Special Article

Update on preoperative evaluation and optimisation

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ABSTRACT

The patients presenting for surgery today often belong to the extremes of age, have multiple co-morbidities, and undergo complex surgeries. This makes them more prone to morbidity and mortality. A detailed preoperative evaluation of the patient can contribute to reducing this mortality and morbidity. There are various risk indices and validated scoring systems and many of them need to be calculated using preoperative parameters. Their key objective is to identify patients vulnerable to complications and to return them to desirable functional activity as soon as possible. Any individual undergoing surgery should be optimised preoperatively, but special considerations should be given to patients with comorbidity, on multiple drugs, and undergoing high-risk surgery. The objective of this review is to put forth the latest trends in the preoperative evaluation and optimisation of patients undergoing noncardiac surgery and emphasise the importance of risk stratification in these patients.

Key words: Postoperative complications, preoperative rehabilitation, risk assessment

INTRODUCTION

A detailed pre-anaesthetic evaluation allows for the systematic validation of perioperative risks allowing us to optimise the functional and physiological status of the patient and ameliorate the perioperative complications.

The prime objective is to establish solidarity between the anaesthesiologist and the patient which warrants a mutual understanding of plans for anaesthesia technique and identifying risks associated with the plan. The secondary objective is to advise premedication drugs and perform any interventions required before surgery.[1] An important requirement for risk assessment is to order investigations on an individual basis and obtain referrals from other specialities. Effective preoperative assessment can decrease delay and postponement of the surgery on the day of surgery.[2]

Over the decades, several changes have occurred in the healthcare sector and now patients with advanced age or several co-morbidities on polypharmacy are undergoing surgery. This has necessitated modification in the perioperative care of patients.[3]

With the increase in patients' awareness, knowledge, and perception of safe anaesthesia and surgery, more sensitive preoperative assessment tools are needed. This article systematically describes and evaluates the existing literature on preoperative assessment and reviews the recent developments on this topic.

METHODS OF PRE-ANAESTHETIC EVALUATION

History and examination

A detailed history, thorough physical examination, and laboratory investigations are the cornerstones

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of preoperative optimisation [Table 1]. Prior history of any detrimental reactions to anaesthesia, difficult intravenous canulation, complications with airway management, prolonged emergence, postoperative nausea/vomiting, and delirium must be taken in detail.[4] It can be more specific e.g., whether the patient is posted for elective or emergency surgery, a cardiac patient coming for non-cardiac surgeries, patient on an anticoagulant, etc., In the geriatric population, evaluation of the functional status through comprehensive measures must be done to identify patients at risk and predict complications.[4,5]

All the medications that the patient is taking have to be carefully documented along with the doses. Also, the history of intake of over-the-counter and herbal medications, illicit drug use, any addiction, malignant hyperthermia, or any other adverse reactions has to be elicited.[6,7] Anthropometric measurements and haemodynamic parameters should be recorded. Careful examination of the airway and spine should be done. A systematic and complete review of the various organ systems should be done [Table 2].

Risk assessment

The patient can be classified into a risk category by using standardised quaestionaries or self-administered, electronic questionnaires which have also been found to be acceptable to patients.[2] Tools for risk assessment may be divided into risk scores and prediction models, which are normally developed using multivariable analysis of risk factors leading to certain determined consequences.

Risk assessment based on co-morbidities

The American Society of Anesthesiologists physical status (ASA PS) grading is helpful in developing an anaesthetic plan,[5] but it is subjective and may have intraoperative variability. Also, it does not take into account the preoperative physiological and functional status of the patient, type of surgery, and post-operative care.

