cemplicity

THE NEED TO KNOW

The Case for Patient-Reported, Post-Discharge SSI Surveillance

THE NEED TO KNOW

The case for patient-reported, post-discharge SSI surveillace

1. Introduction

Cemplicity currently runs continuous patient-reported, post-discharge SSI surveillance (PR-PDS) in the UK and NZ for 6 NHS Trusts and a number of private acute care providers. These programmes are proving valuable tools for quality and safety improvement.

Over the past three months, we have undertaken desk and qualitative research with a range of private and public acute care providers across NZ, Australia, the UK and Ireland. Our goal was to understand how we can better help healthcare providers reduce SSI incidence through better identification once patients are back in community care.

This paper summarises what we have learned and outlines our ideas for an enhanced PR-PDS service for acute care providers.

2. Current SSI Surveillance Methods

Surgical site infections (SSIs) are one of the most common complications associated with surgery; every patient undergoing surgery is at risk of acquiring an infection. A patient with an SSI may need additional antimicrobial treatment or may require further surgery, particularly if grafts or implants have been compromised. They may need to be readmitted and stay longer in hospital. SSIs can involve considerable physical and emotional burdens for the patient, including pain, discomfort and prolonged or permanent disability. There is also a higher risk of mortality, particularly among elderly patients.

For all these reasons – the effect on patients and the waste and rework in health systems, infection surveillance systems are important, proven to impact patient outcomes positively and are therefore well established in developed countries.

This positive impact occurs firstly through the collection and reporting of hospital readmission and pathology data for comparison and benchmarking, a role undertaken by the Surgical Site Infection Surveillance Service (SSISS) in the UK, the Health Quality and Safety Commission (HQSC) in NZ, the National Office for Clinical Audit (NOCA) in Ireland and State infection control services in each Australian State.

Secondly, impact is also realised through disseminating surveillance data at a local level, enabling clinicians and hospital executives to review local circumstances and surgical outcomes and use this evidence base to motivate greater compliance with infection prevention and control measures, instigate practice change and encourage standardisation of care. This local reporting may use patient-reported, post-discharge surveillance (PR PDS) data as well as readmission and pathology results.

Finally, some healthcare providers are using PR PDS to enable more proactive care. SSIs can be identified earlier, and patients can be supported to access appropriate medical advice and support before infections worsen.

Identifying SSIs is challenging because the majority of SSIs appear after discharge. A 2016 literature review of over 55 articles suggested that 60.1% of all SSI appear after discharge, although with significant variation reported across these articles, and variation by type of surgery[1]. What's more, the health systems in which Cemplicity works are reducing the length of hospital stays post-treatment to offset growing demand and staff shortages. This means the proportion of SSI occurring post-discharge is increasing.

Adding to the challenge is the difficulty in tracking patients after they leave a hospital. Using a patient seeking private healthcare in New Zealand as an example, a patient having surgery will first meet with their surgeon.

NHS Case Study

Like all countries in which Cemplicity operates, the mandated national monitoring and reporting protocols for SSIs are tightly prescribed.

Unlike other regions, NHS England also recommends patient-reported PDS using a short validated survey tool. All surveying is recommended at 30 days post-operation, or 90 days if implants are used.

The guidelines for this surveillance method include three criteria for using patient-reported information to identify an SSI.

Criterion 1: Discharge pus + antibiotics prescribed.
Criterion 2: Clinical signs + dehiscence.
Criterion 3: Clinical signs + antibiotics prescribed.

The surgeon will select the private hospital at which to perform the surgery. If the patient has an SSI they are most likely to seek medical help from their GP. The GP may request a pathology test prior to prescribing antibiotics. In severe cases the patient may be readmitted to a public hospital.

The only way that the private hospital knows about this patient's SSI is if they are told by the surgeon, or if they have a systematic way to share data with the pathology lab or local public hospitals.

Exchanging patient data is challenging, especially across public and private health services and in health systems that are without shared care records or unique patient identifier.

