



**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 Programme in Regional Anaesthesia (Dept. of Anaesthesiology)  
Dr. Balasaheb Vikhe Patil Rural Medical College  
(Academic Council Meeting Dated 25<sup>th</sup> August, 2022)**

**Title - Fellowship in Regional Anaesthesia**

**Proposal**

Proposal to start 1year fellowship in Regional Anaesthesia for post M.D. / DNB Anaesthesia/ DA with one year experience of anaesthesia work, candidates form RMC, PIMS (DU) Loni as well as from other colleges from all over India.

**Introduction**

Our institute, being a tertiary care centre for referral of patients from various primary health centres and other institutes as well, witness a wide array of patients of trauma, burns, and other injuries apart from the various other diseases.

In such individuals, the primary management remains as pain management peri-operatively. Considering the age group of patients and their co-morbidities, neuraxial blocks and general anaesthesia prove to be risky. Hence, we prefer nerve block technique, which helps in preventing the extreme hemodynamic instabilities, prolonged post-operative analgesia, better and early rehabilitation and mobilization.

With increasing trends towards eco-friendly anaesthesia, the Regional Anaesthesia is one the major up-coming branches of anaesthesia. We have a complete setup with peripheral nerve locators, nerve stimulators and recent addition of USG machine for the peripheral nerve blocks in our institute which has proven to be a boon for the department also benefiting the patients coming for various procedures.

In the course of postgraduate (M.D. /DNB) training in anaesthesia there are rotation postings in various specialities where-in they can have the hands-on nerve blocks, but the exposure to wide variety of cases in all age groups may not be adequate enough to have confidence to provide the nerve blocks independently. To strengthen their ability of peripheral nerve blocks, with the help of USG machine, residents can undergo a 1year training as fellowship in regional anaesthesia, in our institute.

We have faculties who are well versed in Regional Anaesthesia, and various nerve blocks, with their different approaches and techniques.

Various procedures under nerve blocks:

### Orthopaedics:

- Fracture upper limbs : including # clavicle, humerus, radius, ulna, metacarpals, carpals, phalanges, shoulder arthroscopy procedures including diagnostic and repair of the culprit tendons, etc.
- Fracture Lower limbs: including Fracture femur, IT femur, Neck of Femur, tibia, fibula, Malleolus.

### Plastic surgery:

- Post burn contracture of the upper and lower limbs, collagen dressings in the upper and lower limbs, other aesthetic procedures of the upper and lower limbs, and trunk.

### Surgery:

- Debridement of wounds over upper limbs and lower limbs, amputations of lower limb at various levels.

**Obstetrics and gynaecology:** Post cesarean section truncal blocks for analgesia, mostly after General anaesthesia.

### Types of blocks:

	UPPER LIMB	LOWER LIMB	TRUNCAL BLOCKS
<b>LEVEL1</b>	Inter scalenebrachial plexus Supraclavicularbrachial plexus Axillary brachial plexus Superficialcervical plexus	Femoral Saphenous Popliteal Sciatic	Transversus abdominal plane Rectus sheath Ilio-inguinal / iliohypogastricnerveblock.
<b>LEVEL2</b>	Costoclavicular Lateral infraclavicularSuprascapular nerve Mid- forearm (wrist) Mid-humeral	Subgluteal sciatic nerve Commonperonealnerve Tibial nerve Ankleblock	PEC 1/2, SAP1/2 Erector spine block Multifidusblock. Caudalblock

<b>LEVEL3</b>	Truncal injection Root level injections Stellate ganglion Deepcervicalplexus Diaphragmatic functionassessment	Obturator nerve Parasacral sciatic Lumbarplexus	Quadratuslumborum Thoracic paravertebral Lumbar paravertebral Centralneuraxialblocks 1. Spinal 2. Epidural
	<b>CONTINUOUS CATHETER BASED TECHNIQUES</b>		

**Curriculum:**

A curriculum should define three components, namely, Knowledge to be gained (Syllabus, Cognitive domain), Skills to be acquired (practical training, psychomotor domain) and the Attitude to be developed (Behavioral changes to be brought about, Affective domain) and the Teaching-Learning methods to be adopted to achieve the goals and the methods of assessment throughout the training period (Formative assessment) and at the completion of training (Summative assessment).

