



Surgical antibiotic prophylaxis duration

www.bit.ly/3eGoCKw



Professor Martin Cormican, National Clinical Lead, AMRIC

Marie Philbin, Chief Pharmacist, AMRIC

10th December 2021



Invite for the webinar has been extended to:

- Anyone involved in the use of Surgical Antibiotic Prophylaxis
 - **Prescribes** – Surgeons, Obstetricians, Gynaecologists, Anaesthetists, Cardiologists
 - **Dispenses** – Pharmacy Staff
 - **Administers** – Nurses
 - **Infection Specialists** – Consultant Microbiologists, Infectious Diseases Physicians, Antimicrobial Pharmacists
 - **Quality & Patient Safety Staff**
- We would like you to welcome you all here today



Structure of the webinar

- Background/rationale for this work
- AMRIC/NCPS joint position statement on surgical antibiotic prophylaxis duration
- Audit tool
- Supporting materials





Some background as to the rationale for the work





- **Surgical antibiotic prophylaxis is a critical step in preventing surgical site infection.**
- **Maximum benefit with the least harm is achieved by:**
 - **Administering the right agent, at the right dose, at the right time and for the right duration.**
- **In terms of duration most procedures only require a single dose of surgical antibiotic prophylaxis to reduce the risk of a surgical site infection (SSI)**
 - **Extended duration of surgical antibiotic prophylaxis is not associated with further reduction in risk of SSI**
 - **There is evidence of harm such as acute kidney injury and *Clostridioides difficile* infection with extended duration**

JAMA Surgery | Original Investigation

Association of Duration and Type of Surgical Prophylaxis With Antimicrobial-Associated Adverse Events

Westyn Branch-Elliman, MD, MMSc; William O'Brien, MS; Judith Strymish, MD; Kamal Itani, MD; Christina Wyatt, MD; Kalpana Gupta, MD, MPH

CONCLUSIONS AND RELEVANCE Increasing duration of antimicrobial prophylaxis was associated with higher odds of AKI and *C difficile* infection in a duration-dependent fashion; extended duration did not lead to additional SSI reduction. These findings highlight the notion that every day matters and suggest that stewardship efforts to limit duration of prophylaxis have the potential to reduce adverse events without increasing SSI.

JAMA Surg. 2019;154(7):590-598. doi:10.1001/jamasurg.2019.0569
Published online April 24, 2019.

Author Affiliations: Author affiliations are listed at the end of this article.

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- **2020 national antimicrobial point prevalence study showed 62% of cases exceeded a single dose**
- **2017 European Study showed Scotland only 35% of cases exceeded a single dose**
- **Scope for improvement**
- **Development of position statement & associated resources to assist in that improvement**