A combination of the standardised questionnaires like CAGE (an acronym for Cutting down, Annoyance by criticism, Guilty feeling, Eye-openers)[8] and laboratory tests such as carbohydrate-deficient transferrin (CDT) a biomarker and gamma-glutamyl transferase (GGT) should be used for the detection and monitoring of

Table 1: General health assessment

Organ system	Relevant points to consider	Relevant points to consider	Relevant points to consider	Relevant points to consider
Cardiovascular	Hypertension (baseline blood pressures, what medications, any complications)	Coronary artery disease (history of MI, stents/ CABG, recent functional studies (stress testing, cath reports, echos)	Arrhythmias (what medications used, any implanted devices, recent symptoms, Holter tests, etc)	
Pulmonary	COPD: (Medications used, frequency of exacerbations, steroid use, on home oxygen, recent infections, any recent PFT information, recent CXR data if applicable)	Asthma (Medications used, frequency of exacerbations, ever been intubated, steroid use)	Smoking history (Pack year history, recent episodes of bronchitis, sputum production)	Sleep apnoea (may be a predictor of difficult airway)
Endocrine	Diabetes Mellitus (Type I vs II, medications used, home fingerstick readings, last HbA1C, any known macro/ microvascular complications)	Adrenal insufficiency		
Neurological	List any deficits including residual effects of old CVAs			
Haematological	History of bleeding disorders, blood clots			
Rheumatological	History of steroid use, lung/systemic involvement, any known joint (i.e., atlanto-axial) instability			
Pain	Preoperative pain score and document any history of chronic pain and list all preoperative pain medications and dosages taken by the patient (chronic opiate users may require more intra-operatively)			
Is the patient on anticoagulation medications?	List any recent pertinent coagulation studies, if/when anticoagulation was reversed			
Other	List all other medical conditions			

COPD=Chronic obstructive pulmonary disease, CXR=Chest X Ray, PFT=Pulmonary Function Test, CABG=Coronary artery bypass graft, CVA=Cerebrovascular accident, MI=Myocardial ischaemia, HbA1C=Glycosylated haemoglobin

Table 2: Detailed physical and systemic examination

Review of systems	History signs and symptoms	Measures taken
Constitutional	Recent fevers or infections, night time sweating, motion sickness symptoms	Complete exam, note any deficits discovered and compare with old records
Cardiovascular	Exercise tolerance (how many stairs?), angina, activity level	Complete exam with a focus on murmurs or rubs, check for bruits
Pulmonary	Shortness of breath, cough, dyspnoea on exertion, smoker, use of inhalers, baseline oxygen if applicable	Complete exam with a focus on wheezes or crackles
Gastrointestinal	Reflux symptoms, fasting status	
Haematology	Easy bruising or bleeding	
Musculoskeletal	Any cervical motion instability, myalgias, range of motion of extremities	Complete exam, note any clubbing, deformities, bruising, and gauge level of difficulty for intravenous access

heavy alcohol use as they are more effective than using either the laboratory tests or questionnaire alone.[9]

For cardiac peri-operative risk stratification, considering comorbidities using age-adjusted scores, such as the National Surgical Quality Improvement Programme (NSQIP) model,[10] Charlson comorbidity index (CCI)[11] or the revised cardiac risk index (RCRI)[12] have been recommended. In a critical review, authors report that CCI is clinically useful and also provides a valid assessment of the patient's clinical status, and distinguishes diagnostic and prognostic differences amongst subsets of patients sharing a similar medical diagnosis.[11] In their prospective study, Davenport DL *et al*.[13] recommend that the NSQIP risk factors should be used to validate the ASA PS classification.

Functional status or exercise tolerance

It is measured in metabolic equivalents (METS). One MET is the energy consumed by the body at rest and is equivalent to 3.5 mL of oxygen consumed per kilogram of body weight per minute. The ability to climb a flight of stairs equates to a moderate exercise capacity which corresponds to four METS and this is interpreted as a lower risk of cardiovascular complications.[10] It is easy to measure and takes less than one minute to complete. Another safe test that characterises an individual's functional capacity and can predict whether they will withstand surgical stress is cardiopulmonary exercise testing (CPET). It includes measurement of gas exchange variables, pulse oximetry, heart rate, 12-lead electrocardiography, and intermittent non-invasive blood pressure during exercise, typically using a cycle ergometer. It integrates the assessment of cardiac, respiratory, and metabolic variables in a condition simulating that of surgery. The major drawback is that it requires specialised facilities and trained personnel and is time-consuming.[14]

