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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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
  * accessing Vascath or Permacath
  * patient connection to the machine
  * patient disconnection from machine
  * removal of needles
  * haemodialysis machine 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 fistula needle
  • the machine lines
  • fistula needle bevels
  • syringe tips.

> In haemodialysis the key site is:
  • A-V fistula or graft 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 machine:
  - perform hand hygiene
  - set up dialysis machine as per unit procedure
    - line and prime the machine
  - perform all relevant checks on machine.

> Prepare patient & area:
  - perform hand hygiene
  - weigh patient, take BP
  - perform fluid and patient assessment
  - apply tourniquet & place loosely on arm
  - perform hand hygiene
  - calculate fluid removal and enter into machine along with dialysis time.

> Perform any other checks that may be required for the patient.
Step 2- Disinfect Cannulation Area

> Examples include large plastic trays, trolley or a patient over-way table that can be cleaned & disinfected are to be used
  • (“blue sheets” or paper trays are not acceptable).
Step 2- Cannulation Area Disinfection

> Perform hand hygiene

> Disinfect cannulation area using a detergent/disinfectant or alcohol-based wipe
  • ensure tray/trolley or patient over-way table is totally cleared and visibly clean
  • disinfect all the surfaces (to create an aseptic field)
  • disinfect using adequate friction
  • ensure that the wipe remains moist – allowing all surfaces to come in contact with the disinfectant.
Step 3 – Gathering equipment

> Ensure cannulation area is completely dry
  • if a surface remains wet then asepsis will be compromised
> Gather all equipment (medications etc.) and place them around the tray or on one side of the trolley/patient over-way table.
Step 3 – Gathering equipment

> Equipment should include:
  > • intravenous cannulae
  > • syringes (usually 10ml or 2ml 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 or on the trolley/patient over-way 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 area.
> 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 $\geq 0.5\%$ 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 prescribed anticoagulants
Step 8 – Cleaning Equipment

- Discard sharps
- Remove gloves, perform an additional hand hygiene & re-glove prior to cleaning equipment
- Clean the tray/trolley or patient over-way table & machine front using either a detergent solution or detergent/disinfectant wipe
- 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/trolley or patient over-way table with a detergent/disinfectant or an alcohol-based wipe

> Gather equipment required for “run back” as per unit procedure e.g.
  - gloves
  - gauze swabs
  - patient dressing
  - tape
Step 2 – Disconnection set up

- Perform hand hygiene
- Open equipment & prepare “runback” tray/trolley or patient over-way table include any IV medications as required
- Protect key parts by using a non-touch technique i.e. bloodline connections
Step 3 - Patient disconnection

- Perform hand hygiene
- Put on gloves (& other PPE as required)
- Reinfuse patients blood as per unit procedure – ensuring not to touch any **key parts**
- Continue runback procedure, don’t touch anything other than machine & circuit
Step 3 - Patient disconnection

> Once blood circuit has been returned to the patient, disconnect blood lines from patient fistula needles
  > remove fistula needles
  > discard all sharps appropriately
> Note: Puncture sites are key sites, gauze swabs and tapes are key parts
> Remove gloves & perform hand hygiene
> Patient to hold needle sites wearing a glove as per unit procedure
> Put on gloves and check patient sites for bleeding. Apply dressing and tape as per unit policy
> Remove gloves and perform hand hygiene
> Complete patient care, including documentation
Step 3 – Patient disconnection

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

> If you choose or need to strip the machine prior to covering the puncture sites, then remove gloves, perform hand hygiene.

> 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/trolley or patient over-way table used for disconnection, haemodialysis machine, chair and patient environment etc. according to unit procedure

- 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/trolley or patient over-way table using a detergent/disinfectant or alcohol-based wipe
> Gather equipment
> Perform hand hygiene
> Set up cannulation area
> 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/trolley or patient over-way table & 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/trolley/over-way table using a detergent/disinfectant or alcohol-based wipe
> Gather equipment
> Perform hand hygiene
> Set up any medications etc. (NTT)
> Set up runback tray/trolley or patient over-way table (NTT)
> Perform hand hygiene & put on gloves
> Return patients blood circuit as per unit procedure (NTT)
Patient disconnection (cont.)

> Disconnect patient blood lines, remove fistula needles, tape needles once bleeding has stopped.

> Clean tray/trolley or patient over-way table, & the patient area using a disinfectant

> Remove gloves & perform hand hygiene

> If you choose or need to strip the machine prior to covering the puncture sites, then remove gloves, perform hand hygiene.

> 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

> SA Health 2013, Aseptic Technique online training found at:  http://digitalmedia.sahealth.sa.gov.au

> Australian Commission on Safety and Quality in Health Care 2017, National Safety and Quality in Health Service Standards 2nd Ed., Australian Commission on Safety and Quality in Health Care, Sydney.


