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Emergency Laparotomy in the Older Person

VPCC Emergency Laparotomy Workshop

10th November 2022

Dr Rachel Aitken – Geriatrician & Gen Physician at Melbourne Health

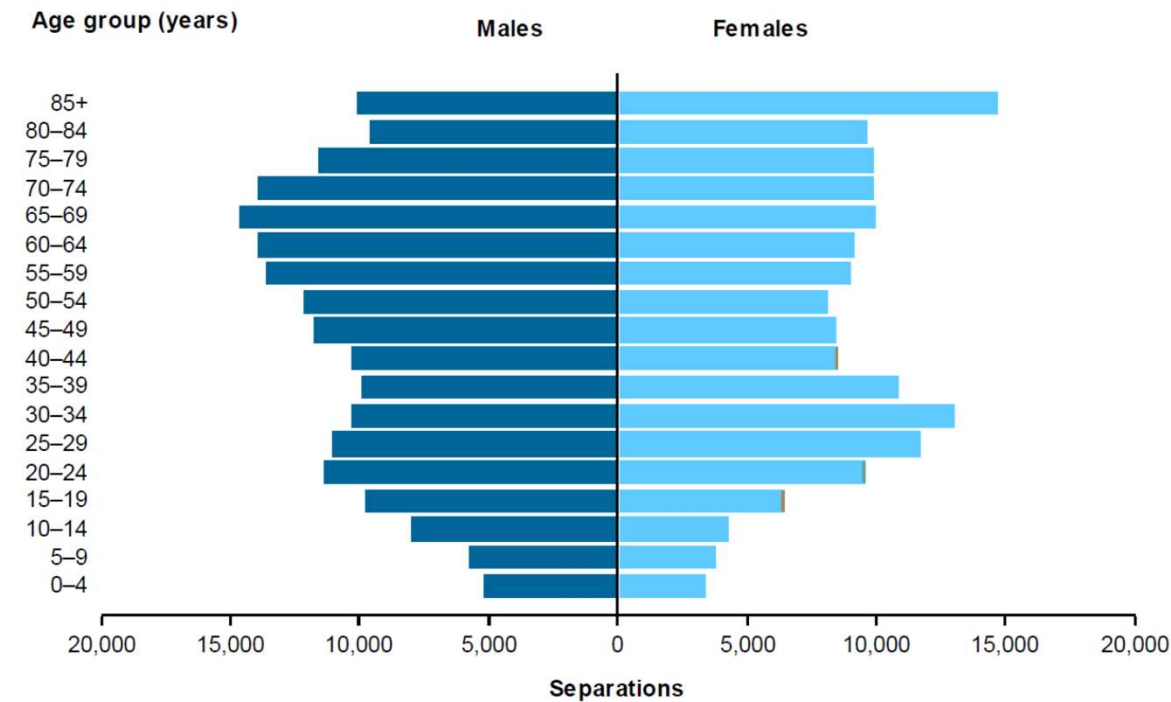
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The older person and emergency surgery

Figure 6.1: Emergency admissions involving surgery, by sex and age group, all hospitals, 2017–18



Note: See Box 1.1 for notes on definitions and data limitations.



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Older patients admitted under EGS

Growing group

- Ageing population living longer with morbidity
- Medical advances in expertise
- Patient and community expectations
- Variation in opportunities for shared decision-making

Surgical pathology in older people

- Small bowel obstruction (1/3)
- Perforation (20%)
- Large bowel obstruction (10%)



