Antimicrobials:

What are we prescribing and can we do it better?

Yuen Su, Infectious Diseases physician

Danh Nguyen, AMS Pharmacist

Outline

What are we prescribing?

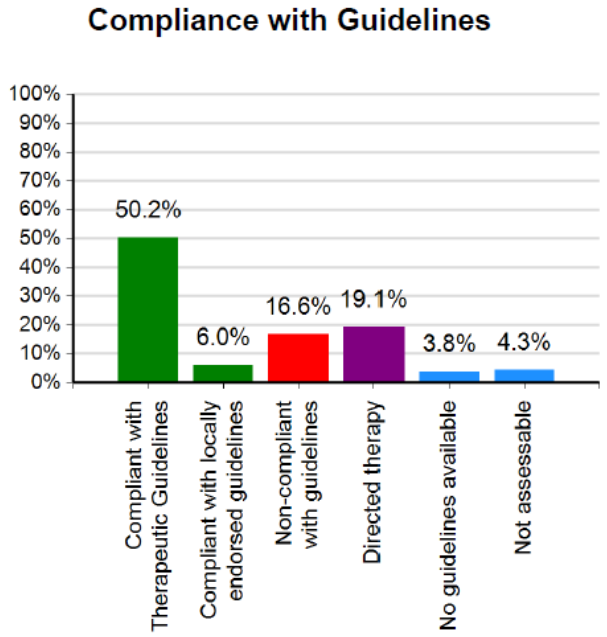
Can we do it better?

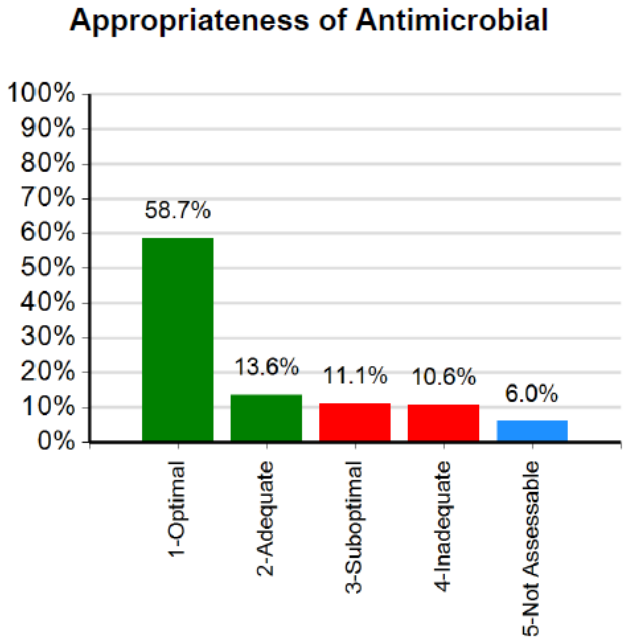
- Pneumonia
- IV to oral switch
- Topical antimicrobials
- Intra-abdominal infections
- De-escalation

What are we prescribing?

NAPS National Antimicrobial Prescribing Survey

2021





Compliant with Guidelines	56.2%
Noncompliant with Guidelines	16.6%
Directed Therapy	19.1%
Other	8.1%

*Therapeutic Guidelines' and 'Local Guidelines' are deemed as being **compliant** with guidelines (displayed in green). None Available and Not Assessable are grouped as 'Other' (displayed in blue).*

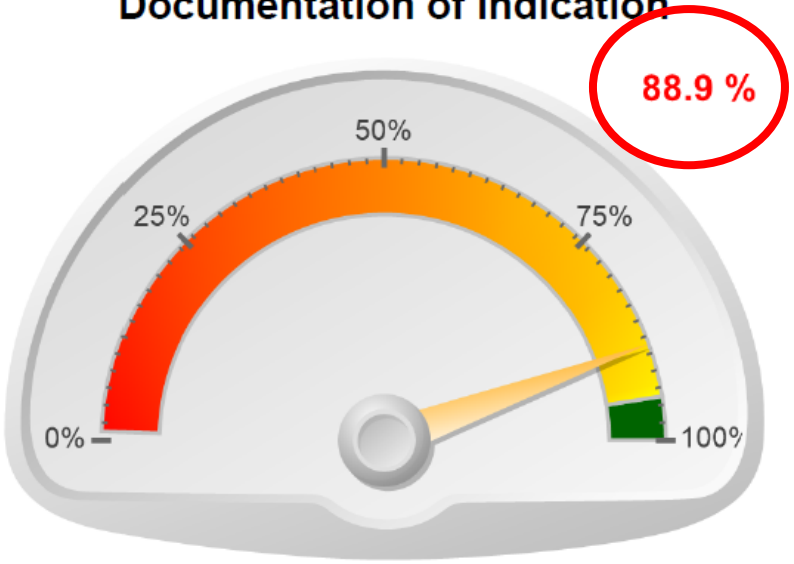
Appropriate	72.3%
Inappropriate	21.7%
Not Assessable	6.0%

*'Optimal' and 'Adequate' are deemed as being **appropriate** (displayed in green).*
*'Suboptimal' and 'Inadequate' are deemed as being **inappropriate** (displayed in red)*

	2020	2021
Compliance with guidelines/directed therapy	82%	75%
Appropriateness	82%	72%

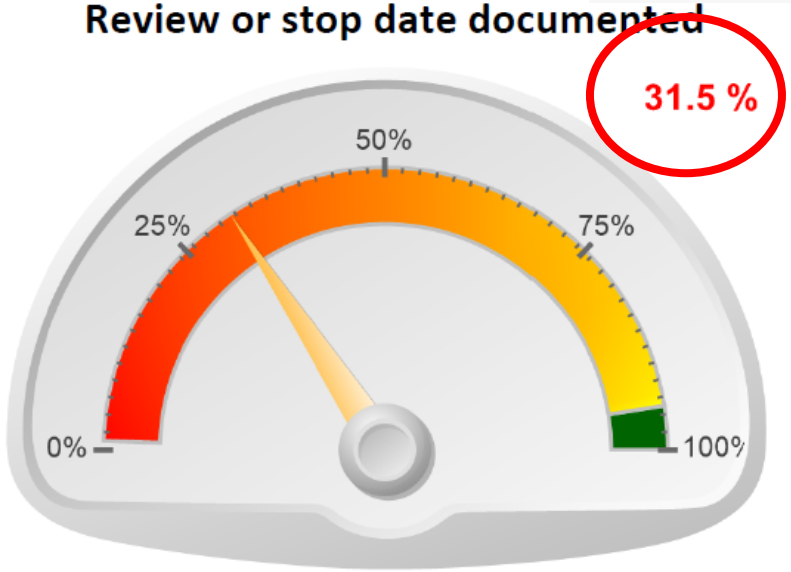
Worse compared with 2020!

Documentation of Indication



The percentage of total prescriptions where an indication was documented.
For best practice this should ideally be greater than 95% (green section)

