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SURGICAL SITE INFECTION: POSITIVE OUTCOMES THROUGH CONTINUITY OF CARE

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Surgical site infection: positive outcomes through continuity of care

Key learning outcomes

- Surgical wounds and surgical wound complications
- Clarify the meaning of surgical site infections (SSI)
- Explore the value of post-operative dressings
- Present examples of quality care and best practice
- Understand the value of continuity of care
- Explore the benefits of clinical pathways

Definition

- A surgical wound is a cut or incision in the skin that is usually made by a scalpel during surgery

- A surgical wound can also be a result of a drain placed during surgery[1]

In 2015/2016, more than 10 million operations were performed by the NHS[2]

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Surgical complications

- All surgical wounds are at risk of developing complications, i.e:
- Surgical wound dehiscence (SWD)
- Seroma
- Haematoma
- Delayed healing
- Poor quality or abnormal scar formation
- Incisional hernia
- SSI[3]

Incidence of SSI

It is estimated that:

- SSIs affect one in three patients undergoing surgery globally[5]
- 50% of SSIs become evident following hospital discharge and hospital audits will not include these[4]

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What is a SSI?

A SSI is a post-surgical infection that can affect either the incision or deep tissue at the operation site[4].

There are three types/classifications of SSI:

- Superficial
- Deep
- Organ/space[4]

Clinical signs and symptoms

Superficial and deep infection[3];

- Increased pain and tenderness at the surgical site
- Local or spreading swelling and induration
- Localised heat and redness
- Purulent drainage from the incision
- Local or spreading cellulitis
- Superficial or deep wound abscess

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Clinical signs and symptoms

In deep infection;

- Separation of the edges of incision
- Post-operative fever and abnormal blood test findings

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Clinical signs and symptoms

Organ/space infection[3];

- Purulent discharge when a drain is used through the skin into an organ or body space
- Organ or body space diagnosed abscess
- Evidence of infection following a direct examination
- Post-operative fever
- Positive blood tests and biopsies

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SSI and surgical wound dehiscence[6]

- Some post-operative surgical site complications increase the risk of surgical wound dehiscence, e.g. SSI, haematoma and delayed healing
- Conversely, surgical wound dehiscence can increase the risk of SSI
- Surgical wound dehiscence may not be caused by SSI and so may not require treatment for infection

Antimicrobial resistance (AMR)

- The damaging effects of antimicrobial resistance (AMR) are already manifesting themselves across the world
- General misconception that any surgical complication, e.g. SWD, seroma is synonymous with infection, which can lead to unnecessary antimicrobial prescribing and subsequent resistance[6]

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Role of dressings

- Surgical dressings should be kept undisturbed for a minimum of 48 hours after surgery (up to four days if possible) unless leakage occurs or symptoms change[4]

- Value and role of post-operative dressings needs to be communicated to patients, families and carers

Leukomed® Sorbact ® post-operative dressing

- Innovative surgical post-operative dressing for the reduction of bacterial colonisation with a purely physical mode of action

Sorbact bacteria-binding technology

- Safely binds bacteria from the wound
- No known mechanism of resistance has been described

Bacteria-proof adhesive film

- Effectively protects against external contamination
- Breathable and shower-proof

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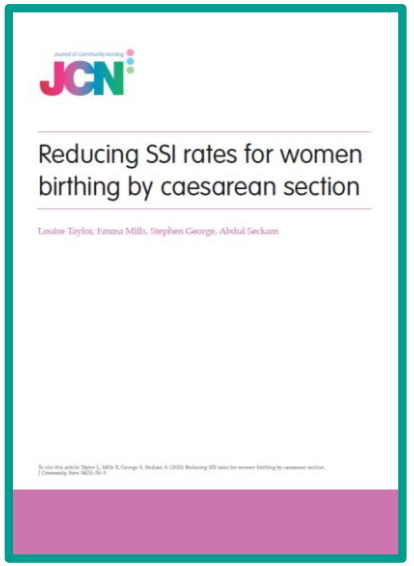
Aneurin Bevan University Health Board — drivers of change

- 2016, Public Health Wales (PHW) [7] reported overall 14-day SSI rate for women undergoing caesarean section of 4.35%
- From 2015–2016, ABUHB experienced an increase in the SSI rate for women birthing by caesarean section from 3.07% to 5.95%
- Multifaceted approach — ABUHB method:
  - Pre-operative care
  - Post-operative care (includes choice of dressing)
  - Staff training and processes



Taylor L, et al (2020) Reducing SSI rates for women birthing by caesarean section. *J Community Nurs* **34(3)**: 50–3

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Pre-operative care

- Evidence around skin preparation before surgery was reviewed
  - Chlorhexidine wash continued to be the skin preparation of choice, however the skin was no longer dried with swabs — left to air dry

