



**PRAVARA INSTITUTE OF MEDICAL SCIENCES
(DEEMED TO BE UNIVERSITY)**

**Loni, Tal. Rahata, Dist. Ahmednagar 413736
NAAC Re-accredited with 'A' Grade**

SYLLABUS

**Post Doctoral Fellowship in Paediatric Anaesthesia (Dept. of Anaesthesiology)
(Dr. Balasaheb Vikhe Patil Rural Medical College)
(Academic Council Meeting Dated 25th August 2022)**

Introduction

Delivering anaesthesia for paediatric & neonate requires special amount of skill & knowledge with respect to anatomy, physiology, pharmacology, embryology, surgical procedure, fluid & electrolyte balance because children cannot be considered as small adults.

In the course of postgraduate (M.D. DNB) training in anaesthesia there is rotation for paediatric surgery but the exposure to wide variety of cases in paediatrics age group & neonates may not be adequate enough to have confidence to provide anaesthesia in this group independently. This lacunae can be filled by the one year fellowship in paediatric anaesthesia. Different institutes are having such fellowship programmes.

In our Institutes we are having super specialist in paediatric surgery Dr. Gharpure (MCH, paediatric surgery AIMS Delhi). He is operating wide variety of neonatal & paediatric patients excellently and successfully. We are having Dr. Bhavika Singla who has done fellowship in paediatric anaesthesia from Bombay & she is taking keen interest in these cases. Anesthesiologists from our institute are exposed to such patients for providing anaesthesia & contribute for the success of these cases. Neonatal & paediatric ICUs are well developed & well equipped for taking good amount of post operative care of such patient which is also very important factor in contributing towards the success in these cases.

In general surgery we are anaesthetising 35 to 40 paediatric patients per month. Apart from this we are facing orthopedic, ENT, Ophthalmology, burns & plastics, neurology surgeries in paediatric & neonatal patients. Outside OT we have to deal paediatric patients in CT & MRI setup.

No of operations done in surgical branches -

| | |
|-----------------|---|
| General Surgery | 50-60 Pts/mth, Emergeny - 15-20 Pts/mth |
| ENT | 15-20 Pts/mth |
| Orthopedic | 20-25 Pts/mth |
| Ophthalmology | 10-15 Pts/mth |
| Burns/plastic | 15-20 Pts/mth |
| Neurology | 8-10 Pts/mth |
| MRI CT Scan | 15-20 Pts/mth |

Type of operations done:

General Surgery -

Tracheo -oesophageal fistula
Diaphragmatic Hernia
Imperforate anus
Anorectal malformations
Hirshprung's Disease
Branchial Cyst
Intestinal obstruction
Intestinal perforation
Posterial urethral valves
Pelviureteric stenosis for Anderson Hyne operation
Tumours of kidney
Nephrectomy
Decorticationof lung
Hypospadius correction
Circumcision
Congenital Hernia
Hydrocele
Undescended testes
Bladder Stone
Congenital Hypertrophic pyloric stenosis

Burns & Plastic

Cleft Lip & Cleft Palate
Contracture release
Burns Dressing
Skin Grafting

ENT

Foreign body in bronchus

Foreign body in oesophagus

Tonsillectomies

Adenoidectomy

Mastoid surgeries

Tympanoplasty

Tongue tie

Extraauricular appendages

Emergency tracheostomy

Orthopedic

CTEV correction

Hip Spika

Polydactyly

Syndactyly

R+U for nailing/plating

shaft femur for nailing & plating

Humerus fracture

External fixater application

Ophthalmology

Congential cataract

Squint surgery

Corneal tear

Ptosis surgery

Probing for canalicular blocks

Chalasion

Enucleation

Evisceration

Foreign body in eye

Alkali Burns

Examination of Eye under GA

Occuloplastic surgery for the tumors of eyeball

Neurosurgery

Minigocoele

Minigomydocoele

Hydrocephalus for V. P. Shunts

Trauma-Head injury -Subdural haematoma

Extradural Haematoma

Considering the paediatric load for anaesthesia fellowship in paediatric anaesthesia can be welcomed under our esteemed institute PIMS Loni

Type of Anaesthesia

We have facility to provide general anaesthesia with modern anaesthesia workstations e.g. Dragers primus, Fabius plus which are having facilities to give IPPR with volume/pressure cycle mode of ventilation. All operation theater are modular one.

