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CLINICAL REVIEW

Functional assessment in older people

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Older people often present to healthcare services with acute and chronic problems that act together to adversely affect function. A common pathway comprises functional decline, followed by loss of independence and need for institutional care. However, this process is not necessarily inevitable or irreversible. Timely recognition of functional difficulties can lead to interventions that may prevent or arrest the decline. This article focuses on the functional assessment of older adults by generalist clinicians (see box 1 for terminology used in this broad field).

What is an assessment of functional status and why does it matter?

Decline in function itself may be a presentation of otherwise occult pathologies⁴ so, not surprisingly, it is associated with increased mortality.⁵ Relatively minor insults (such as changes to drugs and constipation) may precipitate substantial deterioration in function.⁴ Systematic reviews have shown that intervention based on comprehensive geriatric assessment can improve physical function and reduce admission to care homes and hospital in older people.¹⁻⁷ The first step in this process is

the recognition and description of functional problems—this task should be routine for all health professionals and not the sole preserve of the geriatrician.

It is unusual for patients themselves to identify functional decline,⁸ and assessment precipitated by “crisis” remains common.⁹ Because functional screening of unselected older populations has not consistently improved clinical outcomes,^{10 11} opportunistic assessment is preferred and should form part of consultations for management of chronic diseases. We suggest a process of functional evaluation based on structured history and examination, which may be supplemented with standardised assessment instruments.

How is physical function best assessed?

The variable nature of presentations in older people makes it impossible to list all situations where functional assessment may be useful, but we suggest that such an assessment should always inform:

- Management of illness associated with any change in functional ability

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Video on bmj.com (see also <http://bmj.com/video>)



In this video, filmed in Australia, Dr Kurrle performs a functional assessment of an older adult in the home. We show some of the basic components of functional assessment that it is important for a doctor to know, some of which may be used in other settings, such as the GP surgery or on a hospital ward. In many settings an occupational therapist would provide a detailed assessment of the patient's home and their activities of daily living.

The assessment is split into stages

- (1.30) - Living room: mobility, sit to stand, lighting and furniture, dexterity.
- (3.00) - Kitchen: Turning on taps, cooking, holding a cup.
- (4.40) - Bedroom: Dressing, transfers to and from bed.
- (6.12) - Bathroom: Personal care, transfers to and from shower/bath.
- (7.34) - Toilet: Transfer onto and off the toilet
- (8.06) - Balcony Garden: Mobilisation out of door, hanging laundry.
- (8.28) - General mobility: Walking with or without aid, climbing stairs.
- (9.10) - Further assessment and interventions

Summary points

- In older adults functional decline is a common presentation of many disease states
- Causes and consequences are diverse, so functional assessment is not suited to a traditional medical model of system based history and examination
- Consider functional assessment "screening": where illness has caused change in function; before considering long term care; and when planning major elective procedures in older adults
- Validated scales for assessing basic and extended activities of daily living can help inform and focus history taking
- Key elements of the physical examination include subjective "end of the bed" assessment; upper and lower limbs; vision; hearing; and the patient's environment
- Functional decline is rarely related to a single problem, a problem list can guide intervention
- When functional change is evident, referral for multidisciplinary, comprehensive geriatric assessment is often needed

Sources and selection criteria

This review is based on the authors' clinical and research experience and is informed by a search of published literature. We searched electronic databases (Medline and Embase) from inception to December 2010 inclusive, using truncated keywords based on National Library of Medicine, medical subject headings: "aged" OR "aged, 80 or over", "rehabilitation", and "geriatric assessment". In addition, key reference works and national and international guidelines were searched for relevant papers. Particular attention was given to systematic reviews and meta-analyses. For this manuscript the intention was not to offer comprehensive systematic review, rather to give a narrative overview and critique of published literature.

