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PREOPERATIVE EVALUATION and risk assesment

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Aims of preoperative assessment

- Opportunity to identify co-morbidities.
- Optimize any co-morbidities.
- Establish a rapport.
- plane

COMPONENTS OF THE PROCESS

- Preoperative history and physical examination
- Preanesthesia evaluation
- Risk assessment

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TIMING AND LOGISTICS OF PREOPERATIVE EVALUATION

Patients who are <65 years old who have stable, adequately treated mild medical conditions, and undergoing low-risk.

Intermediate and high-risk patients or patients having high-risk procedures rhaving low risk procedures with monitored anesthesia care.

The greatest benefits to early preoperative anesthesia consultation appear to be in high-risk patients (eg, those with ischemic heart disease, ASA-PS ≥4, frailty) having intermediate-to high-risk surgeries (eg, vascular surgery) [8].

- Reduce unnecessary testing
- Case cancellations
- Delays on the day of surgery
- length of stay
- Mortality

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Preoperative history and physical examination

- Preoperative evaluation (ie, the preoperative history and physical examination) may be performed by surgeons, primary care physicians, specialists, anesthesiologists, and advanced practice providers.

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Pre anesthesia evaluation

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Pre anesthesia evaluation

- MUST be performed by an anesthesia provider

- Should accomplish the following :

✓Create a plan for anesthesia and postoperative care

✓Educate patients and families about anesthesia care

✓Determine the appropriate setting for care

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Pre anesthetia evaluation

Patient interview

Focused examination of the airway, lungs, and heart

Review of pertinent medical records

Indicated preoperative tests

Consultations with specialists if necessary

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RISK ASSESSMENT

- Perioperative risk reflects both the risks associated with the patient's medical conditions and the risk associated with the planned procedure.

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Patient risk factors for perioperative morbidity and mortality

The ASA-PS

Category	Health status	Examples
ASA 1	A normal healthy patient	Nonsmoker, BMI <30
ASA II	A patient with mild systemic disease	No functional limitations and a well-controlled disease (e.g., treated hypertension, obesity with BMI under 35, frequent social drinker, or cigarette smoker
ASA III	A patient with a severe systemic disease that is not life-threatening	Some functional limitation due to disease (e.g., poorly treated hypertension or diabetes, morbid obesity, chronic renal failure, a bronchospastic disease with intermittent exacerbation, stable angina, implanted pacemaker)
ASA IV	A patient with a severe systemic disease that is a constant threat to life	(e.g., unstable angina, poorly controlled COPD, symptomatic CHF, recent (less than three months ago) myocardial infarction or stroke)
ASA V	A moribund patient who is not expected to survive without the operation	(e.g., ruptured abdominal aortic aneurysm, massive trauma, and extensive intracranial hemorrhage with mass effect)
ASA IV	A brain-dead patient whose organs are being removed with the intention of transplanting them into another patient	

Surgical risk

- emergency,
- intraperitoneal,
- intra-abdominal,
- intrathoracic,
- major vascular,
- open, longer procedures,
- those associated with greater blood loss and intraoperative fluid shifts

Risk assessment tools

- The ACS NSQIP Surgical Risk Calculator

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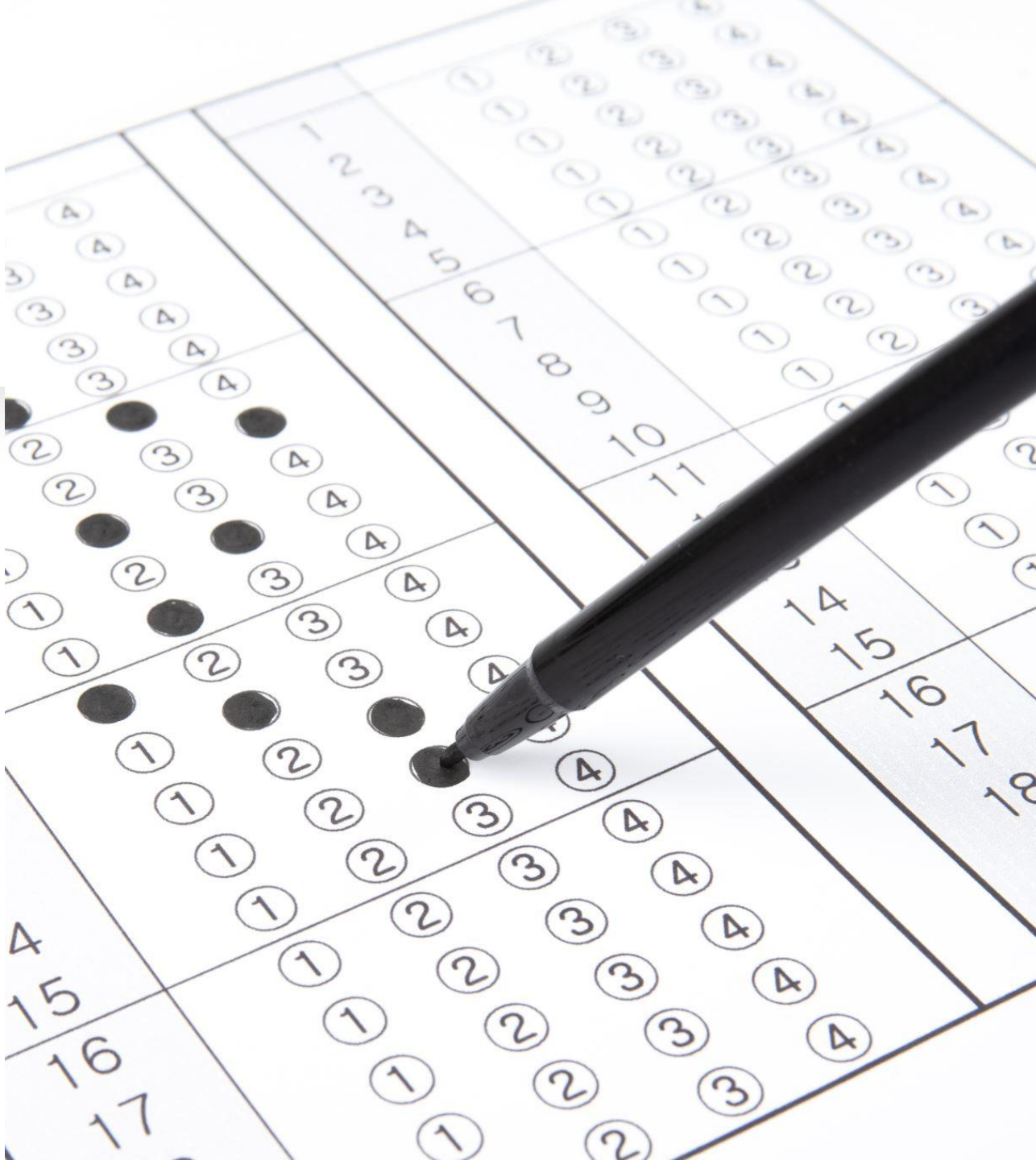
CLINICAL EVALUATION



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- ❑Medical and surgical history
- ❑Assessing functional capacity
- ❑Physical examination

