BURNS PATIENTS: OPERATING THEATRE NURSING MANAGEMENT - CHW

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- As part of the CHW Operating Suite, all nurses are to abide by standards that allow for the delivery of safe and effective intraoperative nursing care.
- Within the highly specialist burns theatre, the delivery of intraoperative care requires specific knowledge and skills to be competent. The burns instrument nurse role involves the ability to organise and maintain the operative environment appropriate to individual patient needs and an ability to function in accordance with hospital policies. A basic knowledge of burns surgeries and the potential complications is essential to the provision of safe and effective patient care. It is also an integral part of burns surgery that both the instrument nurse and the circulating nurse be competent in the use of burns specialist equipment.
- The burns surgical team work closely in the clinical setting and therefore it is also important that the instrument nurse prepare for each patient by liaising with team members to clarify the individualised surgical plan.
- This document is aimed at providing all instrument/circulating nurses within the operating suite the essential guidelines to allow optimal intraoperative burns nursing care.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
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Team Leader:	Clinical Nurse Educator	**Area/Dept:** Operating Theatre

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CHANGE SUMMARY

- Changes in dose for Injectable Adrenaline 1:1,000
- Change from Tisseel® to Artiss® Updated definition of Burns
- Updated staffing requirements
- Updated list of burns Equipment and Instrumentation Requirements
- Skin preparation in Burns surgery

READ ACKNOWLEDGEMENT

- All instrument and circulating nurses working within the operating suite may encounter burns surgery on any shift, and therefore must read and acknowledge this document and agree to work within the guidelines provided.

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1 Background

The Children's Hospital at Westmead (CHW) is the paediatric arm of the NSW Statewide Burn Injury Service for all severe burns

Dependant on the condition of the patient and nature of burn wound, there may be a need for surgical intervention once admitted.

The NSW Statewide Burns Injury Service approach to surgical management of the burn patient is as follows:

i. Emergency surgery within 24 hours post burn injury to prevent complications associated with deep burns, often involving muscle or other tissue.

ii. Early excision of the necrotic burn tissue within 1-4 days post injury and coverage with a skin graft or skin substitute.

iii. Secondary wound coverage.

iv. Reconstruction and scar revision.

The role of the intraoperative nurse is critical in the provision of holistic care and in the achievement of positive patient health outcomes. At times, the burns theatre can be a challenging and busy environment. It is essential however, that clarification of clinical duties occurs, prior to the commencement of a procedure. Communication between all members of the perioperative team is vital in guaranteeing a safe and effective work environment.[1]

2 Assessment of the Burn Wound

It is important to ensure that burns are appropriately assessed and managed in order to promote the wellbeing of the child. This process includes estimation of the Percentage of the **Total Body Surface Area Burnt (%TBSA)** using the Paediatric Rule of Nines and/or Palmar Surface methods, along with assessment of the burn wound depth, and is conducted by the Burns Specialist team upon patient presentation. This assessment allows the intraoperative burns nurse to prepare adequate resources for surgery.[2]

3 Definitions

Minor Burns

- Classified as burns which can be managed in outlying hospitals/medical centres, or via the Burns and Plastic Surgery Treatment Centre (BPTC) at CHW.[3]
- A burn is classified as minor if:
  - It involves less than 10% body surface area
  - there is no involvement of priority areas (face/neck, hands, feet, perineum)
  - there is no full thickness skin loss
  - there is no history of inhalation

- it was not caused by electricity
- there are no suspicious circumstances
- there are no adverse social circumstances to outpatient management

Major Burns

- Classified as burns which require referral to a specialised burns unit such as CHW.[3]
- A burn is classified as major and fit the referral criteria if:
  - it involves greater than 10% body surface area
  - there is any respiratory involvement
  - there is greater than 5% full thickness skin loss
  - any priority areas are involved, i.e. face/neck, hands, feet, perineum, major joints
  - it is circumferential
  - Uncertain history
  - it is caused by electricity or chemicals

4 Staffing Requirements

For all burns surgical lists, there will be a minimum of two (2) instrument/circulating nurses, with a minimum of one (1) Registered Nurse who is competent in the burns theatre and has adequate knowledge and skill in the use of speciality burns equipment.

