



Patient safety

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Will take you to new heights

Safety? Whose safety?



Anesthesia is an area in which very impressive improvements in safety have been made.

Anaesthesiology: A High risk Speciality



Anaesthesiology is a high-risk speciality as compared with other specialities in medicine

How safe is surgery and anesthesia?

- λ 1 death per 5,000 anesthetics administered during the 1970s, to 1 death per 100,000 in 2015.
- λ Today's surgical patients are sicker and aged than ever.
- λ 5% of all surgical patients die within one year of surgery.
- λ Surgical Patients over 65 years, 10% die within one year of surgery.

Dr. Jeana Havidich; 2014 ASA Convention:

- λ 3.2 million anaesthesia case data: 2010-2013.
- λ Complication rate: decreased from 11.8 percent to 4.8 percent
- λ Evening or holiday procedures: no increase in complications
- λ Healthier patients having elective daytime surgery: highest minor complications
- λ Serious complications highest in pt >50 years



Complication of anesthesia

- Major Complications

- cardiac arrest
- Perioperative MI
- Aspiration
- Anaphylaxis
- Drug overdose
- Convulsion
- nerve pulses
- Organ injury
- Malignant hyperthermia

- Minor complications

- Airway obstruction
- Postop nausea, vomiting
- Sore throat
- Hemodynamic instability
- Pneumonia
- Delirium
- Shivering
- Organ dysfunction (kidney, liver)
- Cognitive defect

10 common causes of cardiac arrest under anaesthesia

1. Drug overdose/ adverse reaction
2. Rhythm disturbances
3. Peri-op MI
4. Airway obstruction
5. High spinal
6. Lack of vigilance
7. Bleeding
8. Over-dosage of inhalation agent
9. Aspiration
10. Technical problem in anaesthesia system