Box 1 Language of functional assessment

A detailed discussion on theories of function and disability is beyond the scope of this review, but an explanation of the terminology can help contextualise this complex field

Activities of daily living (ADL): These are "everyday tasks," ranging from aspects of self care that are needed daily (such as toileting and eating—often described as basic or personal ADLs) through to more complex tasks (such as shopping, using a telephone—often described as instrumental or extended ADLs). When a person has difficulty with one or more basic activities, daily support (from family or carer) is needed for the person to remain safe

Comprehensive geriatric assessment: The simultaneous multilevel assessment of various domains by a multidisciplinary team to ensure that problems are identified, quantified, and managed appropriately. This includes assessment of medical, psychiatric, functional, and social domains, followed by a management plan that often includes rehabilitation¹

Disability: A construct described in the World Health Organization's *International Classification of Functioning, Disability and Health* (ICF).² Disability (now termed activity limitation) refers to restrictions in performing usual tasks. ICF terminology recognises two other levels of function: physical impairment and handicap; all these levels of functioning are interconnected.² Quality of life measures seek to describe outcomes beyond participation in society and are outside the scope of WHO-ICF

Frailty: A popular conceptual definition of frailty is "the propensity to deteriorate in the face of a stressor."³ Frailty constructs range from simple measures of physical function, such as grip strength, through defined physical phenotypes, to complex multidimensional indices that are useful in research but difficult to apply in clinical practice

Functional ability: Primarily refers to performance of basic and extended ADL to maintain safety. Thus functional ability is a global term and not synonymous with the more focused label "physical function." Although the focus of this review is physical function, comprehensive functional assessment should also include cognition, mood, and carer related matters

- Consideration of transfer to a care home or integrated care setting
- The planning of major elective treatments, such as surgery.

The initial functional assessment screen does not require specialised equipment and can readily be conducted in the care home, general practice, accident and emergency department, or hospital ward or clinic. However, if the purpose is to determine how the patient would function in their own home, it is often best to perform assessments in that environment.

Throughout the assessment the focus must be on the patient: do they perceive the current level of function as problematic or do they have other difficulties that they prioritise at a higher level? For example, food preparation and outside mobility are important only if the patient still needs or wishes to engage in these tasks. The clinician should ascertain the views of the

patient and carers at an early stage, including willingness to undergo investigation and expectations of treatment. Box 2 provides tips on performing a functional assessment.

History

We recommend a semi-structured approach to information gathering. The information required is not common to the usual "medical" interview, and we suggest that the descriptors used in activities of daily living (ADL) scales (box 3) guide the interview,¹² whether for initial evaluation or assessment of progress. Direct screening questions on mobility, falls, and continence are useful, given the prevalence of these problems and their potential effect on functioning.^{13 14} Further assessment can be tailored to the patient's specific abilities and problems (box 4).

Box 2 Tips on functional assessment in older people

Take time: Interviewing and examining the older patient will generally take longer than for other patients, so allow yourself and the patient enough time. Assessments may be spread over several consultations. After an initial clinic or office visit, a longer assessment in the patient's home may ultimately be more time efficient than multiple consultations in the surgery

Review case notes: Patients with multiple comorbidities often attend many hospitals and other services, so taking the time to review previous correspondence before seeing the patient will make for a more efficient assessment

Establish effective communication: Does the patient hear you and understand you; do you understand them?

Keep it simple and functional: Assessment does not require specialist equipment. When taking a history and examining the patient, you should not simply record the pathology but include a description of the impact on physical functional ability. For example, in a stroke survivor, a report of "weakness MRC grade 4 lower limb" may be technically correct, but a functional descriptor, such as "leg weakness, leading to frequent falls and inability to climb stairs," is more useful

Ensure aids are used: Aids to improve functioning are often available to the patient but may not be consistently or appropriately used. If the patient uses a hearing aid, ensure it is worn and working; ensure glasses are worn; ensure that footwear is appropriate and that mobility aids (such as a walking stick or frame) are used

Collate a problem list: Often more than one problem contributes to a functional "crisis." A unifying diagnosis is less important than identifying all the modifiable contributors; multiple problems may need to be tackled in parallel (see case study, box 4)

Get expert help: When physical functional problems are discovered there must be clear referral pathways to multidisciplinary rehabilitation teams that include medical assessment. Multiple agencies may be needed and are more effective when they work in unison

Box 3 Activities of daily living (ADL) scales*Barthel index of basic ADL**

This index is commonly used in UK clinical practice to describe basic ADL—these activities are considered as "core" to functional assessment.¹² Many ADL scales take the name "Barthel"¹⁵; the items below are adapted from the most prevalent version of the scale.¹⁶

Feeding: Are you able to feed yourself? Can you cut up food without help?

Bathing: Are you able to take a bath or shower without help? Are you confident to take a bath or shower with no one in the room or house?

Grooming: Do you need help with brushing hair, shaving, or applying make-up?

