RECENT ADVANCES IN ANAESTHESIA FOR ABDOMINAL SURGERY

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Though the frequency of anaesthetizing an abdominal case is more, the available literature detailing the recent advances in this field are scanty. It is a fact that, this topic does not find a place for discussion or presentation during anaesthesia conferences. Under the said circumstances, here is an attempt to update our knowledge about the advances that are taking place in this field and review the role of an anaesthesiologist that could better the outcome after a major abdominal surgery. Hereunder, the author wishes to present the data that was collected while conducting a prospective clinical study on this subject.

Safe outcome after a major surgery is the key factor in the development of modern day Anaesthesia and Surgical Care. It is well established that the anaesthesia care, complicated surgical procedures and the co-morbid conditions of the patient would alter the outcome after an abdominal surgery. During the past few decades, there has been a tremendous improvement in our understanding of the underlying factors that are involved. For example :

(1). An increase in knowledge and understanding of the underlying perioperative pathophysiologcal changes that occurs as a result of stress response induced during major abdominal surgery and anaesthesia.

(2). Importance given to the preoperative stabilization and optimization of the disease processes and the patient's deranged parameters based on the detailed information provided by the advanced laboratory medicine and the imaging technology.

(3). Use of newer and safe anaesthesia drugs, multimodal anaesthesia approach and importance given to institute a specific pre-emptive, perioperative as well as post operative pain management protocol.

(4). Introduction of continuous advanced non invasive as well as invasive monitoring technology that would constantly recognize and document any deviations in the perioperative parameters as a result of perioperative stress response and guides one to undertake an early, appropriate and aggressive intervention.

(5). Understanding the importance of providing an excellent intensive care and pain management during the immediate recovery and post operative period. This includes the need for utmost care and constant monitoring during transfer from the operation room to recovery bay or to the post operative intensive care area.

The most important development in the recent years is the understanding of the series of perioperative physiological changes as stress response that takes place due to anaesthesia and surgery. The impact of these bio-chemical responses on the cardio-vascular, metabolic, fluid and electrolytes status etc. directly affects and alters the patients response and the physiological condition that in turn has a direct bearing on the risk involved and the outcome after a major surgery. Efforts are also are on applying appropriate modulator therapeutic strategy during the perioperative period to prevent and combat the stress response in time. Ultimately, it is expected that these recent understandings would allow even major surgical procedures to be performed successfully even on a high risk patient. The present prospective study was undertaken to have an insight into the anaesthesiologist's role during the perioperative period in recognizing the various markers of stress response, and modulating the resulting variations by appropriate perioperative interventions. To start with the anaesthesiologist should make the differentiation between the upper abdominal

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surgery and the lower abdominal surgery and the respective dermatomes involved. Major upper abdominal surgery involves upper GI, liver, spleen, adrenals and the kidneys. Whereas the lower abdominal surgery involves colo- rectal, intestinal, appendix and genito-urinary system. This differentiation is mandatory since it provides a guide to the number of dermatomes that have to be blocked and the type of gut preparation that is required.

The present study concentrated on evaluating the degree of stress response during routine anaesthesia for major abdominal surgery as reflected in the biological markers of stress response like Blood Glucose, Serum Electrolytes and Blood Gases. These markers were compared according to:

a]	Type of Anaesthesia	:	Epidural Anaesthesia vs. Combined Epidural and G A.
b]	Type of Surgery	:	Impact of two types of Gut preparation
c]	Duration of Surgery	:	Two hour vs. More than Two Hour.
d]	Glycaemic Control	:	Diabetics vs. Non Diabetics.

The continuous monitoring of vital parameters HR, BP, ECG, CVP, SpO2, EtCO2, temperature, blood sugar, urine output, ABG and electrolytes were carried out. The timely interpretation of any deviations in these biological markers, and an instant and appropriate therapeutic intervention throughout the surgical procedure were instituted and documented.

BOWEL PREPARATION : Patients undergoing bowel surgery often have the bowel prepared preoperatively with a variety of aperients and retention enemas. Some of these are more vigorous than others and can produce varying degrees of dehydration and electrolyte depletion. One estimate has put the dehydration in the region of 1-2 liters and this fact should be borne in mind, before instituting epidural anaesthetic techniques for surgery. In this situation the protocol should incorporate adequate prehydration to achieve normovolemia or even hypervolemia to maintain a stable cardiovascular system in the face of sympathetic nervous system which is inevitably impaired. Usually the bowel preparation is instituted one or two days before surgery as per the surgical department's protocol.

