

OPTIMIZATION AND PREHABILITATION: TRANSFORMING PREOPERATIVE CARE

MAUREEN F. MCLAUGHLIN, RN, MS, ACNS-BC, CPAN, CAPA
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Impact to Nursing Practice

- State one outcome measures of preoperative optimization and prehabilitation of the postoperative patient.
- Discuss one screening tool used to identify preexisting perioperative risks.
- Describe one intervention for a modifiable patient risk factor.

2

Goals of Care

- Minimal/nil postoperative disability
- Return/maintain preoperative level of health
 - ? Improve
- Maintain functional capacity ~ mental and physical
- Emotional well-being
- Quality of life
- Reduced LOS/cost

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Current Challenges

- Elimination/alteration of pre-op testing roles/function
- Reduced surgical wait time
- Consultant based care
- Lack of referral/contact w/ anesthesia team for prehabilitation
- Inpatients:
 - Direct to OR
 - Production pressure
 - Reduced resources

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Roadmap for Transforming Preoperative Assessment to Preoperative Optimization

- “Traditional” preoperative assessment ~ accepting pt condition
- Occurs close proximity to timing of surgery
 - ? Too late to address comorbid conditions and/or modifiable risk factors
 - Nil ability to mitigate risks of anes/surgery

Aronson, S. et al. (2020) *Anesthesia & Analgesia*, 130(4), 811-819.

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Measurement of Disability-free Survival after Surgery

Table 3. Postoperative Morbidity, Mortality, and Disability-free Survival

Time	Postoperative Complication (n = 491)	Complication Rate (%)	Unplanned Readmission to Hospital [†]	Cumulative Mortality [‡]	Disability [†]	New Disability [†]
Day 30	Wound infection Respiratory complication Myocardial infarction Unplanned ICU admission Stroke Any complication	36 (7.3) 17 (3.5) 12 (2.4) 2 (0.4) 2 (0.4) 73 (15)	35 (7.2) (n = 487)	5 (1) (n = 495)		
3 months			29 (6.4) (n = 454)	6 (1.3) (n = 471)	91 (22)	65 (18)
6 months			32 (7.2) (n = 442)	7 (1.5) (n = 458)	74 (18)	52 (14)
12 months			30 (7.3) (n = 413)	22 (5.0) (n = 438)	60 (16)	46 (13)

Values are presented as number (%).

[†]Unplanned readmission to hospital as a consequence of index surgery. [‡]Moderate or severe disability defined as a WHODAS score \geq 25%. [†]New disability compared to preoperative state, defined as a document in WHODAS score \geq 8%.

ICU = Intensive Care Unit; WHODAS = World Health Organization Disability Assessment Schedule 2.0.

Shulman, M. (2015). *Anesthesiology*, 122(3), 524-536.

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Pre-operative Optimization/Prehabilitation???

- Measures to mitigate postoperative alterations in return of functional independence
- Improve patient satisfaction
- Patient empowerment
- Reduced health-care associated costs
- Optimization: interventions managed by a clinician ~ not behavior modification
- Prehabilitation: changes made by the patient pre-op

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Integration of the Duke Activity Status Index into preoperative risk evaluation: a multicentre prospective cohort study

- Duke Activity Status Index (DASI)
- Measurement of exercise tolerance before surgery (METS)
- Prognostication of adverse events
- DASI score > 34 a/w reduced odds of 30-day mortality

British Journal of Anaesthesia, 124 (3); 261e270 (2020)

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THE DUKE ACTIVITY STATUS INDEX

Circle Yes or No to the questions

Activity	Yes or No	Weight
1. Are you able to take care of yourself, that is, eating, dressing, bathing, or using the toilet yet?	Y N	2.75
2. Are you able to walk indoors, such as around the house yet?	Y N	1.75
3. Are you able to walk a block or 2 on level ground yet?	Y N	2.75
4. Are you able to climb a flight of stairs or walk up a hill without stopping yet?	Y N	5.50
5. Are you able to run a short distance yet?	Y N	8.60
6. Are you able to do light work around the house like dusting or washing dishes yet?	Y N	2.70
7. Are you able to do moderate work around the house like vacuuming, sweeping floors, or carrying in the groceries yet?	Y N	3.50
8. Are you able to do heavy work around the house like scrubbing floors, or lifting or moving heavy furniture yet?	Y N	8.60
9. Are you able to do yard work like raking leaves, weeding or pushing a power mower yet?	Y N	4.50
10. Are you having sexual relations?	Y N	5.25
11. Are you able to participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football yet?	Y N	6.60
12. Are you able to participate in strenuous sports like swimming, singles tennis, football, basketball or skiing yet?	Y N	7.50

Total the weight for each YES answer given, this will give you the DASI Score
(You can do this for you)

Scoring the Duke Activity Status Index:
Functional Capacity in METS = (DASI score) x 0.43 + 9.6 then divide by 3.5

Cardiac Section 2

Page 1 of 1

PRE

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Functional Status/Capacity

- Self-care ~ 1 met
- Flight of steps/hill or walk on level ground at 3 to 4 mph ~ 4 mets
- Heavy house/yard work; 2 flights of stairs ~ 4-10 mets
- Strenuous sports such as swimming, singles tennis, football, basketball, and skiing ~ >10 mets

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Metabolic Equivalents Screening for Occult CV DS

Table 16-3 Metabolic Equivalents for Common Physical Activities

Metabolic Equivalents	Examples
1	Watching television
	Eating, dressing
	Walking on level ground at 2 to 3 mph
∨	Doing light housework (e.g., dusting)
4	Climbing a flight of stairs
	Walking on level ground at 4 mph
∨	Doing heavy chores (e.g., scrubbing floors)
>10	Playing strenuous sports (e.g., tennis)

Adapted from Fleisher LA, Beckman JA, Brown KA, et al. American College of Cardiology American Heart Association Task Force on Practice Guidelines. American Society of Echocardiography. ACC/AHA 2007 Guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. J Am Coll Cardiol. 2007;50(17):e170.

