

Exploring Themes in Surgical Specialties Using Frequency- and Value-Weighted Keyword Analysis

Introduction

The portfolio reporting tool provides an interactive way to explore patterns across clinical negligence claims by specialty, mishap category, disease and treatment. By converting unstructured case narratives into structured, weighted concepts, the tool reveals thematic patterns that would otherwise require extensive manual review. This case study examines surgical specialty claims excluding orthopaedics and neurosurgery, using two complementary keyword-based treemaps:

- a modified-TFIDF frequency-weighted view, and
- a value-weighted view that incorporates the financial cost of each claim.

Together, these views allow us to distinguish high-volume operational themes from high-severity, high-cost complications.

What the Report Shows

The report allows users to select any combination of:

- Specialty groups and individual specialties
- Misadventure groups and individual mishaps
- Disease groups and individual diseases
- Treatment groups and individual treatments

The selected filters populate two treemaps:

1. Frequency-weighted treemap (modified TFIDF) Shows the most prominent textual themes across the selected cases.
 2. Value-weighted treemap (TFIDF × claim value) Highlights themes associated with disproportionate financial impact.
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Because clinical negligence portfolios often exhibit loss concentration—a small number of cases driving a large share of total cost—the value-weighted view is essential for identifying where risk-mitigation efforts should be prioritised.

Portfolio Viewer - Exploring Surgical Specialty Trends

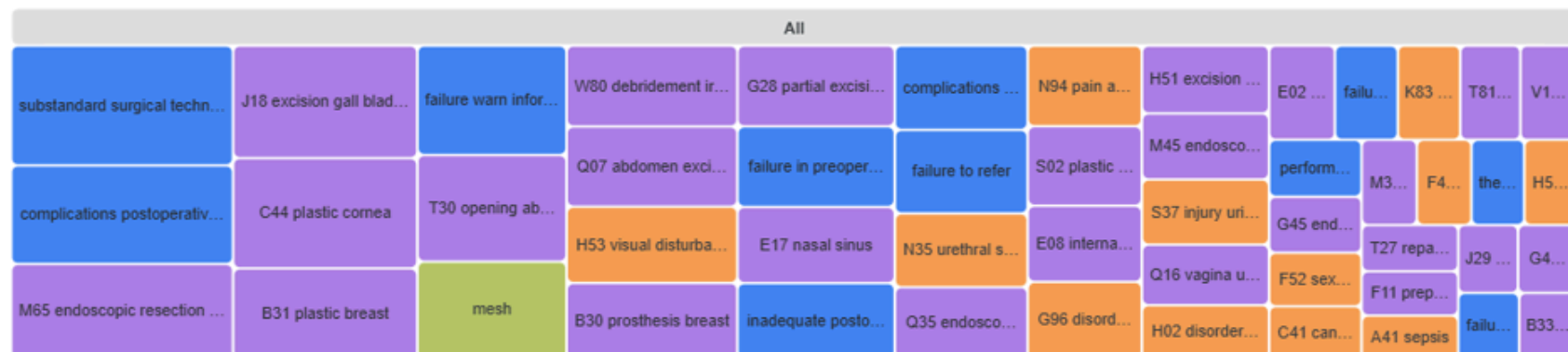
Specialty_Gp:... (1) ▾ Mishap Group ▾ Disease Group ▾ Treatment Group ▾

