

# Operative Management of Spinal Wound Complications Over a 3 Year Period at the National Spinal Injuries Unit

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## Background

Wound breakdown and infection after spinal surgery can result in further surgery, prolonged hospital stay, and significant morbidity. Some studies have found spinal surgery site infections after spinal surgery to be as high as 15%.

Patient-related risk factors for the development of wound breakdown after spinal surgery include diabetes, multiple comorbidities, smoking, and patient age. Procedure-related risk factors include include length of surgery, complexity of surgery, retention of a colonised or infected implant, and prolonged hospital stay.

## Aims

- To quantify the operatively managed spinal wound complications here at the Mater over a 3 year period
- To identify risk factors for wound complications
- To identify patients that may benefit from early Plastic Surgery involvement

## Methods

The study was based at the *National Spinal Injuries Unit* at the Mater Misericordiae University Hospital, Dublin Ireland. Ethical approval was granted by the Clinical Audit & Effectiveness Committee in December 2024. Theatre logbooks, *Patient Centre* Electronic Health Record, theatre notes, and *Centricity* Anesthesia peri-operative records were analyzed.

Patients included in the study were those whose first washout was performed between 12.01.2022 and 15.11.2024. A wide range of data were recorded including patient factors such as comorbidities, age, indication for index spinal surgery procedure, and smoking status. Management details including the number of washouts required, rate of Plastic Surgery involvement, microbiological sampling practices, and antimicrobial administration regimens were recorded.

The categorical variables were summarised using frequencies (N) and percentages (%) for each category and the continuous variables were summarised using mean (M) and standard deviation (SD) statistics.

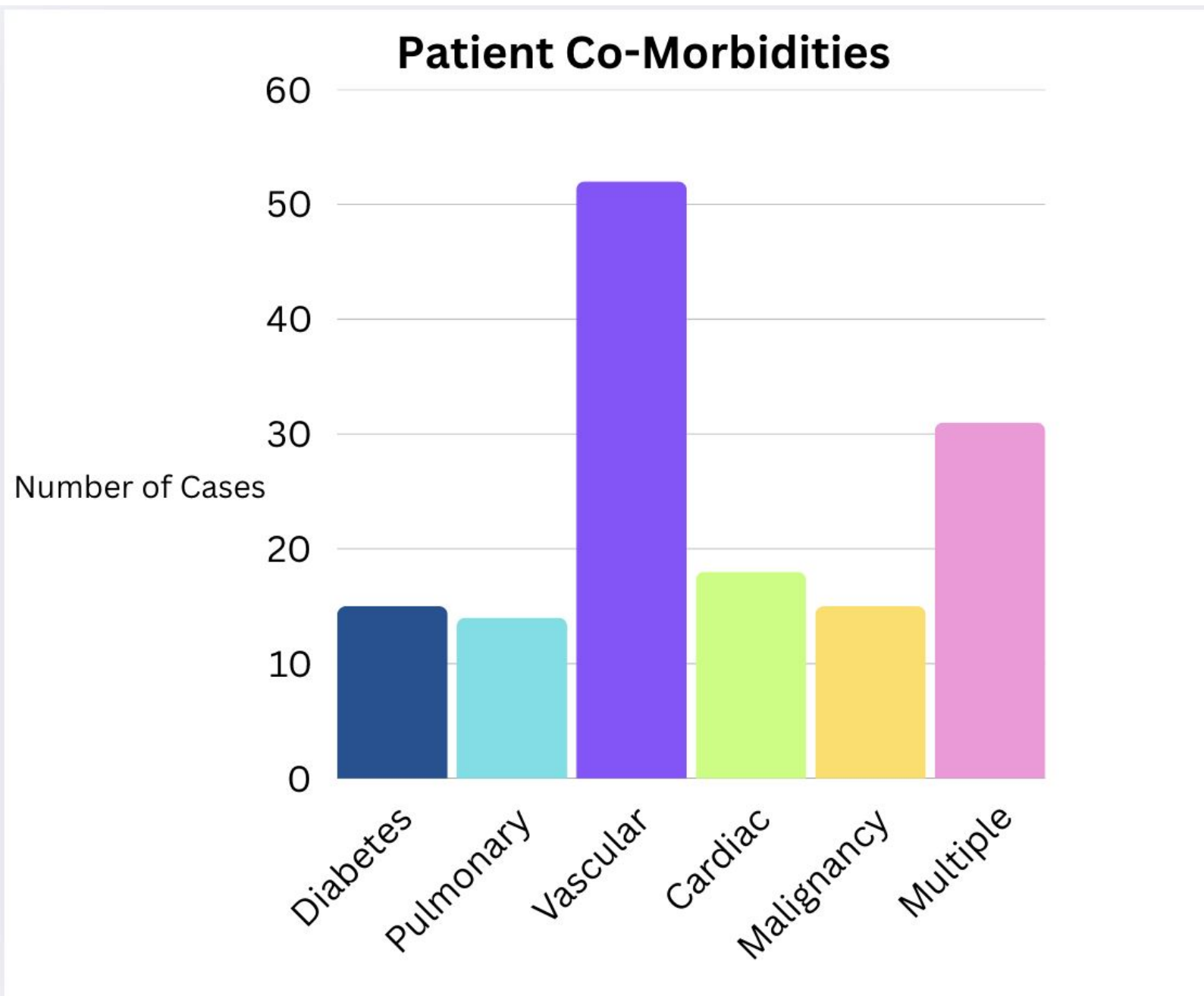
Univariate and multivariate logistic regression was used to model the likelihood of plastic surgery involvement in a spinal washout. To determine the relationship between different variables and the number of washouts required, Chi-squared tests were used for the categorical variables and independent sample t-tests for the continuous variables.

