Healthcare Improvement Scotland | SAPG Safeguarding antibiotics

Optimising antimicrobial treatment – the Scottish experience

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Scottish Antimicrobial Prescribing Group
Safeguarding antibiotics for Scotland, now and for the future

NHS SCOTLAND

Overview of presentation

- Structures for antimicrobial stewardship
- Guidance and treatment algorithms
- Quality improvement programmes
- Prescribing quality indicators
- Current initiatives and future work

Scottish Antimicrobial Prescribing Group (SAPG)

- Consortium with multidisciplinary approach and chaired by opinion leader
- Representatives from national stakeholders and regional NHS boards
- Funding for secretariat, pharmacists, epidemiologist and information analysts

Three workstreams

- **Informatics** to develop and link national datasets of antimicrobial use and resistance
- **Quality improvement** to produce guidance and develop QI interventions
- **Education** to develop educational resources for health and care staff, patients and the public

https://www.sapg.scot/

LOCAL STRUCTURES ANTIMICROBIAL MANAGEMENT TEAMS

Courtesy of Dilip Nathwani, past Chair SAPG

Pharmacists in stewardship in Scotland

NATIONAL LEVEL

SAPG funded staff

- Professional Lead
- Informatics Leads

SAPG representatives

- Education Lead
- Directors of Pharmacy (regional lead pharmacist)
- Chair of Association of Scottish Antimicrobial Pharmacists
- Scottish Prescribing Advisers Association member

LOCAL LEVEL

- At least one Antimicrobial Pharmacist (central funding for 1 WTE per region)
- Support staff – Pharmacy technician, antimicrobial nurse, data analyst

Association of Scottish Antimicrobial Pharmacists

- National peer support group established in 2004 – now 25-30 members
- Support SAPG work, share good practice and develop clinical specialty
- Annual work plan with education and research as key focus
- Links with two Schools of Pharmacy to support UG, Masters training and research

SPAA
Scottish Prescribing Advisers Association

- National group of primary care pharmacists with Lead Pharmacist in each region
- Key support group for SAPG to influence primary care prescribers
- Some are involved in local Antimicrobial Management Teams
- Lead initiatives to share prescribing data and provide education on AMR
- Link to social care settings e.g. Care homes

National guidance - hospitals

How we support hospital clinicians to improve management of infections and optimise antibiotic use.

Antimicrobial Companion app

Antibiotic policies

Antibiotic dosing in obesity

Community acquired pneumonia

Gentamicin and vancomycin

Gram negative infection

Neutropenic sepsis

Staph aureus bacteraemia

Surgical prophylaxis

Developed in collaboration with national specialist groups

If evidence lacking agree national consensus on what is best practice

Implemented at local level by Antimicrobial Management Teams

Healthcare Improvement Scotland | SAPG

GOOD PRACTICE RECOMMENDATIONS FOR SURGICAL AND PROCEDURAL ANTIBIOTIC PROPHYLAXIS IN ADULTS IN NHS SCOTLAND

Aim
This document aims to provide NHS boards with recommendations for local surgical and procedural prophylaxis guidance based on recommendations of SIGN 104 [1].
Antibiotic prophylaxis is defined as the use of antibiotics before, during, or after a diagnostic, therapeutic, or surgical procedure to prevent infectious complications.
Each NHS board, through its Antimicrobial Management Team (AMT), is responsible for maintaining guidelines including the following key components:

SUMMARY OF GOOD PRACTICE RECOMMENDATIONS	
1	Guidance should be readily accessible to prescribers and should give recommendations for interventional procedures requiring antibiotic prophylaxis
2	Guidance should include recommendations on choice and route administration of antibiotics including timing, route and duration
3	Guidance should highlight need for careful assessment of pre-operative penicillin allergy and should include alternatives for those with true penicillin allergy
4	Guidance should provide recommendations for prophylaxis in patients who are colonized with MRSA and CPE
5	Guidance should incorporate specific local dose recommendations for the prophylactic use of gentamicin and glycopeptides
6	Guidance should be subject to regular review by the Antimicrobial Management Team and formal update every 2 or 3 years (following local process) in conjunction with the relevant specialties
7	Compliance with guidance should be monitored
8	Selected unintended consequences of guidance should be monitored
9	Guidance should be supported by training on use of guidance for all medical and where appropriate non-medical prescribers and other associated clinical/theatre staff
10	AMTs should have systems in place to respond to poor compliance with guidance and/or the development of unintended consequences of antibiotic prophylaxis

