

## Background

- Shoulder instability continues to be a common problem that is difficult to treat, partly due to the numerous post-operative complications that can impact the clinical course.
- Even though *C. acnes* lives on healthy skin at baseline, surgical incisions introduce the possibility of deeper tissue colonization or bacterial adherence to surgical implants, causing deeper infections.
- The less than 3.4% rate of shoulder infection, most commonly due to *C. acnes*, after arthroscopic or open shoulder surgeries is relatively small but significant enough to halt clinical improvement.

- Low-grade deeper infections that are harder to diagnose must be considered in patients with a suboptimal clinical course.

## Objectives

- To identify the incidence of subclinical infection in patients undergoing revision shoulder stabilization surgery
- To identify any risk factors for developing a subclinical infection.

## Methods

- Charts Reviewed:** 94 charts of patients who underwent revision surgery by the senior author after a previous arthroscopic or open stabilization surgery for shoulder instability from January 2012 to December 2022
- Inclusion Criteria:** Patients of any age who underwent either bony or soft tissue revision surgery, regardless of number of previous surgeries or corticosteroid injections
- Exclusion Criteria:** Patients that had a previous infection in the shoulder, if there was no record of the procedures performed in the previous surgery, or if cultures were not available for review

- Outcomes:** Demographic information, surgical information, cultures obtained, and positive cultures

