

Tissue Infection Referral Management to Increase Donor Volume
A Six Sigma Green Belt Study

Alexander Fike, CTBS
afike@versiti.org

Background:

Versiti has long embraced Continuous Improvement (CI) believing it is a mindset enabled by a flexible toolset aimed at raising the level of organization-wide performance and serves as a bridge between employees' daily work and their problem-solving needs. Under the CI umbrella are numerous methodologies to drive ongoing improvements, most notably is Six Sigma. Six Sigma is a concept that relies on a collaborative team effort to improve performance by systematically removing waste, reducing variations, and optimizing processes.

At Versiti, our Tissue Donation Specialist (TDS) team determines suitability on potential tissue donors primarily via EMR review, referencing acceptance criteria from different tissue processing agencies. In uncertain cases, the TDS team can prescreen with our tissue processing partners, presenting known medical and social histories for preliminary suitability determination before contacting the next of kin with donation options. This prescreening process prevents inappropriate family approaches when the donor is unsuitable.

Like many, COVID-19 forced the TDS team to transition from in-office work to remote work and a layer of accountability was lost with this transition. It became easier to close referrals without anyone questioning your decision as we were no longer sharing the same office space. In 2023, the TDS team triaged and screened 6918 death referrals from 211 hospital and Medical Examiner/ Coroner partners across the state of Wisconsin. Infections accounted for 20% of all deferrals, making it the second most common deferral reason. Considering the complex nature of infection diagnoses, the diverse perspective of multiple MS processors, and the significant volume of infection-related deferrals; a comprehensive evaluation of infection referral management practices was warranted.

Hypothesis:

Problem Statement

From September 17, 2023, to November 4, 2023, the number of tissue donation referrals prematurely closed due to infection concerns, without a processor prescreen, averaged 5.3 per week.

Objective Statement

Reduce the number of tissue donation referrals prematurely closed for infection concerns without a processor prescreen from 5.3 per week to 1 per week (an 80% reduction) by December 31, 2023, thereby gaining an additional 1.6 donors per 100 referrals without adversely impacting our conversion rate.

Methods:

The TDS team logs daily referrals in a spreadsheet, allowing quick access to volumes and outcomes. I was able to filter the outcomes to include only infection related deferrals and export those to a separate tracking spreadsheet. On a weekly basis I reviewed each deferral against the following criteria:

- Was a prescreen performed?
 - If no, was processor criteria followed, as written?
 - If no, would this referral have been likely accepted by our processing partners?

Experience and expertise were used to judge potential acceptance of previously closed referrals with infection concerns.

Key Process Output Variables (KPOVs)

- Decrease the amount of tissue donation referrals that are prematurely closed for infection concerns,
- Increase the number of prescreened referrals concerning for infection.

These KPOVs were chosen since the TDS team is the owner and sole performer of the screening process for all deceased tissue referrals, allowing for a great deal of control over the process. To determine the degree of stability for both KPOVs a P-chart was used due to varying sample sizes. Of note, the number of referrals closed for infection concerns is outside of our control and varies seasonally, and while this number was monitored it was not a selected KPOV. All infection deferrals were monitored on a weekly basis over the course of seven weeks.

The current state control chart (Fig.1) was stable within both control limits and represented by a mean of .208 over the course of seven weeks. Indicating that from 9/17/23 – 11/4/23, 21% of tissue referrals closed for infection concerns were done so prematurely and had a high potential to be accepted on a prescreen. During the same period, our data also indicates that on average 37% of infections cases were prescreened with our processing partners.

Targets/ Goals for KPOVs

After determining the baseline data for the two KPOVs, the following goals were set:

- Reduce the amount of tissue referrals prematurely closed with infection concerns by 80% (5.28 per week to 1 per week)
- Increase the number of prescreened infection cases by 50% (8.8 per week to 13 per week)

Initially, I had intended to solely increase the number of prescreened referrals; however, prescreening a referral is not practical or necessary in all situations. Through this analysis, I realized that reducing prematurely closed referrals would be more impactful in increasing our donor volume and I revised my problem statement.

Results:

Upon reviewing the data with my project team, we identified multiple factors impacting our number of prematurely closed infection referrals:

1. Individual TDS with varying screening abilities and donation experience,
2. Lack of referrals being prescreened with processing partners. Applying past solutions on a current referral where specifics may differ, blanket solutions.
3. Individual TDS with non-working EMR access, forcing them to screen potential donor over the phone. RNs are busy and might not be providing the complete picture.

