

**Department of Anaesthesiology
and
Intensive Care
AIIMS, New Delhi**

OVER THE YEARS



1957-2003



**Department of Anaesthesiology & Intensive Care
All India Institute of Medical Sciences
Ansari Nagar, New Delhi - 110029**

Preface



The department of Anaesthesia and Intensive Care nurtured from scratch by giants like Prof. Col. G.C. Tandon, Prof. G. C.Gode, Prof. H.L. Kaul; has been pace setter in this field, trained many leading anesthesiologists of today, envolved new procedures, protocols and super-specialties.

From humble beginning in 1957 it has grown into the present. This book aims glimpse from the beginning to date and hopes that sometime in the future, corrections, omissions if any and updating will be carried out. It will bring pleasant memories to one and all who has been a part of this Department.

Dr. T. S. Jayalakshmi
Professor

Foreword



This book brings pleasant memories of the department growing from baby to its present status. I commend the author for bringing out this publication. I hope that in future also the enthusiastic staff members shall keep the Departmental flag flying high.

Dr. H.L. Kaul
Professor and HOD

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Over the years – 1957-2003



Introduction

Based on the recommendation of the Bore committee for establishment of a national medical centre which would concentrate on training highly qualified medical teachers and research worker, All-India Institute of Medical Sciences was established by an act of Parliament by Government of India in 1956, using Indian finances as well as a grant of a million pounds by the Government of Newzealand. with the objective to develop patterns of teaching in undergraduate and postgraduate medical education in all its branches so as to demonstrate a high standard of medical education to all medical colleges and other allied institutions in India; to bring together in one place educational facilities of the highest order for the training of personnel in all important branches of health activity; and to attain self-sufficiency in postgraduate medical education. Anaesthesiology was one of the main clinical department to achieve the objectives and mandate of the Institute.

The hospital and speciality centres have for both indoor and outdoor patients and also serves rural areas. Commencing from very few patients, today it serves

over per day. The hospital has round the clock emergency services, critical care units, speciality clinics. AIIMS now apart from the main hospital, it has 4 other speciality centres.

The Institute is an Autonomous body has a President, who is by convention the Union Health Minister and has a highest policy making body-Institute Body, Governing Body, Director and several Committees. It awards its own degree. The Dean is the Academic head and the Medical Superintendent is the hospital administrative chief..

Every effort has been made to base the information presented in this book on documentation extracted from the Annual Reports published by the AIIMS, and views of past senior members of the department : the author regrets in case there is any unintentional error, omission or in presentation of information or data

Department of Anaesthesia Department:



Department in Old O.T. Block

Over the years, along with the development of medical sciences, the department has set up its own high standards in patient care, education and research. All clinical departments are anchored to this specialty. The department gradually developed clinical anaesthesia in super speciality and sub speciality and the result is now we have a Main department, Department of Cardiac Anaesthesia, Department of Neuro Anaesthesia and Anaesthesia department in Dr. B.R.A. Institute for Rotary Cancer Hospital. For, Dr. Rajendra Prasad Centre for Ophthalmic Sciences, anaesthesia services continues to remain part of main department. Staff from main department rotate in addition to their own separate staff. In other centres only the post graduates are rotated and not the faculty staff

In 1956 the department was in old operation theatre block (now it is the Genetic Unit, PSM, Forensic and Nursing College department) In 1964, it was shifted to main teaching block, 5th floor east wing. This consists of the anaesthesia office, experimental laboratory, biochemistry lab, store, a workshop and our rooms for faculty. When the animal house facility was created separately the experimental lab was shifted. Now in the teaching block east wing, we have the office, departmental library, faculty rooms (shared) and store.

To start with 2 operation theatres were present in the old block with ICU and a dialysis unit. The operation theatres were shifted to main block in 8th floor (12 theatres) in 1969. For general surgery, urology, gynaecology, plastic, ophthalmic, orthopedic, cardiac, neuro operations. Maternity OT was created near labour room in third floor. In 1970, orthopedic OT shifted to first floor adjacent to the OPD. In 1972, ophthalmic OT was shifted to RP centre. For cancer patients, in IRCH, services were provided by main department till 1998.

Till 1970 the class rooms for post graduate teaching was in the 5th floor, library. Thereafter it was shifted to 8th floor, near the pre-anaesthesia room. In 1977 a new class room was created in 9th floor and this is used now. Department provides Short & long term speciality training every year for sponsored candidates.

Main Intensive Care Unit is under the department and runs from the inception. 2 bedded Intensive Care unit was in old operation theatre block which was shifted to main hospital 8th floor AB Wing in 1969. This catered to Cardiac and Neuro post operative patients (4 beds each) and general surgical and medical patients (4 beds.). Neuro ICU beds shifted to (AB4 ward) Neurosurgery ward in 1982, later to CN centre in 1984. Cardiothoracic ICU beds shifted to Cardiothoracic surgery ward (in AB7- ward) in 1975 and to CN- Centre ICU in 1985. 6 bedded Main



General ICU renovated in 1984 (for medical & post surgical patients).& further expanded to 14 beded ICU in October 1990. Presently this ICU is catering mainly to post surgical patients. The medical patients are admitted to Medical ICU in C2 medical ward. ICU training for Short & Long duration is provided every year for sponsored candidates.

Medical Education & Training

Time to time the department organises CME workshops on various topics. Stress is given for training in CPR. It started in 1976 to undergraduates & post graduates and later to all levels of personnel at AIIMS. Now trainees of different categories from Delhi are receiving training in CPBR both basic and advanced life support .

The departmental staff takes active interest in all hospital & institute activities and they are members of different committees and societies. The Institute appoints faculty members as experts in committees for other Institutions also.



9th Floor Classroom

Profile of Heads of the Department

Prof. Lt.Col. G.C.Tandon
(1958—1970)



In 1958, Lt. Col. Professor G.C. Tandon was deputed to All India Institute of Medical Sciences and he was the Founder Professor and first Head of the Department of Anaesthesiology and also as a Medical Superintendent of AIIMS Hospital. Prof. Tandon was responsible for recognition of Anaesthesiology as a broad specialty related to Medicine and start for the first time M.D. (Anaesthesiology) training programme in 1959. This pattern has been nationally accepted. His efforts led to recognition of Anaesthesiology as an independent specialty related to Medicine by Medical Council of India in 1959, leading to creation of independent Departments and Professorships in most colleges. Prof. Tandon was the First President of Delhi Society of Anaesthesia in 1961, which was the forerunner of the present ISA Delhi branch. In 1964, Prof. Tandon was the President of Indian Society of Anaesthetists at the last joint conference with Association of Surgeons in Bombay. He was the Editor of Indian Journal of Anaesthesia for a number of years.

Prof. G.R.Gode
(1970—1988)



Prof. G.R. Gode joined the AIIMS Faculty in 1966 and rose to the post of Associate Professor and took over as Head of the Department in 1970 from Col. G.C. Tandon .He was elevated to the post of Professor in Anaesthesiology in 1975. He took active interest in the clinical trials in the management of human rabies. Due to him , in 1979, the Australasian International Conference was held in A.I.I.M.S, New Delhi. He was honoured as an Emeritus Scientist by the ICMR. Professor G.R. Gode retired on 31st March, 1988 after 34 years of an illustrious career as one of the pioneer anaesthesiologist of the country.

Prof. H.L.Kaul
(1988—2004)



Prof. Kaul, took over as HOD from Professor G.R.Gode . He is the first post graduate student of the Department who became Head of the Department in 1988. He postgraduated in M.D. Anaesthesia from A.I.I.M.S. in 1970 and joined as a Faculty in September, 1971. He is the founder member of the Research Society of Anaesthesiology and Allied Sciences (RSAAS) and Research Society of Anaesthesiology and Clinical Pharmacology . The Journal of Anaesthesiology and Clinical Pharmacology was started by him in 1987. He was the Chief Editor of the Journal till December, 1999, which was handed over to Prof. P.N.Thota .He was one of the founder member of the South Asian Confederation of Anaesthesiologists (SACA) and Asian and Oceanic Society of Regional Anaesthesia (1999-2001) and was holding important portfolios of other societies. He had conducted several National and International Workshops, Conferences and Congresses.

Faculty over the years Beginining:



Dr. N.P. Singh

Dr N P Singh left and this post was filled by Dr N R Kalle. **List of Faculty commencing from 1958 onwards is given in Appendix A**

In 1958, Dr. N.P.Singh joined as an Assistant Professor and in 1959, Dr. N.R. Kalle joined as Registrar in the Department. In 1959 the first batch of two MD Anaesthesia postgraduate students were recruited. Subsequently, more registrars were added in the department along with their post-graduation. In 1962 Dr V S Hatangadi joined as an Asstt Professor and in the same year



Dr. N.R. Kalle

Registrar/Senior Resident(SR)

Upto 1975 the post of registrar was selected from post MD / post DA/or post graduate student. Since there were shortage of specialist anaesthetists, the registrar jobs were offered to postgraduate students. Subsequently this policy was changed and from 1975 only MDs were considered for the post of senior resident and in the same year the designation of the registrar was changed to senior residents. The selection process was by interview which was changed to written later.

Senior residents actively take part in all academic and research activities. 2 months. village posting in Ballabhgargh is compulsory for all. SR's are expected to participate in research projects and to complete 2 small research projects per year and should have published 4-6 papers by the end of 3 year tenure. Senior Residents are assigned to take PG, UG, nursing classes as part of their teaching activities. In addition to their routine clinical work, they are assigned certain responsibilities with faculty member. The senior residents may be assigned government duties on National Functions (Republic Day, Independence Day) as standby Resuscitation Squad. 2 months. village posting in Ballabhgargh is compulsory for all. With the expansion of various specialities and sub specialities, the number of registrars/senior residents in the department has increased from 2 to 26.

Till 1988 all senior residents were posted in all specialities. In 1988, with advent of superspecialities, they were rotated in all specialties except in cardiothoracic centre and Rotary Cancer Centre.

Postgraduate (Junior resident-Academic)

Teaching and Training

Postgraduation started from 1959. Residents join this department from various parts of the country as well as from abroad. Till 1961, the post graduate course was for 2 years and subsequently it was changed into 3 years course. The number gradually increased from two to twenty four.

Selection process:

Upto 1980, the selection process for the post graduation was based on practical and viva which was amended subsequently to written examination on an All-India entrance examination. Selection of junior residents for post graduates course is made twice a year i.e. in January and July. No diploma course is available for this specialty. A total of 24 seats are allotted to this department Apart from regular seats, sponsored candidates from different states are also allowed to join the course.

A.I.I.M.S has awarded MD Anaesthesia degree to 256 doctors whose names are given in Appendix B

Teaching Activities :

All post graduates take part in the didactic teaching activities regularly. The post-graduate training covers intensive training in practical methods of anaesthesiology and encouraged to assist and conduct major anesthetic procedures under supervision. Each student is encouraged to learn and practice newer methods of teaching. The methods of teaching are by lectures, tutorials, seminars, journal clubs, case discussions in the classroom and bed side, in the operation theatres & Intensive Care Unit. The programme is, on Monday seminars, clinical and combined grand rounds, clinico pathological conference on Tuesday, case presentation or thesis presentation on Wednesday, journal club on Thursday and Tutorials on Friday. The timing is in the afternoon from 3.30 to 5.00 P.M. All teaching activity is moderated by Faculty member. The teaching programme is attended by faculty, junior residents (MD students, House Officers) and senior residents.

The department follows an integrated approach and standard protocols for patient care, education and research. Postgraduate course (MD) is of three years duration

and includes a thesis .

The postgraduates are rotated in all surgical specialties, Intensive Care and clinics. The department follows :A laid down curriculum and a fixed guideline for anesthetic procedures to be undertaken by the junior residents. (The details are given in Residents Manual and Syllabus)

It is mandatory for all postgraduates to submit research based on experimental or clinical studies before they appear for the final examination. Only 1976,1977 and 1978 batches were exempted research (on a trial) and reintroduced in 1979. Upto 1980,emphasis was laid on animal experiments for thesis projects and later it is mainly on clinical subjects .

The faculty of the department evolved the curriculum and syllabus for MD Anaesthesia. Originally it was defacto which from 2003 has crystallised into a dejure one .The academic section of AIIMS,under the Dean has published the syllabus. Appendix C reproduces details of the syllabus for Anaesthesia –vide pages 1-32 of the syllabus book of AIIMS.

Undergraduate

The course leading to the degree of MBBS has been in existence since 1956.As per the rules ,the institute admits 50 students every year to its MBBS course.The students are selected through a country-wide written test and nominations by the Union Government.

The subject of anaesthesia was introduced in the undergratuete curriculam from the inception of AIIMS and it has been constantly upgrading its course content in tune with the changing needs .The aim of anaesthesia teaching for medical students is to give knowledge of basic concept used in anaesthesia and to teach them CPR and skills of airway management and other useful procedures and practices, This is achieved in 10 sessions by didactic teaching,lectures, demonstration and conducting simple procedures under supervision.

In 1972,the teaching sessions were increased from 10 to 16 and stress was laid on the basic aspects of cardiopulmonary resuscitation and management of critically ill patients.Earlier teaching were given to seventh semester undergraduates which was rescheduled to sixth semester in 1988 and it still continues.In the two hour seminar for speciality session, anaesthetic aspects were also included in the lecture schedule.

The Syllabus for the MBBS in detail is given as such from the syllabus book of AIIMS page 61-63 as Appendix D

Societies

Research Society of Anaesthesiology & Clinical Pharmacology (RSACP)



In 1985, with a view to create awareness and provide facilitates in various aspects of Anaesthesiology, Clinical Pharmacology and Allied Sciences, particularly among its younger doctors, the society was formed and registered. Membership was open to all anaesthesiologists.Apart from the Journal of Anaesthesiology and Clinical Pharmacology, the Society holds continuing medical education programmes and national conferences highlighting different aspects of anaesthesia. Annual conferences under the banner of the society, conducted every year.

Research Society of Anaesthesiology & Allied Sciences(RSAAS)

The Research Society of Anesthesiology and Allied Sciences (RAAS) was formed and registered on 7th February, 1989. All residents and faculty are its members. It was formed with the prime objective to cultivate and promote study and practice of Anaesthesiology by encouraging scientific research and experimental work in Anaesthesia and related topics. Under the auspices of this society, every year seminars and workshops are organized .The society also provides financial aids to residents to attend conferances &.print and publish educational matters.



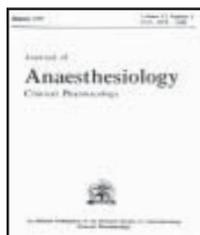
The emblem of the society depicts sun rising behind the mountains to illustrate the main aim of our society of helping to spread knowledge of Anaesthesiology and related specialities in the medical community.

Indian Journal Anaesthesia (IJA) and Journal of Anaesthesiology and Clinical Pharmacology

From 1961-1965, IJA was run by the department. The Chief Editor was Col. G. C. Tandon and Dr. S. K. Goel and N.R. Kalle on Assistant Editors from the department.



In 1986, under the auspices of the RSACP, "Journal of Anaesthesiology and Clinical Pharmacology," a quarterly publication was started. It was aimed at covering basic and applied research in clinical anaesthesiology, applied



physiology, pharmacology, pathophysiology of pain and intensive care medicine. It carries review articles, scientific research papers and case reports. Prof H.L.Kaul was the Editor in Chief and associate editors were from the department faculty. The membership for the

journal is now more than a thousand. It is considered a good journal in the speciality of Anaesthesiology published in India. It is an indexed journal, cited in Excerpta medica (EM Base) and "IND MED". It is available on Internet at URL <http://indeed.nic.in>.



Till 1999, the editorial office of the journal was in the department and was handed over to DR.Thota. Presently the editorial office is in Ludhiana, Dayanand Medical College, Department of Anaesthesia., The Chief Editor is Prof .Tej Kaul, who was the ex-postgraduate from AIIMS

Clinics Run by the Department

Treatment for chronic pain by nerve block was practised from the beginning and it was expanded in 1989. The Pain Clinic is in 7th floor Pre anaesthesia room runs in the afternoons. In the pain clinic facilities for various modalities for pain therapy viz. regional blocks, neurolytic block, TENS, Acupuncture, Acupulsor etc. are available. Interventional techniques are done in the main OT. Since 1989, the department runs Anesthesia Clinic in 5th floor OPD. Faculty and residents are posted for both clinics

Organisation of scientific meets

National conferences & International conferences, workshops and continuous medical education programmes are organized by the department regularly. These are included in the significant events yearwise.

Social Activities

Time to time department organises picnics. It is here the extra curricular and social talents of a departmental member is detected. All members share their talents and enthusiasm during such occasions. In addition post examination dinners, best of luck parties, welcome parties are also organised regularly.



Awards & Medals

Sanjeevani Medal:

This medal is given to the best post graduate in the department. This started in 1988. The recipients of this award were;

- 1) Issac Meethaiha
- 2) Praveen Kalia
- 3) Bindu Pandit
- 4) Anju Rominia
- 5) Balachunder
- 6) Kathirynel
- 7) Anuj Bhatia

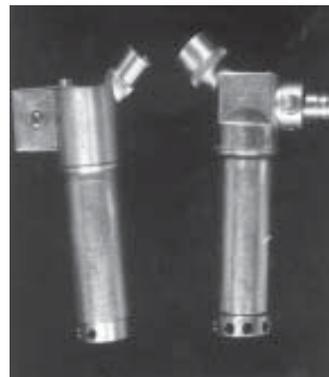
Col. G.C. Tandon Medal :

This is awarded to Best Senior Resident in the department. Introduced from 1998.

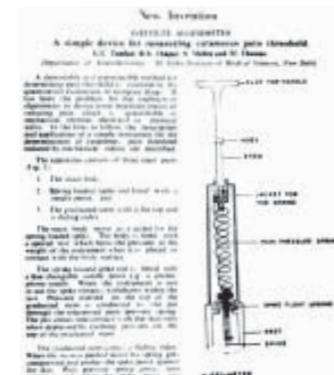
The awardees were :

- 1) Indu Kapoor
- 2) Jagan D.
- 3) Rani Sunder
- 4) Mala C.G.

Significant Events



T - T - INHALER



INSTITUTE ALGESIMETER

Events of the department are depicted yearwise regarding the activities, lectures delivered, places of visits, awards, visitors etc. as below:

1965-66

Prof. T.C. Gray, Dean Faculty of anaesthetists, England, visited the department and lectured in January, 1966. Prof. Sir Robert Macintosh of Oxford visited the department in February, 1966. Dr. Peter Scotts delivered a lecture on the portable chambers for the use of hyperbaric oxygenation.

1969-70

The first conjoined twin operation was performed successfully. Prof. Lt. Col. G.C. Tandon retired and Dr. G.R. Gode took over as HOD.

1970-71

Distinguished scientists visited the department during the period under review and delivered lectures on various topics: **Dr S Lipton, Liverpool, U.K., Dr W E Spoerel, Canada, Dr W N Rolasar, Aberdeen, U.K. and Dr D Kamesaroff, Melbourne, Australia.**

1971-72

Dr S Yajnik went to the Medical College, Mosul, Iraq in November 1971 to strengthen the undergraduate teaching in anaesthesiology and help in establishing a department of anaesthesia there and returned on 10th July, 1972.

1972-73

Dr G R Gode attended the Vth World congress of Anaesthesiologists at Tokyo, Japan from 19th to 23rd September, 1972. Dr V A Punnoose proceeded to Auckland, New Zealand, on a fellowship for advanced training in cardiothoracic anaesthesia on 1st January 1973.

1973-74

A Symposium was organized by the department on 'Anaesthesia in Rural service'. Dr Gode proceeded on a senior commonwealth Fellowship to United Kingdom for a period of three months and he visited a number of medical centres in that Country.

1974-75

Dr G R Gode, attended the 4th Asian and Australian Congress of Anaesthesiologists at Singapore from 22nd September, 1974. Dr V A Punnoose returned from New Zealand after completion of an eighteen months tenure in the cardiothoracic anaesthesia service at the Green Lane Hospital, Auckland. Dr S S Saini proceeded on a fellowship to Norway for training in neurosurgical anaesthesia for one year. **Prof I.C.Geddes of Liverpool** visited the Department and gave a series of lectures on metabolism of halothane, reviewing the possible aetiological factors in halothane hepatitis

1975-76

Prof. G R Gode visited the Republic of Maldives as W.H.O. consultant in September 19, 1975 and March, 1976. For developing anaesthesia services

1976-77

Dr N R Kalle visited the Institute of Child Health, Kabul (Afghanistan) to assist in the development of anaesthesia services in that Institute.

1977-78

Dr G R Gode visited the Republic of Maldives as W.H.O. consultant in June, 1977 and November, 1977. Dr. (Mrs) N. Saxena visited the Institute of Child Health, Kabul in March, 1977.

1978-79

The Vth Asian and Australian Congress of Anaesthesiology was held at AIIMS, New Delhi in September, 1978. Dr G R Gode was the Organizing Secretary. Nearly 1,200 Indian and Foreign delegates attended the conference. About 100 free papers were presented. There were six symposia & four guest lectures. The proceedings for publication of the Scientific session of the congress was edited and by Dr H L Kaul. Dr S K Goel edited souvenir on the occasion for the publication. Dr G R Gode delivered the I.C.M.R. Oration on "Treatment of Human Rabies: Problems and Possibilities" Dr N R Kalle, Associate Professor of Anaesthesiology visited New Zealand hospitals in January, 1979 for six weeks on a travelling fellowship under the AIIMS – New Zealand Exchange programme.

1981-82

Dr S K Goel and Dr M K Arora were elected as President and Secretary respectively of the Indian Society of Anaesthetists, Delhi branch. Dr G R Gode was chairman of the seminar 'Anaesthesia and Endocrine Diseases' at the Annual Conference of the Indian Society of Anaesthetists at Chandigarh. He was also the chairman of the seminar on 'Modern Concept of Intensive Care' in the workshop for postgraduate students. Dr T C Gray from Liverpool and Dr Thronton from Sheffield, U.K., visited the department and delivered lectures.

1982-83

Prof.G.R. Gode delivered an oration at K.G. Medical College, Lucknow in April, 1982; at the Annual Conference of M.P. Branch of ISA at Rewa in August, 1982; the Laxmi Narayan Balwate Memorial Lecture at Jabalpur University in November, 1982.

Prof P. Raj from Cincinnati, U.S.A. visited the Department and gave a talk on the management of chronic pain. Dr Edward Summer from Institute of Child Health, Great Ormond Street, London visited the Department and gave a talk on 'Paediatric Cardiac Anaesthesia'.

1983-84

Dr S S Saini was invited and attended the 8th World Congress of Anaesthesiology in January, 1984 held at Manila.

Training in cardiopulmonary resuscitation was organized for all levels of personnel at AIIMS.

Dr Rashmi Madan received Junior commonwealth fellowship for U.K for studies in pain and intensive care.

Dr M K Arora Asstt Prof, delivered a lecture on Respiratory failure & Ventilatory therapy at the National Workshop in neonatal surgery at AIIMS in March, 1984.

Prof. G R Gode delivered guest lectures at the Maharashtra Convention of Anaesthesiology Sholapur in August 83, at the Fourth National Seminar on Zoonosis at the Heffkine Institute Bombay in Jan 1984 and at the Silver Jubilee function of the Fatima Hospital at Lucknow in Oct, 83.

1984-85

Prof. G R Gode was elected as Chief editorial adviser, Dr H L Kaul as Editor and Dr M K Arora as Assistant Editor of the Journal of Anaesthesiology, Clinical Pharmacology.

Prof G R Gode gave a radio talk on "Poisonous gases hazard in industries" in December, 1984.

Mrs Jeri E Eiserman, a respiratory therapist from USA, gave a talk on "Peri-operative care of the open heart surgery patients" in February, 1985. Hospital & Community Services.

1985-86

Prof G R Gode delivered I.O.L. Oration at the XXXIV Annual conference of ISA held at Bombay in December 1985.

Sanjeevani Medal award for best post -graduate student for the year 1984-85 was awarded to Dr Praveen Kalia.Jr.Resident

Rukmani Pandit Award for best paper presented at the XXXIV Annual conference Indian Society of Anesthesiologists in Dec 1985 to Dr Ravi Saxena, Jr. Resident Prof. William C. Shoemaker, M.D. Editor, the Society of Critical care Medicine, USA, gave talk on (a) A.R.D.S. Following Multiple Organ injury: treatment and management. (b) Shock following surgery, trauma, injury-physiology, diagnosis, management.

