PLEASE CLICK ON THE FOLLOWING LINK TO WATCH THE LECTURE ONLINE:-

https://www.youtube.com/watch?v=pp9S1zUF0s8&list=PLuBRb5B7fa_d_ITkxtB-KQYUusx0C1s_x&index=2

Preoperative preparation of trauma patient

DEFINITION

- The preoperative period runs from the time the patient is admitted to the hospital to the time that the surgery begins.

Objectives

- Identify the patient's pre-existing medical problems
- Optimize comorbidities
- Confirm the appropriateness of the planned procedure.
- Planning to minimize risk and maximize benefit. Make advance preparation and organize facilities, equipment and expertise.
- Anticipate and plan for adverse events, inform everyone concerned

American Society of Anaesthesiologists Grade

ASA

- . The most common general assessment of fitness used by anaesthetists is the American Society of Anesthesiologists' (ASA) Physical Status Classification (27). Approximately 50% of patients undergoing elective surgery fall into ASA Group 1 (25) and surgical mortality for this group is reported as between 1 in 6000 and 1 in 10 000 (28-30). This classification, although useful, is scientifically imprecise . It was originally designed to facilitate the collection of 'statistical data in anaesthesia' and not to estimate operative risk. However, it is the only indicator of preoperative status that has been consistently recorded in large numbers of patients and correlates well with surgical morbidity .

- **ASA 1**: A normal healthy patient. Example: Fit, nonobese (BMI under 30), a nonsmoking patient with good exercise tolerance.
- **ASA 2**: A patient with a mild systemic disease. Example: Patient with no functional limitations and a well-controlled disease (e.g., treated hypertension, obesity with BMI under 35, frequent social drinker or is a cigarette smoker).
- **ASA 3**: A patient with a severe systemic disease that is not life-threatening. Example: Patient with some functional limitation as a result of disease (e.g., poorly treated hypertension or diabetes, morbid obesity, chronic renal failure, a bronchospastic disease with intermittent exacerbation, stable angina, implanted pacemaker).
- **ASA 4**: A patient with a severe systemic disease that is a **constant threat to life.** Example: Patient with functional limitation from severe, life-threatening disease (e.g., unstable angina, poorly controlled COPD, symptomatic CHF, recent (less than three months ago) myocardial infarction or stroke.
- **ASA 5**: A moribund patient who is not expected to survive without the operation. The patient is not expected to survive beyond the next 24 hours without surgery. Examples: ruptured abdominal aortic aneurysm, massive trauma, and extensive intracranial hemorrhage with mass effect.
- **ASA 6**: A brain-dead patient whose organs are being removed with the intention of transplanting them into another patient

	Surgery grades	Examples
1	Minor	Excising skin lesion, draining of abscess
2	Intermediate	Primary repair of inguinal hernia, excising varicose veins in the leg, tonsillectomy, knee arthroscopy
3	Major	Total abdominal hysterectomy,endoscopic, resection of prostate, lumbar discectomy, thyroidectomy, total joint replacement, Thoracic surgeries, colonic resection,most of orthopedic procedures

Clinical scenarios

Patient 1

- 23 yrs old male admitted 1 hour ago to surgical ward as a case of right distal humerus fracture , scheduled for operation tomorrow morning , patient hasn’t known comorbidities,baseline vital signs are assessed and his blood pressure is 115 /65 , and has BMI of 25

Patient 2

- A 45-year-old male with a 25 pack-year history of cigarette smoking is scheduled at 7:00 a.m. for THA after 9 years history of right hip osteoarthritis . He is 5’10”, 250 lbs (BMI of 35.9) and leads a sedentary lifestyle. His past medical history includes type 1 diabetes mellitus and chronic liver disease and long history of COPD . Baseline vital signs are assessed and his blood pressure is 148/90 mmHg.

Patient 3

- A 20-year-old college athlete is scheduled to undergo an elective knee artroscopy . Nonsmoker, nondrinker, no medications, BMI 23. This patient would be assigned. The patient takes recreational medications only (mostly cannabis) and has a BMI of 23 .

Patient 4

- 30-year-old woman is scheduled to undergo elective surgery for excisional biopsy of a large thigh tumor. Comorbidities include anemia from menorrhagia and type II diabetes treated with metformin. She is a non-smoker, occasional social drinker, and has a BMI of 32 .

