HISTORY PAST & PRESENT

History Past

Arthur Ernest Guedel (1883 1956)

General

Dr. Guedel made many important contributions to anaesthesia practice, equipments & knowledge.

- Born in Cambridge city, Indiana on June 13, 1883. **Began his career with severe handicap of poverty.** At 13 yrs, he started working & in a machine accident, lost 1st 3 fingers of his right hand
- Attended Indiana Medical School & graduated as 1st honors student in 1908
- As intern, he administered Ether & Chloroform & later practised anaesthesia
- Served in American Expeditionary Forces, France as anesthesiologist in WWI & trained orderlies and nurses (1917-19). **Lieutenant Arthur Guedel** was known as **"The motorcycle anaesthetist of WWI** (to cover 6 hospitals)
- Became Lecturer in Anaesthesia, University of Indianapolis 1920-28
- Moved to Los Angeles 1928, became Asst Prof in Anaesthesia at Univ of Southern California School of Medicine
- In 1941, ill health forced him into retirement
- He died in LA in 1956

He was an all-round nice guy "Probably no anaesthesiologist had more friends than Dr. Guedel. It was said of him that he had no acquaintances, for everyone who met him was immediately enveloped as a good friend by Dr. Guedel's warm personality, good humour, kindness and scientific ability."

Contributions to Anaesthesia

1. **Eminent anaesthesiologist & teacher** - devised simple, quick & reliable methods of teaching & ways of checking accuracy & safety of dosage of ether
2. Developed **Eye Signs** of Anesthesia & a **school** to train physicians, nurses and orderlies in **open-drop ether** during WWI
3. Devised **self-administration technique of N_2O & air** for obstetric analgesia & minor surgical procedures (1911)
4. Described anaesthetic properties of **Divinyl Oxide**
5. **Systemized signs of Inhalation Anesthesia -**1920
6. Designed & improved on basic anesthesia equipment. Introduced **Guedel laryngoscope blade, Guedel OPA & OTT** in 1933
7. Introduced **controlled respiration** using Ether-1934
8. 1st ed of textbook **'Inhalation Anesthesia'** in 1937
9. Described the **classic description of clinical use of Cyclopropane & CO_2 absorption -**1940
10. First American (anyone outside UK)to be awarded prestigious **Hickman Medal for original work in anaesthesia**, by Royal Society of Medicine, London in 1941
11. Improved upon John Snow's **"five degrees of narcotism"**(1847) & defined the four planes into which 3rd stage is sub-divided (1937)
12. Received the **ASA Distinguished Service Award in 1950**, for Eye Signs
13. Standard book **'Inhalation Anesthesia, A Fundamental Guide'** (1951)
14. Guedel's chart appeared in other anesthesia texts and also used by military for teaching in WWII
15. A 1972 study of MAC of various anaesthetic agents documented that pupillary changes of ether correlated with its alveolar concentrations, confirming Dr. Guedel's observations