Review or stop date documented



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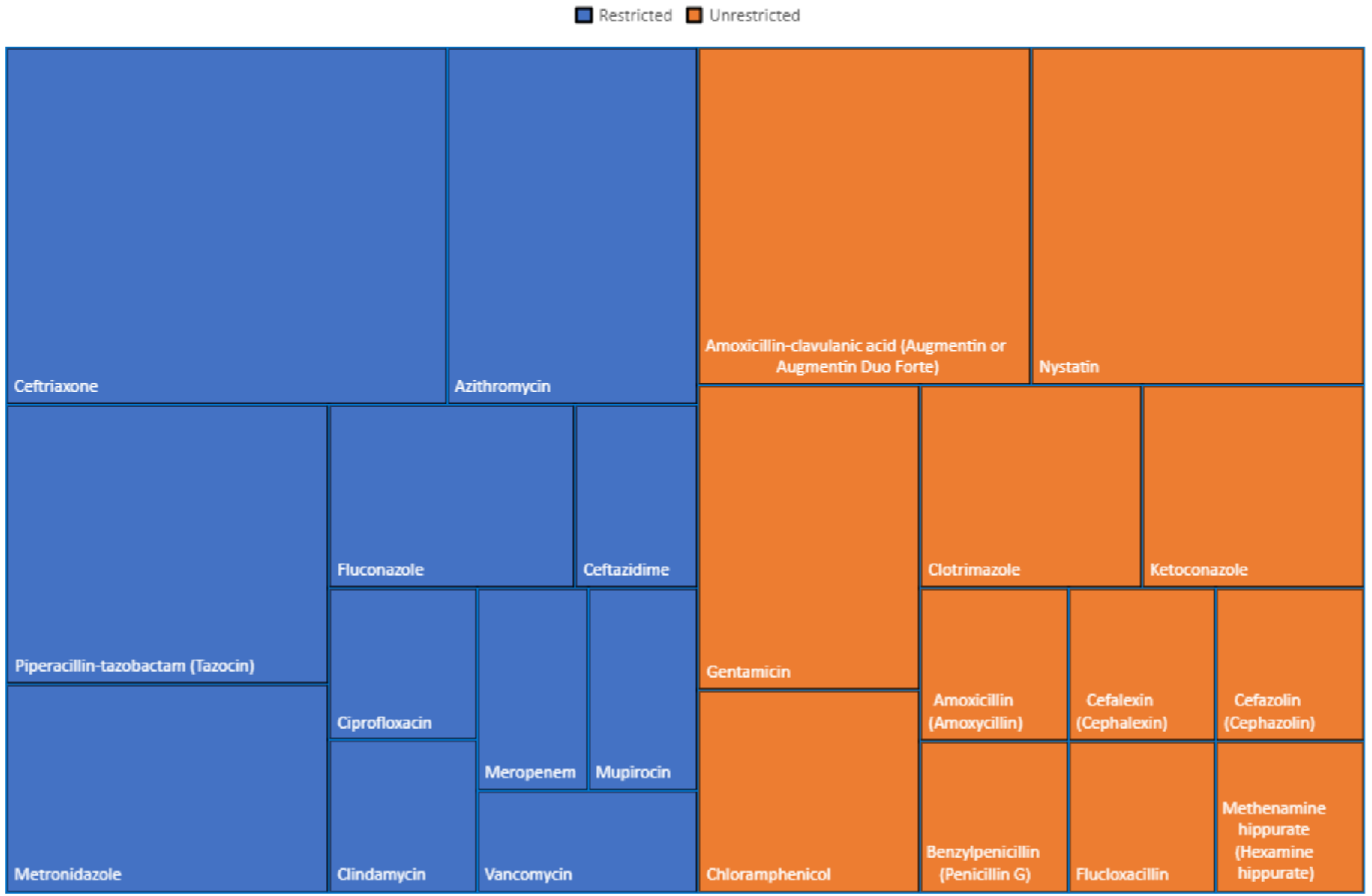
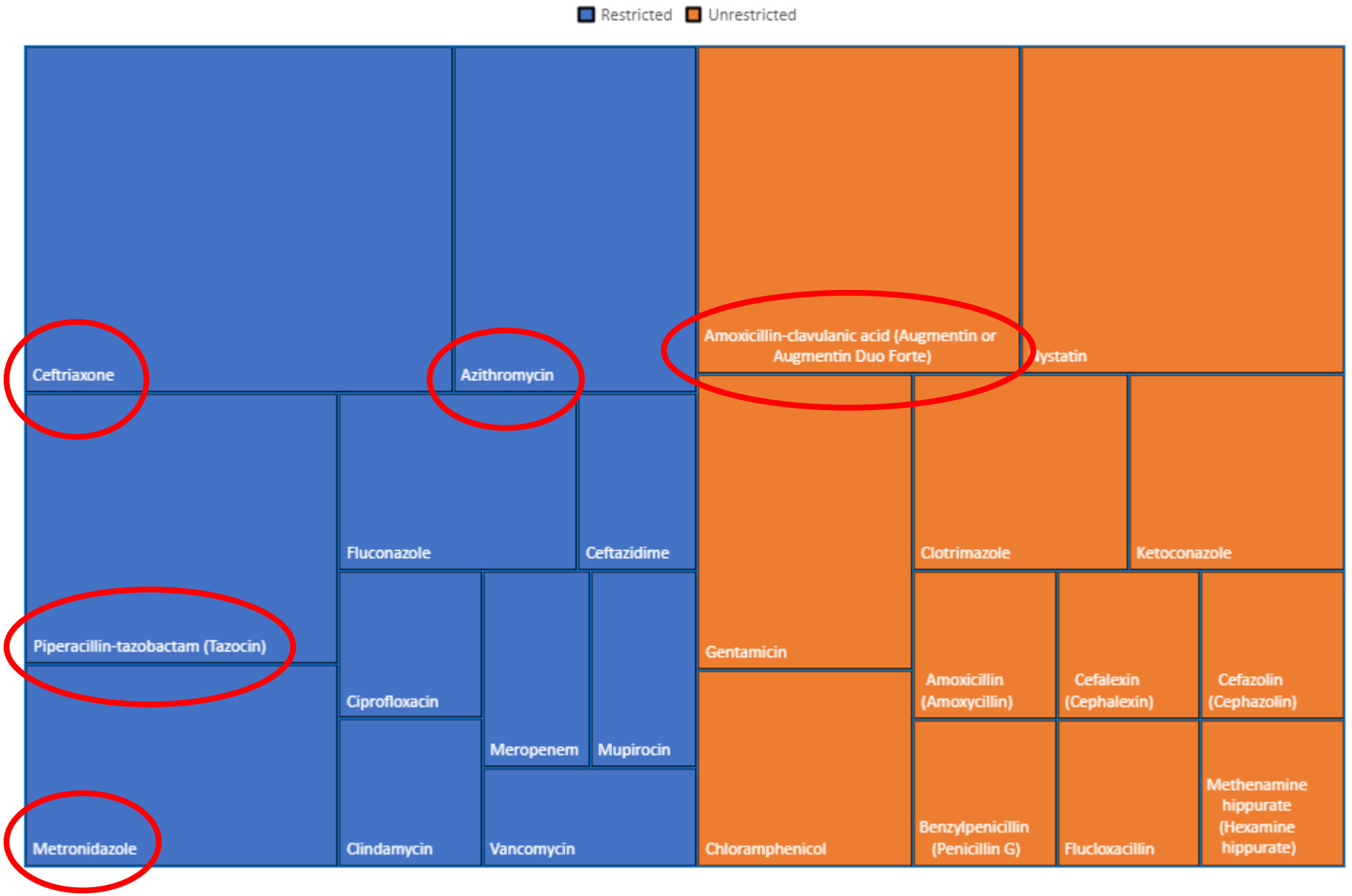
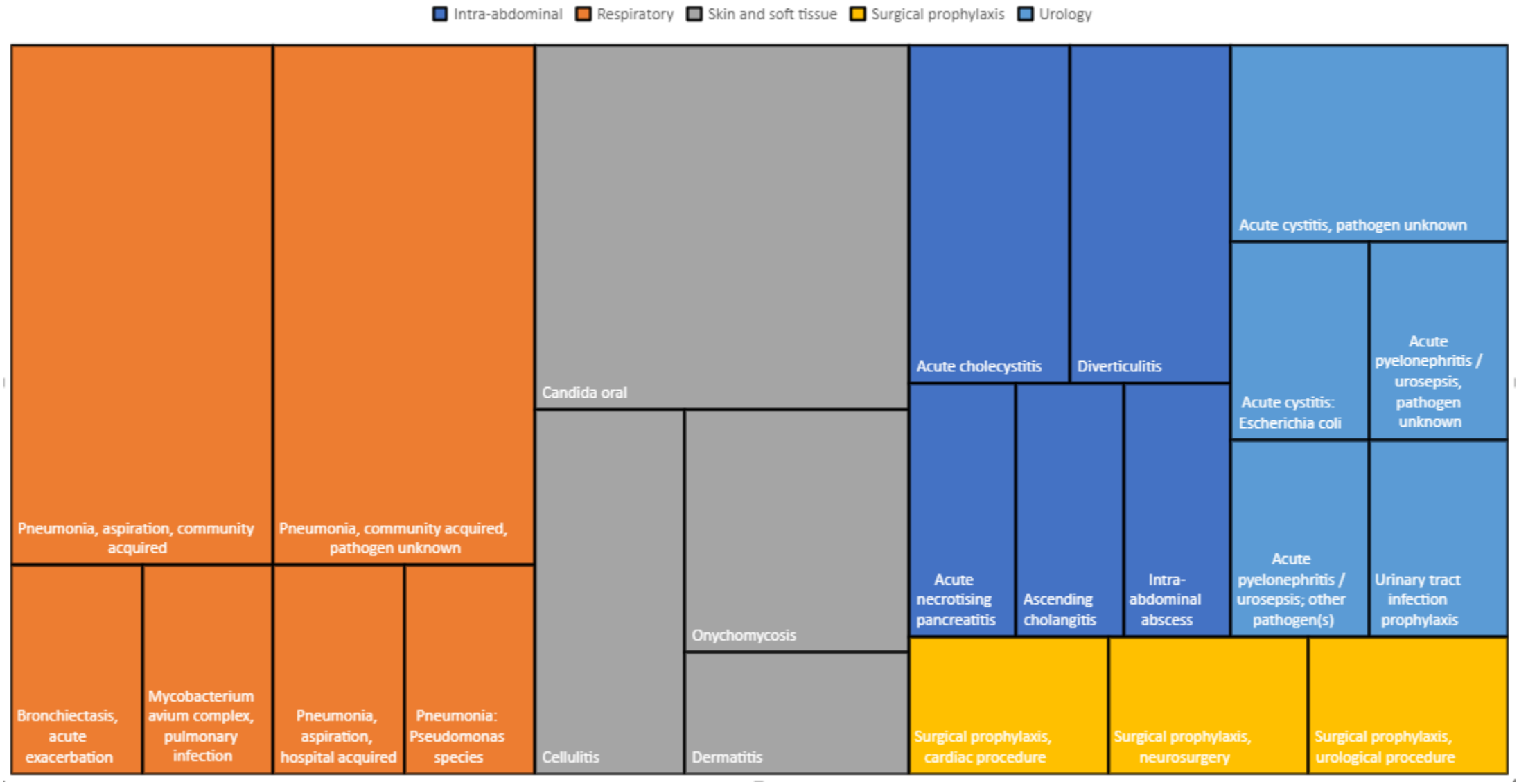
Inappropriate prescribing by antimicrobial



Inappropriate prescribing by antimicrobial



Inappropriate prescribing by Indication



Can we do it better?

Pneumonia

<u>Common themes</u>

- AB choice
  - Ceftriaxone for mild to moderate CAP
  - Augmentin
  - Oral cephalexin
- AB duration
  - Typically 10 to 14 days

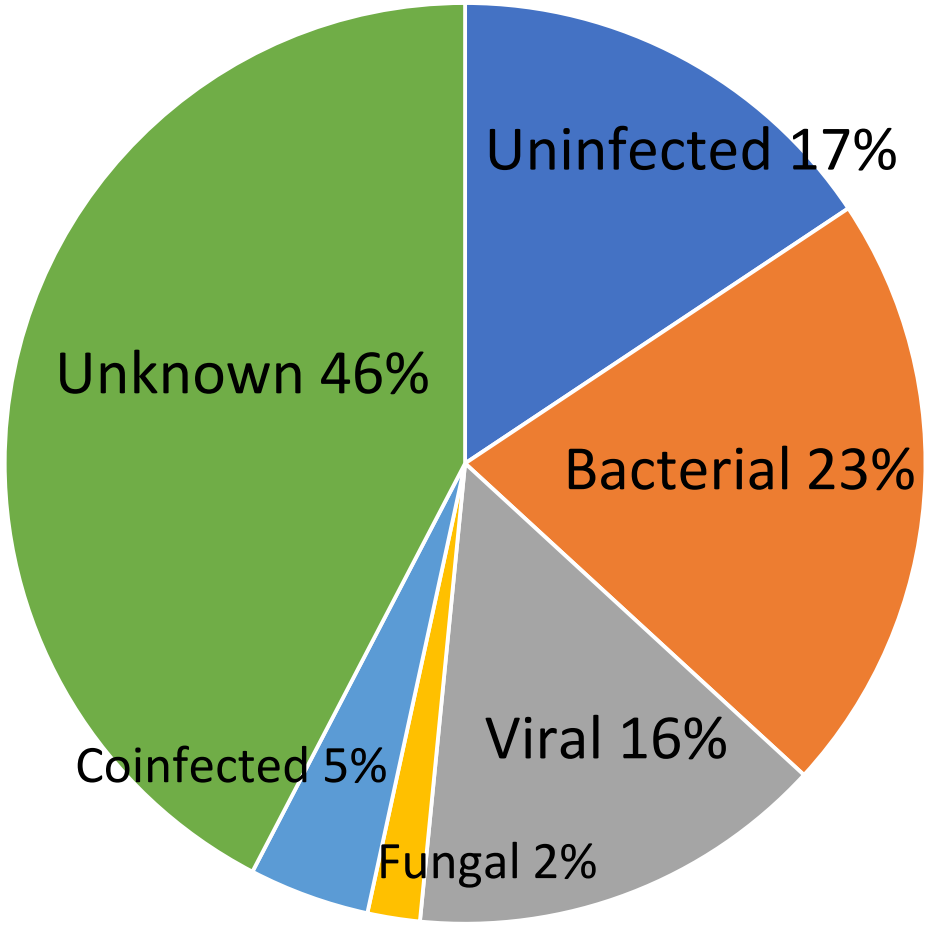
  BUT
  - Short course treatment is adequate
    - CAP: 3-5 days
    - HAP: 7 days
- IV to oral switch

Table 2 Final categorization by disease status in 259 patients with CAP syndrome.