The prevalence of major cardiovascular events can be cumulated according to the type of surgery performed. Minor surgery like cataract, and cosmetic surgery has a $<1\%$ risk for a major cardiovascular events. Otorhinological, urological and orthopaedic procedures may have a 1% risk.[15] General abdominal or intraperitoneal surgery or neurosurgical procedures may account for $\geq 3\%$ risk for cardiovascular complications while peripheral vascular surgery, thoracic, and transplant surgery may be associated with $\geq 5\%$ risk.[15]

Various risk assessment methods have been described to assess perioperative complications related to the respiratory and cardiovascular systems [Table 3][16-18] and [Table 4].[15,19-22]

Risk prediction tools

Physiological and operative severity score for the enumeration of mortality and morbidity (POSSUM) can be used in both elective and emergency cases. It has two components: a physiological score including 12 factors, and a surgical severity score, with 6 operative factors. Over the years, POSSUM was modified to Portsmouth POSSUM (P-POSSUM) which corrects for the tendency of POSSUM to overestimate surgical mortality in low-risk patients. In a prospective study on fifty subjects undergoing major general surgeries, the validity of P-POSSUM was assessed and it was observed that this score is a reliable predictor for determining the quality of care given to a patient to avoid post-operative complications that might lead to increased morbidity and mortality.[23]

Surgical APGAR score (SAS) is a 10-point scale that was initially developed for evaluating patients after general surgery or vascular procedures The assessment is done postoperatively and is based on three parameters: lowest heart rate and mean arterial

Table 3: Various risk indices used for assessment of post operative pulmonary complications

	Used	Scoring	Interpretation	Advantage	Disadvantage
ARISCAT Risk Index[16]	Overall Incidence of postoperative pulmonary complications (of any severity)	A weighted point score to seven independent risk factors	Incidence of pulmonary complications in patients with scores stratified as low-, intermediate and high-risk is 1.6, 13.3, and 42.2%[16] respectively	Simple to calculate manually at the bedside with readily available clinical information	Inclusion of minor complications of little clinical significance (e.g., new wheezing treated with bronchodilators)
Arozullah respiratory failure index[17]	Predicts the incidence of postoperative respiratory failure (mechanical ventilation for ≥48 h)	Based on several factors, including type of surgery, Laboratory results, functional status, history of chronic obstructive pulmonary disease and age	Risk of respiratory failure ranging from 0.5 to 26.6 percent	Likely to be of more value in research settings.	Too complicated for use in clinical practice
Gupta calculator for postoperative respiratory failure[18]	Calculator for postoperative respiratory failure	Uses multiple preoperative factors to predict risk of failure to wean from mechanical ventilation within 48 h of surgery or unplanned intubation/reintubation postoperatively			Not possible to perform this calculation manually
Gupta calculator for postoperative pneumonia[18]	derived in a similar manner to the respiratory failure calculator				

pressure, and estimated blood loss intraoperatively. It helps in predicting postoperative intensive care unit (ICU) admission.[22]

Acute physiology and chronic health evaluation (APACHE II) analysis is commonly used in the ICU. Even though it is not a surgical or anaesthetic score, it is comprehensive. It estimates the patient's clinical and biological status accurately, allowing for mortality prediction.

Detecting the risk of obstructive sleep apnoea

Owing to the increasing prevalence of obstructive sleep apnoea, the Society of Anaesthesia and Sleep Medicine guidelines recommend screening all patients for obstructive sleep apnoea (OSA). Polysomnography, though the gold standard for the diagnosis of OSA is impractical to be used as a routine screening tool. The existing OSA screening tools generally have high sensitivity but low specificity implicating that the false positive rate is high.[24]

In a prospective study on 137 consecutive adults, the authors estimated that with every one-point increase in the Mallampati score, the odds of having OSA increased more than twofold.[25] The STOP-Bang (an acronym, which stands for snoring, tiredness, observed apnoea, blood pressure, body mass index, age, neck circumference, and gender) questionnaire is a good screening tool for OSA.

