

Perioperative Challenges in Senior Citizens



Dr Geeta Joshi

Prof in Anesthesiology

Head, Department of Pain & Palliative Medicine

Gujarat Cancer & Research Institute

Ahmedabad, Gujarat, India



Perioperative challenges in Senior Citizen

On November 17, 2013, the cabinet approved the National Policy on Older Persons recognizing the elderly people as senior citizens. This is in line with United Nation's policy.



Nov 29, 2014 - The President of Bangladesh Abdul Hamid, has declared the country's people aged 60 years or above as senior citizens.

The number of the country's total elderly people is 3,000,000 and this number will stand at 4 million by 20



Statistics of two countries

INDIA

Year	Male Persons	Female Persons	Persons
2001	6.60	7.10	6.90
2006	7.10	8.00	7.50
2011	7.70	8.70	8.30
2016	8.70	9.80	9.30
2021	10.20	11.30	10.70
2026	11.80	13.10	12.40

The evolution of the population structure of Bangladesh is driven by decreasing mortality, increasing life expectancy and progress towards a more sustainable fertility.

Given these characteristics the proportion of the population aged 60 years and above is expected to increase from 6% (2006) to 17% by 2050

elderly people require surgery four times more often than the rest of the population, and that this number will increase by 25% by 2020

Risk factors for postoperative mortality in elderly surgical patients

ASA physical status	III or IV
Surgical procedure	Major and /or emergency procedures
Coexisting disease	Cardiac, pulmonary, diabetes mellitus, liver and renal dysfunction
Functional status	1- 4 METs (Metabolic equivalents)
Nutritional status	Poor, albumin <35%, anaemia



Challenges

Physio
logical
Chang
es

Senior Citizen

Social
Issues

Financi
al
Issues

Co-
Morbid
conditi
ons

Psych
ologic
al
issues

Physiological Changes: General

General Changes

- Decreased elasticity of vessels
- Loss of facial contours as a result of alveolar bone resorption and loss of dentition
- Cervical arthritis
- There is a gradual increase in body fat, a decrease in lean muscle mass and strength
- A reduction in total body water
- Decrease in plasma proteins
- An increase in arm brain circulation time

Anesthesia Implications

- Difficult venous access, central venous access in major surgery
 - anaesthesia mask fit with difficulty.
 - Restrict the neck movements
- make these patients prone to vertebro basilar arterial insufficiency.
- protein energy malnutrition may be seen larger unbound
- proportion of drugs with higher protein binding property like propofol, lidocaine and fentanyl.
- IV administered drugs take longer time to have its effects and must be given slowly and small bolus doses.

Physiological Changes: Cardiovascular System

CVS Changes

- Decreased cardiac output and stroke volume
- Reduced arterial elasticity and peripheral sclerosis
- Decreased size of sino-atrial and atrio-ventricular nodes
- Increased sympathetic nervous systems activity and
- Sclerosis of the coronary arteries.

Anesthesia Implications

- Hypotension, response to alpha blockers
 - Maintain Blood pressure
 - Perfusion to vital organs crucial
 - Pre-existing cardiac disease
- Diastolic dysfunction, no drug for treatment

was the leading cause of postoperative deaths in patients aged >80

JAMA 1979

Physiological Changes: Respiratory System

RS Changes

- FVC decrease @ 14-30ml/yr
- FEV1 reduce @ 23-32ml/yr
- Ventilatory response to Hypoxia & Hypercarbia decreased by 50 and 40%
- Decrease in 'T' cell function & mucocilliary function

Anesthesia Implications

- Impaired Gas Exchange
- Blood O2 content is reduced by 10-15%
- Risk of aspiration
- Retention of secretions

Respiratory mortality ranged from 0-0.6% depending on surgical site
And presence of pulmonary risk factors
Aspiration during anesthesia had a high mortality of 5%

Acta Anesth Scan 1986

Physiological Changes: Renal System

Renal Changes

- Decreases in glomeruli and nephrones by almost 40%.
- Renal blood flow falls by about 50% after 40 years of age.
- The fall in glomerular filtration rate (45% by 80 years of age) is reflected by decline in creatinine clearance of 0.75 ml/min/year.