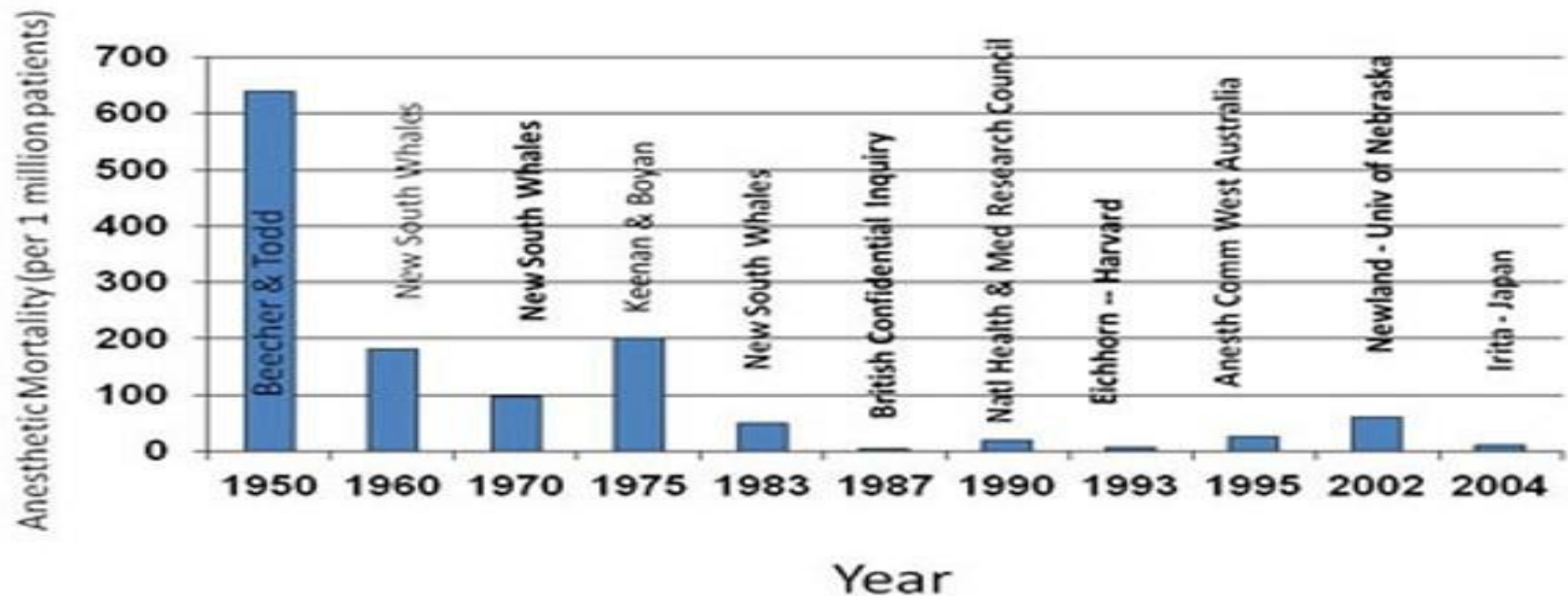
Anaesthesia Vs Aviation industry

- λ The safety of airline travel-highest:
- λ Increased in air traffic density; More take-offs and landings with less separation between aircraft.
- λ Practice of anesthesiology similar like aviation
- λ Take off and landing: similar to induction and recovery
- λ Increased No of Surgical patient; diverse age group;
- λ Increasing co-morbidities; complex surgical procedure.
- λ Fatal accident complications still happened.

Lets look at the mortality from Anaesthesia

- λ In 1950: 3.7 in 1000 anaesthetics
- λ 1980: 1 in 10,000 anaesthetics
- λ 2015: 1 in 100,000- anaesthetics

Overall Anesthetic Mortality



Mortality: GA Vs RTA

- λ Now Lets Compare the Mortality from GA with an event that anyone, anywhere on this Mother earth can face face



GA Vs RTA

2013: WHO released “Global Status report on road safety;

^λ RTA mortality 18 per 100,000 people/year

^λ Mortality From GA: 1 in 100,000

So, A patients has HIGHER chances of dying from RTA than from exposure to General Anaesthesia.

What makes anaesthesia safe ?





What makes anesthesia safe

- **Pre operative assessments**
- **Monitors and anesthesia machines**
- **Safe drug equipment**
- **Anesthesia skills and knowledge's**
- **Guidelines and protocol**
- **Surgical skills**

Factors influencing risk of Anaesthesia?

- λ **Patient status:** age, co-morbidities
- λ **Procedure –:** urgency, invasive
- λ **Facility:** resources, equipment, monitoring
- λ **Skill/ expertise-** anaesthetist, surgeon
- λ **Readiness,** fatigue of the physicians



Where Safety Starts ?



Patient



Surgeon's Skill



Facilities, Equipment, and Medications



Anaesthetist's Skill



.....Survival



Safe Anaesthesia Practice

- λ Protocol
- λ Crisis management / guideline
- λ Training / skill development/ updation- CPD activities
- λ Evidence based medicine; Transforming evidence into practice



The goal is to provide highest standard of care and safety in
any setting

International Task Force on Anaesthesia Safety

Approved by:

World Federation of Societies of Anaesthesiologists

(WFSA)

Principle of Anaesthesia Care



STANDARD OF ANESTHESIA (in order of adoption)	SITTING	INFRASTRUCTURE
highly recommended	Level 1 Small hospital/ health center	Basic
highly recommended+ recommended	Level 2 Small hospital/ health center	Intermediate
highly recommended + recommended + suggested	Level 3 Referral hospital	Optimal



Minimum infrastructure requirements for general anesthesia include:

- a well-lit space of adequate size
- a source of pressurized oxygen (most commonly piped in);
- an effective suction device;
- standard ASA monitors.
 - heart rate, blood pressure, ECG, pulse oximetry, capnography, temperature; and inspired and exhaled concentrations of oxygen and applicable anesthetic agents

