

**Investigation into
Medical Imaging Credentialing and Quality Assurance**

Phase 1 Report

**D D Cochrane MD FRCSC
Chair, BC Patient Safety & Quality Council
March 9, 2011**

Introduction

Prompted by concerns regarding the quality of the interpretation of radiology images by three individuals in British Columbia, on February 11, 2011, the Honourable Colin Hansen, Minister of Health Services requested, an independent investigation into the credentialing of radiologists and medical imaging quality assurance in BC. This investigation, to be led by Dr. Douglas Cochrane, Provincial Patient Safety and Quality Officer and Chair of the BC Patient Safety & Quality Council, was to examine all aspects of the licensing and credentialing of radiologists in two phases. The first phase is to focus on the credentials and experience of individual providers and the second phase to focus on the processes: 1) related to physician credentialing and privileges pertaining to medical imaging within health authorities, including the role played by the BC College of Physicians and Surgeons, 2) related to quality assurance and peer review of medical imaging reports and to review fully the incidents where physicians lacked either the appropriate credentials or experience to interpret images, including analysis of the response by health authorities when they learned of problems.

Background

In October 2010, concerns were raised to Vancouver Coastal Health (VCH) administration about the quality of a radiologist's interpretation of CT scans. The health authority investigated these concerns by consulting the College of Physicians and Surgeons (the College) and reviewing the medical imaging reports. The review by VCH identified the breach of a voluntary undertaking not to interpret CT scans or obstetrical ultrasounds and the failure to report personal skill upgrading done in CT and ultrasound imaging to the College. As a result, a formal review of this individual's CT interpretations was performed by VCH in December 2010. Significant discrepancies between the individual's reports and the reports provided by peer reviewers assessing the same images were found.

In December of 2010, Fraser Health (FHA) was informed by the College of concerns regarding the interpretation of CT scans by a locum radiologist. This individual had provided locum services in Interior Health (IHA) and had been the subject of a quality review prompted by physician concern. IHA had notified the College, and they in turn informed Fraser Health who then undertook a review of the CT interpretations reported by the locum during the month he/she practiced in the region. The results of this review were consistent with the findings of Interior Health; the radiologist in question was found to have insufficient knowledge and skills to interpret CT scans.

In January 2011, concerns were expressed by referring physicians at St. Joseph's General Hospital in Comox about the interpretation of CT scans by a local radiologist. A formal and comprehensive third party review is currently underway to ascertain the merit of these concerns.

In all cases, the privileges of the radiologists were suspended and third party reviews were undertaken to assess the quality of the original diagnostic imaging interpretations and reports. Where discrepancies were identified, follow up with patients and the referring physicians was provided and any necessary treatment plan changes were implemented. These reviews do not address a fundamental problem: a system that permits radiologists without the requisite skills and knowledge to practice in British Columbia.

Mandate

The investigation requested by Minister Hansen is outlined in the Terms of Reference (see Appendix A). The current report addresses the first phase of this investigation with a subsequent report to be issued on August 31, 2011.

The purpose of Phase 1 was to ensure that radiologists practicing in British Columbia have the appropriate credentials and experience to interpret medical images. All radiologists working in health authority owned and operated sites were included with a special focus on those interpreting ultrasound, CT, MRI and interventional radiology procedures.

The second phase of the investigation will examine the specific instances where radiologists lacked the credentials or experience to interpret medical images and the health authority response to those issues. It will also review the existing structure for the licensing and credentialing of physicians in BC's health authorities including the processes for quality assurance and peer-review. From the results of this investigation, recommendations will be made to the Minister of Health Services for improving the existing processes.

During the course of the Phase 1 review, it became apparent that reviews of the reporting of two other radiologists were indicated. These reviews are in process now. As well, issues, in addition to credentialing were of critical importance and should not be left without comment until the second phase report is submitted in August. I have therefore made recommendations that merit consideration at this time as they bear on the interests of the public with respect to the quality of diagnostic imaging.