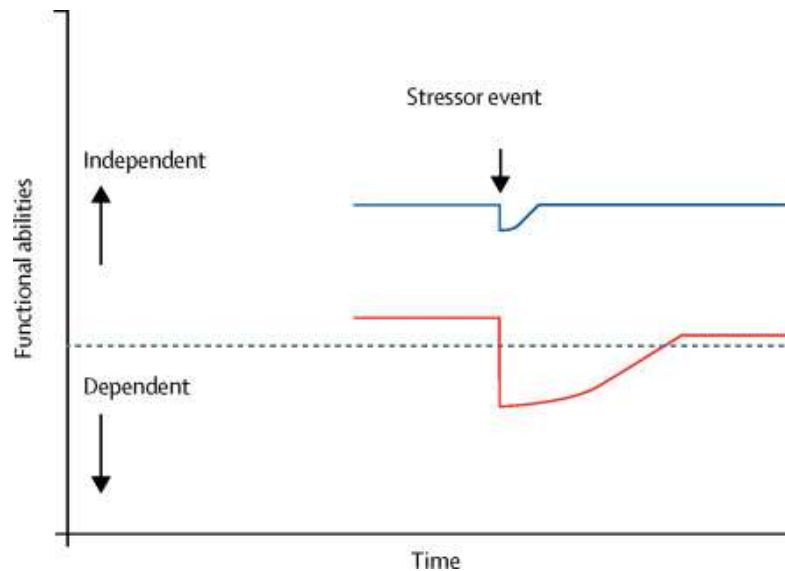
Heterogenous characteristics

- Frailty
- Multimorbidity
- Cognitive and Functional Impairment

High perioperative risk

- Death
- Complications
- Loss of independence
- Less known re: patient-reported outcomes

Geriatric Syndromes and Perioperative Risk



Frailty

- ↑ mortality (12 mo OR 1.1-4.97)
- ↑ postoperative complications (OR 1.5-4.8)
- Associations with increased LOS, increased discharge to residential care facility and reduced QoL

Cognitive Impairment






- ↑ inpatient mortality (OR 1.15)
- ↑ LOS (mean difference 2.35 days)
- ↓ likelihood of discharge home (OR 0.3)

Lin H, Watts JN, Peel NM, Hubbard RE. Frailty and post-operative outcomes in older surgical patients: a systematic review. BMC Geriatrics 2016;16(157).
Masutani R, Pawar A, Lee H, et al. Outcomes of Common Major Surgical Procedures in Older Adults With and Without Dementia. JAMA 2020;3(7):e2010395.

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Clinical Frailty Scale (CFS)

CLINICAL FRAILTY SCALE

	1	VERY FIT	People who are robust, active, energetic and motivated. They tend to exercise regularly and are among the fittest for their age.
	2	FIT	People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally , e.g., seasonally.
	3	MANAGING WELL	People whose medical problems are well controlled , even if occasionally symptomatic, but often are not regularly active beyond routine walking.
	4	LIVING WITH VERY MILD FRAILTY	Previously "vulnerable," this category marks early transition from complete independence. While not dependent on others for daily help, often symptoms limit activities . A common complaint is being "slowed up" and/or being tired during the day.
	5	LIVING WITH MILD FRAILTY	People who often have more evident slowing , and need help with high order instrumental activities of daily living (finances, transportation, heavy housework). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation, medications and begins to restrict light housework.

	6	LIVING WITH MODERATE FRAILTY	People who need help with all outside activities and with keeping house . Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.
	7	LIVING WITH SEVERE FRAILTY	Completely dependent for personal care , from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~6 months).
	8	LIVING WITH VERY SEVERE FRAILTY	Completely dependent for personal care and approaching end of life. Typically, they could not recover even from a minor illness.
	9	TERMINALLY ILL	Approaching the end of life. This category applies to people with a life expectancy <6 months , who are not otherwise living with severe frailty . (Many terminally ill people can still exercise until very close to death.)

SCORING FRILITY IN PEOPLE WITH DEMENTIA

The degree of frailty generally corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

In **very severe dementia** they are often bedfast. Many are virtually mute.



DALHOUSIE UNIVERSITY

Clinical Frailty Scale ©2005–2020 Rockwood, Version 2.0 (EN). All rights reserved. For permission: www.geriatricmedicine.ca
Rockwood K et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005;173(5):489–495.

Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I, Mitnitski A. A global clinical measure of fitness and frailty in elderly people. *CMAJ*. 2005;173(5):489–495.

