FRAILTY
ALS OUTCOME PARAMETER

Prim. PD Dr. Peter Paal MBA PM.ME EDAIC EDIC FERC

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EUROPEAN RESUSCITATION COUNCIL

No COI

Master in Bio- und Medizinethik, Mitglied diverser Fachgesellschaften und Organisationen, die sich mit medizinethischen Fragen beschäftigen, z.B. **Ethikkommittee Barmherzige Brüder, ÖGARI, European Resuscitation Council, ICAR MEDCOM**

https://www.epicshare.org/share-and-learn/normalizing-advance-care-planning-gives-patients-power-and-families-peace-of-mind

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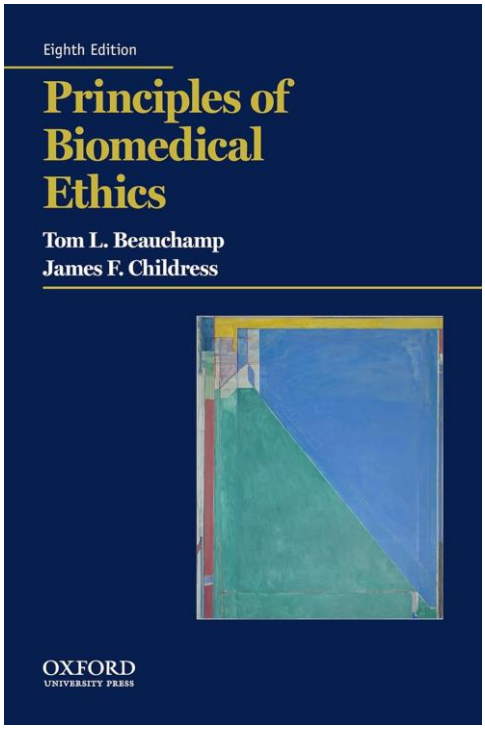
ICAR



Autonomy	**Autonomie**
Non-maleficence	**Schadensvermeidung**
Beneficence and	**Fürsorge** und
Justice	**Gerechtigkeit**

Beauchamp TL, Childress JF. 1979. Principles of Biomedical Ethics. Oxford: Oxford University Press

Aim

Shared decision making and
perioperative advance care planning
for mentally incapacitated or patients at risk of death

History on patient's rights

Modern cardiopulmonary resuscitation - 1962

Pulse of life - https://www.youtube.com/watch?v=g3_AC8w170s

DNR orders – ASA 1993

Craig DB, et al. Can J Anaesth 1998 May;45(5 Pt 2):R160-71. doi: 10.1007/BF03019216.

Intensive care medicine – polio pandemic - Copenhagen

https://www.smithsonianmag.com/innovation/how-polio-outbreak-copenhagen-led-to-invention-ventilator-180975045/

Palliative care – cura palliativa

https://de.wikipedia.org/wiki/Cicely_Saunders

Some progress in internal medicine (CHF),
little progress in perioperative medicine

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Definition

- **Frailty is an aging-related syndrome of physiological decline, characterized by marked vulnerability to adverse health outcomes**
- Burden of symptoms including
  - **weakness and fatigue**,
  - **medical complexity**, and
  - **reduced tolerance** to medical and surgical interventions
- Awareness can improve outcome

Walston JD. Up to date 2024 May 14

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Prevalence

- **4 - 16% in community-dwelling persons > 65** and up to **43% of older patients with cancer**
- **Pre-frailty** prevalence **28 - 44% in >65 years** old)

Fried LP, et al. J Gerontol A Biol Sci Med Sci 2001; 56:M146.
Kiely DK, et al. J Am Geriatr Soc 2009; 57:1532.
Bandeen-Roche K, et al. J Gerontol A Biol Sci Med Sci 2006; 61:262.
Woods NF, et al. J Am Geriatr Soc 2005; 53:1321.
Cawthon PM, et al. J Am Geriatr Soc 2007; 55:1216.
Handforth C, et al. Ann Oncol 2015; 26:1091.