## RESULTS

### Descriptive statistics for demographic variables and co-morbidities

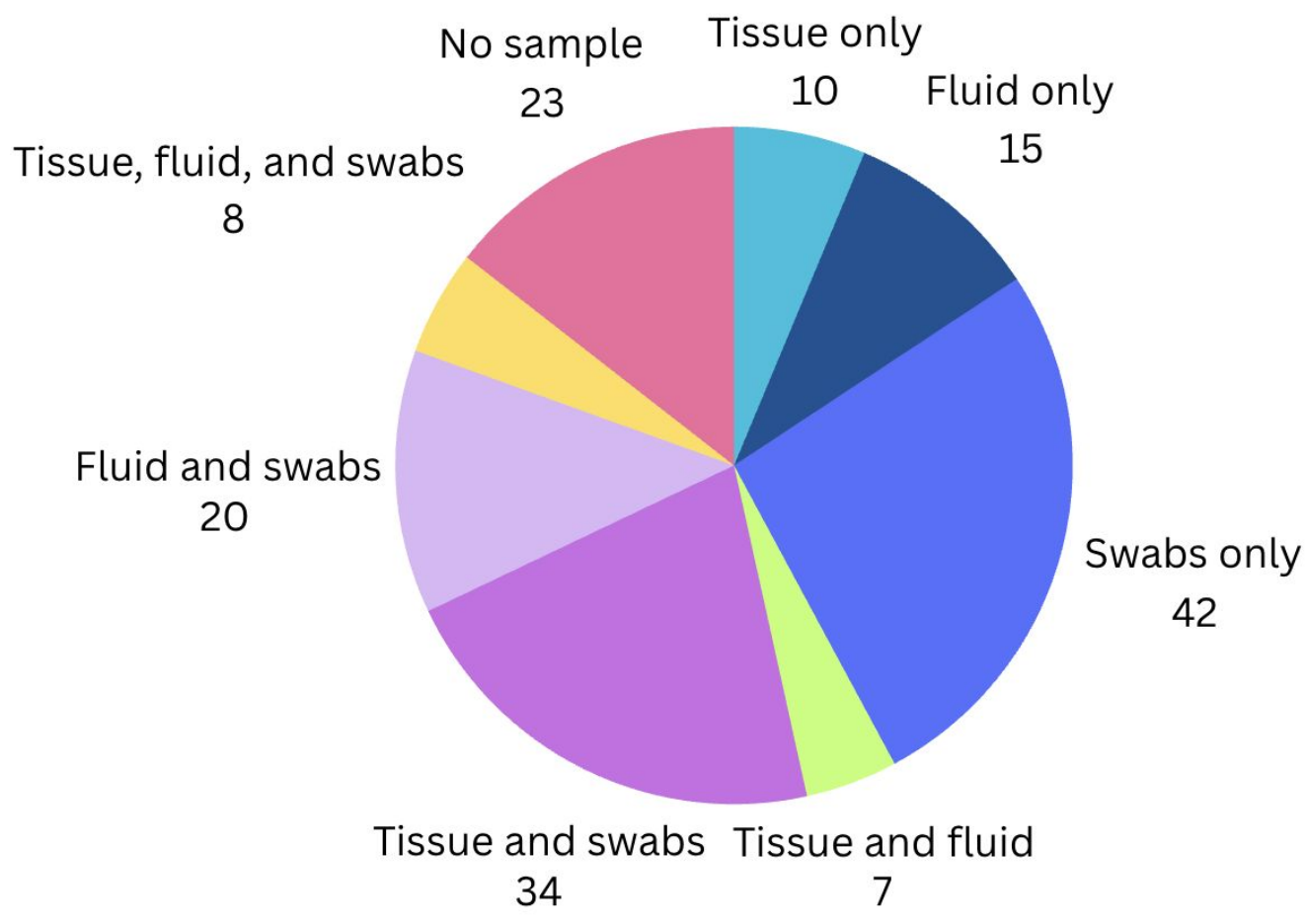
Variables	Frequency, N (Mean, M)	% (SD) (Min – Max)
Age (years)	M = 59.35	SD = 17.03, 20 – 88
Gender		
Male	51	50.5%
Female	50	49.5%
Comorbidities		
Pulmonary	14	13.9%
Vascular	51	50.5%
Diabetes	15	14.9%
Cardiac	18	17.8%
*HbA1c (diabetic patients only)	M = 55.27	SD = 10.80, 40 – 74
Previous spinal malignancy	14	13.9%
Radiotherapy	1	1.0%

\*HbA1c = haemoglobin A1c  
(for Diabetic patients only)