Dr Max Harry Well, M.D., Prof Illinois, USA, gave a talk on (a) the significance and measurement of lactic acidosis for diagnosis of perfusion failure and shock states. (b) New concepts in cardiopulmonary resuscitation.

Dr Vinod K Puri, Director, Critical Care Medicine, Michigan, USA; gave talk on (a) New techniques of nutrition in adult patients (b) Fluid Management in adult patients.

Dr Sreedhar Nair, M.D. USA, gave talk on interpretation of blood gases.

Dr Ashok Sarnaik, Director, Critical care Medicine at Children's Hospital of Michigan, USA, gave talk on (a) Management of Coma (b) C.P.R. in paediatric patients.

Dr Vidyasagar, Prof of paediatrics at University of Illinois medical centre, USA, gave a talk on Respiratory failure in children and its management.

Dr Leostern, Prof. And Chairman, Rhode Island, USA, gave a talk on (a) Glucose metabolism and hypoglycemia (b) Thermal regulation in newborn.

Dr C.W. Brayn -Brown, Prof of Anaesthesiology -Texas Medical School, USA, gave talk on Oxygen transport in critically ill and post-operative patients management.

1986-87

Prof Gode delivered an oration on "Extradural and Intrathecal Narcotics" in the 9th Annual Conference of Karnataka State Branch of the Indian Society of Anaesthetists (ISA) at M.R. Medical College, Gulbarga in August 1986, A lecture on "Critical Care and Resuscitation" at the training course for Health Administrators in Sept 1986 and an oration on "Spinal Narcotics" on Feb 87 at the 9th Annual Conference of U.P. chapter of ISA (Jhansi). He was invited to Sheri- Kashmir Institute of Medical Sciences, Srinagar to give lecture on "Anaesthesia and Pentazocine" in Dec, 1986 and for an oration by the Indian Society of Pain Research on "Spinal Narcotics - Clinical and Experimental Studies"

in February 1987.

Dr S S Saini participated in the Annual Conference of Physiotherapists at Patna and spoke on "Physiology of Pain Management of Intractable Pain". At the Annual conference of Neuro-otology and Equilibriomatic Society of India, he spoke on the "Anaesthetic Management of Acoustic Neuromas". At the Golden Jubilee celebration of Indian Medical Association at Dehradun, he participated in a discussion on "Role of Anaesthesiologists in the Management of Head Injuries". He participated in the symposium held by WHO/ICMR in Technology Transfer Programme at AIIMS and spoke on "Management of Pain of Malignant Etiology". In the Conference sponsored by WHO at AIIMS on New Horizons of Hospital Management, he spoke on "Role of ICU in the Management of Critically ill". He participated in the conference on Standardisation of Training and Evaluation in Clinical Neurosciences in India, at Bangalore.

Dr Usha Kiran organised and participated in the International Holistic Health Conference in February 1987, at Mount Abu. She was the co-ordinator in one of the plenary sessions titled "Principles of Healthy Living".

Prof Spoerel of Canada visited the Department in February, 1987. He delivered lectures on "Relief of Post-operative Pain" and New Techniques of IPPR".

1987-88

Dr R K Batra was invited as a visiting lecturer by Wakefield Health Authority U.K. for a period of six months. He also visited Killing-Beck Cardiac Hospital Leeds U.K.

Dr Kaul & T S Jayalakshmi visited IGICH, Kabul as visiting Professors in October, 1987 & February, 1988 respectively.

Prof S Yajnik, Prof and Head Department of Anaesthesiology, K G Medical College, Lucknow was invited as a Visiting Professor from 26th to 30th March 1989. During his stay he discussed various topics dealing with Physics in Anaesthesia and delivered a lecture on "Management of Cancer Pain-new strategies"

1988-89

Prof H L Kaul was awarded INSA- Royal Society visiting fellowship to England from 20th Sept to 27th Oct, 1988. During this period Prof Kaul visited Anaesthetics department of the University of Sheffield medical school and gave a talk on Paediatric anaesthesia. He also visited Queen University of Belfast Department of Anaesthesia and delivered a lecture on post-operative Pulmonary Complications. He visited various training and research facilities in Belfast and Intensive therapy unit of the western Infirmary, Glasgow. This visit included discussion on the modalities of transport of critically ill patients over long distances. He also gave

a talk on "Intensive care unit in India, the problem and prospects"; visited Indira Gandhi Institute of child Health, Kabul in June and Sept, 1988 for 2 weeks each as visiting Professor. The visit included lectures and demonstrations.

After a gap of 18 years, a second conjoined twin separation was successfully managed. All the members of the departmental faculty participated in pre, intra, and post-operative management in the successful venture.

Dr. Somayaji Ramamurthy, Chief, Pain Management clinic, University of Texas, Health Science Centre, gave a talk on "Some new therapeutic modalities for management of chronic pain".

Dr. Jean-Louis Gouget from France gave a lecture demonstration entitled "new trends in Respiratory muscle re-education for patients on IPPV and pain control by computer controlled micro-current.

Dr. Elizabeth G. Gradshaw, Consultant Anaesthetist, Ealing Hospita, London, gave a talk on "Anaesthesia in Day Care Surgery".

1989-90

Dr G P Dureja has been selected as a Govt. of India nominee in the Indo British Technical Cooperation Programme, 1990 for a twelve week's training course in "Medical Education Technology" at the Dundee Institute of Technology, Dundee (UK). Dr Abha Saxena was sponsored by the Department of Anaesthesiology, AIIMS, through Ministry of Health to King's College Hospital, London, UK. During this visit, she learnt about latest advances in the fields of intensive care unit, pain therapy, renal and hepatic transplantation.

1990 -91

Dr Abha Saxena attended the 6th Biennial Conference of Indian Association of Cancer Chemotherapists at AIIMS and spoke on Head and neck cancers-A challenge to the anaesthesiologists.

Dr A P Bhalla attended the 4th International Symposium on pain Clinic at Kyoto, Japan in November 1990 and presented Case report on Management of 4 cases of Neuralgia of the lateral cutaneous nerve of thigh. He participated in the meeting of the Research Society of Anaesthesia and Clinical Pharmacology at Hyderabad in October 1990 and gave a talk on Crytalloids versus Colloids.

Dr Rashmi Madan was selected as a member of the executive Committee of Delhi Chapter of Indian Society of Anaesthesiology. She attended the meeting of the Indian Society of Anaesthesiology at Madras in Decemebr 1990 and spoke on Comparison of effect Enflurane & Halothane in children.

Dr M K Arora gave a talk on Anaesthetic management of bronchoesophageal

fistula at the meeting of Anaesthesiologists at Madras in 1990.

Dr H L Kaul visited the CMET, Dundee Institute of Technology (DT) U.K. under the Indo-British Technical Co-operation programme. He participated in the Asian- Australasian Congress of Anaesthesiology held at Seoul, Korea in September 1990 and gave talk on Computerized anaesthesia recording system in operation theatre. He gave a talk on how to plan a Scientific study at the operation theatre, at the Research Society of Anaesthesiology – Clinical Pharmacology conference held at Hyderabad in October 1990. He spoke on some interesting Paediatric Anaesthesia Problems at the meeting of the Pakistan Anaesthesia Society held at Karachi in February 1991. He gave a talk on Evaluation of alternative anaesthesia technique Air-O₂ Anaesthesia through PEDIUS-Machine at Anaesthesiology meeting at Madras in December 1990.

Dr S P Sachdeva, Consultant Anesthesia from Peterborough, U.K. visited the department in September 1990.

Dr D Attygalle, WHO Fellow from Srilanka gave a lecture on Ophthalmic Anaesthesia in Srilanka in February, 1991.

Dr R K Mirakhor Consultant, Queens University & Royal Victoria Hospital from Belfast, Ireland, was invited as Visiting Professor by AIIMS. During his stay he delivered three guest lectures on i) Use of Propofol infusion anaesthesia, ii) Newer –muscle relaxants and iii) Total intravenous anaesthesia for ophthalmic surgery and gave demonstration on Propofol infusion and newer muscle relaxants in December 1990.

Prof R.S.J. Clarke from Queens University & Royal Victoria Hospital Belfast, Ireland, gave a talk on Benzodiazepines & their antagonists in January 1991.

Dr K Nirmala Devi from U.N. Volunteer in Lusaka Teaching Hospital Africa, Lusaka spoke on Anaesthesia experience in Africa in February 1991.

Dr D K Maharana, Medical Superintendent Northern Coal Fields from Varanasi visited the department in December 1991.

Dr Suresh ZT. Eapen from Postgraduate S.C.B. Medical College, Cuttack underwent one month training in the Department.

Dr B B Rewari, Dr Rakesh Manocha, Dr Keshav Goswami, Dr A K Mathur, Dr R C Khurana and Dr Jagdish Saran from Central Health Services doctors had training in resuscitation.

Lt.Col. T P Madhusudan, from Military Hospital, Kasuali is being trained in paediatric anaesthesia.

Dr Pradeep Jain from sir Ganga Ram Hospital, New Delhi is continuing training in paediatric anaesthesia from March 1991 onwards.

1991-92

Dr D K Pawar worked for one year as a fellow in Anaesthesia at the Royal Children Hospital, Melbourne, Australia for Paediatric anaesthesia training. During this period, he was invited by the department of Anaesthesia, University Hospital,

Singapore, Malaysian Anaesthetist Society, and Thai college of Anaesthetists, where he delivered talks and took part in case discussions, and gave practical demonstration in the operation theatre.

Dr Maya served as a visiting lecturer to King's College Hospital, London for a period of one year. During her stay, she worked in all the specialities, and learnt about the computerized system of anaesthesia records and Intensive Therapy unit. She also attended various seminars and symposia including fiberoptic laryngoscopy.

Dr T S Jayalakshmi and Dr A Saxena attended a workshop on database Medlar Fundamentals held at National Informatics Centre in Jan, 1992. Dr T S Jayalakshmi also attended a seminar on "Medical books in India" in Feb 1992 organized by National Book Trust of India and Medical Journal of India.

Dr G P Dureja produced a video film on 'CVP monitoring' for education purposes. He was a member of organizing Committee of workshop on 'Media in Medical Education' held at CMET, AIIMS in Jan 1992.

Dr. Petrov Zlatko from Yugoslavia visited the department under cultural exchange programme Dr. Mohammad Musa and Khoie from Afghanistan visited the department as WHO fellow in March-April 1991. Dr. I.M. Bali, Consultant anaesthetic, Belamina, North Ireland visited the department in Jan. 1992 and gave a lecture on "Anaesthetic management of PET and eclampsia". Dr. JR Maltby from University of Calgary, Canada visited the department in March 1992 and gave a talk on 'Preoperative oral fluids in adults'

1992-93

Dr H L Kaul has been nominated as member of the Committee on quality of Practice by World Federation of Society of Anesthesiologist at the Hague in June 1992.

Dr Abha Saxena was awarded a fellowship by the International School for Cancer care to attend four week course on pain and palliative care in Oxford.

Dr M K Arora went for a fellowship as a visiting Assistant Professor at McGill University, Montreal, Canada.

Dr T S Jayalakshmi and Dr Rashmi Madan were elected Finance Secretary and General Secretary respectively of the South Asian Confederation of Anaesthesiologists.

Dr. Petrov Zlatko from Yugoslavia visited the department under cultural exchange programme Dr. Mohammad Musa Andkhoie from Afghanistan visited the department as WHO fellow in March-April 1991. Dr. I.M. Bali, Consultant anaesthetic, Belamina, North Ireland visited the department in Jan. 1992 and gave a lecture on "Anaesthetic management of PET and eclampsia". Dr. JR Maltby from University of Calgary, Canada visited the department in March 1992 and

gave a talk on 'Preoperative oral fluids in adults'

1993-94

No events Documented.

1994-95

Dr H L Kaul was selected for Prof Venkata Rao oration in ISA annual conference at Jaipur; continued as chief editor and Dr Jayalakshmi T.S and Dr G P Dureja as editor and Dr Murali, Dr Abha Saxena continued to be associate editor of journal of Anaesthesiology and Clinical Pharmacology.

Dr G P Dureja was awarded the Gold medal at 33rd World Congress of Complementary Medicine, New Delhi 1995 in recognition of promoting Acupuncture research in India; was nominated as secretary and Dr. T.S.Jayalakshmi as Vice President of Indian Society for pain Research and Therapy (ISPRAT).

Dr Abha Saxena elected as the secretary of Research Society of Anaesthesiology and Allied Sciences.

Dr Murray Wilson, Sheffield UK; Prof Giuissepe, Italy; Prof J.J.Rouby, France; Dr Gabriella Hegyi, Budapest; and Prof William Shoemaker UCLA Los Angeles CA.

1995-96

Prof H L Kaul continued as Chief editor of Journal of Anaesthesiology and Clinical Pharmacology with Dr T S Jayalakshmi and Dr G P Dureja as editor's. Dr Abha Saxena and Dr Murali continue to be associate editors.

Dr. John Schou, Germany; Prof. Kazi M. Iqbal, IPGMR, Bangladesh; Dr. Say Wan Lim, World Federation Society of Anaesthesiologists; Dr. W.C. Shoemaker, Washington; and Michael G. Beez.

1996-97

Prof H L Kaul continued as the Chief Editor of Journal of Anaesthesiology and Clinical Pharmacology with Dr T S Jayalakshmi and Dr G P Dureja as editors. Dr Abha Saxena and Dr Murali continue to be associate editors. He has been appointed as honorary consultant and advisor to Armed Forces Medical Services.

Dr G P Dureja continued as Secretary and Dr T.S.Jayalakshmi as Vice President of Indian Society for Pain Research and Therapy (ISPRAT).

Dr V Muralidhar was elected member of the National Academy of Medical Sciences in 1996.

Dr. Herman H. Waldvogel, Evian, France; Dr. Otto Pecher, Munich, Germany; Dr. Elizabeth A.M. Fronst, New York; Dr. Dilip Subedar, New York; and Dr. Roop Kishan, UK.

1997-98

Prof H L Kaul has been selected as a member of the Advisory Committee on Ethics of the World Congress of Anaesthesiology to be held in Montreal in 2000. He continues to be the member of the Quality Control Committee of the World federation of Societies of Anaesthesiologists and as advisor to the armed forces health services. He was invited as visiting consultant to Kuwait. He continued as the chief editor of Journal of Anaesthesiology and Clinical Pharmacology with Dr T S Jayalakshmi and Dr G P Dureja as editors. Dr Abha Saxena and Dr Murali continued as the associate editors.

Dr G P Dureja continued as the secretary and Dr. T.S.Jayalakshmi as Vice President of Indian Society for Pain Research and Therapy. Dr Dureja appointed as one of the editor of Hospital Today journal Prof. Elizabeth M. Frost, New York, USA; Dr. T.C.K. Brown, Melbourne; Dr. Anneka Meursing, World Federation of Societies of Anaesthesiology.

1998-99

Prof H L Kaul: Dr T S Jayalakshmi: Dr G P Dureja : .Dr Rashmi Madan : Dr M K Arora : continued as chief editor,editor and associate editor, in the Journal of Anaesthesiology and Clinical Pharmacology.

G.P.Dureja continued as one of the editor of the Hospital Today journal

1999-2000

Dr H L Kaul elected as President of Research Society of Anaesthesiology and Clinical Pharmacology; President –Elect of the Asian & Oceanic Society of Regional Anaesthesia; Review Editor, International Monitor on Regional Anaesthesia and Pain Therapy; continued as Chief Editor, with the same other editorial members in the Journal of Anaesthesiology and Clinical Pharmacology

Dr G P Dureja continued the editorship in Hospital Today journal

2000 –2001

Prof Kaul continued as a President of Research Society of Anaesthesiology Clinical Pharmacology (RSACP) and also Elected as a President of Asian and Oceanic Society of Regional Anaesthesia (AOSRA). Prof Kaul was invited as a Faculty in the World Congress of Anaesthesiologists held in Montreal, Canada. He was also appointed a member of the Ethics Committee for the Congress.

The Journal of Anaesthesiology and Clinical Pharmacology was handed over to Dr. P.N.Thota,Manipal Medical College,Mangalore,in Jan,2001.

Dr D K Pawar was nominated as the chairman of the ‘Pain Relief Committee’ of the World federation of the Societies of Anaesthesiologists.

Dr G P Dureja continued as the editor of the Multispeciality Journal “Hospital Today” and the Secretary of the “Research Society of Anaesthesiology & Clinical Pharmacology”.

2001-2002

Prof. Kaul was awarded the ‘Claris life time achievement award & oration’ at the International Congress of Critical Care Med. Held in New Delhi on 8th Feb., 2002. He delivered the Prof. Pritam Singh Oration at the NZ ISACON Congress in Amritsar in Oct. 2001.He was elected as President of Asian Oceanic Society of Regional Anaesthesia during the 6th Biennial Congress held in Seoul, Korea in September, 2001.He chaired a session and delivered a lecture on Regional Anaesthesia – Asian Perspective

Prof. Kaul has invited as visiting consultant to Kuwait in Aug.-Sept., 2001 and Jan 2002 for a period of 6 weeks & 4 weeks respectively.

Prof. Kaul was an Organizing Faculty at the 1st World Congress of Regional Anaesthesia and Pain Medicine held in Barcelona, Spain in June, 2002. He also conducted a workshop on “Continuous Spinal Anaesthesia” and chaired a session entitled “Prevention of Chronicity of Pain”.

Dr. T.S. Jayalakshmi was selected for representing Asia in the investigators meeting in Barcelona, Spain in June 2001,a Pfizer sponsored global study on Voriconazole vs Amphotericin B in candidemia She was one of the Organising Faculty and Co-ordinator and group leader for the National Conference in Infection Control in Indian Hospitals – Challenges & strategies (HICCON-2001)

Dr. R.K. Batra was a visiting consultant in Kuwait in July, September and October. Dr DK Shende presented scientific paper “ Effects of peribulbar bupivacaine with or without morphine on perioperative pain and PONV in vitreoretinal surgeries” at 8th World Congress of Intensive care and Critical Care Medicine at Sydney 28 October- 1 November 2001.

Dr. Dureja has Organized monthly clinics at Spastic Society of Northern India, New Delhi for Management of Cerebral Palsy Children. He continued as the

Editor of a Multispeciality Journal “Hospital Today”.and the Secretary of the “Research Society of Anaesthesiology Clinical pharmacology and the Secretary of the “Indian Society for Pain Research & Therapy”. He Organized a Live Workshop on “Regional Anaesthesia and Pain

Management” at the Annual Conference of ISA at Ahmedabad on 25th Dec. 2001. He was Invited to deliver 2 Guest Lectures on ‘Chronic Pain Management’ and ‘Spinal Opioid’ at the 6th Biennial Conference of Asian & Oceanic Society of Regional Anaesthesia at Seoul, Korea. He was elected as a Member of the Post Graduate Curriculum review committee constituted by medical Council of India. He Conducted a Live Workshop on ‘Cancer Pain management Techniques’ at the Regional Cancer Hospital Cuttack on 6th Sept. 2001. He organized a workshop on Management of Spasticity at BIRD, SVIMS Tirupati on 10th Feb., 2002. And also delivered a Guest Lecture on Spastic Cerebral Palsy : Role of Botox and Phenol Blocks at the Paediatric Neurology Conference at Trivandrum, Kerala on 7th March, 2002. He was invited to deliver a ‘Oration’ on Myofascial Pain at a Symposium on Myofascial Pain held at Singapore 27th – 28th March, 2001.

In the 36th Annual Conference of Indian Society of Anaesthesiologist Dr. T.S. Jayalakshmi, Dr. G.P. Dureja and Dr. Ganga Prasad were elected as office bearers as President, Secretary and treasurer) for the ISA (Delhi Chapter). During the Annual Conference, ISA, Delhi Chapter awarded the best metro ISA branch. In the mediquiz, the residents of the department bagged the 1st, 2nd and 3rd prize.

2002-2003

Dr. Ravi Saksena appointed as Chief of Trauma Centre and Incharge Casualty.

Dr. T.S. Jayalakshmi, Dr. G.P. Dureja and Dr. Ganga Prasad functioned as office bearers (President, Secretary and treasurer) and Dr. S. Rajeshwari appointed as Editor of Newsletter of Indian Society of Anaesthesiologist,DelhiChapter.

Dr. Maya was invited by the Vice Chancellor of Bundelkhand University (Jhansi) to organise and conduct the M.D. Anesthesiology Practical & Viva voce examination in M.L.B.MedicalCollege&Hospital.She participated in Voluntary Community service in the Annual Eye Camp organized by Radhaswami Satsang, Beas in Punjab.

Prof. H.L. Kaul was invited as Visiting Consultant for a period of 4 weeks by Ahmadi Hospital, Ahmadi, Kuwait from 29th July to 23rd August 2002. He participated in the conference “Centre of Excellence on Critical Care Interventions” held from 19-20th October,2002atMumbai. He was invited to attend the 3rd North Zone-ISACON-2002 held from 26th October to 27th October 2002 and delivered the first Dr. OP Kohli MemorialOration. He was invited to the ISA GOLDCON-2002 the 50th National Conference of Indian Society of Anaesthesiologists held from 27th to 30th December 2002 at Coimbatore and delivered the Inaugural oration of the Paediatric Anaesthesia chapter of Indian Society of Anaesthesiologists on 29th December 2002 He attended the 23rd Critical Care Congress organized by

Society for Critical Care Medicine held from 28th January to 2nd February 2003 at San Diego, Texas, USA. He was invited to attend International Critical Care Congress-2003 and 9th Annual Conference of Indian Society Care Medicine from 8-11th February 2003 at Jaipur. He was invited to attend 5th South Asian Confederation of Anaesthesiologists Congress held in Dhaka, Bangladesh from 18-20th February 2003. He attended the workshop on "Management of Mass Casualties during disasters" held at Jammu (J & K state) from 14-16th March 2003. He was invited to deliver a Guest Lecture on Blood Conservation and optimizing use of blood transfusions at JNMC, Aligarh Muslim University.

Research

The research conducted in the department from the inception is summarised below yearwise. Names of faculty and residents involved in the study is not mentioned.

1964-65

Facilities for research was developed in the experimental laboratory of Anaesthesiology. Research studies related to the clinical problems and therapeutic applications of continuous epidural analgesia; biochemical and physiological changes during anaesthesia for open heart surgery and studies on profound hypothermia by immersion and extra corporeal techniques were stressed.

1965-66

Research projects included were: study of Halothane in prevention of haemorrhagic shock, metabolic changes during ether and halothane anaesthesia, the liver under different anaesthetic techniques, acid-base changes accompanying profound hypothermia, acid-base changes and blood lactic acid levels in dogs during graded haemorrhagic shock under ether and halothane anaesthesia.

1970-71

The department continued to take in its long-term projects which includes: Effect of cobra venom; haemorrhagic shocks; effects of anaesthetic agents on liver functions, experimental hyperthermia; and study of trilene air anaesthesia. Effect of cobra venom: Intra-venous administration of cobra venom in dogs resulted in paralysis of voluntary muscles leading to respiratory arrest and death. It was also found that artificial ventilation for the duration of paralysis in cobra envenomation could significantly diminish the mortality, as the cobra venom contains besides the neurotoxin constituents like cardiotoxins, haemolysin and a number of enzymes, studies have been initiated to obtain pure samples of modified cobra venom which should only retain the neuromuscular blocking activity. Experiments have been conducted wherein these purified samples of cobra venom have been used in conjunction with intermittent positive pressure respiration in the treatment of experimental tetanus. The pharmacological effects of the purified cobra venom are being compared with those of d-tubocurarine in order to determine

the relative potency as well as the incidence of side-effect.

Haemorrhagic shock: The study continued to compare the efficacy of the various replacement fluids or their combinations in the management of hypovolaemic shock. Various fluids used for this purpose include dextran-75, low molecular dextran (dextran-40), Ringer's lactate and haemaccel. The parameters evaluated were: central venous pressure, arterial pressure, urine output, blood chemistry and the mortality rate. Another study in this area which has been initiated during this year was changes in arterial pH, PCO_2 , PO_2 , base deficit and blood volume during graded experimental haemorrhagic shock. These studies are received financial assistance from the Indian Council of Medical Research.