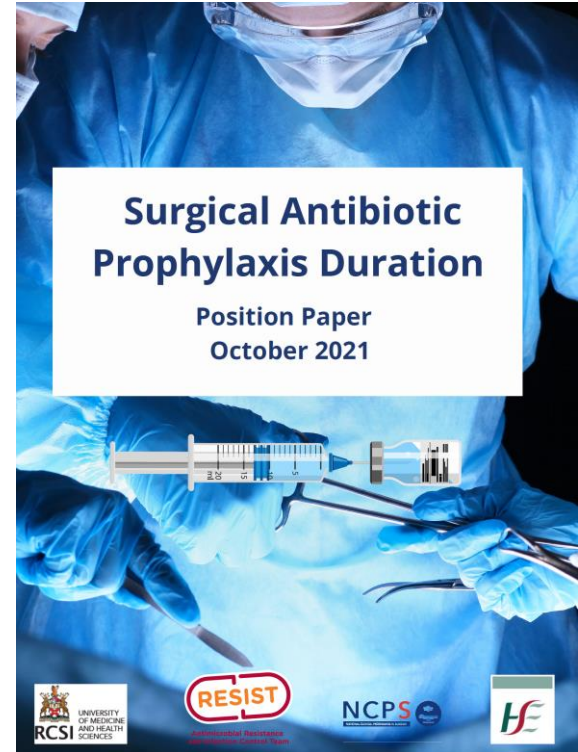




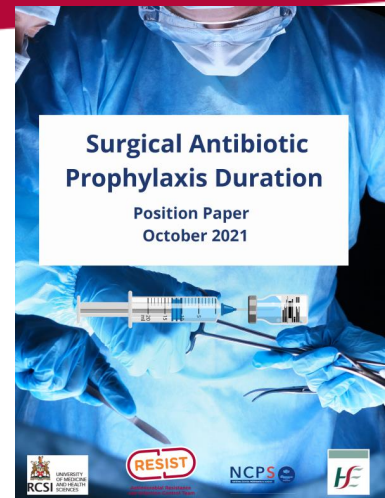
The position statement



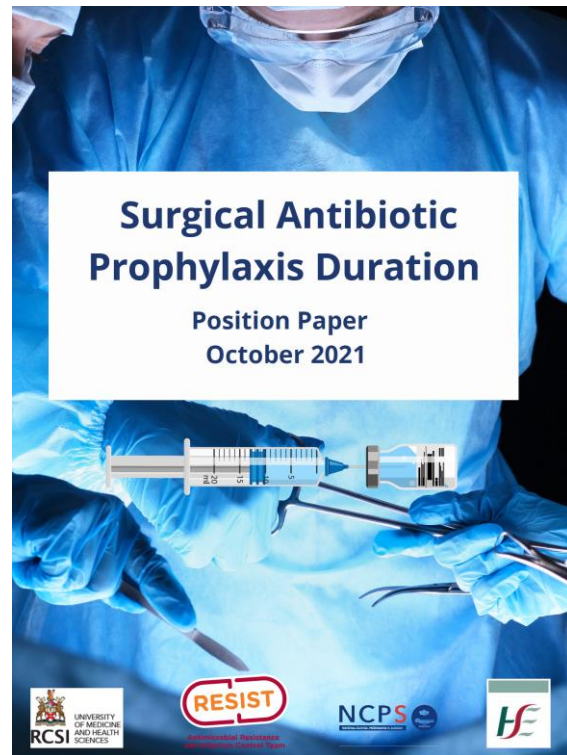
- Position statement on duration of antibiotic prophylaxis in surgery
- Developed jointly by National Clinical Programme for Surgery (NCPS) & HSE antimicrobial resistance and infection control team (AMRIC)
- Review & feedback provided by:
 - The Royal College of Surgeons of Ireland
 - The College of Anaesthesiologists
 - The Institute of Obstetrics & Gynaecologists
 - HSE National Clinical Programmes for Anaesthesia, Women & Infants, Heart, and, Trauma & Orthopaedics.
 - Irish Society of Clinical Microbiologists
 - Infectious Diseases Society of Ireland
 - Irish Antimicrobial Pharmacists Group
 - HSE Antimicrobial Stewardship Advisory Group
- Consensus of expert opinion supported by all key stakeholders



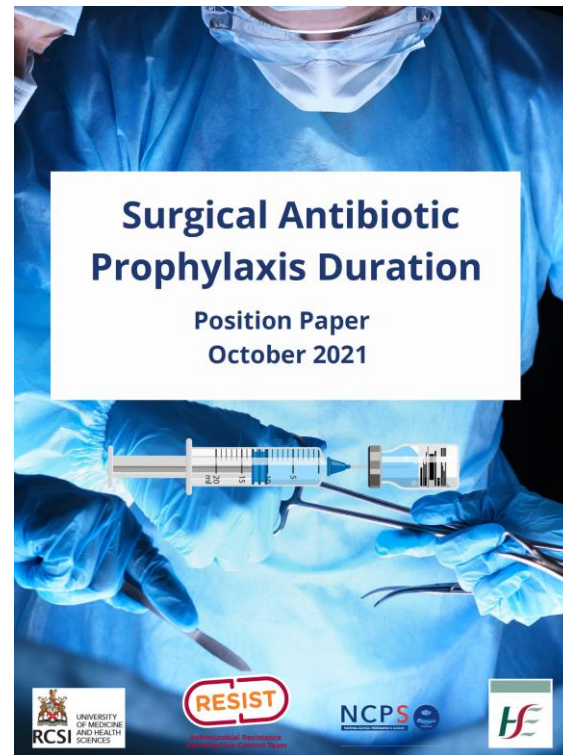
- Recommendations
 - Maximum durations of surgical antibiotic prophylaxis depending on the type of surgery
 - Supported by evidence
- Durations
 - **Most procedures do not require post-operative antibiotics**
 - Otherwise depending on type of procedure
 - Maximum of 24 hours
 - Maximum of 48 hours
 - Locally agreed maximum may be less than this



- Taking account of evidence & expert opinion a duration greater than 48 hours cannot be reasonably justified.
 - Applicable to both parenteral & oral routes.
 - Antibiotic prophylaxis should not be continued beyond the limits specified even if **drains** remain in place.



