

Community-Acquired Pneumonia: Towards Improving Outcomes Nationally Sustainability of CAPTION

A Drug Use Evaluation project conducted in collaboration with:

New South Wales Therapeutic Advisory Group

University of Tasmania

Victorian Drug Usage Evaluation Group

South Australian Therapeutic Advisory Group/Department of Human Services

Queensland Drug Usage Evaluation Group



National Prescribing Service Limited

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CAPTION key messages

Therapeutic Guidelines: Antibiotic, Version 12, 2003:

- **Use a systematic approach to assessing severity**
 - The Pneumonia Severity Index (PSI) is a useful tool in assessing Community-Acquired Pneumonia
- **Select antibiotic therapy according to pneumonia severity**
- **Penicillins are first choice for non-severe CAP. Ceftriaxone provides no additional benefit in this patient group**
- **Consider atypical pneumonias when selecting antibiotic regimen**

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Assessing patients with CAP

- Consider CAP when 2 or more of the following symptoms prevail:
 - fever, rigors, new onset cough, change in sputum colour, chest discomfort, dyspnoea.
- history and examination
- Chest X-ray
- Oxygen saturation - on RA
- Investigations for the causal pathogen



Calculating the PSI

PSI risk class I	
Patient age ≤ 50 years and patient has none of the following:	
<i>History of:</i>	<i>Clinical signs:</i>
<ul style="list-style-type: none"> neoplastic disease liver disease congestive cardiac failure cerebrovascular disease renal disease 	<ul style="list-style-type: none"> acutely altered mental state respiratory rate ≥ 30 per minute systolic blood pressure < 90 mm Hg temperature $< 35^\circ\text{C}$ or $\geq 40^\circ\text{C}$ pulse rate ≥ 125 per minute
PSI risk classes II, III, IV and V	
Calculate score using the following information (see Figure to determine risk class and management):	
Factor	PSI score
<i>Patient age</i>	Age in years (male) or age in years -10 (female)
<i>Nursing home (but not hostel) resident</i>	+10
<i>Coexisting illness</i>	
<ul style="list-style-type: none"> neoplastic disease liver disease congestive cardiac failure cerebrovascular disease chronic renal disease 	+30 +20 +10 +10 +10
<i>Signs on examination</i>	
<ul style="list-style-type: none"> acutely altered mental state respiratory rate ≥ 30 per minute systolic blood pressure < 90 mm Hg temperature $< 35^\circ\text{C}$ or $\geq 40^\circ\text{C}$ pulse rate ≥ 125 per minute 	+20 +20 +20 +15 +10
<i>Results of investigations</i>	
<ul style="list-style-type: none"> arterial pH < 7.35 serum urea ≥ 11 mmol/L serum sodium < 130 mmol/L serum glucose ≥ 14 mmol/L haematocrit $< 30\%$ pO₂ < 60 mmHg or O₂ saturation $\leq 90\%$ pleural effusion on chest X-ray 	+30 +20 +20 +10 +10 +10 +10



Patient classification using PSI

- PSI Class 1 (lowest risk) has none of the following
- Age > 50 years
- history of neoplastic disease, CCF, CVD, renal or liver disease
- Clinical signs - altered mental state, PR > 125 per minute, RR > 30 per minute, SBP < 90 mmHg or temp < 35C or > 40C
- Limitations of PSI

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Doses of Antibiotics in CAP Version 13 TG

- **Orals (Class 1 & 2)**
 - **amoxicillin 1g 8 hourly and** (if intending to treat for *mycoplasma* or *chlamydophila*) **doxycycline 200mg stat then 100mg daily or roxithromycin 300mg daily for 5 days**
- **IV (Class 3 & 4)**
 - **benzylpenicillin 1.2g or ampicillin 1g 6 hourly plus either oral doxyxycline 100mg 12 hourly 7 days or roxithromycin 300mg 5 days**
- **(Class 5)**
 - **azithromycin 500mg daily or erythromycin 500mg - 1g 6 hourly plus either ceftriaxone 1g daily or cefotaxime 1g 8 hourly**

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Treatment options for patients with penicillin hypersensitivity -

