Teaching musculoskeletal examination skills to UK medical students: Have we abandoned GALS? A regional survey

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Abstract

Background: Specialists in Rheumatology and Orthopaedics are frequently involved in undergraduate teaching of musculoskeletal (MSK) examination skills. Students often report that teaching is inconsistent, confusing and bears little resemblance to the curriculum. The Gait, Arms, Legs and Spine (GALS) is a MSK screening tool that has been endorsed globally by the two specialties, although has been hampered by low uptake. This cross-sectional survey evaluates the current state of undergraduate teaching in Rheumatology and Orthopaedics, in particular attitudes towards teaching using the GALS method.

Methods: An electronic questionnaire was sent to specialist trainees and Consultants in the East and West Midlands region, representing 5 UK medical schools. Descriptive statistical data analysis was performed.

Results: There were 76 respondents from 5 medical schools. Evidently, the specialties seem to adopt similar modes of teaching with the majority of respondents favouring use of ‘real’ patients. There was a request for newer teaching methodologies to be used: role-play (19.7%), multi-media computer-based learning (35.5%), audio-visual aids (31.6%), and social media (3.9%). It is also apparent that GALS is under-utilised with 50.0% of clinicians not using it in their teaching.

Conclusions: There is a genuine desire for clinical educators to improve their teaching ability, collaborate more with curriculum planners, and feel valued by institutions. There remains a call for implementing a standardised approach to MSK clinical teaching.

Keywords: Musculoskeletal, Undergraduate, Education, Medical, Curriculum
Background

Musculoskeletal (MSK) disease has a significant impact on today’s society, both physically and financially [1-5]. What’s more, the morbidity and associated disability of these conditions is projected to increase further, in line with an ageing and heavier population [6].

Without doubt all medical students should receive teaching on MSK examination. I believe we owe it to our successors for them to feel confident at assessing MSK-related conditions. Joint examination should still be regarded as a clinical skill; in fact there can be much reward from identifying pathology with well tried-and-tested techniques. It is important to realise that despite advancements in diagnostic technology, patients still require a thorough and holistic clinical assessment of their condition. Consequently, we have long recognised the need for high quality and enthusiastic teaching of MSK examination skills in the undergraduate arena.

Unfortunately, there are several barriers to delivering this teaching in an effective manner. In spite of the high frequency of MSK disease, the locomotor system is often overlooked and not given the same attention as other bodily systems [7]. Evidently, MSK examination is seen as a neglected skill by practising clinicians [8-10]. This is paralleled by a global inadequacy in clinical skills teaching [11], and lack of confidence on the part of the teacher [12].

Another major obstacle to enhanced education of MSK examination has been its under-representation in undergraduate curricula [13]. There has been little agreement about what ‘core’ standards are expected of students [9]. This is paralleled by the inter-professional way in which MSK clinical skills are often taught,
in that students often report inconsistency and confusion in the way that teaching is
delivered. It is obvious that the focus of examination will be different when students
are taught by different specialists; however there is consensus that MSK clinical
teaching should be simplified and standardised [14].

It is also important to note that the number of teaching hours does not always
 guarantee an improvement in students’ clinical skills [11]. In order for specialists to
optimise teaching opportunities, they should embrace new teaching strategies and
learning styles that are being driven by new medical curricula. More recent evidence-
based strategies include use of small group interactive teaching sessions, patient
educators and computer-assisted learning (CAL) programmes [11].

The advent of the Gait Arms Legs and Spine (GALS) locomotor screen in the
1990s was a major step forward. Not only did it try to simplify locomotor examination
for inclusion in the “medical clerking”, it also gave us a novel and practical way to
examine the MSK system, with the aim of detecting important abnormalities and
functional disabilities with a high sensitivity and specificity [15]. It comprises three
screening questions: (1) do you have any pain or stiffness in your muscles, joints or
back? (2) Can you dress yourself completely without difficulty? (3) Can you walk up
and down the stairs without difficulty? What should follow is a brief screening
examination (Table 1). We are informed that students who are taught the GALS
screen as part of the curriculum perform it as confidently as other systems [16]. The
same can also be said for doctors [17]. Nevertheless, GALS should not be seen as a
substitute for a more detailed assessment of the MSK system.

In spite of this evidence, there appears to be a reluctance to utilise GALS in
clinical practice and teaching [17,18]. The purpose of this survey was to identify
disparities between specialist-led undergraduate teaching, and possible reasons for renouncing GALS as a teaching method.