- Treatment is **NOT** prophylaxis
 - If infection is suspected or confirmed pre-op/intra-op/post-op then the model of antibiotic prophylaxis is no longer applicable.
 - Treatment agent & duration as per local prescribing guidelines or infection specialist advice.





Suggestions/resources to progress implementation of the recommendations from the position paper



National collaborative working group – NCPS & HSE AMRIC

- Developed a suite of resources to assess in implementation of the position statement
 - Professor Martin Cormican, National Clinical Lead, AMRIC
 - Professor Debbie McNamara, National Clinical Lead, NCPS
 - Dr Sinéad O'Donnell, Consultant Microbiologist Beaumont Hospital
 - Ciara Hughes, Programme Manager, NCPS
 - Therese Dalchan, GM for AMRIC in HSE Acute Operations
 - Audrey Lambourn, Communications Manager, AMRIC
 - Marie Philbin, Chief Pharmacist, AMRIC



Audit

- Audit will fulfil audit requirement.
- Audit data is to support quality improvement, there is no reporting requirement associated with its use
 - A sample process: audit 10 consecutive patient discharges within a single speciality.
- Audit tool available and a video to guide you through the use of the tool
- If access to a PC is limited download Microsoft Office/ Microsoft Excel to smartphone to allow completion on such a device.



Surgical Prophylaxis Audit Tool

Patient 1

Antimicrobial Resistance
and Infection Control Team

Audit Date: 13/10/2021

	Question	Answer
Question 1	Specialty <i>(If 'Other', specify in next column)</i>	Colorectal
Question 2	Please specify the procedure carried out. <i>(If 'Other', specify in next column)</i>	Right hemicolectomy with anastomosis
Question 3	Is surgical antibiotic prophylaxis indicated for this procedure according to local guidelines?	Yes
Question 4	Was an antibiotic prescribed? <i>(If 'No', no further questions require completion)</i>	Yes



<p>Question 5</p>	<p>What is the recommended maximum duration of antibiotic for this procedure according to local guidelines? If no local guidelines in place, what is the recommended maximum duration as per the HSE position statement on duration? <i>(If 'Other', specify in next column)</i></p>	<p>Pre-op plus intra-op dose(s)(where indicated)</p>
<p>Question 6</p>	<p>What duration was the antibiotic given for?</p>	<p>Pre-op dose only Pre-op plus intra-op dose(s)(where indicated) 24 hours 48 hours Other</p>
<p>Question 7</p>	<p>Were antibiotics given for less than or equal to the recommended duration (as recommended by local guidelines or HSE position statement if no local guidelines)? <i>(If 'Yes', no further questions require completion)</i></p>	<p>No</p>



<p>Question 8</p>	<p>If antibiotics were administered for greater than the recommended maximum duration (local guidelines or HSE position statement) was there a specific documented reason?</p>	<p>Yes</p>
<p>Question 9</p>	<p>If 'Yes' to Question 9, what was the reason for continuing the antibiotics beyond the recommended maximum for that procedure?</p>	<p>Confirmed/ Suspected infection diagnosed pre-op/ intra-op</p>
		<p>Confirmed/ Suspected infection diagnosed pre-op/ intra-op Confirmed/ Suspected infection diagnosed post-op Drain in place Other</p>



Question 10 <i>(Optional)</i>	If prolonged/ post-operative antibiotics were decided on during the procedure, is the reason for this documented in the operative notes?	Yes
Question 11 <i>(Optional)</i>	Was this duration specified in the operative notes?	Yes
Question 12 <i>(Optional)</i>	If prolonged/ post-operative antibiotics were prescribed, was there a documented stop date at the time of prescribing on the drug chart or entry into the electronic patient record?	Yes

