A 513 PATIENT SINGLE CENTRED STUDY REDUCING THE INCIDENCES OF SURGICAL SITE INFECTION RATES IN ORTHOPAEDIC SURGERY

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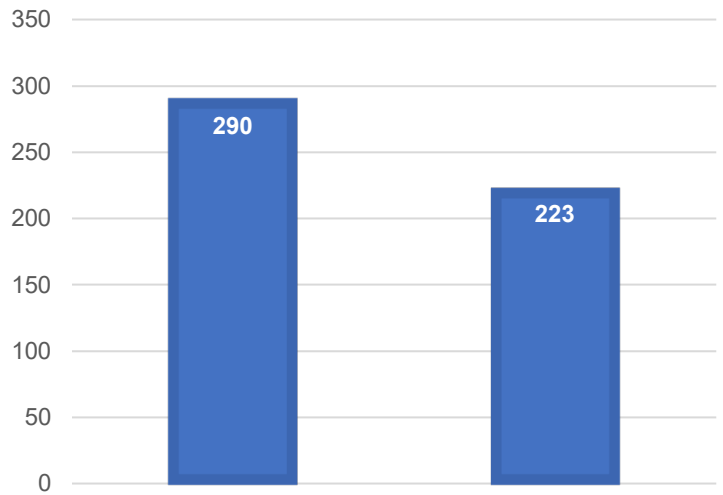
Introduction

The authors work in a busy NHS Trust with a population of 1.6 million which, prior to COVID-19 had 18 million visitors per year. The Trust is situated in a seaside destination giving rise to an ageing demographic making it a popular retirement location. Khow(1) supports that more people are living over the age of 65 and they are at a higher risk of hospitalisation and falls. With increased strain on the Trust, the authors are always looking to improve the service delivery to the patient they treat. The Trust carriers out approximately 350 elective orthopaedic surgeries each year. Orthopaedic Surgery falls within a Mandatory Surveillance programme, recording Surgical Site Infection (SSI) rates as a measurement of quality and cost effectiveness which can be associated with patient safety. SSI can increase costs for Hip surgery by £3214 and Knee surgery £2356(2)The aim of this study was to reduce the incidence of Orthopaedic SSI to improve patient outcome and reduce expenditure within the authors NHS Trust by implementing an Enhanced Recovery After Surgery Programme (ERAS). The authors Trust implemented an ERAS programme in 2016 following guidance from NHS England as they had been identified as high outlier for infections.

Method

- A 2 year period was selected to capture data to demonstrate a valid comparison.
- Clinical judgement was used to identified problematic wound healing in patients with Diabetes, high/low Body Mass Index, revisions and complex surgery.
- Data was collected on 513 elective orthopaedic patients using an audit tool (Fig 1).
- Introduced ringfenced orthopaedic beds
- Standardised/optimised analgesia
- Multidisciplinary Team Surgical team adapted their approach to a timely rehabilitation period
- The approach was taken to educate patients and hospital staff to achieve post-surgery outcomes
- Patient-focused social well-being encouraging earlier mobilisation
- Nurse-led discharge by the enhanced recovery team
- Streamline communication to enhance continuity of care by setting up outpatient clinics and follow up telephone consultations
- Sporadic standard dressing changes where omitted for a structured surgical dressing solution.
- Negative Pressure Wound Therapy System* with a Hydrofiber contact layer was implemented for high risk patients

NUMBER OF KNEE AND HIP ELECTIVE SURGERIES Fig.1



Presented at EWMA Virtual Conference, 2020

Discussion/Results

Data identified in August 2019 – November 2019: 3 hip infections were recorded for this 4 month period. A surgical solution pathway was in its development phase and the authors were identifying patients using clinical judgement.
If we compare this period to December 2019- March 2020 the surgical solutions pathway was fully implemented and data showed no infections for this period (Fig.2) If we calculate using the figures from Jenks et al (2013) this equates to a median cost of £9642. However, Badia (3) states that a total cost per patient for readmission in trauma and orthopaedic secondary to a surgical site infection is £25,940 of this £8979 is a readmission.

