Evaluating Physical Therapists Knowledge of Diagnostic Imaging
Katelyn Sikora SPT, Bryan Cheskiwicz SPT, Tolbert Jefferies SPT
Advisor: Michael Ross PT, DHSc, OCS, FAOMPT

RESEARCH QUESTION
What is the effectiveness of physical therapists in evaluating and interpreting diagnostic imaging in comparison to other healthcare professionals?

BACKGROUND
Diagnostic imaging is the process of creating a visual representation of the internal structures of the body for clinical practice. Diagnostic imaging has become a popular demand in the healthcare field with the increase in these services. Forms of diagnostic imaging commonly seen within clinical practice are radiography, magnetic resonance imaging, computed tomography, and ultrasonography. With direct access to physical therapy, improvements in musculoskeletal outcomes can be foreseen with a reduction in cost1. However, the increased use of diagnostic imaging has contributed to increases in the cost of these services without improved patient outcomes. As the profession of physical therapy strives toward an autonomous practice, knowledge advancements and competency are likely required2. The diagnostic accuracy of the clinical examination of physical therapists in combination with diagnostic imaging has been evaluated as sufficient when compared to other healthcare professionals3. Quality clinical assessment of diagnostic imaging, with or without clinical guidelines, can aid in facilitation of improving interpretation of various diagnostic imaging modalities in clinical practice.

Many factors can impede or facilitate the interpretation of diagnostic imaging. Knowledge of normal and abnormal anatomy of various body tissues, knowledge of advanced diagnostic imaging modalities, and the clinical expertise of the healthcare provider recommending or evaluating the imaging. However, some studies have shown that diagnostic imaging may be evaluated ineffectively by physical therapists and other healthcare professionals via identification of abnormal tissues, possible diagnoses, and clinical scenarios. This controversy may be due to flawed experimental design or routine errors associated with image interpretation. However, it could also be explained by the lack of knowledge and adequate instruction of diagnostic imaging in academic and clinical practice.

PURPOSE
The purpose of this literature analysis is to review the efficacy of physical therapists in evaluating and recommending diagnostic imaging. Criteria relative to the effective evaluation of diagnostic imaging will also be investigated.

Figure. Radiograph of the pelvis and hips of a 30 year old male with a 6 month history of worsening left hip pain.

MATERIALS AND METHODS

Authors Purpose Methods Subjects
Crowell M. et al Study: Diagnostic imaging in the direct-access sports physical therapy clinic: A 5-year retrospective practice analysis. To evaluate the effectiveness and appropriateness of diagnostic imaging exams ordered by physical therapists in a direct access sports physical therapy clinic. This was a 2-year retrospective observational study. Researchers evaluated 108 magnetic resonance imaging and computed tomography exams ordered from four physical therapists. Board-certified radiologist determined the appropriateness of each order based on American College of Radiology appropriateness criteria. 1,580 cadets, faculty, staff, and family members at West Point. 78/108 (71.3%) were males. 60/108 (28.7%) were females. Mean age was 24.8 (10.6).

Mortis A. Cook C. Hassen A Study: Ohio physical therapists accuracy in identifying abnormalities on diagnostic images with and without a clinical vignette. To evaluate the accuracy of practicing clinicians to identify musculoskeletal conditions on plain-film radiographs, magnetic resonance imaging, and computed tomography. This was a cross-sectional study based on an 18 question survey through Survey Monkey. Participants identified were asked to provide diagnoses based on diagnostic imaging with and without a clinical scenario. Conditions assessed included cervical spine radiograph, anterior cruciate ligament tear, and avascular necrosis of the femoral head (Figures).

Ross M. et al Study: The knowledge of low back pain management between physical therapists and family practice physicians To assess and compare knowledge in managing patients with low back pain, including the need for diagnostic imaging between physical therapists and family practice physicians. Physical therapists and physicians completed standardized examinations that assessed knowledge, attitudes, the usefulness of clinical practice guidelines, and management strategies for patients with low back pain. Comparison between physical therapists and family practice physicians was conducted using relative risk and independent t-tests. Purchased mailing addresses of physical therapists and family practice physicians from the private practice section of the American Physical Therapy Association and the American Academy of Family Physicians.

Beulet B. Trehan S. Shalvoy R. Mello M Study: The Ottawa knee rule: Examining use in an academic emergency department To evaluate physician knowledge of, barriers to implementation of, and compliance with the Ottawa Knee Rule in academic emergency departments, while evaluating whether the patient characteristics met guideline compliance. This was a cross-sectional study based on a 10 question assessment of attending emergency department physicians on 3 affiliated academic emergency departments. Knowledge, attitudes, and self-reported practice behaviors related to the Ottawa Knee Rule were assessed. A retrospective emergency department record review was conducted for patients, 15 years old or older, who presented with acute knee trauma to the 3 study emergency departments.

46 emergency department physicians. Board certified in emergency medicine and/or pediatric emergency medicine. Faculty at one of the nation’s largest academic emergency medicine departments. Staff had a combined annual volume of approximately 200,000 emergency department visits.

RESULTS

The general consensus among these studies is that further refinement of diagnostic imaging interpretation skill is necessary among physical therapists. Crowell et al4 found that board certified physical therapists were 3 times more likely to document the correct diagnosis, based upon magnetic resonance imaging findings. The study by Morris et al2 demonstrated that physical therapists had an improved response rate to diagnostic imaging with the use of a clinical scenario: 48% correctly identified an anterior cruciate ligament tear on magnetic resonance imaging, improving to 61% with a case scenario; 6% correctly identified avascular necrosis of a hip on a radiograph, improving to 26% with a case scenario; 31% correctly identified a cervical spine fracture in a computed tomography image, improving to 35% with a case scenario. Ross et al3 found that physical therapists and physicians demonstrated comparable levels of knowledge with regard to diagnostic imaging for patients with low back pain. However, both groups appeared to recommend diagnostic imaging frequently when it was not necessary. Beulet et al4 found poor compliance for the Ottawa knee rule among emergency department providers. More specifically, the rate of compliance for the Ottawa knee clinical prediction rule among emergency department providers was only 63%.

Table. Accuracy of imaging diagnosis with and without use of clinical scenarios. Note: MRI= magnetic resonance imaging; CT = computerized tomography.

<table>
<thead>
<tr>
<th>Item</th>
<th>With Imaging Only</th>
<th>With Imaging and Clinical Scenario</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior Cruciate Ligament Rupture (MRI)</td>
<td>417 (48.2%) = correct</td>
<td>449 (51.8%) = incorrect</td>
<td>531 (61.3%) = correct</td>
</tr>
<tr>
<td>Avascular Necrosis of the Hip (Arthrogram)</td>
<td>48 (5.5%) = correct</td>
<td>81 (9.4%) = incorrect</td>
<td>222 (25.6%) = correct</td>
</tr>
<tr>
<td>Cervical Spine Fracture (CT)</td>
<td>268 (30.9%) = correct</td>
<td>598 (69.1%) = incorrect</td>
<td>315 (36.4%) = correct</td>
</tr>
</tbody>
</table>

CONCLUSIONS
Current literature supports the use of diagnostic imaging in clinical practice to evaluate various tissues within a physical examination. Evidence suggests that physical therapists and other healthcare providers need improvement in when to order and how to effectively evaluate diagnostic imaging. Improvement with ordering and interpretation of diagnostic imaging is required as the profession of physical therapy moves more toward direct access. Implementation of diagnostic imaging education in physical therapy curricula may be required to provide adequate knowledge of diagnostic imaging within the profession of physical therapy.

REFERENCES