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C7		Yes									
RESIST NCPS Surgical Prophylaxis Audit Tool		Patient 1		Patient 2		Patient 3		Patient 4			
Audit Date: 01/12/2021		Answer	If 'Other', please specify	Answer	If 'Other', please specify	Answer	If 'Other', please specify	Answer	If 'Other', please specify	Answer	If 'Other', please specify
Question 1	Specialty (If 'Other', specify in next column)	Breast		Colorectal		Gynaecology		MaxillofacialDental			
Question 2	Please specify the procedure carried out. (If 'Other', specify in next column)	Other		Lap right hemicolectomy with anastomosis		Laparoscopy		Osteotomy maxilla with IF, bilateral			
Question 3	Is surgical antibiotic prophylaxis indicated for this procedure according to local guidelines?	No		No		Yes		Yes			
Question 4	Was an antibiotic prescribed? (If 'No', no further questions require completion)	Yes		No		Yes		Yes			
Question 5	What is the recommended maximum duration of antibiotic for this procedure according to local guidelines? If no local guidelines in place, what is the recommended maximum duration as per the HSE position statement on duration? (If 'Other', specify in next column)	Pre-op dose only				Pre-op plus intra-op dose(s)(where indicated)		Pre-op dose only			
Question 6	What duration was the antibiotic given for?	Pre-op plus intra-op dose(s)(where indicated)				4 days		3 days			
Question 7	Were antibiotics given for less than or equal to the recommended duration (as recommended by local guidelines or HSE position statement if no local guidelines)? (If 'Yes', no further questions require completion)	No				No		No			
Question 8	If antibiotics were administered for greater than the recommended maximum duration (local guidelines or HSE position statement) was there a specific documented reason?	Yes				Yes		No			
Question 9	If 'Yes' to Question 9, what was the reason for continuing the antibiotics beyond the recommended maximum for that procedure?	Confirmed/ Suspected infection diagnosed pre-op/ intra-op				Confirmed/ Suspected infection diagnosed pre-op/ intra-op					
Question 10 (Optional)	If prolonged/ post-operative antibiotics were decided on during the procedure, is the reason for this documented in the operative notes?	No				Yes					
Question 11											

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Question 4	Was an antibiotic prescribed? (If 'No', no further questions require completion)	Yes		No		Yes		Yes	
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Question 7	Were antibiotics given for less than or equal to the recommended duration (as recommended by local guidelines or HSE position statement if no local guidelines)? (If 'Yes', no further questions require completion)	No				No		No	
Question 8	If antibiotics were administered for greater than the recommended maximum duration (local guidelines or HSE position statement) was there a specific documented reason?	Yes				Yes		No	
Question 9	If 'Yes' to Question 9, what was the reason for continuing the antibiotics beyond the recommended maximum for that procedure?	Confirmed/ Suspected infection diagnosed pre-op/ intra-op				Confirmed/ Suspected infection diagnosed pre-op/ intra-op			
Question 10 (Optional)	If prolonged/ post-operative antibiotics were decided on during the procedure, is the reason for this documented in the operative notes?	No				Yes			

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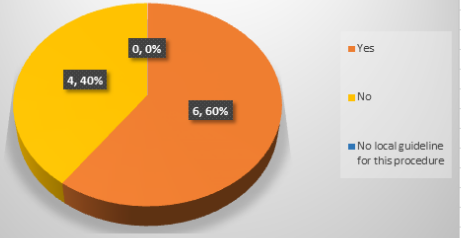
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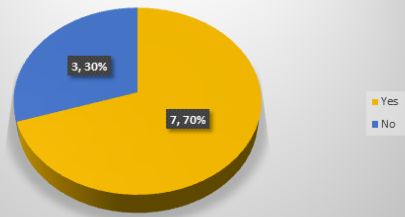
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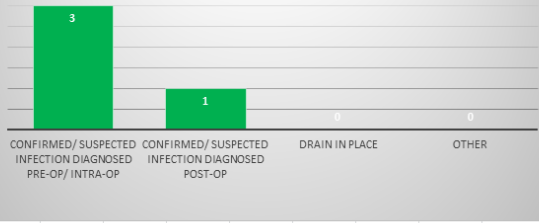
Graph 1: Were Prophylactic Antibiotics Indicated?



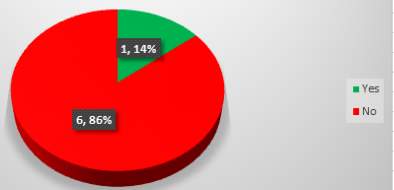
Graph 2: Were Prophylactic Antibiotics Prescribed?



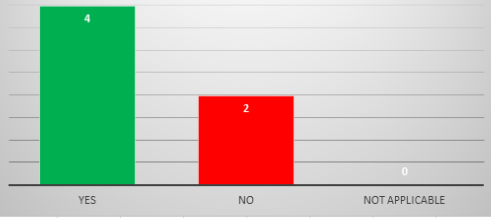
Graph 5: Reasons for Continuing Antibiotic Beyond Recommended Maximum for that Procedure



Graph 3: Were antibiotics given for less than or equal to the recommended duration?