	<i>PSI Class I and II</i>	<i>PSI Class III and IV</i>	<i>PSI Class V</i>
<p>Non-immediate penicillin hypersensitivity</p> <p>(usually later onset - includes rash, fever, haemolysis, and serum sickness like reactions)</p>	<p>oral cefuroxime 500mg bd</p> <p>± doxycycline / macrolide oral</p>	<p>ceftriaxone or cefotaxime IV</p> <p>plus doxycycline / macrolide oral</p> <p>+ IV gentamicin if required</p>	<p>Avoid penicillin therapy</p> <p>macrolide IV plus ceftriaxone or cefotaxime IV</p>
<p>Immediate penicillin hypersensitivity</p> <p>(urticaria, angioedema, bronchospasm, or anaphylaxis within 1 hour of drug administration)</p>	<p>oral moxifloxacin 400mg daily</p>	<p>oral moxifloxacin 400mg daily</p> <p>plus doxycycline / macrolide oral</p> <p>+ IV gentamicin if required</p>	<p>IV moxifloxacin 400mg daily</p> <p>plus macrolide IV</p>

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The Guidelines - 2006 changes

- **Important caveats on limitations of PSI**
 - Underestimates severity in young hypoxic patients
 - Patients requiring ICU admission should be managed as Class V
- **PSI Class I/II**
 - Beta lactam monotherapy recommended
 - Dual therapy elective, doxycycline first choice, then clarithromycin / roxithromycin
- **PSI Class III/IV**
 - Doxycycline first choice for combination with beta lactam, and increased dose, then clarithromycin / roxithromycin
- **PSI Class V**
 - IV azithromycin in preference to IV erythromycin

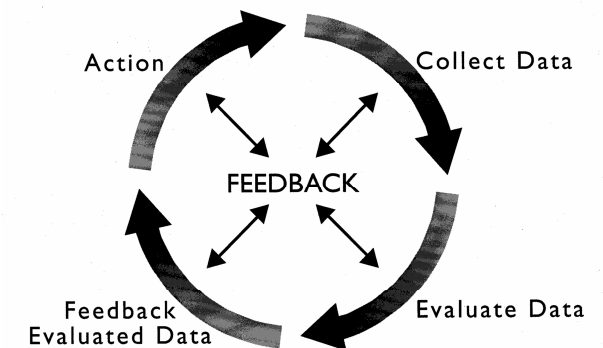
Method

- Undertaking Drug Use Evaluation (DUE)

n = 20 for each cycle

- Two indicators measured:

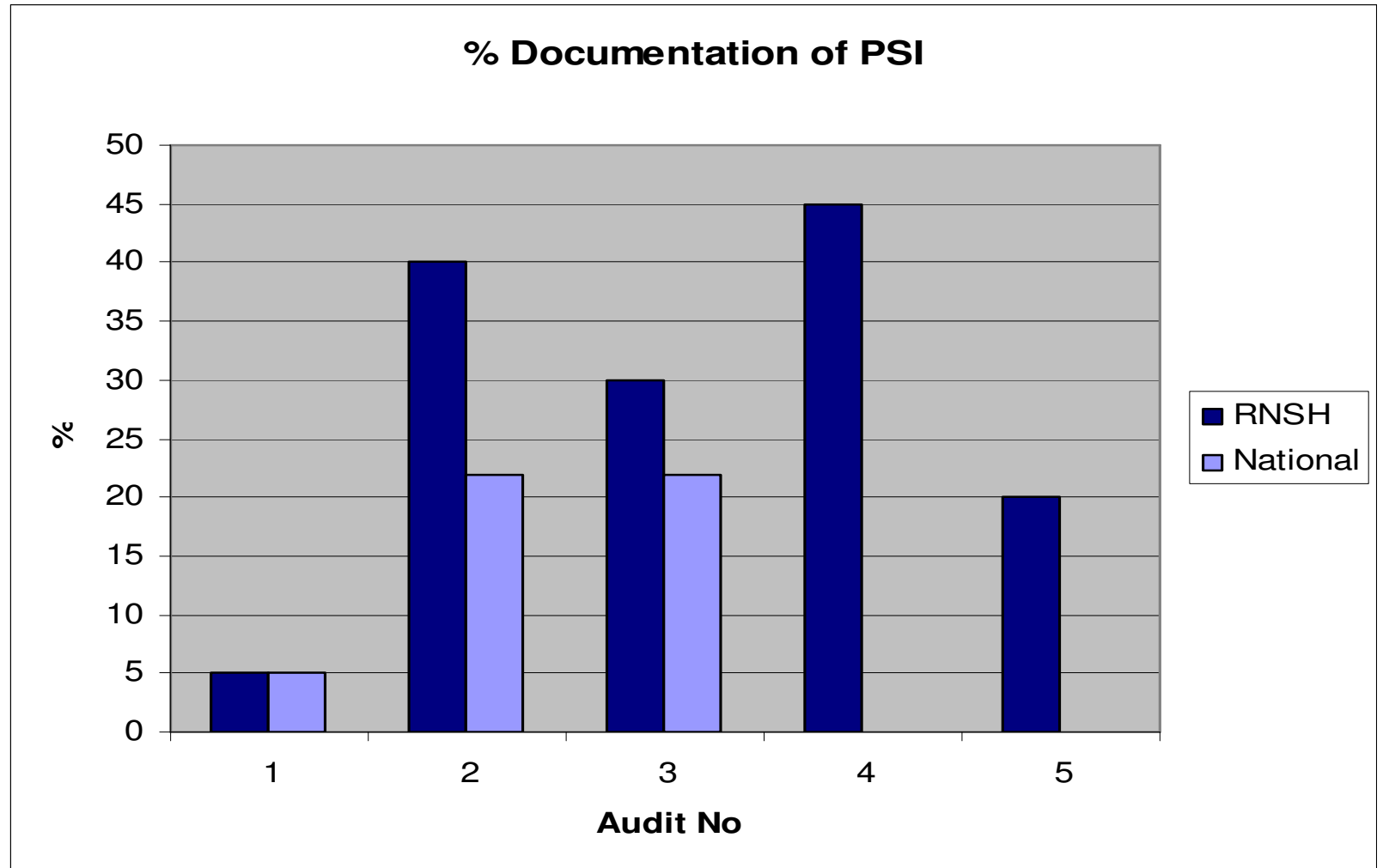
- Use of Pneumonia Severity Index(PSI)
- Concordance with TG:ABX for treatment of CAP