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ELF study

Frailty in Older Patients Undergoing Emergency Laparotomy

Results From the UK Observational Emergency Laparotomy and Frailty (ELF) Study

Kat L. Parmar, BSc, MB ChB, MSc, PGCE, FRCSEng, Jennifer Law, BMBS, BMedSci, MSc,†*

Ben Carter, PhD, MSc,‡ Jonathan Hewitt, MB BS, MSc, FRCPGlas, PhD,§

Jemma M. Boyle, MB ChB, PGCE, MRCS,¶ Patrick Casey, MB ChB, MRCS,||

*Ishaan Maitra, BSc (Hons), MB ChB, MRCS,** Ian S. Farrell, MB ChB, MPharm, MRCS,††*

*Lyndsay Pearce, BMedSci, BMBS, FRCSEng,‡‡ and Susan J. Moug, BSc (Hons), MB ChB, PhD, FRCSE§§✉,
on behalf of the ELF Study Group*

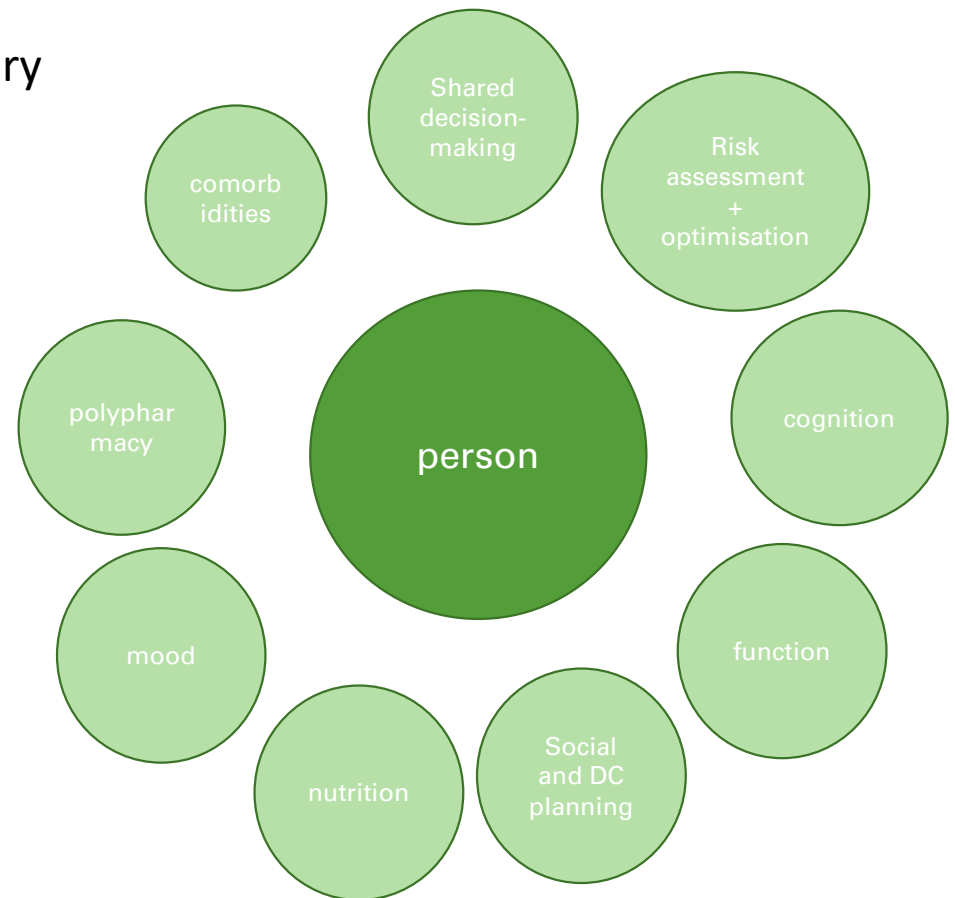
- 20% of 937 older adults deemed frail (CFS ≥ 5)
- 90-day mortality 19.5%
- 90-day mortality associated with frailty adjusted for age and sex
 - CFS ≥ 5 aOR 3.18 (95% CI 1.24-8.14) vs CFS 1
 - CFS 6/7 aOR 6.1 (95% CI 2.26-16.45) vs CFS 1
- Increasing frailty also associated with risk of complications, length of ICU and hospital stay

Annals of Surgery 2021;273(4):709-718.