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Health consequences and mortality

- **Increased vulnerability contributes to increased risk** for
  - procedural complications
  - disability
  - falls & hip fractures
  - institutionalization
  - death
- **Frailty** is the **hallmark geriatric syndrome** as forerunner **to other geriatric syndromes,** including frequent
  - **Falls**
  - **Fractures**
  - **Delirium**
  - **cognitive impairment, and**
  - **incontinence**

Clegg A, et al. Lancet 2013; 381:752.
Woods NF, et al. J Am Geriatr Soc 2005; 53:1321.

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What is frailty?

- **Multiple factors**
  - medical,
  - environmental,
  - educational, and
  - psychological background

  impact frailty, functional status and physiologic reserve
- **Age, chronic comorbidities, and disability do not establish the diagnosis of frailty**

Rodríguez-Mañas L, et al. J Gerontol A Biol Sci Med Sci 2013; 68:62.
Morley JE, et al. J Am Med Dir Assoc 2013; 14:392.
Sternberg SA, et al. J Am Geriatr Soc 2011; 59:2129.
Hamerman D. Ann Intern Med 1999; 130:945.

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What is frailty?

- **Frailty exists on a spectrum**. The end stage of the continuum of frailty is often considered to be **failure to thrive**
- **Old age itself does not define frailty**

Rodríguez-Mañas L, et al. J Gerontol A Biol Sci Med Sci 2013; 68:62.
Morley JE, et al. J Am Med Dir Assoc 2013; 14:392.
Sternberg SA, et al. J Am Geriatr Soc 2011; 59:2129.
Hamerman D. Ann Intern Med 1999; 130:945.

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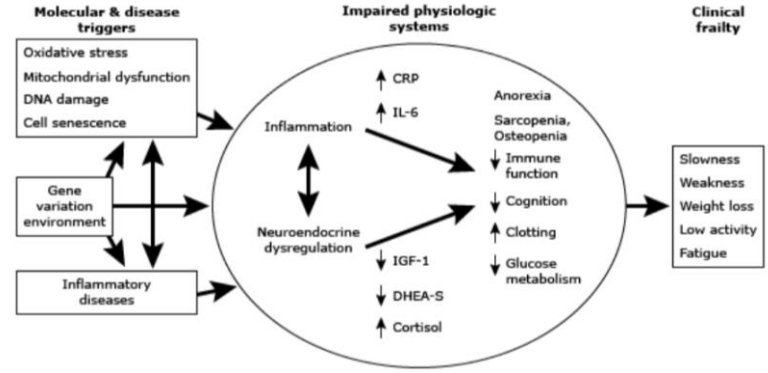
Hypothesized patho-physiology model of frailty and adverse health outcomes



CRP: C-reactive protein; IL: interleukin; IGF: insulin-like growth factor; DHEA-S: dehydroepiandrosterone sulfate.

Walston J, et al. J Am Geriatr Soc 2006; 54:991.

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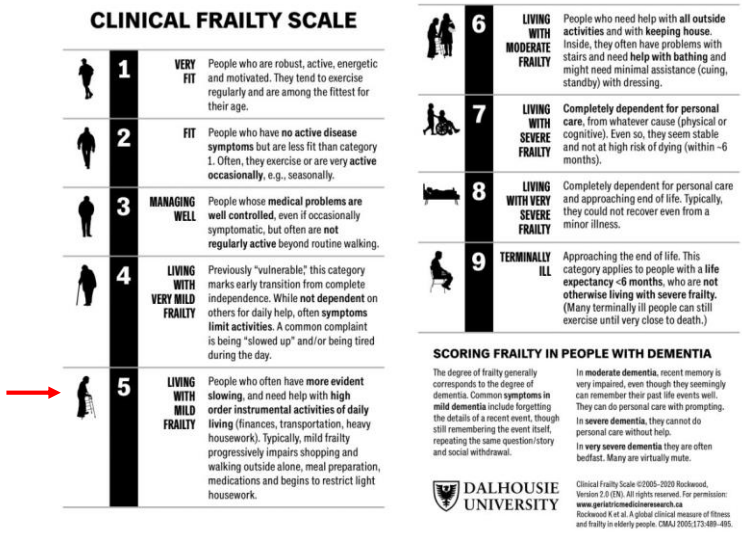
Clinical Frailty Scale



Rockwood K, et al. CMAJ. 2005;173(5):489-95.