<https://aneskey.com/preoperative-evaluation-and-management/>

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Prehabilitation for Anesthesia & Surgery

- Nutrition
- Exercise
- Worry
- Smoking cessation
- Target pop: high risk, older, frail

Joyce, M. et al. (2020) UpToDate

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Nutritional Supplements

- Metabolic stress response ~ CHO, lipid, protein stores
- Malnutrition a/w increased p-op complications
 - > mortality @ 30/60 days
- Dietician referral
- Efficacy: nutritional pre-hab < hosp LOS by 2 days
[N=438 supplements vs N 476]

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Exercise Programs

- Improve body's ability to deliver O₂ to tissues
- Pre-op capacity: cardiopulm exercise testing (CPET)
- 6 minute walk test ~ aerobic capacity/endurance
- Efficacy: 4-week high intensity training
 - Fewer p-op complications

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Cognitive Function

- Risk factor for p-op delirium
- Cognitive stimulation?
- Electro-puncture on scalp?

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Smoking Cessation

- Modifiable behavior
- Risk/benefits of cessation
- Pharmacotherapy

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Stress Reduction

- Pre-procedure anxiety/depression a/w worse functional recovery
- Psychological prep:
 - Behavioral instruction
 - Cognitive intervention
 - Relaxation techniques
 - Emotional-focused interventions
 - *Not much evidence*
- Pre-op education ~ set expectations

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Multi-modal Interventions

- N=77
- Home-based exercises, nutritional counseling/protein supplements, relaxation
- Intervention group: > 6 minute walk test

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Prehabilitation

The next challenge for anaesthesia teams

- Death w/in 30 days post surgery ~ 3rd leading COD
- Public health crisis ~ hidden 'pandemic' [2018 citation]
- Aging: comorbid disease
 - Polypharmacy
 - Sedentary lifestyle
 - Frailty
- >> % of aging population

Schieer, R. et al. (2020). *European Journal of Anaesthesiology*, 37, 259-262.

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Prehabilitation

- Pathways to promote early referral to periop medicine specialists
- Optimize physiological/psychological resilience
 - w/stand pending stressor of surgery
- Maladaptive behaviors:
 - Smoking Etoh Sedentary lifestyle
- Optimize comorbidities:
 - Nutrition Anemia DM Pulmonary Cardiac ds

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Table 2. Specific prehabilitation diagnostic and treatment options

Multidisciplinary team	Specific diagnostic and treatment options				
Exercise physiologist/physiotherapist	Cardiopulmonary exercise testing	Pulmonary function testing	Frailty score	Structured responsive exercise programme	Inspiratory muscle training
Dietitian	Malnutrition screening score	Dietitian review	Albumin surveillance	Daily nutritional plan	Protein supplement, for example, postexercise
Psychologist	Hospital anxiety and depression scale (HADS)	Coping strategies to reduce anxiety	Relaxation/breathing exercises (imagery/visualisation)	Motivational techniques/coaching	Recording for home-exercise
Nursing team	Educational interventions	Smoking and alcohol cessation programmes	Bundled care with re-orientation, oral hygiene, head of bed elevation in patients at increased risk of pulmonary complications	Enhanced recovery after surgery programmes	
Medical team	Medical optimisation of diabetes heart failure COPD anaemia pain treatment	Enhanced recovery after surgery programmes	Audit Quality improvement initiatives		

COPD, chronic obstructive pulmonary disease.
Schieer, R. et al. (2020). *European Journal of Anaesthesiology*, 37, 261.

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Prehabilitation

- Patient education ~ patient empowerment
 - ? Behavioral change prior to surgery
- Pain management p-op
- ERAS protocols
- DREAM:
 - Drinking
 - Eating
 - Mobilization

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DREAMing

• DRinking, EATING and Mobilisation

Leads to:

- Less reliance on iv fluids
- No plastic; poles, pumps and oxygen cylinders to hinder mobilisation
- earlier return to normal diet
- earlier return to normal medications
- No plastic to prevent discharge
- Functional pain control

Editorial

Is the pursuit of DREAMing (drinking, eating and mobilising) the ultimate goal of anaesthesia?

<https://twitter.com/nicholasalevy/status/1197257187577466881>

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Prehabilitation and Optimization of Modifiable Patient Risk Factors: The Importance of Effective Preoperative Evaluation to Improve Surgical Outcomes



Figure 1. Determinants of clinical outcomes for surgical patients.

Bourdreaux, A. (2019). *ADRN*, 10(1/4), 500-506.

