AIMS
AGING INNOVATION IN PERIOPERATIVE MEDICINE & SURGERY

Inspired by research. **Driven** by compassion. **Inspiré** par la recherche. **Guidé** par la compassion.

IMPROVING OUTCOMES FOR THE OLDER SURGICAL PATIENT: AN EVIDENCE-BASED APPROACH TO FRAILTY

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The Ottawa Hospital RESEARCH INSTITUTE | L'Hôpital d'Ottawa INSTITUT DE RECHERCHE

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CONFLICTS AND DISCLOSURES

- None

- Acknowledgements

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IARS
PSI FOUNDATION
CIHR IRSC
Canadian Institutes of Health Research | Instituts de recherche en santé du Canada
uOttawa
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OBJECTIVES

- Review the epidemiology of our aging surgical population and impact of frailty
- Highlight evidence-based approaches to improving outcomes
- Apply these approaches across the perioperative journey

FRAILTY:


Scale
frailty
Fried
Clinical
Index
Modified
phenotype
Health
speed
Edmonton
SF36
<1SD
criteria
physical
Risk
gait
frail
assessment
Score
strength
albumin
Canadian
Geriatric
classic
Activities
dependence
ADL
walk
low
grip
Study
Indicator
based
ADLs
Ageing
deficits
living
surgery
Groningen
Charlson
comprehensive
performance
functioning
preoperative
depression
domains
Aging
status
IADL
Katz
Survey
daily
item
Analysis
variables
falls
disability
test
serum
Role
activity
SPPB
MMSE
yeaR
go
kg
one

OUR WORKING DEFINITION

- Frailty
  - An aggregate expression of risk resulting from accumulation of age-, and disease-related deficits

OUR WORKING DEFINITION

- Frailty
  - An aggregate expression of risk resulting from accumulation of age-, and disease-related deficits
    - Deficits present across multiple domains
    - Decreased reserve
    - Vulnerable to stressors

A quick trip ~10 years in the past…


2012

SPECIAL ARTICLE

Optimal Preoperative Assessment of the Geriatric Surgical Patient: A Best Practices Guideline from the American College of Surgeons National Surgical Quality Improvement Program and the American Geriatrics Society

Warren B Chow, MD, MS, MSHSOR, Ronnie A Rosenthal, MD, MS, FACS, Ryan P Merkow, MD, MSHSOR, Clifford Y Ko, MD, MS, MSHS, FACS, Nestor F Esnaola, MD, MPH, MBA, FACS

Table 1. Checklist for the Optimal Preoperative Assessment of the Geriatric Surgical Patient

In addition to conducting a complete history and physical examination of the patient, the following assessments are strongly recommended:

- ☐ Assess the patient's **cognitive ability** and **capacity** to understand the anticipated surgery.
- ☐ Screen the patient for **depression**.
- ☐ Identify the patient's risk factors for developing postoperative **delirium**.
- ☐ Screen for **alcohol** and other **substance abuse/dependence**.
- ☐ Perform a preoperative **cardiac** evaluation according to the American College of Cardiology/American Heart Association algorithm for patients undergoing noncardiac surgery.
- ☐ Identify the patient's risk factors for postoperative **pulmonary** complications and implement appropriate strategies for prevention.
- ☐ Document **functional status** and history of **falls.**
- ☐ Determine baseline **frailty** score.
- ☐ Assess patient's **nutritional status** and consider preoperative interventions if the patient is at severe nutritional risk.
- ☐ Take an accurate and detailed **medication history** and consider appropriate perioperative adjustments. Monitor for **polypharmacy**.
- ☐ Determine the patient's **treatment goals** and **expectations** in the context of the possible treatment outcomes.
- ☐ Determine patient's **family** and **social support system**.
- ☐ Order appropriate preoperative **diagnostic tests** focused on elderly patients.

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- ☐ Identify the patient's risk factors for postoperative **pulmonary** complications and implement appropriate strategies for prevention.
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- ☐ Determine baseline **frailty** score.

Anaesthesia 2014, 69 (Suppl. 1), 81–98 doi:10.1111/anae.12524

Guidelines

Peri-operative care of the elderly 2014

Association of Anaesthetists of Great Britain and Ireland

Membership of the working party: R. Griffiths, F. Beech,[1] A. Brown, J. Dhesi,[2] I. Foo,[3] J. Goodall,[4] W. Harrop-Griffiths, J. Jameson,[5] N. Love, K. Pappenheim and S. White

1 Minimum components of pre-operative geriatric assessment specific to anaesthesia.

n	Items to be assessed	Appropriate assessment tools
ıl	Co-morbidity/severity:	
	• Cardiovascular	Vital signs, ECG, shuttle, CPET
	• Respiratory	S_pO_2, (pulmonary function tests)
	• Haematological	Full blood count
	• Renal	Urea and electrolytes, estimated glomerular filtration rate
	• Nutritional	Weight, body mass index, albumin (liver function tests)
	• Musculoskeletal	Assessment of potential nerve block insertion sites
	Previous anaesthesia	Enquiry after (age-related) problems
	Anaesthesia-specific	Airway assessment, dentition
	Alcohol intake	CAGE questionnaire for alcoholism
	(Pain intensity)	(Visual analogue pain score)
	Presenting pathology	Radiological
Medication	Medication review	NSQIP pre-operative assessment
	Anticoagulant therapy	Coagulation screen
	Relevant allergies	
Cognitive	Mental capacity	Ask 'Have you or (your carer) noticed a change in your memory?',
	Decision-making capacity	Abbreviated mental test score
	Communication	Vision, hearing, speech
	Risk factors for postoperative delirium	NSQIP pre-operative assessment
Functional capacity	Gait and balance	6-metre walk
	Mobility	Walks unaided/with stick/with frame/does not walk Housebound? (yes/no)
Use of functional aids	Visual	Glasses
	Hearing	Hearing aids
	Mobility	Walking stick, frame, wheelchair
	Dentures	
Risk score	Pathology-specific	e.g. Nottingham Hip Fracture Score
	Frailty	NSQIP pre-operative assessment

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Risk score	Pathology-specific Frailty	e.g. Nottingham Hip Fracture Score NSQIP pre-operative assessment

Risk score

Pathology-specific Frailty

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BJA

British Journal of Anaesthesia, 130 (3): 262–271 (2023)

doi: 10.1016/j.bja.2022.12.010
Advance Access Publication Date: 25 January 2023
Review Article

CLINICAL PRACTICE

A systematic review of perioperative clinical practice guidelines for care of older adults living with frailty

Jake S. Engel[1], Jason Tran[1], Noha Khalil[2], Emily Hladkowicz[2], Manoj M. Lalu[2,3,4,5], Allen Huang[4,6], Camilla L. Wong[7], Brian Hutton[2,5], Jugdeep K. Dhesi[8,9] and Daniel I. McIsaac[2,3,4,5,*]

Perform multidimensional frailty assessment [Strong Evidence]

PREOPERATIVE FRAILTY ASSESSMENT

- For the past 8 to 12 years
  - Clear guidance provided to assess frailty in ALL older patients

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- Even in 2024
  - This RARELY happens

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- Implications…

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~10+ YEARS OF PERIOPERATIVE CARE

April 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

2012 TO 2024

- BIG PICTURE:
- ~33 million surgeries for older Americans
  - ~13 million with frailty

FRAILTY AS A PREDICTOR OF MORBIDITY & MORTALITY

- Mortality
  - Adjusted 2-fold increase
  - ~1.5% to ~3%
    - 30 days

Anesthesiology 2020; *BMC Med* 2018

FRAILTY AS A PREDICTOR OF MORBIDITY & MORTALITY

- Mortality
- Morbidity
  - Adjusted 2-fold increase
  - ~25% to ~50%
    - In-hospital/30 days

Anesthesiology 2020; *BMC Med* 2018

POPULATION LEVEL 2012024

- Deaths: 200,000
- Complications: 3,300,000

FRAILTY AND RESOURCE USE

- Length of stay
  - 1.5-fold increase
  - $12,000 extra per case

Anesthesiology 2023; *Anes & Analg* 2021

POPULATION LEVEL 2012 TO 2024

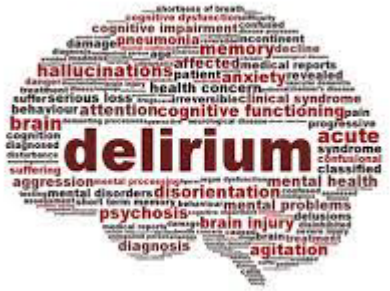
- FRAILTY-ATTRIBUTABLE RESOURCE USE

  33 million bed days

  - $150 billion

PHYSICAL AND COGNITIVE FUNCTION

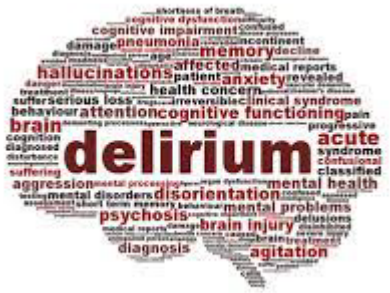
- Patient-reported disability
  - 2-fold increase
- Delirium
  - 4-fold increase



Anesthesiology 2020; *BMC Med* 2018

POPULATION LEVEL 2012 TO 2024

- FRAILTY-ATTRIBUTABLE RECOVERY
  - ~1,300,000 new cases of patient reported disability
  - ~4,000,000 more cases of delirium



SO… WHAT CAN PERIOPERATIVE PHYSICIANS DO DIFFERENTLY NEXT WEEK?

- 1st…
- Let's think about Ida

- 1st…
- Let's think about Ida

  - And how frailty assessment can help us to optimize her care…

IDA

- Lower limb bypass planned in 6 weeks
  - Severe claudication

IDA

- 84 y.o. female
- PMHx
  - Atrial fibrillation
  - HF, preserved ejection fraction
  - Diabetes, type 2
  - HTN
  - GERD
  - Osteoarthritis
  - Osteoporosis
  - Anxiety
- PSHx
  - Partial gastrectomy
  - Open cholecystectomy
- PAHx
  - No issues with GA or RA

IDA

- 84 y.o. female
- Meds
  - Rivaroxaban
  - ASA
  - Metformin
  - Long acting and correction insulin
  - Metoprolol
  - Ramipril
  - Pantoprazole
  - Acetaminophen
  - Risedronate
  - Vit D and calcium
  - Citalopram

IDA

- 84 y.o. female
- Allied health
  - Lives in a retirement home
  - Independent in IADLs
  - Needs some help with bathing
  - Uses a walker

HOW DO WE SUM THIS UP?

HOW DO WE SUM THIS UP?

- American Society of Anesthesiologists' Physical Status Score
  - IV?

HOW DO WE SUM THIS UP?

- American Society of Anesthesiologists' Physical Status Score
  - IV?

- Revised Cardiac Risk Index
  - 2 (>10% risk of death, MI, cardiac arrest)

Duceppe, CJC 2017

DOES FRAILTY IMPROVE RISK STRATIFICATION?

