Preoperative assessment of the older patient

Michelle Aukland ST5 UHCW

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Preoperative assessment of the older patient

C.L. Pang[1,*], M. Gooneratne[1] and J.S.L. Partridge[2]

[1]Royal London Hospital, Barts Health NHS Trust, London, UK and [2]Guy's and St Thomas' NHS Foundation Trust, London, UK

*Corresponding author: c.pang@nhs.net

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Learning objectives

Describe key age-related physiological changes

What is frailty? How it can be assessed?

Key components and impact of a comprehensive geriatric assessment

Key points

- Age-related multi-morbidity is associated with adverse outcomes in older people
- Important to identify and assess multimorbidity & frailty at preop assessment
- Comprehensive geriatric assessment determines and optimises a person's medical, psychosocial and functional capabilities and limitations
- CGA improves outcomes, including M&M
- Individualised assessment, using principles of shared decision-making, informs the discussion of risks

Introduction

- UK population is ageing
- 25% population > 65 yrs by 2050 (16% in 1998)
- More older people undergoing elective & emergency surgery
- Age-related comorbidity or multi-morbidity observed in older patients is independently associated with adverse outcomes, including mortality and discharge to institutional care
- Need for comprehensive preoperative assessment to inform shared decision-making

Introduction (cont)

- Evidence that MDT models of assessment and care improve outcomes
- Traditional preop assessment pathways persist
- Traditional models of nurse-led pre-assessment can have disadvantages for older/ frail patients:
- Focus on optimising intraop and immediate postop care
- Less focus on long-term outcomes
- Difficult to coordinate care amongst multiple specialties, which may disrupt patient's perioperative care and delay surgery
- Lack of screening for comorbidities and geriatric syndromes relevant to the shared decision-making process e.g. cardiorespiratory disease, cognitive impairment and frailty
- Recent guidance - specialist comprehensive geriatric assessment (CGA)

Physiology of the older person

Ageing = time-dependent post-maturity changes that take place at a cellular level

Changes may lead to a decline in physiological reserve and functional status

Cardiovascular system

- Arteries become less compliant, increasing SVR
- Hypertension may cause LVH and strain
- Increased collagen and fibrous tissue deposition impairs diastolic filling
- To maintain CO, preload is increased
- CO preserved initially, heart functions on flatter part of the Frank Starling curve (reduced physiological reserve)
- Intraop fluctuations in BP and CO
- Catecholamine receptors downregulated - decreased responsiveness to catecholamines
- Reduced efficacy of vasoconstrictors -ephedrine and metaraminol
- Decrease in maximal HR & CO (receptor downregulation)
- Fat infiltration / fibrosis of cardiac conducting pathways - HB, AF, ectopic beats and arrhythmias
- Valve calcification - sclerosis, AS

Respiratory system – lung mechanics

- Structural changes - lung parenchyma, spine and chest wall
- Reduction in airway elastance, lung compliance and chest wall compliance
- TLC ,FVC, FEV1s & VC reduce
- CC increases
- RV and hence FRC decrease
- Increased tendency of alveolar collapse
- Gas exchange impaired across the alveolar membrane
- Smoking and COPD accelerate this
- Even in non-smokers, CC encroaches onto the TV when supine by 65 yrs
- Upper airway increasingly susceptible to collapse from the loss of elastic tissue around the oropharynx
- OSA increases with age - screen

Respiratory system – ventilatory response

- Declining chemoreceptor function - marked impairment in ventilatory response to hypoxia or hypercarbia
- linear decrease in PaO_2 with age and increase in $PaCO_2$

Renal system

- Healthy adults lose 50% nephrons between 18 and 75 yrs – reduced renal cortical mass
- Cortical BF and GFR are reduced because CO is decreased
- Fewer nephrons, Na load per nephron is greater
- Ability to excrete Na is reduced because of a deterioration of the countercurrent multiplier system in loop of Henle
- Reduced RAAS activity - compromises body's ability to manage fluid and electrolyte balance - patients less able to tolerate hypo- or hypervolaemia in periop setting
- DM, HTN, nephrotoxic drugs eg ACEi
- BPH (up to 60% at 90 yrs) - obstructive renal impairment

Neurological system

- 17% people >80 yrs affected by cognitive decline (decline in one or more cognitive domains)
- Animal studies show -Decreased neurotransmitters (Ach, dopamine) loss of neuronal cells & demyelination. Slower nerve conduction speeds and increased latency. General decline in performance and increased risk of cognitive dysfunction
- Visual impairment - cataracts, macular degeneration, glaucoma
- Sensorineural hearing loss
- Difficulties with communication and can contribute to cognitive impairment, particularly during acute illness
- Autonomic neuropathy (DM). Impaired baroreceptor responses - perioperative CV instability, and delayed gastric emptying – aspiration risk

Neurological -delirium

- Common (14-56%) postoperative clinical syndrome amongst older inpatients
- Risk factors - ICU, sensory impairment, intercurrent illness, surgery, dementia, pain