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Prehabilitation

- Increasing exercise capacity
- Building muscle mass
- Improving nutritional state
- Psychologically preparation
- Concurrent ERAS pathway(s)

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Modifiable Risk Factors

- Smoking ~ increased p-op complications, SSI, VTE, CV
 - Smoking cessation program/information
- Malnutrition & frailty ~ <serum albumin/prealbumin levels
 - Sarcopenia ~ low muscle mass
 - Poor surgical outcomes
 - Focus on max diet pre-op ~ ensure
- Advanced age ~ cognitive function, ADLs, med profile
- Geriatric medicine specialist ~ Geriatric care management

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Modifiable Risk Factors

- Chronic anemia ~ independent risk factor p-op poorer outcomes
 - Iron deficiency anemia- Rx 2-4 weeks w/ Fe supplements/erythrocyte-stim: > hgb
- Chronic opioid use/misuse: APS consultation
- Obesity: BMI>30 ~ ? Defer surgery & refer to wt loss program
- Uncontrolled medical condition ~ CAD, CVA, HTN
 - Algorithms to screen & risk-stratify
 - Implantable devices
 - Poorly controlled DM ~ A1C levels ~ > risk for SSI, poor healing
 - Med management ~ careful med rec- ID pts who have stopped taking their meds

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Predicting intensive care and hospital outcome with the Dalhousie Clinical Frailty Scale: a pilot assessment

C. Fisher*, D. K. Karalipilait, M. Bailey†, N. G. Glassford‡, R. Bellomo**, D. Jones††

- Frailty ~ syndrome reduced resistance & reserve
- Complex interaction b/w:
 - Comorbidities
 - Functional state
 - Age
 - Physiologic reserve
- Predictor of poor outcomes
- ? Impact of pre-op interventions

Anaesth Intensive Care 2015 | 43:3

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Clinical Frailty Scale®

- 1 Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.
- 2 Well** – 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, but are not regularly active.
- 4 Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “bowed up” and/or being tired during the day.
- 5 Mildly Frail** – These people often have more evident slowing, and need help in high order IADLs (i.e. long distance transport, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.
- 6 Moderately Frail** – People 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 (cupping, standing) with dressing.

- 7 Severely Frail** – 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 Very Severely Frail** – Completely dependent, approaching the 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 evidently frail.

Scoring frailty in people with dementia

The degree of frailty 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 questionnaire and social withdrawal.

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

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

* Canadian Society for Geriatrics, 2008.
† J. A. Richardson et al. (2004) Study of Frailty and Risk in Older People. *BMJ*, 329(7474):1045-1049.

© 2007 Health Services and Geriatrics Division, Dalhousie University. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of the publisher.

Figure 1: The Dalhousie Clinical Frailty Scale (reproduced with permission).

p.362

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Continued Evolution of Perioperative Medicine: Realizing Its Full Potential

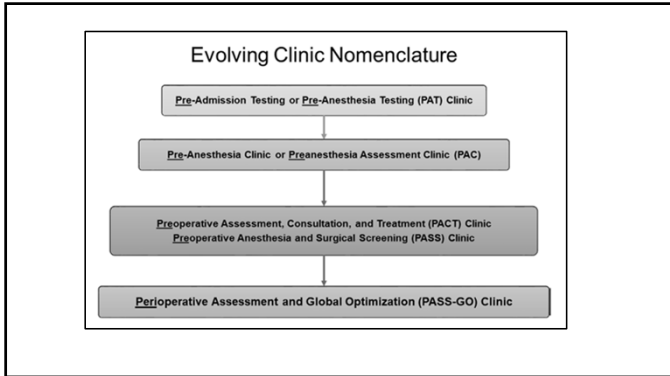
Thomas R. Vetter, MD, MPH,* and Angela M. Bader, MD, MPH†‡

As prophetically observed by Lee¹ in 1949: “I think that an anaesthetic outpatient department could contribute considerably to preventive medicine. The anaesthetist is frequently confronted with a patient ... who is not in the best possible state for operation. He has not ... been made as safe for surgery as possible ... For the anaesthetist to see the patient the evening before operation, or even two or three days before that, is not enough.”

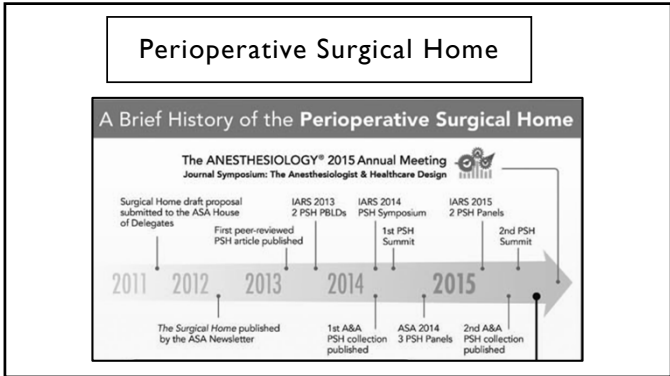
Barriers: lack of common goals; cost; access; scheduling challenges

Anaesthesia & Analgesia, 13(4), 804-807.