Surgical Outcome Risk Tool (SORT)

ACS NSQIP® | Surgical Risk Calculator | American College of Surgeons — Inspiring Quality: Highest Standards, Better Outcomes

Prospective Comparison of Preoperative Predictive Performance Between 3 Leading Frailty Instruments

Daniel I. McIsaac, MD, MPH, FRCPC,*†‡ Emma P. Harris, MD,* Emily Hladkowicz, MA,*‡
Husein Moloo, MD, MSc, FRCSC,†§ Manoj M. Lalu, MD, PhD, FRCPC,*‡
Gregory L. Bryson, MD, MSc, FRCPC,*‡ Allen Huang, MD,‖ John Joanisse, MD,¶
Gavin M. Hamilton, MD, MSc,* Alan J. Forster, MD, MSc, FRCPC,‡# and
Carl van Walraven, MD, FRCPC, MSc†‡#

- Age, Sex, ASA, Procedure *vs* Age, Sex, ASA, Procedure + Frailty

McIsaac, *Anes Analg* 2019

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- Age, Sex, ASA, Procedure *vs* Age, Sex, ASA, Procedure + Frailty
  - Discrimination (AUC)

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- Age, Sex, ASA, Procedure + Frailty
  - 1-7% increase in discrimination (death or disability)
  - 2-8% increase in discrimination (nursing home)

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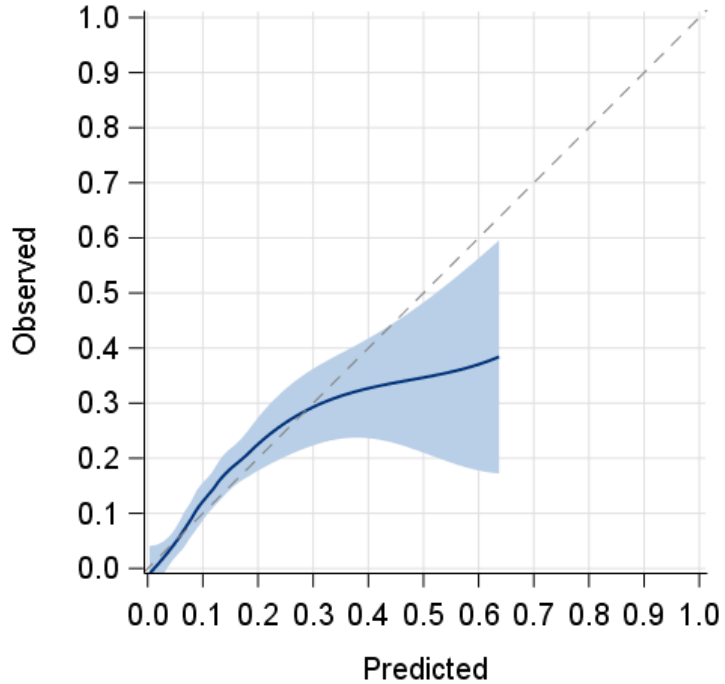
- Age, Sex, ASA, Procedure



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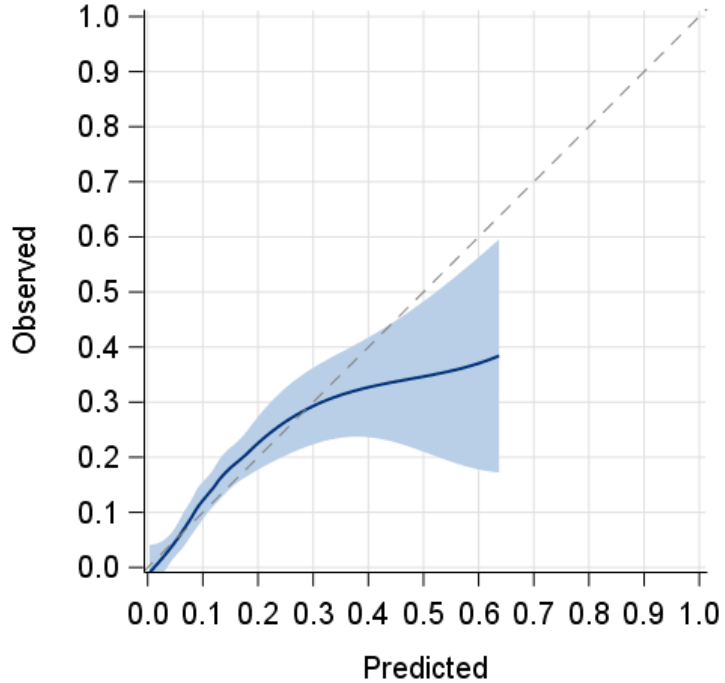
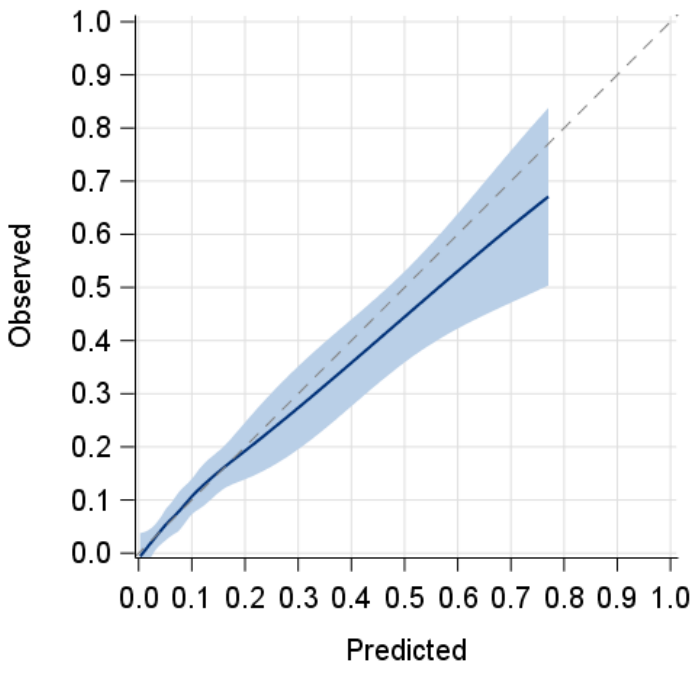
- Age, Sex, ASA, Procedure



- Age, Sex, ASA, Procedure + Frailty



ORIGINAL CLINICAL RESEARCH REPORT

A Bayesian Comparison of Frailty Instruments in Noncardiac Surgery: A Cohort Study

Daniel I. McIsaac, MD, MPH, FRCPC,*†‡ Sylvie D. Aucoin, MD, MSc, FRCPC,* and Carl van Walraven, MD, MSc, FRCPC†‡§

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FRAILTY AND THE UNIVERSAL RISK CALCULATOR

- NSQIP risk calculator vs NSQIP risk calculator + Frailty (RAI)
  - 30-day mortality
    - >1000x more likely that accuracy is improved

ACS NSQIP® Surgical Risk Calculator + 

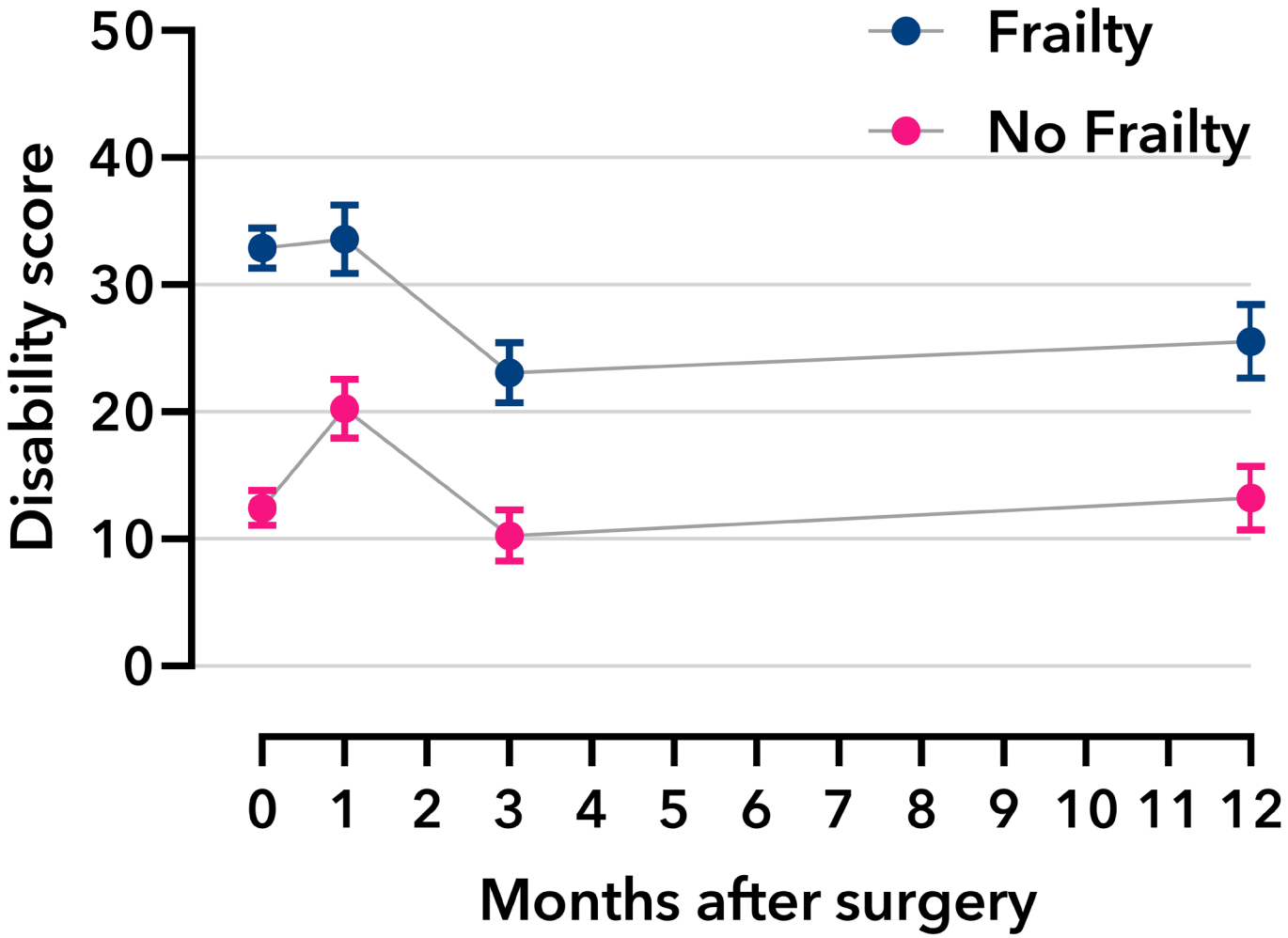
Multidimensional

IDA'S GOALS

- Walk to retirement home dining hall
- Walk outside with friends and family
- Less pain/fewer ulcers

