W23: Optimising outcomes from surgical treatment of the frail and multimorbid older person
Workshop Chair: Adrian Wagg, Canada
13 September 2017 09:00 - 10:30

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<td>Adrian Wagg</td>
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<td>What is frailty and who has it? How do I measure it?</td>
<td>Tomas Griebling</td>
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<td>How can I prevent, detect and best treat delirium in my frail older patients?</td>
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**Speaker Powerpoint Slides**
Please note that where authorised by the speaker all PowerPoint slides presented at the workshop will be made available after the meeting via the ICS website [www.ics.org/2017/programme](http://www.ics.org/2017/programme) Please do not film or photograph the slides during the workshop as this is distracting for the speakers.

**Aims of Workshop**
After this workshop, participants will be able to:
1. Identify, measure and screen for physical and cognitive frailty in older persons
2. Identify co-existing conditions which might be amenable to pre-operative intervention to achieve best outcomes following surgical treatments for lower urinary tract and pelvic floor dysfunction in frail older women.
3. Identify and implement post-operative interventions designed to improve outcomes from surgical intervention for lower urinary tract and pelvic floor dysfunction in women

**Learning Objectives**
1. Identify, measure and screen for physical and cognitive frailty in older persons
2. Identify co-existing conditions which might be amenable to pre-operative intervention to achieve best outcomes following surgical treatments for lower urinary tract and pelvic floor dysfunction in frail older women.
3. Identify and implement post-operative interventions designed to improve outcomes from surgical intervention for lower urinary tract and pelvic floor dysfunction in women

**Learning Outcomes**
Identify and use appropriate tools to identify cognitive and physical frailty in their patients.
Identify common comorbid conditions in older people which may be amenable to pre-operative intervention in order to prevent post operative poor outcomes
Put in place delirium prevention protocols, screen for and identify delirium in the post operative period and utilise appropriate order sets to initialise evidence informed treatment
Put in place protocols and guidelines for “elderly friendly” post operative care in order to minimise postoperative complications and ensure efficient delivery of post operative rehabilitation.

**Target Audience**
Physicians and surgeons

**Advanced/Basic**
Advanced

**Suggested Reading**
https://www.youtube.com/watch?v=hwz9M2jZi_o – delirium recognition
https://www.youtube.com/watch?v=hwz9M2jZi_o – delirium assessment
https://www.youtube.com/watch?v=TKp3w9E4Fyc – modifiable factors in frailty

**Other Supporting Documents, Teaching Tools, Patient Education etc**

Tomas L. Griebling, MD, MPH
What is Frailty and Who Has It? How Do I Measure It?
Frailty is a complex geriatric syndrome that can influence multiple aspects of older adult life as well as clinical care decisions. It is characterized by a deterioration of functional status if a variety of domains. Numerous associated and causative factors have been hypothesized which may predispose to development of frailty. These include increased inflammatory conditions that lead to underlying dysfunction or deterioration of organ-systems, and impaired cellular and tissue function leading to organ-system decline.

Multiple different systems have been developed to measure and assess frailty. One way to conceptualize development of frailty is through an ‘accumulated deficit model’. Each additional loss of functional status or ability leads to greater summative levels of frailty. While this is a helpful way to think about how frailty can develop and progress, it can be difficult to accurately measure levels of frailty in this model. However, one of the more widely used and clinically validated systems is what has been termed the ‘frailty phenotype’ as outlined by Fried and colleagues. This conceptual model includes measureable changes in five functional domains that are associated with the development of the frailty syndrome including: 1) diminished walking time / gait speed; 2) decreased hand grip strength; 3) decreased levels of physical activity; 4) a sense of easy exhaustion with activity; and 5) unintended weight loss (> 10 pounds / > 4.55 kilos / > 5% total body weight) in the past year. Individuals who display three or more of these criteria are considered to be ‘frail’, those who demonstrate one or two are considered ‘pre-frail’ or at increased risk, and those with none of the criteria are considered ‘non-frail’.

Consideration of the level of frailty is important clinically because worse frailty has been linked to poorer outcomes from surgery and some other types of clinical care. Clinicians can easily measure a number of key frailty components as part of a routine assessment of geriatric patients. These including measures of functional abilities, gait speed, grip and weight. There has been an increasing interest in the relationship between changes in cognition and the development of frailty. Cognitive status is another parameter that can be readily measured as part of a routine clinical evaluation.

This presentation will highlight conceptual models and operational definitions of frailty, and will review validated measurement tools that can be incorporated as part of the geriatric assessment. The current literature on the utility of frailty measurement and predictive value of various measures will also be discussed.

Suggested Reading:

Studenski S, et al:  Gait Speed and Survival in Older Adults. JAMA  2011; 305: 50-58

Kathleen F. Hunter PhD RN NP GNC(C) NCA
Does frailty and multimorbidity matter and can I improve things when I plan surgical treatment for my older patients?

With world wide population ageing, there is increased demand for urological and urogynecological surgical interventions, even for those patients who are frail or have multiple comorbid conditions. Surgery can be successful in this group from the perspective of patient satisfaction and improved quality of life. In frail older adults, the presence of poor physical function, geriatric syndromes, impaired cognition and poor nutrition can increase risk of poor outcomes even if comorbidity is low. To best use resources, the at risk group of older people who are frail need to be identifiable preoperatively.