Uninfected	44
CHF/volume overload	24
Lung cancer	14
Pulmonary fibrosis, infarct, other	6
Bacterial	60
Proven	28
Presumptive	32
Viral	42
Fungal	6
Coinfected (virus + bacterium or fungus)	12
Unknown	119
Likely bacterial	69
Likely viral	18
Undetermined	32
Total	259[a]

[a] Total cases = 259. Each coinfected patient is listed in three places: under the individual class of each organism (e.g., bacterial, viral or fungal), and under coinfected.

Prospective observational study over 1 year
259 patients with CAP syndrome – CXR plus Sx or Ix



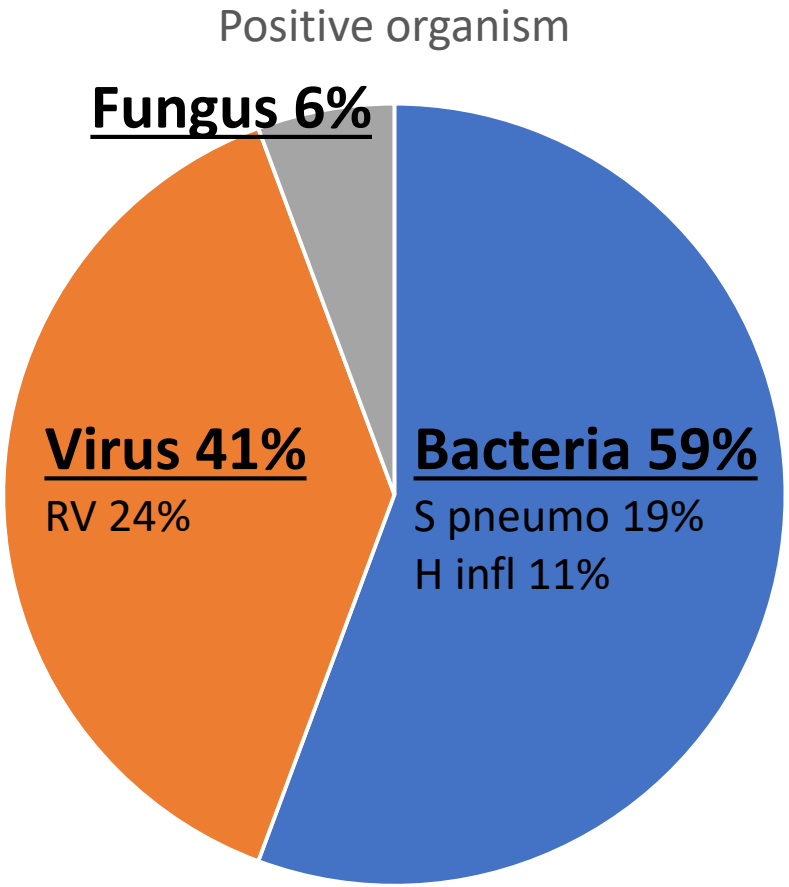
Musher et al. J Inf 2013;67:11-18

Table 4 Etiologic agents in 108 CAP patients.[a]

Bacterial	64
Streptococcus pneumoniae	20 (17)[b]
Haemophilus influenzae	12
Staphylococcus aureus	9 (3)
Pseudomonas aeruginosa	6 (1)
Klebsiella pneumoniae	2 (1)
E. coli	2
Mycobacterium avium-intracellulare	2
Nocardia	2 (1)
Moraxella	1
Other bacteria	8 (5)
Viral	44
Rhinovirus	26
Coronavirus	7
Parainfluenza virus	4
Respiratory syncytial virus	3
Human metapneumovirus	3
Influenza virus	1
Fungal (*Pneumocystis jiroveci*)	6

[a] Data are shown as the numbers of potential etiologic agents identified. The total number exceeds the number of infected patients because of cases in which multiple organisms were identified.

[b] Under bacterial, numbers of patients with proven infection (isolation of organism from a normally sterile site) are shown in parentheses.



Strep pneumo – 33% of bacterial cases – 9% of infected
No aetiology in 46%
40% unnecessary AB's

Pneumonia

Common themes

- AB choice
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  - Augmentin
  - Oral cephalexin
- AB duration
  - Short course treat
    - CAP: 3-5 days
    - HAP: 7 days
- IV to oral switch

Mild to moderate CAP

Oral amoxicillin or IV benpen plus doxycycline

Severe CAP

IV ceftriaxone plus azithromycin

NO ROLE FOR AUGMENTIN (IV or ORAL)

Cefuroxime preferred because of superior pneumococcal cover

Discontinuing β-lactam treatment after 3 days for patients with community-acquired pneumonia in non-critical care wards (PTC): a double-blind, randomised, placebo-controlled, non-inferiority trial

Aurélien Dinh, Jacques Ropers, Clara Duran, Benjamin Davido, Laurène Deconinck, Morgan Matt, Olivia Senard, Aurore Lagrange, Sabrina Makhloufi, Guillaume Mellon, Victoire de Lastours, Frédérique Bouchand, Emmanuel Mathieu, Jean-Emmanuel Kahn, Elisabeth Rouveix, Julie Grenet, Jennifer Dumoulin, Thierry Chinet, Marion Pépin, Véronique Delcey, Sylvain Diamantis, Daniel Benhamou, Virginie Vitrat, Marie-Christine Dombret, Bertrand Renaud, Christian Perronne, Yann-Erick Claessens, José Labarère, Jean-Pierre Bedos, Philippe Aegerter, Anne-Claude Crémieux, for the Pneumonia Short Treatment (PTC) Study Group

Summary

Background Shortening the duration of antibiotic therapy for patients admitted to hospital with community-acquired *Lancet* 2021; 397: 1195–203

JAMA Internal Medicine | Original Investigation | LESS IS MORE

Duration of Antibiotic Treatment in Community-Acquired Pneumonia

A Multicenter Randomized Clinical Trial

Ane Uranga, MD; Pedro P. España, MD; Amaia Bilbao, MSc, PhD; Jose María Quintana, MD, PhD; Ignacio Arriaga, MD; Maider Intxausti, MD; Jose Luis Lobo, MD, PhD; Laura Tomás, MD; Jesus Camino, MD; Juan Nuñez, MD; Alberto Capelastegui, MD, PhD

IMPORTANCE The optimal duration of antibiotic treatment for community-acquired pneumonia (CAP) has not been well established.

Annals of Internal Medicine ORIGINAL RESEARCH

Excess Antibiotic Treatment Duration and Adverse Events in Patients Hospitalized With Pneumonia

A Multihospital Cohort Study

Valerie M. Vaughn, MD, MSc; Scott A. Flanders, MD; Ashley Snyder, MS; Anna Conlon, PhD; Mary A.M. Rogers, PhD, MS; Anurag N. Malani, MD; Elizabeth McLaughlin, MS, RN; Sarah Bloemers, MPH; Arjun Srinivasan, MD; Jerod Nagel, PharmD, BCPS; Scott Kaatz, DO; Danielle Osterholzer, MD; Rama Thyagarajan, MD; Lama Hsaiky, PharmD, BCPS; Vineet Chopra, MD, MSc; and Tejal N. Gandhi, MD

Clinical Infectious Diseases

MAJOR ARTICLE

IDSA Infectious Diseases Society of America hivma hiv medicine association OXFORD

Late-career Physicians Prescribe Longer Courses of Antibiotics

Cesar I. Fernandez-Lazaro,[1,2,©] Kevin A. Brown,[1,3] Bradley J. Langford,[1] Nick Daneman,[1,4,5] Gary Garber,[1,6] and Kevin L. Schwartz[1,3,7]

