A Current Canadian Quality Assurance Program

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Declaration of Conflict of Interest

I have no conflicts of interest to disclose
Learning Objectives

1. Describe the structure and function of a current Quality Assurance program for Radiologists, and other specialists that perform imaging, as part of an integrated multidisciplinary provincial Quality Assurance program.

2. Recognize that participation in a Quality Assurance program is important to meet the on-going requirements of life-long learning with respect to the CanMEDS competency of Medical Expert.

3. Consider that different approaches to Quality Assurance may be possible.
“....and we’re a rectangle, nature’s most perfect shape”

Premier Lorne Calvert
Sask’s 13th premier
Corner Gas – Season 2
Harvest Dance
Roughriders’ 13th man still a secret
Presentation Summary

Saskatchewan DIQA Program

- History / Background
- Committee structure / Funding
- Standard Setting
- Audit Process
- Results / Audit examples
- Themes for poor quality
- Strengths / Weaknesses
- Future Plans
Advisory Committee on Medical Imaging (ACMI)

- College of Physicians and Surgeons of Saskatchewan (CPSS) committee
- Started in the 1970’s
- Initially existed to provide advice to Government and Health Authorities on equipment purchases
- Development of QA and audit process began in late 1990’s
- Collaboration between CPSS and Government (primarily Ministry of Health)
Advisory Committee on Medical Imaging (ACMI)

- Multi disciplinary mandate / approach
  - Responsible for QA of “all” diagnostic imaging in the province
  - Radiologists, Obstetricians and Gynecologists, Cardiologists
  - Exception – ER physicians excluded (ER U/S)
- Primarily a QA / educational process
- Mandate covered under bylaws of the CPSS
  - Allows for competency assessment of physicians
  - Can have impact on practice / licensure
  - Applies to all Saskatchewan licenced physicians (Telemedicine)
Committee Structure / Funding

ACMI membership:

• Multi disciplinary / stakeholder representation
  • Radiology
  • Nuclear Medicine
  • Obstetrics / Gynecology
  • Ultrasonography
  • Ministry of Health
  • Technologists
  • Radiation Safety
  • Others as needed (Cardiology)
Funding:

• Ministry of Health
  • $125,000 – annual budget

• Committee and support run by CPSS
  • Quarterly meetings
  • Audit costs / management
Standard Setting

*Development of Standards (ACMI)*:

- Codified in CPSS Regulatory Bylaw 25

*Operation of Diagnostic Imaging Facilities in the Province of Saskatchewan*

- Defines standards / expectations for a facility and physicians;
  - Director responsibilities
  - Record of examinations
  - Training Standards (Techs and Physicians)
  - Radiation Standards (Radiation Health and Safety Act)
  - Physician accreditation (full or limited)
  - Procedures / equipment
Standard Setting

Confirmation / Development of Standards:

- General Ultrasound
- Obstetrical Ultrasound
- Nuclear Medicine
- CT
- Bone Densitometry
- Interventional Radiology
- MRI
- Echocardiography

Essentially
CAR Practice Guidelines

Echocardiography
Standards of Canada
Initial Plans:

• All physicians – q 5 years – physician centric
  • ER physicians allowed to develop own process
• On-site survey
  • Physician (medical interpretation – images and report)
  • Technologist (image and equipment quality)
• Visit primary physician work site
  • Secondary site(s) on subsequent audits
Audit Process

*Evolution:*

- Mail-in audits – representative films (pre-PACS)
  - d/t lack of manpower for on-site
- Reviewers
  - Physician
  - Technologist
- Review / finalization of report by ACMI committee
- Recommendations / report
  - Physician
  - Dept Head / Director of Facility / Senior Medical Officer
Audit Process

Representative sample of practice:

- Radiography ~ 30 cases
- Fluoroscopy 20 cases
- Mammography 15 (including w/u)
- Ultrasound 45 (Ob, Abdo/pelvic, other)
- CT 15
- Special Procedures 12
- Nuclear Medicine 30 (Bone Density 15)
- MRI 25
Audit Process