For all surgery with a burn classification as 'major' (>10%), operating theatre management will allocate a minimum of three (3) instrument/circulating nurses to that theatre, with a minimum of one (1) Registered Nurse who is competent in the burns theatre and has adequate knowledge and skill in the use of speciality burns equipment.

5 The Burns Theatre

Prior to the burns elective list, the nursing staff will ensure the theatre has all the essential and requested equipment according to the surgeon preference folders located in the Operating Suite sterile stock room.

5.1 Preparation – Prior to commencement of Procedures

Most children with major burns have a disturbance in thermoregulation. Whilst undergoing burns surgery, children can be left exposed to the surrounding elements for considerable amounts of time. It is therefore essential that the theatre environment is kept warm and with minimal traffic.[4]

Nursing staff allocated to the Burns Theatre are to:

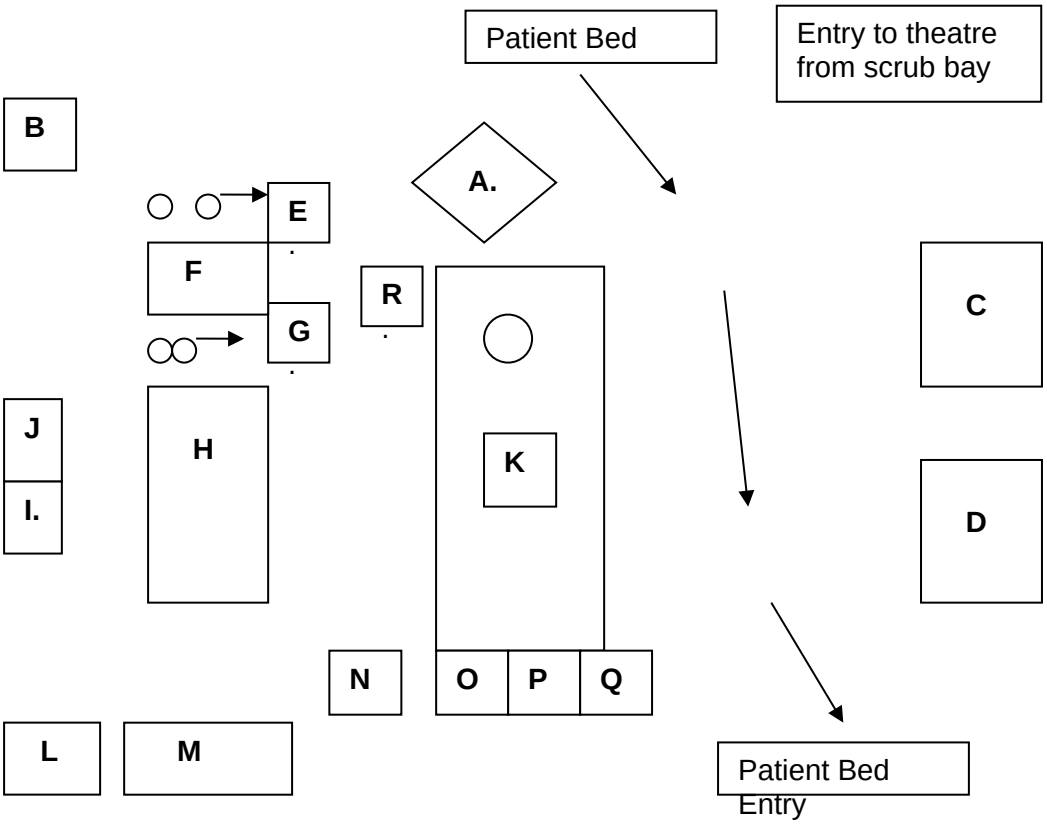
- Ensure the ambient temperature for all burns lists is kept at approximately 23 degrees. The temperature control panel to adjust this is located next to the main reception desk.

