

Meeting the Challenge of Antimicrobial Stewardship in Australian Aged Care Homes  
Professor Karin Thursky, National Centre for Antimicrobial Stewardship  
Broadcast live from the 2016 conference of the Australasian College of Infection Prevention and Control



Australasian College  
for Infection Prevention and Control  
**2016 CONFERENCE**  
Melbourne, Australia | 20-23 November 2016  
Pullman Melbourne, Albert Park

## Meeting the Challenge of Antimicrobial Stewardship in Australian Aged Care Homes

Professor Karin Thursky  
Director National Centre for Antimicrobial Stewardship  
On behalf of the Aged Care Stream

Teleclass broadcast sponsored by  
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**www.webbertraining.com** **November 22, 2016**

## Mrs Betty Smith

- Born 1931 (85 years old)
  - 1 child (daughter)/ 5 grandchildren
  - Published award-winning novels.
  - Admitted to a RACF **Jan 2016**
  - Alert, Limited mobility with frame
  - Urinary continent
  - *Medication:* Atenolol
- April 2016**
- Fever (Single oral temperature  $>37.8^{\circ}\text{C}$ )
  - Urinary frequency and urgency
  - Urinary dipstick: Leucocytes: +2 Nitrites: Positive
  - Her GP was informed (via phone)
    - *Provisional diagnosis:* UTI
    - MSU specimen ordered
    - Cephalexin 500mg oral BD prescribed



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**Day 1-13**

- Urinary incontinence noted multiple times.
- No medical follow up examination.
- No review of antimicrobial prescription.
- No microbiological urine specimen taken.



**Day 14**

- Reduced conscious state
- Hypotensive
- Transferred to local hospital
  - Provisional diagnosis – septicaemia
  - Treated empirically with ceftriaxone
  - Remained obtunded on ward, acute kidney injury

**Day 16**

- An ESBL producing E.coli identified from blood cultures



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- Died in hospital Day 17
- Daughter
  - ‘Was this urinary tract infection preventable?’
  - Could her clinical care have been better managed?



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# Overview of the problem



Inappropriate antibiotic use in ACHs is harmful to public health and to residents:

- Increases selection pressure for MDROs
- ACHs are potential reservoirs and gateways for MDROs<sup>1</sup>
- Antibiotic use is associated with MDRO carriage in residents
- *C. difficile*, allergic reactions, other adverse medication events
- Direct harm to ALL residents in high use antibiotic ACHs<sup>2</sup>



1. van den Dool et al. The Role of Nursing Homes in the Spread of Antimicrobial Resistance Over the Healthcare Network. ICHE. 2016 Jul (A modelling study showing sustained transmission once MDRO transferred into the ACH)
2. Daneman et al. JAMA 2015

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From: **Variability in Antibiotic Use Across Nursing Homes and the Risk of Antibiotic-Related Adverse Outcomes for Individual Residents**

JAMA Intern Med. 2015;175(8):1331-1339. doi:10.1001/jamainternmed.2015.2770

**Table 3. Antibiotic-Related Adverse Outcomes Among Residents Living in Nursing Homes With Low, Medium, and High Antibiotic Use<sup>a</sup>**

Characteristic	Antibiotic Use, No. (%)		
	Low (n = 33 822)	Medium (n = 31 425)	High (n = 24 943)
<i>Clostridium difficile</i>	274 (0.8)	268 (0.9)	221 (0.9)
Diarrhea or gastroenteritis	3347 (9.9)	3388 (10.8)	2889 (11.6)
Infection with antibiotic-resistant organism	412 (1.2)	431 (1.4)	319 (1.3)
Antibiotic allergy	13 (0.0)	25 (0.1)	22 (0.1)
General adverse event from medication	96 (0.3)	124 (0.4)	88 (0.4)
Any antibiotic complication with or without potential for indirect harms to nonrecipients (primary composite outcome <sup>b</sup> )	3869 (11.4)	3890 (12.4)	3311 (13.3)
Only antibiotic complications with potential for indirect harms to nonrecipients (secondary composite outcome <sup>c</sup> )	3797 (11.2)	3801 (12.1)	3237 (13.0)

<sup>a</sup> Residents with a do-not-hospitalize order were excluded from these analyses of adverse outcomes because they were not at risk of a hospitalization event.