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Efficacy

- In a systematic review **… physical exercise** programs were effective at reducing … physical frailty. **Favorable effects also of nutritional supplementation and cognitive training**
- A 3-years lifestyle intervention of **cognitive training, nutrition counseling, and advice on physical activity** was associated with severity and incidence of frailty measured by a comorbidity or deficit accumulation index

Apóstolo J, et al. JBI Database System Rev Implement Rep 2018; 16:140.
de Souto Barreto P, et al. Am J Med 2018; 131:1382.e7.

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Nutritional supplemen-tation

Mnemonic for common causes of malnutrition in older adults

	MEALS ON WHEELS
M	Medications
E	Emotional problems (depression)
A	Anorexia (nervosa or tardive)
L	Late-life paranoia or alcoholism
S	Swallowing disorders
O	Oral factors
N	No money
W	Wandering (in patients with dementia)
H	Hyperthyroidism, hyperparathyroidism
E	Entry problems/malabsorption
E	Eating problems (severe tremor, stroke, weakness)
L	Low-salt or low-cholesterol diets
S	Shopping and food preparation problems

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Medication review

A step-wise approach to reviewing medications for older adults

Approach
Review current drug therapy
Discontinue potentially unnecessary therapy
Consider adverse drug events as a potential cause for any new symptom
Consider nonpharmacologic approaches
Substitute with safer alternatives
Reduce the dose
Use beneficial therapies when indicated

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Hospital care and ACE

- **Hospitalization increases risk for institutionalization and decrease in quality of life**
- Often, decline in level of function and ability to care for oneself occurs during hospitalization and persists after discharge
- Frail individuals had a sevenfold increased risk of progressing from no disability to mild disability within one month of hospitalization, vs. non-frail patients (35 vs 7%)

→ **Acute Care for Elders (ACE) bundle**

Palmer RM, et al. Clin Geriatr Med 1998; 14:831.
Sager MA, et al. Arch Intern Med 1996; 156:645.
Gill TM, et al. JAMA 2010; 304:1919.
Counsell SR, et al. J Am Geriatr Soc 2000; 48:1572.

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Frailty and postoperative outcome

Frailty predicts adverse surgical outcomes related to

- general elective and emergency surgery and
- renal transplantation
- cardiac surgery

Makary MA, et al. J Am Coll Surg 2010; 210:901.
Garonzik-Wang JM, et al. Arch Surg 2012; 147:190.
Kim DH, et al. Ann Intern Med 2016; 165:650.
Li Y, et al. CMAJ 2018; 190:E184.
Rothenberg KA, et al. JAMA Netw Open 2019; 2:e194330.

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Frailty among patients undergoing **breast reconstruction** surgery: A systematic review and meta-analysis

- **Overall complications** (OR 1.52, p = 0.002)
- **wound complications** (OR 1.87, p < 0.0001)
- **readmissions** (OR 1.94, p < 0.0001)
- **reoperations** (OR 1.41, p = 0.003)

  greater in frail than in non-frail patients

- **Difference remained higher among prefrail compared with non-frail patients**

Shafiee A et a. J Plast Reconstr Aesthet Surg. 2023 Sep:84:556-566

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Assessment of the impact of frailty on adverse surgical outcomes in patients undergoing surgery for **intracranial tumors** using modified frailty index:
A systematic review and meta-analysis