## Results

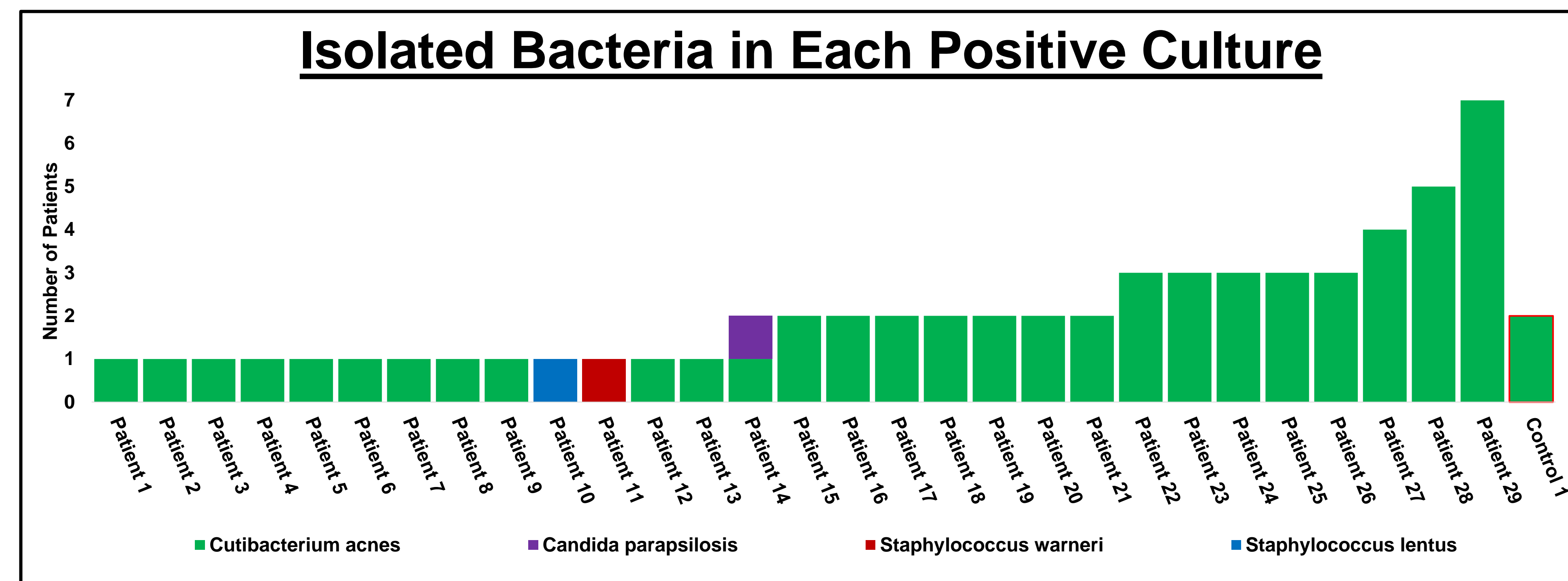


Figure 1. Isolated Bacteria in Each Positive Culture

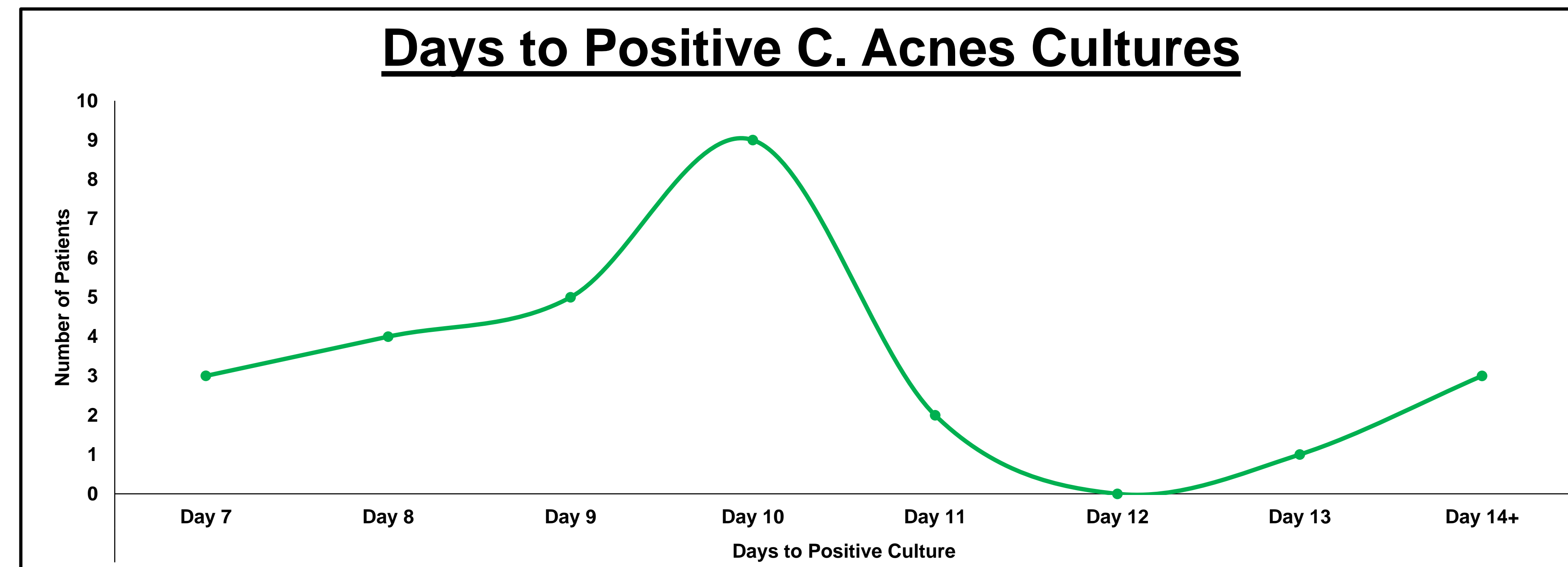


Figure 2. Days to Positive C. acnes Cultures. Number of days after intra-operative shoulder culture was taken to positive C. acnes culture. C. acnes=Cutibacterium Acnes.