Trilene oxygen and trilene air anaesthesia: Trichloroethylene used in a non-breathing circuit in over 50 cases. This studied technique indicated that trichloroethylene can be employed with reasonable margin of safety in various clinical situations. Attempts were made to devise a simple anaesthetic machine which would allow the use of trilene in non-breathing circuits with air as vehicle.

1971-72

The department centered in the following areas of research :

High altitude physiology: Although no team went to the high altitude during this period, the previous data have been analysed in detail. Experimental evidence were obtained for the effect of hypoxia on myocardial function.

Constrictive pericarditis: An evaluation of so-called "myocardial" factors in constrictive pericarditis was made. Atrial pacing techniques have been utilised for this purpose and appeared to be promising.

Chronic severe anaemia: The effect of exercise on circulatory abnormalities of patients with chronic severe anaemia evaluated and work control to delineate the role of peripheral vascular resistance at fixed heart rates in producing cardiac output changes in this state.

Pacemaker therapy in cardiovascular diagnosis and therapeutics: The place of long-term cardiac pacing in the patients with complete heart block evaluated.

1972-73

Design and fabrication of a cheap anaesthesia machine for work in rural areas has reached an advanced stage. Two prototypes prepared used in animals satisfactorily.

Haemorrhagic Shock : Further work on haemorrhagic shock controlled. This comprises evaluation of the effect of heavy doses of morphine on the pathogenesis of shock and the effect of trilene in anaesthetic concentration on the shock state. This work may contribute to a better understanding of the effect of trilene in

situations of hypovolaemic shock and its usefulness in such patients requiring anaesthesia.

Rabies : A clinical project to work out a new approach for the treatment of rabies has been started. Treatment included intermittent positive pressure respirations, tracheostomy, volume replacement and vasodilatory drugs.

Anaesthetics in Hypoproteinaemic Patients: A study is being made in which hypoproteinaemic monkeys are exposed to various anaesthetics and the response recorded. Hypoproteinaemia being common in some parts of the country, this study may throw light on the response of such patients to commonly used anaesthetics and to some anaesthetic situations like shock, hypoxia, etc.

1973-74

Fabrication : Design and fabrication of an economical anaesthesia apparatus relevant to the needs of our country continued. Trichloroethylene as a sole anaesthetic agent with the atmospheric air as carrier gas has been explored with clinical trials in the department. This technique is economical. A prototype of an anaesthetic apparatus, both hospital model as well as a portable model, has been fabricated and found satisfactory.

Shock : Further work on experimental haemorrhagic shock continued. The effects of morphine and trichloroethylene as anaesthetic agents in experimentally induced shocked animals have been studied in this year. Effects of anaesthetic agents in relation to induced hypoproteinaemia studied in the department. A model of hypoproteinaemia in the monkeys has been standardised and the effects of exposure to anaesthetic agents on liver function tests and histological changes were studied.

1974-75

Design and fabrication of an all purpose anaesthesia apparatus, held up due to non-availability of trichloroethylene in the country, has been taken up again. A clinical project for the trial of an intensive care approach to the treatment of rabies encephalitis confirmed. Some cases have been treated. The lacunae in our knowledge of the pathophysiology and progression of symptomatology in rabies are being studied. The last patient treated lived for a period of 15 days raising the hope of ultimate survival in such cases when intensively managed. The treatment in this case consisted of intermittent positive pressure ventilation and management of electrolyte, fluid and acid base homeostasis.

A clinical trial of the new anaesthetic agents, ketamine and althesin was undertaken. Both these agents have been tried in cases with raised intracranial and intraocular pressure and their suitability for such cases verified.

A trial of a new sedative hypnotic - amnesic (Lorazepam) as a premedication agent under progress.

1975-76

The project of intensive therapy in human rabies continued. Other clinical studies in progress are:

Evaluation of anaesthetic techniques for microlaryngeal surgery.

Effects of ketamine, althesin and/or thiopentone on intraocular tension changes in glaucoma.

Oxygen and trilene + relaxant anaesthesia in a non-return system in cardiac surgery. Electrolyte disturbances, during the course of human rabies and its intensive therapy.

Temperature changes in surgical patients.

1976-77

The design and fabrication of prototype of simple, inexpensive, all purpose anaesthetic apparatus is being continued. This will be an apparatus which can be useful in situations of non availability of medical gases as in most of the towns and villages of the country.

The trial of intensive care approach in the treatment of patients with rabies continued. The pathophysiology and progression of symptomatology of this disease is being studied. The maximum survival time amongst the treated patients in the department is 21 days. Antiviral agents and interferon-inducing agents are being tried to achieve a break through in the treatment of this fatal disease.

A clinical trial of the new anaesthetic agents, ketamine and althesin, has completed. The effects of this agent on the intracranial and intraocular pressure has been studied. A trial of a new sedative hypnotic - amnesic (Lorazepam) as a premedication agent is being continued.

1977-78

Design and fabrication of a simple inhaler for pain relief has been completed and patented.

Design and fabrication of prototype of simple inexpensive all purpose anaesthetic apparatus is being carried out - a prototype of an apparatus which can be used in situations of non-availability of medical gases.

The project on intensive care approach in the treatment of rabies patients continued.

The pathophysiology and progression of symptomatology in this fatal disease is being studied. The maximum survival time amongst the treated patients in the department is 21 days. Various antiviral agents and interferon inducing agents are being tried for the treatment of this disease.

Trial of newer intravenous anaesthetics is continuing with the newly introduced drug "Etomidate". Its general utility as an I.V. induction agent in comparison with thiopentone, its effects and intracranial and intraocular tension will be studied.

1978-79

Design and fabrication of a simple inhaler for pain has been completed and patented. Clinical trials with the inhaler has been initiated in obstetrical and post operative patients.

Design and fabrication of simple inexpensive all purpose anaesthetic apparatus is progressing. The apparatus will be useful in situation where medical gases are not available.

The project on intensive care approach in the treatment of rabies patients is continued.

Trials of newer intravenous anaesthetics is continuing with etomidate. Its effects in compared with thiopentone.

1981-82

A clinical study of the effects of different anaesthetic agents on the foetus and mother during the elective caesarian section

It was observed that all 4 relaxants including pancuronium, gallamine and d-tubocurarine can be safely used. D-tubocurarine produced more depression in the foetus but this was within acceptable range.

Cardiovascular and antisialogogue effects of various doses of atropine used with neostigmine for reversal of neuromuscular blocking agents.

This study did not show any significant difference statistically in the antisialogogue effect of various doses of atropine used with neostigmine with regard to its neuromuscular blocking effect.

Comparative clinical study of oxygen-ether, oxygen-halothane and oxygentrichloroethylene for general anaesthesia

Oxygen alone as a carrier of volatile inhalation agents in non-rebreathing circuit is efficient and safe. Since halothane is very expensive, and a widespread use of cautery during surgery makes the use of ether unsafe, trichloroethylene appears

to be the ideal agent which can be used in this circuit. It is also cheap and provides analgesia in the post-operative period.

Recovery from anaesthesia using different inhalational agents through Bain Circuit:

The study was carried out on 60 patients. Comparison was made between PaCO₂ of the two arterial samples. It was found that at the flow rates, the T-piece (modified E-system) was the most efficient for maintaining normocapnia in children during anaesthesia.

1982-83

Temperature gradients at different sites of the body during extracorporeal cooling and rewarming in cardiac surgery

The temperatures from nasopharynx, rectum, oesophagus tympanum and skin of 50 patients during cardiac surgery under cardiopulmonary bypass were continuously monitored and compared during cooling and rewarming.

The rate of cooling on bypass was most rapid in the oesophagus followed by that in nasopharynx and the tympanum. The rectum and skin cooled more slowly. The same sequence was seen during rewarming.

Comparison of transcutaneous nerve stimulation (TNS) and conventional analgesics in the treatment of postoperative pain

The technique of TNS on the gate control theory of pain was found to be useful in treating patients with postoperative pain as an effective additive to narcotic analgesics.

Estimation of blood loss during surgery of scoliosis fusion under deliberate hypotension and normotension

Difference in blood loss was marked apparently under SNP hypotension as compared to the central group. But it was not found to be statistically significant because of the small number of cases and variation in the age groups of patients and the type of operative procedures

Clinical and serum potassium changes in anaesthesia for modified ECT using four different I/V inducing agents

Recovery time was prolonged with thiopentone and ketamine. Patients in the propanidid group awoke earliest followed by those in the Etomidate group.

Apnoea time was longest with propanidid. There was slight rise in serum K⁺ in all the groups except Etomidate. The rise after ECT was highest in the thiopentone group followed by that in propanidid and least with ketamine.

Postoperative analgesia by Epidural narcotics

Onset of analgesia was quickest with pethidine followed by morphine and bupivacaine. Duration of analgesia was greatest with morphine followed by pethidine. Tidal volumes were significantly and comparatively improved from postoperative values. Epidural analgesia with morphine was found to be better than other drugs.

Comparative study of cyclopropane, ether, halothane and thiopentone as induction agents for closed mitral commissurotomy

Heart rate fell significantly with cyclopropane as compared to halothane. Thiopentone and ether increased the heart rate. Suxamethonium bradycardia was seen only with cyclopropane. Blood pressure fell maximum with thiopentone and least with ether. Restlessness in the early postoperative period was more common in the thiopentone group.

1983-84

Effect of sodium nitropruside and halothane on intracranial pressure (ICP) in neuro-surgical patients:

No relationship was found between the initial levels of ICP and the mean increase caused by these two agents. It was concluded that it will be safe to use these agents only after making the brain slack and after the dura has been opened.

Effective life on indicator soda lime used for CO₂ absorption in a closed circuit:

The effective life of soda lime is taken to be indicated by the colour change in the absorbent and this usually occurs in 10-12 hours. This study has shown that indicator soda lime may be safely and economically used during anaesthesia for a period four times as long.

Effect of propranolol pretreatment in the haemodynamic effect of sodium nitroprusside during hypotensive anaesthesia in neurosurgery:

It was concluded from the study that propranolol pretreatment is a useful adjunct to the hypotension produced by sodium nitroprusside.

Total intravenous anaesthesia-evaluation of propranolol and thiopentone for major surgery:

This technique of general anaesthesia has a place because of its ease of utility, economy and avoidance of theatre pollution but intraoperative monitoring

to assess the depth of anaesthesia is mandatory.

Metabolic changes during ketamine infusion anaesthesia:

This study was conducted to evaluate the stress response associated with low dose (>1.00 mg/kgm/hr) infusion. It was found that the group of patients receiving low doses exhibited stress responses to the surgical stimulus by showing glucose intolerance while the group receiving higher doses (1.5mg/kgm/hr)

Evaluation of stress responses in air-trilene relaxant anaesthesia:

The study showed that plasma cortisol and urinary catecholamines were high or than normal intra-operatively but this rise was significantly greater in the O₂+N₂O and pethidine group compared with the air trilene relaxant group. Comparative evaluation of sub-arachnoid morphine and pethidine for post-operative analgesia: Sub-archnoid morphine was found to be a better analgesic agent post-operatively than pethidine.

Interinstitutional multidisciplinary study on pain:

The study was carried out to see the efficacy of transcutaneous nerve stimulation in clinical cases of pain and injection of anhydrous-glycerol in trigeminal neuralgias with TNS. Out of 59 patients 48 had relief of pain and no relief was noticed in 4 patients. With anhydrous glycerol injections 170 out of 192 patients, had complete relief of pain. In 12 patients there was no relief and they were treated surgically.

1984-85

Clinical evaluation of halothane in low flow anaesthetic system

Low flow anaesthesia system was found to be significantly more economical as compared to conventional system in use. The technique was safe if inspired oxygen concentration was monitored continuously.

Potassium requirement during and after cardiopulmonary by-pass for open heart surgery

It was concluded that potassium requirement is possibly related to alteration in the internal potassium haemostatis mechanism such as insuline, aldosterone, catacholamines during and after cardiopulmonary by-pass.

To compare the effect of general anaesthesia alone and general anaesthesia supplemented with extradural block on blood loss, portal pressure and liver functions during lieno-renal surgery for portal hypertension.

Supplementation of continous extradural block along with general

anaesthesia reduces the portal vein pressure, bloodlo0ss, requirement of muscle relaxants and analgesics as compared to general anaesthesia alone.

Intrathecal morphine for post-operative analgesia- a comparison of 3 different doses.

0.25, 0.5 and 1.00 mg Morphine was given to 60 patients, 20 in each group, for relief of pain in lower abdominal surgery. 0.25 my dose was found to be effective in relieving pain for 20 hrs. with minimum side effects compared to 0.5 mg and 1.00 mg.

Comparison of inhalational analgesia with epidural block for relief in labour pain.

Epidural block for relief of labour pian was found to be more satisfactory compared to other inhalational analgesia techniques.

Epidural pentazocine for postoperative pain relief

Epidural pentazocine was used in 50 patients for the relief of post-operative pain in lower abdominal and pelvic surgery patients. The duration of action was upto 24 hrs. These patients had minimal side effects. Sickness and respiratory depression was found to be much less when compared to previous studies where morphine/pethidine was used.

Comparative evaluation of three neuroleptic combination as induction agents

Induction characteristics of diazepam-pentazocine, diazepam-morphine and thiopentone were studied in 60 patients 20 in each group. Induction of anaesthesia was slow in dizepam-pentazocine group. There was no significant difference in induction characteristics in these three groups. Recovery from anaesthesia was delayed in 1st two groups. These patients were drowsy but arousable and comfortable.

1985-86

Intrathecal pentazocine for postoperative pain relief: effectiveness and dose response study:

A dose response study was undertaken to assess the efficacy of intrathecal pentazocine in postoperative pain relief. Doses of 0 to 5 mgms were administered to 60 patients undergoing lower abdominal and lower limb operations and a dose response relationship was established. It was found that 3 mgms of pentazocine was a safe and effective dose. There were no untoward effects seen in the study.

Cardiovascular changes in hypertensive patients during laryngoscopy and intubation under anaesthesia:

A total of 60 patients were studied. They were divided into three groups of 20 each. Group I-Normotensive; Group II-Controlled Hypertensive; Group III-Uncontrolled Hypertensive patients. Patients in each group were randomly allocated to sub-group of A & B depending upon the route of administration of lignocaine. Subgroup A received intravenous lignocaine in dose of 1.5 mg/kg i.v. and subgroup B received topical lignocaine. Pulse, systolic and diastolic blood pressure & E.C.G. were monitored. The significance of difference between the haemodynamic changes was analysed by paired 't' test. It was concluded that pretreatment with lignocaine either intravenously or topically did not completely abolish but attenuated the hypertensive tachycardia response in normotensive as well as hypertensive patients.

Effect of different concentration of Trichlorethylene on intracranial pressure with moderate hypocapnia (pa Co₂-30-35 mmHg) and with severe hypocapnia (Paco₂ 25-30 mm Hg)

Intracranial pressure (ICP) was monitored from the lateral ventricle and compared. Different anaesthetic concentration of trichlorethylene was added into the anaesthetic circuit using calibrated trichlorethylene vaporizer. In both the studies majority of the patients showed statistically significant rise in I.C.P. with all concentrations of trichlorethylene when the PaCo₂ was maintained within 25-35 mmHg. It was concluded that this range of PaCo₂ did not abolish the increase in I.C.P. effect of Trichlorethylene.

Modification of stress response in lower abdominal surgery with intrathecal narcotics:

30 healthy female patients undergoing abdominal hysterectomy were studied. The anaesthetic technique was similar in all the patients. They were divided in three groups based on the regime of postoperative analgesia. Group I received intramuscular pethidine (1 mg/kg), Group II received 1 mg intrathecal morphine and group III received 3mg intrathecal pentazocine. The parameters studied were blood glucose, cortisol, and complications of dural puncture. There was no change in levels of cortisol in the three groups. Blood glucose levels were lowest in group III. Pain relief was satisfactory in group I and group II. Group II patients had to be given systemic analgesic supplements.

Stress response during anaesthesia in children

Stress response during anaesthesia was studied in 40 children aged 4-10 years. Majority of them underwent ophthalmic operations lasting for 45 mts to 60 mts. They were divided into two groups of 20 each. In group I the patients were kept on spontaneous respiration during anaesthesia and in group II patients, respiration was artificially controlled using nondepolarising muscle relaxant. Blood

glucose, serum cortisol, prolactin and electrolytes were studied in both the groups before induction and during recovery. In both groups there was rise in blood glucose and serum cortisol after intubation, after incision and during recovery. Serum prolactin and electrolytes showed no changes.

To evaluate the efficacy and safety of intrathecal pentazocine in obstetric analgesia:

The study was carried out in 64 patients without bad obstetric history. Patients were divided into four groups. In two groups 3 mgs and 5 mgs of pentazocine was diluted with C.S.F. prior to administration. In the other two groups 4 mgms and 6 mgms of pentazocine were administered without dilution with C.S.F. It was found that intrathecal pentazocine after diluting with C.S.F. relieved labour pain effectively. No untoward effects in mother or new born were observed.

Oculocardiac reflex in strabismus surgery:

Sixty patients of paediatric age, mean age 6±2 years, were randomly allotted to three groups of 20 each. No pretreatment was given in group I. In group II & III, patients were given lignocaine 1 mg/kg i.v. and atropine 0.01 mg/kg i.m. respectively preoperatively. A significant decrease in the incidence of oculocardiac reflex was observed in lignocaine group.

1987-88

Effect of two different concentrations of bupivacaine given epidurally for relief of pain in labour

This study was conducted in forty five patients divided in one group of 30 who received 0.125% and second group of 15 who got 0.25% of bupivacaine epidurally. It was found that low concentration of bupivacaine (0.125%) was significantly less effective in producing pain relief but it was found to be safe in respect of toxicity (reduced total dose), untoward effects and less incidence of instrumental delivery.

Cardiotoxicity of trilene in dogs. In collaboration with Pharmacology Department.

1988-89

Pressor response during laryngoscopy and intubation and its attenuation by metaprolol, lignocaine and nitroglycerine

A comparative study

This study was conducted in 60 patients divided in four equal groups.

These patients received either lignocaine intravenously 1.5 mg/kg. 90 secs before induction, topical/nitroglycerine 12 min before induction, or metoprolol orally 50mg 2 hours prior to induction. It was found that oral metoprolol provided the best protection against the pressor response observed during laryngoscopy and intubation.

Comparison of epidural buprenorphine with IV buprenorphine and pethidine for post operative pain relief in children

A total of 60 children have been studied. Twenty received buprenorphine 1.5 mcg/kg and remaining 20 received pethidine 1mg/kg and remaining 20 received pethidine 1mg/kg iv for post-operative analgesia. Quality of analgesia was assessed using clinical parameters, PEFR, and modified visual analogue score. Results were analysed and it was found that the quality and duration of analgesia was much better with epidural buprenorphine as compared to IV buprenorphine and pethidine.

Estimation of serum potassium and serum creatine phosphokinase levels after succinylcholine administration in patients with CRF.

It has been seen that there is increase in serum K and C.P.K. levels after succinylcholine and this rise is more in C.R.F. patients. Increase in serum K. and C.P.K. value is less if patients are precurarized. This study was carried out in 30 patients divided into 3 groups. Group I consisted of control patients of ASAI. Group II: CRF patients where pre-curarization was done and Group III: CRF patients with no precurarization.

The cardiovascular effects of increasing blood levels of trichloroethylene (TCE) in dogs.

The concentration of TCE was estimated in ten dogs with increasing concentrations of TCE under normocapnic conditions. The study showed that the mean blood concentration of 9.16 mg% of TCE was required to attain surgical plane of Anaesthesia. At a mean blood conc. Of 203.8%, cardiac arrest occurred in 60% of dogs. A therapeutic ratio of 22.26 was calculated which was more than 10 times that of ether, 20% incidence of transient bigeminy was found even in presence of normocapnia. It is concluded that TCE is a safe anaesthetic under normocapnic conditions and higher therapeutic ratio.

Induced hypotension using Sodium nitroprusside (SNP) in patients of portal hypertension undergoing L.R. Shunt (ICMR)

The operative blood loss in L.R. shunt averages about 2 litres and the increased operative time accounts for the high morbidity and mortality. SNP was used for hypotensive anaesthesia and the blood loss in these patients were found to be considerably less than the controls and the blood transfusion requirement was also lower. No reactionary haemorrhage in patients receiving SNP was seen.

It was concluded that SNP hypotensive anaesthesia may be used more widely in operations for portal hypertension where liver function is preserved.

Effect of pretreatment with nifedipine on Intraocular pressure (IOP) after suxame thionium and endotracheal intubation on normal and glaucomatous eyes.

Sublingual nifedipine was given 20 mins before induction and intubation performed with thiopentone and suxamethonium. IOP was measured before and after premedication after pretreatment and after intubation. There was no significant change in IOP in control as well as in nifedipine group in normal and glaucomatous eyes.

Use of ketamine for diagnostic laparoscopy

100 OPD patients were given ketamine anaesthesia for diagnostic laparoscopy. An induction dose 0.7 mg/kg and maintenance dose of 0.058 mg/kg per min IV infusion was found useful for this procedure.

Incidence of bronchial foreign bodies: comparison of left with right side impaction

Survey of children revealed that the frequency of left sided impaction was lesser than right sided although the bronchi are supposed to arise at the same angle in children, unlike an adult. Radiological studies were conducted to find out the angulation of bronchi at their origin and reasons for higher frequency of right sided impaction defined.

1989-90

Caudal Morphine for post operative pain relief in children

At the end of a standardized anaesthesia technique, 40 children were randomly allotted to two groups. Twenty children received caudal morphine 40 ug/kg in 5-7 ml of normal saline. All the children were evaluated post operatively for pain relief by using pain discomfort scale (for less than 4 years) and visual analogue scale (for more than 4 years) upto 48 hours. The morphine group had a significantly low pain scores and received no additional analgesics where as in the other group, children received on an average 5 doses in 48 hrs with a higher average pain score.

Prophylactic antiemetics in outpatient dental surgery

Prophylactic antiemetics were administered to eighty outpatients coming for dental surgery. They were randomly allotted to 4 groups. Group I received Metoclopramide 10 ug/Kg intramuscular 10 minutes prior to extubation. Group II received digene gal 0.5 ml/Kg two hours prior to induction. Group III received

no prophylaxis. Post operative nausea, vomiting and retching was evaluated by an observer who was not aware of the prophylaxis. There was no significant difference in the incidence of nausea and vomiting.

Effect of Bupivacaine scalp infiltration on the haemodynamic response to craniotomy under CA (Anaesthesiology, Neurosurgery)

Skin incision for craniotomy is accompanied by tachycardia and arterial hypertension which can be detrimental in patients with intracranial pathology. A double blind randomized study was conducted in two groups. In Group I, patients had their scalp infiltrated with 0.5% bupivacaine and in group II normal saline was used for infiltration. There was a significant rise in pulse rate and BP in normal saline group compared to bupivacaine group on skin incision.

Intraperitoneal bupivacaine for post operative pain relief in patients undergoing cholecystectomy

A double blind randomized study was conducted on 30 patients divided into two groups. Group I received intraperitoneal bupivacaine 20 ml of 0.5% and Group II received intraperitoneal saline 20 ml at the conclusion of surgery. Pain relief was observed upto 10 hours in patients who received I/P bupivacaine. There was a significant increase in requirement of analgesics in saline group over 24 hours compared to bupivacaine group.

Sturgeweber syndrome-Anaesthetic Implications for ophthalmic surgery

A retrospective study was done in patients with Sturgeweber syndrome undergoing ophthalmic surgery. The preoperative problems in these cases were associated intracranial & intraoral annergsm, calcification, mental retardation and convulsions. The anaesthesial technique in these patients is aimed to detect preoperative associated problems, and to prevent any intra operative rise in intraocular and intracranial pressure.

Anaesthesia for investigative procedure in ophthalmic paediatric out-patients

Two techniques of general anaesthesia have been compared for paediatric patients undergoing investigative procedures. In one group the patients were anaesthetized and maintained on O₂ N₂Ohalothane breathing spontaneously through a face mask. In other group IV ketamine was used as the sole anaesthetic agent. It is concluded that both the techniques are equally effective with minimal difference in advantages over each other.