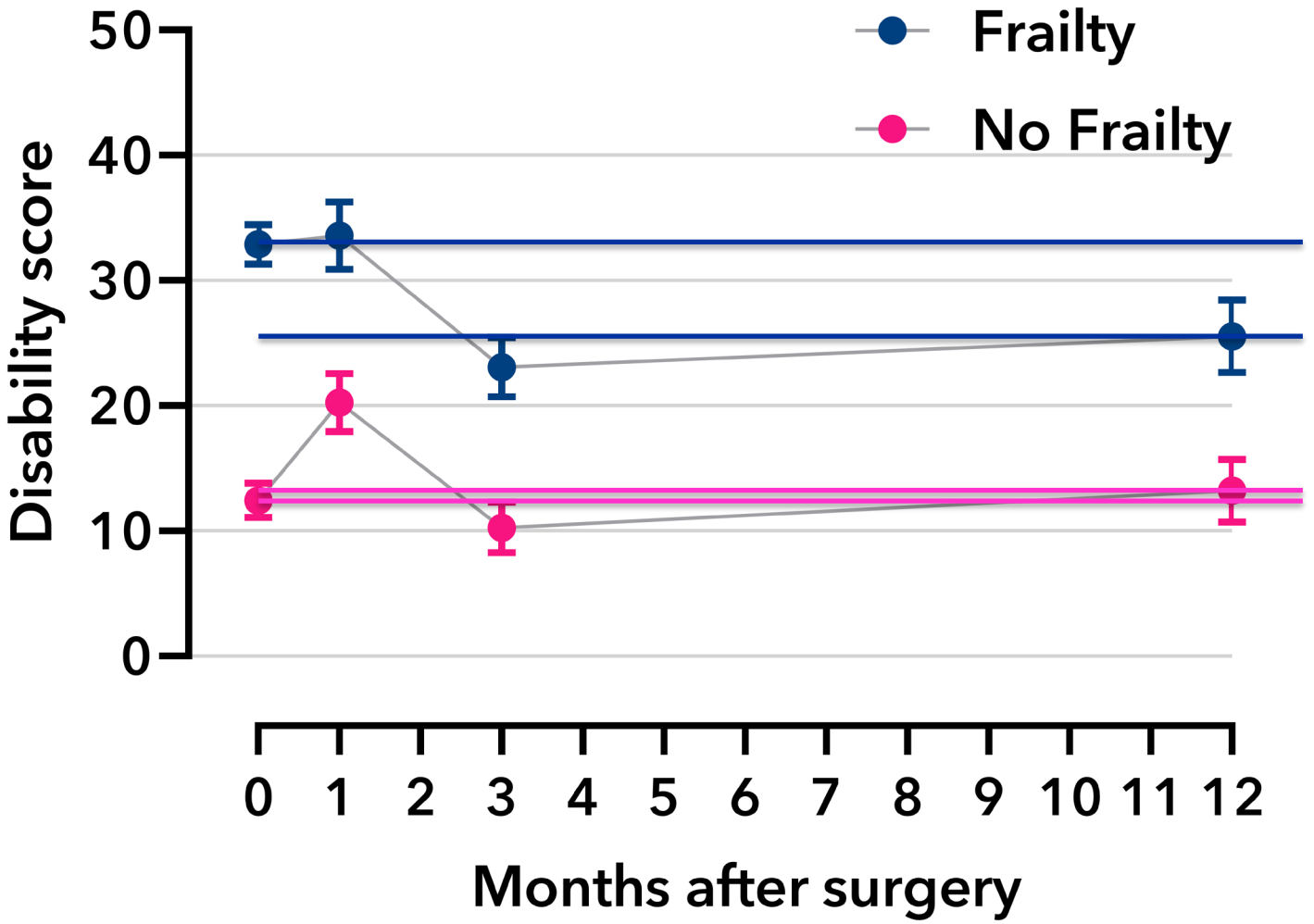
LONG TERM FUNCTIONAL OUTCOMES

LONG TERM FUNCTIONAL OUTCOMES



McIsaac, BJA 2020

LONG TERM FUNCTIONAL OUTCOMES



FRAILTY=
GREATER DECREASE
in disability from baseline

Adj mean difference
-8.1 points, *P<0.001*

McIsaac, BJA 2020

BENEFITS OF FRAILTY ASSESSMENT

- More accurate prognostication of outcomes that…
  - Your patients
  - Your colleagues
  - Your health system

…care about

BENEFITS OF FRAILTY ASSESSMENT

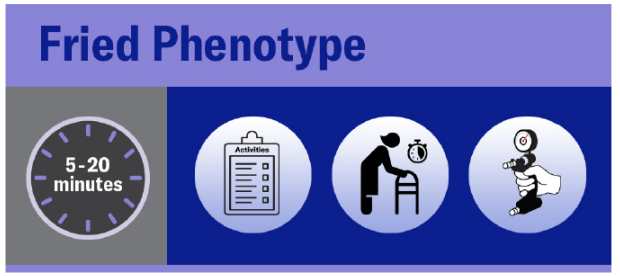
- More accurate prognostication of outcomes that…
  - Your patients
  - Your colleagues
  - Your health system

…care about

AND

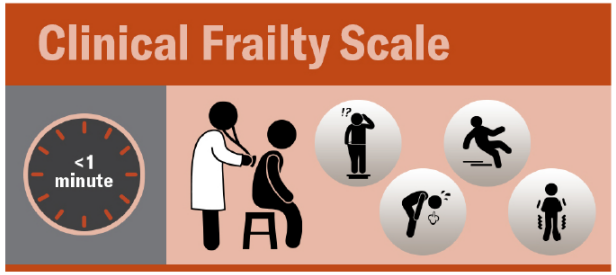
Identifies patients who *may* be more likely to benefit from surgery

EFFICIENT AND EVIDENCE-BASED FRAILTY ASSESSMENT



Resources: • Hand-held dynamometer • Activity questionnaire • Space and timer for a 15-foot walk

Resources: Does not require extra space or instruments



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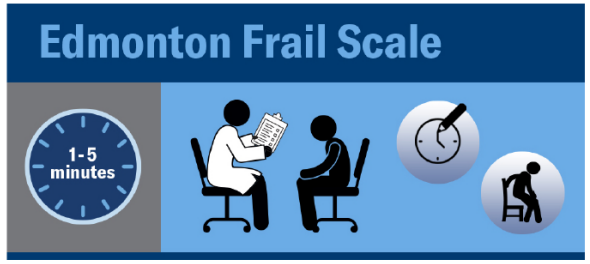
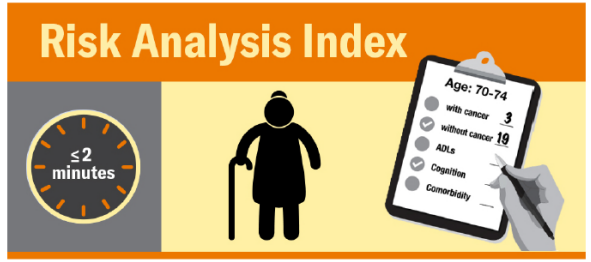
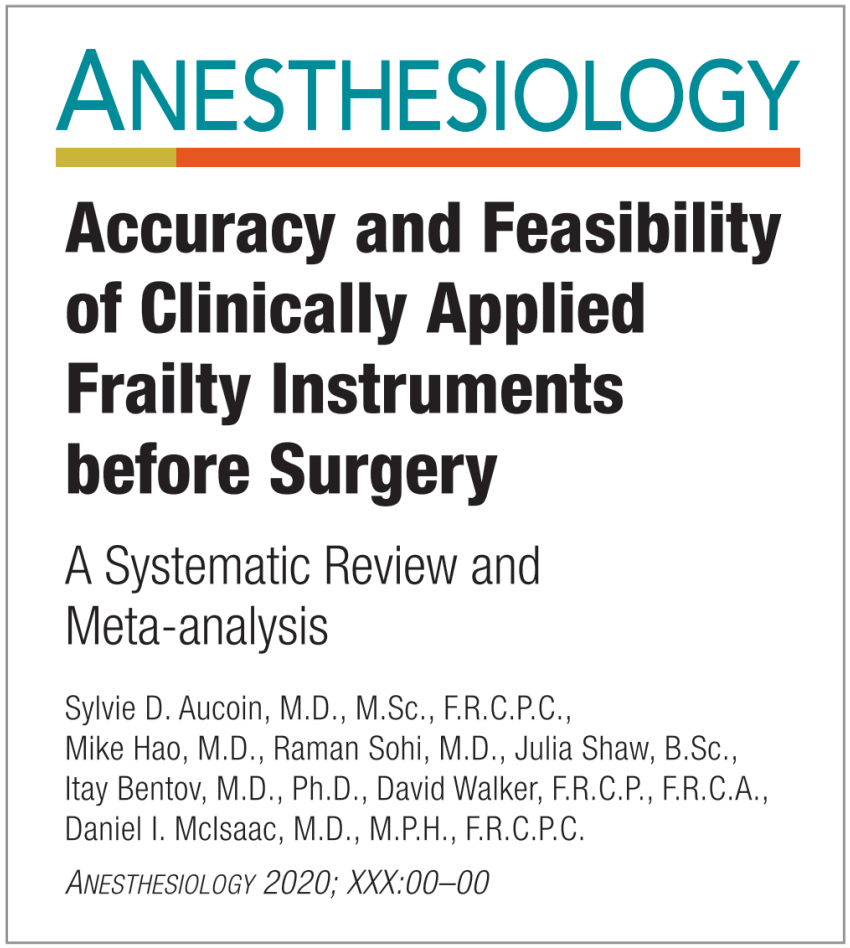


Resources: Paper, pen, and assessor needed for clock draw test, space and chair for timed up and go



Resources: Does not require extra space or instruments

asahq.org/frailty



- 70 studies
- 35 Frailty instruments
  - Fried Phenotype
  - Frailty Index
  - Clinical Frailty Scale
  - Edmonton Frail Scale
  - Risk Analysis Index

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 FRAILTY 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

Rockwood K et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489–495.

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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 FRAILTY 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

Rockwood K et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489–495.

Highly recommended

- -Fast
- -Accurate
- -No Questionnaires
- -No Equipment
- -Intuitive

CLINICAL FRAILTY SCALE

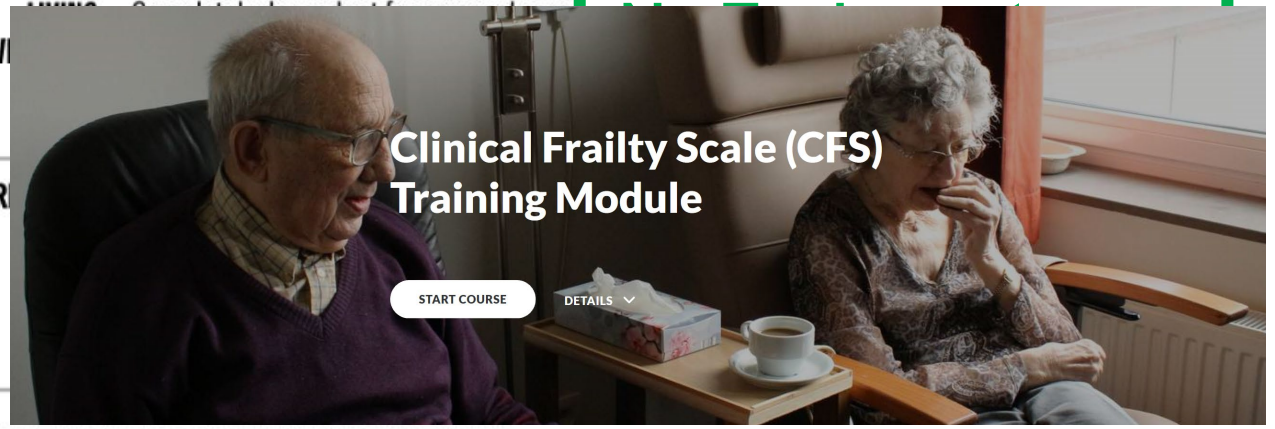
	1	VERY FIT	People who are robust, active, energetic and motivated. They tend to exercise regularly and are among the fittest for their age.
	2	FIT	People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g., seasonally.
	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	WI	
	9	TER	

Highly recommended

-Fast

-Accurate

-No Questionnaires



SCORING FRAILTY 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.