Graph 4: Was there a Specific Reason Documented if Antibiotics were Administered for Greater than the Recommended Duration?



Audit – experience of a Model 4 hospital

- Audit to establish a baseline using local surgical antibiotic prophylaxis guidelines (recommended duration is shorter for some surgeries)
- 60 surgical patients audited – across all surgical specialities
- 94% of patients were prescribed surgical antibiotic prophylaxis
- Surgical antibiotic prophylaxis duration was compliant with local guidelines in 60%
- Tool was easy to use – would be nicer in an App format

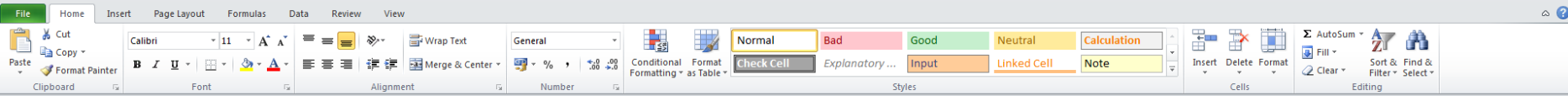


Audit – experience of a Model 4 hospital

Initial Actions taken based on audit results

- Position statement circulated to all surgical team members
- Results fed back to clinical directorates and presented at grand rounds – there was a lot of interest at Grand Rounds

If any of you have experiences to share
I can add anonymously to the webpage



Cumulative Audit Analysis of % of Patients Where Antibiotics were Used for the Recommended Duration or Less

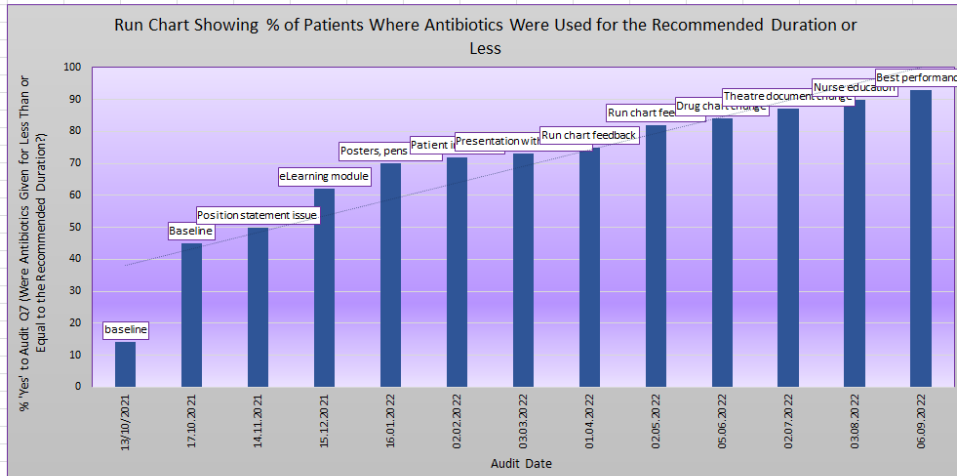
The aim of this run chart is to visually demonstrate the trend over time of the percentage of patients where antibiotics were used for the recommended duration or less. The run chart will assist in the impact assessment of interventions employed. **This run chart should be added to after each audit.**

To complete this cumulative audit analysis:

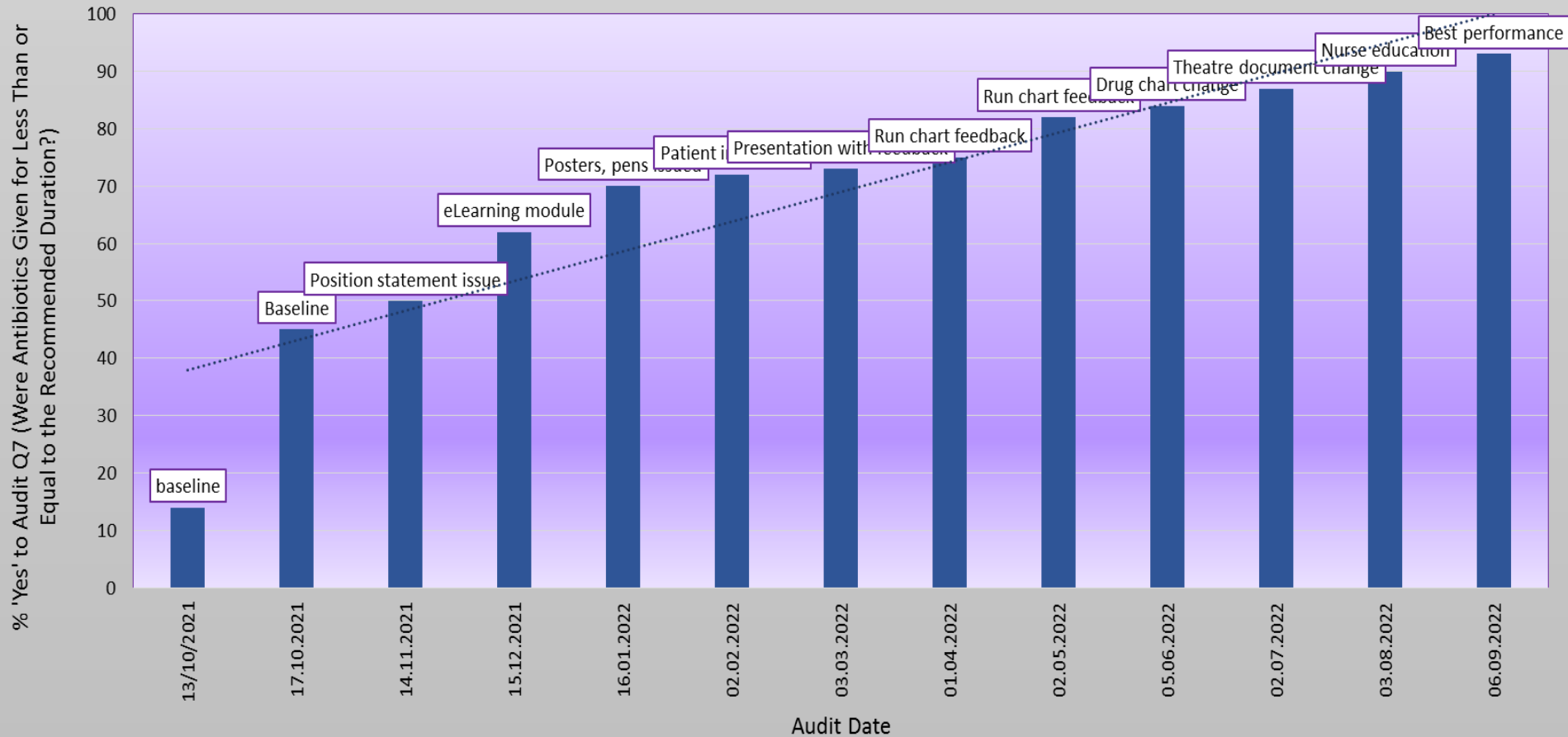
1. From each audit, retrieve the following information:

- the date the audit was carried out
 - the percentage of times you answered "Yes" to Question 7 'Were antibiotics given for less than or equal to the recommended duration?' This figure is retrieved from *Graph 3* on the 'Analysis' sheet of each audit.
 - Include in the 3rd column of the table below, the main intervention(s) used for that period or specify it is was a baseline audit etc.
2. Enter the dates and corresponding '% Yes to Q7' chronologically in the table below.
3. Once this information has been entered, the graph will populate with your data and add a trend line. An increasing trend line indicates that there is an increase in the percentage of patients who are receiving the recommended duration of prophylaxis or less. A decreasing trendline indicates that there is an increase in patients receiving longer than recommended durations of prophylaxis within this cohort.

Date	% 'Yes' Q7	Main Interventions Used
13/10/2021	14	baseline
17.10.2021	45	Baseline
14.11.2021	50	Position statement issue
15.12.2021	62	eLearning module
16.01.2022	70	Posters, pens issued
02.02.2022	72	Patient info leaflet
03.03.2022	73	Presentation with feedback
01.04.2022	75	Run chart feedback
02.05.2022	82	Run chart feedback
05.06.2022	84	Drug chart change
02.07.2022	87	Theatre document change
03.08.2022	90	Nurse education
06.09.2022	93	Best performance



Run Chart Showing % of Patients Where Antibiotics Were Used for the Recommended Duration or Less



Date	% 'Yes' Q7	Main Interventions Used
13/10/2021	14	baseline
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Governance

- Agree local governance for a quality improvement (QI) working group
 - Surgical/theatre directorate governance group
 - Antimicrobial advisory committee or Pharmacy & therapeutics committee
 - Quality & safety committee
 - Audit committee
- Assemble QI group - suggested members
 - Lead Surgeon/Obstetrician/Cardiologist
 - Surgical/Obstetrics/Cardiology NCHD
 - Anaesthetist
 - Infection Specialist (Microbiologist or Infectious Diseases Physician)
 - Antimicrobial Pharmacist
 - Nurse Manager
 - Quality Manager