In a prospective study, 384 patients undergoing surgery were screened for OSA. The specificity for predicting moderate to severe OSA increased from 37-85% by the addition of a serum bicarbonate level ≥28 mmol/L to a STOP-Bang score ≥3.[26]

The STOP-Bang questionnaire gives all parameters equal weight but not all items have equal predictive value for OSA. A two-step scoring system may improve performance, though it adds complexity. The first step is the completion of the STOP-Bang score, and assigning the degree of risk the patient has. The second step is applied to intermediate-risk patients (i.e., score 3 or 4), and involves analysis of the specific items that have been scored positive.[27]

A recent cohort study concluded that a patient having a STOP-Bang score of ≥5 had a fivefold higher risk of cardiovascular complications and a twofold increased risk of respiratory complications than a patient with a STOP-Bang score <5.[28]

The Berlin questionnaire has questions on snoring, increased sleepiness in the daytime, sleepiness while driving, episodes of apnoea during sleep, hypertension, and body mass index to categorise patients as having low or high risk for OSA. In a meta-analysis of cohort studies, patients who were screened for OSA preoperatively were stratified as high risk if the Berlin score was ≥2.[29]

Table 4: Various risk indices used to predict perioperative cardiac complications[14]

Risk Indexes	Parameter	Interpretation	Limitations
Goldman Cardiac Index[15,19]	Age over 70 years (5 points) Myocardial infarction occurring within the last 6 months (10 points) Presence of heart failure signs (jugular vein distention, or ventricular gallop) (11 points) Significant aortic stenosis (3 points) Arrhythmia (other than sinus or premature atrial contractions) (7 points) The presence of 5 or more premature ventricular complexes per minute (7 points) Medical history or conditions including the presence of PO2 less than 60; PCO2 greater than 50; K below 3; HCO^-_3 under 20; BUN over 50; serum creatinine greater than 3; elevated SGOT; chronic liver disease; or the state of being bedridden (3 points) Type of operation: emergency (4 points); intraperitoneal, intrathoracic, or aortic (3 points)	Class I (0 to 5 points): correlates with a 1.0% risk of cardiac complications during or around noncardiac surgery. Class II (6 to 12 points): correlates with a 7.0% risk of cardiac complications during or around noncardiac surgery. Class III (13 to 25 points): correlates with a 14% risk of cardiac complications during or around noncardiac surgery. Class IV (26 to 53 points): correlates with a 78% risk of cardiac complications during or around noncardiac surgery.	There have been significant changes in the management of surgical patients since the development of this index. Diagnostic and therapeutic changes also affect anaesthetic management.
Revised Cardiac Risk Index 1999[20]	IHD: 1 Cerebrovascular Disease :1 H/O CHF: 1 Insulin therapy for diabetics: 1 Serum creatinine level: ≥2.0 mg/dL :1 Planned high risk procedure: 1	Class I [0 predictors] correlates with a 0.4% 30-day risk of death, MI, or CA. Class II [1 predictor] correlates with a 0.9% 30-day risk of death, MI, or CA. Class III [2 predictors] correlates with a 6.6% 30-day risk of death, MI, or CA. Class IV [greater than or equal to 3 predictors] correlates with a more than 11% 30-day risk of death, MI, or CA.	Several factors are not included. eg. atrial fibrillation or morbid obesity patient-important outcomes not included in the assessment include the risk of stroke, major bleeding, prolonged hospitalisation, and ICU admission. Used carefully in emergency surgery patients, as the score is not as well validated in this population.
Gupta Perioperative MI and cardiac arrest risk calculator 2011[15,19,21]	Age, ASA Class, Preoperative function Creatinine level, procedural type anorectal, aortic, bariatric, brain, breast, cardiac, ENT, Foregut or hepatobiliary, appendix, spleen, intestinal, gynaecological, orthopaedic, Other abdomen, peripheral vascular, urological, vein X=age * 0.02 + status + ASA+ creatinine + type - 5.25	25th percentile=0.05% risk 50th percentile=0.14% risk 75th percentile=1.47% risk 90th percentile=1.47% risk 95th percentile=2.60% risk 99th percentile=7.69% risk	Only had retrospective validation. Underestimates the risk of MI compared with the RCRI. Pulmonary oedema and complete heart block, stress test results and beta-blocker therapy outcomes for previous perioperative cardiac risk calculators, were not included among the NSQIP database from which this index was obtained.
Universal surgical risk calculator 2013[15,22]	Age, ASA class, gender, functional status, emergency case, steroid use for chronic condition, ascites or CHF within 30 days of preoperatively Required ventilator, DM, HTN requiring medication, prior cardiac event, disseminated cancer, dyspnoea, current smoker within 1 year, History of COPD, ARF, BMI, dialysis	18 outcomes can be calculated Serious complication (cardiac arrest, myocardial infarction, pneumonia, progressive renal insufficiency, acute renal failure, PE, DVT, return to the operating room, systemic sepsis, unplanned intubation, UTI, wound disruption) Any complication Pneumonia Cardiac Complication (cardiac arrest or MI) Surgical Site Infection Urinary Tract infection Venous Thromboembolism Renal Failure Colon Ileus Colon Anastomotic Leak Readmission Return to OR Death Discharge to Nursing or Rehab Facility Predicted Length of Hospital Stay	Poorly predictive of other potential adverse events and clinical outcomes