PATIENT ASSESSMENT

- o History taking
- o Examination
- o Investigations
- o Preoperative treatment
- o Documentation
- o Communication

INVESTIGATIONS

When requesting laboratory tests the questions of importance are:

- 1- Does the investigation detect conditions not found on history taking and physical examination which will affect perioperative management?
- 2- Do the investigations give a useful baseline for comparison in the postoperative phase?
- 3- What are the specificities and sensitivities of the investigation?
- 4- Are there medicolegal considerations for performing the investigations?
- 5- If the result is not available, will the operation be cancelled?

- Sandler , in his prospective study, showed that the history decided 56% of all diagnoses and 46% of all management in medical outpatients. Examination accounted for a further 17% and routine haematological and urine testing accounted for only 1%. Delahunt and Turnbull ,found abnormal tests in 8% of patients admitted for minor surgery under general anaesthesia which were not predictable from the history and examination, and none of these abnormalities led to any change in management.

- Laboratory tests can aid in clarifying a patient's preoperative condition once a disease is suspected or diagnosed, but they frequently fail to uncover pathological conditions and are inefficient in screening for asymptomatic disease

Blood Tests

Full Blood Count

- A full blood count (FBC) is generally requested to detect anaemia, which may place the individual at risk from a general anaesthetic .However, routine screening of FBC contributes little to the patient's management .Most cases of anaemia, which may alter patient management, can be detected by a full history and examination. Routine FBCs for ambulatory patients undergoing minor surgery are thus unnecessary. For those procedures involving a significant amount of blood loss, a preoperative FBC can act as a baseline for transfusion requirement and postoperative comparison

Full Blood Count

- 1 Major surgery.
- 2 Chronic bleeding.
- 3 History of anaemia.
- 4 Renal disease.

Urea and electrolytes

- 1 Clinical evidence of renal disease.
- 2 Symptomatic cardiovascular disease.
- 3 Diabetes.
- 4 Drugs-Diuretics, digoxin, steroids, others causing electrolyte disturbances.

Clotting screen

- Routine preoperative coagulation screening might be useful to identify patients at risk from excessive bleeding, but studies have shown that routine coagulation screening is unreliable and produces a large number of false-positive results

Clotting screen

- In Rohrer's et al's study , 7.4% of patients with a clinical suspicion of coagulopathy and none of the patients without any clinical indications had abnormal coagulation. It would seem wise only to request coagulation screening when a coagulopathy is clinically suspected.

Clotting screen

- 1 Clinical evidence of liver disease including a history of hepatitis.
- 2 Bleeding disorder.
- 3 Anticoagulants.

Liver function tests

- 1 Clinical evidence of liver disease.
- 2 Chronic liver disease, including a history of hepatitis.

Chest radiography

- Reasons for taking a preoperative chest radiograph (POCR) are to confirm or establish a diagnosis and evaluate the extent of pathology; to detect conditions previously unsuspected and to establish a baseline for comparison with postoperative films. However, unexpected abnormalities are rare

Chest radiography

- 1 Cardiorespiratory disease.
- 2 Possible pulmonary malignancy (primary or secondary).
- 3 Severe trauma.
- 4 Immigrants from countries with endemic TB. (1 and 4 only if no radiograph within the last 12 months)
- 5 chest infection

Electrocardiograph

- 1 Patients older than 60 years undergoing major surgery.
- 2 Symptoms and signs of cardiovascular disease, including ischaemic heart disease or hypertension.
- 3 Symptomatic respiratory disease.

Indications for preoperative echocardiogram

- 1. A patient with a newly diagnosed murmur and with any or all of: a. poor functional capacity b. syncope or dizzy spells c. angina.
- 2. A patient with a known aortic or mitral stenosis and a significant change in symptoms since their last echocardiogram.
- 3. A patient with known ischaemic heart disease in whom LV function has not been previously assessed .