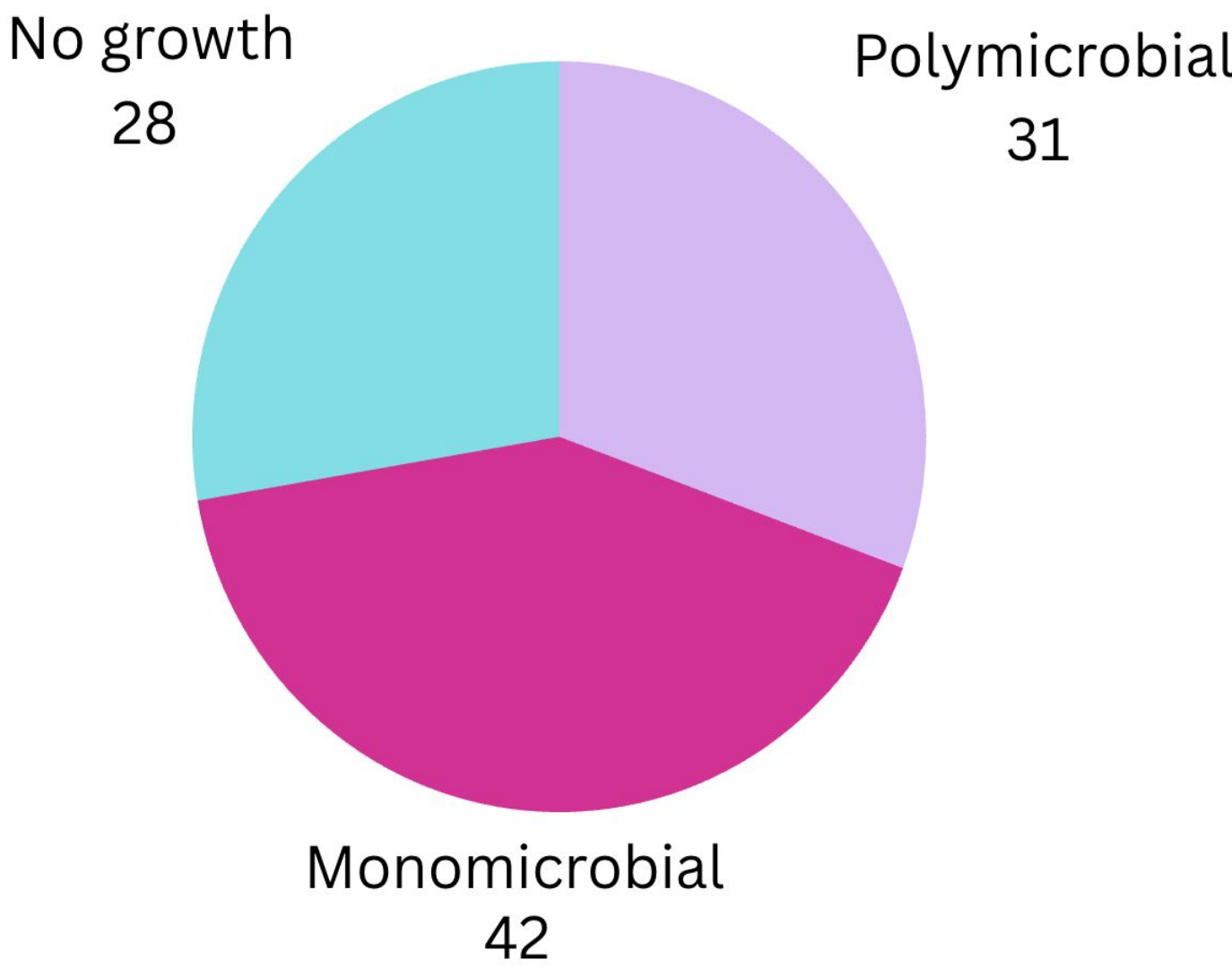


Variables	Frequency, N (Mean, M)	% (SD) (Min – Max)
Weeks since index procedure	M = 7.32	SD = 19.10, 0 – 156
Reason for washout		
Wound dehiscence	67	66.3%
Dural tear/CSF leak	17	16.8%
Haematoma	4	4.0%
Metalwork failure	4	4.0%
Seroma	2	2.0%
Sinus	2	2.0%
Intraspinal abscess	3	3.0%
Other	2	2.0%
Number of washouts		
1	62	61.4%
2	26	25.7%
3	10	9.9%
4	3	3.0%
Duration of stay (weeks)	M = 3.21	SD = 4.73, 0 – 31
Plastic surgery involvement	9	8.9%
Flap reconstruction required	9	100%