Prevention of suxamethonium induced muscle damage comparison of diphenylhydantoin with dTc d-tubocurarine.

This study was undertaken to evaluate the efficacy of diphenylhydantoin

pretreatment on suxamethonium induced myalgias, fasciculation, serum Na⁺, K⁺ and CPK and to compare it with dTc pre-treatment, controls receiving no pretreatment. 60 patients of either sex were studied by allocating randomly to three groups of 20 each. Patients in group I received diphenylhydantoin 50 mgm/Kg, group II received 3 mgm dTc and group III received no treatment. Fasciculations were observed visually and graded on a 4 point scale; Na⁺/K⁺ and PCK levels were measured pre-operative, 5 and 20 min. post induction. Myalgia if any was also noted and graded on a point scale.

Patients pretreated with dipheylhydantoin had a significant reduction in incidence of myalgia though fasciculations remained unchanged. There was reduction in fasciculation with dTc pretreatment, but no decrease in incidence of myalgia. Both dTc and diphenylhydantoin prevented a rise in serum K⁺ observed following suxamethonium Diphenylhydantoin produced statistically significant fall in serum Na⁺ as compared to controls. Thus diphenylhydantoin was found to be an effective pretreatment for prevention of suxamethonium induced myalgia and increase in serum K⁺ and CPK.

Role of Oral Drugs for Pain Relief in the Terminally Ill Cancer Patients

100 patients who had attended the pain clinic over a period of one year were studied. Patients were started on oral analgesic therapy based on WHO analgesic ladder. The NSAID of choice was acetylsalicylic acid and narcotic used were codeine sulfate 60-9- mg. Both were given 4 hourly adjuvant treatment which consisted of antidepressants, and/or major tranquillizers. Adequate pain relief was obtained in 80% of patients. The quality of analgesia obtained with Disprin + Codeine combination was far superior than that obtained by dextropropoxyphene or buprenorphine. Patient acceptability was also high (90%). 15% patients needed a neurolytic procedure.

Stress response in Paediatric Patients, undergoing Surgery – Comparison of Epidural with balanced Anaesthesia

45 children aged 2-12 years undergoing major surgery were given apidural analgesia using local anaesthesia followed by a narcotic (buprenorphine) at the end of surgery. 55 children received intravenous pethidine intermittently. Besides clinical pain scoring, biochemical evaluation included measurement of serum-cortisol, FFA and lactate/pyruvic acid and blood sugar. Significant changes were observed in biochemical parameters of stress in most patients at intubation and incision, but no significant difference was observed in the two groups on the basis of route of administration narcotics.

Post-operative Pulmonary Complication in relation to pre-operative lung disease

A total of nearly 1000 patients were evaluated preoperatively and pulmonary functions recorded at the bedside. These were repeated post-operatively on day 1,3,5 and 7 to correlate with incidence of complication. Of the total patients 574 had no preoperative pulmonary dysfunction and these had a very low incidence of postoperative pulmonary complications (3.2%) under general of severe to moderate pre-operative pulmonary dysfunction. In these patients the incidence of complications under regional anaesthesia (spinal and epidural) was significantly lower (7.8%). Pre-operative preparation including breathing exercises, chest physiotherapy and antibiotics markedly reduced the incidence of life threatening complications. From the study, it was not possible to predict the complications either on the basis of clinical or pulmonary function data.

1990-91

Survey of post-operative pulmonary complications in relation to pre-operative lung disease (ICMR)

Post-operative pulmonary complications were evaluated in 728 patients undergoing surgery under different types of anaesthesia. The pre-operative pulmonary disease was assessed on the basis of clinical examination, chest x-ray and bedside pulmonary function tests, using an electronic spirometer. On the basis of pulmonary function tests, patients were designated as normal or suffering from mild, moderate, or severe pulmonary disease. Pulmonary complications developed in 56 of the 728 patients studied (7.69%) in the post-operative period. Complications were more frequent in older patients (age > 65 years), smokers, those with pre-operative lung disease and after thoracoabdominal surgery (P<0.001). Those receiving general anaesthesia had a higher morbidity (P<0.05) compared to regional anaesthetic technique. However, the types of surgeries were different and more major and prolonged procedures particularly in the upper abdomen and thorax were conducted under general rather than regional analgesia. Pneumonia and atelectasis were the most common pulmonary complications and were generally evident on clinical examination and chest X-ray, Lung function tests did not have significant predictive values in any patient. However, those with severe pre-operative lung disease tended to have longer pre-operative preparation and less severe surgeries and hence acceptable complications rates.

Evaluation of intrathecal morphine for intra and post-operative pain relief in patients with surgical obstructive jaundice

40 patients with surgical obstructive jaundice were evaluated with

respect to post-operative analgesia and respiratory function when morphine was administered intravenously or intrathecally. Intrathecal morphine 7 mg/Kg provided excellent analgesia with preservation of pulmonary function.

Comparison of caudal morphine with bupivacaine and bupivacaine alone for post-operative analgesia in children

80 children undergoing elective surgical procedures were evaluated for efficacy and duration of post-operative analgesia using low dose (30ug/kg) morphine and 1.5 ml/kg or 0.25% bupivacaine and were found to have analgesia lasting for about 25 hours without any side-effects.

Evaluation of incidence of post-operative pulmonary complications following oesophagectomy – A comparison of two prospective analgesic regimes

40 patients undergoing oesophagectomy were divided into two groups post-operatively. One group received epidural morphine boluses and other group received epidural bupivacaine by infusion. Comparison for pain relief, post-operative pulmonary complication were made. Pain relief was comparable in both the groups. Incidence of post-operative complications was 35% in morphine group and 42.1% in bupivacaine group. Duration of anaesthesia for more than four hours was the single most important factor for pulmonary complication,.

Evaluation of stress response to laryngoscopy and intubation in children and its attenuation by ketamine and lignocaine

Evaluation of stress response to laryngoscopy and intubation in 60 children of age group 3-8 years and its attenuation by IV lignocaine was done. No significant attenuation of this response was found by any of these agents.

Nursing management of patients on mechanical ventilator

9 patients who had acute and chronic respiratory problems on mechanical ventilators were studied. During the stay in ICU, the patient's psychological, physiological, biochemical and nutritional needs were met. The care of a patient on mechanical ventilator involves more than checking the vitals. The study emphasized the role of an attending nurse who have to act and anticipate events and respond promptly to clinical care in managing patients on mechanical ventilator.

1991-1992

Effect of early ambulance after subarachnoid block

One hundred outdoor patients and 50 indoor patients were given subarachnoid block with 5% lignocaine for minor surgery below umbilicus and outdoor patients were ambulated just after full recovery of sensation and muscle power and discharged with a questionnaire. There was no permanent neurological sequelae. It was concluded that early ambulance does not increase the incidence of post-spinal sequelae.

Pain correlation in head and neck cancers

A total of 167 cases suffering from head and neck cancers were studied. The incidence of pain was 80.24% of which about 68.65% patients had moderate to severe pain. Piroxicam was found to be as efficacious as aspirin with less complications and possibility of better patient compliance. A double blind randomized trial of oral codeine, diazepam, morphine as premedicants in paediatric patients.

The study was carried out in 60 children who were given oral codeine (0.4 mg/kg), diazepam (0.2 mg/kg) or morphine (0.2 mg/kg).

The preoperative sedation was comparable with diazepam and codeine. However, morphine in the dosage used, showed a much less satisfactory level of sedation preoperatively. It was concluded that, oral diazepam and codeine may be recommended for preanaesthetic paediatric medication whereas a higher dose of oral morphine sulfate in a different formulation may be required to evaluate the efficacy as an oral premedicant.

Anaesthesia for Caesarean section – AIIMS experience

A retrospective study was done in patients coming to labour room who had caesarian section in the year 1990 to analyse the technique of anaesthesia used and to determine the complication rate in these patients. Out of 1800 deliveries 419 underwent caesarian section. 53.7% of these patients received spinal anaesthesia and 2.75% received general anaesthesia, three eclamptic patients were shifted to ICU for control of convulsions, one patient had respiratory problem after spinal anaesthesia.

Evaluation of prophylactic epidural blood patch in prevention of post spinal headache in surgical patients.

Regional analgesia for day care surgery

One hundred outdoor surgical patients of ASA grade I and II

were taken up for the study. They were given regional analgesia by subarachnoid block (SAB) after performing lumbar puncture by 25 G disposable needle. After the effect of block was weaned off they were ambulated and discharged from the hospital with a questionnaire. Only 55 patients responded and informed about the complications. Results were compared with 50 indoor patients who received regional analgesia by the same 25 G needle but ambulated after 24 hours bed rest. Results are comparable in both groups of patients. So it may be concluded that postspinal headache is not related to CSF leak and SAB can be safely practiced in day care surgery.

1992-1993

Synergism of preoperative oral clonidine H.S. and 2 hours before surgery for postoperative analgesia in lower abdominal surgery.

Combination of oral clonidine and diazepam preoperatively along with postoperative epidural morphine produced mild hypotension and mild hypoxaemia though clinically insignificant.

Effect of metoprolol/labetalol with diazepam on preoperative anxiety, preinduction potassium levels and haemodynamic responses to intubation

The anxiety was relieved in all the three groups of drugs and there was no significant difference in between the groups both objectively and subjectively and also in serum potassium content.

Low flows Anaesthesia – In paediatric age groups

The study results show that the to and fro system using the paediatric canister is a safe and effective method of administering low flows of inhalational agents in selected children undergoing elective surgery.

Evaluation of renal functions in patients undergoing surgery for obstructive jaundice with an without the use of mannitol.

Mannitol did not produce improvement in creatinine clearance and urinary sodium excretion in spite of diuresis. The pathogenesis of this effect has not been explained fully and it is suggested that the water and salt retaining mechanisms leading to profound disturbances of body fluid compartments should be taken care of in jaundiced kidneys.

Intravenous bolus vs continuous infusion of atracurium in end stage renal disease patients – Cost effectiveness in third world countries.

The dose of atracurium required when used as boluses was found to be less than when used as an infusion. Hence it is recommended the bolus doses may be used in third world countries as it is more cost effective.

Single drug regimen for perioperative analgesia diclofenac sodium

The patients receiving injection pethidine for premedication and intraoperative analgesia, diclofenac sodium 1.5 mg/kg 8 hourly for 48 hours showed superior analgesia as judged by visual analogue scoring and pulmonary function testing permitting us to recommend diclofenac as a sole agent for perioperative analgesia.

Evaluation of diclofenac sodium as a perioperative analgesic

40 patients of both sexes undergoing general surgical procedures were studied. Group I received preoperative morphine and morphine bolus doses for postoperative pain. Group II patients received diclofenac sodium premedication and for postoperative pain relief. The overall analgesia in group II patients was found to be superior as studied by visual analogue scoring and pulmonary function testing.

Evaluation of laryngeal mask airway during anaesthesia for major surgery. Comparison of haemodynamic response of laryngeal mask airway insertion with that of tracheal intubation.

The study had two parts, 1st part of study done in 33 healthy adult patients in the age ranging from 15-71 years in whom laryngeal mask airway (LMA) was used for airway management instead of the endotracheal tube (ETT) during anaesthesia.

Insertion of LMA did not show any rise in haemodynamic parameters in contrast to ETT intubation which shows a significant rise. Thus LMA can be of great value for the anaesthetic management of patients where evidence of pressor response is of great concern.

IOP Changes during LMA insertion. Comparison with endotracheal intubation

Laryngoscopy and intubation are associated with a rise in heart rate, blood pressure and IOP. LMA insertion has been associated with significantly less changes in cardio-vascular parameters. This study evaluated the IOP changes associated with LMA insertion. These changes were again found to be significantly lower as compared to endotracheal intubation.

1993-1994

Effect of Metoprolol/Labetalol with diazepam on preoperative anxiety, preinduction, potassium levels and haemodynamic response to intubation.

The effectiveness of metoprolol/labetalol as premedicants on preoperative anxiety, preinduction, potassium levels and haemodynamic response to intubation was evaluated. Metoprolol/labetalol with diazepam was more effective than diazepam alone in alleviating anxiety preoperatively. Metoprolol and labetalol were equally effective. The serum potassium decreases in the immediate preoperative period, was completely prevented by labetalol but only partially by metoprolol. The hemodynamic response to intubation as assessed by systolic, diastolic and mean arterial pressure, pulse rate and rate pressure product was effectively attenuated equally well by metoprolol and labetalol.

Low flow with enflurane and isoflurane in paediatric age group through to and fro circuit.

A low flow system using a to and fro circuit was evaluated in children and the newer agents, enflurane, isoflurane were compared with halothane. The system was found safe in the paediatric age group irrespective of inhalational agent used.

Single vital capacity breath induction with halothane, isoflurane and enflurane.

An open prospective study was conducted in unpremedicated patients undergoing routine elective surgery under general anaesthesia, in which 60 adult patients were randomly assigned to receive either 4% halothane, 3.5% isoflurane or 3.5% enflurane in O₂ : N₂O mixture for single vital capacity breath induction. Though enflurane and isoflurane produced faster induction than halothane, the latter was found better on account of lesser side effects.

Experience with oral morphine: A retrospective analysis over 1 year period.

The efficacy of oral morphine in Cancer patients over a 1 year period was analysed. The maximum and average doses dispensed were 400 mg/day and 180 mg/day, respectively. Good pain control was achieved in 80% cases. Main side effects e.g. nausea, vomiting and constipation were easily controlled, respiratory depressions were not encountered, nor was there any addiction or misuse of drug.

Comparison of atracurium and vecuronium for renal failure

Atracurium besylate and vecuronium were compared in patients with endstage renal disease undergoing renal transplantation. It was found that atracurium was better muscle relaxant than vecuronium, patients are more stable having smooth relaxation and early recovery at the end.

Evaluation of safe local anaesthesia technique for knee joint arthroscopy.

The study was conducted in patients undergoing arthroscopy. Patients were divided into 3 groups Gr I-GA, Gr II – Regional anaesthesia group and gr III – local anaesthesia. It was seen that local anaesthesia technique is safe and well accepted by the patients and is also cost effective.

Potentiation of NM Blocking effect of pancuronium and vecuronium by enflurane and isoflurane.

Enflurane was found to potentiate the block more than isoflurane.

1994-95

Pre-emptive analgesia

A prospective randomized cross-over study was carried out in 80 patients to see the effect of preemptive analgesia with morphine alone or morphine and Bupivacaine by the epidural route before and after application of painful (surgical) stimulus. The results suggest that preemptive analgesia reduces the postoperative analgesic dose requirement, duration of analgesic requirement and interval between the doses. Epidural morphine with Bupivacaine 0.125% provides better preemptive analgesia than epidural morphine alone.

Comparison of anaesthetic techniques for laser surgery of larynx.

60 adult patients undergoing laser surgery of the larynx were taken for the study. They received either enflurane or isoflurane in air O₂ mixture. The anaesthetic techniques allowed good haemodynamic stability. They were associated with a moderate degree of endocrine stress response. There was no incidence of arrhythmias airway fire/explosions or awareness.

Wrong drug administration under anaesthesia (drugs/agents) – survey of last 10 years.

A questionnaire regarding errors in drugs/agents administration during anaesthesia was given to 800 anaesthesiologists in India 252 questionnaires were received back. Highest category of incidence involved syringe swabs and ampoule error. Overall the drugs most commonly administered by mistake were muscle relaxants, narcotics and adrenaline. Error in administration of inhalation agents were reported by five anaesthesiologists and out of which 3 were vaporizer errors and the other two related to administration nitrous oxide in place of oxygen.

Evaluation of enteral nutritional support in critically ill patients.

20 patients were studied in both enteral and parenteral nutrition in which a comparison was made between total leukocyte count, anthropometric measurements, and creatinine height index. Patients were receiving average 1500 cal/day (enteral) and 1661 cal/day (TPN) and it was found that there was no correlation between creatinine height index (CHI) and leukocyte count, whereas there was a correlation between creatinine height index and triceps skin thickness. CHI below 20 was found to be compatible with life. Serially falling CHI indicated patient to be in a hypermetabolic state and requiring additional calorie and protein supplements.

Oral ketamine for the use of paediatric radiotherapy

Ketamine in the dose of 10-15 mg/kg was given orally to determine its efficacy for sedation in children between 1-4 years of age, undergoing radiotherapy. Oral ketamine had a very variable onset of action, ranging between 25 minutes to 40 minutes. There was a failure rate of almost 33% (i.e. no sedation even after 40 minutes). Because of its erratic action and high failure rate it was not found to be a useful sedation for children undergoing radiotherapy.

1995-1996

Evaluation of clinical response of the use of atracurium besylate and vecuronium bromide in patient with obstructive jaundice undergoing surgery

30 patients with surgical obstructive jaundice and 30 normal patients were studied for clinical response of vecuronium bromide and atracurium besylate during surgery. There was no statistical significant difference in the onset of action between jaundiced patients receiving vecuronium (4.71 min) and atracurium

(5.23 min) $p < 0.1181$). The onset of action was prolonged in the jaundiced patients receiving both drugs compared to their respective controls. The condition in all groups was “bad”. The average duration of action was longer in jaundiced patients receiving atracurium (15-84 min). The recovery time was longer in jaundiced patients receiving vecuronium (18.57 min) compared to jaundiced patients receiving atracurium (8.69 min).

Comparative evaluation of spinal anaesthesia with four different Bupivacine (0.5%) solution with varying glucose concentration.

In a randomised prospective study 372 patients were studied. They were divided into 4 groups receiving bupivacine 0.5% solutions with varying glucose concentration (Group I – no dextrose, Group II – 0.96% dextrose, Group III – 1.92% dextrose, Group IV – 8% dextrose). We found that the spread of bupivacine can be controlled to a certain extent by varying glucose concentration. Isobaric bupivacine (no glucose) is the most predictable in spread but to achieve a higher level 0.96% dextrose containing solution is preferable over hyperbaric (8% dextrose). There was a statistically significant difference ($p > 0.05$) between the mean level of block achieved in group I compared to groups III and IV. We conclude that greater the glucose concentration of the bupivacine solution used for spinal anaesthesia higher is the level of the block.

“Safety” efficacy and haemodynamic – endocrine response to use of air – oxygen – enflurane and air – oxygen – isoflurane anaesthesia for major laser surgery of the airway.

A total of 60 patients were studied who were undergoing resection of laryngeal papillomas, tracheal stenosis etc. Anaesthesia techniques utilizing oxygen mixtures resulted in safe, haemodynamically stable state. Airway fire as a complication of laser surgery was not observed in any patient in this study.

Oxygen saturation on arrival to recovery room

Preliminary report on 90 patients have shown that Oxygen saturation less than 91% was seen in 7% of patients on arrival to recovery after general anaesthesia.

Anaesthesia incident monitoring study

This is a nationwide multicentric study. AIIMS is the national coordinator. This study is supported by the World Federation of Society of Anaesthesiologist (WFSA). The aim of the study is to find out the anaesthesia related incidents which affect or could affect the safety of the patient. The incident may be preventable or unpreventable.

The preliminary report from the four center in the country have shown

that the commonest incidents are airway related. The others are drug reaction, equipment failure circulatory or cardiovascular.

1996-1997

Comparison of three types of axillary approach to brachial plexus blockade in the upper extremity surgery.

The comparison of success rate, complications, post operative analgesia and patients cooperation was studied in 45 patients with three different approaches posted for elective forearm and hand surgery. The three approaches were transarterial fixation, paraesthesia elicitation and use of peripheral nerve stimulation. The success of brachial plexus block was highest in paraesthesia technique followed by PNS techniques and transarterial technique. Transarterial approach was the easiest to perform. The commonest nerve which was nursed was the musculocutaneous nerve. Premature ventricular ectopic seen in 4 patients (9%) and got reversed to normal sinus rhythm without any interventions.

Comparative evaluation of polygeline and ringer lactate as preloading fluids during spinal anaesthesia.

A total of 116 adults undergoing lower abdominal surgery under spinal anaesthesia were randomly divided into 2 groups. Groups R (n=59) received RL (10 ml/kg) and Group P (n=57) received 3.5% Polgeline (5 ml/kg) as a preload. It is concluded that preloading with 3.5% polygeline significantly ($p < 0.001$) prevented spinal anaesthesia induced hypotension.

Effect of epidural morphine on minimum alveolar concentration (MAC) of isoflurane in humans.

The effect of epidural morphine on the minimum alveolar concentration (MAC) was studied in 48 patients undergoing upper abdominal surgery. We found that epidural administration of 3 mg morphine in 10 ml saline decreased the MAC of isoflurane in humans. This is cost effective as less amount of isoflurane – a costly anaesthetic agent will be used.

Tolerance to ketamine in children undergoing radiotherapy

Records of 250 children in the age group 6 months to 4 years, receiving radiotherapy were analysed to determine the incidence of tolerance to ketamine on repeated administration. 178 children received 10 cycles of RT while 72 received more than 10 cycles of RT. 66% of children showed development of tolerance on both criterion: decreased sleep duration and increased dose requirement after the 7th RT cycle. This is the largest reported series in literature.

Determination of the optimum dose of ketamine for post operative an-

algnesia using continuous subcutaneous infusion.

3 doses of ketamine were used to provide post operative analgesia in a double blind randomised manner to 60 adult patients undergoing lower abdominal surgery. The parameters monitored were pulse, blood pressure respiratory rate, Aldrette sedation score and VAS. Rescue doses of morphine were given whenever analgesia was deemed inadequate. Ketamine in a dose of 600 mgm/kg/m was found to be most suitable for P.O. analgesia, without undue sedation and minimal side effects.

Validation of the “rupee scale” for pain assessment.

87 patients suffering from chronic cancer pain were asked to assess their pain on a “rupee scale” and also on a standard verbal numerical rating scale (VNRS). The score obtained on the 2 scales were statistically analysed using chi-square test, correlation coefficient and regression coefficients. The rupee scale was found to correlate to the VNRS with a correlation coefficient of 0.83 and regression coefficient of 0.83. The rupee scale can be used for Indian patients instead of the not so widely understood VNRS.

1997-1998

Comparison of efficacy of schedule injection of intramuscular morphine with epidural and intravenous morphine following major abdominal and thoracic surgery

Forty-five adult patients scheduled for abdominal and thoracic surgery were randomly divided into 3 groups of 15 each and were given post operative analgesia either by epidural/intravenous or intramuscular morphine. It was found that schedule injection of morphine was as effective in relief of post operative pain as intravenous or epidural. Though patients complained of pain due to intramuscular injection but that was only when they got first two injections.

Body temperature changes during closed circuit anaesthesia

Patients undergoing abdominal surgery were studied for change in temperature during anaesthesia. In group I patients, closed circuit with sodalime was used while Bains circuit was used in group II. Monitoring included electrocardiogram, non-invasive blood pressure, oxygen saturation, end-tidal carbon dioxide, body temperature, room temperature and sodalime temperature. The mean body temperature changes at 1st and 2nd hour and at the end of anaesthesia was significant in group II while it was not significant in group I.

Perioperative cortisol level in patients of Cushing's syndrome

In 10 patients plasma cortisol levels were studied in the perioperative period. Patients were not given any hydrocortisone preoperatively. They could

withstand the perioperative stress of anaesthesia and surgery well in spite of fall in plasma cortisol level compared to basal level ($p < 0.01$). There was no need of extra hydrocortisone in any patient except for the initiation of first replacement therapy before devascularisation of the 2nd adrenal gland.

Isoflurane as a sole vasodilator for management of phaeochromocytoma

Fifteen patients of phaeochromocytoma undergoing resection of the tumour were managed with 3.5 – 5% of isoflurane to stabilize their intraoperative haemodynamic fluctuations. Sodium nitroprusside was used when 5% isoflurane could not stabilize hypertension within 2 minutes. 10 out of 15 patients could be managed alone with isoflurane. 5 patients required SNP infusion (0.5 – 1.5 mg total) during hypertensive peaks. The predicting factors could not be found from the available patient parameters e.g. duration of hypertension, preoperative heart rate, urinary catecholamines, CVP or pre-induction BP and HR.

Ondansetron prophylaxis against post operative nausea and vomiting (PONV) after major gynaecological surgery.

