

# Changing wound care protocols to reduce post-operative caesarean section complications

## Introduction

Research from the Health Protection Agency<sup>1</sup> identified 394 surgical site infections among 4,107 women followed up after a Caesarean section (C-section) operation (9.6%). The majority of these infections were minor (88%) and the risk was found to be higher in overweight or obese women.

This rate of infection is higher than would be expected for what is considered to be a relatively 'clean' operation i.e. not in an area of the body with high bacterial levels such as the large bowel which has a 14.7 per cent infection rate. The rate of infection following a hysterectomy is 6.6%.<sup>1</sup>

The use of Negative Pressure Wound Therapy (NPWT) for the treatment of open wounds is not uncommon. However there are few studies which would support the ability of NPWT to prevent infection and/or wound breakdown in closed incisions.

An audit within the Wrightington, Wigan and Leigh Trust, from August to December 2011 highlighted a high incidence of re-admission due to infection in caesarean section patients, with four patients readmitted in November 2011 alone. The audit also uncovered a higher incidence of wound infection in women with a BMI >35 assessed at booking visit.

This audit also uncovered the following issues:

- Lack of wound management knowledge
- Lack of patient education
- The initial wound dressing was removed at day one following surgery

In response to the study findings, recommendations were made in accordance with NICE guidance.<sup>2</sup> Based on this evidence and to aid optimal wound healing the dressing, OPSITE® Post-Op Visible (Smith & Nephew, Hull) is now left *in situ* for a minimum of seven days on all uncomplicated cases. For patients with BMI >35, PICO® (Smith & Nephew, Hull) is used as the standard post-operative dressing for this group, and is left *in situ* for one week.

Patient information cards are now issued to all patients prior to discharge in order to reduce confusion regarding activity levels and when to drive.

## Methods

Due to the high rate of re-admission and wound infection in patients with BMI >35, it was decided to evaluate the use of PICO® a Single Use Portable Negative Pressure Device.

PICO therapy was applied in theatre immediately following the operation and was left *in situ* for one week only.

Midwives have undergone wound management training and education on the application and management of the PICO therapy.

A total of 50 patients were recruited for the evaluation, 25 elective and 25 emergency surgery patients. The evaluation was over a twelve month period. The age range was 18-42 years, mean age of 31. Post-discharge surveillance was completed and patients were monitored for 30 days post-operatively. Infections were confirmed with both clinical observation and microbiological investigation.



Figure 1: PICO therapy *in situ* on a patient post Caesarian section

## Results

| Total number of patients in trial                                   | 50                                  |
|---|-------------------------------------|
| Elective C-sections   | 25                                  |
| Emergency C-sections  | 25                                  |
| Age range (years)   | 18-42                               |
| BMI range   | 30-53                               |
| Readmissions during evaluation (12 month)                           | 0                                   |
| Readmissions during November prior to evaluation                    | 4                                   |
| Infection rates prior to evaluation                                 | 12% for 6 months prior to the study |
| Infection rates during evaluation of PICO and OPSITE post-operative | 6% for 5 months                     |

In November 2011 there were four re-admissions due to wound infection. Based on an average of three days stay the cost relating to these re-admissions equated to £4,200\*.

Two patients had a temporary allergic reaction to the dressing and therapy was abandoned at four days post-operatively, this was possibly due to the drape retention strips and not the silicon wound contact layer.

The infection rate prior to the PICO and OPSITE evaluation was 12% for six months. Following the change in practice and the introduction of PICO and OPSITE Post-Op Visible, the infection rate was 6%.

This would suggest an average reduction of 50%, which could result in significant cost savings and improve wellbeing for a number of patients.

