Improving Antimicrobial Stewardship & Sustainability by Promoting Oral Metronidazole in Surgical Patients

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Background

- Antimicrobial resistance (AMR) is a major public health issue
- Predicted that 10 million people could die every year from AMR
- Antimicrobial stewardship aims to ensure we preserve antimicrobials for future generations
- Right drug, right dose, right route, right duration
Current Problems

- IV Antimicrobials often overused in acute setting
- Patient Risk of AMR & HAIs (CDI, SAB)
- Healthcare Workload & Cost
- Environmental waste
Local Perspective

- High IV Abx use in RAH surgical wards 20 & 24
- Target for AMS improvement

GGC Top 10 wards by IV antibiotic DDDs in 2020 Q4
In 2020 Q4 the top 10 wards used 15.5% of all IV antibiotics in GGC
Previous QI Surgical Wards

Developing a Ward Team Approach to Antimicrobial Stewardship: Promotion of IVOST Utilising the Daily Ward Safety Brief and a ‘Red to Green’ Poster Display and Review Tool

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Introduction
Antimicrobial stewardship (AS) is essential in reducing the risk of antimicrobial resistance. Prospective feedback of AS issues and adopting a multidisciplinary team approach to AS is beneficial to patient care and safety.

Documenting antibiotic stop dates and allergy status on the medicine chart and monitoring broad-spectrum antibiotics to protect status can improve AS by ensuring patients receive the correct antibiotic for the appropriate duration. In addition, management of common antibiotic interactions with certain products such as insulin and oral herbs is important to prevent antibiotic treatment failure.

In NICE guidelines, 83% of antibiotic prescribing is 30% of medications chart and antibiotic stop/review in less than 10% of oral and 10% of intravenous (IV) antibiotics. In addition, less than 30% of antibiotic cautions are managed at discharge and just over 50% of ‘protected’ antimicrobial pharmacist orders comply with the required drug documentation. Antimicrobial pharmacist guidelines (AMPGT) were recently introduced to NHS Scotland. This project was not to determine the AMAPTS within the ward but to measure the impact of his role on AS and patient care and safety.

Aims
To determine if introduction of an AMPGT to the multidisciplinary ward can improve AS and patient care and safety at the Royal Alexandra Hospital (RAH).

Method
Working with the ward teams the AMPGT ward service was developed, clinical standardised and agreed. The AMPGT visited RAH medical and COG MCU weekly over a period of 12 weeks and reviewed available medicine charts for the following:

- Antimicrobial prescribing
- Antibiotic allergy interactions
- Use of appropriate IV antibiotic interactions
- Use of appropriate IV antibiotic interactions

AMPGT ward visit feedback was shared in real time with the ward team via a ward visit report. In addition, if an antibiotic cautions interaction was identified, the AMPGT also provided an information leaflet to raise awareness and improve management of this common interaction. This AMPGT also provided compliant and as many antibiotic interactions for any patient prescribed these medicines.

Data was displayed on a red/green chart to measure if improvement in antimicrobial medication chart documentation, IV antibiotic review, management of common antibiotic interactions and compliance with the local protected antimicrobial policy was achieved.

Results
Following introduction of the AMPGT service, medicine chart documentation of allergy status and oral antibiotic stop/review improved from baseline to all wards.

![Fig 1](image)

In general medical medical records of IV antibiotic stop/review days (Fig 2) doubled from 25% at baseline to 46% after service introduction. The desired improvement was achieved in general surgery from 4% baseline to 28% post-change. The difference of IV antibiotics prescribed beyond 48 hours in red/green was reduced from 4% baseline to 21% follow-up AMPGT service introduction.

![Fig 2](image)

![Fig 3](image)

![Fig 4](image)

![Fig 5](image)

![Fig 6](image)

![Fig 7](image)

![Fig 8](image)

Conclusion
Introduction of an AMPGT service providing prospective feedback of AS issues to the ward team at RAH resulted in improvement in the following:

- Antimicrobial medication chart documentation
- Use of IV antibiotics
- Antibiotic allergy interactions
- Use of appropriate IV antibiotic interactions
- Use of appropriate IV antibiotic interactions

These results demonstrate that introduction of an AMPGT to the ward team can improve AS and patient care and safety.

Acknowledgements
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- Assistance was given to the AMPGT ward service by the Ward based Antimicrobial Stewardship Centre
- Given the AMCPS pharmacy team for supporting this opportunity and my antimicrobial team colleagues in ensuring support.
QI Reflections & Next Steps

**DOs**
- Engage and involve **core** multidisciplinary ward staff at all times
- QI initiatives that **improve** system efficiency and **reduce work load** are more likely to embed and succeed

**DON’Ts**
- QI initiatives that **add** work are a real challenge to maintain and embed
- QI initiatives that are **person dependant** will not be maintained if staff change
Metronidazole

- Commonly Rxd IV for intra-abdominal sepsis
- Excellent oral bioavailability 95-100%
- Guideline update Jan 2021 to promote oral use where appropriate
Oral Metronidazole