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Treatment duration

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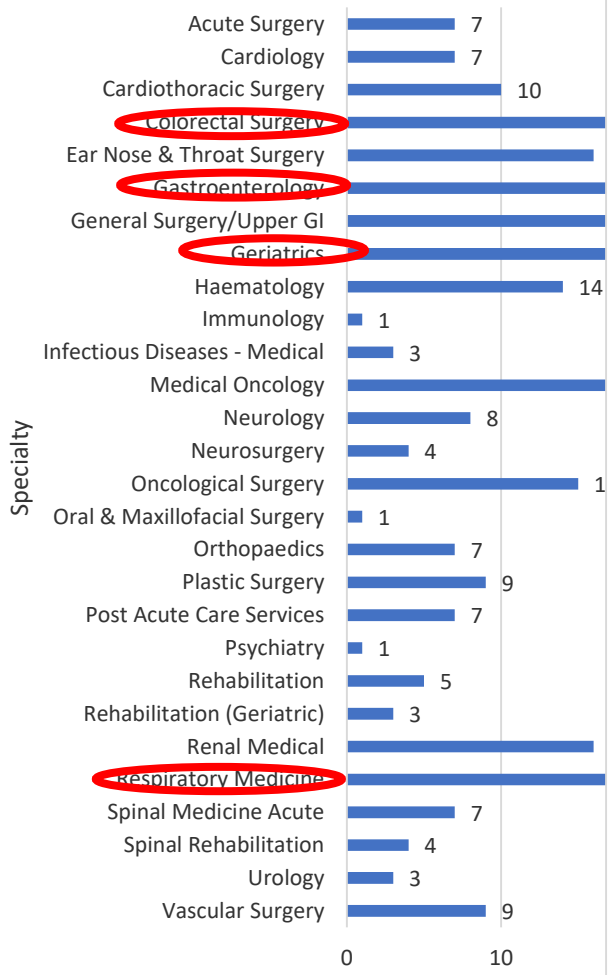
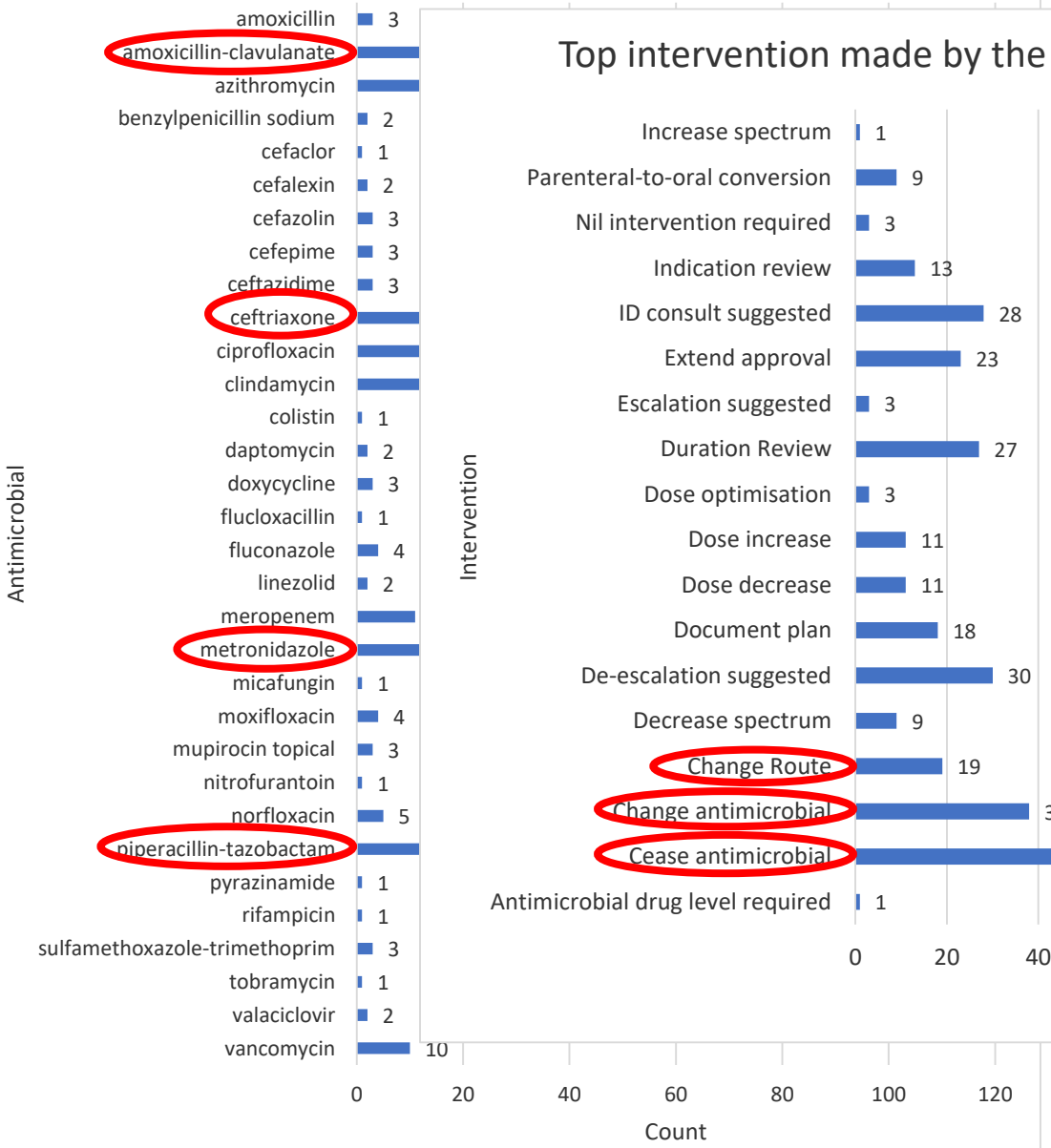
IV to oral switch

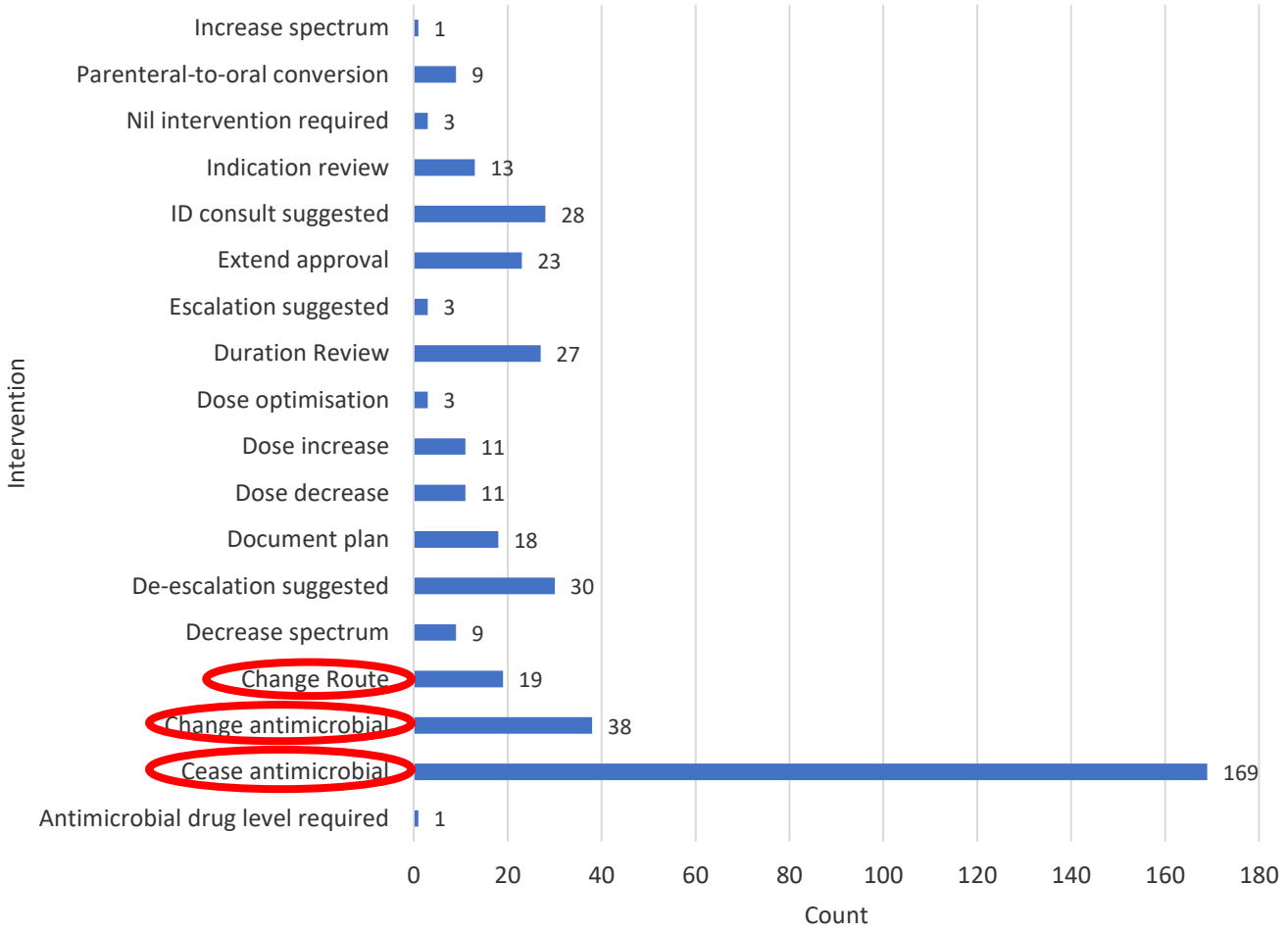
Top specialty targeted by the



Top antimicrobial intervened by the Antimicrobial Stewardship team



Top intervention made by the Antimicrobial Stewardship Team



J Antimicrob Chemother 2016; **71**: 2295–2299
doi:10.1093/jac/dkw129 Advance Access publication 27 April 2016

Journal of Antimicrobial Chemotherapy

What prevents the intravenous to oral antibiotic switch? A qualitative study of hospital doctors' accounts of what influences their clinical practice

Jennifer Broom[1,2], Alex Broom[3], Kate Adams[4] and Stefanie Plage[3]*

1. Influence of consumerist dynamics within doctor-patient relationship
2. Ripple effects of hierarchical structures within medical team
3. Belief by both clinicians and patients around the mythical properties of IV antimicrobials

Recommendations:

- Demystify IV to PO antibiotic efficacy
- Engage consumers and prescribers around negative effects of IV antibiotic use
- Support junior doctor decision making

Antibiotic duration and timing of the switch from intravenous to oral route for bacterial infections in children: systematic review and guidelines

Brendan J McMullan, David Andresen, Christopher C Blyth, Minyon L Avent, Asha C Bowen, Philip N Britton, Julia E Clark, Celia M Cooper, Nigel Curtis, Emma Goeman, Briony Hazelton, Gabrielle M Haeusler, Ameneh Khatami, James P Newcombe, Joshua Osowicki, Pamela Palasanthiran, Mike Starr, Tony Lai, Clare Nourse, Joshua R Francis, David Isaacs, Penelope A Bryant, on behalf of the ANZPID-ASAP group

J Antimicrob Chemother 2017; **72**: 543–546
doi:10.1093/jac/dkw470 Advance Access publication 20 December 2016

Journal of Antimicrobial Chemotherapy

Development of operationalized intravenous to oral antibiotic switch criteria

H. Akhloufi[1,2]*, M. Hulscher[3], D. C. Melles[1], J. M. Prins[4], H. van der Sijs[5] and A. Verbon[1,2]

Impact of Intervention by an Antimicrobial Stewardship Team on Conversion from Intravenous to Oral Fluoroquinolones

Soh Mee Park[1], Hyung-sook Kim[1], Young Mi Jeong[1], Jung Hwa Lee[1], Eunsook Lee[1], Euni Lee[2], Kyoung-Ho Song[3], Hong Bin Kim[3], and Eu Suk Kim[3]

Original article

Efficacy of early switch from intravenous to oral antimicrobials in patients with aspiration pneumonia: A prospective observational study