Intravenous Gentamicin Use in Adults (GGC Guidance)

Table 1: Initial GENTAMICIN doses and dose intervals

Actual body weight → / Creat Cl (mL/min) ↓	40 - 49 kg	50 - 59 kg	60 - 69 kg	70 - 80 kg	> 80 kg
< 21	2.5 mg/kg (max 180 mg) then take a sample after 24 hours				
21 - 30	180 mg 48 hourly	200 mg 48 hourly	240 mg 48 hourly	240 mg 48 hourly	260 mg 48 hourly
31 - 40	200 mg 48 hourly	240 mg 48 hourly	280 mg 48 hourly	300 mg 48 hourly	320 mg 48 hourly
41 - 50	240 mg 48 hourly	280 mg 48 hourly	320 mg 48 hourly	360 mg 48 hourly	400 mg 48 hourly
51 - 60	200 mg 24 hourly	240 mg 24 hourly	280 mg 24 hourly	300 mg 24 hourly	320 mg 24 hourly
> 60	240 mg 24 hourly	280 mg 24 hourly	320 mg 24 hourly	360 mg 24 hourly	400 mg 24 hourly

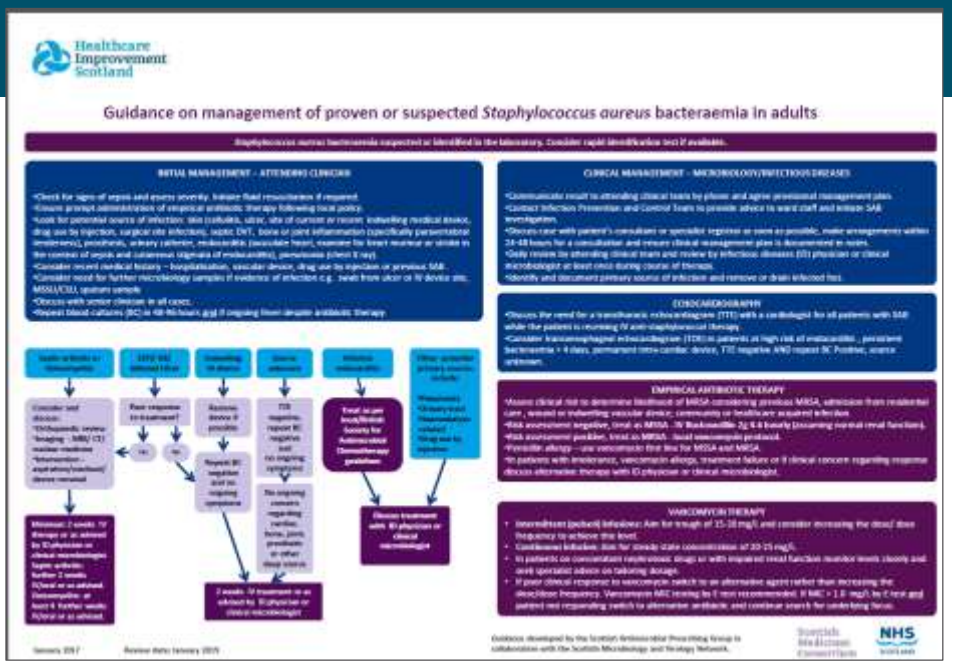
Caution: If the patient weighs < 40 kg and CrCl is ≥ 21 ml/min, give a single dose of 5 mg/kg then take a sample 6 – 14 hours after the dose and follow the instructions in Step 2.