Methodology

The evaluation considered data provided the health authorities, the College, and the Diagnostic Accreditation Program (DAP). The data elements are listed in Appendices B and C. The evaluation of individual credentials and experience was based on the date of registration and license issued by the College, the year of Royal College certification, maintenance of competences hours in diagnostic imaging as reported to the Royal College in 2010, and other continuing medical education activities reported to the health authority. Current volumes of studies in CT, MR and ultrasound were used to profile services provided to patients. Information received from the public was considered in the review where applicable.

Results and Analysis

Royal College Competencies

The Royal College included competency in computed tomography of all body sites in 1981. Ultrasound competency was expected of certificants the same year. Magnetic resonance imaging competency was expected in 1990.

Practitioners

As of February 2011, there were 287 practitioners licensed to provide diagnostic imaging services across 66 sites in BC. These individuals meet the criteria required by the College for licensure. All are registered and licensed to practice in BC. All individuals are providing services within the scope defined by their license. Five percent of providers have either a provisional or conditional – practice setting registration in BC; six of these individuals have Royal College of Physicians and Surgeons of Canada (RCPSC) certification in Diagnostic Imaging and 9 have foreign training at the level required of the RCPSC and are committed to achieving Royal College certification. No individual is providing services that extend beyond the scope defined by their registration based on the information available. Those who work under supervision and who are limited as to the location of practice are in compliance with these requirements.

Health Authority Quality Assurance and Review Processes for Diagnostic Imaging

There are formal and informal quality measurement and assurance processes operating in the health authorities. These processes are specified in the bylaws and rules of the medical staff and include annual credential review and reappointment and practitioner performance reviews. These processes provide the opportunity for confirmation of training, credential review, acknowledgement of specialty training and updating.

The information provided by the health authorities with respect to individual medical staff members was variable in completeness and quality. With regard to permanent medical staff, the licensure, appointment and re-appointment information and the imaging modalities used in daily work were described accurately. For locum physicians the information was incomplete with respect to credentialing and licensure. Often the period of appointment was not provided. Performance review was not provided to locum physicians.

Health authority medical staff rules describe the responsibilities of Department or Program Heads with respect to medical quality review. The rules also outline expectations with regard to intra and interdisciplinary peer review of image interpretation, including morbidity and mortality imaging rounds, clinical case conferences, clinical audits and annual quality improvement projects.

The documentation provided describing peer review does not describe in detail how the health authorities assess provider performance or the methods they use to give feedback to individual providers regarding interpretive and non technical performance and quality. No health authority has a structured peer review program in place that provides prospective, concurrent review of imaging interpretation. The only facilities that come close to having regular review are those with clinical case rounds and imaging review rounds.

There are sectors within the health system that manage provider performance well, however overall the tools used are variable, their application inconsistent, and their value in providing assurance of quality limited.

Diagnostic Accreditation Program (DAP)

Since 2006, DAP reviews of imaging facilities have been scheduled on a three year cycle and have focused on the technical aspects of the facilities, policies and procedures and the safety of patients

and staff within the facilities. As part of the accreditation process, quality assurance and safety as applied to the staff, technology, other risk factors has been assessed and necessary actions have followed recommendations to address deficiencies noted in the on-site visit.

Prior to 2010, the DAP accreditation process assessed the quality of physician reporting only (2008 Standards). Of the 43 sites having CT scanners (58 scanners), medical review was performed in 15 during DAP accreditation on site visits between 2007 and 2010. During the same period, only 14 of the 21 sites with MRI scanners underwent a medical review.

Patient Client Input

During the course of the phase one review, a number of concerns were received from patients regarding specific imaging services.