Musculoskeletal system - sarcopaenia

- Muscle mass decreases
- Skin changes -thinning epidermis, dermis and subcutaneous fat
- Bruising, pressure-related injuries
- Reduction in SC fat increases heat loss. Shivering less effective because of reduced muscle mass
- Thermoregulation impaired. Temperature monitoring should be routine

Musculoskeletal system - osteoarthritis

- Osteoarthritis and osteoporosis can cause significant pain and reduced mobility
- Impact on QOL and cardiorespiratory reserve
- Increased risk fragility fractures
- Reduced bone healing (reduction in osteoblast activity)

Introduction to CGA

- ‘multidisciplinary diagnostic process intended to determine a frail older person’s medical, psychosocial and functional capabilities and limitations to develop an overall plan for treatment and long-term follow-up’
- Multidimensional, holistic assessment
- Evidence-based & individualised plan
- Allows shared decision making
- GCA undertaken by MDT -geriatrician, SN, OT, PT, SW
- Community, outpatient or inpatient setting
- Identification, assessment and optimisation of RFs that contribute to M&M
- Assessments include - baseline cognitive impairment, cardiorespiratory disease, frailty & functional status

Evidence for GCA

- Multiple studies in medical inpatients and those in the community show improved long term outcomes
- Hip # patients – CGA cost-effective/ improved M&M
- Elective vascular surgery - reduced LOS, postoperative complications (delirium, cardiac, bladder, bowel)
- Heterogeneity in models of CGA - difficulty in carrying out systematic reviews of current literature
- Cochrane review - emergency surgical setting (hip fracture and one cancer surgery paper)shows benefit of CGA on mortality, LOS and financial cost

Components of GCA

- British Geriatric Society provide toolkit and good practice guide
- CGA should target patients most likely to benefit from intervention

1. Physical assessment
2. Frailty
3. Medication review
4. Functional, social and environmental assessment
5. Psychological assessment

Physical assessment - medical

- History and examination -pre-existing morbidity, new medical conditions may be diagnosed. Optimise
- Risk/benefits of managing concurrent disease eg initiation of anticoagulation in a patient at risk of falls
- Assessment of geriatric syndromes: hearing/vision impairment may impact communication and therefore may complicate consent process
- Assess for balance, frequent falls, poor appetite, urinary incontinence constipation

Physical assessment - mobility

- Objective measures -gait speed or ‘Timed Up & Go’, appraisal of balance and use of mobility aids
- ‘Timed Up & Go’ - time taken to stand up from a standard chair, walk a distance of 3 m, turn, walk back to the chair and sit down
- Routine part of Edmonton Frail Scale assessment
- Gait velocity - slow velocity associated with postop mortality and falls
- Interventions -muscle strengthening and balance retraining and a home hazard assessment

Physical assessment - nutrition

- Weight and BMI
- Nutritional screening- MUST
- Dietary history - screening questions to ascertain recent weight loss, daily caloric intake and risk of vitamin and mineral deficiencies
- Preop nutritional supplementation – cancer patients as part of a prehabilitation programme
- Dietician

Physical assessment - continence

- Pain, intercurrent illness -increase the risk of urinary retention and constipation
- Urinary incontinence assessed with use of frequency/volume charts and bladder scanning after voiding
- Patients with pain on micturition, haematuria, vaginal prolapse or prostatic hypertrophy may need onward referral

Frailty

- Frailty -state of increased vulnerability to poor resolution of homoeostasis after a stressor event.
- Associated with postop M&M such as living in an institutionalised setting and death
- Different models of frailty exist, and routine screening and intervention in the form of a ’frailty toolkit’
- ‘Fried’ Model
- Rockwood Model – Basis of CFS
- Aerobic capacity can be optimised
- Preoperative exercise programmes have been shown to be feasible and safe- Improve physical fitness
- Evidence that exercise reduces postop complications & inpatient stay

