A Question of Cancers

How the International Collaboration on Cancer Reporting is standardizing cancer pathology reporting worldwide

By John Srigley

Who diagnoses cancer? Members of the public are likely to respond "oncologists" or simply "doctors." Patients may have a somewhat clearer idea. But medical professionals will know that, most of the time, it is the pathologist who makes the diagnosis. In fact, for many of us, cancer is such a significant part of our work that I refer to us as "diagnostic oncologists" – those responsible for naming and guiding the treatment of our patients' cancers.

But what are the characteristics that define a specific type of cancer? And, beyond that, what is the particular stage or grade of tumor? The answer may differ from region to region, or even between institutions. Obviously, such differences can impede patient care – especially as changing economies and technologies make our patient populations more globally mobile than ever. The solution? A set of cancer diagnostic and prognostic reporting guidelines that are consistent around the world – and that is precisely the goal of the International Collaboration on Cancer Reporting (ICCR).

At a Glance

- *Different diagnostic and reporting guidelines mean that patients in different locations may not receive consistent cancer diagnoses*
- *To standardize these guidelines, we need international collaboration, guided by a single entity such as the ICCR*
- *The ICCR works with the WHO and professional pathology organizations worldwide to establish diagnostic datasets for each type of cancer*
- *Success requires resources – not just financial, but also in terms of contributions from as many subject matter experts as possible*

A history of the ICCR

The fundamental mission of the ICCR is to produce standardized and internationally harmonized protocols – known as datasets – for the structured reporting of cancer worldwide. The reason this was such a compelling mission lies in the history of the ICCR itself.

David Ellis and I conceptualized the ICCR together nearly a decade ago. I had been leading the synoptic cancer pathology program in Cancer Care Ontario for the past five years, and we had adopted the College of American Pathology as our protocol standard for cancer pathology reporting. At the same time, Ellis and the Royal College of Pathologists of Australasia had embarked upon a similar program referred to as "structured pathology reporting," in which they were developing their own cancer datasets. When I went on sabbatical to New Zealand to work on urological cancers, I worked with a friend of Ellis' who told him about my work in Ontario; it led to an invitation to Sydney to give a talk to their structured pathology group. Eventually, we thought, "Wouldn't it be nice to have one approved, internationally harmonized dataset to reduce the burden of protocol development worldwide? We could make it readily available, especially to low- and middle-income countries without the resources to develop datasets locally." And that's how it all started.

By 2011, we had a quadripartite group together: the College of American Pathologists, the Royal College of Pathologists (in the United Kingdom), the Royal College of Pathologists of Australasia, and the Canadian Association of Pathologists in conjunction with the Canadian Partnership Against Cancer. At that point, we had developed four trial datasets, one led by each country: lung, endometrial, melanoma, and prostate cancer. During that process, we established a protocol for dataset development that allowed us to work quickly (finishing all four datasets in six months) and efficiently (reducing the number of elements in each dataset by including only those with a solid evidence base).

"The fundamental mission of the ICCR is to produce standardized and internationally harmonized protocols – known as datasets – for the structured reporting of cancer worldwide."

One noticeable advantage to working across international borders is what we call the "international paradox." We found that we were able to attract the world's best domain experts and develop consensus far more readily at the international level than locally or nationally. This was partly because there was more international respect, and partly because lower-level politics were less obvious in a big, global group. In fact,

on the basis of our four initial datasets, we were able to bring the European Society of Pathology into the group – and then we were further joined by the American Society for Clinical Pathology (ASCP) and the Faculty of Pathology at the Royal College of Physicians of Ireland for a grand total of seven sponsoring entities.

Global expansion

We've also built an important alliance with the International Agency for Research on Cancer (IARC), part of the World Health Organization. Currently, we are working very closely with Ian Cree to develop datasets corresponding to each volume of the fifth series of the Blue Books. We started that work three or four years ago in conjunction with the fourth series, so we have coordinated datasets for the thoracic volume, the genitourinary volume, the head and neck volume, and – still in progress – the endocrine and skin volumes. It's a great collaboration because the Blue Books produce the actual classification system with the morphology, markers, and molecular data, whereas the datasets include staging, predictive, and prognostic information as well.

