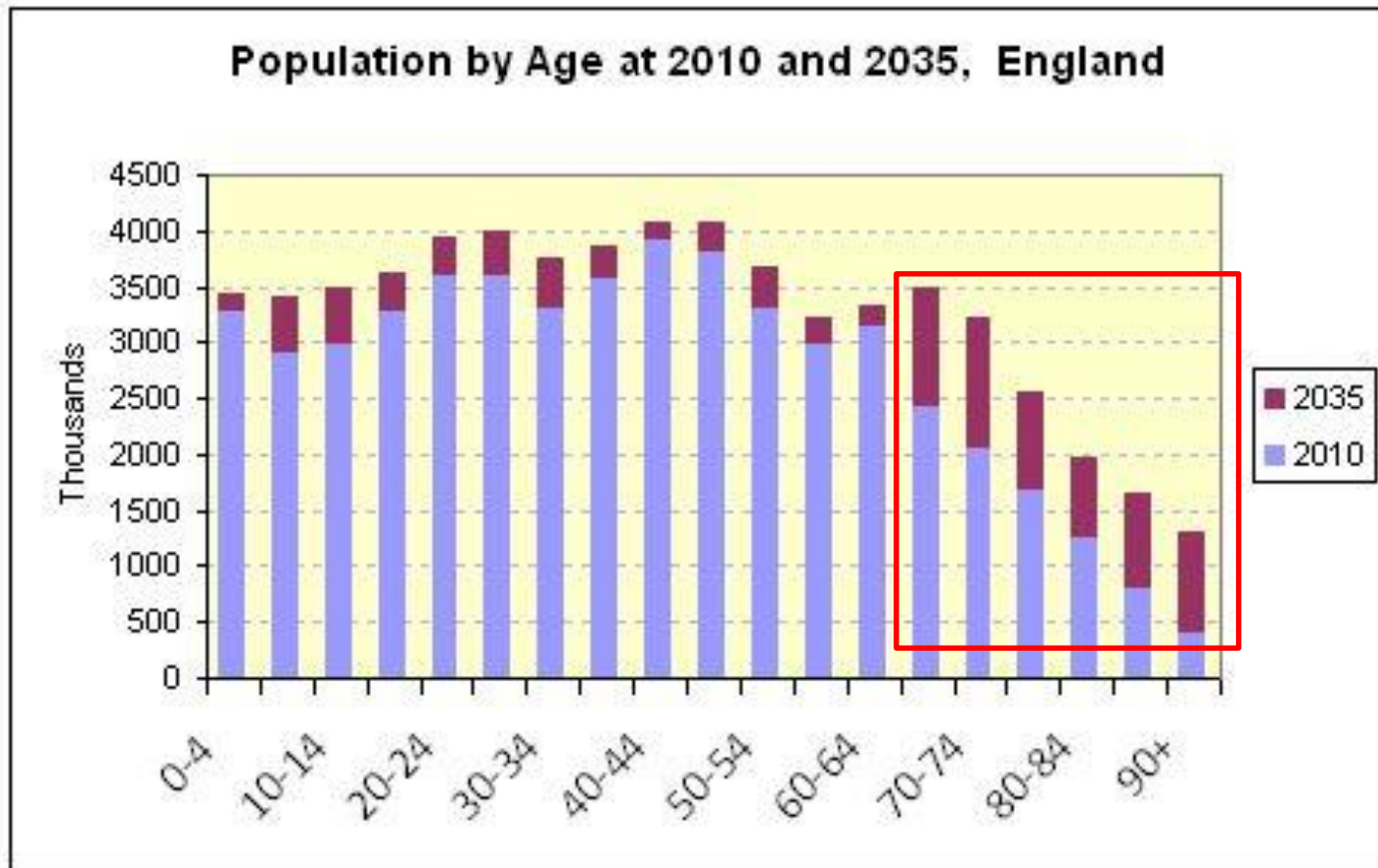


Challenges in pre-operative optimisation in UK

Dr Elizabeth MacDonald
Consultant in Elderly Medicine
Western General Hospital
Edinburgh

