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Histopathology and radiology – the perfect marriage?

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It has been described as one of the toughest winters in 20 years for the NHS. So, in 2018, the year in which the NHS turns 70, it is imperative that 'innovation' takes centre stage and common-sense ideas be allowed to blossom. One such idea from Dr Pedro Oliveira, histopathologist at Manchester's Christie Hospital meets this brief. He suggests Radiology and Histopathology should break out of their departmental silos and 'get married'.

A marriage of radiology and histopathology?

Both radiology and histopathology generate images and are the foundation of [the 21st Century digital health vision](#). Dr Oliveira explains that radiology became digital because it had no choice; the multiple CT, MRI and PET images simply could not be evaluated 'dynamically' without the power of digital reconstruction.

Histopathology is very similar to radiology. A stained slide of physical tissue is a different view of the tissue or organ being captured by the plain film, CT, MRI or PET scan. A cascade of different radiology and histopathology image profiles combine to provide the clinician with the clues for diagnosis.

However, using the microscope invented by Robert Hooke in 1667, histopathology still lurks in the Dark

Ages. Dr Oliveira is confident that a 2018 histopathologist could make a diagnosis of a basal cell carcinoma with the Hooke's microscope. He gives an example of a typical 1976 breast cancer report: *'a breast comprising a nipple bearing skin ellipse and underlying fibro-fatty tissue in which there is a scirrhous tumour. Section shows spherical cell carcinoma of the breast has migrated to complex datasets requiring a deep level of clinical, family history, histopathology and genetic information'*.

Today's histopathology report is far more detailed with expectations that demand faster diagnosis to meet the premise that 'early diagnosis is key to survival'.

Dr Oliveira believes the only way to achieve report detail and speed – replacing the present out-dated Laboratory Information Systems (LIMS) – is to think completely outside the histopathology box and create a new 'Pathology Powerhouse' with a move to digital scanners, a more comprehensive IT infrastructure and most importantly, a reformulation of the 'workflows' for both histopathology cut-up and reporting and a reskilled workforce particularly amongst biomedical scientists. It is also the only option to meet the expectations of the increasingly complex nature of histopathology reporting. This is the magic bullet to overcoming the ballooning workload.

The Vision of the Pathology Powerhouse

Dr Oliveira has been leading a Digital Pathology Vanguard at Christie NHS Foundation Trust. Amongst the changes he's made are a new LEAN digital histopathology workflow fully integrated into the EPR.

Once his vision is complete Manchester would have a single Histopathology 'shop' with all cutup by fully trained biomedical scientists covering all hospitals within a twenty-mile radius. Rapid processor and automatic embedding technology that removes laborious human processes would be complemented by smart digital machines providing continuous scanning, resulting in a fully automated [digital pathology service](#). This would be supported by a hub and spoke digital network between the Histopathology 'mothership' and the satellite hospitals.

The solution will allow histopathologists to provide a faster, higher quality and cost-effective service for their local community and go some way to addressing the present manpower shortage. Report turnaround times and referrals would all be much more efficient with experts in certain areas e.g. neuropathology more easily accessible. Missing slides, lost slides or even misfiled slides would be a frustration of the past.

Digitisation brings Revolution

The change does not stop there. Dr Oliveira describes a three stage 'hop, skip and a jump' process to this mini revolution in the medical imaging space.

To complement the 'hop' of creating large merged Histopathology departments, the 'skip' is for them to divorce themselves from the other pathologies (haematology, biochemistry and microbiology) resulting in a *'creative destruction'* of the histopathology department. Then, instead of becoming a standalone department, the 'jump' process returns to my opening theme i.e. to terminate the stand-alone radiology department and marry it with histopathology. He suggests they have been dating for years and cites joint working in the neuro, bone and breast clinical areas and their natural interaction and dependencies as part of the multi-disciplinary team (MDTs) process.

Digitisation speeds innovation and transformation

The [Carter Review](#) describes how the NHS could reduce £5 billion of variation in outcomes through a gain in efficiency. It recommends using technology to achieve this. In this marriage of common sense, Dr Oliveira is not simply considering technology but re-working the fabric and infrastructure of an established but broken model.

Despite automation and digitisation, there will always be a need for histopathologists and trained biomedical scientists to report and one technology that will be essential to realise this vision will be the universal use of speech recognition integrated into the reporting workflow. For example, in Plymouth, [Derriford Hospital's histopathology services](#) implemented speech recognition and overcame a 600-report backlog with their present report turnaround now exceeding national targets. The initiative has been recognised with an NHS Innovation Award.

The first pioneer to disrupt the status quo and roll out a newly configured 'Department of Diagnostic and Tissue Imaging (DDTI)' across a whole health economy covering a population of millions, will no doubt be shortlisted for the Oscar equivalent of an innovation award.

As Steve Jobs once said: 'The ones who are crazy enough to think that they can change the world, are the ones who do'. Does Dr Pedro Oliveira fall into that category? Time will tell.

Tags: [Digital healthcare](#), [Clinical documentation](#)

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About Dr. Simon Wallace

Dr. Simon Wallace is the Chief Clinical Information Officer (CCIO) of Nuance's Healthcare division in the UK and Ireland. Simon has worked as a GP, hospital and public health doctor in Brighton and London. His interest in health informatics began in the 90s when he spent a year at the King's Fund investigating the impact of the internet on shared decision making between patients and their healthcare professional. For the past 15 years, he has worked for a range of organisations including Bupa, Dr Foster, Cerner Corporation and GSK across a range of technologies which include electronic patient records, telemedicine, mobile health and lifestyle devices. Simon has a keen interest in the voluntary sector, recently completing a 7 year term as a Trustee for Fitzrovia Youth in Action, a children and young people's charity based in London.



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