HIGHLY RECOMMENDED

- λ Minimum standards that would be expected in all anaesthesia care for elective surgical procedures
- λ “Mandatory” standards

Mandatory standard

- λ **Pre-anaesthesia checks/ Care**
- λ **Safe Conduct of anaesthesia**
- λ **Monitoring during anaesthesia**
- λ **Post Anaesthesia Care**

PRE ANESTHESIA CHECK

➤ *check patient risk*

factor

*ASA 1,2,3,4,5, e in case of
emergency*

- *Airway assessment*
- *Aspiration risk*
- *Allergies*
- *Abnormal investigation*
- *Comorbidity*
- *Medication*
- *Formulate anesthesia
plan*

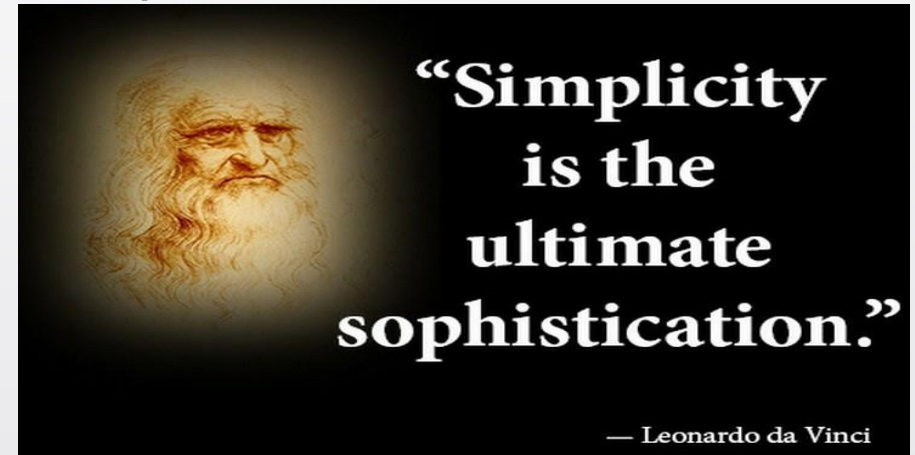


Check resources? Before starting Anaesthesia



Choice of Anaesthesia

- λ Judged by type of patient / procedure/ facility
- λ Chose the Simplest and safest technique
- λ Variety of options available
 - LA
 - LA + Sedation
 - Regional +/- sedation
 - GA with LMA/i-gel
 - GA with ETT
 - GA + Regional combination
- λ Try to minimise the multiple combinations



SURGICAL SAFETY CHECKLIST

Patient Name:

Procedure:

Date:

Notes:

Before induction of anesthesia

SIGN IN

- Patient has confirmed:
 - Identity • Site
 - Procedure • Consent
- Site marked Not applicable
- Anesthesia safety check completed
- Pulse Oximeter on patient and functioning
- Does patient have a Known allergy?
 - NO YES
- Difficult airway/aspiration risk?
 - NO YES, and equipment/assistance available
- Risk of >500ml blood loss (7ml/kg in children)?
 - NO YES, and adequate intravenous access and fluids planned

Before skin incision

TIME OUT

- Confirm all team members have introduced themselves by name and role
- Surgeon, Anesthesia Professional and Nurse verbally confirm:
 - Patient • Site • Procedure
- Anticipated critical events:
 - Surgeon reviews: What are the critical or unexpected steps, operative duration, anticipated blood loss?
 - Anesthesia team reviews: Are there any patient-specific concerns?
 - Nursing team reviews: Has sterility (including indicator results) been confirmed? Are there equipment issues or any concerns?
- Has antibiotic Prophylaxis been given within the last 60 minutes?
 - YES Not applicable
- Is essential imaging displayed?
 - YES Not applicable