- Ensure there are sufficient quantities of fluids available for use. All intravenous and irrigation fluids except Povidone-iodine are to be pre-warmed in the warming cupboards located in the dirty corridors.
- Check sterile stock collections for patients on the operating list, ensuring collections are adequate for %TBSA, type of treatment required and are in accordance with surgeons' preferences. This is achieved through utilisation of the burns resource folder and surgeons' preference cards (located in the sterile stock area shelves).
- Locate and check stock is sufficient on the burns speciality dressing trolley (located in the extra equipment store room).
- Communicate with the burns medical team (consultant, anaesthetists and surgeons) to clarify the individualised surgical plan for each patient.
- Notify the relevant Operation Assistants of the assistance required throughout the surgery, e.g. lifting and turning the patient. This is to minimise the duration of surgery and length of time the patient is exposed.

Any changes made to the operating theatre patient list are to be communicated to the Operating Theatre Floor Supervisor.

5.2 Burns Operating Room Plan

The following diagram is a schematic view of the burns theatre room plan when working in theatre nine (9). Please ensure the theatre includes this equipment in the position shown.



A: Anaesthetic Machine
B: Excess Stock Trolley (includes warming mattress single use matts, nappies)
C: Anaesthetic Stock Trolley
D: Burns Speciality Dressings Trolley
E: Two Single bowl stands
F: Half Size Instrument Trolley (for mesher)
G: One Double bowl stand
H: Large Instrument Trolley
I: PACS computer
J: CHW Computer
K: Operating Table (circle indicates the position of the patient's head)
L: Scout Trolley
M: Small Instrument Trolley (used as an extra scout trolley)
N: Artiss® Spray Machine
O: Diathermy Machine
P: Overhead Heater
Q: Versajet® Machine
R: Inditherm® Warming Mattress Machine

5.3 List of Essential Burns Equipment & Furniture & Location

Equipment & Furniture	Location
Versajet® Machine	Equipment Storeroom
Versajet® Sterile Handpiece 8mm/14mm	Back Sterile Stock Room
Artiss® Spray Machine	Equipment Storeroom
Artiss® Products	Biomed Room -20* Freezer
Large Instrument Trolley x 1	Equipment Storeroom
½ Table x 1	Equipment Storeroom
Double Bowl Stand x 1	Equipment Storeroom
Single Bowl Stand x 1	Equipment Storeroom
Blood Loss Scales	Todman Recovery Locked Cupboard
Inditherm® Warming Mattress and console	Equipment Storeroom
Overhead Heater	Equipment Storeroom
Burns Trolley	Equipment Storeroom

5.4 Burns Intraoperative Protocol

For the nursing staff to adequately prepare for patient intraoperative care, it is beneficial to have a sound knowledge of the burns surgical terminology often used on the operating lists. Below is a list of terminology and their definitions associated with burns surgery.[5]

- **Autograft:** Patients own skin graft
- **Eschar:** Non-viable hard necrotic tissue that must be removed prior to grafting

- **Escharotomy:** Surgical incision of the eschar of a circumferential burned limb in order to restore blood flow to unburned tissue distal to the eschar. It is also indicated for circumferential burns of the abdomen or chest if respiration is impaired.
- **Fasciotomy:** Surgical incision of the fascia to relieve tension or pressure. Often required for electrical burns.
- **Split Skin Graft:** A skin graft of the epidermis and part of the dermis. Also called partial thickness graft.
- **Debridement:** The removal of dead, damaged, or infected tissue to promote blood flow and improve the healing potential of the remaining healthy tissue.
  Debridement is also performed to attain a healthy tissue layer on which grafted skin is secured. There are several methods that may be utilised by the surgeon and are dependent on the depth of the burn:
  - Scrubbing: Manual debridement using sponges and scrub brushes.
  - Surgical/Sharp: Surgical excision using scalpels, scissors and/or knives, such as *Goulian Weck Blades* and *Cobbitts Knife*.
  - Hydro: use of Versajet® instrument to simultaneously hold, cut and remove damaged tissue.
- **Split Skin Grafting:** The removal of the upper layers of the skin (full epidermal and part of the dermal layer) from a healthy area to an area of tissue with a skin defect. The graft heals by taking up a blood supply from the base of the wound thereby allowing the grafted skin to survive. This process takes about five (5) days.
- **Donor Site:** The area of tissue from where a skin graft is obtained. The site heals through epithelisation of the deeper layers of dermis, and takes about two (2) weeks.
- **Meshed graft:** The cutting of holes into the donor skin using a meshing device in order to enlarge the graft through stretching to cover a greater surface area. It also allows the free passage of exudate from underneath the grafted skin and promotes epithelisation.
- **Fenestrated graft:** The cutting of holes into the donor skin using a scalpel to allow the free passage of exudate from underneath the grafted skin
- **Full Thickness Grafting:** The removal of the epidermal and complete dermal layers of skin (often including subcutaneous fat) from a healthy area to an area of tissue with a skin defect. The donor site requires primary closure.