Masahiro Uni M.D. [a], Naoki Nishimura M.D., Ph.D. [a], Yasuhiko Yamano M.D. [a, b], Genta Ishikawa M.D. [a], Atsushi Kitamura M.D., Ph.D. [a], Yutaka Tomishima M.D. [a], Torahiko Jinta M.D., Ph.D. [a],

Impact of switching from intravenous to oral linezolid therapy in Japanese patients: a retrospective cohort study

Akihiro Tanaka*, Akiko Yano, Shinichi Watanabe, Mamoru Tanaka and Hiroaki Araki

Effectiveness of sequential intravenous-to-oral antibiotic switch therapy in hospitalized patients with gram-positive infection: the SEQUENCE cohort study

D. Rodriguez-Pardo[1] · C. Pigrau[1] · D. Campany[2] · V. Diaz-Brito[3] · L. Morata[4] · I. C. de Diego[5] · L. Sorli[6] · S. Iftimie[7] · R. Pérez-Vidal[8] · G. García-Pardo[9] · T. Larrainzar-Coghen[1] · B. Almirante[1]

Benefits of early switch to oral therapy include:

Antimicrobial	Intravenous cost ($)	Oral cost ($)	Cost Difference ($)
Metronidazole	42	1.50	30x
Clindamycin	178	17	10x
Azithromycin	20	5	4x
Ciprofloxacin	112	1.80	60x
Moxifloxacin	190	60	3x

Criteria for early switch to oral therapy

Box - Guidance for intravenous to oral switch

It is often appropriate to switch a patient's therapy from the intravenous to oral route when all of the following apply:*

- clinical improvement
- fever resolved or improving
- no unexplained haemodynamic instability
- tolerating oral intake with no concerns about malabsorption
- a suitable oral antimicrobial with the same or similar spectrum, or an oral formulation of the same drug, is available.For children, a suitable paediatric formulation is available.

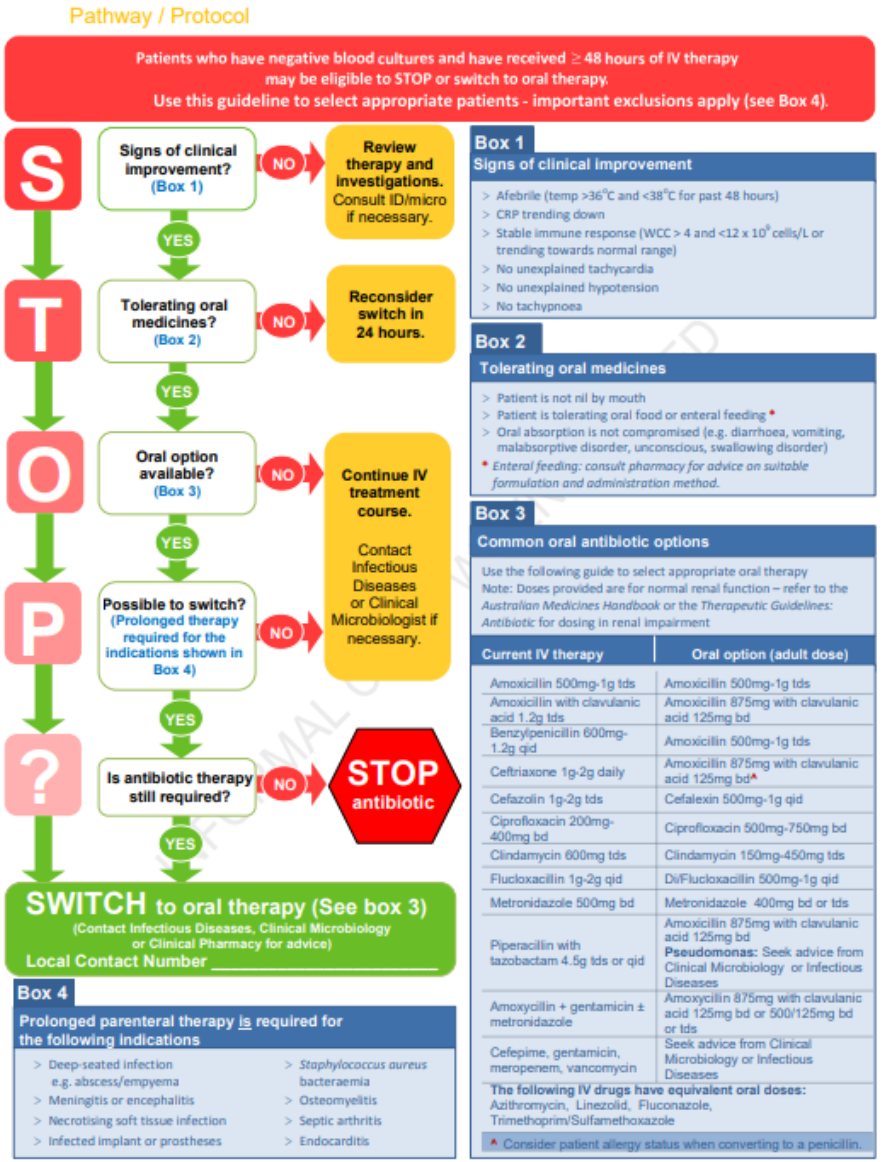
* Does not apply to infections that require high tissue concentrations or prolonged intravenous therapy (e.g. meningitis, endocarditis).

Inclusion Criteria:

- Temperature >36^{0}C and <38^{0}C over 24-48 hours
- CRP trending down
- WCC >4 and <12x10^9 cells/L or trending towards normal range
- Respiratory rate <20 or at baseline
- Heart rate < 90 bpm (excluding alternate causes e.g. underlying AF, use of beta agonists)
- Mental status at baseline
- Oxygenation >90% at room air or at baseline
- Tolerating oral medications
- Adequate absorption

Exclusion Criteria:

- Bacteraemia (discuss with Clinical Microbiology or Infectious Diseases)
- Bone and Joint infection (osteomyelitis, septic arthritis, prosthetic device)
- CNS infection (encephalitis or meningitis)
- Deep seated infection e.g. abscess/empyema
- Endocarditis and endovascular infections
- Necrotising soft tissue infection
- Prosthetic device infection
- Patient not tolerating oral or enteral feeds
- Oral absorption compromised (e.g. diarrhoea, vomiting, malabsorption)



IV	PO
Amp/amoxicillin 1-2g q6h	Amoxicillin 500mg-1g q8h
Amoxicillin/clavulanic acid 1.2-2.2g q6-8h	Amoxicillin/clavulanic acid 875/125mg q12h
Benzylpenicillin 1.2-1.8g q4-6h	Amoxicillin 500mg-1g q8h
*Ceftriaxone 1-2g q12-24h **OR** *Cefotaxime 1-2g q8h	• Amoxicillin 1g q8h (for CAP) • Amoxicillin/clavulanic acid 875/125mg q12h (for HAP OR intra-abdominal infection OR as directed therapy) • Cefalexin 500mg-1g q6-12h (for urinary infection - if proven susceptible to cefazolin/cefalexin) *IF mild penicillin allergy:* • Cefuroxime 500mg q12h (for chest if mild penicillin allergy) • Trimethoprim/sulfamethoxazole 160/800mg q12h **AND / OR** Metronidazole 400mg q12h (for intra-abdominal infections)
Cefazolin 1-2g q8h	Cefalexin 500mg-1g q6h
Flucloxacillin 1-2g q6h	Di/flucloxacillin 500mg-1g q6h
*Piperacillin/tazobactam 4.5g q6-8h	*IF **NOT** covering Pseudomonas:* • Amoxicillin/clavulanic acid 875/125mg q12h
	IF covering for Pseudomonas: • *Ciprofloxacin 500-750mg q12h and consider additional agent(s) if broader cover required
Amp/amoxicillin **AND** *†Gentamicin **AND / OR** Metronidazole	Amoxicillin/clavulanic acid 875/125mg q12h
*Cefepime, *Ceftazidime. *Meropenem, *Vancomycin	Check microbiology results, seek ID/micro/AMS advice
Antimicrobials with good oral bioavailability	
*Azithromycin 500mg q24h	First line: • Doxycycline 100mg q12h **OR** • *Azithromycin 500mg q24h Second line: • Clarithromycin 500mg q12h
*Ciprofloxacin 400mg q8h	*Ciprofloxacin 500-750mg q12h
*Clindamycin 450-600mg q8h	*Clindamycin 450-600mg q8h
*Fluconazole 200-400mg q24h	*Fluconazole 200-400mg q24h
*Linezolid 600mg q12h	*Linezolid 600mg q12h
Metronidazole 500mg q12h	Metronidazole 400mg q12h (q8h only for *C.difficile*, deep-seated abscesses, directed therapy against specific anaerobes and higher doses for amoebiasis)
*Moxifloxacin 400mg q24h	*Moxifloxacin 400mg q24h
*†Posaconazole	*†Posaconazole (modified release tablets)
*†Rifampicin	*†Rifampicin
*Trimethoprim/sulfamethoxazole 160/800mg q12h	Trimethoprim/sulfamethoxazole 160/800mg q12h
*†Voriconazole	*†Voriconazole

Bioavailability

Examples of antimicrobials with good oral bioavailability

The following antimicrobials have go… appropriate for the indication, has a… administration.

- azithromycin [NB1]
- ciprofloxacin
- clindamycin
- doxycycline
- fluconazole
- itraconazole (Lozanoc capsul…
- linezolid
- metronidazole
- moxifloxacin
- posaconazole modified-releas…
- rifampicin
- trimethoprim+sulfamethoxaz…
- voriconazole

NB1: Despite lower bioavailability, oral azithromycin is extensively distributed and achieves high intracellular concentrations.

