किंग जार्ज चिकित्सा विश्वविद्यालय उ०प्र०, लखनऊ
रिहयुमेटालाजी विभाग

लाल बहादुर शास्त्री केन्द्र, आर०ए०एल०सी०कैम्पस, लखनऊ-२२६०१८
पूर्व : छत्रपति शाहूजी महाराज चिकित्सा विश्वविद्यालय उ.प्र. लखनऊ
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OFFICE OF THE DEAN
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K.G. Medical University, U.P. Lucknow

सेवा में,

अधिष्ठाता चिकित्सा संकाय,
के०जी०एम०यू०उ०प्र०,
लखनऊ।

महोदया,

रिहयुमेटालॉजी विभाग का Curriculum संलग्न कर आवश्यक कार्यवाही हेतु प्रेषित ।

भवदीय,

(डा० पुनीत कुमार)
कार्यवाहक विभागाध्यक्ष,

Information regarding superspeciality programme (DM- Clinical Immunology and Rheumatology) run by the department.

1. *Goal and objective of the program*

Aim of the DM course is to provide training in the field of clinical Immunology and rheumatology to produce competent super-specialist doctors who are able to provide best clinical care to patients and serve as future teachers, trainers and researchers in the subject.

At the end of the course, the trainee should be able to-

1.Diagnose and manage whole spectrum of immune-mediated and rheumatic disorders.

2.Practically perform and interpret the common laboratory techniques used in the Immunology Lab.

3.Understand and critically analyze the new literature in the field.

4.Teach the subject to undergraduates and postgraduates in Medicine.

5.Plan and undertake research in the field of clinical immunology and rheumatology.

2. *Duration of course*

Three years

3. *Syllabus including skills*

Candidate should acquire an overall knowledge in the field of clinical immunology and rheumatology by reading standard textbooks and peer reviewed journals.

At this level of training, insistence of a Comprehensive syllabus may not be appropriate and it is likely to change from time to time. Following is the recommended core syllabus for the three years -

1. Scientific basis of rheumatic diseases

A. Anatomy and Physiology

- Synovium
- articular cartilage
- Bone structure and function
- Tendons and ligaments
- Connective tissue
- responses to mechanical stress
- Biomechanics of peripheral joints
- Biomechanics of spinal degeneration
- Scientific basis of pain

B. Immunology and inflammation

- Principals Of Innate And Adaptive Immunity
- Signal Transduction In Immune Cells
- Cytokines

- Inflammation And Its Chemical Mediators
- Complement System
- Neuroendocrine Immune Crosstalk In Chronic
- Inflammatory Systemic Diseases
- Osteoimmunology
- Tissue Destruction And Repair
- Principles Of Tissue Engineering And Cell And Gene-Based Therapy

C. System biology

- Principles and techniques in molecular biology
- Open Science for Systems biology,
- Proteomics
- Metabolomics
- Epigenetics
- microbiomes in rheumatic diseases

2. Clinical basis of rheumatic disease

- Principles Of Clinical Outcome Assessment
- Principles Of Health Economics
- Principles Of Genetic Epidemiology

- Interpreting The Medical Literature For the Rheumatologist
- Ethics In Clinical Trials

3. Approach to the patient

- History and physical examination
- Laboratory tests in rheumatic disorders
- Synovial fluid analysis
- Skin in rheumatic diseases
- Eyes in rheumatic diseases
- Lungs in rheumatic diseases
- Gastrointestinal tract in rheumatic diseases
- Heart in rheumatic diseases
- Kidneys and rheumatic diseases
- Nervous system in rheumatic diseases
- Skeletal muscles in rheumatic diseases
- Multimorbidity
- Aspiration and injection of joints and periarticular tissue and intralesional therapy
- Minimally invasive procedures

4. Imaging techniques

- Conventional radiography

- CT
- MRI
- Musculoskeletal USG
- Bone Scintigraphy
- Positron Emission Tomography
- Dual X-ray absorptiometry

5. Principles of management

A. General-

- Patient Perspective
- Treatment Recommendations And "Treat To Target"
- Arthritis Patient Education
- Self-Management And Health Promotion
- Principles Of Rehabilitation
- Multidisciplinary Approaches To Managing Chronic Pain In Arthritis
- Placebos, Caring, And Healing In Rheumatology
- Complementary And Alternative Medicine
- Drugs And Pregnancy
- Perioperative Care Of Patients With Rheumatic Disease