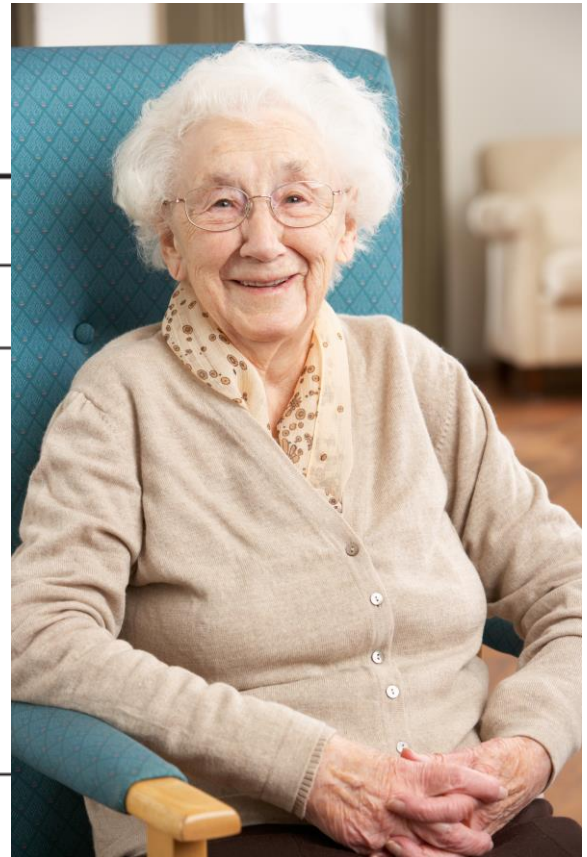
The ageing population



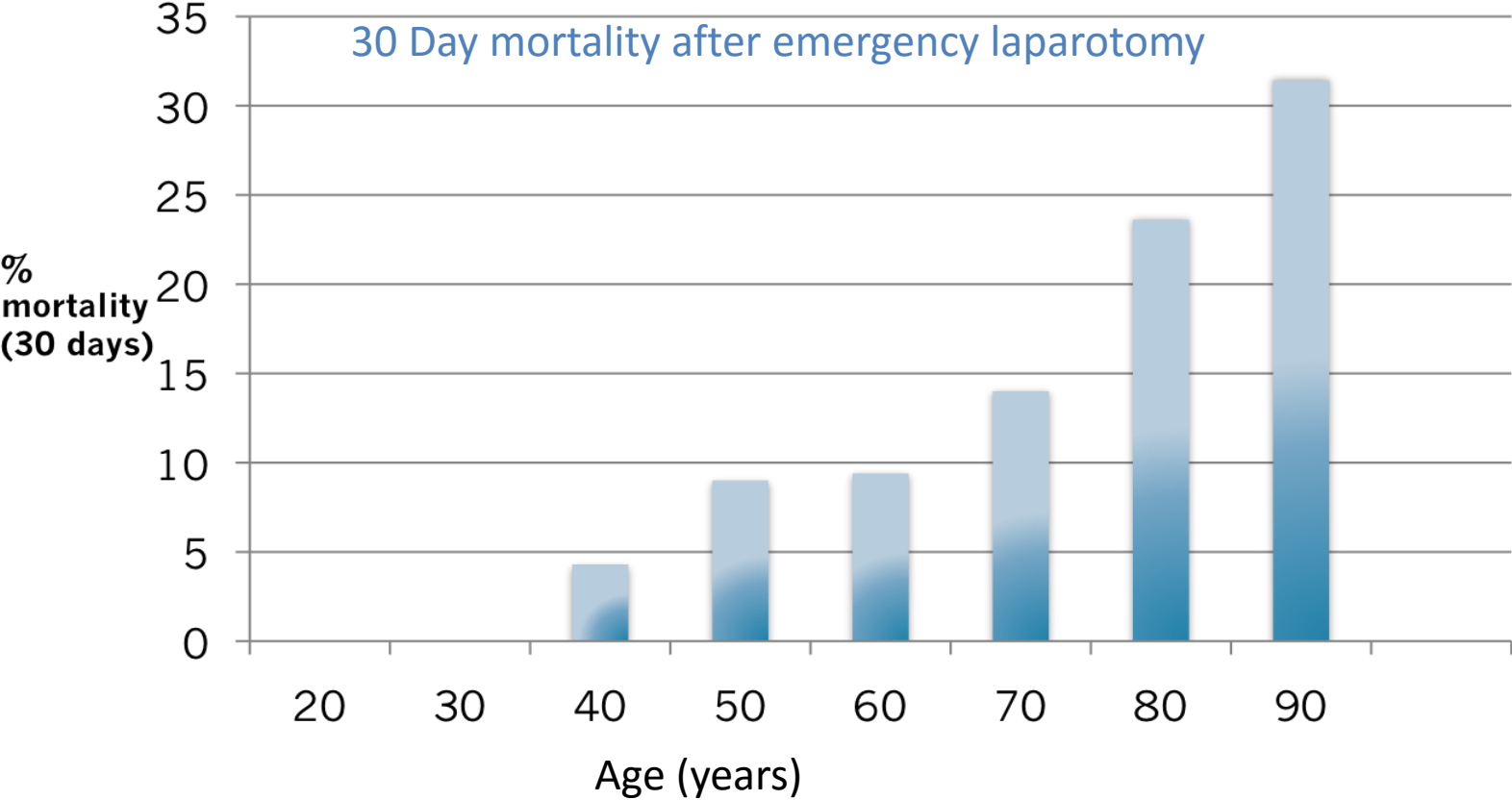
The 21st century surgical population



		by Age Group	
		45-64 y	65+ y
		29.4%	70.3%
		25.5%	59.6%
		39.1%	45.2%
		10.8%	88.0%
		31.8%	51.4%
Otolaryngology	39.6%	22.1%	29.9%
Urology	4.0%	6.3%	24.9%



Older patients have increased postoperative mortality in emergency surgery....



Saunders et al Br J Aneasthesia 2012 109(3)368

.....and in elective surgery

Surgical specialty	30 day Mortality aged<80	30 day Mortality aged >80
General surgery	4.3%	11.4%
Vascular	4.1%	9.4%
