Editorial

Improving Undergraduate Musculoskeletal Education: A Continuing Challenge

Musculoskeletal problems are common, accounting for 20% of both primary care and emergency room visits[1]; it is estimated that 16% of the North American population has some form of arthritis[2]. The economic burden of musculoskeletal illness is massive, accounting for 1% to 2.5% of the gross national product of Western nations[2]. Therefore, adequate provision of and education in musculoskeletal care is important given the sheer magnitude and burden of this illness affecting patients and society at large.

The report by Oswald, *et al* in this issue of *The Journal* identifies current musculoskeletal physical examination (MSK-PE) teaching practices in Canadian undergraduate medical education[3]. The report also examines the use of the Patient Partners® in Arthritis Program (PPIA) in undergraduate MSK-PE. Their study used a self-administered questionnaire that was completed electronically by 12 of 17 Canadian medical schools.

The results of this study are concerning. The total average time spent in MSK-PE teaching was 4 to 7 hours. This was broken down into 3 to 5 hours of small-group teaching (10 or fewer students) and 1 to 2 hours of large-group teaching. Further, 58% of MSK-PE teaching was done either fully or partly by non-MSK experts.

Previous studies have shown that 56% of family practitioners report medical school as the only source of formal instruction in the MSK system[4]. In this context, the findings of Oswald, *et al* are especially worrisome, since over half of our family physicians have completed an average of 4 to 7 hours of formal MSK-PE teaching. Therefore, it is not unexpected to find 51% of family doctors reporting inadequate training in orthopedics[4] and 82% of recent medical school graduates failing to demonstrate basic competency in a validated examination of MSK medicine[5].

The MSK physical examination is essentially a set of different actions that must be executed in a sequential or step-like fashion. This form of "complex learning" is referred to as a procedure[6]. The MSK-PE procedure includes both motor and intellectual skills. The common characteristic of a motor skill is the development of smoothness of action, precision, and timing. An intellectual skill involves a learner's interacting with the environment, making decisions about a variety of events. The feature of a motor skill that sets it apart from other varieties of learning (i.e., attitudes) is that it improves through practice, whereas an intellectual skill improves through interaction and application to a range and variety of different situations and contexts[6].

With this "theoretical base" it is clear that MSK-PE learning is very much like learning the procedure of safely operating a motor vehicle. It would be ridiculous to believe 4 to 7 hours of formal driving education, taught by individuals who do not drive on a regular basis, in a large-group format, would be sufficient to learn such a complex task. Why do we believe this of MSK-PE education? To this end, the authors correctly state, "large-group teaching of physical examination skills offers neither the opportunity for students to attempt the skills discussed nor does it provide opportunities for feedback to students".

Barriers for MSK-PE teaching discussed in the article include a lack of agreement on teaching topics, a lack of confidence among non-MSK specialists, poor communication, and poor remuneration for such activities[7,8]. One of the major barriers to MSK-PE teaching is the lack of consistency in the examination among specialties and the confusing array of clinical tests[9]. Students are often overburdened with a large amount of information that serves only to confuse. An important step to addressing this problem was the development and preliminary validation of a core set of clinical skills for medical students[9]. This set is suggested as the "basic minimal requirement" and is a good starting point on which to build an MSK-PE teaching program. Further modification of this set of clinical skills is required following a period of testing and validation.

Oswald, *et al* conclude their discussion by providing a review of other strategies implemented to improve MSK-

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PE teaching, including standardized clinical instruction modules (SCIM) and the PPIA.

SCIM are similar in structure to an objective structured clinical examination (OSCE), but are designed to teach medical students and provide formative feedback[10]. With the SCIM an MSK specialist teaches a clinical skill, then supervises students during practice and provides immediate feedback. We moved to the SCIM model for teaching MSK-PE because of poor student evaluations and a lack of standardized format and content of our MSK-PE system. Our student evaluations have improved significantly, MSK-PE teaching is now standardized, and we have reduced the number of instructors from 35 to 24.

The first 3-hour session in our SCIM model involves the use of the PPIA, a centrally coordinated, standardized national program that trains patient educators with arthritis to teach and evaluate MSK clinical examination skills. The authors of this study report 66% of Canadian medical schools utilize the PPIA for an average of 1–2 hours of MSK-PE teaching time. Studies on the effectiveness of the PPIA have been conflicting. Utilizing student OSCE examinations as the outcome measure, teaching superiority of rheumatology faculty over trained patient educators was found in one study, whereas similar results between the 2 groups were found in another[11,12]. A combined program of PPIA and an integrated expert MSK clinician would be an optimal approach, although likely limited by resources.

We must recognize that a lack of MSK-PE teaching is one example of a much larger issue of the lack of curriculum time and resources devoted to MSK education[13]. It is imperative that we continue to clearly define our goals and objectives of MSK-PE teaching in undergraduate medical students, keeping in mind MSK-PE learning should be done in a graduated approach beginning with comfort in basic skills. These objectives can then be used as a blueprint for the national certifying examinations. The current MSK-PE objectives of the Medical Council of Canada Qualifying Examination regarding joint pain lack significant detail and are in need of further refinement. Medical schools and the Liaison Committee on Medical Education could be pressured for more time to enable students to achieve these objectives.

Oswald, *et al* have provided important information on the current state of MSK-PE teaching in Canadian medical schools. The results of their study should act as a stimulus for educators. Key elements of improvement of MSK-PE could include: (1) refinement, dissemination, and broad acceptance of clearly defined goals and objectives; (2) continued lobbying for time and resources; and (3) continued development of novel teaching methodologies and dissemination of existing successful teaching methodologies.

ANDREW E. THOMPSON, MD,
Assistant Professor of Medicine,
Division of Rheumatology, Department of Medicine,
Schulich School of Medicine, University of Western Ontario,
London, Ontario, Canada

Address reprint requests to Dr. Thompson.
E-mail: andy.thompson@rogers.com

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