

# Preoperative Anesthetic Clearance a Necessity in Secondary Healthcare Institutions

Saurabh Sharma<sup>1</sup>, Kranti Bisht<sup>2</sup>

<sup>1</sup>Department of Anesthesiology and Critical care, Civil Hospital Palampur, Himachal Pradesh, India  
Correspondence address Email: [dr.saurabh.sh303\[at\]gmail.com](mailto:dr.saurabh.sh303[at]gmail.com)

<sup>2</sup>Department of Gynaecology and Obstetrics, Civil Hospital Palampur, Himachal Pradesh, India

**Abstract:** *Preoperative Anesthetic clearance or PAC in short is not just an exercise undertaken to check the fitness status of any patient about to undergo surgery, but also acts as a screening tool to identify high risk cases. Especially in a secondary healthcare system with limited resources and lack of backup services, an anesthetist has to be very meticulous in selection of cases. PAC is the primary tool to carry out this. It is a procedure basically carried out to analyze the general physical, cardiac and respiratory status of the patient. It ascertains that whether or not the patient is able to handle the stress of anesthesia or not. It also acts as a screening tool to identify any modifiable risk factor which can be corrected before surgery.*

**Keywords:** anesthesia, surgery, MPS, ASA, METS, CVS

## 1. Introduction

PAC as a screening is done in every hospital which carries out major surgeries. Some big hospital have dedicated clinics for this while in our set up we have a dedicated time 2pm to 4pm for PAC clinic. It is manned by one the trained anesthetist posted in our hospital. Usually in a PAC clinic a systematic approach is used for every patient to assess its fitness level to withstand the stress induced by surgery and anesthesia. Surgery itself is a stressful condition for the body and adding physiological changes induced by anesthesia can add up in this.

## 2. History

PAC usually starts with the proper history of the patient in which all the important information is collected. Parameters like height, weight, BMI is noted to screen obesity and other related conditions. Other information like the patient registration number, diagnosis and type of surgical procedure is noted.

## 3. Present History

Any present ailment like active respiratory tract infection, pyrexia or active disease is noted and if any of this is present the surgery may be deferred till the resolution of symptoms or for at least two weeks and patient is called back for review. The benefit of this identification is to rule out any active case and prevent catastrophe during surgery.

Another important parameter of history taking is to rule out following conditions

**Diabetes mellitus:** Uncontrolled DM can lead to various problems like delayed wound healing, impaired cardiac response to physiological stress, sudden cardiac arrest. Surgery evokes the 'stress response', that is, the secretion of catecholamines, cortisol, growth hormone and, in some cases, glucagon. These hormones oppose glucose

homeostasis, as they have 'anti-insulin' and hyperglycaemic effects.

**Hypertension:** Same is the case with increased blood pressure. Patients with uncontrolled HTN are prone to excessive bleeding, sudden catastrophic fall in blood pressure post SAB, cardiac arrest and stroke either during or in the immediate post op period. A thorough understanding of the common antihypertensive medications is beneficial to all health care providers during the management of these patients. The major classes of antihypertensive agents include diuretics, ACEIs, ARBs, direct renin inhibitors, calcium channel blockers,  $\alpha$ -adrenergic blockers,  $\beta$ -adrenergic blockers,  $\alpha_2$ -adrenergic agonists, and vasodilators. This also includes being familiar with the medications or factors that could worsen blood pressure control [1]

**Respiratory disorders like Asthma and COPD-** Respiratory patients are more prone to undergo bronchial spasm during intubation and have high chances to have prolonged post op stay at hospital due to exacerbated post op complications. Patients with COPD typically have increased airway reactivity, which may lead to reactive bronchoconstriction or bronchospasm upon airway manipulation.[2] Any H/o hospitalization in the past for the same problem is also noted.

**Seizures:** H/o seizure disorder is also screened before surgery to rule out any potential neurological event that can occur. Patient who has h/o seizures have a tendency to get hurt, dislocations, hypoxia and if received without a proper IV line administration of drugs can be very difficult.

**Liver disorder-** We screen for liver disorders mainly hyperbilirubinemia and deranged liver enzymes. As many of the Anesthetic drugs are metabolized in liver therefore proper functioning of liver is essential for everyone undergoing surgery.

**ATT intake/medication-** h/o of ATT intake is necessary to ensure patient safety and to reduce the chances of

transmission from one patient to another. A person having any h/o of such medication is tested using sputum or CBNAAT available at our hospital. Any history of herbal or any other type of medication is noted.

