

# UWI NICE

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# BULLETIN

## ORGANIZATIONAL STRUCTURE

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## DIRECTOR'S INAUGURAL MESSAGE

### *UWI N.I.C.E. – A New Beginning*

Our First Research Day seven years ago launched the research agenda of the strategic plan of UWI SCMR. Simultaneously, the Ethics committee was established in partnership with PHA. There has been an exponential growth in research submissions, approvals and oral presentations at national, regional and international conferences and symposia. From less than ten submissions and approvals in 2008 to almost 50 per year by 2011; and from one presentation at the annual CHRC in 2008 to 13 by 2012. The School is well on target to fulfill its vision to becoming the leading center of research in all aspects of health in the Commonwealth of The Bahamas.

The time has come to translate oral presentations to abstracts and publications. We are pleased to establish UWI NICE as the official scientific publication of our school.

In a country of 350,000 people, there is much to document: basic demographic data, and disease and treatment outcomes of even our most common medical conditions including the communicable and non-communicable diseases, are scarce. This year will mark the 40th Annual Scientific Conference of the Medical Association of the Bahamas; few of the presentations have ever been published. We would be remiss not to mention the numerous grand round presentations on a weekly and monthly basis at the various departments of the three hospitals of the Public Hospitals Authority and the private one, the Doctors Hospital. There should be no question as to the need of a designated medical bulletin in the Bahamas serving as the repository of diseases and their management.

The UWI NICE is not the first attempt to publish medical literature in the Bahamas. In the 1980s and 1990s, there was the Bahamas Medical Journal and the New Providence Medical; there were attempts at newsletters too. I suggest in the absence of a medical institution of higher learning with a steady stream of eager minds and a committed faculty, the lack of sustainability was inevitable. Herein lies the promise of success for the SCMR Bulletin, UWI-N.I.C.E.

*And now we welcome the New Year, full of things that have never been*



The BTC Telemedicine Lab Plaque is unveiled in the PMH Oncology Department. L-R: Dr. Perry Gomez, Minister of Health; Dr. Robin Roberts, Director, UWI SCMR; Mr. Frank Smith, Chairman PHA; Mr. Jerome Sawyer, Sr. Manager, Public Relations, BTC and Dr. Victor Blanchette, Haematologist and Co-Chair of the SickKids Caribbean Initiative.

# TELEMEDICINE LAUNCH

The most notable highlight of the academic year was the acquisition of our telemedicine video conferencing formally opened by the Honourable Perry Gomez, Minister of Health on July 15, 2013. This collaborative effort between the University, Princess Margaret Hospital and the SickKids Foundation, Toronto Canada through their Caribbean SickKids Paediatric Cancer and Blood Disorders (CPCB) has been going extremely well.

The generous donation of \$100,000 from BTC has assisted significantly in facilitating the real-time consultation between family members and medical specialists in two different countries; enabling closer and timelier patient physician interaction, and a higher level of clarity to the process of patient care.

Within the last few months teleconferencing has taken on new life with the sharing of lectures and symposiums within the University. We are seeking to initiate a Masters in Public Health as of Sept 2014 and anticipate 2015 video conferencing and continued medical education to be ongoing at least 4-6 hrs daily.

from *The Editor's Desk...*



# ARE WE TRUTHFULLY THE “GOOD DOCTORS”?

Professor Mridul Panditrao , Managing Editor

**TIME FOR INTROSPECTION: THE  
FORGOTTEN SCIENCE OF MEDICAL  
DEONTOLOGY!**

*Every time, we deal with a patient, we need to ask ourselves a very simple and pertinent question?*

*“Was I ‘Good’ to my patient? (“Did I do everything ‘good’ and nothing ‘bad’?”)*

Providing service with adequate skill, precision and expertise is not enough, but what matters the most is to judge, if it was appropriate, necessary and not tinged with ‘vested interest’. If and when we are questioned by our own morality, about these issues, then we must stop there for a moment, introspect and be our own ‘Devil’s Advocates’, if necessary. The ‘stark and naked materialism’ especially, on the part of health care providers at large, is the worst bane which has attained such monstrous proportions that the society on the whole, has started looking at the physician community with very suspicious and negative attitude.

As the medicine is technologically evolving, there is a paradigm shift towards the protocol based practice, so that there is very little margin for error. Sadly, in the pursuit of ‘perfection’, ‘standardization’ and ‘quality’, the clinicians tend to forget, that we are not dealing with the ‘mechanical objects’, but living beings, who do require to be treated with the attitude of respect, understanding and kindness, which according to them, may have much more significance than only ‘quality assurance’.<sup>1</sup>

On the other hand, even the physicians/clinicians should not be considered as, the perfect mechanical devices or robots. The picture is painted in only either black or white, viz; ‘there can only be and must be the perfection in the service and if there is error that needs to be punished’, as is usually projected by the popular media and legal fraternity. These advocates of model of perfectionism, maintain, that, the better efforts will lead to perfection in the service, especially in medicine, because we are dealing with living human beings.

So if there is error, that needs to be punished severely and swiftly, because then there will be no further room for error. This ideology fundamentally is flawed, because, nobody, even its advocates are not ‘perfect’ themselves. We, medical professionals are also to certain extent adding fuel to the ‘fire’, by getting embroiled in the ‘blame game’ and ‘mud-slinging’ in the event of ‘an error’. All these usually tend to culminate into nasty, ugly and avoidable legal wrangles.

Because the process becoming more and more complex, the attitude on the part of doctors, while dealing with their patients/ their relatives is of, divulge only what is ‘needed to know’. This ‘lack of communication’ can be considered as one of the main causes of ‘litigation’.

As this vicious process of self-perpetuating and self-destructive hostilities, is relentlessly unfolding, we the senior members of medical profession/ teachers/ trainers need to seriously ponder over the prevailing situation and start re-inventing, the now almost certainly forgotten/ near extinct science of “ Medical Deontology”, in the interest of ‘future generation’ of the physicians!

Definitions:

Medical Deontology, the term is constituted by two terms, deon (Greek) – ‘duty’ or ‘obligation’ and Logos (Greek) – meaning opinion, word ...”

Medical deontology is defined as the discipline for the study of norms of conduct for the health care professions, including moral and legal norms as well as those pertaining more strictly to professional performance. <sup>2</sup>

“It is a system of moral principles that apply values and judgments to the practice of medicine.” In fact one can visualize it as a “set of ethical standards and principles of behavior of medical practitioners while executing their

professional duties, professional ethics of medical workers and principles of behavior of medical personnel, directed toward maximum benefit of treatment.”<sup>3</sup> It is the science of understanding the rights and duties/ responsibilities of mainly Physicians but also, the other health care professionals.

At its core are the intricately inter-related 3 sub divisions: <sup>4-6</sup> Medical Jurisprudence or Law ( Jur Latin meaning Law and prudentia Latin meaning knowledge ) or also known as Forensic Medicine, by some, can be defined as the science which applies the principles and practice of the different branches of medicine to the elucidation of doubtful questions in courts of justice. According to some authorities, it is used in a more extensive sense and also comprehends Medical Police, or those medical precepts which may prove useful to the legislature or the magistracy.<sup>7</sup>

Medical ethics (ethica Latin from Greek ethice) – teaching of morals, Medical ethics is defined as a system of moral principles that apply values and judgments to the practice of medicine. As a scholarly discipline, medical ethics encompasses its practical application in clinical settings as well as work on its history, philosophy, theology, and sociology

Medical hodegetics (from Arabic); literally means, guidelines for the study of medicine. The guidelines which cover the ideal principles which must be learnt while studying medicine as were once envisioned by the ancient “Fathers of the Medicine.’

So as medical professionals, when we come in contact with the patient, we are governed by the principles and practices involving the above-mentioned three areas. Medical deontology includes problems of observing medical confidentiality, the problem of the extent of the medical worker’s responsibility for the life and health of the patient, and problems of relationships of medical workers to each other.<sup>3</sup>

Thus the “Triad of Medical Deontology” is understanding the interpersonal dynamics between the three players involved

- **Medical worker with Patient,**

- **Medical worker with the Relatives of the patient,**
- **Medical worker with other Medical workers, who might or might not be their colleagues/ team members.**

## HISTORICAL ASPECT:

This science has its roots very deep from ancient times. As we trace the historical precedents, we come across the “The Laws of Hammurabi” (Laws of Ancient Babylon, 18th century B. C.)

In the western literature, Hippocrates (5-4 century B. C.) has the dominant position due to the “Oath”. In actuality it was in fact put in place by the members of a Medical school on Kos, a Greek island and he being one of them. The importance of Hippocrates, stems from the fact that he differentiated the ‘magic’, ‘religion’ from ‘medicine’ and introduced the ‘scientific observational methodology as the part of ‘medical treatment of patients’. The “Hippocratic Oath” actually describes the responsibilities of the ‘doctor’ towards his patients and colleagues’, so logically it became ‘binding’ for them.

Indian “The Book of Life” (“Ayurveda” – 5-4 centuries B. C.) also describes criteria for a good teacher and who should study medicine. The depth of understanding can be gauged by noting the teachings of one vedic (physician) teacher to his pupil “You now leave your passions, anger, greed, madness, vanity, pride, envy, roughness, buffoonery, falsity, laziness and any vicious behavior. From now on, you will have your hair and your nails shortly cut, wear red clothes and conduct a pure life”. It also offers counsel on behavior with patients and their relatives and pointers that can be used by us when dealing with such issues as brain death and organ transplantation. Especially striking is the emphasis on transcending the needs of the body, mind and intellect in order to reach a state where the cycle of birth - death - rebirth is broken<sup>9</sup>.