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Application of CGA Principles to the EGS patient

- Complex, multidimensional and multidisciplinary assessment and management plan
- Risk Assessment
- Shared decision-making
 - Goals and values
 - What if we do nothing?
 - Implications of stoma
- Perioperative goals of care
- Optimisation of comorbidities for surgery
- Prevention and management of complications
- Proactive discharge planning and engagement of multidisciplinary team



		End-of-Life Period			
Illness Phase		Curative Phase	Palliative Phase		Terminal Phase
Prognosis		Normal life expectancy	Limited life expectancy		Imminent Death
			Possible Death	Probable Death	
Duration		Years	Months to Years		Hours to Days
Aims of Treatment		Curative or Restorative Intent Life prolonging treatment, disease modification	Palliative Approach Symptomatic or Non-burdensome		Comfort Cares Dignity, comfort, preparation for a peaceful death are the only priorities

Dr Chuan-Whei Lee, RMH

Organisational factors and mortality after emergency laparotomy: Multilevel analysis of 39,903 National Emergency Laparotomy Audit patients

Oliver CM,^{1,2,3,4} Bassett MG,^{3,4,5,6} Poulton TE,^{3,4,5} Anderson ID,^{3,7,8,9} Murray DM,^{3,10} Grocott MP,^{3,11,12,13} & Moonesinghe SR,^{2,3,4,5} for the NELA collaborators

- Much of between-hospital mortality variation explained by differences in processes, infrastructure and hospital characteristics
- **Postoperative geriatric medicine review associated with substantially lower mortality in older (≥ 70 years) patients (30-day mortality OR 0.35, 95% CI 0.29 – 0.42, 90-day mortality OR 0.64, 95% CI 0.55-0.73)**

Br J Anaesth. 2018 Dec;121(6):1346-1356. doi: 10.1016/j.bja.2018.07.040. Epub 2018 Oct 3.

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RESEARCH PAPER

Older patients undergoing emergency laparotomy: observations from the National Emergency Laparotomy Audit (NELA) years 1–4

RACHEL M. AITKEN^{1,2}, JUDITH S. L. PARTRIDGE^{1,3}, CHARLES MATTHEW OLIVER^{2,4}, DAVE MURRAY^{2,5}, SARAH HARE^{2,6}, SONIA LOCKWOOD^{2,7}, NICK BECKLEY-HOELSCHER⁸, JUGDEEP K. DHESI^{1,3,9}

- NELA risk score mortality risk $\geq 5\%$ 67.9% in ≥ 65 vs 19.5% in < 65
- ≥ 65 30-day mortality 15.3% vs < 65 4.9% $p < 0.001$, 90-day mortality 20.4% vs 7.2%, $p < 0.001$
- ≥ 65 LOS median 15.2 vs < 65 11.3 days $p < 0.001$, discharge to care home 6.7% vs 1.9%, $p < 0.001$
- Postoperative geriatrician review associated with reduced mortality (30-day OR 0.38 CI 0.35-0.42, $p < 0.001$; 90-day OR 0.6, CI 0.56-0.65, $p < 0.001$)

Age & Ageing 2020;49(4):656-663.

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How does postop geriatrician review lower mortality

Hypotheses

- geriatrician service reflective of hospital with superior resources / service
- measure of geriatrician-led complex multidimensional multidisciplinary comprehensive assessment and management plan (“CGA+”)
- other unmeasured confounders (known and unknown)

Why does preoperative review increase mortality?

- sicker more complex patient requiring risk assessment, shared-decision making, optimisation, delays to theatre



Limitations

- Case ascertainment
- Incomplete and inaccurate data collection
- Modifications to dataset
- Inability to comment on non-operative group
- Patient-reported outcomes, cognition and function unmeasured
- Unmeasured confounders
- Clinically driven selection of covariates

Seventh Patient Report of the National Emergency Laparotomy Audit

December 2019 to November 2020

Older Persons

12,098 (55.4%)
patients were aged 65 or over

4,194 (34.7%)
patients aged 65 or over were
living with frailty (CFS ≥ 5)