[A]. PEGLEC ORAL PREPARTION : The patients undergoing colorectal surgeries under go the gut preparation by oral administration of "PEGLEC" preparation (peglec sachet dissolved in two liters of water) to drink over two hours. These patients will be on clear liquid diet till six hours before surgery.

Table 1: Formulation of PEGLEC: ORAL

	Chemicals	Dosage
1.	Polyethylene Glycol	118.00 G.
2.	Sodium Chloride	2.93 G.
3.	Potassium Chloride	0 .484 G.
4.	Sodium Bicarbonate	3.370 G.
5.	Anhydrous Sodium Sulphate	11.360 G.

[B]. PROCTO-CLYSIS RETENTION ENEMA: The patients undergoing upper gastrointestinal surgeries receive PROCTO-CLYSIS retention enema twelve hours before the surgery. These patients will be on liquid diet as tolerated till eight hours before the surgery.

Table 2:
Formulation of PROCTO-CLYSIS ENEMA

	Chemicals	Dosage
1	Sodium Dihydrogen Phosphate Dihydrate	10% w/v.
2	Disodium Hydrogen Phosphate Decahydrate	8% w/v.

One should realize that the upper GI surgery patients would receive phosphate salt during their bowel preparation that would result in pronounced peri-operative acid-base imbalance and electrolyte depletion. Gleb Muzikant reported significant acid base and electrolyte changes in upper GI patients who received phosphate salts frequently than polyethylene glycol for bowel preparation in case of the lower GI surgery patients. Polyethylene glycol contains high amount of potassium chloride and sodium bicarbonate. The net effect indicates that there will be is less electrolyte imbalance in the lower GI surgery group when compared to those who are posted for upper GI surgery. Further, these patients will be starving due to the disease process that may demand total parenteral nutrition which would result in moderate to hyper catabolic status with major disturbances in fluid, electrolytes and acid-base.

DIABETES : It is well known that any form of injury or surgical stress results in insulin resistance, glucose intolerance and hyperglycemia even in non-diabetics. This is known as "diabetes of injury". A large clinical study conducted by Greet Van den Berghe also referred as the "Leuven study" showed that preventing even moderate hyperglycemia during a major surgery substantially improves the outcome. This study on non diabetics, also showed that titrating insulin infusion to achieve normoglycemia [below 110mg/dL or 6 mmol.L] reduced the mortality when compared to conventional insulin treatment. Peter.G.Noordzij observed that the post operative hyperglycemia is associated with an increased cardio vascular morbidity and mortality in patients undergoing non cardiac, non vascular surgery. During their study, they observed that there was 40.92% increase in blood glucose level in non diabetics. where as 34.3% increase in diabetics. In the present study, hyperglycemic response was observed in both diabetic as well as non diabetic group. However, in spite of strict control of blood glucose level with titrating doses of insulin, there was a higher glycaemic response in the diabetic group. In diabetic patients the mean requirement of insulin was doubled when compared to non diabetic patients.

EPIDURAL : EPIDURAL + GENERAL ANAESTHESIA : In the present study, patients who received epidural anaesthesia alone, had a rise in blood glucose of 28.72% whereas in those patients who received both epidural and general anesthesia the increase in blood glucose was 42.41%. Most of the surgeries under epidural anaesthesia alone were lower gastrointestinal surgeries like colonic surgeries with less tissue trauma. Hence the observed increase in blood glucose was less when compared to the group of patients who received combined epidural and general anaesthesia, and underwent extensive and prolonged surgeries. It is an established fact, that the extensive epidural analgesia with local anaesthetic agents will prevent the endocrine and metabolic responses to surgery in the pelvis and on the lower limbs. Epidural blockade from dermatomal segments T4 to S5 established before the start of surgery will prevent an increase in cortisol and glucose concentrations in response to surgery. In this case, both afferent and efferents from the operative site to the central nervous system, the hypothalamic pituitary axis and efferent autonomic neuronal pathways to the liver and adrenal medulla are blocked. Thus the adrenocortical and glycaemic responses to surgery are abolished. Less extensive neural blockade will not completely abolish the hormonal and metabolic changes. In the upper abdominal and thoracic surgeries, it is not possible to prevent pituitary hormone responses completely even with extensive epidural local anaesthetic blockade. This fact was proved by an established study by Bromage and colleagues, where an epidural block up to C6 dermatome inhibited glycaemic changes, but not the increase in cortisol concentration in response to upper abdominal and thoracic surgeries. Anthony Rodgers[1], following randomized trials concluded that the neuraxial blockade reduces postoperative mortality and other serious complications. The size of some of these benefits remains uncertain, and further research is required to determine whether these effects are due solely to benefits of neuraxial blockade or partly to the avoidance of general anaesthesia.

