ACRM
AMERICAN CONGRESS OF REHABILITATION MEDICINE

Archives of Physical Medicine and Rehabilitation

journal homepage: www.archives-pmr.org

Archives of Physical Medicine and Rehabilitation 2013;94:1628-34

ORIGINAL ARTICLE

# Intrarater and Interrater Reliability of Select Clinical Tests in Patients Referred for Diagnostic Facet Joint Blocks in the Cervical Spine

Geoff M. Schneider, PhD,[a] Gwendolen Jull, PT, PhD,[b] Kenneth Thomas, MD, MHSc,[c] Ashley Smith, PT,[b] Carolyn Emery, PT, PhD,[d] Peter Faris, PhD,[e] Kathryn Schneider, PT, PhD,[d] Paul Salo, MD[f]

*From the [a]Graduate Sciences Education, Faculty of Medicine, University of Calgary, Calgary, Alberta, Canada; [b]School of Health and Rehabilitation Sciences, The University of Queensland, St Lucia, Queensland, Australia; [c]Department of Surgery, Faculty of Medicine, Foothills Hospital, Calgary; [d]Sport Injury Prevention Research Centre, University of Calgary, Calgary; [e]AHS Research—Research Excellence Support Team, Foothills Medical Centre, Calgary; and [f]Department of Surgery, Faculty of Medicine, University of Calgary, Heritage Medical Research Building, Calgary, Alberta, Canada.*

**Abstract**

**Objective:** To measure the intra- and interrater reliability of select standardized clinical tests used for the assessment of patients with axial neck pain referred for diagnostic facet joint blocks.

**Design:** Single-group, repeated-measures study.

**Setting:** Tertiary interventional pain management center.

**Participants:** Consecutive patients with persistent neck pain, referred to a tertiary interventional pain management center, were approached to participate. Fifty-six patients consented to participate in the study.

**Interventions:** Subjects underwent a standardized clinical testing protocol, performed by 2 physiotherapists, before receiving diagnostic facet joint blocks. Subjects were examined twice by 1 assessor for the determination of the intrarater reliability of the testing protocol, and again by a second assessor for determination of interrater reliability.

**Main Outcome Measures:** Intraclass correlation coefficients (ICCs), kappa coefficients, and 95% confidence intervals were calculated to determine the intra- and interrater reliability for cervical range of motion (ROM; 6 directions), extension-rotation (ER) test, manual spinal examination (MSE), and palpation for paraspinal tenderness (PST) from C2 through C7.

**Results:** For intrarater reliability, kappa coefficients ranged from .51 to .88 for the ER test, MSE, and PST, and ICCs ranged from .91 to .97 for ROM. For interrater reliability, kappa coefficients ranged from .74 to .96 for the ER test, MSE, and PST, and ICCs ranged from .90 to .95 for ROM.

**Conclusions:** The standardized clinical tests exhibited moderate to substantial reliability in patients with axial neck pain referred for diagnostic facet joint blocks. The data justify the incorporation of these tests into a clinical prediction model to screen patients before referral for diagnostic facet blocks.

Archives of Physical Medicine and Rehabilitation 2013;94:1628-34



Neck pain is common in today's society with an estimated cumulative incidence of 179 cases per 1000 persons.[1] Up to 65% of individuals report neck pain in their lifetime.[2,3] Although the specific etiology can be difficult to determine, studies[4-6] using comparative, controlled facet joint blocks implicate the facet joint as a primary source of pain in 36% to 67% of those with persistent neck pain.

The approach for the diagnosis of facet joint—mediated pain most recognized internationally is controlled block procedures using either 2 different local anesthetics or placebo-controlled procedures.[7,8] The use of facet joint procedures in the United

Supported by the Canadian Institutes of Health Research (grant no. GSD - 104587), LifeMark Health, Calgary Orthopaedic Research and Education Fund, and Alberta Spine Foundation.

No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated.

0003-9993/13/$36 - see front matter © 2013 by the American Congress of Rehabilitation Medicine
http://dx.doi.org/10.1016/j.apmr.2013.02.015

States increased by more than 600% between 1997 and 2006.[9] Facet joint blocks are invasive procedures, associated with significant costs and a small element of risk to the patient. There are lengthy wait times for these procedures in many jurisdictions where resources are limited. Patients who ultimately respond negatively to diagnostic blocks magnify these wait times. A clinical method to screen for patients most likely to benefit from diagnostic facet blocks would aid in reducing health care costs and wait times. There is little evidence to suggest that any 1 factor related to the patient's history or clinical examination can predict the outcome of facet block procedures.[10] Thus, it has been suggested that the derivation of a clinical prediction guide, incorporating findings from a cluster of clinical tests, may provide the clinician with a more accurate determination of those who may respond positively to diagnostic facet joint blocks.[11]