Aristotle (384-322 B. C.) introduced the term “ethics”, meaning “a concept of human morals”

In middle Ages: IbnSina (Avicenna, 10-11 centuries) prominently is noted, for his work “The Canon of Medical Science” and “Ethics”



As we go ahead the concepts have been dealt in greater details by likes of Jeremy Bentham (English philosopher, lawyer, priest; 1748-1832), who introduced the notion of deontology as meaning "... the teaching on the due behavior of a person while achieving his end" (18 century).

Some references in Russian medicine, e.g. "The Word Concerning Piety and Moral Qualities of a Hippocratic Physician" and "The Word Concerning the Ways of Teaching and Learning the Practical Medicine" by MatveyYakovlevichMudrov (1776-1831), "Letters from Heidelberg" and "The Diary of an Old Doctor" by NikolayIvanovichPirogov (1810-1881) are noteworthy.

The controversial Nuremberg process (1947), which depicts the verdict to the Nazi physicians, "The Nuremberg Code", postulates not legal, but also moral regulations of medical experiments.

Post 1947 - the World Medical Association was created. Its main action was the adoption of "The Geneva Declaration" – the oath of a physician – the doctor (1948), the International Code of Medical Ethics (1949), "The Helsinki Declaration of Human Rights" (1964), "The Helsinki-Tokyo Declaration" (1975), and "The International Declaration on Human Rights" (1983).

## PRINCIPLES OF MEDICAL DEONTOLOGY/ ETHICS

The primary Duties of physicians are to behave in accordance with the principle that has long been set in Hippocratic Oath:

PRIMUM NON NOCERE (Latin) - FIRST, DO NO HARM – this maxim is the main ethical principle in medicine.

Six of the values that commonly apply to medical ethics discussions are: 3

- Autonomy - the patient has the right to refuse or choose their treatment. (Voluntas aegrotisupremalex.) The principle of autonomy recognizes the rights of individuals to self determination. This is rooted in society's respect for individuals' ability to make informed decisions about personal matters.
- Beneficence - a practitioner should act in the best interest of the patient. (Salus aegrotisupremalex.) The term beneficence refers to actions that promote the wellbeing

of others. In the medical context, this means taking actions that serve the best interests of patients.

- Non-maleficence - concept of non-maleficence is embodied by the phrase, "first, do no harm," or the Latin, primum non nocere. Many consider this should be the main or primary consideration (hence primum): that it is more important not to harm your patient, than to do them good.
- Justice - concerns the distribution of scarce health resources, and the decision of who gets what treatment (fairness and equality).
- Dignity - the patient (and the person treating the patient) have the right to dignity [4].
- Truthfulness and honesty - the concept of informed consent has increased in importance since the historical events of the Doctors' Trial of the Nuremberg trials and Tuskegee Syphilis Study.

It has been argued that mainstream medical ethics is biased by the assumption of a framework in which individuals are not simply free to contract with one another to provide whatever medical treatment is demanded, subject to the ability to pay. Because a high proportion of medical care is typically provided via the welfare state, and because there are legal restrictions on what treatment may be provided and by whom, an automatic divergence may exist between the wishes of patients and the preferences of medical practitioners and other parties. Tassano[3] has questioned the idea that Beneficence might in some cases have priority over Autonomy. He argues that violations of Autonomy more often reflect the interests of the state or of the supplier group than those of the patient.

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We can add some principles such as

- Medical privacy - allows a person to keep their medical records from being revealed to others.
- Confidentiality - is commonly applied to conversations between doctors and patients. This concept is commonly known as patient-physician privilege. Legal protections prevent physicians from revealing their discussions with patients, even under oath in court.
- Fidelity - is the quality of being faithful or loyal to one's patients as if it is the service rendered in relation with the



cause of 'Lord Almighty'.

- Veracity- Truth telling or Obligation to full and honest disclosure, of the information, concerns or any such matter, in context with a patient's health/ disease state to himself/herself and their near and dear ones.

So going back to our basic fundamental question, "Are we 'good doctors'?", nobody should have even the slightest hesitation in answering it unflinchingly, affirmatively!

The author has always firmly believed in these principles from beginning of his career and more so, especially after assuming the uncompromising position of being a passionate teacher, it has been his firm endeavor to try his best and inculcate these values in the future practitioners of the clinical medicine!!

Conflict of interest statement!

The author confirms that there is no conflicts of interest related to this editorial

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## White Coat Humor



A guy is walking past a big wooden fence at the insane asylum and he hears all the residents inside chanting, "Thirteen! Thirteen! Thirteen! Quite curious about this, he finds a hole in the fence, and looks in. Someone inside pokes him in the eye. Then everyone inside the asylum starts chanting, "

Fourteen! Fourteen! Fourteen!

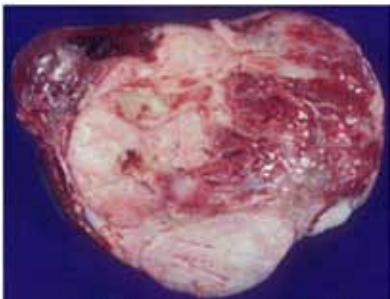
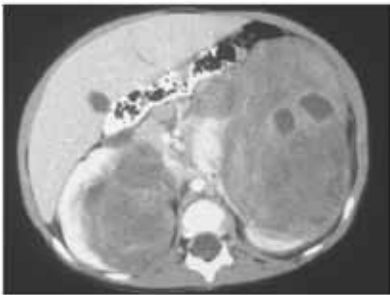
A patient complained to his doctor, "I've been to three other doctors and none of them agreed with your diagnosis." The doctor calmly replied, "Just wait until the autopsy, then they'll see that I was right."



# AN EPIDEMIC OF WILM'S TUMORS IN THE BAHAMAS

ROBIN A ROBERTS<sup>1</sup> & CORRINE B SINQUEE--BROWN<sup>1</sup>

University of the West Indies School of Clinical Medicine and Research, The Bahamas



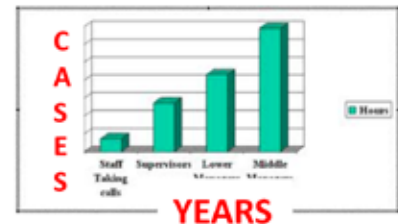
Over the past 16 years, there have been 14 documented cases of Wilms' tumors; 4 occurred in 2009 alone. With approximately 6000 births annually on the Bahamas, Wilms' tumor present at a slightly higher than expected rate in the medical literature. The average age of presentation was 3.7 years.

All presented with a palpable mass and 4 (29%) were bilateral. All cases had favorable histology. Depending on The staging at diagnosis, patients were treated according to the National Wilms' Tumor Study Group (NWTSG) protocol standard therapy in the first instance (Nephrectomy with Vincristine + Act D for Stage I +II/ Vincristine +ActD+ Doxorubicin for stage III + IV+ XRT). 4 patients died because of progressive metastatic disease (inspite of favorable histology

and stage) and one from a surgical complication. **A review of 8 cases at the Section of Cancer Genetics, Institute of Cancer Research in Britain did not identify any clear pathogenic WT1 mutation.**

The underlying factors for this high incidence of Wilms' tumors, the bilateral occurrence and failure to respond to recommended protocols in the Bahamas have yet to be determined.

Name	Age	Year	Site	Stage	RX	Relapse	Current Status
WC	2	1995	UNI*	III	N+C+R	+ Pul	Died Mets
SC	3	1995	BIL*	V	N + C		Alive
DD	10	1996	UNI	III	N + C+R	+ Pul	Died Mets
MA	3	1996	UNI	III	C+ N		??
DT	6	1996	UNI*	III	N+C+R		Alive TF
EA	18m	2001	BIL*	V,III	N +C+R	+Pul/Ab	Died Mets
TL-T	11m	2005	BIL	V	S+C		Alive
AP	5	2007	BIL	V	N+C		Alive
EP	2	2007	UNI	I	N+C+R		Alive
AS	19m	2009	UNI	II	N+C	+Pul/Ab	Alive
RR	3	2009	UNI	II	N+C		Died
JL	22m	2009	UNI	1	N+C		Alive
EC	5	2009	UNI	III	N+C+R	+Pul	Alive
KS	6	2011	UNI	IV	N		Died - S



## Conclusion:

Wilms' tumors have a relatively high prevalence in the Bahamian pediatric population, presenting with advanced stage disease. Despite the favorable histology and availability of standard of care management guidelines, disease outcomes have been less favorable. No WT1 mutations have been identified.

# Peri-operative management of Gastro-Intestinal Endoscopies and Suggested protocol: A Case series

Richardson S., Panditrao M., Panditrao M., Burton V.

## ABSTRACT:

With the increased awareness about the incidence of colorectal malignancies, both in clinicians as well as the common public, the diagnostic Gastro-Intestinal Endoscopies are one of the most commonly performed, especially as a day case (Outpatient) procedures. In Rand Memorial Hospital, they have assumed a large proportion, on any given surgical operation list. The patients mostly belong to the geriatric age group and usually have co-morbidities, therefore pose a major challenge from the perspective of entire peri-operative management.