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

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

DALHOUSIE UNIVERSITY

Rockwood K et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489–495

ted with •

FRAILTY ASSESSMENT

A SUMMARY

SUMMARY-FRAILTY ASSESSMENT

- Perioperative clinicians need to perform an assessment
  - CFS is fast, accurate and intuitive
  - Risk Analysis Index (RAI) – excellent for automated/EHR use
  - Frailty Index, EFS and Fried Phenotype are reasonable options too

SUMMARY-FRAILTY ASSESSMENT

- Perioperative clinicians need to perform an assessment

- We will find people living with frailty
  - 25% to >40% of older adults
  - Much higher in surgical patients

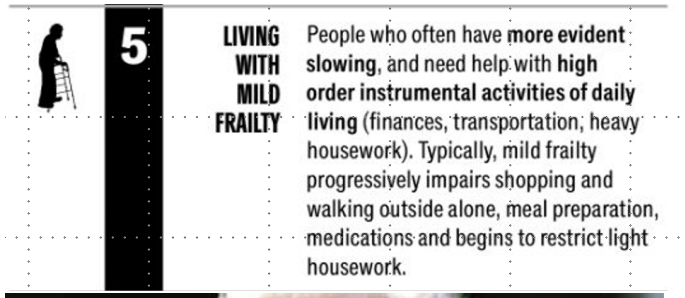
SUMMARY-FRAILTY ASSESSMENT

- Perioperative clinicians need to perform an assessment
- We will find people living with frailty
- Our assessment will provide us and our patients with more accurate information
  - Directly informs a shared decision and risk/benefit discussion

SUMMARY-FRAILTY ASSESSMENT

- Perioperative clinicians need to perform an assessment
- We will find people living with frailty
- Our assessment will provide us and our patients with more accurate information
- Based on frailty status, optimization can be individualized
  - Nutrition, cognition, function
  - And optimizing the system…

WHAT CAN WE DO KNOWING IDA LIVES WITH FRAILTY?



OPTIMAL PERIOPERATIVE MANAGEMENT OF THE GERIATRIC PATIENT:

Best Practices Guideline from ACS NSQIP®/American Geriatrics Society

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Geriatric Surgery Verification
QUALITY IMPROVEMENT PROGRAM

A QUALITY PROGRAM of the AMERICAN COLLEGE OF SURGEONS

Optimal Resources for Geriatric Surgery

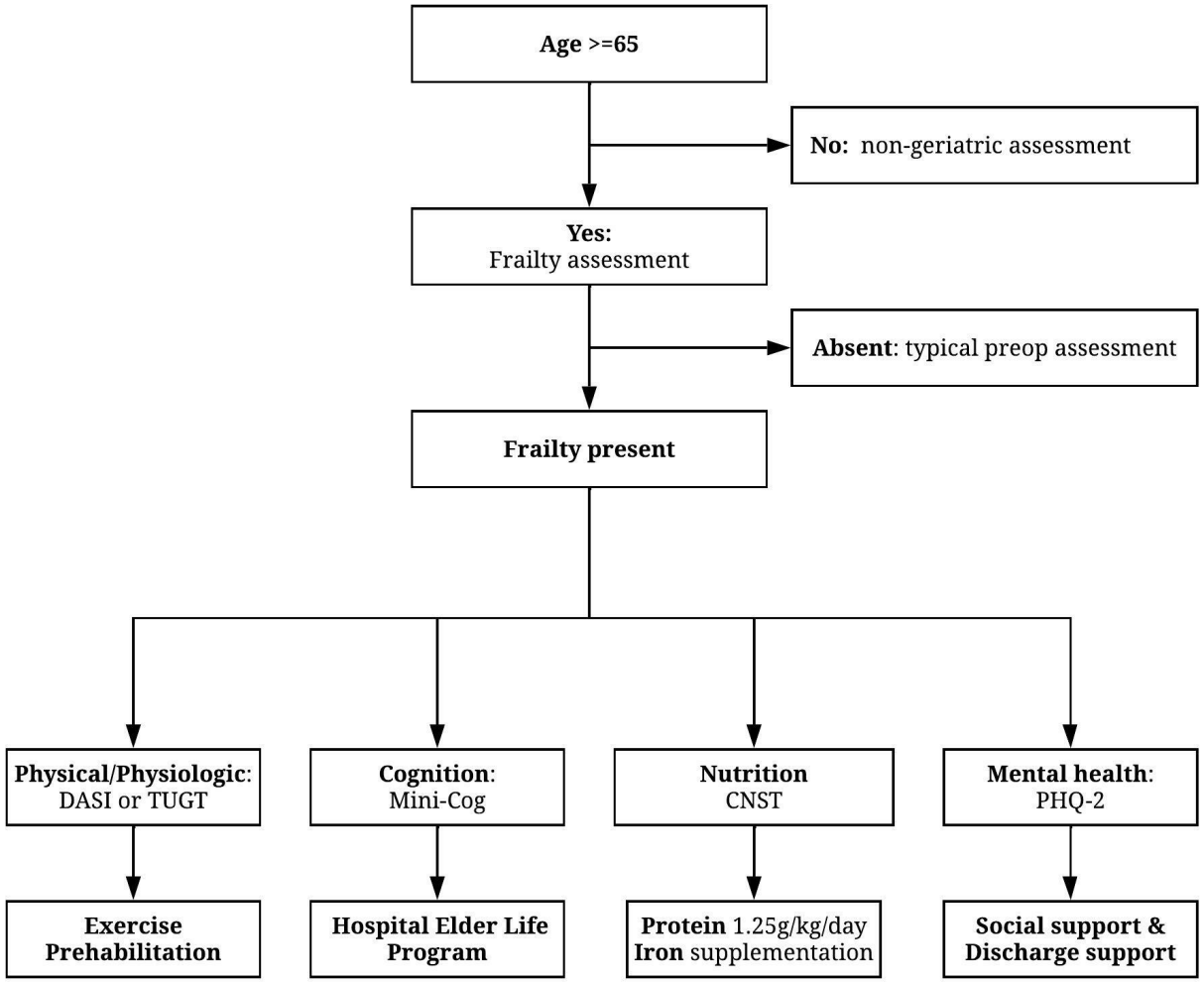
Contributors to frailty

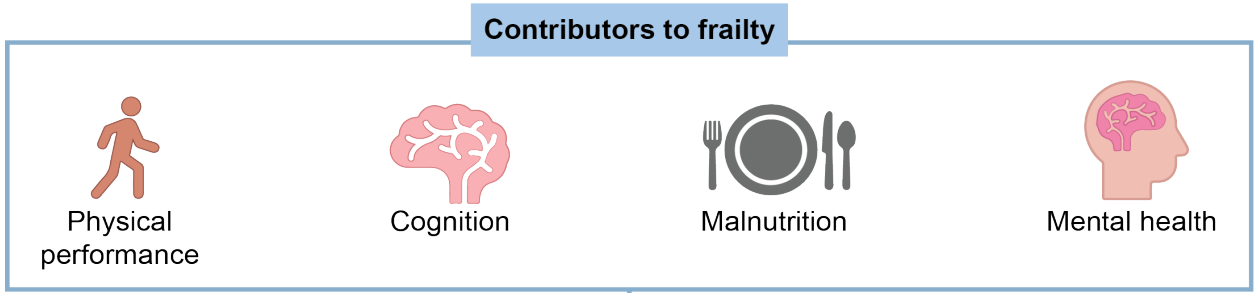
Physical performance

Cognition

Malnutrition

Mental health





McIsaac, Anes Analg 2019

PHYSICAL OPTIMIZATION

PHYSICAL OPTIMIZATION

- Exercise prehabilitation
  - Adherence appears to be the key
    - ↓complications
    - ↓ disability

JAMA Surgery | Original Investigation

Effect of Multimodal Prehabilitation vs Postoperative Rehabilitation on 30-Day Postoperative Complications for Frail Patients Undergoing Resection of Colorectal Cancer

A Randomized Clinical Trial

Francesco Carli, MD, MPhil; Guillaume Bousquet-Dion, MD; Rashami Awasthi, MSc; Noha Elsherbini; Sender Liberman, MD; Marylise Boutros, MD; Barry Stein, MD; Patrick Charlebois, MD; Gabriela Ghitulescu, MD; Nancy Morin, MD; Thomas Jagoe, MD; Celena Scheede-Bergdahl, PhD; Enrico Maria Minnella, MD, PhD; Julio F. Fiore Jr, PhD

BJA

British Journal of Anaesthesia, xxx (xxx): xxx (xxxx)

doi: 10.1016/j.bja.2022.04.006
Advance Access Publication Date: xxx
Clinical Investigation

CLINICAL INVESTIGATION

Home-based prehabilitation with exercise to improve postoperative recovery for older adults with frailty having cancer surgery: the PREHAB randomised clinical trial

Daniel I. McIsaac[1,2,3,*], Emily Hladkowicz[2,4], Gregory L. Bryson[1,2], Alan J. Forster[2,5], Sylvain Gagne[1,2], Allen Huang[2,6], Manoj Lalu[1,2], Luke T. Lavallée[2,7], Husein Moloo[2,8], Julie Nantel[9], Barbara Power[2,6], Celena Scheede-Bergdahl[10], Carl van Walraven[2,11,12], Colin J. L. McCartney[1,2] and Monica Taljaard[2,3]

PHYSICAL OPTIMIZATION

- **Practical advice**
  - Walk vigorously
    - Pedometer
    - ↑ steps 10%/week
    - Eat well (protein!)

PHYSICAL OPTIMIZATION

I'm having surgery because I can't walk vigorously!

PHYSICAL OPTIMIZATION

I'm having surgery because I can't walk vigorously!

- **Practical advice**
  - Swimming/biking
    - 20 mins
      - 3x/week
    - Increase by 5 mins per week

NUTRITIONAL OPTIMIZATION

NUTRITIONAL OPTIMIZATION

- Key consideration if malnutrition identified
  - Increasing importance if exercising

- **Protein**: 1.2 – 1.6 g/kg/day

Gillis, Curr Op Clin Nutr Met Care, 2020; Weiman, Clin Nutr, 2017; Gillis, Anaes, 2019

NUTRITIONAL OPTIMIZATION

- **Low hanging fruit**
  - Protein>1g/kg/day
  - 1 scoop whey powder~25 to 30g
  - High protein shake ~15g

COGNITIVE OPTIMIZATION

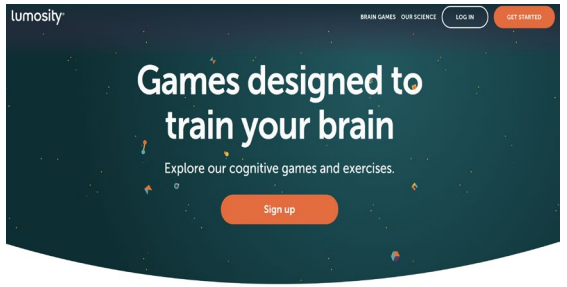
COGNITIVE OPTIMIZATION

JAMA Surgery | Original Investigation

Effect of Cognitive Prehabilitation on the Incidence of Postoperative Delirium Among Older Adults Undergoing Major Noncardiac Surgery
The Neurobics Randomized Clinical Trial

Michelle L. Humeidan, MD, PhD; Joshua-Paolo C. Reyes, BS; Ana Mavarez-Martinez, MD; Cory Roeth, BA; Christopher M. Nguyen, PhD; Elizabeth Sheridan, MPH, MACPR; Alix Zuleta-Alarcon, MD; Andrew Otey, MBA; Mahmoud Abdel-Rasoul, MS, MPH; Sergio D. Bergese, MD

- **Delirium rate**
  - Intervention -14%
  - Control -23%
  - P=0.08



Discover the full suite of training areas

JAMA Surg, 2020

COGNITIVE OPTIMIZATION

- **Delirium prevention bundles**
  - Orientation
    - Glasses, hearing aids, day light, family members
  - Mobilization
    - Physio, in-bed exercise
  - Maintain homeostasis
    - Reduce drains and lines, stay hydrated and fed
  - Avoid deliriogenic agents
    - Remember: Multimodal analgesia ~ polypharmacy

PROCESSED EEG & DEPTH OF ANESTHESIA

BJA

British Journal of Anaesthesia, 127 (5): 704–712 (2021)

doi: 10.1016/j.bja.2021.07.021
Advance Access Publication Date: 28 August 2021
Neuroscience and Neuroanaesthesia