5.5 Medications

- Refer to the CHW Policy on '*Intra-Operative Medications and Skin Preparations: Administration and use by the Surgeon/Proceduralist in the Operating Suite'* and the NSW Health Policy Directive PD2013_043 '*Medication Handling in NSW Public Health Facilities',* to abide by hospital protocols on checking and administering medications. [6, 7]
- If at any time you are unfamiliar with the indications and contraindications of any medication, please notify the Clinical Nurse Educator and/ or Clinical Nurse Specialist Grade 2 for assistance.

- All medication must be visually checked and labelled clearly with at least one (1) Registered Nurse participating in this checking process.
- Any container or syringe/s of diluted medication of larger quantities must also be sufficiently labelled.
- Storage of any medication or diluted medication on the sterile instrument table should be protected in a labelled kidney dish to prevent confusion with any other substance on the sterile field.
- Prevention of sharps injuries when handling intraoperative medications requires the use of yellow kidney dishes or an appropriate sharps receptacle positioned as close to the field of use as possible as per NSW Health Policy Directive PD2007-052 *"Sharps Injuries - Prevention in the NSW Public Health System"*. [8]

The following medications/IV fluids are commonly ordered in burns surgery:

1. Adrenaline 1mg in 1mL (1:1,000)
2. Intravenous Normal Saline 0.9%
3. Adrenaline 1mg in 10mL (1:10,000)
4. Marcain 0.25% with Adrenaline 1:400,000 or Marcain 0.25% for fingers/toes
5. Artiss®
6. Histoacryl
7. Liquid Paraffin
8. Flamazine cream 1.0% or Silver Sulfadiazine (SSD) – used for infected burns

Always check with the surgeon at the beginning of each case whether they plan to inject the donor site/s. The rationale for injecting the donor site/s is to promote vasoconstriction and to enhance graft excision. When using Marcain, the patient receives additional pain relief at donor site/s.

The following options are medications that may be prepared in burns surgery

OPTION 1- Injectable Adrenaline 1:1,000

1. Dilute 1mL of 1:1,000 Adrenaline into 500mL of Intravenous Normal Saline (equals 2micrograms/mL). The maximum dose is 7 micrograms with an average between 5-7micrograms per kilogram.
2. Prepare for administration in a 50mL luer lock syringe and attach a spinal needle chosen by the surgeon for injection. **All syringes and receptacle storing this medication must be clearly labelled immediately with a red font sticker**.
3. Check with your surgeon and anaesthetist for maximum volume of injectable adrenaline.
4. Record on the white board the volume you have injected.

OPTION 2- Injectable Intravenous Normal Saline 0.9% for Tumescence

1. Have 500mL sterile IV Normal Saline bag poured into jug.
2. Draw up IV Normal Saline into two 50mL Luer lock syringes. Attach a spinal needle chosen by surgeon for injection. All syringes and receptacle storing this medication must be clearly labelled immediately.
3. The amount is dependent on surgeon preference and total fluid intake capacity of the donor site area to be excised.
4. Record on the white board the volume you have injected.