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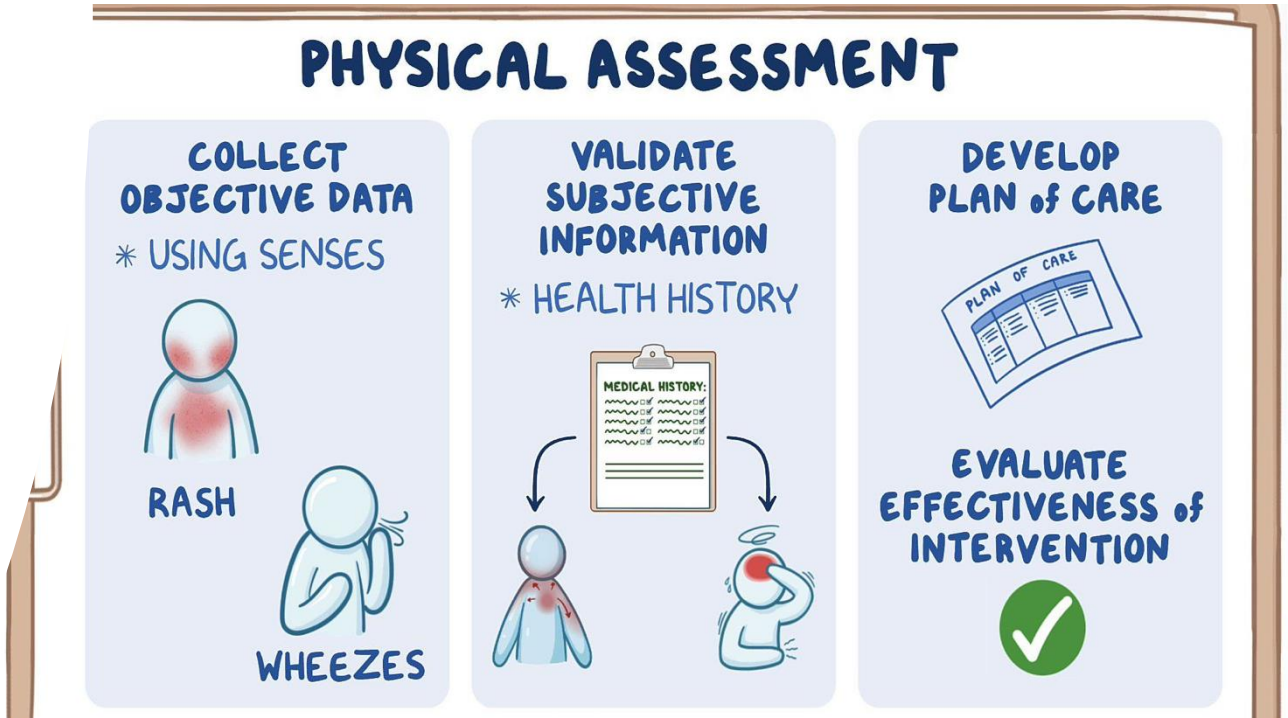
Conduct of Assessment

- History, Physical examination, and Investigations +/- further consultations.

- Make sense of collected data to formulate anaesthetic plan.



History

- Profile:
  - Name/ Age/ Gender/ Weight/ Height
  - Type of surgery
  - Smoking history
  - Fasting hours
- Review of Systems (focused):

Cardiovascular	Respiratory	Neurologic	GIT	Renal	
IHD (CP /Angina/ stent) CHF (PNDs/ orthopnea) Exercise intolerance Palpitations	Asthma COPD OSA Recent URTI/LRTI Cough/ sputum Smoking	-Epilepsy -CVA/TIA -Denervation disease	GERD PUD Hiatus Hernia Intestinal obstruction.	CRF ARF On dialysis	Blood disorders Antiplatelet Anticoagulation

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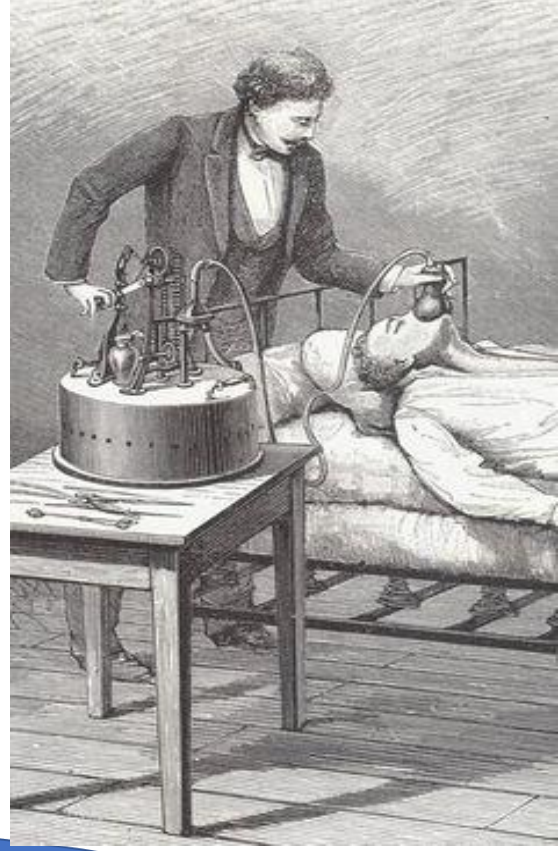
History



- Past medical history.
- Medications including allergies.
- Surgical history including previous anaesthesia.

- PREVIOUS ANAESTHESIA:
- Very important part of previous anaesthesia history is airway related history.
  - Previous difficult airway.
  - Previous airway surgeries/ burns.
  - Snoring/ obstructed breathing.

- Previous anesthesia
- Type of anesthesia
- Complications: difficult airway management/delayed emergence / PONV)-
- Family hx.

- Always check previous records/ old file.

Physical Examination

- General appearance: Obesity, malnutrition, pregnancy head and neck ..etc
- Vital signs: BP, HR, RR.

- Cardiac exam

Rate and rhythm
Heart sound

- Respiratory exam

Sign of respiratory distress
Respiratory rate
Auscultate Lung

- Neuro exam

Metal status
Gross motor/gross sensory

Airway examination

- Purpose: To anticipate any possible difficulty in ventilation and intubation.
- Importance: airway and respiratory events are the most common events during anaesthesia. (most common: sore throat and dental damage).

Method of Assessment (L.E.M.O.N)

L

Look externally

face / mouth opening/ teeth / tongue

E

Evaluate the three distances

interincisal / thyromental / sternomental distance

M

Mallampati score (3 or 4)

O

Obstruction (presence of any obstruction like:

peri-tonsillar abscess , thyroid mass , VC nodule)

N

Neck mobility

Components of the preoperative airway physical examination

Airway examination component	Nonreassuring findings
Length of upper incisors	Relatively long
Relationship of maxillary and mandibular incisors during normal jaw closure	Prominent "overbite" (maxillary incisors anterior to mandibular incisors)
Relationship of maxillary and mandibular incisors during voluntary protrusion of mandible*	Patient cannot bring mandibular incisors anterior to (in front of) maxillary incisors
Interincisor distance	Less than 3 cm
Visibility of uvula	Not visible when tongue is protruded with patient in sitting position (eg, Mallampati class >2)
Shape of palate	Highly arched or very narrow
Compliance of mandibular space	Stiff, indurated, occupied by mass, or non-resilient
Thyromental distance	Less than three ordinary finger-breadths
Length of neck	Short
Thickness of neck	Thick
Range of motion of head and neck	Patient cannot touch tip of chin to chest or cannot extend neck

This table displays some findings of the airway physical examination that may suggest the presence of a difficult intubation. The decision to examine some or all of the airway components shown on this table depends on the clinical context and judgment of the practitioner. The table is not intended as a mandatory or exhaustive list of the components of an airway examination. The order of presentation in this table follows the "line of sight" that occurs during conventional oral laryngoscopy.

* A more objective measurement related too mandibular protrusion is the upper lip bite test, which assesses the patient's ability to reach and cover the upper lip with their lower incisors. Grading for the upper lip bite test is as follows:

- Grade 1: The patient can fully cover the upper lip with lower incisors
- Grade 2: The patient can partially cover the upper lip with lower incisors
- Grade 3: The patient cannot reach the upper lip with lower teeth

From: Apfelbaum JL, Hagberg CA, Caplan RA, et al. Practice guidelines for management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology 2013; 118:251. DOI: 10.1097/ALN.0b013e31827773b2.