Volatile anaesthetic agents -Halothane, Isoflurane, Sevoflurane Delivered Through Tec Vaporisers.

Anti Cholinergic Drugs - Atropine, Glycopyrrolate

IV Anaesthetic Drugs - Ketamine, Propofol, Na Pentothal

Muscle Relaxants -Succinyl Choline, Atracurium, Vecuronium, Rocuronium

Analgesics-Paracetamol, Fentanyl, Diclofenac Sodium

Opioids & sedatives- Midazolam, Dexmedetomidine, Clonidine

Paediatric Spinal Anaesthesia - With 0.5% Bupivacaine With Adjuvants like Clonidine

Caudal Epidural-With Bupivacaine 0.25%

Nerve Blocks - PNS or USG guided

Supraclavicular brachial plexus block

Interscalene block

Axillary block

Femoral nerve Block

Penile block

Peribulbar block for eye surgery

Intravenous regional anaesthesia

From this year input for the PG in anaesthesia has increased to 11 students per year & allotted also. These PG students are more likely to seek such fellowship from their parent institutes as they will be learning paediatric anaesthesia in more familiar atmospheres. As SR ship is compulsory now, the students can simultaneously do SR ship along with fellowship in paediatrics. Fellowship programme will also initiate newer development in the techniques & use of newer drugs & agents in the field of paediatric anaesthesia. With this additional qualification our students can also position themselves in large set up at metro cities & big cities to take our institutes name to higher level.

1. Title - Fellowship in "Paediatric Anaesthesia"

2. Objective -

- a. To train the postgraduate students in "Paediatric Anesthesia"
- b. To upgrade the Department of Anaesthesia by developing fellowship programmes.
- c. To highlight the prestige of PIMS through different fellowships.
- d. To initiate research work in paediatric anaesthesia.
- e. To avail the facility of such fellowship in rural area & giving the rural paediatric patients services as good as metro cities.
- f. To develop high standard in paediatric anaesthesia which will in turn attract the postgraduate student from all over India & contribute towards the progress of the PIMS.

3. Eligibility of the programme

- M.D., DNB in anaesthesia, DA with one year experience of anaesthesia work from any recognized university in India
- Postgraduate qualification in anaesthesia from any recognized universities from abroad, provided candidate clears MCI examination & obtains MCI or state recognition
- If there are less than 10 applications candidates may be selected on the basis of interview only. If there are more than 10 applications a CET may be conducted CET will include MCQS & justification essay.

4. Duration -

- One calendar year with two semesters
- 900 TL
- 40 Credits (20 Credits each semester)

5. Content / Syllabus of the programme

1. Anatomy of Neonate & paediatric age group
2. Physiology of Neonate & paediatric age group
3. Embryology
4. Pharmacology
5. Fluid & electrolyte management
6. Acid Base balance
7. Biochemistry in paediatrics
8. Preoperative check up & preparation of patient before operation.

9. Premedication & understanding psychological impact of surgical stress & separation from parents, its long term effects, ways to reduce these impacts for the better outcome of surgery.
10. Type of Anesthesia whether general or combined with caudal/ epidural/ spinal. In general whether intubated or with LMA.
 - A. For General Anaesthesia induction agents, their doses, adverse reactions. Different volatile anaesthetic agents their advantage & disadvantage.
 - B. Regional Anesthesia-
 - a. Caudal anaesthesia - Different drugs used , technique of caudal anaesthesia, adjuvant which can be used, doses of adjuvants, complications of caudal anaesthesia
 - b. Spinal anaesthesia-technique, different drugs used intrathecally with proper doses , adjuvants which can be used, doses of adjuvant. Advantages of this techniques, disadvantage & complication of paed. Spinal anaesthesia.
 - c. Epidural anaesthesia understanding the techniques of identifying epidural space with Touhy needle & passing epidural catheter, use of different drugs, adjuvants used, learning advantages disadvantages of the epidural anaesthesia. Awareness regarding complication & precautions to avoid it.
11. Nerve Block

Learning of technique of different nerve blocks under PNS & USG guidance knowing the doses of diff. Local anaesthesia drugs used. Limitation of techniques , prerequisites for conduction of nerve block, Need for supplementation of sedation for successfully utilization of nerve block.

