

Factors influencing antimicrobial prescribing in the Emergency Department

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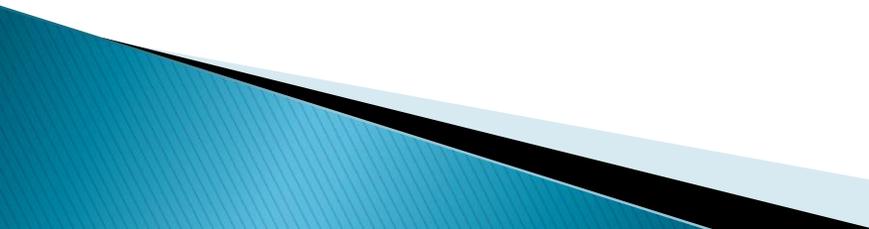
Chief Pharmacist

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Background

- ▶ In Australia up to 50% antibiotics prescribed are inappropriate
 - ▶ Antimicrobial prescribing decisions are complex
 - ▶ Rural decision making is not well understood
 - ▶ Implementing antimicrobial stewardship programs is challenging in rural hospitals
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Why are rural hospitals different?

- ▶ Rural district hospital:
 - Single prescriber in Emergency Department (ED)
 - Locum medical workforce
 - Limited after-hours diagnostic support
 - No on-site infectious diseases expertise
 - No dedicated antimicrobial stewardship pharmacist
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Impact of antimicrobial resistance

- ▶ 24000 deaths per annum US/EU
- ▶ Medical costs per patient increases by US\$18000– US\$29000
- ▶ ↑ LOS 6–13 days
- ▶ Guideline non-compliance:
 - Cost ↑ A\$2642 per patient
 - A\$300,000 per annum

Why Emergency Department?

- ▶ Empiric antibiotics are commonly prescribed
 - ▶ “Do not change the winning team”
 - ▶ It is important that first prescriber selects antibiotic appropriately
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Methods

- ▶ Mixed method approach:
 - Quantitative
 - Qualitative

Methods

- ▶ Quantitative:
 - Longitudinal observational study
 - 200 antibiotic prescriptions
 - 104 patients
 - 19 prescribers

Methods

- ▶ Qualitative:
 - Interviewed 16 ED doctors
 - Case vignettes
 - Pneumonia
 - Pyelonephritis
 - Semi-structured format