Contd...

Table 4: Contd...

Risk Indexes	Parameter	Interpretation	Limitations
Geriatric sensitive perioperative cardiac risk index 2017[15]	Age, ASA Class, sex, high risk surgery, CHF, stroke Required insulin, DM, HTN requiring medication, current tobacco use, COPD, Creatinine level, BUN, Dyspnoea, laparoscopic surgery, surgical category, dialysis,	0-100% (0% lowest -100% highest risk	Does not take into consideration nutritional and cognitive, functional status
Cardiovascular risk index 2019[15]	Age ≥75 years :1 h/o heart disease :1 symptoms of angina: 1 Hb <12 g/dL :1 Vascular surgery: 1 Emergency surgery :1	0 points lowest risk 1 Points 2 Points ≥3 points: highest risk	
ANESCARDIOCAT score[19]	Seven intraoperative conditions Hypotension (1 h of a 20 mm Hg or greater decrease or a 20% change in mean arterial pressure) The need for blood transfusion, History of coronary artery disease, History of cerebrovascular disease, Chronic kidney disease, Preoperative abnormal ECG abnormalities (e.g., left ventricular hypertrophy, left bundle branch block, and ST-segment and T-wave abnormalities)	Very low, low, intermediate, and high degrees of risk of MACE and cerebrovascular events.	The risk assessment is only possible at the end of the surgery, and therefore, although the tool is predictive of postoperative risk, it does not allow for improvements to be made before surgery.

ARF=Acute renal failure, ASA=American Society of Anesthesiologists, BMI=Body mass index, BUN=Blood urea nitrogen, CA=Cardiac arrest, CHF=Congestive heart failure, COPD=Chronic obstructive pulmonary disease, DM=Diabetes mellitus, DVT=Deep vein thrombosis, ECG=Electrocardiogram, ENT=Ear nose throat, HCO-3=Bicarbonate, HTN=Hypertension, h/o=History of, Hb=Haemoglobin, IHD=Ischaemic heart disease, K=Potassium, MACE=Major adverse cardiac event, MI=Myocardial ischaemia, NSQIP=National Surgical Quality Improvement Program, PCO2=Partial pressure of carbon dioxide, PO2=Partial pressure of oxygen, PE=Pulmonary embolism, RCRI=Revised cardiac risk index, SGOT=Serum glutamic-oxaloacetic transaminase, UTI=Urinary tract infection, ICU=Intensive care unit, OR=Operating room

Other tools e.g., Sleep apnoea clinical score [SACS], multivariable apnoea prediction (MVAP) index, and NoSAS (neck circumference, obesity, snoring, age, sex) score have been described in the literature. The Epworth sleepiness scale is neither sensitive nor specific for screening for moderate to severe OSA.[30]