3,963 (18.1%)
patients were
aged 80 or over

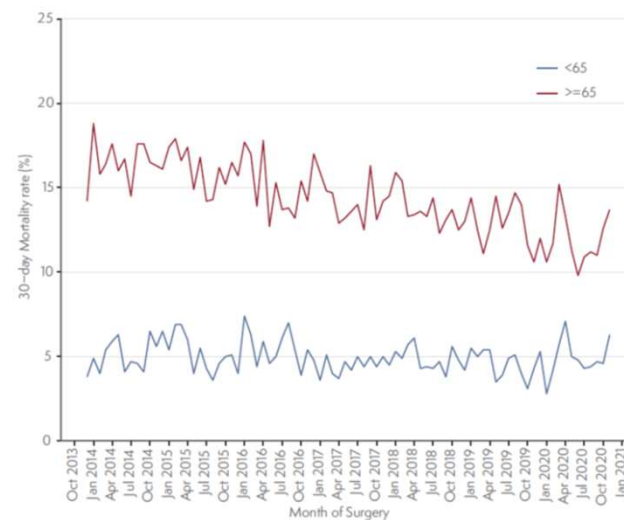
1,965 (49.6%)
patients aged 80 or over were
living with frailty (CFS ≥ 5)

- 27.1% of patients aged 80 and over OR aged 65 or over and frail had an assessment by a consultant geriatrician
- 27.3% of patients aged 65 or over and frail (CFS ≥ 5) were assessed by a consultant geriatrician (29.6% in Year 6)
- 28.7% of patients aged 80 or over were assessed by a consultant geriatrician (30.3% in Year 6)

Key findings

- 91.8% of patients over 65 had frailty assessed (86.9% in Year 6)
- Length of stay in those aged over 65 and frail (CFS ≥ 5) was 14 days (15 days in Year 6)
- Length of stay in those aged over 80 was 13 days (14 days in Year 6)
- 30-day mortality in those over 65 and frail (CFS ≥ 5) was 18.6% (19.7% in Year 6)
- 30-day mortality in those aged over 80 was 14.2% (16.1% in Year 6)

Figure 7.1.1 Comparison of 30-day mortality in patients over the age of 65 years and patients under the age of 65 years



Bgs Nela position statement 2020



1. All patients being considered for, or undergoing emergency laparotomy aged 65 years or more, should undergo a **frailty assessment using the Clinical Frailty Scale**.
2. All patients being considered for emergency laparotomy aged ≥ 65 years with a Clinical Frailty Score ≥ 5 (or aged ≥ 80 years with any frailty score) should receive **geriatrician-led multidisciplinary comprehensive geriatric assessment (CGA)** within 72 hours of admission to a ward or step down from critical care to a ward.
3. The provision of geriatric medicine support should be consultant-led throughout the patient pathway and integrated in the perioperative clinical care pathway.
4. Routine data collection in patients aged over 65 years being considered for or undergoing emergency laparotomy should include **cognitive and functional status and discharge destination**.

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ANZELA-QI KPIs and key associated outcomes collected

Eight standards of care KPIs were collected, categorised by whether they occurred before, during or after surgery (Table 3).

Table 3: ANZELA-QI eight key performance indicators

Before surgery

KPI 1: *Proportion of all emergency laparotomy patients who received a preoperative CT scan by a consultant radiologist*

KPI 2: *Proportion of patients for whom a risk assessment was documented preoperatively*

KPI 3: *Proportion of patients arriving in theatre within a time appropriate for the urgency of surgery*

During surgery

KPI 4: *Proportion of patients with a calculated preoperative risk of death $\geq 5\%$ for whom a consultant surgeon and consultant anaesthetist were present in theatre*

KPI 5: *Proportion of patients with a calculated preoperative risk of death $\geq 5\%$ for whom a consultant surgeon was present in theatre*

KPI 6: *Proportion of patients with a calculated preoperative risk of death $\geq 5\%$ for whom a consultant anaesthetist was present in theatre*