These block include supraclavicular nerve block, interscalene block, femoral block, peribulbar block, penile block, ankle block, wrist block, finger block, IV regional anaesthesia.
12. Special precaution to be taken while giving anaesthesia with respect to different types of surgery.
13. Monitoring under anaesthesia.
14. Invasive techniques for CVP, Arterial Line
15. Use of LMAs
16. Use of paediatric fiber optic scopes.
17. ICU care for premature, neonates & paediatric age group.
18. TPN-Fluid & electrolyte balance
19. Inotrope support with use of syringe pumps
20. BLS/ACLS
21. Ventilator setting & management
22. Pain management intra operatively & post operatively.

23. Practical exposure for conducting cases in different surgeries like general surgery, ENT, ophthalmology, Burns, plastic, Neurosurgery, Orthopedics, CT, MRI & knowing the specific difference in giving anaesthesia in these different situations.
24. Learning central venous access in case of difficult Iv access.
25. Establishing intra-arterial catheter for invasive blood pressure monitoring.
26. *How to improve in safety for anesthetic management of children.*
 - *By Monitoring Equipment*
 - Medications*
 - Techniques*
 - Resuscitation*
27. *Approach towards Enhanced Recovery after Paeditric Surgery for improvement of surgical outcomes*
 - a. *Preoperative counselling*
 - b. *Minimal fasting – Gastric ultrasound playing major role in establishing safety for children while moving towards Liberal feeding,*
 - c. *No routine pharmacological premedications /These practices are critical components of Enhanced Recovery after Surgery.*
28. *Para oxygenation in addition to pre oxygenation has resulted in reduction in desaturation episodes during periods of apnoea.*
29. *Motivation to collect more evidences regarding ongoing disputes and issues such as effect of anaesthesia on Neurodevelopment.*
30. *Hospitalization and surgery can provoke significant stress and anxiety – Importance of non pharmacological agents like*
 1. *Preoperative visit*
 2. *Use of Music* } *to allay anxiety*
 3. *Smart Phones*

All there should be encouraged and implemented.
31. *Newer drugs for Paediatric usage.*
 - Remimazolam – Ultrashort acting for Sedation.*
 - Articaine*
 - Propofal infusion*
32. *Promotion of nerve blocks for intra and postop analgesia*
 - *To reduce morbidity*
 - *For smooth and fast recovery*
 - *To reduce anxiety and psychological trauma during hospitalization.*
33. Recent advances in paediatric anaesthesia

Text books on paediatricanaestheisa for reference

- 1) Smithsanaesthesia for infants & children.
- 2) Gregoryspaediatricanaesthesia
- 3) Cote & lerman's -practice of anaestheisa for infants & children.
- 4) Manual of paeditricanaestheisa-Lerman

Candidates will be expected to publish one research paper & attend one state/national / international conference & present paper or poster.

6) Curriculum Delivery/Transaction

- Candidates will be posted in different surgical faculties' e.g. General surgery, Neurology. Orthopaedics surgery, Ophthalmological surgery, ENT Surgery, Burns plastic surgery, MRI, CT Scan procedures. Candidate will learn giving anaesthesia& related problems under the faculties posted in these theaters. Candidates will rotate in these theaters.

- Each candidates will have one month rotation of paediatric ICU management.- Over the year candidates will have seminar, Case presentation, Journal club, and lecture in the afternoon session twice week. Detailed programme can be prepared for the year.

7) Programme outcome

Aftre completing the fellowship programme the candidates will be confident in anesthetic management of neonatal, pre mature & paediatric patients for elective as well as emergency surgical cases from General surgery, Neurosurgery, ENT, Ophthalmology, Burns & plastic & outside of cases in the department radiology for CT & MRI.

Candidate will also be able to manage the post operative ICU neonatal, premature & paediatric patients as well as post operative pain management .

8) Examination & Evaluation Methods

Two examination will be conducted at the end o each semester.