As most of these patients need to be fully conscious at the end of the procedure, it is imperative that the technique of anesthesia/ sedation is very well planned out and executed. We have devised a protocol for managements of these patients.

We are presenting our own experience with managing these patients over the last twenty one months with our recommendations.

## KEY WORDS:

Gastro-Intestinal Endoscopies, Challenges in Peri-operative management, Conscious Sedation Recommended Protocol, Experience of management

## INTRODUCTION

The advent of optical colonoscopy has enabled gastroenterologists to visualize the colonic mucosa/lumen and has since become the cornerstone and 'Gold standard' of colon cancer screening programs. We as Anesthetists have made great strides to fine-tune the technical aspects of this procedure and have also made important advances that allow for a more effective and safer colonoscopy. This article focuses on our protocol regarding diagnostic Gastro-Intestinal Endoscopies premedication and sedation. We present our own experience, a review of our management and describes recent studies and how these findings may one day further enhance our practice.

## MATERIALS AND METHODS

As this was a retrospective collective analytical study, there were no ethical issues concerning the patients. The general consent had already been obtained for the conduct of endoscopy under the suitable anesthesia, at the time of conduct of procedure.

However the permission of concerned authorities were obtained for compilation, analysis and drawing inference.

A standardized protocol was manufactured and strictly adhered to, which included the steps as follows:

## PRE-ANESTHETIC ASSESSMENT

- Anesthetic Clinic (Patient interview for anesthetic clearance)
- Patients' questions and concerns are addressed
- Pre-Meds (w/ special instructions eg. HTN, DM, Asthma)

- IV Midazolam 1mg (Anxiolytic)
- IV Pepcid 20mg/PPI
- IV Metoclopramide 10mg

## Intra-Operative Management

- Monitoring
- ECG: Normal Sinus Rhythm
- NIBP: = -20% of Baseline Blood Pressure (<1% patients had significant/dramatic incr/decrease in BP)
- SPO2: Supplemental Oxygen (-3-5L O2/min.): Spontaneously breathing face mask SPO2: 95 - 100%
- ETCO2: 28 - 37mmHg
- Intra-Op Medications
- IV Midazolam 1mg
- Anxiolytics
- Propofol infusion (-120 - 200mg)
- Smooth, Rapid induction
- Moderate duration of action
- Hypnotic effects
- Metamizole 2.5g infusion in 1L IVF
- Smooth Muscle relaxant
- Decrease muscle spasm

## Intra-op Complications

- Severe Hypotension
- Severe Bradycardia
- De-saturation (Obese, Obstructive sleep apnea patients)
- Elderly patients and subjects with compromised renal and hepatic functions may be at a greater risk of side effects, which justifies the need for proper medical surveillance during the endoscopic procedure

## POST-OPERATIVE MANAGEMENT

- Post op pain management x prn
- Out patients given light meal

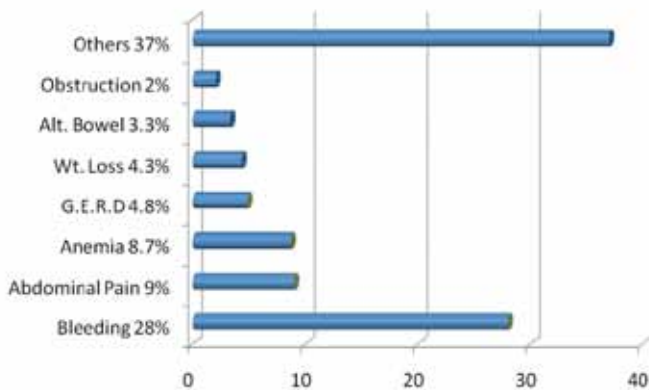
# Peri-operative management of Gastro-Intestinal Endoscopies and Suggested protocol: A Case series (cont...)

- Post op monitoring x 30 – 60mins.
- Surgeon discusses intra-op findings & patients are given follow up instructions
- Patients are discharged into the care of a pre assigned loved one

## RESULTS

This is a retrospective collective analytical study, comprising of the data of patients that presented between the periods of April 2012 to December 2013. The total number of patients was (n) 422. The appropriate statistical methods were employed. Focus is predominantly on colonoscopy patients, as they represent 57% of patients that presented within the aforementioned period.

April 2012 – September 2013



## DISCUSSION

### WHY ANESTHESIA FOR COLONOSCOPY?

Colonoscopy is not generally considered a painful procedure, however sedation and analgesia is employed due to a number of reasons:

- Allay patient anxiety.
- Alleviate discomfort due to mechanical stress caused by colorectal distension following insufflation of air into

the colon, the length and diameter of the scope.

- Prevent resistance and sudden movements by the patient
- Facilitate proper biopsy taking by ensuring patient immobility
- Facilitate proper clinical examination whenever it is otherwise difficult

Our goal is to allow for a safe and comfortable endoscopic procedure.

### PROPOFOL-BASED SEDATION

Propofol provides much more flexibility in meeting sedation needs than sedation with fentanyl-midazolam. It is well suited for colonoscopy due to its rapid onset and offset of action. Propofol affords a pain-free “sleep-like” state, with very rapid awakening and virtually no sense of nausea, drug “hangover” or other lingering side effects. With propofol it is possible to “deepen” the patient within one to two minutes during the uncomfortable insertion of the colonoscope or during passage through the colonic flexures. If desired, propofol sedation can be discontinued on reaching the cecum, which is generally not so uncomfortable.

### EPIDEMIOLOGY

At least 12.5 million procedures are performed annually in the United States (US) alone. Our primary interest is the prevention and diagnosis of colorectal cancer (CRC). CRC is the most prevalent visceral cancer in North America, with 145,000 new cases diagnosed every year, accounting for 60,000 deaths

### LOCAL STATISTICS

In The Bahamas, more specifically at the RMH, an eThese numbers represent ???% of the cases done here. These figures prompted this research. An estimated 10 Colonoscopies are performed monthly.

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## COMMONALITY OF SYMPTOMS

The predominant age groups (46 – 60 & 61 - 69) pose challenges specific to this patient population

- Aging population (Degenerative changes, debilitated state)
- Co-Morbidities (HTN, DM, CKD, Ca)
- Patient Anxiety (private parts exposed)
- Physician examination (Positioning, Difficult procedure)

## WHY THIS PROTOCOL?

Propofol-based sedation has been proven to be safe and effective. Individuals experience complete or near-complete amnesia for the procedure. Memory and most cognitive functions typically return nearly to normal prior to discharge.

## LACUNAE & RECOMMENDATIONS

- No protocol is perfect
- Pre assessment
- Strategize (Adequate anesthesia)
- Quick and concise endoscopic procedure
- Adequate post op care

Conclusions

Our goal is to continue to allow safe, and comfortable endoscopic procedures. Offer a simple, well-accepted and easily available modality that can increase the access to colorectal cancer screening and surveillance.

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# WONDERFUL, GLORIOUS SLEEP!

WINSTON CAMPBELL, FACS.  
BOARD-CERTIFIED SPECIALIST, EAR-NOSE-&-THROAT/HEAD & NECK SURGERY  
BOARD-CERTIFIED SPECIALIST, SLEEP MEDICINE

This is what we all long for, every time our heads hit the pillow, but sadly for some, this is a mere illusion, a figment about which some can only dare to dream. The fascinating story for today may be spray-painted onto a canvas, simply depicting how restorative, heavenly, peaceful sleep, so essential for robust, holistic health, morphs and creeps into silent, insidious and impending disaster and even significantly fore-shortens life-spans when the sole, irritative symptom is just a seemingly innocuous, raucous and inglorious snore. Yes, the cultural parody of the snore...that uncomely blemish, that awkward, disdainful acoustic wart that no sleeping partner wants on his/her CV. Indeed some, in particular wives, would propagandize the mere mention of this event as a conjured-up, blatant lie, even in the face of incontrovertible, recorded evidence by the spouse. The indignity of the intangible snore ranks high up there with some of other more tangible causes for embarrassment! How can a mere, banal snore, or rather a cascade of snores be the harbinger and prime manifestation of such catastrophic, otherwise unforecasted and even lethal humoral and vascular forces? Indeed, it sounds almost like a chapter taken from some wicked fairy-tale!

Except for some migratory vertebrates, all life forms have a designated, adaptive, period of inactivity, from viruses, bacteria, birds to mammals, and the development of dormant states continues to seem essential for the life preservation of many organisms. Indeed, in classic experiments of total sleep deprivation and circadian disruption in rats, those animals ultimately die whilst exhibiting adverse effects on their innate immune systems. In humans, sleep is that moment in time when the cortex of the brain in all its imperial splendor, pulls the sheer curtains, lowers the drapes and shuts itself, shutting off and becoming completely oblivious to the maddening crowd of those fast-wave, incoming stimuli bombarding from the lower brain and the peripheral nerves, perchance enabling it to go on vacation to some serene, secluded island paradise.....if so blessed. This reversible, so called cortical de-afferentiation is the time when the brain and body recoil, recharge, re-energize and restore themselves. Memory is consolidated, striated muscles go limp and

metabolism ebbs and flows as the cortex immerses itself into a reverie of its own intrinsic variety of slow waves, occasionally interspersed by the rhapsody of dreams.

