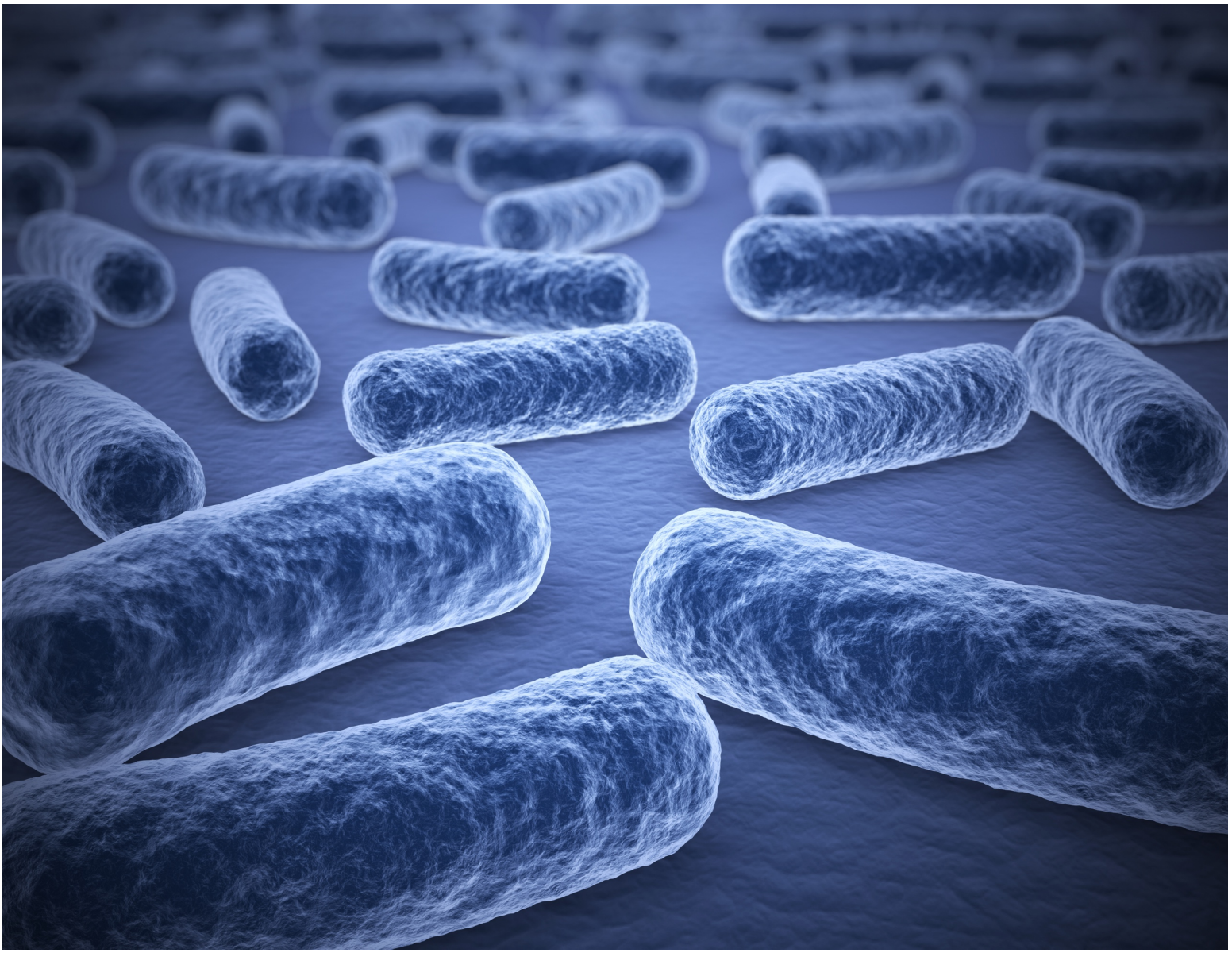
Infection Prevention Society

NHS Improvement



High Impact Interventions

Care processes to prevent infection

4th edition of Saving Lives: High Impact Interventions

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Contents

Introduction 4

Background 4
Scope of the project 4
Why use the high impact interventions? 4

Using the high impact interventions 5

What is a high impact intervention? 6
How do the high impact interventions work? 6
Training and use 6
Using the high impact interventions to ensure all elements are performed 7
Using the high impact interventions tool 7