900 hr. OT TL Distribution -

200 hrs of OT training in General surgery/yr

100 hrs of OT training in Orthopedic surgery/yr

100 hrs of OT training in Ophthalmology surgery/yr

100 hrs of OT training in ENT/yr

100 hrs of OT training in Burns & plastic/yr

100 hrs of OT training MRI CT Scan/yr

100 hrs of OT training ICU/yr

100 hr for seminar, case presentation, journal club, One hr day, twice a week

In OT training in different specialties of paediatric surgery candidate will have hands on for induction of general anaesthesia, intubation, use of volatile anaesthetic agents, maintenance of anaesthesia, use of muscle relaxants, reversal of muscle relaxants, extubation & management of problems faced with preparation of drugs in paediatric concentration. Establishment of intravenous accesses

Hands on for regional techniques like caudal, epidural block, spinal anaesthesia, continuous epidural anaesthesia, nerve blocks under PNS or USG guidance.

Use of fiber optic intubation, Use of LMA. Candidates will be learning specific problems related to specialty paediatric surgeries like General surgery, Neurosurgery, Urosurgery, Orthopaedics, Ophthalmic, ENT, Burn & Plastic & MRI CT Scan Procedures.

In ICU training candidates learn about mechanical ventilation, water electrolyte balance, acid base balance & its management, intra arterial accesses, central venous line access & monitor different parameters in ICU, Insertion of chest drain, Insertion of peritoneal dialysis catheters.

First Examination at the end of first semester include

- a) Anatomy of neonate & paediatric age group.
- b) Physiology of neonate & paediatric age group.
- c) Embryology
- d) Pharmacology
- e) Fluid & electrolyte management
- f) Biochemistry in paediatrics
- g) Acid base balance

Second Examination at the end of second semester will include

- a) Preoperative checkup & preparation of patient before operation
- b) Premedication
- c) Type of anaesthesia -
General or combined with caudal spinal epidural, methods of intubation, different type of endotracheal / LMA tubes
- d) For general anaesthesia -Iv induction agents, volatile anesthetic agents.
- e) Regional anaesthesia -caudal, spinal, epidural
- f) Nerve Blocks
- g) Specific problems related to different surgeries in General surgery, Orthopedics, ENT, Ophthalmology, Neuro surgery, Burns & plastics, CT MRI procedures.

- h) Central venous access, invasive blood pressure monitoring
- i) Recent advance in paediatric anaesthesia

- **Evaluation:-**

Term end examination will be arranged and conducted by Dept. of Anaesthesiology, Dr. Balasaheb Vikhe Patil Rural Medical College and declare the result.

Examination Scheme

Paper – I: Post Doctoral Fellowship in Paediatric Anaesthesia – I

Paper – II: Recent advances in Post Doctoral Fellowship in Paediatric Anaesthesia

Theory Examination:- (1 Paper of 100 marks)

| | | | |
|-----------------------|------------|---|-----------|
| MCQ | = 40 Marks | } | 100 Marks |
| SAQ (6 each 10 Marks) | = 60 Marks | | |

Papers will be evaluated by senior professor in anaesthesia

Practical Examination:-

| | | | |
|------------------------------|------------|---|-----------|
| One Long Case | = 40 Marks | } | 100 Marks |
| One Short Cases | = 20 Marks | | |
| Two Table Viva 20 Marks each | = 40 Marks | | |

For practical –Oral –anatomy, physiology, embryology, Biochemistry, fluid & electrolyte management, acid base balance

Table viva for Drug's IV fluids Xray, ECG, ABG

Minimum Passing:-

- i) Minimum 50% in Theory papers (Each paper minimum is 40%)
- ii) Minimum 50% in Practical /Clinical & Viva Voce
- iii) Overall 50% Theory & Practical/Clinical

Award of class:-

| | |
|--------------|--|
| 50% to 59.5% | = II nd class |
| 60 to 74.5% | = I st Class |
| Above 75% | = I st Class with Distinction |

Attempts:-

- A student shall clear the Examination only within three attempts or within 4 years of admission.
- Result / Issue of Mark Sheet – Head of Institute & HOD will jointly issue the Mark Sheet.