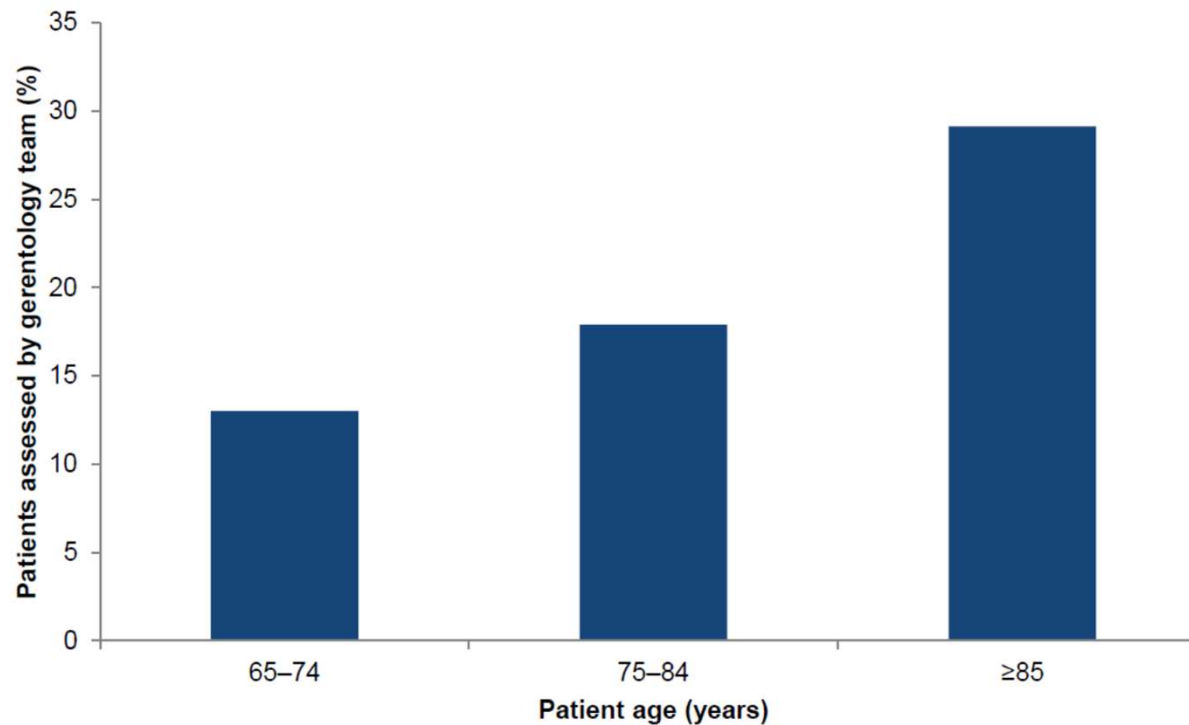
After surgery

KPI 7: *Proportion of patients with a preoperative risk of death $\geq 10\%$ who were directly admitted to critical care postoperatively*

KPI 8: *Proportion of patients age 65 years or over who were assessed by a specialist in gerontology*

KPI-8

Figure 11: Proportion of patients aged 65 years or over assessed after surgery by a specialist in gerontology or a gerontology team



- 17.7% patients aged ≥ 65 years received geriatrician input
- One hospital achieved 79%
- Commentary in guideline: this is achievable



ORIGINAL SCIENTIFIC REPORT

Guidelines for Perioperative Care for Emergency Laparotomy Enhanced Recovery After Surgery (ERAS) Society Recommendations: Part 1—Preoperative: Diagnosis, Rapid Assessment and Optimization

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Zara Cooper⁸ · Jugdeep K. Dhesi⁹ · W. Brenton French¹⁰ · Michael C. Grant¹¹ · Folke Hammarqvist^{12,13} ·
Sarah P. Hare¹⁴ · Joaquim M. Havens¹⁵ · Daniel N. Holena¹⁶ · Martin Hübner¹⁷ · Jeniffer S. Kim¹⁸ ·
Nicholas P. Lees¹⁹ · Olle Ljungqvist²⁰ · Dileep N. Lobo^{21,22} · Shahin Mohseni²³ · Carlos A. Ordoñez^{24,25} ·
Nial Quiney²⁶ · Richard D. Urman²⁷ · Elizabeth Wick²⁸ · Christopher L. Wu^{29,30} · Tonia Young-Fadok³¹ ·
Michael Scott³²

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Consensus guidelines for the optimal care of emergency laparotomy patients using an ERAS approach

- ERAS = multidisciplinary structured bundle of interventions applied to surgical patients to improve outcomes
 - Interventions are evidence-based or reached via expert consensus
- ERAS introduced in elective colorectal group → has spread to other elective surgical groups
 - Reduced LOS, complications, costs

