screening of weekend meropenem prescriptions for consultant review (see SOP at the top of the poster)

Other interventions at HEFT for the AMR CQUIN:

- Daily Infectious Diseases physician review of patients on tazocin/meropenem in AMU
- Review of guidelines to reduce reliance on carbapenems
- Daily tazocin ward round

References

- (1) Prabaker K, Weinstein RA. Trends in antimicrobial resistance in intensive care units in the United States. *Curr Opin Crit Care*. 2011;17:472–479.
- (2) Chen L et al. Notes from the Field: Pan-Resistant New Delhi Metallo-Beta-Lactamase-Producing *Klebsiella pneumoniae* – Washoe County, Nevada, 2016. *MMWR Morb Mortal Wkly Rep* 2017;66:33.
- (3) Baquero F, Negri MC, Morosini MI, et al. Antibiotic-selective environments. *Clin Infect Dis* 1998;27(Suppl 1):S5–11.
- (4) Fishman N. Antimicrobial stewardship. *Am J Med*. 2006 Jun;119(6 Suppl 1):S53–61;
- (5) Davies SC, Gibbins N. UK five year antimicrobial resistance strategy 2013 to 2018. London: Department of Health, 2013.
- (6) NHS. Commissioning for Quality and Innovation (CQUIN)—Guidance for 2016/17. 2016. Available from <https://www.england.nhs.uk/wp-content/uploads/2016/03/cquin-guidance-16-17-v3.pdf>