Certification:-

- A) Title – Post Doctoral Fellowship in Paediatric Anaesthesia.
- B) A fellowship is awarded upon successful completion of the prescribed study program, which will state that i) Candidate has completed the prescribed course of Post Doctoral Fellowship in Paediatric Anaesthesia, ii) Candidate has completed prescribed clinical experience. iii) Candidate has passed the prescribed examination.

- C) Certificate will be issued with the signatures of concern Dean, Dr. Balasaheb Vikhe Patil Rural Medical College & Vice-Chancellor, Pravara Institute of Medical Sciences (Deemed to be University).
- D) Certificates to be prepared by concern College.

Portion

- Pre operative check up & preparation of patients before operation
- Premedication & understanding psychological impact of surgical stress & separation from parents, its long term effects, ways to reduce these impacts for the better outcome of surgery.
- General anaesthesia & anaesthetic agents
- Regional anaesthesia - Spinal, Caudal, epidural
- Nerve blocks with PNS & USG guidance.
- Special precaution to be taken while giving anaesthesia with respect to different types of surgery.
- Monitoring under anaesthesia.
- Invasive techniques for CVP, Arterial Line
- Use of LMAs
- Use of paediatric fiber optic scopes.
- ICU care for premature, neonates & paediatric age group.
- TPN-Fluid & electrolyte balance
- Inotrope support with use of syringe pumps
- BLS/ACLS
- Ventilator setting & management
- Pain management intra operatively & post operatively.
- Practical- 100 marks-passing 50%
- Consist of -case present-1 major & 1 Minor

Table viva-Instruments, Drugs, IV fluids, X-ray, ECG, ABG, Anaesthesia Circuits Paper will be evaluated by senior professor

9) Certification authority & design of certificate

- Certification authority will be Vice-chancellor, PIMS
- Certificate design will be according to PIMS design.

10) Place & venue of the academic work at the programme, PIMS(DU), DBVPRMC, Loni

11) Department offering the programme-Department of Anesthesia

12) Intake per batch-Two per year can be ---as per decision of higher authorities.

13) Academic Calendar - Admission in May every year examination in second half of april.

- 14) **Time Table-** to be submitted later
- 15) **Maintenance of attendance-**Via Biometric Attendance
- 16) **Arrangement & conduction of programme-**
 - Class room session – In Seminar hall of Dept. of Anaesthesia.
 - Practical session- In all operation theater & ICU (paeditric& neonatal)
- 17) **Liasoning-** HOD Anaestheisa or Senior Professor
- 18) **Evalution-** HOD & Senior Professor
- 19) **Documentation-**HOD & Senior professor
- 20) **Appointment** of Director/Co ordinator. Resourse Person, Teacher Assistance – Dean DBVPRMC
- 21) **Approximate Expenditure involved to run one batch per programme.**

Administrative expenditure at 20000 is expected for paper work, processing of applications, advertisement & conducting interviews.

More expenditure may be incurred in getting external examination for practical examination
- 22) **Fees proposed to be charged per course-1 lac/person/ yr.**
- 23) **Financial & administrative** expectation from PIMS (Du)/PMT to run the programmes
PIMS-DU/PMT will be excepted to provide accommodation to the participants in postgraduate Hostel, Provide mess facilities & Library facility with books & journals on paedtric anaesthesia Dedicated USG machine with high resolution for giving nerve block.
- 24) **Infrastructure requirements-**Classroom, operation theater with good no. of peadiatric cases already available.
- 25) **Yearly A-A-A0 Audile** of the programme & financial audit process & format- according to the PIMS norms.
- 26) **Annual** meta evaluation & up gradation of the content & delivery of the programme.- according to PIMs norms
- 27) **Central** documents – According to PIMS Norms
- 28) **Grievance redressal** & appeals mechanism- According to PIMS Norms
- 29) **Any** other aspect of the programme not covered above
 - Provision of leave
 - separate provision of stipend not needed as the candidates will be working as SR Level& so they will receive salary for the same post from the institute.

30) **Saving** clause whenever difficulty arises – powers of the authorities of the university.

According to PIMs norms

The facility of the fellowship provision can be highlighted on PIMS website with special mention regarding the variety of surgeries performed & number of cases performed per year. This will definitely attract candidates for this fellowship.




Registrar
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