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ERAS in EL

1. Early identification of physiological derangement and intervention
2. Screen and monitor for sepsis and accompanying derangement
3. Early imaging, surgery, and source control of sepsis
4. **Risk Assessment**
5. **Age-related evaluation of frailty, and cognitive impairment**
 - ***All patients over 65 years of age and others at high risk (e.g. patients with cancer) should be assessed for frailty using a validated frailty score***
 - *Perform a validated simple assessment of cognitive function such as the Mini-Cog in all patients over 65 years of age if time permits. For patients who are at risk of delirium and postoperative cognitive dysfunction take steps to keep the patient orientated and avoid drugs known to cause harm as defined in the Beers' criteria.*
 - ***All patients over 65 should have regular delirium screening pre and postoperatively with a validated assessment method***
 - *Patients over 65 of age should be assessed by a physician with expertise in care of the older patient (geriatrician) preoperatively and evidence-based elder-friendly practices used. If preoperative assessment is not possible refer for postoperative follow-up*
1. Reversal of antithrombotic medications
2. Assessment of venous thromboembolism risk
3. Pre-anaesthetic medication – anxiolysis and analgesia
4. Preoperative glucose and electrolyte management
5. Preoperative carbohydrate loading
6. Preoperative nasogastric intubation
7. **Patient and family education and shared decision making**

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Guideline for Perioperative Care for People Living with Frailty Undergoing Elective and Emergency Surgery