- New drapes were introduced with increased adherence to the skin area surrounding the incision site

Post-operative care

- Clear information about wound care and leaving the dressing intact was given to patients on discharge
- Midwives reminded of the importance of following up wound swabs to ensure infections treated with appropriate medication
- Range of dressings available was reviewed
  - Aim — to provide optimum protection against infection for women with a raised body mass index (BMI)
  - Leukomed® Sorbact® bacteria binding post-operative dressings were introduced for patients with BMI >30 in the latter half of 2017
    - Decision subsequently taken to use on all patients at start of 2018

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Staff training — consistency

- Wound care education for midwives and support workers internal mandatory study days
- Electronic training package for aseptic non-touch technique (ANTT) introduced
- Introduction of Leukomed® Sorbact® included a face-to-face training package for staff

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The emotive effect of SSI...

... I had a two-year-old and a new-born to look after so relied heavily on family to help me, due to pain and appointments. I was put on two types of antibiotics following my C-section, but had developed an infection anyway. Bed transfers were the most difficult. I couldn't do this independently so relied on my husband for assistance and to pass me baby so I could breastfeed her during the night.
(Woman A)

As a result, my husband had to take extra unpaid leave from work which affected us financially.
(Woman E)

It just made me really worried and stressed, I struggled to breast feed anyway and gave up while recovering from infection.
(Woman F)

It was very painful and limiting with trying to look after my babies and hard to keep clean.
(Woman D)

When commenting on post-recovery...

I felt ok once infection had improved, but still had internal pain from the wound. A slow healing process which was frustrating with a baby and a toddler!
(Woman G)

Very relieved, but also some feelings of guilt that if I'd had a 'normal' birth I would have never got an infection and would have been able to look after my baby better earlier.
(Woman I)

I was prescribed some antibiotics from my midwife who had swabbed my wound. Then it got much worse very quickly, I was checked and swabbed at the hospital — the midwives there were amazing. Then once that swab came back my midwife took really quick action in getting me different antibiotics, she really was brilliant — having good care really helped me emotionally.
(Woman K)

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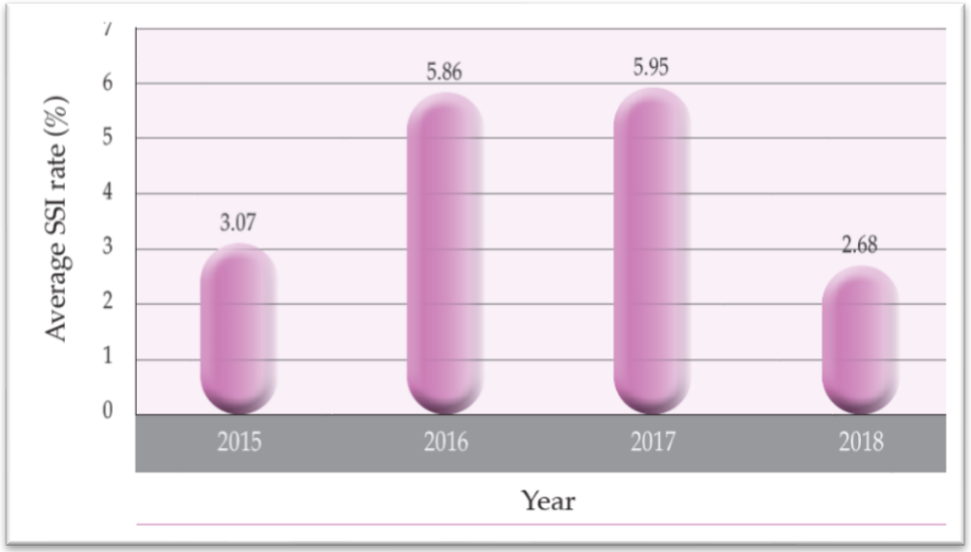
Results — SSI and cost reduction



Taylor L, et al (2020) Reducing SSI rates for women birthing by caesarean section. *J Community Nurs* **34(3):** 50–3

- 2017—2018 ABUHB maternity services reduced average SSI rate from 5.95% to 2.68%
  - 54% reduction in the SSI rate within one year
    - Welsh national average 4.02%[8]

Results — SSI and cost reduction

- Cost-savings to ABUHB — 2018 PHW report[8] indicated ABUHB maternity services reduced overall SSI rate by 47 individual episodes in 2018
  - NHS average cost = £3,976 per SSI episode[9]
  - Using this figure ABUHB maternity services saved an estimated £163,816 during 2018
  - Considers £23,056 ABUHB spent to implement using Leukomed® Sorbact® during 2018

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Personal experience

- Three sections in four years
- Second section — problematic
- High risk due to it being third section and previous complications
- Scar pain
- No time to rest
- Breastfeeding and bonding