**Blood Transfusion:** Any H/o blood transfusion and any adverse reaction noted.

**Surgery-** Previous h/o surgical procedure is noted to identify the type of anesthesia used in last surgery and any adverse reactions related to it.

**Allergy:** Allergy of any kind is noted.

**Smoking/Drinking:** It is also noted whether the patient is a smoker or not. What is the smoking index. History of productive cough for the past one month. h/o of alcohol intake, amount and last drink, whether alcohol is an eye opener for him. In long standing h/o alcohol MAC values are increased as well as live functions are usually deranged.

**General Physical Examination**

Physical condition of patient is noted. Any deformity is noted.

**Chest:** Breath sounds are auscultated and noted whether they are bronchial or vesicular. And added sound like wheeze and crepts are noted. SPO<sub>2</sub> noting has been added to screen any patient with respiratory ailment and to reduce any adverse event during surgery.

**CVS:** It is auscultated for heart sounds. Any other added sound and murmurs and noted. Blood pressure and heart rate is noted. Pulse is also noted for rate, character and volume.

**Spine:** It is visually examined and also palpated for any deformity in curvature. If such deformity is seen a note is made in the PAC sheet and relevant investigations like radiological scan are ordered.

**METS:** Mets or metabolic equivalent status of the patient is noted by asking questions like whether they are able to climb 2 flight of stairs (table1), or regular household or field work. Alike, the current guidelines of the American College of Cardiology and American Heart Association (ACC/AHA) from 2014 recommend no further cardiac testing in patients undergoing non-cardiac surgery with moderate risk for a major cardiac event (MACE) with a functional capacity that exceeds 4 MET with class IIb evidence. [3] A METS score of more than 4 has been kept as a standard cut off value for selection of patient.

Table 1

Metabolic Equivalents	Examples
1	Watching television
	Eating, dressing
	Walking on level ground at 2 to 3 mph
∨	Doing light housework (e.g., dusting)
4	Climbing a flight of stairs
	Walking on level ground at 4 mph
∨	Doing heavy chores (e.g., scrubbing floors)
>10	Playing strenuous sports (e.g., tennis)

Adapted from Fleisher LA, Beckman JA, Brown KA, et al. American College of Cardiology American Heart Association Task Force on Practice Guidelines; American Society of Echocardiography. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery. *J Am Coll Cardiol.* 2007;50(17):e170.

**Oral Assessment**

Following tools are used for oral assessment of every patient to identify any difficult intubation.

**Mallampatti Scoring:** MPS is the easiest and handy tool to identify patients with chances difficult intubation. Dr. Sheshagiri Mallampatti found a significant correlation

between this clinical sign (now better known as the Mallampati Score) and the intubation difficulty.[4]Patient is asked to open his/her mouth fully without saying anything.the oral cavity is graded according to following chart. There are 4 grades in MPS system (table 1). MPS upto Grade III are taken up for surgery here, while grade IV are referred to a higher centre.

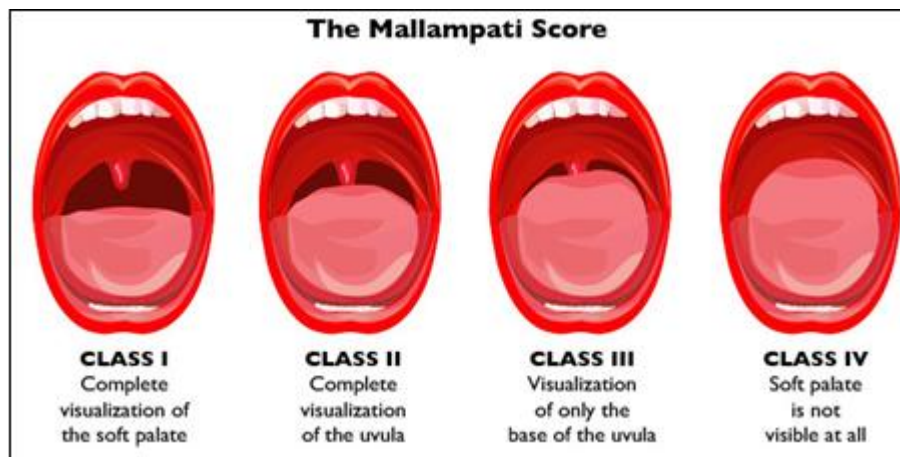


Image 1

**Mouth Opening:** It is assessed along with MPS grading while asking the patient to open the mouth as wide as possible and asked to put three fingers vertically.

