



"vigilantiā sine dolore"

TTAA NEWS

THE NEWSLETTER OF THE TRINIDAD & TOBAGO ANAESTHETISTS ASSOCIATION

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Update 2013 Report ... by Dr Deryk Chen (TTAA President)

SPECIAL POINTS OF INTEREST:

- 125 participants including regional delegates
- Joint venture between TTAA and UWI-AICU
- Theme based on ICT
- Informative workshops

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The theme for Update 2013 was 'Information & Communication Technology in Anaesthesia & Intensive Care'. It was the 1st Joint Venture between TTAA and UWI-AICU and heralds the commencement of collaborative efforts for the future.

125 participants attended and this included the presenters, workshop facilitators, exhibitors, delegates and event organisers. The 2-day meeting comprised 4 sessions of oral presentations and 2 sessions

with 6 rotating workshops.

This **JOINT VENTURE** was yet another accomplishment for TTAA since its objectives for 2013 included developing partnerships. Due to the implications of Technology today on our daily clinical practice, this Update was conceptualized to evaluate the extent to which this has impacted on Anaesthesia & Intensive Care and even Pain Management.

There was an **Opening Ceremony** hosted by the Principal's Office on the St. Augustine Campus on the evening preceding the 2-day conference to welcome our visiting presenters and delegates. Dr Ian Sammy, Deputy Dean Clinical Sciences deputized for the Principal and Dean in delivering the opening remarks. This enabled an earlier start next day at the convention center at Capital Plaza.

On Day 1, Session I dealt with some of the Challenges in our Practice - the Role of ICT. The opening plenary lecture, on The Challenges of Sharing Perioperative Data, was presented by Dr. Hyacinth Harding-Goldson, Senior Lecturer & Head of the Department of Anaesthesia & Intensive Care, Mona, Jamaica.

Session II was more focused on the

Changing Faces in our Practice - Role of ICT with the plenary lecture given by our External Examiner, Dr Craig Bailey, Consultant Anaesthetist from St Thomas Hospitals, London. He represented the UK Faculty of Anaesthetists and an

America with Mariela Quinones and Mark Schmelzer demonstrating on three (3) substations with various airway management devices. Finally 6) Biomed Technologies team from Maquet, Latin America demonstrating the use of NAVA Mode of ICU Ventilation.

Sponsors & Exhibitors - Many thanks to the following companies for their contributions and participation in our Update 2013 without whom this meeting would not have been successful. AstraZeneca; Abbott Pharmaceutical and Abbott Nutrition; Pfizer; Merck, Sharpe & Dhome; GlaxoSmithKline; Bryden Pi; Villafana & Co; AALaquis for

Draeger and Storz Latin America; Biomed Technologies Ltd for Maquet and Spacelabs; Miatrin for GE Ultrasound.

We had a Luncheon Speaker for the first time and was privileged to have Professor Phillip Barrie MD,FACS,MBA,FCCM, a previous SCCM President and sponsored by Pfizer Pharmaceuticals to deliver a special lunch time presentation on The Proper Management of Intra-abdominal Infection which was well packed with valuable caveats.

Overall it was one of our best Updates over the years since its introduction in the 1980s and one of the best attended and thoroughly enjoyed by all delegates. We were most pleased to attract the great number of Exhibitors who contributed to the increased number of workshops and the innovation of a satellite luncheon meeting. Also it was a delight to have anaesthetists from the region and the increased interest shown by the private practice anaesthetists. Hopefully this will bode well for the future. See you again at our next Update 2016!!



Some of the Update 2013 attendees listening to a lecture presentation
Picture Insert: Fibre optic endoscope demonstration during airway workshop

Editor of the Journal Anaesthesia, UK and spoke on the Changing Face of Airway Devices. With emphasis on the I-Gel device.

On Day 2, Sessions IV & V looked at ICT Applications that had miscellaneous implications; and on networking. The plenary speakers respectfully were Professor Hariharan Seetharaman's (The Cost to Expand the Technical Horizon) and Professor AY Kumar of Cave Hill Campus, UWI, Barbados (The Future of Networking in Medical Education and Training)..