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The third C-section

- Went into Aneurin Bevan — different county/different country!!
- Interesting being a TVN and having trialled it myself
- Everyone knew about the dressing, clear explanations

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Value of continuity of care

- Quality of care over time
- Process that involves the patient and all members of the healthcare team
- Ensure patient's needs met in a timely manner
- Embrace the role of patient advocate, work closely with other members of the healthcare team

Discharged from Wales to England

- TVN aware of discharging into neighbouring counties/trusts
- Funding
- Different formularies
- Different pathways/policies/guidelines
- Anxieties involved as a patient
- Very smooth process — reassuring

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Back to the family

Quality of life

- Tongue tied — breastfeeding difficult
- Sick — showers
- No time to worry
- Just needed to get on with life!
- Emotional time/vulnerable

Wye Valley Trust

- Return from maternity leave
- Three patients with SSI within two-week period
- Young, new mums
- Consequences for the patients
- Pathway — not robust
- Film and pad — negative pressure wound therapy (NPWT) dressing

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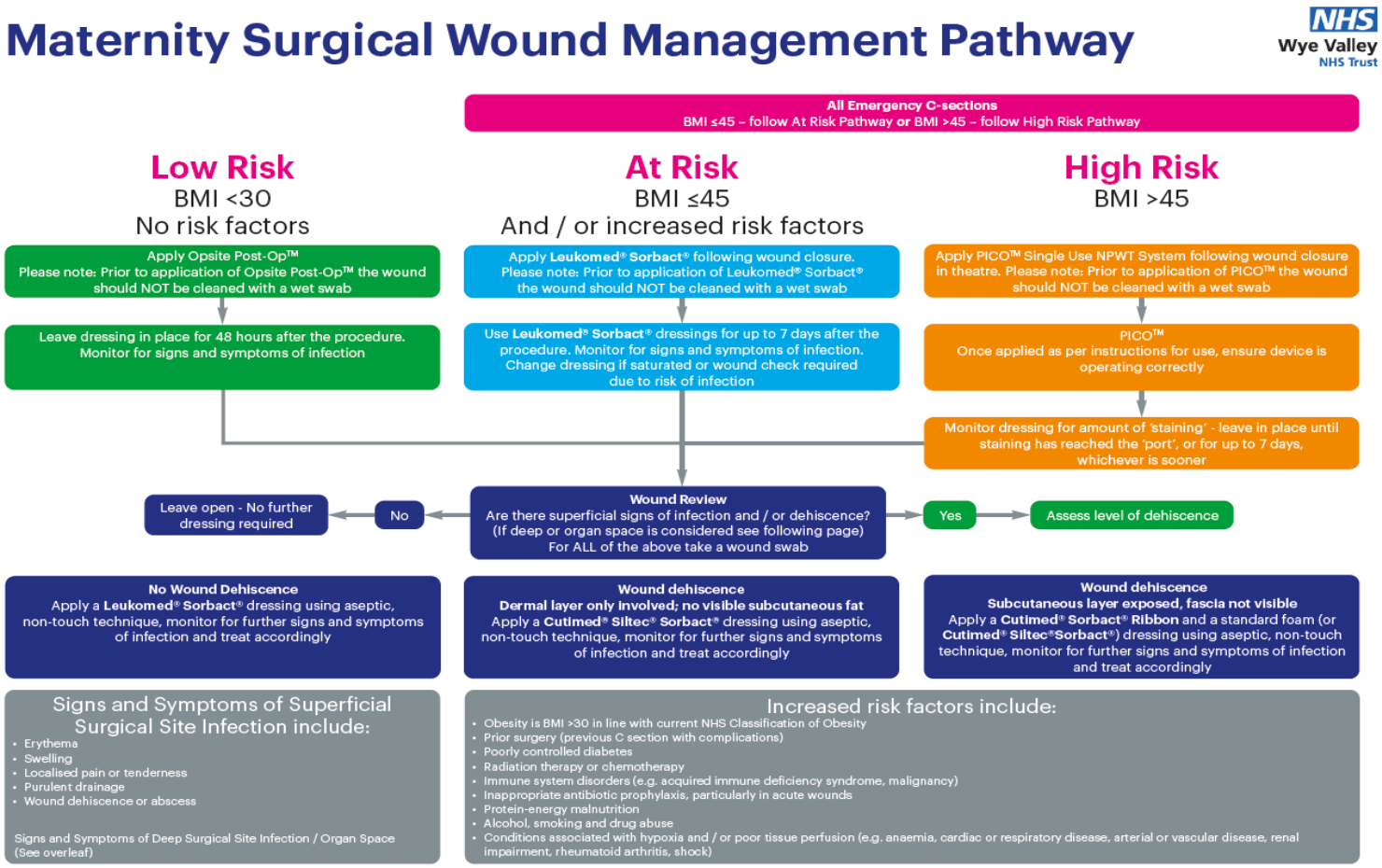
The added value of training