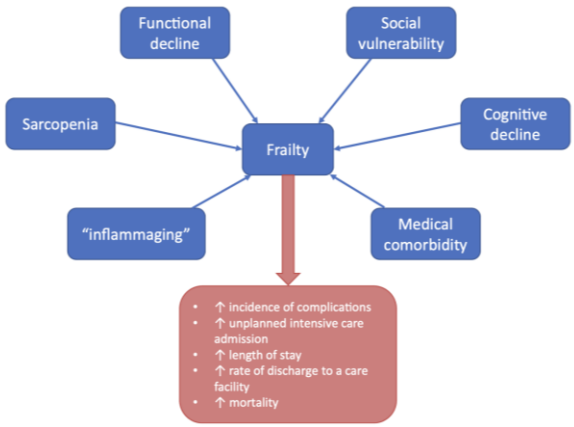
- Increasing frailty was associated with **worse prognosis for all included outcomes**
- **Literature suggests that frailty is a superior and independent predictor of adverse outcomes compared to age**

Sepehr A et al. J Clin Neurosci. 2023 Aug:114:120-128.

19

Frailty: the perioperative and anesthesia challenges of **an emerging pandemic**

Fig. 1 Comparisons between different domains of frailty

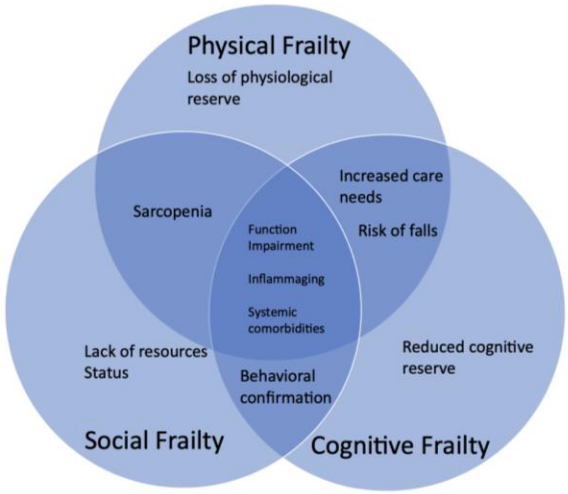


Zhaosheng J et al. J Anesth. 2023 Aug;37(4):624-640.

20

Frailty: the perioperative and anesthesia challenges of **an emerging pandemic**

Fig. 2 Schema of the contributory factors and perioperative outcomes of frailty



Zhaosheng J et al. J Anesth. 2023 Aug;37(4):624-640.

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Establishing goals of care

REVIEW

OPEN

CURRENT OPINION

Preoperative frailty screening, assessment and management

Maximilien Cappe[a], *Pierre-François Laterre*[b,c] *and Mélanie Dechamps*[b,d]

Frailty should be part of the routine preoperative evaluation for … surgery. Frailty must be considered in assessing eligibility for surgery and in planning **prehabilitation and rehabilitation**

Cappe M et al. Curr Opin Anaesthesiol. 2023 Feb 1;36(1):83-88.

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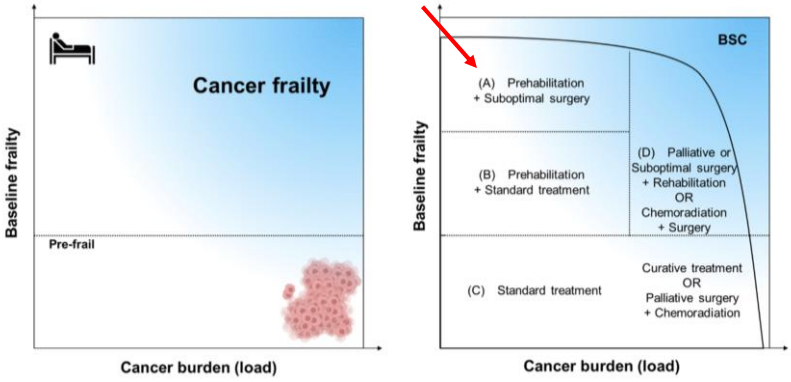
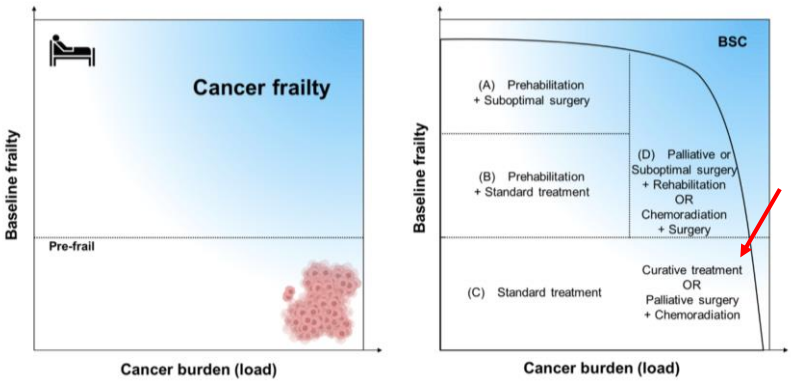
Frailty and colorectal surgery - **cancer frailty**