Specialty: Excl... (2) ▾ Misadventure ▾ Disease Code ▾ Treatment Code ▾

Key Case Themes by Number & Value

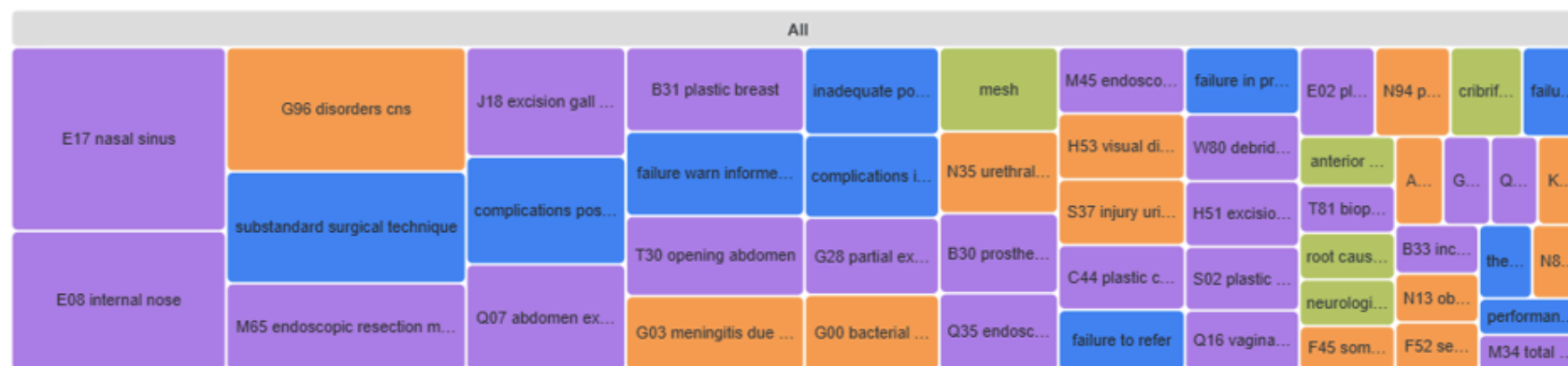
Keyword Importance (mTf-Idf Weighted Word Scores)

■ Misadventures ■ Treatments ■ Others ■ Diseases



Keyword Importance (Claim Cost and mTf-Idf Weighted Word Scores)

■ Treatments ■ Diseases ■ Misadventures ■ Others



Usage Notes: Use the dropdown menus at the top to explore themes by either grouping of specialty (medical, surgical or dental) or by individual specialty or combinations thereof. Similar filtering by misadventures, diseases and treatments is equally possible.

The top heatmap contains the modified tfidf (word importance scored) terms that are in the selected data set. The bottom heatmap contains the same keywords but in addition they are now weighted by the value of the claim. In this way frequency and severity effects can be explored and contrasted. The three digit prefixes to some terms represent the ICD10 or OPCS4 codes.

Interpretation

The keyword only weighted list (the top treemap) highlights a breadth of common textual themes across surgical specialties, emphasising frequently discussed procedures and symptoms such as *mesh*, *dry eye*, *flaps*, *stoma* and various gynaecology / urology procedure words.

By way of contrast, only 32% (8 of 25) of the top keyword-only weighted themes appear in the cost-weighted top signals in the bottom treemap chart: *mesh*, *transurethral resection prostate*, *pelvis pain*, *CSF leak*, *endoscopic sinus surgery*, *bladder*, *nasal obstruction*, *neurosurgical*.

The cost-weighted list reorders priorities to highlight high-severity, high-cost consequences that are under-represented by plain keyword scoring: *skull-base* and *spinal cord injury* themes, *CSF leaks* and complex *neurosurgical / ENT complications*, *hypoxic brain injury* and *paraplegia* receive large cost weight despite having lower keyword score ranks.

Several high keyword only items *dry eye*, *abdominoplasty*, *stoma*, *dyspareunia*, *sexual dysfunction*, *sepsis* have little or now cost-weighted presence amongst the highest cost list, indicating these are frequent topics but not primary drivers of monetary risk amongst this subset of our portfolio of 100 claims.

The cost-weighted view therefore uncovers concentration of monetary risk in neurological, skull-base and complex ENT complications and directs resource prioritisation away from purely frequent text signals toward fewer, higher cost clinical mishaps.

Call to Action

If applied to a larger, more representative portfolio, the insights from this dual-weighted approach would support several risk-management actions:

- Prioritise targeted review and mitigation workstreams for skull-base, spinal cord, CSF leak and complex ENT complications, which carry disproportionate financial and severity risk.
- Use frequency-weighted themes for operational surveillance, monitoring common issues such as mesh complications and routine gynaecology/urology procedures for quality-improvement opportunities.
- Integrate both views into dashboards, using frequency-weighted themes to detect emerging patterns and value-weighted themes to trigger escalation, deeper case review and resource allocation.

Together, these approaches provide a balanced view of volume-driven operational issues and severity-driven financial risks, enabling more informed decision-making across clinical governance, claims management and patient-safety functions.