Data analysis– quantitative

- ▶ Compliance

- *Therapeutic Guidelines: Antibiotic*

- ▶ Statistical analysis– GEE logistic regression

- Gender

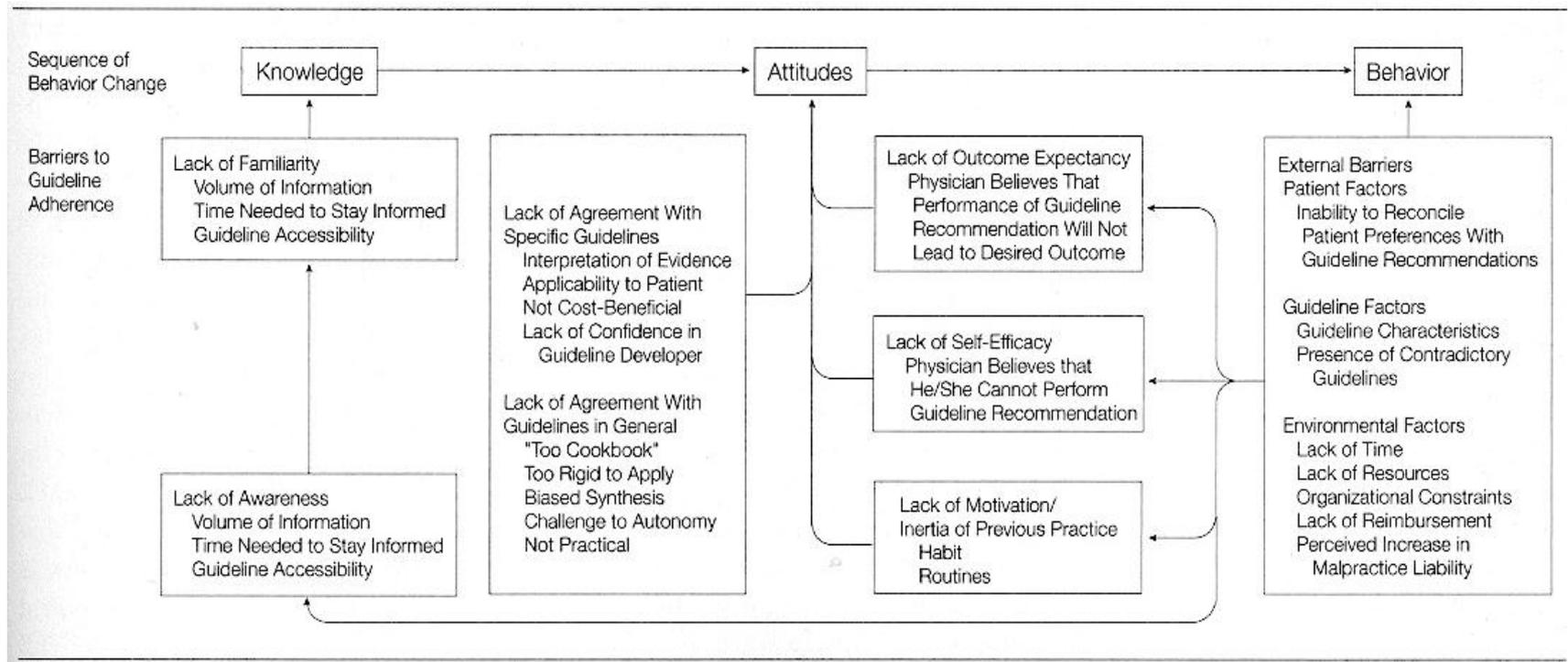
- Doctor –locum vs. regular

- Drug

- Indication