Note that patients who have unusual clinical characteristics, e.g. weight < 40 kg, weight >120 kg, age >90 years may require dose adjustments and require close monitoring. Contact pharmacy for advice.

SAPG January 2017 For review January 2019

Treatment algorithms to support clinical decisions

Neutropenic sepsis
UTI in older people



Gentamicin and vancomycin quality improvement programme

National point prevalence study examined compliance with the guidance on a specified date across acute hospitals in all health boards in Scotland.

A qualitative study was conducted in 2 large and 2 small health boards involving 27 pharmacists, 23 junior doctors and 9 senior doctors. Thematic analysis of data from focus groups and one-to-one interviews was used.

Barriers to successful implementation of national guidance were identified. The three main areas for quality improvement were: documentation; education; clarification of the guidance content.

"We've actually got pre-printed prescription sheets which has helped quite a lot in renal with both vancomycin and gentamicin and the gentamicin prompts when the level has to be taken… There is the table that tells them the starting dose depending on the patients weight x, y and z which has made a huge difference in the renal unit."

"They are easy to access online. You don't have to – no matter what ward you are on – you don't have to look on the wall or whatever. They are online. That's great."

Gentamicin and vancomycin quality improvement programme

National guidance

Updated and restructured to make it easier to follow

Educational resource

Existing educational resources collated to inform a national resource comprising a series of case studies covering practical and clinical issues accessed via an online learning platform

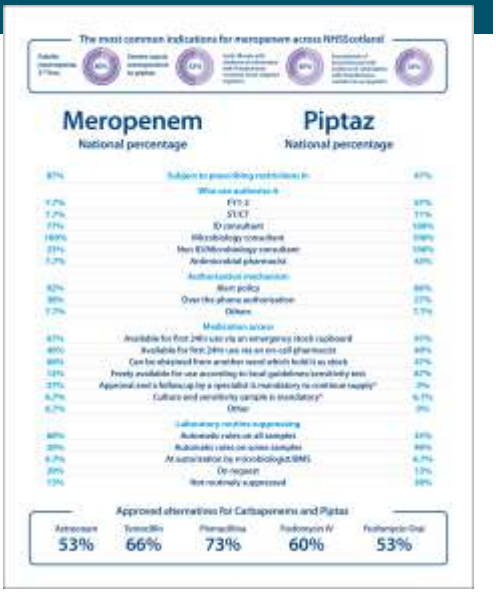
Standardised documentation

Prescription charts for both gentamicin and vancomycin.

On-line calculator

Previous calculators for gentamicin and vancomycin were updated and validated plus new gentamicin Hartford calculator developed

Carbapenems quality improvement programme



Increasing threat from multi-drug resistant Gram negative bacteria and trend of increased use of carbapenems and piperacillin-tazobactam (piptaz) in Scotland

SAPG developed and implemented guidance to optimise the use of these antibiotics.

What was the impact of the guidance?

- An on-line survey was used to investigate local prescribing guidance and laboratory reporting.
- A bespoke point prevalence survey (PPS) was used to collect antibiotic utilisation information.
- Data were collated and analysed to produce national and board level reports to illustrate **prescribing guidance versus actual clinical practice.**

Carbapenems quality improvement programme

Clinicians in four health board areas interviewed regarding their use of carbapenems and asked for suggestions to improve practice. Information was analysed qualitatively using thematic analysis.

RESULTS

- Clinicians rely on infection specialists for advice on initiation and continuation/de-escalation - lack of confidence amongst clinical teams
- Overuse of ultra-broad spectrum agents acknowledged but tools to support review and de-escalation/IVOST required – formal review
- Lack of awareness and confidence amongst clinicians in using carbapenem-sparing agents unless within local guidelines and/or microbiology reports

"I think on some occasions it's not quite clear where you go to deescalate from Meropenem... I think better guidance on ... where to go following Meropenem would benefit ..."... FY2 Medicine

"We're not as good as putting a duration as we should be" ... Micro consultant

"It would be great to have a robust generic way to have post prescribing review"... ID consultant

Carbapenems quality improvement programme - ACTIONS

An education resource including a quality improvement toolkit is being developed to support **reliable review of IV antibiotics** and to ensure **duration or oral therapy is documented** on the medicine chart.

