Guide to:
Caesarean scar care

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Recommendations for midwives

Nourisil™ MD
Silicone Scar Gel
Caesarean section is becoming increasingly common (World Health Organisation (WHO), 2015). In England in 2016/17, there were 636,401 births, of which 27.8% were by caesarean section; in 2005/06 the caesarean section rate was 23.5% (NHS Digital, 2017).

Responding to recommendations that caesarean section ‘should ideally only be undertaken when medically necessary’ (WHO, 2015: 4), the Royal College of Obstetricians and Gynaecologists (RCOG) (2015) stated: ‘In line with [National Institute for Health and Care Excellence] NICE guidance in the UK, we also believe that if a woman requests a caesarean section, she should be informed of all the risks and benefits of the procedure ... If she remains certain that caesarean section is the right option for her, then that choice should be fully respected.’

This guide has two aims. First, to review the guidelines and recommendations available for health professionals to advise women. Second, to evaluate the biology and mechanism of scar formation and healing; recommendations on the care of caesarean section scars; possible treatment options; and potential concerns.

**Scars: the biology and mechanism of healing**

Nearly all wounds leave scars, and each year in the developed world around 100 million patients acquire post-surgical scars (Brown et al, 2010). Caesarean section scars are typically horizontal, 10–20 cm long and made just below the bikini line; rarely, vertical scars below the navel may be made (NHS Choices, 2017).

When adult tissue is wounded, the body forms a scar. This occurs in four stages (Gauglitz et al, 2009; Wolfram et al, 2009).

- **First, the bleeding phase initiates platelet aggregation and degranulation at the site, forming a fibrin clot. This becomes a foundation for wound repair.**

  - In the inflammatory phase, platelet degranulation prompts the release of cytokines, such as epidermal growth factor, insulin-like growth factor and transforming growth factor. These cytokines attract neutrophils, macrophages, epithelial cells and fibroblasts to the wound.

  - Within 48–72 hours of the wound occurring, the proliferation phase begins. Fibroblasts multiply, forming a scaffold of reparative tissue termed the extracellular matrix (ECM). The ECM—comprising procollagen, elastin, proteoglycans and hyaluronic acid—bridges the wound, promoting the ingrowth of blood vessels. The proliferation phase may last 3–6 weeks, and modified fibroblasts enriched with actin filaments—myofibroblasts—promote wound contraction.

  - Following wound closure, the maturation phase begins. This may last several months. During this time, the ECM is degraded and modified into mature-type collagen. The maturation phase requires a balance between ECM protein degradation and deposition. If the balance is upset, scarring abnormalities may occur, which could result either in a hypertrophic scar or a keloid scar.

**Types of scar**

Hypertrophic scars occur after a prolonged inflammatory response, resulting in greater collagen deposition due to increased expression of transforming growth factor (Rabello et al, 2014). Hypertrophic scars are often raised, red or pink in colour, confined to the original wound margins, and possibly itchy. They have an incidence of 40–70% following surgery, a low recurrence rate after surgical excision, and no association with skin colour. They usually subside over a period of a few years (Gauglitz et al, 2009; Wolfram et al, 2009).

Keloid scars are pink or purple in colour, extend beyond the original wound margins, have an incidence of 6–16% in African populations, and have a high recurrence rate after surgical excision (Gauglitz et al, 2009; Rabello et al, 2014).

**Recommendations for women**

Exploring the emotional impact of scarring is an important, yet seldom undertaken, area of research. In a study of 82 scar patients (70% women), Brown et al (2010) found that the type of the scar made little difference to patients’ psychological distress, but that those with non-visible scars reported greater levels of distress than those with visible scars, regardless of clinicians’ estimates of scar severity.
Despite psychological distress affecting how some patients live with their scars, there is little mention of caesarean section scar care in official aftercare guidance. Such an omission might be usefully addressed by midwives.

In relation to antibiotics, NICE clinical guidelines (2011: 25) state: ‘Offer women prophylactic antibiotics at caesarean section before skin incision. Inform them that this reduces the risk of maternal infection more than prophylactic antibiotics given after skin incision, and that no effect on the baby has been demonstrated.’

NICE guidelines (2011: 29) also state that caesarean section wound care should include:
- Removing the dressing 24 hours after the caesarean section
- Specific monitoring for fever
- Assessing the wound for signs of infection (increasing pain, redness or discharge), separation or dehiscence
- Encouraging the woman to wear loose, comfortable clothes and cotton underwear
- Gently cleaning and drying the wound daily if needed, planning the removal of sutures or clips.

Updated guidelines (NICE, 2013: 21) have advised sutures over staples for skin closure.

**Scar-healing products**

Marini et al (2017) suggest that moist wound healing, or preventing the wound from drying out, is crucial in the avoidance of abnormal scarring, the optimisation of tissue repair and the reduction of healing time. Their list of ‘consensus properties on the ideal wound dressing’ are shown in Box 1.

**Silicone gel**

An early application of silicone for scar therapy was documented by Perkins et al (1983), who successfully used silicone gel sheets to treat 42 burns patients, recommending it for the treatment and prevention of abnormal scarring (Mustoe et al, 2002).

Noting that silicone gel spreads as an ultra-thin sheet, dries quickly and has reportedly reduced scar texture, colour and height by 86%, 84% and 68% respectively, Puri and Talwar (2009) described their successful use of silicone gel with 30 patients with superficial, hypertrophic and keloid scars. They suggested that silicone gel may benefit scars by:
- Increasing the hydration of the stratum corneum, thereby regulating fibroblast production and reducing collagen, resulting in a softer and flatter scar
- Protecting scar from bacteria
- Modulating the expression of growth factors
- Reducing itching and discomfort.

