

The HSA Biobank and the changing research landscape

One of the TCRN's major achievements over the last 10 years is the establishment and administration of the Health Science Alliance (HSA) Biobank. The Biobank has been crucial to the development of novel translational cancer research at UNSW and beyond – today, it houses more than 19,000 specimens from more than 4200 patients.

The HSA Biobank was launched in 2012 as a joint initiative of UNSW Sydney, NSW Health Pathology (previously SEALS) and the South Eastern Sydney Local Health District. Unlike other biobanks, which are often established to meet the research needs of a particular disease, the HSA Biobank is a universal cancer biobank that's open to translational cancer researchers around the world. It houses human tissue, blood samples and health data from patients with a wide variety of cancers, such as gynaecological, breast, colorectal, sarcoma and gastrointestinal.

Specimens are collected from patients undergoing surgery for cancer or suspected cancer at Prince of Wales public and private hospitals, the Royal Hospital for Women, St George public and private hospitals and the Sutherland Hospital in Sydney; and Border Medical Oncology in Albury Wodonga. The Biobank is physically located in the UNSW Biorepository in the Lowy Cancer Research Centre.

"The guiding principle was really about giving all patients the opportunity to contribute to research, so it was a biobank that wasn't driven by a particular research question or a particular tumour group," says Nicki Meagher, the Biobank's former project manager.

Each specimen is supported by annotated patient data, including clinical data from the hospital where the patient was being treated, surgical pathology reports (including clinical diagnosis and tumour morphology data) from NSW Health Pathology and electronic medical records; and National Death Index data from the Australian Institute of Health and Welfare. MBS and PBS data are also available as part of a unique agreement between the TCRN and the Commonwealth Department of Health.

Laying the foundations

To date, the Biobank has provided tissue samples and/or patient health data to support more than 50 translational cancer research projects. But while it's now well established, building a biobank and the associated processes and frameworks required to support its use is a complex and ongoing process.

Among the TCRN's key achievements during this implementation phase was creating a streamlined patient consent process, thereby ensuring the bank would receive a steady stream of samples from willing patients. The TCRN team worked with the local health district to develop a consent form that could be

integrated into standard hospital paperwork and started looking for opportunities to build the patient consent process into standard hospital workflows.

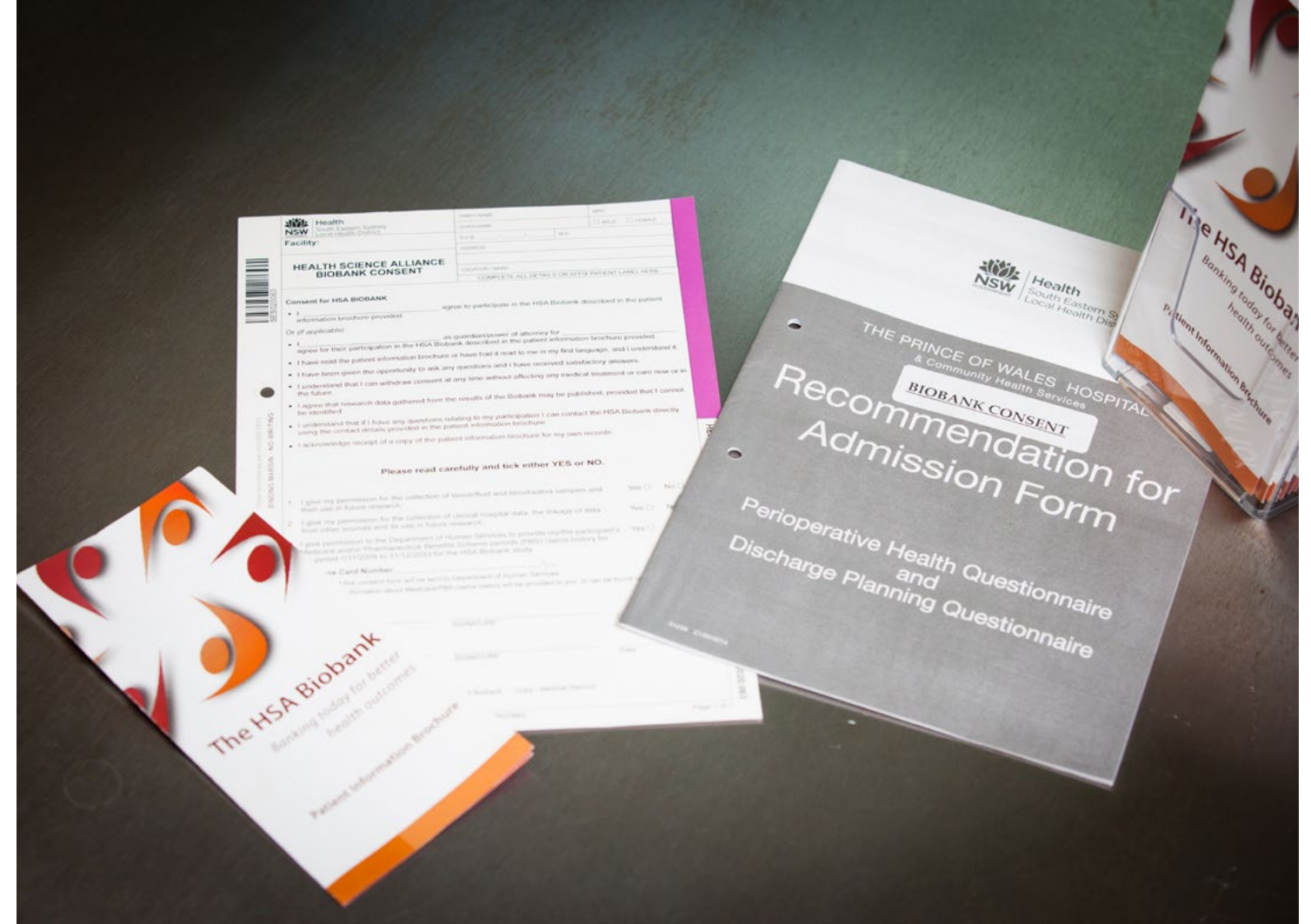
"The long-term idea was to embed it within the preoperative process, so when patients consent to having their surgery, to have their surgeon – someone they trust and know – explain to them how the biobanking process works," Meagher says.