In Cemplicity's recent interviews with acute care providers across our four regions, none of these providers had an automated data sharing arrangement with local public hospitals or independent pathology labs. While their SSI incidence management approach meets local mandates and accreditation standards, it is generally accepted that the real rate of SSI is higher than the reported rate.

Clinical signs must include 2 or more symptoms (pain, heat, redness or swelling).

One of our clients in the NHS has used this survey for over 10 years, with over 1,000 SSIs identified. She reports that 93% of these SSIs met criterion 1 or 3, so antibiotics had been prescribed.

In our SSI research with clients across the private and public sector, several people questioned the reliability of using patient-reported data to identify SSIs. The fact that the majority of cases included a prescription for antibiotics means that these results have been clinically validated.

The U.K. Surgical Site Infection Surveillance Service (SSISS) guidelines strongly recommend that hospitals use PDS, including PR PDS, as this will considerably enhance the value of the data as a quality improvement measure.

However, given the optional nature of additional methods, the only method of post discharge surveillance included in benchmarks is readmission.

Most national surveillance systems were set up some time ago (e.g. in England as early as 1997 and in NZ in 2013). Initially systems focused on inpatient stay but subsequent reductions in post-operative hospital stay meant a significant proportion of SSIs occurred post-discharge. Systems then evolved to detect patients who are readmitted, attend outpatient clinics, or have pathology tests.

The focus of national surveillance systems in our four regions is on orthopaedic and cardiac specialties, although NHS Wales has implemented national surveillance for women having caesarean sections, with impressive results.[2]

Evidence suggests that the more data sources that are used, the higher the rate of SSIs that will be reported.[3] A study in Queensland identified that half of the SSIs associated with coronary artery bypass grafting were found through PDS.[4] Work undertaken in Scotland demonstrated that PDS will at least double the rate of SSI detection[5] and healthcare providers should not be penalised or blamed for proactively monitoring SSI incidence post-discharge. The monitoring bodies, such as SSISS, acknowledge this by distinguishing between SSI systems and reporting for benchmarking and comparison, and patient-reported SSI systems designed for local improvement and to guide clinical practice. In the UK, the only method of PDS included in national benchmarking is readmission to hospital.

3. Need to know or need to treat?

One of the most interesting questions that arose in our research interviews was

> Who is responsible for the patient post-discharge?

Across our regions, most providers believe the GP (or another community care service like a midwife or district nurse) is responsible for a patient once they leave the hospital.

Therefore, a symptom tracking service that is designed to monitor a patient to pick up signs of an SSI earlier would be of most benefit to the GP (of course it would be of most benefit to the patient, but if an alert about concerning symptoms is to be sent anywhere, it would be to the patient's GP.)

In a randomised controlled trial[6] in emergency surgery patients, 223 people were asked to complete a wound assessment survey postoperatively on days 3, 7 and 15. Results were compared with a sample of 269 patients receiving routine care. The primary finding was that the surveyed group had 3.7 times higher odds of diagnosis within 7 postoperative days. The trial group had significantly reduced community care attendance, similar hospital attendance and significantly better experiences in accessing care.

Most of our private sector interviewees felt a monitoring programme like this would be of most value to primary or community care providers who 'need to treat' rather than acute care providers. However, some of our public sector interviewees, particularly those operating in an integrated care setting, were interested in the ease with which digital platforms can survey patients earlier and more frequently. In a paper or phone-based surveillance system, early and more frequent follow-up required too much resource.

'Need to know'

All the private acute care providers we spoke to meet their mandatory SSI surveillance requirements and their accreditation standards for health-acquired infections (HAI). They do not need to do more to meet regulations and standards.

However, without exception, they care deeply about minimising the incidence of SSIs, primarily for the impact on patients. They 'need to know'.

'Need to know to treat'

For providers taking an integrated view of patient care, and who have a direct role in minimising patient harm as well as reducing rework and waste, PR PRS may be able to play an effective role. As well as the usual survey timing (30 days or 90 days), introducing symptom tracking through the early days post-discharge (e.g., days 3, 7 and 15) may enable quicker action if the patient's response signals a possible infection. This action could be an alert to an Infection Prevention and Control (IPC) nurse or a message to the patient at the end of their survey to recommend they contact their GP or midwife.

