

The Preoperative Phase

Surgical Site Infection Master Class

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Introduction

- Work through NICE guidance
- Discuss preoperative interventions
- Concentrate on evidence based risks
- Look at problems with implementation
- Potential solutions

Evidence described today

- No evidence
- Insufficient evidence
- Evidence of no difference
- Evidence of difference

NICE Recommendation



Historical perspective

- Prior to mid 19th century
- Most wounds became infected
- Up to 70-80% mortality
- Large bacterial burden
- SSI rate has improved
- Bacterial burden still the most important factor

Areas affecting bacterial burden ?

- Patient preparation
 - Bathing / Showering
 - Clothing
 - Nasal decontamination
 - Hair removal
 - MRSA screening
- Type of surgery
 - Antibiotic prophylaxis

Patient Preparation

- Evidence for bath / shower
 - Chlorhexidine shown to decrease SSI rate
- Evidence of no difference
 - Chlorhexidine over detergent / soap bar
- Insufficient evidence
 - Timing of bath / shower
 - multiple baths / showers

NICE Recommendation

- Patients to shower or bath using soap
- Day before or day of surgery



Nasal decontamination

- Approx 1/3 people carry *S.aureus* in nose
- Further 1/3 carry it intermittently
- Most common infecting organism for SSI
- Seems logical to remove it ?

Nasal decontamination

- Can take many days to clear from
 - Nose
 - Other carriage sites
- No evidence to support
 - An overall decreased SSI rate
 - A decreased *S.aureus* SSI rate

NICE Recommendation



- Do not to employ nasal decontamination routinely
- Research needed on subject
 - Would particular groups benefit ?

MRSA screening

- MRSA represents risk to patients undergoing surgery
- Elective admissions should all now be screened
- Should take steps to reduce bacterial load prior to surgery
- Consider appropriate antibiotic prophylaxis

Hair removal

- Common practice
 - Improve surgical view and access
 - Perceived decreased infection rate
- Evidence for increased SSI with Razors
 - Compared to clippers
- Insufficient evidence for timing
 - Day before / day of surgery

NICE Recommendation



- Do not remove hair to decrease SSI rate
- If hair does need to be removed
 - Do not use razors
 - Use clippers with disposable head
 - Remove on day of surgery

Theatre wear

Theatre wear

- No evidence concerning patient attire

NICE Recommendation



- Give patients specific theatre wear
- Appropriate for procedure and clinical setting
 - Provide access to patient and operative site
- Should maintain dignity and comfort

NICE Recommendation

- Give patients specific theatre wear
- Appropriate for procedure and clinical setting
 - Provide access to patient and operative site
- Should maintain dignity and comfort
- **Take adequate steps to keep patients warm**



*National Institute for
Health and Clinical Excellence*

Issue date: April 2008

Inadvertent perioperative hypothermia

**The management of inadvertent
perioperative hypothermia in adults**

NICE clinical guideline 65

Developed by the National Collaborating Centre for Nursing and Supportive Care

Warming

- Importance of arriving warm
 - Slow to warm when cold
 - Prevention of hypothermia easier
 - Avoid changing clothes too soon
 - Significantly improve outcome
 - Various methods available

Staff clothing

- Traditional to
 - Wear freshly laundered non sterile clothing
 - Change if becomes soiled
 - Reuse scrub suits
 - Dispose of other items e.g. hats/masks
- No evidence regarding
 - Suits / hats / shoe covers
- Insufficient evidence regarding masks

Staff movement

- Tradition to change out of theatre attire
- No evidence of effect on SSI
- Good practice to minimise movement
 - Maintain theatre discipline
 - Protect staff from contamination

NICE Recommendation



- All staff to wear
 - Specific non sterile theatre wear
- Keep movement to minimum
- Operating team to remove hand jewellery before operations

Types of surgery

- Clean
- Clean-contaminated
- Contaminated
- Dirty or infected

Antibiotic use

- Evidence that use reduces number SSI
- Antibiotics are inexpensive / generally safe
- Should everyone receive them ?

Antibiotic use

- Should consider adverse effects
 - Hypersensitivity
 - *C.difficile*
- Role for local formulary

NICE Recommendation



- Do not use for clean uncomplicated surgery
- Use antibiotic prophylaxis before;
 - Clean surgery with implants
 - Clean contaminated surgery
 - Contaminated surgery
- Consider single dose
- Repeat if surgery prolonged
- Inform patients

NICE Recommendation

- Give on starting anaesthesia or earlier if tourniquet is used



Importance of timing

- Must give prior to start of surgery
 - Earlier with tourniquets
- No more than 1 hour prior to this
 - Up to 2 hours prior for Vancomycin

Problems with administration

- Logical to administer in theatres
- May not be completed on time
 - e.g. Vancomycin
- Could administer prior to arrival in theatres
- May be problems with coordination

Problems with administration

- Patients arrive on day of surgery
- Admission suites rather than wards
- May not be able to administer drugs

Issue of responsibility

- Surgeon who prescribes
- Anaesthetist who administers
- Conflict not uncommon

Potential solutions

- Joint responsibility
- Simple solution
 - Anaesthetist to administer
 - In theatres
- For long infusion times
 - Consider giving on ward
 - Consider change in antibiotic

Documentation

- Need for clear documentation
- Often poor
- Multiple places
- Should ensure that it takes place
 - Good practice
 - Facilitate clinical audit
 - Wider responsibilities

Responsibilities

- Health Act 2006 introduced hygiene code
- Trusts have responsibility to
 - Put key policies and procedures in to place
 - Audit them
- Embedding effective infection prevention and control into our everyday practice