NEUROSCIENCE AND NEUROANAESTHESIA

Anaesthetic depth and delirium after major surgery: a randomised clinical trial

Lisbeth A. Evered[1,2,3,*,†], Matthew T. V. Chan[4], Ruquan Han[5], Mandy H. M. Chu[4], Benny P. Cheng[4], David A. Scott[2,3], Kane O. Pryor[1], Daniel I. Sessler[6], Robert Veselis[1,7], Christopher Frampton[8], Matthew Sumner[9], Ade Ayeni[9], Paul S. Myles[10], Douglas Campbell[9,11], Kate Leslie[3,12,13] and Timothy G. Short[9,11]

- Target BIS=50 (vs 35)
  - Delirium: 9% ARR (P=0.01)
  - Poor 1-year cognitive recovery: 11% ARR (P<0.001)

WHAT CAN WE DO NEXT WEEK

- CFS-based frailty assessment for everyone 65+
- Encourage increase in ambulation week over week
- Recommend protein supplementation
- Avoid deliriogenic agents and polypharmacy
- Consider targeted light GA (BIS=50)

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SYSTEM OPTIMIZATION

SHARING IS CARING

Research

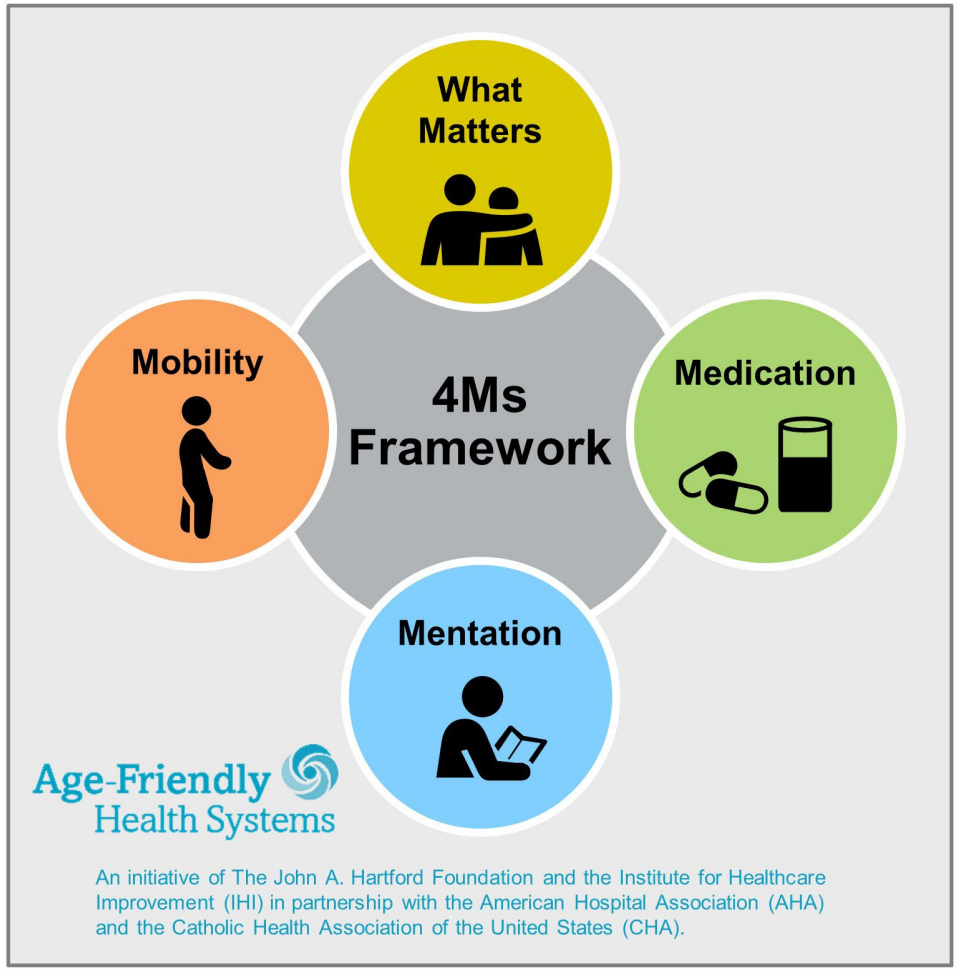
JAMA Surgery | Original Investigation | ASSOCIATION OF VA SURGEONS

Association of Routine Preoperative Frailty Assessment With 1-Year Postoperative Mortality

Patrick R. Varley, MD, MSc; Dan Buchanan, MS; Andrew Bilderback, MS; Mary Kay Wisniewski, MT, MACom; Jason Johanning, MD; Joel B. Nelson, MD; Jonas T. Johnson, MD; Tamra Minnier, MSN, RN; Daniel E. Hall, MD, MDiv, MHSc

- Routine frailty assessment + communication to periop team
  - 18% *relative* decrease in overall mortality (OR 0.82, 95%CI 0.72 to 0.92)
  - 4% absolute decrease in mortality for those with frailty (-6% to -2%)

THINK DIFFERENTLY



For related work, this graphic may be used in its entirety without requesting permission.
Graphic files and guidance at ihi.org/AgeFriendly

What Matters

Know and align care with each older adult's specific health outcome goals and care preferences including, but not limited to, end-of-life care, and across settings of care.

Medication

If medication is necessary, use Age-Friendly medication that does not interfere with What Matters to the older adult, Mobility, or Mentation across settings of care.

Mentation

Prevent, identify, treat, and manage dementia, depression, and delirium across settings of care.

Mobility

Ensure that older adults move safely every day in order to maintain function and do What Matters.

- ABCs of acute care
- 4Ms of geriatrics

CONSULT DIFFERENTLY

Research

JAMA Internal Medicine | Original Investigation | LESS IS MORE

Association of Preoperative Medical Consultation With Reduction in Adverse Postoperative Outcomes and Use of Processes of Care Among Residents of Ontario, Canada

Weiwei Beckerleg, MD, MPH; Daniel Kobewka, MD, MSc; Duminda N. Wijeysundera, MD, PhD; Manish M. Sood, MD, MSc; Daniel I. McIsaac, MD, MPH

- Medicine/cardiology
  - Association with increased mortality
    - OR 1.19 (1.11 to 1.29)

CONSULT DIFFERENTLY

Randomized clinical trial

Randomized clinical trial of comprehensive geriatric assessment and optimization in vascular surgery

J. S. L. Partridge[1,3], D. Harari[1,3], F. C. Martin[1,3], J. L. Peacock[3], R. Bell[2], A. Mohammed[1] and J. K. Dhesi[1,3]

- Geriatric consultation
  - 2.2 day reduction in LoS
  - 13% *absolute* decrease in delirium
  - 20% *absolute* decrease in medical complications

CONSULT DIFFERENTLY

CLINICAL INVESTIGATION

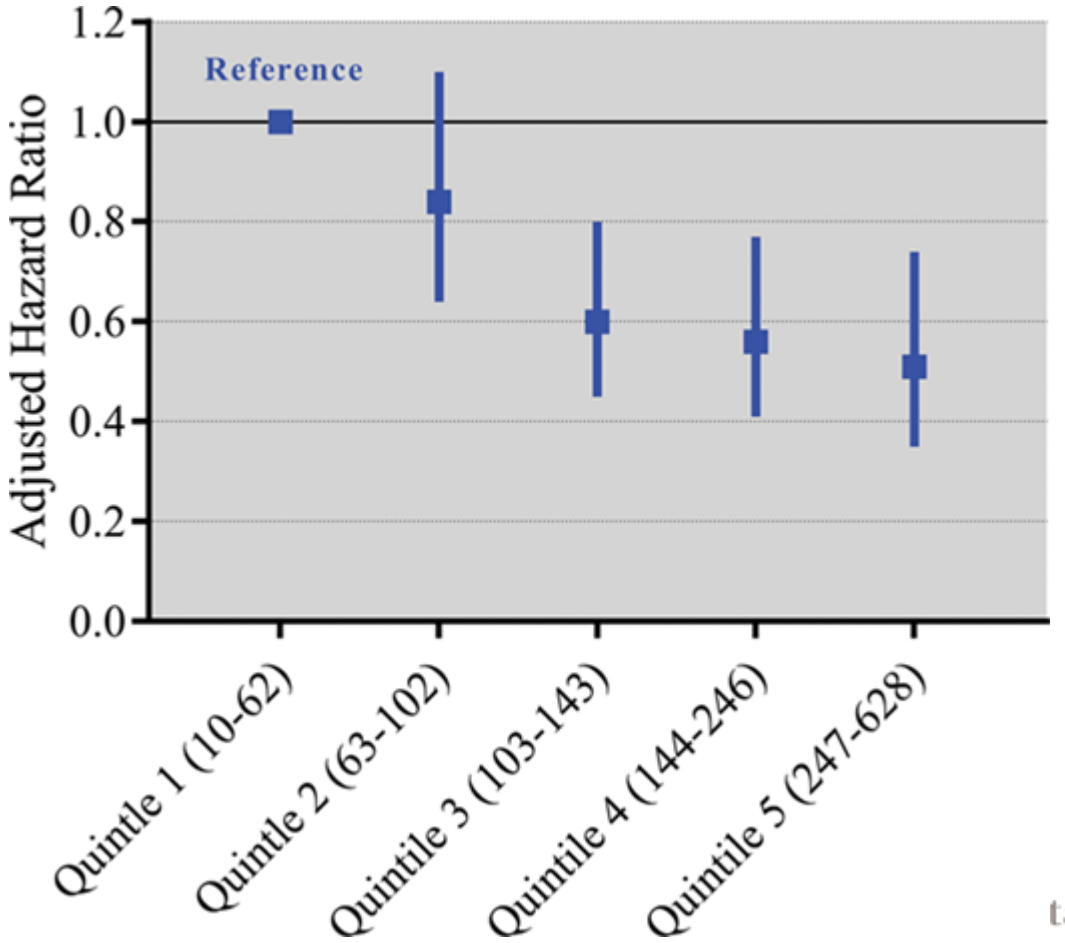
Effect of Preoperative Geriatric Evaluation on Outcomes After Elective Surgery: A Population-Based Study

Daniel I. McIsaac, MD, MPH,[*†‡§] *Allen Huang, MDCM,*[†¶**] *Coralie A. Wong, MSc,*[‡] *Duminda N. Wijeysundera, MD, PhD,*[‡†††‡§§] *Gregory L. Bryson, MD, MSc,*[*†] *and Carl van Walraven, MD, MSc*[†‡§¶]

- Association with decreased mortality
  - HR 0.81 (0.68 to 0.95)

