STATISTICAL ANALYSIS PLAN

Study name	Topical Antibiotic Treatment for Spine Surgical Site Infection
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We will compare answers to survey questions related to knowledge of IWA (five questions scored from 0-100 points) and the use of IWA. We will divide surgeons into categories of IWA use (i.e., low-, medium-, and high-users based on Spine SCOAP data) and compare these groups with respect to survey questions related to knowledge using linear regression modeling with robust standard errors to examine whether other patient-panel- or surgeon-level factors are associated with IWA knowledge scores. We will conduct *post-hoc* missing data analyses of IWA users who did and did not respond to the survey to examine whether IWA usage group is associated with the survey non-response rate (survey non-response bias). If important patient-panel or surgeon-level factors are found to predict survey non-response, we will correct for potential survey nonresponse bias using variable response propensity weights.

We will use the linked data sources to characterize hospitals based on SSI and IWA use in order to inform the design and size of a cRCT. Based on the ascertainment period for rates of SSI (determined in Aim 1), we will assess the number of hospitals required, the length of recruitment needed, and the number of months of follow-up in order to have ample power to compare risk reductions in SSI of 30%, 40%, 50% between hospitals randomized to IWA versus usual care. We will also use the linked data to determine the ICC, a critical parameter that reflects the level of correlation of outcomes due to hospital- or provider-level characteristics and has a major influence on cRCT design.

Site willingness to participate will be determined and if the site is unwilling to participate they will be replaced until enough willing sites within sufficient numbers of clusters are determined. For the PAN we will conduct a thematic analysis in which we will look for patterns in the data related to participation in cRCT. Thematic analysis is performed through the process of coding in six phases: 1) familiarization through reading the data, 2) generating and applying codes, 3) searching for themes among codes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the final report. The audio-recordings of the interviews and focus group discussions will be transcribed, checked for accuracy against the audio-recording, and entered into Dedoose Qualitative Database[36] in order to select and code relevant statements made by participants. Once coding of the qualitative data is complete, the study team will organize the codes into themes, such as knowledge, attitudes, and barriers for the implementation of a cRCT.