Solution Selection

The chosen solution to our problem was to make prescreening referrals with infection concerns mandatory, with specific expectations. I standardized our deferral documentation in our donor tracking software and required the TDS to report infection deferrals closed without a prescreens via email. These changes went into effect on November 5, 2023. The TDS were required to have each EMR access working as part of their 2023 annual competency assessment.

Improve

As stated above, the chosen solution to our problem was multi-faceted to ensure we were not closing any referral prematurely. I continued to track each infection deferral against the same criteria:

- Was a prescreen performed?
 - If no, was processor criteria followed, as written?
 - If no, would this referral have been likely accepted by our processing partners?

When a non-conformity was identified a detailed email was sent directly to the responsible TDS and their supervisor that summarized the *miss* and offered guidance on handling future referrals. Proper supportive documentation in our donor tracking software was monitored and follow-up emails were sent when appropriate. Email communication was not ideal for this purpose but due to the TDS' hybrid work schedule it was impossible to meet face-to-face and discuss the misses real-time.

I monitored infection deferrals for 8 weeks following the November 5th implementation and saw numerous improvements. The percentage of tissue referrals with infection concerns that were prescreened with our processing partners increased from 37% to 57% and remained stable within the control limits. This did fall short of my goal but is still a sizable increase.

The percentage of tissue referrals prematurely closed with infection concerns decreased from 21% to 3% on average and I was able to exceed my goal with an 85% reduction. (Fig.2) Without micro-managing the TDS staff I think a total elimination of non-conformities would be quite challenging.

Conclusion:

Due to the highly variable nature of tissue donation, it is difficult to estimate a precise monetary gain. I reviewed the first 100 tissue donors of 2024 and identified donors that matched all the following criteria:

- Prescreened because of infection concerns,
- 1 processor deferred on the prescreen due to infection concerns,
- 1 processor accepted the prescreen and final eligibility screen.

I identified nine donors meeting the criteria who could have been missed under previous prematurely closed referral data. Multiplying these nine donors by the difference in pre- and post-implementation prematurely closed cases (0.208-0.03) equates to 1.6 additional donors per 100 donors. Estimates suggest this project could result in up to 12 additional donors annually.

I provided the Tissue Screening Supervisor with an updated outcomes list to streamline case identification through our donor tracking software, eliminating the need for a separate tracking log. An "Infection Rule Out" category was created to facilitate search and review of infection deferrals more efficiently. My secondary metric was to monitor our conversion rate for any adverse changes. While our conversion rate decreased by about 4% in Q4 2023 compared to Q3 2023, it improved by 8% in 2024 compared to Q4 2023.