Dressing: Can you get dressed without help? Can you manage buttons and laces?

Continence: Do you ever wet yourself if you are not able to get to the toilet in time? Do you ever soil or mess yourself with bowel motions?

Toileting: Do you need help to use the toilet?

Transfers: Are you able to get out of bed and on to a chair with no help?

Mobility: Are you able to walk 50 yards on the flat with no help? Do you use any walking aids such as a stick or frame? Have you fallen or stumbled in the past year?

Stairs: Are you able to climb a flight of stairs without help?

Extended or instrumental ADL (based on the Nottingham extended ADL scale)¹⁷

Mobility: Are you able to walk outside on uneven surfaces? Are you able to travel on your own to local destinations? Do you feel confident to use public transport?

Leisure: Are you able to continue your previous hobbies? Are you able to stay in contact with friends and family?

Domestic: Are you confident in managing your finances? Are you able to go shopping for essentials? Can you manage your laundry?

Kitchen: Are you able to make a hot drink or snack? Are you able to walk with a hot drink without spilling it?

*This structured history includes screening questions for continence, mobility, and falls

Patients may omit important symptoms, rationalising them as an inevitable consequence of ageing or fearing that admitting to problems may lead to placement in a care home. While exploring activities of daily living, make the distinction between what the patient wants to do, what they can do, and what they actually do—with the last descriptor being the most important.

With the patient's consent, proactively seek a history from as many perspectives as possible (family, carers, care home staff) to give a more objective description of current and previous function. Use health records, particularly to confirm extent or rate of decline. This process is easiest if information is available

in a structured format such as the ADL questionnaires discussed below.

Clinical examination

A systems based physical examination may not always detect important problems that affect functional ability. Failure to appreciate the differences between functional assessment and traditional medical examination will frustrate the clinician and may deny the patient the opportunity for intervention.

Where physical problems are evident from the history, explore the impact on function directly. As an example, if patients admit

Box 4 Hypothetical case study in functional assessment

Mrs A is an 84 year old woman with chronic health problems including cataract, osteoarthritis, and mild cognitive impairment. She has lived on her own since the death of her husband. She has attentive friends, but no formal support. She is brought to your general practice surgery by a concerned neighbour who feels Mrs A is “struggling to cope.”

Assessment

You recognise the need for basic functional assessment. Initially Mrs A denies any problems. Using the questions in box 3 you ask specifically about basic activities of daily living, falls, continence, memory, and mood. Using these direct but non-threatening questions she admits to problems with dressing and climbing stairs. Her neighbour confirms these problems and adds that Mrs A’s eyesight seems to be a problem, that she doesn’t go out as much, and sometimes needs help with the shopping. You have already noticed that Mrs A used a table to steady herself when walking from the waiting area to your consulting room—“furniture walking.” Focused physical examination shows general muscle wasting and no focal neurological deficits. You note that she struggles to read large print in a magazine.

You arrange for a longer home visit at the next opportunity. In the home environment you ask Mrs A to demonstrate her mobility on stairs, her ability to dress herself, and transfers on and off a chair. You note her antalgic gait, particularly on the stairs; that she uses the arms of the chair to help her get up from it, so she would need a handrail to get up from the toilet (at a similar height); and that her visual problems complicate dressing. You mention that her arthritis must make it difficult to do the shopping and cleaning, and she admits that “sometimes she relies on friends to help but that it would be nice to be able to go out more often.”

Outcome

You create a problem list with important items of: visual impairment affecting reading and dressing; general deconditioning and pain from osteoarthritis impairing chair and toilet transfers and ability to go out on own, shop, and clean; lack of mobility causing some social isolation.

With Mrs A’s agreement, arrangements are made for ophthalmic review; analgesia is prescribed; help with shopping, cleaning, and laundry is arranged through social services; and an occupational therapy assessment for toileting aids is requested. You recognise that a more comprehensive assessment of mobility and care needs is required and refer Mrs A for multidisciplinary assessment through the local care of the elderly team.

that they struggle to climb stairs, it is essential to observe them doing this, so ask them “could you show me?” Note patients’ speed and safety in performing the task, not simply whether they complete it (box 4). Although direct observation of ADL is the most informative assessment, this is not always practical, and for certain items (toileting, bathing) may not be acceptable to the patient.