**1. Knowledge to be gained (Theory, Cognitive domain)**

The candidate should be able to demonstrate a clear understanding of the following aspects in Regional Anesthesia.

**(i) Equipment**

- a) Physical principle behind the Ultra Sound image generation
- b) Knobology, Transducers and its application.
- c) Potential pitfalls and artifacts in Ultra Sound imaging of nerves.
- d) Colour Doppler principle and its application.
- e) Special software available for better needle nerve visualization.
- f) Biological effects of Ultra Sound.
- g) Equipment disinfection and sterilization procedures.
- h) Physical principle behind the PNS equipment.
- i) Setting up and trouble shooting of Peripheral Nerve Stimulator.

**(ii) Applied Anatomy**

- a) Regional innervations and anaesthesia strategies for head and neck surgery.
- b) Regional innervations and anaesthesia strategies for Upperlimb.
- c) Regional innervations and anaesthesia strategies for thorax.
- d) Regional innervations and anaesthesia strategies for abdominal cavity.
- e) Regional innervations and anaesthesia strategies for Hip and Lower limb.
- f) Potential US window and cross sectional anatomy for regional anaesthesia.
- g) Epidural and Intrathecal space anaesthesia.
- h) Nerve architecture and implications with respect to regional anaesthesia.

**(iii) Applied physiology**

- a) Nerve conduction and type of nerve fibres.
- b) Pain pathway- visceral and somatic.
- c) Patho physiology of acute and chronic pain-difference between nociceptive/neuropathic pain.
- d) Autonomic nervous system and differential blockade.
- e) Nerve Injury-assessment, treatment and follow-up.
- f) Nomenclature and Intra neural injection definition and implications.
- g) Tourniquet implications.

**(iv) Applied Pharmacology**

- a) Pharmacokinetics and dynamics of Local anaesthetics ( single / continuous infusions).
- b) Pharmacokinetics and dynamics of LA adjuvants.
- c) Pharmacokinetics and dynamics of Anti coagulants.
- c) Conscious sedation.
- d) LA Systemic Toxicity.
- e) Neurolytic agents.

## 2. Skills to be acquired (practical training, psychomotor domain)

### What to focus in teaching? Land mark guided/PNS guided/US guided Regional anaesthesia?

The focus of the training program is to train the resident to deliver appropriate safe and effective regional anaesthesia for optimal perioperative out come. The appropriate component to fRA delivery can be taught through theory (Knowledge) where as safe and effective delivery needs guidance device. We evolved from Landmark to PNS to US guidance to deliver local anesthetic close to the nerves. It is needless and gross ignorance to compare and debate, which one is better because each one is a different tool, helped us to deliver the effective RA at different time. Interms of safety and efficacy US guidance unparalleledly superior because it shows what we are doing. However the ideal regional anesthesiologist should have through understanding of the three-dimensional anatomy including surface landmark to guide where to place the probe to search the nerves, and skill of stimulating the doubtful targets (PNS) where US resolution is not able to discriminate nerves from the surrounding structure and skill of using US to see, interpret and reach the target of interest. Hence the teacher should instill the skill of using all three tools to complement each other wherever it is appropriate to deliver safe and effective anaesthesia. In an ideal setup, US guidance occupies 80% of the interventions and PNS complements US in 20 % of the deeper location (eg, lumbar plexus / Para sacral /sciatic etc) where US axial and lateral resolution is poor to discriminate nerves and understanding regional anatomy.

At the end of 1 year the fellow should be able to demonstrate competency in performing various RA techniques in the following aspects.