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INSPECTION

1. Does it look difficult?

- Obesity
- Beard
- Deformities, masses, scars or burns.
- Large breasts in females.
- Neck deformities or large neck fat pad
- Position of the mandible: excessive protrusion or recession.
- Nasal deformity, deviation, patency of nostrils.
- Mouth asymmetry, deviation, high arched palate, large tonsils, abcess.
- Dentition: protrusion, missing/loose, hygiene, crowns and caps.

INSPECTION

2. Mouth opening.

- At least 3 fingers of patient's own.

3. Mobility of the lower jaw and neck.

- Ability of protruding the lower jaw in front of the upper one.
- Neck extension and flexion.

INSPECTION

4. *Mallampati* score

- Patency of mouth and throat cavities (tongue/mouth).

class	Structures identified when pt seated

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Mallampati One

1	Tonsillar pillars, Uvula , soft & hard palate

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Mallampati two

2	Uvula ,soft & hard palate

Mallampati three

3	Base of uvula ,soft & hard palate

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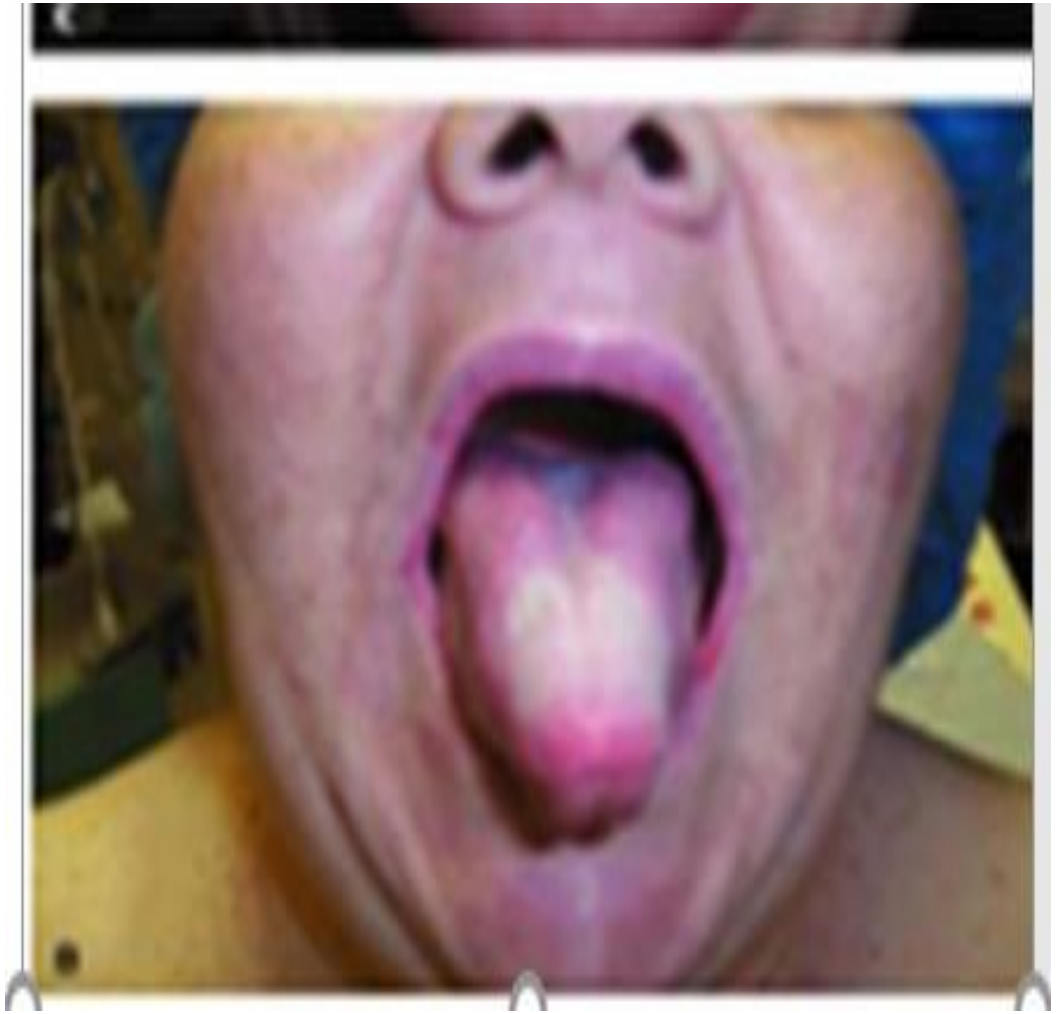
Mallampati four

4	Only hard palate is can be seen



PALPATION

- Submandibular and submental area for masses.

- Tracheal centralization.

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Three distances

Thyro-mental distance

- ✓ It describes the distance between the mentum & thyroid notch
- ✓ It helps in determining how readily the laryngeal axis will fall in line with the pharyngeal axis
- ✓ It is normally > 6cm in adults .

Sterno- mental distance

- ✓ It describes the distance between the mentum & suprasternal notch
- ✓ If this distance less than 12 cm it predicts difficult intubation

Inter-incisor distance

- ✓ It describes the distance between the upper and lower incisors
- ✓ It is normally 4.5 cm

Assessment for conditions that increase perioperative risk

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Criteria and medical conditions for which preoperative evaluation is recommended before the date of surgery

Medical condition	Other criteria
General: ▪ Normal activity inhibited ▪ Monitoring or medical assistance at home within two months ▪ Hospital admission within two months ▪ Obesity (BMI >40 kg/m^2) ▪ Frailty ▪ Malnourishment **Cardiovascular:** ▪ Coronary artery disease ▪ Arrhythmias ▪ Systolic blood pressure >160 mmHg or diastolic blood pressure >100 mmHg ▪ Heart failure ▪ Unrepaired or complex congenital heart disease ▪ Pulmonary hypertension ▪ Severe valvular disease **Pulmonary:** ▪ Asthma, severe ▪ COPD with symptoms ▪ Exacerbation or progression of COPD or asthma within two months ▪ Previous airway surgery ▪ Unusual airway anatomy ▪ Airway tumor or obstruction ▪ Home ventilatory assistance or monitoring ▪ OSA without PAP therapy **Endocrine:** ▪ Diabetes requiring insulin therapy ▪ Adrenal disorders ▪ Active thyroid disease **Central nervous system/Neuromuscular:** ▪ Prior stroke ▪ Aneurysm ▪ Degenerative disorder with moderate to severe disability ▪ Poorly controlled seizure disorder ▪ CNS disease (eg, multiple sclerosis) ▪ Myopathy or other muscle disorders **Hepatic:** ▪ Active hepatobiliary disease or compromise **Renal:** ▪ Renal insufficiency or failure **Hematologic:** ▪ Anemia ▪ Thrombocytopenia ▪ Bleeding disorder ▪ Anticoagulant therapy **Musculoskeletal:** ▪ Kyphosis or scoliosis compromising function ▪ Temporomandibular joint disorder limiting mouth opening ▪ Cervical or thoracic spine injury/disease **Oncology:** ▪ Chemo- or radiotherapy within last two months ▪ Significant physiologic compromise from disease or treatment	**Age:** ▪ >65 years, unless surgery is minor (eg, cataract, cystoscopy) and under monitored anesthesia care **Language:** ▪ Patient or parent/guardian cannot hear, speak, or understand the language of clinicians **Anesthesia related:** ▪ Patient has had previous difficult intubation, paralysis or nerve damage during anesthesia, severe allergic reaction, or cardiac arrest during anesthesia ▪ Patient or family member has had previous elevated temperature or malignant hyperthermia during anesthesia, or has pseudocholinesterase deficiency **Procedure related:** ▪ Intraoperative blood transfusion likely ▪ ICU admission likely ▪ High-risk surgery **Pregnancy (for non-obstetric procedures):** ▪ Patient is pregnant (unless the procedure is termination)