*Representative sample of practice:*

• Male and female patients
• Adult and pediatric cases
• Ob U/S – at least 2 cases from each trimester
• Pelvic U/S to include TA and TV studies
• Selection from different technologists
• Previous mammograms to be included
• CT / MRI – samples of all body systems routinely read
Evolution – Post PACS (current):

• Obtain billing information from Sask Health
  • Indicates numbers and types of services provided

• Select dates for audit
  • Review studies performed on those dates
  • Hospital and private facilities
  • Review images, reports and requisitions
  • Review old studies if appropriate

• Reviewers ➔ ¹₀ Physician / Technologist ➔ ACMI committee

• Recommendations / report
Audit Process

ACMI Recommendations:

1. Satisfactory
   • Routine re-audit

2. Minor deficiencies
   • Recommendations to remediate
   • Re-audit – 3 or 6 months

3. Significant Deficiencies Identified
   • Recommendations to remediate – Re-audit
   • Possible referral to Registrar
     • Possible Competency Assessment
     • Possible limitation of practice
Results

Physician numbers:
Performing Diagnostic Imaging

- Radiologists 103
- Obstetrician / Gynecologists 27
- Internists / Cardiologists 22

* includes physicians cited outside province but fully licensed in Saskatchewan (telemedicine / teleradiology)
Audits to date

Radiologists (103):

- 55 Audits 53.4%
  - 50 satisfactory 90.9%
  - 5 audited more than once 9.1%
    - 3 referred to the Registrar 5.5%
Audits to date

Obstetricians / Gynecologists (27):

- 23 Audits 85.2%
- 11 satisfactory 47.8%
- 12 audited more than once 52.2%
- 2 referred to the Registrar (repeat) 21.7%
- 3 referred to the Registrar (repeat)
Echocardiologists (22):

- 13 Audits
  - 11 satisfactory
  - 2 audited more than once
    - none referred to the Registrar

Audits to date
Illustrative Examples

Practice Audits:

• Audit #1 - Obstetrician / Gynecologist
• Audit #2 - Obstetrician / Gynecologist
• Audit #3 - Radiologist
• Audit #4 - Radiologist
Audit Results – examples

Audit #1 – Ob/gyn

Practice:
• Solo practitioner – performs own scans – office setting
• 200-250/month (avg. 2700 scans/yr)
  • (900 hours, ~112 x 8 hour days, ~ $250K)

Results:
• Obstetrical scans (15)
  • All major deficiencies
• Pelvic U/S (43)
  • 4 acceptable (at a low standard)
  • 27 major deficiencies
  • 12 minor deficiencies
Audit #1 – Ob/gyn

Findings:
• Images not technically optimized – of very poor quality
• Insufficient number and substandard quality of images
  • Often as few as 2-3 images per case
• Almost no measurements
  • documenting fetal measurements or anatomy
• No consistent approach to studies
• Marked lack of annotations
• Imaging of structures often only in single plane
• In many cases
  • Reported abnormalities not documented
Audit #1 – Ob/gyn

Audit summary:

“quality of U/S studies falls well below the minimum or acceptable standards”

Recommendation:

• Stop scanning
• Hire sonographer or take training upgrade
  • Demonstrate ability to perform U/S prior to returning
• Referred to Registrar
Audit #1 – Ob/gyn

Outcome:

• Physician upgraded skills
• Formal competency assessment (re-audit)
  • Radiologist and Ob/gyn – on-site
  • Demonstrated appropriate;
    • Knowledge
    • Scanning ability / documentation / quality
    • Interpretive skills
• Returned to practice
Audit Results – examples

Audit #2 – Ob/gyn

Practice:

• Hospital O&G clinic / FAU
• Sonographer performs exams
• Ob/gyn interprets and reports exams

Results:

• 78 studies reviewed
  • 1st, 2nd, 3rd Trimester
  • Pelvic U/S
Audit #2 – Ob/gyn

Findings:

• Documentation of structures/organs appeared random
• Twin pregnancies not clearly annotated
  • Twin A, B not clear
• Annotations routinely lacking
• **No** documentation of placenta
  • Including relationship to internal os - or cord insertion
• Fetal cardiac imaging suboptimal
• Too quick
  • Example – “complete” twin study with BPP on both twins – 17 mins
  • Ob scans often done in 7 – 10 mins
Findings:

• MD report documents “normal” structures, but;
  • Images do not show structures
  • MD not present for scan
• Technical quality of nuchal translucency studies poor
• Very poor assessment of spine and intracranial contents
• Absence of cardiac activity not documented appropriately
Audit summary:

“The provision of ultrasound to patients has not met the expected standard. This clinic should not be operating in its current state”

Recommendation:

• Stop scanning

• Sonographer has poor skills (needs upgrading), but;
  • physician is responsible for ensuring quality of images
  • MD lacks appropriate understanding of imaging to ensure quality diagnostic studies
Audit #2 – Ob/gyn

Outcome:

• Sonographer
  • Upgraded skills
  • Underwent on-site assessment of skills – returned to practice

• Physician
  • Voluntarily withdrew from practice
    • Not allowed to interpret scans until proven to have adequate interpretive skills
  • Underwent remediation
  • Formal competency assessment ➔ exam ➔ passed

• Returned to practice
Audit Results – examples

Audit #3 – Radiologist

Practice:

• Hospital practice (2 person)
• X-ray, Fluoro, Mammo, U/S, CT
• ~ 1800 studies / month / Rad (21,600 / year)

Results:

• On-site assessment *(Rad and Tech)*
  • ~ 100 cases reviewed
  • Technical satisfactory
  • Interpretation and management questioned
Audit #3 – Radiologist

Findings:

• Reporting style often disorganized and confusing
• No evidence of systematic approach to reporting
• Terminology often vague or confusing
• Differential Diagnosis and recommendations poor
• Weakness in basic anatomy
• Breast imaging particularly weak
  • Non-standard workup and confusing recommendations
  • Poor management
Audit #3 – Radiologist

Audit summary:

“The physician’s practice does not meet the standard of care expected of a Radiologist”

Recommendation:

• Competency Assessment
  • Ordered by the Council of the College
  • Competency Committee makes own format for assessment
    • 3 person committee
    • 4 components (practice Audit, MCQ, OSCE, Test Cases)
**Audit #3 – Radiologist**

*Outcome:*

- Competency Assessment

  "Failed to demonstrate overall competence in Diagnostic Radiology as expected for independent practice"

- Underwent remediation
- Council not satisfied with reports of remediation
- 2nd Competency Assessment

  "...Radiologist lacks adequate skill and knowledge to practice"
**Audit #3 – Radiologist**

**Outcome:**

- 2\textsuperscript{nd} Competency Committee
  - Recommended additional training period (1 year minimum)
  - Raised concerns about the possible quality of historical imaging interpretation based on the nature of the deficiencies noted in the report

- Regional Health Authority and Ministry of Health
  - Ordered independent retrospective review of all imaging read by MD
    - 68,360 studies (general X-ray, CT, Mammo, U/S)
    - Cost ~ $4 M
    - > 26,000 hours of support staff time
Audit #3 – Radiologist

Outcome:

• Radiologist
  • Had voluntarily withdrawn from practice
  • Elected not to renew license after 2\textsuperscript{nd} Competency Assessment
Audit Results – examples
Audit #4 – Radiologist

Practice:
• Hospital practice – primarily solo
• X-ray, Fluoro, Mammo, U/S, CT
  • CT “training” later in career
• ~ 2300 studies / month (27,600 / year)

Results:
• 90 cases reviewed
  • 45 satisfactory
  • 45 deficiencies (39 major)
    • CT particularly worrisome
Audit #4 – Radiologist

Findings:

• Studies technically good quality
• Missed or misinterpreted many findings – particularly on CT
  • Liver lesions (multiple)
  • Bone mets
  • PE’s
  • Adrenal / ovarian masses
  • Benign findings sometimes called malignant
  • Missed many other ancillary findings
• Suboptimal workup of malignant lesions on Mammo
Audit #4 – Radiologist