Sessions III & VI were both afternoons, spent rotating through the six (6) workshops - 1) Ultrasound guided Peripheral nerve blockade which had three (3) substations facilitated by Dr Sandra Kopp and team from Mayo clinic, Minneapolis, USA 2) Neuroaxial blockade for Chronic pain by Dr Senthil Raju from AICU - UWI, St Augustine, 3) Medical Protection Society with Dr Brian Charles on Mastering Quality Service, small things that make a big difference. 4)AALaquis team from Draeger, Panama demonstrating Data Management in the OR with Salvador Padilla and Stefan Nordman 5) AALaquis team from Storz, Latin

Marijuana & Us ...

With the recent hype to legalise marijuana (*Cannabis sativa*) within the Caribbean, as well as the already high prevalence of recreational marijuana use, we are reminded of anaesthetic issues specific to cannabis users.

So how does Cannabis impact upon Anaesthesia?

The primary psychoactive component in cannabis is delta-9-tetrahydrocannabinol (Δ^9 THC). However, more than 60 other active cannabinoids have been isolated from cannabis, modern strains having higher concentrations than older varieties. Cannabinoids act via negatively coupled G protein linked receptors CB₁ and CB₂ (adenylate cyclase inhibition). CB₁ receptor activation also directly inhibits voltage sensitive Ca²⁺ channels and augments inwardly rectifying K⁺ channels. The net effect of receptor activation being membrane hyperpolarization and inhibition of neurotransmitter release. CB₁ receptors are primarily neuronal being located in the brain, spinal cord and primary nerve afferents whereas CB₂ receptors are mainly found on immune cells.

Cannabis can be ingested or inhaled. The actual concentration of cannabinoid present in marijuana is difficult to ascertain as it varies significantly with strains. Absorption is rapid through the lungs after inhalation. CNS effects peak within 15 minutes and persist for 2 to 4 hours depending on the dose. Following ingestion, bioavailability is unpredictable because of erratic absorption with delayed onset, first pass metabolism and prolonged duration.

THC is analgesic, sedating, anti-emetic, anti-spasmodic, euphoriant, anxiolytic and bronchodilatory. Acute toxicity is low, with users describing feelings of euphoria, heightened sensory perception and a distortion of space and time. Sedation usually follows the period of psychomotor stimulation. In some individuals, especially new users, anxiety and dysphoria are reported. Aggravation of psychotic states in patients with psychiatric disorders have also occurred and commonly include delusions of paranoia.

Ingestion in children can cause hypotonia and coma. Sedation or agitation may need to be addressed after acute intoxication as part of the conduct of anaes-

thesia. Agitation can be treated with reassurance and benzodiazepines are the drugs of choice if pharmacological agents are required.

Vasodilatation frequently occurs and may lead to hypotension and tachycardia. This increases cardiac output and myocardial oxygen demand but the likelihood of myocardial ischaemia is rare in young, otherwise healthy patients.

Long term use has similar effects on cardiovascular and respiratory systems as does tobacco smoking. Delivery of anaesthesia is comparable to that for tobacco smokers. Cannabis users smoke unfiltered and breath hold after large inhalations, to maximize the dose, and therefore have increased exposure to tar, carbon monoxide and other carcinogens compared to normal cigarette smoking. Many cannabis users are unaware of this fact. The risk of hyper-reactive airways must not be overlooked in this patient population. Incidents of airway obstruction during anaesthesia, attributable to cannabis inhalation have been reported. Possible cross tolerance between Cannabis and anaesthetic agents is likely in chronic users with suggestions that clinically significant increased doses of propofol (and possibly other anaesthetic agents) may be needed

Withdrawal is mild, with symptoms being irritability and anorexia if they occur. Generally only modest supportive therapy is required once no concurrent drugs have been used. The incidence of concurrent tobacco use is high and nicotine patches may help in the management of withdrawal.

Analgesic effects of Cannabis are due to central antinociceptive CB₁ receptors located in the periaqueductal grey, rostral ventral medulla and superficial dorsal horn of the spinal cord. This is possibly augmented by CB₂ related inhibition of mast cell degranulation and neutrophil migration thereby attenuating inflammation. These theories have been extrapolated from animal models but clinical data is to confirm this is inadequate. THC has shown to be a partial agonist at both receptor subtypes and this may explain its weak analgesic effects. At present systemic cannabis administration for mainstream pain management is not supported by clinical evidence and may only

have a role in niches such as neuropathic pain. Intrathecal or peripherally administered cannabinoids, in an approach like opioids, may be a future alternative to avoid central effects of cannabinoids.