Thoracic	6.3%	13.5%
Orthopedic	1.2%	8.3%

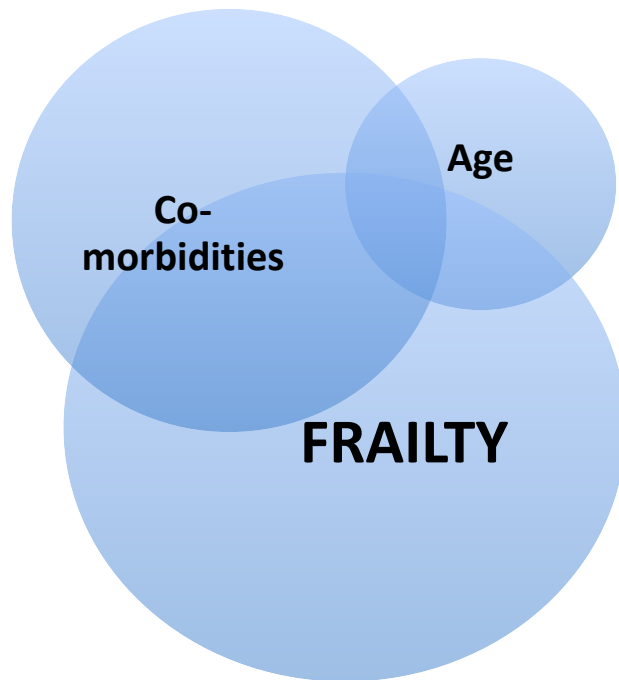
... and they have increased postoperative medical complications

....and there are functional and cognitive consequences

- Functional impairment/disability
 - Deterioration in function persisting up to 6months post colorectal surgery
- Postoperative cognitive disorders
 - Delirium (25%) , longer term Post Operative Cognitive Dsyfunction

More studies of longer-term functional and cognitive outcomes are required to allow more 'realistic' pre-operative decision making in older patients

