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Rationalizing the cost of anaesthesia in Zimbabwe: a proposal

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Introduction

With the worsening economic situation in the country, it is only prudent to develop 'survival strategies' in order to keep afloat . Under such hardships human behaviour manifests the jungle rules of 'survival of the fittest'. That is exactly what is happening particularly in the health sector, as I will highlight in this letter. The importation of medical drugs in Zimbabwe is controlled, but their resale is liberalized. The same anaesthetic drug may cost a hospital two to three times more by buying it from one company than from the other as shown below (Table I). This information is from an unpublished survey of the buying patterns of three hospitals and two public hospital pharmacies.

Strategies to Cut Down Costs in Anaesthesia.

I would like to share my own view on what I see as strategies for rationalizing anaesthetic drugs and accessories use, which would result in cost saving. The strategies are divided into two: those relating to the hospital and those for the Anaesthetist.

Table I. Cost of drugs (in Z$) bought by three hospitals from three different companies.

Drug	Hospital A	Hospital B	Hospital C
Etomidate	$408.75	$350.32	$398.62
Thiopentone	$121.70	$111.88	$132.28
Propofol	$331.29	$284.66	$397.20

For Hospitals.

Anaesthetic Drugs Committee: A hospital should have an anaesthetic drug use committee comprising of the chief pharmacist and two or three anaesthetists. This committee could meet once or twice a month and formulate the hospital anaesthetic drug cost saving strategies. The advantage of this small committee is that they will highlight

to the pharmacist where a wastage is avoidable and what drugs not to buy in bulk.

A case in point is the large stocks of etomidate which some hospitals have, yet this intravenous anaesthetic drug is not used frequently and costs more than Abbott propofol which is the drug of choice for most procedures.

Anaesthetic Intravenous Induction Agents: Propofol has become much cheaper now since the patent ran out. Hospitals would do better having large stocks of propofol than etomidate. Where day surgery is the main activity of the hospital, there should be only a few vials of thiopentone and etomidate, but large stocks of the ideal agent propofol. For inpatients, anaesthetists should, as a matter of hospital policy, be encouraged to use the cheapest anaesthetic intravenous induction agent like thiopentone. There is not much benefit in using propofol for induction in a patient having a gastrectomy or posterior fossa tumour. For all non-day surgery patients, where thiopentone is used, the hospital saves about $125 per patient.

This sounds like a pittance but if you multiply this by three to five patients per list having major surgery and then considering that there are in most cases two lists per day multiplied by five days per week this comes to a saving of between $3 750 to $6 250 per week.

Inhalational Agents: Halothane is still the mainstay of anaesthesia in Zimbabwe. Isoflurane has several advantages over halothane, although it is much more expensive. I would recommend that every hospital keep Isoflurane in reserve for those special cases when it is needed. A few private hospitals are now using Isoflurane routinely. Of course they recover their money from the patient, but this might incur shortfalls on the patient's medical bills when the medical aid societies pay the hospital, thus loading unnecessary financial burden on the patient.

Sevoflurane has excellent induction and recovery properties especially in paediatric anaesthesia. I would strongly recommend that when used, it should be for the shortest possible time i.e. stopped as soon as anaesthesia is induced, because it is still extremely expensive to be used for maintenance of anaesthesia..

Neuromuscular Blockers: New muscle relaxants are being released on the market e.g rocuronium and rapacuronium. These are meant to replace the depolarizing neuromuscular blocker suxamethonium. The truth is they are close but not as good as suxamethonium for the intended purpose. Therefore there is no economic sense in bulk buying these drugs instead of suxamethonium – which is much cheaper. There are also few special indications for atracurium which is slightly more expensive than the older alcuronium. Therefore a hospital, especially the public hospitals, would save a lot and keep it simple, by buying suxamethonium and alcuronium and making sure that there is a constant supply.

For The Anaesthetist.

Gloves: Non sterile gloves are recommended for canulation, intubation and extubation. Hospitals cannot charge for these gloves as they fall into the category of non-chargeables (or non-tariff) items. If you use three pairs (conservative estimate) per patient i.e. for canulation, intubation, extubation and on a long list e.g. ENT list of 15 patients, this totals to 45 pairs per anaesthetist per list. I would advise cutting down on the number of pairs of gloves used per patient by simply keeping unsoiled gloves (e.g after canulation) for the intubation etc. These can be removed and kept for the next procedure on the same patient. They can also be cleaned by simply washing the gloved hands with soap and water for future use.