Indications for preoperative echocardiogram

- . 4. A patient with major ECG changes compared to previous recordings held in the notes (and hopefully eventually on sentinel), such as LBBB, RBBB major ST changes or Q waves that have not been assessed by a cardiologist.
- 5. A patient with known heart failure with a significant change in symptoms and an increase in BNP.
- 6. New onset AF where their surgery is urgent and will precede their referral to the next arrhythmia clinic.
- 7. A patient with LBBB or RBBB (Not incomplete RBBB) that has not been previously identified

Condition	Investigation	Aims
Thyroid disease	TSH	Check for disease control and avoiding thyroid hormones related complications (thyroid storm, mixeodema coma)
Thyroid surgery	Upper airway Fiberoptic check	Check for airway patency and vocal cord mobility
Rheumatoid arthritis	Dynamic c-spine x-ray +/- c-spine CT scan or MRI ECG, ECHO	• Check for C1-C2 subluxation, subaxial subluxation, cervical canal stenosis and c-spine ROM • To check for arrhythmia or valvular disease
Ankylosing spondylitis	Dynamic c-spine x-ray	Check for c-spine ROM
C-spine fracture	C-spine x-ray +/- c-spine CT scan	Check for c-spine fractures
Previous tracheal surgery or tracheostomy	Neck Chest CT scan	Check for tracheal dimensions and possible stenosis
Neck tumors or conditions that affect the airway	Upper airway Fiberoptic check	Check for airway patency
Chronic carbamazepine use	CBC, LFT, KFT	Check for chronic carbamazepine use side effects (pancytopenia , abnormal liver function and liver enzymes
Diuretics	KFT, serum Electrolytes	Check for electrolyte disturbances

Regulations and protocols

- Each specific hospital is likely to provide **local guidelines**, however it is useful to understand the tests than could be done pre-operatively and have an appreciation as to why each may be requested.

MINOR SURGERY

	ASA GRADE		
TEST	ASA I	ASA II	ASA III OR IV
CBC	Not routinely	Not routinely	Not routinely
Coagulation Tests	Not routinely	Not routinely	Not routinely
Kidney Function tests	Not routinely	Not routinely	Consider in people at risk of AKI1
ECG	Not routinely	Not routinely	Consider if no ECG results available from past 12 months
Lung Function or ABG`s	Not routinely	Not routinely	Not routinely

AKI, acute kidney injury.
1 See recommendation 1.1.8 of the NICE guideline on acute kidney injury.

INTERMEDIATE SURGERY

	ASA GRADE		
TEST	ASA I	ASA II	ASA III OR IV
CBC	Not routinely	Not routinely	Consider for people with cardiovascular or renal disease if any symptoms not recently investigated
Coagulation Tests	Not routinely	Not routinely	Consider in people with chronic liver disease • If people taking anticoagulants need modification of their treatment regimen, make an individualized plan in line with local guidance • If clotting status needs to be tested before surgery (depending on local guidance) use point-of-care testing1
Kidney Function tests	Not routinely	Consider in people at risk of AKI2	Yes
ECG	Not routinely	Consider for people with cardiovascular, renal or diabetes comorbidities	Yes
Lung Function or ABG`s	Not routinely	Not routinely	Consider seeking advice from a senior anesthetist as soon as possible after assessment for people who are ASA grade 3 or 4 due to known or suspected respiratory disease

AKI, acute kidney injury.
1 Note that currently the effects of direct oral anticoagulants (DOACs) cannot be measured by routine testing.
2 See recommendation 1.1.8 of the NICE guideline on acute kidney injury.

MAJOR SURGERY

	ASA GRADE		
TEST	ASA I	ASA II	ASA III OR IV
CBC	Yes	Yes	Yes
Coagulation Tests	Not routinely	Not routinely	Consider in people with chronic liver disease • If people taking anticoagulants need modification of their treatment regimen, make an individualized plan in line with local guidance • If clotting status needs to be tested before surgery (depending on local guidance) use point-of-care testing1
Kidney Function tests	Consider in people at risk of AKI2	Yes	Yes
ECG	Consider for people aged over 65 if no ECG results available from past 12 months	Yes	Yes
Lung Function or ABG`s	Not routinely	Not routinely	Consider seeking advice from a senior anaesthetist as soon as possible after assessment for people who are ASA grade 3 or 4 due to known or suspected respiratory disease

AKI, acute kidney injury.
1 Note that currently the effects of direct oral anticoagulants (DOACs) cannot be measured by routine testing.
2 See recommendation 1.1.8 of the NICE guideline on acute kidney injury.

RMS

Conclusion

- With such a vast array of investigations available, the surgical house officer is faced with the difficult decision of which tests, if any, are required before operation. These recommendations must be used with the clinical information obtained from an accurate history and examination. If a relevant investigation has been performed in the preceding 4 months a repeat investigation is not warranted, unless there is a significant change in the patient's condition. If, for any reason, there is doubt regarding these tests then advice should be sought. This encourages communication between the surgeon and the anaesthetist which is essential for the well-being of the patient.

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THANK YOU