

## Supplementary data

### Pilot study of a multifaceted nurse-led antimicrobial stewardship intervention in residential aged care.

**Table S1.** Antimicrobials prescribed over the three-month intervention period, by indication (n=61 prescriptions from 40 residents).

	Total	RACH-1	RACH-2
Residents prescribed an antimicrobial, n	40	16	24
Antimicrobial prescriptions, n	<b>61</b>	<b>26</b>	<b>35</b>
<b>Indications, n (%)*</b>			
<b>Urinary tract infections, n (%)</b>	<b>13 (21)</b>	<b>6 (23)</b>	<b>7 (20)</b>
UTI	7	5	2
Catheter-associated UTI	6	1	5
<b>Respiratory tract infection, n (%)</b>	<b>22 (36)</b>	<b>6 (23)</b>	<b>16 (46)</b>
Nonspecific respiratory infection	13	4	9
Pneumonia	5	1	4
Other	4	1	3
<b>Skin/Soft tissue infections, n (%)</b>	<b>15 (25)</b>	<b>6 (23)</b>	<b>9 (26)</b>
Nonspecific wound	2	1	1
Cellulitis	2	2	0
Ulcer	5	2	3
Shingles	2	0	2
Other	4	1	3
<b>Prophylaxis, n (%)</b>	<b>2 (3)</b>	<b>1 (4)</b>	<b>1 (3)</b>
Post-surgery	1	1	0
Urinary tract infection	1	0	1
<b>Other infections, n (%)†</b>	<b>5 (8)</b>	<b>4 (15)</b>	<b>1 (3)</b>
<b>Unclear/not reported, n (%)</b>	<b>4 (7)</b>	<b>3 (12)</b>	<b>1 (3)</b>
<b>Met minimum criteria for infection</b>			
Yes	25 (41)	11 (42)	14 (40)
No	23 (38)	7 (27)	16 (46)
Not applicable <sup>2</sup>	13 (21)	8 (31)	5 (14)

\*Denominator is total number of antimicrobial prescriptions. Antimicrobials may have greater than one documented indication.

† Indications outside of urinary, respiratory and skin/soft tissue infections.

## Post-pilot questionnaire - Questions

1. What is your profession?

- Registered nurse
- Enrolled nurse
- Personal care attendant (PCA)/Assistant in Nursing (AIN)
- General practitioner
- Pharmacist
- Other \_\_\_\_\_

2. Please rate how strongly you agree or disagree with the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have an important role in antimicrobial stewardship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a good understanding of antibiotic resistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident to assess common infections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident to manage common infections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Antibiotics are used appropriately in my facility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel pressured to give antibiotics to residents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The following questions relate to components of the START antimicrobial stewardship program that was piloted at your facility.

The program included the following resources:

- **Education:** face-to-face, online workbook, fact sheets
- **Guidelines:** assess and manage common infections
- **Documentation forms:** record assessment and management of infections
- **Resident/families fact sheet:** information on appropriate antibiotic use

The following infections were targeted:

- Urinary tract infections
- Lower respiratory tract infections
- Skin and soft tissue infections

3. Which START resources were you **aware** of? (Select all that apply)

- Education
- Guidelines
- Documentation forms
- Resident/family fact sheet
- None of the above

Display This Question:

If Which START resources were you aware of? (Select all that apply) = Education

3a. Did you attend an **education session or access the workbook**?

- Yes
- No

Display This Question:

If Did you attend an education session or access the workbook? = Yes

3ai. In regards to **education**, please rate how strongly you agree or disagree with the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The content was relevant to my practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was too much content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The content was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was information I did not know before	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like more education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I am satisfied with the education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Did you attend an education session or access the workbook? = No

3a.ii. Which of the following reasons best describes why you **did not attend or access the education**?

- I did not have time
- It is too long or complicated
- I have adequate knowledge of this topic
- It is not relevant to my practice
- Other \_\_\_\_\_

Display This Question:

If Which START resources were you aware of? (Select all that apply) = Guidelines

3b. Did you use any of the **guidelines**?