- Literature review
- Videos clips to engage clinical teams
- Slideset 1 Making the case for change
- Audit tools
- Testing improvement ideas
- Slideset 2 Using the QI toolkit
- Good practice tools

Quality indicators for prescribing

DEFINITION OF AN INDICATOR:
an **explicitly defined measureable** item giving a possible indication on the level of quality.

Quality indicators allow trends to be measured

- over time
- between locations
- before/after interventions

QIs used in healthcare to drive improvements in practice

REPEATED SMALL SCALE DATA COLLECTION AND FEEDBACK TO ENABLE RAPID CHANGES IN PRACTICE

QUALITY INDICATOR WITH A TARGET FOR REDUCTION OF TOTAL ANTIBIOTIC USE IN PRIMARY CARE

Best in class approach - prescribing rate at level of lowest quartile

Target – 50% of GP Practices reach lowest quartile or make a defined acceptable move to lower prescribing rate

Report Period	Lower Quartile	Mid Quartile (Median)	Upper Quartile	Count of GP Practices
Scotland Baseline (Jan – Mar 2013)	1.80	2.14	2.49	987
Scotland Year 1 (Jan – Mar 2014)	1.73	2.03	2.36	985
Scotland Year 2 (Jan – Mar 2015)	1.74	2.04	2.40	978
Scotland Year 3 (Jan – Mar 2016)	1.63	1.91	2.26	965

Baseline was reset in 2017 to stimulate further progress

Report Period	*Lower Quartile*	*Mid Quartile (Median)*	*Upper Quartile*	*Count of GP Practices*
(Jan – Mar 2016)	1.63	1.91	2.26	965
(Jan – Mar 2017)	1.59	1.87	2.17	954

Data from internal SAPG meeting papers

HOSPITAL QUALITY INDICATORS

Started in 2009 to underpin targets for reduction of *Clostridium difficile* infection – focused in admission wards and surgical prophylaxis for colorectal surgery

Two measures for each:
indication documented & compliance with local policy (Admissions)
single dose & compliance with local policy (Colorectal prophylaxis)

Progressed to include downstream wards and other surgical specialties

Evolved to increase number of measures and wards chosen based on local need to improve prescribing

Hospital quality indicators - focus on empirical prescribing

Majority of antibiotics are prescribed empirically and choice should follow local policy
Initial measures continued but measure for 'Administration of antibiotics' added

Empirical Prescribing	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Indication for Antibiotic Treatment Recorded in Notes?	Y / N	Y / N	Y / N	Y / N	Y / N
Antibiotic(s) Compliant with Local Prescribing Policy?	Y / N	Y / N	Y / N	Y / N	Y / N
All doses administered as per medicine chart?	Y / N	Y / N	Y / N	Y / N	Y / N