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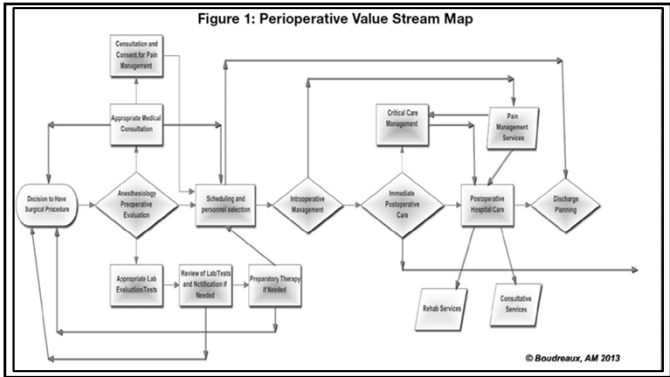


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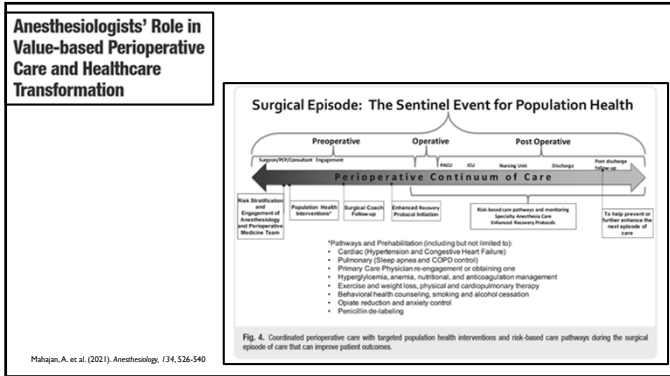
PSH

- Pt centered, physician led, interdisciplinary, team-based model
- Coordination of care through continuum
- Improved pt satisfaction
- Reduce costs
- Improve outcomes

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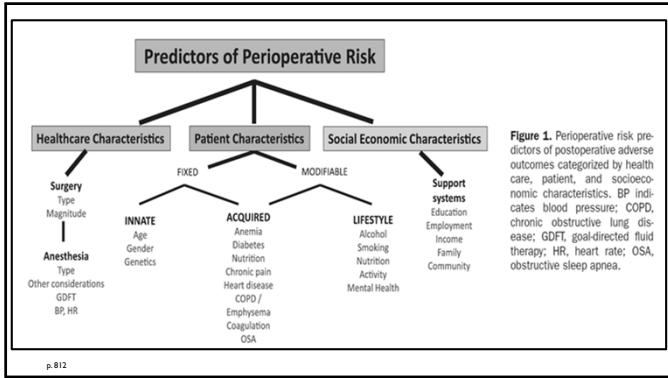
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Transforming Assessment to Management

- PAT/PAC limitations: too close to surgery to make impact
- Perioperative enhancement team ~ POET
- Multidisciplinary
- Modifiable risk factors
- Surgical candidacy 1st determined
- Optimization program
- Pt triaging ~ algorithm for POTEL/in-person

Aronson, S. et al. (2020) Anesthesia & Analgesia, 130(4), 811-819

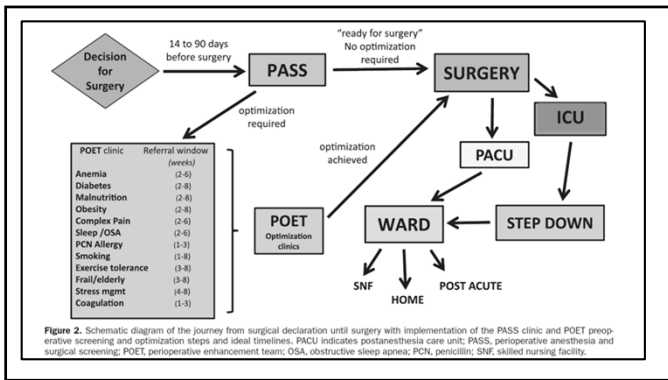
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Anemia: this scores last laboratory value for Hgb (<12).
 Endocrine: this scores last laboratory values for either/both Hgb A1C (>7.5) or blood glucose (>160).
 Tobacco: this scores smoking/tobacco status in social Hx.
 POSH: this scores patient age (>80) or age >65 y with any of the following
 • Dementia or cognitive decline
 • Visual impairment worse than 20/70 binocular with correction
 • Frailty
 Pain: this scores questionnaire sent to the patient at the time of surgical clinic appointment.
 • Current drug abuse (prescription or illegal)
 • Do you think your pain is terrible/won't get any better?
 STOP-BANG: this scores 4 questions.
 • Age >50
 • Neck circumference >42 cm
 • Patient is male
 • BMI >35
 Epworth sleepiness scale: this scores values from the flowsheet.
 DASI: this scores values from the flowsheet.
 PCN allergy: this score self-reported PCN allergy, as well as PCN allergy confirmation from the Allergy Clinic.^a
 PONS: this scores 7 different rules.
 • BMI <18.5
 • Unintentional weight loss of >10% in last 6 mo
 • Answer to question regarding "Eating less than half of normal diet in past week?"
 • Albumin value <3 mg/dL
 • Vit D value <20
 • Hgb A1C >7.5

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Framework for prehabilitation services

- Regaining independence postop high priority
- Pre: what risks do [I] face? Can anything be done to mitigate?
- 3 domains:
 - Exercise
 - Nutrition
 - Psychology
- Screening as close as possible to pt referral

Bates, A. Et al. (2020). *British Journal of Surgery*, 107, e11-e14.