Maeda H, et al. J Clin Med. 2023 Jul 31;12(15):5041

23

Frailty and colorectal surgery - **cancer frailty**



Maeda H, et al. J Clin Med. 2023 Jul 31;12(15):5041

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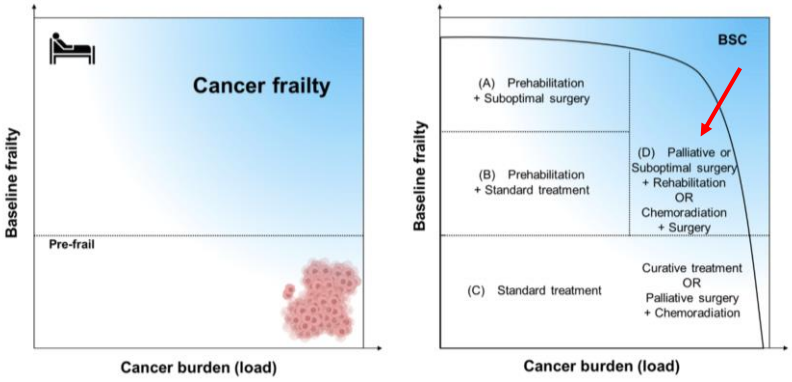
Frailty and colorectal surgery - **cancer frailty**



Maeda H, et al. J Clin Med. 2023 Jul 31;12(15):5041

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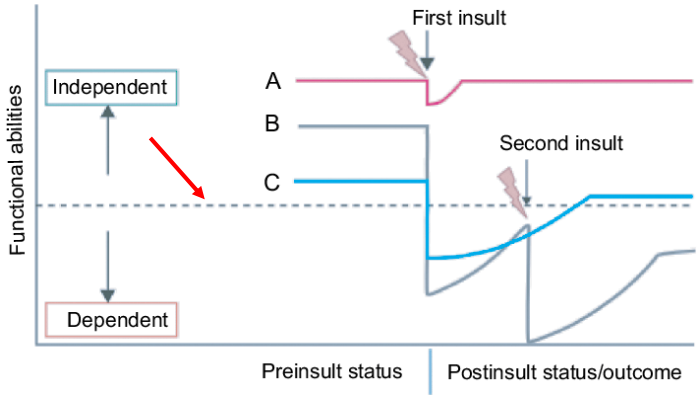
Role of frailty in recovery from surgery



Desserud KF, et al. Br J Surg. 2016; 103(2):e52-61

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Frailty, Recovery and Outcome

Intensive Care Med
https://doi.org/10.1007/s00134-024-07404-9

ORIGINAL

Frailty, Outcomes, Recovery and Care Steps of Critically Ill Patients (FORECAST): a prospective, multi-centre, cohort study

John Muscedere[1*], Sean M. Bagshaw[2], Michelle Kho[3], Sangeeta Mehta[4], Deborah J. Cook[5], J. Gordon Boyd[6], Stephanie Sibley[1], Han T. Wang[7], Patrick M. Archambault[8,9], Martin Albert[10], Oleksa G. Rewa[2], Ian Ball[11], Patrick A. Norman[12], Andrew G. Day[12], Miranda Hunt[1], Osama Loubani[13], Tina Mele[14], Aimee J. Sarti[15] and Jason Shahin[16] on behalf of the Canadian Critical Care Trials Group

