



Objectives

- Anaesthetic management
- Postoperative delirium
- Geriatric assessment in the perioperative period
- Does anaesthesia could influence recurrence of cancer?

Elderly patients with cancer

- Too old
- Too sick
- Too expensive?

Anaesthesia-related deaths in the United States (1999-2005) and France (2005)

Age	Mortality Rate per 100,000 Anesthetic Procedures	95% Confidence Interval
0-7 yr	0.60	0.12-3.2
8-15 yr	1.20	0.30-3.2
16-39 yr	0.52	0.24-0.83
40-74 yr	5.20	2.7-8.1
≥ 75 yr	21.00	8.3-34.0

ASA physical status

ASA physical status	Mortality Rate per 100,000 Anesthetic Procedures	95% Confidence Interval
I	0.40	0.12-0.81
II	5.0	1.6-9.1
III	27.0	12.0-44.0
IV	55.0	1.1-130.0

Postoperative Complications: Pre- and Intraoperative Predictors

Preoperative and Intraoperative Predictors	Postoperative Event	Odds Ratio (confidence interval)	P-value
ASA class ≥3	any adverse postoperative event	2.7 (1.6-4.4)	<.0001
Emergency surgery	any adverse postoperative event	2.0 (1.1-3.4)	.014
Intraoperative tachycardia	any adverse postoperative event	3.8 (1.9-7.5)	<.0001
Emergency surgery	death	22.0 (6.2-76.0)	<.0001
History of PTCA	death	7.1 (1.3-39.2)	.024
Preoperative wheezing	death	12.9 (2.1-77.6)	.005
Use of invasive monitor	death	13.4 (3.3-55.0)	<.0001
Race (black)	death	9.2 (2.2-37.9)	.002
ASA class ≥ 3	adverse cardiac event	2.7 (1.4-5.2)	.003
Signs of heart failure	adverse cardiac event	2.1 (1.1-5.1)	.034
Emergency surgery	adverse pulmonary event	3.6 (1.6-8.3)	.003
History of heart failure	adverse pulmonary event	5.7 (2.1-15.5)	.001
Use of invasive monitor	adverse pulmonary event	9.7 (3.7-25.4)	<.0001
From nursing home	adverse neurologic event	6.5 (1.8-23.2)	.004
Functional status ≥ 3	adverse neurologic event	3.0 (1.4-6.4)	.004
Intraoperative tachycardia	adverse neurologic event	3.6 (1.4-9.4)	.009
Use of invasive monitor	adverse neurologic event	5.2 (2.5-11.1)	<.0001
Race (black)	adverse neurologic event	3.4 (1.3-8.9)	.015

ASA = American Society of Anesthesiologists.
PTCA = percutaneous transluminal coronary angioplasty.

Leung JM, Dzankic S., (2001) JAGS

Predictors of 1-year Mortality

Univariate analysis

Predictor	Relative risk (odds ratio) (95 % CI)	P value
Charlson Comorbidity Score (3+ versus 0 - 2)	13.091 (7.722 - 25.027)	< 0.0001
ASA physical status Class 3, 4 versus Class 1	8.300 (2.009 - 34.289)	0.0035
Age (65+ versus 18 - 39 yr)	4.459 (2.032 - 9.784)	0.0002

Multivariate analysis

Predictor	Relative risk (odds ratio) (bootstrapped 95 % CI)	P value
Charlson Comorbidity Score (3+ versus 0 - 2)	16.116 (10.110 - 33.717)	< 0.0001
Cumulative deep hypnotic time (per h)	1.244 (1.062 - 1.441)	0.0121
Systolic blood pressure < 80 mm Hg (per min)	1.036 (1.006 - 1.066)	0.0125

Monk TG, et al.; Anesthesiology 2008

Perioperative Risk in Elderly Patients

- High prevalence of co-morbidities
- Preoperative malnutrition
- Polypharmacy

↓

- Increased risk for postoperative complications, infections, sepsis
- Higher morbidity and mortality
- Increased risk for postoperative delirium and POCD
- Length of stay in hospital
- Discharge to nursery homes
- Increased costs