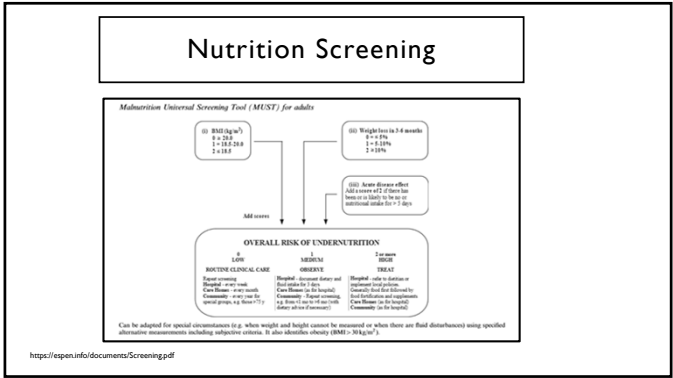
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FRAIL scale

- F**atigue
- R**esistance (ability to climb one flight of stairs)
- A**mbulation (ability to walk one block)
- L**Illnesses (Greater than 5)
- L**oss of Weight (>5%)

0 = robuste / 1-2 = pre-frail / ≥ 3 = frail

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Guidelines for Preventative Care Plan

Table 2 Final screening		Severity of disease (= increase in requirements)	
Absent Score 0	Impaired nutritional status	Absent Score 0	Normal nutritional requirements
Mild Score 1	Wt loss >5% in 3 mths or Food intake below 50-75% of normal requirement in preceding week	Mild Score 1	Hip fracture* Chronic patients, in particular with acute complications: cirrhosis*, COPD*, Chronic haemodialysis, diabetes, oncology
Moderate Score 2	Wt loss >5% in 2 mths or BMI 18.5-20.5 + impaired general condition or Food intake 25-60% of normal requirement in preceding week	Moderate Score 2	Major abdominal surgery* Stroke* Severe pneumonia, hematologic malignancy
Severe Score 3	Wt loss >5% in 1 mth (>15% in 3 mths) or BMI <18.5 + impaired general condition or Food intake 0-25% of normal requirement in preceding week in preceding week	Severe Score 3	Head injury* Bone marrow transplantation* Intensive care patients (APACHE>10)
Score:	+	Score:	= Total score
Age	if >70 years: add 1 to total score above	= age-adjusted total score	
Score >3: the patient is nutritionally at-risk and a nutritional care plan is initiated			
Score <3: weekly re-screening of the patient. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.			

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Patient Activation Measure

Below are some statements that people sometimes make when they talk about their health. Please indicate how much you agree or disagree with each statement as it applies to you personally by circling your answer. Your answers should be what is true for you and not just what you think the doctor wants you to say.

Statement	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
1. When all is said and done, I am the person who is responsible for taking care of my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
2. Taking an active role in my own health care is the most important thing that affects my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
3. I know what each of my prescribed medications do	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
4. I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
5. I am confident that I can tell a doctor concerns I have even when he or she does not ask	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
6. I am confident that I can follow through on medical treatments I may need to do at home	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
7. I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
8. I know how to prevent problems with my health	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
9. I am confident I can figure out solutions when new problems arise with my health.	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A
10. I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress.	Disagree Strongly	Disagree	Agree	Agree Strongly	N/A

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Psychometric Screening

Level 1	Level 2	Level 3	Level 4
DISENGAGED AND OVERWHELMED "My doctor is in charge of my health."	BECOMING AWARE BUT STILL STRUGGLING "I could be doing more for my health."	TAKING ACTION AND GAINING CONTROL "I'm part of my health care team."	MAINTAINING BEHAVIORS AND PUSHING FURTHER "I'm my own health advocate."
Individuals are passive and lack confidence. Knowledge is low, goal-orientation is weak, and adherence is poor. Healthcare utilization: Very high ED/ER use, very high risk of Ambulatory Care Sensitive (ACS) utilization, very high risk of readmission, very low use of preventive care and screens.	Individuals have some knowledge, but large gaps remain. They believe health is largely out of their control, but can set simple goals. Healthcare utilization: High ED/ER use, high risk of ACS utilization, high risk of readmission, low use of preventive care and screens.	Individuals have the key facts and are building self-management skills. They solve for best practice behaviors, and are goal-oriented. Healthcare utilization: Low ED/ER use, low risk of ACS utilization, low risk of readmission, good use of preventive care and screens.	Individuals have adopted new behaviors, but may struggle in times of stress or change. Maintaining a healthy lifestyle is a key focus. Healthcare utilization: Very low ED/ER use, very low risk of ACS utilization, very low risk of readmission, very good use of preventive care and screens.

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GIRFT

GETTING IT RIGHT FIRST TIME

HOME ABOUT WORKSTREAMS BEST PRACTICE LIBRARY REPORTS NEWS JOBS

Getting It Right First Time (GIRFT) is a national programme designed to improve the treatment and care of patients by reviewing health services.

Tweets by @GIRFT

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The effectiveness of prehabilitation or preoperative exercise for surgical patients: a systematic review

- Inactivity ~ Leading cause of physical function decline
 - > P-op pain, anxiety, fear of injury
 - P-op decline in physical function
- Prolonged inactivity: CV, musculoskeletal Reduction aerobic capacity ~ alterations ventilation/perfusion
- Decreased muscle strength ~ > risk falls/injury
- Limited physical activity pre ~ > morbidity/mortality

Cablan, C.J., et al. (2015). *Journal of Database of Systematic Reviews & Implementation Reports*, 13(1), 146-187.

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The effectiveness of prehabilitation or preoperative exercise for surgical patients: a systematic review

- N=17 Ortho=13
- Outcome criteria:
 - Functional status ~ ADLs/routine roles
 - ROM/strength/exercise capacity not included
 - Secondary outcome: admissions to rehab/readmission/nsg home
 - QOL
- Prehab did not benefit quality of life or pain
 - < need to p-op rehabilitation admission
 - No impact on readmission rate/nsg home
- Physical fitness not achievable w/in short period ~ must be maintained

Cablan, C.J., et al. (2015). *Journal of Database of Systematic Reviews & Implementation Reports*, 13(1), 146-187.