Once a potential surgical patient is identified as frail, they should be referred for preoperative Comprehensive Geriatric Assessment (CGA). Team based CGA goes beyond the traditional preoperative assessment of comorbidity and medications, taking in to account medical, functional, psychological and social factors. Some factors, such as sarcopenia, the loss of skeletal muscle mass associated with ageing, are potentially modifiable preoperatively with nutrition and strength/balance interventions. This type of intervention part of “surgical prehabilitation”. There is beginning evidence that CGA, along with preoperative intervention as well as post-operative follow-up can improve outcomes for frail older persons.

Recent research and guidance on preoperative integration of geriatric assessment and services in surgical care, including urological surgery, will be presented.

Suggested Reading:


Dr. Bill Gibson MBChB MRCP(UK)
How can I prevent, detect and best treat delirium in my frail older patients?
Delirium is an acute neuropsychiatric disorder, characterised by inattention and global cognitive dysfunction. It classically has an acute onset and fluctuant change in mental status. It is highly prevalent in hospitalised older adults, with up to 90% or older adults treated in ITU having delirium, and up to half of post-operative patients over 65 years old affected. Although the pathophysiology is not well understood, it is likely that a combination of factors associated with the ageing brain, including accumulated ischaemic insults, breakdown of the blood-brain barrier, and changes in neurotransmitter function and availability are involved in the development of delirium. Identified risk factors in the literature include greater age, with those aged over 80 at a five-fold increased risk compared to young adults and pre-existing cognitive impairment. The use of a simple, standardised diagnostic tool, the Confusion Assessment Method (CAM) will be outlined. Delirium can be subdivided into hyperactive delirium, characterised by agitation, shouting, aggression, and upset, or hypoactive delirium, typically presenting with a patient who is flat or withdrawn, often described as “resting” or “sleeping” by staff, or “just not right”. It is well recognised that hyperactive delirium has a lower mortality, most likely as it is far more easily recognised. Delirium is associated with negative outcomes for patients, including increased mortality, greater length of stay in hospital, and significant distress for patients and their families, as well as risks to staff and other patients. In addition, the occurrence of delirium is strongly associated with an increased risk of dementia in the future.

During this session the potential causes of a delirium diagnosis will be discussed, as well as the management of delirium. Whole-system approaches to avoiding delirium in surgical patients, including pre-operative screening for cognitive impairment, elderly friendly hospitals, avoidance of restraints, minimising inappropriate interventions such as urinary catheters, and observance of a day/night cycle within the hospital setting.

Suggested Reading

NICE (UK) Guidelines  [https://www.nice.org.uk/guidance/cg103](https://www.nice.org.uk/guidance/cg103)

Dr. Adrian Wagg MB FRCP (Lond) FRCP (Edin)

**How can I make things the best after surgery in frail and multimorbid older women?**

As a higher proportion of people in the population survive into later life, the prevalence of urinary and faecal incontinence and pelvic floor dysfunction will rise. Likewise, the number of older men and women requiring surgery for their condition will also rise. Although the health of the baby boomer generation appears to be better than their forebears, a substantial proportion of older people suffer with either multimorbidity, frailty or both. Surgery for incontinence in older people from the gynaecological, urological and lower GI perspective lacks data in multimorbid and frail older people. Case series have reported on surgical outcomes in people in their eighth and ninth decade of life but there are few data on post operative functional, cognitive and quality of life outcomes. The morbidity and mortality for older patients undergoing anti-UI procedures appear to be similar to those of other major non-cardiac surgical procedures. Mortality is inconsistently associated with increased age, and most strongly related to cardiac or cancer complications. Many studies do not uniformly control for the impact of comorbidity on mortality. Although some single institution cases series have reported excellent surgical results the findings of these case series should be considered with caution because they tend to describe healthy well-selected patients undergoing procedures at specialised centres. The true risk of surgery in older patient is likely higher than that reported. It si clear that frailty is associated with poorer outcomes from surgery, so proactive identification seems pertinent, to allow for early discharge planning and co-ordination. This can be done with simple screening tools or a frailty index can be derived from administrative data.

In addition to pre- and per-operative management, it is increasingly important to ensure that post operative care and early, proactive rehabilitation to discharge is undertaken. As much as interventions for older people in any environment needs to be multicomponent, a multiprofessional approach to identification and active management of postoperative older people needs to be taken. This includes delirium prevention, detection and management, early mobilization, associated with reduced length of stay a reduction in complication, nutrition and early removal of catheters and lines, in addition to active bowel and bladder management. There is emerging evidence for the benefit of a geriatric liaison service in the identification and management of postoperative patients.

Suggested reading:

BJU Int. 2016 May 11. doi: 10.1111/bju.13526

Educational Objectives

Discuss frailty as one of the major geriatric syndromes

What is it?
- Review conceptual models of frailty
- Compare and contrast these theoretical frameworks

Who has it?
- Examine prevalence data
- Outline risk factors for frailty in older adults

How do I measure it?
- List assessment methods for components of the syndrome
- Describe clinical use of assessment tools

What is Frailty?

Frailty is a geriatric syndrome
- Multifactorial condition
- Associated with aging
- Various clinical outcomes and effects

Comorbidity
- Underlying diseases or disorders
- Progression of comorbidities may lead to frailty

Disability
- Need for assistance to perform activities
- Activities of daily living (ADLs)
- Instrumental activities of daily living (IADLs)
- May be an outcome of progressive frailty

More commonly associated with aging
- Frailty can occur at any age
- Young and middle-aged
- Linked to comorbidity
  - Neurologic conditions
  - Immunological conditions
  - Rheumatological conditions

Not inevitable
Not considered normal part of aging
What is Frailty?