Audit summary:
“High level of concern RE CT interpretation”

Recommendation:
• Refer to Registrar
• Possible competency assessment
Audit #4 – Radiologist

Outcome:

• Physician elected to retire


• Regional Health Authority and Ministry of Health
  • $2^0$ Audit CT cases – 140 cases
  • Random audit – 449 cases
  • Then, retrospective review – 7213 cases
  • Final additional review – 3766 cases
    • Total = 5 ½ years
    • ~11,000 cases
Audit #4 – Radiologist

Outcome (RHA review of 10,956 CT’s):

• Ranked Variance Category:

  1 - No variance 6373 (58.1%)
  2 - Substantially correct 3141 (28.6%)
  3 - Clinically significant variance 398 (3.6%)
  4 - Urgent clinically significant variance 1044 (9.5%)

\[ \text{13.1%} \]

• Cost ~ $2 M

• ~ 3600 hours of support staff time
## Audit Results – Summary

<table>
<thead>
<tr>
<th></th>
<th># MD’s</th>
<th># Audits</th>
<th>Satisfactory</th>
<th>Re-audit</th>
<th>Referred to Registrar</th>
<th>Stopped practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rads</strong></td>
<td>103</td>
<td>55</td>
<td>50 (90.9%)</td>
<td>5 (9.1%)</td>
<td>3 (5.5%)</td>
<td>2 (3.6%)</td>
</tr>
<tr>
<td><strong>Ob/gyn</strong></td>
<td>27</td>
<td>23</td>
<td>11 (47.8%)</td>
<td>12 (52.2%)</td>
<td>5 (21.7%)</td>
<td>2 (8.7%)</td>
</tr>
<tr>
<td><strong>Cardiologist</strong></td>
<td>22</td>
<td>13</td>
<td>11 (84.6%)</td>
<td>2 (15.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>152</td>
<td>91</td>
<td>72 (79.1%)</td>
<td>19 (20.9%)</td>
<td>8 (8.8%)</td>
<td>4 (4.4%)</td>
</tr>
</tbody>
</table>
Risk Factors:

• Single / solo / small practice
  • Group practice tends to be protective
• U/S self-scanning
• Lack of qualified technologist or ultrasonographer
• Shorter length of examination time
  • “Speed kills quality” – particularly Ob U/S
• Larger volumes
• Lack of documented training for new modalities
  • CT (potentially MRI)
Sask. DIQA Program

Strengths / Weaknesses

**Strengths:**

- Multidisciplinary
  - Except for ER physicians
- Stakeholder involvement – including government
- Educational / QA focus – generally confidential
- Reviews MD for clinical performance
  - Medical interpretation and recommendations
  - Technical quality of study
- Has identified a number of suboptimal performers
  - Improves quality / value – remediation and re-audit
Sask. DIQA Program

**Strengths / Weaknesses**

**Weaknesses:**

- Concerns RE immediacy of review
  - RHA’s and Government – want results for every imager now
- Time for audits
  - Physicians – review 100 + cases / audit
  - Report creation
- Difficulty finding enough reviewers
- Small pool of sub-specialty reviewers
  - Particularly for smaller sub-specialty areas or
  - Subspecialized scope of practice
- ER MD’s not included currently
Weaknesses:

• Doesn’t look at other more global / systemic metrics of “Quality”

  Service Quality
  • Patient experience
  • Referring physician satisfaction
  • Patient safety
  • Access times / wait times
  • Report turn around time

  Economic Quality
  • Cost and value for money
  • Waste in the system
Hybrid Program:

A. Daily peer review program
   - 2 RHA’s doing pilot projects – “RADPEER” like process
   - Only Radiologists at the moment – hospital based
   - Mainly due to RHA and Government
     - Want to know now if problems (current or developing)
     - Want to avoid costly retrospective reviews

B. Ongoing DIQA Audit program
   - More in-depth / comprehensive audit of practice
     - versus small sample daily review
   - Include ER physicians – start teleradiologists
Presentation Summary

Saskatchewan DIOA Program

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Sask. DIQA Program
Questions / comments