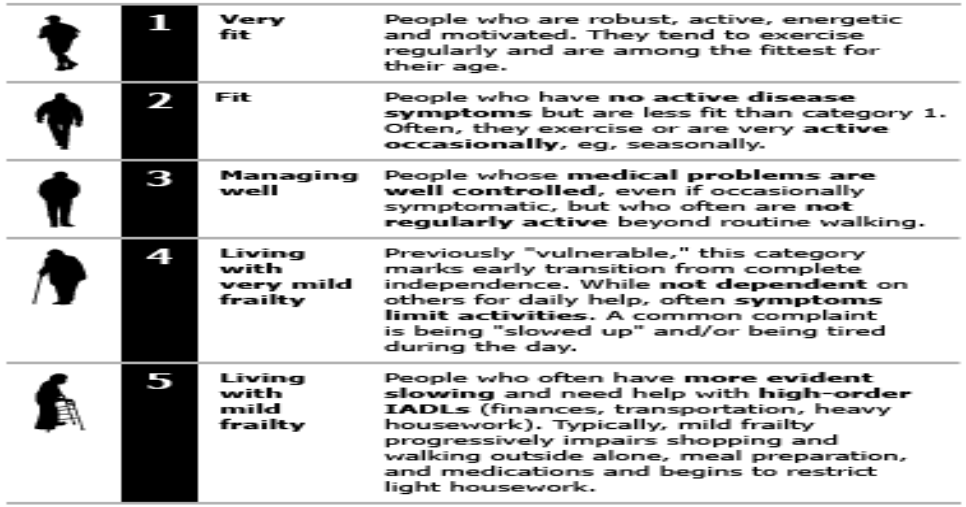
This table shows medical conditions and other patient criteria for preanesthesia evaluation before the day of surgery. For further information, refer to UpToDate content on preanesthesia evaluation for noncardiac surgery.

BMI: body mass index; CNS: central nervous system; COPD: chronic obstructive pulmonary disease; ICU: intensive care unit; OSA: obstructive sleep apnea; PAP: positive airway pressure.

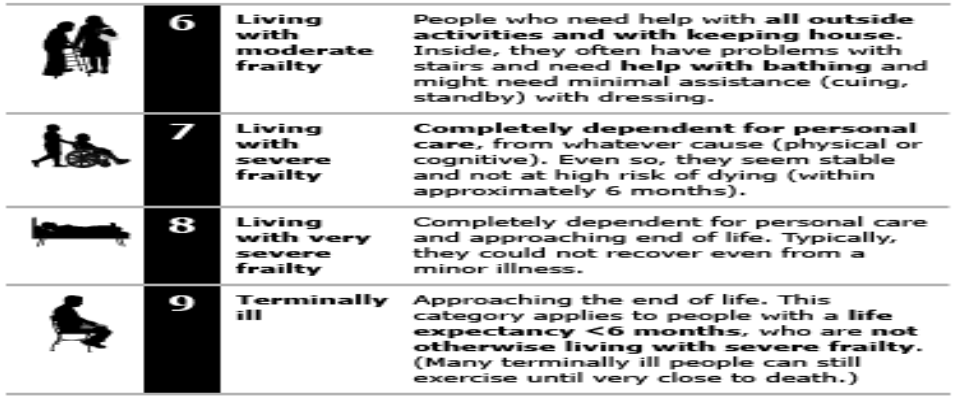
Older age

- Frailty ：65 Y/O ,MAJOR SURGERY

Clinical Frailty Scale



1	**Very fit**	People who are robust, active, energetic and motivated. They tend to exercise regularly and are among the fittest for their age.
2	**Fit**	People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, eg, seasonally.
3	**Managing well**	People whose **medical problems are well controlled**, even if occasionally symptomatic, but who often are **not regularly active** beyond routine walking.
4	**Living with very mild frailty**	Previously "vulnerable," this category marks early transition from complete independence. While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being "slowed up" and/or being tired during the day.
5	**Living with mild frailty**	People who often have **more evident slowing** and need help with **high-order IADLs** (finances, transportation, heavy housework). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation, and medications and begins to restrict light housework.



6	**Living with moderate frailty**	People who 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 (cuing, standby) with dressing.
7	**Living with severe frailty**	**Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within approximately 6 months).
8	**Living with very severe frailty**	Completely dependent for personal care and approaching 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 living with severe frailty**. (Many terminally ill people can still exercise until very close to death.)

Scoring frailty in people with dementia

The degree of frailty generally 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 question/story, and social withdrawal.

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

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

In **very severe dementia** they are often bedfast. Many are virtually mute.

IADLs: instrumental activities of daily living.

Older age

- **Cognitive dysfunction**
- **History of falls** One study found that 100 percent of patients who had fallen three or more times in the six months before major surgery had a perioperative complication
- **Dependency in activities of daily living**

Cardiovascular disease

- **Hypertension**
- The 2024 American College of Cardiology/American Heart Association (AHA/ACC) guideline on cardiac evaluation for noncardiac surgery recommends that BP measurements on the day of surgery should not impact decision-making, and that elevated BP >180/110 mmHg only impacts outcomes in patients with revised cardiac risk index (RCRI) risk factor.
- Regardless of BP on the day of surgery, if patients have taken their BP medications, are asymptomatic, and there is evidence that the patient's BPs before the day of surgery are usually <160/100, then proceeding with planned anesthesia is acceptable.

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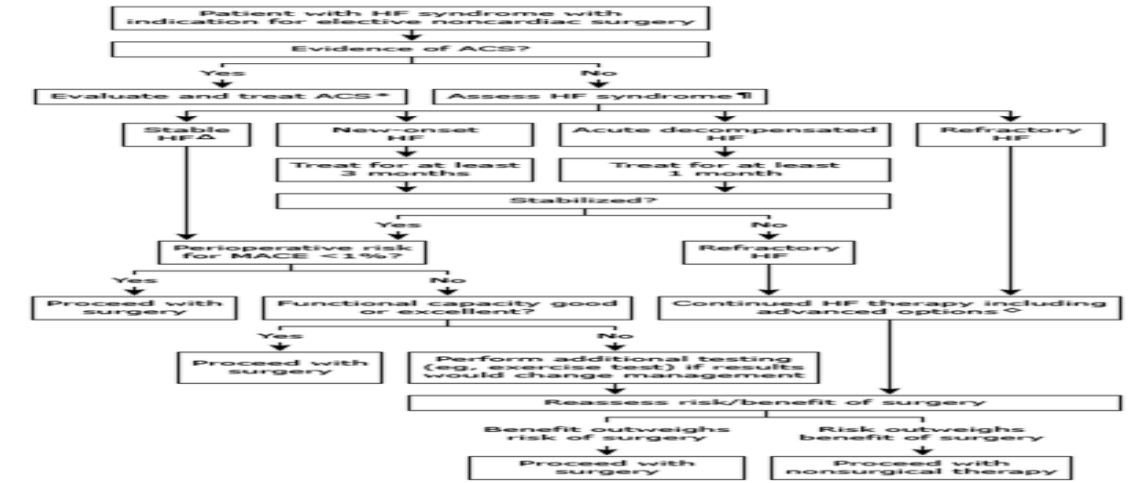
HEART FAILURE

Algorithm for patients with a heart failure syndrome with an indication for elective noncardiac surgery



ACS: acute coronary syndrome; HF: heart failure; MACE: major adverse cardiac events; BNP: B-type natriuretic peptide; NT-proBNP: N-terminal pro-BNP.

* Refer to UpToDate content on management of ACS.

¶ Assessment of the HF syndrome includes clinical evaluation with selective use of preoperative tests based upon the likelihood of testing changing management. While we do not recommend routine preoperative measurement of BNP or NT-proBNP levels, measurement of BNP or NT-proBNP is helpful in patients with suspected HF when the diagnosis is uncertain and may also be helpful in patients with HF when disease stability is uncertain. During treatment with sacubitril-valsartan, plasma NT-proBNP levels (but not plasma BNP levels) can be used to assess HF.