Blommers et al., Z Gerontol Geriat 2011; Singler K et al., Internist 2011; Bettelli G, Minerva Anesthesiol 2011; Ely et al. JAMA 2004; Heymann A et al., JIMR 2010; Luetz A. et al. Crit Care Med 2010

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Anaesthetic Management

**AIM: Maintenance of organ function
Stress-protection**

Preoperative Evaluation

- Functional reserve
- Multi-morbidity
- Polypharmacy
- Optimising therapy ?
- Cancer specific considerations

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Preoperative Risks in Elderly Patients

- Age-related changes of the cardiovascular system
 - Increased incidences: Hypertension
Ischaemic Heart Disease
Arrhythmia
 - systolic and diastolic dysfunction
 - **1/3 of perioperative morbidity and mortality is caused by cardiovascular disease**
- Age-related changes of the respiratory system
 - Decreased sensitivity vs. Hypoxia and hypercapnia
 - Respiratory muscles ↓
 - TVC↓ ; FRC↑

Blommers E. et al., Z Gerontol Geriat 2011
Pisani MA, J Intensiv Care Med 2009

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Preoperative Risks in Elderly patients

- Pharmacokinetics and pharmacodynamics
 - Hepatic clearance ↓
 - Enzyme production ↓, oxidative reduction ↓
 - Impaired renal function (GFR ↓ 45%)
 - Total body water ↓
 - Albumin ↓ Proteins ↓
 - Increased sensitivity versus opioids, hypnotics etc.

Bettelli G, Curr opin Anesthesiol 2010, Minerva Anesthesiol 2011
Pisani MA, J Intensiv Care Med 2009

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Anaesthetic Management

**AIM: Maintenance of organ function
Stress-protection**

Preoperative Evaluation

Intraoperative

- Functional reserve
- Multi-morbidity
- Polypharmacy
- Optimising therapy ?
- Cancer specific considerations

- Haemodynamic stability
- Normothermia
- GA plus Regional anaesthesia

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Anaesthetic Management: Intraoperative Considerations

- Short fasting times
- Preoperative drugs: short acting drugs
- Intraoperative:
 - Short acting drugs
 - Normothermia, Avoidance of hypotension
 - Avoidance of too deep anaesthesia
 - Prophylaxis of nausea and vomiting
 - Considering fast track concepts
 - Combination of General anaesthesia and thoracic anaesthesia
 - Avoidance of catheters and tubes

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Postoperative: multimodal concepts

- Pain Management
- Patient controlled analgesia
- Mobilization
- Nutrition
- Screening for delirium
- IMCU / ICU

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Postoperative Delirium

Older Patients (>60yrs)

- Frequent postoperative complication: 14-56%
- Up to 60% of the patients after long-time analgesic and sedative therapy
- Up to 80% of patients being mechanical ventilated
- Hip-Fracture → 35-65%
- On the ICU → 19-82%
- Cancer patients: chemotherapy induced delirium, disease-related
- **In 66-84% delirium is not diagnosed !**

Subtypes

- hyperactive delirium > ca. 15%
- hypoactive delirium > ca. 25%
- mixed > ca. 59%

Bellelli et al. J Am Ger Soc 2006
Kallivart et al. JAGS 2005
Kontinen et al. Acta Anaesthesiol Scand 2006
Ely et al. JAMA 2004

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Delirium: Consequences

- Longer stay in hospital/ ICU
- Increased morbidity
- Increased mortality
- Increased cognitive impairment
- Increased risk for dementia
- Increased discharge in a nursing home
- Increased costs

Thomason JW et al. Critical Care 2005
Marcantonio et al JAGS 2005
Ely et al. JAMA 2004
Rockwood et al Age and Ageing 1999
Inouye et al JAMA 1996
Milbradt et al Crit Care 2004
Girard TD et al. Crit Care Med 2010
Davis et al Brain 2012