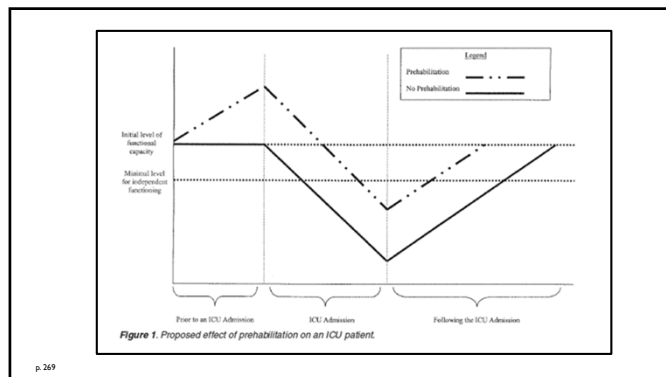
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The Effect of Bed Rest and Potential of Prehabilitation on Patients in the Intensive Care Unit

- Prehabilitation: enhancing functional capacity w/stand stressor of inactivity
- SMART program:
 - Significant
 - Measurable
 - Attainable/realistic
 - Related to individual pt
 - Time-limited

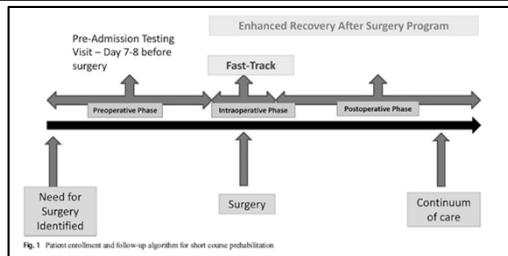
Tapp, R. et al. (2002). *AMCN Clinical Issues*, 13(2), 263-276.

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Implementation of Prehabilitation for Major Abdominal Surgery and Head and Neck Surgery: a Simplified Seven-Day Protocol



Moore, J. (2020). *Journal of Gastrointestinal Surgery*, July 23

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WHAT YOU CAN DO TO MAKE YOUR SURGERY A SUCCESS

NUTRITION

It is important to maintain your current weight before surgery. Snack often on healthy foods and drink plenty of water.

BREATH 3 TIMES BEFORE SURGERY

Remember to inhale deeply and exhale slowly. Repeat 3 times before surgery.

SKIN CARE

Getting rid of germs on your skin before surgery will lower the chance of infection. Wash your body with Hibiscrub, an antiseptic soap. Do this starting 7 days before surgery and the morning of surgery.

Fig. 2 Educational/instructional sheet given to the patient at the time of prehabilitation enrollment

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ERAS Society

CHINESE 中文 ABOUT NEWS NATIONAL SPECIALTIES PATIENT INFO OUR OFFER MEMBERS

ERAS / ABOUT / HISTORY

The mission of the ERAS Society is to develop perioperative care and to improve recovery through research, education, audit and implementation of evidence-based practice.

The mission of the Society is to develop peri-operative care and to improve recovery through research, education, audit and implementation of evidence-based practice. Below is short description of how the ERAS Society was developed and some highlights from its history.

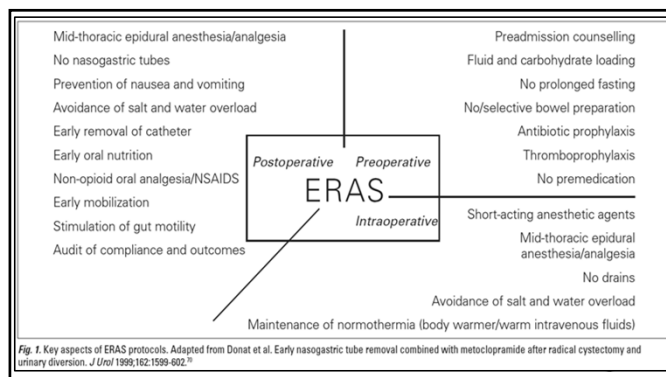
2001



Ken Fearon and Olof Ljungqvist met in London at a nutrition symposium and decided to start a collaborative group on peri-operative care.

www.erasociety.org

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Enhanced recovery after surgery (ERAS) protocols: Time to change practice?

- 1990's Professor Henrik Kehlet
- Enhanced recovery programs
- "Fast track"
- Modify physiological and psychological responses to major surgery
- Minimize stress response
- Protocolized approach

Melnik, M. et al. (2011). *Can Urol Assoc*, 5(5), 342-348.

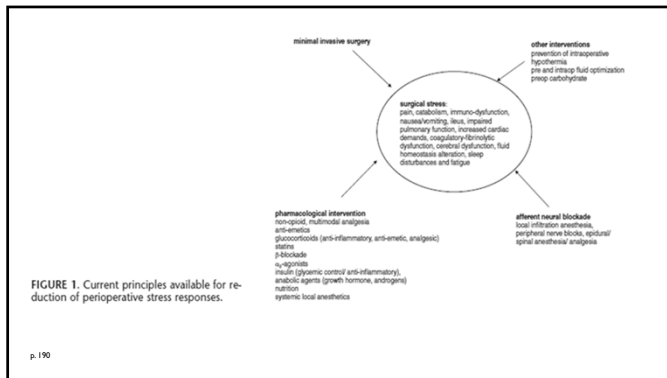
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Evidence-Based Surgical Care and the Evolution of Fast-Track Surgery

