NOW AND THEN

The 'GALS' locomotor screen

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Abstract

The locomotor system is complex and difficult to examine. A selective clinical process to detect important locomotor abnormalities and functional disability could prove valuable. A screen based on a tested 'minimal' history and examination system is described, together with a simple method of recording. The screen is fast and easy to perform. As well as providing a useful introduction to examination of the locomotor system, the screen includes objective observation of functional movements relevant to activities of daily living. Its inclusion in the undergraduate clerking repertoire could improve junior doctors' awareness and recognition of rheumatic disease and general disability. It could also provide a valuable screening test for use in general practice.

(*Ann Rheum Dis* 1992; 51: 1165-1169)

Musculoskeletal disorders form a considerable part of the general practitioner workload,^{1 2} are common in hospital inpatients,³⁻⁵ and are the single most important factor influencing disability in later life.⁶ Examination and assessment of the locomotor system is therefore a common requirement for doctors in many areas of health care. This requirement is likely to increase as the proportion of elderly patients in the community expands, and as patient perceptions alter with respect to treatment and health care availability.

Within medical schools there is increasing emphasis on the acquisition of basic clinical skills at the undergraduate level.⁷ The ability to question and examine a patient is a fundamental competency on which further education and training can be built. Reviews suggest that compared with other body systems locomotor history and examination skills are poorly learnt, resulting in inadequate recognition and assessment of locomotor disease and disability by junior doctors.^{3 4}

This paper presents one simple approach to improving the recognition of musculoskeletal abnormalities and disability. It summarises a preliminary screening history and examination appropriate for inclusion into the undergraduate curriculum. It is adapted from a system that has been shown to have good sensitivity to detect important locomotor abnormalities.⁸ Aspects of this screen overlap with other systems (particularly the nervous system) and the procedure can be viewed as a general functional (disability) as well as basic

musculoskeletal assessment. The screen may readily be incorporated into a 'system review' clerking, and takes only a minute or so to perform. Its use should improve the acquisition of further, regionally based locomotor skills via orthopaedic and rheumatology teaching. Although designed and tested in adults⁸ the screen can also be used in children in the context of play.

Figure 1 Inspection from the side for normal spinal curvatures.

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Accepted for publication
4 June 1992

Method

SCREENING HISTORY

This comprises three questions: (a) ‘Have you any pain or stiffness in your muscles, joints, or back?’; (b) ‘Can you dress yourself completely without any difficulty?’; and (c) ‘Can you walk up and down stairs without any difficulty?’

Positive answers to any of these will obviously require further enquiry. If all three are negative, however, significant musculoskeletal abnormality or disability is unlikely.

SCREENING EXAMINATION

The patient is examined wearing only underwear. The table and figs 1–9 list the principal

features to note at each stage. For convenience of regional description, the examination can be broken into gait, arms, legs, and spine (‘GALS’). In practice, however, the order of examination is unimportant and the usual most convenient examination sequence is gait, spine, arms, legs, with overlap between these components.

(1) *Gait*. Inspect the patient walking, turning and walking back.

(2) *Spine*. Inspect the patient standing from three views. (a) *From behind*—observe normal

Main features to note during screening inspection

Position/activity	Observation
Gait	Symmetry, smoothness of movement (legs, arm swing, pelvic tilting) Normal stride length Normal heel strike, stance, toe off, swing through Ability to turn quickly
Inspection from behind	Straight spine (no scoliosis) Normal, symmetrical paraspinal muscles Normal shoulder and gluteal muscle bulk/symmetry Level iliac crests No popliteal swelling No hindfoot swelling/deformity
Inspection from the side	Normal cervical and lumbar lordosis Normal (mild) thoracic kyphosis Normal lumbar spine (and hip) flexion
‘Touch toes’	
Inspection from in front	
Spine	
‘Head on shoulders’	Normal cervical lateral flexion
Arms	
‘Arms behind head’	Normal glenohumeral, sternoclavicular, and acromioclavicular joint movement
‘Arms straight’	Full elbow extension
‘Hands in front’	No wrist/finger swelling or deformity
‘Turn hands over’	Ability to fully extend fingers Normal supination/pronation (superior and inferior radioulnar joints) Normal palms (no swelling, muscle wasting, erythema)
‘Make a fist’	Normal power grip
‘Fingers on thumb’	Normal fine precision pinch/dexterity
Legs	Normal quadriceps bulk/symmetry No knee swelling or deformity (varus/valgus) No forefoot/midfoot deformity Normal arches

Figure 3 Lateral cervical flexion.

Figure 2 Pressure over mid supraspinatus—observe for the hyperalgesic response of fibromyalgia.

Figure 4 Normal pain free movement of glenohumeral, acromioclavicular, and sternoclavicular joints.

spine (and lower limb) features. (b) *From the side*—observe normal spine contours (fig 1). Ask the patient to 'bend forward and touch toes'. Press over the midpoint of each supraspinatus (fig 2) to elicit hyperalgesia of fibromyalgia. (c) *From in front*. Ask the patient to 'try to place your ear on your left then your right shoulder in turn' (fig 3).

(3) *Arms*. Still inspecting from in front, ask

the patient to: 'Place both hands behind your head, elbows back' (fig 4); 'Place both hands down by your side, elbows straight'; 'Place both hands out in front, palms down, fingers straight'; 'Turn both hands over' (fig 5); 'Make a tight fist with each hand (fig 6); 'Place the tip of each finger onto the tip of your thumb in turn'.

The examiner then squeezes across the

Figure 5 Normal pronation/supination (proximal and distal radioulnar joints); normal palms.

Figure 7 No tenderness of metacarpophalangeal joints.

Figure 6 Normal power grip.

Figure 8 Normal internal rotation of hip in flexion.