We should then awaken refreshed, energized and replenished to meet the vicissitudes of the oncoming day especially if having had the additional pleasure or intrigue of a mysterious dream or two. The wonder, rapture and miracle of glorious sleep! This interlude into paradise however, can abruptly shift into one of torrid, neuro-psychiatric and cognitive turmoil and ultimately lead to cardiovascular and cerebrovascular incidents, endocrinopathies and even amputations of five to ten years from one's life-span. The leading symptom of this dramatic, malignant switch is simply that apparently innocent, repetitive, raucous cacophony we call a snore! To be clear, we are highlighting a particular, peculiar kind of snore that one should not ignore. It is the snore that has an intermezzo of quiet, a spell of silence when there is little or no tidal airflow, with little or no oxygen going to the lungs for perfusion of the heart, brain and other vital entities. This break in that monotonous cacophony engenders extreme anxiety in the spouse or sleeping partner, reflexively resulting in the elbow being thrust into the chest of the snorer or having him/her rolled over to one side. That kind of snore is just an indicator of upper airway obstruction in which the quiet spell is a period of 'no airflow' [known as an apnoea]. The malady is known as obstructive sleep apnoea.

It follows then that when this particular type of snorer exclaims, on being forced to confront the reality of those noisy night-tunes, "It don't bother me!", [as is sometimes the case], he/she is dead wrong! Indeed, it not only affects the individual in a variety of ways but also the unfortunate sleeping-partner, who is now subjected to secondary, environmentally-induced insomnia. Some adaptive, coping mechanisms employed in the past entail sending the snorer to sleep at the foot of the bed, then shipping him to the sofa in the living room, eventually to the bed-room in the east-wing and finally, booting him out of the front-door...for good! Anecdotally, there are those patients who, after successful diagnosis and management,

# WONDERFUL, GLORIOUS SLEEP!

have on hind-sight reflected that had they received that specific treatment a few years previous, it might have saved their marriage!! Sadly, additional fractured, interpersonal relationships, including marital, family and co-worker, are just some of the other rippling, disastrous ramifications that can result from such chronic sleep deprivation and subsequent neuro-psychiatric derangement .....all emanating from this peculiar kind of snore. On one hand, the sleeping partner becomes sleep deprived from the inability to initiate and maintain sleep whilst the snorer's frequent nocturnal, post-apnoeic arousals generate fragmented and non-refreshing sleep, on the other. Both soon become 'irritable, grumpy and short-tempered' and increasingly challenged in their individual ability to serenely bear the 'normal' stresses and crosses that are continually strewn in the path of regular, daily living and survival. Not surprisingly, a series of volcanic eruptions of grand proportions soon begin to be registered on the Richter Scale!

Aetiologically, let us now look at the potential airway obstruction sites and then the physiologic responses and sequelae engendered that ultimately unleash these wide-ranging, untoward cardiovascular, cerebrovascular, endocrine and neuro-psychiatric sequences with significant lapses in vigilance and memory. There are three [3] anatomical levels of obstruction to that finite airway situated above the level of the glottis. There is that twirling ball of lingual muscle residing in the floor of the mouth that suspends anteriorly from the arch of the mandible, especially when in the supine position, that can readily obstruct the narrow strip of airway immediately behind the tongue-base. This narrow strip of airway is particularly vulnerable during the extreme muscle atonia of REM sleep. Furthermore, the position of the tongue in relation to the soft palate also carries great obstructive risk, as might be depicted in Modified Mallampati categories III & IV.

Moreover, at the level of the soft palate and uvula, [the second level of potential obstruction], the posterior air strip at the oropharynx/nasopharynx junction may be readily collapsed by a very long, thickened or swollen uvula and/or a low, webbed soft palate, especially if further exacerbated by a high-arched hard palate. At this same level, the lateral oropharyngeal airspace may be eaten up by exophytic, bulky

tonsils internally and/or by lateral-neck, fatty infiltration compressing the pharyngeal airway externally, as exhibited in obese females with collar size greater than 16 inches and in males with collar size greater than 17 inches. These various oropharyngeal and hypopharyngeal anomalies may be further stratified under the Fujita Types I, IIa, IIb & III. The third potential level of obstruction is at the nasal passages, either at the choanal back-door as seen with hyperplastic, adenoid tissue or at the anterior nasal chamber where deformities of the nasal septum and nasal valve predominate together with turbinate dysfunction, allergic rhinopathy and nasal polyps.

It is also imperative that the patency of the nasal and nasopharyngeal passages be optimally established and secured to a significant degree as this also happens to be the critical route along which the various therapeutic forms of commonly utilized pneumatic splints, [such as CPAP, BIPAP & AUTO-PAP], must travel in order to push forward the collapsed linguo-palatal complex and distend and dilate the erstwhile, compromised pharyngeal airway.

Unlike the aforementioned migratory vertebrates that enjoy alternating, uni-hemispheric sleep and that remain continually responsive and active throughout their lifetime, such as some dolphins, killer whales [members of the Cetacea species] and as well as in some migrating birds, where one half of the brain sleeps with contralateral eye closure whilst the other hemisphere remains in the awake state with contralateral eye opened, we humans do not enjoy that phylogenetic luxury. Hence, when the airway is significantly obstructed, [resulting in varying degrees of compromised airflow], several pathophysiological pathways may ensue as a result of the cycle of hypoxia in tandem with extremely negative intra-thoracic pressures, on one hand and the subsequent, very, very, critical arousal from sleep toward the transient awake state, on the other. The body habitually yearns for routinely scheduled, consolidated, deep, sweet sleep. However, when the upper airway is significantly obstructed, the resulting hypoxia and hypercarbia trigger the peripheral and central chemoreceptors creating a transient, but usually sub-conscious, arousal from sleep so that the snorer is now alert enough to physically overcome the airway obstruction and take in a deep breath that redeems the hypoxia enabling return to the default,

# WONDERFUL, GLORIOUS SLEEP! (CONT.)

sleep phase, but only to have the airway again obstructed and the whole cycle repeat itself, sometimes, thirty, forty or over sixty times per hour of sleep time!!

That critical arousal, to which we alluded, generates sustained, heightened sympathetic nerve activity during the night that can persist during the day with significant cardiovascular, metabolic and endocrine implications. The acute, 'fright-flight-flight' scenario eliciting the desired sympathetic nerve activity, was not meant to become a chronic, almost incessant epic of once per every minute of sleep time over the duration of some months to years....as is commonly seen in the sleep apnoeic. Hence the prolonged damage to health becomes, profound, latent and imperceptively insidious. The resulting rapid de-oxygenation and re-oxygenation states lead to oxidative stress, endothelial inflammatory changes, altered immune states, shifts in the fibrinolytic and platelet systems resulting in enhanced atherogenesis and strokes. The extremely negative intra-thoracic pressures generated by struggling, diaphragmatic, inspiratory efforts against a closed-off upper airway, lead to pre-loading and post-loading of the cardiac chambers which in conjunction with the hypoxia and elevated circulating catecholamines result in a pot-pourri of systemic hypertension, pulmonary hypertension, congestive heart failure, brady-tachyarrhythmias, atrial fibrillation, nocturia, coronary artery insufficiency, increased nocturnal myo-cardial infarcts, strokes, Cheyne-Stokes breathing, chronic renal failure, inter alia. The mechanisms for endocrinopathy involve the sustained sympathetic nerve activity, leading to increased gluconeogenesis, hyperglycaemia, insulin resistance and steatorrheic cirrhosis. When this is further compounded by elevated ghrelin levels secreted by the gastric mucosa, triggering appetite cravings for the highest caloric-laden foods available, on one hand and the elevated but very, dysfunctional leptin levels generated from adipose tissue, on the other, odious transformations into obesity and apparitions of metabolic syndrome take shape. Negative impacts by triggering the rennin-angiotensin-aldosterone axis further complicate the aforementioned. Further endocrinopathy may be seen in low testosterone levels and the corresponding alterations in libido and REM-related penile and clitoral tumescence.

Clearly, sleep apnoea now becomes the hub of our high-risk factors and the major attractant for our prevailing, chronic non-communicable disorders. Undiagnosed sleep apnoea is co-morbid with 80% of our refractory hypertension. Undiagnosed sleep apnoea is co-morbid with over 80% of our obese, type II diabetics. Epidemiologically, it is further estimated that 80% of the sleep-apnoeic population is yet to

be diagnosed. Indeed, this is truly the unattended, unnoticed, 800-pound gorilla squatting in the social and preventive patients' waiting-room!! coaxing, prompting and instruction from the device during the course of monitoring, when deemed appropriate, to further enhance validity and reliability of the data. Of course, the costs entailed are also much less than those of the overnight, standard polysomnogram.