A clinical test must be deemed reliable before it can be incorporated into a clinical prediction guide.[12,13] Although still controversial, findings from clinical tests such as range of motion (ROM), segmental palpation, the extension-rotation (ER) test, and manual spinal examination (MSE) are used as guides to assist clinicians in making management decisions in the context of cervical facet joint—mediated pain.[11,14,15] The reliability of the ER test has not been examined.[15] Studies[16-21] evaluating the reliability of MSE (ie, passive spinal mobility at each segment and pain provocation during segmental motion) in patients with neck pain have reported conflicting results. In addition, clear operational definitions of the examination and inclusion of all spinal segments in the cervical spine have been inconsistent.[16,18] No published literature addresses the reliability of these tests in individuals who have been referred for diagnostic facet joint blocks. For the purposes of the present study, these patients may be distinguished from patients with "typical mechanical neck pain" by their reports of persistent symptoms for at least 3 months' duration, with higher levels of neck pain and disability, and a failure to respond to conservative rehabilitation and pharmacologic interventions.[22]

The purpose of this study was to determine the intrarater and interrater reliability of common clinical tests used to evaluate patients with persistent neck pain referred for diagnostic facet joint blocks. Determining the reliability of each test will enable the derivation of a clinical prediction guide to identify which patients are best suited for diagnostic facet joint blocks.

## Methods

### Study design

This study was a single-group, repeated-measures reliability study.

### Participants

Consecutive patients with persistent neck pain, referred to a tertiary interventional pain management center in Calgary, Alberta, Canada, were approached to participate. Subjects were included if aged between 18 and 65 years and reported neck pain intensity of $\geq$3 out of 10 on a numeric pain rating scale (NPRS) for at least the last 3 months.[23] This standard was set to ensure that a subject's pain intensity exceeded that of the reported measurement error of the NPRS.[24] Subjects were excluded if they presented with cervical radiculopathy, upper motor neuron disease, or both; neck pain related to systemic disease, infection, neoplasm, or fracture; a medically diagnosed psychological disorder; uncontrolled diabetes; uncontrolled clotting disorder; pregnancy; or a workers' compensation claim or ongoing litigation.

Consecutive sampling methods were applied and of the 108 individuals approached to participate in the study, 27 were excluded (14 were older than 65y, 4 possessed a significant language barrier, 3 already had their injection, 1 could not cease anticoagulant therapy, 4 had pain intensity <3, and 1 could not secure transportation to the appointment), 11 declined participation, and 56 consented to participate. There were no clinically relevant differences in age, sex, neck pain intensity, and duration of neck pain between individuals who participated in the study and those who declined.

At baseline, participants completed a demographic questionnaire, the Neck Disability Index,[25] the Pain Catastrophizing Scale,[26] the General Health Questionnaire-28,[27] and the self-report version of the Leeds Assessment of Neuropathic Symptoms and Signs Pain Scale.[28] The questionnaires provided background data for the study and are not reported in the results. Subjects were assessed before their first diagnostic facet joint block. Ethical approval for this study was obtained from the Conjoint Health Research Ethics Board at the University of Calgary.

### Procedures

Once written consent was obtained, subjects completed all questionnaires. They then underwent a standardized clinical examination. The assessors were 2 experienced physiotherapists with 12 to 16 years of clinical experience. Select clinical tests commonly used in patients with neck pain were included in the standardized clinical examination. The physiotherapists were provided with a training manual outlining the standardized approach to the clinical examination, including operational definitions of the clinical tests. They underwent a 1-hour training session to ensure a standardized approach. Data collection took place between October 2011 and March 2012.

To determine interrater reliability, subjects were assessed by the 2 physiotherapists independently before their scheduled diagnostic facet joint blocks. Subjects were given a 5-minute break between testing sessions. Assessor order was randomized to minimize any potential bias. The second assessor was blinded to the results of the first assessment. Both assessors were blinded to any clinical information pertaining to the subjects (including the level of facet joint block to be performed) to reduce the potential for clinical review bias.[29] Subjects were asked not to reveal any information from the first assessment to the second assessor. Intrarater reliability was determined by having the same physiotherapist reexamine the same patient 7 days after the initial examination.

The clinical examination was performed in the following sequence and included the assessment of cervical ROM, ER test, MSE, and palpation for segmental tenderness (PST). Each testing session lasted approximately 15 minutes.

***List of abbreviations:***

| | |
|---|---|
| **ER** | **extension-rotation** |
| **ICC** | **intraclass correlation coefficient** |
| **MSE** | **manual spinal examination** |
| **NPRS** | **numeric pain rating scale** |
| **PST** | **palpation for segmental tenderness** |
| **ROM** | **range of motion** |
| **SEM** | **standard error of measurement** |