Issues & action

- Discuss audit findings with QI group
- Develop and implement a QI plan
- Re-audit post implementation of QI plan
- Use the run chart in the Excel audit tool to document progress and impact of individual interventions

Issues & action

- Other suggested local quality improvement actions:
 - Amendment of operative notes proforma to encourage documentation
 - Amendment of drug chart / electronic prescribing record
 - Amendment of sign out theatre documentation
 - Amendment of post-op surgical nursing care plan



Supporting resources Education

- eLearning module on all aspects of surgical antibiotic prophylaxis including “the right duration” on HSeLanD (**RCPI 2 CPD credits**)
 - Audience: anyone who prescribes, dispenses or administers surgical antibiotic prophylaxis.

HELP EXTEND MY LEARNING

Learning outcomes

By the end of this course you will be able to:

- Indicate the factors that influence the right agent and right dose for surgical antibiotic prophylaxis.
- Identify the appropriate timings for initial dosing and re-dosing during surgical procedures to support better patient outcomes.
- Decide on the appropriate duration of surgical antibiotic prophylaxis to promote patient centred-care.

This course should take you approximately 30 minutes to complete.

< PREV NEXT >

HELP EXTEND MY LEARNING

Case study: Meet Tom

Tom is a 45-year-old man undergoing a transurethral resection of the prostate (TURP). He has a history of multiple UTIs.

You've cared for previous patients who've developed a post-operative bloodstream infection after the TURP procedure and want to prevent that from occurring in Tom.

Select NEXT to continue.

< PREV NEXT >



Supporting resources

- A3 posters and pens with key messaging.
- Part of a multifaceted approach





RESIST

Join the Superbug resistance.



Supporting resources

- A **patient information leaflet** entitled “Antibiotics before an operation to reduce risk of infection”.
- NALA approved for plain English language
- Will be automatically issued to any hospital that requested posters & pens in January
- Order from www.healthpromotion.ie in January

Supporting resources

- Communications e.g. RCSI communications in progress, RESIST newsletter, Health Matters, Hospital Professional News



Surgical antibiotic prophylaxis

HSE-AMRIC along with other HSE national programmes & colleges for surgery, anaesthetics, obstetrics have agreed a position paper about the use of antibiotic prophylaxis for the surgical site infection. The key message is that in most cases no further antibiotic is needed once operation is finished but in some cases it may be useful to continue for 1 day and in other cases for longer.

The idea behind antibiotic prophylaxis is to have enough antibiotic in the tissues for the time of surgery and in some cases for a short period afterwards. This has huge benefits in reducing the risk of infection but if the antibiotic is continued for too long there is no benefit and there is an increasing risk of harm from the antibiotic. Stopping antibiotic prophylaxis at the best of both worlds with all the benefit and very little risk of harm.

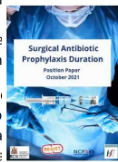


12 Antimicrobial

Surgical Antibiotic Prophylaxis Duration



Written by Maria Phibin, Chief Antimicrobial Pharmacist, National Antimicrobial Resistance and Infection Control Team



Infection at the surgical site. Surgical antibiotic prophylaxis plays an important role in reducing the rate of surgical site infections (SSI). Optimisation of prophylaxis requires an understanding of the agent, dose, timing of administration and duration. It should be noted that many oral non-antibiotic factors and practices, such as infection prevention and control strategies, surgical technique and preoperative preparation and management, can also influence the rate of SSI.

Maximising benefit of surgical antibiotic prophylaxis
Surgical antibiotic prophylaxis is a critical step in preventing SSI. The maximum benefit with the least harm is gained by administering an appropriate agent at the right time and for the right duration. Giving an antibiotic for longer than is needed does not reduce the risk of infection and does increase the risk of harm.

Evidence shows that the majority of patients need just one pre-operative dose of antibiotic to prevent SSI. (see table below) September and October 2020



What is surgical antibiotic prophylaxis?
Surgical antibiotic prophylaxis refers to the planned administration of antibiotics to a patient without a confirmed or suspected infection.

showed that prophylaxis exceeded a single dose in 62% of patients. For comparison, a 2017 European study performed in Scotland demonstrated that only 26% of patients received more than a single dose of antibiotic for prophylaxis. This suggests there is scope for quality improvement. Continuing an antibiotic beyond the recommended duration post-surgery does not further reduce SSI. In fact, extended duration of surgical antibiotic prophylaxis is associated with increased in-hospital mortality and increased antibiotic resistance.