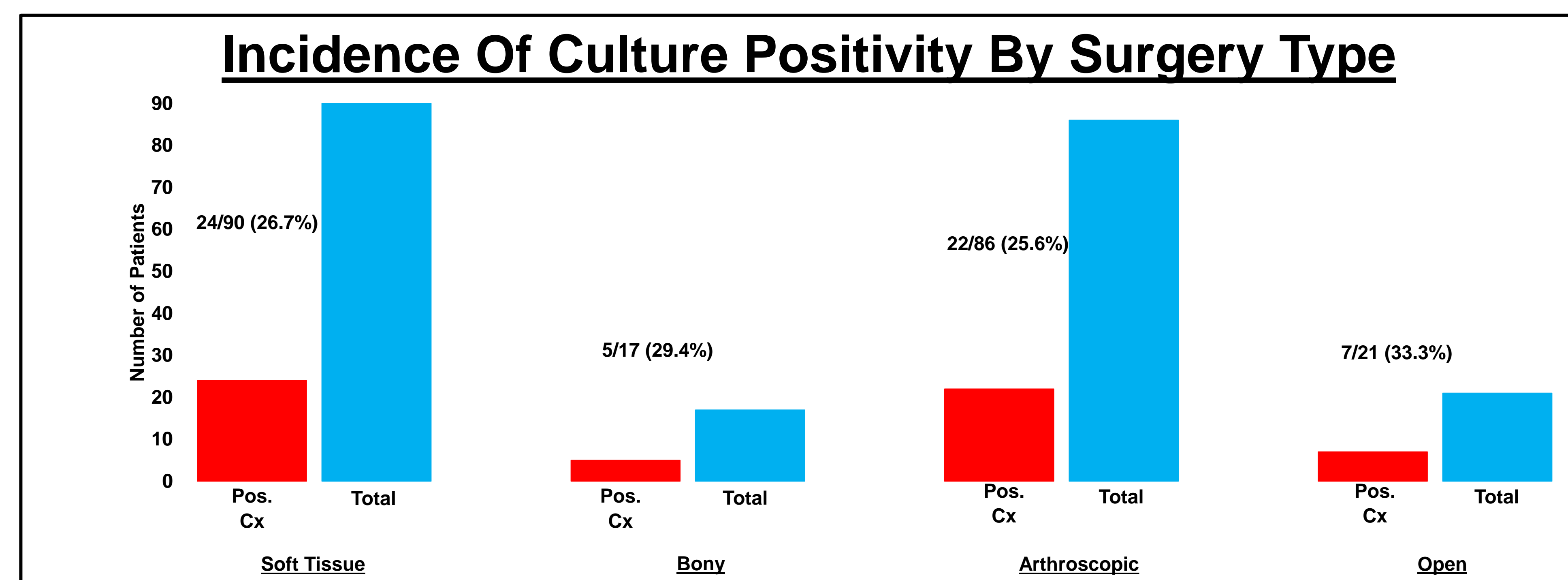


Figure 3. Incidence Of Culture Positivity By Surgery Type. Positive culture incidence for initial soft tissue procedures, bony procedures, arthroscopic procedures, and open procedures. Pos. Cx=Positive Culture; Total=Total patients undergoing each procedure type.

