Applying Aseptic Technique in Haemodialysis

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This presentation is based on the Aseptic Technique online training package available for all SA Health staff at http://digitalmedia.sahealth.sa.gov.au/

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Principles of Aseptic Technique
What is aseptic technique?

> Asepsis is the absence of pathogenic (infectious) microorganisms.
> Aseptic technique protects patients during simple, complex, and invasive clinical procedures by using appropriate infection prevention measures that maximise and maintain asepsis.
> Infection prevention measures include environmental controls, hand hygiene, personal protective equipment (PPE) use, aseptic field management and non-touch technique.
> Aseptic technique can be applied to a range of procedures undertaken within a variety of clinical settings.
Clinical procedure types

> Simple, complex and invasive

> **Simple** procedures are non-invasive procedures which require few steps and are not technically difficult. Examples include
  - closed surgical wound dressing
  - peripheral IV insertion site dressing

> **Complex** procedures have more steps and are usually more technically difficult. Examples include
  - PICC, CVC, PA catheter and arterial line dressings
  - large open wound dressings requiring packing
Clinical procedure types

> Invasive procedures include any type of procedure that involves invasion of the internal body by breaking or incision of the skin, or by inserting a tube or medical device capable of entering tissue, the vascular system, cavities or organs.

> Invasive procedures can be performed with or without touching key parts and or key sites.
Clinical procedure types

> Examples of procedures performed without touching key parts and/or key sites include:
  - administration of peripheral intravenous (IV) medications, IV flush
  - peripheral IV cannulation (ensure vein is not palpated after skin preparation)

> Examples of procedures performed with touching key parts and/or key sites include:
  - insertion of a peripherally inserted central catheter (PICC), central venous catheter (CVC), pulmonary artery (PA) catheter, arterial line and umbilical catheter
  - insertion of an indwelling urinary catheter
Examples of haemodialysis procedures requiring aseptic technique

> Most procedures during haemodialysis are invasive including:
  
  • patient cannulation
  
  • patient connection to the machine
  
  • patient disconnection from machine
  
  • removal of needles
  
  • haemodialysis Filtration set up
  
  • administration of IV medication.
Infection prevention measures

> Actions performed and equipment used by the clinician to ensure aseptic technique is performed safely

- Environmental controls
- Hand hygiene
- Personal protective equipment
- Aseptic field management
- Non touch technique
Key parts and key sites

> **Key parts** - sterile parts of the procedure equipment. Examples include:
  - syringe tips
  - needle hubs
  - bungs
  - indwelling urinary catheters

> **Key sites** - open wounds, insertion and access sites. Examples include:
  - CVC or PICC insertion sites
  - open wounds
Key parts & key sites in haemodialysis

> In haemodialysis **key parts** include:
  > • connection points of the cannulae
  > • the machine lines
  > • needle bevels
  > • syringe tips

> In haemodialysis the **key site** is:
  > • A-V access point
Hand hygiene products

> Hand Hygiene is an integral part of aseptic technique

> Perform routine hand hygiene by either:
  • performing a hand wash using liquid soap & water
  • applying an alcohol-based hand rub (ABHR)
Hand Hygiene Technique

Rinse off & pat dry with paper towel (40–60 secs)

ABHR – rub until dry (20-30 secs)
Risk assessment

> Prior to commencing a clinical procedure requiring aseptic technique, you will need to perform a risk assessment

> Consider the risk to both the patient and yourself of acquiring an infection

> Determine if the procedure is simple, complex or invasive

> This will guide you on the infection prevention measures to apply

> Key questions to help you to identify the risks are:
  
  • What are the key parts and key sites?
  • Do I need to touch any key parts or key sites?
  • What are the appropriate infection prevention measures to protect key parts and key sites?
Preparation
Step 1 - Preparation phase

Preparation is important in order to ensure proper application of aseptic technique

> Prepare patient & area:
  • perform hand hygiene
  • weigh patient, take BP
  • perform fluid assessment
  • calculate fluid removal
  • apply tourniquet & place loosely on arm

> Prepare machine:
  • enter time & fluid removal into machine
  • perform all relevant checks on machine

> Perform any other checks that may be required for the patient
Step 2- Tray disinfection

> Large plastic trays that can be cleaned & disinfected are to be used
  • (“blue sheets” or paper trays are not acceptable)
Step 2- Tray disinfection

> Perform hand hygiene

> Disinfect tray using a detergent/disinfectant or alcohol-based wipe
  - ensure plastic tray is visibly clean
  - disinfect all the surfaces of the plastic tray (to create an aseptic field)
  - disinfect the tray using adequate friction
  - ensure that the wipe remains moist – allowing all surfaces to come in contact with the disinfectant
Step 3 – Gathering equipment

> Ensure tray is completely dry
  • if a surface remains wet then asepsis will be compromised
> Gather all equipment (medications etc.) and place them around the tray
Step 3 – Gathering equipment

> Equipment should include:
  > • intravenous cannulae
  > • syringes (usually 10ml and 1ml tuberculin for local anaesthetic but this may vary between facilities)
  > • saline & lignocaine (pre-filled syringe an option)
  > • gauze swabs
  > • gloves
  > • skin preparation (chlorhexidine ≥ 0.5% in 70% alcohol, e.g. BD Persist Plus™ swabs)

> Nothing goes in the tray which isn’t required for the procedure

> Remember you are aiming for asepsis not sterility
  > • sterility is not possible unless in a controlled environment i.e. operating room
Ideal cannulation tray set-up