High impact interventions 9

Prevention of ventilator associated pneumonia 9
Prevention of infections associated with peripheral vascular access devices 11
Prevention of infections associated with central venous access devices 14
Prevention of surgical site infection 17
Prevention of infections in chronic wounds 19
Prevention of urinary catheter associated infections 22
Promotion of stewardship in antimicrobial prescribing 25



Introduction

Background

The high impact interventions (HII) were originally published in 2005 as part of ‘Saving Lives’. Since then, the tools were updated in 2007 and 2010. This review was undertaken by a working party commissioned by the Infection Prevention Society in 2017 in association with NHS Improvement.

Scope of the project

The High Impact Interventions are an evidence-based approach that relate to key clinical procedures or care processes. When these HIIs are performed appropriately that can reduce the risk of infection. They were developed to provide a practical way of highlighting the critical elements of a procedure or care process, the key actions required and a means of demonstrating assurance.

The revision group reviewed the existing tools and updated them according to the latest guidance. The group was formed of members from all care sectors across England. Consideration was given to the application of these High Impact Interventions in non-acute care settings and efforts have been made to ensure these are applicable to community, social care, mental health and ambulance providers. However, some elements of the care processes will not be applicable to all areas and a decision should be made locally on which elements are to be applied.

Why use the high impact interventions?

Patient outcomes can be systematically improved when all elements of the HIIs are performed correctly and consistently.
The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance (2015), identifies that registered providers must audit compliance to key policies and procedures for infection prevention. These tools have been developed to facilitate this by way of regular auditing of the HII actions and will support cycles of review and continuous improvement in care settings and provide assurance of compliance.



Using the High Impact Interventions

The Health Act 2008 Code of Practice for Prevention and Control of Healthcare Associated Infections (2015) states that 'Effective prevention and control of Healthcare Associated Infections has to be embedded into everyday practice and applied consistently by everyone,' and that NHS organisations must audit key policies and procedures for infection prevention and control.

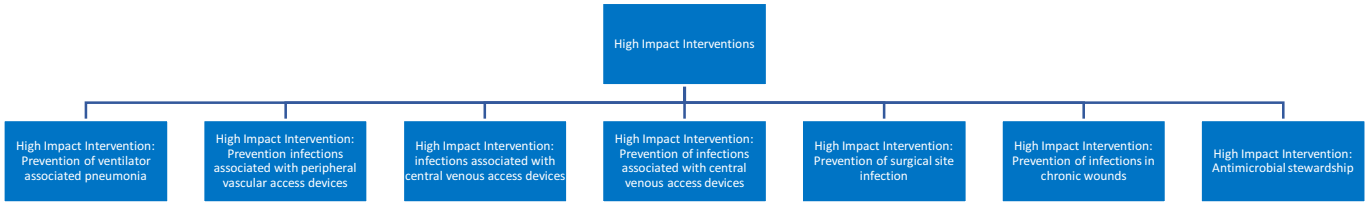
In 2013, the EPIC3 group noted that 'standard infection control precautions need to be applied by all healthcare practitioners to the care of all patients. Every clinician has the potential to significantly reduce the risk of infection to their patients by ensuring that they consistently comply with evidence based practice and guidelines every time they undertake a clinical procedure.

The High Impact Interventions (HII) are a means to provide compliance assurance. HIIs in this document relate to those key clinical procedures which can increase the risk of infection if not performed appropriately. They have been developed to provide a simple way of highlighting the critical elements of a particular procedure, the key actions required and a means of demonstrating reliability using compliance measurement. The purpose of the HII is to minimise unwarranted variation in practice by providing a way of identifying where compliance needs to be increased and a measure of how often all elements are performed for a given procedure. The HII tool is also the means by which results can be quickly fed back to staff and actions can be agreed and implemented.