Muscedere J, et al. Intensive Care Med 2024. https://doi.org/10.1007/s00134-024-07404-9

Frailty, Recovery and Outcome

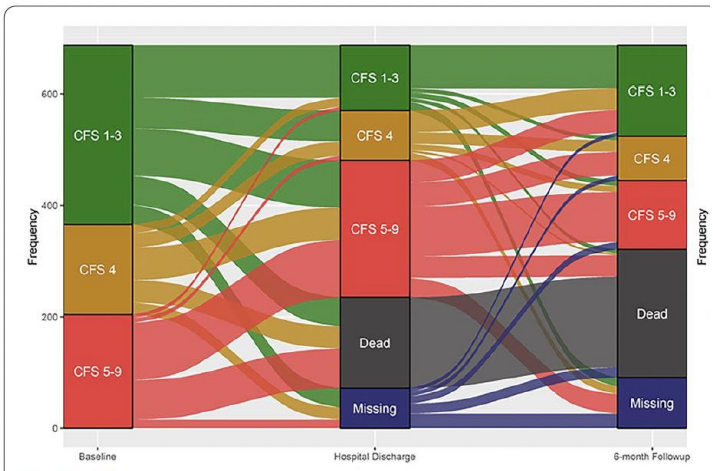

Fig. 2 Alluvial plot

Muscedere J, et al. Intensive Care Med 2024. https://doi.org/10.1007/s00134-024-07404-9

Frailty, Recovery and Outcome

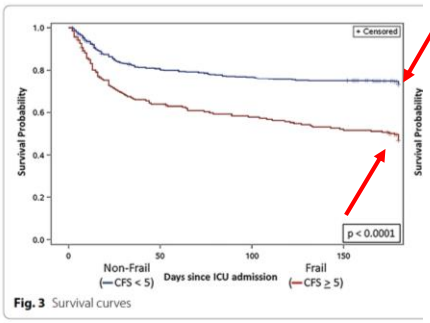

Fig. 3 Survival curves

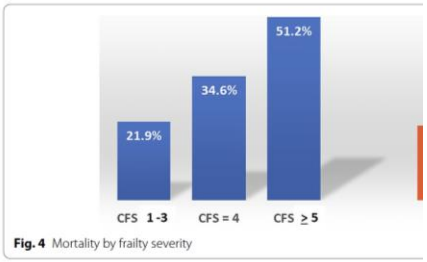

Fig. 4 Mortality by frailty severity

Muscedere J, et al. Intensive Care Med 2024. https://doi.org/10.1007/s00134-024-07404-9

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In hospitals, very old (80+ years) are fastest growing population

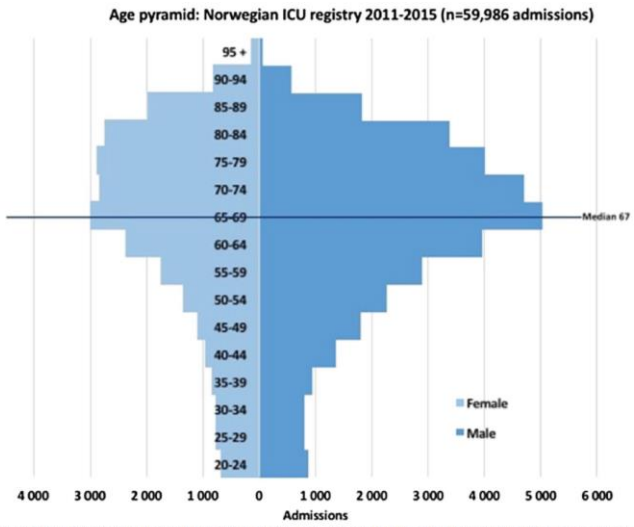

Fig. 1 Age distribution in Norwegian ICU patients from 2011 to 2015. Personal communication: Norwegian Registry of Intensive Care

Flaatten H, et al. Intensive Care Med 2017; 43:1319–1328. DOI 10.1007/s00134-017-4718-z