## Demographics

| Demographic                  | Culture Negative | Culture Positive | Total        | Bivariate Comparison |
|------------------------------|------------------|------------------|--------------|----------------------|
| <b>Average Age</b>           | 33.83 years      | 38.58 years      | 35.12 years  | 0.17                 |
| <b>Gender</b>                |                  |                  |              | 0.03                 |
| Male                         | 57 (73.1%)       | 27 (93.1%)       | 84 (78.5%)   |                      |
| Female                       | 21 (26.9%)       | 2 (6.9%)         | 23 (21.5%)   |                      |
| <b>Race</b>                  |                  |                  |              | 0.25                 |
| White                        | 36 (46.2%)       | 23 (79.3%)       | 59 (54.2%)   |                      |
| Asian                        | 7 (9.0%)         | 2 (6.9%)         | 9 (8.4%)     |                      |
| Hispanic                     | 5 (6.4%)         | 0 (0.0%)         | 5 (4.7%)     |                      |
| Black                        | 0 (0.0%)         | 2 (6.9%)         | 2 (1.8%)     |                      |
| Other/Unknown                | 30 (38.5%)       | 2 (6.9%)         | 32 (29.9%)   |                      |
| <b>Smoker</b>                |                  |                  |              | 0.67                 |
| Yes                          | 11 (14.1%)       | 2 (6.9%)         | 13 (12.2%)   |                      |
| No                           | 63 (80.8%)       | 25 (86.2%)       | 88 (82.2%)   |                      |
| Previous                     | 4 (5.1%)         | 2 (6.9%)         | 6 (5.6%)     |                      |
| <b>Previous CS Injection</b> |                  |                  |              | 0.52                 |
| Yes                          | 4 (5.1%)         | 2 (6.9%)         | 6 (5.6%)     |                      |
| No                           | 74 (94.9%)       | 27 (93.1%)       | 101 (94.4%)  |                      |
| <b>Malnutrition</b>          |                  |                  |              | 0.60                 |
| Yes                          | 2 (2.6%)         | 0 (0.0%)         | 2 (1.9%)     |                      |
| No                           | 76 (97.4%)       | 29 (100.0%)      | 105 (98.1%)  |                      |
| <b>Renal Failure</b>         |                  |                  |              | 1.00                 |
| Yes                          | 0 (0.0%)         | 0 (0.0%)         | 0 (0.0%)     |                      |
| No                           | 78 (100.0%)      | 29 (100.0%)      | 107 (100%)   |                      |
| <b>Liver Failure</b>         |                  |                  |              | 1.00                 |
| Yes                          | 0 (0.0%)         | 0 (0.0%)         | 0 (0.0%)     |                      |
| No                           | 78 (100.0%)      | 29 (100.0%)      | 107 (100%)   |                      |
| <b>Diabetes Mellitus</b>     |                  |                  |              | 1.00                 |
| Yes                          | 1 (1.3%)         | 0 (0.0%)         | 1 (0.9%)     |                      |
| No                           | 77 (98.7%)       | 29 (100.0%)      | 106 (99.1%)  |                      |
| <b>IC</b>                    |                  |                  |              | 0.60                 |
| Yes                          | 2 (2.6%)         | 0 (0.0%)         | 2 (1.9%)     |                      |
| No                           | 76 (97.4%)       | 29 (100.0%)      | 105 (98.1%)  |                      |
| <b>Intravenous Drug User</b> |                  |                  |              | 1.00                 |
| Yes                          | 0 (0.0%)         | 0 (0.0%)         | 0 (0.0%)     |                      |
| No                           | 78 (100.0%)      | 29 (100.0%)      | 107 (100%)   |                      |
| <b>Number of Revisions</b>   |                  |                  |              | 0.83                 |
| 1                            | 58 (74.4%)       | 22 (75.9%)       | 80 (74.8%)   |                      |
| 2                            | 9 (11.5%)        | 2 (6.9%)         | 11 (10.3%)   |                      |
| 3+                           | 11 (14.1%)       | 5 (17.2%)        | 16 (14.9%)   |                      |
| <b>Total</b>                 | 78 (72.9%)       | 29 (27.1%)       | 107 (100.0%) |                      |

Table 1. Demographic Information for our Sample Population. Percentages are expressed as total proportion of individual cohort (culture negative or culture positive cohorts). Bold p-values signify statistical significance. CS=Corticosteroid; IC=Immunocompromised

## Conclusions

- More than a quarter of patients requiring revision surgery after shoulder stabilization procedures have a subclinical shoulder infection, with males being at a higher risk of developing an infection than females.
- Surgeons should always consider infection as a reason for lack of clinical improvement and possibly needing revision surgery after shoulder stabilization.
- The prompt diagnosis and treatment of these infections could be vital in improving results after these surgeries.

## Disclosures

- Disclosures:** Reported Online
- Funding:** None