As we discussed the potential for PR-PDS several other valid questions and concerns were raised.

1. **How reliable or scientific is patient reporting?**
2. **PR-PDS will increase an acute hospital's reported rate of SSI by a significant amount, leading to more work to complete incidence reporting.**
3. **Some surgeons and consultants who choose to operate at a private hospital may have concerns about the provider surveying their patients.**
4. **Benchmarking across services, surgeons and hospitals based on PR-PDS may be unfair if response rates are not high and risk factors are not accurately captured and interpreted.**

In formulating our plans for an enhanced service, each of these points has been considered.

4. Applying an equity lens

Many national surveillance systems were designed over a decade ago and provide a population-level measure of SSI incidence that cannot be easily analysed to explore outcome variation.

Lighter, more agile patient-reported SSI surveillance provides the opportunity to address dataset gaps and to enrich the understanding of the drivers of inequality e.g.:

- Capturing patient age, gender, ethnicity and first language in a consistent format against each response.
- Incorporating risk stratification metrics that identify patients who may need additional support or communication e.g., matching a patient's postcode to an index of multiple deprivation and using this to classify patients into risk groups, that can then be used for analysis of reporting or for different clinical pathways.
- Incorporating questions on health confidence, so patients with less confidence navigating health services can be offered more support.
- Tracking effective shared decision-making and matching this to SSI incidence so that the impact of partnership with patients can be measured and improved.
- Monitoring patients' access to primary care and the length of time different patient cohorts take to identify symptoms and then access medical services.
- Asking about and understanding the impact of infection on patients' quality of life and how this differs for patient cohorts experiencing worse outcomes.
- Designing tailored reporting to focus on the different SSI outcomes and experiences of disadvantaged patients.

5. Cemplicity Recommended PR-PDS Approach

1. Survey Design

We have reviewed a number of surveys including the NHS standardised survey and several others.

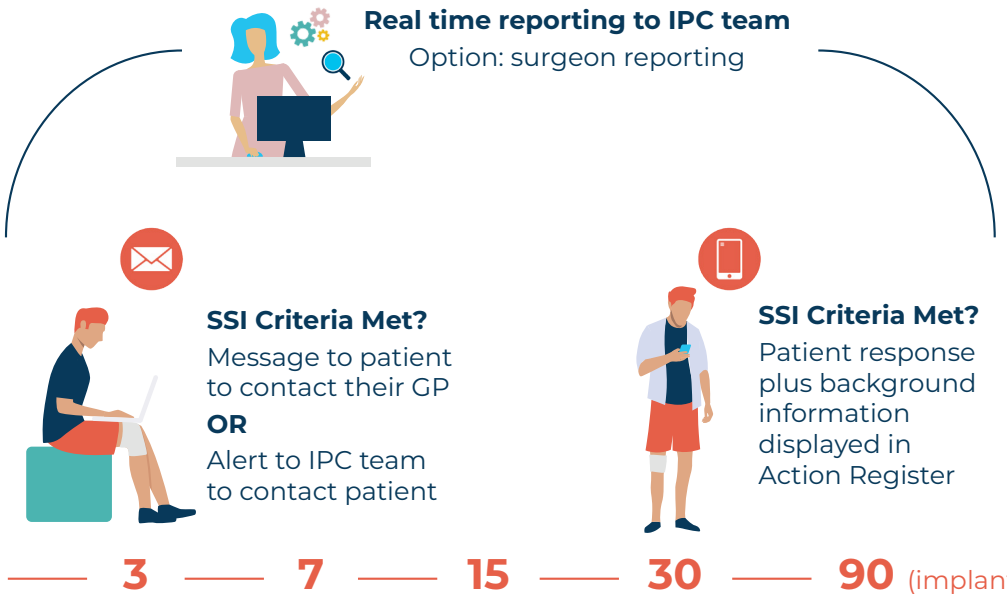
We have considered the wider range of information needs that help with understanding the causes and behaviours associated with SSIs.