**Methods**

A questionnaire was developed, then piloted by 7 clinicians at Warwick hospital; made up of medical educators and specialists in Rheumatology and Orthopaedics. A modified version was published as a web survey using SurveyMonkey® [19]. This is shown in Table 2. 10 of the questions were compulsory. Questions 6, 7, 9 and 12 allowed respondents to select more than 1 option. Clinicians were asked to select which medical school they provided teaching for. Doctors in the fields of Rheumatology and Orthopaedics at all levels (Specialist registrar, Consultant, Staff and Associate Specialist, Locum Appointed for Training) were invited to take part in the survey. Invitation was via email; this contained an automated hyperlink and a brief covering letter. Rheumatology specialists in the Midlands region were contacted directly by the author and sent 2 reminder emails during the course of the collection period. Orthopaedic specialists were contacted by nominated representatives in the West and East Midlands training regions, and also sent 2 reminder emails. Responses to the survey were entirely voluntary and without financial or other incentive.

**Ethics**

The survey was reviewed by the local Research and Development team and was deemed not to require Ethics Committee approval.

**Results**
There were 76 responses, comprising 49 Consultants (64.5%), 3 StR (3.9%), 4 ST3 (5.3%), 2 ST4 (2.6%), 5 ST5 (6.6%), 6 ST6 (7.9%), 5 ST7 (6.6%), 1 ST8 (1.3%), and 1 LAT (1.3%). No data was received for SAS doctors. 47 (61.8%) of the respondents stated Rheumatology and 29 (38.2%) Orthopaedics as their primary specialty. All midlands’ medical schools were represented by the results: Birmingham 25/76 (32.8%), Keele 8/76 (10.5%), Leicester 18/76 (23.7%), Nottingham 9/76 (11.8%) and Warwick 16/76 (21.1%).

**Frequency of teaching**

The majority of respondents, 28/76 (36.8%) were delivering teaching on a weekly basis. 13/76 (17.1%) were teaching on a monthly basis. 1 clinician was involved in teaching every day.

**Teaching methods**

Figure 1 and Figure 2 illustrate the comparison in teaching methodologies between the 2 specialties. Overall, there is a partiality for using real patients in clinical skills teaching (67/76, 88.2%), comprising 45 responses from Rheumatology and 22 from Orthopaedics. The next most favoured technique would appear to be the use of peers for practising clinical examination (53/76, 69.7%), consisting of 32 from Rheumatology and 21 from Orthopaedics. Figure 3 and 4 go further to indicate preferred teaching methods for the detection of disease. There would appear to be a desire for newer teaching methodologies to be used: role-play (15/76, 19.7%), multimedia computer-based learning (27/76, 35.5%), audio-visual aids (24/76, 31.6%), and social media (3/76, 3.9%).

**Use of GALS screen**
There was an even split between those clinicians using GALS as part of their teaching (38/76, 50.0%) and those choosing not to teach using this method (38/76, 50.0%). When analysed as separate groups, 36/47 (76.6%) Rheumatologists stated that they use GALS whereas only 2/29 (6.9%) Orthopaedic specialists favoured this approach. With regards to reasons for not incorporating GALS into regular teaching, 43/76 (56.5%) clinicians declared that they had no experience of using it, consisting of 14 Rheumatologists and 29 from Orthopaedics. 24/76 (31.6%) stated that they would rather spend time teaching a more thorough regional examination of the MSK system. Moreover, 24/76 (31.6%) inferred that GALS does not reflect their routine clinical practice, consisting of 10 Rheumatologists and 14 from Orthopaedics. Similarly, 15/76 (20%) of respondents stated that they prefer to have their own individual examination style, therefore GALS is not seen as relevant, made up of 8 Rheumatologists and 7 from Orthopaedics. In Figure 5 and 6 one can appreciate attitudes toward GALS and how these vary according to specialty.

**Undergraduate curriculum**

12/76 (15.8%) of respondents were uncertain about the general structure (traditional, integrated, problem-based, spiral) of the undergraduate curriculum at their affiliated medical school. Similarly, 33/76 (43.4%) people were also not sure whether GALS was incorporated into the undergraduate curriculum.

**Barriers to delivering effective teaching**

The majority of clinicians (46/73, 63.0%) stated lack of time as the main barrier to giving effective clinical skills teaching. 23/73 (31.5%) felt that organisational and institutional factors were implicated. 22/73 (30.1%) respondents reported that one of the main barriers was the lack of a standardised approach to MSK examination.
19/73 (26.0%) also saw a lack of applicability of teaching techniques to current practice.