Frailty

Comorbidity

Disability

Functional Assessment

Activities of Daily Living (ADLs)
- Bathing, grooming, eating, dressing, ambulation or other mobility, and toileting

Instrumental Activities of Daily Living (IADLs)
- Shopping, housekeeping, laundry, using telephone, taking transportation, balancing finances, preparing food or medications

Provides insight into level of independence or dependence and may predict some outcomes


Functional Reserve Capacity

Stressor

Functional Reserve Capacity

Response

Predictive Value of Function

<table>
<thead>
<tr>
<th>Functional Status at Age 70</th>
<th>Average Life Expectancy (years)</th>
<th>Annual Health Care Costs ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>14.3</td>
<td>$4600</td>
</tr>
<tr>
<td>IADL Deficit Only</td>
<td>12.4</td>
<td>$8500</td>
</tr>
<tr>
<td>1+ ADL Deficit</td>
<td>11.6</td>
<td>$14,000</td>
</tr>
</tbody>
</table>

Lubitz et al. NEJM 349:1048-1055, 2003

Frailty Phenotype Model

Five (5) hallmark features of frailty
- Unintended weight loss (≥ 10 pounds / year)
- Low levels of physical activity
- Easy exhaustion
- Diminished handgrip strength
- Reduced walking speed

≥ 3 characteristics = Frail
1-2 characteristics = ‘Pre-frail’
0 characteristics = Not frail

Frailty Phenotype Model

Validation study
5,317 community based older adults
> 65 years
Men and women

Overall prevalence 6.9%
Subjects followed longitudinally
Incidence of new onset frailty 7.2% at 4 years


Accumulated Deficits Model

Alternative conceptual model
Small deficits add up to lead to functional loss
Multisystem deterioration
Loss of physiological reserve capacity
Cycle of continued deterioration

Manifestations:
- Decreased physical activity
- Worsening of comorbid conditions
- Malnutrition

‘Domino’ effect
Some treatments could prevent or delay accumulation of deficits / progression

Accumulated Deficits Model

Deficit Accumulation Index (DAI)
39 different variables
Each assessed in terms of function or status
Leads to numeric scoring

Utility in clinical practice versus in research settings
Simple numerical summation may not reflect subtle factors associated with frailty


Cognition and Frailty

- Increased recognition of the role of cognition as a component of frailty
- Additive versus synergistic effect as a hallmark component of the frailty syndrome
- Not necessarily included in some of the published assessment tools
- Often added to other assessment tools

Who has Frailty?
Who has Frailty?

**Frailty Phenotype model**

- Validation study
  - 5,317 community based older adults
    - > 65 years
    - Men and women
  - Overall prevalence 6.9%
  - Subjects followed longitudinally
  - Incidence of new onset frailty 7.2% at 4 years


Who has Frailty?

**Links to frailty and biomarkers**

- Atrial fibrillation and other cardiac arrhythmias
- Mobility
  - Life-space analysis
  - Not mobile outside neighborhood at least 4 times weekly = 1.7 times more likely to be frail (p<0.005)
  - Homebound had 3x increase in mortality


Who has Frailty?

**Hormonal deficiencies**

- No single abnormality directly linked to frailty
- Multiple deficiencies may be associated
  - Study of 494 women 70-79 years old
  - Testosterone, insulin-like growth factor-1 (IGF-1), dehydroepiandrosterone (DHEAs)
  - Single deficiency showed trend toward frailty
  - Two or three = OR 2.79 (95% CI 1.06 – 7.32)


Who has Frailty?

**Muscle Strength and Bone Health**

- Decreased musculoskeletal strength linked to several components of frailty (gait speed, activity, grip)
  - Cross-sectional analysis (Women's Health Initiative)
  - 250 women 76-86 (mean 79.6 ± 2.7)
  - Frailty prevalence 6.8%
  - Sarcopenia + either osteoporosis or osteopenia → OR = 6.4; 95% CI = 1.1 – 36.8)


Who has Frailty?

**Inflammation and Frailty**

- Increased levels of inflammation associated with frailty (biomarkers)
  - Women’s Health & Aging Study – 558 women
    - WBC and IL-6 independently associated with frailty
    - Top tertile WBC: OR 1.15 (95% CI = 1.34 – 7.41)
    - Top tertile IL-6: OR 2.81 (95% CI = 1.19 – 6.64)
    - Combined: OR **9.85** (95% CI = 3.04 – 31.99)


Who has Frailty?

**Biomarkers INCREASED**

- C-reactive protein
- D-dimer
- Fibrinogen
- IL-6
- WBC

Who has Frailty?

**Biomarkers DECREASED**

- Insulin like growth factor (ILG-1)
- Growth hormone (GH)
- Dehydroepiandrosterone (DHEA)
- Glucose tolerance
  - Metabolic syndrome
  - Diabetes mellitus

Arch Intern Med 162:2333-2342, 2002
How is Frailty Assessed?

Weight Loss
- Unintentional
- Consider association of underlying medical conditions/comorbidity
- ≥ 10 pounds in one year
- ≥ 5% body weight in one year


How is Frailty Assessed?