The DUE cycle

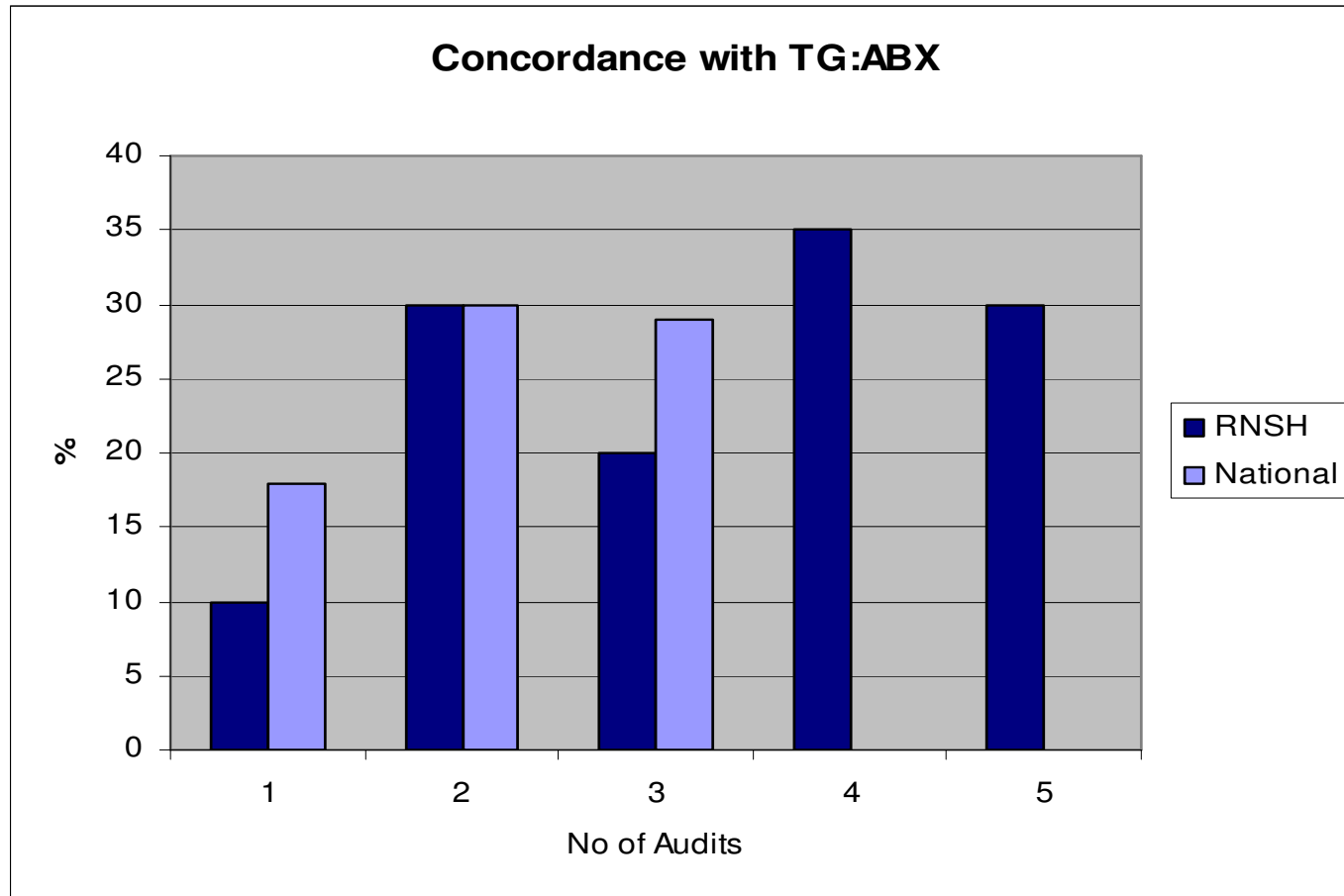


Results : Use of PSI





Results: Concordance TG: ABX





Discussion: Use of PSI

- Increased PSI Usage: 15% overall
- General lack of awareness of PSI as a tool to assess CAP
- Respiratory team - Concerned that prime focus may become the PSI score in treatment of CAP
- Lack of confidence in the PSI as a risk assessment tool



Discussion: Concordance with ABX: TG

- Increased concordance ABX: TG by 20%
- Aged Care team – Concern over adoption of non 3rd generation cephalosporin agents
- Respiratory Team- Preference to prescribe once daily agents regardless of resistance patterns & this often influenced prescribing of antibiotics in ED
- High turnover of ED staff i.e. high proportion of Overseas Dr's working in ED



Discussion: Sustainability of Caption at RNSH

- Paramount to reinforce PSI as a predictor of mortality & tool to help manage CAP
- Reinforce important caveat that all young patient with hypoxia on room air or patients with unusual co-morbidities should be considered to be at high risk especially since the introduction of TG13
- Ongoing pharmacy time commitment
- Investigate other teams beliefs
- Involve infectious diseases eg. resistance patterns



Conclusion

- Promotion of TG & Academic Detailing: RNSH showed an improvement in the treatment of CAP from the baseline audit result
- Sustainability remains a Challenge!



Backup slides: Intervention Activities

- 1st Intervention Phase- 28 detailing sessions
 - 18 Consultants, 3 Reg's, 2 CNC, 3 P'cists & 2 othersGroup sessions x 8 (84)
- 2nd Intervention Phase- 19 detailing sessions
 - 2 Interns, 6 Residents, 8 Reg's & 3 P'cists3 Group sessions (52)
Presentation at Journal Club for Respiratory Physicians'- 7 Consultants,
3 Reg's, 3 Residents & 2 Interns
CAPTION presentation Material utilised at Undergraduate Medical
Training



Back up Changes to audit maker

- Audit 4- 35% Concordant(7/20)
5/7 patients Rx ceftriaxone.
Of that 5, 4 patients had O2 sats<90
therefore 1/5 may have Rx ceftriaxone inappropriately
- NB: 1/5 had gram neg infection

- Audit 5 - 30% concordance(6/20)
- 2/6 pts had ceftriaxone were considered concordant by audit maker
- 1/6 no evidence of gram neg infection but O2 sats =80
- 1/6 pt gram(-ve) infection was identified in their blood.