> Wrapping paper maintains asepsis providing it is dry
  • key parts are protected by covers, caps, packaging

> Aseptic field is organised
Step 4 – Cannulation set up

- Perform hand hygiene
- Open equipment and prepare cannulation tray.
- Protect key-parts using non-touch technique
- Perform hand hygiene
- Apply gloves & other relevant PPE according to risk assessment
- After preparation of equipment proceed to the patient
Step 5 – Disinfecting key site

> Disinfect patient A-V access (key site)
  • product should contain ≥ 0.5% chlorhexidine gluconate & 70% alcohol (e.g. BD Persist Plus™)

> Allow to dry – this usually takes around 20 seconds

> Note: If key sites aren’t dry then they are not aseptic
Step 6 – Cannulation of A-V access

> Use a non-touch technique
  • do not touch key parts i.e. cannulation needle
  • key parts must not touch anything else
> Administer local anaesthetic if required
> Cannulate patient
Patient Connection
Step 7 - Patient connection

> Connect haemodialysis lines using a non-touch technique

> Do not touch any key parts i.e.
  - in this case – the line connections

> Do not allow key parts to touch anything else
  - start the machine to commence haemodialysis
  - administer any medications
Step 8 – Cleaning Equipment

> Clean the tray & machine front using either a detergent solution or detergent/disinfectant wipe

> Discard sharps
  
  • if gloves are visibly soiled with blood, then remove gloves & perform an additional hand hygiene prior to cleaning equipment

> Remove gloves / PPE

> Perform hand hygiene

> Complete patient care

> Hand hygiene before leaving the patient area
Patient Disconnection
Patient disconnection

> Note: Connection & disconnection of the patient from haemodialysis uses the same aseptic technique principles
> Disconnection requires the use of an aseptic field
Step – 1 Gather equipment

> Perform hand hygiene

> Disinfect tray with a detergent/disinfectant or an alcohol-based wipe

> Gather equipment required for “run back” e.g.
  - 10ml syringe
  - recirculation connector
  - gloves
  - gauze swabs
  - patient dressing
Step 2 – Disconnection set up

> Perform hand hygiene
> Open equipment & prepare “runback” tray
  • include any IV flushes / therapy as required
> Protect key parts by using a non-touch technique i.e. syringe hub
Step 3 - Patient disconnection

> Perform hand hygiene
> Put on gloves (& other PPE as required)
> Disconnect arterial line & connect to saline – ensuring not to touch any key parts
> Continue runback procedure, don’t touch anything other than machine & circuit
Step 3 - Patient disconnection

> Disconnect venous line from patient
  • remove needles
  • tape needle sites once bleeding has stopped
  • discard all sharps appropriately

> Note: Puncture sites are key sites, gauze swabs and tapes are key parts

> Remove gloves & perform hand hygiene

> Check patient sites for bleeding, change tape as necessary

> Complete patient care, include documentation
Step 3 – Patient disconnection

> Once puncture sites are covered the disconnection procedure is considered complete.

> If you choose or have to strip and clean the machine prior to covering the puncture sites, then another hand hygiene & re-application of gloves will be necessary before completing patient care.
Step 4 – Clean patient area

> Clean patient environment including the tray used for disconnection, haemodialysis machine, chair etc. according to facility guidelines

> Remove gloves & perform hand hygiene before leaving the patient area
Summary Steps
Preparation phase

> Perform hand hygiene

> Patient Preparation - all to be completed prior to commencing the Connection Phase:
  • weight/BP’s
  • fluid assessment
  • calculate fluid removal
  • enter time and fluid removal into machine
  • place tourniquet loosely on arm
  • all other relevant machine and patient checks that may be required
Patient connection

- Perform hand hygiene
- Disinfect tray using a detergent/disinfectant or alcohol-based wipe
- Gather equipment
- Perform hand hygiene
- Set up cannulation tray
- Open sterile equipment using a non-touch technique (NTT)
Patient connection (cont.)

- Perform hand hygiene
- Put on gloves (& other relevant PPE)
- Disinfect key sites i.e. A-V access
- Cannulate A-V access (NTT)
- Connect patient to haemodialysis machine (NTT)
- Clean tray & machine screen with either a disinfectant solution or detergent/disinfectant wipe
- Discard all sharps
- Perform hand hygiene before leaving the patient area
Patient disconnection

- Perform hand hygiene
- Disinfect tray using a detergent/disinfectant or alcohol-based wipe
- Gather equipment
- Perform hand hygiene
- Set up any IV flushes, medications etc. (NTT)
- Set up runback tray (NTT)
- Perform hand hygiene & put on gloves
- Disconnect arterial line & connect saline, runback as per procedure (NTT)
Patient disconnection (cont.)

> Disconnect venous line, remove cannula, tape needles once bleeding has stopped.
> Clean tray, & discharge clean the patient area using a disinfectant
> Remove gloves & perform hand hygiene
> If you choose, or have to, strip and clean the machine prior to covering the puncture sites then another hand hygiene & re-application of gloves will be necessary before completing patient care
Further requirements

> Your organisational hand hygiene annual accreditation

> SA Health Aseptic Technique online training package
References


> Australian Commission on Safety and Quality in Health Care 2010, Australian Guidelines for the Prevention and Control of Infection in Healthcare, Australian Commission on Safety and Quality in Health Care, Canberra.


> SA Health Infection Control Service 2013, Aseptic Technique Workbook, SA Health, Adelaide.