Anesthesia Implications

- Volume overload thus can occur
- Decreased renal function is responsible for prolonged action of relaxants of relaxants
- They are more prone to renal insufficiency, dehydration and renal failure.
- Impaired conservation of sodium and decreased exertion of potassium.

Most of the Pulmonary Emboli occurred during surgical procedure
Or within 7 days of surgery.

Masui Jap J Anesth 1999

Fluid & Electrolyte Therapy: “Rule of thumb”

Water loss of 2kg or more is significant. Elderly patients have higher risk for a given percent of saline depletion because of their limited homeostasis reserve. In younger patients 4 L of saline are least before clinical signs of depletion are visible and 4 L saline are given before oedema develops. In elderly there is no such comparable estimate so monitoring of vital signs should be stressed. Recommended rate of fluid administration depends on the type of fluid lost. In water depletion, rapid replacement might result in cerebral oedema so half the deficit is infused in 24 hrs and the rest half in the next 24 - 48 hrs.



Physiological Changes: Hepato-Biliary System

Hepato-Biliary Changes

- Hepatic blood flow falls by approximately 1% per year to about 40% beyond 60 years
- decreased gastric motility, increased gastric pH, decreased hepatic blood flow and liver mass with reduced hepatic microsomal enzyme function.
- Increased incidence of cholelithiasis in patients above 90 years.
- Delayed emptying time

Anesthesia Implications

- affect drug pharmacokinetics
- drugs solely depending on liver for their metabolism and excretion
 - warfarin, may produce exaggerated effects

Decreased activity and muscle mass is responsible for decreased energy expenditure by as much as 15% per year but magnitude of oxygen consumption and energy requirement after a period of stress is much less reflected in elderly as their BMR is low.

Physiological Changes: Nervous System

CNS Changes

- Autonomic dysfunction blunting of the physiological compensatory response to hypotension and thermoregulation
- Impairment of cognitive functions gradually increased with age.
- The prevalence of baseline cognitive deficits is 1.5% in 65 – 70 yrs, doubles every 5 yrs thereafter, reaching 25% for those above 85 years

Anesthesia Implications

- more prone to hypothermia
 - Postoperative delirium
- In 15-50% of elderly patients, postoperative cognitive dysfunction (POCD) and postoperative delirium (PD) are noted

Preoperative assessment of cognitive impairment should be routine in all patients above 70yrs. Several simple methods of evaluation in elderly are available like Folstein Mini Mental status test or three item recall test