We have also considered survey design best-practice for online data collection modes.

Pulling this together, we have developed a modular question set that surgical hospitals can adapt to their needs. The less adaption, the greater the opportunity for benchmarking and peer learning.

Where information can be gathered using validated questions, these have been prioritised. We know that NHS hospitals will prefer to use the NHS standardised survey, however we encourage them to consider additional questions that will make the responses more actionable. (Please contact us to request a copy of the question set.)

Timing



NHS guidance is that the maximum period of follow-up depends on whether the surgical procedure involves the insertion of an implant. If there is no implant, surveillance for an SSI should be stopped on the 30th day after the operation (since an infection that develops after the 30 days would not meet the U.S. Centre for Disease Control (CDC) definition of an SSI, published in 1992.)

If an implant has been inserted, a deep incisional or organ/space SSI may meet the definition of an SSI for up to one year after the operation. Many of our clients survey patients who had implants inserted 90 days after the operation. They may also wish to resurvey patients with implants at 1 year.

Clients can choose different surveying intervals or even multiple survey intervals. We recommend you consider 30 days and 90 days but also consider the norm for your country.

Providers in an integrated service or those interested in alerting an IPC team or patient when there is an early sign of infection may choose to add additional survey rounds closer to the discharge date.

As PR PDS is not used for benchmarking or national reporting, there is greater flexibility in the timing of surveying, to meet the needs of your patients and service.

2. Building a Complete and Useful Dataset

Across developed countries, there is good consistency in SSI surveillance and reporting standards. All the countries where Cemplicity operates use the CDC standard data fields, although some regulators also require additional information.

Once an SSI is identified, IPC teams need to gather information on the patient and their operation from different information sources. This complete dataset identifies risk factors associated with the patient and procedure, allowing targeted quality and clinical improvement steps to be taken.

Continuous PR-PDS with Cemplicity will likely increase the number of SSIs identified, adding to the workload for IPC teams. Therefore, we recommend that as many of these additional data fields as possible (e.g. ASA Score. Wound Class, Patient BMI) are included in the weekly file sent to Cemplicity.

When a patient completes the survey, these additional fields are matched to their response. We can then present this additional data straight back to the IPC teams to save them time. For clients using an Incident or Risk Management platform, there is also the option for us to pass patient records straight back into this 3rd party platform.

3. Clinical Engagement

All healthcare initiatives work better if clinicians are actively involved in their design, the results are fair and if the initiative directly supports clinical improvement.

We recommend close consultation with the Clinical Governance Group on:

- Finalising survey questions and the timing of invitations, using this paper as a guide.
- The presentation and reporting of results and reporting, and whether reporting at the individual surgeon level will be enabled.
- Whether role-based log-ins or email alerts should be enabled for each surgeon to see their SSI reporting compared to other surgeons. (There is the option for other surgeons' names to be anonymised, and an alert can also be enabled for some surgeons and not others, so this can be implemented in an opt-in approach.)

Streamlining reporting back to surgeons is one way to minimise the burden of increasing the identification of SSIs and to provide value to surgeons to support their patients' involvement.

4. Fair Benchmarking

There are two primary factors that deliver fair benchmarking.

1. **Achieving excellent patient participation and response rates so that results represent the patient population.**
2. **Ensuring risk factors are appropriately taken into consideration when comparisons are being made.**

Patient Participation and Response Rates

Achieving high response rates in a healthcare setting is an area of particular focus for Cemplicity.

As a result of our ongoing tracking and analysis of response rates and testing of different invitation strategies, we can achieve up to 70% response rates through email and SMS invitation modes and reminders.

Then, as a result of our research, we are designing our system to enable a hospital's IPC team administrator to view non-respondents so that they can then phone them to survey them by phone. The administrator enters responses straight into our system.

Some providers currently mail or phone all patients post discharge to survey them on SSI incidents. Implementing the Cemplicity system offers a significant opportunity to reduce administrative burden.