We plan to continue creating these datasets in conjunction with the fifth series of Blue Books, but that's not all we're doing. At the moment, we are trialing the translation of our datasets into other languages. The ASCP has been very interested in improving cancer diagnostics in low- and middle-income countries through a project spearheaded by the Union for International Cancer Control, so they have supported the translation of our initial 20 datasets into Spanish, French, and Portuguese. I think that, as we move forward, all of our datasets will be translated into multiple languages. We are currently in discussion with an organization called the China Anti-Cancer Association, whose oncopathology committee is interested in working with the ICCR to translate datasets into Chinese languages, which would be amazing. There are so many different cancer treatment centers in China that standardization is an invaluable step forward.

The problem with translating the Blue Books themselves is that it would require more resources than are currently available, and that it's hard to ensure that the content is properly reflected in the translation. As a compromise, IARC is happy to have the ICCR datasets available in multiple languages, so that at least the diagnostic information is accessible to people all around the world regardless of income, resources, or preferred language.

We're also collaborating with SNOMED International. The ICCR datasets can be implemented in different formats – paper-based, via word processor, or in sophisticated software setups. We use a classification system for cancer pathology reporting that goes from Levels 1–6. Level 1 is pure narrative reporting without standardized content, whereas Level 6 is "the ultimate report" – structured data based on standards like the ones we're establishing at the ICCR. Some of the CAP and ICCR datasets have

been structured in a format based on the SNOMED CT concept, with each element linked with the corresponding SNOMED CT terms – and there's an international group whose priority is to complete the remaining datasets over the next few years. The ultimate implementation of the dataset is that Level 6 format with links to the SNOMED CT terminology, because it gives them true international interoperability. The terminology is the same no matter what country you're in or what system you're using. The idea has been a success so far, and I'm looking forward to the next few years.

Toward structured pathology

What does a non-structured, or Level 1, report look like? Most are narrative reports that pathologists simply type or dictate. They contain no structured areas and follow no external standards. A Level 3 report consists of discrete elements – procedure, organs and systems involved, size and appearance of the tumor, histological characteristics, tumor grade and stage, predictive and prognostic biomarkers, and so on. A Level 6 report contains all of those discrete elements within a defined structure and uses standardized terminology; it's also saved in an appropriate transmission format and linked by numerical codes for retrospective analysis.

My Ontario jurisdiction was the first in the world to fully implement structured cancer pathology at Level 6 across the whole province (about 110 hospitals and 450 pathologists serving 13.5 million people). Every day, we produce hundreds of cancer pathology resection reports – thousands of data elements. What we've done is take that data and develop quality indicators that we can compare across hospitals and regions to evaluate performance. So not only is pathology data used for patient care at individual institutions, but at a population level via the Cancer Care Ontario registry. We can look at data such as the distribution of cancer types, grades, or tumor stages, and we can provide feedback on quality to hospitals or individuals so that they can improve their practices. The project was fully implemented in 2012, so at this point we have a phenomenal amount of data relating to cancer pathology in the province – and it will only continue to grow.

The Level 6 structured synoptic cancer pathology reporting program has now been implemented in five other Canadian provinces, and they're now starting to roll out quality indicators as well. In the next five years, we hope to have the remaining provinces up and running – and I know similar work has been done in California, the Netherlands, and Switzerland. Pathologists here, there, and around the world play a vital role not only as diagnostic oncologists, but also in cancer control, which is why this population-level information is so important. It allows us to do appropriate healthcare planning and resource allocation, develop quality metrics, and conduct pathology research. I think many pathologists don't understand that they have a huge role outside of individual cancer care within their regions or countries: describing

the burden of cancer on the population, breaking down the information, ensuring its accuracy, and using it to improve future healthcare and cancer control. Structured reporting is a foundational step toward making cancer care better at every level.