Figure 9 No tenderness of metatarsophalangeal joints.

second to fifth metacarpal (fig 7) to elicit tenderness due to metacarpophalangeal joint synovitis (which may not be evidenced by swelling).

(4) *Legs.* With the patient still standing, inspect from in front for normal lower limb appearances. The screen is then completed by inspection or examination of the patient lying on a couch. In this position: (a) flex each hip and knee while holding the knee (confirming full knee flexion, no knee crepitus); (b) passively internally rotate each hip in flexion (no pain, restriction; fig 8); (c) press on each patella for patellofemoral tenderness and palpate for an effusion; (d) squeeze across the metatarsals for tenderness due to metatarsophalangeal disease (fig 9); and (e) inspect both soles for callosities, reflecting abnormal weight bearing (spine, hip, knee, or foot abnormality).

SUGGESTED METHOD OF RECORDING FINDINGS
If the three screening questions are negative then

pain	0
dress	✓
walk	✓

is briefly recorded in the notes. If positive, further questions and responses will be required.

If the patient's gait (G) is normal and there is no abnormal appearance (A—that is, no swelling, deformity, wasting, abnormal attitude, or skin change) or movement (M) of their arms (A), legs (L), or spine (S), the following template may usefully be written in the notes with respect to examination:

G	✓	A	M
A		✓	✓
L		✓	✓
S		✓	✓

If abnormality is detected at one or more of

these regions, the tick is replaced by a cross and further note of the abnormality made. For example in a patient with knee osteoarthritis:

G	×	A	M
A		✓	✓
L		×	×
S		✓	✓

antalgic gait
R knee—varus
↓ flexion
crepitus
effusion

Discussion

The locomotor system is complex and an extensive history and examination is time consuming. A screening procedure to detect problems in defined areas is therefore desirable.⁸ If the screen is positive then targeted regional examination is undertaken to define the problem. Such a screen is therefore an introduction, not a substitution, for the acquisition of more detailed locomotor examination skills.

The rationale for the selection of screening questions and examination tasks is twofold. Firstly, the principal focus is on symptoms and activities of direct relevance to the patient, providing an insight into the patient's capabilities to undertake important daily activities. Secondly, only sufficient history and examination are included to detect significant musculoskeletal abnormality. Pain, for example, is the principal symptom of locomotor disease and one of obvious impact and relevance to the patient. Dressing is an important daily event but also a sensitive functional test of most upper and lower limb joints, requiring in addition reasonable neuromuscular power and co-ordination. Walking is another important functional activity that may be affected by lower limb joint, lumbar spine, neurological, or muscular abnormality: walking up and down stairs is a more stringent test of lower limb (and cardiovascular and respiratory) function than walking on the flat, and therefore a more appropriate screen. Similarly, with respect to examination of selected movements, 'hands behind head' screens the patients ability to get their hands to their face, head, and mouth (relevant to washing, eating, etc) but is also a sensitive test of glenohumeral abnormality (abduction and external rotation being the first affected movements at this joint). By inference, if this movement is normal the patient will also be able to get their hands round behind their back (for example, to wipe their bottom). Observation of power grip and fine precision pinch is a quick, sensitive screen of hand function and dexterity relevant to many daily activities; both are affected early by local joint or periarticular disease.

A further relevant aspect of the screen is that most rheumatological abnormality is detected by inspection at rest and during movement. In other words, if a joint looks normal, assumes a normal resting position, and moves smoothly through its range of movement without facial evidence of discomfort, then it probably is

normal. Palpation in the screen is restricted to joints commonly targeted by inflammatory arthropathy (metacarpophalangeal joints, metatarsophalangeal joints, knees), and briefly to screen for pain associated with fibromyalgia syndrome which is easily overlooked.³ If the screening history or examination is positive then more detailed questioning and regional examination will be warranted.

The order of examination is unimportant and the summary is intended as a guide rather than as doctrine. Each individual will develop their own sequence, combining certain elements with tests of other systems. For ease of description observations relating to gait, spine, arms, and legs are described separately, though in practice there is considerable overlap during certain manoeuvres (for example, observation of the standing patient from in front and from behind). With respect to recording in the notes, however, 'GALS' is an easy, concise system to employ. It can stand on its own as a combined objective record of functional disability and musculoskeletal system examination, or readily be incorporated within the neurological ('CNS') clerking with which there is particular overlap. Although currently practised systems reviews may include questions relating to activities of daily living, objective observation of functional capabilities (for example, walking, ability to grip, ability to get hands to mouth) are often omitted, though often relevant, particularly in older patients. In presenting the 'GALS' screen we are not necessarily supporting the traditional 'systems review' clerking.⁹ If more focused questioning and examination relating to the presenting problem is undertaken the 'GALS' procedure will still be useful in selective situations as a rapid test of functional performance and to screen out regional locomotor abnormalities that merit closer scrutiny.

This brief 'screen' is sensitive to important locomotor abnormality and functional impairment⁸ and forms a useful introduction to a

large, potentially complex system. The screen is quickly learnt by undergraduates⁸ and post-graduates,¹⁰ and its regular application can improve junior doctor's recognition of patient disability and locomotor disease.¹⁰ Its inclusion in the undergraduate programme could enhance student awareness and clinical skills relating to the locomotor system and to disability in general. Consideration of such a screen is particularly germane at a time when the undergraduate curriculum is under review with major emphasis on clinical skills and attitudes. For these reasons the 'GALS' screen has been endorsed by the education committees of the Arthritis and Rheumatism Council and the British Society for Rheumatology (autumn 1991). The screen might also be useful to allied health professionals, particularly those working with elderly patients.

We are grateful to the Education Committees of the Arthritis and Rheumatism Council and the British Society for Rheumatology for considering and endorsing this procedure.

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