**Temporo Mandibular Joint:** It is assessed by palpating around the tragus while the patient has been asked to open the mouth. Any subluxation of joint or difficulty while opening is noted.

**Loose/Artificial Teeth:** Any loose teeth or artificial denture is noted. This can lead to difficulty in oxygenation and ventilation.

**ASA Classification:** It is an internationally accepted classification for determination of risk during surgery. Here in our institution we undertake patients up to ASA class II. This cut off is kept to reduce any chance of adverse event during surgery.

ASA class	Physical status
1	Normal healthy patient
2	Patient with mild systemic disease
3	Patient with severe systemic disease
4	Patient with severe systemic disease that is a constant threat to life
5	Moribund patient not expected to survive without emergent procedure

**Investigations:** Following investigations are undertaken in every patient to estimate baseline status

**Complete Hemogram:** Mainly for estimation of hemoglobin and platelet count. A cut off value of 10gm% is kept and any patient below this level is asked to arrange adequate blood or if the surgery can be deferred to build up pharmacologically. Platelet count  $80000/\text{mm}^3$  is taken as a cut off value. Below this level chances of spinal hematoma formation and bleeding increases.

**Renal Function Tests:** Mainly blood urea nitrogen and Serum Creatinine are checked to ascertain the kidney status as elimination of various agents take place through kidney. Also during SAB, CSE acute renal failure can occur if there is excessive hypotension.

**Liver Function Tests:** Mainly total and direct bilirubin is measured with values more than 2 is taken as a cut off. Bilirubin more than 2 has a high chance of getting deposited in the SA node obstructing its functionality. Another parameter checked is liver enzymes mainly aspartate and alanine transferase for liver functional status as any derangement can lead to impaired metabolism of anesthetic drugs.

**Serum Electrolytes:** Mainly checked for values of Sodium and Potassium. If any of these fall beyond the set limits, these are corrected as per need and then the patient is taken for surgery.

**Chest X-Ray:** It is done to check the pulmonary status, any structural or functional abnormality, any h/o of koch or evidence of previous disease like COPD. For any doubtful xray the patient is told to undergo sputum and PFTs. It also helps to check the cardiac anatomical state to check for cardiomegaly or aortic abnormalities.

**Electrocardiogram:** or ECG in short is done for patients to assess their cardiac status and if any abnormality is detected the patient is asked to undergo ECHO which is available in our hospital.

**Serology:** This is a burden of necessity. All the patients are screened for Hepatitis B and C and HIV. If any case is detected then the surgery is conducted with universal precautions.

#### 4. Conclusion

As we can conclude that in a setting with limited resources history of patient is of paramount importance. It act as a rapid screening tool for selection of patients. Moreover all the patients who have comorbidities are identified and put on medications so that their perioperative period remains uneventful. Blood and other investigations plays an important role in this. Though they are expensive but in our setup all these investigations are free of cost, thereby limiting the economic burden on patient. On contrary to the western medical practice where investigations are only carried out when required, as they are routinely done in their annual medical check up, but developing nation like ours annual medical checkups are a rare event. since we do not

have ICU back up, in secondary institutions these are done to reduce any adverse event. Everyday many different surgeries are carried in our hospitals but the stepping stone for each surgery is Preoperative Anesthesia Clearance.

**Conflict of interest**

None

**Source of support**

None

**References**

- [1] Yancey R. Anesthetic Management of the Hypertensive Patient: Part I. *Anesth Prog.* 2018 Summer;65(2):131-138. doi: 10.2344/anpr-65-02-12. PMID: 29952638; PMCID: PMC602278
- [2] Chino K, Ganzberg S, Mendoza K. Office-Based Sedation/General Anesthesia for COPD Patients, Part II. *Anesth Prog.* 2019 Spring;66(1):44-51. doi: 10.2344/anpr-66-02-05. PMID: 30883229; PMCID: PMC6424168.
- [3] Fleisher LA, Fleischmann KE, Auerbach AD, Barnason SA, Beckman JA, Bozkurt B, et al. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation.* 2014;**130**(24):e278–333. [PubMed] [Google Scholar]
- [4] Mallampati SR, Gatt SP, Gugino LD, Desai SP, Waraksa B, Freiburger D, Liu PL. A clinical sign to predict difficult tracheal intubation: a prospective study. *Can Anaesth Soc J.*1985 Jul;**32**(4):429-34.[PubMed]