Recommendations and Conclusion

Diagnostic imaging is blessed and challenged with the introduction of new technologies on an ongoing basis. Computed tomography, has evolved through (at least) 4 generations since 1976 and MRI is now in its third generation. Within each generation and in each imaging modality, the diagnostic tools have been improved and new tools introduced as hardware and software change; the result is that better, more accurate and comprehensive diagnoses can be reached non-invasively. It is a challenge for residency and fellowship training programs to keep up with these changes whilst ensuring competency of their graduates, and it is a greater challenge for the practicing radiologist.

Traditional continuing medical education programs and updates are unlikely to be adequate for an established practitioner when new (not incremental) technology is introduced into clinical care. In the centers having larger groups of radiologists, where specialization is possible and in the training centers and specialty hospitals, formal and informal methods exist for staff to upgrade their knowledge and skills and benefit from peer review. These opportunities and protections are not available to all radiologists in BC given our geographic and population distribution.

The scope of work undertaken by radiologists in BC is in keeping with their training in most cases. Unfortunately, for individuals who achieved RCPC certification prior to 1981 (CT and ultrasound) and 1990 (MR), the health authorities have little evidence of skill upgrading by the radiologists when new technologies are put into service. It is likely that in many centers, modality specific expertise

was gained “on the job”, and in facilities where peers and learners were readily available, informal processes would support continuing education and peer review would detect interpretation differences based on awareness of the capabilities of the technology.

In reviewing individual practices and health authority facilities, there are by virtue of geography, planning and history, radiologists and organizations who do not have the support of colleagues, either formally or informally, and who provide the services without the benefit of peer review.

Recommendations

Recommendation #1 – Province-wide Prospective Concurrent Peer Review System

It is recommended that the Ministry of Health Services, the College of Physicians and Surgeons and the health authorities create a province-wide concurrent peer review system for diagnostic imaging for quality review and monitoring of image interpretation and technical image quality. It is envisioned that such a system would:

- A) Define a process that requires a proportion of studies initially read by each radiologist in the health authority to be re-read by another radiologist. The image reports would be compared and inconsistencies classified. Interpretive differences would be reported to the original reporting radiologist and others for the purpose of improving reporting quality. Where the review found differences of clinical importance; a supplementary report would be issued and appropriate parties, including the patient, notified.**
- B) Facilitate the selection of random images for peer review and distribution of the images to peer reviewers across the province; facilitate report comparison, adjudication and summary reporting.**
- C) Be incorporated into the provincial e-health strategy focused on professional clinical quality assurance.**
- D) Generate reports for the health authority and it’s Board describing the quality of image interpretation in their facilities.**

Implementation of a peer review system could be approached in two phases. The first phase would begin March 16, 2011 and pursue work underway by the College through its Diagnostic Imaging Quality Assurance Committee. This body has drafted a process for peer review within health

authorities that will require a review of a proportion of studies initially read by each radiologist in the health authority to be re-read by another radiologist.

The second phase would involve the implementation and use of an electronic system and practices that enable second reads of randomly selected images. This system would allow the work of second reads to be distributed across the health system so that the impact on individual radiologists is minimized while preserving the integrity of the review process. VCH and VIHA have already embarked on this process, which can be expanded to include all of the health authorities. This process would:

1. Review vendors of suitable systems that address the workflow, statistical validity of review, and the quality needs of the province. This would include assessments of current provincial resources including existing PAC systems, the provincial network/gateway, the image transfer grid and other facilities as to their suitability to support this system.
2. Define the work processes so that concurrent review can be distributed amongst peers in all health authorities. All radiologists would participate in this activity and would have their work reviewed by peers
3. Define reporting processes to the diagnostic imaging departments, the radiologists and to the Boards of the health authorities.

Recommendation #2 – Retrospective Screening Peer Reviews to Support Quality

Until province-wide prospective concurrent peer review (Recommendation #1) is fully implemented, it is recommended that the College through its Diagnostic Imaging Quality Assurance Committee undertake retrospective screening reviews of imaging services in selected facilities beginning immediately. Determination of the facilities to be reviewed is seen as a joint responsibility of the health authority and the College. Criteria for a screening review might include facilities whose radiologists request such a review and those where the peer support has been limited or absent.