Frailty is stronger predictor than age of poor outcome

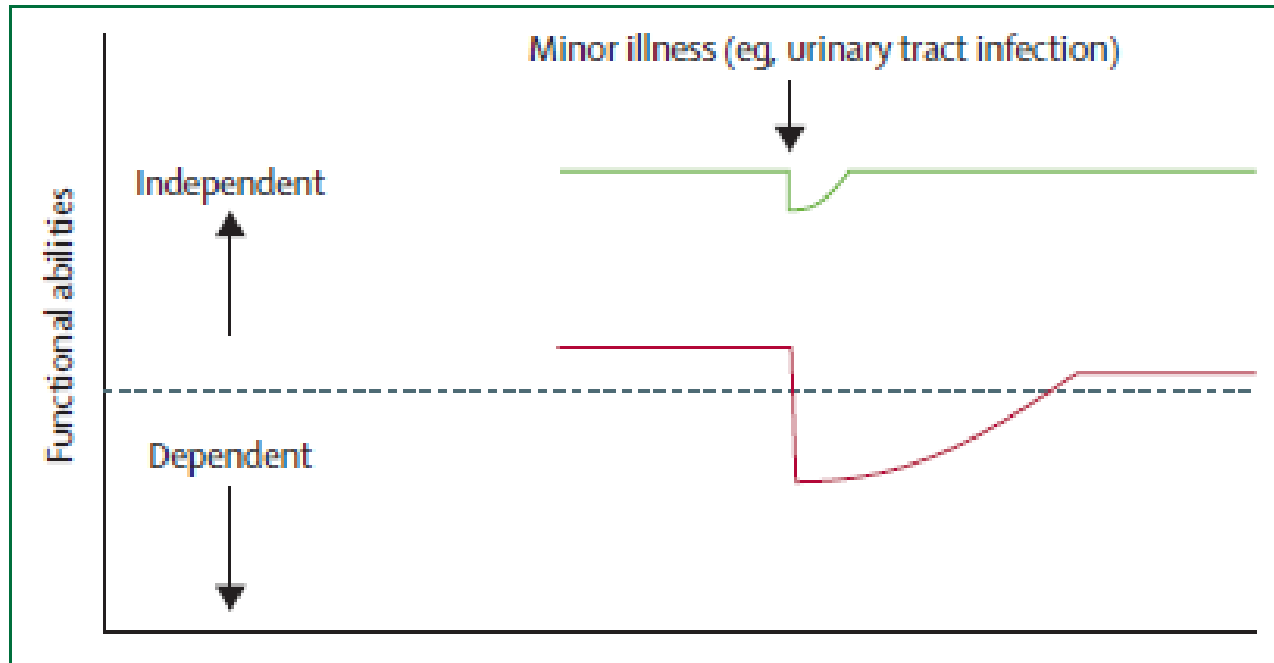


Being frail pre operatively independently predicts increased:

- 30 day mortality
- 1 year mortality
- Post operative medical complications
- Length Of Stay
- Readmission rate
- Discharge to institutional care

Frailty: “A state of increased vulnerability to even minor stresses”

Immobility...Instability...Intellectual Impairment...Incontinence



Adding frailty to standard peri-operative risk assessment improves predictive value

Frailty: Phenotype model

Syndrome defined by set of criteria

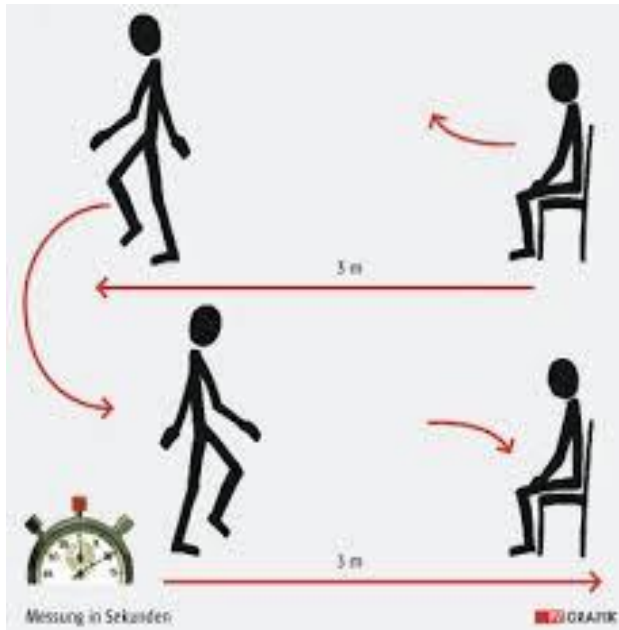
Frailty Criteria

- Low grip strength
- Low walking speed
- Low activity
- Self reported exhaustion
- Unintentional weight loss

Frailty level

0	non frail
1-2	pre frail
3-5	frail

Timed up and go test - a measure of walking speed



- Fast ≤ 10 sec
- Intermediate = 11-19 sec
- Slow ≥ 20 sec

- Easy screening test for frailty
- Predicts postoperative outcome
- Predicts falls risk