This section describes in more detail the principles behind the HIIs and how you can implement them in your care setting.

This introduction includes sections on
- What is a high impact intervention?
- How do the HIIs work?
- Using the spreadsheet tools

What is a high impact intervention?



These tools are a revision of Saving Lives: High Impact Interventions (HII) published in 2005 and revised in 2007 and 2010. They link evidence, a measuring tool and a strategy for improving the clinical process to deliver evidence based practice. Direct measurement of a clinical process is a technique which has been recognised to have advantages over outcome based monitoring and is the principle of these tools. By looking at the process of care delivery over a short timescale, improvements in the care process can be identified quickly and put into action. Instead of just looking at a single element of care the HIIs link together a number of care elements in a procedure. Patient outcomes can be systematically improved when all these elements are performed consistently. Leaving specific elements out or not doing them correctly increases the risk of infection. The tools provide a method of measuring how effective the clinical process is and a way of improving it. Specifically these tools are designed to reduce the risk and spread of healthcare associated infection by focusing on the risk factors which cause infections, for example hand hygiene and use of intravenous lines.

How do the HIIs work?

The method relies on a mix of cognitive (educational), administrative (charting the clinical process) and behavioural (feedback of results) aspects. The HIIs show the key elements relevant to a specific clinical procedure which need to be observed and recorded as having been done. To ensure local ownership observation can be performed by identified clinical staff within the ward or department as part of a peer review process. It does not need to be the responsibility of Infection Control Teams. The frequency of observation for each measurement can be decided locally according to levels of infection, the minimum number of observations carried out for each HII should be agreed locally and should be at a level useful for assurance purposes. Experience has shown that a short timescale for making observations, feeding-back results and clinical staff generating improvement ideas, allows for changes in the clinical process to be made rapidly. The process is summarised as:

Observation > Feedback results > Ideas for improvement > Improve

Training and use

The tools are not designed to be a continuous record of practice. They serve as a way of identifying where improvements can be made for overall performance and on delivery of individual care elements. Analysis or examination of infection data across

a trust can serve to identify priority areas for using the HIIs e.g. where infection numbers are highest or where there appears to be an identified risk concerned with particular procedures. However, the principle of the HIIs can be applied to all clinical areas as required. The HIIs use a simple tick-box that allows rapid completion. Ticking a box shows that the care element was given/performed or not applicable. Using this basic information, a percentage compliance with each element can be calculated and crucially provides an overall average of compliance for a given procedure. Infection prevention and control teams can support the training of those that will carry out observations of care to complete the audits.

Using the high impact interventions to ensure all elements of care are performed

Checking compliance with the elements in the care process will show the elements which were or were not performed.

1. Identify when all elements have been performed
2. Recognise where individual elements of care have not been performed
3. Enable you to focus your improvement effort on those elements which are not being consistently performed

Using the high impact interventions tool

1. Each time a care element is performed, insert a ✓ in the relevant column. If the action is not performed leave it blank.
2. Ensure you only ✓ it when an element of care is performed correctly or if the element is not applicable.
3. Calculate the totals and compliance levels by totalling the columns and using the tools provided
4. Your goal is to perform every element of care every time it is needed. The "All elements performed" column should be ✓ when every care element is given correctly. This should total to 100% compliance when all care elements have been given correctly on every occasion.
5. Where elements have not been performed overall compliance will be less than 100%. This provides immediate feedback for users of the tool on those elements missed, and actions can then be taken to improve on compliance levels.
6. The percentage compliance figures for individual care elements show you where you need to focus effort to improve overall compliance.
7. The number of times when all elements are performed should be the same as the number of observations you perform. For example if you monitor the care process 10 times, then there should be 10 occasions when all elements were performed.