So what does this mean to us?

Cannabis has many beneficial effects akin to many premedication targets. However, many aspects of its use warrant attention:

Anaesthesia for chronic users must be managed analogous to chronic tobacco smokers and concurrent tobacco use is likely.

Cross tolerance to anaesthetic agents in chronic users is likely.

Cannabis inhalation results in higher likelihood of carboxyhaemoglobin, exposure to carcinogens and tar as compared to tobacco.

Sedation from acute intoxication would be additive to other sedatives administered.

Cannabis for analgesia is unreliable with unwanted central effects and has only modest analgesic potency.

Acute toxicity is low, and a low threshold to consider multi-drug use must be held if the clinical scenario does not match.

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Drug Shortages in Anaesthesia & Critical Care ...

It is safe to say that all local anesthesiologists and intensivists have been affected by the present state of injectable drug shortages. **This problem first manifested in the US in 2009** with reports concerning shortages of the sedative propofol¹. By 2011, the problem was rampant and an ASA survey showed that 98% of responders experienced a drug shortage with the most common being propofol and succinylcholine². The specialties most affected were anesthesia, emergency, cardiovascular, pain medicine and oncology³. Eventually in late 2011, President Obama addressed the issue which subsequently became the front page of the New York Times, calling for broader drug reporting and speedier review of drug applications⁴.

Drug shortages have persisted until present with the American Association of Health System Pharmacists (the reporting body for drug shortages) still reporting many perioperative drugs as being short⁵. These drug shortages appear isolated to the US and those countries that procure drugs from the US. To deal with the US propofol shortage the FDA even allowed the importation and use of European propofol⁶. Europe, Canada and India have had few reports of perioperative drug shortages to date.

Locally, the public was first exposed to the nature of drug shortages in a Sunday Guardian column by Ira Mathur in April 2012, chronicling the pain that dying patients undergo at local hospices due to lack of appropriate analgesics. In a somber narrative, she highlighted the shortages of opioids and opioid preparations to improve end of life care⁷. The article prompted a response by the Minister of Health and cited numerous obstacles, foremost being unnecessary delays in the local drug approval bodies.

As early as 2011, the local anesthesia and critical care community felt the brunt of the drug shortages. Public hospitals with the highest turnover were affected the most. Mainstays of anesthesia such as Isobaric bupivacaine (0.5%) and thiopental were absent from many operating rooms. Shortages of succinylcholine restricted its use to dire emergencies and with limited neostigmine at hand, elective cases were curtailed. In the ICU as well as in the OR, shortages of adrenaline and noradrenaline proved to be a great challenge in patient care. Other critical drugs reported short in the last two years include, ephedrine, metaraminol, dexamethasone, amiodarone, adenosine, IV potassium chloride, IV MgSO₄, labetalol, propranolol and furosemide. Thankfully due to its early outsourcing to India and Europe, Propofol was never in short supply locally.

In the latter half of 2013 we are still plagued with an inconsistent supply of our essential drugs. Added to the list is the

present shortage of Lactated Ringer's solution and the persistent deficit of noradrenaline. Noradrenaline is presently recommended as the first line vasopressor in sepsis⁸ and Lactated Ringer's is gaining popularity as the first line crystalloid choice over 0.9% NaCl for resuscitation and critical care^{9,10,11}.

The factors affecting major drug shortages include the following.^{3,6}

- Lack of raw materials (thiopental, ephedrine)
- Manufacturing difficulties
- Voluntary drug recall, especially if the manufacturer has a large market share (propofol)
- Economic and business factors. When manufacturers decide to discontinue a drug due to its lack of profitability, it may take another manufacturer several months to take up the slack created
- Increase in drug demand. This is usually bought about by a new clinical practice guideline. Examples include ketamine shortages in the US due to its resurgence in acute and chronic pain management. Even changes within an institution can affect drug supply. This coupled with changing practice guidelines can explain the current shortage of both noradrenaline and lactated ringer's solution.