OPTION 3- Injectable Marcaine 0.25% with Adrenaline 1:400,000 or Marcain 0.25%

1. Using a **10mL syringe** and a long 25g injection needle, the surgeon will inject appropriate dosage to the donor graft site/s. **All syringes and receptacle storing this medication must be clearly labelled immediately.**

OPTION 4- Topical Adrenaline 1:10,000

1. The instrument nurse will be required to prepare topical adrenaline 1:10,000 for every burns patient undergoing surgery.
2. Draw up Adrenaline 1:10,000 in two (2) 20mL Orange enteral feeding syringes and attach matching sterrad burns cannula tips ready for easy application. **Immediately clearly label syringes 'Adrenaline 1:10,000' & 'NOT FOR INJECTION'.**
3. Do not store high volumes of this medication on your instrument table as there may be a higher likelihood of incidents. Please prepare when required*
4. Record on the white board the volume you have used topically on each patient.

***Note:** For all burns classified as 'major', extra boxes of Adrenaline 1:10,000 vials must be readily available in the operating room. These are found in the Anaesthetic medication trolley.

OPTION 5 - ARTISS®

ARTISS® is a topical fibrin sealant that does not require dilution. It is indicated to adhere autologous skin grafts to surgically prepared burn wound beds. ARTISS® is stored in the -20 degree freezer outside theatre two (2) in the dirty corridor. To prepare ARTISS® requires thawing on the sterile field by immersing the syringe in a kidney dish of sterile warm water. ***Note:** It is produced without labels or colouring on the syringes to indicate contents. The Sterile Set Up.

5.6 The Sterile Set Up

Instrumentation:

1. Burns Instrument Tray
2. PRN Zimmer® Mesher or MEEK® Mesher (mesh sizes selected by surgeon)

3. PRN Air Dermatome® and sterile blades or Humeca® dermatome and sterile blades (width plate selected by surgeon)
4. PRN Versajet® Handpiece (8mm or 14mm)
5. PRN extra Goulian Weck Blade handles and packs of sterile blades

Disposable Single Use Sterile Items:

1. Minor Burns Disposable Pack
2. Mesher boards
3. Goulian Blades
4. 2x Spinal Needles of chosen size (19 gauge, 20 gauge or 21 gauge)
5. 2x 16 gauge cannulas
6. Fluid spike
7. Medication labels
8. Marking pen
9. 2x 20mL Enteral Feeding Syringe
10. 2x General Sterrad Burns Cannula
11. Dressing Scissors and Blue Wound Swab (Prior to commencing)
12. PRN Artiss® Spray Set

Equipment:

Please refer to the Burns Resource Folder for company user guides on the following burns equipment:

- Versajet®
- ARTISS® Spray Machine
- Inditherm® Mattress and console
- Zimmer® Mesher
- MEEK® Mesher
- Air Dermatome®
- Humeca® dermatome

Fluids:

1. 2x 500mLs Injectable 0.9% Normal Saline
2. Liquid Paraffin (For Dermatome)
3. PRN Water for Irrigation (for dressings)
4. PRN 1000 mL 0.9% Normal Saline for Versajet®

Skin preparation:

Please be advised that the surgeon/proceduralist will debride/scrub the operative site prior to the commencement of the procedure and will use antiseptic skin preparation such as:

- Povidine-iodine
- Chlorhexidine Gluconate solution 0.05% – to be used if there's no indication of grafting to burn site

Preparation and use:

Chlorhexidine Gluconate 0.05% aqueous solution is the SCHN standard cleansing solution for burn wounds. **Use a 1:100 dilution of the 5% Chlorhexidine Gluconate concentrate**. For example add 10mls of the concentrate to every Litre (1000mls) of water used. Avoid the use of Chlorhexidine around the eyes, ears and mucous membranes.
Use a sterile Rediwipe (disposable wash cloth) soaked in the Chlorhexidine Gluconate cleansing solution to clean the burn wound surface. Wipe firmly in order to remove loose blistered skin, wound exudate and devitalised tissue.