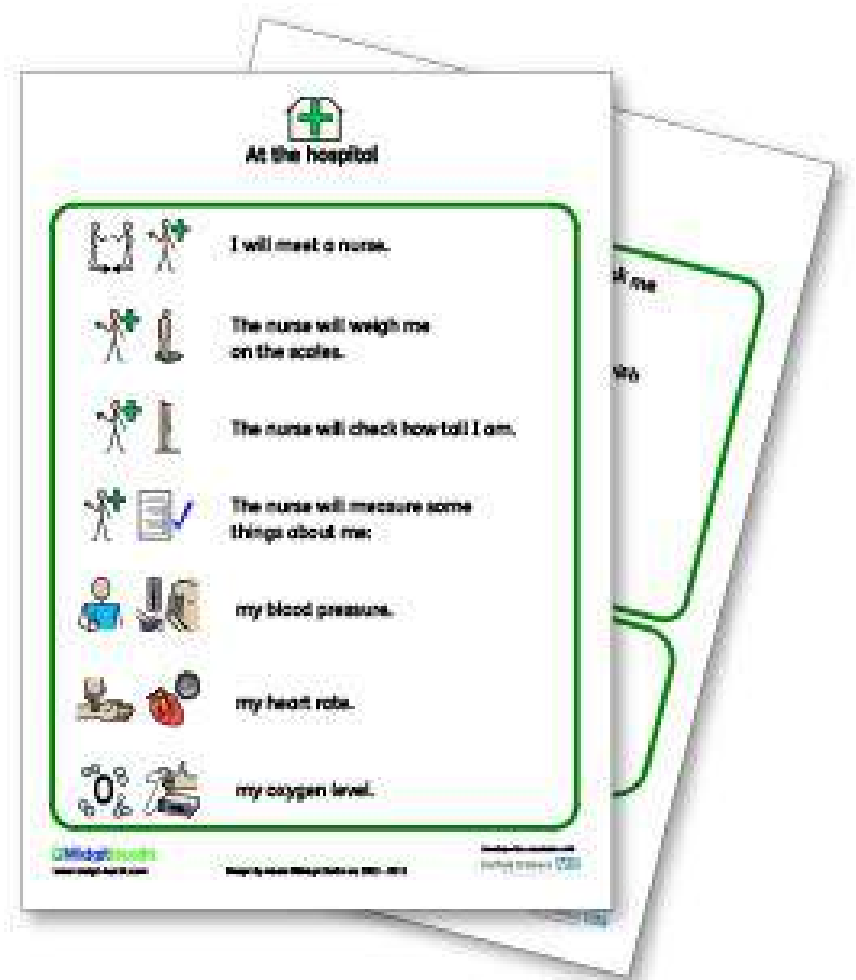
Preoperative Assessment

- ✓ Careful History
- ✓ Physical examination
- ✓ Twelve lead ECG
- ✓ Functional status assessment
- ✓ Nutrition assessment
- ✓ Anesthesia Risk Assessment
(e.g. Goldman Cardiac Risk index)



Preoperative Preparation

- ✓ Effective control of co-existing diseases
- ✓ Current medications
- ✓ Stopped smoking for 8 weeks
- ✓ Preoperative chest Physiotherapy
- ✓ Training in deep breathing & coughing
- ✓ Correction of malnutrition
- ✓ Treatment of infection



Antiplatelet effects of aspirin can only be reversed through the regeneration of new platelets (life cycle 9 days). Platelet transfusion. It is no longer routine to discontinue aspirin therapy preoperatively, particularly when administered to patients with known coronary artery disease with a dose less than 75mg per day.

Routine precautions for major surgery

- ✓ Temp monitor & Control
(Surface & Core Temp)
- ✓ Body warmer
- ✓ Ripple mattress
- ✓ DVT Prophylaxis
- ✓ Invasive Pressures Monitoring



A technique that seems to provide maximum oxygenation in the shortest period requires eight deep breaths of 100% oxygen within 60 seconds with an oxygen flow of 10 L per minute

Intraoperative Hemodynamic stability

- ✓ Combination of anesthesia & Vasopressors
- ✓ Beta blockers or Vasodilators
- ✓ Avoid fluid overload
- ✓ CVP & U/o Monitoring

Warming preoperatively and cleaning postoperatively with warm solutions, using warming systems, warming IV fluids, keeping the environmental temperature warmer, covering the patients with blankets before and after the surgery.



Quick recovery from Anesthesia

- ✓ Use short acting drugs
- ✓ Combined Regional + GA
- ✓ Antagonize Muscle Relaxants

Pedersen et al found that morbidity and mortality in the first 24 hours and over the next six postoperative days was twice and 10 fold more frequent than seen intraoperatively.

Acta Anesth Scand 1990

Combined
Regional
General



Dr GANESH
CHAUDHARI

FRIENDS FOR LIFE

Postoperative period

- ✓ Prevent Hypoxaemia
(Suppl O2, reverse NMB drugs)
- ✓ Prevent Hypothermia
(warming blanket in Peri-op)
- ✓ Effective post-op pain management
(Multi-modal Pain management)
- ✓ Acute Pain services



Postoperative cognitive dysfunction

Possible causes of POCD

- ✓ Emboli
- ✓ Perioperative physiological disturbances
- ✓ Pre-existing cognitive impairment
- ✓ Anesthesia & other drugs