Example

	Care element 1	Care element 2	Care element 3	Care element 4	All elements performed
1	✓		✓	✓	
2	✓	✓		✓	
3	✓	✓	✓	✓	✓
4	✓	✓	✓		
5	✓	✓	✓	✓	✓
Total number of times an individual element was performed	5	4	4	4	2
% when element of care was given	100%	80%	80%	80%	40%*
% of care elements performed overall	100%	80%	80%	80%	17 out of 20 or 85%*

*There should be local agreement on which measure is more useful



High impact interventions to prevent ventilator associated pneumonia

Aim

To reduce the incidence and consequences of ventilator associated pneumonia (VAP) in acute care settings.

Why use the high impact intervention?

The purpose of the HII is to act as a way of improving and measuring the implementation of key elements of care. The risk of VAP increases when one or more elements are excluded or not performed.

Elements of the care process

There a single set of actions to be implemented for best practice in the:
a. ongoing care phase

Ongoing care phase
1. Elevation of the head of the bed • The head of the bed is elevated to 30-45^0 (unless contraindicated) [7, 9, 11].
2. Sedation level assessment • Sedation is reduce/held for assessment at least daily (unless the patient is awake and comfortable or action is contraindicated) and documented [2, 5, 7].
3. Assess for extubation • Assess for weaning and extubation at least daily (unless contraindicated) and document [1, 2, 7.]
4. Oral Hygiene • The mouth is cleaned with chlorhexidine gluconate (≥1-2% gel or liquid) 6 hourly (as chlorhexidine can be inactivated by toothpaste, a gap of at least 2 hours should be let between its application and tooth brushing) and documented [4, 7, 10]. • Teeth are brushed 12 hourly with standard toothpaste and documented.
5. Subglottic aspiration • A tracheal tube (endotracheal or tracheostomy) which has a subglottic secretion drainage port is used if the patient is expected to be intubated for >72 hrs [6, 7, 8]. • Secretions are aspirated via the subglottic secretion port.
6. Tracheal tube cuff pressure • Cuff pressure is measured 4 hourly, maintained between 20-30cm H_2O (or 2cm H_20 above peak inspiratory pressure) and recorded on ICU chart [3].

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High impact interventions to prevent infection associated with peripheral vascular access devices

Aim

To reduce the incidence and consequences of infection related to peripheral vascular access devices.

Why use the high impact intervention?

This HII is based EPIC3, RCN, INS, and NICE guidelines. The risk of infection reduces when all elements within the clinical process are performed every time and for every patient. The risk of infection increases when one of more actions of a care process are excluded or not performed.

Elements of the care process

There are two sets of actions to be implemented for best practice in the:
a. insertion phase
b. ongoing care

Insertion phase
1. Aseptic Technique • Insert peripheral vascular access device utilising aseptic technique including hand hygiene [4-7.]
2. Vein Assessment • Carry out assessment of a patient's veins prior to insertion of a vascular access device [1].
3. Skin Preparation • Patient's skin has been prepared with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine application is used) [4-7].
4. Dressing • A sterile semi-permeable dressing is applied to the vascular access device that allows the site to be observed [4-7].
5. Documentation • Documentation includes; date, time and reason for insertion. Vessel Health Assessment, details of site preparation. The type and size of the vascular access device should be recorded [4-7].

Ongoing care phase
1. Hand hygiene • Hands are decontaminated immediately before and after each episode of patient contact using the correct hand hygiene technique [4].
2. Personal Protective Equipment • Wear personal protective equipment only when indicated and in accordance with local policy [4].
3. Continuing Clinical indication and Vessel Health • Indication of ongoing need and vessel health should be documented at least once a shift, vascular access devises are removed when no longer indicated or if there are signs of infection/phlebitis [4-7]. • The insertion site should be visually inspected at a minimum during each shift and, in the case of peripheral vascular catheters, a visual infusion phlebitis (VIP) score should be recorded [3, 4, 7].
4. Vascular Access Device Access • Access ports and catheter hubs are decontaminated with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used) [4-7].
5. Administration set replacement • Administration sets for continuous infusions are changed, at a minimum, every 96 hours [4, 7]. • Administration sets in continuous use for blood and blood components should be changed every 12 hours, or when transfusion is complete. Platelets must be transfused through new giving sets [4, 7]. • Giving sets are labelled with the date and time to ensure they are changed at correct intervals [4, 7].
6. Dressing • Sterile, transparent dressing should be changed, at a minimum, every 7 days or sooner if the integrity of the dressing is compromised. • Cleaning of the access site should be carried out with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used) at each dressing change. • Dressings must be changed using a recognised aseptic technique [4-7].