- Acetic Acid 1.5% - to be used if there is an indication of or known positive growth of pseudomonas over the burn wound.

Preparation and use:

Please Note: SCHN CHW Pharmacy currently supplies a 3% Acetic Acid solution. To make a 1.5% solution - dilute 1 part of 3% acetic acid solution with 1 part of sterile water for irrigation ie. 1:1 dilution.
Place sterile Rediwipes soaked in dilute Acetic Acid solution (concentration of 1.5%) over the affected burn sites – avoid the eyes, ears and mucous membranes. Leave Acetic Acid soaks in contact with the burn wound surface for 5 minutes. Remove Acetic Acid soaks and then apply burns dressings.

Medications

1. Adrenaline 1:10,000 topical
2. PRN Adrenaline 1:1,000
3. Marcain 0.25% with Adrenaline 1:400,000 or Marcain 0.25% Plain for fingers/toes
4. Artiss®
5. Histoacryl
6. Liquid Paraffin
7. Flamazine cream 1.0% or Silver Sulfadiazine (SSD) – used for infected burns

Draping

Due to the varying location of eschar and potential donor sites, the use of adhesive disposable drapes in burn surgery may not always be practical. It is therefore acceptable to use linen drapes when burns are considered to be major.

6 Instrument Nurse Role

As previously discussed, burns surgery is fast-paced with the aim of controlling blood loss from debridement and limiting the patient's exposure and heat loss. It is therefore essential that the instrument nurse prioritise duties and communicate clearly with the circulating nurse/s. [4]

1. Establishment of the sterile field and required instrumentation.
2. Drawing up of medications and fluids, along with correct labelling of containers and syringes.
3. Containment of Accountable items.
4. Conducting the Surgical Count of Accountable items and instrumentation.
5. Establishment of debridement instruments, including Versajet® and Goulian Weck Blades. Please be cautious when loading blades and follow CHW recommended practice.
6. Ensuring items for haemostasis, including Topical Adrenaline, Diathermy and Sponges, are available for immediate use.
7. Ensuring patient positioning is optimal.
8. Participation in time-out.
9. Appropriate patient draping.
10. Ensuring appropriate setup of equipment, including attachment of Air Dermatome® to turbine tool outlet, diathermy and setup of Versajet® handpiece and irrigation fluid if required.
11. If MEEK Micrograft is to be used, please be aware that **ONLY** the Surgeon and/or the Burns CNC are allowed to prepare and operate the MEEK mesher.
12. Moistening of Skin Board with Injectable 0.9% Normal Saline.*
13. Refilling of Topical Adrenaline and fluids when required.
14. Preparation of ARTISS® if required.
15. Preparation instrumentation and other equipment used to secure skin graft to graft site (e.g. sutures, glue and staplers).
16. Ensuring dressings are available and appropriately prepared.
17. Completion of final Surgical Count.

Note: *Be aware that any skin graft, no matter how small, can be utilised in a major burn. Do not allow skin grafts to dry out or to become saturated; a saline soaked gauze to cover the graft is sufficient. If you are requested to assist receiving the split skin graft from the dermatome, only use atraumatic forceps to handle the split skin grafts*

7 Documentation

All burns intraoperative care is to be documented according to CHW policy utilising the following forms:

1. M18 Registered Nurse Operating Room Report
2. Instrument Tracking Form
3. Timeout NSW Health Mandatory Form
4. Prosthesis Form PRN
5. Instrument Checklist Form
6. Biobrane Log Book (Please ensure Biobrane is consented for)

In addition to this, the nurse may have additional information to hand over to the postoperative nursing team to improve patient outcomes. Please utilise the nursing clinical progress notes if required.