B. Small molecules

- Principles of pharmacologic pain management

- Nonsteroidal anti-inflammatoty drugs
- Glucocorticoids
- Synthetic disease modifying antirheumatic drugs - Hydroxycloroquin, Methotrexate, Leflunomide, Tetracyclines
- Immunosuppressive agents: Cyclosporine, Cyclophosphamide, Azathioprine, Mycophenolate Mofetil, and Tacrolimus
- Tyrosine kinase inhibitors

C. Biologic agents

- Monoclonal antibodies and receptor antagonists
- Interleukin-1 inhibitors
- Interleukin-6 inhibitors
- Interleukin-17 and Interleukin- 23 inhibitors
- Tumor necrosis factor inhibitors
- Inhibitors of T-cell co-stimulation
- Inhibitors of B-cell
- Emerging therapeutic targets
- Biosimilars in rheumatology
- Infections and biologic therapy
- Precision medicine and pharmacogenomics in rheumatology

6. Regional and widespread pain

- Neck pain
- Low back pain

- The Shoulder
- Elbow, wrist and hand
- The Hip
- The Knee
- Ankle and foot
- Temporo-mandibular joint
- Entrapment neuropathies and
- Compartment syndromes
- Complex regional pain syndrome (reflex sympathetic dystrophy)
- Fibromyalgia and related syndromes

7. Specific articular and connective tissue

diseases

Epidemiology, Etiopathology, genetics, classification, clinical features, workup, and

management strategies for the following disorders:

1.Rheumatoid arthritis

2.Spondyloarthropathy

- Ankylosing Spondylitis
- Reactive Arthritis
- Psoriatic Arthritis
- Enteropathic Arthritis

3. Systemic Lupus Erythematosus

4. Antiphospholipid antibody syndrome

5. Sjogren's Syndromne

6. Scleroderma

7. Mixed connective tissue disease

8. Overlap syndromes

9. Vasculitides

- Polymyalgia rheumatica and Giant cell arteritis
- Takayasu's arteritis
- Polyarteritis nodosa
- Kawasaki disease
- Behcet disease
- Cogans syndrome
- ANCA associated vasculitis: Granulomatosis with polyangitis, Microscopic polyangitis, Eosinophilic granulomatosis with polyangitis
- Cryoglobulinemia
- IgA vasculitis
- Hypersensitivity vasculitis
- Cutaneous leukocytoclastic vasculitis and panniculitis
- Primary angiitis of the central nervous system

10. Idiopathic Inflammatory myopathies

11. Metabolic, drug-induced, and other non- inflammatory myopathies

12. Other systemic illness-

- Adult onset stills disease,
- Monogenic auto-inflammatory diseases: familial Mediterranean fever (FME), Tumor necrosis factor receptor-associated periodic syndrome, and Mevalonate kinase deficiency
- Relapsing Polychondritis
- Amyloidosis
- Sarocoidosis
- IgG4 Related disease

13 Crystal arthropathy

- Gout and Hyperuricemia
- Calcium Pyrophosphate Deposition Disease
- Basic Calcium Phosphate Crystals Deposition Disease

14 .Osteoarthritis

15. Metabolic bone disease

- Osteoporosis
- Osteomalacia and rickets
- Renal osteodystrophy
- Pagets disease of bone

8. Pediatric rheumatology

1. Evaluation of children with rheumatologic complaints
2. Juvenile idiopathic arthritis
3. Connective tissue diseases in children

- Juvenile Onset Systemic Lupus Erythematosus
- Pediatric Inflammatory Myopathies
- Childhood Scleroderma

9. Infection related rheumatic diseases

- Infectious arthritis- Bacterial, Mycobacterial, brucella, fungal and parasitic arthritis, viral infections,
- Other infection related diseases - Acute Rheumatic Fever

10. Other arthropathies and miscellaneous disorders

- Diffuse Idiopathic Skeletal Hyperostosis
- Neuropathic artropathies
- Osteonecrosis
- Rheumatoid manifestations of endocrine and lipid disease
- Hemophilia and Von Willebrand disease
- Sickle Cell disease and other hemoglobinopathies
- Hemochromatosis
- Gauchers disease