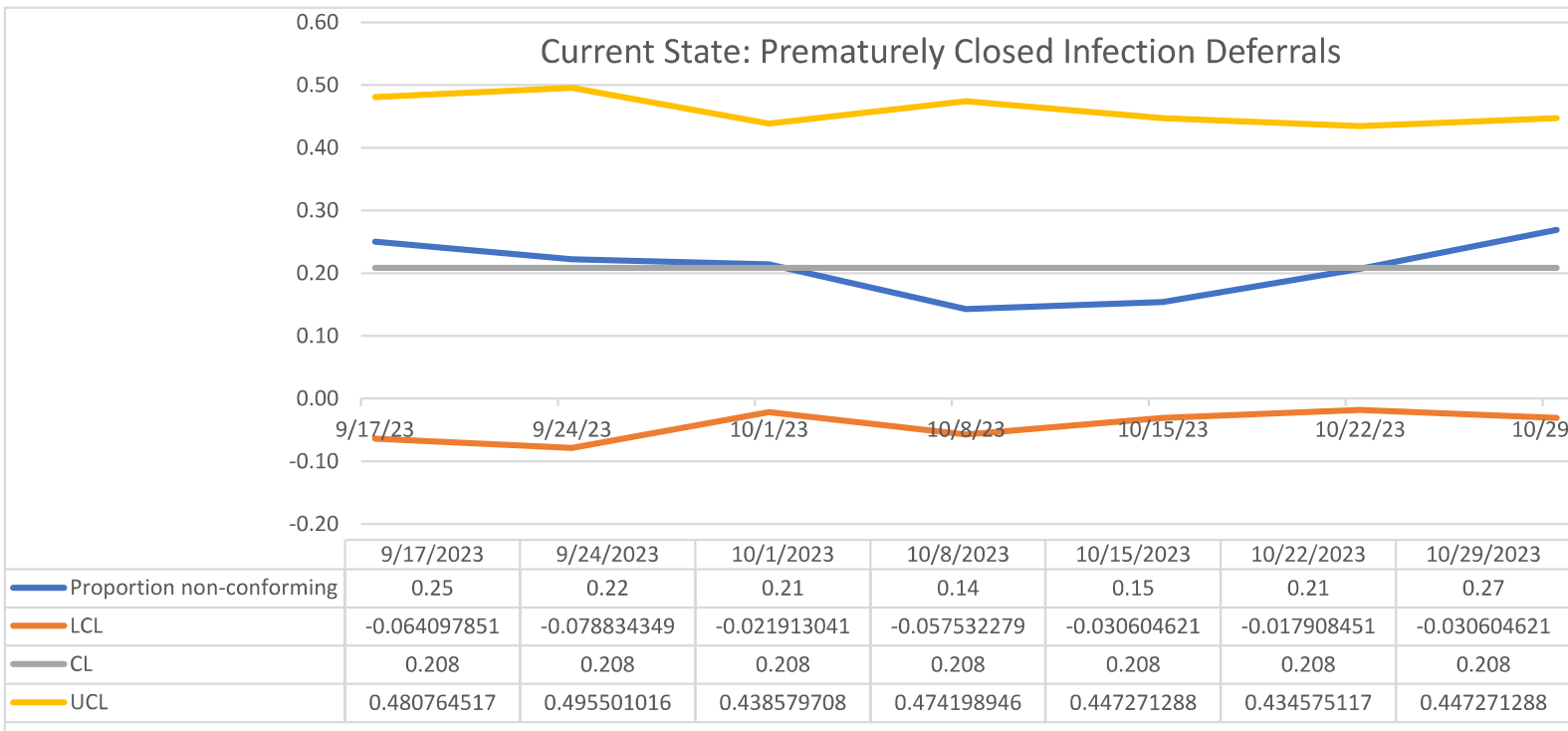
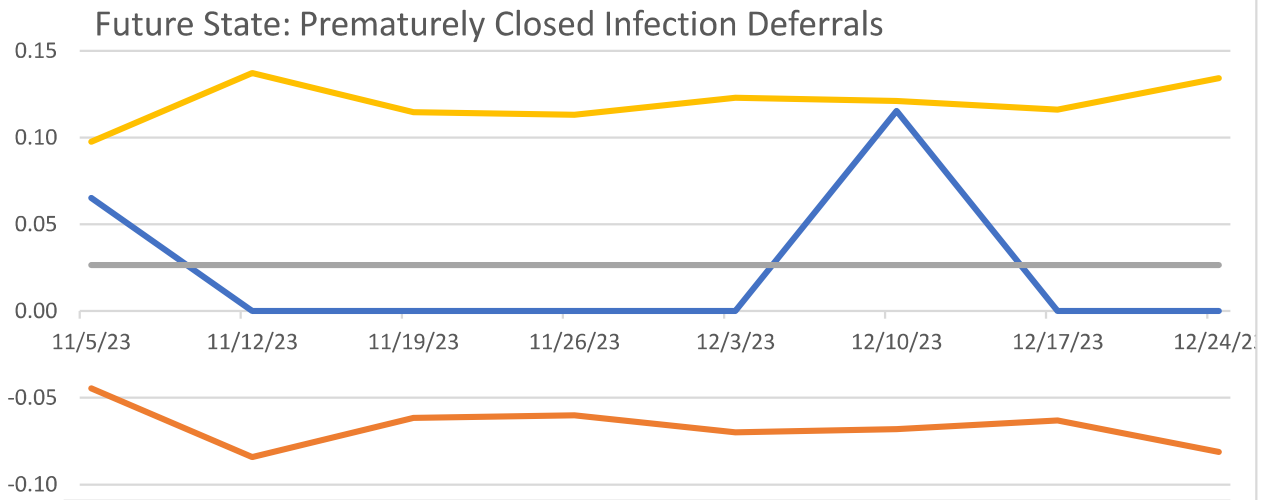


Figure 1: Current State P-Chart for Prematurely Closed Infection Deferrals



	11/5/2023	11/12/2023	11/19/2023	11/26/2023	12/3/2023	12/10/2023	12/17/2023	12/24/2023
Proportion non-conforming	0.07	0.00	0.00	0.00	0.00	0.12	0.00	0.00
LCL	-0.044559721	-0.084094082	-0.061503313	-0.060071478	-0.069907445	-0.068034332	-0.063008584	-0.081292545
CL	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
UCL	0.097657066	0.137191427	0.114600658	0.113168823	0.12300479	0.121131677	0.116105929	0.13438989