<sup>b</sup> Includes any of *C difficile*, diarrhea or gastroenteritis, antibiotic-resistant organisms, allergy, and general medication adverse events.

<sup>c</sup> Includes only *C difficile*, diarrhea or gastroenteritis, and antibiotic-resistant organisms.

Table Title:

Antibiotic-Related Adverse Outcomes Among Residents Living in Nursing Homes With Low, Medium, and High Antibiotic Use<sup>a</sup>

Date of download: 11/12/2016

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# Antimicrobial Use in Australian ACH



Antibiotics are inappropriately prescribed in Australian aged care homes (ACHs).

In a study of five Australian ACHs over a 26 month period:

- **39.7%** of antibiotics were for indications not meeting 'McGeer criteria'<sup>1</sup>

The 2015 acNAPS pilot revealed:

- **67.2%** of total antimicrobial prescriptions judged inappropriate
- **1 in 5 prescriptions (21.7%)** were for residents who did not have any signs or symptoms of infection in the week prior to start date

1. Stuart et al. 2012



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## NAPS National Antimicrobial Prescribing Survey

Welcome Caroline! | My

The Aged Care NAPS 2016 data collection has now closed. Thank you to all those facilities that participated. The results are currently being analysed and will be released early 2017.

○ ○ ○ ○ ○

Please select your module below

**Hospital**

HOSPITAL  
NAPS National Antimicrobial Prescribing Survey

SURGICAL  
NAPS National Antimicrobial Prescribing Survey

QI Quality Improvement  
NAPS National Antimicrobial Prescribing Survey

**Residential Aged Care**

AGED CARE  
NAPS National Antimicrobial Prescribing Survey

**Veterinary**

VETERINARY  
NAPS National Antimicrobial Prescribing Survey

[www.naps.org.au](http://www.naps.org.au)

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# Meeting the Challenge of Antimicrobial Stewardship in Australian Aged Care Homes

## Professor Karin Thursky, National Centre for Antimicrobial Stewardship

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### Microbiology Fact Sheet

This Fact Sheet is intended as a guide only and does not equate to expert opinion. Interpretation of results should always be taken in context with the patient's current condition and clinical review.

#### Urine MC&S – interpretation of results

- Urine microscopy, culture and susceptibility (MC&S) testing is used to detect a urinary tract infection (UTI):
  - In the lower parts of the urinary tract (the bladder), this infection is called **cystitis**.
  - In the upper part of the urinary tract (the kidneys), this infection is called **pyelonephritis**.
- Sometimes bacteria are found in urine samples without an infection being present, this is **asymptomatic bacteriuria**; up to 25% of elderly women have this and treatment is generally not recommended.

**Microscopy**

- If there is a high white cell, polymorph or pus cell count  $>40 \times 10^3/L$ , ++ or +++ in urine, this suggests an infection is more likely to be present.
- If squamous epithelial cells are present  $>10 \times 10^3/L$ , ++ or +++, this suggests contamination from the skin and the urine specimen is **not a good sample**.

**Culture**

- If there is a colony count of  $>10^7/L$ , ++ or +++ of a bacteria, this is more likely to be a **true infection**.
- Growth of more than one bacteria species is uncommon and suggests possible **contamination** (especially in non-catheter specimens).
- Common bacteria likely to cause UTIs include: *Escherichia coli*, *Proteus*, *Klebsiella*, *Enterococcus* and *Staphylococcus saprophyticus*.

**Susceptibility**

- If the patient is taking an antibiotic to which the bacteria is reported as resistant (R) or intermediate (I), then this treatment may need to be changed to an antibiotic that is reported as susceptible (S).
- If there is more than one antibiotic to which the bacteria is reported as susceptible (S), the patient should be prescribed the one with the **narrowest spectrum**.