150 adult females undergoing major gynaecological procedures were studied in a randomized, blind, placebo controlled method. Group I (n=50) received 8 mg ondansetron, group II (n=50) received 10 mg metoclopropamide in 4 ml saline and group III (n=50) received 4 ml of saline only 5 minutes before induction of anaesthesia. All the patients received similar type of anaesthesia. Patients were followed up for 24 hrs. The incidence of nausea in 3 groups were in 9, 14 and 17 patients respectively, where as incidence of vomiting were in 7, 9 and 16 patients respectively. Ondansetron significantly decreased nausea ($p < 0.01$) compared to metoclopropamide. Also the incidence of vomiting was lower in both ondansetron and metoclopropamide group ($p < 0.05$).

Study of perioperative control of diabetes mellitus: Comparison of continuous glucose insulin postassium infusion with subcutaneous administration of insulin.

30 diabetic patients and 15 normal patients undergoing abdominal and pelvic operations were studied to compare the glycaemic control. 15 diabetic/patients (Gr – I) received 2/3 rd or 1/2 of preoperative lente insulin by subcutaneous route. 15 diabetic patients (Gr – II) received intravenous insulin infusion. Blood sugar, lactate, pyruvate, serum sodium and potassium were monitored perioperatively. Glycaemic control was obtained in Gr I and Gr II with a marginally better control in I/V infusion group compared to subcutaneous. Significant increase in blood sugar levels was noted in non-diabetic control group. Lactate, pyruvate, serum sodium and potassium were comparable in all groups.

It was concluded that both subcutaneous and intravenous insulin infusion are suitable for surgeries of intermediate nature and require a constant monitoring of glucose perioperatively.

Double blind placebo controlled comparison of antiemetic effects of droperidol, ondansetron or a combination of both in paediatric strabismus surgery

A prospective, randomised, double blinded study was conducted to evaluate the antiemetic efficacy of combination of droperidol (15 ug/kg) and ondansetron (10 ug/kg) in the paediatric patients undergoing strabismus surgery. Droperidol and ondansetron combination was very effective in preventing PONV (15%) as compared to placebo (62.5%), droperidol (30%) and ondansetron (37.5%).

Effects of peribulbar bupivacaine injection on perioperative pain, oculocardiac reflex (OCR), recovery and post-operative nausea and vomiting (PONV) in retinal detachment surgery.

A prospective randomised, double blind study was conducted to compare the effects of peribulbar 0.25% bupivacaine and intravenous morphine 150 Ug/kg in 40 ASA I & II patients. All patients were evaluated for intraoperative oculocardiac reflex, perioperative pain recovery from anaesthesia and PONV in the 1st 24 hours postoperatively. Peribulbar block attenuated the severity of OCR, was associated with better recovery and significantly lower incidence of PONV (35% vs 70%, p=0.0026).

1998-1999

same as 97-98

2000-2001

To evaluate the efficacy and safety of remifentanyl based anaesthesia in major day care surgery

Combination of remifentanyl and propofol for retrobulbar nerve block

Dose response study of inhaled nitric oxide in patients with acute respiratory distress syndrome (ARDS)

Evaluation of gastric pH changes and postoperative nausea and vomiting during Laparoscopic and open upper abdominal surgeries

Evaluation of effect of combined neostigmine and bupivacaine in lower abdominal and orthopaedic surgeries

A comparative evaluation of two anaesthesia techniques for rigid bronchoscopy in children

Effects of maternal posture during induction of subarachnoid block for elective caesarian section using 0.5% hyperbaric bupivacaine: sitting Vs lateral position.

Comparison of therapeutic Vs prophylactic ondansetron for PONV in children undergoing strabismus surgery.

Effect of addition of morphine/tramadol to adrenalized lignocaine in interscalene brachial plexus block

Comparison of enteral vs parenteral nutrition in critically ill mechanically ventilated patients.

Epidural midazolam and ketamine as adjuncts to bupivacaine for postoperative analgesia in total abdominal hysterectomy.

Evaluation of optimal intraabdominal pressure in laparoscopic cholecystectomy patients.

Incidence of nausea and vomiting after laparoscopic cholecystectomy. A comparison of two antiemetic techniques (acupuncture and ondansetron).

Comparison of perioperative pain relief in patients undergoing lung biopsy: Video assisted thoracoscopy (VATS) Vs minithoracotomy.

Role of Esmolol in attenuating the haemodynamic response occurring during modified electroconvulsive therapy.

Evaluation of efficacy of ketoprofen as an adjuvant to fentanyl in Video-assisted thoracoscopic surgery

Evaluation of addition of low dose clonidine to bupivacaine-fentanyl in labour analgesia

Assessment of analgesic effect of a combination of epidural morphine and ketamine in perioperative analgesia in patients undergoing upper abdominal surgery.

Effect of ketamine as an adjuvant to epidural morphine on postoperative analgesia requirement in patients undergoing thoracotomy.

Pre-analgesic efficacy of low dose IV ketamine vs IV ketorolac in total abdominal hysterectomy.

Low dose intravenous ketamine for prolonging pain relief in postoperative period in paediatric patients undergoing lower abdominal surgery

Effect of low dose ketamine for attenuation of intubation response in paediatric and adult patients undergoing surgery.

Outcome of postoperative geriatric surgical patient admitted to Intensive care unit.

Morbidity and mortality in surgical patients admitted to ICU

Effect of intravenous ketorolac on Postoperative analgesia with caudal bupivacaine in children.

Safety and feasibility of use of the LMA with low flow anaesthetic technique for major surgery

Comparison of oral/intranasal midazolam and fentanyl premedication in paediatric patients undergoing elective ophthalmic surgery

Effect of addition of various doses of fentanyl to intrathecal bupivacaine 0.5% (heavy) on perioperative analgesia and subarachnoid block characteristics in lower abdominal surgeries.

Total intravenous anaesthesia in children using remifentanyl and propofol

Remifentanyl in the intensive care setting: Use of Remifentanyl and Propofol for

sedation in-patients on ventilator in an ICU.

2001-2002

Pre-emptive analgesic efficacy of low-dose IV Ketamine versus IV Ketorolac in total abdominal hysterectomy
 Continuous cervical sympathetic blocks for management of Complex Regional Pain Syndrome (CRPS) type I.
 Evaluation of Botulinum Toxin injection in the management of spasticity in cerebral palsy children.
 Effect of Botulinum Toxin injection in upper back myofascial pain. An open label pilot study.
 Radiofrequency lesioning of Lumbar Sympathetic plexus in patients with CRPS of lower extremities – A comparative evaluation with neurolytic blocks.
 Intravenous Regional Analgesia with Bretyllium in the management of CRPS Type-I : A comparative evaluation with cervicothoracic sympathetic Block.
 Ketamine and Midazolam as adjuvants to bupivacaine in Epidural analgesia
 Evaluation of the I-Stat Handheld Analyser in Different Clinical Settings and Comparison with conventional Blood-Gas Analyser – AVL 995 Automatic Gas System
 Efficacy of oral Clonidine Premedication in Children undergoing lower abdominal and urogenital surgery under spinal anaesthesia
 Dose response study of inhaled nitric oxide in patients with acute respiratory distress syndrome (ARDS)
 Comparison of therapeutic Vs prophylactic ondansetron for PONV in children undergoing strabismus surgery.
 Effect of addition of morphine/ tramadol to adrenalized lignocaine in interscalene brachial plexus block.
 Comparison of enteral vs parenteral nutrition in critically ill mechanically ventilated patients.
 Epidural midazolam and ketamine as adjuncts to bupivacaine for postoperative analgesia in total abdominal hysterectomy.
 Evaluation of optimal intraabdominal pressure in laparoscopic cholecystectomy patients.
 Incidence of nausea and vomiting after laparoscopic cholecystectomy.
 A comparison of two antiemetic techniques (acupuncture and ondansetron).
 Comparison of continuous spinal epidural Vs epidural analgesia in labour.
 Comparison of perioperative pain relief in-patients undergoing lung biopsy: Video assisted thoracoscopy (VATS) Vs minithoracotomy.
 Role of Esmolol in attenuating the haemodynamic response occurring during modified electroconvulsive therapy.
 Evaluation of efficacy of ketoprofen as an adjuvant to fentanyl in Video-assisted thoracoscopic surgery.

Evaluation of addition of low dose clonidine to bupivacaine- fentanyl in labour analgesia.
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 Pre- analgesic efficacy of low dose IV ketamine vs IV ketorolac in total abdominal hysterectomy.
 Low dose intravenous ketamine for prolonging pain relief in postoperative period in paediatric patients undergoing lower abdominal surgery.
 Effect of low dose ketamine for attenuation of intubation response in paediatric and adult patients undergoing surgery.
 Outcome of postoperative geriatric surgical patient admitted to Intensive care unit.
 Morbidity and mortality in surgical patients admitted to ICU.
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 Effect of addition of various doses of fentanyl to intrathecal bupivacaine 0.5% (heavy) on perioperative analgesia and subarachnoid block characteristics in lower abdominal surgeries.
 Total intravenous anaesthesia in children using remifentanyl and propofol
 Remifentanyl in the intensive care setting: Use of Remifentanyl and Propofol for sedation in-patients on ventilator in an ICU.
 Efficacy of premedication with oral midazolam, ketamine and combination of midazolam and ketamine in pediatric patients.
 Continuous cervical sympathetic blocks for management of Complex Regional Pain Syndrome (CRPS) type I.
 Spinal Preloading: Comparison of different colloids as Preloading fluid prior to subarachnoid block.
 Management of lower limb complex regional pain syndrome (CRPS) type I;
 Evaluation of percutaneous radiofrequency thermal lumbar sympathectomy Vs phenol lumbar sympathetic neurolysis.
 Effect of Botulinum toxin in peripheral muscle rigidity.
 Effect of cervical sympathetic blockade in patients with idiopathic trigeminal neuralgia: Evaluation by somato sensory evoked potentials (SSEP) and endogenous opioid level estimation.
 Evaluation of haemodynamic, ventilatory and ABG changes during retroperitoneal laparoscopic nephrectomy.

2002-2003

Collaborative Research Project:

Multicentric Global Research Project – A randomised open label comparative multicentre study of Voriconazole – Versus Conventional Amphotericin B followed by fluconazole in the treatment of Candidemia in non-neutropenic subjects (150-608)- Completed. (Anaesthesia and Microbiology Deptt.)

To evaluate the feasibility and utility of conscious pain mapping using 5mm laparoscope in women with chronic pelvic pain – (Anesthesia & Gynecology).

Evaluation of single stage adjustable strabismus surgery (SSASS) under topical anesthesia with intravenous midazolam and fentanyl (anesthesia and Ophthalmology Dept.)

Ambulatory laparoscopic Hernia repair and its feasibility (Anaesthesia & G Surgery)

Haemodynamic, ventilatory & acid base changes during laparoscopic retro peritoneal nephrectomy (Anesthesiology and Urology Surgery).

Comparison of two anaesthetic techniques for PCNL (Anaesthesia and Urology).

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Clinical Observations on Anaesthesia in Coronary Artery Disease, 15th Ann. Conf. Indian Soc. Of Anesthetists, 1964.

A Technique of Balanced General Anaesthesia Using Halothane and Scoline, 15th

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Appendix A

Faculty list:

Name	Joined as	From	To	left as
Lt.Col.G.C.Tandon	Prof. & HO	1958	1970	Prof &HOD(Retd)
Dr. N.P. Singh	Asst. Prof	1958	1962	Asst Prof
Dr. N.R.Kalle	Lecturer	1962	1982	Assoc.Prof(Retd)
Dr. V.S. Hatangdi	Lecturer	1962	1968	Asstt. Prof
Dr. S. Yajnik	Lecturer	1966	1973	Asstt. Prof
Dr. G.R. Gode	Lecturer	1966	1988	Prof&HOD(Retd)
Dr. S. Dhawan	Lecturer	1966	1981	Assoc.Prof
Dr. V.A. Punnoose	Lecturer	1968	1983	Assoc.Prof(HoDCTCentre)
Dr. S. Khanna	Lecturer	1971	1972	Lecturer
Dr.S.K. Goel	Lecturer	1971	1983	Assoc.Prof
Dr. H.L. Kaul	Lecturer	1971	Continuing	
Dr. N. Saxena	Lecturer	1971	1988	(to CNC as Prof.)
Dr. S.S. Saini	Lecturer	1972	1988	(to CNC as Prof.)
Dr. Vimla Manjeshwar	Lecturer	1974	1975	Lecturer
Dr. T.S. Jayalakshmi	Lecturer	1978	Continuing	
Dr. Y.K. Batra	Lecturer	1980	1981	Lecturer
Dr. Chandralekha	Asstt. Prof.	1980	Continuing	
Dr. G.N. Kalla	Lecturer	1980	1982	Lecturer
Dr. Rashmi Madan	Lecturer	1981	2003	(RPC) Professor
Dr. H.H. Dash	Lecturer	1981	1987	(to CNC)
Dr. M.K. Arora	Lecturer	1981	Continuing	
Dr. S. Vijayaraghawan	Lecturer	1982	1984	Lecturer
Dr. Shaileja C. Kale	Lecturer	1983	1987	(to CNC)Asstt.
Dr. R.K. Batra	Lecturer	1983	Continuing	
Dr. P. Mandal	Asstt. Prof.	1988	2003	Addl. Prof.
Dr. S. Rajeshwari	Asstt. Prof.	1988	Continuing	
Dr. Usha Saha	Asstt. Prof.	1988	1989	Asstt. Prof.
Dr. V. Muralidhar	Asstt. Prof.	1989	1997	Assoc Prof.
Dr. Sushma Ahlawal	Asstt. Prof.	1990	1991	Asstt. Prof
Dr. Anjan Trikha	Asstt. Prof.	1990	Continuing	
Dr. Lokesh Kashyap	Asstt. Prof.	1991	Continuing	
Dr. D. Shinde	Asstt. Prof.	1991	Continuing	(RPC)
Dr. Udayalakshmi Rao	Asstt. Prof.	1992	1993	Asstt. Prof
Dr. Ganga Prasad	Asstt. Prof.	1994	Continuing	
Dr. Bindu Pandit	Asstt. Prof.	1995	2003	Asstt. Prof
Dr. V. Mohan	Asstt. Prof.	1995	Continuing	
Dr. Lakesh Kumar	Asstt. Prof.	1996	1999	Asstt. Prof
Dr. Amita Gupta	Asstt. Prof.	1996	1997	Asstt. Prof
Dr. T.R. Rahman	Asstt. Prof.	1996	1997	Asstt. Prof
Dr. Pragati Ganjoo	Asstt. Prof.	1999	2000	Asstt. Prof
Dr. Manorama Singh	Asstt. Prof.	2000	2000	Asstt. Prof
Dr. Vimi Rewari	Asstt. Prof.	2000	Continuing	
Dr. Anjolie Chhabra	Asstt. Prof.	2000	Continuing	
Dr. G.S. Sadara	Asstt. Prof.	2001	2003	Asstt. Prof
Dr. Rani Sunder	Asstt. Prof.	2003	Continuing	
Dr. V. Darlong	Asstt. Prof.	2003	Continuing	

Appendix B

A.I.I.M.S has awarded MD Anaesthesia degree to 256 doctors upto 2003 December, whose names are given as under:

S.No.	Names	Year of Passing
1.	Dr.L.Narhari Rao	1961
2.	Dr. Martin Issac	1962
3.	Dr. Nalini R Kalle	1962
4.	Dr.S.C. Khatariar	1962
5.	Dr. K.V.Prasada Rao	1963
6.	Dr.J.M. Mandappa	1963
7.	Dr. Thimmaiah M. Nagarajan	1964
8.	Dr.Thoppilabraham Koshy	1964
9.	Dr.B.Rama Mohan Rao	1964
10.	Dr.Mary Thomas	1964
11.	Dr.Sushila Dhawan	1965
12.	Dr.Vasudev S.Hatangdi	1965
13.	Dr. K. Sheela	1965
14.	Dr.Anand Ramchander Gudi	1965
15.	Dr. Sudhakar V. Mayadeo	1965
16.	Dr.BaniKumar Sharma	1966
17.	Dr.S. Vaidyanath	1966
18.	Dr.Shantanu K. Goel	1966
19.	Dr.T.S. Ganapathy	1966
20.	Dr. D. Vijay Kumar	1966
21.	Dr.M. Sriram	1966
22.	Dr. W.Sridhar Rao	1966
23.	Dr.N.R.Satyanarayan	1967
24.	Dr. Punnoose V.A.	1967
25.	Dr. Biman Chandra Ray	1967
26.	Dr. R. Rajagopalan	1968
27.	Dr. Shreniwas Ramchandra	1969
28.	Dr. Sushma Khanna	1969
29.	Dr. Nita Saxena	1970
30.	Dr.Rejamd.Abdul Muiz Bora	1970
31.	Dr. B.D. Sujatha	1970
32.	Dr. Cherian Abraham	1970
33.	Dr. Hira Lal Kaul	1970

34.	Dr.Sudhendu Das Gupta	1970
35.	Dr.Nirode Baran Moulick	1971
36.	Dr. Anantapur B.Ramamurthy	1971
37.	Dr.Attibele Ramchandra	1971
38.	Dr. Nalini Raja	1971
39.	Dr. Nirupama Das	1971
40.	Dr.Surath Manimala	1972
41.	Dr.Surindar Singh Saini	1972
42.	Dr.Gorla Satyamurthy	1972
43.	Dr. Urmila Devi Passi	1972
44.	Dr.V.Mahadevan	1973
45.	Dr.Nirupama R.Katre	1973
46.	Dr. Gita	1973
47.	Dr.Leela P.Kriplani	1974
48.	Dr.T.S.Jayalakshmi	1974
49.	Dr.Neelofar Bano	1974
50.	Dr.Sanatan Das	1974
51.	Dr.Avilavarapu Veeraju	1975
52.	Dr.Deen Dayal Tantla	1976
53.	Dr.Gour Mohan Bhar	1976
54.	Dr.Koka Sri Hari	1976
55.	Dr.Kiran Bhasin	1976
56.	Dr.Meera Krishnan	1976
57.	Dr.M.R.Rajagopal	1976
58.	Dr.Rashmi Madan	1976
59.	Dr.T.Madhavi Kutty	1976
60.	Dr. Vimla Varma	1976
61.	Dr.Gur Bakhsh Kohli	1976
62.	Dr.Gopi Nath Kalia	1976
63.	Dr.Vidya Murty	1976
64.	Dr.Krishna Panigrah	1976
65.	Dr.Bikram Rajkumar Ahuja	1976
66.	Dr.Hemant Yashwant Sane	1976
67.	Dr.M.Sujata Prasad	1976
68.	Dr.S.Q.Shah Sayeed	1976
69.	Dr.Ashok Vasantryo Sumant	1977
70.	Dr. Banambar Ray	1977
71.	Dr.Hari Har Dash	1977
72.	Dr.Shajlaja C. Kale	1977
73.	Dr. S.Sathiavathy	1977
74.	Dr.Anil Karlekar	1978
75.	Dr. Iftikar Ahmed	1978
76.	Dr.Jyotsna Basu	1978
77.	Dr.Roshan Lal Garg	1978

78.	Dr.Raj Kumar Achoubisana	1978	122.	Dr. Usha Goel	1983
79.	Dr.Sharmila Sen Gupta	1978	123.	Dr. Mary Abraham	1983
80.	Dr.TeJ Kishan Kaul	1978	124.	Dr.Praveen Kr. Kalia	1984
81.	Dr.Aruna Ramesh Patil	1978	125.	Dr.Subrata Nag	1984
82.	Dr.Bharati Belani	1978	126.	Dr. Gajinder Singh	1984
83.	Dr.E. Vijaya Kumar	1978	127.	Dr. J.M. Shahani	1984
84.	Dr.Mahesh Kr. Arora	1978	128.	Dr. Maya	1984
85.	Dr. Pran Nath	1978	129.	Dr.Nongthombam T. Singh	1984
86.	Dr.Rajeshwar K. Talwar	1978	130.	Dr. Ravi Saxena	1984
87.	Dr.Surjeet Kaur	1978	131.	Dr. R. Rajeshwari	1984
88.	Dr.Vijay Ticku	1978	132.	Dr. Purnima Raina	1985
89.	Dr.G.Parmeswara	1979	133.	Dr.Kongbrailatpam N. Devi	1985
90.	Dr.A.Subramaniam Annapurna	1979	134.	Dr. Brahma Deo Jha	1985
91.	Dr.Sushila Chandrasekharan	1979	135.	Dr.Chandra Bahadur Karky	1985
92.	Dr. Rajiv Singla	1979	136.	Dr. Shashi Bhushan Bhatt	1985
93.	Dr.S. Vijayraghavan	1979	137.	Dr.Arvind Kr. Gupta	1985
94.	Dr.Jaspal Kaur Khurana	1979	138.	Dr.Ashutosh Wali	1985
95.	Dr.Sunil D.Shitoot	1980	139.	Dr. Rajiv Chawla	1986
96.	Dr. K. Bhaskaran	1980	140.	Dr.A.Durga Prasad	1986
97.	Dr.Milan Kanti Chowdhary	1980	145.	Dr.Ashutosh Gupta	1986
98.	Dr.Jyoti Bhushn Pandya	1980	146.	Dr.Shubhangi S. Muley	1986
99.	Dr. Yatin Mehta	1980	147.	Dr.Vivek Vardhan Veturi	1986
100.	Dr.Ravinder Kr. Batra	1980	148.	Dr. Niraj Vishnoi	1986
101.	Dr.Abraham Fenn Cheriyan	1981	149.	Dr. Panchanan Mandal	1986
102.	Dr. Selvarajan N.	1981	150.	Dr.Muntimadugu Mastan	1986
103.	Dr.Shachi Nandan Rattan	1981	151.	Dr. Mantha Srinivas	1987
104.	Dr.Swaran Prabha	1981	152.	Dr.Tiakala Longkumar	1987
105.	Dr.Parmod Kr. Bithal	1981	153.	Dr.V. Latha	1987
106.	Dr.Anil Kr. Jain	1981	154.	Dr. Shailendra Joshi	1987
107.	Dr.Chander Mohan Bhagat	1981	155.	Dr. Sandhya	1988
108.	Dr. Suman Dhingra	1981	156.	Dr. Lokesh Kashyap	1988
109.	Dr.Amar Pal Bhalla	1982	157.	Dr. Sushma Ahlawat	1988
110.	Dr.Sunil Kumar	1982	158.	Dr. Sunil Kr. Gupta	1988
111.	Dr.Yankidonka Shipmo	1982	159.	Dr. M.Krishna Mohan	1989
112.	Dr. Abha Saxena	1982	160.	Dr.Y.Lakshmi Harayan	1989
113.	Dr.Dinesh Kr. Choudhry	1982	161.	Dr.Udaya Lakshmi Rao	1989
114.	Dr.Bupesh Kaul	1982	162.	Dr.Dharamavaran S.R.	1989
115.	Dr. Tarun Kr. Danda	1982	163.	Dr.Abhiram Mallick	1989
116.	Dr. Ridaplinwar	1982	164.	Dr.Allu Satyanarayana	1989
117.	Dr. Navneet Kaur	1982	165.	Dr.Radha Mohan Issursing	1989
118.	Dr.Bandana Chatterjee	1983	166.	Dr. Vijaya Narasimha Raju G.	1990
119.	Dr.P.Issac Muthiah	1983	167.	Dr.Veena Hatta	1990
120.	Dr.Sushil Kr. Sonar	1983	168.	Dr.Arvind Kr. Singh	1990
121.	Dr.Praveen Kr. Khilnani	1983	169.	Dr.Neilavinuo Khimiao	1990