History Present

1. **Name**	:	Dr. (Prof.) P. Mazumder
2. **Qualification**	:	MBBS, DA, MD, FFARCS
3. **Last worked at**	:	Presently, Chairman, HOD, Dept of Anaesthesia & Critical Care, Rockland Hospital
4. **Years in service**	:	48 Yrs.
5. **Years of Retirement**	:	**Never Retired**, working till date
6. **Date & Place of Birth**	:	2nd September, 1937
7. **Schooling**	:	Manikganj Village, Dist. Dhaka (Bangladesh)
8. **What made you opt for medicine**	:	My Late Elder brother
9. **MBBS qualification**	:	1961, Calcutta National Medical College, Calcutta
10. **PG qualification**	:	DA & MD (1965) DU, FFARCS (London) 1973
11. **Did you become anaesthetist by choice**	:	No, by compulsion due to poverty. Nobody to support my education
(a) **What did you want to do**	:	Literature from Presidency College Calcutta
(b) **What prevented you from doing that**	:	My elder brother, only earning member in the family, told me **"if you take literature, you will not get food"**
12. **Extra Academic interest**	:	as a student - Games. Now- Hospital & Gardening
13. **Special person you remember**	:	My elder brother (engineer) pulled me up from refugee camp (for 3 yrs) & inspired me to struggle, work & achieve what I am today
14. **Interest in anaesthesia sub speciality**	:	ICU & care of the critically ill
15. **Teacher who most inspired you**	:	Dr. B.L. Bhattacharjee & Sir M K Sykes, Hammersmith Hospital, London
16. **Teacher you were in awe of**	:	Prof Sykes taught me "why & how" in anaesthesia
17. **Professional experience**	:	48 yrs - Safdarjung, MAMC, GB Pant, LHMC, Hammersmith, Cardiff, Glasgow, Liverpool, Amsterdam, Rotterdam (Holland), Sri Chitra (Trivandrum), Mool Chand, Aashlok, National Heart, Sita Ram Bhartia, Balaji Action, Rockland & Cleveland Ohio, USA
18. **Your first PG student**	:	Dr. Kirti Saxena, LHMC
19. **Your most memorable Student**	:	Dr. R K Mirakhoor
20. **When did you become HOD**	:	1976 Sri Chitra Institute of Med Sciences, Trivandrum
21. **Your objective as HOD**	:	Teaching, Post Doctorate Training in Neuro & Cardiac Anaesthesia
22. **Did you achieve it**	:	Yes, PDCC is now accepted all over the country. I am the first to introduce it in 1981 with just one candidate
23. **Anything you want to change from those years**	:	I want the anaesthetist should be a total doctor - not a technician
24. **How do you spend your time now**	:	Hospital & **GARDENING**
25. **Special hobbies**	:	Music (folk songs of India) & **OF COURSE GARDENING**
26. **Is there a change in work culture today**	:	People have become very money minded irrespective of any speciality, no ethics or respect for Doctors - Money & Money. Of course, Society is responsible for this change. No NOBILITY in this NOBLE profession.
27. **Your message for young anaesthesiologist**	:	Keep head up, do your duty, never be afraid, if you are correct
28. **Your hope for future**	:	Speciality is very good but society has made us technician and unequal amongst the equal.
29. **Would you advice your grand children to become doctors**	:	No, never. I feel **Medicine is for the mediocre.**

TEMPERATURE REGULATION UNDER GENERAL ANAESTHESIA

Dr Nishkarsh Gupta[1], Dr Raminder Sehgal[2]

The core temperature of the body is maintained between a narrow range of 36.7±0.4°C for optimum functioning. Anaesthetized persons become relatively poikilothermic in cold **OT temperature** of < 21° C. Moreover, the anaesthetic agents decrease metabolic rate, inhibit vasoconstriction, abolish shivering, increase sweating threshold and depress hypothalamic regulatory mechanisms. The interthreshold range is increased to 2 -4°C (normal: 0.2°C) and behavioral regulation also becomes irrelevant in anaesthetized patients. Therefore core hypothermia develops rapidly after induction of anaesthesia, especially in patients with the following risk factors:-

a) BMR and various compensatory mechanisms decrease in direct proportion to age due to attrition of lean tissue mass, contributing to reduced ability to maintain core temperature in elderly patients in cold operating room environment. Infants are also vulnerable to hypothermia because of increased body surface area to body weight ratio, thin skin, limited fat stores, decreased ability to shiver and increased metabolic rate.

b) Both shivering and vasoconstriction thresholds are higher in females so they tolerate a large variation in core temperatures.

c) *Diabetic* neuropathy (20-40% patients) results in increased AV shunting and decreased sweating, resulting in greater intraoperative hypothermia.
Thyroid hormones increase the metabolic rate and heat production, leading to rise in body temperature. Hypothyroidism causes 50% reduction in BMR and causes hypothermia.

d) One unit refrigerated blood or 1 litre crystalloid solution administered at room temperature decreases the mean body temperature by 0.25 ° C.

e) Extent of surgical procedure, surgery with major body cavities and major vessels exposed are associated with higher incidence of hypothermia. Endoscopic surgeries using cold irrigating fluids/ gases and prolonged duration of anaesthesia (> 2 hours) have an increased risk of hypothermia.

HYPOTHERMIA UNDER GA HAS THREE PHASES.

Redistribution Phase: Induction of general anaesthesia leads to peripheral vasodilatation which causes core heat to flow to periphery, thereby decreasing core temperature by 1.6 ± 0.3 ° C (transfer of 46 kcal) during first hour of anaesthesia.

Linear Phase: During later stages slow, linear decrease in core temperature results from heat loss exceeding metabolic heat production. Cutaneous heat loss to environment is mediated by radiation > convection (laminar flow theatres) > conduction > evaporation.

Core Temperature Plateau: The final stage of hypothermia is characterized by a leveling of temperature decline as a result of thermoregulatory vasoconstriction. It may be passive (small operations) or active (long surgeries).