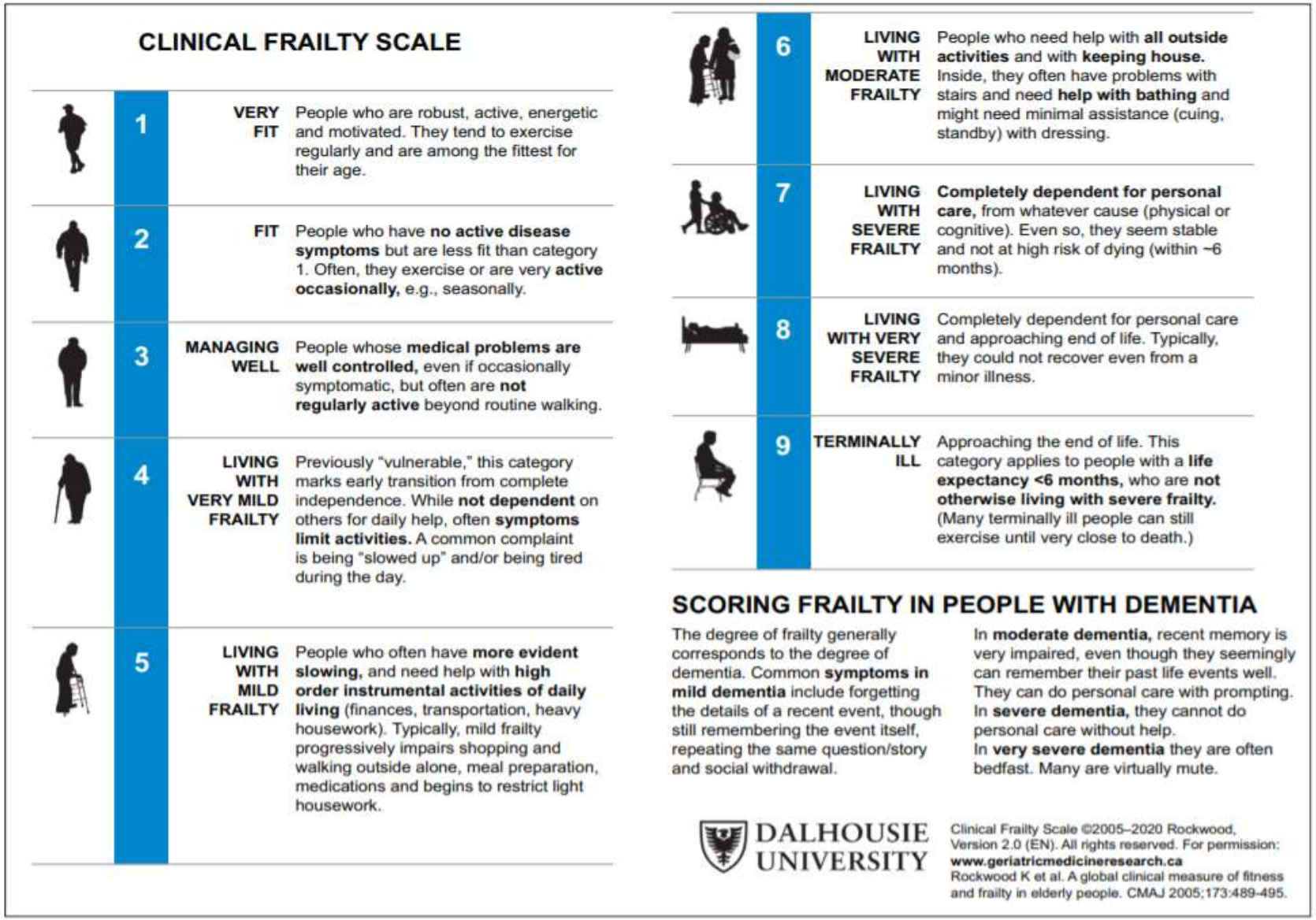

Fig 1 Clinical Frailty Scale. Used with permission from Geriatric Medicine Research, Dalhousie University.

Medication review

- Balanced assessment of adherence, risk/benefits
- Identify medications that may precipitate issues eg falls/delirium - anti-muscarinics, sedatives, opiates, donepezil, antihypertensives
- Decision-making tools – ‘Screening Tool of Older Persons’ Prescriptions’ can be used in conjunction with the patient

Functional, social and environmental assessments

- **History taking & clinical assessment**
- **Objective tools** - modified Barthel Index of instrumental activities of daily living or Nottingham Extended Activities of Daily Living scale
- **Surgical impact on functional status**. Surgery in frail patients is associated with an initial increase in disability, but a net decrease in long-term disability.
- Explore Family and social support networks
- Patients should be counselled about the potential risk of requiring additional help or period of institutionalisation
- **Identify issues related to social care** - reduces inpatient bed days

Psychological – cognitive impairment

- Mild or previously undiagnosed cognitive impairment -20-24% patients for elective surgery
- Mild cognitive impairment (MCI) is as high as 80% in emergency surgical patients
- MCI is associated with adverse postop outcomes, including increased LOS, POD / cognitive decline.
- POD -independent predictor of postop M&M < 1 year post op. Screen for.
- **Screen** for pre-existing cognitive impairment e.g. Montreal Cognitive Assessment tool
- Assesses multiple cognitive domains - short-term memory recall, visuospatial ability, executive function..

Psychological - mood

- Incidence depression in older people : 5-10%
- Screen for anxiety and depression - Hospital Anxiety and Depression Scale
- Identifies level of support required by the patient and if further support from mental health services required

Psychological – Individualised risk assessment

- limits to the accuracy of any individual system
- Portsmouth Physiological and Operative Severity Score for the Enumeration of Mortality (P-Possum)
- Surgical Outcome Risk Tool (SORT)
- National Surgical Quality Improvement Program (NSQIP)
- used along with objective markers of fitness – CPEX
- Inform decisions regarding surgical choices eg open AAA repair vs endovascular repair
- HDU/ITU requirement
- Assessment of functional status and discussion around advanced care planning.

Conclusions

- The care of the older surgical patient requires MDT assessment, management of multiple medical conditions, geriatric syndromes and functional status.
- GCA is an interdisciplinary, holistic, diagnostic and therapeutic process that facilitates the assessment and optimisation
- The model involves and informs the patient and their relatives of their perioperative risk
- Aligned with the principles of shared decision-making
- Pathways involving a multidisciplinary approach to the older surgical patient should be welcomed

Key points

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Questions?