Antimicrobial	Oral bioavailability
Ciprofloxacin	70-80%
Moxifloxacin	90%
Clindamycin	90%
Fluconazole	>90%
Metronidazole	>95%
Sulfamethoxazole-trimethoprim	100%
Azithromycin	40%

Table 1 **Intravenous to oral conversion for antibiotics with over 90% bioavailability**

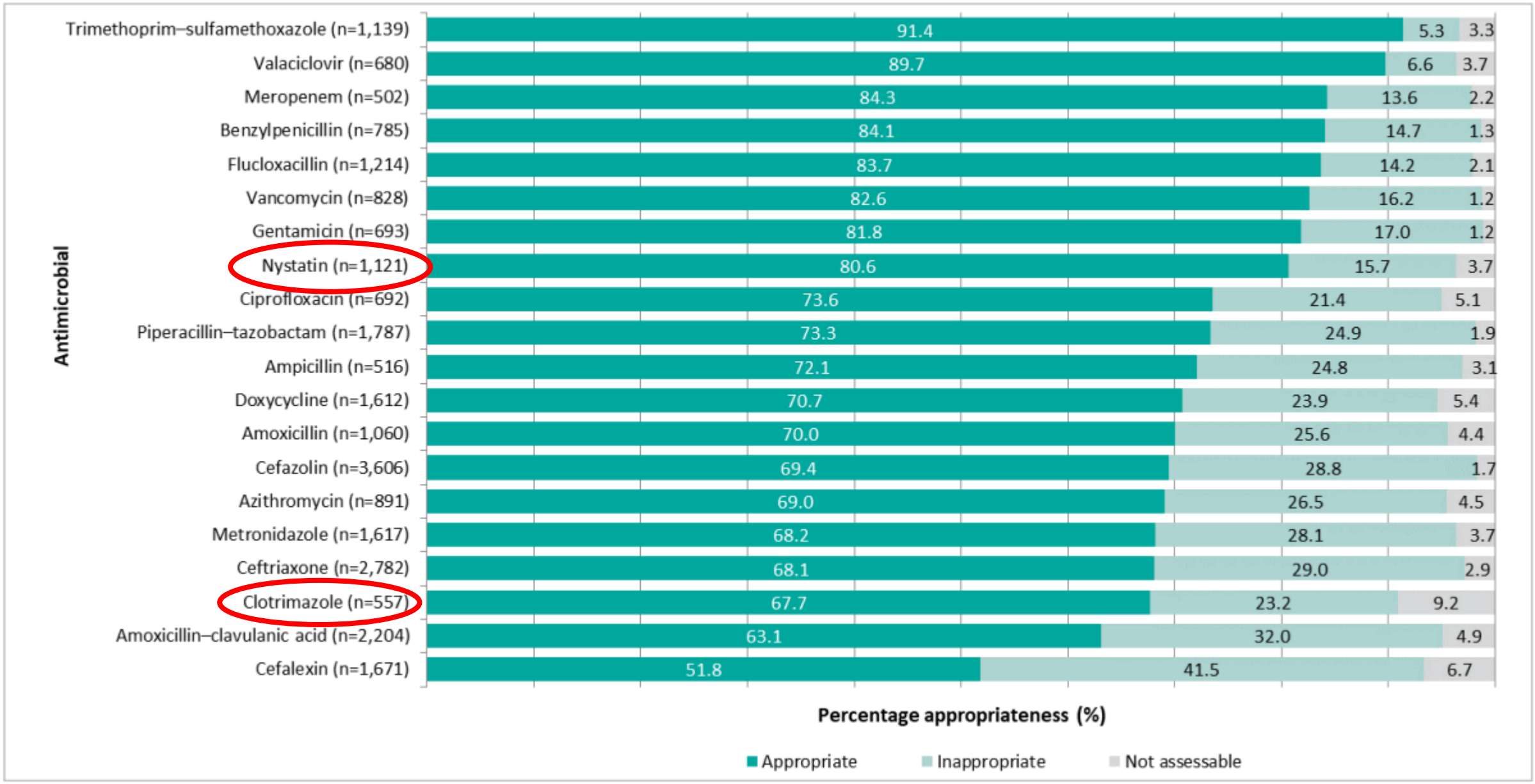
Intravenous antibiotic	Oral antibiotic option	Oral formulations
Lincomycin or clindamycin	Clindamycin	Suspension (poor palatability) and capsules
Fluconazole	Fluconazole	Suspension and capsules
Metronidazole	Metronidazole	Suspension and capsules
		Suspension and tablets
		Tablets and capsules

…r antibiotics with …

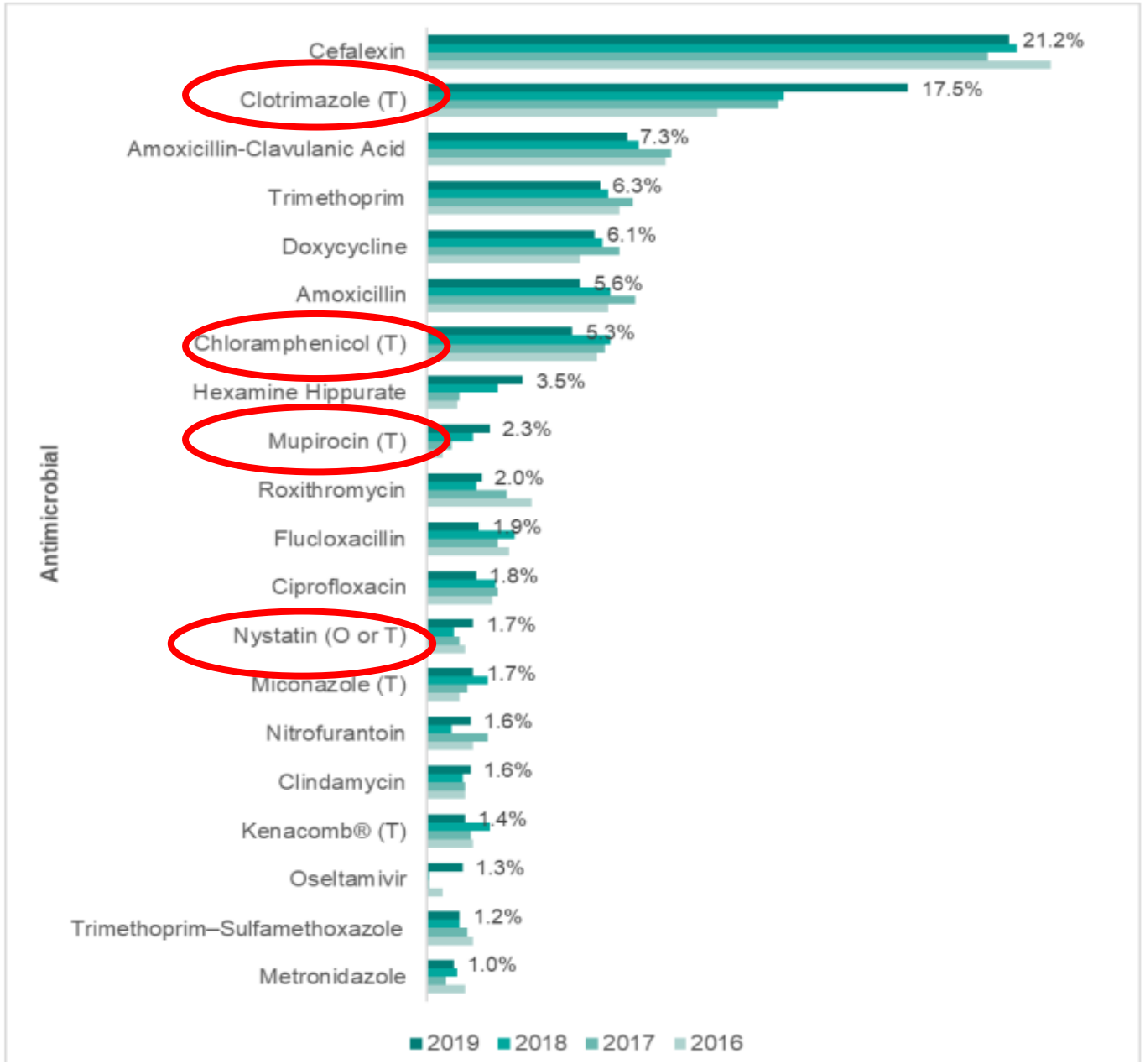
		Oral formulations
		Suspension and capsules
		Suspension and capsules
		Suspension and tablets
		Suspension and tablets
Flucloxacillin		Suspension (poor palatability) and capsules
	OR	
	Cefalexin	Suspension and capsules
Cefazolin	Cefalexin	Suspension and capsules
Ciprofloxacin	Ciprofloxacin	Tablets

Topical antimicrobials

Appropriateness for the most commonly prescribed antimicrobials in Hospital NAPS contributor hospitals, 2019



Most commonly prescribed antimicrobials, AC NAPS contributors, 2016–2019*.



Mupirocin and *Staphylococcus aureus*: a recent paradigm of emerging antibiotic resistance

A. Upton[1]*, S. Lang[2] and H. Heffernan[3]

[1]Department of Infectious Diseases, Auckland Hospital, Private Bag 92024, Auckland; [2]Department of Microbiology, Middlemore Hospital, Auckland; [3]Antibiotic Reference Laboratory, Institute of Environmental Science and Research, Wellington, New Zealand

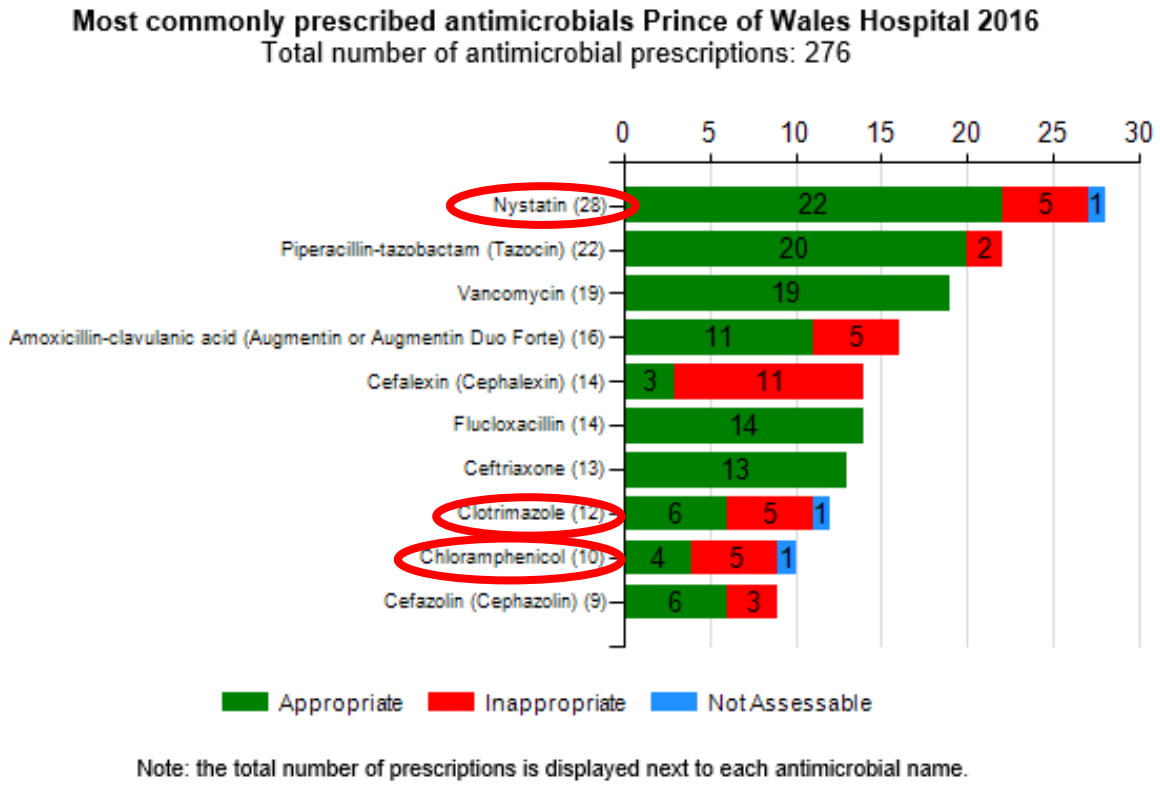
A bug in the ointment: topical antimicrobial usage and resistance in New Zealand

Deborah A Williamson, Stephen R Ritchie, Emma Best, Arlo Upton, Alison Leversha, Alesha Smith, Mark G Thomas

How should topical antimicrobials be used?