In an observational study of 105 patients, Sandhofer and Schauer (2012) examined the effectiveness of silicone gel in accelerating epithelialisation, reducing inflammation and preventing scarring. They observed that silicone reduced wound healing time and scar formation, and that it could be used in combination with other treatments.

Kim et al (2014) randomly assigned 30 surgical scar patients to treatment with either silicone gel sheeting or a topical silicone gel. Their results found no significant difference in efficacy, but that topical products were more convenient, and advocated the use of topical silicone gels as a first-line therapy in the management of postoperative scars.

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**Box 1. Consensus properties on the ideal wound dressing**

- Barrier to bacteria to prevent infection
- Protection from irritants and foreign materials
- Water vapour permeable to prevent maceration and promote wound healing
- Absorb exudate from the wound if excessive
- Prevent heat and fluid loss
- Non-adhesion of the dressing to the injured tissue
- Prevention of wound disruption
- Flexibility of the barrier dressing on strained (stretching/contracting) areas
- Acceptable environmental and shelf stability (including combat conditions -4000°C to 6000°C)
- Hydrophobic to prevent trans-epidermal water loss
- Cost-effective
- Aesthetically attractive
- Easy to apply
- Pain-free application and removal.

(Marini et al, 2017: S89)
Although a Cochrane Review (O’Brien and Jones, 2013) indicated weak clinical evidence for using silicone gel sheeting in preventing abnormal scarring in high-risk individuals, it also found that clinical trials evaluating silicone gels for the treatment of hypertrophic and keloid scars demonstrated improvements in scar thickness and colour.

In a study into using silicone gel dressings to address four challenging cases, including scars caused by third-degree burns, Marini et al (2017) concluded that silicone gels had beneficial properties for wound management and prevention, but advised that further research be conducted.

In October 2017, a quick-drying silicone scar gel, containing five different types of silicone—Nourisil MD (Figure 1)—was launched, and became available for prescription on the NHS drug tariff from February 2018.

**Creams**

Mahmudi et al (2015) cite various topical creams—fusidic acid, honey, Hypericum perforatum and lavender—that have been used for caesarean section scar healing. In a randomised double-blind trial into the use of turmeric in scar healing, they found that it resulted in faster healing times for caesarean section scars, with reduced complications.

However, dose standardisation and quality control are two of the challenges in applying such products to clinical settings.

**Vitamin E**

Noting that the topical application of vitamin E for post-surgical scar prevention and treatment is popular with the public and clinicians, Tanaydin et al undertook a systematic review of six published studies. Although only three reported beneficial effects of vitamin E, they found that in two studies when vitamin E was used in combination therapy—one with hydrocortisone and silicone; the other with silicone—‘there [seemed] to be a positive effect on scar healing’ (Tanaydin et al, 2016: 962).

**Scar-healing concerns**

A study by Baxter and Lynn (2015: 424) found that there was a need for caesarean scar care education in midwifery, especially as ‘caesarean section in obese patients is associated with an increased risk of surgical wound complications, including haematoma, seroma, abscess and dehiscence’ Ayres-de-Campos (2015: 406).

In a study of 4107 women (Wloch et al, 2012), 9.6% developed a post-caesarean section infection, with 0.6% readmitted for treatment. The authors concluded that risk factors included ‘obesity, age <20 years and operations performed by associate specialist or staff grade surgeons’ (Wloch et al, 2012: 1332). Comparatively, in a study of 765 women who had a caesarean section, Enohumah et al (2011) found a surgical site infection incidence rate of 16%.

New antimicrobial treatments in wound management use reactive oxygen species (Dryden, 2017). In an observational study of 186 women who were offered this treatment as a post-caesarean section wound dressing, there was a 60% reduction in surgical site infection, which the authors concluded could result in a potential nationwide saving of £5105 400 for the NHS each year (Dryden et al, 2014).

**Summary**

Caesarean section is an increasingly common procedure, yet despite evidence of the psychological impact of scarring, there is little guidance to address the care of caesarean section scars specifically. The phases involved in normal scarring are well-defined, and products are available to help minimise and treat scarring, with
evidence supporting the efficacy of silicone-based products as one element in addressing this challenge. Surgical site infection is one of the complications of caesarean section, and midwives are increasingly aware of the need for greater proficiency in caesarean section-related wound care and education.

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Baxter E, Lynn J. Do midwives see caesarean section wound care education as a need? British Journal of Midwifery. 2015; 23(6): 424–28


Sandhofer M, Schauer P. The safety, efficacy, and tolerability of a novel silicone gel dressing following dermatological surgery. SKINmed. 2012; 10(6, Suppl. 1) S1–S7


Nourisil™ MD helps to flatten, soften and smooth scars, relieve the itching and discomfort of the skin caused by scars and helps reduce any associated pain and redness.

Nourisil™ MD contains a unique blend of five silicones and Vitamin E which helps to maintain the skin’s moisture balance, while improving the appearance of scars.

Silicone-based products are recommended as the first line of therapy for both treatment and prevention of keloids and hypertrophic scars. Silicones are the only non-invasive, evidence-based treatment option available for the management of scars.

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Quick Drying
Nourisil™ MD has an elegant silky feel and dries in 60 seconds*

Airless Dispenser
Nourisil™ MD comes in a convenient, ready to use 30g airless dispenser. The self-sealing valve stops air from coming in and prevents the product drying out. Nourisil™ MD has a shelf-life of 36 months when left unopened and 12 months after opening.

Vitamin E
Nourisil™ MD contains Vitamin E which is an antioxidant. Studies have shown that, when added to silicone, Vitamin E improves the effectiveness of the treatment of scars.

Medical Device

Available for prescription on the drug tariff

For more information visit: www.nourisilmd.co.uk

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