Most of our local drug distributors use American based suppliers and there lies our major problem. Failure to diversify our drug sourcing is the primary reason for our perioperative drug shortages. During the dark days of the bupivacaine shortage, clever outsourcing to Indian based manufacturers allowed a barely sustainable trickle of drug in our hospitals. This same outsourcing saved us from the propofol woes faced in the US. However late detection, lack of awareness, a sluggish local drug advisory committee and a general lack of recognition of the problem continue to ensure that drug shortages persisted well into 2013.

Although anesthesiologists are masters of adapting different drugs to the clinical scenario and are trained in the safe use of many drugs these skills are being unfairly challenged by the current spate of drug shortages. For some of the drugs we use, there are simply no tested alternatives. This is especially true in Trinidad and Tobago as prior to drug shortages we already had a limited number of intraoperative drugs.

Drug shortages place anesthesiologists and health care institutions under great amounts of stress. The end result being patients not getting the standard of care they deserve and in certain cases life threatening consequences. Shortages of ephedrine have placed the parturient at a greater than expected risk when decision against spinal anesthesia is taken in favor of the more predictable haemodynamics

under general anesthesia. In this era of drug shortages, there have been a documented increase in the amount of medication related errors due to unfamiliar drugs and non standard formulations⁶.

How can the anesthesia community deal with this ongoing problem? Olivera & colleagues proposed that anesthesiologist get involved in multidisciplinary drug committee meetings as well as early drug reporting at a hospital and a national level, as they are the parties affected the most⁶. Drug committee meetings are held monthly, where new drugs are introduced and shortages are addressed. At our institution (SFGH), there is usually a representative from the Anesthesia & Intensive Care department present.

Increased surveillance for drug shortages can effectively modify practice early, and prevent a precipitous drop in drug supply. US based drug shortages can be followed at the ashp website : <http://www.ashp.org/DrugShortages/Current/>. Also, current practice changes could also be predicted to favor drug shortages especially when the drugs are already on a short list. For example, with the surge in interest in ultrasound guided regional anesthesia, one could soon predict a local anesthetic shortage.

Many US based anesthesiologists were able to deal with drug shortages as they already had a diverse drug supply to begin with. Unfortunately, here in the Caribbean, this is not the case. Despite being experts with our present drug set - once those drugs are gone we have little or no alternatives. As such, we should increase advocacy and efforts to get new drugs on our formulary. This would at least make us better able to deal with shortages and improve the level of care we provide to patients.

Certain drugs such as phenylephrine and esmolol are off patent and have been available in other Caribbean countries for many years and would serve as suitable alternatives for ephedrine and labetalol respectively, which have been the victims of severe shortages lately. Many such options exist (see Table 1, pg 4), and although not a perfect substitute, rocuronium can be used in some situations where we use succinylcholine. Sicker patients are now visiting our Operating Rooms and more drugs allow us new ways of caring for them and make our specialty more robust and better able to deal with internal and external challenges.

Drug shortages may continue to play an important role in patient management in the foreseeable future. As the specialty develops locally, we must ensure that the problem is adequately dealt with. By increasing drug advocacy and improving our drug repertoire we can ensure that our specialty not only recovers but continues to thrive.

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PROPOSED 2014 CALENDAR OF EVENTS

- **TTAA Foundation Workshop** **January 2014**
- **AGM** **March / April 2014**
- **World Anaesthesia Day** **October 16th**
- **TTAA Dinner & Awards** **November / December 2014**
- **Other proposed events:**
 - Caribbean Anaesthesia Conference**
 - Ultrasound Workshop**
 - Educational Seminars**

Drug Shortages in Anaesthesia & Critical Care ... con't

Table 1 showing current drug options available in T&T and possible substitutes.

Drug Category	Current drug	Options
Opioids	Morphine, pethidine, Fentanyl	Remifentanyl
Local anesthetics	Lidocaine, Bupivacaine	Ropivacaine,
Vasopressors / inotropes	Ephedrine, Adrenaline, Noradrenaline, Dopamine, Dobutamine	Phenylephrine
Antihypertensives	Labetalol, Hydrallazine	Esmolol, metoprolol
Muscle Relaxants	Succinylcholine, Cis-atracurium	Rocuronium / Sugammadex

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