Use paper data collection form
Or Excel spreadsheet

Sample 5 patients per week

Share results with team and discuss reasons for any poor compliance

Monitor trends over time

Reporting prescribing quality indicators – Scotland

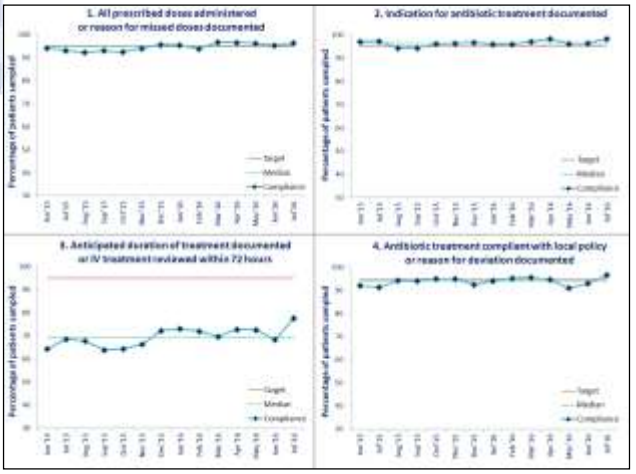
	Medical				Surgical			
Measure	Median (%)	Min (%)	Max (%)	Boards compliant	Median (%)	Min (%)	Max (%)	Boards compliant
1. Doses administered	95	91	100	8/14	94	84	100	6/15
2. Indication documented	96	84	100	10/14	93	86	100	6/15
3. Duration documented	69	45	95	1/14	54	25	97	1/15
4. Compliant with policy	94	90	100	8/14	90	82	100	3/15

Monthly data from one medical ward and one surgical ward per hospital and 20 patients per ward

Target compliance level is 95%

Data shared locally and collated for national report

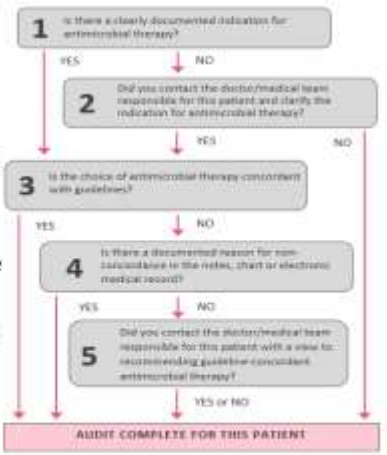
AGGREGATED NATIONAL DATA USING IHI EXTRANET



Australian hospital audit system

What is the 5x5 Antimicrobial Audit?

- A continuous audit activity that collects information about empirical antimicrobial prescribing
- Developed by the Clinical Excellence Commission and based on the work of the Scottish Antimicrobial Prescribing Group
- Auditors answer up to 5 yes/no questions for 5 patients per week, with the audit process combining both data collection and prompted intervention



QUAH

The 5x5 Antimicrobial Audit is a component of the QUAH Antimicrobial Stewardship Toolkit
Based on Prescribing Indicators developed by the Scottish Antimicrobial Prescribing Group (SAPG)
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CLINICAL EXCELLENCE COMMISSION

2017 - HOSPITAL QUALITY INDICATOR VIA APP

MOVING FROM INTERVENTIONS TARGETING PATIENT POPULATIONS TO PERSON-CENTRED CARE

Guidance
Quality improvement programmes
Prescribing quality indicators

AIM TO OPTIMISE PRESCRIBING AT POPULATION LEVEL
e.g. health board, hospital, ward

PERSON-CENTRED CARE
- **Address individual patient needs**
- **Consider benefits and risks**

Principles of **realistic medicine**:

- Ensuring high quality care for patients
- Reducing the burden of over treatment
- Reducing unwarranted variation
- Ensuring value for money
- Combining the expertise of patients and professionals
- Identifying and managing clinical risk

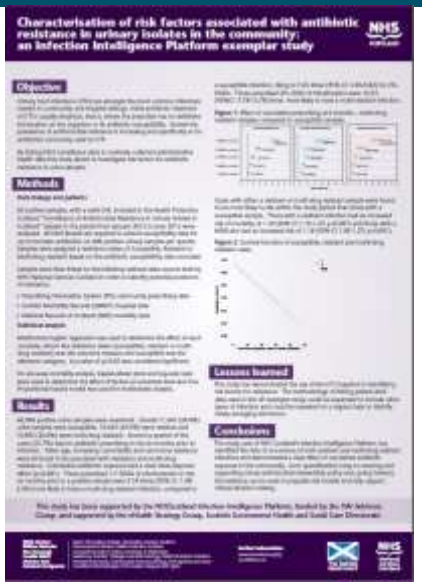
How can SAPG Support "Realising Realistic Medicine"?