**Solutions**

There was a definite agreement for clinical educators to collaborate with medical schools and to devote more time to MSK clinical skills throughout undergraduate training. Several respondents wanted to see more contextual teaching reflecting more ‘real world’ scenarios of primary and secondary care. It was suggested that integrated ‘specials’ blocks of the locomotor system could go some way to increase confidence in this area. Furthermore, there is much to be said for students to be accepted in to a firm, and arguably students are likely to learn more effectively if they can engage with a consistent learning environment:

“*Medical students don’t spend long enough in the department to feel involved in the clinical activity. I hardly see them, even in the city hospitals. I am not sure where the students are.*”

“We have medical students who are not even attached to the orthopaedics team, then attend fracture clinic for only one morning.”

There was also praise for designated teaching clinics, where students can be taught in a more realistic and thorough manner, although only if this can be agreed within the funding constraints of the individual hospital. There was also a plea to find enthusiastic teachers and to reward those who devote invaluable time to regular teaching:
“...Acknowledgement of the real value of good teachers rather than the usual lip service paid to teaching. Many appear to think that having students attend clinics is teaching – I would disagree vehemently.”

“Teaching payment directed to only those who actually teach and not absorbed into the general hospital income pot.”

Many Orthopaedic respondents were cynical about undergraduate clinical skills training and felt that too often teaching was merely exam-focused and did little to develop ones interest in Orthopaedics. They did, however, support the use of simulated and computer-assisted techniques to support learning.

**Ways to improve teaching of musculoskeletal clinical skills**

Several respondents stated that they were already confident in examination techniques, however there was also plea for more training of both specialist trainees and consultants in the use of GALS and newer teaching techniques. There was mention of peer observation of teaching and student feedback. With that in mind, it was postulated that this might lead to more consistent and effective teaching:

“I regularly teach hand examination and find that this is certainly something that is consistently taught. I am unsure therefore if I am doing the best for my students!”

“I am reasonably confident but it would be useful to have updates on changes in evidence based examination techniques - I tend only to seek these periodically but otherwise stick to my tried and tested approach.”
It was also seen as imperative for medical schools to provide clinicians and educators with the necessary support for teaching part of the curriculum, and hospital trusts to make provision for designated undergraduate teaching time:

“I would like to see a summary of what is required by the medical school.”

Discussion

This study seeks to compare and contrast current teaching practices between specialists from Rheumatology and Orthopaedics. It would appear encouraging that the responses are not too dissimilar, with the two specialties adopting similar techniques for demonstration of clinical skills. Moreover, there is a general call for employing newer teaching modalities to drive learning. A large proportion prefers to have their own teaching style rather than use GALS. Although GALS has been validated for use in the undergraduate curriculum [16], its under-representation in day-to-day clinical teaching may reflect a change in attitude towards the screening tool. This is compounded by the fact that educators are often not familiar with the undergraduate curricula. As a result, there is a desire to increase awareness of learning objectives and how best to teach these. This study highlighted notable examples of how deficiencies in teaching could be tackled. It was felt that an integrated ‘specials’ block on musculoskeletal disease could help to bridge the gap between different specialties and deliver a more consistent teaching programme. This approach has gained popularity in several UK medical schools, and has been shown to be an effective vector for students’ knowledge, confidence, and satisfaction [20]. Nevertheless, such a heuristic package of teaching requires the motivation and subsequent reward of multiple educators, many of who are engaged in busy clinical duties. A key theme to emerge was that clinicians are more likely to respond to
teaching requests when they are primed with the course objectives and given adequate time and financial recompense.

**Strengths & Limitations**

This is the first time that the musculoskeletal specialties have been compared with respect to undergraduate clinical teaching. This study exhibits several limitations. The fact that only the midlands region was surveyed means that it would be inaccurate to foster any generalisations to the wider community. This survey, in line with other online surveys, is hampered by a low response rate. There was also over-representation of Consultants and Rheumatologists.

**Conclusions**

In the current climate, it is imperative that clinical teaching is contextual and reflects the ever-increasing burden of musculoskeletal disease. Competence in MSK examination is essential for all students prior to qualification, although how this is delineated is more complex. Medical schools should embrace evidence-based instructional methods of learning and work more closely with clinicians to facilitate meaningful and consistent teaching practice. They should ensure that the curriculum is reflected in the assessment. Clinicians also have a duty to align their teaching methods with course objectives and intended outcomes.