Armed with just these bits of information on one hand, and the enormity of the economic burden alone, inflicted by our chronic non-communicable disorders, on the other, it is incumbent upon the practicing physician to enhance his/her index of suspicion of sleep apnoea in the presenting patient through clinical history and evaluation and where indicated, to have the diagnosis established through an appropriate sleep study. **The unintended and misdirected expenditure of untold millions of our regional, health dollars is a pattern that would wise for policy-makers to expeditiously repent, a needless and onerous burden that would prudent to relieve and a gaping hole in our national and personal treasury that requires urgent and intense, fiscal remedy.....stat!!**

Pragmatically, when one considers the significant percentage of the sleep-apnoeic populus yet to be diagnosed, a well-validated Home Sleep Study in tandem with a strong clinical picture would be extremely expeditious, efficient and convenient, whilst at the same time maintaining the desired high correlation with the standard, conventional polysomnogram. Some of the latest technology exhibited by Home Sleep Study devices enable the user to perform not one but two or three nights of continuous, nightly monitoring whilst enjoying the familiarity and comfort of his/her own bed and bedroom, with subsequent data downloading and reporting within 48 hours. Moreover, there is also impromptu, verbal

This analysis may then lead to appropriate identification and classifying of the disorder with subsequent determination of the various modes of individually-tailored management, be they behavioural counseling; therapy for allergic/vasomotor rhinopathy; usage of various forms of pneumatic splints or oral devices; an array of anatomically focused, uvulo-palatal, pharyngeal, lingual or orthognathic, surgical procedures; or some amalgamation or permutation of the foregoing. Henceforth, not only the former snorer/sleep apnoeic but also the oft forgotten, forlorn, embattled, long-suffering, bed-partner insomniac may now enjoy the miracle of wonderful, glorious sleep with all its earthly benefits.



# Peri-Operative Management of Patients for endoscopic Surgery: A Review and Suggested Protocol

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## ABSTRACT:

Background:

Laparoscopic surgical procedures have revolutionized the modern 'Day Patient Care'. It also has opened new avenues, new challenges and newer thinking in anaesthetic practices. The 'trespassing of physiology' as a result of producing "pneumoperitoneum" especially with carbon dioxide and its consequences, in depth understanding of physio-systemic changes and their therapeutic manipulation is the key to peri-operative management and has been discussed as a "Problem Oriented Approach".

## METHODS:

In-depth understanding of physio-systemic changes and their therapeutic manipulation is the key to peri-operative management. The general anesthesia, as once recommended has been challenged by various other approaches, successfully managed based upon proper patient selection, appropriate surgical time management and preparedness for eventualities.

## CONCLUSION:

Laparoscopy is a boon, if wisely conducted, else can be an ultimate bane.

## KEY WORDS:

Laparoscopy, Peri-operative management, A Review.

## INTRODUCTION

Endoscopic procedure is the most recent advancement in surgical arena.

The word endoscopy has origin from 2 Greek words: Endo which means the inside/within and Scopus is the instrument to examine.<sup>1</sup> The first endoscope was invented by Philipp Bozzini in Mainz in 1806, as a "Lichtleiter" (light conductor) "for the examinations of the canals and cavities of the human body".<sup>2</sup> The two pioneers, Goerg Wulf and Karl Storz. Storz persevered till he had actually developed very bright but 'cold' light which would illuminate the internal organs without producing any thermal injury. The real breakthrough came in 1950s when Hopkins put forward the concept of fiber-optics and in 1957, first fiber-optic endoscope was invented by Basil Hirschowitz and Larry Curtiss.<sup>3</sup> One of the most

important and novel achievement in early 1970s was, invention of laparoscope, with surgeons experimenting with various techniques and procedures starting with simple pelvic/ gynecologic procedures.

However the real impetus to the laparoscopic surgery came in late 80s / early 90s, when the focus of surgical field, shifted to upper abdomen with cholecystectomy being the most commonly performed procedure.<sup>4-7</sup> This led to many unwarranted and unanticipated adverse incidents during the conducts of this procedure.<sup>8</sup> With further innovations it is now possible to perform, a true "key-hole" surgery as well as navigate thorough hollow viscus. With advent of 'videoscopes', the limitation of visualization through the lens/ eyepiece also has become redundant, making the enlarged image available, for better visualization, ease and accuracy of the intervention, teaching/ training as well as research. The process of medical auditing, setting up guidelines and specialized training of surgeons and availability of better equipment is making this already accepted modality even more popular.

Applications and scope of endoscopic surgery has been discussed in Table-1.

In this review, the effort has been to focus upon the alterations in physiology which occur during conduct of the procedures and a 'Challenge Oriented Approach' which can be followed in managing the perioperative period in these patients.

## CHALLENGES

**Challenges due to Pneumoperitoneum & altered/increased Intra Abdominal Pressure (IAP) on:**

Ventilation/ Perfusion (V/Q) mismatch  
Gas in wrong place  
Cardiovascular system changes

**Challenges due to improper patient selection / the actual procedure gone wrong / not performed properly**

**Challenges due to positions required for laparoscopic procedures**

**Challenges of peri-operative period inclusive of the anaesthetic techniques and management strategies**

# Peri-Operative Management of Patients for endoscopic Surgery: A Review and Suggested Protocol

## Challenges due to Pneumoperitoneum

Pneumoperitoneum can be defined as an abnormal presence of air either due to disease process or iatrogenic intervention, inside the peritoneal cavity. The air/gas (CO<sub>2</sub>) is an unnatural, unwanted and interfering agent inside abdominal cavity causing, following patho-physiologic changes.<sup>8</sup>

## Ventilation / Perfusion changes (V/Q)

As the pneumoperitoneum is initiated and IAP starts increasing beyond > 15 mm Hg, a result the domes of diaphragm<sup>9</sup> getting elevated, the abdominal muscles getting overstretched; the compliance, both alveolar as well as that of chest wall decreases by nearly 30%<sup>10</sup> causing drastic fall in Functional residual capacity (FRC), leading to increased V/Q mismatches and chances of hypoxia.

So it is recommended to keep the IAP to < 15 mm Hg<sup>11</sup>.

## Gas in Wrong place

In addition as an integral part of laparoscopy for production of pneumoperitoneum, insertion of needle “Verress’ needle” at an appropriate spot is essential. Many reported complications are due to:

- Wrong point of insertion
- Wrong direction of insertion
- Wrong depth of insertion (wrong plane)

## Some of them include:

Subcutaneous and retro-peritoneal emphysema<sup>12</sup>  
Extensive emphysema involving entire neck, torso and anterior abdominal wall up to inguinal ligaments has been reported. In certain laparoscopic procedures like inguinal hernia repair, intentional production of extra peritoneal emphysema is imperative.

Pneumomediastinum,<sup>13</sup> pneumopericardium,<sup>14</sup> and pneumothorax.<sup>15</sup>

All of these are relatively rare, but potentially fatal problems. The causes may be:

- Operator related
- Through congenital / potential communications
- Rarely actual rupture of the intervening membranes like pleura, pericardium or dome of diaphragm.
- The detection of these entirely depends upon:
  - High degree of suspicion
  - Progressively increasing PETCO<sub>2</sub> levels in spite of good/adequate controlled ventilation
  - If ABG done: increased PaCO<sub>2</sub> – PETCO<sub>2</sub> gradient
  - Clinically / radiologically evident gas in these areas

CO<sub>2</sub> absorption via peritoneal cavity.

Although it has been well established that pneumoperitoneum of up to IAP < 15 mm Hg, adequate controlled ventilation and persistent monitoring does not cause, either significant rise in PaCO<sub>2</sub> levels or any ill effects in normal healthy patients. In patients with pre-existing cardio-respiratory imbalance, these can assume life threatening proportions and can lead to increased morbidity & mortality.<sup>16,17</sup> This also highlights the fact that increased levels of PaCO<sub>2</sub> in laparoscopy have more bearing upon increased absorption of CO<sub>2</sub> levels from various sites rather than due to problems in ventilation or V/Q mismatch and other related problems associated with IAP, provided IAP has been maintained < 15 mm Hg.

## CO<sub>2</sub> embolism

This is a rare but the most severe, fatal complication of gas in wrong place. The intravascular entry of gas can occur either due to:

- Accidental intravascular entry of needle or trocar
- Excessive intra abdominal insufflations leading to puncture of vessel and artery
- CO<sub>2</sub> being more soluble than air, the chances of severe consequences like complete blockade of preload (absence of inferior vena caval & right atrial output) are less common.

## Cardiovascular System changes

This has multi factorial etiology:

- Intra abdominal pressure and effects of pneumoperitoneum
- Position of the patient
- Preoperative cardio respiratory status of the patient & intravascular volume
- Levels of CO<sub>2</sub> absorption and its effects
- The effects of Anesthesia / Anaesthetic agents
- Autonomic response of the patient’s body to these manipulations
- The net effects of all these factors on hemodynamics of the patient are:
  - Increased preload (due to indirect increase in IAP)<sup>18,19</sup>
  - Increased after load due to increased systemic vascular resistance & pulmonary vascular resistance
  - Decreased myocardial contractility usually as a result of general anesthesia
  - Effectively decreased effective cardiac output, initially decreased MAP, increased heart rate, and later on increased blood pressure. All of these are directly proportional to the

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levels of IAP > 10 mm Hg and onwards.

However later on as the PaCO<sub>2</sub> levels rise, the neuro-humoral factors related with hypercapnia, adrenal medullary, catecholamine induced effects starts kicking in the sympathetic mediated efforts tend to equilibrate these effects in normal, healthy patients. However in the patient with pre-existing cardiovascular problems or in hypovolemic patients, these effects are poorly balanced leading to major catastrophic fall in cardiac index even up to more than 50%.<sup>20</sup>

Anticipating these problems, one may offset them by:

Adequately preloading the patient

Using vasoconstrictors (alpha1 agonists)

Adequate analgesia / good sedation with opioids

Anti-hypertensives such as labetalol (alpha & beta blocker) and nicardipine (calcium channel blocker) for intraoperative hypertension, after light anesthesia is excluded.