Needles: The anaesthetist can use a minimum number of needles per list by simple, good planning when preparing drugs. For example – for a day surgical list with six patients – the anaesthetist may choose these drugs, morphine, droperidol, lignocaine and propofol. First use a 19G needle to draw up the morphine and droperidol in different syringes then draw up 1ml 2% lignocaine in six to 20ml syringes, finally use the same needle to draw up the propofol into the 20ml syringes. Thus by simply planning like this the anaesthetist has saved 23 needles. Again if this is calculated per list in a busy hospital there is a big potential for saving. A single 19G needle costs about $2.50.

Analgesic Drugs: For a paediatric minor surgery list a lot of saving can be done by simply diluting potent drugs like the 15mg morphine per ampoule to 1 mg/ml with water for injection or saline. The average intravenous dose of morphine is 0.1mg/kg and therefore most paediatric patients will need 0.5 to 5mg intravenous injection. All that is needed is the diluted morphine to be put in one or 2ml syringes for the individual patients. Thus one ampoule of morphine can service a long paediatric list without any risk of contamination. Pethidine, fentanyl and the antiemetic droperidol could be used in a similar fashion as the dosages required are small.

Anaesthetic Gases: The use of low flow anaesthesia has been shown to cut down costs. Hospitals should encourage anaesthetists to use low flows by providing anaesthetic machines with a circle system, capnography and anaesthetic agent monitor. Low flow anaesthesia is a specialized technique which requires learning and experience. Experienced anaesthetists should teach colleagues and juniors on this cost saving practice.

It is not surprising to find a gas flow of six to 10L/minute running for the entire period it takes to do a posterior fossa tumour for example, yet low flows of one to 3L/minute could be used and with good monitors, even lower than this with massive savings on the anaesthetic gases.

Also of paramount importance is for the Anaesthetist to always ensure that gases are turned off before leaving the theatre. In one incident, I discovered as I checked the anaesthetic machine before the morning list that it was running with a gas flow of 9L/minute of oxygen. On investigation it transpired that the machine was left running by a senior house officer after an emergency appendicectomy done at 21 00 hours the previous night. This translates to a anaesthetic gas waste of 5 940L. What a waste !!

Choice of Anaesthesia: There are many advantages for choosing regional anaesthesia over general anaesthesia for most of the operative procedures below the umbilicus. Intra-operative cost for subarachnoid block (SAB), for example for Caesarean Section delivery is Z$383.50 which is three to four times cheaper than general anaesthesia (GA) as shown in Table II.

Table II: General anaesthesia vs spinal block for Caesarean Section delivery.

G.A		S.A.B.	
Tracheal tube	145.00	sterile gloves	13.00
Thiopactine & 20ml syringe	100.00 + 7.50	Spinal Needle (25G)	10.50
Suxamethonium + 2ml Syringe	130.00 + 3.00	Bupivacaine (Plain)	100.00
Alcuronium + 5ml Syringe	80.00 + 4.00	Spinal Pack (Laundry &	
Halothane/45 min	300.00	Sterilizing)	60.00
Nitrous oxide/45 minutes	120.00	Ephedrine	200.00
Neostigmine + 5m	70.00 + 4.00	**Total**	**383.50**
+Atropine	45.00		
Morphine + 2ml Syringe	50.00		
Total	**1 060.00**		

Items common to both types of anaesthesia have not been included in the costing. It is obviously a big cost saving move for the hospital to promote and for the anaesthetist to choose regional block than general anaesthesia.

Concentrated drugs (Morphine 15mg/ml, Droperidol 5mg/2ml, Midazolam 15mg/3ml etc): In most cases only a quarter to three quarters of these constitute an average intra-operative dose. By diluting these drugs to 1mg/ml, a more accurate amount is given and the remainder given to the next patient(s) provided sterile syringes are used to draw up the drug from the main syringe of dilute solution. With this technique the risk of contamination is no more than the risk of breaking a new ampoule of the same drug. As already pointed out, one ampoule of droperidol, for example, diluted to 0.5mg/ml (i.e 2ml of droperidol with 5mg, made up to 10ml with saline) will provide enough antiemetic cover for a whole long list as the average dose is 125 to 1000mcg droperidol depending on size of patient (children or adult).

In conclusion, these are some measures which both hospitals and anaesthetists can take to cut down the cost of anaesthesia without compromising the safety of the patient. This should apply for private and public sectors.