The **Deleterious Effects** of mild hypothermia on various organ systems include:

a) Impaired platelet function and coagulation cascade leading to abnormal coagulation, increased blood loss and subsequent allogenic transfusion requirements.

b) Impaired immune function and thermoregulatory vasoconstriction decreases wound oxygen delivery and impairs wound healing.

c) Increased catecholamine concentration causes vasoconstriction which increases blood pressure and cardiac morbidity.

d) Hepatic and renal metabolic dysfunction prolongs action of drugs. MAC of volatile anaesthetics also decreases by 5%/°C decrease in temperature. No anaesthesia whatsoever is required to prevent movement in response to skin incision at core temperature lower than 20°C.

e) Hypothermia decreases nerve conduction time, delays repolarisation of nerve spike potential, slows rate of acetylcholine release and reduces rate of muscle contraction. Mild hypothermia (2-3°C) increases the duration of action of Vecuronium by two fold and Atracurium by 60%.

f) Shivering increases oxygen consumption, carbon dioxide production and causes respiratory acidosis. This may disrupt wounds, promote bleeding, increase intracranial and intraocular pressure and may cause patient injury.

g) Delayed fitness for discharge from the PACU and added cost of care.

METHODS USED TO PREVENT HYPOTHERMIA IN THE OPERATING ROOM :-

- Maintaining an **Ambient Temperatures** >26°C prevents intraoperative hypothermia during surgery but it may not comfortable for the operating staff and increases the risk of infections.
- The easiest method decreasing heat loss is to apply **passive insulation (**cotton blankets, surgical drapes, plastic sheeting, and reflective composites) to the skin surface. A single layer of each reduces heat loss by 30%, while three blankets reduce heat loss by additional 18 ± 6% only. Effect of warming blanket is relatively ineffective and short-lived.
- **Circulating Water** is most effective when placed over the patient than underneath. Newer circulating-water systems are found to supply more heat than forced-air, mainly because the heat capacity of water is much greater than for that of dry warm air and, in part, because they provide posterior as well as anterior heating. The combination of heat and decreased local perfusion (resulting when patients weight reduces capillary blood flow) may increase chances of pressure/heat necrosis and cause burns.
- **Forced Air Warming** is the most effective perianaesthetic warming system. Prewarming of peripheral tissues significantly reduces the initial decrease in core temperature after induction of anaesthesia. This is due to increased peripheral tissue temperature and heat content which decreases the potential heat sink presented by the peripheral tissue mass. The best of forced air systems increase the arm and leg heat content by 69 kcal in first 30 minutes of warming and 136 kcal during first hour of warming. Tissue heat transfer at higher temperature settings, however, may be associated with sweating and thermal discomfort.
- **A**ll nutrients raise energy expenditure though the tissues and **Aminoacids Have the Highest Thermogenic Effect** (AA increase metabolic rate by 30 kcal/100kcal whereas carbohydrate and fat increase by 6kcal and 4 kcal respectively). This is further enhanced during anaesthesia due to inhibition of normal thermoregulation. The amino acid induced heat generation under anaesthesia occurs predominantly in the extrasplanchnic tissues (skeletal muscle) and reflects an increased protein turnover. The amino acid infusion increases oxygen consumption by 55% to 71% but doesn't impose any additional symathoadrenal activity. Amino acid infusion during anaesthesia restores core body temperature at awakening, eliminates postoperative shivering, and reduces hospital stay.

Thermal disturbances are associated with severe consequences, so rather than taking a passive approach to thermal management, anesthesiologists should actively use available technology to monitor patients in cold operating rooms and to prevent gross disturbances in the core temperature.

1- Assistant Professor, PGIMER & Associated RML Hospital.
2- Senior Consultant, Department of Anaesthesia, Sir Ganga Ram Hospital.

NEXT MONTHLY CLINICAL MEETING

Organised by	:	Department of Anaesthesiology, Batra Hospital
Venue	:	Main Auditorium, Nursing Block, Batra Hospital
Date	:	20. 7. 2010 (Tuesday)
Time	:	4: 30 PM

Topics to be presented :

1)	Separation of conjoined Twins - Our experience.	- Dr Jaishankker
2)	Post operative Visual loss - a case report	- Dr Umar
3)	Unusual problem with ETO sterilization	- Dr Neha

The longer we dwell on our misfortunes, the greater is their power to harm us.

Dr Arvind Bahl, MD and **Dr Ravi Bhaskar, MD, FFARCS**
have joined as
Sr Consultant in the Department of Anaesthesiology and Critical Care Services, Rockland Hospital, ND