Risk Factors

One of the reasons we encourage clients to pass us background fields is because this saves them time when an SSI is identified.

The other reason is that these fields can be used as filters in Cemplicity reporting. For example, we can use the information to only report within specialities or procedure type, and these can be filterable by patient BMI, age group, wound class or emergency Vs elective procedures.

Without these risk factors, surgeons and facilities can still focus on their own trends in SSI incidents. This is more reliable because their patient populations will likely change over time.

5. Equity - Understanding and Reducing Variation in Outcomes

When designing a PR PDS programme, we need to incorporate strategies to address the inequalities embedded in each service. This is usually a range of measures including capturing the right data (e.g. ethnicity, BMI), designing alerts, interventions, and self-management material personalised to each patient (e.g. health confident, younger people may receive an alert to contact their GP whereas less confident people with English as a second language may receive a phone call from the IPC team) and developing an Equity Dashboard view of results that draws attention to the outcomes of specific patient cohorts.

7. Conclusions

Most SSIs occur post-discharge. Surveillance based solely on hospital readmissions or pathology lab results meets national reporting requirements but underreports the real incidence of SSIs.

Quality, safety, and clinical improvement rely on accurate information. Patient-reported, post-discharge surveillance is a reliable way to get this accurate picture of what is really happening so that improvement is targeted to the right areas. PR PDS can be useful alongside national surveillance systems to identify SSIs treated in the community. They can also be a cost-effective way to introduce surveillance in additional specialities, without burdening community healthcare teams with additional data capture work.

Not only does PR PDS provide the opportunity to augment datasets with additional data fields that are useful to address equality issues, but there are also other ways that we can design these programmes to support equity-targeted workflows.

Increasingly, digital tools are being used to track symptoms when people are at home to reduce the burden on care teams. There is evidence that earlier surveying of patients for SSIs post-discharge can help patient access care more quickly before their infection worsens. Cemplicity is interested in exploring this use of our platform.

Patient-reported SSI symptoms are reliable and there are validated questions that can be the core of a PR-PDS survey. However, there are also other things that can be asked of patients to add richness to the insight and to support effective improvement efforts. The impact of SSIs on patients is often severe and at times fatal. With the right approach and good clinical engagement, healthcare

providers have an opportunity to significantly improve patient outcomes.

References

1. **Proportion of Surgical Site Infections Occurring after Hospital Discharge: A Systematic Review. Erik Woelber 1, Emily J Schrick 2, Bradford D Gessner 3, Heather L Evans; 2016 Oct;17(5):510-9.**
2. **https://phw.nhs.wales/services-and-teams/harp/healthcare-associated-infections-hcai/hcai-reports-and-dashboards/caesarean-section-surgical-site-infection-surveillance-all-wales-annual-report-2018**
3. **Variability in infection surveillance methods and impact on surgical site infection rates Aurora Pop-Vicas, MD, MPH, Rebecca Stern, MD, Fauzia Osman, MPH, Nasia Safdar, MD, PhD Published: July 01, 2020**
4. **Si D, Rajmokan M, Lakhan P, Marquess J, Coulter C and Paterson D. Surgical site infections following coronary artery bypass graft procedures: 10 years of surveillance data. BMC Infectious Diseases. 2014; 14: PMC4061097**
5. **Reilly J, Allardice G, Bruce J and McCoubrey J. Procedure specific surgical site infection rates and post discharge surveillance in Scotland. Infection Control and Hospital Epidemiology. 2006; 27: 1318–23.**
6. **McLean, K.A., Mountain, K.E., Shaw, C.A. et al. Remote diagnosis of surgical-site infection using a mobile digital intervention: a randomised controlled trial in emergency surgery patients. npj Digit. Med. 4, 160 (2021). https://doi.org/10.1038/s41746-021-00526-0**

cemplicity°

For more information, just ask.

United Kingdom
0800 098 8525

Australia
1800 765 924

New Zealand
0800 157 258

hello@cemplicity.com
cemplicity.com