Saving Lives Campaign

- Tools and Resources to help reduce HCAI
- As a series of evidence based practices
- Presented in care bundle format
 - ‘High impact interventions’
- Infection rates reduce when
 - All elements in bundle used
 - Every time
 - Every patient

SSI care bundle

Perioperative actions

Hair removal

- Use a clipper with a disposable head.
- Shaving with a razor is not recommended.⁵

Prophylactic antimicrobial

- Appropriate antimicrobial administered within 60 minutes prior to incision.^{13,14}

Normothermia

- Maintaining a body temperature above 36°C in the perioperative period has been shown to reduce infection rates.^{16,17}

Glucose control

- Maintaining a glucose level <11mmol/l has been shown to reduce wound infection in diabetic patients.¹⁵

Implementing guidance

- Trusts required to
 - Implement these evidence based measures
 - Audit compliance with them
- 100% is often difficult to achieve
- Need to look at ways to improve compliance
- In doing so improve patient safety

Improving patient safety

- High profile cases of error
 - Receive widespread publicity
 - Extensive efforts made to decrease recurrence
- Less dramatic errors more common
 - Less effort made to reduce recurrence
 - e.g. omitting antibiotic leading to a SSI
- Look at safety culture in other services ?

Airline industry

- Well developed safety culture
- Checklists important part of process
 - Anticipate untoward events
 - Improve communication
 - Ensure plane safety
- All crew members encouraged to speak up
- Encourage them to function as part of team

Theatre safety culture

- Checks in some areas well developed
- Often deficient in other areas
- Hierarchical structure can cause problems
- Junior member's concerns may be
 - Seen as less important
 - Dismissed
- When checks used can be very effective

‘Safe surgery saves lives’

- WHO global patient safety challenge
- Surgical safety checklist
- Introduce concept of ‘time out’
- Improve communication

‘Safe surgery saves lives’

- WHO global patient safety challenge
- Surgical safety checklist
- Introduce concept of ‘time out’
- Improve communication
- **Three phases**
 - Before induction of anaesthesia
 - Before skin incision
 - Prior to leaving the operating room

Contents of checklists

- In addition to higher profile checks
- Measures to reduce infections
- Antibiotic prophylaxis
 - Are given
 - Correct timing

**HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN
WITHIN THE LAST 60 MINUTES?**

YES

NOT APPLICABLE

Contents of checklists

- In addition to higher profile checks
- Measures to reduce infections
- Antibiotic prophylaxis
 - Are given
 - Correct timing
- Not intended to be comprehensive
- Modifications encouraged

WHO Surgical Safety Checklist

(adapted for England and Wales)

SIGN IN (To be read out loud)

Before induction of anaesthesia

Has the patient confirmed his/her identity, site, procedure and consent?

Yes

Is the surgical site marked?

Yes/not applicable

Is the anaesthesia machine and medication check complete?

Yes

Does the patient have a:

Known allergy?

No

Yes

Difficult airway/aspiration risk?

No

Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

No

Yes, and adequate IV access/fluids planned

TIME OUT (To be read out loud)

Before start of surgical intervention for example, skin incision

Have all team members introduced themselves by name and role?

Yes

Surgeon, Anaesthetist and Registered Practitioner verbally confirm:

What is the patient's name?

What procedure, site and position are planned?

Anticipated critical events

Surgeon:

How much blood loss is anticipated?

Are there any specific equipment requirements or special investigations?

Are there any critical or unexpected steps you want the team to know about?

Anaesthetist:

Are there any patient specific concerns?

What is the patient's ASA grade?

What monitoring equipment and other specific levels of support are required, for example blood?

Nurse/ODP:

Has the sterility of the instrumentation been confirmed (including indicator results)?

Are there any equipment issues or concerns?

Has the surgical site Infection (SSI) bundle been undertaken?

Yes/not applicable

• Antibiotic prophylaxis within the last 60 minutes

• Patient warming

• Hair removal

• Glycaemic control

Has VTE prophylaxis been undertaken?

Yes/not applicable

Is essential imaging displayed?

Yes/not applicable

SIGN OUT (To be read out loud)

Before any member of the team leaves the operating room

Registered Practitioner verbally confirms with the team:

Has the name of the procedure been recorded?

Has it been confirmed that instruments, swabs and sharps counts are complete (or not applicable)?

Have the specimens been labelled (including patient name)?

Have any equipment problems been identified that need to be addressed?

Surgeon, Anaesthetist and Registered Practitioner:

What are the key concerns for recovery and management of this patient?

PATIENT DETAILS

Last name:

First name:

Date of birth:

NHS Number:

Procedure:

*If the NHS Number is not immediately available, a temporary number should be used until it is.

This checklist contains the core content for England and Wales

www.npsa.nhs.uk/nrls

Has the surgical site infection (SSI) bundle been undertaken?

Yes/not applicable

- Antibiotic prophylaxis within the last 60 minutes
- Patient warming
- Hair removal
- Glycaemic control

Introduction of checklists

- unpopular
- ‘Another piece of paper’
- Concerns may slow down list
- With good local support
 - Improved patient safety
 - Without decreasing theatre efficiency

Summary

- Described the preoperative guidance
- Highlighted areas with limited evidence
- Focused on evidence based intervention
 - Antibiotic administration
 - Warming
- Looked at challenges to implementation
- Suggested potential solutions

Conclusions

- Measures described can have significant impact on patient safety
- Duty to implement and audit
- Highlighted importance of documentation
- Opportunity to embrace WHO checklist as a means to improve compliance

Any questions ?