Figure 2: Future State P-Chart for Prematurely Closed Infection Deferrals

Tissue Infection Referral Mgmt. to Increase Donor Volume

A Six Sigma Green Belt Study

Alexander Fike, CTBS

afike@versiti.org

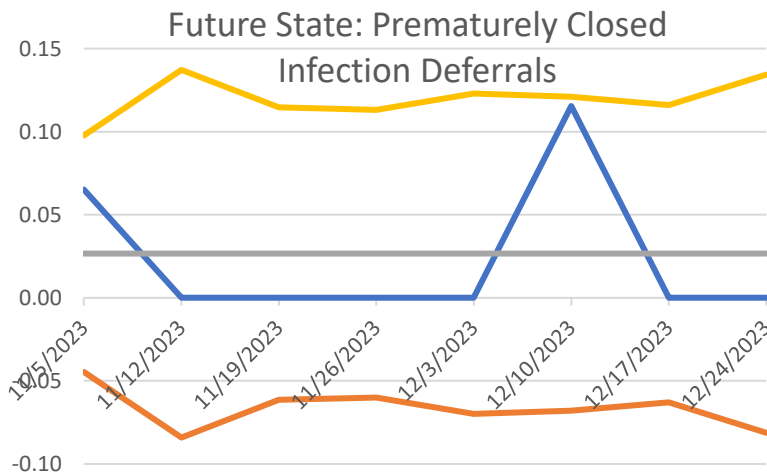
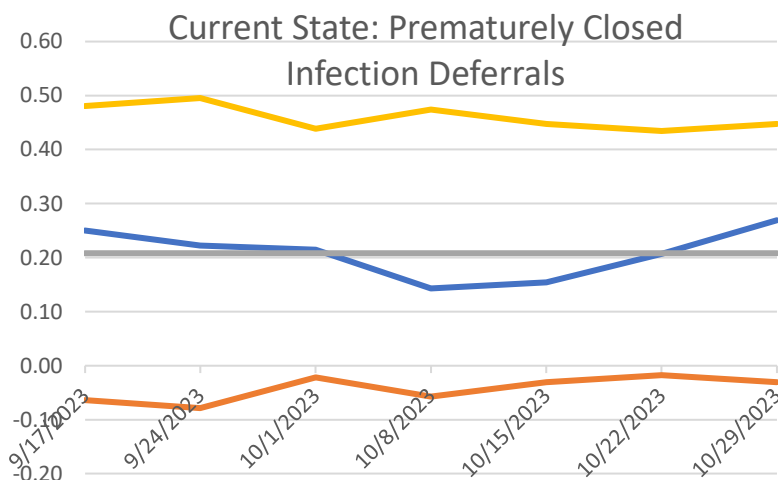
Background: In 2023, our Tissue Donation Specialist (TDS) team triaged and screened 6,918 death referrals from 211 hospital and Medical Examiner/Coroner partners throughout Wisconsin. Of these, 20% (1,383) of the closed referrals were attributed to concerns related to infections. Our TDS staff relies on pre-screen consultations with our processing partners to prevent prematurely closing suitable referrals and to ensure that accurate donation options are presented to the next of kin (NOK). Considering the complex nature of infection diagnoses, the diverse perspectives of multiple MS processors, and the significant volume of infection-related deferrals, a comprehensive evaluation of infection referral management practices was warranted.

Problem Statement: From September 17, 2023, to November 4, 2023, the number of tissue donation referrals prematurely closed due to infection concerns, without a processor prescreen, averaged 5.3 per week.

Objective Statement: Reduce the number of tissue donation referrals prematurely closed for infection concerns without a processor prescreen from 5.3 per week to 1 per week (an 80% reduction) by December 31, 2023, thereby gaining an additional 1.6 donors per 100 referrals without adversely impacting our conversion rate.

Methods: Initially, our baseline assessment revealed that 21% of tissue referrals closed for infection concerns were done so prematurely, lacking a prescreen consult, yet held potential for acceptance by one of our MS processing partners (fig. 1). Upon identifying various contributing factors, we implemented a proactive measure: all referrals involving infection concerns now must undergo a mandatory prescreening process.

Conclusion: Through the implementation of mandatory prescreens for referrals with infection concerns, alongside diligent monitoring, follow-up, and staff coaching, we successfully reduced the rate of prematurely closed referrals due to infection concerns from 21% to 3% (fig. 2). As a result of completing this project, we anticipate an increase of 1.6 additional donors per 100 donors or 12 additional donors per year.



Yellow line: Upper Control Limit
Orange line: Lower Control Limit
Blue line: Non-conformities
Gray line: Weighted average of non-conformities