**Note:**  
**Dipsticks:** dipsticks alone are not reliable in the diagnosis of a UTI, a urine sample should be sent for culture for confirmation where ever possible.  
**Catheter specimens:** samples taken through a urinary catheter are almost always colonised by bacteria, these do not need to be treated if the patient is otherwise well.  
 Whether or not antibiotics are given, it is important to remember that infection will not clear without changing the catheter and in many cases this is all that is required; antibiotics may then be avoided.

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### Microbiology Fact Sheet

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#### Sputum MC&S – interpretation of results

- Sputum microscopy, culture and susceptibility (MC&S) is used in the detection of a lower respiratory tract infection, usually pneumonia (infection in the lungs).
- A healthy respiratory tract has a mixture of different bacteria which are harmless and do not require treatment, this is called **colonisation**.
- It is important to consider carefully the likely significance of culture results from sputum to avoid over-treating patients with antibiotics; there is no need to treat everything that is cultured.

**Microscopy**

- If sputum is described as **purulent** or **mucopurulent**, or there is a high white cell, polymorph or pus cell count ++ or +++, this suggests that a bacterial infection is more likely to be present.
- If squamous epithelial cells are present ++ or +++, this is likely to be saliva rather than sputum and is **not a good sample**.
- If ++ or +++ Gram negative or Gram positive bacteria are seen on microscopy, there is more likely to be a **true infection**.

**Culture**

- If there is a colony count of  $>10^7/L$ , ++ or +++, this is more likely to be a **true infection**.
- "Mixed upper respiratory tract flora" is normal and does not usually need treatment.
- Common bacteria likely to cause pneumonia include: *Streptococcus pneumoniae*, *Pneumophila influenzae* and *Moraxella catarrhalis*.

**Susceptibility**

- If the patient is taking an antibiotic to which the bacteria is reported as resistant (R) or intermediate (I), then this treatment may need to be changed to an antibiotic to which the bacteria is reported as susceptible (S).
- If there is more than one antibiotic reported as susceptible (S), the patient should be prescribed the one with the **narrowest spectrum**.

**Note:**  
**Staphylococcus aureus:** in sputum usually reflects colonisation. They do not normally need treatment if the patient is otherwise well, although may cause a pneumonia following influenza, respiratory burns or respiratory illnesses with septicaemia; these patients are often extremely unwell.  
**Gram-negative bacilli:** (e.g. *Escherichia coli*, *Pseudomonas aeruginosa*) in sputum usually reflects colonisation and often seen in those who have taken recent antibiotics. They do not normally need treatment if the patient is otherwise well, although they may cause a lung infection, especially in people with a chronic lung disease, so careful clinical judgement is required.