- Find the target of interest in the center of the image.
- Place the machine focus on the target structures.
- Place depth setting at 1cm deep to target structures.
- Adjust gain, time-gain compensation, and frequency as necessary.
- Appreciate Joint Committee recommended standardization of patient-screen relationships.
- Initiate the PART manoeuvres to optimize image quality.
- Define relevant anatomy in each region including the ability to identify muscle, pleura, nerve, tendon and bone.
- Able to use PNS appropriately to locate the peripheral nerves.
- Scan anticipated needle trajectory with colour Doppler to identify any unsuspected vascularity.
- Define needle insertion technique using the Joint Committee recommended terminology. (in-plane vs out-of-plane)
- Recognize correct and incorrect distributions of local anesthetic
- Understand potential difficulties and pitfalls.
- Use of nerve stimulator along with USG to detect intraneural needle placement
- Rescue blocks
- Block failure management plans
- Application of the acquired knowledge and skill for providing
  1. Acute pain relief—such as management of post-operative pain by continuous catheter techniques
  2. Rehabilitation—such as in peri - arthritis shoulder, knee mobilization following TKR surgeries.
  3. Levels of difficulty of USG guided blocks based on learning curve required to achieve success rate

### Course structure:

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PIMS (DU), Post Doctoral Fellowship Programme in Regional Anaesthesia (Dept. of Anaesthesiology) - Syllabus, implemented from Academic Year 2022-2023

Notification No. 66/2022

Academic Council Meeting dated 25.08.2022

This would be a 1 year course; registration would start in the month of June and January every year, with an intake capacity of 2 per batch, i.e. 4 per year.

### **Aims of the fellowship:**

On successful completion of the course the fellow should be able to demonstrate competency in terms of skill, knowledge and attitude in delivering safe and effective Regional anaesthesia for better patient care.

### **Admission criteria:**

- M.D., DNB in Anaesthesia, DA with one year experience of anaesthesia work from any recognized university in India or abroad.
- Overseas candidates will have to obtain MCI registration before joining.
- PIMS may conduct entrance examination if there more than 20 applicants or else candidates will be selected by interview.

### **Other Issue**

- Rs. 50,000/- per year course fees may be charged from candidates
- Post M.D./D.N.B. candidates DA with one year experience of anaesthesia work can be promoted to join fellowship programme during SR ship & pay for the course charges to university.
- Such candidates will get the payments of SR ship as per the rule of PIMS.
- Candidates will do emergency duties as per the departmental scheduled

### **Registration process:**

- 2 candidates will be selected in each batch; registration would start from June for July batch and December for January batch. The fellowship would be starting from 1<sup>st</sup> January and 1<sup>st</sup> July every year.
- Nominal fees proposed to be charged per course per participant with the approval of authorities:
- Proposed fees: Rs. 50,000/- each candidate. (May increase 10-15% yearly)
- About 20% of the fees would be utilized for faculty incentive, as per the list provided by the head of the department of anaesthesiology, at the end of every session.

### **Books to read:**

- 1) Regional nerve blocks by Sandeep Diwan

- 2) Hadzic's peripheral nerve blocks and anatomy for ultrasound – guided regional anaesthesia, Admir Hadzic. Second edition.
- 3) An illustrative manual of ultrasound guided regional anaesthesia for children and adults. Vrushali Ponde, third edition.
- 4) Step by step: Regional anaesthesia , Arun Kumar Paul. Second edition.
- 5) Hadzic's textbook of Regional Anaesthesia and Acute pain Management, Second edition, by Admir Hadzic.
- 6) Hadzic's Peripheral Nerve Blocks and Anatomy for Ultrasound-guided Regional Anaesthesia, 3<sup>rd</sup> edition, By Admir Hadzic.
- 7) Atlas of Sono-anatomy for regional Anaesthesia and pain medicine, by Manoj Karmakar.
- 8) Local and regional anaesthesia in emergency department, made easy, Mike Wells.
- 9) Complications of regional anaesthesia: principles of safe practice in local and regional anaesthesia, by Brendan Finucane, third edition.
- 10) Atlas of **Regional Anesthesia**, by Dr. David L. Brown.
- 11) Essentials of regional anaesthesia by David Kaye.
- 12) Atlas of ultrasound – guided regional anaesthesia, by Andrew Gray.
- 13) Miller's Anaesthesia, 9th Edition, 2020.