HEART RATE AND BLOOD PRESSURE RESPONSE : During surgery, the changes in plasma catecholamines exhibit same trend as other hormonal changes involved in the neuroendocrinal response to stress. Abdominal surgery produces an increase in plasma nor adrenaline and adrenaline values. Pelvic surgery is associated with an increase in plasma adrenaline alone. Accordingly, a rise in cardiac output, heart rate, blood pressure, increased myocardial contractility, increased oxygen demand all are resultant effects of stress response. Results in a study to assess surgical stress during general anesthesia has shown that the surgical stress index increased at the time of skin incision and further stayed high during surgery when compared to the preoperative behaviors. In the present study, it was observed that in response to a surgery , there was a minimum increase in the mean heart rate ie. by 3.8% during the first two hours of the study period. Further, in those patients, who underwent prolonged surgery that lasted four hours under combined epidural anaesthesia and general anaesthesia, the heart rate increased by 12.2% . Corresponding increase in the mean arterial pressure from the basal mean arterial pressure was 3.7 % during the first two hours and just 0.9% in patients who underwent surgery that lasted for four hours indicating the benefits of a steady anaesthesia depth that is maintained by multimodal approach i.e. general anaesthesia as well as by continuous epidural anaesthesia by the use of syringe pumps.

CENTRAL VENOUS PRESSURE AND URINE OUTPUT : The activation of stress response as a result of surgery would influence the salt and water metabolism. These changes support the preservation of adequate body fluid volumes. Arginine vasopressin, which is released from the posterior pituitary, promotes water retention and the production of concentrated urine by direct action on the kidney. Increased vasopressin secretion may continue for 3–5 days, depending on the severity of the surgical injury and the development of complications. Renin is secreted from the juxtaglomerular cells of the kidney, partly as a result of increased sympathetic efferent activation. Renin stimulates the production of angiotensin II. This has a number of important effects in particular, it stimulates the release of aldosterone from the adrenal cortex, which in turn leads to sodium and water reabsorption from the distal tubules in the kidney However, during the present study there was a minimal variation in central venous pressure during the course of the surgery that lasted from two hours to four hours. The important observation of the study is that, in spite of maintaining near normal mean arterial pressure, central venous pressure and other vital parameters, there was a 22.3% mean decrease in urine output at four hours of induction.

Further, it also well established that anaesthesia and surgery produced oliguria, and postoperatively patients are unable to excrete the large amounts of salt and water that is administered. Infusion of saline solution intravenously into normal subjects results in a diuresis and a restoration of normal salt and water balance within hours, where as in case of those suffering from trauma, surgery, or acute illness are unable to do so. The capacity to diurese an excess fluid load depends on the recovery or anabolic phase. The two terms, sodium retention phase and sodium diuresis phase has been used to describe these two periods of response to trauma or illness.

FLUID AND ELECTROLYTES : Anesthesia and operative procedures also induce changes in water and electrolyte metabolism, whose causes might be an increased secretion of ADH, cortisol, aldosterone and renin-angotension II. Thus, the endocrine response to surgical trauma leads to conservation of sodium and water and to excretion of potassium. The increased ADH secretion leads to enhanced water reabsorption in the kidney, resulting in a postoperative decrease in diuresis and a decrease in plasma concentrations of sodium.