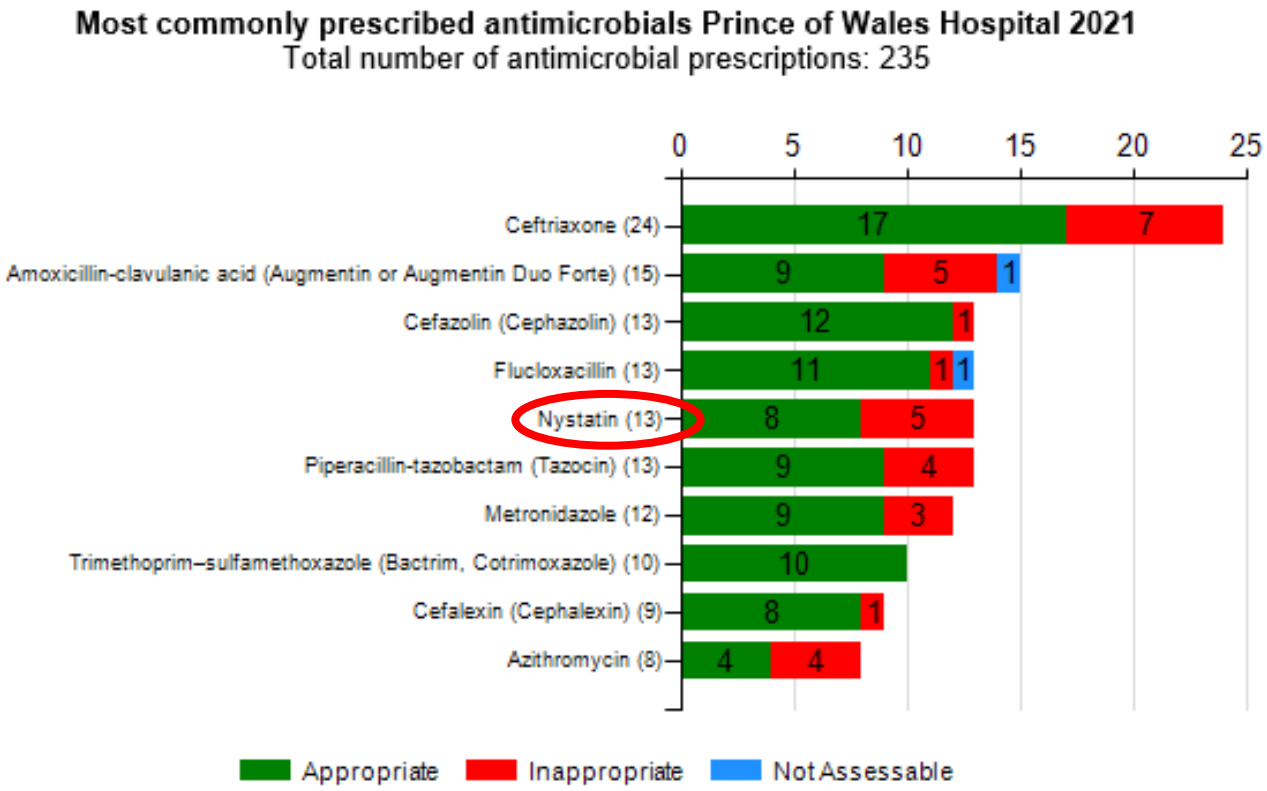
- We encourage when ordering topical antimicrobials including clotrimazole, chloramphenicol and nystatin to select the orders with **pre-filled durations/hard stops** to assist in guiding prescribing the optimal duration for these agents
- Fungal skin infections, oral thrush and conjunctivitis should be assessed to see if **therapy has improved condition**
- Looking for **underlying causes** and addressing the cause if possible e.g. addressing inhaler technique with inhaled corticosteroids to reduce risk of oral thrush
- We **discourage** the charting of **PRN topical antimicrobials** as this will result in incomplete courses/suboptimal durations leading to risk of resistance

Prince of Wales Hospital NAPS 2016 vs. 2021



Note: the total number of prescriptions is displayed next to each antimicrobial name.

Most common indications
Total number of antimicrobial prescriptions: 276



Note: the total number of prescriptions is displayed next to each antimicrobial name.

Most common indications
Total number of antimicrobial prescriptions: 235

Intra-abdominal infections (IAIs)

<u>Common themes</u>

- AB choice
  - CTX/mtz as empiric choice
  - Gentamicin 2nd dose not charted

What is the best empiric AB choice for IAIs?

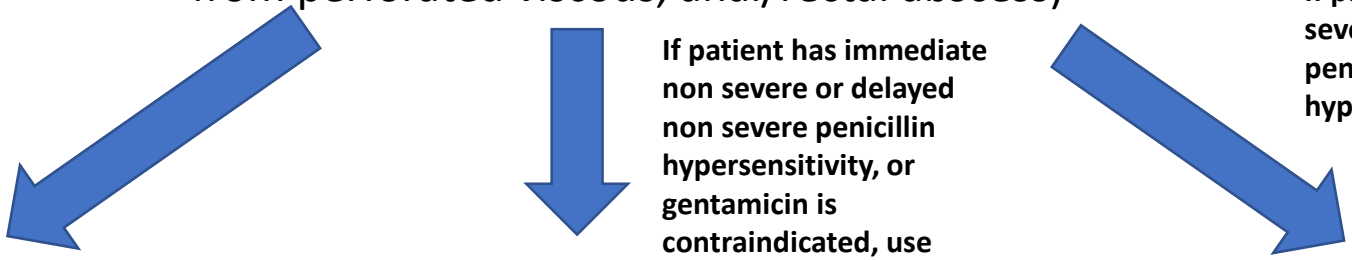
E coli (% susceptible)	Bloodstream, n=194, 2020	Non-urine non-blood, n=127, 2020
Augmentin	78%	59%
Ceftriaxone	84%	59%
Gentamicin	89%	85%

Gentamicin is the best choice in an empiric regimen

Intra-abdominal infections guideline: Empirical management

Community onset

(Cholecystitis, cholangitis, appendicitis (incl abscess), diverticulitis (incl abscess), secondary peritonitis from perforated viscous, anal/rectal abscess)



If patient has immediate non severe or delayed non severe penicillin hypersensitivity, or gentamicin is contraindicated, use

If patient has immediate severe or delayed penicillin hypersensitivity, use

Ampicillin 2 g Q6H IV

PLUS

Gentamicin 4-5 mg/kg for 2 doses, or 7 mg/kg if sepsis

PLUS

Metronidazole 500 mg Q12H IV if nil by mouth OR metronidazole 400 mg bd po

Ceftriaxone 2 g daily IV

PLUS

Metronidazole 500 mg Q12H IV if nil by mouth OR metronidazole 400 mg bd po

Clindamycin 600 mg Q8H IV

PLUS

Gentamicin 4-5 mg/kg for 2 doses, or 7 mg/kg if sepsis

Intra-abdominal infections guideline: Empirical management

Community onset

(Cholecystitis, cholangitis, appendicitis (incl abscess), diverticulitis (incl abscess), secondary peritonitis from perforated viscous, anal/rectal abscess)

If patient has immediate non severe or delayed non severe penicillin hypersensitivity, or

If patient has immediate severe or delayed penicillin hypersensitivity, use

Don't forget!
2nd dose of gentamicin on day 2

Ampicillin 2 g Q6H IV

PLUS

Gentamicin 4-5 mg/kg for 2 doses, or 7 mg/kg if sepsis

PLUS

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Clindamycin 600 mg Q8H IV

PLUS

Gentamicin 4-5 mg/kg for 2 doses, or 7 mg/kg if sepsis

De-escalation

- Urine
- Pneumonia
- Wound infections

Blood culture

Lab No: 459222626
Collected: 18:49 26-Mar-22
Received: 18:49 26-Mar-22
Ward of Collection: Star 4B (HKH)
Specimen: Blood

REPORT NAME: Microbiology Blood Culture Report
REPORT STATUS: ** VALIDATED **

BOTTLES:
Aerobic / Anaerobic

POSITIVE BOTTLES:
2 of 2
GROWTH AFTER:
7.5 hours
GRAM STAIN:
Gram negative rods

Gram negative rods

Escherichia coli

CULTURE:
Pure Growth

	AMP	AMC	CTX	CTR	GM
Escherichia coli	S	S	S	S	S

Urine culture

REPORT NAME: Microbiology Urine Report
REPORT STATUS: ** VALIDATED **

CHEMISTRY

pH	5.0
Glucose	Negative
Ketone	Negative
Protein	1+
Blood/Hb	2+
Leucoesterase	3+
Nitrite	Negative
Bilirubin	Negative
Urobilinogen	Negative
Specifc Gravity	1.015

MICROSCOPY		Units	Ref Range
White cells	>100	x10^6/L	(<10)
Red Cells	10-100	x10^6/L	(<10)
Squamous cells	<10	x10^6/L	(<10)

BACTERIAL COLONY COUNT:
> 10^8 cfu/L

CULTURE:
Predominant growth

1. Escherichia coli

ANTIBIOTIC SENSITIVITIES

Organism 1: Escherichia coli
R=Resistant S=Sensitive

Amp/amoxycillin	S
Amoxycillin-clavulan	S
Cefalexin/Cefalothin	S
Trimethoprim	S
Nitrofurantoin	S
Gentamicin	S