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Patient Selection: Stages of Aging

Primary/Healthy

- No activity limitations
- Reduced functional reserve

Intermediate/
Vulnerable

- Functional reserve critically reduced
- Functional limitations
- Some recovery possible

Secondary or frailty

- No recovery of functional reserve
- Severe limitations

Near Death

- No functional reserve

Hamerman D. Toward an understanding of frailty. Ann Intern Med 130:945-50, 1999

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CGA: 30-day morbidity

Component of PACE	Any complication		Major complication	
	RRa	95% CI	RRa	95% CI
MMS abnormal (< 24)	1.23	0.81-1.88	1.08	0.48-2.44
ADL dependent (> 0)	1.41	0.95-2.10	1.87	0.95 -3.69
IADL dependent (< 8)	1.43*	1.03-1.98	1.65	0.88-3.08
GDS depressed (> 4)	1.30	0.93-1.81	1.69	0.93-3.08
BFI mod/severe fatigue (> 3)	1.52*	1.09-2.12	1.24	0.67-2.27
ASA abnormal (≥ 2)	1.00	0.73-1.38	1.96*	1.09-3.53
PS abnormal (> 1)	1.64*	1.07-2.52	1.97	0.92-4.23
Satariano's index (1)	1.11	0.78-1.59	1.29	0.68-2.44
Satariano's index (2+)	1.58	0.88-2.85	1.95	0.74-5.18

* P < 0.05 Audisio RA Crit Rev Hematol Oncol 2008

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Preoperative Geriatric Assessment

TABLE 1. Characteristics of Elderly Surgical ICU Patients With and Without Six-Month Mortality

	6-Month Mortality (n = 16)	Alive at 6 Months (n = 91)	P
Frailty			
Age (yr)	76.1 ± 4.7	73.9 ± 6.2	0.1285
Cognition (Mini-Cog)	2.3 ± 1.3	3.5 ± 1.5	0.0017
Weight loss (10 lbs)	3/16 (20.0%)	12/88 (13.6%)	0.4549
Body mass index	23.8 ± 5.8	26.7 ± 4.7	0.0314
Albumin (g/dL)	2.93 ± 0.57	3.69 ± 0.62	<0.0001
Falls (#)	1.6 ± 1.6	0.7 ± 1.4	0.0033
Depression	3/16 (18.8%)	31/90 (34.4%)	0.2590
Hematocrit (%)	35.0 ± 5.5	41.0 ± 5.2	0.0002
Disability			
Average ADL (Katz)	3.2 ± 1.7	4.8 ± 2.0	0.0004
Co-morbidity			
Charlson index	5.1 ± 2.6	3.1 ± 2.2	0.0050
ASA score	3.2 ± 0.4	2.9 ± 0.5	0.0114
Medications (#)	6.5 ± 3.2	5.3 ± 3.0	0.1457

ADL indicates activities of daily living.

TABLE 1. Characteristics of Elderly Surgical ICU Patients With and Without Six-Month Mortality

Modeling Geriatric Preoperative Assessment Using Frailty, Disability and Co-Morbidity.
Robinson, Thomas; Eisen, Ben; Wallace, Jeffrey; Church, Scott; McFann, Kim; Plester, Shirley. RN, MS; Sharp, Terry; Moss, Marc.
Annals of Surgery 2003; 238(3):449-455, September 2003.
DOI: 10.1097/SLA.00013.1318345598

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Conclusions

Tailored Anaesthesia

Preoperative Geriatric Assessment

Optimising Preoperative Therapies

Nutrition

Delirium: Screening, Prophylaxis

Pain Management

Do not harm!
Thank you!

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Review Article

Perioperative care of the elderly oncology patient: A report from the SIOG task force on the perioperative care of older patients with cancer¹⁸

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