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High impact interventions to prevent infection associated with central venous access devices

Aim

To reduce the incidence and consequences of infection related to central venous access devices.

Why use the high impact intervention?

This high impact intervention is based on EPIC3, RCN, INS, and NICE guidelines. The risk of infection reduces when all elements within the clinical process are performed every time and for every patient. The risk of infection increases when one of more actions of a care process are excluded or not performed.

Elements of the care process

There are two sets of actions to be implemented for best practice in the:
a. insertion phase
b. ongoing care

Insertion phase
1. Aseptic Technique • Device is inserted utilising an approved aseptic technique as per local policy and protocols [4-7]
2. Site Selection and vessel health assessment • Ultrasound should be used for all routine placement of central lines • Subclavian site is preferable to jugular for non-tunnelled lines. • Femoral veins should be avoided, if used in an emergency there is a documented plan for replacement [4].
3. Skin Preparation • Patient's skin has been prepared with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used) [2, 4, 7].
4. Dressing and securement • A sterile semi-permeable dressing is applied. • Any stabilisation devices should not interfere with the observation of the site [4-7].
5. Documentation • Documentation includes; date, time and reason for insertion. Vessel Health Assessment, details of site preparation. The type and size of the vascular access device should be recorded [4-7].

Ongoing care phase
1. Hand hygiene • Hands are decontaminated immediately before and after each episode of patient contact using the correct hand hygiene technique [4].
2. Personal Protective Equipment • Wear personal protective equipment only when indicated and in accordance with local policy [4].
3. Continuing Clinical indication and Vessel Health • Indication of ongoing need and vessel health should be documented at least once a shift [1]. • The insertion site should be visually inspected at a minimum during each shift and, a visual infusion phlebitis (VIP) score **may be** recorded on central vascular access devices, in line with local policy [3]. • Central venous access devices should not be routinely replaced [4-7].
4. Central Line Device Access • Access ports and catheter hubs are decontaminated with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used) [4-7].
5. Administration set replacement • Administration sets for continuous infusions are changed, at a minimum, every 96 hours. • Administration sets in continuous use for blood and blood components should be changed every 12 hours, or when transfusion is complete. Platelets must be transfused through new giving sets. • TPN administration sets should be changed when the TPN has finished or 24 hours after commencement of the infusion [4, 7].
6. Dressing • Sterile, transparent dressing should be changed, at a minimum, every 7 days or sooner if the integrity of the dressing is compromised. • Cleaning of the access site should be carried out with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used) at each dressing change. • Dressings must be changed using a recognised aseptic technique [4-7].

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High impact interventions to prevent surgical site infection

Aim

To reduce the incidence and consequences of surgical site infection (SSI).

Why use the high impact intervention?

This high impact intervention is based on WHO and NICE guidelines. The risk of infection reduces when all elements within the clinical process are performed every time and for every patient. The risk of infection increases when one of more actions of a care process are excluded or not performed.

Elements of the care process

There are two sets of actions to be implemented for best practice in the:
a. preoperative phase
b. intraoperative phase

Preoperative phase
1. Preoperative showering Patient has showered (or bathed/washed if unable to shower) preoperatively using soap [4].
2. Hair removal If hair removal is essential, it is removed using clippers with a disposable head (not by shaving) and timed as close to the operating procedure as possible [1, 2, 4].
3. Prophylactic antibiotics Appropriate antibiotics were administered within 120 minutes prior to incision (if required) [1, 4].
4. Surgical hand preparation All jewellery, nail polish and artificial nails should be removed. Surgical team should decontaminate their hands prior to 1st operation using aqueous antiseptic surgical solution. Prior to subsequent operations (or where hands have been contaminated) hands should be decontaminated using an alcoholic hand rub or aqueous antiseptic surgical solution [4].