EXPERIENCE MATTERS

- High volume centers
  - Complex procedures
  - Complex patients



McIsaac, Anes 2017

EXPERIENCE MATTERS

- High volume centers
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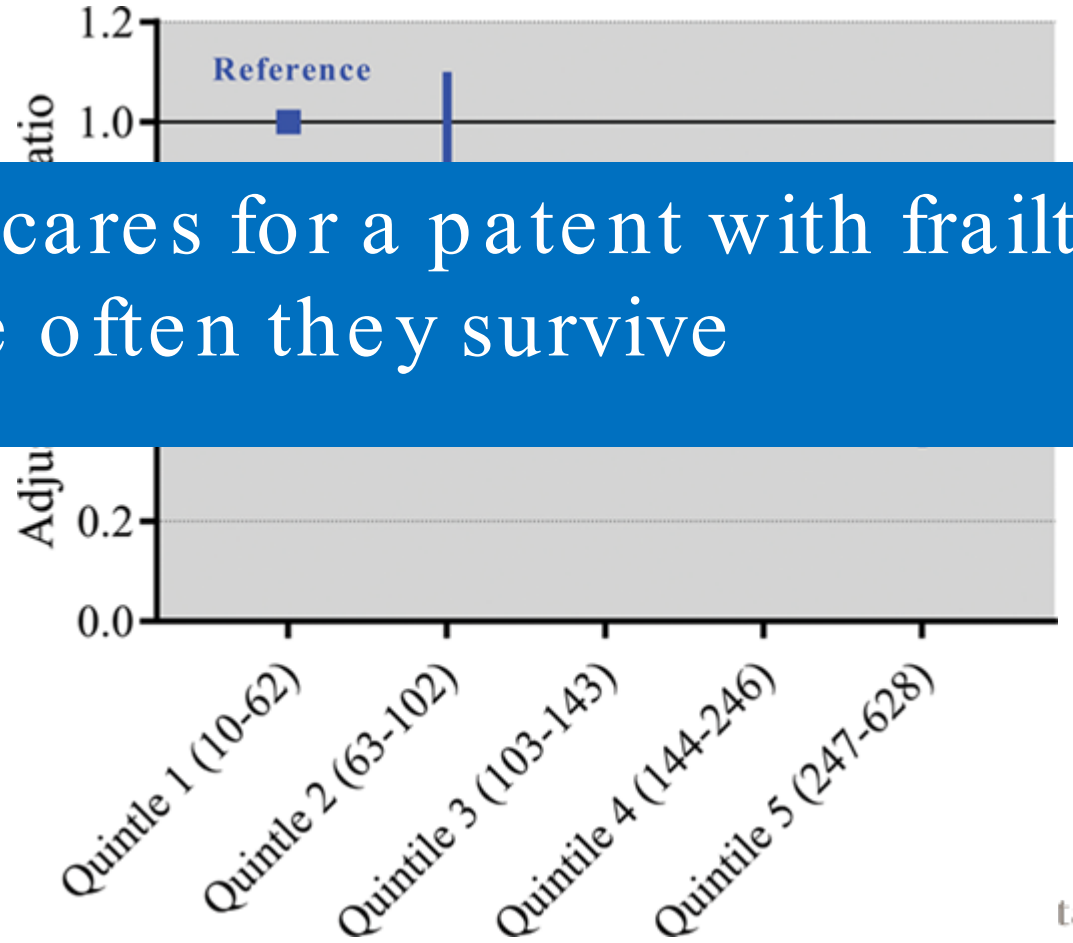

The more often a center cares for a patent with frailty…
…the more often they survive

McIsaac, Anes 2017

WRAPPING UP

- Perioperative frailty is:
  - Common
  - Associated with greater risk & *benefit*
  - Modifiable

WRAPPING UP

- Frailty assessment guides optimization
  - Exercise
  - Nutrition
  - Cognition
  - Mental health
  - Health system
  - But…

WRAPPING UP

- Frailty assessment guides optimization
  - Exercise
  - Nutrition
  - Cognition
  - Mental health
  - Health system

Only through effective, collaborative multidisciplinary care will outcomes be optimized

IDA'S OUTCOME

- MINS
- Superficial SSI
- LoS=12 days
- Rehab = 21 days

IDA'S OUTCOME

- Back home
- Can walk to dinner
- Gets outside with family

THANK YOU

Project Big Life

Health Calculators for a Big Life Powered by Big Data

BIG LIFE LIFE EXPECTANCY

YOUR LIFE EXPECTANCY

92 Years

Life expectancy for people who answered the same questions is

92 YEARS

Continue Press Enter

https://www.projectbiglife.ca

NUTRITIONAL OPTIMIZATION

✗ Finds it hard to eat a lot more food

✓ Enjoys milkshakes

Recipes

The protein supplement can be enjoyed on its own or can be used in a recipe to suit your taste preferences.

Ingredients

Protein Serving
- **Option 1:** 1 bottle of protein shake
- **Option 2**: 1 scoop of protein powder & 1 cup milk/water

Strawberry Banana Smoothie
- 1 protein serving
- 1 cup frozen whole strawberries
- 1 small banana, sliced

Peanut Butter Chocolate Smoothie
- 1 protein serving
- 1 banana
- 2 tbsp peanut butter

Directions
- In a blender, combine all ingredients
- Blend until smooth
- Pour into glasses and serve

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Surgical Risk Calculator

ACS NSQIP

ACS AMERICAN COLLEGE OF SURGEONS

Home | About | FAQ | ACS Website | ACS NSQIP Website

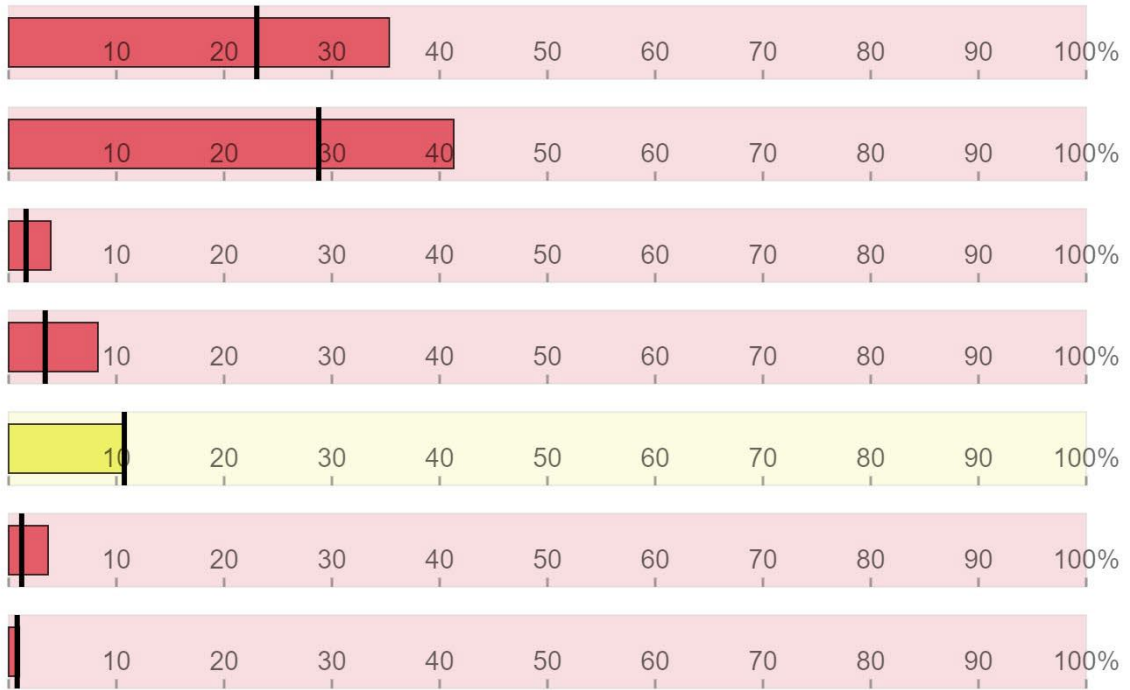
Procedure: 35566 - Bypass graft, with vein; femoral-anterior tibial, posterior tibial, peroneal artery or other distal vessels

Risk Factors: 75-84 years, Partially dependent functional status, Severe systemic disease/constant threat to life, Diabetes (Insulin), HTN, Mobility Aid, Supported at home

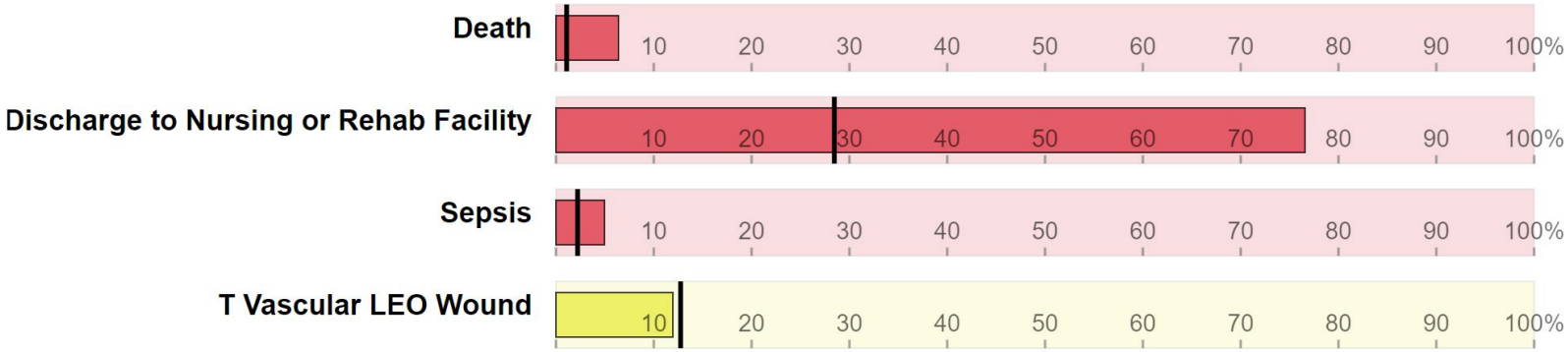
Change Patient Risk Factors

Note: Your Risk has been rounded to one decimal point.

Outcomes



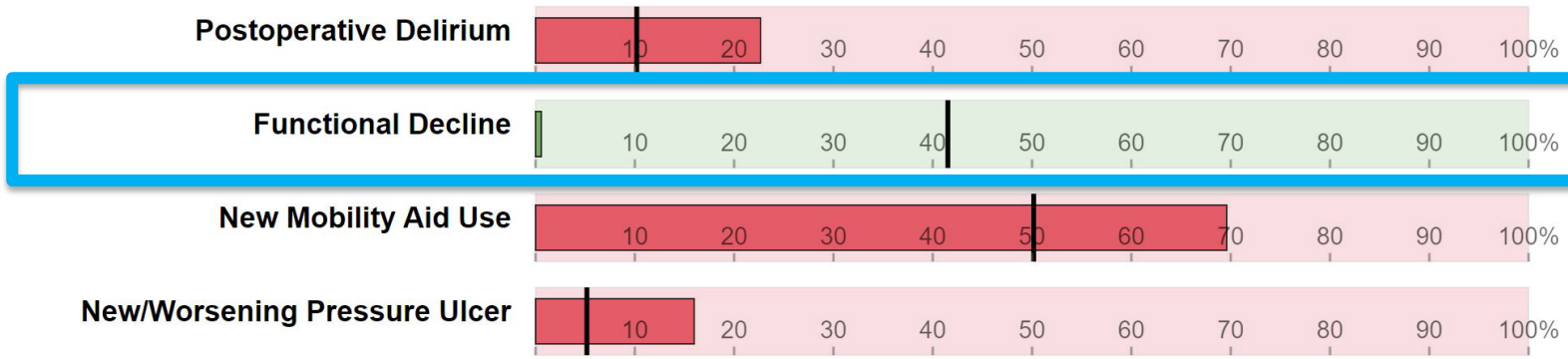
Outcomes	Your Risk	Average Risk	Chance of Outcome
Serious Complication	35.3%	23.0%	Above Average
Any Complication	41.3%	28.8%	Above Average
Pneumonia	3.9%	1.6%	Above Average
Cardiac Complication	8.3%	3.4%	Above Average
Surgical Site Infection	10.8%	10.7%	Average
Urinary Tract Infection	3.7%	1.2%	Above Average
Venous Thromboembolism	1.0%	0.8%	Above Average



Death	6.4%	1.1%	Above Average
Discharge to Nursing or Rehab Facility	76.6%	28.5%	Above Average
Sepsis	5.0%	2.2%	Above Average
T Vascular LEO Wound	12.0%	12.7%	Average

Predicted Length of Hospital Stay: 10.5 days

Geriatric Outcomes



	Your Risk	Average Risk	Chance of Outcome
Postoperative Delirium	22.7%	10.2%	Above Average
Functional Decline	0.6%	41.5%	Below Average
New Mobility Aid Use	69.6%	50.2%	Above Average
New/Worsening Pressure Ulcer	16.0%	5.2%	Above Average

COMPREHENSIVE GERIATRIC ASSESSMENT

- Geriatrician-led, multidimensional assessment plus care planning
  - NNT 17 successful home discharge!