**At the end of training programme the fellow should develop the attitude to**

1. Communicate sensitively and effectively with patients and their families regarding ultrasound findings
2. Explain the merits and demerits of RA techniques in terms that the patient can understand
3. Demonstrate team leadership/management skills for the management of an effective regional anaesthesia service
4. Recognize costs associated with RA practice
5. Collaborate with other members of the healthcare team to ensure quality patient care
6. Use evidence-based, cost-conscious strategies in caring
7. Identify and acknowledge gaps in personal knowledge and skills in the care of patients presenting for UGRA
8. Use textbook and online and computer-based resources to broaden knowledge base regarding UGRA techniques.
9. Perform electronic search of the medical literature to identify articles that address the medical issues surrounding RA.
10. Understand and critically evaluate outcome studies related to the influence of UGRA on perioperative outcome.
11. Develop time management skills to perform the required tasks in a reasonable amount of time.

**Teaching and learning methods:**



Theory	Practical
Friday 3pm-4pm 1class/week 1x40 =40classes Once in 4weeks one class should be dedicated to Journal club. The candidate should have the ability to critically review the article and aware of recent concepts about all the existing blocks as well the newer one.	<u>Clinical training</u> Monday to Friday 9.00am to 5.00pm, 9.00 am to 1.00 pm on Saturdays <ul style="list-style-type: none"> <li>Observing/Facilitating/Conducting exclusive Ultrasound Guided Regional Anaesthesia list.</li> <li>Minimum exposure.</li> <li>Aiming to attain the level of competency as indicated in the EPA by the end of one year training.</li> </ul> <b>Should be available in house to attend emergency calls for regional anaesthesia.</b>
<u>Teaching and Learning methods</u> Didactic lecture Microteaching Discussion Demonstration and Simulation based teaching	<u>Cadaveric training Aim -</u> to make the candidate understand the correlation between sonoanatomy and gross anatomy so that he/she can identify all the relevant structures needed for the performance of RA. Areas to dissect - 1. Upper limb. a) BP above clavicle. b) BP below clavicle. 2. Lower limb. a) Sciatic nerve. b) Femoral nerve 3. Abdomen - a) TAB, rectus sheath. b) Lumbar plexus , quadratus lumborum 4. Thorax - thoracic paravertebral

<p><u>Log book maintenance</u> -E- portfolio -RA record</p> <p><u>Research Activities.</u> Active participation in ongoing RA research projects.</p>	<p><b>Phantom training</b> Integral part of clinical Training for</p> <ol style="list-style-type: none"> <li>1. Needling skills             <ul style="list-style-type: none"> <li>• Out of plane technique</li> <li>• In plane technique</li> <li>• Walk down technique</li> <li>• Rocking</li> <li>• Jiggling</li> <li>• Hydro-dissection</li> <li>• Hydro-location</li> <li>• Angle on insonation and principles</li> <li>• Advanced software usage - needle guides/ profile</li> </ul> </li> <li>2. Water bath spine phantom- for spine anatomy.</li> </ol>
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**Formative assessment:**

Formative assessment will be performed through Entrust able Professional Activity Scoring System. Converting each block in to a professional activity develops EPA's. Each block performance will be assessed by three specific competencies (medical knowledge, skills and system based practice) and three general (problem based learning improvement, professionalism, inter-personal communication skills) competencies. Each competency will be evaluated and scored as per the policy document [Annexure 1] and the final verdict on the competency level will be granted.

The competency will be divided in to levels of increasing Entrust ability as follows.

Level	Task
I	can observe
II	can perform under strict supervision
III	can perform under loose supervison
IV	Can perform independently
V	Cant each

The final competency level will be derived by computing scores obtained in the individual

competency domain as described into department EPA policy document.  
The candidate should achieve minimum of level III or IV in various EPA's as described in the policy document.