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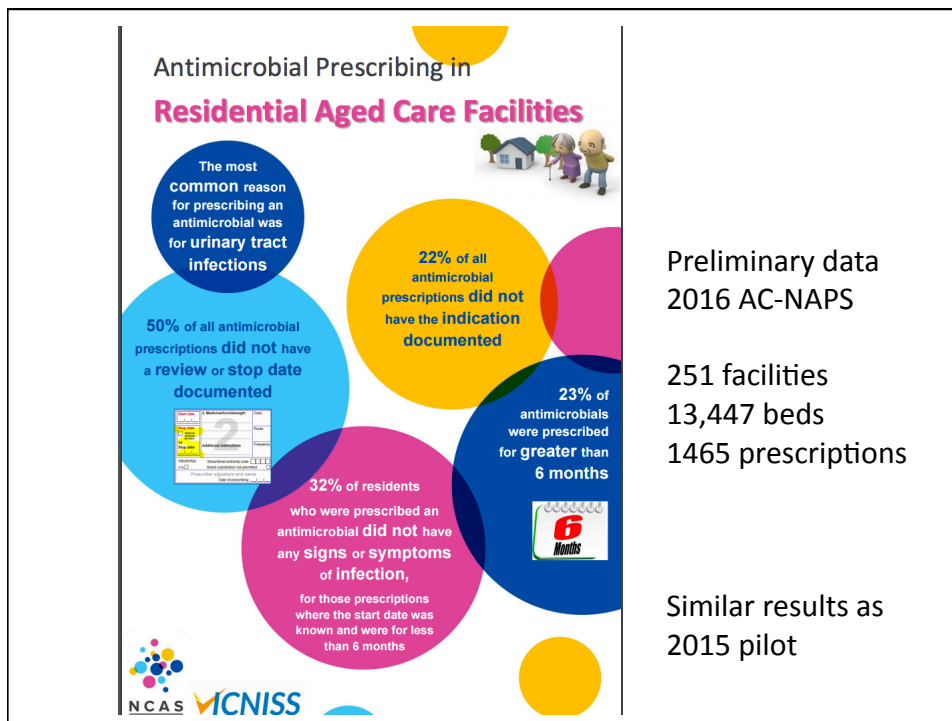
		No. of facilit.	No. of beds audited	Prevalence of antimicrobial use	Prevalence of infection
<b>State</b>	NSW	35	1619	209 (12.9%)	62 (3.8%)
	QLD	23	2007	248 (12.4%)	48 (2.4%)
	SA	7	587	81 (13.8%)	21 (3.6%)
	TAS	10	570	47 (8.2%)	8 (1.4%)
	VIC	166	7454	569 (7.6%)	223 (3.0%)
	WA	15	1210	146 (12.1%)	55 (4.5%)
<b>Remoteness</b>	Major Cities	74	5934	623 (10.5%)	184 (3.1%)
	Inner regional	104	5085	432 (8.5%)	145 (2.9%)
	Outer regional	61	2206	213 (9.7%)	68 (3.1%)
	Remote	9	154	26 (19.0%)	17 (12.4%)
	Very remote	3	68	6 (8.8%)	3 (4.4%)
<b>Organisation type</b>	Not for profit	76	6070	660 (10.9%)	166 (2.7%)
	Government	157	5712	531 (9.3%)	204 (3.6%)
	Private	18	1665	109 (6.5%)	47 (2.8%)
<b>National aggregate</b>		251	13447	1300 (9.7%)	417 (3.1%)

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Antimicrobial prevalence 6.5-19%				432 (8.5%)	145 (2.9%)
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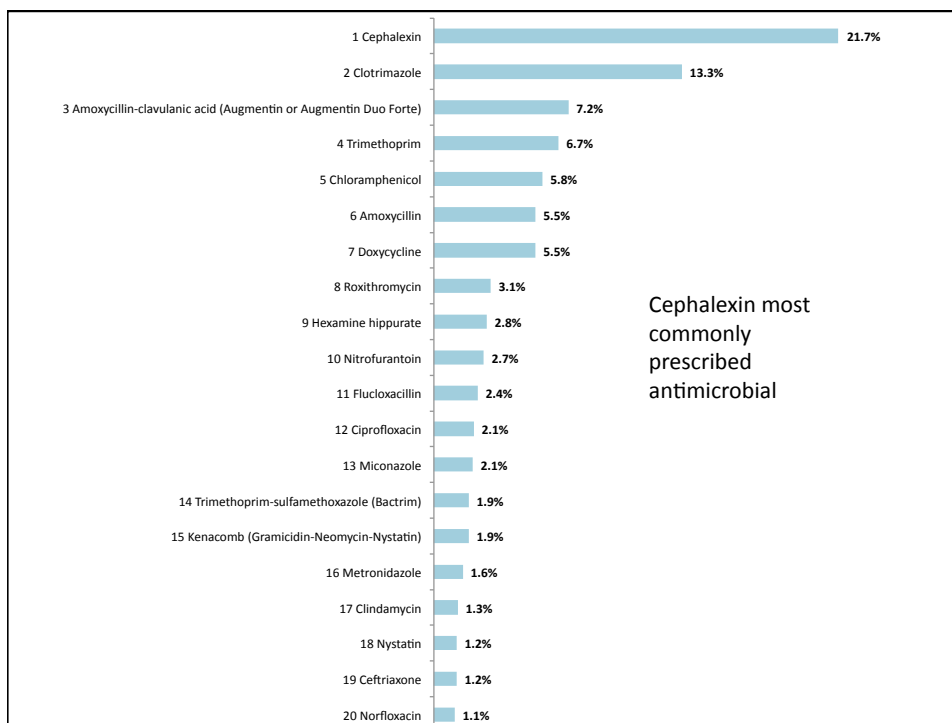