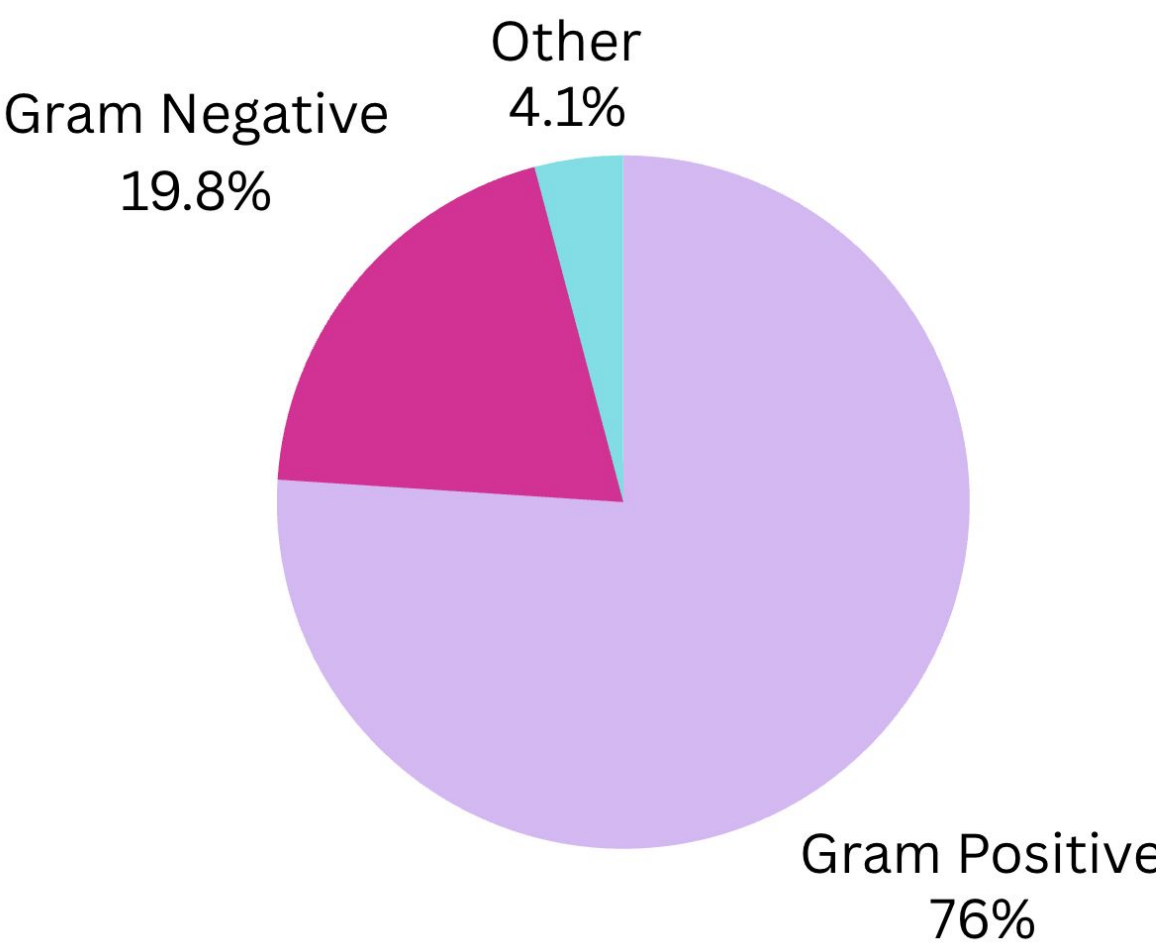
### Sample Type for Each Operative Procedure