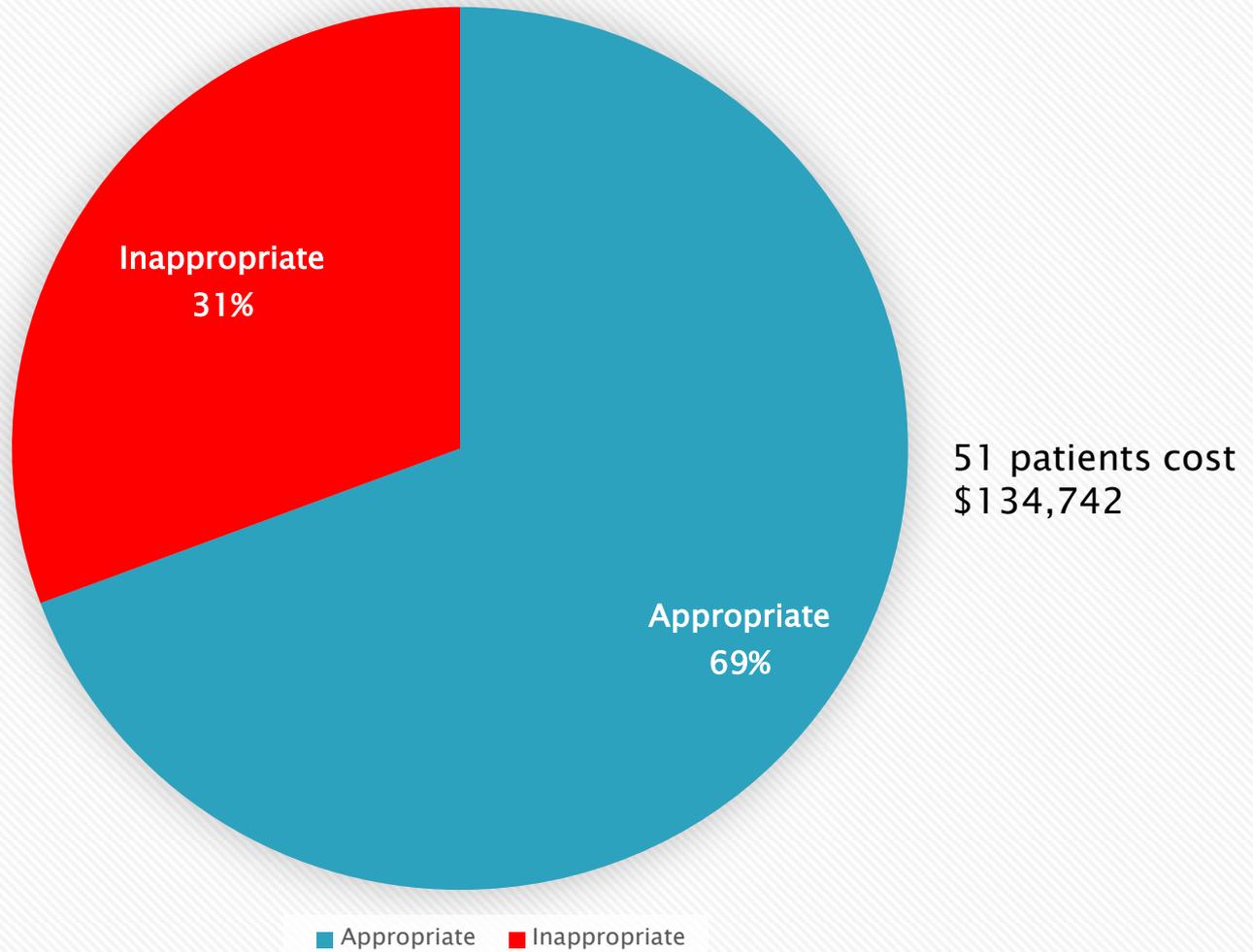
Data analysis– qualitative

► Cabana et al 1999 framework

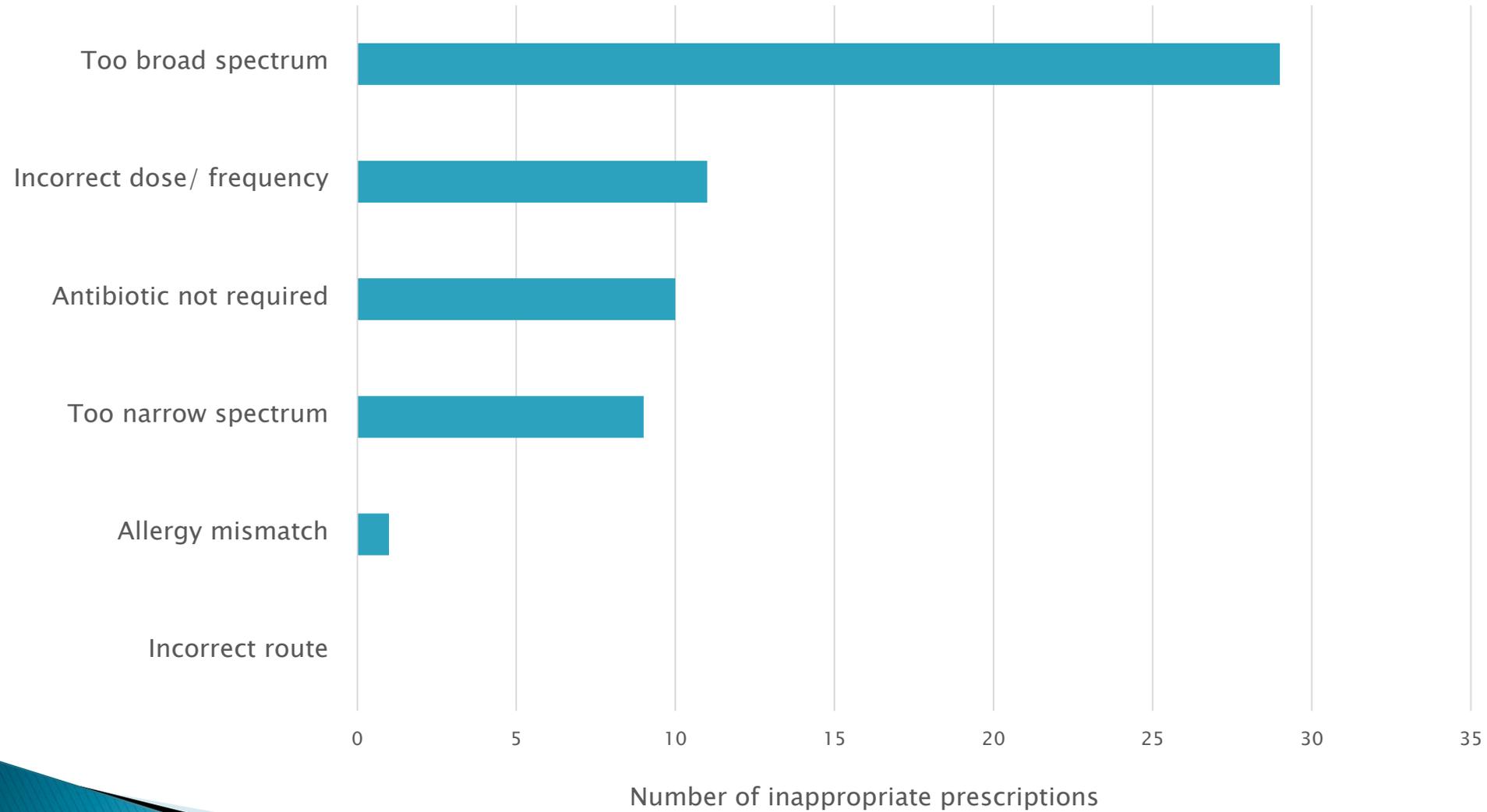


Results: quantitative

Appropriate vs inappropriate antibiotic prescriptions



Reasons for inappropriate prescriptions