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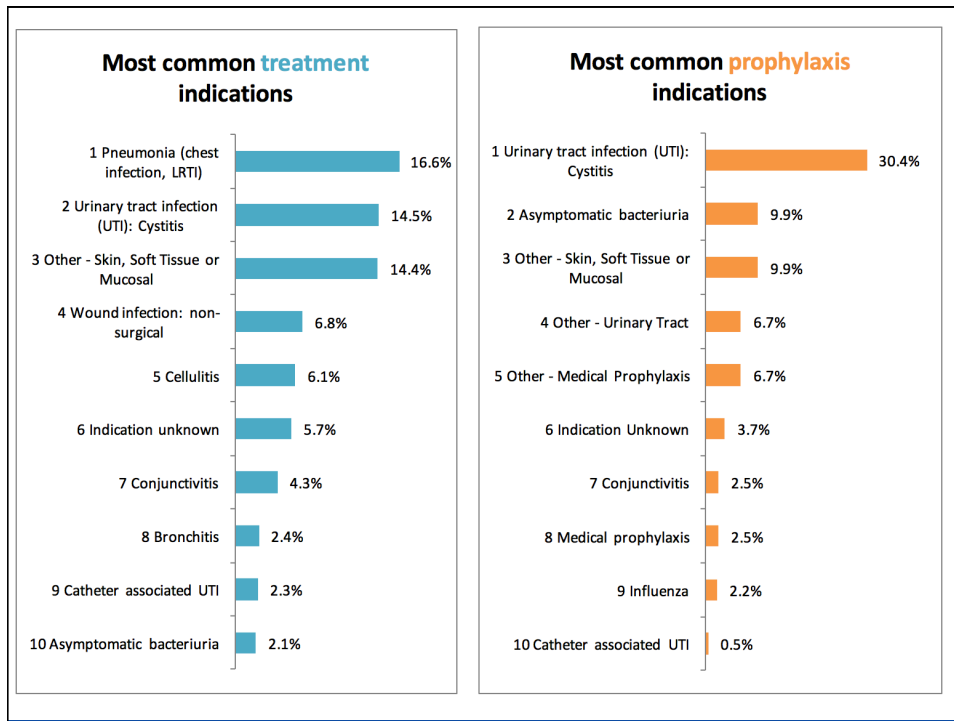
A total of **245 of 251 participating facilities (97.6%)** completed this section.

Question	Response	
<b>National Residential Medication Chart used</b>	Yes	44.9% (110)
	No	52.2% (128)
	Unsure	3.3% (8)
<b>Availability of Therapeutic Guidelines: Antibiotic (either elec or hard copy)</b>	Access	84.9% (209)
	No access	15.1% (37)
<b>Endorsed guidelines routinely used for management of suspected urinary tract infections</b>	Yes	54.3% (133)
	No	28.6% (70)
	Unsure	17.1% (42)
<b>Alcohol based hand-rubs available</b>	Yes	85.3% (209)
<b>Hand hygiene training sessions held for staff</b>	Yes	94.7% (232)



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## Results from AC-NAPS



Key areas for improvement:

- Inadequate documentation and review
- Use of antimicrobials for unspecified infections
- Prolonged duration of prescriptions
- Low proportion of patients with microbiology specimen prior to commencement of antimicrobials
- Treatment despite not meeting infection criteria (drivers)

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## Factors impacting prescribing quality