In addition we recommend a “screening” assessment, which should be useful in all older people and can direct further focused examination. As an aide memoire we suggest the mnemonic PULSE (adapted from the PULSES assessment tool¹⁸)

P (physical condition)

A key component is the initial general inspection. Subjective “end of the bed” assessment has clinical value, and recognition of specific abnormalities (wasting of intrinsic hand muscles, abnormal posture, tremor) may direct further assessment. Problems in older people often develop in areas of the body not covered by “conventional” examination. Unless actively looked for, the clinician may miss rectifiable problems that will affect physical function. A comprehensive examination may not be possible in the initial consultation, and assessment should be directed by the history. For example, problems with mobility should prompt examination of the feet, where common problems that affect walking, such as onychogryphosis (toenail hypertrophy and distortion) or peripheral neuropathy may be detected. Other important areas that should be actively screened, particularly in frailer patients, are pressure areas and the oral cavity; a rectal examination may be useful, particularly if constipation is suspected.

U (upper limb function)

Because this is crucial in accomplishing most activities of daily living, specific assessment is important. Tests of the ability to lift and carry objects (such as a cup) screen for proximal functional ability. Assessment of manual dexterity and fine

motor ability (such as tying shoelaces or managing buttons) can serve as a screen for distal upper limb function.

L (lower limb function)

Gait and balance are fundamental components of lower limb function. Observation of walking provides useful information on strength, joint function, and balance. Begin by observing mobility around the room, with patients using their usual stick or frame.

For the non-specialist, we suggest the “get up and go test”¹³ (box 5) as a lower limb assessment. This tool was developed as a screening test for falls but can be used as a basic test of walking and transfers. Patient and observer safety is paramount when assessing mobility and transfers, and for subjects with poor mobility, assessments may have to be deferred to specialist teams with appropriate equipment and moving-handling skills.

S (sensory)

Because sensory problems are prevalent in older people and can affect function, we recommend basic assessments of vision (with a pocket Snellen chart or by asking the patient to read successively smaller print from a newspaper) and hearing (using the whispered voice test).^{20 21}

E (environment)

Environment and functional status are linked, and a comprehensive examination should ideally include some assessment of the patient’s home. Patients may perform poorly in an unfamiliar ward or office, whereas the home environment may limit functional ability because of awkward stairs, clutter, and falls hazards. It can be useful if patients’ usual carers are present so that you can see how they interact and help (or hinder) patients in their daily tasks.

Mood, cognition, and (if appropriate) carer stress should also be examined as part of a comprehensive assessment, but these

Box 5 The “get up and go test” and common abnormalities of gait¹⁹

With the patient in normal footwear and using their customary walking aid, ask the patient to:

- Rise independently from an armless chair or with arms folded
- Stand still
- Then walk 3 m (10 ft)
- Turn 180 degrees
- Return to chair
- Sit down

Abnormalities that may be seen include:

- Unsteadiness
- Need for external support
- Apraxic gait (short steps, shuffling, and en-bloc turning—suggests cerebrovascular disease)
- Ataxic gait (unsteady, broad based—often seen in cerebellar dysfunction)
- Festinant gait or lack of arm swing (suggests parkinsonism)
- Hesitant gait (loss of confidence)
- Antalgic gait (may be caused by a painful hip or knee)
- Combinations of the above are common

form part of another article in the series and will not be covered further.

Standardised assessment tools

Many such tools are available for use in different settings or disease states, but no consensus exists on the optimal measure,²²⁻²⁴ and detailed knowledge of scales is not essential for the general clinician.

However, awareness of some of the more prevalent instruments may help in communicating with other professionals and in interpreting older age research (box 6). Moreover, functional assessment need not involve detailed and time consuming scales. For example, the get up and go test (box 5) is as useful for predicting falls as many more complex tools.¹⁹ If time allows, use of a longer validated assessment instrument can have added value—for example, instrumental ADL tools such as the Nottingham scale¹⁷(box 3) or Lawton scale (box 6)²⁵ give standardised quantifiable data that may avoid the ceiling effects associated with common assessments of basic activities of daily living.

Although detailed assessment of basic and extended ADL is often performed by occupational therapists, day to day observations by nursing staff or informal carers are also useful. Occupational therapy assessment may be performed in wards or clinics, in purpose built environments (such as kitchens and bathrooms), or in the patient’s home (through a supervised visit for inpatients).