Statistical analysis of antibiotic prescriptions

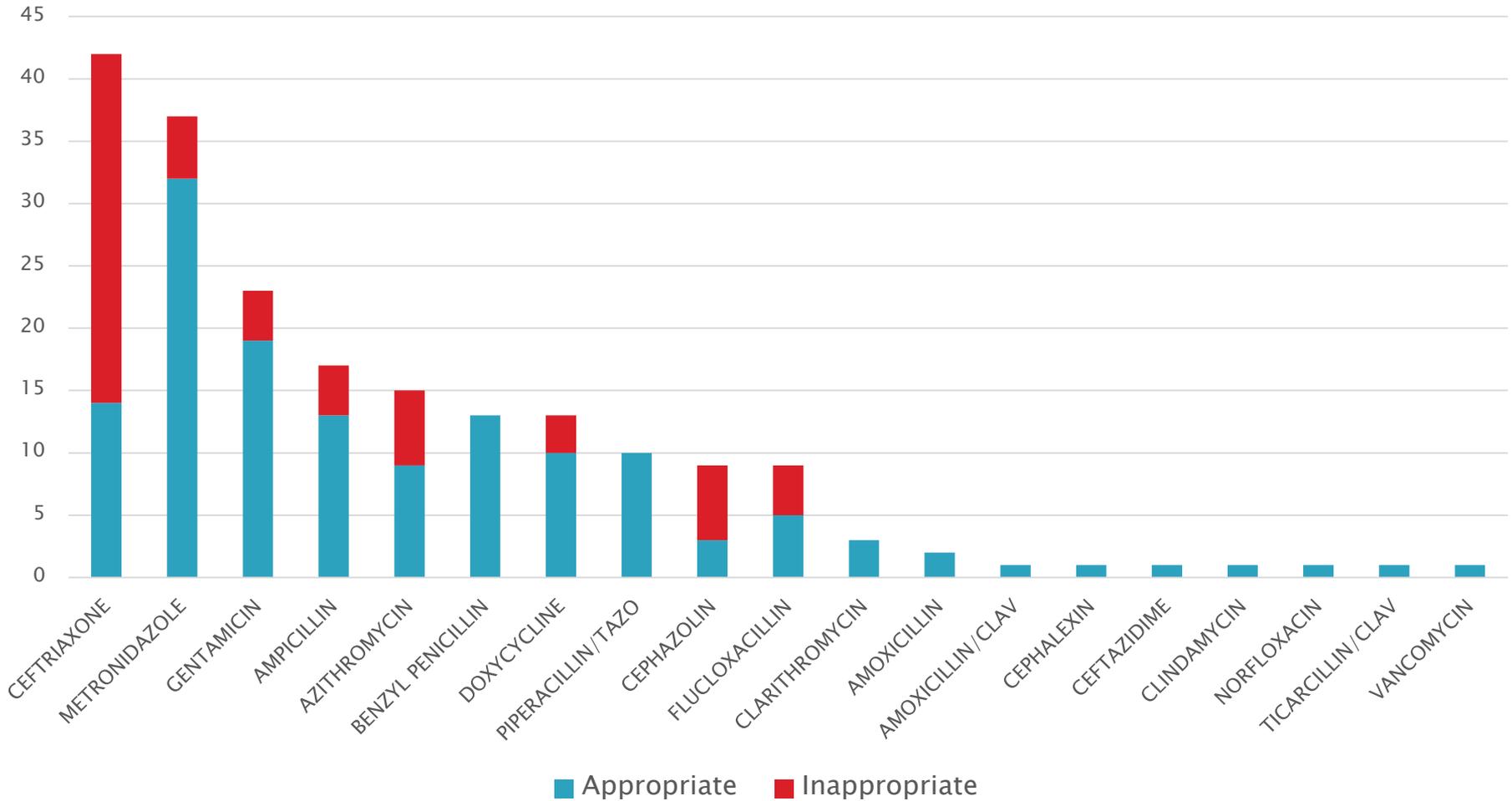
Variable	Chi-Square	df	Sig.
Gender (patient)	0.50	1	0.48
Doctor	0.17	1	0.679
Drug (Antibiotics)	36.01	7	<0.001*
Indication	2.22	6	0.898