Grip Strength
- Hand dynamometer
- Dominant hand
- Mean of 3+ measures

<table>
<thead>
<tr>
<th>Male BMI</th>
<th>Cutoff</th>
<th>Female BMI</th>
<th>Cutoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 24</td>
<td>≤ 22</td>
<td>≤ 23</td>
<td>≤ 17</td>
</tr>
<tr>
<td>24-26</td>
<td>≤ 23</td>
<td>23-26</td>
<td>≤ 17.3</td>
</tr>
<tr>
<td>26-28</td>
<td>≤ 24</td>
<td>26-29</td>
<td>≤ 18</td>
</tr>
<tr>
<td>&gt; 28</td>
<td>≤ 25</td>
<td>&gt; 29</td>
<td>≤ 21</td>
</tr>
</tbody>
</table>


How is Frailty Assessed?

Easy Exhaustion
- Measure of poor endurance
- Self-reported

CES-D (Centers for Epidemiological Studies Depression) scale questions
  “I felt that everything I did was an effort”
  “I could not get going”
Criterion is positive if at least one (1) condition is present for 3 days or more during last week


How is Frailty Assessed?

Low Physical Activity
- Questionnaire assessment
- Minnesota leisure Time Physical Activity Questionnaire
- Time spent in each activity recorded in minutes for past 2 weeks—then multiplied by activity score
- Half of total all activities in kilocalories per week

Criterion is positive if weekly activity is:
- Male < 383 kcal/week
- Female < 270 kcal/week


How is Frailty Assessed?

Questionnaires
- Use of survey instruments alone likely inadequate
- Debate over which instrument(s)
- Do these measure all components of frailty?
Comprehensive Geriatric Assessment (CGA)
- Measures multiple domains in addition to frailty
- Time and resources
Component Analysis (individual factors)
- Validated assessment tools

How is Frailty Assessed?

Gait Speed and Mobility

- Important for independent toileting
- ‘Get Up and Go Test’
  - Stand from chair, walk 3 meters, turn, return and sit down
  - Allowed to use mobility assistive devices (walker, cane)
  - Measures quadriceps strength, mobility, gait, balance, transfers, and ability to follow instructions
  - Timed vs. untimed
    - ≤ 10 seconds – most adults
    - 11-20 seconds – normal for frail older adults


Cutoffs to walk 4.57 m (15 feet)

<table>
<thead>
<tr>
<th>Height / male (cm)</th>
<th>Cutoff (sec)</th>
<th>Height / female (cm)</th>
<th>Cutoff (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 173 cm</td>
<td>≥ 7 (0.65 m/sec)</td>
<td>≤ 159 cm</td>
<td>≥ 7 (0.65 m/sec)</td>
</tr>
<tr>
<td>&gt; 173 cm</td>
<td>≥ 6 (0.76 m/sec)</td>
<td>&gt; 159 cm</td>
<td>≥ 6 (0.76 m/sec)</td>
</tr>
</tbody>
</table>


Predicted Median Life Expectancy by Age and Gait Speed

Studenski, S. et al. JAMA 2011;305:50-58

Videos courtesy of Stephanie Studenski, MD, MPH
National Institutes on Aging (NIA)
How is Frailty Assessed?

Cognitive Assessment
- Important in overall assessment of older adults
- Informed consent and decision-making capacity
- Some treatments may influence cognition (medications)
- Folstein Mini-Mental State Exam (MMSE)
  - 13 items – 30 points
- Mini-Cog
  - 3 item recall and clock-drawing test


How is Frailty Assessed?

3 unrelated items – repeat and remember
- Specific items, not abstract concepts, colors, etc.
  Draw face of a clock, including all numbers, and set time (11:10)
- Repeat 3 items
  - 1 point for each remembered item
  - 0 (abnormal) or 2 (normal) points for clock
  - Total 0-2 suggests dementia / 3-5 negative screen


Frailty and Outcomes
Frailty and Outcomes

N = 594 patients
Age > 65 yrs
Independently predicts surgical outcomes
• Complications: OR (2.06 / 2.54)
• LOS: OR (1.49 / 1.69)
• Discharge status: OR (3.16 / 20.48)

Makary et al, J Am Coll Surg 210: 2010

Frailty and Outcomes

AUC = 0.87

Makary et al, J Am Coll Surg 210: 2010

Summary

• Frailty is a very common geriatric syndrome
• Several conceptual models exist
• Overall prevalence in community-dwelling older adults is about 7%
• Frailty is related to but not synonymous with comorbidity and disability

Summary

• Frailty typically assessed by contributory components
• Each has validated measures
• Specific validation tools depend on conceptual model
• All have advantages and disadvantages (clinical versus research use)
• Important to consider frailty due to impact on outcomes
DOES FRAILTY AND MULTIMORBIDITY MATTER? PLANNED CARE FOR SURGICAL TREATMENT OF FRAIL OLDER PATIENTS

Kathleen F Hunter PhD RN NP GNC(C) NCA
Associate Professor, Faculty of Nursing, University of Alberta
Nurse Practitioner, Specialized Geriatrics (Glenrose Hospital)
Assistant Adjunct Professor, Division of Geriatric Medicine UofA
ICS 2017 Florence Workshop 23

Why do surgery in older adults?
- Demand – with an ageing population worldwide, demand for urological/urogynecological surgery increasing - even among the frail
  - Underlying issues not life threatening, but have important quality of life implications