In reviewing individual qualifications and health authority facilities, there are, by virtue of geography planning and history, radiologists and organizations who do not have the support of colleagues, either formally or informally, and who are required to provide CT imaging and interpretation services. The preceding recommendation does not imply issues or concerns specific to the quality of services of individual radiologists but is intended to address the, as yet immature, service delivery organization of diagnostic imaging in parts of BC, so that support for best practices can be

implemented. The need to continue retrospective screening reviews of facilities will be assessed when the concurrent peer review system (Recommendation #1) is implemented.

Recommendation # 3 Diagnostic Accreditation Program Medical Reviews

It is recommended that the Diagnostic Accreditation Program immediately undertake the medical review for any facility that has not yet had this completed as part of the last DAP diagnostic imaging review. The program should use the published 2010 standards for these assessments, the results should be make known to the responsible health authority.

The 2010 standards provide an excellent framework for diagnostic imaging peer review interpretation and physician quality assurance. There have been logistic and process reasons given to explain that lack of attention to medical review in the DAP process. It is the responsibility of the profession in British Columbia to ensure that accreditation programs in general and the Diagnostic Accreditation Program in particular have access to the necessary expertise to make these evaluations. It is unacceptable that the profession has not made available individual diagnostic imaging specialists to support their colleagues through the DAP review process.

Recommendation #4 Health Authority Board Responsibility

It is recommended that health authority boards instruct their Medical Advisory Committees or equivalent to implement clinical audit and peer review programs for all medical staff members, including regular in-depth performance reviews as described in their medical staff rules. The results of these reviews should be reported as part of the regular appointment and re-appointment process or as necessary when performance concerns and remedial actions are necessary. Medical staff member participation in these reviews should be reported to the Board quarterly.

As indicated in recommendation #1, the health authority Boards should receive and evaluate the reports generated by the peer review system and to take actions as necessary to rectify deficiencies with respect to imaging modalities or providers at sites for which they are responsible.

Conclusions

The physicians providing diagnostic imaging interpretation in British Columbia are appropriately qualified and licensed. No individual is currently providing services that infringe upon limitations of their licensure. The majority of providers are working within the scope of their experience as evidenced by their training, reported upgrading and maintenance of certification activities.

The health authorities have not structured themselves to provide organized peer review and performance management for their diagnostic imaging services. The profession and the health system have relied on informal and limited formal medical practitioner quality assurance processes that can be improved through a coordinated province-wide approach.

Geography and access to specialist providers limits the opportunities for formal and informal peer review. The implementation of province-wide image review, incorporating all providers regardless of where in BC they are providing services, will strengthen the diagnostic imaging services provided by the health authorities and will better support our providers.

The second phase of this review is to provide recommendations to the Minister on how health authority credentialing and quality assurance processes can be improved. It will also describe the index incidents where physicians lacked either the appropriate credentials or experience to interpret images and will include an analysis of the responses of health authorities when they learned of problems. The second phase report will be delivered to the Minister on or before August 31, 2011.

**Dr. Doug Cochrane Investigation into Medical Imaging Credentialing
and Quality Assurance**

Terms of Reference

Phase 1

Objective:

The objective of Phase 1 of the investigation is to ensure that radiologists currently practicing in BC are appropriately credentialed and experienced to interpret images generated by medical imaging modalities.

Scope:

Radiologists that read and interpret images from all medical imaging modalities are within scope of Phase 1, but the focus of Phase 1 will be on:

- Ultrasound,
- Computed Tomography (CT),
- Magnetic Resonance Imaging (MRI), and
- Interventional Radiology procedures.

The scope includes images generated by health authority owned and operated sites, as well as images that may have been produced elsewhere and referred to a health authority for diagnostic interpretation.