Table 1: Hormonal responses to surgery and fluid overload

Hormone	Response to Surgery	Response to overload	Effect on fluid distribution
Aldosterone	Increase	Decrease	Sodium and fluid retention; potassium excretion
Antidiuretic hormone	Increase	Decrease	Water retention
Renin-Angiotensin	Increase	Decrease	Sodium and fluid retention; potassium excretion
Atrial natriuretc peptide	Increase or no change	Increase	Diuretic; natriuretc

During the present study there was a minimal deviation in the observed values for sodium in both the study groups. This may be due to the fact that these patients received parenteral sodium in the form of intravenous fluids and Inj. Sodium bicarbonate. In the epidural group, the trend indicated a rise in serum sodium at the end of two hours and again at the end of four hours that amounts to a mean percentage rise of 0.79% and 1.63% respectively. Similarly in case of combined epidural and general anaesthesia group, one would have expected large changes in the serum sodium values since these patients had a large fluid shifts when they were undergoing major surgeries and had received various forms of gut preparations and intravenous fluids preoperatively. However, the mean decrease in serum sodium at the end of two hours was in the range of 0.39% and an increase in mean sodium concentration by just 1.06% at four hours of induction. This observation could be explained on the basis of the plasma expanders without any sodium ions that they received during study period. Further during the study it was documented that the patients who underwent upper gastrointestinal surgeries [UGI] presented with a lower serum sodium values to start with when compared to those group of patients who underwent lower gastrointestinal surgeries [LGI]. This could be explained by the fact that these patients would be virtually starving preoperatively for days and would have received intensive gut preparation in the form of many courses of extensive stomach wash.

The increased secretion of aldosterone and renin leads to conservation of sodium and excretion of potassium paralleling the increase in catabolism. In addition, the preoperative dehydration, prolonged fasting period and bowel preparation adds on to the ionic loss; Patient will present with a comparatively lower serum potassium values to start with which may continue to remain low during the surgical period also. This state of preoperative and per operative hypokalemia could be explained on the basis of shifting of potassium from extracellular to intracellular compartment due to administration of sodium bicarbonate and insulin. It has been calculated that the potassium losses are about 100 mmol/day for the first two days after surgery although these may be greater following bowel surgery. Although potassium is lost from the cells as protein is catabolized, the losses of potassium in the urine may be disproportionately greater, probably through mineralcorticoid effects. Even though the total body potassium may decrease, the serum potassium concentration may be normal or increase in the catabolic patients, depending on the presence of other sources of loss, e.g.urine, fistulae, diarrhoea or nasogastric aspirate. During the present study it was observed that in the group of patients who received only epidural anaesthesia for the surgery, the mean serum potassium value was in the range of 3.58. At the end of first two hours it increased to 3.66 and again fell to a lower level of 3.16 at the end of four hours. Similar values for those who underwent major surgeries under combined epidural anaesthesia and general anaesthesia was in the range of 3.63, 3.48 and 3.44 indicating a better management of serum potassium levels by appropriate doses of intravenous administration of potassium chloride i.e. a mean of 20.18 mEq. During the present study, the overall changes in the values for the plasma chloride in both the study groups were minimal. However, there was a marginal increase from the basal value by 2.7% at four hours of induction. This may be due to administration of intravenous fluids containing chloride ions. The increasing base deficit is related to chloride administration. The largest source of chloride is usually normal saline. Classically, dilutional acidosis would explain the predominance of this acidotic change. The absence of plasma volume change would suggest that the mechanism postulated to result in dilutional acidosis is incomplete. Chloride as well as lactate levels should be assessed whenever a metabolic acidosis is encountered peri-operatively.

HYPOTHERMIA : The inadvertent hypothermia during general anesthesia develops with a characteristic three-phase pattern. The initial rapid reduction in core temperature after induction of anesthesia results from an internal redistribution of body heat. Here the anesthetics inhibit the tonic vasoconstriction that normally maintains a large core-to-peripheral temperature gradient. Core temperature then decreases linearly at a rate determined by the difference between heat loss and production. However, when the surgical patients become sufficiently hypothermic, they again trigger thermoregulatory vasoconstriction, which restricts core-to-peripheral flow of heat. Constraint of metabolic heat, in turn, maintains a core temperature plateau (despite continued systemic heat loss) and eventually reestablishes the normal core-to-peripheral temperature gradient. Together, these mechanisms indicate that alterations in the distribution of body heat contribute more to changes in core temperature than to systemic heat imbalance in most patients. Mild peri-operative hypothermia is commonly observed in surgical patients. Though this hypothermia looks innocuous, the complications of mild perioperative hypothermia include longer duration of hospitalization, increased intraoperative blood loss, and transfusion requirements, increased adverse cardiac events, and an increase in patient thermal discomfort in the recovery room. The effects of mild hypothermia on surgical site infection has been studied recently and reported that the major concern is a documented decrease in subcutaneous tissue perfusion and a low oxygen tension at a surrogate wound that inversely correlated with the risk of surgical site infection. In addition, hypothermia induces an antinflammatory T-cell cytokine profile with increased levels of interleukin 10 and decreased levels of interleukin-2 leading to a pro-infectious status. It should also be noted that mild hypothermia increases nitrogen losses and decreases collagen production, which may serve to slow the wound healing and contribute to the risk of surgical site infection. During the present study the nasopharyngeal temperature was monitored only in those who underwent major surgeries under combined general and epidural anaesthesia. There was a fall in mean temperature by 3.5% at the end of four hours through the surgery. This fall was observed in spite of taking all the known measures to preserve the body temperature that included the use of hot water circulating mattress below the patient.