Predisposing factors for POCD

- Early POCD
- Increasing age
- General rather than regional anaesthesia
- Increasing duration of anaesthesia
- Respiratory complication
- Lower level of education
- Re-operation
- Postoperative infection
- Prolonged POCD (months postoperatively)
- Increasing age only
- Cognitive disturbance in the elderly

Aspects of cognitive function tested by the Mini-Mental State Examination

- Orientation in time
- Orientation in place
- Repetition of named objects
- Repetition of simple phrase
- Ability to undertake simple arithmetic
- Recall of objects named earlier in the interview
- Naming of objects shown by examiner
- Execution of simple tasks by written and spoken command
- Writing a simple sentence
- Copying a simple design

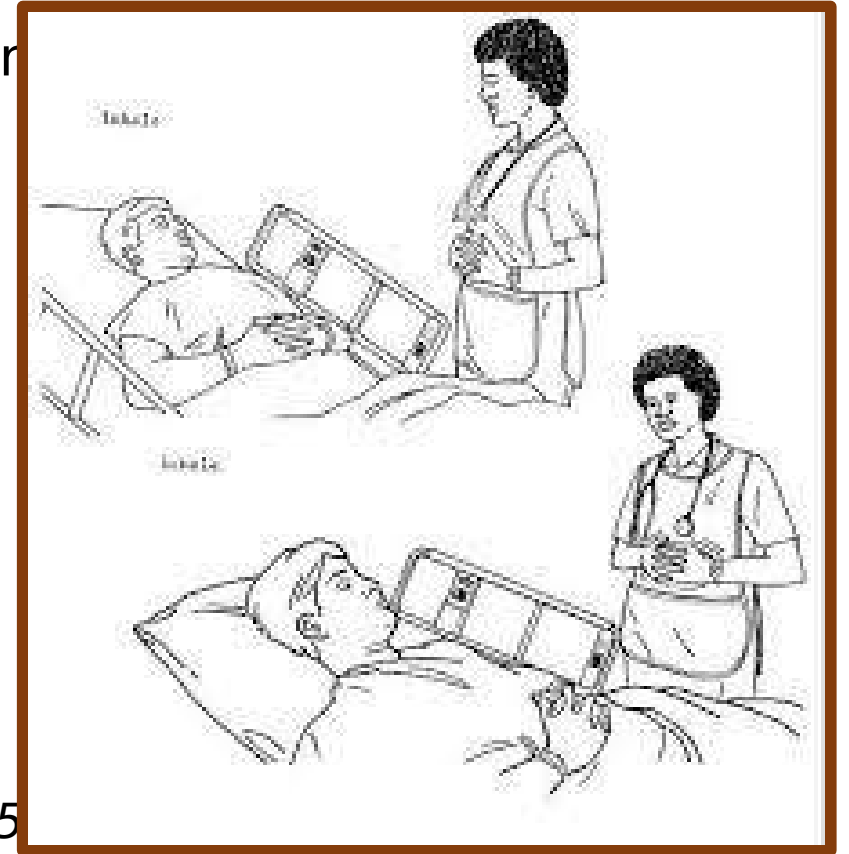
Advance Directives

much has been written about the benefit of advance directives, and what efforts have been expended to increase their prevalence without remarkable success.

The average rate of advance directives at the time of discharge from hospitals is 10 to 15% despite interest and laws.

Knowledge of desire regarding resuscitation is important, and in the perioperative period, the designation of alternate decision-maker is especially important

Roger M Oskvig, CHEST; May 1999;115;5:158S-15



Surgeons are not always RIGHT !!!