Radiologists that work solely in Community Imaging Clinics and do not provide publicly-funded medical imaging services are not within scope.

Process:

Dr. Cochrane will gather information from each health authority, the BC College of Physicians and Surgeons, and other sources as required, about the individual radiologists including their appointment history, educational background, medical credentials/privileges, and license status.

Deliverables and Timing:

Dr. Cochrane will deliver a report on his findings by March 14, 2011, for public release.

Phase 2

Objective:

The objective of Phase 2 of the investigation is to provide recommendations to the Minister of Health Services on how the credentialing and quality assurance processes within health authorities can be improved.

Scope:

The following is within scope of Phase 2:

- A **full** description of the incidents where physicians lacked either the appropriate credentials or experience to interpret images, including analysis of the response by health authorities when they learned of problems, the relationship between the BC College of Physicians and Surgeons and health authorities, and the relationship between the BC College of Physicians and Surgeons and other professional and regulatory bodies in BC and other provinces.
- A review of all processes related to physician credentialing and privileges within health authorities, including the role played by the BC College of Physicians and Surgeons.
- A review of all processes related to quality assurance and peer review of medical imaging reports.
- Further issues that arise during the course of the review.

Process:

Dr. Cochrane will gather information for fact finding and analysis by working with representatives from each health authority, the BC College of Physicians and Surgeons, the BC Radiological Society, the Ministry of Health Services and other organizations as required.

Deliverables and Timing:

Dr. Cochrane will deliver a report with recommendations for the Minister of Health Services by August 31, 2011.

February 15, 2011

CEO
HA

Dear _____,

As you are aware, arising from concerns regarding the quality of professional practice, I have been asked to undertake a review of the credentials of members of your medical staff who have been granted privileges in diagnostic imaging (radiology) by your Health Authority Board. This is the first phase of a comprehensive investigation of radiology medical staff credentialing and clinical quality assurance processes in the health authorities.

In order to complete the first phase review which is focused on diagnostic imaging, as defined by Minister Hansen, I request the following information, provided in a readable electronic format.

Regarding your medical staff appointment and re-appointment process,

1. Copies of your current Medical staff Bylaws and Rules.
2. A copy of your medical staff application form and reappointment form.
3. An outline of your process for credentialing, appointment and re-appointment, including the process used for verification of medical licence and any associated restrictions in B.C. or other jurisdictions, reference checks and document verification, the administrative officers and Medical Advisory Committee(s) responsible.

Regarding the diagnostic imaging (Radiology) health authority structure,

1. A description of diagnostic imaging organization in the Health Authority and its facilities (hospitals and other facilities). As the relationships between the medical staff and the facility may differ, please describe the models in place in your Health Authority. For example, is there a Health Authority-wide department or is diagnostic imaging organized locally in a hospital or a programme. The description should include answers to the following questions:
 - a. What is the administrative structure responsible for quality and safety in the department/programme?
 - b. How does this structure interface with the members of the medical staff?
 - c. Is peer review done in the hospital or the Health Authority, and if so, describe how, when reviews are undertaken and by whom?
2. Documentation of the most recent DAP review including:
 - a. Date of last review of diagnostic imaging.
 - b. Summary of recommendations.

Regarding individual medical staff members holding privileges in diagnostic imaging,

Using the appended template, please provide the following information for each individual currently interpreting ultrasound, CT and MR images of any body system and those providing interventional radiology services in your Health Authority. Please include individuals interpreting images generated by your Health Authority facilities and images that may have been produced elsewhere and have been sent/referred to your Health Authority for diagnostic interpretation. Also include radiologists who are working in the community for your Health Authority and medical staff members in Radiology who have departed your Health Authority in the past five years. The appended template includes the following data fields:

Anonymous identifier

Appointment to the Medical Staff

Date of appointment

Date of last reappointment

Facility where the individual practices

Administrative officer (Department Head or other) responsible for interpretive quality

DI specialty credentials

Specialty credentials (Y/N)

