NexoBrid® Guideline

Full Title of Guideline:	Guideline for application of NexoBrid® treatment in Adult burn injured patients.
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Division & Speciality:	Cancer and Associate Specialties Burns.
Scope ***(Target audience, state if Trust wide):***	Burn Care clinicians
Review date ***(when this version goes out of date):***	Version 3: February 2023
Explicit definition of patient group to which it applies ***(e.g. inclusion and exclusion criteria, diagnosis):***	Adult Burn Injured patients
Changes from previous version ***(not applicable if this is a new guideline, enter below if extensive):***	Review of Guideline with European Consensus Guideline update (2020) [4]
	Evidence base: 2b at least one randomised controlled trial 3a at least one well-designed controlled study without randomisation 3b at least one other type of well-designed quasi-experimental study 4 well –designed non-experimental descriptive studies (i.e. comparative / correlation and case studies)
This guideline has been registered with the trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert. Caution is advised when using guidelines after the review date or outside of the Trust.	

Introduction

Current standard of care for deep dermal or full thickness burns is surgical debridement in the operating theatre. Surgical debridement is effective in removing necrotic tissue, but can result in a loss of some viable tissue. NexoBrid® a medicinal non-surgical eschar remover product can be used to debride deep partial thickness and full thickness burns; it is selective in removing eschar and does not damage surrounding viable tissue.

1. Scope

These guidelines are applicable to all Registered Nurses and Medical Practitioners caring for Burn injured patients located in Burns Unit, Critical Care Unit or Operating Theatres. All Registered Nurses and Medical Practitioners must have undertaken NexoBrid® training and deemed competent.

2. Aims

The aim of this guideline is to support Registered Nurses and Medical Practitioners in the Burns Unit, Critical Care Unit or Operating Theatres to implement consistent, high quality, cost effective burn wound NexoBrid® management.

3. Indications

NexoBrid® will only be used on selected patients with mid to deep dermal or full thickness burns. Patient selection will be dependent on the location of burn injury, all potential patients to be discussed by multi-disciplinary team and Consultant approval required.

Possible candidates for NexoBrid® application:

- Patients with any burn area
- <15% TBSA per treatment, adult burn injured patients
  Sequential procedures for larger TBSA is possible with up to 15% TBSA per session[4]

4. Contra-Indications

- Not for use on patients aged <18 years of age
- Chemical burns[4]
- Electrical burns / high voltage injuries
- Patients with known hypersensitivity to bromelain or papain, which is in **pineapples, papaya fruit, kiwi and tropical fruits**
- Penetrating burns wounds where foreign materials (e.g. implants, pacemakers and shunt) and/or vital structures (e.g. larger vessels, varicose veins, and eyes) are or could become exposed during debridement.
- Pregnancy
- Do not use NexoBrid® if wound has been previously dressed with either iodine or silver dressings.

5. Cautions

- Patients with coagulopathy
- Anticoagulation Therapy - due to debridement, needs to be stopped as per Trust Theatre protocol
- NexoBrid® should be used with caution in patients with cardiopulmonary and pulmonary disease, including pulmonary burns trauma and suspected pulmonary burn trauma.
- Limited pharmacokinetic data in patients with TBSA >15%

6. Dose of NexoBrid®

NexoBrid® comes in 2 forms:

- 2g NexoBrid® powder in 20g gel is applied to cover a burn wound area of 100cm^2 **(approx. 1%TBSA)**
- 5g NexoBrid® powder in 50g gel is applied to cover a burn wound area of 250cm^2 **(approx. 2.5%TBSA)**

Application of NexoBrid

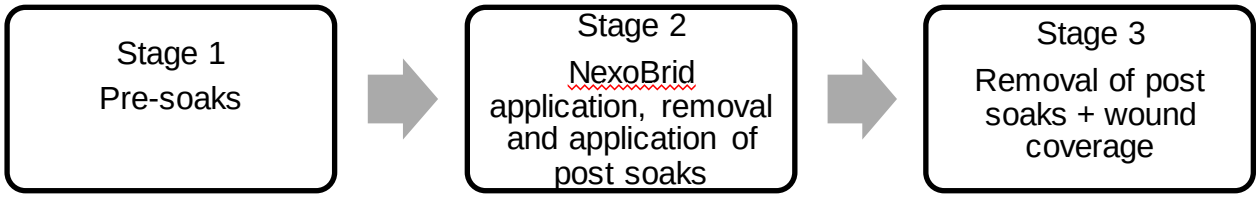
NexoBrid® should only be applied by trained Healthcare Professionals in the environment of the Burns Unit, Operating Theatre and Critical Care.

NexoBrid® powder and gel are supplied in two different quantities (see NexoBrid® dose above); using dosage / %TBSA estimations calculate how much product is required to cover the desired % area.

Classifications regarding time of NexoBrid application post burn injury:

- Immediate / very early ≤12hrs
- Early : 12 – 72hrs
- Delayed > 72hrs
- Application not advised if burn injury > 5 days

NexoBrid® treatment is on average a 1-2 day procedure; the process of application should follow the flow chart below. Patients that arrive very early in the morning may forgo the overnight pre-soaks, instead having 2 hour soaks, if staffing/analgesic arrangements permit.