df = degrees of freedom, Sig. = Significant result $p < 0.001$

Statistical analysis of antibiotic prescriptions

Antibiotic class	Odds Ratio	95% Confidence Interval		Hypothesis Test Sig.
		Lower	Upper	
1 st and 2 nd generation cephalosporins	3.3	0.7	14.3	0.12
3 rd and 4 th generation cephalosporins	6.6	2.4	20.0	<0.001*
Aminoglycosides	0.8	0.2	2.6	0.66
Macrolides	1.9	0.6	6.3	0.25
Nitroimidazoles	0.4	0.1	1.4	0.16
Penicillin and beta-lactamase inhibitor	0.2	0.01	3.2	0.25
Tetracyclines	0.8	0.2	4.4	0.82
Penicillins (reference)	1			

Appropriate vs. inappropriate prescriptions by drug



Results: qualitative

Knowledge

Attitude

Behaviour

Solutions

Practice
improvement

Knowledge

Awareness of overprescribing

“we use ceftriaxone ... when they are not even pneumonia...they are clearly over treated, there’s no question”

“I do think the ceftriaxone... is a really interesting point ... I’ve been working in Australia for 2 years, and I noticed as soon as I moved here I couldn’t believe how much we use it because it is very much a restricted [drug in UK]”

Awareness of guidelines

“What is that the local guideline, No not that I know of it’s always been ETG [Therapeutic Guidelines]”

Attitude

Prescribing culture

"...there are 2 doses I usually pick, I don't know why, but 240 and 360, big one 360 small one 240"

"They do suggest benpen [benzyl penicillin] but most of us are using ceftriaxone that's what the physician like"

"... with the gentamicin if you sometimes ... chart a bit more then you have to have a long discussion with the nurses ... some of them are just familiar with the 240, and they don't particularly give more than that"

Behaviour

Organisational factors

“When we are working on night shifts there is not many investigations available”

“[If] I’m worried about the patient [who] I think is going to deteriorate or we’re short staffed I’ll just go straight to ceftriaxone”

ED specific factors

“The part gets difficult here again in the ED... is that... sometimes...we don’t have a diagnosis in the [first] few hours”

“I must admit once they leave emergency [department] I don’t tend to follow them up too much”

“[Ward doctors] have no obligation to continue whatever we have started, it is expected that they form their own decision, own diagnosis and own management plan. Our job is to start with the initial management but they don’t have to stick with it”

Solutions

“I was using a lot of ceftriaxone where it probably wasn’t necessary. So I’ve certainly changed that now”

“I think people should have less licence to prescribe their favourite antibiotic”

“I mean if there was a general consensus amongst both the permanent ED CMOs [ED doctors] and the ward doctors then we’d have a lot more power to then say to the locums look here’s the document we use in [this] hospital... no more... ‘cefa [ceftriaxone] kill everything’ (sic) for every patient”

Practice improvement

- ▶ Doctors suggestions
 - Education
 - Restricting availability of broad-spectrum antibiotics
 - Consensus based local approach
- ▶ Antibiotic audit recommendations
 - Targeted interventions (e.g. ceftriaxone)
- ▶ Next phase
 - Implementation of the recommendations

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