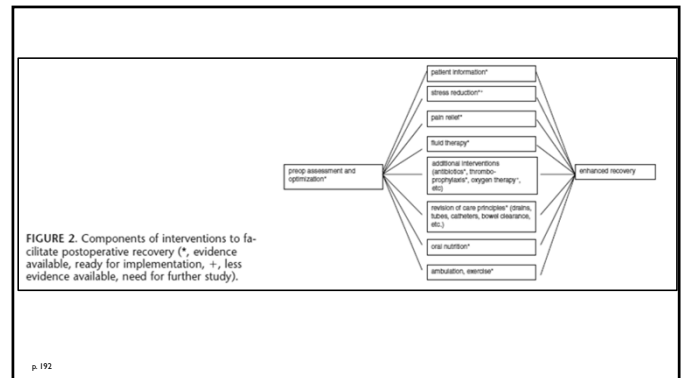
- Surgical outcomes: LOS, M&M, pt satisfaction, return to full function
- Recent studies ~ harmful:
 - NGTs
 - Pre-op bowel preps
 - Drains
 - BR
 - Graduated diets
- "Fast-track": enhance recovery, reduce M&M

Kehlet, H. & Wilmore, D. (2008). *Annals of Surgery*, 248(2), 189-198.

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ERAS

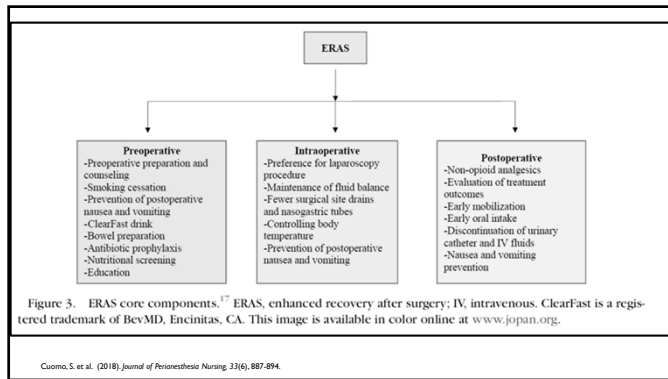
- Standardized
- EBP-based
- Minimize surgical "stress" response
- Minimize p-op pain

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ERAS

- Multi-modal/multi-disciplinary approach to surgical pts
- Reduce LOS
- Improve quality of p-op recovery
- Decrease time in PACU
- Early mobility
- Hasten functional recovery
- Reduce p-op pain med needs
- Reduce p-op complications

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Overview of enhanced recovery pathway*

Preoperative considerations

- Identification and optimization of comorbid conditions
- Prehabilitation, if necessary
- Patient and family education and discharge planning
- Avoidance of prolonged preoperative fasting
- Pain management planning (procedure-specific multimodal opioid-sparing pain prophylactic agents administered at least two hours before surgery)
 - Oral acetaminophen 1 g[†]
 - Oral cyclooxygenase (COX)-2 specific inhibitor[‡]
 - Oral gabapentin in selected patients undergoing procedures with a high risk for persistent postoperative pain[‡]
- For selected procedures, thromboembolism prophylaxis with subcutaneous heparin 5000 units administered 30 to 60 minutes before surgery

Joshi, G. Anesthetic management for ERAS. 2021. Up to date

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Pre-operative Considerations

- Minimize fasting period
- Encourage hydration w/ specific instructions:
 - 2 glasses of H2O before bed and before traveling to hosp
 - Simple CHO ~ Gatorade
 - ? DM
- Patient education
 - Realistic pain expectations
 - Patient's role in recovery process

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Day of Surgery

- Oral acetaminophen
- Cox-2
- Gabapentin
 - Pt age? Dose?
- VTE prophylaxis
- ? Avoid benzo
- Aspiration risk

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Intraoperative considerations

- Use of a minimally invasive surgical approach, when feasible
- Antibiotic prophylaxis administered 30 to 60 minutes before the surgical incision
- Use of short-acting anesthetic agents (inhalation and/or IV agents) during induction and maintenance of general anesthesia
- Avoidance of fluid overload
- Lung protective mechanical ventilation
- Maintenance of normothermia
- Glycemic control
- Multimodal antiemetic prophylaxis
 - IV dexamethasone 8 mg after induction of anesthesia[‡]
 - IV 5-HT3 antagonist (eg, ondansetron 4 mg at the end of the surgical procedure)[‡]
 - For patients at very high risk for PONV, use of a third antiemetic agent (eg, preoperative transdermal scopolamine, intraoperative IV haloperidol 0.5 to 1 mg shortly after anesthetic induction, and/or use of TIVA anesthetic technique)
- Procedure-specific multimodal opioid-sparing pain prophylaxis
 - Use of local or regional analgesic techniques (ie, peripheral nerve block, interfascial plane blocks, surgical site infiltration), when feasible
 - IV acetaminophen 1 g after induction of anesthesia (if it was not administered preoperatively)[‡]
 - IV ketorolac 15 to 30 mg near the end of the surgical procedure[‡]
 - Administration of a long-acting IV opioid (eg, morphine 0.05 to 0.1 mg/kg IBW, hydromorphone 5 to 10 mcg/kg IBW) approximately 20 minutes before extubation[‡]

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Perioperative Management

- Induction:
 - Propofol
 - Fentanyl
 - IV lido gtt
 - NMBA
- Low TV (6-8 ml/kg): + peep
- IV fluids ~ hemodynamics
 - 3 ml/kg ~ no "pre-load" "zero-balance"
- Regional anesthetic +/-
- Antiemetics
- Goal of early emergence

