Precision Redefined.

AI-Powered Insights Refined Breast Cancer Care

The Challenge: Questioning the Standard of Care

In 2021, breast surgeons at a major academic medical center embarked on a critical re-evaluation of a routine practice: sentinel lymph node biopsy (SLNB) for postmenopausal women with early-stage breast cancer. While SLNB was the established standard, even guidelines like Choosing Wisely recommended against its routine use in women over 70.1 However, the surgeons recognized that a significant gap existed in the data available to guide treatment decisions for younger postmenopausal patients (55-69), who still faced potential risks like lymphedema, reduced mobility, and long-term quality-of-life issues associated with the procedure. The existing clinical registries lacked the granularity to capture nuanced outcomes like lymphedema, and traditional chart reviews were too resource-intensive to conduct on the scale needed. The surgical oncology team needed a more efficient and insightful way to assess real-world outcomes across their network of 15 hospitals.

The Solution: Unlocking Insights with AI-Powered NLU

Recognizing the limitations of conventional data sources, the team partnered with Carta Healthcare. They were particularly interested in Carta Healthcare's use of natural language understanding (NLU) and reasoning engines to extract structured and unstructured data from electronic health records (EHRs). This technology offered the potential to analyze a vast amount of patient information, going beyond the limitations of structured registry data. The team formulated a bold question: could SLNB be safely omitted in a broader population of women, particularly those aged 55-69? This aligns with the broader trend in breast cancer treatment towards de-escalation strategies, as highlighted by the SOUND trial, which demonstrated that axillary surgery, and even SLNB, could be omitted in certain low-risk patients without negatively impacting outcomes.[2]

The Method: A Comprehensive Retrospective Analysis

With institutional support, the team launched a comprehensive retrospective analysis. They leveraged Carta Healthcare's platform to analyze over 580,000 patient records, encompassing structured data, clinical notes, imaging reports, genomic results, and more. The goal was to compare rates of pathologic node positivity (pN1) and lymphedema across different age groups and tumor stages, providing a robust dataset for informed decision-making.

The Impact.

Transforming Practice and Patient Care

The robust evidence generated by the Carta Healthcare platform enabled the surgical team to confidently revisit their surgical guidelines and shared decision-making tools. They began to refine their approach, moving away from a one-size-fits-all strategy and toward a more tailored approach to breast cancer treatment. As one clinician noted, “This research informs the overall goal of moving away from a one-size-fits-all approach for treating breast cancer. Instead, our focus is tailoring care so that treatment is at the right level for each patient, which includes doing less surgery when it’s unlikely to have a benefit.”

The ability to extract nuanced information, like the location of lymphedema (arm vs. leg), directly from unstructured physician notes, proved invaluable. This level of detail, readily accessible through Carta Healthcare’s NLU, would have been impossible to obtain through traditional methods.

Today, the institution continues to expand its use of Carta Healthcare for quality improvement initiatives and clinical trial design, ensuring that fewer patients undergo unnecessary procedures and that more care decisions are based on data that truly reflects the real-world patient journey, aligning with the principles of **evidence-based medicine** and **patient-centered care**.