Robinson et al Ann Surg 2013; 258: 582-90

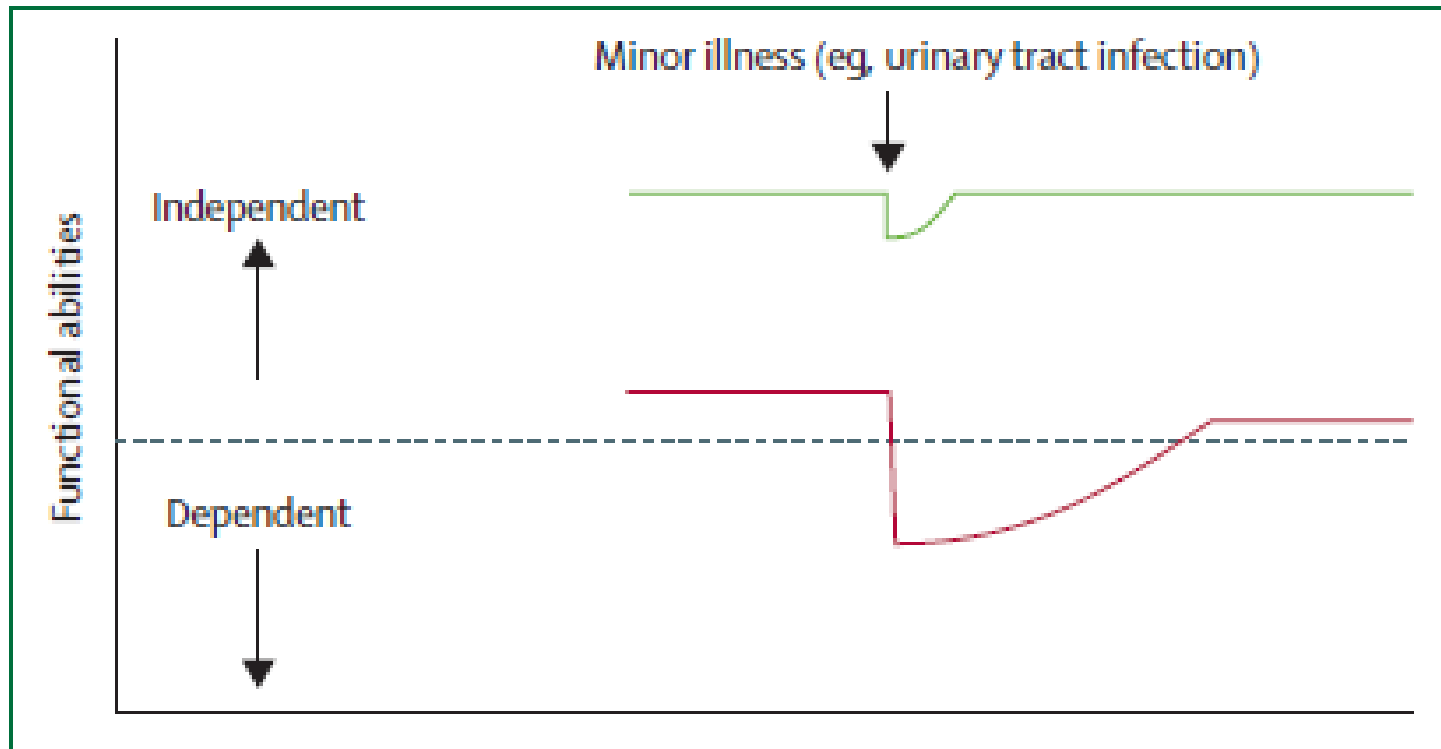
TUAG in patients undergoing elective colorectal surgery n= 98

Outcome			Time up and go test (s)		p value
		Fast <10s (n=30)	Intermediate (n=42)	Slow >20s (n=26)	
> 1 complication	37% (36)	13% (4)	29% (12)	77% (20)	< 0.001
Cardiac	4% (4)	0	0	15% (4)	
Respiratory	11% (11)	0	2% (1)	38% (10)	
Infection	30% (29)	10% (3)	26% (11)	58% (15)	
Discharge to Institution	26% (25)	0	24% (10)	58% (15)	< 0.001
Mortality (1yr)	12% (12)	3% (1)	10% (4)	31% (8)	0.006

Frailty: Deficit Accumulation model

- Principle: the more 'small' things that an individual has wrong the more likely they are to be frail
- Measures the number of deficits present over a wide range of domains within an individual
- Early Frailty Index (FI) included 92 possible deficits - number positive generates a numeric score (20/92 FI 0.22)
- Many subsequent simpler scores requiring fewer variables now validated – easy to administer questionnaires
- Identifies, quantifies frailty and indicates where deficits may be