Δ Stable HF syndromes include stable HF as well as asymptomatic left ventricular dysfunction.

◇ Refer to UpToDate content on management of refractory heart failure.

- **Undiagnosed murmurs –**

Patients with undiagnosed murmurs require a careful history. Any electrocardiogram (ECG) abnormalities, symptoms of dyspnea, chest pain, syncope or near-syncope, or suspicion of valvular disease in individuals >50 years of age warrant an echocardiogram.

- **Coronary artery disease** –A goal for preoperative evaluation is to identify a small subset of patients who have unstable or severe CAD that will pose a significant risk with the planned surgical procedure. Even patients with significant CAD have a low risk when having low-risk surgeries

Cerebrovascular disease

- **Timing of surgery after ischemic stroke —** We suggest delaying truly elective surgery for at least three months after stroke, and if possible 9 to 12 months, to reduce the risk of recurrent stroke

Risk factors for perioperative stroke[1-7]

Patient factors
Older age
Cardiovascular disease (hypertension, recent MI, atrial fibrillation, HF, cardiac valvular disease)
Prior stroke
History of TIA
Renal disease (acute renal failure, dialysis dependence)
Diabetes
COPD
Female sex
Carotid stenosis
Tobacco use
Non-cardioselective beta blocker therapy
Surgical factors*
Cardiac surgery
Neurosurgery
Carotid endarterectomy
Major vascular surgery
Major intraabdominal procedures
Pulmonary resection
Transplant surgery
Arthroplasty
Shoulder surgery in the beach chair position
Head and neck surgery

MI: myocardial infarction; HF: heart failure; TIA: transient ischemic attack; COPD: chronic obstructive pulmonary disease.

* Rates of stroke after cardiac surgery and after carotid endarterectomy are higher than the rates of stroke after non-cardiac, nonneurologic surgery. For further information refer to UpToDate content on neurologic complications of cardiac surgery and complications of carotid endarterectomy.

References:

1. *Mashour GA, Shanks AM, Kheterpal S. Perioperative stroke and associated mortality after noncardiac, nonneurologic surgery. Anesthesiology 2011; 114:1289.*
2. *Axelrod DA, Stanley JC, Upchurch GR Jr, et al. Risk for stroke after elective noncarotid vascular surgery. J Vasc Surg 2004; 39:67.*
3. *Sharifpour M, Moore LE, Shanks AM, et al. Incidence, predictors, and outcomes of perioperative stroke in noncarotid major vascular surgery. Anesth Analg 2013; 116:424.*
4. *Jørgensen ME, Torp-Pedersen C, Gislason GH, et al. Time elapsed after ischemic stroke and risk of adverse cardiovascular events and mortality following elective noncardiac surgery. JAMA 2014; 312:269.*
5. *Bateman BT, Schumacher HC, Wang S, et al. Perioperative acute ischemic stroke in noncardiac and nonvascular surgery: incidence, risk factors, and outcomes. Anesthesiology 2009; 110:231.*
6. *Smilowitz NR, Gupta N, Ramakrishna H, et al. Perioperative Major Adverse Cardiovascular and Cerebrovascular Events Associated With Noncardiac Surgery. JAMA Cardiol 2017; 2:181.*
7. *Kikura M, Oikawa F, Yamamoto K, et al. Myocardial infarction and cerebrovascular accident following non-cardiac surgery: differences in postoperative temporal distribution and risk factors. J Thromb Haemost 2008; 6:742.*

Pulmonary disease

- Estimation of pulmonary risk is a standard element of all preoperative medical evaluations.

- Preoperative evaluation of pulmonary risk, including pulmonary function testing, the risks associated with pulmonary hypertension, and strategies to prevent pulmonary complications.

- CPET , the six-minute walk test

Obstructive sleep apnea

STOP-Bang questionnaire

☐ Yes	☐ No	**Snoring?** Do you **snore loudly** (loud enough to be heard through closed doors, or your bed partner elbows you for snoring at night)?
☐ Yes	☐ No	**Tired?** Do you often feel **tired, fatigued, or sleepy** during the daytime (such as falling asleep during driving)?
☐ Yes	☐ No	**Observed?** Has anyone **observed** you **stop breathing** or **choking/gasping** during your sleep?
☐ Yes	☐ No	**Pressure?** Do you have or are you being treated for **high blood pressure**?
☐ Yes	☐ No	**Body mass index more than 35 kg/m^2?**
☐ Yes	☐ No	**Age older than 50 years old?**
☐ Yes	☐ No	**Neck size large (measured around Adam's apple)?** Is your shirt collar 16 inches or larger?
☐ Yes	☐ No	**Gender (biologic sex) = Male?**
Scoring criteria:		
Low risk of OSA: Yes to 0 to 2 questions		
Intermediate risk of OSA: Yes to 3 to 4 questions		
High risk of OSA: Yes to 5 to 8 questions		

OSA: obstructive sleep apnea.

References:
1. *Chung F, Yegneswaran B, Liao P, et al. STOP questionnaire: a tool to screen patients for obstructive sleep apnea. Anesthesiology 2008; 108:812.*
2. *Chung F, Subramanyam R, Liao P, et al. High STOP-Bang score indicates a high probability of obstructive sleep apnoea. Br J Anaesth 2012; 108:768.*

Endocrine disease

- **Diabetes**
- Increased risk of perioperative infection, postoperative cardiovascular morbidity and mortality, and comorbidities
- Optimal blood glucose targets have not been determined,

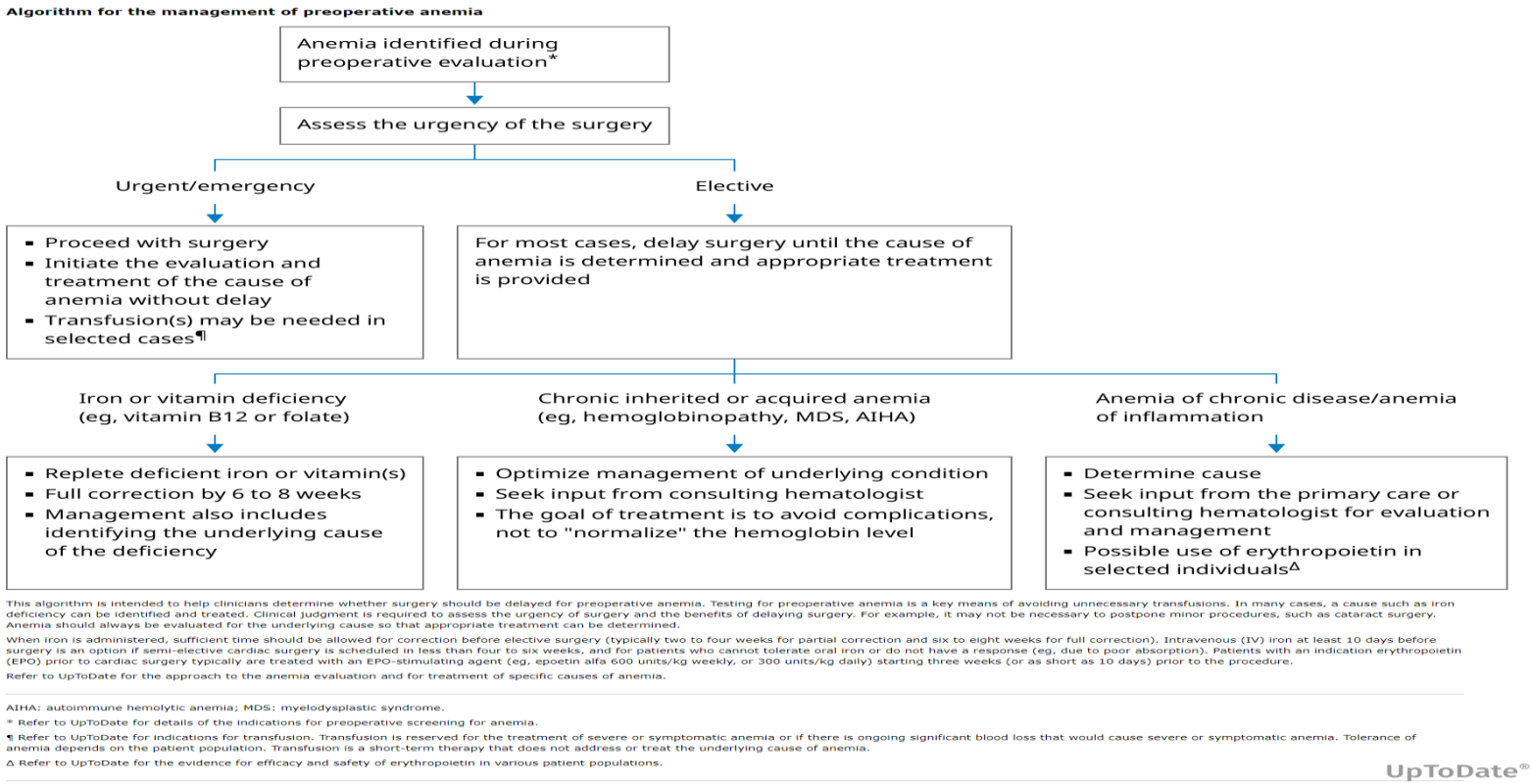
- some procedures (eg, joint replacement or major spine surgeries),some surgeons have established absolute A1C cutoffs for performing elective surgery (eg, <7.5 to 8 percent).