Unnecessary antibiotic use is a major driver in the emergence of antimicrobial resistance. Antibiotics kill those infectious microorganisms that are resistant to antibiotics to colonise and multiply. A shift to more resistant microorganisms occurs quickly after someone starts on antibiotics. This means that the person develops infection after surgery; the infection may be harder to treat. The primary drive for this initiative is to reduce the risk of patient harm from unnecessary doses of preventative antibiotics around the time of surgery.

Surgical antibiotic prophylaxis duration



The position statement is intended to represent clear recommendations, supported by evidence and the broadest possible consensus of expert opinion in Ireland regarding generally accepted maximum duration of surgical antibiotic prophylaxis for different types of surgery.

Most procedures do not require

initially indicated duration of antibiotic prophylaxis for a particular surgical procedure. The position statement outlines that for most procedures, the standard of a single dose within 60 minutes prior to incision is applicable. An additional intra-operative dose may be required in certain circumstances such as significant blood loss or if the procedure duration extends beyond three or four hours of the initial dose. (timing will depend on the half-life of the antibiotic)

For a smaller number of procedures, a duration of 24 or 48 hours can be justified given uncertainty of current evidence and differences in expert opinion. However, locally agreed maximum durations may be less. There is no evidence to support prophylaxis longer than 48 hours for any surgical procedure. This applies equally to antibiotic administered by parenteral or oral route. It should be noted that antibiotic prophylaxis should not be continued beyond the limits specified even if drains remain in place.

It is important to recognise that treatment is not the same as prophylaxis. When an infection is suspected or confirmed prior to surgery or after a surgical procedure, then the mode of antibiotic prophylaxis no longer applies. Infection requires treatment, not prophylaxis. The right agent and duration of treatment should be based on relevant therapeutic guidelines and/or advice from an infection specialist, for example, a clinical microbiologist or infectious disease physician.

Resources to support quality improvement
A collaborative group, from the NCRS and AMRIC, has developed resources to support the implementation of this position statement, including:

- An audit tool to be used as part of a quality improvement project, and a YouTube video explaining its use
- A PowerPoint presentation that can be used for local delivery

on duration of surgical antibiotic prophylaxis has recently been

developed by the HSE Antimicrobial Resistance and Infection Control Team (AMRIC), the HSE Antimicrobial Stewardship Advisory Group & the National Centre for Surgery (NCS).

This was developed by the HSE Antimicrobial Resistance and Infection Control Team (AMRIC), the HSE Antimicrobial Stewardship Advisory Group & the National Centre for Surgery (NCS). This is a consensus opinion of experts in Ireland and is supported by evidence.

From January 2021, all surgery have received new antibiotics and materials to raise awareness of this position statement. Patient education materials are being made available to order from www.antibioticprescribing.ie from mid December. For more information, please contact antibioticprescribing@hse.ie and further resources are available at www.antibioticprescribing.ie

Antibiotics
before an operation to reduce risk of infection

RESIST
Join the Superbug resistance.

How will we know if we are improving care for patients?

Appendix 4 Measures

	Target 2021	2021 Projected Out-Turn	Target 2022	Target 2023	Target 2024	Target 2025
Compliance with surgical antibiotic prophylaxis duration position statement (as per the annual antimicrobial point prevalence study)	28% of surgical antibiotic prophylaxis prescriptions extended beyond 24 hours		26%	24%	22%	20%



action plan 2022-2025



Supports

- Recording and copy of slides will be available on the resources page next week
- Resources page on www.antibioticprescribing.ie on the hospital-related page
 - Or via the short link www.bit.ly/3eGoCKw
 - Include the video on how to use the audit tool
- If interest we can plan a further webinar in February/March for sharing of ideas/progress



Further work by AMRIC/NCPS

- Webinar for Surgeons @ the RCSI Wednesday evening slot
 - If any other group would like us to do a session we would be delighted
- Just initiated a link with the Private Hospital's Executive to share the position paper and resources.





**Thank you for your support in implementing this
quality & patient safety initiative**

**We would be interested to hear of your local experiences of this quality
improvement work or any feedback you have on any of the tools or
resources, email marie.philbin1@hse.ie**