170.	Dr. Anshuman	1990	214.	Dr. Tamil Selvan Perumal	1997
171.	Dr. Virginia Reade Khyriem	1990	215.	Dr. Ilavajady S.	1997
172.	Dr. Rajendra Prasad	1991	216.	Dr. Shivakumar S.	1997
173.	Dr. Anju Romina Bhalora	1991	217.	Dr. Ajay Kumar	1998
174.	Dr. Bindu Pandit	1991	218.	Dr. B. Sennaraj	1998
175.	Dr. Mary Muanpuui Ralte	1991	219.	Dr. Balakrishna Bhattarai	1998
176.	Dr. Rashmi Bodra	1992	220.	Dr. Sampath Shenoy	1999
177.	Dr. Sujata Chaudhary	1992	221.	Dr. Piyush N. Mallick	1999
178.	Dr. Manisha Mehta	1992	222.	Dr. Vanlalnghaka Darlong	1999
179.	Dr. Anand Kulkarni	1992	223.	Dr. Puneet Maheswari	1999
180.	Dr. Nanda Gopal Mandal	1992	224.	Dr. Anuj Bhatia	1999
181.	Dr. Navin Prakash	1992	225.	Dr. Birendra P. Sah	1999
182.	Dr. Manjula	1992	226.	Dr. Sukham Thoibahenba Singh	1999
183.	Dr. Mona Sachdeva	1992	227.	Dr. Pratap Rudra Mahanty	1999
184.	Dr. Sunita	1993	228.	Dr. Amar Singh Bodh	1999
185.	Dr. Dinesh Thakur	1993	229.	Dr. Kallol Deb	2000
186.	Dr. Pradeep Kumar Rai	1993	230.	Dr. Subramanyam M.S.	2000
187.	Dr. Tika Nath Sharma	1993	231.	Dr. Hemant Kumar	2000
188.	Dr. Manabendra Halder	1993	232.	Dr. Anindya S. Mondal	2000
189.	Dr. Balagurumurthy	1993	233.	Dr. Sailesh K. Mishra	2001
190.	Dr. Lakshmi Ganesan	1994	234.	Dr. Amit Sudan	2001
191.	Dr. Kuchi B. Sridevi	1994	235.	Dr. Ashit K. Naik	2001
192.	Dr. Shiv Kr. Singh	1994	236.	Dr. Sumesh Arora	2001
193.	Dr. Peyyety Janaki Subhadra	1994	237.	Dr. Nalin Sharma	2001
194.	Dr. Gagan Deep Singh	1994	238.	Dr. Jagan D.	2001
195.	Dr. Sanjay Kumar	1995	239.	Dr. T. Senthil Kumar	2002
196.	Dr. Kundan Das	1995	240.	Dr. Lalit Sehgal	2002
197.	Dr. Chandra Mogera	1995	241.	Dr. Bhupendra Singh	2002
198.	Dr. Anupam Krishna Das	1995	242.	Dr. Sajith Chakithandy	2002
199.	Dr. Balachundhar Subramaniam	1995	243.	Dr. Anirvan Karmakar	2002
200.	Dr. Kathirvel Subramaniam	1995	244.	Dr. Rahul Seewal	2002
201.	Dr. Abhijit Kanti Dam	1995	245.	Dr. Anand H. Kulkarni	2002
202.	Dr. Ajay Patekar	1995	246.	Dr. Sudesh Prakash	2002
203.	Dr. Sivakumar Nagaraju	1995	247.	Dr. Ajit Bhat	2002
204.	Dr. Ashikho Savio	1995	248.	Dr. Umesh G.	2002
205.	Dr. Meenakshi	1996	249.	Dr. Jaydeb Ray	2002
206.	Dr. Linette Judith Morris	1996	250.	Dr. Saju Sharafudeen	2003
207.	Dr. Nagesha S.K.	1996	251.	Dr. Arvind Palanisamy	2003
208.	Dr. Sri. Sri Palanivel	1996	252.	Dr. Chaitali Sen	2003
209.	Dr. Nilmani Upadhyay	1996	253.	Dr. Sundar Krishnan	2003
210.	Dr. Senthil Kumar S.	1996	254.	Dr. Madan Kumar N.	2003
211.	Dr. Mylapore Latha	1996	255.	Dr. Ashwini Kr. Sharma	2003
212.	Dr. Prabhakara B.	1996	256.	Dr. Nagendra Prasad C.	2003
213.	Dr. Khalid Hussain Abu	1997			

Appendix C

ANAESTHESIOLOGY—MD

“The course content should include a fund of acquired information and the strategy evolved for acquiring the information. Most useful information should be included taking into account the limits of the time available. The contents should ensure that the candidate acquires basic skills and attitudes in the subject. It should discipline the thinking habit for problem solving and discovery of new knowledge in the field.

To this Extent the Course Content should include certain facts

- a) A through knowledge of the pharmacokinetics and pharmacodynamics of anaesthetic drugs and adjuncts.
- b) Knowledge of cardiovascular, respiratory neurological, hepatobiliary, renal and endocrine homeostasis and related drygs as relevant to patients undergoing anaesthesia.
- c) Relevant anatomy, physiology and biochemistry
- d) A basic idea of the elewant physical principles involved in the construction and functioning of equipment used in anaesthesia and monitoring.
- e) Knowledge to attain expertise of the commonly used techniques in general, regional and local anaesthesia
- f) A clear-cut concept of unconsciousness and its implications.
- g) Relevant knowledge about chronic intractable pain and its management.
- h) Relevant knowledge to manage patients in intensive therapy unit
- i) Relevant knowledge of medical Statistics.
- j) Knowledge & Expertise in Cardiopulmonary resuscitation.

The Course content should also include ways and means of stimulating the thought processes of the candidate and ensure that the candidate can critically acquire new information from books, journals, lectures, seminars and discussions. It should include ways and means of developing reflective thinking and problem solving by critically analysing events during anaesthesia. Interpretation of these data and logical reasoning should lead to application of facts and principles in practice.

It is needless to emphasise that the course content should ensure that the candidate acquires the necessary aptitude and motor skills to become a competent anaesthesiologist, learn the art of teaching students, nurses and paramedical staff and carry out a simple research project.

1st Year Theory

- a) **Anatomy** – Diaphragm, larynx and upper and lower airway, learn relevant, anatomy for regional anaesthesia and venous cannulations. Some Anatomical areas of interest to the anaesthetist are Orbit of the Eye, Base of skull, Vertebral Column, spinal cord, and meninges, axilla, 1st rib, Intercostal space.
- b) **Principles of physics and use of equipment in anaesthesia**
 - i) Anaesthesia machine – checking the machine and assembly of necessary items.
 - ii) Airway equipment including Tracheostomy/Equipments for airway management-mask, LMA, fibreoptic laryngoscopes; other devices like Combi tube etc.
 - iii) Breathing systems continuous flow systems, draw over system – Assembly and checking.
 - iv) Monitoring in Anaesthesia with concepts of minimal monitoring.
 - v) Safety in Anaesthesia Equipments
 - vi) Medical gases – storage and central pipeline system.
- c) **Physiology**
 - i) Theories of mechanism of production of Anaesthesia Respiratory, cardiovascular, hepatobiliary, renal and endocrine system. Pregnancy, Blood Groups, Muscle & N M Junction, ECG, Regulation of temperature & Metabolism, Stress response, cerebral blood flow and ICP.
- d) **Pharmacology**
 - i) General pharmacological principles
 - ii) Concepts of pharmacokinetics and pharmacodynamics Uptake and distribution of inhaled anaesthesia agents.
 - iii) Drug interaction in Anaesthesiology
 - iv) Drugs used in Anaesthesia, Drugs used for treatment of diseases and interaction of these.
- e) **Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia viz.**
 - i) GA – Intravenous, Inhalational, Endotracheal etc. using spontaneous and controlled mode of ventilation.

- ii) RA – spinal, epidural and local
- f) **Biochemistry relevant to fluid balance & Blood Transfusion, Artificial Blood & Perioperative fluid therapy.**
Acid base homeostasis in health and disease.
- g) **Documentation and medico-legal aspects of anaesthesia**
Stress the importance of accurate documentation.
- h) **Theoretical background on disorders of:**
 - i) Cardiovascular system
 - ii) Respiratory system
 - iii) Hepatobiliary system
 - iv) Urinary system
 - v) Endocrine system, Pregnancy
- i) **Cardiopulmonary Resuscitation; Theories of cardiac pump, thoracic pump Thoracic pump and defibrillation.**
Resuscitation of a patient with overdose of drug/poisons. Management of unconscious patients. Resuscitation of a severely injured patient.
- j) **Neonatal resuscitation**
- k) **Introduction to Research methodology, Random clinical trails etc. Basics of biostatistics.**
- l) **Preoperative assessments and medication – general principals.**
- m) **Introduction to anatomical, physiological, pharmacological and biochemical aspects of pain and pain management.**
- n) **Introduction to artificial ventilation**
- o) **Oxygen therapy**
- p) **Introduction to the operation theatre, recovery rooms (concepts of PACU),ICU.**
- q) **Recovery from anaesthesia.**
- r) **Oxygen therapy**

- s) **Introduction to the operation theatre, recovery rooms (concepts of PACU),ICU.**
- t) **Recovery from anaesthesia.**
- u) **Shock- pathophysiology, clinical diagnosis and management.**
- v) **Pulmonary function tests – principles and applications .**
- w) **Effect of positioning.**

2nd year Theory

- a) **Relevant anatomy of each system**
- b) **Physics of equipment used in anaesthesia**
Medical gases – gas plant, central pipeline Scavenging system.
 - i) Reducing valves
 - ii) Anaesthesia machine, Humidifiers
 - iii) Flow meters
 - iv) Vaporizers – Characteristics and functional specifications.
 - v) Breathing systems – Assembly, functional analysis, flow, Minimum
 - vi) monitoring standards requirements, APL and flow directional valves.
- c) **Sterilization of equipment**
- d) **Computers, Utility, computer assisted learning and data storage. Computerised anaesthesia records.**
- e) **Pharmacology of drugs used in cardiovascular, respiratory endocrine, renal diseases and CNS disorders.**
- f) **Acid-base and electrolyte balance and**
- g) **Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG Paediatrics – Prematurity, Physiology, anatomy of neonate NS adult**
- h) **Principles of monitoring equipment used for assessment of**

- i) Cardiac function viz. Rhythm, pulse, venous and arterial pressures, cardiac output,
 - ii) Temperature
 - iii) Respiratory function viz. Rate volumes, compliance, resistance, blood gases
 - iv) Intracranial pressure, depth of anaesthesia and
 - v) Neuromuscular block
- i) **Working principles of ventilators**
 - j) **Special anaesthetic techniques as relevant to outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments and calamitous situations.**
 - k) **Anaesthetic management in special situations – Emergency, ENT, Ophthalmology, Obstetrics, Obstetric analgesia, Plastic, Dental, Radio-diagnosis and Radiotherapeutic procedures and patients with systemic diseases.**
 - l) **Medical statistics relevant to data collection, analysis, comparison and estimation of significance**
 - m) **Journal clubs.**

SECOND YEAR

1. Principles of paediatric anaesthesia, management of neonatal surgical emergencies, RA in infants.
2. Associated medical disorders in surgical patients – anaesthesia implications and management.
3. Basics of orthopaedic anaesthesia
4. Day care anaesthesia
5. Rural anaesthesia – anaesthesia for camp surgery
6. Anaesthesia for otorhinolaryngology with special emphasis on difficult airway management.
7. Blood and blood component therapy. Anaesthetic implications in coagulation disorders.
8. Monitored anaesthesia care
9. Anaesthetic implication in Diabetic mellitus, thyroid and parathyroid disorders, phaeochromocytoma, Cushings disease etc.
10. Management of acid-base disorders
11. Principles of geriatric anaesthesia

12. Anaesthesia outside the OR and in special situation
Principle of management in Trauma, disorders and mass casualties

3rd Year Theory

- a) *Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorders posted for unrelated surgery.*
- b) *Management of patients in shock, renal failure, critically ill and/or on ventilator*
- c) *Chronic pain therapy and therapeutic nerve blocks.*
- d) *Selection, purchase, maintenance and sterilization of anaesthesia and related equipment.*
 1. Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/Transplantation/burn and plastic surgery.
 2. Principles of neonatal ventilation and critical care
 3. Principles of human resources and material management.
 4. General principles of medical audit
 5. Principles of one lung anaesthesia.

ATTITUDE DEVELOPMENT

The student should develop attitudes that lead to:

1. Life long learning and updating
2. Sympathetic Communication with relatives
3. Sympathetic Communication with patients
4. Appropriate communication with colleagues to function in a group in OR/ICU
5. Become a teacher for Technicians, Nurses, and paramedical staff. And teach undergraduates.
6. Ability to discuss. Participate in case discussion and scientific presentations

Ability to function as a leader in the Operating room.

SKILL DEVELOPMENT

Requirement of Practical Training by Junior Resident

It is felt that at the end of a 3-year training course a candidate should have the knowledge and ability to:

1. Plan and conduct anaesthesia, recovery, and postoperative pain relief for elective and emergency surgery related to all surgical specialities.
2. Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
3. Manage unconscious patients: Airway management and long term management of unconscious patient.
4. Manage patients admitted to an intensive care unit.
5. Manage patients suffering from chronic intractable pain.
6. Organize the Hospital environment to manage mass casualty situation
7. Critically review and acquire relevant knowledge from the journals about the new Development in the speciality.
8. Should be able to participate in anaesthesia audit.

Major stress will be on practical training. The Goals of postings both the general goals and of specific sub speciality postings will be fulfilled by rotating the junior resident in various operating theatres, Intensive Care, Pain Clinic, Emergency Room (Casualty) Out Patient Department and Peripheral anaesthesia Facilities. The recommended period of stay in each area is as follows:

Speciality	Months
General Surgery	4
Urology	1
Eye	2
ENT	2
Dental	1
Orthopedics/Trauma	3
Gynecology	2
Obstetrics	2
Pediatrics	2
Burns/Plastic	1
CTVS	2
Neurosurgery	2
ICU	3
Pain	1
Recovery	1
Organ Transplant	1
Peripheral Theatre (Radiology, Radiotherapy)	1
ECT Cardiac Cath)	
Elective	1

The student will be instructed in preoperative preparation of the patients and discussion of the intraoperative problems of cases being conducted on the day. During these postings the students will initially observe and then perform various procedures and conduct the anaesthetic procedure as listed. Each procedure observed and performed will be listed in the log book. Which will be signed by attending faculty.

The trainee will undergo a graded training in the following:

Orientation: at the beginning of 3 years each student should be given an orientation to the hospital operation theatre and subject of anaesthesia. The candidate shall be assigned thesis guides so as to help them prepare protocols. Introductory lectures should be aimed to familiarize the student with the

- a) *basic anaesthesia delivery equipment and Monitors and important principles of physics that govern the functions of these equipments.*
- b) *Intravenous Anaesthetic drugs and Inhalation agents.*
- c) *Patient evaluation, interpretation of laboratory investigation as applied to the care of the patients planning and conduct of general anaesthesia, and postoperative care. The faculty should do the teaching. Students should be taught basic and advanced cardiac life support. The student should be familiarized about the principle of the sterilization and universal precautions. They should be able to ask for consultation when necessary.*

The students are encouraged and taught to search literature to be able to write a thesis protocol.

1st Year Objectives

The first year resident should be taught expertise in the management of ASA I and II cases. To start with they will observe and slowly become independent in giving general anaesthesia and spinal anaesthesia to ASA I & II cases for minor and major surgery, under graded supervision. They should be posted to the following specialties doing the first year gynecology, General Surgery, Orthopedic, ENT, Recovery Room, Urology.

2nd Year Objectives

The student should be taught to give general anaesthesia regional anaesthesia to ASA I, II, III & IV under supervision they should be able to give extradural block

(EDB), Spinal Block and Peripheral Nerve Blocks under supervision. Should learn pediatric and trauma life supports and maintain skills for basic and advanced cardiac life support.

It is advised that they may be posted in the following specialties Obstetrics, Dental Surgery, Eye ICU, Pain Clinic and Peripheral Theatres.

The student should be able to be able to analyze data and write a thesis. Should be able to present scientific data.

3rd Year Objectives

The student should be able to plan and administer anaesthesia to all patients under graded supervision including patients for cardiac, Neurosurgery, Pediatric surgery and for all major surgery. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases. The junior resident should be able to manage critically ill patient treat intractable pain. They should also know how to organize mass casualty. The curriculum should be able to provide 1 month of elective posting.

Minimum Procedures/Cases to entered in the log book

Regional	
SAB	30 SAB
EDB	30 including continuous EDB
Caudal	10
Sciatic/Femoral	5+5
Bier Block	5
Ankle Block	5
Stellate Ganglion	3 (observe)
Brachial Plexus	5 observe 10 do
Sympathetic Block	5 (Observe)
Trigger Point injection	5
Other peripheral N. Block	10
Ophthalmic Blocks	10
Field Block	5
Anaesthesia for :	
Open Heart	3-5 observe
Closed Heart	5 observe
Craniotomy	5 observe
Spinal Surgery	5 observe
Joint Replacement	5 observe
Anaesthesia for organ transplant	5 observe (desira)
Procedures	
Internal Jugular Cannulation	5+5 do/observe
External Jugular Cannulation	5
Subclavian Vein Cannulation	5+5 do/observe
Peripheral Central Line	15
Arterial Line Cannulation	10
Conduct of Cases	
ASA I	100
ASA II	50

ASA III	30
ASA IV	10
Labour Analgesia	5
Organ Transplant	5 observe

DETAILED CURRICULUM FOR POSTINGS

I. GENERAL GOALS OF ALL POSTINGS

II. Objectives:

A. Learn to perform preoperative evaluation

- learn to collect and synthesize preoperative data and to develop a rational strategy for the perioperative care of the patient. Outpatients: Develop skills in obtaining medical information from sources outside our institution, that is, other hospital and private physicians.
- Learn a through a systematic approach to preoperative evaluation of patients with systemic diseases. Perform preoperative medical evaluations of patients undergoing many different types of operations, both of inpatients and outpatients but especially elderly patients with complex medical illnesses such as alcoholism, chronic obstructive pulmonary diseases, congestive heart failure, coronary artery disease, hepatic failure, hypertension, myocardial infarction, renal failure, and stroke etc.
- Learn to prioritize problems and to present cases clearly and systematically to attending consultants.
- Develop working relationships with consultants in other specialties to assist in preoperative evaluation. Learn to get a good consultation.
- Learn to interact with preoperative patients and develop effective counseling techniques for different anaesthetic techniques and perioperative procedures: Learn to assess and explain risk of procedure and take informed consent.

- ##### B. Learn anesthetic techniques and skills and understand operate different equipment used by anaesthetist, develop optimum plans depending on patients condition. Know the special considerations and techniques required to anaesthetize patient in locations inside and outside of the operating room, for example, the Cardiac Catheterization Laboratory, Electroconvulsive Therapy, Genitourinary Clinic Magnetic Resonance Imager, Radiology & Radiotherapy.

- Perform the anaesthesia machine check and prepare basic

- equipment necessary for all anaesthetic cases.
2. Prepare drug table: select appropriate drugs for a case and develop a good system for arranging the drug and work tables.
 3. Place standard monitors, for example, electrocardiogram, noninvasive blood pressure device, precordial stethoscope, neuromuscular blockade monitor, pulse oximeter, and capnograph.
 4. Learn proper techniques of preoxygenation
 5. Learn how to induce anaesthesia, both routine induction and rapid sequence induction, and the pertinent mechanical skills and choice of drugs.
 6. Perform airway management by knowing various procedures and equipment:
They should know how to use/do
 - i) Direct laryngoscopy using curve and straight blade
 - ii) Laryngeal mask airway*They should be familiar with*
 - a. Fiberoptic techniques
 - b. Light wand techniques
 - c. Blind techniques
 - d. Combitube
 7. Failed Intubation or difficult airway algorithms
 - a. All techniques for endotracheal intubation
 - b. Additional techniques such as retrograde wire intubation and surgical Cricothyroidotomy both of which will be learned on a mannequin.
 8. Awake intubation
 - a. Topical/Local anaesthesia for airway
 - b. Airway nerve block, for example, superior laryngeal nerve and glossopharyngeal nerve block
 9. Learn anesthetic maintenance: appropriate choice and use of anesthetic drugs and adjuvant drugs such as muscle relaxants and how to monitor their effects.
 10.
 - a. Assessment of Anesthetic depth
 - b. Assessment of volume status
 - c. Replacement of intraoperative fluid losses
 - d. Appropriate use of blood and blood products
 - e. Effect of different types of surgical procedures on anesthetic management, for example, effects of aortic cross-clamping
 - f. Appropriate use of intraoperative laboratory tests blood gas coagulation tests etc.

11. Become skilled in catheterizing or cannulating the following vessels for sampling blood, measuring concentrations or pressures, or administering drugs of fluids.
 - a. Veins: all ages and all sizes
 - b. Arteries: radial and other sites
 - c. Central vessels: internal jugular, subclavian, and "long-arm" routes.
12. Become skilled in using and interpreting the following routine noninvasive and invasive monitors intraoperatively and others:
 - a. Electrocardiogram with ST-segment analysis
 - b. Noninvasive blood pressure
 - c. Capnograph: values and changes in values and waveform
 - d. Pulse oximetry: values and changes in values
 - e. Neuromuscular blockade monitor
 - f. Invasive arterial pressure: waveform and changes in the waveform
 - g. Central venous pressure: values and waveform
 - h. Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing
 - i) Cardiac output
 - ii) Mixed venous oxygen saturation
 - iii) Evoked potential
 - iv) transesophageal echocardiography: basic understanding
13. Become skilled in techniques for regional anesthesia
 - a. Brachial plexus blockade: interscalene, supraclavicular, axillary techniques with and without nerve stimulator for localization.
 - b. Spinal anaesthesia (including continuous spinal where appropriate)
 - c. Epidural anaesthesia: lumbar, caudal, and thoracic
 - d. Lower extremity blockade: femoral, sciatic, and lateral femoral cutaneous nerves
 - e. Upper extremity blockade: ulnar, median, and radial nerves
 - f. Bier block
 - g. Cervical plexus block
14. Become skilled in discontinuing anaesthesia and monitoring emergence from anaesthesia

- a. Reversal of neuromuscular blockade
 - b. Determination of appropriate time for extubation
 - c. Monitoring of airway function during and after emergence
15. Become familiar with/skilled in perioperative pain management
- a. Postoperative epidural infusion (opiates, local anaesthetics)
 - b. Patient-controlled analgesia
 - c. Adjunctive nerve blockade
16. Become skilled in use of techniques for conscious sedation and monitored anaesthesia care
- a. Selection of patients for conscious sedation
 - b. Selection of drugs for use in conscious sedation
 - c. Monitoring techniques helpful in controlling depth of sedation
 - d. Recognition of when conscious sedation has become unconscious sedation
17. Know how to successfully resuscitate, and develop skill of Basic Life support and Advance Cardiac Life support.
- a. The resident will be evaluated every 3 months end posting by all attending consultants who worked with them. The attending physicians complete a Departmental Resident Evaluation Form, which is reviewed by the Clinical Competence Committee inform them of any problems identified and serious problems will be discussed with them immediately after they occur.
 - b. Residents will complete a log book. After each posting it will be checked and signed by the faculty concerned.

Trauma & Resuscitation

All residents must achieve basic and advanced cardiac life support; advanced trauma life support, and pediatric life support training. They should start with the training of Airway breathing circulation (ABC) training and master the skills repeatedly and then procedure to advanced life support.

GOALS OF TRAUMA/TRAUMATISED PATIENT AND DISASTER MANAGEMENT

- a. Acquire improve ability to evaluate & triage the patient and formulate anesthetic plans, especially in the trauma patient.
- b. Acquire ability to administer operative anaesthesia safely and rapidly.
- c. Acquire ability to identify, prevent and care for postoperative complications.

A. *Manage anaesthesia for severely traumatized patients by doing the following as rapidly as possible:*

1. Evaluation/documentation
2. Placement of intravascular catheters
3. Airway intubation
4. Choose among anesthetic options and induce and maintain anaesthesia safely

POST ANAESTHESIA CARE UNIT (PACU)

I. *Goals*

Understand the importance, purpose, and components of the anaesthesia record and the report from the anaesthetizing anesthesiologist.

Use information about the patient that is received and observed on admission to the PACU and during care there for the following purposes:

1. To create a care plan
2. To score the patient's condition according to the Aldrete system
3. To assess the patient's recovery and condition for a safe discharge or transfer

Observe, recognize, and learn to treat the most commonly occurring problems likely to arise in the Postanaesthesia Care Unit (PACU).

Understand the parameters patients must meet for safe discharge from the PACU to the following:

1. Home
2. Inpatient ward
3. Intensive care unit

Detection of Hypoxemia and Oxygen therapy should be learned in this posting should be recognize.