Specialty Credentials/privileges in:

CT – specify body systems

2010 number of reports – specify body systems

MR – specify body systems

2010 number of reports – specify body systems

Ultrasound

Paediatric – 2010 number of reports

Obstetrical – 2010 number of reports

General – 2010 number of reports

Specialty systems – 2010 number of reports

Interventional (body system)

2010 number of interventional procedures – specify body system

Date CT scanning interpretation started

Date MRI interpretation Started

Qualifications of the medical staff member

Undergraduate education

School

Degree granted

Date of graduation

Postgraduate education

University

RCPSC certification

Date of certification

Re-certification if applicable

Date of re-certification

Maintenance of competence programme

Date of last submission

Append copy of 2010 submission to the MOCERT

Certification by other professional colleges

Subspecialty qualification

Programme

Date completed

B.C. College of Physicians and Surgeons licence

Type of licence

Date of licensure

Restrictions or limitations on licence applicable to diagnostic imaging (voluntary or College)

College required remediation with respect to diagnostic imaging

Date of remediation order

Date restriction removed by College or individual

Departmental Reviews

Date of last review of this individual by Department Head or equivalent

Non-technical (for example Physician Achievement Review or equivalent)

Date of last review

Areas for improvement

Diagnostic interpretive review

Date of last review

Areas for improvement

Please forward this information to Andrew Wray (awray@bcpsqc.ca) at the B.C. Patient Safety & Quality Council by Wednesday, February 23, 2011. Please confirm the contact person to whom the review team may address questions should they arise.

I thank you and your staff for your assistance in providing this information. Please do not hesitate to contact Mr. Wray or myself if you have questions or concerns.

Yours sincerely,



D. Douglas Cochrane, M.D., FRCSC, FAAP
Provincial Patient Safety & Quality Officer and
Chair, B.C. Patient Safety & Quality Council

DDC/ec

Review Methodology

The evaluation considered data provided by the health authorities, the College, and the Diagnostic Accreditation Program (DAP). Health authority data for individuals was anonymized prior to submission to the reviewer:

- A. The education, certification and licensure of physicians providing diagnostic imaging services in BC:
 - 1. under-graduate and graduate education university and dates of graduation,
 - 2. date of Royal College of Physicians and Surgeons certification in diagnostic imaging,
 - 3. type of medical licensure bestowed by the College of Physicians and Surgeons, including any relevant limitations or undertakings,
 - 4. 2010 Royal College of Physician and Surgeons of Canada maintenance of competence (MOCERT) hours and ,
 - 5. date of appointment and last re-appointment by the health authority, the location of service, and any limitations imposed upon that appointment.
- B. The current scope of practice in CT, MR, ultrasound and intervention, for each provider based upon the number of services provided in 2010;
- C. The most recent Diagnostic Accreditation Program reviews of diagnostic imaging facilities; and
- D. Current licensing information for individual radiologists providing diagnostic imaging services in the health authority sector in BC (provided by the College of Physicians and Surgeons).

The practitioners were grouped for review as

follows: A. BC registration to provide diagnostic imaging;

Full, provisional, conditional

With or without undertaking or other limitation

B. Certification in Diagnostic Imaging;

Royal College of Physicians and Surgeons of Canada Certification

Pre- or post- 1981 if providing CT and ultrasound interpretation

Pre or post 1990 for MRI interpretation

From non-Canadian Jurisdictions

C. Royal College of Physicians and Surgeons of Canada Maintenance of Competence;

- - hours

- Evidence of continuing medical education relevant to CT, MRI, ultrasound or intervention in particular for those individuals who were certified prior to either 1982 (CT, ultrasound) or 1990 (MRI)

D. Scope of practice in 2011

- Modality and service volumes

Following review of the anonymized data for each provider, the health authority VP Medicine was asked for clarification of fact, for missing information if available and other recommendations.

Information received from the public was considered in the review where applicable.