Blood culture

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7.5 hours
GRAM STAIN:
Gram negative rods

CULTURE:
Pure Growth

Gram negative rods

Escherichia coli

	AMP	AMC	CTX	CTR	GM
Escherichia coli	S	S	S	S	S

Urine culture

REPORT NAME: Microbiology Urine Report
REPORT STATUS: ** VALIDATED **

CHEMISTRY

		Ref Range
pH	5.0	
Glucose	Negative	
Ketone	Negative	
Protein	1+	(<10)
Blood/Hb	2+	(<10)
Leucoesterase	3+	(<10)
Nitrite	Negative	
Bilirubin	Negative	
Urobilinogen	Negative	
Specifc Gravity	1.015	

1. Escherichia coli

ANTIBIOTIC SENSITIVITIES

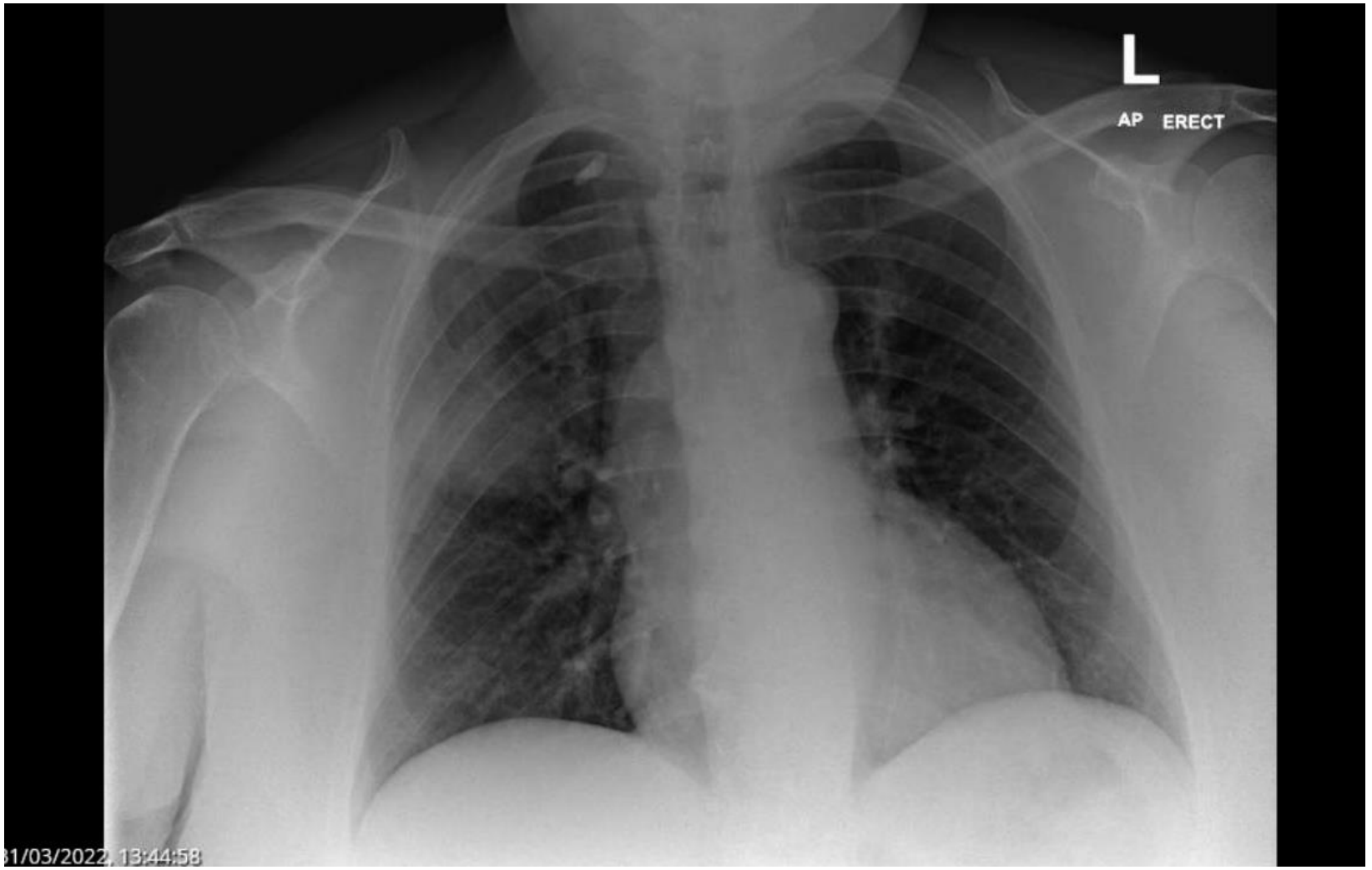
Organism 1: Escherichia coli
R=Resistant S=Sensitive

Amp/amoxycillin	S
Amoxycillin-clavulan	S
Cefalexin/Cefalothin	S
Trimethoprim	S
Nitrofurantoin	S
Gentamicin	S

What would you de-escalate to?
When would you switch to oral AB's?

63F

- Fever, cough, confusion
- HR 120
- RR 33
- Sats 88% RA
- SBP 90/60
- CORB score = 4



What empiric antibiotics would you commence?

* Final Report *

BC Isolates

SITE Blood Culture

Cultures are monitored for growth for 5 to 42 days depending on the clinical history.
Clinicians are notified of positive cultures by phone.

Bottle Type	Aerobic	
Result	POSITIVE	After <24 hours incubation
Bottle Type	Anaerobic	
Result	POSITIVE	After <24 hours incubation

GRAM STAIN

Gram Stain	Gram positive cocci
Detected In	Both bottles

Report to follow

ISOLATES

Growth of...	Streptococcus pneumoniae from both aerobic and anaerobic bottles

SENSITIVITIES:

	Streptococcus sp., alpha haemolytic
Amoxycillin	Susceptible
Clindamycin/lincomycin	Susceptible
Penicillin	Susceptible

* Final Report *

Urine Pnemococcal Ag

ANTIGEN DETECTION

Streptococcus pneumoniae Ag POSITIVE

Test Method	BinaxNOW immunochromatographic assay

Comments:
This positive urine pneumococcal antigen result should be interpreted in light of culture results and clinical findings.
This test can remain positive for more than 1 month after pneumococcal infection.
False positive results can occur in children with nasopharyngeal colonisation, following recent pneumococcal vaccination and in some patients with UTI.

Result type:	Sputum MCS
Result date:	30 March 2022 16:32 AEDT
Result status:	Auth (Verified)
Result title:	Sputum Isolates
Verified by:	Contributor_system, OMNILABV11 on 30 March 2022 16:32 AEDT
Visit Info:	1010301592, Prince of Wales, Inpatient, 30/03/2022 -
Contributor system:	OMNILABV11

* Final Report *

Sputum Isolates

Site	Expectorated sputum
Volume	<1 mL
Appearance	Mucoid
BACTERIAL CULTURE	Light growth of commensals

ISOLATES

Heavy growth of...	Streptococcus pneumoniae

SENSITIVITIES:

	Streptococcus pneumoniae
Amoxycillin	Susceptible
Azithromycin	Susceptible
Penicillin	Susceptible

*** Final Report ***

BC Isolates

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Clinicians are notified of positive cultures by phone.

Bottle Type	Aerobic	
Result	POSITIVE	After <24 hours incubation
Bottle Type	Anaerobic	
Result	POSITIVE	After <24 hours incubation

GRAM STAIN

Gram Stain	Gram positive cocci
Detected In	Both bottles

Report to follow

ISOLATES

Growth of...	Streptococcus pneumoniae from both aerobic and anaerobic bottles

SENSITIVITIES:

	Streptococcus sp., alpha haemolytic
Amoxycillin	Susceptible
Clindamycin/lincomycin	Susceptible
Penicillin	Susceptible

*** Final Report ***

Urine Pnemococcal Ag

ANTIGEN DETECTION

Streptococcus pneumoniae Ag POSITIVE

Test Method	BinaxNOW immunochromatographic assay

Comments:
This positive urine pneumococcal antigen result should be interpreted in light of culture results and clinical findings.
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Contributor system:	OMNILABV11

*** Final Report ***

Sputum Isolates

Site	Expectorated sputum
Volume	<1 mL
Appearance	Mucoid

Would you change your antibiotic regimen?
When would you switch to oral antibiotics, and which antibiotics?

Lab No: 459230553
Collected: 14:00 22-Mar-22
Received: 15:35 22-Mar-22
Ward of Collection: 2C ICU (HKH)
Specimen: Tissue Scrotum left
L hemiscrotal skin

REPORT NAME: Microbiology Operative/Invasive Culture
REPORT STATUS: ** VALIDATED **

GRAM STAIN:
Polymorphs : 1+
Organisms : Gram positive cocci 2+
Gram negative rods 1+

CULTURE:
Mixed Flora - Scant

1. Staphylococcus aureus (MRSA) - Scant
2. Streptococcus "milleri" group 1+

ANTIBIOTIC SENSITIVITIES

Organism 1: Staphylococcus aureus (MRSA) - Scant

	R=Resistant S=Sensitive
Penicillin G	R
Amp/amoxycillin	R
Di/Flucloxacillin	R
Cefalexin/Cefalothin	R
Cefazolin	R
Clindamycin	S
Vancomycin	S
Co-trimoxazole	S
Fusidic acid	S
Rifampicin	S

Organism 2: Streptococcus "milleri" group 1+

	R=Resistant S=Sensitive
Penicillin G	S
Amp/amoxycillin	S
Cefalexin/Cefalothin	S

59M
DM
Fournier gangrene
Current AB’s

Piperacillin-tazobactam 4.5 g Q6H IV
Vancomycin 1 g bd IV
Clindamycin 600 mg Q8H IV

What do you de-escalate to?

What are we prescribing?

Can we do it better?

- Pneumonia
- IV to oral switch
- Topical antimicrobials
- Intra-abdominal infections
- De-escalation

Can we do it better?

Document antimicrobial review or stop dates

Think about AB choice

- Pneumonia

Think about AB route

- Oral as good as IV for some AB's
- When to step down from IV to oral

Think about AB duration

- Pneumonia
- Urinary tract infection
- Intra-abdominal infections when source controlled
- Topical antimicrobials