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Title: Multi-modal research imaging data management at University Hospital Southampton

Authors: Neil S O'Brien[1], James A Leighs[1], Orestis L. Katsamenis[2,4], Philip J. Basford[2], Philipp Schneider[2,4], Peter Lackie[3,5], Simon Cox[2], Martin Burke[6], Sofia Michopoulou[1], Angela Darekar[1], Matthew J Guy[1]

Affiliations:

1. Imaging Physics Group, Medical Physics, University Hospital Southampton NHS Foundation Trust, SO16 6YD, UK
2. Faculty of Engineering and Physical Sciences, University of Southampton, SO17 1BJ, UK
3. Biomedical Imaging Unit, Laboratory and Pathology Block, University Hospital Southampton NHS Foundation Trust, SO16 6YD, UK
4. μ-VIS X-ray Imaging Centre, University of Southampton, SO17 1BJ, UK
5. Faculty of Medicine, University of Southampton, SO17 1BJ, UK
6. Informatics, University Hospital Southampton NHS Foundation Trust, SO16 6YD, UK

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Abstract (300 words; 300 word limit):

At University Hospital Southampton we have a large, varied patient cohort with high enrolment in clinical research projects and trials, many of which include acquisitions using various modalities such as SPECT, PET, CT, and MRI. Clinical imaging data is well accommodated on PACS, but research imaging data management requires a different approach to provide greater flexibility, including robust anonymisation and access to large volumes of raw data. This has historically been performed on an ad-hoc basis, burning studies to removable media (time-consuming) or storing images on a small network-attached storage server which supports a proprietary image database. Data re-use has been limited in scope, whilst approaches to anonymisation have been difficult to implement and often utilised different tools for different projects, leading to duplication of effort. Occasionally, issues with retrieving large and complex archived datasets from PACS have led to significant project delays. Further, as collaborators from the μ-VIS X-ray Imaging Centre and Biomedical Imaging Unit develop 3D X-ray histology (XRH) and explore the potential to integrate this new technique into clinical workflows, the demand for flexible multi-modality research data management is ever increasing.

Here we report on a project deploying the eXtensible Neuroimaging Archive Toolkit (XNAT) to improve the storage and management of research imaging data and metadata to better support our research projects; this talk will provide an outline of our progress, some of the challenges we faced, and our eventual goals.

We have established and tested DICOM connectivity between XNAT and Nuclear Medicine, MRI and XRH scanners. The system is accessible to Imaging Physics staff and potentially across the Trust (and in future externally, for anonymised data), and provides reliable storage, searching, customisable anonymisation and access to research imaging data. Future directions to explore include integration with sample management systems and linkage to other clinical data repositories.