But….can it be successful?
- Even in very old women, surgery can be successful and produce positive outcomes
- Follow-up of 128 women 80 years and older in the Netherlands who had undergone surgery for POP
  - Variety of surgical interventions
  - 3 cases of serious complications (1 death)
  - 88% of the 87 who responded to the postal survey were very satisfied with outcome Schweitzer et al 2005

Frailty and surgery
- Increased interest in intervention for frailty in surgical patients but should special pre op interventions be offered to all older adults?
  - Likely not the best use of resources
  - Enhanced vs usual preop assessment of N=62 older women undergoing pelvic floor surgery Richter et al 2005
    - No difference on mental, physical or satisfaction between groups
    - Healthy older women - baseline good health, high functional status
Going forward

- Identify frailty
  - Not just age alone as criteria
- Refer those who are frail for Comprehensive Geriatric Assessment preoperatively
  - Geriatrician/geriatric team - more comprehensive view of risk than traditional pre-op assessment
- Sarcopenia (loss of skeletal muscle mass) potentially modifiable preop with nutrition and strength/balance interventions – “surgical prehabilitation”
- AUA - need to address frailty, delirium risk, functional status and decision making capacity preop in addition to comorbidity and medications

Comprehensive Geriatric Assessment

- Comprehensive review of medical, functional, psychological and social
- Holistic, multidimensional, interdisciplinary
- Involves geriatrician and specialized geriatric team

Does CGA and involvement of the geriatric service make a difference?

- Systematic review of preoperative CGA on post operative outcomes
- 5 studies included
  - 2 RCTs, 3 before/after studies
  - Heterogeneity precluded meta-analysis
- Concluded likely a positive impact, further definitive research needed.

POPS 2007

- Proactive care of older people undergoing surgery (POPS) Harari et al 2007
- Development and modelling phase
  - Observational cohort of 65+ undergoing elective surgery, exploratory evaluation of before/after comparison
  - Referrals from GPs – even those pts deemed “medically unfit”
  - Elective orthopedic patients n= 54 in each group (pre POPs and POPs)
- Developed a referral guidance and pathway
- Individualized interventions preop, post op and post discharge

Table 1. Domains of health

<table>
<thead>
<tr>
<th>Domain of health</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical health</td>
<td>Natrium level, cholesterol level, blood pressure, body mass index, smoking status, alcohol consumption, physical activity level</td>
</tr>
<tr>
<td>Mental health</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Social function</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Health status</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
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<tr>
<td>Functional status</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Psychological</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Social</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Economic</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Environment</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Community</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Self-care</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Personal</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Emotional</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Socioeconomic</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
<tr>
<td>Access to care</td>
<td>Activities of daily living, falls risk, sleep quality, cognitive function, mobility, depression, anxiety, social support</td>
</tr>
</tbody>
</table>

Welsh et al 2014

Table 2. Referral guidance (pre-operative risk assessment) for POPS

POPS accepts referrals of patients aged 65 years and over who are waiting surgery with any of the following risk factors:
- Uncontrolled hypertension (BP above 160/90)
- Recent history of myocardial infarction (in the past 2 years)
- Unstable angina
- Undergoing treatment for heart failure
- Poor control of diabetes
- Previous stroke
- Cerebral Vascular Accident
- Chronic lung disease, which you consider may put your patient at risk
- Poor nutritional status (BMI <20), or weight loss of 5 kg or more over past 6 months
- Two or more falls from standing height in the past year
- Significant memory problems, or history of confusion, or known dementia
- Needs personal help with:
  - Getting to the toilet
  - Moving from bed to chair
  - Standing up
  - Dressing
  - Walking
  - Likely to need a complex discharge package

Harari et al 2007
**POPs 2007 Interventions**

- **Preop**
  - Assessed by POPs team (geriatrician, nurse specialist, OT, PT, SW)
  - All patients: preop home exercises, nutrition, relaxation techniques, pain management
- **Postop**
  - Geriatrician and nurse reviewed pts on ward
  - Early detection/tx of med complications, early mobilization, pain mgmt, bladder-bowel fx, nutrition, discharge planning
- **Post discharge**
  - Therapy visit for fx problems, outpt review of medical problems
  - Linking to other services: e.g. falls program, continence service

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**POPs 2007 Outcomes**

- POPs group had more preop comorbidity, but fewer post op medical complications
- Improvements in: pressure ulcers, pain control, early mobilisation and inappropriate use of urinary catheters
- LOS reduced by 4.5 days, fewer delayed discharges

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**POPs – Urology 2016**

- Embedding of a geriatric liaison service for elective and emergency urology patients 65 and older by Braude et al 2016
- **Phase 1**: control month n=112
  - Started daily round, weekly multidisciplinary meeting, targeted geriatrician led ward rounds
- **Phase 2**: intervention month n=130
  - Quality improvement, created Geriatric Surgical Checklist to standardize intervention and identify pts needing CGA, collaboration between surgical and geriatric medicine teams

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**POP – Urology 2016 Outcomes**

- **Patient outcomes**
  - Reduced LOS in intervention group (4.0 days vs 4.9 for control)
  - Significantly decreased medical and surgical complications in intervention group
  - Non-significant reductions in cancellations, unplanned readmissions
- **Survey of staff who participated in board round baseline, 1 and 6 months**
  - Improved understanding of roles
  - Staff felt more involved, helped identify CGA issues

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**Take-aways**

- Frail surgical patients can benefit from CGA and involvement of the geriatric service in their care preoperatively as well as postoperatively
- Beginning evident that integration of geriatric services with surgical services contributes to positive outcomes
Select References


How do I identify, prevent, and best treat delirium in my frail older patients?