BLOOD-GAS PARAMETERS : During the present study, there was a minimal decrease in mean pH from 7.37±0.1 to 7.33±0.1 at four hours of induction. Marginal increase in pCO2 of 6.2% and marginal increase in bicarbonate of 3.2% were also noted at four hours of induction. There was also decrease in the standard base excess by 12.4% from the basal value at four hours of induction. pH was almost maintained in the normal range, though slightly acidotic, this was due to correcting the metabolic acidosis with the administration of appropriate doses of sodium bicarbonate intermittently. The mean requirement of sodium bicarbonate was 62.92mEq. The development of metabolic acidosis among the patients who are undergoing extensive surgical procedures is common. The various reasons for development of perioperative metabolic acidosis are:

- Dilutional acidosis due to infusion of large volume of saline in solution
- Lactic acidosis due to hypovolaemia and / or low perfusion state, that is prolonged by organ ischemia or decreased lactate metabolism by liver.
- Ketoacidosis due to either prolonged fasting or diabetes mellitus.
- A rare reason for perioperative acidosis is hyperphosphatemia caused by phosphate salts used for mechanical bowel preparation.

Dilutional acidosis: The mechanism of dilutional acidosis is thought to be due to volume expansion after excessive normal saline administration. Volume expansion leads to diluted plasma bicarbonate and renal bicarbonate wasting. The bicarbonate wasting occurs from an increased filtrate volume moving through the proximal renal tubules, the primary site for bicarbonate reabsorption. The higher sodium load in the filtrate interferes with the re-absorption of bicarbonate. Thus, the bicarbonate is lost leading to bicarbonaturia and acidosis. Lactic acidosis due to hypovolaemia and / or low perfusion state is ruled out during the present study since the mean central venous pressure, mean arterial pressure and normothermia were maintained during the study period. Measuring lactate level could have differentiated between the two types of acidosis. The mean standard base excess was -5.34 at the time of induction with mean pH of 7.37, which can be attributed to the bowel preparation. While comparing electrolytes and blood gas parameters between the patients who received epidural anaesthesia and combined general anaesthesia and epidural anaesthesia during the present study; it was observed that the metabolic acidosis developed in patients who received combined general anaesthesia and epidural anaesthesia compared to patients who received only epidural anaesthesia at four hours of induction. Changes in electrolytes remained same in both the groups. Comparing the blood gas parameters and electrolyte values in the upper gastrointestinal surgery and the lower gastrointestinal surgery at the time of induction indicated no variation except for the fact that the potassium value was higher (3.74mEq/L) in the lower gastrointestinal surgery group when compared to the upper gastrointestinal group. This variation in observation could be mainly due to type of fasting guidelines and bowel preparation practiced in two different type of surgeries . The mean base excess was -6.09 in lower gastrointestinal surgeries and -5.76 in upper gastrointestinal surgeries at induction. In this study, one did not find any difference in acid base status between the two study groups, though both groups remained borderline acidotic with mean pH 7.35+/- 0.08 and 7.36 +/- 0.08 respectively.

POST OPERATIVE ANALGESIA : Despite a general assumption that the upper abdominal surgery is more painful than lower, objective measurements have recently indicated that the patients after hysterectomy may suffer more pain than after cholecystectomy; patients undergoing cholecystectomy also had a greater demand for opioids postoperatively when the operation was performed through midline incision rather than through a subcostal one. Patients undergoing gastric surgery or choledocholithotomy also appear to have more pain than those undergoing simple cholecystectomy. Patients aged under 60 will have greater demand for analgesics than patients over 60. The conventional methods of pain relief after abdominal surgery are patient controlled or round the clock intravenous opioids or continuous epidural opioids and local analgesic combination administration for the first 24 hours through a drug loaded mechanical or electronic pump. Use of rectal diclofenac or and paracetamol suppositories are also in practice. In the present study, the continuous epidural analgesia was a preferred choice since all the patients under the study group had epidural catheter in place before starting the surgery.