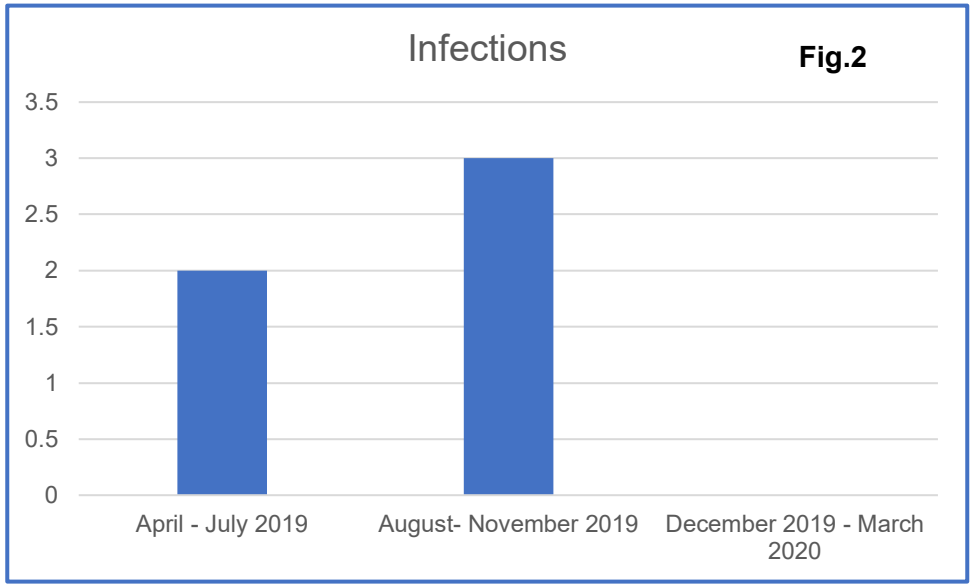
Since the implementation of Negative Pressure Dressing System on high risk patients the data also indicates a reduction of readmissions (Fig.2)
April 2019- July 2019 data indicated 8 readmissions compared December 2019 to March 2020 where there was 5. Following the cost model included in Badia (3) this would have equated to a saving of £26,937 on readmission costs alone.
An in-depth analysis was taken of 6 months worth of data, which included 48 patients who was receiving NPWT therapy to ascertain clinical effectiveness. The operation types can be seen in Fig.5. The 6 month period demonstrated that the earlier NPWT System* with a Hydrofiber contact layer was initiated the clinical outcome was improved. This was supported by reduced length of stay, reduced readmissions and a reduction in infection rates. The improved clinical outcomes empowered the MDT's decision to initiate NPWT pathway(Fig.4) on all high risk patients as an element of SSI reduction.

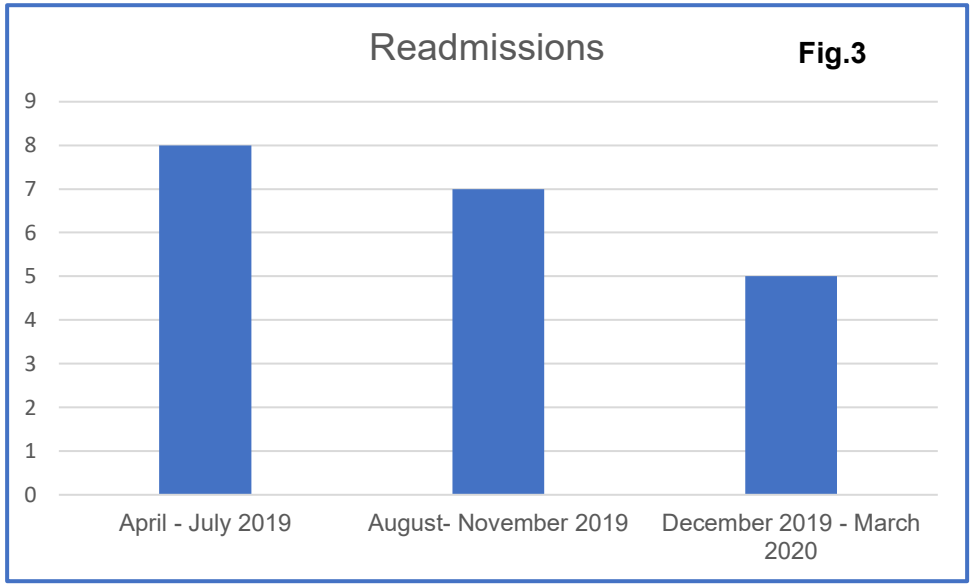
EWMA (4) reported having out-patient clinics will improve the standard of patient care. The authors agreed with EWMA and implemented out-patient clinics into their Trust as a further measure in reducing their infection and readmissions rates by providing continuity of care. The authors also felt post discharge telephone consultations would enhance communication resulting in a better patient experience and improve outcomes which was important for data collection