- Digital clubbing and Hypertrophic Osteoarthropathy
- Cancer-related musculoskeletal syndromes: Synovial sarcoma, Cartilaginous tumors, Metastatic disease, Paraneoplasticsyndromes, Raynaud syndrome, Erythema nodosum, Lupus-like syndrome, Eaton-lambert syndrome, Myositis associated with malignancy, Vasculitis associated with malignancy, Carcinomatous polyarthritis, Hypertrophic osteoarthropathy, Palmar fasciitis and polyarthritis syndrome, Oncogenic osteomalacia
- Heritable connective tissue disorders: Marfan syndrome, Ehlers-Danlos syndrome, osteogenesis imperfecta, Skeletal dysplasias and related conditions, Osteopetrosis, Fibrodysplasia Ossificans Progressive
- Hypermobility syndromes
- Bone tumors
- Soft tissue rheumatism
- Rheumatic complications of drugs

Practical skills in Rheumatolgy

a. Clinical examination with special reference to rheumatic and immunological diseases

b. Rational use and interpretation of various investigations used in clinical immunology and rheumatology

C. Diagnostic synovial fluid aspiration and examination including polarized light microscopy

d. Joint and soft-tissue injections with steroids.

e. Proficiency in the use of immunomodulators and immunosuppressive agents

f. Basic physiotherapy and rehabilitation skills

g. Tissue biopsies like bone marrow, synovial, skin, liver, kidney, muscle, minor salivary gland, sural nerve etc.

h. Clinical evaluation of primary and secondary Immunodeficiency

i. Handling of Flow-cytometer, PCR, Electrophoresis, Gel documentation, Nephelometer, ELISA, Polarising and Florescence microscope

4. *Teaching learning and assessment methods*

Teaching and academic Activities: Following academic activities are planned throughout the year and trainees will be encouraged to actively participate in these meetings, carefully listen to the topics, ask questions, critically analyze and give his/her comments and suggestions.

1. Seminar (once a week in the department)

2. Journal Club (once a week in the department)

3. Clinical Case (once a week -department)

4. Case based review (once a week - department)

5. Mortality meet (once a month - department)

6. Clinical grand round (once a week - university)

7.Journal club/mortality meet (once a week in the university)

8. Active participation in Conferences/Workshops in the relevant areas (local/national/international)

9. Basic training courses in Biostatistics, Research methodology, Scientific writing,
Laboratory Immunology and Molecular biology.

Training Program

Learning in DM is self-directed and will take place while working in various areas of the department and through interactions in the rounds. Each candidate will be posted by rotation in the following areas of the department of clinical immunology and Rheumatology

Out-Patient Clinic -Each clinic contains both new and follow-up cases. The candidate is expected to work up the new cases and arrive at an appropriate provisional diagnosis. Patients and accompanying attendant should be clearly explained regarding the nature of disease and further plan regarding evaluation and management.

Necessary investigations should be ordered by using prescribed completely filled forms. Short history, and clinical assessment should be clearly mentioned on the form.
In case of any difficulty regarding diagnosis and management of case he/she will discuss with the consultant. In case of patient who requires opinion from other speciality doctor, then he/she should be referred with the objective of referral clearly written on the OPD paper.

Patient who requires any procedure like synovial fluid aspiration and steroid injection will be sent to procedure room.

Patient requiring admission for evaluation and management should be sent to the ward after discussing with consultant.

He/she will also see the follow-up patients under the supervision of attending consultant. Student should specify the date and day when patient has to come for follow up along with necessary investigations.

Rheumatology/ immunology ward- trainee actively participates in the management of the admitted patient under the supervision of the faculty. He/she
is expected to evaluate the patient in detail, record the clinical history and physical examination findings.

After making an appropriate provisional diagnosis he/she will send the relevant investigations and present the case to the consultant during the rounds.

During stay of the patient, attandant of the patient should be frequently and appropriately apprised of the clinical progress.

He/she is responsible for case sheet maintenance. Candidate will make discharge summary of the patient, which should be precise, but comprehensive.

They will be made to learn to understand and tackle the different issues including psychological issues of patients with compassion and gentle behavior with effective communication skills.

Student should work in harmony with the colleagues and nursing and other staff.

Inter-departmental consultation - trainee is also expected to accompany or individually see the patients with associated rheumatic and immunologic problems admitted in other departments for whom an opinion has been sought.