Pre-operative investigations

In the year 2022, the Indian Society of Anesthesiologists (ISA) published the guidelines for preoperative investigations considering the socio-economic, demographic, and medico-legal aspects of the Indian scenario [Table 5].[31] The guidelines are unique in that they mention the acceptable validity time for a previously performed investigation. So far, no guidelines by any professional bodies across the world have mentioned this. Investigations like normal complete blood count, renal and liver function tests, and coagulation profile are valid for 2 months. If a previously taken 12-lead electrocardiogram and chest radiogram were normal, then it is valid for 12 months provided the clinical condition of the patient has not changed during the period.[31] Considerations for ordering preoperative serum chemistry can be perioperative therapies, endocrine disorders, and the risk of renal and liver diseases.

In patients with bleeding disorders, renal and liver dysfunction, and the type and invasiveness of the procedure, coagulation studies should be considered.

To identify patients at risk of postoperative acute kidney injury, investigations like blood urea nitrogen-creatinine ratio, and pre-operative and peri-operative haemoglobin decrease are required.

Pulmonary function tests (PFTs) are not needed in the majority of patients undergoing extra thoracic surgery. In most cases, PFTs confirm the clinical impression without adding to the estimation of risk. PFTs may be useful in patients undergoing thoracic surgery, patients with known or suspected respiratory disease e.g., chronic obstructive pulmonary disease, subjects with decreased exercise tolerance, unexplained dyspnoea, a smoker for >20 years, and interstitial lung disease.[32]

Table 5: Recommendations for Preoperative investigations: Practice Guidelines from the Indian Society of Anaesthesiologists[31]

	Minor	Intermediate	major
Complete blood count	Y	Y	Y
Serum creatinine	N	Y	Y
Serum sodium and potassium	N	N	Y
Liver function testing	N	N	Y
Coagulation profile (PT/INR and aPTT)	N	N	N
Nondiabetic patients, preoperative blood glucose estimation	N	N	N
Noncardiac patients, preoperative 12 lead electrocardiogram testing	Y (at age 45 years)	Y (at age 45 years)	Y
Chest radiogram	N	Y (Above 50)	Y (Above 50)
Ultrasonography airway assessment for predicting difficult laryngoscopy	N	N	N

PT=Prothrombin time, INR=international normalised ratio, aPTT=Activated Partial Thromboplastin Clotting Time, Y=to be done, N=Need not be done

Park JH *et al*.[33] in a critical review concluded that to predict postoperative infection and complications in thoracic and upper abdominal surgery, lower preoperative forced vital capacity values could be used regardless of airflow limitation.

According to the European Society of Anaesthesiologists (ESA), the assessment of cardiac troponins should be done prior to surgery and then 48 to 72 hours after surgery in high-risk patients like cardiac patients, critically ill cases, those posted for highly complex surgery, and morbidly obese.[12]

Urine analysis is indicated for specific procedures e.g., prosthesis implantation, urologic procedures or when the patient has symptoms of urinary tract infection.