Frailty: an unstable state



**Can we alter frailty level pre-operatively
to lessen vulnerability to surgical stress?**

Emerging models of preoperative optimisation

- **Prehabilitation** (Phenotype model)
“pre-operative exercise training programmes to enhance functional capacity with view of withstanding a stressful event”
- **Comprehensive Geriatric Assessment** (Deficit accumulation model)
Multi -dimensional multi-disciplinary diagnostic process focussed on determining a frail older persons medical, functional and psychological capability.....
.....in order to develop a co-ordinated and integrated plan for treatment and long term follow up
- **? Combination of the two**

Exercise training in frail elderly in community

Meta-analysis of physical training in older, frailer adults in community

(De Vries et al Ageing Res Rev 2012 11 136)

- 18 studies; age range 60-85 years
- all had reduced mobility and co-morbid patients were included
- Physical training group had:
 - Improved mobility
 - Improved physical function
 - Most effective type of training unclear
 - Health outcomes not part of study

Prehabilitation

Review: Peri-operative exercise training in elderly surgical subjects

(Jack et al Best practice & research Clin Anaesth 2011 25 462)

Some promising results:

Inspiratory muscle training

- may decrease pulmonary complications

Improvement in walking speed after exercise programmes

- No clear improvement yet in postoperative outcomes

But:

Tend to study the 'younger elderly', co-morbid often excluded

Case Report: Optimising a frail elderly patient with prehabilitation

(Carli et al Can Urol Assoc J 2014;8)

** Multimodal – nutrition/ exercise programme / cognitive programme

Programme ran both pre and post operatively

Comprehensive Geriatric Assessment (GCA)

Domains of frailty

- Medical Co-morbidities
- Polypharmacy
- Cognition
- Mobility/falls risk
- Mood
- Social support
- Nutrition
- Functional independence
- Continence
- Skin integrity



- CGA is a meticulous search for deficits in domains of frailty..... using a multidisciplinary approach
- Recognises disease presents differently in frailty.....symptoms and signs can be modified, masked or mimicked by other co-morbidities or polypharmacy
- Each frail patient is an unique mix of deficits so.....
GCA creates an individualised list of problems to address

Interventions of CGA

CGA must include both assessment and intervention

CGA is a continuous process – not once off

Individualised interventions can include a mix of :

- Optimisation of medical co-morbidities
- Rationalisation of polypharmacy
- Physiotherapy - exercise/ optimise mobility/falls prevention
- Occupational Therapy – optimise functional independence
- Dietician – nutritional support
- Cognitive therapy
- Review of the ‘little things’ – vision, hearing
- Review of social support network



Many small improvements in many areas add up to overall significant improvement
Theory of Marginal gains

Evidence for benefit of CGA in medical patients

Systematic review: CGA versus usual medical care in acute hospital setting
(Ellis G et al Cochrane Database Syst Review 2011: 7)

22 randomised trials; 10,315 patients aged >65, 6 countries

Patients who received CGA were:

- More likely to be alive and living in own home at 6 months
- More likely to be living in own home at 12 month
- Less likely to be institutionalised at 12 months
- More likely to have cognitive improvement during admission (n=370)

Evidence for benefit of pre operative CGA

Limited studies of CGA (assessment and intervention) preoperatively

Systematic review:

Impact pre-operative CGA on postoperative outcome in older elective surgical patients

(Partridge JSL et al Anaesthesia 2014 69 (S1) 8)

5 heterogeneous studies: CGA group had

- Reduced postoperative complications
- Reduced Length of stay

but GCA applied both pre and post op in 2 studies

Models of inpatient CGA pre &/or postoperative:

1. POPS model in Guys/St Thomas (Harari et al; Age Aging 2007)

Pre and post op CGA improved mortality, morbidity, length of stay

2. Geriatric surgery service in Singapore (Tan KY world J Surg 2011)

Post op CGA improved mortality, morbidity, length of stay and Functional outcome

Summary

Frailty is the major challenge for all areas of healthcare

- Frailty is a strong pre operative predictor of poor surgical outcomes
- The Frail surgical patient should be proactively identified preoperatively
 - Makes the diagnosis
 - Identifies a high risk population to be targeted
- Frailty assessment should be included as routine in preoperative assessment
 - Improves risk assessment
 - Enhances decision making
 - Identifies areas of potential reversibility
- Frail – and pre-frail - patients should be targeted pre-operatively by an individualised, multimodal, pre-habilitation programme – starting pre operatively and continuing to discharge and beyond
- Resource and skills to meet needs of frail patients should be embedded in surgical areas