Meningococcal disease is a contagious bacterial condition that can result in life-threatening sepsis as well as the development of extensive blistering and lesions. This article presents the topical management regimen for one young patient’s wound care in conjunction with the community and outpatient paediatric teams. Practical tips on how to manage complex wounds in children will be outlined to demonstrate that such cases can be managed effectively by nursing teams in a relaxed home environment and outpatient setting, preventing readmission and supporting the emotional recovery of the child and parents. The success of this case study and the reintegration of the child back into daily life and school was attributed to the joint working and collaboration between parents and child, and tissue viability, paediatric and community nursing teams.

KEYWORDS:
- Wound care
- Meningitis
- Rash
- Debridement

Meningococcal disease, also referred to as cerebrospinal meningitis, is a contagious bacterial condition caused by the meningococcus organism Neisseria meningitidis. The organism can lead to meningococcal meningitis alone, meningococcal meningitis with meningococcal septicaemia, or meningococcal septicaemia alone (Newton, 2015).

Meningitis is an inflammation of the meninges, the protective membrane that covers the brain and spinal cord (Shmaefsky, 2010). It is spread by person-to-person contact through respiratory droplets passed on by those already infected. The onset of symptoms is sudden and death can follow within hours, with the disease mainly affecting young children. However, it is also common in older children and young adults.

There are several vaccines available to control meningococcal disease but it remains potentially fatal and should always be viewed as a medical emergency (World Health Organization [WHO], 2013).

The causative gram negative bacterium Neisseria meningitidis is classified into numerous strains and sub-groups with the early stages of infection characterised by fever, joint or generalised body pain, severe headache, nausea and vomiting. As the disease progresses, patients may display altered consciousness, meningitis and the development of a skin rash, which may be followed by adrenal haemorrhage, shock and, finally, fatal cardiac or renal failure. Overall, the mortality rate in confirmed meningitis is about 10% (Thomas et al, 1999).

In the early stages, the signs and symptoms of meningococcal disease can replicate those of a minor viral illness, however increased public awareness and the use of the ‘glass test’ (where the spots/rash do not fade under pressure from a normal drinking glass) to identify the associated non-blanching purpuric rash (caused by bleeding under the skin) has helped raise the profile of the disease (Tasker et al, 2013).

The development of the rash is unique to each individual. According to recently published guidance from the Meningitis Research Foundation (2014) on the diagnosis and treatment of meningococcal meningitis and septicaemia in general practice, the classic non-blanching rash is one of the most important signs to recognise and children suspected of the condition should be thoroughly checked. The rash can be more difficult to detect on darker skin but may be clearer on paler areas such as the soles of the feet, palms of the hands, palate and abdomen, or the white parts of the eye.

According to the National Institute of Health and Care Excellence (NICE, 2010), in the initial stages of meningococcal septicaemia a petechial rash can develop as smaller blood vessels under the skin rupture and bleed and present like tiny ‘pinpoint’ spots. If the petechial rash begins to spread this is a sign that the disease is progressing. In relation to skin samples, NICE (2010) stipulates that when investigating for possible meningococcal disease the following techniques are not to be used:
- Skin scrapings
- Skin biopsies
- Petechial or purpuric lesion aspirates.

CASE STUDY

This case featured a six-year-old girl who attended the local emergency department...
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The patient developed multiple blistering lesions to her legs, arms and buttocks.

It is thought that while the child was being medically managed in intensive care the developing blistering and subsequent necrotic lesions were kept dry and exposed. In terms of managing peripheral necrosis, this practice is not uncommon in the intensive care setting and at the time the clinical stabilisation of the child was a priority. Within two weeks she had recovered to the point where she was extubated and removed from mechanical ventilation.

Wound care
The patient presented to the local paediatric clinic a week after discharge from hospital with extensive 100% necrotic lesions to the whole of her legs and other areas, including the buttocks and arms.

She was seen by the plastic surgery consultant and, given how unwell the child had been, it was decided not to surgically debride the wounds but to treat them conservatively and attempt to heal them by secondary intention, which required long-term specialist wound management rather than surgical intervention. At this point the child was referred to the tissue viability team.

Working together
The paths of the paediatric nurse and tissue viability specialist do not often cross. When they do — as with this case — it is usually for the assessment and management of complex wounds. The paediatric department within the author’s trust have a busy outpatient clinic that is run by a team of experienced paediatric nurses; wound care is a common factor in the cases that present daily to the clinic teams. The author leads the wound care team, which works collaboratively with the paediatric nurses within the hospital. The child was referred to the wound care team by the senior paediatric nurse who had also a considerable amount of experience in wound management.

Red Flag
Sharp debridement

Sharp debridement should always be performed with caution due to the following dangers:
- Pain
- Bleeding
- Infection
- Delayed healing
- Removal of healthy tissue along with necrotic tissue.

For this reason sharp debridement should always be performed by clinicians specifically trained in the technique.
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The author’s team is fortunate to have a robust working relationship with the inpatient paediatric and community paediatric nursing teams, which was key to successfully treating the child and supporting her family. The relationship between the teams complemented the interprofessional working partnerships, which were key to the overall success of this case.