Laboratory - student should have knowledge of principles and methodology of the following tests (hands-on experience)-

a) Indirect immunofluorescence ANA, ANCA

b) Nephelometry - serum complements (C3, C4), immunoglobulin

c) Enzyme Immuno Assays - anti CCP, anti-ds DNA, anti CCP, anti-ds DNA, ACLA, anti-beta 2 GP1, anti MPO and anti PR3, anti GBM, AMA, Anti tTG, anti LKM-1,

d) Immunoblot - ENA profile, MSA panel

f) Polarizing microscopy - crystals in synovial fluid

g) Lupus anticoagulant assay

h) Rose Waller test - Rheumatoid Factor

i) Turbidimetric immunoassay – Quantitative measurement of rheumatoid factor and CRP

i) Flow Cytometry -HLAB27, Separation of lymphocytes

k) PCR

Procedure room-candidate should be able to perform following procedures performed in the department:

Synovial fluid aspiration

Intra articular and soft tissue injections with steroid

Different biopsies- renal, skin, minor salivary gland, muscle, sural nerve, bone marrow, etc.

USG Room-to gain basic knowledge about MSK Ultrasound

Physiotherapy room- to gain basic physiotherapy and rehabilitation skills

Research work

Thesis work - Satisfactory completion is mandatory for appearing in final examination. The work could be either clinical, laboratory or Combined. Idea of work must be original and preferably prospective in nature. It should be reviewed at regular interval in the departmental meeting to check for the progress.
(Special credit will be given to those student who submit paper for publication from his/her thesis in indexed journal).

Research projects - candidate will be encouraged to write research proposals for intramural research grant, grant by national and international rheumatology/ immunology society etc.

Publications - Besides the thesis work, the candidate is encouraged to work on and publish case series and case reports in peer reviewed indexed journals and send papers for presentation to national and international conferences.

At least one original paper/ case report/letter to editor/review article from the seminars presented by him/her in the department should be published/accepted in peer reviewed, indexed journal before appearance in final examination.

Logbook

- For each candidate it is mandatory to maintain a logbook of daily activities-

Presentation in journal clubs along with title & journal name and issue

- Cases presentation in the departmental meetings
- Presentation in departmental seminars
- Difficult or unusual patient seen
- Schedule of rotation
- Work done in lab
- MSK ultrasound
- Procedures done synovial fluid aspiration, 1/A steroid injection, soft tissue injection, biopsies Conferences attended- National/nternational Papers presented at conferences-poster or podium, title, name of the conference, date of presentation
- Paper published with title, name & issue of the journal
- Research project
- Awards

Assessment during the period of training

Performance of the each student will be evaluated Continuously during the course of training program.

Evaluation will include the following:

- Regular internal assessment of the performance

in teaching programs.

- For evaluation of presentations, evaluation sheets could be incorporated for the purpose of assessment with the following points: choice of article/topic (for journal club), completeness and clarity of presentation, understanding of the subject and ability to convey the same, time scheduling, ability to answer questions and Overall pertormance.

- Candidates are also assessed in the "affective" domain particularly with regard to ability to get along with colleagues, nursing staff and other staff of the department.

- Periodic presentation of progress in thesis work

- Logbook would be checked and certified by the Head of Department and other Consultants on regular basis. Evaluation will be documented in the logbook.

- Six monthly evaluation of academic and clinical Competence by theory and practical examination.

- Special credits for publication, awards, research projects

- Feedback from employees patients (indoor/outdoor)

Format for the internal assessment during three year training period

Part 'A: continuous evaluation during the course

1. Day to day academic activities

2. Patient Care: Case work up and discussion,

3. Attitude, behavior and interpersonal relationship

Part 'B': at six monthly interval

1. Theory exam

2. Case presentation and viva

3. Logbook

4. Procedure and lab work

5. *Examination pattern*

Pattern of final examination:

Theory examination - 4 Papers,

(100 Marks each, Duration: Three hours)

- **Paper-I** (Applied Basic sciences and Diagnostic Procedures in

Rheumatology and Clinical Immunology)

- **Paper - II** (Clinical Rheumatology and Clinical Immunology)

- **Paper-II** (Clinical Pharmacology, Rehabilitation Surgery, Speical problems relating to Rheumatic Diseases, Paediatric Rheumatology, Pregnancy and Rheumatic Diseases)

- **Paper- IV** Recent Advances in Rheumatology and Immunology

Pattern of Practical examination

A. **Four semi-long cases** - case presentation and viva voce

B. **Lab techniques** - principal and methodology of various tests,

C. **Grand viva**- (clinical images, Pathology Slides, X-ray, Ultrasound, CT & MRI interpretation, Discussion about thesis)

Number of Examiners-4

Internal Examiner-2

External Examiner-2

Examiner selection- **As per the university guidelines**

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