SNUH
서울대학교병원

Seoul National University Hospital

20,000 new cancer cases annually

6,400 staff members

4 hospital branches

Syapse enables SNUH partners to:

Make better clinical decisions by visualizing survival data

Assess feasibility and identify patients for clinical trials

Explore and answer research questions

Integrating with a precision medicine platform improves clinical and molecular data capture at hospitals

BACKGROUND

In 2018, Seoul National University Hospital (SNUH), a globally renowned hospital in South Korea, partnered with Syapse to establish a cutting-edge precision medicine program. Employing over 6,400 staff members, SNUH is part of a four-hospital system that provides expert patient-centered care for 20,000 new cancer cases per year. Its leadership recognized the impact of precision medicine early on, and a special task force evaluated and chose Syapse as the ideal partner that could offer technology and best-practice expertise to accelerate their precision medicine efforts.

As pioneers in precision medicine, SNUH opted for close ongoing collaboration with Syapse beyond initial implementation requirements to continue to refine and improve its precision medicine data. Integrating with the Syapse platform gave SNUH visibility into the current state of clinical and molecular data and how it was being documented, leading to key process improvements across the organization to capture higher-quality data as a foundation upon which to build a successful, scalable precision medicine program.

COLLECTING BETTER MOLECULAR DATA

Having high-quality, discrete molecular data allows Syapse to provide insights in the form of visualizations that inform patient care. By integrating directly with SNUH's internal molecular lab to centralize the delivery and review of dispersed molecular results, Syapse is able to consolidate molecular data for clinical use, such as preparing for and presenting at molecular tumor board meetings.

One way that SNUH was able to enhance its molecular data was by extracting single-gene immunohistochemistry (IHC) results for key breast cancer genes HER2, ER, and PR. Typically, these results exist in an unstructured format as a string of text in pathology report notes, making them difficult to draw insights from. By extracting this data—something few other health systems have done—SNUH and Syapse are able to generate visualizations that leverage protein expression data important for categorizing types of breast cancer. Syapse has also shown demonstrable results of extracting genomic biomarkers and affiliated entities from pathology reports with another partner health system using the latest natural language processing technology; these efforts are expected to enhance the quality of SNUH's extracted data and enable them to pull more unstructured data at scale.

DATA REFINEMENT & IMPROVEMENT

Through collaboration with Syapse on best practices for manual abstraction, SNUH adapted workflows to better capture precision medicine data, such as having staff review diagnosis and histology information, writing scripts to pre-populate data fields, and building an internal data refinement tool. Currently, required data is pulled from the SNUH EMR and stored in a central data warehouse before being sent to Syapse, with certain data undergoing manual review. Data from the central repository now passes through the data refinement tool so medical recorders and physicians can easily review or update the data. Additionally, SNUH plans to optimize their EMR to capture the most challenging-to-abstract data elements and identify ways to incentivize physicians to enter more complete data.

Syapse also augmented dates of diagnosis for a subset of breast cancer patients using manual abstraction to further improve clinical data quality. Because SNUH is a tertiary academic center, many patients are referred to the hospital with date of diagnosis and previous treatment information existing only in scanned documents. SNUH also has the benefit of highly complete mortality data that they receive from government registries. By matching exact dates of death to dates of diagnosis, Syapse is able to visualize overall survival in a disease cohort.

Thanks to the progress of these visualizations and the multi-year renewal of the partnership, SNUH and Syapse will expand the scope of their research projects to address even more questions in precision medicine. This will include ingesting a broader subset of cancer data, as well as more data from medical oncologists' independent databases. Upstream workflows for data improvement will continue to be refined to proactively structure data in the EMR for date of recurrence, metastasis, and progression information, which currently are often undocumented or exist in an unstructured format.

OVERCOMING UNIQUE CHALLENGES OF INTERNATIONALIZATION

Expanding internationally led to workflow improvements at Syapse as well. Data ingestion and transformation processes were configured to be UTF-8 compatible so that Syapse could work with Korean characters without having to translate back and forth between Korean and English. Parts of the user interface were updated to accommodate a new language as well as compensate for cultural nuances, like modifying character counts and search parameters to reflect differences between Korean and American naming conventions, mapping a new system of medical codes, and accounting for the fact that Korea does not use national provider identifiers (NPI).

Much like SNUH's upfront data improvement efforts help them scale their precision medicine program effectively, these internationalization exercises by Syapse have laid the groundwork to quickly and efficiently expand into other countries.

The process of Syapse data integration:

DATA COLLECTION ACROSS MULTIPLE SOURCES

DATA ACQUISITION INFRASTRUCTURE

DATA STRUCTURING & NORMALIZATION

DATA QUALITY IMPROVEMENT

INSIGHTS DELIVERY

Molecular and hospital clinical data

Interoperability and manual abstraction

Knowledge bases and mapping

Manual abstraction and machine learning