- Health system factors
  - Staff (GPs, locums and nursing), diagnostic access, access to ID physicians
- There ARE guidelines, but no implementation....WHO?
- Identifying signs and symptoms of infection in residents
  - Patterns of prescribing, 'just in case'
- Asymptomatic bacterial colonisation common
- Care provider factors and care relationships
- Advance Care Plans (ACPs) and next-of-kin



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## AMS targets for Australia



- UTIs, RTIs and skin/soft tissue infections
  - Clinical pathways, guidelines
  - Skin care practices (~30% with skin/soft tissue, cellulitis, wounds)
  - Prophylaxis (especially urine)
- Diagnostic testing to support prescribing (sputum, swabs and urine)
  - Support with interpretation for nursing staff
- Social factors influencing prescribing
- Advanced Care Planning/End-of-life prescribing
- Vaccination rates (influenza, pneumococcal)
- Quality Use of Medicines support in ACH

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## CDC AMS Core Elements



2014


Core Elements  
of Hospital Antibiotic  
Stewardship Programs

2015

The Core Elements of  
Antibiotic Stewardship  
for Nursing Homes

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## CDC AMS Core Elements



Leadership commitment

Accountability

Drug expertise

Action

Tracking

Monitor at least one process measure of antibiotic use and at least one outcome from antibiotic use

Reporting

Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff.

Education

2015

The Core Elements of  
Antibiotic Stewardship  
for Nursing Homes

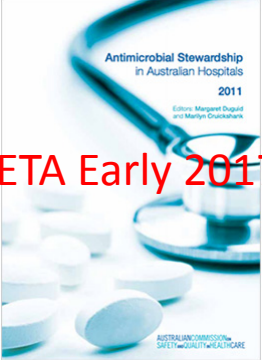
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# Australia

## No specific guidelines for AMS in RACFs



Chapter: AMS in Aged Care Services

ETA Early 2017



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myRACGP
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GUIDELINES
APP

## Medical care of older persons in residential aged care facilities (Silver Book)

Home / Your practice / Clinical guidelines / Medical care of older persons in residential aged care facilities (Silver Book) / Common clinical conditions / Urinary tract infections

Guideline
Table of contents

**Urinary tract infections** Published 2006

[Assessment](#)  
[Management](#)

Urinary tract infections are a significant problem for residents in RACFs. The prevalence among women is 20% between 65-75 years of age; 20-50% over 80 years of age; and among males over 80 years of age, 3%. Four percent of the RACF population has recurrent urinary tract infections.<sup>245</sup> Asymptomatic bacteriuria has an incidence of 50% in the RACF population compared to 10% in older people living in the community.

Contributing factors are related to ageing and disease and include decreased urinary concentrating ability, failure to completely empty the bladder, incontinence, diabetes, kidney stones, urinary catheters, medications with anticholinergic effects, and microbial resistance. Additional factors in women are a short urethra and atrophic changes due to reduced oestrogen levels, while men may have prostatic hypertrophy, urethral stricture, or prostatitis.<sup>246-247</sup> Inadequately treated lower urinary tract infections can ascend to cause pyelonephritis.



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## NCAS Phd Projects



### Optimising Antimicrobial Use for RTIs

- Only 39.7% of patients with RTI met McGeer Criteria
- Only 10% had specimens taken within 48 hours
- TG recommends rapid diagnostic tests for patients with pneumonia/ILI
- Examine impact of routine diagnostic resp multiplex PCR on appropriateness of AB use

### Antibiotic use at end of life in Aged Care Homes

- >55,000 deaths in ACH 13/14
- Define optimal prescribing at end of life
- Antibiotics are extensively prescribed in the last month of life in ACHs, especially in the two weeks before death
  - Perceived symptom relief and/or life-prolongation
  - Potential harms on quality-of-life

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## Accreditation standards in aged care



- No specific item: Medication safety and infection control
- AMS will included as part of the Clinical Care and Care Services Standard
- Consultation on the Standards is likely to occur in early 2017
- Recommend comments and feedback from AMS community
- Australian Commission involved in process

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## What might the accreditation standards look like?