The locomotor system is often seen as complex and difficult to examine. The GALS provided us with a user-friendly, evidence-based and standardised screening tool for the detection of MSK abnormalities. It has been included in global recommendations for a MSK undergraduate curriculum [21]; however GALS is being used less and less in teaching and also clinical practice [17]. The fact that we still do
not have uniformity in the way that MSK clinical skills are taught can only add to the confusion and frustration of medical students. In the future, it is hoped that newer strategies for teaching will become embedded in curricula and develop our confidence as educators. In an ideal setting, Rheumatologists and Orthopaedics would collaborate more to make clinical skills teaching more effective. On a positive note this survey demonstrates that these specialties actually have very similar ideas for future clinical skills training, therefore now would seem a good time to define standards and promote these changes.

Clearly, medical schools should be the drivers for this change in teaching practice. In the first instance, it has been proposed that a core ‘list’ of MSK regional examination skills should be agreed upon by curriculum planners [9,16,21]; however this is likely to be influenced by the style of medical curriculum and local resources. It would seem wrong to abandon GALS altogether, although it is apparent that it is often not used in a clinical way. There is certainly a preference for the musculoskeletal system to be taught in an integrated, interactive and contextual way, however at the present time we have no universally agreed upon approach to its examination. Time will tell whether newer methodologies to teaching can in any way substitute or complement GALS.

Whatever the changes at local organisational or institutional level, we should take individual responsibility for our state of teaching and seek to improve our skills accordingly. This may involve attending update courses on aspects of teaching or through regular appraisal. I believe that there should be more collaboration between medical school faculty and clinical educators to ensure that our teaching practice is dependable. We owe it to future doctors to deliver good quality, effective and
consistent teaching of MSK examination skills, with the aim of promoting a better appreciation and recognition of these disorders in the future.

**List of abbreviations**

GALS (Gait, Arms, Legs and Spine) locomotor screen, MSK (musculoskeletal), CAL (computer-assisted learning), StR (Specialty Registrar), ST3-8 (Higher specialty trainee ST3-8), LAT (Locum Appointed for training).

**Competing interests**

The author declares that they have no competing interests.

**Authors' contributions**

TB conceived the original study idea, designed the survey, analysed the data, and submitted the manuscript for publication.

**Authors’ information**

TB is a Clinical Education Fellow at South Warwickshire NHS Foundation Trust, and undertaking a Masters in Medical Education (MMedEd) at University of Warwick. He is also a Specialist Registrar trainee in Rheumatology and General Internal Medicine in the West Midlands Deanery.

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Figure 1 - Current ways to teach musculoskeletal examination skills to medical students: Rheumatology

Figure 2 - Current ways to teach musculoskeletal examination skills to medical students: Orthopaedics

Figure 3 - Preferred ways to teach musculoskeletal examination skills to medical students: Rheumatology

Figure 4 - Preferred ways to teach musculoskeletal examination skills to medical students: Orthopaedics

Figure 5 - Attitudes towards using GALS in clinical teaching: Rheumatology

Figure 6 - Attitudes towards using GALS in clinical teaching: Orthopaedics

Tables

Table 1 - GALS screening examination

Table 2 - Questions included in the electronic questionnaire sent to clinicians
Figure 2: Bar chart showing the distribution of methods used in training. The methods are listed as follows:

1. Students practising on peers/each other: 72.4% (21)
2. Students practising on instructors/teacher: 17.2% (5)
3. Students practising on simulated patients: 13.8% (4)
4. Students practising on real patients: 75.9% (22)
5. Plastic/rubber models: 10.3% (3)
6. Audio-visual aids: 34.5% (10)
7. Role playing: 13.8% (4)
8. Anatomy cadaver lab: 17.2% (5)
9. Multi-media, interactive computer-based learning: 13.8% (4)
10. Social media: 17.2% (5)
11. Leaflets/Handouts: 17.2% (5)
Figure 4
Figure 5
Figure 6
Additional files provided with this submission:

Additional file 1: Table 1.docx, 14K
http://www.biomedcentral.com/imedia/1943215319112663/supp1.docx
Additional file 2: Table 2.docx, 13K
http://www.biomedcentral.com/imedia/2966203391126633/supp2.docx