Before patient leaves operating room

SIGN OUT

- Nurse verbally confirms with the team:
 - The name of the procedure recorded
 - That instrument, sponge, and needle counts are correct (or not applicable)
 - How the specimen is labelled (including patient name)
 - Whether there are any equipment problems to be addressed
 - Surgeon, Anesthesia Professional and Nurse review the key concerns for recovery and management of this patient

Standard monitoring recommended by ASA



Medication

- λ Human error: most common
- λ All drugs should be clearly labelled; cross check before administering



ANESTHESIA LABELS © Division of Anesth. Pacif.		RE-ORDER AL 2000 1-800-957-8099 FAX 605-322-4666
VECURONIUM 10mg / 10mL	GLYCOPYRROLATE 10mg / 10mL	
FENTANYL 100mcg / 10mL	NEOSTIGMINE 10mg / 10mL	
PROPOFOL 10mg / 10mL		
LIDOCAINE 10mg / 10mL	EPHEDRINE 10mg / 10mL	
ROCURONIUM 10mg / 10mL	MIDAZOLAM 10mg / 10mL	
ATROPINE 10mg / 10mL	SUFENTANIL 10mg / 10mL	
SUCCINYLCHOLINE 10mg / 10mL	NEOSYNEPHRINE 10mg / 10mL	
	PANCURONIUM 10mg / 10mL	

Unanticipated Difficult Intubation Strategy - 'Call for help'

PLAN A:

Initial intubation Strategy
Elective intubation

Max 4

Rapid Sequence Induction

Max 3

Optimum position



Bougie



Alternative laryngoscope



PLAN B:

Secondary intubation Strategy

Not in Rapid Sequence

RSI

iLMA, pLMA
or cLMA



then fiberoptic,
Aintree & ETT 7.0



PLAN C:

Oxygenation and ventilation

Wake patient up

Consider **Sugammadex**

Facemask, oro-
or nasopharyngeal



cLMA, pLMA or iLMA



PLAN D:

Can't intubate;
Can't ventilate
CICV

Melker



Manujet & jet ventilation catheter



Surgical airway



rway

Post-anaesthesia Care

- λ Facilities and personnels
- λ Monitoring Pain
- λ relief Discharged
- λ criteria





POSTOPERATIVE PHASE

PREOPERATIVE PHASE

INTRAOPERATIVE PHASE



Preanaesthesia progress notes



Postanaesthesia progress notes



LIST OF THINGS ANESTHESIA is Blamed for :

- 1- DELAYS or being early
- 2- Everything
- 3- Bleeding
- 4- BP too high/too low
- 5- GLOBAL WARMING
- 6- TEEN PREGNANCY
- 7- SOIL EROSION
- 8- HARD TO OPEN KETCHUP PACKAGES
- 9- Lindsey Lohan
- 10 Michael JACKSON
- 11- FOX NEWS
- 12- MEMORY loss
- 13- PARKING problems



Avoid blame culture
Develop Help Culture

Post Crisis: Recommendations for colleagues

λ Be aware that such an adverse event could happen to you also

Discuss with your colleague or seniors. This is not weakness. This

λ *represents appropriate professional behaviour*

Listen to what your colleague wants to tell and support him/her with your professional expertise

λ

A professional work-up of that case based on fact is important for analysis and learning out of medical error.

λ

Senior/ colleague should offer support in discussing and briefing with patient/relative after an medical error.

λ

Changing definition of Anesthesia

- λ Word anaesthesia was coined from two greek words: “an” meaning without and “aesthesia” meaning sensation.
- λ Traditionally the goal of anaesthesia were described as **Amnesia, analgesia, and muscle relaxant.**
- λ More recently, Anaesthesia can be considered as a science of **reflex management.**



Aims of general anaesthesia

- In real there are Only 2 aims of GA
 - Narcosis: unrousable unconsciousness
 - Reflex Depression
- Reflexes may
 - Motor : Movement, coughing
 - Autonomic reflexes
 - Cardiovascular: BP, HR changes
 - Neuro-endocrine: Cortisol, vasopressin