1. Airway integrity and compromise
2. Arrhythmia
3. Hypertension
4. Hypotension
5. Pain prevention and relief
6. Nausea and vomiting
7. Decreased urine output

8. Emergence delirium
9. Delayed emergence from anaesthesia
10. Shivering
11. Post obstructive pulmonary oedema

III. Evaluation Determine Goal Achievement (End posting summative)

INTENSIVE CARE UNIT

I. Goals

Understand the spectrum of critical illnesses requiring admission to ICU recognize the critically ill patient who needs intensive postoperative care from the patient who does not require such care.

PRINCIPLES OF MANAGING A CRITICALLY ILL MEDICAL PATIENT

Cardiovascular

Recognition and acute management of Shock (all forms) Cardiac arrhythmias Cardiogenic pulmonary edema Acute cardiomyopathies Hypertensive emergencies, myocardial infarction.

Respiratory

Recognition and acute management of Acute and chronic respiratory failure Status asthmaticus Smoke inhalation and airway burns Upper airway obstruction, including foreign bodies and infection Near drowning Adult respiratory distress syndrome. Use of Pulmonary function tests including bedside spirometer.

Renal

Recognition and acute management of Fluid and electrolyte disturbances. Should be able to prescribe fluids in Renal failure Acid-basis disorders. Should be able to prescribe drugs based on Principles of Drug dosing in renal failure Should know when to use Dialysis/hemofiltration.

Central Nervous System

Recognition and acute management of Defects in hemostasis Hemolytic disorders should be able to prescribe component therapy based on the results of Coagulation profile.

Thrombotic disorders should be able to diagnose Deep Vein thrombosis and know Principles of Anticoagulation and fibrinolytic therapy.

Know the indications of Plasmapheresis for acute disorders, including neurologic and hematologic diseases.

Gastrointestinal disorders

Should be able to recognize and manage Gastrointestinal bleeding hepatic failure should be able to prescribe prophylaxis against stress ulcer bleeding.

A. Should be able to do the following (ideally) at the end of the posting:

1. Radial arterial catheters and other sites as necessary
2. Central venous catheters
 - a. Subclavian route
 - b. Internal or external jugular route
3. Pulmonary arter (PA) catheters (Observe only)

B. Understand and interpret the following PA catheter variables, initiate appropriate therapy in response to changes in them:

1. PA waveform
 - a. Normal
 - b. Pathologic
 - c. PA wedge
2. Mixed venous oxygen saturation
3. Right ventricular ejection fraction
4. Thermodilution cardiac output
 - a. Technological basis for cardiac output measurements
 - b. Factors producing errors in cardiac output measurements

C. Manage cardiovascular instability

1. Know different fluid therapy options and when to use them
2. Know the different inotropic drugs and when to use them
3. Know how to use invasive monitoring devices to guide therapeutic use of fluids and inotropic drugs

D. Manage respiratory failure and postoperative pulmonary complications

1. Know how to use arterial blood gas and ventilatory variables to evaluate postoperative patients with respiratory failure.
2. Understand the operation of mechanical ventilators including

different ventilatory modalities and how each is best used for management of respiratory failure and noninvasive) including modes complications and modes of weaning Principles & Application of Oxygen therapy.

E. Pathophysiology and Clinical manifestation of septicemia and its treatment.

1. Recognize sepsis in the postoperative patient including all the typical hemodynamic findings.
2. Know the appropriate tests to diagnose sepsis, including diagnostic tests.
3. Use various monitoring devices to assist in managing sepsis; specifically understand the optimization of oxygen delivery to tissues in the septic patient and the appropriate management of fluids and vasopressors to accomplish these goals.
4. Know the different classes of antibiotics and antifungal agents and their use in treating sepsis

F. Deliver appropriate nutritional support

1. Learn about the use of enteral nutrition in the patient who cannot tolerate input per os
2. Learn about the use of parenteral nutrition in the critically ill surgical patient
3. Interact with nutrition support services in planning nutrition for the critically ill patient.

G Provide effective pain management and sedation postoperatively.

1. Learn the appropriate use of pain management modalities in the ICU including:
 - a. Patient-controlled analgesia
 - b. Epidural and subarachnoid narcotics
2. Learn the use of sedative/hypnotic drugs in the ICU for
 - a. For patient on Ventilator Principles of Transplantation

Care of Immunosuppression Infections in the immunocompromised patient Should know Organ rejection.

Monitoring and Biostatistics

Should be able to use Prognostic indices such as acute physiology and chronic

health evaluation, therapeutic intervention scoring system and know the concept of audit. Ethical and legal aspects of critical care Know the legal important of Should be able to take informed consents not resuscitate orders; (DNR) withdrawing of therapy.

Psychosocial Issues

Should be able to communicate with distressed relatives
Should be able to give the correct picture of a critical patient, but with compassion in view of critical nature of the illness.
Should be able to Transport a critically ill patient/resuscitate patient with acute traumatic injury

PEDIATRIC TRAINING

Should be able to Recognize and manage cardiovascular and respiratory failure in a critically ill child

Evaluate manage the critically ill neonate

Prescribe appropriate dose of all drugs and fluid and electrolytes in a child Core procedural skills for residents. In addition to practical training in the following procedural skills, the resident must have an understanding of the indications, contraindications, complications & pitfalls of these interventions. Due to the variability of individual training programs, practical experience may be limited for some procedures.

Cardioversion

Pulmonary artery catheterization

Transcutaneous pacing

Draining of tension Pneumothorax

Insertion of chest drain

Conventional and Percutaneous Tracheostomies

CARDIOVASCULAR ANAESTHESIA

I. Goals

- A. Understand cardiac physiology Develop knowledge of cardiovascular anaesthesia (anaesthesia for the patient with cardiovascular disease). Choose appropriate anesthetic techniques for patients with different types of cardiovascular disease and the skills for lifelong continuing education.
- B. Develop technical and monitoring skills necessary for cardiovascular anaesthesia
- C. Administer anaesthesia for a wide variety of cardiothoracic Cases and develop interest in further learning.
- D. Perform a thorough preoperative assessment of the patient undergoing cardiovascular surgery.
- E. Know intraoperative anaesthetic management for the patient undergoing cardiopulmonary bypass. Know how cardiopulmonary bypass is instituted and discontinued Understand cardiopulmonary bypass and discuss the mechanical aspects of it as follows:
 - 1. Different types of pumps-pulsatile and nonpulsatile
 - 2. Physiology of hypothermia and cardiac and cerebral protection
 - 3. Effects of bypass on volumes of distribution and clearance of anaesthetic drugs and anesthetic maintenance, including amnesia
- F. Know how and why to use inotropic support, vasodilators, and antiarrhythmic drugs that may be necessary before but are especially necessary after cardiopulmonary bypass.
- G. Insert vascular catheters or cannulas for adult and pediatric patients and obtain measurements from them as follows:
 - 1. *Arteries*
Internal Jugular vein and the subclavian vein Pulmonary artery (Swan-Ganz) catheters and initiate appropriate therapy in response to changes in the following pulmonary artery (PA) variables:
 - a. Waveform
 - b. Normal tracing
 - c. Pathologic tracing
 - d. Pulmonary artery wedge tracings
 - 2. *Mixed venous oxygen saturation*
 - 3. *Thermodilution cardiac output Observe/know about a Transesophageal echocardiography (TEE) probe and interpret TEE images*

- F. Manage care during cardiac surgery as follows:
 - 1. Blood replacement
 - 2. Monitoring the effect of heparin
 - 3. Postcardiopulmonary bypass coagulopathy
 Rationale for various therapies such as aprotinin designed to prevent Coagulopathy
- G. Know following procedures and anaesthetic implications:
 - 1. Aortic repairs
 - 2. Congenital repairs – pediatric
 - 3. Coronary artery bypass grafting and valves – adults
 - 4. Electrophysiology
 - 5. Thoracic surgery
 - 6. Transplantation – heart and lungs
- H. Work as a team member with fellow anaesthesiologists, surgeons, perfusionists, and nurses
- I. Maintain good clinical judgment under stress and act quickly and accurately in diagnosis, interpretation, and treatment of intraoperative problems.

Evaluation to Determine Goal Achievement

NEUROANAESTHESIA

I. Goals

- A. Administer anaesthesia safely to patients with neurologic disease who are undergoing neurologic or non-neurologic surgery, diagnostic procedures requiring anaesthesia, or nonsurgical interventions requiring anaesthesia.
- B. Understand the basic concepts of central nervous system (CNS) physiology as they relate to neuroanaesthesia, specifically, mastery of autoregulation of blood flow, blood flow response to CO₂, blood flow response to cerebral oxygen (CMRO₂) and glucose (CMR glu) metabolic rates, and cerebrospinal fluid physiology.
- C. Know the effect(s) of commonly used anaesthetic agents and adjuvant agents, for example antihypertensives, on cerebral physiology.
- D. Understand the anaesthetic implications of the most common neurosurgical procedures, that is, what is likely to happen during neurosurgery that will affect anaesthetic management.
- E. Understand the basic concepts behind electrophysiologic monitoring of the brain and spinal cord.
- F. Understand how concurrent medical illnesses affect anaesthesia during neurologic surgery.

II. Objectives

- A. Review the medical history and physical examination of patients; assess their major neurosurgical problem. Evaluate the patients Glasgow Coma Scale as well as other medical problems that may affect anesthetic care' and know what information about nervous system function and pathology as important to the anaesthesiologist.
 1. Recognize both the adult and pediatric patient with poor elastance of increased intracranial pressure (ICP)
 2. Evaluate the patient with subarachnoid hemorrhage and intracranial aneurysm by means of the Hunt-Hess and Fischer gradings systems; recognize preoperative vasospasm; and anticipate which patients are likely to require special techniques such as barbiturate protection, hypotension, induced hypertension, or temporary vessel occlusion.
 3. Differentiate between radiculopathy and myelopathy and understand the anaesthetic implications of each, that is, which patients require awake intubation and positioning.
 4. Know the basic differences between the following types of brain,

spinal cord, and metastatic tumors of the CNS and their association with edema and intraoperative blood loss. Know the anesthetic implications of:

- a. Acoustic neuroma, Ependymoma, Gliomas, Meningioma, Pituitary tumours. Understand the following different types of spinal operations as well as their anaesthetic implications:
 - b. Anterior cervical discectomy and fusions, anterior cervical corpectomies, posterior cervical fusions, laminectomies, and foramenotomy, Laminectomies for excision of spinal cord tumors, both intrameullary and extramedullary, Lumbar laminectomies, microdiscectomies, corpectomies, and fusions and instrumentation, Thoracic laminectomies and discectomies.
5. Anticipate premedication for an anesthetic considerations during electrocorticography.
 6. Anticipate airway and sedation requirements for stereotactic neurosurgical procedures conducted with either general anaesthesia or monitored anaesthesia care.

Perform the following specific procedures and monitoring techniques necessary to care for the neurosurgical patient.

1. Choose appropriate premedication and agents for anaesthetic induction and maintenance based on a knowledge of their effects on cerebral physiology and on neuropathology.
2. Choose and place the following monitors and monitoring devices for use during spinal and intracranial surgery:
 - a. Arterial line, central venous (CVP) or pulmonary artery (PA) pressure catheters by all approaches, especially the basilic or cephalic veins
 - b. Observe/know about Oprecordial Doppler and interpretation of sounds
3. Perform techniques for awake intubation and positioning of the neurosurgical patient with either an unstable neck or myelopathic signs and symptoms
 - a. Assess when awake intubation and positioning are needed
 - b. Intubate an awake patient such that coughing or movement are minimal
 - c. Master anaesthesia for awake intubation, including but not limited to, superior laryngeal and glossopharyngeal nerve blocks and transtracheal injection of lidocaine
4. Detect and treat air embolism during neurosurgery:
 - a. Know use of monitors to detect air embolism and what monitoring patterns are associated with air embolism.

- b. Recognize the relative risks of different procedures and positions for air embolism.
5. Know general principles of positioning the patient for neurologic surgery and the advantages and disadvantages of each position:
 - a. Lateral
 - b. Prone
 - c. $\frac{3}{4}$ prone
 - d. Supine-head turned
 - e. Sitting-theoretical knowledge only because this position is no longer used at our institution
6. Know anesthetic effects on the electroencephalogram (EEG) and evoked potentials and basic implications of and appropriate responses to changes in each.
7. Understand the basic indications and techniques, and, if possible, perform the following special procedures used during neuroanesthesia:
 - a. Induced hypotension
 - b. Induced hypertension
 - c. Moderate Hypothermia
 Barbiturate cerebral protection, Cardiopulmonary bypass and circulatory arrest – theoretical knowledge only in most instances.
8. Know the differential diagnoses and treatment alternatives of intraoperative intracranial hypertension (“tight brain”).
9. Reverse general anesthesia rapidly with a minimum of hemodynamic change to allow early postoperative assessment of the patient and recognize when failure to emerge from anesthesia is not likely an anesthetic effect.
10. Know the management of Head Trauma, and its anesthetic management

III. *Evaluation to Determine Goal Achievement*

- A. Preparation for case and ability to carry out plan discussed the night before:
 1. Recognition of intraoperative problems and communication with the attending; ability to appropriately respond to changing clinical situation; clinical judgment
 2. Mechanical skills of placing lines and positioning the patient
 3. Application of basic and clinical science knowledge and skills to the neurosurgical patient
- B. The neuroanesthesia group will meet at the conclusion of each rotation and on overall performance evaluation will be made based on the above criteria ED.

PAIN MANAGEMENT

I. *Goals*

- A. Differentiate among the different chronic pain states, for example, reflex sympathetic dystrophy and neuropathic or myofascial pain, and know what treatments are effective for each.
- B. Know the types of drugs that relieve pain and their efficacy, indications, side effects and contraindications and use.
- C. Know the laboratory tests, radiologic studies, and psychological tests used to help differentiate chronic pain syndromes.
- D. Learn to perform a thorough, directed history and physical examination, which will emphasize and facilitate the diagnosis of different pain states.
- E. Know the multidisciplinary approach to pain management
- F. Know when it is appropriate to refer patients to different specialists for definitive or adjunctive therapy, for example, neurosurgery, orthopedic surgery, neurology.
- G. Manage acute and perioperative pain syndromes proficiently.

II. *Objectives*

- A. Learn the anatomy of the sympathetic nervous systems, specifically, the anatomy of the epidural and subarachnoid spaces and the location of sympathetic and parasympathetic ganglia
- B. Perform blocks and techniques in administering them that are commonly used to manage acute and chronic pain as follows (please note: Some of these blocks may not be performed in a given month because of the patient population available during that month):
 1. Epidural steroid injection (all levels)
 2. Long-term epidural catheterization
 3. Blocks should observe and know about the following blocks:
 - a. Celiac plexus
 - b. Infraorbital nerve
 - c. Intercostal nerve
 - d. Lumbar sympathetic
 - e. Stellate ganglion
 - f. Facet blocks
 4. Complications associated with each blocks and appropriate treatment of each.

- C. Know the cutaneous dermatomal mappings
- D. Diagnose myofascial pain syndromes and perform trigger point injections
- E. Know the different modalities of physical therapy that may relieve both acute and chronic pain and learn how to obtain such therapy.
- F. Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation.
- G. Know the acute pain and cancer pain guidelines:
 1. Treatments the WHO Treatment Ladder
 - a. Drugs:analgesics, opiates, sedatives, and stimulants
 - b. Nerve blocks
 - c. Neruolysis, surgical and chemical
 2. Routes of administration and risk and benefits of each epidural
 - a. Intramuscular
 - b. Intrapleural
 - c. Intravenous
 - d. Oral
 - e. Patient controlled
 - f. Subcutaneous
- H. Diagnose and know how to treat the following pain syndromes:
 - a. Diabetic neuropathy
 - b. Inflammatory states such as bursitis, carpal tunnel syndrome, skeletal pain, and tendonitis
 - c. Phantom limb pain
 - d. Post-herpetic neuralgia
 - e. Reflex sympathetic dystrophy
 - f. Trigeminal neuralgia
 - g. Low back pain

III. Evaluation to Determine Goal Achievement

PEDIATRIC

I. Goals

- A. Administer anaesthesia safely for routine surgical, diagnostic, and therapeutic procedures.
- B. Recognize and treat postanesthesia problems
- C. Recognize when you or your institution cannot provide adequate care for a particular problem.

II. Objectives

A. Preoperative

Neonatal anatomy and physiology applied to conduct of anaesthesia.

1. Review the chart, take an adequate history, assess the major systemic problems, identify special problems such as latex allergy or apnea related to prematurity, and develop a plan of care.
2. Recognize and cope with the emotional problems of parents and child, and attempt to alleviate them.
3. Know the principles of and medications used for preoperative sedation.
4. Induce anaesthesia in an distraught or uncooperative child.
5. Recall and state the anatomic, physiologic, and pharmacologic differences and similarities in the major organ systems between children and adults.
6. Transport safely a sick pediatric patient to the operating room and be able to state and perform the solutions to any problems which may arise in the following areas:
 - a. Heat maintenance
 - b. Cardiovascular stability
 - c. Ventilation
 - d. Oxygenation
7. Record and estimate preoperatively blood volume, hourly fluid requirements, estimated fluid deficit, third space loss, red cell mass at the patient's hematocrit, acceptable red cell mass loss, and acceptable blood loss.

B. Intraoperative

1. Know appropriate endotracheal tube sizes – cuffed and uncuffed
2. Induce and maintain anesthesia by inhalation, intravenous, intramuscular, and rectal routes and know the differences in effects of various anesthetics between adults and pediatric patients.
3. Administer mask or laryngeal mask airway anesthesia when appropriate.
4. Maintain the airway of an anesthetized pediatric patient and intubate the trachea without trauma in 98% of cases within 1 minute.
5. Perform awake intubation.
6. Recognize abnormal airways and maintain them during anesthesia.
7. Describe the appropriate management of laryngospasm
8. Recognize the following signs of hypoxias: bradycardia, poor color, poor venous filling, distant heart tones, and abnormal electrocardiogram.
9. Understand the various forms of breathing circuits used in pediatric anesthesia and them appropriately.
10. Apply consistently and interpret data from a blood pressure cut,

electrocardiogram, oximeter, capnograph or mass spectrometer, and a thermistor.

11. Know the indications of use of a heat lamp and heated humidifier when appropriate. Answer questions concerning the importance of thermoneutrality in pediatric by demonstrating the use and abuse of the following, Heat lamp, b. Heat blanket, Heat humidifier, Room temperature.
12. Master the techniques of halothane and isoflurane/nitrous oxide/oxygen/ muscle relaxant anesthesia.
13. Determine and discuss when deep or awake extubation is appropriate and apply the proper approach.
14. Understand and apply the basic concepts of neuromuscular block in children, know when anesthesia is adequately reversed, and know the differences between dose/effect in infants and children as compared to adult patients.
15. Apply the principles of fluid and blood replacement during anaesthesia.
16. Understand the benefits and risks of regional anesthesia, including spinal anesthesia and regional analgesia for postoperative pain.

C. *Postoperative*

1. Transport safely and manage immediate postoperative care in the following areas: ventilation, oxygen administration, temperature control, cardiovascular monitoring, fluid balance, and pain relief.
2. Recognize postoperative croup and treat it.
3. Understand postanesthesia apnea, factors associated with it, the appropriate duration of monitoring and treatment.

D. *Special problems*

1. Manage the following in pediatric patients undergoing anesthesia and surgery:
 - a. Blood replacement
 - b. Drug administration and anesthetic requirement (minimum anesthetic concentration)
 - c. Fluid and electrolyte balance, glucose requirement, and renal maturation
 - d. Hypocalcemia
 - e. Hypoglycemia
 - f. Metabolism
 - g. Temperature control
 - h. Vitamin K administration

2. Care of patients in the following special circumstances:
 - a. Special problems
 - i. Congenital heart disease
 - ii. Epiglottitis
 - iii. Malignant hyperpyrexia
 - iv. The child with the anatomically difficult airway (e.g. Pierre Robin syndrome)
 - b. Special procedures
 - I Bronchoscopy (in particular for foreign body aspiration)
 - ii. Tonsillectomy (in particular for the rebleeding tonsil)
 - iii. Computerized axial tomographic scan and magnetic resonance imaging
3. Know and experience management of a pediatric patient with a full stomach
4. Identify the following various problems in pediatric patients and handle them:
 - a. Diaphragmatic hernia
 - b. Omphalocele and gastroschisis
 - c. Pierre-Robin syndrome
 - d. Pyloric stenosis
 - e. Tracheoesophageal fistula
5. Understand pediatric resuscitation, drugs and doses used for it, and defibrillation

III *Evaluation to Determine Goal Achievement*

OBSTETRIC

1. **Goals**

- A. Learn how the physiology of normal pregnancy alters the response to anaesthesia
- B. Learn pertinent aspects of fetal and placental physiology
- C. Learn what obstetricians may require from anesthesiologists
- D. Learn how pregnancy creates special problems for the anesthesiologist learn the nature of high-risk obstetrics and how special medical problems alter the approach to obstetric anesthesia
- E. Participate in morbidity mortality conference and ongoing research-

II. **Objectives**

- F. Learn how to evaluate the neonate and principles of neonatal resuscitation
- G. Learn how drugs affect the neonate

- H. Learn how to communicate effectively with obstetricians and with labor and deliver nurses.
 - A. Obtain pertinent information from the history and physical examination of the obstetric patient to assess major systemic problems.
 - B. Understand obstetric physiology and pharmacology as follows:
 - 1. Alteration of maternal physiology during pregnancy
 - 2. Effects of anesthesia, both general and regional, on human uteroplacental blood flow and of adjunctive medications such as vasopressors and vasodilators on uterine blood flow
 - 3. Perinatal pharmacology and placental transfer of drugs
 - 4. Effects of epidural and systemic medications on labor and delivery
 - 5. Learn all anesthetic techniques suitable for managing normal labor pain including:
 - a. Epidural local anesthesia
 - b. Epidural opiate anesthesia
 - c. Inhalation analgesia
 - d. Intravenous analgesia
 - C. Understand epidural and spinal analgesia and anesthesia as follows:
 - 1. Anatomy and physiology of the epidural space and spine
 - 2. Techniques of needle placement including midline and paramedian approaches
 - 3. Pharmacology of local anesthetics
 - 4. Complications and side effects
 - D. Know common problems encountered in continuous epidural infusion and how to prevent and treat them
 - E. Know how to use of intraspinal opiates in obstetrics:
 - 1. Physiology and pharmacology
 - 2. Benefits for labor, deliver and postoperative pain
 - 3. Side effects
 - F. Understand the advantages of regional and general anesthesia for cesarean section.
 - G. Know the risk factors, prevention, and treatment of maternal aspiration
 - H. Evaluate difficult airways and know how to prevent the problems associated with them and to manage failed intubation.
 - I. Be familiar with recent advances in obstetric anaesthesia
 - 1. The effect of epidural anesthesia on labor and deliver
 - 2. Drug interaction

- 3. The epidural test dose
- 4. Anesthesia for pre-term delivery
- J. Recognize high-risk factors in obstetric patients and how they affect anesthetic management as follows:
 - 1. Morbid obesity and anesthesia: Problems and management
 - 2. Preeclampsia: basic considerations and controversy in management
 - 3. Neurologic disease and pregnancy
- K. Understand anesthetic choices for the pregnant patient with heart disease
- L. Identify and manage common medical emergencies in the post-parturient
- M. Know how the late 20th century social problems affect anesthetic care, such as perinatal human immunodeficiency virus infection and maternal substance abuse
- N. Manage maternal anaesthesia and the stressed fetus
- O. Know current fetal monitoring techniques and how to interpret the information they provide

III. Evaluation to Determine Goal Achievement

REGIONAL ANESTHESIA

I. GOALS

- A. To teach anesthesia residents the art and sciences of regional anesthesia understand the anatomy, pathophysiology, and appropriate management of complications and side effects of regional anesthetic techniques, - the test doses; total spinal, subdural blocks – assessment and treatment; Risk of spinal, epidural hematoma and abscess – assessment and treatment; Postdural puncture headach – assessment and treatment; Pneumothorax – assessment and treatment; Physiologic side effects: sympathectomy, phrenic nerve block, intercostal nerve block – assessment and treatment; Peripheral nerve injury – assessment and follow up.
- B. To understand general principles of local anesthetic pharmacology, including the pharmacodynamics and pharmacokinetics of various local anesthetics. This includes onset duration, motor/sensory differentiation, and toxicity profile of various local anesthetics and allergy its treatment.
- C. To understand the principles and indications for various local anesthetic adjuvants including. Epinephrine, phenylephrine, narcotics, sodium bicarbonate, carbonation, hyaluronidase, alpha agonists, anticholinesterases.
- D. To be familiar with the relevant anatomy for regional techniques, including: Spinal canal and its contents, neural plexuses of the limbs, major autonomic ganglia
- E. Be familiar with the physiologic changes associated with spinal epidural anaesthesia.
- F. Understand the indications for an the contraindications to regional anesthetic techniques including central neuraxis blocks, peripheral nerve blocks, sympathetic nerve blocks.