Intraoperative phase
1. Skin preparation Patient's skin has been prepared with chlorhexidine / alcohol solution and allowed to air dry. (If the patient has a sensitivity or it is contraindicated povidone-iodine application is used) [1,4].
2. Normothermia Measure core body temperature and maintain active warming (unless active cooling is part of the procedure) has been documented or observed [2-4].
3. Supplemented oxygen Adult patients that are intubated for their procedure receive 80% inspired oxygen during the intraoperative phase [2-4].

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High Impact Interventions to prevent infection in chronic wounds

Aim

To reduce the incidence and consequences of infection in chronic and hard to heal wounds and chronic-wound-related blood stream infection.

Why use the high impact intervention?

The identification and management of chronic wounds in all health and social care settings, especially those identified as being infected, presents a significant clinical challenge. It affects the quality of life for individuals and is an ever-increasing financial burden to the NHS. Specific wound features or patient factors greatly increase the risk of infection and other complications. Prompt referral to relevant specialities, a holistic assessment and vigilance to ensure prompt identification and management of signs of infection are all key. Forecasted UK population trends indicate that the number of patients with chronic wounds will increase and it is important to note that the majority of these patients will be managed mainly within primary care settings.

Elements of the care process

There actions below relate to evidence based practice based on both wound care actions and patient management. The use of this HII will support cycles of review and continuous improvement, which will deliver consistent appropriate and high quality clean safe patient care.

Patient management and wound care phase
1. Aseptic technique • Wound management is undertaken utilising an approved aseptic technique as per local policy and protocols [4].
2. Wound assessment • Dressing type and frequency, wound assessment including referral for imaging and/or biopsy if deep seated infection; outcomes and next wound review date are documented [6-8, 12-15, 17, 18].
3. Wound swabs • Wound swabs are taken only when signs and symptoms of infection are present or when non healing persists, using an appropriate technique and documented. • Antibiotics are prescribed if indicated in accordance with local prescribing guidance [2, 16, 17].
4. Wound management • The wound is dressed creating an optimum wound healing environment according to the local wound management formulary documented • Referral is made in the case of static or deteriorating wounds (referral may include tissue viability specialist, multi-disciplinary foot care team, surgeon and other specialists e.g. dietician as required) [7-9, 12-15, 18].
5. Documentation of patient education • Education and information is provided to the patient as appropriate with involvement in decision making where appropriate. • Clear communication of patients known to be infected or colonised with pathogenic organisms, including MRSA, is given to all relevant healthcare providers involved with the patient's care [3, 4, 7-15, 18]

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High Impact Interventions to prevent catheter associated urinary tract infection

Aim

To reduce the incidence and consequences of urinary tract infection associated with both short and long term urethral catheters.

Why use the high impact intervention?

Catheter associated urinary tract infections comprise a large proportion of healthcare associated infections and occur whether a person has either a short term catheter or long term catheter. There is a strong association between duration of urinary catheterisation and risk of infection and these are becoming more serious with the continued development of a wide range of multi-resistant bacteria which can cause catheter associated urinary tract infections and associated life threatening complications (RCN 2012). Risks are greatly reduced complying with all parts of the process for safe catheterisation, maintenance, and removal as soon as no longer needed. This is important in both terms of promoting comfort, safety and infection prevention control measures. (NICE guidelines 2014).

Elements of the care process

There are two sets of actions outlined below as good practice.

a. Insertion phase
b. Routine maintenance and assessment for continuing indication phase

Insertion phase
1. Assessment for catheter indication Assessment of the need of the catheter is to be documented ensuring a clear clinical indication which includes exploring alternative options [1-3].
2. Aseptic procedure Catheterisation should follow an aseptic procedure including hand hygiene and is documented [1-3].
3. Urethral meatus The meatus should be cleaned with normal saline prior to insertion. Use a lubricant gel from a sterile single use sachet/syringe to minimise urethral trauma [1-3].
4. Catheter insertion documentation Document as a minimum the following: • date of insertion, • indication for catheterisation • catheter size • type of catheter and planned date for removal [1-3]

