Diagnostic Imaging and Rehabilitative Ultrasound Imaging (RUSI) Training & Legislation in Physiotherapy: A Pan-Canadian survey of university programs, provincial college and Canadian Armed Forces

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Live as if you were to die tomorrow. Learn as if you were to live forever.

-Mahatma Gandhi
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Andrews University- Michigan USA

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BACKGROUND AND RATIONALE

Diagnostic Imaging (DI)

✓ Worldwide, health care systems are evolving to face the population needs. Physiotherapists’ extended roles are successfully implemented worldwide and in Canada and Diagnostic Imaging has been identified as key knowledge

  Donato et al 2004. Primary contact physical therapy.
  Suckley J 2012. Core clinical competencies for PT extended scope.
BACKGROUND AND RATIONALE

Diagnostic Imaging (DI)

✔ A need for further delineation of educational baselines in DI is highlighted by recent research.


✔ In Canada, a study exploring PT’s own appreciation of perceived level of competency for DI utilization revealed a need for greater instruction and training.

Chong et al 2015. Ontario PT’s opinions on ordering DI.
BACKGROUND AND RATIONALE

Diagnostic Imaging (DI)

✓ In USA, the same findings led to a survey on DI educational content in professional degree programs and a following education manual proposition in 2015.

Boissonnault et al 2014 and Orthopeadic section of APTA 2015.
BACKGROUND AND RATIONALE

Rehabilitative Ultrasound Imaging (RUSI)

✓ Rehabilitative Ultrasound Imaging (RUSI) has been used worldwide for the past 30 years by PT’s in research and clinical environments.
BACKGROUND AND RATIONALE

Rehabilitative Utrasound Imaging (RUSI)

Definition used in this research:

“Procedure used by physical therapists to evaluate muscle and related soft tissue morphology and function during exercise and physical tasks. RUSI is used to assist in the application of therapeutic interventions, providing feedback to the patient and physical therapist."

Teyhen D  2006 San Antonio RUSI Symposium
Similarly to Diagnostic Imaging, **studies report a need for further delineation of educational baselines** for the utilization of this tool.

McKiernam et al 2013. Professional issues in the use of RUSI for female pelvic floor dysfunction in 2013

Potter et al 2012. Skills and training in the use of RUSI
AT THIS MOMENT

The precise actual and projected Canadian entry-level (E-L) and post-professional (PP) curricula in both subjects are unknown along with the short-medium (within 5 years) projected Canadian legislative environment changes expected to accommodate this trend.
PURPOSE OF THE STUDY

Obtain a contemporary detailed Pan-Canadian review of undergraduate and postgraduate university programs in DI and RUSI

To anchor it in the review of the actual and emerging provincial legislations including those of the Canadian Forces.
METHODOLOGY

✓ Cross-sectional, descriptive survey*

✓ 3 web-based developed online surveys (SurveyMonkey)

✓ Information was collected from June 2016 to March 2017

*Based on Boissonnault WG, White DM, Carney S et al. Diagnostic and Procedural Imaging Curricula in Physical Therapist Professional Degree Programs. 2014
METHODOLOGY

1) 15 entry-to-practice Canadian physiotherapy programs →76.5% full or part-time faculty, 23.5% faculty lecturer, associated faculty or director in interim

2) 12 physiotherapy organizations regulating the practice of physiotherapy →50% registrars, 50% other admin positions

3) The Canadian Armed Forces →PT practice leader/advisor
DESCRIPTIVE STATISTICS

- % of total Canadian PT workforce
- # Entry-Level PT programs
- % of first year Canadian students
- # Post Professional PT programs DI

100% responding rate for universities, legislative bodies and CAF
KEY RESULTS-UNIVERSITIES

Actual teaching

✓ Both DI and RUSI were identified as essential competencies for PT graduates by most of the university respondents.

- DI 73% agreed 13% neutral 13% disagreed
- RUSI 60% agreed 20% neutral 20% disagreed

✓ 60% (9/15) entry-level university programs reported offering at least 3 hours of DI material.

✓ 13.3% (2/15) offered RUSI
KEY RESULTS-UNIVERSITIES

Actual teaching

✓ 77.8% of these universities teaching DI started less than 10 years ago and both universities teaching RUSI started 5 years ago.

✓ Only one university reported offering at least 3 hours of DI in post-professional curriculum offering credits (3-credits online course), one university offered 17 hours non-credit continuing education course in DI and none offered RUSI.
KEY RESULTS-UNIVERSITIES

Projected teaching within 5 years

✓ 66.7% of the 15 university respondents reported plans to increase material in DI.

✓ 46.7% of the 15 university respondents reported plans to increase material in RUSI.

✓ No university reported a decrease in DI or RUSI material.
### TEACHING CONTACT HOURS BY MODALITY IN ENTRY-LEVEL PROGRAMS (N=8)*

<table>
<thead>
<tr>
<th>Teaching Modality</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Classroom lecture</td>
<td>0</td>
</tr>
<tr>
<td>Independent reading</td>
<td>10-14</td>
</tr>
<tr>
<td>Laboratory (practice identifying structures/conditions)</td>
<td>5-9</td>
</tr>
<tr>
<td>Online coursework</td>
<td>15-19</td>
</tr>
<tr>
<td>Simulated patient experience</td>
<td>0</td>
</tr>
<tr>
<td>Supervised actual patient care</td>
<td>0</td>
</tr>
<tr>
<td>Video/CD-ROM</td>
<td>0</td>
</tr>
</tbody>
</table>

*Results from one university could not be used due to incomplete information*
## ESTIMATED NUMBER OF INSTRUCTIONAL HOURS
PER TOPIC FOR ENTRY-LEVEL (N=8)* AND POST-PROFESSIONAL (PP) PROGRAMS (N=1).