B. COGNITIVE SKILLS

At the completion of this rotation residents should be able to demonstrate the following skills.

1. Rational selection of regional anesthesia technique and choice of local anesthetic for particular patient encounters.
2. Ability to assess adequacy of regional anesthesia before the start of surgery, and demonstrate appropriate plans for

3. supplementation of inadequate blocks.
3. Provide effective anxiolysis and sedation of patients by both pharmacologic and interpersonal techniques.
4. Select appropriate monitors for specific patient encounters, and document performance of regional anesthetic adequately.

IV. Evaluation to Determine Goal Achievement

Demonstrate ability to perform/familiarity with the following regional anesthesia techniques:

- Brachial plexus blockade
- Sciatic nerve block
- Femoral nerve block, o or 3-in-1 block
- Caudal block – adult and peadiatric
- Ankle block
- Epidural block/Catheter
- Spinal subarachnoid block
- Biers block
- Others

OBJECTIVES OF DENTAL ANAESTHESIA

Understand the principles of conscious sedation
Principles of anesthesia in a dental Chair
Local Blocks for Dental Surgery

OBJECTIVES OF TRANSPLANT ANAESTHESIA

Know the basic Principles of anaesthetizing an immouncompromised patient of anaesthetising patient with end stage renal/liver disease Wam/Cold ischemic Time

OBJECTIVES FOR OPHTHALMOLOGY POSTING

1. Give anaesthesia for intra and extraocular surgery
2. To anaesthetize premature babies for ROP surgery
3. To give Monitored Anaesthesia Care to learn to sedate patients for MAC
4. To give Ophthalmic nerve blocks

OBJECTIVES FOR ENT POSTING

1. To give topical anesthesia for awake intubation (nasal and oral)
2. To give local block for Tonsillectomy
3. Local anesthesia for tracheostomy
4. Local block for thyroid surgery to give anesthesia for MLS
5. To give anaesthesia for Laser surgery of airway
6. To give anesthesia for vascular malformations/tumours of noses

APPENDIX – I**Text books:**

1. Miller RD, ed Anesthesia, 5th ed
2. Wylie Churchill Davidson
3. Nunn and Utting
4. Stoelting RK, Miller RD, eds. Basics of Anesthesia

APPENDIX (CARDIAC)**Text Books:**

1. JA Kaplan: Cardiac Anesthesia J Benum of: Anesthesia for Thoracic Surgery C Lake: Pediatric Cardiac Anaesthesia

APPENDIX (NEURO ANAESTHESIA)**Text books include:**

1. Cucchiara and Michenfelder: Clinical Neuroanaesthesia, Churchill-Livingstone
2. Cottrell and Smith: Anaesthesia and Neurosurgery, 3rd ed, CV Mosby
3. Millel: Anaesthesia, 4th ed, Churchill-Livingstone; Chapters 21, 38 and 56
4. Kirby and Gravenstein: Clinical Anesthesia Practice, WB Saunders; chapters 22, 4 and 73
5. Russel and Rodichok: Primer of Intraoperative Neurophysiologic Monitoring, Butterworth and Heinemann

APPENDIX (PEADIATRIC ANAESTHESIA)**Text books:**

1. Gregory GA: Pediatric Anaesthesia, 2nd ed
2. Steward D: Handbook of pediatric Anaesthesia, MD

APPENDIX (ICU)**Text books:**

1. Icu Book Paul Marino
2. Critical Care by Joseph Civetta, Robert W Taylor and Robert Kirby publisher Lippincott

APPENDIX (PAIN)**Text books:**

1. Bonica: The Management of Pain
2. Cousins and Bridenbaugh: Neural Blockade in Pain Management
3. Raj: Practical Management of Pain

ASSESSMENT METHODS

Assessment is a vital part of any course and it is element where there is frequently considerable doubt, There are 2 major components:

- A) *Formative Assessment:* Ongoing evaluation during the course – During each posting/Module/End Unit
- B) *Summative Assessment :* Final assessment after 3 years and/at the end of each semester Assessment

FORMATIVE ASSESSMENT/ (Ongoing Evaluation)

Formative assessment will be conducted during each posting/module/unit. This will include the following:

TECHNICAL SKILLS COMPETENCY EVALUATIONS:

- Method to be used**
- 1) Case presentations (evaluation by Peers)
 - 2) Simulated case cards
 - 3) OT discussions
 - 4) OSCE

ORAL SKILLS – Attitudinal Development:

- Method to be used**
- 1) Ability to present seminars, discussion in class room (evaluation by Peers)
 - 2) Talking to patients in pre-anaesthesia rounds
 - 3) Operation theatre Management

CARDIOPULMONARY RESUSCITATION:

- Method to be used**
- 1) Mannequins demonstration
 - 2) Check lists for evaluation
 - 3) OSCE

CPR evaluation will be repeated at the end of each semester

SUMMATIVE ASSESSMENT**Final Assessment and End Semester Assessment****1) THEORY (Subject contents already outlined in curriculum)**

Should consist of

- a) Structured Essay Questions (SEQs)
- b) Short Answer questions (SAQs) minimum of 10 SAQs will be mandatory (in all four papers taken together)
- c) Problem Solving Questions
- d) Multiple choice Questions (MCQs) MCQs of different types

Should be included atleast in one of the 4 papers. The use of MCQs is recommended for formative/end semester evaluation.

Final Theory papers:	4 papers	Marks
Paper I	Basic Sciences as applied to Anaesthesiology, including ethics, statistics, Quality assurance, medicolegal Aspects	100
Paper 2	Anaesthesia in relation Associated Systemic	100
Paper 3	Anaesthesia in relation to subspecialities such As cardiac, neuro, obstetrics and pediatrics etc.	100
Paper 4	Intensive care Medicine, Pain Medicine and Recent advances in Anaesthesiology	100

2) PRACTICAL

4 components: Marks

The practical examination should be structured and objective as possible

A) Clinical Cases	1 long case	40 min	100
	2 Short cases	15 min each	40 each

Structured Assessment (Long Case)

1. Oral skills/presentation	10
2. Diagnosis/investigations	10
3. Preanesthetic Preparation	20
4. Anaesthetic management	40
5. Post operative complications & management	20

B) OSCE: *At least 10 OSCE stations with checklists*
For objective assessment marks

C) VIVA-VOCE (Structured) TOTAL MARKS : 200

1. Problem solving situations	40
2. Drugs/Anaesthetic	40
3. Equipments for Anaesthesia/In. Care	40
4. Investigations ECG/Xrays/MRI Endoscopy etc.	40

D) 1. CPR Assessment on Mannequins	40
	Total Marks
Theory (Papers 1-4)	400
Practical (Cases, OSCE, Viva Voce)	400
Grand Total	800

The candidate will be required to secure minimum 50% marks in theory and 50% marks in clinicals and viva-voce separately, which is mandatory for passing the whole examination. Candidate failing in theory will not qualify to take practical examinations. There should be enough gap between theory and practical Exam. as recommended by MCI rules.

Final Assessment Marks Weightage	
30%	: Internal (Formative) Assessment & Thesis
70%	: Summative Assessment

The committee recommends that three external and three internal examiners should conduct the clinical examination. A maximum of 4 candidates should be examined per day and if there are more than 4 candidates the examination should be conducted on 2 consecutive days.

THESIS

Objectives

1. The student would be able to demonstrate capability in research by planning and conducting systematic scientific inquiry & data analysis and deriving conclusion.

2. Communicate scientific information for health planning.

Guide for thesis

1. Chief guide will be from the department of Anaesthesiology
2. Co-guide(s) will be from the department or from other disciplines related to the thesis.

Submission of thesis protocol

It should be submitted at the end of six months after admission in the course.

1. *Protocol in essence should consist of:*
 - a. Introduction and objectives of the research project
 - b. Brief review of literature
 - c. Suggested materials and methods, and (scheme of work)
 - d. Statistician should be consulted at the time of selection of groups, number of Cases and method of study. He should also be consulted during the study.
 - e. Bibliography
2. *The protocol must be presented in the department of Anaesthesiology before being forwarded to the Research Committee of the Institute.-*
3. *Protocol will be approved by the research committee appointed by the Dean/Principal to scrutinise the thesis protocol in references to its feasibility, statistical validity, ethical aspects etc.*

Submission of thesis

1. The thesis shall relate to the candidate own work on a specific research problem or a series of clinical case studies in accordance with the approved plan.
2. The thesis shall be written in English, printed or typed on white bond paper 22 x 28cms with a margin of 3.5 cm bearing the matter on one side of paper only and bound with cloth/rexine, with the title, author's name and the name of the College printed on the front cover.
3. The thesis shall contain: Introduction, review of literature, material and methods, observations, discussions, conclusion and summary and reference as index medicus

Each candidate shall submit to the Dean four copies of thesis, through their respective Heads of the Departments, not later than six months prior to the date of commencement of theory examination in the subject.

Evaluation of thesis

1. The thesis shall be referred by the University evaluation to the Examiners appointed by the University. The examiners will report independently to the Controller of Examinations and recommend whether the thesis is –
 - a) approved
 - b) returned for improvements as suggested or
 - c) rejected
2. The thesis shall be deemed to have been accepted when it has been approved by atleast two external examiners and if the thesis is rejected by one of the external examiners it shall be referred to another external examiner (other than the one appointed for initial evaluation) whose judgement shall be final for purposes of acceptance or otherwise of the thesis.
3. Where improvements have been suggested by two or more of the examiners, the candidate shall be required to re-submit the thesis, after making the requisite improvements, for evaluation.
4. When a thesis is rejected by the examiners, it shall be returned to the candidate who shall have to write it again. The second thesis, as and when submitted shall be treated as a fresh thesis and processed.
5. Acceptance of thesis submitted by the candidate shall be a pre-condition for his/her admission to the wirtten, oral and practical/clinical part of the examination.
Provided that under special circumstances if the report from one or more examiners is not received by the time, the Post-graduate examination is due, the candidate may be permitted provisionally to sit for the examination but the result be kept with held till the receipt of the report subject to the condition that if the thesis is rejected then the candidate in addition to writing a fresh thesis, shall have to appear in the entire examination again.
6. A candidate whose thesis stands approved by the examiners but fails in the examination, shall not be required to submit a fresh one if he/she appears in the examination in the same branch on a subsequent occasion.

Appendix D*Syllabus for MBBS (Undergraduates)*

“ The physician should have a good knowledge of what the anesthetic will do to the patient, even though the physician does not administer it. .

The student, therefore, should observe and study the physiological changes which take place in the anesthetized patient. When these changes are of sufficient magnitude, they develop complications or toxic effects. The student should learn what these are, how they are caused, and how they may present and be treated. Emphasis should be laid on good preoperative preparation. Students should learn basic techniques of maintaining a clear airway and giving assisted or artificial ventilation. They should also learn how to position the patients head, how to hold the chin and how to insert an airway. Medical studients should learn enough about an anesthetic machine.

In addition to these technical accomplishments, the student may have the opportunity to administer either general or spinal anaesthesia under the direct and constant supervision of a member of the staff.

OBJECTIVES

The students, at the end of their posting should be able to:

1. Introduce principles of acute medicine as it is practiced in managing the anesthetized patient in the operating room and in managing the patient in the recovery unit.
2. Discuss and demonstrate principles of applied physiology and applied pharmacology. Simulation on Human patient Simulator (HPS) is ideal to teach many aspects of applied physiology and pharmacology.
3. Review principles of and learn skills in resuscitation (cardiopulmonary, cerebral, fluid and others).
4. Learn care of the unconscious patient, including airway and ventilation management.
5. Learn management of blood, fluid, electrolyte balance, and metabolic disturbances in the surgical patient, with specific emphasis on those derangements which are encountered in the anesthetized patient.
6. Review management of acute and chronic pain problems.
7. Introduce concepts of drug interactions, especially as they apply to patients receiving anesthesia.
8. Demonstrate the evaluation of patients relative to surgical and anesthetic risk. Teach appropriate preoperative preparation of patients subjected to surgery and anesthesia.
9. Introduce the various techniques of anesthesiology
10. Pharmacology of muscle relaxant, application and monitoring

11. Pharmacology; Basic/Applied of local anesthetics: Various types of blocks advantages/Problems with each. Descriptive for same main blocks. Local infiltration, Brachial Plexus, Caudal etc.

Skills

Maintenance of Clear airway
 Bag Mask Ventilation
 Starting A Venous Access
 CPR – Basic and advanced

Giving a simple infiltration block, Some nerve block
 Performing A lumbar puncture

TEACHING LEARNING METHODOLOGY

Teaching and learning in anesthesiology should be guided through a series of posting in which the emphasis is laid on practical hands – on experience. Human patient simulator (HPS) be purchased for better skill development and to reduce the danger to the patients during the learning curve of student. To allow repeat practice according to ability of the student to reach the level of competence needed.

Posting Schedule

Two weeks in 7th Semester
 To achieve the objectives the students will be posted to

Preanaesthetic Clinic: 1

1. Preoperative evaluation & optimization
2. **Operating theatre:** Anaesthetic Machine/monitoring, Anaesthetic Techniques
3. **Recovery room:** Recovery criteria: Management of complications
4. **Intensive Care Unit:** Management of respiratory failure Various types of ventilatory Assistance devices Monitoring Devices and application. Management of patient in Coma.
5. Pain Clinic: Evaluation of patient/non invasive/invasive management

Emergency On Call

The Intern will be posted to same areas as above and will be asked to follow a case from preoperative preparation to full recovery to get an idea of

comprehensive care.

A log book will need to be completed by the student under the supervision of the faculty member.

LOG BOOK

Skills	
I/V Cannulation	5
Oropharyngeal/Nasopharyngeal Airway insertion	10
Bag Mask Ventilation first on Mannekin	5
Mask Ventilation in unconscious patient	5
Attaching pulse oximeter, BP cuff and ECG	
Electrodes and setting up a monitor	5
Lumbar puncture	2
Infiltration block	2
Demonstration of epidural/nerve block	2 each
LMA insertion demo	5
Intubation demo	5
CPR on mannekin	5

TEXT BOOK RECOMMENDED

1. “The book of Anaesthesia” edited by Alan R. Aitkenhead, David J. Rowbotham, Graham Smith published by Churchill Livingstone.
2. “Fundamentals of Anaesthesia” edited by Colin Pinnock, Ted Lin, Tim Smith Published by Greenwich Medical Media Ltd.

REFERENCES BOOKS

1. Fundamental Principles and practice of Anaesthesia, Ed Petter hurttom, Cooper Butterword, Published by Martin Dunitz, 2002.
 Principles and Practice of Anaesthesiology Edited David E. Longnecker
 Published by Mosby St. Louis.



May, 1971.

Chairs(from left to right)

Dr.(Mrs.)N. Saxena, Dr.(Mrs.) S.Khanna, Dr.V.A.Punnoose, Dr.G.R.Gode(Head of the Dept),
Dr.S.Yajnik, Dr.(Mrs.) S.Dhawan, Dr.S.K.GoeI

Standing 1st Row

Dr. R. Gupta, Dr.Deptii, Dr.Zeenat, Dr.Gita, Dr.(Mrs.)N. Katre, Dr.N. Bano, Dr.Jayalakshmi,
Dr. Leela, Dr.(Mrs.)U.Passi, Dr. (Mrs.)M.Rao

Standing 2nd Row

Dr. Ismaily, Dr. Satya Murthy, Dr. Mahadevan, Dr. Ram Chandra, Dr.S.S.Saini,
Maj. N.B.Moullick, Dr. Pati.



May, 1975

Sitting (L to R)

Dr.T.S.Jayalakshmi, Dr.Nita Saxena, Dr.S.K.GoeI, Prof.GR.Gode, Dr.V.A.Punnoose, Dr.H.L. Kaul,
Dr.Nirupama Das,

Standing 1st Row

Dr.Krishna Panigrahi, Dr.Madhavi Ramachandran, Dr.Mary, Dr.Sujata, Dr.Mira Krishnan,

Standing 2nd Row

Dr.Kiran Bhasin, Dr.Vimla Mitra, Dr.Rashmi Madan, Dr.Vidya Murthy
Shri R.P.Sharma, Shri Anir Chand, Dr.A.V. Raju, Dr.M.R.Rajagopal, Dr.S.K.Sayeed, Dr.G.B.Kohli,
Dr.K.Srihari, Dr.G.N. Kalla, Dr.B.Ray, Dr.D.D.Tamta

Standing 3rd Row

Shri Chedi Lal, Shri K.B.Saxena, Shri Umed Singh



May, 1976

Sitting on Ground (L to R)
Sitting on Chairs

Standing 1st Row

Standing 2nd Row

Mr. Umed Singh, Ram Kumar, K.B.Saxena, R.P.Sharma
Drs. N.R.Kalle, G.B. Kohli, N. Saxena, S.S.Saini, G.R.Gode, S.Dhawan, A. V/Rajju, Vidya Prasad,
K.P.J.Choudhury.
Drs. Neeraj Varshney, Aruna P. Ghorpade, Sujata Prasad, Rashmi Madan, Vinla Mitra, Meera Krishnan,
Madhavi Ramachandran, Krishna Punigrabi, Shaalaja Kale, Sathiyavathy Ramesh, Mrs.Choudhury,
Kiran Bhasin.
Drs. G.N.Kalla, M.R.Rajagopal, S.K.Sayeed, K.Srihari, Ashok V.Stumant, H.Y.Sane, D.D.Tantla, G.M.Bhar,
H. Doshi, B.Roy, Bikram Ahuja.



May, 1982

Sitting (L to R)
Dr.V.A.Punnoose, Dr.Rashmi Madan, Dr.S.S.Saini, Dr.Chandratekha, Dr. Nita Saxena, Dr. H.H.Dash

Standing 1st Row
Dr.Navnit Kaur, Dr.Akhitar, Dr.C.M.Bhagat, Dr.Bupesh Kaul, Dr.R.Rajeshwari, Dr. Amaaporna, Dr. Usha Goel, Dr.Abha Rani, Dr.Yanki D.Shipmo, Dr.Ridaplin War,
Dr.Mary Abraham, Dr.Bandana Chatterjee, Dr.Maya, Dr.Naresh Kaul, Dr.Sunil D.Shitoot, Dr.Samir Kapoor.

Standing 2nd Row
Bhalla, Dr.P.K.Khilmani, Dr.P.K.Kalia, Dr. Jagdish Shahani, Dr. Dinesh K. Chaudhry, Dr.Mannohan Singh, Dr.P.Issac Muthiah, Dr. S. Vijayaraghavan.

Dr.R.S.Choudhry, Dr.Mahesh K. Arora, Dr.T.S.Jayalakshmi, Dr.H.L. Kaul, Dr.S.K.Goel, Dr.N.R.Kalle, Prof.G.R.Gode (Head of the Deptt.),
Dr.V.A.Punnoose, Dr.Rashmi Madan, Dr.S.S.Saini, Dr.Chandratekha, Dr. Nita Saxena, Dr. H.H.Dash

Dr.C.M.Bhagat, Dr.Bupesh Kaul, Dr.R.Rajeshwari, Dr. Amaaporna, Dr. Usha Goel, Dr.Abha Rani, Dr.Yanki D.Shipmo, Dr.Ridaplin War,
Dr.Mary Abraham, Dr.Bandana Chatterjee, Dr.Maya, Dr.Naresh Kaul, Dr.Sunil D.Shitoot, Dr.Samir Kapoor.

Dr.Gajendra Singh, Dr. Yatin Mehta, Dr.Parmod Bithal, Dr.S.N.Rattan, Dr. Subroto Nag, Dr.N. Tomcha, Dr.S.K.Sonar, Dr. Sunil Arora, Dr.A.P.
Bhalla, Dr.P.K.Khilmani, Dr.P.K.Kalia, Dr. Jagdish Shahani, Dr. Dinesh K. Chaudhry, Dr.Mannohan Singh, Dr.P.Issac Muthiah, Dr. S. Vijayaraghavan.

Alimsonians At Chandigarh, Jan 1992



Anaesthesia AIIMSONIANS at 49th Annual Conference ISA, at Delhi - 1997



Anaesthesia AIIMSONIANS at Bangalore, ISA Annul Conference.



Happy Moments - At Picnic



Anaesthesia AIIMSONIANS - INTERNATIONAL WORKSHOP at Delhi - 1983



*Happy Moments - At Cultural Programme
Dr. N. R. Kalle falicitating the artist*





AIIMONIANS
at
ISA Delhi Executive



Australasian Conference
Audience at AIIMS

AIIMONIANS at Delhi
with
Prof. Denton Cooley, 1979



Dr. H.L.Kaul,
Dr. Nita Saxena, Dr. Saini,
Dr. G.N.Kalla



AIIMONIANS
with
Delhi Governor
and
ISA Delhi members



Departmental Picnic
with family members



**Dr.H.L.Kaul,
Dr.B.L.Bhattacharjee,
Dr.Bali**



**Inauguration of
Conference at AIIMS, by
Governor of Delhi
(ISA Annual day)**



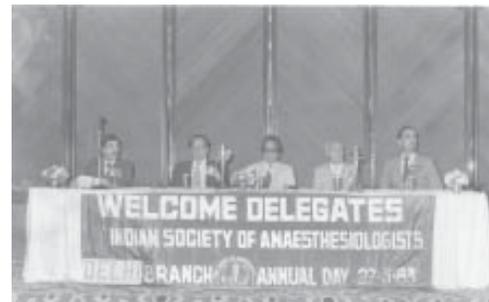
**Departmental Picnic
playing coco**



Dr.H.L.Kaul



Conference at AIIMS



**ISA Delhi Annual Day-
Inauguration**



**Departmental Picnic –
sweet memories**



**Get together at
AIIMS Gymnasium**



**Departmental Picnic –
sweet memories**



**AIIMSONIANS
celebrating
Col. G.C. Tandon
80th Birthday**



**AIIMSONIANS
celebrating
Col. G.C. Tandon
80th Birthday**





AIIMONIANS with family



Departmental Picnic

**Mrs. Col. G.C. Tandon,
Dr. H.L.Kaul and
Dr. R.K.Batra**



Departmental Picnic



Departmental Picnic



Returning from Picnic in the bus



**AIIMONIANS with
conference delegates**



**Dr. Kaul with
ICU staff**



Departmental Picnic



**Dr.Saini receiving gift
from Dr.Kaul**



**Group photograph in
2003 during
Dr. Rashmi Madan's
farewell**



Departmental Picnic



**AIIMONIANS during
International Workshop**



**Farewell to Technical
staff AB-8 duty room.**



**AIIMONIANS took over
as
ISA Delhi Executive**



**AIIMONIANS took over
as ISA Delhi Executive**



Departmental Picnic



**AIIMONIANS
at
Chandigarh conference**



**Dr. Madhavi visiting
the department**



**Inauguration
International Conference
on pain 1993**



**AIIMSONIANS at
Chandigarh
January, 1992**



**International Conference
on Pain - 1993 organiz-
ing members**



**AIIMSONIANS at
49th Annual Conference
ISA, at Delhi - 1997**



**International
Conference on Pain -
1993 at banquet**



**International
Conference
on Pain – 1993
Inauguration of
Exhibition
by Prof.Yashpal.**



**Dr. Kaul
in a conference**



**AIIMSONIANS at
49thAnnual Conference
ISA, at Delhi – 1997**



**AIIMSONIANS
at Bangalore,
ISA Annual Conference**



**Dr. Kaul with SACA
members**



**SACA Conference
at Chennai**