Dr. Bill Gibson MBChB MRCP
Assistant Professor, Division of Geriatric Medicine
University of Alberta

Delirium
An acute neuropsychiatric disorder characterized by inattention and global cognitive dysfunction.

DSM V Criteria
Disturbance in attention (i.e., reduced ability to direct, focus, sustian, and shift attention) and awareness.
Change in cognition (e.g., memory deficit, disorientation, language disturbance, perceptual disturbance) that is not better accounted for by a preexisting, established, or evolving dementia.
The disturbance develops over a short period (usually hours to days) and tends to fluctuate during the course of the day.
There is evidence from the history, physical examination, or laboratory findings that the disturbance is caused by a direct physiologic consequence of a general medical condition, an intoxicating substance, medication use, or more than one cause.

Epidemiology
Common
• 1-2% in the community
• Between 6% and 56% of hospital inpatients
• 15 – 53% of post-surgical patients over 65
• Up to 90% on ITU

Pathophysiology
Not well understood
Neurotransmitter hypothesis
Inflammatory hypothesis
Hormonal changes
Blood-brain barrier changes
Functional reserve

Risk factors
Age (Over 80 OR 5.22)¹
Pre-existing cognitive impairment (OR 8.97)¹
Fracture (OR 6.5)¹
Coexisting neurological disease (PD, MS, CVD)²
Previous delirium²
Visual or hearing impairment²
Urinary Catheter²
Causes
- Drugs, dehydration, detox (alcohol) discomfort (pain, retention)
- Electrolytes, elimination problems (constipation), environment
- Lungs (hypoxia), lack of sleep
- Infection, infarction (heart or brain), iatrogenic
- Restraints, restricted movement, renal failure
- Injury, impaired sensory input, intoxication
- Unfamiliar environment
- Metabolic, metastases, medications

Clinical features
- Acute onset and fluctuant
- Inattention
- Disorganised thinking
  - May be hyperactive or hypoactive

Other features
- Plucking behaviours
- Disordered sleep cycle
- Hallucinations (rare)
- Delusions

Confusion Assessment Method
1. Acute onset and fluctuating course
2. Inattention
3. Disorganised thinking
4. Altered level of consciousness
   - 1 + 2 + 3 or 1 + 3 + 4

Why is this a problem?
Delirium is associated with poor outcomes
- Mortality
- LOS
- Dementia

Highly distressing for patients and relatives
Delirium does not cause amnesia
- People will remember events while delirious
- They will remember how they were treated
  - Increased mortality
  - Increased LoS

Delirium does not cause amnesia
The reaction to an “aggressive” patient is often
Shouting at them
Trying to sit them down
Getting several people in the room
Standing over them
Restraints
Calling security

These just make things worse

A word on restraints…

Don’t tie your patients up

Management

Minimise stimulation
• Reduce the number of people in the room
• Get the most sensible nursing aide you have
• Send everyone else out
• Low lighting
• Quiet
• Improve comprehension with glasses and hearing aids

Social norms
There is no trouble so great or grave that cannot be much diminished by a nice cup of tea.

Bernard-Paul Heroux

Identify the cause

- Urinary retention
- Pain
- New drugs
- Old drugs
- Missing drugs
- Bowels
- Infection
- Glucose

Identify the cause

- New neurology
- Signs of chest pain
- Recent blood results
  - Uraemia? CRP? Calcium?

Identify the cause

- Environmental
- Restraints
- Boredom
- Change in environment
  - Admission to hospital
  - Movement within hospital

Pharmacological Management

- Avoid benzodiazepines
  - Paradoxical agitation
- Olanzapine 2.5mg
- Haloperidol 0.5mg
- Quetiapine 12.5mg
- Respirodone 0.5mg

https://www.nice.org.uk/guidance/cg103

Can we?

Up to 40% of cases of delirium in inpatients are preventable

How?

Hospital Elder Life Programme (HELP)
- Maintaining orientation to surroundings
- Meeting needs for nutrition, fluids and sleep
- Promoting mobility within the limitations of physical condition
- Providing visual and hearing adaptations for patients with sensory impairments

OR of delirium in the treated group 0.6

Individual patients?

Preoperative and in-reach geriatric consult
- RR of delirium 0.64 in the consult group

No evidence to support prophylactic antipsychotics

Limited evidence for the use of melatonin at night
- Better evidence on medical than surgical wards

Risk assessment

Early identification

Really simple things...

Elder friendly hospitals

http://seniorfriendlyhospitals.ca/toolkit

Staff training

Physical environment
- Orientation
- Day/night differentiation

Organisational culture

Conclusion

Delirium is common, distressing, dangerous, and preventable
Design your systems to cope with the fact that many of your patients are old, frail, and at risk
Identify patients at risk of delirium before surgery and minimise those risks
### Do

- Set up your team to prevent, identify, and treat delirium
- Use a simple screen such as CAM
- Arrange the inpatient environment to reduce the risk
  - Day/Night
  - Big clocks and calendars
  - Family photographs
  - Introduce yourselves
- Involve your geriatrician colleagues
- Use appropriate pharmacotherapy

### Don’t

- Ignore the lady who’s being nice and quiet
- Use benzodiazepines
- Tie your patients to the bed
How can I make things the best after surgery in an older, frail, multimorbid group?