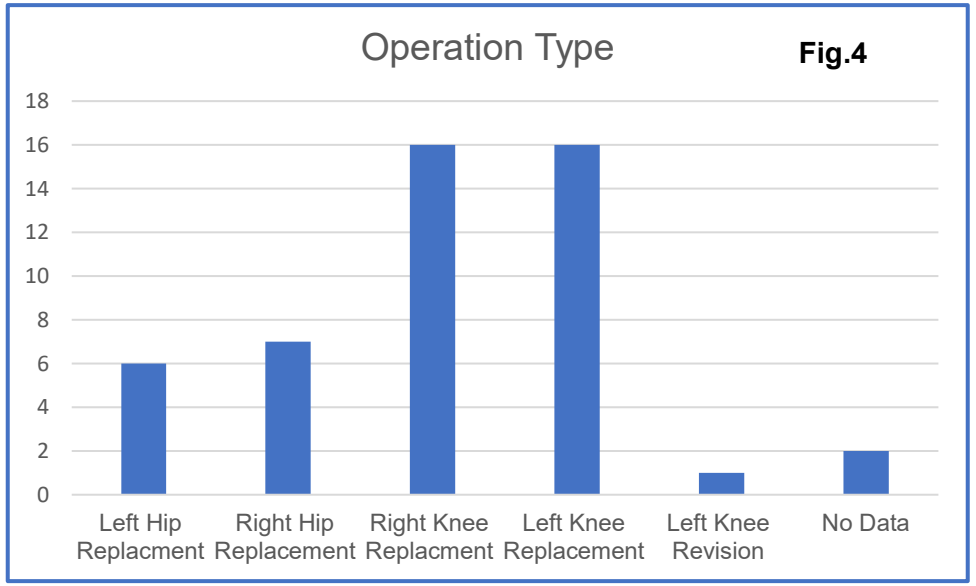
Ring-fencing of elective orthopaedic beds was also implemented as a measure to reduce procedure cancellations, infection rates and abolish MRSA(5)
Standardising analgesia also contributed to the earlier mobilisation of patients post-operatively. The authors also introduced day rooms to encourage social interaction and improve patient well-being.

By providing patient education this supported the patients understanding and potentially identifying earlier post operative complications. Follow up telephone consultations improved patient communication channels, enhancing the patient experience. Sporadic dressing changes were omitted by education and implementation of a dressing pathway (Fig.4), standardising ward staff approach. Following wound care education the authors utilised the dressing manufacturer to train hospital staff in the correct application of the Hydrofiber surgical** dressing and NPWT System* with a Hydrofiber contact layer.

Results


Infections
Fig.2
3.5
3
2.5
2
1.5
1
0.5
0
April - July 2019
August- November 2019
December 2019 - March 2020


Readmissions
Fig.3
9
8
7
6
5
4
3
2
1
0
April - July 2019
August- November 2019
December 2019 - March 2020


Operation Type
Fig.4
18
16
14
12
10
8
6
4
2
0
Left Hip Replacment
Right Hip Replacement
Right Knee Replacment
Left Knee Replacement
Left Knee Revision
No Data