The following graph illustrates the overall total wound infections for the previous year and following commencement of PICO and OPSITE Post-Op Visible

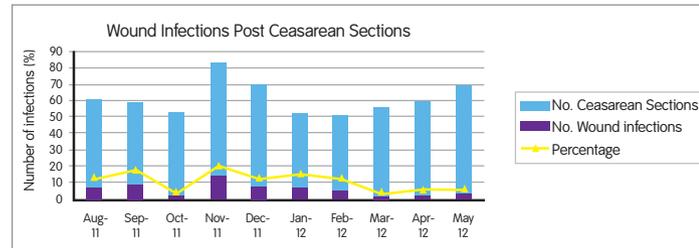


Figure 2: This graph illustrates the drop in wound infection rates once PICO and OPSITE Post-Op Visible were introduced



Figure 3: Post-Caesarean section Patient Information Card

## Patient feedback

Three patients who have previously experienced infected C-section wounds had no problem with wound infection when PICO was employed (one patient had three previous C-sections with infection)

Patient feedback has revealed positive outcomes; some of their comments are cited below: "This is my 3rd C-Section and I have had infected wounds following both previous operations. On this occasion the wound has healed well and the dressing has been comfortable"

"After my last C-Section the midwife removed the dressing the following day and advised that I use a sanitary pad to protect the wound. The pad was constantly moving and caused discomfort. I have had no problems with this dressing" (Nursed with OPSITE Post-Op Visible).

## Discussion

| Dressings                    | Number of patients | Cost per month  | Readmissions       | Cost                                   |
|------------------------------|--------------------|---|--------------------|--|
| PICO/ OPSITE Post-Op Visible | 65 (average)       | £735.60<br>5 PICO (£600)<br>60 OPSITE Post-Op (£135.60) | 0                  | £735.60 per month<br>£8827.20 per year |
| Standard treatment           | 65 (average)       | £39.65  | 3 average (£3,150) | £3189.65 per month<br>£38,274 per year |

Obesity is strongly associated with development of a surgical site infection, with the risk of developing an infection, (whether superficial, deep or organ/space) increasing the more overweight the woman is<sup>1</sup>. Those who were overweight (BMI 25-30) are 1.6 times more likely to develop an infection, obese women (BMI 30-35) are 2.4 times more likely and those with a BMI over 35, 3.7 times more likely.

Wound infection impacts not only on the mother and her family but also has an impact on the health service costs in relation to antibiotic use, GP time and midwifery care.

The benefits of the initiative include a reduction of re-admissions which cost in the region of £350 per bed day, excluding wound management, as well as a reduction of preventable wound infections and wound dehiscence. From a community perspective, the approximate costs of district nursing visits would be around £62 per patient per day and added to this the cost of an antimicrobial product. Thus there is a huge potential saving when reducing the overall infection rates.

Based on an average of 65 C-sections per month, the monthly expenditure of current dressing for OPSITE Post-Op Visible is £135.60 (60) and PICO £600 (5). However, in November 2011 there were four re-admissions due to wound infection. Based on an average of three days stay this equated to £4,200 (2011). Following this change in practice there have been no re-admissions or incidents of dehiscence.

A change of dressing from the original post-operative dressing to the OPSITE Post-Op Visible incurred an extra cost of £1.65 per dressing, however, the dressing remained intact during this time. The PICO NPWT system which costs £120 per kit is designed to provide a full seven days of therapy. See table above for cost comparison with standard treatment.

## Conclusion

This study demonstrates that using negative pressure on closed incisions in high risk patients can potentially reduce wound complications, readmission rates and may reduce the overall incidence of wound breakdown in this vulnerable patient group. In addition, the positive impact on the patient and families' wellbeing during a very important time in their lives cannot be ignored.

## References

- Health Protection Agency (2012) Risk of infection from caesareans at nearly 10 percent, <http://www.hpa.gov.uk/NewsCentre/NationalPressReleases/2012PressReleases/120801Infectionriskfromsection/> accessed October 2012.
- National Institute of Health and Clinical Excellence (2008a) Surgical Site Infection: Prevention and treatment of surgical site infection, Clinical Guidelines CG 74.