

The evolving role of pathologists in multidisciplinary tumour teams

In July 2018, Judith Hugh, MDCM, gave a keynote presentation at the annual meeting of the Canadian Association of Pathologists, held in Quebec City.

In keeping with the meeting's focus on the evolving role of the pathologist in the era of predictive biomarkers and precision medicine, the presentation looks at how this era is driving subspecialization in pathology and the participation of pathologists in multidisciplinary teams.

A multidisciplinary team is defined as “collaborative patient care by a team of clinical and allied specialists whose collective diagnostic and therapeutic intent is individualized patient management.”^{1,2} Core team members in breast cancer, for example, are breast surgeons, radiation oncologists, medical oncologists, imaging specialists, pathologists, breast cancer nurse specialists and a team coordinator. Multidisciplinary teams have become mandatory across the developed world since the turn of the millennium. In breast cancer, they were adopted as a standard for cancer centres in the UK and US in 2004, and by 2012 95% of breast cancer clinics in 39 countries surveyed had multidisciplinary tumour teams. The World Health Organization (WHO) adopted them as a worldwide priority action in its 2017–18 cancer resolution.

DO MULTIDISCIPLINARY TEAMS INFLUENCE PATIENT OUTCOMES?

Systematic reviews have been conducted since 2010 looking at the influence of multidisciplinary teams on patient outcomes. Overall, they find improved adherence to guidelines, a better teaching environment and improved clinician/team satisfaction. However it has been difficult to demonstrate a survival benefit, due to confounding factors over time, differences in participants and a lack of appropriate controls. Now that they're so prevalent, can you really do a randomized controlled trial?

One really good paper, published in 2012, has managed to overcome these obstacles. The Interventional Cohort Study on Breast Cancer Survival³ conducted in Scotland compared outcomes in a pre-1995 cohort, before multidis-

ciplinary teams were in place, against a 1995 to 2000 cohort where multidisciplinary teams were in place only in the Greater Glasgow area and not in West Scotland, against a post-2000 cohort where teams were in place in both. There's no patient selection bias: if you lived in Greater Glasgow, you went to a multidisciplinary tumour team. There was a contemporaneous control group in West Scotland where multidisciplinary teams were not used, a strict definition of teams, guidelines and audit. The authors looked at breast cancer-specific survival five years later.

Prior to the mandating of teams, survival was worse in the Greater Glasgow area than in West Scotland, with 5-year cancer-specific survival of 73.6% in West Scotland vs 71.3% in Greater Glasgow (HR=1.11; confidence interval [CI] 1.00–1.20, p=0.04). This led the health authority to implement multidisciplinary tumour teams in the Greater Glasgow area only. In 2005, when they looked back at the 5-year survival, it had increased to 75.9% in West Scotland, even without multidisciplinary teams. However, during that time, 5-year breast cancer specific survival in the Greater Glasgow area increased to 79.2% (HR=0.82; CI 0.74–0.91, p<0.001).

WHAT ROLE FOR THE PATHOLOGIST?

In my view, the pathologist is at the epicentre of a comprehensive management approach, because we are the linchpin: there is no diagnosis of cancer without us. No matter what it looks like or feels like, we give the data that enable others to actually follow guidelines. From that, surgical and radiation oncologists, clinical trials, and patient wishes and other factors can modulate the plan to produce the best patient care. And the exchange goes backwards and forwards between team members. How though, do you assess whether the pathologist is contributing in this ideal way to multidisciplinary team functioning?

There is, in fact, an instrument designed for just that purpose, published in 2011 in the BMJ. The authors found that pathology contributes to the team in 2 ways. The first is the provision of pathologic information. The second is in providing an articulate and precise specialty-related contribution.⁴ The authors then had a surgeon and a psychologist observe team meetings and grade pathologists on these two contributions. These [physician competency framework] roles may sound familiar, because they relate to the CanMEDS definition of 3 roles for the pathologist in the team, as collaborator (translating pathology reports and allowing clinical, pathologic, radiologic correlation), scholar (promoting evidence-based practice), and health advocate (playing a

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role in resource utilization by validating the need for biopsy, biomarker testing etc.). This is what we've been training people to do.

This observational data was drawn from 5 team meetings in 3 teams. Average scores out of 5, given by 2 observers for the provision of pathologic information, were 2.85 and 3.2. They found that, for the most part, when pathologists are giving the information, they're reading it from a report. That is hardly engaging in a team context. Scores on specialist contribution were actually worse, at 2.03 and 2.15. This indicates a perceived performance level that is just above "impedes the contribution of others" but not even at the level of "inarticulate and vague." There is obviously an urgent need for team participation to improve. Diagnoses must not be the only function of pathologists. A recent study showed that after 20 training sessions, pigeons can "diagnose" new images of breast cancer from benign breast disease with 80% accuracy.⁵ That's the performance of individual pigeons. When you consider the flock opinion, their accuracy approached 100%! Of course no one is suggesting that hospitals start hiring pigeons, but the ability to make histologic diagnoses is at the top of the list when it comes to professions that will likely be replaced by artificial intelligence.