Routine maintenance and assessment for continuing indication phase
1. Hand hygiene Hands are decontaminated immediately before and after each episode of patient contact using the correct hand hygiene technique [1-3].
2. Personal protective equipment Wear personal protective equipment only when indicated and in accordance with local policy [1-3].
3. Assessment Daily assessment of the need of the short term urinary catheter needs to be clearly documented. Long term catheters should be reviewed regularly, at least every catheter change and documented [1-3].
4. Catheter hygiene Routine daily personal hygiene is required for meatal cleaning [1-3].
5. Routine maintenance • Do not break the connection between the catheter and the urinary drainage system unless clinically indicated. Use a separate clean/disposable container when emptying the drainage bag. • Document on the drainage bag when last changed and should be changed in line with the manufacturer's recommendation. The urinary catheter tubing and leg bag should be fixed to the patient's leg using a leg strap [1-3].
6. Patient information Ensure patients and carers are given information regarding the reason for the catheter and the plan for review and removal e.g. indwelling urinary catheter passport [1-3].

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High impact interventions to promote stewardship in antimicrobial prescribing

Aim

To outline an approach to safe and rational antimicrobial prescribing in the healthcare setting and a method of auditing it.

Why use high impact intervention?

This high impact intervention is based on the Start Smart then focus (2011) toolkit, the Health and Social Care act: 5 year antimicrobial strategy and NICE guidance for antimicrobial stewardship. Organisations should use this high impact intervention as part of their antimicrobial strategy, thus enhancing stewardship in antimicrobial usage, and ensuring optimal patient care by reducing inappropriate prescribing. The high impact interventions are audit tools to be used by nurses and prescribers, there are several more actions that can be recommended for each process based on Start Smart then focus. It is evidence-based, taking into consideration recent scientific and medical literature, as well as widespread clinical experience.

Elements of the care process

There are two sets of actions to be implemented for best practice for both nurses and prescribers:

a. All care settings (Both primary and secondary care)
b. Specifically for secondary care (in addition to part a)

All care settings
1. Drug Allergy Check thorough drug allergy history has been taken and is documented either in the patient record or on the prescription chart / electronic prescribing system.[2]
2. Prompt antimicrobial treatment Check whether prompt effective antibiotic treatment has been initiated within one hour of diagnosis (or as soon as possible) in patients with severe sepsis or life-threatening infections.[2]
3. Appropriate antimicrobial prescribing Antibiotics are prescribed if clinically indicated according to the patient's clinical signs/symptoms of infection and/or sepsis.[1,2,3,4]
4. Indication of antimicrobials. Check all antimicrobials prescribed have a documented indication written either in the patient record or on the prescription chart / electronic prescribing system. Prompt prescriber to rectify if absent.[1,2,3,4]
5. Appropriate microbiological testing. Appropriate microbiological cultures have been sent by the nursing or medical team prior to commencing antimicrobial treatment, for example blood cultures if patient is showing signs of sepsis, wound swab if patient has a wound infection.[1,2,3,4]
6. Microbiology review. The resulting microbiology results and sensitivities have been reviewed and therapy actioned if required.[1,2,3,4]

Secondary care
1. Review of antimicrobials Check all antimicrobials prescribed have a documented review within 72 hours written either in the patient record or on the prescription chart / electronic prescribing system. Prompt prescriber to rectify if absent.[1,2,3,4]
2. Antimicrobials prescribed per local guidance Antimicrobial therapy is prescribed in line with national and local evidence-based guidelines and policies (Includes medical antimicrobial prophylaxis).[1,2,3,4]
3. Intravenous medication reviewed. Intravenous medication reviewed to consider switch to oral therapy.[1,2,3,4]
4. Duration of antimicrobials. Check all antimicrobials prescribed have a documented duration of treatment documented or date for further review either in the medical notes or on the prescription chart / electronic prescribing system. Prompt prescriber to rectify if absent.[1,2,3,4]

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