Support clinical teams to personalise and rationalise prescribing of antimicrobials through:

- Clinical decision support
- Doing simple things better
  - Reduce redundancy and improve/focus review of treatment
  - Reduce treatment duration and burden of IV antibiotics
  - Approach to antibiotic treatment in palliative and frail elderly patients
  - Minimise mislabelling of allergy

Clinical decision support tools

Clinical decision support tools



Risk factors to consider when prescribing first line antibiotic (trimethoprim) for UTI

Variables included - *age group, care home residence, previous hospital admissions, total antibiotics prescribed in previous 6 months, time since most recent trimethoprim prescription*

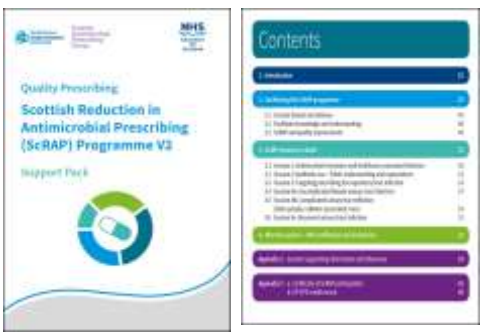
Currently developing models to inform calculator as decision support tool

New programmes of work

- **Supporting and promoting antibiotic review in hospital**
- **De-labelling penicillin allergy**
- **Antifungal stewardship**
- Developing a programme in paediatrics
- Developing and supporting nurse and midwives in contributing to stewardship

Day 3 Antibiotic Review Resource

- Address issues with increasing antibiotic use in hospitals driven by Sepsis programme
- Build on success of ScRAP primary care resource
- Draw on published evidence
- Develop educational resource for hospital teams to support antibiotic review / de-escalation / stop
- Supporting quality improvement methodology and ideas
- Audit tools and good practice examples



Facilitated education for GP Practice Teams to support reduction of unnecessary antibiotic use

De-labelling of Penicillin Allergy

- Reported reactions in about 10% of hospital patients
- Reality is that at least 80% of these reactions are not allergy
- Mislabelling associated with poorer outcomes, increased cost, increased length of stay and AMR
- National guidance on de-labelling
- Screening of patients using a risk-based algorithm
- Patients unlikely to be allergic will have penicillin challenge test
- Communication of result is key to success

Antifungal stewardship

- Currently no national approach
- Wide variation in practice in use of systemic antifungals
- High cost medicines
- Need uniform, cost-effective approach to utilise biomarker diagnostic tests
- Optimise empirical and directed prescribing in key areas:
  - Critical care
  - Haemato-oncology
  - Respiratory medicine

APPROACH - Literature review, HTA cost-effectiveness of diagnostics, surveys of current practice → **National good practice recommendations**

CONCLUSION

Structures to support antimicrobial stewardship are needed to optimise antimicrobial treatment

Management support and clinician engagement is essential

Guidance supports good practice and quality improvement approach supports implementation

Optimisation requires behaviour change which is difficult and seeking views from front line clinicians helps

Person-centred treatment is becoming a reality through clinical decision support tools and a holistic approach to care

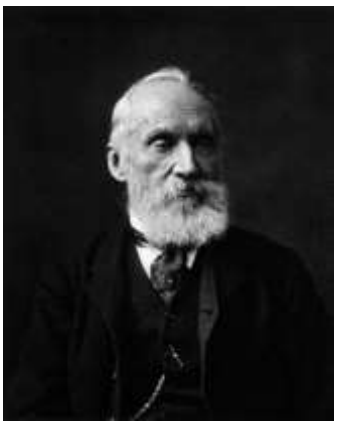
Final thought on optimising prescribing ….

"To measure is to know"

"When you can measure something and express it in numbers, you know something about it. But when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind."

"If you cannot measure it you cannot improve it"

Lord Kelvin (1824-1907)



ANY QUESTIONS

Thanks to members of SAPG and health board Antimicrobial Management Teams

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