BEYOND DIAGNOSIS

I would argue that beyond diagnoses, the pathology community has a vital professional role to play at local and national/international levels and that the entry point for this role is the multidisciplinary team. Once pathologists are integrated into the treatment team and understand the nuances of treatment, they can help to establish collaborative links locally in order to obtain feedback on preanalytic factors, assure best tissue processing practices for biomarkers, engage in quality assurance and improvement, and test algorithms. At broader levels, pathology working groups are vital to sharing information, creating guidelines and selecting biomarker tests. It is in the selection of biomarker tests that pathologists must assume a leadership role.

The advance of personalized medicines requires accurate biomarker testing to select individual patients who will benefit from particular treatments. The accuracy and utility of these biomarker tests requires pathologist leaders who understand the test, the tissue and treatment issues, and participation in the multidisciplinary team is the key to this understanding. As evidence of this function for pathologists, it is worthwhile looking at what we're telling our trainees. The Pathology Milestone Project, launched by the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Pathology, established a 5-tiered graded responsibility that highlights knowledge, skills, attitudes and other attributes necessary for pathology residents to achieve ACGME competency. These include "ICS2: Interdepartmental and health care clinical team interactions." At level 3 of 5, the trainee is expected to be able to prepare and present cases at multidisciplinary tumour conferences. At level 4, they are expected to be able to lead a team conference and "know how subtleties may impact or alter patient care." Signifi-

cantly, the highest level, which is achieved by exceptional residents or those in practice for several years, is the ability to organize and be responsible for multidisciplinary tumour team conferences where the pathologist serves as a consultant to the healthcare team.

LEADERSHIP


However, pathologists are not always seen as natural leaders, and there is an abundance of negative stereotypes. These were recently reviewed in an article by Michael Schubert in *The Pathologist*, entitled "The last respite of the socially inept".⁶ What is behind those stereotypes? A popular career website called OwlGuru.com explores characteristics of successful people in different professions, allowing users to identify careers suited to them. If you look at the characteristics of a successful pathologist, the top 5 characteristics are attention to detail, dependability, analytical thinking, integrity and achievement/effort. Significantly, they have a high introvert score (76/100) and correspondingly low extrovert score (30/100). By way of comparison, surgeons have an introvert score of 17/100 and an extrovert score of 83/100.

However, if you compare those 5 characteristics with the attributes of a good leader, as detailed in publications from LEADS Canada or the National Center for Healthcare Leadership, our attention to detail becomes an ability to focus on the matter at hand and to be held accountable by others. Our dependability yields a commitment to service and an ability to form strong partnerships with our non-pathologist medical colleagues. Analytical thinking allows us to assess and evaluate the information we encounter during team meetings, and to strategically align our current efforts with the future of our institutions and our profession. Our integrity demonstrates character and professionalism to other members of the team. And, finally, our work ethic makes us achievement-oriented. To be good team members, we must develop all of these skills, and we must remain self-aware and ensure that we always listen to our colleagues and make decisions as a single unit, rather than a dozen disparate doctors. A good introvert skill!

A ROLE MODEL

I'm sure many of you know the *Journal of Experimental Medicine*. It was founded in 1896 to publish studies that are outstanding and enduring in medical biology, and integrates disciplines in the field of pathogenesis. It has a respectable Impact Factor of 11.991 (2016) and is rated as the 5th most respected of 128 journals in Immunology and the 7th of 150 journals in Medicine. It was founded by William Henry Welch (1850–1934), a man often referred to as the Dean of American Medicine. That sobriquet is well deserved. He was the first MD recruited to Johns Hopkins in 1884, becoming the first Dean of that medical school in 1893. He played a large part in the recruitment of William Halsted and William Osler, and went on to become the President of the National Academy of Sciences, the American Medical Association and the Rockefeller Institute for Medical Research. Significantly, William Welch was a pathologist. He opened the Department of Pathology at John Hopkins

in 1889, and was a champion of evidence-based medical practices. His graduating residents included Walter Reed, Simon Flexner, George Whipple and Peyton Rous, the last 2 becoming Nobel laureates. Many of his students went on to become chairs or directors of prominent institutions, and it wouldn't be too much of a stretch to say that everyone in this room has been impacted, however minutely, by his influence.

I am not suggesting that every pathologist can be William Welch. However the precedent has been established that progress in medicine rests on the ability to integrate the biology of disease with the effect on tissues, and take that into the clinic. I believe that is the purview of the pathologist and that the multidisciplinary tumour team is the context where progress will be made, especially in the age of personalized medicine. 

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