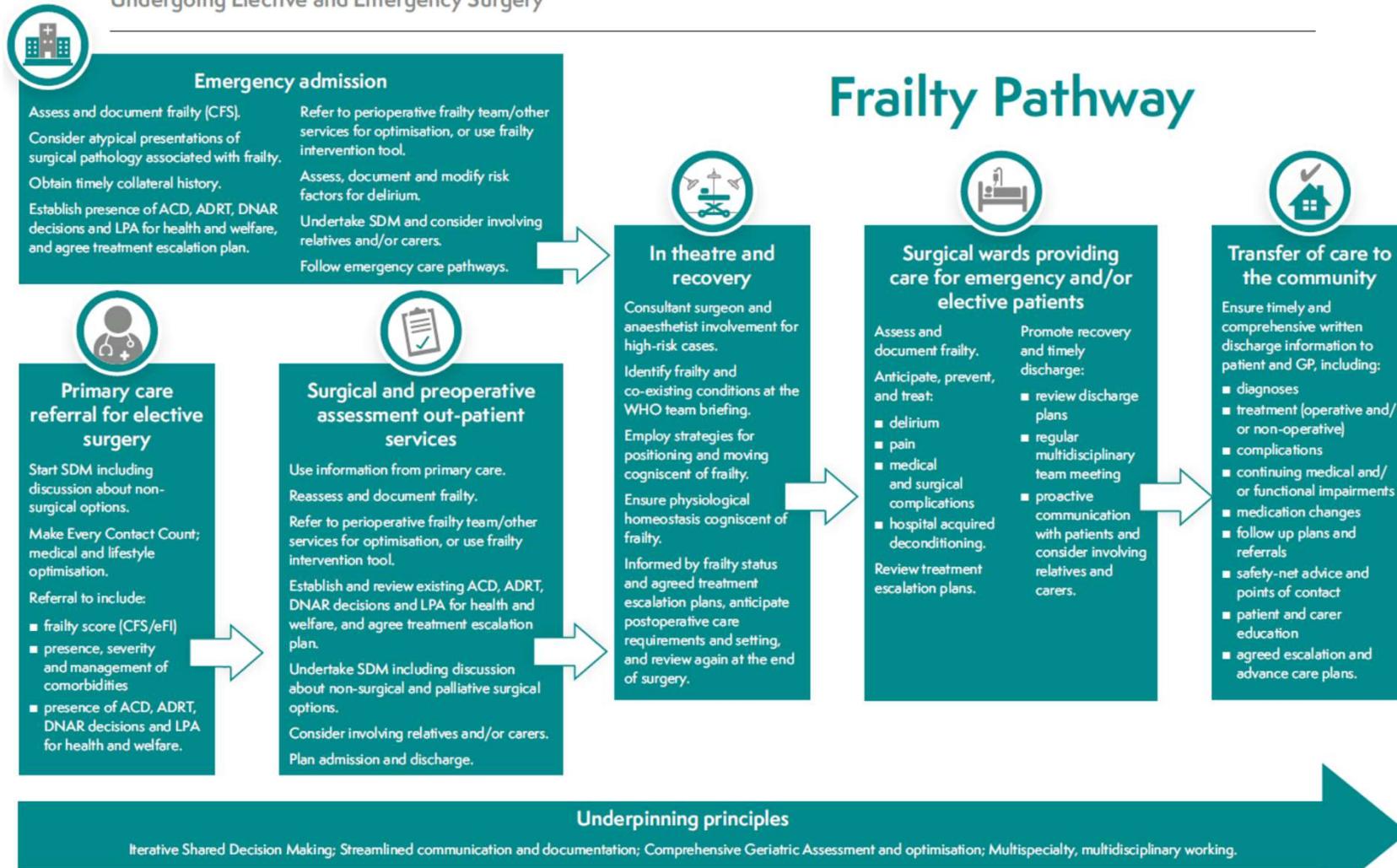
September 2021

9 standards for the perioperative care for people living with frailty

1. Perioperative care pathway to include frailty
2. Clinical lead for perioperative frailty
3. Screen frailty with CFS
4. $CFS \geq 5$ referred for preoperative CGA and optimisation
5. $CFS \geq 5$ have cognition assessed with validated tool
6. Local guideline for prevention and management of perioperative delirium
7. Perioperative frailty team with expertise in CGA and optimisation
8. All staff receive training on frailty, delirium and dementia
9. Measure and regularly review adherence to recommendations

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Guideline for Perioperative Care for People Living with Frailty Undergoing Elective and Emergency Surgery



Implementation - International

Vilches-Moraga A, Fox J. Geriatricians and the older emergency general surgical patient: proactive assessment and patient centred interventions. Salford-POP-GS. Aging Clinical and Experimental Research 2018;30:277-282.

- Reduced length of stay
- Reduced readmission rate
- Reduced involvement of other specialist teams including medical urgent on call team
- Improved patient and staff satisfaction
- Increased coding of comorbidities and complications

Shipway D, Koizia L, Winterkorn N, et al. Embedded geriatric surgical liaison is associated with reduced inpatient length of stay in older patients admitted for gastrointestinal surgery. Future Healthcare Journal 2018;5(2):108-16.

- Mean reduced LOS 3.1 days in all patients aged >60 (p=0.007)
- Mean reduced LOS 4.4 days in emergency patient aged >60 (p=0.005)

Khadaroo, et al. Clinical Effectiveness of the Elder-Friendly Approaches to the Surgical Environment Initiative in Emergency General Surgery, JAMA Surg 2020;155(4):e196021.

- Significantly reduced death, complications, LOS and discharge to alternative care

McDonald SR, et al. Association of Integrated Care Coordination with Postsurgical Outcomes in High-Risk Older Adults, the Perioperative Optimisation of Senior Health (POSH) Initiative. JAMA Surgery 2018

- Reduced LOS (4 vs 6 days, p<0.001), lower readmission rate at 7 days
- Fewer postoperative complications and more likely to be discharged home independently

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Implementation - Australia / NZ

Styan L, Murphy S, Fleury A, McGowan B, Wullschleger M. Establishing a successful perioperative geriatric service in an Australian acute surgical unit. ANZ Journal of Surgery 2018;88(6):607-611.

- Patients >65 years admitted to ASU 2015 vs historical control
- Increased recognition of complications (14% vs 33%, $p < 0.001$) including delirium
- Successful implementation

Thu K, Nguyen HPT, Gogulan T, Cox M, Close J, Norris C, Sharma A. Care of Older People in Surgery for general surgery: a single centre experience. ANZ Journal of Surgery 2021;91(5): 890-895.

- 'Care of Older People in Surgery' (COPS) shared care model
- 214 patients ≥ 75 admitted to ASU >24 hours 2017-2018 vs historical control
- Reduced medical complications (AKI, arrhythmia, UTI)
- Reduced MET calls
- Reduced LOS
- Increased incidence of delirium and acute coronary syndrome

Key Points

- The older EGS population are a vulnerable and high-risk group with increased likelihood of geriatric syndromes and poor postoperative outcomes
- There is strong evidence to support routine measurement of frailty using the clinical frailty scale (CFS)
- CFS can be effectively used as a screening tool for geriatrician referral
- There is good evidence to support geriatrician review of older EGS patients
 - This practice is increasing locally and internationally year on year!