As such, building relationships with clinicians and hospital administrators was crucial in legitimising biobanking within the hospital setting. The TCRN team focused on identifying local champions within each hospital – usually senior surgeons who could see the value of biobanking to patients and clinicians alike.

Hospital pathologists also played a key role: the TCRN worked in collaboration with NSW Health Pathology to develop a streamlined system in which pathologists prepared patient samples for banking. Using custom-built, health-grade IT infrastructure developed by the TCRN's Translational Bioinformatics team, the pathologists can transfer de-identified patient data from the hospital to the Biobank's Open Specimen database via secure HL7 messaging.

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The HSA Biobank today

This early work resulted in the robust clinical, technical and administrative processes that continue to support the Biobank’s operations today. But the bank itself is changing: while it was initially established as a specimen-centric resource, its purpose and goals have been continually refined in response to the changing research landscape and to ensure the long-term sustainability of the bank.

As such, the Biobank team continues to bank specimens from existing tumour streams at participating hospitals, but they’re also starting to respond to more bespoke requests from individual researchers. This has led to new opportunities to expand the types of biospecimens and associated data that are collected and stored, including live cell cultures, microbiota, bioimages and research data, among others.

“We’ve moved to this sort of hybrid model, which is the way biobanking is moving globally, in that you’re trying to meet researcher needs in a more targeted fashion,” says Dr Carmel Quinn, a Senior Project Officer at the TCRN. Along with TCRN Biobank Manager Mamta Porwal and UNSW Biorepository Manager

Anusha Hettiaratchi, Quinn oversees the day-to-day administration of the Biobank.

“We believe it’s the only way to operate in order to remain sustainable, where the business-as-usual of collecting tissue samples and patient data continues but you can also offer a more bespoke service.”

Looking to the future

But it’s not just the Biobank’s collection processes that are changing. As the TCRN wraps up, the Biobank is being transitioned to sit under the auspices of the Mark Wainwright Analytical Centre (MWAC) at UNSW Sydney. Here, it will become part of the university’s core research infrastructure.

Since 2014, the TCRN and MWAC teams have been working together to manage the infrastructure and administrative processes required to support the Biobank. Making the complete shift to the MWAC is the next logical step.

According to Dr Carl Power, Head of the Biological Resource Imaging Laboratory within the MWAC, UNSW Sydney agreed to take over responsibility for the biobanking project because of its inherent value as a research resource.

“It’s not just about the existing Biobank, but all of those other things which have been developed around it – all this best practice that has been put in place, which is equally as important as the bank itself,” he says.

“So, what we’re trying to do is make sure we can capitalise on all of the investment that’s already been made, which is significant and has had significant benefit already.”

Meeting local research need

The Biobank will be renamed to align with the health and innovation precincts at UNSW, a change that demonstrates an ongoing commitment to broadening the bank’s reach and keeping it available to anyone collecting clinical samples for research.

To this end, designated research space, including a new lab for biospecimen collection and processing, will be located within the integrated Acute Services Building, a UNSW research wing within the expanded Prince of Wales Hospital. The aim is to bring biobanking into the clinical space and acknowledge the importance of inclusive, accessible biobanking infrastructure that can respond to local need.

“The co-location in the hospital building, we feel, will give us a lot more traction in terms of interaction with clinicians, with surgeons, the ability to receive the biospecimens in a very short time and to have the appropriately processed and managed,” Power says.

“It will also create an opportunity for researchers who want to work with these specimens to access local lab space where they can perhaps do their own preparation or use the samples in a particular way.”

A one-stop shop

Power and his team will also be focused on reducing duplication of biobanking efforts within the Randwick precinct – currently, many researchers collect their own specimens for use in particular research projects, thereby duplicating ethics, consent, tissue acquisition, storage and data management processes.

To that end, the team is working on a service model that takes the biobanking process and offers it either as a complete service, or as a series of discrete activities that can be tailored to the needs of individual researchers.

“We’re trying to create a one-stop shop for biospecimen services so that anybody who is working with clinical specimens could have access to a full service or part of the service at any stage,” Power says.

“Some people might only want assistance at an early stage, such as with preparing their ethics, while others might just want access to the samples that have already been collected.

“We want to ensure that that everybody who’s using biospecimens has a high level of support.”