### Summative assessment:

#### (i) Theory

<b>Title</b>	Regional Anaesthesia
<b>Time</b>	3hrs
<b>Mark Distribution</b>	Equipment and technology - 20% Applied Anatomy and physiology - 20 % Applied pharmacology - 10% RA strategies for specific surgery - 30 % Complications - 10% Recent advances- 10%
<b>Pattern</b>	10 short notes 10x10 =100.
<b>Pass</b>	Minimum 45%

#### (ii) Practical (3Hrs)

Components:

1. Clinical case discussion
2. Viva voce

The practical examination should be structured and objective as much as possible.

Clinical Cases	No	Duration	Method of assessment	Marks
Long case	1	30 minutes case exposure. 30 minutes assessment	Detailed history, examination management and complications to be discussed. (mark distribution given below)	40
Shortcase	2	15minutes exposure for each case. 15minutes assessment for each case	Key positive and negative findings with relevance to the RA strategy. Detailed discussion about the proposed strategy.  The long case and short case should have different regional areas. (UI/LL/Thorax/Abdomen)	30 (15each)

## Long case structured assessment (Mark distribution)

Segment	Percentage	
Oral skills/presentation	10%	
<b><u>Preoperative assessment</u></b> Surgical illness General system pathology and its implication  <b><u>Risk stratification</u></b> ASA classification Perioperative Cardiovascular events Preoperative neurological dysfunction <b><u>Preparation</u></b> Anti platelets Bridging anti coagulants	30%	
<b>Anesthetic management</b>	50%	
<b><u>Bed side clinical discussion</u></b> Regional anaesthesia strategy Merits and demerits of the proposed plan		<b><u>Bed side demonstration</u></b> Patient positioning and Ergonomics
Consent Execution Management plan for immediate, late complication and failure.		Image acquisition and optimization Interpretation of sono-anatomy Proposed needle trajectory
<b><u>Postoperative analgesia</u></b> Modes Merits and demerits Pharmacological regimen Complication and its management	10%	

## (iii) Viva-Voce (Structured)

1.	Equipment and PNB gadgets	10 Marks
2.	Drugs	10 Marks
3.	Sono-anatomy interpretation	10 Marks

Segments	Total Marks
Theory	100
Practical including viva	100 (70+30)
<b>Grand Total</b>	<b>200</b>
<b>Pass</b>	<b>Minimum 45% in two segments (Theory, Practical) but the aggregate should be more than 50%.</b>

### **Certification authority & design of certificate**

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

**Place & venue of the academic work at the programme :** PIMS, RMC, Loni

**Department offering the programme:** Department of Anaesthesia

**Intake per batch :** Four (4) per year, 2 candidates in each session -as per decision of higher authorities.

**Academic Calendar:** Admission in January and July every year, Examination to be conducted in months of January and July every year.

**Time Table:** to be submitted later

**Maintenance of attendance:** Via Biometric Attendance

### **Arrangement & conduction of programme:**

- Class room session - In Seminar hall of Dept. of Anaesthesia.
- Practical session - In all operation theatre& ICU (paeditric & neonatal)

**Liasoning :** HOD Anaestheisa or Senior Professor

**Evaluation :** HOD & Senior Professor

**Documentation :** HD & Senior professor

**Appointment of Director/Co-ordinator. Resource Person, Teacher Assistance :** Dean RMC

**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

**Fees proposed to be charged per course** :Rs. 50,000/person/ yr.

**Financial & administrative:** Expectation from PIMS (DU)/PMT to run the programmes

PIMS-DU/PMT will be expected to provide accommodation to the participants in postgraduate

Hostel, Provide mess facilities & Library facility with books & journals on regional anaesthesia.

Dedicated USG machine with high resolution for giving nerve block.

**Infrastructure requirements** : Classroom, operation theatre with good no. of cases already available.

**Yearly A-A-A0 Audit** of the programme & financial audit process & format-according to the PIMS norms.

**Annual** meta-evaluation & up gradation of the content & delivery of the programme. - according to PIMS norms.

**Central documents:** According to PIMS Norms

**Grievance redressal & appeals mechanism:** According to PIMS Norms

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.

**Saving clause whenever difficulty arrives** – 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.