Consideration needs to be given to the start time of NexoBrid treatment application and when removal and wound assessment will be required.

The use of NexoBrid® should follow a systematic approach, using the following process below to ensure safe, holistic and proficient treatment of the patient. Photographs of the burn should be taken at each of the highlighted stages.

1. NexoBrid® Bundle paperwork
2. Pre-treatment preparation / Consent
3. Analgesia
4. **Wound Cleansing** / Pre-soaks
5. Preparing your equipment
6. Removal of Pre-soaks
7. Wound Preparation
8. NexoBrid® Preparation
9. **NexoBrid® Treatment application**
10. **NexoBrid® removal and wound assessment**
11. **Post-soaks**
12. Wound coverage

	Action	Rationale
Required Paperwork	• Consent form and operation sheet • Photography consent form • Patient information leaflet • NexoBrid® protocol (for your reference) • Equipment list • NexoBrid® Bundle	
Pre Treatment Preparation Consent	• Written consent to be taken by qualified medical profession using trust consenting process. • Patient information leaflet must be given to the patient and any questions answered. • Check for history of anticoagulant use. If positive anticoagulants should be allowed to wear off or be reversed as appropriate. If medically indicated / clinical concern anti-coagulant testing should be performed prior to NexoBrid® application.[4]	To adhere with medical ethics and law To ensure patient informed of procedure
Analgesia	Analgesia requirement will be reviewed on an individual patient basis with a Consultant Burns / Anaesthetist review and required analgesia prescribed. For guidance refer to • Analgesia Guidelines for Adult Burn Injury Patients outside of Critical Care guidance (Available at NUH Policies , Procedures and Guidelines http://nuhnet/Pages/home.aspx) • Regional anaesthesia is recommended of the isolated (upper / lower) burnt extremity[4] • Local anaesthesia is useful in minor burns[4] If a block is unable to be achieved consideration needs to be given to how the patient will be managed for the application process: • sedation/general anaesthesia required • Non sedative analgesia Additional analgesia should be offered to the patient during the treatment such as oral morphine, fentanyl (sublingual or lozenges), gabapentanoids, ketamine and nitrous oxide. • Patient pain scores must be assessed throughout the procedure and recorded using the patients e-obs pain score	Adequate analgesia assessment and requirements
Wound Cleansing	• Burns wound to be cleaned thoroughly prior to application of NexoBrid®. All blisters and dressing residue should be removed with Saline and sterile gauze as per standard of care. Take wound swabs and send for microbiology. • Ensure that ALL blisters (superficial Keratin layer) have been removed • ***Ensure Clinical Photography performed***	To minimise wound infection and to ensure adequate adhesion of NexoBrid® to the burn wound

Pre-soaks	• Apply sterile gauze soaked with normal saline • Apply to the wound bed for minimum of 2hours. • Apply K- bandage over soaked gauze to secure • **Leave on for a minimum of 2 hours, can be left on overnight to synchronise application with day shift team**[4] • Hydrogel dressings can be used as an effective moisturiser to dry eschar to improve pre-soaking[4] • Sterile gauze should remain wet until application of NexoBrid® • Complete and document pain assessment	To minimise wound infection and pyrexia
Preparing your equipment	• Clean your trolley • Create a sterile field. • Open your equipment box (Appendix 2)	Maintaining a sterile environment to minimise infection
Removal of Pre-soaks	• After wound has been soaked for at least 2 hours remove pre-soaks and clean wound with Normal saline • Complete and document pain assessment	
Wound Preparation	• The area for treatment with NexoBrid® should be surrounded with a continuous border of rolled jelonet / or soft yellow paraffin border barrier approx. 2 - 3cm from the desired treatment area. • This is to prevent loss of product but should not come in to contact with the area to be treated as it will prevent the enzyme from penetrating the eschar.	NexoBrid® will not cause harm to healthy tissue but protective barrier is to ensure the area requiring treatment is treated.
	• While preparing area for treatment Sterile sodium chloride (0.9%) solution must be applied to the burn wound to prevent wound bed drying out. • Wound moist environment required during the application procedure to maximise enzyme effectiveness.	Prevent the burn wound from drying out during procedure