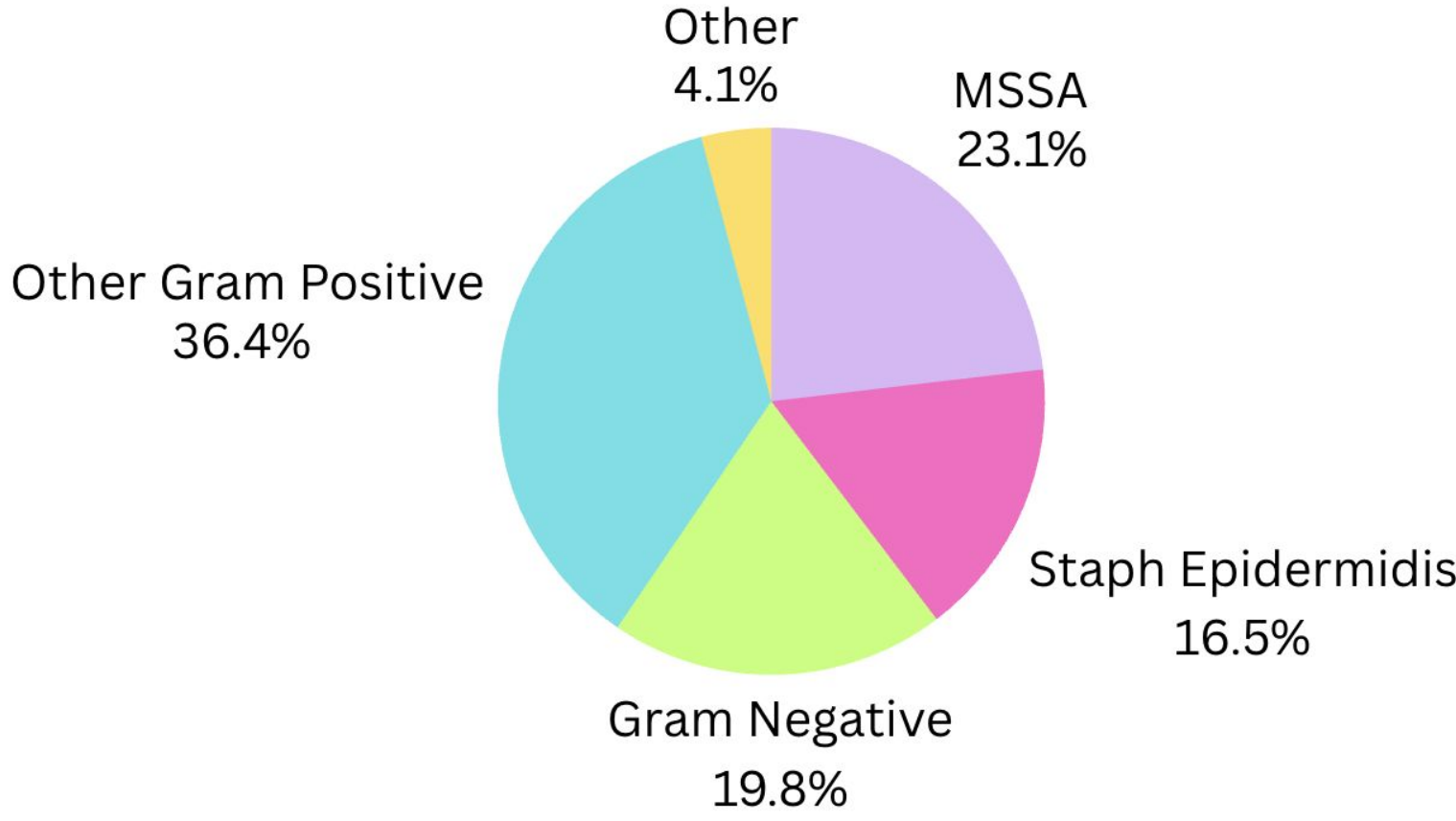
### Quantity of Microbiology Cultured



### Gram Stain Classification



### Frequency of Identified Organisms



### Results Associated with Plastic Surgery Input

- Longer operative times of index procedure (p=0.002)
- Longer time since between last spinal instrumental and first washout (p=0.019)
- The average number of specimens sent intraoperatively (p=0.005)
- Increased number of washouts required (p=0.001)

## Conclusions

- Predictors of Plastic Surgery involvement include: vascular disease, increased number of washouts, and higher number of microbiology specimens
- Standardised sampling may improve patient care with appropriate antibiotics and reduced number of washouts required
- These interventions are likely to reduce patient morbidity, reduce hospital stay, and reduce financial costs incurred