The use of intraoperative Bispectral Index (BIS) helps the clinician with the choice of “more anesthesia” or anti-hypertensive. These patients may need continued support in the post operative period, whereby the duration of postoperative monitoring and support depends on the patient’s rate of return to baseline homeostatic state with hemodynamic stability, oxygen delivery, and neurological function. There are some reports of acute hypoxemia, hypotension, life threatening ventricular dysrhythmias leading to cardio-vascular collapse and cardiac arrest,<sup>21,22</sup> which cannot be correlated with PaCO<sub>2</sub> levels are reported. The proposed causes of cardiovascular collapse during laparoscopy include CO<sub>2</sub> pulmonary embolization, cardiac arrhythmias, stimulation of vagal stretch receptors secondary to peritoneal distention during insufflation or manipulation intra abdominal organs leading to vagal stimulation and diminished cardiac preload secondary to caval compression leading to asystolic cardiac arrest as a potential manifestation of these hemodynamically significant events.<sup>23,24</sup> In addition, these could be also be due to lighter planes of general anesthesia. These can be treated with stopping insufflations, opioid administration, increasing levels of inhalational anaesthetic agents especially isoflurane and anticholinergics like glycopyrrolate or atropine.

## Challenges due to improper patient selection/ incompetently conducted procedure/operator oriented problems

There is absolutely no doubt that laparoscopic procedures have many tangible as well as actual benefits to offer; in the hands of well trained, knowledgeable and skillful operators. However as is logical, if the safety, proper protocols and basic ethics are compromised the problems are bound to happen.

The commonest causes of conversion of closed to open

procedure, reported<sup>25</sup> especially in gall bladder surgeries are elderly patients, chronicity of gall bladder disease and gangrenous gallbladder.

Trocar site hernia formations in post-operative period have been reported especially ventral and umbilical hernias<sup>26</sup>.

Abdominal wall implantation of aggressive malignant tumors  
Bile duct injuries, accidental division, resection and obstruction due to accidental clamping with haemostatic clamps

Problems due to improper trocar insertion

The problems of Verress needle insertion have already been discussed in context of problems of pneumoperitoneum.

However the uniqueness of laparoscopic surgery is blind insertion of trocar through anterior abdominal wall for making a part/ parts for insertion of laparoscope and its related/associated equipments. The complications are:

Hematomas due to abdominal wall blood vessel injuries (superficial/inferior epigastric, iliac vessels)

Gastro-intestinal hollow visceral perforations leading sepsis and mortality.

Intra abdominal solid organ injuries like hepatic/splenic tears.

Major vessel (IVC/ abdominal aorta) injuries.

Peritoneal/omental/mesenteric injuries.

Retroperitoneal haematomas especially in post operative period.

To obviate most of these problems Hasson has suggested his mini laparotomy technique<sup>27</sup>:

## Challenges due to positions required for laparoscopic procedures:

Depending upon nature of pathology, organ involved and anatomical location intra abdominally, the position of patient required for laparoscopic surgery will have to vary.

Various positions which are indispensable part of laparoscopy are:

Trendelenberg/head down is necessary pelvic/lower abdominal surgeries,

Reverse Trendelenberg or rT/head up is required for surgical procedures in upper abdominal quadrants : Cholecystectomy, Nissen’s funduplication

Lithotomy is a must in majority of surgeries.

Lateral posture in addition to head up/down tilt this has to be added for better exposure of abdominal quadrant to be approached (modified left lateral with right side up for cholecystectomy).

Deleterious effects on various systems:

## Respiratory system

Head down tilt: Increased IAP, as already mentioned before, causes the intra-thoracic displacement of domes of the diaphragm into the causing respiratory embarrassment. Rarely endo-bronchial intubation (even in head up positions) can be seen, which can be confirmed by various methods like auscultation, fiber-optic bronchoscopy.

Headup/lateral tilt: may increase the dead space fraction of the aerated but less perfused lungs, enhancing the V/Q mismatch and compromising and already compromised patient. Ventilatory strategies to overcome these in the form of lower tidal volumes, adequate rate with adjusted I:E ratio, continuous monitoring of airway pressures (peak and plateau) and addition of appropriate PEEP, can improve the respiratory parameters.

## Hepato/Renal (RBF) and splanchnic blood flow

In most of the head up tilt positions in addition to pneumoperitoneum/increased IAP and CO<sub>2</sub> level abnormalities may lead to decreased RBF, decreased GFR and decreased urinary output reportedly by nearly 50%. However in healthy patients these changes returned to normal levels after deflation of CO<sub>2</sub>. Similarly elevated hepatic enzymes and bilirubin levels have been reported but returning to normal levels in healthy patients. That may not be the case in patients with compromised hepatic function.

## Peripheral problems

The patients with head up tilt, lithotomy position and in addition increased IAP; have been found to have femoro-popliteal venous stasis and predisposition to full blown picture of deep venous thrombosis and thrombo embolization.

The additional peripheral problem that must be understood is the peripheral nerve/plexus injuries in head down, arm over extended, common perineal nerve injury due to improperly padded lithotomy positions. So proper padding is an important modality.

## Challenges of peri-operative period inclusive of the anesthetic techniques and management strategies

Before discussing the suitable peri-operative management techniques one needs to understand the concerns from the surgical point of view regarding problems, especially due to anesthesia, they are

- Related to nitrous oxide administration
- Related to intravenous drugs especially opioids
- Related to anaesthetic technique specifically.
- Role of nitrous oxide.

Although nitrous oxide has generated maximum number of controversies worldwide, it is still being commonly used

anaesthetic for many balanced general anesthesia procedures. There exists some evidence<sup>30-33</sup> regarding, minimal diffusion of nitrous oxide across bowels and incidence of post-operative nausea and vomiting, But the nitrous oxide can be eliminated from the anesthesia if anti-nociception, analgesia, and hypnosis are ensured using other agents. Sodium channel blockade ("local anesthesia"), acetaminophen, and non-steroidal anti-inflammatory drugs (NSAIDs), decreases the need for analgesia with opioids. Nonetheless, opioids remain essential for postoperative analgesia and intraoperative anesthesia. Potent inhalational anesthetics such as isoflurane, sevoflurane, and desflurane are superior to nitrous oxide in almost all aspects. Propofol infusions used during laparoscopic surgery can decrease the need for inhalational agents, decrease rate of nausea and vomiting and can replace nitrous oxide.

## Intravenous anaesthetic agents.

Propofol can be used safely in patients with cardiovascular disease when carefully titrated based on physiological data including neurological status and vital signs. There is a concern for use of drugs like fentanyl and the effects on sphincter of Oddi/PONV. It is general consensus that instead of using propofol as a sole anaesthetic agent, an addition of isoflurane improves overall outcome in laparoscopic procedures, especially with pure mu-agonists like fentanyl can be suitably replaced by newly available drugs which have minimal biliary stasis activity like Nalbuphine which itself has been found to have good analgesic activities.<sup>34</sup>

As such minimal post operative pain in laparoscopic procedures and availability of parenteral NSAIDs may actually make the use of opioids redundant.

## Anaesthetic techniques.

Which technique to use?: general, regional, combination, local?. Each of these have their various pros and cons, which need to be discussed.

## PROTOCOL TO BE FOLLOWED

Considering all the problems till now that have been discussed, for in patients, for prolonged laparoscopic procedures with intricate intra abdominal manipulations, oddities of the patient positioning and the patient discomfort due to pneumoperitoneum, it seems prudent that balanced general anaesthesia with help of intravenous/inhalational induction, oxygen, nitrous oxide, muscle relaxant, endo tracheal intubation and an opioid be used as a choice.

## Inclusion Criteria:

- Female patients in reproductive age group
- Upper abdominal procedures
- Pelvic surgical procedures
- Before opening abdomen
- ASA I- II grade
- Moderate Obesity



Adequate infra structure and surgical skill level

### **Exclusion Criteria**

- High risk, incurable coagulopathy
- Uncontrolled cardiopulmonary disorders
- Old surgical operations in the lower part of the abdominal cavity/Total adhesive process in abdominal cavity
- Third trimester of pregnancy
- Large size pathological formation
- Uncompensated internal hemorrhage

### **Pre-operative preparation**

Detailed History

Thorough Examination/Clinical Assessment

Routine Investigations

Special Investigations

Intravenous Access

Pre-Anaesthetic Medications

Monitoring

### **Suggested protocol:**

After thorough preoperative evaluation which should be routine in ASA I and II patients.

In patient with compromised cardio-respiratory systems, (IHD or COPD), proper evaluation with 2D ECHO and dynamic pulmonary function tests must be done.

Although the post operative benefits might seem very tantalizing for them, the potentially turbulent intraoperative course must be seriously considered.

All hepato-renal compromising drugs to be avoided. If already the renal function is already compromised, choice of any microbial agent must take into consideration this angle. Similarly halothane does not seem to an agent of choice.

All the precautions for prevention of venous stasis, nerve injury in the form of deep vein thrombosis prophylaxis, padding with elastic bandages.

Monitoring of non invasive blood pressure, ECG/heart rate, pulse oximetry and capnography (ETCO<sub>2</sub>) must be compulsory monitored in ASA I and II patients. In the severely compromised patient or where extensive prolonged procedure is anticipated, recommended is intra-arterial line, direct blood pressure monitoring, beat to beat ST segment analysis and preferably Trans Esophageal Echocardiography (TEE). BIS will be an excellent aid.