- AMS policies and procedures
- Antimicrobial prescribing restrictions
- ACH specific antimicrobial guidelines
- Access to QUM/on-site infection prevention staff
- Access to education for nurses targeted for ACH
- Antimicrobial prescribing surveillance and effective feedback to prescribers

*Do these standards apply to the ACH or to the prescribers (GPs)?  
How do we effectively influence the decision maker?  
How do we equip to workforce in ACH to implement AMS?*

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## Aged Care Stream






- Email: [support@naps.org.au](mailto:support@naps.org.au)
- AC-NAPS: [www.naps.org.au](http://www.naps.org.au)
- NCAS: <https://www.ncas-australia.org>
- Twitter: NCAS\_Aus
- Aged Care/AC-NAPS team
  - A Prof Rhonda Stuart
  - Dr David Kong
  - A Prof Kirsty Buising
  - Dr Noleen Bennett: Infection Control Consultant (ACNAPS lead)
  - Caroline Chen: Pharmacist
  - Dr Rod James: Microbiologist
  - Sonia Koning: Pharmacist
  - VICNISS: A Prof Leon Worth, Dr Ann Bull
  - PhD fellow: Lesley Dowson

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 <p>A national initiative to stop inappropriate antibiotic use for asymptomatic bacteriuria in long-term care residents.</p> <div style="display: flex; justify-content: space-between;"> <div style="background-color: black; color: white; padding: 10px; border-radius: 15px; width: 80px; text-align: center;"> <p><b>STOP</b></p> <p><b>WAIT</b></p> <p><b>GO</b></p> </div> <div style="width: 80%;"> <p><b>STOP</b> treating asymptomatic bacteriuria; it is not an infection  <b>STOP</b> testing foul-smelling, dark, or cloudy urine</p> <p><b>WAIT</b> and rehydrate residents who develop changes in mental status, behaviour, or function <i>without</i> typical urinary tract infection symptoms</p> <p><b>GO</b> to urinalysis and urine culture if typical signs and symptoms of urinary tract infection are present</p> </div> </div> <p>For more directions and guidance:  <a href="http://www.ammi.ca">www.ammi.ca</a>          #SymptomFreeLetItBe</p> 	 <p>AAW 2016 Canadian Campaign</p> <p><a href="https://www.ammi.ca/AntibioticAwareness/">https://www.ammi.ca/AntibioticAwareness/</a></p> <p>National Centre for Antimicrobial Stewardship</p>
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December 1 **2017 TELECLASS SCHEDULE RELEASED**

December 8 **VIABILITY OF BACTERIA ON FABRICS**  
 Prof. Jerry H. Kavouras, University of Illinois at Chicago

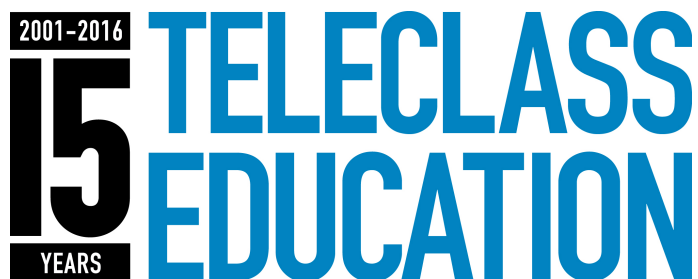
December 15 (FREE Teleclass)  
**INFECTION CONTROL IN ELDERLY CARE INSTITUTIONS – WHERE SHOULD WE GO?**  
 Prof. Andreas Voss, Radboud University Medical Centre, The Netherlands



[www.webbertraining.com/schedulepl.php](http://www.webbertraining.com/schedulepl.php)

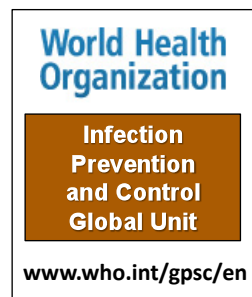
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