NexoBrid® Preparation	Check prescription for volume of NexoBrid® to be applied either 2g or 5g • NexoBrid® pack can be out of the fridge for one hour prior to application • Prepare the NexoBrid® using an aseptic technique • The powder vial must be opened by carefully tearing off the aluminium cap and removing the rubber stopper. • The powder is then transferred into the corresponding gel bottle. If necessary, a sterile tongue depressor or spatula can be used to break the dry powder cake in its vial prior to transfer. • Powder and gel must be mixed thoroughly until a uniform; slightly tan to slightly brown mixture is obtained. This usually requires mixing the powder and the gel for 1 to 2 minutes. • It is important the NexoBrid® is well broken up to allow for even distribution on the wound bed and accurate debridement. • Do NOT mix the powder with the NexoBrid® gel until ready to apply, should be prepared at the patient's bedside. **Ensure Photographs taken prior to the application of NexoBrid®** • Complete and document pain assessment	To ensure aseptic preparation of the NexoBrid® Gel needs to be applied within 15 minutes of mixing
NexoBrid® Treatment Application	• Apply NexoBrid® within 15 minutes of reconstituting, at a thickness of 1.5 to 3mm, the NexoBrid® is applied to ensure that it covers the entire burn wound area, and remains confined by the sterile paraffin ointment. • Discard any remaining NexoBrid®	If the NexoBrid® gel is not applied within 15 minutes it becomes inactivated
	• Cover / wrap wound with cling film / a sterile occlusive dressing (Appendix 2). • Dress with dry gauze to absorb wound leakage. • Cover the wound and sterile occlusive dressing with Gamgee or thick dressing and secure in place with Hypafix or bandages as appropriate. • If the burn is circumferential the patient must independently, or be assisted to, rotate the area every 15 minutes for the first hour to allow for even distribution of the product. • The NexoBrid® should be left in place for 4 hours. • Complete and document pain assessment every 15minutes initially for first hour, than at least hourly until removal	To ensure NexoBrid® stays in contact with burn wound and maintain patient comfort
Patient adverse	• If the patient experiences any adverse reactions remove the product immediately,	

reaction	clean the wound with and apply the post treatment soak • If rash appears, patient experiences excessive pain assess for removal and apply Normal Saline soaks • Monitor and assess patient to ensure no deterioration in condition and complete and document pain assessment • Seek medical assistance as required • Follow Trust PGD Guideline Administration of drugs during anaphylactic reactions in adults and Algorithm link: https://www.nuh.nhs.uk/staff-area/resuscitation-department/resuscitation-documents/ • Report and record actions in patient medical and nursing documentation.	
NexoBrid® removal and wound assessment	• After **4 hours**[4] remove all dressings • NexoBrid® removal should be performed with additional analgesia. • Complete and document pain assessment • This should be discussed and a plan agreed prior to start of removal.	Shortening of application time to<4hrs not recommended
	• NexoBrid® can be removed by using a sterile tongue depressor or cleaning thoroughly with sterile gauze that has been soaked in sterile Normal Saline 0.9% and wipe away • The wound depth should be assessed at this stage and must be performed by a burn consultant[4]. The wound bed will differ from a surgically debrided wound with viable dermis presenting as a white bed with small areas of 'pinprick' bleeding. **Photographs must be taken immediately after the removal of NexoBrid®** Photographs taken by Medical Photography are preferred over Nervecentre. • Assessment of wound depth by Burns Consultant / Registrar • Assess for: Completeness of debridement %TBSA and burn depth to determine further wound management • Review management plan. • Complete and document pain assessment Need to review at this stage is due to the post soaking phase which follows on from this, where the wound is dressed with wet dressings which calms the inflammatory phase and cools the area which affect the way the capillaries are seen within the dermal layers. It is important to determine the treatment process for wound healing before post soaking to avoid the risk of misdiagnosis of the wound bed/ effectiveness of the debridement.	To remove NexoBrid® and debrided tissue To determine further management of wound

Post-soaks	**Inpatient Treatment** **Long Soak** Apply a dressing soaked with Saline to the treated area for **12 hours** You do not need to change the soaks or continually moisten the dressing. Dress with generous amounts of dry gauze to prevent wound leakage	To absorb any remnants of NexoBrid®
	Day case Patient Treatment **Short Soak** Apply a dressing soaked with Saline to the treated area for **2 hours**	
Wound Care coverage post debridement	• Wound coverage should be achieved immediately after the post-soaks are removed. • **Do not repeat wound assessment:** Bleeding previously visible may no longer be present and depth assessment is not accurate. • A Management plan with regard to further treatment should be defined and documented post NexoBrid® removal by an experienced burn surgeon.[4] • Burns that were assessed to have viable dermis during the NexoBrid® removal phase should be dressed with a suitable dressing to avoid wound desiccation e.g. hydrogel / silflex / hydrocolloid • Burns that are assessed to be full thickness after enzymatic debridement and underlying structures are visible should be considered for skin grafting. Grafting should be delayed for at least 2 days post treatment.[4]	To ensure exposed dermis does not dry out
Proforma	Ensure completion of NexoBrid® Proforma throughout the duration of the procedure and case report on completion of treatment.	

This Guideline has been developed by utilising information from:

1. Guideline for application of NexoBrid® treatment version 2 Nottingham University Hospital NHS Trust. Author: Mary Kennedy Kirsty Johnson. February 2019
2. NexoBrid™ Nursing Guideline. Chelsea and Westminster NHS Foundation Trust. Author: Kate Elworthy. May 2017
3. Burns Centre Guidelines for Application of NexoBrid®. University Hospitals Birmingham NHS Foundation Trust. January 2016
4. Hirche C et al. Eschar removal by bromelain based enzymatic debridement (Nexobrid®) in burns: European consensus guidelines update. 2020 **Burns** 46 pp782-796