**Pain management/distraction**

One of the fundamental components of this case was the assessment and management of the child’s pain and anxiety. This was not a one-off pain event and required consistent renegotiation with the child and family, with a particular emphasis on empathy and trying to understand the effect of the pain on the patient.

From the outset, a mixture of nitrous oxide (N₂O) and oxygen (O₂) (commonly known as ‘gas and air’) was used as a first-line treatment for pain management during dressing changes (a topical medical grade honey dressing was used as a primary dressing in conjunction with a secondary silicone dressing — see more below). Gas and air is a safe and effective analgesic for children who are usually able to understand and administer the system themselves (Pediani, 2003). The provision of gas and air, along with supporting the child throughout her dressing changes with games, books, and interaction/distraction, helped the teams to work in an efficient manner.

**Debridement/dressings**

From the onset, the team was aware that the patient’s necrotic lesions would require some form of debridement to remove the devitalised tissue. Debridement remains the cornerstone of good wound management, facilitating the removal of non-viable tissue from the wound bed to promote wound healing and aid wound bed preparation (Falanga, 2001; European Wound Management Association [EWMA], 2004; Vowden and Vowden, 2011).

Understanding what method of debridement to use and when to debride can be daunting, especially for nurses working autonomously in the community. It is vital therefore that they are able to assess the patient holistically and treat the wound according to individual patient’s needs and not treat the wound in isolation.

In this case, the necrotic tissue was extensive and dry, therefore it was reasoned that rehydration would be needed. As mentioned above, a medical grade honey dressing was used as a primary dressing...
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in conjunction with a secondary silicone dressing. Medical-grade honey was considered the best source of hydration and conservative debridement. There are various advantages of using medical-grade honey in wound care, which include (Grothier and Cooper, 2011; Bradbury et al, 2014):

- The provision of a moist wound-healing environment
- Removal of malodour and anti-inflammatory action
- Potential economic gains such as the potential to prevent unnecessary surgical debridement and skin grafting.

Skin care
A skin care regimen was put in place that involved washing and moisturising the intact skin with a suitable emollient to keep it soft and supple and also helped to prevent itching or discomfort from the dressings and bandages.

The honey and silicone dressings were applied directly to the wound bed to prevent adherence and ease removal on dressing change. A soft padding bandage was then used to secure the dressings to both lower limbs — these were applied from below the toes to ‘two fingers’ below the groin level, in a loose spiral fashion. The bandages were then secured with a tubular liner placed over the bandages to keep everything in place.

In this case, the medical-grade honey dressings achieved both partial and total autolytic debridement in the majority of the wounds (Figure 2). Additional advantages of the honey included (Evans and Mahoney, 2013):

- Reduction in wound exudate
- Reduction in malodour
- Reduction in pain
- Stimulation of new tissue growth.

Overall, from referral to complete healing, the estimated timeframe was three months. The length of time taken for healing is down to the individual and depends on a number of factors including age, nutritional status and overall health. It is almost impossible to calculate an exact timeframe for healing.

The child’s parents were actively involved in the wound care in terms of managing the skin care regimen when some of the areas had healed, as well as monitoring the newly healed areas and scar tissue. This was important for the family as it helped them be a part of their child’s recovery process.
Sharp debridement
On occasion and with the consent of the parents and the patient herself, sharp debridement was used to remove excess necrosis present in the wounds. This was performed by the specialist tissue viability nurse who had advanced completed nursing competencies in sharp debridement. It is important to note that sharp debridement should only be undertaken with patient and family consent and by staff with the relevant competencies and clinical skills.

In the case of this patient, debridement was a slow process due to the extensive necrotic lesions on the patient’s body and the anxiety she experienced. The delicate balance between conservative and sharp debridement was always at the forefront of the nurses’ minds.

CONCLUSION
Overall, as the photographs in this case illustrate, the team accomplished successful healing with the formation of healthy scar tissue on all of the original wounds (Figure 3).

The patient was able to go back to school during the final stages of healing and her pain levels were well-managed — towards the end of the treatment period, no analgesia was required.

There was no reason for further hospital admission, or any more surgical intervention or skin grafting, and the family and clinical partners agreed that the treatment had been a success.

REFERENCES

KEY POINTS
- Meningococcal disease is a contagious bacterial condition that can result in life-threatening sepsis as well as the development of extensive blistering and lesions.
- This article presents the topical management regimen for one young patient’s wound care in conjunction with the community and outpatient paediatric teams.
- The article demonstrates how such cases can be managed effectively by nursing teams in a relaxed home environment and outpatient setting, preventing readmission and supporting the emotional recovery of both child and parents.
- The success of this case study and the reintegration of the child back into daily life and school was attributed to the joint working and collaboration between parents and child, and tissue viability, paediatric and community nursing teams.
- In the case of this patient, debridement was slow due to the extensive necrotic lesions and the anxiety she experienced. The delicate balance between conservative and sharp debridement was crucial.

Expert commentary
Edwin Chamanga (QCN), tissue viability service lead, Hounslow and Richmond Community Healthcare NHS Trust, London

This article explores an interesting area of wound care. It touches on an area which would present a clinical challenge to most tissue viability nurses across the country as they are not paediatrically trained.

Although the principles of wound healing and wound debridement remain the same in any case, the challenges presented by this patient display the expertise of the multidisciplinary team involved.

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