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Implementing ERAS: how we achieved success within an anesthesia department

- 14 month education endeavor (pop: hyst)
- Collaborative pathway surgeons & anes & nsg ~ EVB
 - Consolidated Framework for Implementation Research
- Lit review, best practice ~ individualized educ sessions for surgeons
- Design pathway ~ educate/inform 164 MDs/76 CRNAs/130 residents
- Email communique ~ Grand Rounds ~ nightly pre-op email to team
- Performance reports p-op re: compliance

Ellis, D. et al. (2021). *BMC Anesthesiology*, 21:36

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

- Early ID of physiologic derangement & intervention ~ periop GDT fluids
- Screen for sepsis & accompanying physiological derangement
- Early imaging ~ CT w/ contrast but do not delay surgery
- Risk assessment
- Age-related eval of frailty & cognitive assessment
- Reversal of antithrombotic meds
- Assess VTE risk
- Pre-anesthesia meds: anxiolysis & analgesics
- Pre-op glucose & e-lyte management
- NGT placement- aspiration risk if not placed
- Pt and family education and shared decision making

Poden, C. et al. (2021). *World Journal of Surgery*, 45, 1272-1290

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Pitfalls and Challenges

- Planning
- Communication
- Medication administration
- Medication safety
- Anesthetic management
- Evaluation and measurement

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Communication or not.....

- ID patient on protocol
- Where is the protocol
- Orders?? Entered??



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Medication Administration

- Who orders?
- Who administers?
 - Pharmacy
 - AMDD
- Who documents?
- Who sees what is documents?
- How does pre-op align with post-op?

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Medication Safety

- Duplicative administrations
- Omissions
- Unwanted sedation
- Efficacy

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Anesthetic Management

- Knowledge
- Access
- Anesthetic plan
- Perioperative management

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Improving Perioperative Brain Health: Turning Knowledge Into Action

Carol J. Peden, MB, ChB, MD, FRCA, FFICM, MPH
Daniel J. Cole, MD, FASA

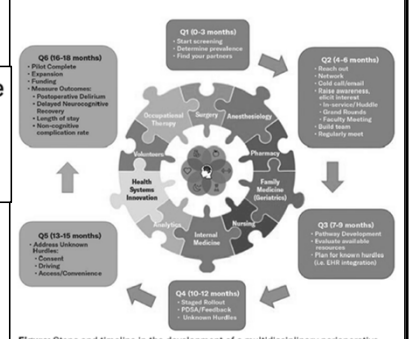


Figure: Steps and timeline in the development of a multidisciplinary perioperative care pathway. The team was designed with the older surgical patient at its center.

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Consensus Guidelines

- Education/training for multidisciplinary care team ~ delirium and PND
- Pre-op cognitive screening
- Delirium screening
- Nonpharmacologic interventions: family, hearing aids
- Optimal pain control
- Avoid antipsychotics & anxiolytics

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Social Vulnerability and Postoperative Complications: We Need More Than ERAS Pathways and Glucose Control to Improve Surgical Outcomes.

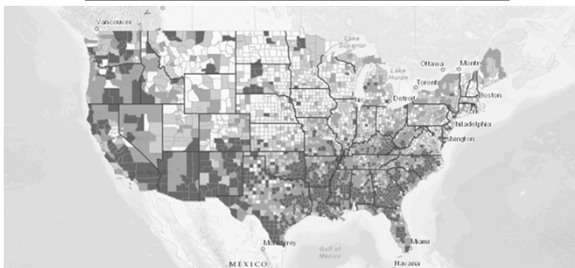
Abaza R, Crandall M
 Annals of Surgery. 2021 Sep 01
 [Journal Article]
 DOI: 10.1093/asj/skz323

Authors Full Name
 Abaza, Ruggieh, Crandall, Marie

- Social vulnerability ~ impact p-op period
- Poverty
- Lack of transportation
- Crowded housing
- Under/un-insured
- Med management/preventative care not available
- Social Vulnerability Index (SVI)
- Higher risk of p-op complications w/ higher SVI

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CDC SOCIAL VULNERABILITY INDEX



<https://svi.cdc.gov/map.html>

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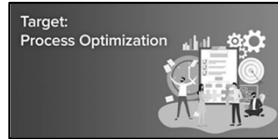
Invaluable Role of the PeriAnesthesia Nurse

- Variety of practice settings
- Policy-specific screenings
- Pre/Day of /Post
- Patient advocacy
- Clear identification of E for eras pathways/other algorithms
- P-op teaching, disposition, f/u
- Quality evaluation of interventions
- Patient Advocate

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Final Thoughts

- Anes & surgery moving focus towards maximizing pre to reduce post complications
- Partner w/ your anes colleagues for implementation/change
- Med safety ~ cautions
- Evaluate pt outcomes
- Multidisciplinary approach



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THANK YOU!!!

maureen.f.mclaughlin@lahey.org



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Self-Assessment

One goal of prehabilitation for the surgical patient is:

- a) weight loss
- b) increased exercise capacity
- c) lowering of Hgb A1-C
- d) reduction in healthcare associated costs

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Self-Assessment

Modifiable preoperative risk factors may include:

- a) progressive dementia and memory loss
- b) depression
- c) smoking
- d) frailty

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Self-Assessment

The primary focus of prehabilitation is:

- a) enabling the patient to regain/resume independence postoperatively
- b) reduce surgical site infections
- c) increase patient satisfaction
- d) reduce hospital length of stay

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