- Benefits of oral versus IV metronidazole

  - Improved antimicrobial stewardship
  - Reduced risk of line infections/complications
  - Improved patient comfort and mobility
  - Reduced staff workload
  - Reduced costs IV **27 times** more expensive than tablets
  - Reduced plastic waste
  - Improved sustainability
Project Aim

- To increase the proportion of Royal Alexandra Hospital surgical patients receiving oral metronidazole where appropriate to **50%** by **February 2022**
Objectives

- Measure baseline proportion of surgical patients meeting the criteria for oral receiving oral metronidazole
- Introduce tests of change to promote use of oral metronidazole where appropriate
- Measure changes in prescribing behaviour to determine if improvement has been achieved
Method

Baseline data collected over 6 weeks Nov/Dec 2020

- Patients on RAH Surgical Receiving or General Surgical wards
- Patients prescribed IV or oral metronidazole

Criteria for oral metronidazole

- Oral route reliable
- Gut absorption not compromised
- No clinical deterioration/sepsis
Method

1\textsuperscript{st} Test of Change

- Staff engagement/awareness
  - Surgeons
  - Junior Medical staff
  - Nurses
  - Pharmacists
  - Microbiology

- Ward posters
- Prospective audit and feedback
Method

2nd Test of Change

- FY1 Ward Champions & Gold Recognition Awards
- Downstream posters/engagement
- Surgical Whatsapp© messages
- WOSSA Presentation
- Sustainability benefits highlighted
THINK before you prescribe or administer IV METRONIDAZOLE could my patient have ORAL THERAPY?

Metronidazole has excellent ORAL bioavailability reaching 95-100%

If your PATIENT meets the following criteria:

- Oral route reliably available
- Gut absorption not compromised
- No clinical deterioration/ systemic sepsis

SWITCH from IV to ORAL metronidazole – GO GREEN!

ADVANTAGES of the ORAL route:

- Improved antimicrobial stewardship
- Reduced patient risk of IV line infections & thrombophlebitis
- More patient friendly: improved comfort & mobility
- Reduced nursing & medical workload
- Reduced cost-IV route 27 times more expensive than ORAL
- Improved sustainability & reduced plastic waste

For further advice on IV to ORAL antibiotic SWITCH options see NHSGGC IVOST policy
RAH Baseline Results

- Only **13%** of patients meeting the criteria receiving oral metronidazole - **room for improvement**!
Results Prescribing Data

- Proportion of Ward 20 & 24 patients prescribed metronidazole receiving oral

**Graph:**
- **Baseline Median:** 7%
- **Post Change Median:** 51%

Graph showing percentage of RAH surgical patients receiving metronidazole, with median values and test of change markers.
Metronidazole Usage Data

IV and oral DDDs

RAH

GGC

Test of Change
Metronidazole % IV of Total

RAH
Baseline median 75%

GGC
Baseline median 79%

Post change median 48%

Post change median 75%
IV Met Usage Data RAH Surgical

- 45% median reduction in IV metronidazole use
- 320 less IV metronidazole administrations per month
IV Met Usage Data RAH Hospital

- 39% median reduction in IV metronidazole use
- 710 less IV metronidazole administrations per month

Baseline Median 600 DDDs  
Post Change Median 364 DDDs

Metronidazole IV Usage Data DDDs RAH Hospital

39% Reduction
Results Medicine Cost Data

- 30% median reduction in metronidazole drug cost alone
- IV 27 times more expensive than tablets (Leeds Teaching Hospital)
Results Nurse Questionnaire

- **N = 10** (Range band 5-band7)
- 100% aware of QI work & high oral bioavailability of met
- 100% promote oral met at least weekly within ward team

**Reduced amount of IV for patient comfort. Quicker to IVOST.**

**Better for patients, more cost effective.**

**IVOST early**

**Reduces issues with venflon infections**

**Less plastic waste on our ward**

**Reducing work load and improving patient care**
Results Nurse Questionnaire

- Any disadvantages or problems?

  - Some patients find the tablets too big to swallow
  - Not always changed when patient is no longer NBM, however quickly changed when highlighted.
  - Occasionally oral metronidazole not discontinued when patient switched to oral co-amoxiclav
  - No none.
Conclusion

- Using QI to engage and raise staff awareness has resulted in a change in prescribing behaviour.
- The aim to increase the proportion of oral metronidazole prescribed to eligible surgical patients to 50% was achieved.
- This is important in terms of:
  - Improved stewardship
  - Improved patient care & safety
  - Reduced staff workload & healthcare costs
  - Sustainability
Sharing our QI work

- BSAC May 2022
- SAPG Networking Event May 2022
- NHS Scotland Event June 2022
Next Steps

- NHSGGC scale & spread
  - GRI, QEUH & IRH

- New ‘Tests of change’ using electronic prescribing system
  - Add message prompt to IV met on HEPMA system

- Expand QI project to other antimicrobials with high oral bioavailability
Proportion of patients Rxd IV metronidazole meeting criteria for oral metronidazole n=97

49%
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