Preoperative oxygenation must be carried out meticulously as to avoid need of mask ventilation, inadvertent stomach inflation as to avoid accidental puncture during trocar placement and also to reduce incidence of PONV.

Induction with intravenous agent like propofol is suitable

but in compromised patients sevoflurane may be the agent of choice. Placement of cuffed endotracheal tube using newer non depolarizing muscle relaxants like rocuronium seems suitable alternative to succinylcholine. Cuffed ET tube seems to be a suitable offset to prevent any remote chance of aspiration of gastric contents.

Controlled ventilation, ETCO<sub>2</sub> monitoring, relaxation with suitable non depolarizing agent and inhalational agent of choice being Isoflurane (being able to offset any increase in systemic vascular resistance).

Preemptive preloading with a suitable crystalloid or colloid to offset the deleterious effects of IAP is a recommended strategy. After induction it is advisable to place a nasogastric tube, urinary catheter which decrease the problems of bladder puncture, GI puncture, improved visualization and post operative gastric distension and PONV.

Positioning of patient requires meticulousness, care and supervision. The tilts must be given very gradually to allow the compensation to take place. Padding of bony points, shoulder braces, avoidance of hyper extension of arms must be carried out. The tilt must not be allowed more than 15 to 20 degrees. Reconfirmation of endotracheal tube position, bilateral air entry must be checked after positioning.

The insertion of needle, production of pneumoperitoneum should be as gentle and gradual as possible. Trocar placement must be carried out as precisely and perfectly as possible.

Controlled ventilation should be adjusted to avoid hyperventilation during pneumoperitoneum production so as to avoid paradoxical excessive increase in intra-thoracic pressure, in the face of increased IAP. In fact the recommended strategy is to increase the rate rather than tidal volume. The PETCO<sub>2</sub> to be maintained between 35-40 mm Hg which may require minimal increase in the total minute ventilation.

Hemodynamic disturbances must be continuously monitored, treated with intravenous fluids, colloids, dobutamine/ inotropic support, Isoflurane will help in decreasing SVR but if required glyceryl trinitrate infusion to be used. If bradyrhythmias, arrhythmias due to peritoneal stretching set in stoppage of insufflations and anticholinergic glycopyrrolate or atropine and deepening the plane of anesthesia (not stopping inhalational agent erroneously) is recommended. Continuous BIS monitoring can help to ensure a deep enough level of hypnosis to prevent recall without overdose.

Continuous monitoring of IAP is very essential but usually missed step. The IAP of < 15 mm Hg is an absolute requisite. Continuous observation for any complications like subcutaneous emphysema, pneumothorax or pneumomediastinum must

go on. If it is not possible to monitor PaCO<sub>2</sub> with arterial blood gases, signs of hypercapnia: unexplained tachycardia, hypertension, dysrhythmias, without significant rise in PETCO<sub>2</sub>, must bring to the high degree of suspicion.

Multimodal analgesia with preoperative / intraoperative opioids agonists / antagonists like Butorphanol / Nalbuphine, intramuscular/ intravenous parenteral NSAIDs at the end of surgery local infiltration using Bupivacaine has been successfully used.<sup>35</sup>

Extubation should be carried out in very patient manner after complete recovery of the NMJ function, laryngeal pharyngeal reflexes and hemodynamic stability.

Post-operatively oxygen by mask is necessary. Same degree of monitoring must continue in Post Anesthesia Care Unit till either patient become road worthy or ward worthy. Pain management is very important modality which must be carried out in a professional manner.

Last but not the least, laparoscopy is in its true sense is a team approach. All the members concerned must treat laparoscopy with its due importance and not as a minor procedure, which many times may culminate into a major catastrophe.

Post-operative management: Monitoring, Pain Management, Road worthiness of Day cases, Follow up or Decision to admission and inpatient care Continuous observation for any complications like subcutaneous emphysema, pneumothorax or pneumomediastinum must go on. If it is not possible to monitor PaCO<sub>2</sub> with arterial blood gases, signs of hypercapnia: unexplained tachycardia, hypertension, dysrhythmias, without significant rise in PETCO<sub>2</sub>, must bring to the high degree of suspicion.

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Post operative nausea vomiting is a minor irritant but can significantly delay the recovery process, discharge criteria and

overall outcome. The adequate gastric decompression, adequate fluid management will help in preventing it. Intraoperative preemptive ondansetron/granisetron or Droperidol have been reported to have been very effective in treating / preventing it. Last but not the least, laparoscopy is in its true sense is a team approach. All the members concerned must treat laparoscopy with its due importance and not as a minor procedure, which many times may culminate into a major catastrophe.

Post-operative management: Monitoring, Pain Management, Road worthiness of Day cases, Follow up or Decision to admission and inpatient care

## RECENT ADVANCES

Looking at the plethora of the literature which has been and being generated, one can safely deduce that laparoscopy and its anesthesia, are still in infancy. Better ways / modalities for improving intraoperative and postoperative conditions reducing deleterious sequel are going on.

### Surgical techniques:

Robotic Laparoscopy is a recent advance. The sheer depth of technology oriented approach is beyond the scope of present review and discussion.

Use of Noble gases for insufflations: Inert gases like helium and argon have been used with mixed reports. Still at a research level.

Laplift / Gasless laparoscopy with a fan retractor lifting the abdominal wall. Many benefits have been quoted but main drawback is of limited surgical exposure. Combination of this with low IAP < 5 mm Hg with CO<sub>2</sub> may be a suitable alternative.

## ANAESTHETIC MANAGEMENT

In suitable number of young healthy patients, with short duration procedures, low IAP and very small degree of head tilt may use laryngeal mask airway (LMA), spontaneous respiration to overcome the obvious problems of ETT and controlled ventilation. Recent evidence suggests that various supraglottic devices like 'pro-seal LMA', LMA supreme or even I Gel can be used suitably and safely for this purpose.<sup>36-41</sup>

Local / regional techniques: There is mixed bag of reports about them. The main problems are patient discomfort, shoulder pain, extensive level of blockade ( up to T<sub>4</sub>) and resulting hemodynamic problems associated and compounding those due to laparoscopy itself. However in patients with moderate cardio respiratory compromise, spinal analgesia with 0.75% heavy bupivacaine ( to achieve T<sub>4</sub> level) added with propofol 0.4 mg/kg bolus followed by 0.1-1.5 mg/kg/hr infusion and Ketamine 0.1 mg/kg bolus followed by 0.3 – 1.0 mg/kg/hr has been used satisfactorily.<sup>42</sup>

## CONCLUSION

Another report is in a post-pneumonectomy patient for continuous thoracic epidural catheter technique combined with spinal at L2-3 level using 1 ml of 0.5% Bupivacaine (5 mg) + 20 microgram Fentanyl. Segmental analgesia (T3-L2) had been achieved without motor weakness. Slow insufflations of CO<sub>2</sub> at 2 l/min were carried out, the head up tilt and left tilt had been kept very minimal. Epidural pain relief was done in post operative period using bupivacaine 1.25 mg/ml + fentanyl 2 microgram/ml given at 5 ml/hr as infusion. The entire exercise was very fruitful.<sup>43</sup> All these reports mainly speak

Local analgesic solutions infusion: intraperitoneal, port site or in the layers of abdomen while closure is going on. Multiple studies have proven that these definitely reduce the postoperative VAS scores.

Laparoscopic surgeries in pediatric patients: As in case of adults, the acceptance of minimally invasive surgical procedures in pediatric patients also gaining momentum. As would be expected, the challenges inherent to pediatric population compound the problems of laparoscopy. Although detailed discussion of this is beyond the scope of the present discussion, recommendations are,<sup>44</sup>

Atropine premedication,

Choice of sevoflurane as the induction/maintenance to allow the I.V. access, endotracheal intubation and controlled ventilation

Meticulous monitoring inclusive of Intake/output, temperature and capnography

IAP of 6 – 12 cm H<sub>2</sub>O

Avoidance of using periumbilical area for puncture as the risk of puncturing of uninvoluted peri-umbilical vessels.

Controlled ventilation

Endoscopic Surgical procedures have come in as a boon to the patients requiring intrabdominal/intra cavity procedures, which if done via conventional method definitely increase morbidity and mortality. However, it is not a path of roses. One must have a in-depth understanding of the procedure, the patho physiologic changes involved, the complications that can happen and how to prevent/overcome them. A problem based approach has been described in this review with a detailed protocol based total peri-operative management. It has been the earnest endeavor of the authors to dispel myths/ auras surrounding the issue, give very precise, clear-cut and evidence based guidelines to both budding endoscopists as well as anesthesiologists.