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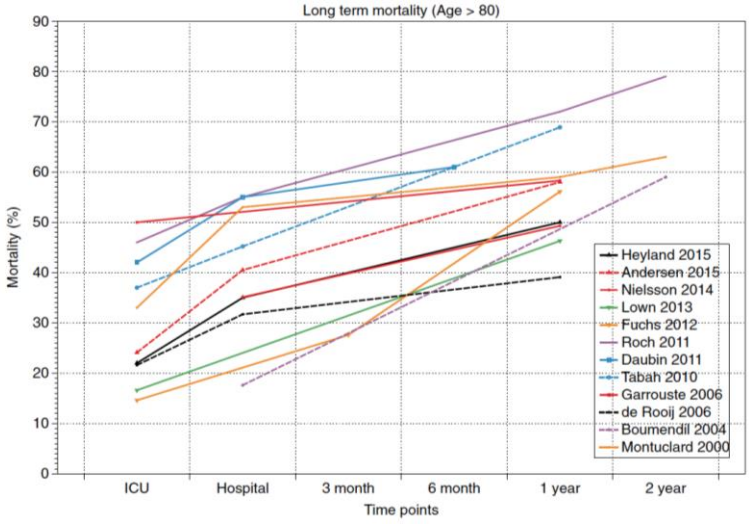
Long-term mortality in very old ICU patients



Flaatten H, et al. Intensive Care Med 2017; 43:1319–1328. DOI 10.1007/s00134-017-4718-z

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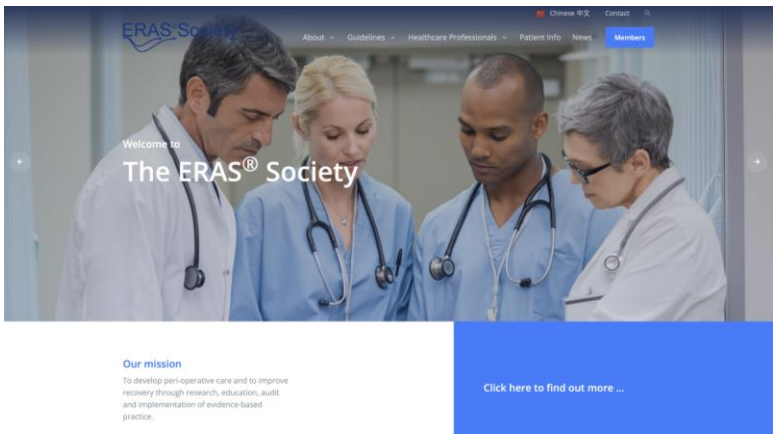
Enhanced Recovery After Surgery (ERAS)



https://erassociety.org

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Perioperative advance care planning

- Perioperative advance care planning in case of
  - Cognitive dysfunction
  - High-risk surgery
  - Very sick patient
  - High frailty
  - Likely fatal outcome
- Palliative care

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Perioperative advance care planning

- Incidence of postoperative death has changed little recently
- Most deaths occur in older patients, with coexisting medical disease, who undergo major surgery
- **Over 80% of postoperative deaths occur in a subpopulation (12.5%) of high-risk surgical patients**

Pearse R, et al. Crit Care 2006, ;10(3):R81. doi: 10.1186/cc4928

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How do we do it?

BARMHERZIGE BRÜDER
KRANKENHAUS SALZBURG

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Preoperative filter in elective patients

→ Cut off 30-50% POSPOM and high Frailty Scale

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Preoperative ACP

- **Define risk of death and likelihood of recovery with**
  - ASA
  - POSPOM
  - Revised cardiac risk score
  - MAGGIC (CHF)
  - Clinical frailty scale
  - Type of surgery or conservative treatment

Discuss

- Likelihood to return to normal life
- Patient's beliefs, wishes and priorities

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POSPOM Score

Preoperative Score to Predict Postoperative Mortality (POSPOM): Derivation and Validation

http://perioperativerisk.com/mortality/

Le Manach Y, et al. Anesthesiology 2016 Mar;124 (3):570-9. doi: 10.1097/ALN.0000000000000972.