<table>
<thead>
<tr>
<th>Topic</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>PP</th>
</tr>
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<tbody>
<tr>
<td>Physical properties of imaging modalities</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5+</td>
<td>1</td>
<td>2</td>
<td>*</td>
<td>5+</td>
<td></td>
</tr>
<tr>
<td>Radiation protection</td>
<td>1</td>
<td></td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>*</td>
<td>4</td>
<td></td>
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<tr>
<td>Indication and contraindications of the modality/tests</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5+</td>
<td>2</td>
<td>1</td>
<td></td>
<td>*</td>
<td>5+</td>
<td></td>
</tr>
<tr>
<td>Strengths and limitations of imaging modalities</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5+</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>*</td>
<td>5+</td>
</tr>
<tr>
<td>Integration of imaging results with other examination findings</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5+</td>
<td>3</td>
<td>1</td>
<td></td>
<td>*</td>
<td>5+</td>
</tr>
<tr>
<td>for patient plan of care development, other than for patient referral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Communication strategies with other medical personnel/patients</td>
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<td>3</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>*</td>
<td>3+</td>
</tr>
</tbody>
</table>

*Results from one university could not be used due to incomplete information
STUDENT’S COMPETENCE post teaching

AS RATED BY EDUCATORS

✓ **Highest scores** (4- agree and 5-highly agree):

  Terminology

  Clinical application of radiologists’ reports

  Making appropriate referrals to radiologists/radiology department for plain-film radiography and ultrasonography

✓ **Lowest score** (1-totally disagree 2-disagree):

  Interpretation of the image

✓ **Superior competence in plain radiographs and US.**
KEY RESULTS-UNIVERSITIES

- Large variability of DI/RUSI instructional content and competence assessment among universities even in the same province.

- Lack of time and prioritization in the curriculum greatest causes for limited DI/RUSI curriculum.

- Emphasis on musculoskeletal system vs neurological or cardio/respiratory system for DI.

- Physiotherapists act as main lecturer/professor in 55.6% of the programs teaching DI and 100% in RUSI.

- Some universities give more importance in interpretation of the image in DI, others report that interpretation is not in PT scope.
<table>
<thead>
<tr>
<th>Province</th>
<th>Central Act (Umbrella)</th>
<th>Number of registered Physiotherapists</th>
<th>Can refer directly for DI</th>
<th>Change expected in DI referral within 5 years</th>
<th>Can use RUSI independently</th>
<th>Changes expected in RUSI utilization within 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta</td>
<td>Yes</td>
<td>2667</td>
<td>Yes¹</td>
<td>No</td>
<td>No²</td>
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<td>3700</td>
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<td>Yes</td>
<td>No</td>
<td>Yes³ DNK</td>
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<td>Yes</td>
<td>DNK</td>
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<td>Nova Scotia</td>
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<td>750</td>
<td>Yes⁵</td>
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<td>Northwest Territories/Nunavut</td>
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<td>20</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Newfoundland/Labrador</td>
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<td>Prince Edward Island</td>
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<td>5000</td>
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<td>Yes⁹</td>
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<tr>
<td>CAF</td>
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<td>85</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>DNK</td>
</tr>
</tbody>
</table>
KEY RESULTS-LEGISLATIVE BODIES

Diagnostic Imaging

✓ Very few Canadian physiotherapists can make a direct referral for DI at the moment.

✓ It is projected that 58.3% (7/12) representing 92.68% of the physiotherapy workforce will have the possibility to directly refer a patient for medical imagery for some form of diagnostic imaging **within 5 years.**

✓ The Canadian model seems to favor **PP training** for DI referral based on some projected legal frameworks and the actual model in Alberta.
KEY RESULTS-LEGISLATIVE BODIES

Rehabilitative Ultrasound Imaging

✓ RUSI utilization is less restricted than DI referral in Canadian PT legislation.

✓ RUSI is permitted by 41.7% of legislative bodies.

✓ 16.7% of legislative bodies are expecting a positive change within the next 5 years.

✓ 41.7% do not know if changes are expected in RUSI utilization.

✓ The fact that RUSI is a relatively new modality and that there is a lack of precise utilization parameters for rehabilitative purposes in Canada was mentioned.
LIMITATIONS

✓ Variability in the precision of the answers

✓ The format of the questionnaire was less suited for problem-based curriculum.

✓ Possibility of misinterpretation of questions or lack of comprehensiveness even if the questionnaires were pilot-tested.

✓ Subjective opinions were gathered from respondent (students’ competence, educator profile or future expected legislative direction) bringing possible personal bias.

✓ The universities that reported not offering at least 3 hours of content in DI and RUSI were not questioned further.
CONCLUSIONS

✓ A large variability of DI/instructional content and competence assessment exists between Canadian universities, even in the same province.

✓ Results indicate an expected increase of importance of DI/RUSI in Canadian PT practice.

✓ Image interpretation as a necessary skill for PT in Canada seems to bring different opinions among educators.

✓ RUSI precise definition and utilization parameters for rehabilitative purposes in Canada may need to be explored.
RECOMMENDATIONS

A concerted position paper steered by a committee sponsored by the Physiotherapy Education Accreditation Canada Society / the Canadian Alliance of Physiotherapy Regulators and the Orthopedic Division of the CPA would be helpful to:

1) Establish a **baseline definition for ultrasonography** utilization for Canadian physiotherapists.

2) Establish a **consensus on DI/RUSI educational objectives and curriculum** at the entry-level in Canadian universities.

3) Establish a **consensus on the core clinical competencies and training background necessary to perform DI/RUSI tasks in Canada**.
THANK YOU!

MERCI!

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