How to use the functional assessment

When a functional assessment or screen identifies problems with physical function, this should trigger an offer of a more comprehensive multidisciplinary assessment and rehabilitation.¹⁻⁷ Even if no problems are identified, record details of the functional assessment because these will prove useful in monitoring progress. Because older adults are often seen by multiple healthcare professionals, robust processes are needed to allow for sharing of data and appropriate referral, while avoiding unnecessary duplication of assessments.

What are the challenges?

We recognise that functional assessment is not always straightforward. However, with the guidance offered we hope that basic assessment should be feasible in a busy practice. The assessments require some initial investment of time, but the combination of early recognition of functional decline and appropriate referral is ultimately more efficient than the multiple consultations that may result if functional problems are left to progress.

Although history taking is the cornerstone of assessment, it poses particular challenges in many older people. Barriers to communication will be more prevalent and can include cognitive impairment (delirium or dementia, or both), deafness, depression, dysphasia, and distraction caused by pain or emotional distress. General rules include the importance of speaking clearly and not too quickly while facing the patient and giving adequate time to respond. The importance of collateral history has already been emphasised.

Many older people have a complex array of medical comorbidities, functional problems, and difficult social circumstances. In these situations it is easy to feel overwhelmed, but we must avoid therapeutic nihilism. For those who perform poorly on the most basic functional assessment tasks there may still be the opportunity for meaningful improvements. A return to complete independence may not be possible for all, but small gains can greatly improve functioning and quality of life. For example, regaining the ability to move from bed to toilet independently with appropriate equipment may mean the difference between staying at home and requiring institutional care.

Busy general clinicians may feel that functional assessment is not part of their remit. With an ageing population, all clinicians are likely to encounter functional problems in their patients. Although not all clinicians have the training and infrastructural resources to offer a comprehensive assessment or rehabilitation interventions, all clinicians should screen for functional problems in older patients so that referral can be appropriately directed (box 4).²⁷

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Box 6 Functional assessment tools prevalent in practice and research

These instruments are favoured by the British Rehabilitation Medicine Society and British Geriatric Society.²²⁻²⁶

Although many scales claim to be specific to a certain construct (such as impairment or disability) they often overlap, and the selection and interpretation of data from these instruments require careful consideration.

*Motor function**General*

Motor assessment scale: Eight hierarchical scales; has proved validity and reliability but is time consuming to administer

Mobility

Rivermead mobility index: Developed from a motor assessment scale; reliable and simple to administer

Upper limbs

Frenchay arm test: Valid, reliable, and simple to administer; some equipment is needed, so it is not "portable"

Basic activities of daily living (ADL)

Barthel index: Has proved validity, reasonable reliability, and is prevalent in practice and research. Its responsiveness to change in higher functioning subjects is limited

Functional assessment measure and functional independence measure: Developed for use in brain injury. Assesses ADL but adds specific items pertinent to cognition and psychosocial issues. This test should be scored by a multidisciplinary team, which can limit its usefulness in a non-rehabilitation setting

Extended ADL

Nottingham extended ADL: Describes activity in four domains; published evidence for the usefulness of this scale in non-stroke cohorts is limited

Lawton instrumental ADL: Eight domain scale that can be administered via interview or as a questionnaire; there are various methods for scoring. In the original description, only five items were tested in men because it was assumed they would not participate in cooking and other duties—this highlights that ADL measures must be culture specific

Improving practice*Resources for healthcare professional*

British Geriatric Society (www.bgs.org.uk/)—Comprehensive web resource with guidelines, educational materials, and original research

American Geriatrics Society (www.geriatricsatyourfingertips.org/)—Web edition of "Geriatrics at your fingertips," available with apps for blackberry, iPhone, and android platforms (registration required)

Barthel Index Program Training and Assessment Campus (<http://barthel-english.trainingcampus.net/uas/modules/trees/windex.aspx>)—Training in use of the Barthel index of activities of daily living is available through a series of online modules (registration required)

BMJ Group resources: BMJ Learning modules

Discharge planning: a guide: <http://learning.bmj.com/learning/search-result.html?moduleId=10017723>

Referring stroke patients to occupational therapy: <http://learning.bmj.com/learning/search-result.html?moduleId=5001071>

Resources for patients

Age UK (www.ageuk.org.uk/)—Provides advice for older people in many areas, including health and wellbeing

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