PREOPERATIVE OPTIMISATION/PREHABILITATION

Patients who are subjected to surgery and anaesthesia are exposed to the risk which varies from minor to major.[34] Patients with poorly managed chronic medical conditions pose a greater risk for adverse postoperative outcomes. Though perioperative complications are not that common, they add to the morbidity, cost, and at times to mortality.[35] Commonly observed perioperative complications are bronchospasm, aspiration, pulmonary infection, wound infection, delayed tissue healing, and myocardial events. Perioperative risk factors can be avoided or at least reduced in severity by preparing the patient for surgery. Preparation of patient for the impending surgery should commence well in advance before deciding the date for the surgery, so as to get adequate time for treating various comorbid conditions and optimisation of the overall health of the patient. The preoperative evaluation should be the starting point for the process of optimisation.[36] The most effective way of optimising the patient's overall condition for surgery is not very well established. So far, there is no evidence-based standard protocol for preoperative optimisation of the patient for surgery.[33] Depending upon the patient's status, proposed surgery, and available resources, the preparation plan should be tailored for that particular patient. A multidisciplinary approach involving the patient, anaesthesiologist, surgeon, and specialist physician will be helpful. Educating the patients about their existing comorbid conditions and the importance of stabilising them before surgery, will play an important role in motivating them for their cooperation in optimising their overall health before surgery. A few important steps which will help to minimise the perioperative risk include quitting smoking and alcohol, adjusting antihypertensive and anti-diabetic treatment for better blood pressure and glycaemic control, incentive spirometry for improving breathing capacity, treating anaemia, and improving exercise tolerance. Preoperative optimisation ensures the best medical condition of the patient and helps minimise the perioperative risk. Literature suggests that postponing the surgery and posting the patient after optimising the risk factors preoperatively can reduce perioperative complication rates by approximately 40%.[37] The duration required for optimisation depends on various factors. It is important to consult the surgical team to know the urgency of the proposed surgery and set the upper limit on the available time window for preoperative optimisation. Communication with concerned surgeons about identifying modifiable risk factors versus the urgency of the surgery should be done.

Major surgery can lead to pain and a reduction in functional capability.[38] Prehabilitation also includes optimising the physical functionality of the patient before the scheduled surgery so as to make the perioperative period safe and pain-free with minimal

functional disturbance postoperatively. This includes subjecting the patient to physical exercise for the building of strength by repeatedly performing specific functional tasks suitable for the particular surgery. Though studies are yet to prove the direct benefit of prehabilitation in reducing the postoperative decline in pain and functional capacity, it has been shown to reduce admission to rehabilitation units. Rehabilitation involves physical exercise, dietary changes, mental preparation, and cessation of bad habits.[39] For better post-surgical outcomes and to reduce the decline in functionality post-operatively, prehabilitation and optimisation play an important role and should be introduced to the patient during pre-anaesthesia assessment.

Anxiety and fear in the surgical patient regarding awareness during surgery, perioperative pain, nausea and vomiting, and fear of dying is very high. Preoperative counseling of the patient and the family can decrease this emotional and psychological distress.[40] Nevertheless, preoperative counseling and optimisation of nutrition are important steps of the enhanced recovery after surgery protocol.[41]

Decision to defer surgery

The decision to defer surgery is individualised and based upon a number of factors including whether the patient is on any medications, the severity of OSA, the presence of comorbidities, and the risk of surgery. Another common reason for delaying surgery is hypertension. According to the European guidelines, postponement of surgery is not recommended in patients with grade 1,2 hypertension whereas, in subjects with systolic blood pressure >180 mmHg and/or diastolic blood pressure 110 mm Hg, the surgery should be postponed until the blood pressure is optimised except for emergency procedures.[42] The patient is generally taken for further evaluation and advice regarding treatment. The threshold to defer surgery is higher in patients undergoing low-risk procedures including cosmetic surgery, endoscopic procedures, arthroscopy, and cataract surgery. In comparison, there is a lower threshold to delay surgery in patients with uncontrolled OSA undergoing high-risk procedures including major invasive surgery that impacts airway or cardiopulmonary function and the administration of postoperative opioids.[43]

Other factors that affect the decision include variations in institutional practice, the availability of preoperative evaluation clinics, monitoring capabilities of the facility where the surgery is to be performed, the likelihood of ventilatory support in the postoperative period, clinician and patient preference and level of surgeon support for completion of sleep testing prior to surgery if required.[15]

SUMMARY

Pre-anaesthetic evaluation is an essential component of anaesthesia practice. It allows for the systematic identification, categorisation, and management of perioperative risks such that the patient's physiological state is optimised for the surgical procedure. A variety of risk assessment tools have been developed and are used in clinical practice. Recent guidelines for preoperative investigations have been given by the ISA depending upon the type and urgency of surgery (elective, semi-elective, emergency), the patient's current physiological status, associated comorbidities, and the medications. Preoperative optimisation or prehabilitation is required to make the perioperative period safe and pain-free with minimal functional disturbance postoperatively.

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Conflicts of interest

There are no conflicts of interest.

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