M/75 Yrs, Rural Background, Dx with Cancer L/3 Oesophagus, resectable
Surgeons explained about high risk, hence avoid surgery

Pre-anesthesia check up

- Daily routine, No of working Hrs
- Occupation,
- Social background
- Tobacco & other Habits
- Psychological evaluation
- Belief in God, Positive attitude

Pre-operative Preparation

- Advice on diet, Hygiene
- Counselling of caretaker
- Daily follow up

Anesthesia Management

- Regional + GA
- Avoid long acting drugs

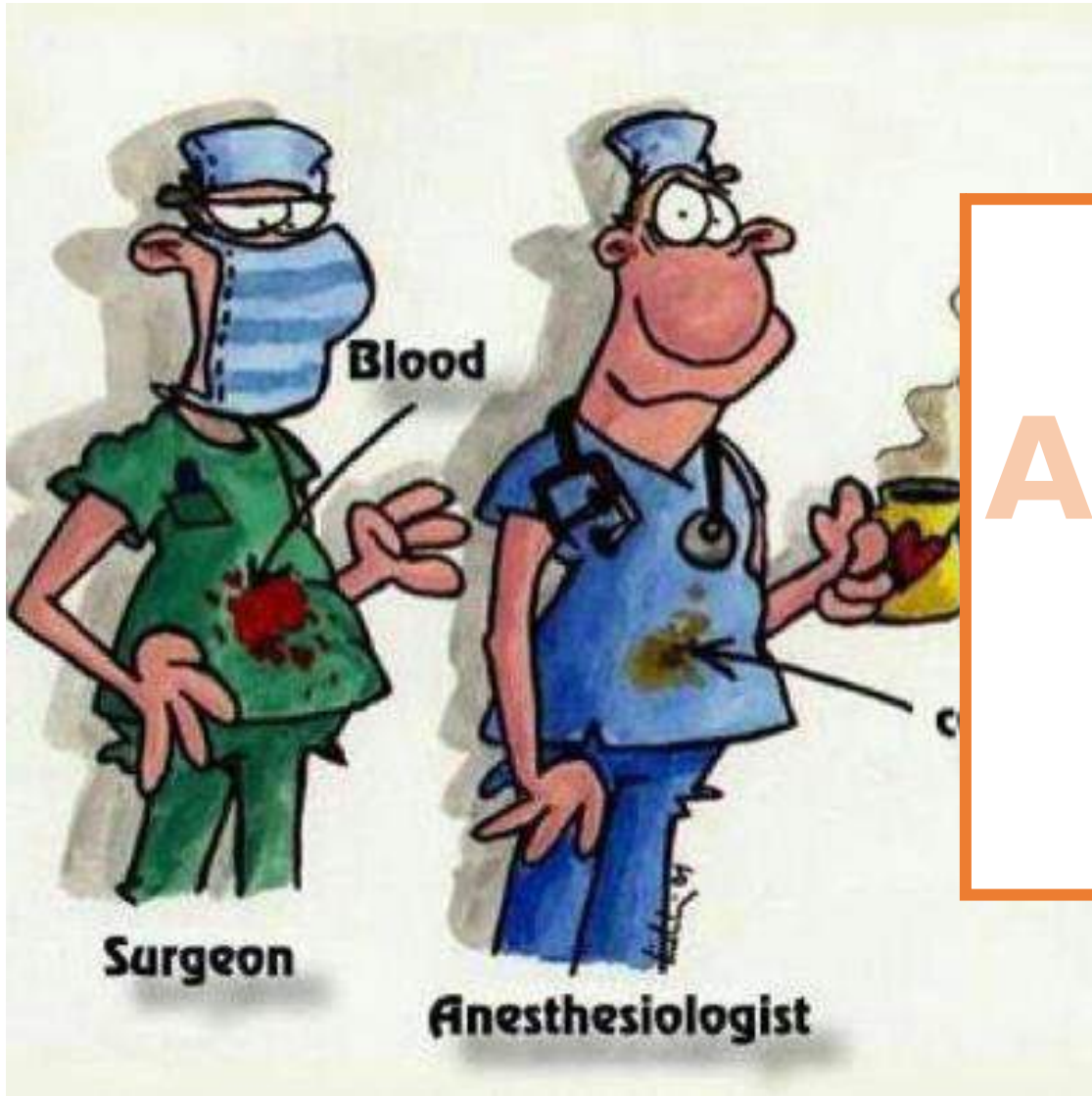
Postop Management

- Continue care
- Non-opioid Pain management

Individualized Care

Senior Citizen





Happy to be
Anesthesiologist!

Thank You