Adrian Wagg
Capital Health Endowed Chair in Healthy Ageing, Department of Medicine, University of Alberta

**NEW FOR 2017**
Please complete the in-app evaluation in the workshop before leaving.

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Step 2, locate workshop
Step 3, scroll to find evaluation button
Step 4, complete survey

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**Frailty as a Predictor of Surgical Outcomes in Older Patients**

<table>
<thead>
<tr>
<th>n=594</th>
<th>Non-Frail (58.2%)</th>
<th>Intermediate (31.3%)</th>
<th>Frail* (10.4%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>71 (67.94)</td>
<td>75 (65.92)</td>
<td>76 (65.94)</td>
</tr>
<tr>
<td>Female Sex (%)</td>
<td>67.6</td>
<td>52.7</td>
<td>41.9</td>
</tr>
<tr>
<td>Post-operative complications</td>
<td>1.0</td>
<td>2.06 (1.2-3.6)</td>
<td>2.54 (1.3-5.8)</td>
</tr>
<tr>
<td>Length of stay</td>
<td>1.0</td>
<td>1.49 (1.2-1.8)</td>
<td>1.69 (1.3-2.2)</td>
</tr>
<tr>
<td>Institutionalized</td>
<td>1.0</td>
<td>3.2 (1.0-9.9)</td>
<td>20.5 (5.5-76)</td>
</tr>
</tbody>
</table>

* Frailty defined by the physical phenotype criteria proposed by Fried. Rockwood et al JACS 2010

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**A global clinical measure of fitness and frailty in elderly people**

- **Survival**
  - For each 1-category ↑ in CFS score ~ 21.2% ↑ death

- **Institutionalization**
  - For each 1-category ↑ in CFS score ~ 23.9% ↑ institutionalization

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**Modified frailty index in non-oncological gynaecology**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Diabetes mellitus: insulin dependent diabetes mellitus or non-insulin dependent diabetes mellitus</td>
<td></td>
</tr>
<tr>
<td>2. Functional status: partially dependent or severe dependent</td>
<td></td>
</tr>
<tr>
<td>3. Respiratory problems: chronic obstructive pulmonary disease or current pneumonia</td>
<td></td>
</tr>
<tr>
<td>4. Congestive heart failure</td>
<td></td>
</tr>
<tr>
<td>5. Neurocognitive impairment: dementia or other neurocognitive impairment</td>
<td></td>
</tr>
<tr>
<td>6. Osteoporotic fractures: previous osteoporotic fractures, current osteoporotic fractures, or fractures in the last 6 months</td>
<td></td>
</tr>
<tr>
<td>7. Hypertension: history of hypertension</td>
<td></td>
</tr>
<tr>
<td>8. Peripartum cardiovascular disease: peripartum cardiovascular disease or heart failure</td>
<td></td>
</tr>
<tr>
<td>9. Impaired immunity: history of impaired immunity</td>
<td></td>
</tr>
<tr>
<td>10. Cardiovascular disease: history of cardiovascular disease</td>
<td></td>
</tr>
<tr>
<td>11. Cardiovascular disease with deficit in neurologic deficit</td>
<td></td>
</tr>
</tbody>
</table>

- CFS score and mathematically derived FI highly correlated (Pearson 0.80, p<0.01)
  - Available at: http://geriatricresearch.medicine.dal.ca/clinical_frailty_scale.htm

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**In addition to a history and physical examination....**

- Assess cognitive ability
  - MMSE / MM, CDQ, Maca

- Assess capacity
  - Interview

- Screen for depression
  - GDS, CES-D, PHQ-2

- Identify risk factors for delirium

- Think alcohol / substance dependence

- http://dx.doi.org/10.1016/j.jamcollsurg.2012.06.017
Perioperative cardiac and respiratory optimisation

Document functional status and any history of falls

Document baseline frailty status

Nutritional state

Medication history – consider appropriate adjustment

Goals and expectations

Family and social support mechanisms

Barthel Index or alternative

MUST or alternative

---

Mini-Cog 3 item test and clock draw

1. GET THE PATIENT’S ATTENTION, THEN SAY:
   “I am going to say three words that I want you to remember now and later. The words are: banana, oscar, chair. Please say them for me now.”
   Give the patient 3 tries to repeat the words. If unable after 3 tries, go to next item.

2. SAY ALL THE FOLLOWING PHRASES IN THE ORDER INDICATED:
   “Please draw a clock in the space below. Start by drawing a large circle. Put all the numbers in the circle and set the hands to show 3:15 (10 past 11).”
   If subject has not finished drawing clock in 3 minutes, discontinue and ask for recall items.

3. SAY: “What were the three words I asked you to remember?”

(Mini-Cog™ copyright S. Benson [source: washington], From: S. Benson, with permission.)

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PHQ-2

ASK THE PATIENT THE FOLLOWING QUESTIONS:

1. “In the past 12 months, have you ever had a time when you felt sad, blue, depressed, or down for most of the time for at least 2 weeks?”
2. “In the past 12 months, have you ever had a time, lasting at least 2 weeks, when you didn’t care about the things that you usually cared about or when you didn’t enjoy the things that you usually enjoyed?”

If the patient answers YES to either question, then further evaluation by a primary care physician, geriatrician, or mental health specialist is recommended.

NB: Not validated in FRAIL elderly patients. CES-D may be preferable (but longer).