ANAESTHESIA “A Modern Concept”

General Anesthesia can thus be defined as

- **A reversible iatrogenic state characterised by unarousable unconsciousness and reflex depression**



Present global scenario

Anesthesiologist worked in :

1. Operating theatre
2. Perioperative physician
3. Trauma , ICU care , Emergency
4. Pain physician
5. Palliative care provider

Reducing aspiration risk (fasting guideline)

Infant and children:

- λ formula milk- 6 hrs
- λ Breast milk: 4 hrs
- λ Clear fluid: 2 hrs

Adult

- λ Heavy meal: 8 hrs
- λ Light meal 6 hrs
- λ Clear fluid: 2 hrs

All Trauma patients; Pregnant Patient in labour: Considered to be full stomach

Obese
Diabetic
Pt with GERD
Hiatus Hernia
Considered to be high risk for aspiration:
Gastroprophylaxis even in full fasted state

Restrictive Vs liberal fluid

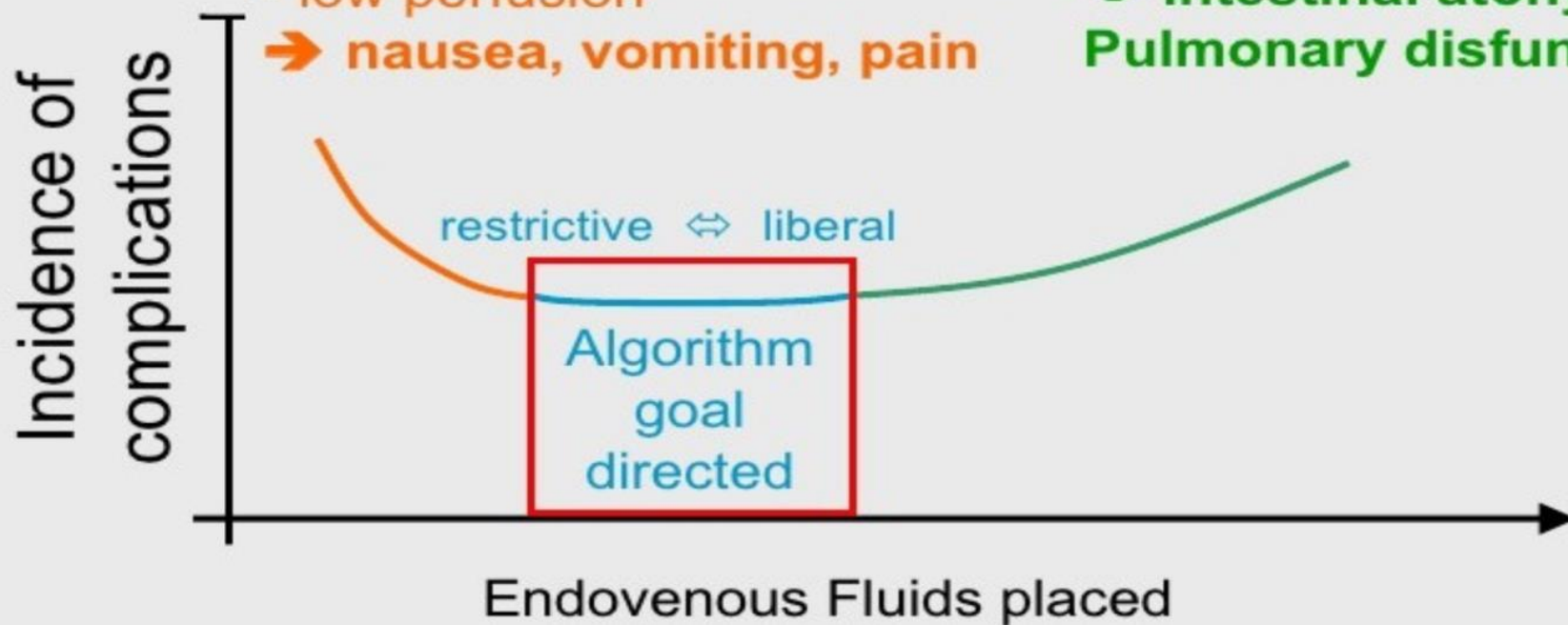
Therapeutic window of fluid management

Too restrictive:

- hypovolemia
- low perfusion
- ➔ nausea, vomiting, pain

Too liberal:

- oedema
- ➔ intestinal atony
- Pulmonary dysfunction



Rational use of Blood

Transfusion trigger checklist

List has to be filled for each RBC!!!!

(Exception: massive bleeding)

Hb < 6 g/dl

- Independent of any compensation possibility

Hb 6 - 8 g/dl

- Clinical symptoms for Anemic hypoxia (tachycardia, hypotension, ischemic ECG changes, lactate acidosis)
- Limited compensation, existing risk factors (e.g. coronary artery disease, heart failure, cerebrovascular insufficiency)
- (Other indication:)

In case of Hb > 8 g/dl transfusion is related to an unclear risk-benefit balance

- Hb > 8 g/dl (only indicated in individual cases; Very low recommendation level (2 C))



Post operative pain

- **Multimodal analgesia**
- **Preemptive preventive analgesia**
- **Greater use of regional anesthesia technique**
- **Regular analgesia technique not PRN**
- **Identify problematic patient and formulate management plan**

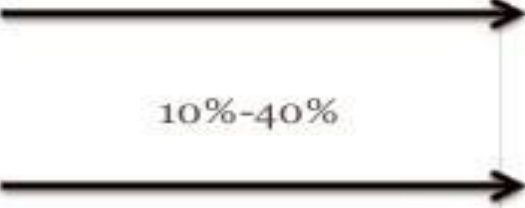



Why opioid free analgesia

Because opioids lead to:

- PONV → delay of start feeding
- Bladder bowel function
- Sedation delay mobilization , patient discharge
, Pulmonary complication
- immuno-suppressive effects infection cancer recurrent /mets
- Inadequate analgesia persistence post-op pain into chronic pain

GENERAL THROMBOPROPHYLAXIS RECOMMENDATIONS

Level of Risk	Estimated DVT Risk	Suggested Thromboprophylaxis
<u>Low</u> ➤ Minor surgery in mobile patients ➤ Medical patients who are fully mobile	< 10%	Early and aggressive ambulation
<u>Moderate</u> ➤ Medical pts, bed rest or sick ➤ Most general, open gynecologic or urologic surgery patients ➤ Moderate VTE + High bleeding risk	10%-40% 	LMWH, LDUH BID/TID or Fondaparinux Mechanical Thromboprophylaxis
<u>High Risk</u> ➤ Hip or knee arthroplasty, Major Trauma, SCI ➤ High VTE + High Bleeding risk	40% - 80% 	LMWH Mechanical Thromboprophylaxis

Hypothermia:peri-operative morbidity/mortality

Consequences of hypothermia

- λ Shivering/oxygen requirement increased: myocardial oxygen supply / demand
- Infection: Directly depress immune function, Vasoconstriction-
- λ reduced tissue oxygen- predispose to infection
- Delay wound healing
- λ Bleeding / transfusion: Depressed platelet and coagulation
- λ Depressed Cardiac function and risk for arrhythmias
- λ Delay recovery from anesthesia

Postoperative infection-Anesthetic role

- Antibiotic prophylaxis
- Hand hygiene
- Aseptic precaution for invasive procedures
- Fluid balance , blood transfusion
- Oxygen –avoiding hypoxia/hyperoxia



Safety first

- λ Unless Safe Anaesthesia is provided--> Safe Surgery will not be Possible and -->Safety of Patient cannot be ensured.



- λ So, Safe Anaesthesia-->Safe surgery-->Safe Patient

Thank you