Trauma and Orthopaedic
Incision Pathway

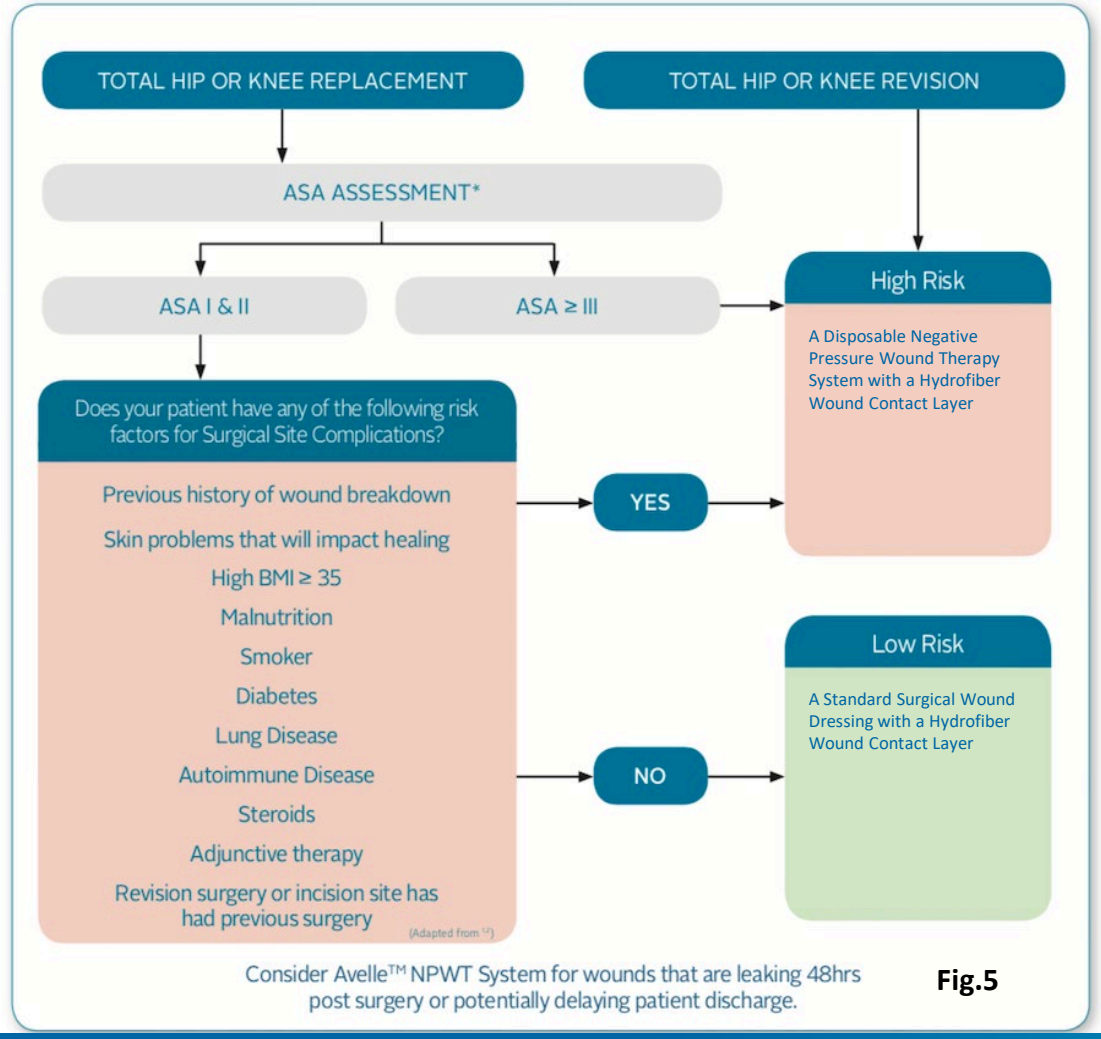


Fig.5

Conclusion

Data supports that an ERAS programme and positive adoption of an Incisional Pathway to standardised care, can support clinical decision making to improve patient outcomes.

Data also indicates that earlier intervention or prophylactic use of NPWT System* with Hydrofiber contact layer has proven to be cost effective treatment for elective orthopaedic high risk patients.

References

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(2) Jenks, P.J., Laurent, M., McQuarry, S. and Watkins, R., 2014. Clinical and economic burden of surgical site infection (SSI) and predicted financial consequences of elimination of SSI from an English hospital. *Journal of Hospital Infection*, *86*(1), pp.24-33.

(3) Badia,(2017) J.M., Casey, A.L., Petrosillo, N., Hudson, P.M., Mitchell, S.A. and Crosby, C., 2017. Impact of surgical site infection on healthcare costs and patient outcomes: a systematic review in six European countries. *Journal of Hospital Infection*, *96*(1), pp.1

(4) EWMA (2020) Sandy-Hodgetts K, Collier M et al. Surgical site infection: preventing and managing surgical site infection across health care sectors. J Wound Care 2020; 29: 2, Suppl 2b, S1–S69

(5) Biant, L.C., Teare, E.L., Tuite, J.D. and Williams, W.W., 2003, February. 'RING-FENCING'OF ELECTIVE ORTHOPAEDIC BEDS: ERADICATION OF MRSA AND EFFECT ON RATES OF POSTOPERATIVE INFECTION IN PATIENTS UNDERGOING JOINT ARTHROPLASTY. In *Orthopaedic Proceedings* (Vol. 85, No. SUPP_II, pp. 179-179). The British Editorial Society of Bone & Joint Surgery.

. * = Avelle™ NPWT System ** = AQUACEL® Surgical Cover Dressings

Avelle™ NPWT System and AQUACEL® Surgical Cover Dressings were purchased by the NHS Trust for the purpose of the evaluation. ® / TM indicates a trademark of ConvaTec group company