Implementation of a Research Platform to Facilitate Clinical Trials and Research in SWSLHD

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BACKGROUND

Clinical trials are essential to establish evidence-based treatments that lead to better outcomes for cancer patients[1,2]. In SWSLHD, there was low participation rates in clinical trials due to systematic barriers to the identification of patients who were eligible for trial enrolment. This included:

- Fragmented patient data across multiple clinical information systems (CIS)
- Dependency on CIS reporting teams to identify patient numbers/lists for recruitment (Minimum of 4 weeks)

A research platform was implemented to address these barriers.

AIM

1. To combine CIS data (eMR PowerChart and Mosaiq) into a single platform (TriNetX) for the Clinical Trial Support Unit (CTSU) to utilise.
2. CTSU to self-report using the research platform, to identify cohorts and recruit patients for clinical trials and local research projects.

METHOD

The implementation team comprised of the SWSLHD CTSU, CIS subject matter experts (SMEs) and TriNetX members were formed. The implementation was conducted in stages between January 2021 – June 2023.

STAGE 1 Jan 2021 – Dec 2021
- Set up database configuration for eMR data
- Establish data feed from the eMR database into TriNetX
- Map eMR data within TriNetX
- User Acceptance Testing (UAT) of eMR data within TriNetX

STAGE 2 Dec 2021 – Oct 2022
- Repeat Stage 1 for Mosaiq

STAGE 3 Jan 2023 – Jun 2023
- Merge eMR and Mosaiq data in TriNetX
- Final merge UAT

Some obstacles were identified during the UAT of the project. The SWSLHD team and TriNetX team worked collaboratively to deploy solutions for:

International vs Australian Terminology

SWSLHD data was mapped to international terminologies used for normalising data (Example: SNOMED, RxNorm, ICD10). Synonyms were applied to the mappings to allow for searching on the platform using local/Australian terminologies.

Example: Anaemia = Anemia

Oncology Diagnosis Coded with SNOMED in eMR

At SWSLHD, the eMR diagnosis library consisted of SNOMED codes. The SWSLHD Cancer Registry team remapped the oncology SNOMED library to the equivalent ICD10 diagnosis and ICDO3 morphologies.

Example:

***SNOMED:** 269515006 Carcinoma of Lip =*

***ICD10:** C00.9 Malignant Neoplasm of Lip & **ICDO3**: 8010/3 Carcinoma*

Patient Diversity Data

TriNetX had missing diversity mappings for language, ethnicity, and country of birth. The SWSLHD team worked collaboratively with the TriNetX team to implement language mappings, with additional diversity improvements in the pipeline for development.

OUTCOMES

46	cohort requests completed
30	of the cohort requests were oncology related
30min–3hrs	to build a cohort on the platform
75%	of requests have informed of viable trial protocols, provided cohort population information, and informed trial feasibility
26	clinical trials connected to SWSLHD via TriNetX
1	clinical trial protocol design in progress utilising TriNetX
2	academic publications in progress utilising TriNetX

BUILDING A COHORT ON TRINETX

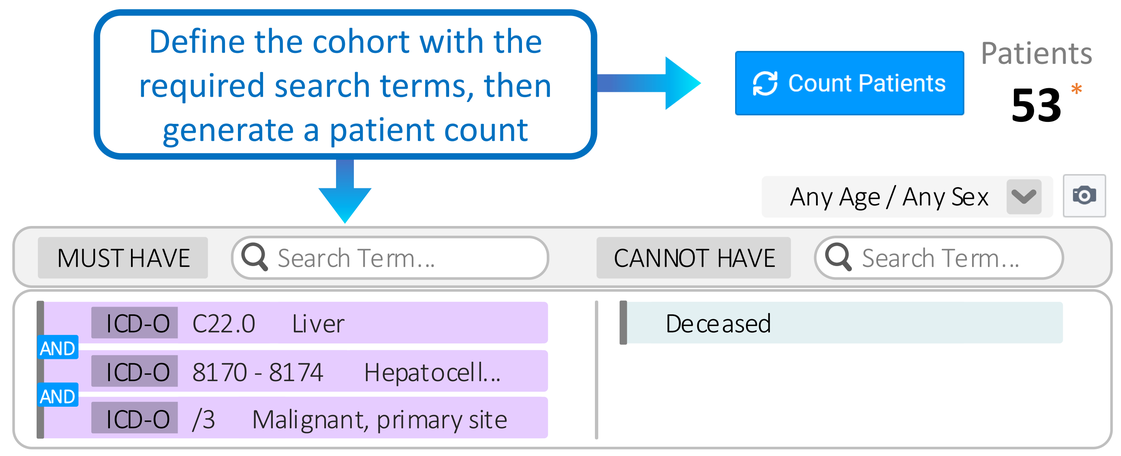

Figure 1: Example cohort search for patients with primary malignant liver hepatocellular carcinoma that are still alive.

* *Result has been modified for the purpose of this demonstration and is not indicative of the patient count at SWSLHD.*

INITIAL RESEARCH PLATFORM FEEDBACK

"Overall, the quality of data is high, the process easy to use and the results useful in future research projects." – Dermatology

DISCUSSION

The complexity of implementing a research platform entailed considerations for:

Patient Information Privacy, Security and Access Controls

- Completing a security assessment to check it meets SWSLHD's security requirements.
- Dedicated data extracts from eMR and Mosaiq that meet patient privacy requirements at SWSLHD.
- Securing patient identifiable data. Such as obfuscating patient IDs and the patients date of birth.
- Setting up federated authentication to enabled two-factor-authentication when accessing the platform.

The Data

- Sending near real-time data into the platform.
- Linking patients that exist in multiple CIS as a single record.
- Re-identifying patients at time of recruitment, as patient IDs are obfuscated within TriNetX.

Time and Resource

- CTSU and CIS SMEs are imperative for a successful implementation. The time and resources required from the implementation team must be accounted for.

The large-scale international data that is accessible within TriNetX is useful in providing novel insights to inform development of future local trials and research projects. Liverpool Dermatology has begun using this data to initiate academic research, by exploring novel epidemiological associations between inflammatory skin conditions and comorbidities throughout the Asia-Pacific region.

The SWSLHD CTSU team is looking to incorporate more TriNetX features into the clinical trial workspace. Including:

- Incorporating data from registries and biobanks
- Conducting phenotypic and genotypic searches
- Resource forecasting and grant funding

CONCLUSION

The implementation of the research platform builds the capability of the CTSU workforce to collate information from multiple CIS. The CTSU team is successfully self-reporting through the research platform on near real-time data to identify cohorts and recruit patients for clinical trials and local research. The additional features that comes with the research platform is enhancing the CTSU capabilities to connect to additional clinical trials, design trial protocols and initiate academic research.

REFERENCES

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