8 Dressings

There are a variety of dressings available within the Operating Suite for use in burns surgery. Selecting a dressing that provides both comfort and *optimal health outcomes is imperative*. It is a major nursing consideration and particularly important to ensure that dressings remain clean; therefore covering areas at risk of contamination (such as the perineum) with a bio-occlusive dressing. It is also important that the nursing staff allocated to the Burns Theatre check with the surgical team prior to surgery their intended wound dressings and ensure that they are available in sufficient quantities. [10,11]

Product	Indication	Application	How to apply	Sizes
Mepilex®	Absorbant, atraumatic dressing made from polyurethane foam with a silicone coating	**DONOR SITES**	Remove plastic backing sheet & apply sticky side to wound. *Do not stretch.* Aim to overlap donor site area by at least 2cm.	Sheets boxed in various sizes
Bactigras®	Woven dressing impregnated with antiseptic soft paraffin	**OVER GRAFTS**	Remove waxed paper and use straight from roll or packet.	Rolls and sheets in various sizes
Jelonet®	Woven dressing impregnated with soft paraffin	**OVER GRAFTS WHEN CEA CELL SPRAY IS USED**	Remove waxed paper and use straight from roll or packet	Rolls and sheets in various sizes
Mepitel®	Non-adherent fine silcone mesh silicone dressing, coated with silicone gel	**OVER GRAFTS**	Remove backing & apply to wound	Sheets boxed in various sizes
Biobrane®	Semi-permeable nylon mesh consisting of a bilayer of silastic membrane coated with porcine collagen	**TEMPORARY WOUND COVER OVER DEBRIDED NON GRAFTED AREAS**	Apply straight from packet with fabric (dull) side down	Sheets boxed in various sizes
Acticoat®	Silver antimicrobial barrier dressing. Provides sustained release of silver over 3 or 7 days.	**OVER DEBRIDED NON GRAFTED AREAS**	Wet in bowl of sterile water for irrigation shortly before use. If soaked for too long, silver will soak out of dressing	Standard Acticoat (3 day) Acticoat7 (7 day) both available in various sizes Acticoat Flex.

Product	Indication	Application	How to apply	Sizes
Mesorb®	Contains an absorbent core of cellulose pulp sandwiched between a non-woven wound contact layer and textured fluid resistant layer	**OVER ACTICOAT TO PROVIDE MOIST RESERVOIR**	Moisten in bowl of Sterile Water for Irrigation and squeeze out excess moisture. Apply over Acticoat, however do not apply sodden	Sheets in packets of various sizes
Exudry® Vest	Non-occulsive, highly absorbent vest shaped dressing with a rayon/cellulose blend layer sandwiched between polyethylene layers.	**OUTER BURN WOUND DRESSING LAYER MAY BE USED AT ANY STAGE**	Wrap patient with underlying dressings in vest, securing with ties and bio-occlusive dressings	Paediatric small, medium and large. Please consider the size of underlying dressings before selection
Webril®	Stretchable cotton bandage with absorbent properties	**TO SECURE DRESSINGS**	A) Wrap firmly around underlying dressings B) Soak in sterile water and wrap around underlying Acticoat dressing – only when circumferential burn.	2", 3", 4", 6"
Crepe®	Lightweight woven bandage	**TO SECURE DRESSINGS**	Wrap firmly around underlying dressings & webril, and secure with staples, Hypafix or Elastoplast.	1", 2", 3", 4" & 6"
Conforming gauze bandage	Lightweight woven bandage (thin, elasticised)	**TO SECURE FINGER AND HAND DRESSINGS**	Following application of primary dressing and webril layer, individually wrap each finger and hand.	1", 2"
Hypafix®	Self-adhesive, non-woven polyester fabric	**TO SECURE DRESSINGS AND BANDAGES**	Remove backing paper & stretch out & apply sticky side to wound.	Available in sterile packets from CSSD (various sizes) or non-sterile rolls on burns trolley. May be cut into

				strips to secure dressings and bandages.
Opsite®, Tegaderm®/ Ioban®	Bio-occlusive dressing/ impregnated with iodine	**TO SEAL ACTICOAT DRESSINGS AND WATERPROOF EXTERNAL BANDAGES (UPPER THIGHS, BUTTOCKS, PERINEUM)**	Cut to size needed and remove backing paper then apply sticky side to wound	Sheets boxed in various sizes

9 References

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