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# ANNEXURE I

## TABLE I

TABLE 1: SCOPE OF LAPAROSCOPIC SURGICAL PROCEDURES

No	Specialty	Procedure
1	Gynecological / Obstetric	Diagnostic laparoscopy Laparoscopic sterilization Laparoscopic assisted vaginal hysterectomy Laparoscopic assisted fertilization procedures Removal of unruptured ectopic / tubal pregnancies Ovarian cyst/rupture of ovarian cyst Ovarian apoplexy Torsion of uterine appendages Reflux of menstrual blood Differentiation between gynecological and surgical pathologies
2	General Surgical	Laparoscopic cholecystectomy Nissen's Funduplication Diaphragmatic or Hiatus hernia repair Appendectomy Vagotomy Adrenalectomy Inguinal hernia repair Colectomy
3	Bariatric surgery	Gastric banding Gastric sleeve Gastric bypass
4	Urological	Nephrectomies : Partial / Radical Living donor nephrectomy Nephro Ureterostomy Pyeloplasty Radical prostatectomy Pelvic lymph node dissection Varicocelelectomy Total Cystectomy with ileal conduit formation



# CASE OF THE MONTH

TITLE : INFANTILE HYPERTROPHIC PYLORIC STENOSIS WITHOUT A PALPABLE OLIVE- A CASE REPORT. M. VEENA, CODILLA D

DR. M. VEENA RADIOLOGIST . DR. DELBUENO CODILLA RADIOLOGIST.  
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## ABSTRACT

A case report of 3 weeks old male child with forceful non bilious projectile vomiting following every feed . Empirical treatment was give initially and as there was no response and clinically suspected as Infantile Hypertrophic Pyloric Stenosis (IHPS). Patient was sent to radiology department for ultrasound of the abdomen and barium meal. On ultrasound it was found that pyloric muscle thickness and pyloric canal length was more than normal and hence diagnosed as hypertrophic pyloric stenosis and managed surgically with Ramsted's pyloromyotomy.

## INTRODUCTION

Continuous non billious projectile vomiting in an infant can be due to IHPS. They will be normal initially at the birth. Vomiting will be intermittent initially and subsequently they follow after every feed. They start presenting usually in 2nd month of life (1). Most common in 1st born male child with a male to female ratio of 4:1.( 2,3..) IHPS is due to abnormal proliferation of the pyloric muscle due to excessive gastrin (4) and also due to abnormal nerve innervations .other causes of vomiting due to gastroenteritis, gastroesophageal reflux, inborn errors of metabolism , allergic causes and other surgical causes like duodenal and jejunal atresia and malrotation should to be excluded before diagnosing hypertrophic pyloric stenosis . This should be confirmed by radiological investigations like ultrasound and barium meal.

## CASE REPORT

3 week old 1st born male child was admitted in Rand memorial hospital on 25/2/2014 with a history of non bilious projectile vomiting since two days. General examination of the baby was unremarkable on the day of the admission and started on empricial treatment with intravenous fluids and anti-emetics. Subsequently vomitings become continuous and the patients condition is not improving and there is no increase in weight and developing signs of dehydration , like sunken eyes depressed anterior fontanels with loss of the skin turgour. Vitals were essentially within normal limits. On examination of the abdomen there was no visible peristalsis and on palpation there was no olive sign detected.

Clinically it was suspected as IHPS and send for laboratory and radiological investigations.

## Laboratory investigations:

They were essentially within normal limits [Sodium (135mmol/lit), potassium(5.6mmol/lit), chlorine(105mmol/lit), carbon dioxide(20mmol/lit), anion gap (10). Magnesium(2.5mg/dl), random blood sugar(83mg/dl), blood urea nitrogen(4), serum creatinine (0.5mg/dl,)], except serum bilirubin, which is increased (12.4mg/dl), while other liver function tests were normal.

Ultrasound examination (Fig 1-2) done on patient in supine position with a high frequency 7 mega hertz transducer. there was distended stomach on left side with gallbladder and collapsed duodenum are found on right side. Pyloric canal length was found to be 18mm and muscle thickness was 5.9mm and transverse diameter of the pyloric anal was 12mm (normal pyloric anal length 12mm,muscle thickness is less than 3mm and pyloric diameter is 10-15mm).



Fig1



Fig2

Barium meal procedure done with barium mixed with milk and passed through the nasogastric tube of 3 ounces and baby was put in right anterior oblique position to facilitate gastric emptying. But in this baby there is no transit of the contrast from the stomach to the duodenum even after 1 hour 30 minutes.(Fig.3)



Fig.4



Fig.3

Barium meal procedure done with barium mixed with milk and passed through the nasogastric tube of 3 ounces and baby was put in right anterior oblique position to facilitate gastric emptying. But in this baby there is no transit of the contrast from the stomach to the duodenum even after 1 hour 30 minutes.(Fig.3)

Hence baby was diagnosed as IHPS.

Baby underwent surgery under general anaesthesia on 28/2/2014 after correcting dehydration with intravenous fluids and maintaining electrolytes . Intraoperative findings showed presence of 3 cm long olive in the pylorus and Ramstedt's pyloromyotomy was done by excising the circular muscle of the pylorus up to the sub mucosa and mucosa was intact and there was no perforation.

Baby was kept nothing per orally for about 6 hours. After 6 hours nasogastric pedalyte 15ml was given every 3rd hourly After 12 hours full strength milk 15 ml every 3rd hourly and following day 20ml every 3rd hourly was given. Patient was tolerating feeds normally and there was no recurrence of the symptoms and patient was discharged on 10th postoperative day.

## DISCUSSION

Hypertrophic pyloric stenosis is due to abnormal thickening of the pylorus muscle and manifests as obstruction tot the gastric emptying.). They will be normal at birth and develops projectile

non bilious vomiting usually in 2nd month of life( 1). The incidence is 2-5/1000 /year in most white population although it varies with geographic area less common in Asians and in blacks, with a frequency of 1/3 to 1/5 that in white population( 5). Males are more commonly affected with a ratio of 4:1.(2,3). Familial link, but the hereditary progeny to the development of IHPS is likely polygenic with no single locus accounting for greater than five fold increase in the risk to the first degree relatives(5).proband wise concordance in monozygotic twins is 0.25-0.44 and that in dizygotic twins 0.05-0.1 patients usually are normal at birth, later followed by intermittent vomiting and subsequently becomes continuous forceful projectile non bilious vomiting leading to dehydration, emaciation and even death if timely intervention is not done.

With repeated vomiting there will be loss of hydrogen and chloride and potassium ions leading to hypokalemic hypochloremic metabolic alkalosis. (6).patients will have voracious appetite.

On general examination of the patients there will be signs of dehydration no increase in weight and instead there will be loss of the weight and some patients develop jaundice as in case of our patient. Jaundice develops because in dehydration there will be decrease in activity of hepatic glucuronyl transferase enzyme which leads to increase in indirect hyperbilirubemia(On examination of the abdomen there will be visible peristalsis and on palpation of the abdomen olive that is hypertrophied muscle is palpated in the upper abdomen. It is suggested that palpation of the olive with appropriate clinical symptoms, it was diagnostic and goes directly to operation theatre and such infants do not need confirmatory imaging findings.(7) In the past it was found in 80% of the patients.(8). The low rate of palpation of olive can be due to presentation at an earlier age, when olive is smaller and in better nourished children abdominal wall fat may obscure palpation of the mass.

Ultrasound is the primary imaging modality (9), which is safe accurate 100% sensitive and specific and there is no radiation and it directly visualizes pylorus. Hypertrophic muscle is hypo echoic and central mucosa is hyper echoic. Pyloric muscle thickness should normally be less than 3mmthat is single muscle on transverse diameter or longitudinally and the length should not exceed 15mm. in IHPS pyloric canal of variable length of more than 15mm separates normal distensible portion of the antrum from duodenal cap(10). Elongated pyloric canal is visualised as cervix on ultrasound and in transverse section it is seen as target sign. The pyloric anal is filled with



compressed and redundant mucosa which protrudes into the gastric antrum (11). This is visualized as antral nipple sign on ultrasound. This can also be viewed on endoscopy and the mucosa protrudes like a cauliflower (12, 13). Ultrasound also differentiates midgut volvulus by seeing the relation of superior mesenteric vein to the superior mesenteric artery (14).

If the vomiting are outside the normal range of the IHPS and if clinical suspicion is low, an upper gastrointestinal study is recommended as it rules out midgut volvulus and gastro esophageal reflux.(15).on upper gastrointestinal study failure of relaxation of the prepyloric antrum typically described as elongation of the pyloric canal. This is performed in right anterior oblique position to facilitate gastric emptying . String sign is noted which is string of the contrast noted through the spaces between the redundant mucosa and as double tract sign which is linear tract of contrast separated by intervening mucosa (16) . Mass impression on gastric antrum is suggested as shoulder sign. Upper GI study also differentiates midgut volvulus and gastro esophageal reflux. Sometimes esophageal Atresia can also be associated with IHPS. (17).

Treatment is surgical management after correcting dehydration and electrolyte imbalance with Ramstad's pyloromyotomy which can be done by open method with upper abdominal incision or by laproscopically in which is pyloric muscle is divided up to sub mucosa and it has very low morbidity. (18, 19).

Our patient presented at 3rd week of life, a little earlier onset and there was no hypochloremic hypokalemic metabolic alkalosis with presence of hyperbilirubenemia and there was no olive sign as suggested in literature that patients presenting early may not show olive sign and electrolyte imbalance may not be present probably because of prompt recognition of the disease (20) and properly corrected for dehydration with intravenous fluids

## CONCLUSION

Although the characteristic features like Clinical history,

physical examination, the nature of the vomiting and age & sex of the child may help us to determine the likely cause, however clinical examination alone at times may be inconclusive and ultra sonography and upper gastrointestinal study with barium are of utmost importance to diagnose or exclude IHPS to decide whether the child is to be saved by surgery or from surgery.

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