Endocrine disease

- Thyroid disease
- Adrenal disorders
- Pituitary abnormalities (DIFICULT AIRWAY)

Hematologic disorders

- **Anemia**



Hematologic disorders

Bleeding risk

Venous thromboembolism (VTE) risk

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AMERICAN SOCIETY OF PLASTIC SURGEONS®

THROMBOSIS RISK FACTOR ASSESSMENT

VTE
ASPS CAMPAIGN FOR AWARENESS

CHOOSE ALL THAT APPLY

EACH RISK FACTOR REPRESENTS 1 POINT

- ❒ Age 41-60 years
- ❒ Minor surgery planned
- ❒ History of prior major surgery (< 1 month)
- ❒ Varicose veins
- ❒ History of inflammatory bowel disease
- ❒ Swollen legs (current)
- ❒ Obesity (BMI > 25)
- ❒ Acute myocardial infarction
- ❒ Congestive heart failure (<1 month)
- ❒ Sepsis (<1 month)
- ❒ Serious lung disease including pneumonia (<1 month)
- ❒ Abnormal pulmonary function (COPD)
- ❒ Medical patient currently at bed rest
- ❒ Other risk factors

_____

EACH RISK FACTOR REPRESENTS 2 POINTS

- ❒ Age 60-74 years
- ❒ Arthroscopic surgery
- ❒ Malignancy (present or previous)
- ❒ Major surgery (> 45 minutes)
- ❒ Laparoscopic surgery (> 45 minutes)
- ❒ Patient confined to bed (> 72 hours)
- ❒ Immobilizing plaster cast (< 1 month)
- ❒ Central venous access

EACH RISK FACTOR REPRESENTS 3 POINTS

- ❒ Age over 75 years
- ❒ History of DVT/PE
- ❒ Family history of thrombosis*
- ❒ Positive Factor V Leiden
- ❒ Positive Prothrombin 20210A
- ❒ Elevated serum homocysteine
- ❒ Positive lupus anticoagulant
- ❒ Elevated anticardiolipin antibodies
- ❒ Heparin-induced thrombocytopenia (HIT)
- ❒ Other congenital or acquired thrombophilia
  If yes:

Type:_____

** most frequently missed risk factor*

EACH RISK FACTOR REPRESENTS 5 POINTS

- ❒ Elective major lower extremity arthroplasty
- ❒ Hip, pelvis or leg fracture (< 1 month)
- ❒ Stroke (< 1 month)
- ❒ Multiple trauma (< 1 month)
- ❒ Acute spinal cord injury (paralysis) (< 1 month)

FOR WOMEN ONLY (EACH REPRESENTS 1 POINT)

- ❒ Oral contraceptives or hormone replacement therapy
- ❒ Pregnancy or postpartum (< 1 month)
- ❒ History of unexplained stillborn infant, recurrent spontaneous abortion ≥3), premature birth with toxemia or growth-restricted infant

TOTAL RISK FACTOR SCORE

2005 Caprini Risk Assessment Model
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Interpretation:

Total Risk Factor Score	Risk Level	DVT Incidence	Prophylaxis Regimen*
0 - 1	Low	<10%	No specific measures; early ambulation
2	Moderate	10 - 20%	ES, IPC, LDUH (5000U BID), or LWMH (<3400 U)
3 - 4	High	20 - 40%	IPC, LDUH (5000U TID), or LMWH (>3400U)
≥5	Highest	40 - 80% with 1 - 5% mortality	Pharmacological: LDUH, LMWH (>3400 U), Warfarin, or FXa I alone or in combination with ES or IP

*Where: ■ ES – elastic stockings ■ IPC – intermittent pneumatic compression ■ LDUH – low dose unfractionated Heparin ■ LMWH – low molecular weight Heparin ■ FXa I – Factor X inhibitor

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Malnutrition

- Malnutrition is a strong predictor of perioperative mortality and morbidity, longer length of stay postoperatively, higher readmission rates, and increased costs of care .
- It is estimated that 50 percent or more of older adult patients having major surgery are undernourished .
- Patients screened as nutritionally at risk before major surgery may benefit from preoperative oral nutritional supplements with a minimum of 18 g protein two to three times per day for 7 to 14 days .

Obesity

- Obesity itself is not consistently associated with an increased risk of major adverse outcomes and is not a factor in most commonly used preoperative risk screening tool.

- obesity is associated with difficulty with airway management, positioning-related peripheral nerve injuries, wound infection, and with a number of comorbidities that increase perioperative risk, including OSA, heart disease, hypertension, and diabetes mellitus.

- Smoking
- Alcohol

Premedication

- Anxiolysis
- Prevention of aspiration
- DVT / PE prophylaxis
- Antibiotics prophylaxis

Anxiolysis

- Visit and interview and establishing good rapport with patient.
- Medications:
  - Benzodiazepines:
    - Diazepam,
    - Midazolam: I.V. (shorter acting than Diazepam) (oral liquid form for children)
  - Opioids:
    - Morphine
    - Pethidine

Perioperative Aspiration

- Risk factors:
  - Fasting state: incomplete
  - Surgical condition:
    - Intestinal obstruction
    - Severe Pain
  - Medications: opioid use
  - Patient related
    - Obesity
    - Gastro-esophageal Reflux disease (GERD)
    - Hiatus Hernia
    - Pregnancy

THE UNIVERSITY OF JORDAN

Prevention of aspiration ASA Fasting Guidelines

Clear fluid	**2 hours**	Water , Fruit juice without pulp,
Milk		
Human	**4 hours**	
Infant formula	**6 hours**	
Light Foods	**6 hours**	Fruits , juice with pulp, Vegetables
Heavy foods	**8 hours**	Fatty meals , meats

Drugs used to decrease incidence of aspiration

❑H2 Blockers

- Classes include Cimetidine, Ranitidine (Zantac), Famotidine.
- They block histamine receptor ability to induce acid secretion by proton pump.
  - ➢ they consequently reduce gastric fluid volume and acidity

❑Antacids

- Given ½ an hour before induction : 30 ml of sodium citrate
  - ➢ Reduce gastric acidity only