Developing a dataset

What makes a dataset? In each one, we include clinical notes, macroscopic examination (the gross features of the tumor), and microscopic data related to the diagnosis, staging, and predictive and prognostic information. When we begin developing a dataset, we identify a series champion who advises the steering committee on the selection of chairs for individual dataset committees and helps us locate the best domain experts from around the world.

The process itself begins with a project manager who combines and updates existing datasets into a draft document outlining the proposed elements; committee members vote and discuss to determine which are selected, and which are core (absolutely required for clinical practice and treatment) versus non-core (desirable and useful, but perhaps lacking a fulsome evidentiary base). At the end of the day, we end up with a final draft document that comes back to the dataset steering committee for input and then goes out for wide international consultation. That's a key part of the development cycle; we send the data to a huge list of pathology and oncology organizations for their feedback, then incorporate it into the final product. Ultimately, the dataset is published on our website and in academic journals.

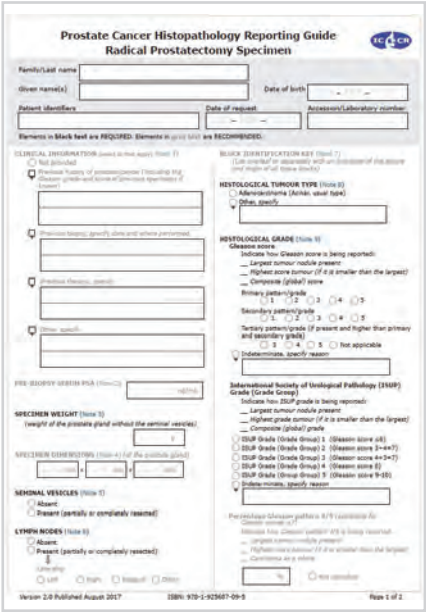
Extending the remit

Over the past few years, we've made huge strides in biomarker research and applications. Many classification systems are moving in a molecular direction – for instance, the central nervous system (CNS) tumor dataset. The brain tumor puzzle includes a lot of molecular pieces, so the next evolution of that dataset includes both immunohistochemical and molecular biomarkers.

Our CNS tumor dataset is unique in that it is layered. The first layer includes the key morphological aspects; the second incorporates biomarkers; the third integrates both. We took that approach because most low- and middle-income countries don't have the resources to do complex biomarker testing. We wanted pathologists in those countries to have standardized morphological guidelines to use in structured reporting, while those with more resources can apply the molecular and integrated layers. That's now spreading to other datasets – for instance, in lung cancer. The pipeline for new datasets looks promising!

We're also expanding our relationships with professional organizations related to individual tumor types. Urological and gynecological pathology are two good examples; both the International Society of Urological Pathology and the International Society of Gynecological Pathologists have done a lot of work in standardizing cancer reporting, so we've approached them for the names of experts who can help develop our datasets. We are currently approaching patient groups for various tumors, to help support our initiative, although we haven't seen much success in that arena yet. Hopefully, as we continue to expand our remit and our relationships, that will change.

Those who wish to join our mission can do so in a number of ways. Individual pathologists, pathology groups, and professional organizations can all take part – but for groups who want to make the biggest difference, I recommend becoming a sustaining member. That provides a seat on the ICCR board of directors and one on the dataset steering committee. Sustaining members can also recommend pathologists for the dataset operating committees, and we make


Prostate Cancer Histopathology Reporting Guide
Radical Prostatectomy Specimen

An image of the ICCR dataset for prostate cancer reporting.

sure that each operating committee includes at least one such recommended individual. That helps us ensure broad representation and lets pathologists at every level give input into the dataset development process. It also improves our sustainability – a critical issue, because although pathologists donate their time and effort to the cause, there are other significant project management costs. Financial issues aside, it's an absolute necessity that we continue to standardize diagnosis, prognosis, and treatment for our patients worldwide. So for any pathologist or group with an interest in improving global diagnostics, I invite you to take advantage of our existing datasets – and perhaps even work with us to improve them!

John Srigley is President of the International Collaboration on Cancer Reporting, Professor of Laboratory Medicine and Pathobiology at University of Toronto, and Consultant Pathologist at Trillium Health Partners, Toronto, Canada.