Ellis, BMJ 2011

COMPREHENSIVE GERIATRIC ASSESSMENT

- Geriatrician-led, multidimensional assessment plus care planning
  - NNT 17 successful home discharge!

Proactive care of older people undergoing surgery ('POPS'): Designing, embedding, evaluating and funding a comprehensive geriatric assessment service for older elective surgical patients

Danielle Harari, Adrian Hopper, Jugdeep Dhesi, Gordana Babic-Illman, Linda Lockwood, Finbarr Martin

Association of Integrated Care Coordination With Postsurgical Outcomes in High-Risk Older Adults
The Perioperative Optimization of Senior Health (POSH) Initiative

Shelley R. McDonald, DO, PhD; Mitchell T. Heflin, MD, MHS; Heather E. Whitson, MD, MHS; Thomas O. Dalton, MD; Michael E. Lidsky, MD; Phillip Liu, MD, MBA; Cornelia M. Poer, MSW, LCSW; Richard Sloane, MPH; Julie K. Thacker, MD; Heidi K. White, MD, MHS, MEd; Mamata Yanamadala, MBBS, MSc; Sandhya A. Lagoo-Deenadayalan, MD, PhD

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FRIED PHENOTYPE

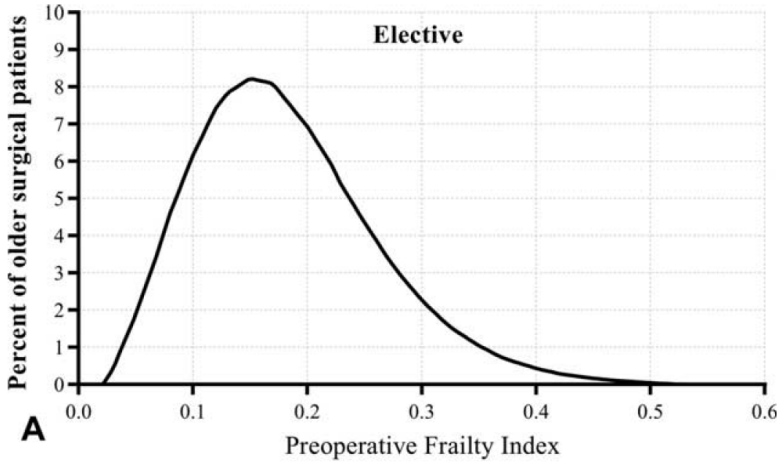
- Set of measured characteristics

-low activity
-weight loss
-falls
-grip strength
-gait speed

↑ Equipment
↑ Time
↓ Accurate

FRAILTY INDEX

- Accumulating deficits framework
  - Measure 30+ multidomain variables
  - Frailty index score = $\frac{\text{Deficits present}}{\text{Deficits measured}}$

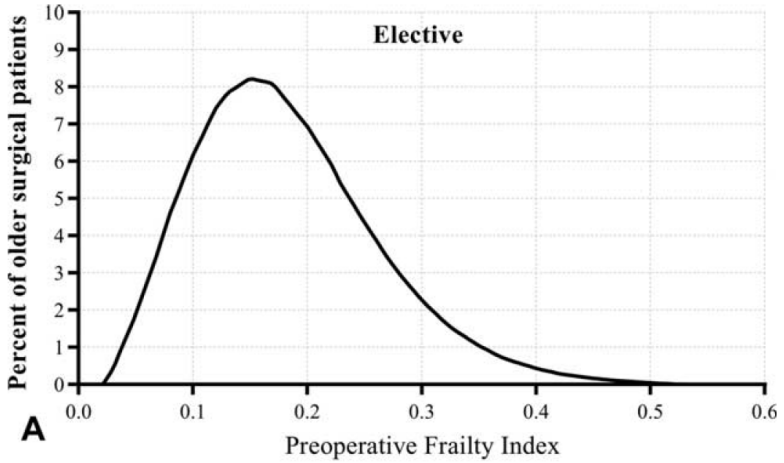


Variable
Anticholinergic risk scale
Arrhythmia
Cancer
Cerebrovascular disease
Chronic obstructive pulmonary di
Dementia
Dental
Dermatologic
Diabetes
Dialysis
Drug or alcohol abuse
Heart failure
Hemiparesis
History of falls
Home oxygen
HOMR Score
Hypertension
Injury
Liver disease
Multimorbidity
Myocardial Infarction
Peripheral vascular disease
Psychosocial (minor or stable)
Resource use band 4–5
Rheumatic disease
Socioeconomic status
Ear, nose, throat
Eye
Supported living environment
Weight loss

Electronic automation

FRAILTY INDEX

- Accumulating deficits framework
  - Measure 30+ multidomain variables
  - Frailty index score = $\frac{\text{Deficits present}}{\text{Deficits measured}}$



Variable
Anticholinergic risk scale
Arrhythmia
Cancer
Cerebrovascular disease
Chronic obstructive pulmonary di
Dementia
Dental
Dermatologic
Diabetes
Dialysis
Drug or alcohol abuse
Heart failure
Hemiparesis
History of falls
Home oxygen
HOMR Score
Hypertension
Injury
Liver disease
Multimorbidity
Myocardial Infarction
Peripheral vascular disease
Psychosocial (minor or stable)
Resource use band 4–5
Rheumatic disease
Socioeconomic status
Ear, nose, throat
Eye
Supported living environment
Weight loss

Electronic automation

↑ ↑ Time

EDMONTON FRAIL SCALE

- Compressed Frailty Index (0 to 17)

Domain	Item	0 points	1 point	2 points
Cognition	Clock drawing	No errors	Minor spacing errors	Other errors
Health status	Number of hospital admissions in last year	0	1	>1
	Patient description of overall health	Good	Fair	Poor
Functional dependence	Help needed with number of activities of daily living?	0–1	2–4	5–8
Social Support	Reliable support available?	Always	Sometimes	Never
Medication use	>4 regular medications?	No	Yes	–
	Patient forgets to take medicines?	No	Yes	–
Nutrition	Recent weight loss present?	No	Yes	–
Mood	Often sad or depressed?	No	Yes	–
Continence	Urinary incontinence present?	No	Yes	–
Functional performance	Timed up-and-go	0–10 s	11–20 s	>20 s or unable

RISK ANALYSIS INDEX (RAI)

- Multivariable, multidomain risk assessment index

- Points (weights) assigned for combinations
  - 0 to 81 points

- Age
- Sex
- Weight loss
- Poor appetite
- CKD
- CHF
- SOB
- Independence
- ADLs
- Cancer

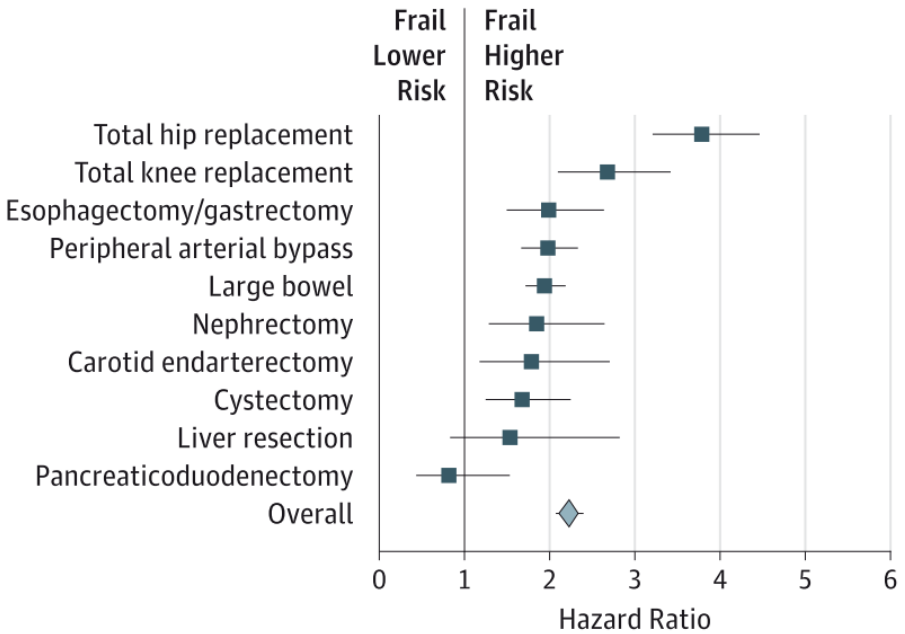
Electronic automation

↑ ↑ Math

MORTALITY

- Effect modification by surgical risk

  - Lower baseline risk surgery = Higher relative risk of frailty



McIsaac JAMA Surgery 2016

MORTALITY

- Effect modification by surgical risk

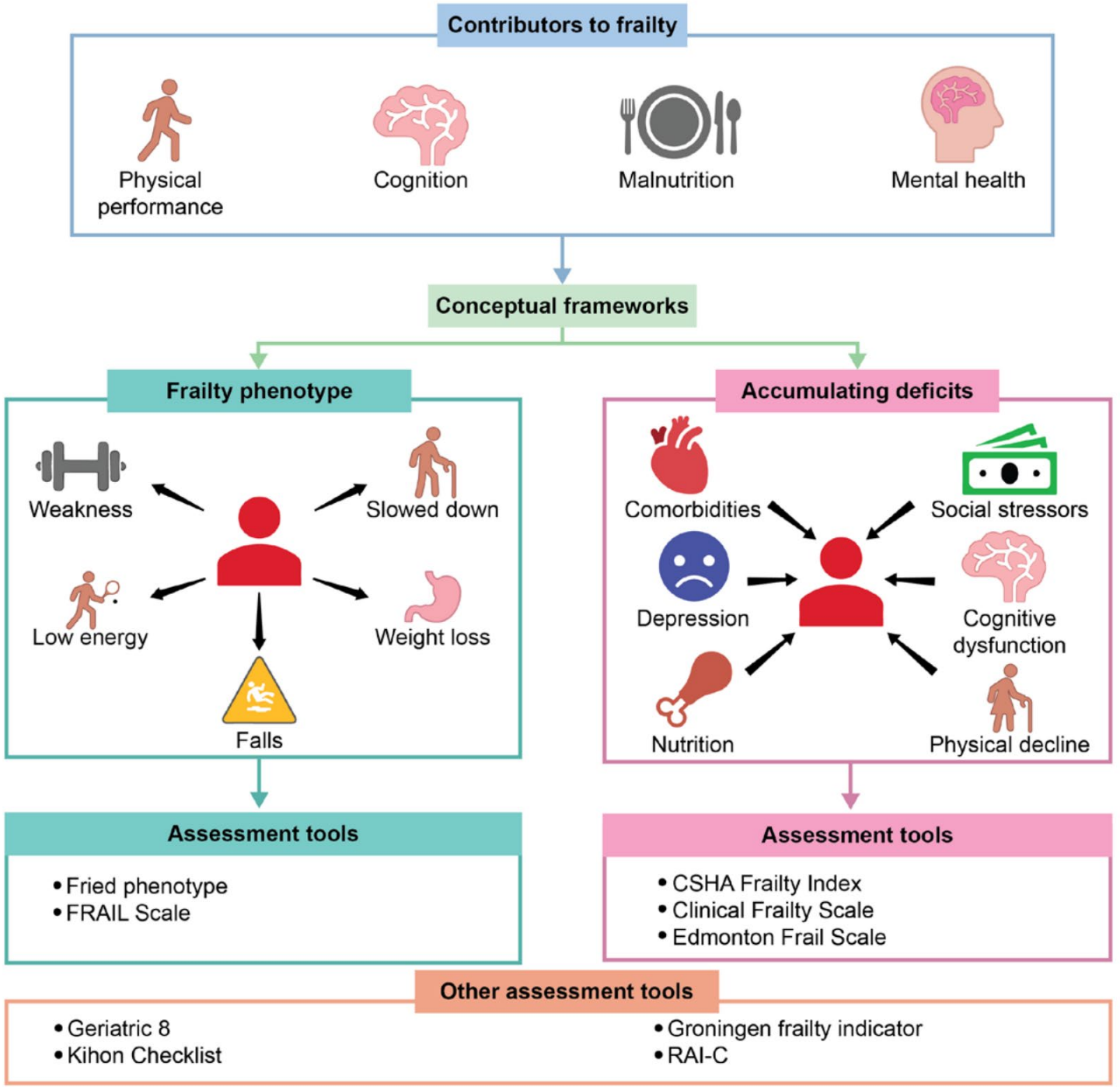
  - Lower baseline risk surgery = Higher relative risk of frailty