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Risk factors for pulmonary complications

Patient related factors
- Age >60
- COPD
- ASA class II or greater
- Functional dependence
- CHF
- OSA
- Pulmonary hypertension
- Current smoking
- Preoperative sepsis
- Weight loss >10% in 6/12
- Serum albumin <35g/L
- Blood Urea > 7.5mM
- Serum Creatinine > 133μM

Surgery related factors
- Operation time > 3h
- Surgical site
- Emergency surgery
- GA
- Perioperative transfusion
- Residual neuromuscular blockade after an operation

Avoiding pulmonary complications

Preoperative optimization of pulmonary function in patients with COPD and asthma that is not well controlled

Smoking cessation, up to 8 weeks pre-operatively

Preoperative intensive inspiratory muscle training – limited data from CABG surgery
Short functional assessment

Any reported deficits in vision, hearing, or swallowing should be documented.

All patients should be asked about history of falls (“Have you fallen in the past year?”).

Assess for limitations in gait and mobility using the Timed Up and Go Test.

Any person demonstrating difficulty rising from the chair or requiring more than 15 seconds to complete the test is at high risk for falls.

30-day mortality more strongly predicted by functional status than age.

Impaired mobility in elderly patients has been linked to increased risk of postoperative delirium and surgical site infections with MRSA.

more independent preoperative functional status strongly predicts both better postoperative function (in terms of ADLs and instrumental ADLs) and shorter recovery periods after major abdominal surgery.


Nutrition

Document height and weight and calculate body mass index (BMI).

Measure baseline serum albumin and prealbumin levels.

Inquire about unintentional weight loss in the last year.

Document patients with severe nutritional risk if they exhibit any of the following:

- BMI <18.5 kg/m²
- Serum albumin <30 g/L (with no evidence of hepatic or renal dysfunction)
- Unintentional weight loss 10% to 15% within 6 months.

Nutrition

Patients at severe nutritional risk should, if feasible, undergo a full nutritional assessment by a dietician to design a perioperative nutritional plan to address deficits, and should be considered for preoperative nutritional support.

Medication management

Ensure you know what the patient takes and when – not what they should be taking WRITE IT DOWN.

Remember to include over the counter remedies, supplements, vitamins and herbs – they won’t tell you about these unless you ask.
Avoid starting new prescriptions for benzodiazepines and consider reducing benzodiazepines when possible. Ensure that pain is adequately controlled to reduce risk for developing postoperative delirium. Use caution when prescribing antihistamine H1 antagonists (especially diphenhydramine/Benadryl) and other medications with strong anticholinergic effects.

When possible, nonessential medications should be discontinued perioperatively and the addition of new medications should be kept to a minimum.

Advance care directives / goals of care planning
Describe the expected postoperative course and possible complications. If relevant, include discussion of possible functional decline and need for rehabilitation or nursing home care during the informed consent process.

Determine the patient’s family and social support systems, which are of significant importance for discharge disposition. If there is concern of an insufficient family or social support system, consider preoperative referral to a social worker.

Blood tests
Routine sets of preoperative screening tests are NOT recommended. Three exceptions are hemoglobin, renal function tests, and albumin, which are indicated for all geriatric surgical patients. Preoperative diagnostic tests should be performed selectively and limited to higher risk patients who can be identified based on history and physical examination, known comorbidities, and the type of procedure to be performed. Normal laboratory values obtained up to 4 months before surgery can be used safely as preoperative tests as long as no substantial change in the patient’s clinical status has occurred.

Preoperative tests for selected patients

Mobility
Normal medications
Oral intake
Catheters and cannulae out

As soon as possible

Regular analgesia, not prn
Consider non-drug measures for pain relief

ICI guidelines for surgery in frail older men and women
Evidence for surgery in frail older persons with LUTS

No studies have been done regarding gynaecological surgery in institutionalised elderly women. (Level 4)

Exogenous administration of oestrogen is ineffective in promoting wound healing after gynaecological surgery in older women. (Level 3)

Injection of bulking agents for SUI appears to give minor benefit in women, however the technique is minimally invasive and age does not appear to correlate with outcomes. (Level 3)

Injection of onabotulinumtoxinA might be an option in patients with idiopathic or neurogenic overactive bladder although risk of residual urine and a lower long-term success rate have been described. (Level 3)

No studies evaluate functional or quality of life outcomes after UI surgery in frail older persons (Level 4)

Risks of morbidity and mortality for frail patients undergoing anti-Urinary incontinence procedures are similar to those of other major non-cardiac surgical procedures. (Level 2)

Surgical mortality risks are still low in elderly persons, and when deaths do occur, they are often due to cardiac or cancer complications. (Level 2-3)

Operative mortality is inconsistently associated with increased age, and most studies do not uniformly control for comorbid conditions (Level 2-3)

Some case series and waitlist-controlled trials suggest that minimally invasive surgical approaches may be useful in older adults, yet these trials may have little to do with whether surgical treatments are appropriate in the frail elderly (Level 3)


Phase 1 included 112 patients in the control month and 130 in the intervention month. Length of inpatient stay was reduced by 19% (mean 4.9 vs 4.0 days; P = 0.01)

Total postoperative complications were lower (risk ratio 0.24 [95% confidence interval 0.10, 0.54]; P = 0.001).

A non-significant trend was seen towards fewer cancellations of surgery (10 vs 5%; P = 0.12) and 30-day readmissions (8 vs 3%; P = 0.07).

Summary

Proactive preoperative assessment and timely intervention and, Proactive post operative mobilization can improve outcomes for older persons undergoing surgery.