- Research suggests that standardised education is lacking for clinicians involved in dressing surgical wounds [10]
- It is estimated that nearly 50% of SSIs could be prevented by following evidence-based guidelines [11,12]

Wye Valley Pathway

- Identify need
- Buy-in from key stakeholders
- Support from Essity
- Getting it Right First Time (GIRFT)

Maternity surgical wound pathway



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Collaborative working between acute and community care

- Benefits of the pathway
- Smooth transition
- Same formulary/access to dressings
- Same pathway across acute and community settings
- No SSIs since pathway implemented this year
- SSI follow-up in the community

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Best Practice Statement


WOUND CARE

Reducing SSI rates for women birthing by caesarean section

Louise Taylor, Emma Mills, Stephen George, Abdul Seckam

Surgical site infections (SSIs) are the most common type of nosocomial infection, accounting for up to 20% of all hospital-acquired infections in Europe (European Centre for Disease Prevention and Control [ECDPC], 2013). There are varying SSI rates reported across the UK. In 2016, Public Health Wales reported an overall 14-day SSI rate for women undergoing caesarean section of 4.35% — 83% of which were superficial infections and 92.5% were detected after discharge (PHW, 2016). From 2015–2016, Aneurin Bevan University Health Board (ABUHB) services experienced an average increase of 2.79% in the SSI rate for women birthing by caesarean section. Therefore, a multifaceted approach to quality improvement (ABUHB organisational method) was adopted throughout the duration of 2017, with a view to implement by 2018. The aim was to reduce SSIs for women birthing by caesarean section in ABUHB. Interventions included the use of evidence-based practice and guidelines, education and engagement among clinicians, patients and staff, and the gradual implementation of Leukomed® Sorbact® (Essity) post-operative dressings.

KEYWORDS:
Surgical site infection ■ Caesarean section ■ Interventions ■ Education ■ Leukomed® Sorbact®

Surgical site infection (SSI) refers to an infection occurring at a part of the body (superficial or deep tissue) where surgery has taken place within 30 of days of a procedure (Stanirowski et al, 2019). Wound healing is a complex and dynamic series of events. If pathogenic bacteria enter wound sites, infection can occur, hindering the healing process.

Subsequently, this leads to physiological, psychosocial and financial complications for patients and their families, for example:

- Physiological — pain
- Psychosocial — anxiety and also lack of bonding with the baby, as the mother may be unable to lift and care fully for the new born or others within the household
- Financial — due to loss of earnings for the patient and potentially their partner if they are required to take unpaid leave to care for the baby/family.

Furthermore, it has been estimated that it can cost the NHS up to £3,976 per SSI episode (Jenks et al, 2014).

There are varying SSI rates reported across the UK. In 2016, Public Health Wales (PHW, 2016) reported an overall 14-day SSI rate for women undergoing caesarean section of 4.35% — 83% of which were superficial infections and 92.5% were detected after discharge. Aneurin Bevan University Health Board (ABUHB) maternity services experienced a rise in SSI rate for women birthing by caesarean section between 2015 and the end of 2016. The annual average SSI rate rose from 3.07% in 2015 to 5.86% in 2016. Thus, the authors explored factors for the increase.

An earlier evaluation of acuity levels using the Birthrate Plus workforce acuity tool (National Institute for Health and Care Excellence [NICE], 2019) highlighted changes in the complexity of women's needs within the health board. A national focus on sepsis and the importance of early recognition of infection with the potential to lead to sepsis may have increased awareness of SSI among midwives caring for women in the community setting. Eagerness to treat and a readiness to report any wound where inflammation or exudate was present before confirmation from swab results had been realised in some cases.

It has also been noted that patient demographics can increase the risk of complications during pregnancy and birth (Stanirowski, 2018a, b). These can include gestational diabetes, preeclampsia, haemorrhage, stillbirth, congenital anomaly (Leddy et al, 2008; Heslehurst, 2011), and can increase incidence of birth by caesarean section with a subsequent 2–3-fold increase in SSI (Conner et al, 2014). Additionally, a new maternity database had been introduced a couple of years before the 2015/16 rise in SSI. Following its introduction, a gradual rise in SSI was noted in the couple of years preceding 2015. The database was designed to be more robust in relation to data collection. The SSI information was embedded in the electronic data

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Conclusion

- Clarified the meaning of surgical wounds, complication and infection
- Explored innovative technology that can be used to prevent SSI
- Heard practical examples from Aneurin Bevan and Wye Valley emphasising the value of continuity of care
- Highlighted how the value of consistent training can affect patient treatment and experience
- Emphasised the importance of clear communication between acute and community teams to help prevent and manage SSIs in the community
- The value of clear clinical pathways

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