CONCLUSION : The extent to which the stress responses are modified depends on the choice of the analgesic techniques used. General anaesthesia may limit the perception of sensations due to injury, but may not abolish the stress response completely as hypothalamus reacts to the noxious stimuli even in the deeper planes of anaesthesia (e.g. rise in HR and blood pressure). Thus a multimodal approach is recommended to obviate the stress response. In addition, from the present study, one could conclude that it is possible to keep the important aspects of stress response on the metabolism completely normal or near normal during major surgery by giving importance to the anaesthesia approach, intensive monitoring and changing the metabolic profile during intra operative period. The present study has reiterated the fact that the degree of stress response during anaesthesia for major and prolonged surgeries will be reflected by instant variations in the biological markers like Blood Glucose, Serum Electrolytes, Blood Gases, Urine output and the Temperature variations. Perioperative and post operative attention to these markers of stress response will act as a guide to assess the degree of perioperative derangement that is caused by the surgical stress and to institute appropriate remedial actions by the anaesthesiologist. Thus, these evidence based measures that are instituted will result in a better out come after a major surgery. From the present study one would recommend that :

- **Preoperative measures :** Conduct a thorough preoperative examination and assess the degree of deviations in the fluid and electrolyte values. Give attention to preoperative optimization and alimentation by administring appropriate intravenous fluids. Be cautious about the blood sugar management in diabetics. Take the patient into confidence and explain the advantages of epidural catheter insertion. Order for estimation of serum electrolyte and blood sugar estimation before shifting the patient to the OT. Severely dehydrated patients will benefit from preoperative central vein cannulation {Subclavian approach is preferred] to institute TPN as well as to monitor the CVP.

- **Preinduction Period :** Review the laboratory data, select appropriate IV fluids and a plasma expander to be perfused through blood sets. After setting the monitors and confirming the basal values, epidural catheter is inserted and fixed while the patient is under mild sedation and receiving oxygen via face mask.

- Give importance to the smooth induction of general anaesthesia by selecting appropriate drugs. In case of epidural anaesthesia alone; the preferred combination is epidural fentanyl and lignocaine with adrenaline and sodabicarb solution. Here the patient is made as comfortable as possible and measures to maintain the temperature is instituted earnestly. Diabetics may require more fluids in the form of plasma expanders to maintain adequate perfusion pressure. Further, these patients require additional measures like administration of sodabicarb to prevent metabolic acidosis. Administration of sodabicarb would result in hypokalemia and demands administration of Islyte M or GPI solution to correct the intracellular potassium deficit. In addition the importance is given to the meticulous monitoring of urine out put, CVP, mean blood pressure and the heart rate during the surgical procedure. Achieving normovolemia, normothermia, normoglycemia, near normal electrolyte, blood gases and urinary output should be the main goal during the perioperative period. In case of general anaesthesia, the preferred approach to maintain a uniform depth of anaesthesia and the muscle relaxation during the surgery is by a continuous infusion of fentanyl and the muscle relaxant via a syringe pump.

Anaesthesiologist should plan the post operative analgesia suitable for the patient before hand and the patient should be aware of the pain relief measures that will be instituted soon after the surgery. Accordingly post operative pain management protocol is drawn and instituted soon after the surgery. Continuous infusion of solution containing local anaesthetic solution along with opioids is the preferred choice for the management of post operative analgesia. This will be instituted following a loading dose of appropriate opioid.

- Anaesthesiologist should be involved or even take the responsibility of the post operative pain management regimen along with fluid and electrolyte management, correction of acidosis, glycemic control, maintenance of normothermia, adequate ventilation and attention to the patient's comfort.
- Anaesthesiologist should remember the possibility of sudden desaturation at the time of shifting and hence adequate measures should be taken to monitor and provide oxygen to these patients while they are on the transfer trolley.
- Anaesthesiologist should hand over the patient to the post operative care team after detailing the instructions and documenting the post operative regimen to be followed.