- Yes
- No

Display This Question:

If Did you use any of the guidelines? = Yes

3bi. In regards to **guidelines**, please rate how strongly you agree or disagree with the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The content is relevant to my practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is too much content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The content is easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like more training to use them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I am satisfied with the guidelines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Did you use any of the guidelines? = No

3bii. Which of the following reasons best describes why you **did not use the guidelines**?

- I did not have time to use them
- They are too long or complicated
- I have adequate knowledge of this topic
- My resident(s) did not have an infection
- They are not relevant to my practice
- Other \_\_\_\_\_

Display This Question:

If Which START resources were you aware of? (Select all that apply) = Documentation forms

3c. Did you use any of the **documentation forms**?

- Yes
- No

Display This Question:

If Did you use any of the documentation forms? = Yes

3ci. In regards to **documentation forms**, please rate how strongly you agree or disagree with the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
They are relevant to my practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is too much content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are easy to complete	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I would like more training to use them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I am satisfied with the forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Did you use any of the documentation forms? = No

3cii. Which of the following reasons best describes why you **did not use the documentation forms**?

- I did not have time to complete them
- They are too long or complicated
- I do not feel they are needed
- My resident(s) did not have an infection
- They are not relevant to my practice
- Other \_\_\_\_\_

Display This Question:

If Which START resources were you aware of? (Select all that apply) = Resident/family fact sheet

3d. Did you use the **fact sheets for residents and families**?

- Yes
- No

Display This Question:

If Did you use the fact sheets for residents and families? = Yes

3di In regards to the **resident/family fact sheet**, please rate how strongly you agree or disagree with the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
_____							

The content is relevant for residents/families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is too much content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The content is easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I am satisfied with the fact sheet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*Display This Question:*

*If Did you use the fact sheets for residents and families? = No*

3dii. Which of the following reasons best describes why you **did not use the fact sheet for residents/families?**

- I did not have time to use them
- It was too long or complicated
- I do not find them useful
- My resident and/or their family did not need one
- Other \_\_\_\_\_

4. What is your preferred mode to receive education? *(Select all that apply)*

- Face-to-face individual session
- Face-to-face group session
- Online
- Fact sheets
- Other \_

5. How **useful** were the following START resources in improving how antibiotics were used?

*If you have not used a resource, indicate how useful you feel it would be to your practice.*

	Extremely useless	Moderately useless	Slightly useless	Neither useful nor useless	Slightly useful	Moderately useful	Extremely useful
Education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guidelines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resident/family fact sheet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. How likely are you to use the following START resources in future?

	Extremely unlikely	Moderately unlikely	Slightly unlikely	Neither likely nor unlikely	Slightly likely	Moderately likely	Extremely likely
Education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guidelines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resident/family fact sheet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Do you have any comments or suggestions to improve the START resources?

8. Do you have any other feedback for the START project?

## **Minimum antibiotic criteria for appropriateness**

### **Urinary tract infections**

- If indwelling catheter:
  - At least one: temp  $\geq 38^{\circ}\text{C}$ , acute change in mental status, flank/loin pain or tenderness, shaking/shivering
- If no indwelling catheter:
  - Painful urination
  - If no painful urination
    - Temp  $\geq 38^{\circ}\text{C}$  or acute change in mental status

AND

- At least one new or worsening symptom:
  - Urge to urinate
  - Frequency of urination
  - Lower abdominal pain or tenderness
  - Visible blood in urine
  - Flank/loin pain or tenderness
  - Urinary incontinence

### **Lower respiratory tract infections**

- If febrile (temp  $\geq 38^{\circ}\text{C}$ ):
    - New or increasing cough
- AND
- At least one: heart rate  $> 100$  bpm, shaking/shivering, acute change in mental status, respiratory rate  $> 25$  breaths/min
- If not febrile (temp  $< 38^{\circ}\text{C}$ ):
    - If diagnosis of COPD present: new or increased cough and purulent sputum
    - If no diagnosis of COPD present: new or increased cough and purulent sputum and at least one: acute change in mental status, respiratory rate  $> 25$  breaths/min

### **Skin and soft tissue infections**

- New or increasing purulent drainage at a wound, skin or soft-tissue site OR
- At least 2 new or increasing symptoms at the affected site: redness, tenderness, warmth, swelling, temp  $\geq 38^{\circ}\text{C}$