❑PPI

- Omeprazole, lansoprazole, and esomeprazole .
  - ✓ Binds to H+ / K+ pump on parietal cell.
  - ✓ Given 40 mg IV 30 min before surgery .
  - ✓ Reduce both volume and acidity

❑Metoclopromide

- ➢ Act on dopamine receptors
- ➢ increase gastric motility & lower esophageal sphincter tone
- ➢ Reduce gastric fluid volume only

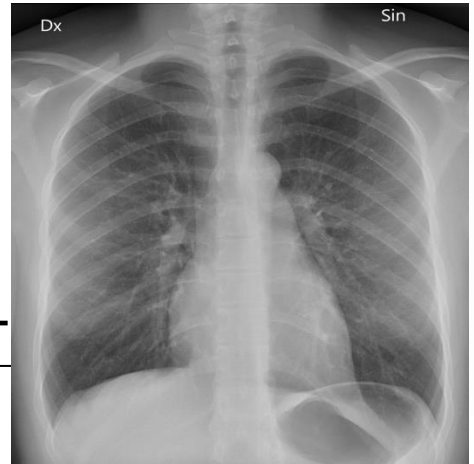
PREOPERATIVE TESTING

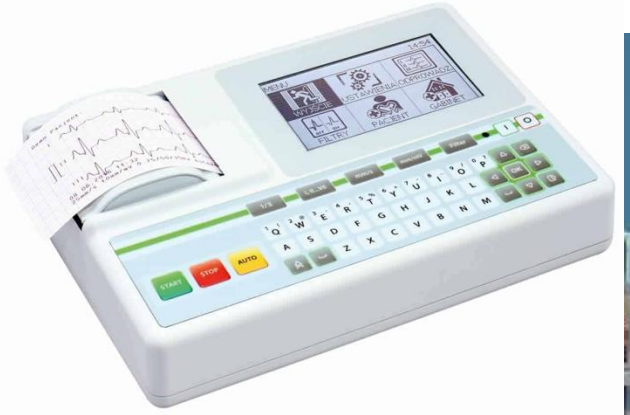
Preoperative investigations

- Routine (test ordered in the absence of a specific clinical indication) testing does not add much to the preoperative assessment.

- Guided by history, physical examination, and nature of surgery.

- Haemoglobin/haematocrit.
- Urine Analysis.
- Chest radiograph (CXR).
- Electrocardiograph (ECG).
- Pulmonary Function Tests (PFT





- CBC — Advanced age/ Anemic pt/ Bleeding /chronic disease (kidney liver heart)
- KFT — Diabetics/ HTN/ chronic disease / on medications like diuretics , digoxin ,ACEI
- Sugar — Diabetics / HTN/ chronic disease / on steroid
- LFT — Liver disease / malnourished pt
- Coagulation — Bleeding disorder/ Kidney disease/ Liver disease/ pt on anticoagulants

Investigations

CXR

- ✓Indicated in
  - ➢patients with respiratory or cardiac disease
  - ➢smokers
  - ➢patients with recent LRTI

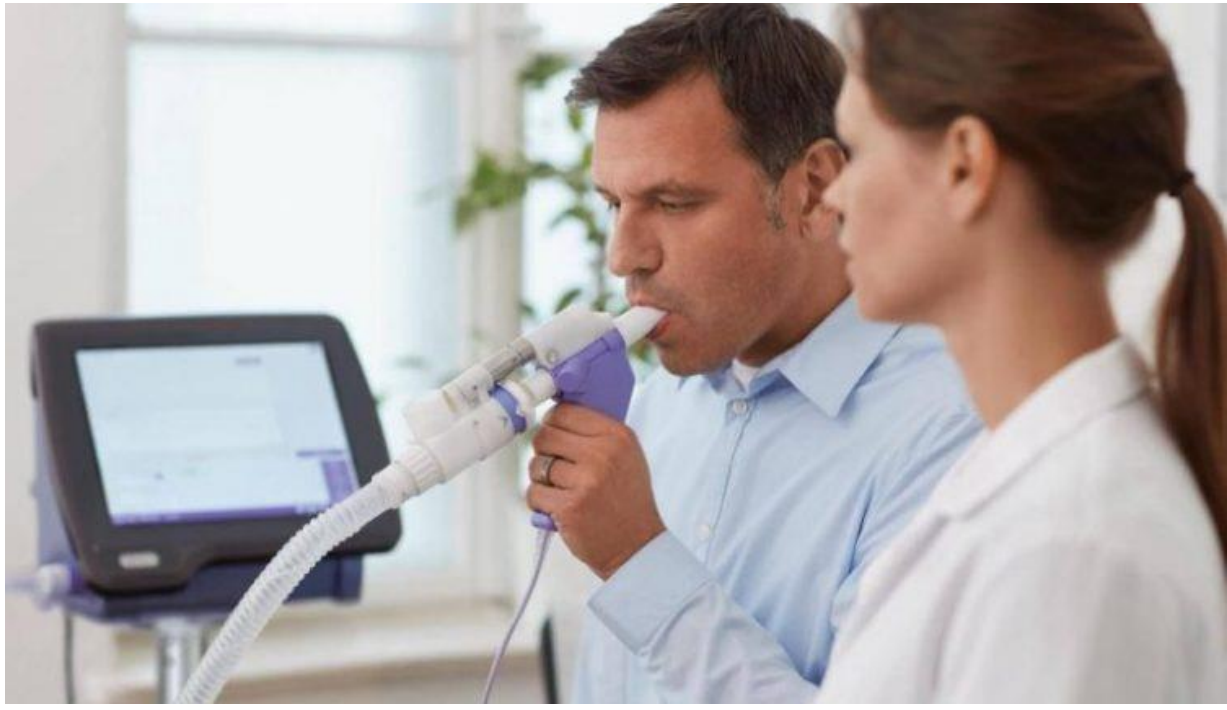
ECG

- ✓Indicated in
  - ➢patients with respiratory or cardiac disease
  - ➢Advanced Age (M: 55y F: 65y)
  - ➢Any patient with CAD risk factors : (HTN, DM, hyperlipidemia , exercise intolerance)

Investigations

Pulmonary Function test:

- Identifying patients at respiratory risk, evaluating the risk, and finding modified factors to decrease risk



Indicated in:

- Obstructive lung disorders
- Restrictive lung disorders
- Neuromuscular disorders

Includes mainly

- ❑Spirometry
- ❑ABGs

Diagnostic testing that may be considered for patients anticipating anesthesia and procedures, for suspected but undiagnosed diseases, or progressive or unstable conditions