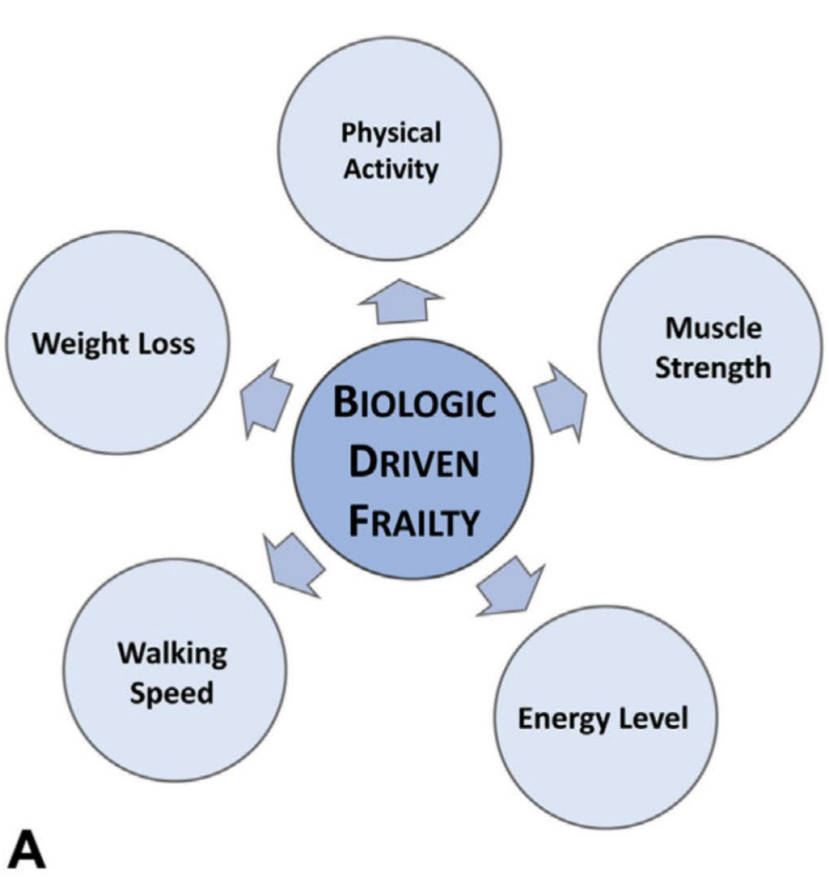
  - Appendectomy/cholecystectomy (2% absolute mortality)
    - Adj HR=2.0
  - Laparotomy/bowel resection (12% absolute mortality)
    - Adj HR=1.5

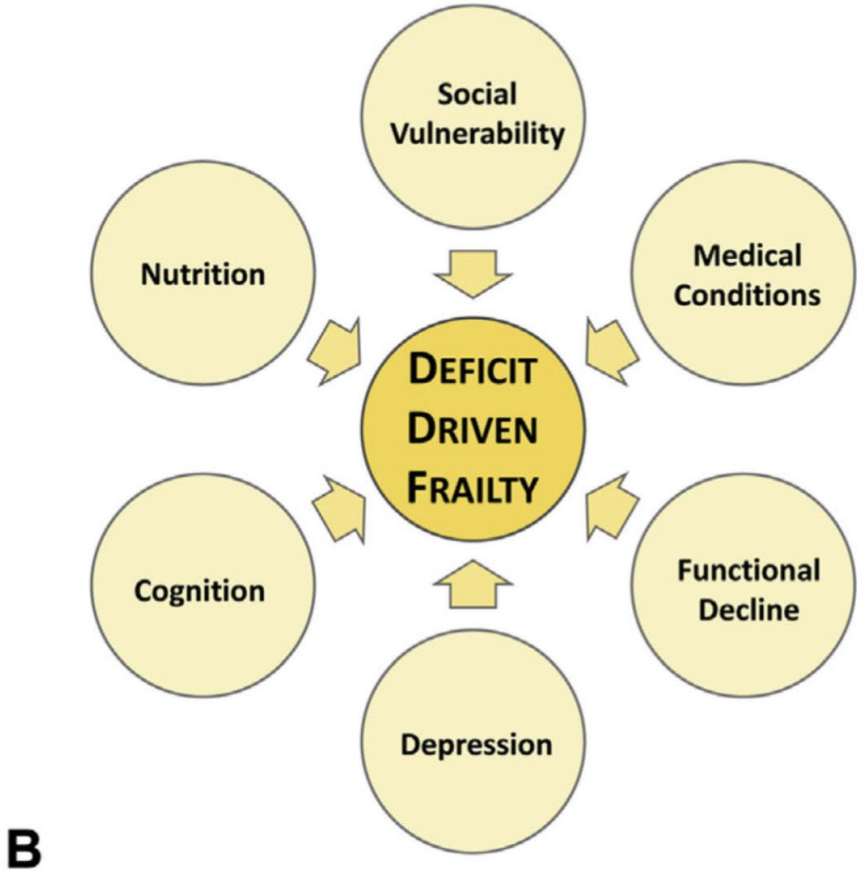
SIMPLE TAKE HOME

Frailty 

↓ risk procedure ≠ ↓ risk periop period


Contributors to frailty
Physical performance
Cognition
Malnutrition
Mental health
Conceptual frameworks
Frailty phenotype
Weakness
Slowed down
Low energy
Weight loss
Falls
Accumulating deficits
Comorbidities
Social stressors
Depression
Cognitive dysfunction
Nutrition
Physical decline
Assessment tools
• Fried phenotype
• FRAIL Scale
Assessment tools
• CSHA Frailty Index
• Clinical Frailty Scale
• Edmonton Frail Scale
Other assessment tools
• Geriatric 8
• Kihon Checklist
• Groningen frailty indicator
• RAI-C





Robinson et al. *J Am Coll Surg* 2015

FRAILTY INSTRUMENTS AND TIME

- CFS vs FP
  - 44 secs vs 5 mins ($P<0.0001$)
- FP reported times SR
  - 5-15 mins
- Edmonton Frail Scale
  - 5 mins
- Frailty Index (full)
  - 5-10 mins

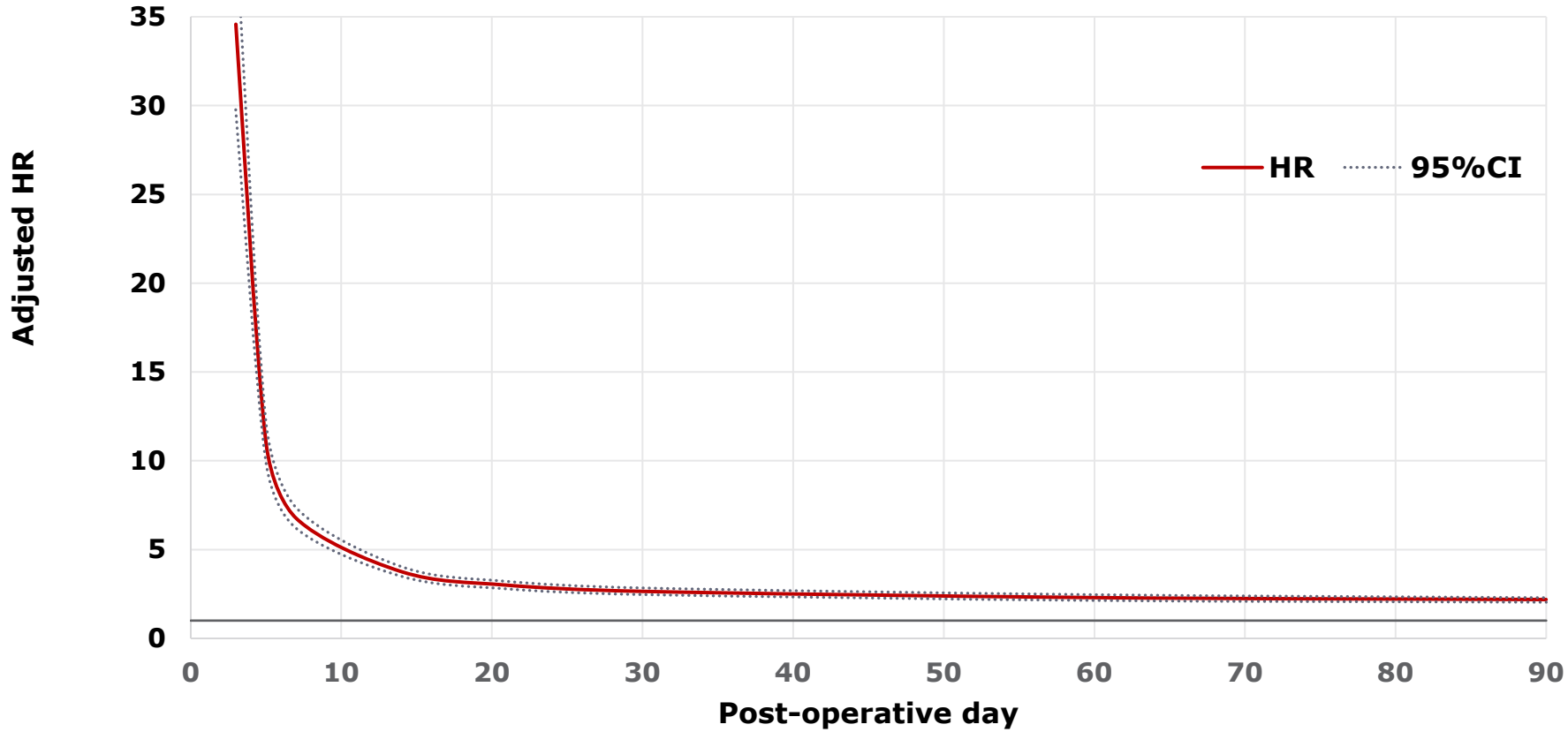
Aucoin, Shaw, Liao, Sohi, Walker, Bentov and McIsaac, 2019 (submitted)

Original Investigation

Association of Frailty and 1-Year Postoperative Mortality Following Major Elective Noncardiac Surgery

A Population-Based Cohort Study

Daniel I. McIsaac, MD, MPH, FRCPC; Gregory L. Bryson, MD, FRCPC, MSc; Carl van Walraven, MD, FRCPC, MSc



The Association of Frailty With Outcomes and Resource Use After Emergency General Surgery: A Population-Based Cohort Study

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