

Overview

Surgical site infection (SSI) is a resource-consuming complication of surgery and a threat to patient safety, accounting for around 20% of all hospital-acquired infections (HAIs) (Leaper, Tanner and Kiernan, 2013; Broex et al, 2009). Locally, participation in national prevalence surveys revealed that 15% of HAI was attributed to SSI. Furthermore, 189 readmissions in 2011/12 were due to SSI (as coded), resulting in 1650 additional bed days, and 10% of chronic wounds in the Wolverhampton community were due to SSI (local audit). To understand this patient safety problem, large-scale surgical site infection surveillance (SSIS) was introduced for patients undergoing a surgical procedure necessitating the creation of a wound and performed in a theatre environment at The Royal Wolverhampton NHS Trust. Information was provided to consultants via a monthly dashboard. Four years data has shown a decline in infection rates, due to consistent information sharing. Additionally, a reduction in the severity of surgical site infections has occurred.

The Royal Wolverhampton NHS Trust is a 900 bedded large combined acute and community teaching NHS Trust undertaking over 14,000 surgical procedures per year, approximately half of these involved a surgical incision as an inpatient. Following several publications of national and European HAI surveillance data the SSI rate remained responsible for a large proportion of infections with little change in national policy on surveillance participation.

Aim and Objectives

SSIS introduced locally as a patient safety initiative, to identify the burden of post-operative wound infection. The specific objectives were

- To provide consultant level infection data;
- To assure the Trust that surgical site infection rates were consistently measured and that they were within published norms;
- To provide baseline data on which to evaluate initiatives aimed at reducing surgical site infection.

Secondary objectives were

- To monitor readmission due to SSI and,
- To understand the incidence of the most serious categories of surgical wound infection (deep and organ/space).

This paper will focus on inpatient data from September 2012 to September 2016.

Methods

A sub-team of the Infection Prevention Team was recruited (see Table 1) to undertake the surveillance, this linked into the larger resource of the Infection Prevention Team particularly in relation to senior leadership and data analyst support.

Data collection commenced in September 2012 using paper forms based on the Public Health England tool (PHE, 2013) on surgical inpatients only. In July 2014 electronic data collection was introduced using the ICNet Surgery Module (Baxter Healthcare Ltd). Data was collected by healthcare assistants and positive triggers were followed up by the nurse (infection prevention nurses covered absences). Post discharge information was undertaken throughout at 30 days (and 12-weekly if a surgical implant had been used up to one year) using paper followed by ICNet Surgery Module as previously. Details of procedures included and excluded from the surveillance are provided in Table 2.

Results

Data collected was reported under the following four categories: Inpatient, readmission, post discharge (confirmed by a healthcare professional), patient reported only (following discharge).

The overall reduction in the rate of infection is demonstrated in Chart 1. This shows a drop in the cumulative numbers of those infections detected and confirmed during initial inpatient stay, readmission or post discharge. As well as numbers of wounds the most severe wounds has also decreased as a proportion of all wounds. Organs space from 8% to 2% and Deep incisional from 30 to 19% (see chart 2).

Table 1 SSI Team Structure

Post	*WTE numbers	Role
Nurse (Band 6)	1	Co-ordinator/Infecton Confirmation
Healthcare assistant (band 3)	2	Data collection
Administrator (Band 2) from September 2015	1	Telephone follow up/general admin

*WTE-Whole time equivalent

Table 2 Procedures included/excluded in surveillance

Included Categories	Surgical	Excluded Surgical Categories
Cardiothoracic Surgery		Mucous membranes only surgery
General Surgery (s large bowel, breast etc.)		Debridement or drainage of haematoma or abscess
Gynaecology		Trans-urethral procedures
Obstetrics		Trans-vaginal procedures
Trauma & Orthopaedics		Trans-anal surgery
Urology		ENT and Maxilla-Facial surgery
		Procedures performed by Endoscopy
		Diagnostic procedures
		Trans-oesophageal procedures

Picture 1 Surgical Site Infection Surveillance Dashboard and Consultant feedback

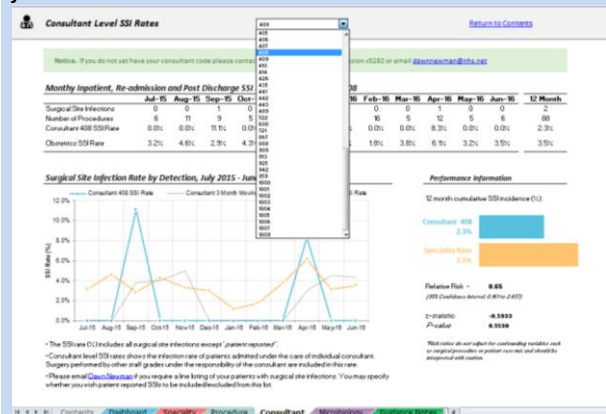


Chart 1 Inpatient, Readmission & Post Discharge SSI Rate with 95% Confidence Intervals

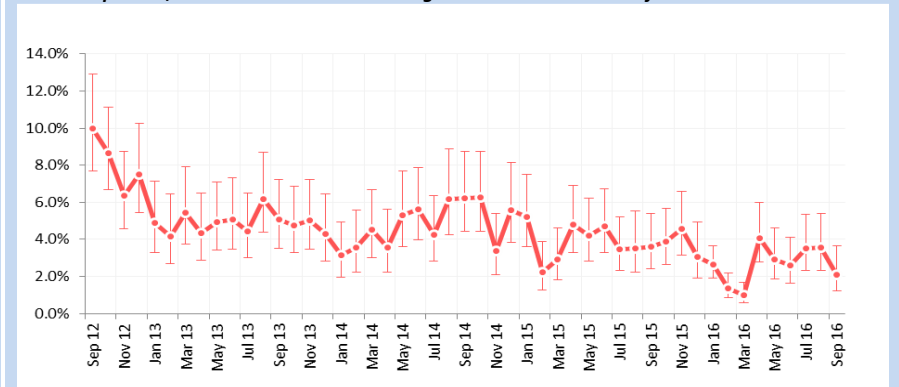
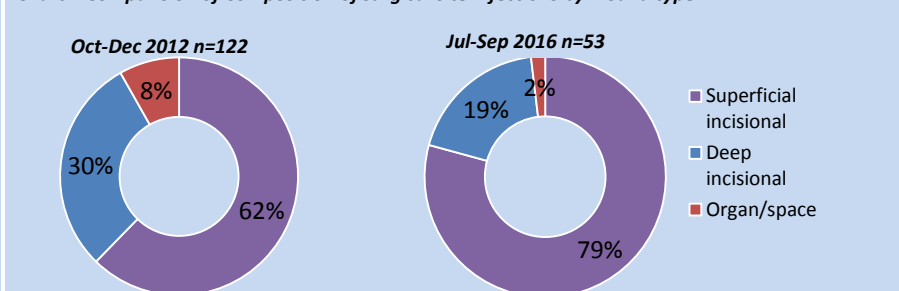


Chart 2 Comparison of Composition of surgical site infections by wound type



Conclusion

In excess of 7,000 procedures per year are now surveyed. Overall surgical site infection rates have fallen from 10% (including post discharge reporting) to 2.1%. During this period there was one 3 month period (Jan-Mar 2013) in which a specific 2% Chlorhexidine in isopropyl alcohol preparation (ChloroPrep) was trialled but then withdrawn. No other large scale improvement projects have taken place aimed at reducing SSI specifically. From this it is possible to conclude that the regular communication of SSI data has had a considerable effect on the rate. Next steps should include detailed analysis of the cost benefit of such surveillance and further enquiry into patient experience.