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Revised Cardiac Risk Index

30-day risk of death, MI, or cardiac arrest

https://www.mdcalc.com/calc/1739/revised-cardiac-risk-index-pre-operative-risk

Elevated-risk surgery Intraperitoneal; intrathoracic; suprainguinal vascular (see 2014 ACC/AHA Guideline)	No 0	Yes +1
History of ischemic heart disease History of myocardial infarction (MI); history of positive exercise test; current chest pain considered due to myocardial ischemia; use of nitrate therapy or ECG with pathological Q waves	No 0	Yes +1
History of congestive heart failure Pulmonary edema, bilateral rales or S3 gallop; paroxysmal nocturnal dyspnea; chest x-ray (CXR) showing pulmonary vascular redistribution	No 0	Yes +1
History of cerebrovascular disease Prior transient ischemic attack (TIA) or stroke	No 0	Yes +1
Pre-operative treatment with insulin	No 0	Yes +1
Pre-operative creatinine >2 mg/dL / 176.8 µmol/L	No 0	Yes +1
4 points Class IV Risk		**15.0** % 30-day risk of death, MI, or cardiac arrest

Fleisher LA, et al. Circulation. 2014 Dec 9;130(24):2215-45. doi: 10.1161/CIR.0000000000000105.

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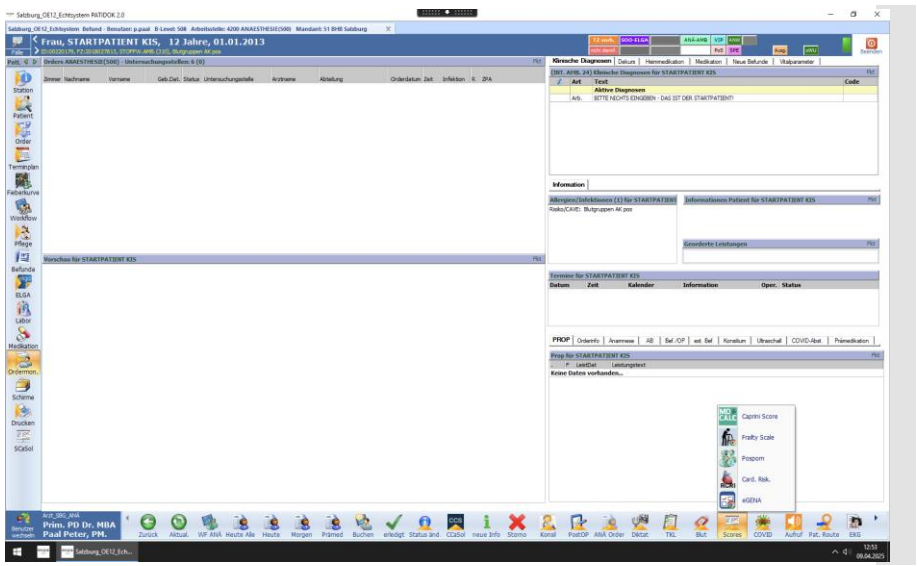
Preoperative risk scoring, ACP and shared decision making



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Preoperative optimization in colorectal surgery

Pilot project for colorectal surgery

- **Prehabilitation**
- **Preoperative** counseling
  - Nutritional,
  - Physiotherapy and
  - Psychological
- **ERAS program – start in 2025**

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Perioperative advance care planning

In the moderately to severely frail patient, often "less is more"

Walter LC, et al. JAMA 2001; 285:2750.

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Outlook

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Perioperative advance care planning in frail patients at risk

Develop national guidelines (ÖGARI) and collaborate with ESAIC on European guidelines

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Conclusions

Conclusions

- Frailty is
  - Failure to thrive
  - A continuum
  - An increasing pandemic
- Frailty promotes morbidity and mortality
- Frailty should be
  - Screened
  - Addressed -> Prehabilitation (orthopedics)
- Advance care planning should be implemented

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