Condition	Tests to consider for evaluation
Age >65	Creatinine, hemoglobin
Alcohol use disorder	ECG, electrolytes, hemoglobin, LFTs, platelet count, PT/INR
Anasarca	Albumin, BUN, creatinine, ECG, electrolytes, TSH, T3, T4
Anemia	CBC, creatinine, ferritin, iron, transferrin saturation, TSH, Vit B_{12}
Bleeding disorder (personal or family history)	LFTs, platelet count, PT/INR, PTT
Blood loss (anticipated) significant	Hemoglobin, type and screen
BMI <16	Albumin, ECG, electrolytes, hemoglobin, PT/INR, TSH, T3, T4
BMI >50	ECG, HgA1c/glucose
Cardiac disease:	
▪ Arrhythmias (new or undiagnosed brady, irregular, or tachy)	BNP or NT-proBNP, ECG, electrolytes, hemoglobin, TSH, T3, T4, echocardiogram
▪ Chest pain (new or worsening) and consistent with ischemic heart disease	BNP or NT-proBNP, ECG, hemoglobin, stress test
▪ Heart failure (decompensated or NYHA class 3 or 4)	BNP or NT-proBNP, chest radiograph, creatinine, ECG, electrolytes, hemoglobin, echocardiogram
▪ Murmur (undiagnosed)	BNP or NT-proBNP, ECG, echocardiogram
Chemotherapy (within last 30 days)	BUN, CBC, creatinine, platelet count
CIED (pacemaker, ICD)	ECG
Cocaine use	ECG
Contrast dye (anticipated use)	Creatinine
Diabetes	Creatinine, HgA1c/glucose
Dyspnea (severe and undiagnosed)	Albumin, BNP or NT-proBNP, BUN, chest radiograph, creatinine, ECG, electrolytes, hemoglobin, TSH, T3, T4
Goiter	T3, T4, TSH
Hematologic disorders (eg, leukemia, myeloma)	CBC, platelet count
Hepatic disease	Albumin, BUN, creatinine, electrolytes, hemoglobin, LFTs, platelet count, PT/INR
Hypercoagulable condition (undiagnosed)	Platelet count, PTT
Inflammatory bowel disease	Electrolytes, hemoglobin
Instrumentation of the urinary tract	Urinalysis
Malabsorption	Albumin, BUN, CBC, electrolytes, hemoglobin, PT/INR
Malnutrition	Albumin, BUN, CBC, creatinine, electrolytes, hemoglobin, PT/INR
Medications:	
▪ Amiodarone	ECG, T3, T4, TSH
▪ Digoxin	ECG, electrolytes
▪ Diuretics	Electrolytes
▪ Heparin (unfractionated)	PTT
▪ Lithium	Electrolytes, creatinine
▪ Steroids (systemic)	Electrolytes, HgA1c/glucose
▪ Thyroid replacement	TSH, T3, T4
▪ Warfarin	PT/INR
▪ Planned initiation of warfarin for first time in hospital	PT/INR
Palpitations	ECG, hemoglobin, T3, T4, TSH
Positive antibody screen on previous type and screen	Type and screen (except for procedures with **no** blood loss potential)
Active pulmonary disease (eg, cough, severe dyspnea, abnormal findings on chest examination)	Chest radiograph
Pulmonary HTN	ECG, BNP or NT-proBNP
Radiation therapy (to chest, breasts, lungs, thorax)	Chest radiograph, ECG
Renal disease	BUN, creatinine, electrolytes, hemoglobin
Possibility of pregnancy	Offer B-hCG
Syncope	BNP or NT-proBNP, creatinine, ECG, electrolytes, hemoglobin, HgA1c/glucose, TSH, T3, T4
Thyroid disease	TSH, T3, T4
Tobacco use + diabetes + age >55 years	Creatinine
Thrombocytopenia	Platelet count
Urinary tract infection (suspected)	Urinalysis; sample hold for C/S if UA suggestive of infection

Preoperative testing should be performed selectively, based on a patient's medical status, the planned procedure, and the likelihood that test results will change management or inform risk assessment. This table shows tests that may be considered when the clinician suspects an undiagnosed or worsening condition, particularly when there has been no recent evaluation, when no laboratory values are available, and for patients undergoing intermediate to high risk procedures. This table is not meant to suggest that all of these tests should be ordered for all patients with the listed conditions. Importantly, these are **not** intended as "routine" or screening tests in patients without risk factors. However, with increasing age and comorbidities of surgical patients, organ and metabolic derangements are not uncommon. Diagnosis and management of these conditions may impact perioperative and long term outcomes. This table should be used in conjunction with UpToDate content on preoperative evaluation and testing.

b-hCG: beta human chorionic gonadotropin; BNP: brain natriuretic peptide; BUN: blood urea nitrogen; C/S: culture and sensitivity; CBC: complete blood count; CIED: cardiovascular implantable electronic device; ECG: electrocardiogram; HbA1c: glycated hemoglobin; ICD: implantable cardioverter-defibrillator; LFTs: liver function tests; NT-proBNP: N-terminal pro-BNP; PT/INR: prothrombin time/international normalized ratio; PTT: partial thromboplastin time; T3: liothyronine sodium; T4: thyroxine; TSH: thyroid stimulating hormone; UA: urine analysis.

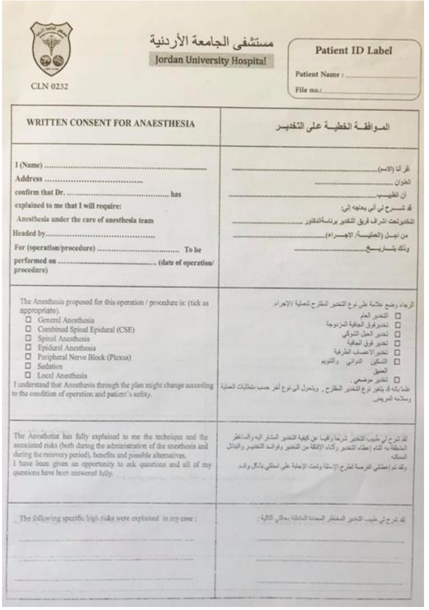
Plan

- Decisions about:
  - Further consultations.
  - Further investigations.
  - Patient's medications.
  - Preparation of blood and blood products.
  - Type of admission (if seen in clinic)
  - ICU bed reservation.
  - Fasting time
  - Ordering Pre-medication.

- **POSTOPERATIVE PLANNING**

- **INFORMED CONSENT AND DECISION MAKING**

-



مستشفى الجامعة الأردنية

Jordan University Hospital

CLN 0232

Patient ID Label

Patient Name : ....

File no.: ....

WRITTEN CONSENT FOR ANAESTHESIA	الموافقة الخطية على التخدير
I (Name) .... Address .... confirm that Dr. .... has explained to me that I will require: Anesthesia under the care of anesthesia team Headed by.......... For (operation/procedure) .... To be performed on .... (date of operation/ procedure)	
The Anesthesia proposed for this operation / procedure is: (tick as appropriate). ☐ General Anesthesia ☐ Combined Spinal Epidural (CSE) ☐ Spinal Anesthesia ☐ Epidural Anesthesia ☐ Peripheral Nerve Block (Plexus) ☐ Sedation ☐ Local Anesthesia I understand that Anesthesia through the plan might change according to the condition of operation and patient's safety.	
The Anesthetist has fully explained to me the technique and the associated risks (both during the administration of the anesthesia and during the recovery period), benefits and possible alternatives. I have been given an opportunity to ask questions and all of my questions have been answered fully.	
The following specific high risks were explained in my case :	

The following potential complications of General Anesthesia or Regional Anesthesia have been thoroughly explained to me: • Nausea, vomiting • Headache • Sore throat • Damage of the teeth and eyes • Backache • Paresis – Post Peripheral Nerve Block after regional anesthesia • Aspiration (if not fasting) • Cardiac Arrest • Brain Damage • Nerve damage after Spinal Injection • Nerve damage after Epidural Injection • Bleeding or hematoma at the site of spinal or epidural injection. • Infection at the site of spinal or epidural injection or meningitis. • Venous thrombosis • Chronic pain at the site of spinal or epidural injection. • Respiratory and cardiovascular depression.	
I understand that the anesthetic plan chosen by my anesthesia team is the most appropriate in my case and that my anesthetic management will be provided by adequately privileged doctor. I further understand that whenever the type of anesthesia needs to be altered from what has already been discussed, it is for the purpose of my safety and wellbeing I authorize the anesthesia team to transfuse blood and blood products based on my clinical needs during the treatment procedure	
I understand that although favorable results can be expected, they cannot be guaranteed. There is no guarantee against poor results or complications of anesthesia.	
I confirm that I have read and fully understand the above.	أؤكد أنني قرأت وفهمت كل ما ورد أعلاه.
Anesthetist Name & Signature Date: .... Time:	اسم وتوقيع طبيب التخدير التاريخ .... الوقت..........

Patient's/ Guardian's Signature اسم وتوقيع المريض / الوصي القانوني

....

Patient Guardian's Relationship to Patient and his/her name صلة الوصي القانوني بالمريض واسمه يرجى التوضيح

....


Thank You!