SYLLABUS/CURRICULUM FOR A THREE YEAR COURSE LEADING TO AWARD OF D.M. RHEUMATOLOGY

Curriculum – D.M. Rheumatology – Three Years Course
The schedule of Posting and training programme for three years period of study: year wise training programme for D.M. Rheumatology.

Eligibility for admission: MD Medicine, MD Pediatrics

Program objectives
The aim of the DM program is to provide advanced training in Immunology to produce competent sub-specialists who are able to provide clinical care of the highest order to patients and serve as future teachers, trainers and researchers in the field.

Specific Learning Objectives
At the end of the course, the student should be able to:

A. Clinically diagnose, investigate and manage a whole spectrum of immune-mediated and other rheumatological disorders
B. Practically perform and interpret the common laboratory techniques used in the Immunology Laboratory
C. Plan and undertake research in Rheumatology in the clinic, laboratory and community
D. Competent to understand and critically analyze the new literature in the field of Rheumatology
E. Teach the subject to undergraduates and postgraduates in Medicine and Pediatrics
Training Program

First Year:
Rheumatology Department
Out-patient/Wards/Laboratory One Year
Laboratory – 2 months included in one year

Second Year:
Peripheral Posting-3 months

1) Nephrology Two Weeks
2) Dermatology Two Weeks
3) Orthopaedics One Week
4) Radiology Four Weeks
5) Ophthalmology One Week
6) Physical Medicine & Rehabilitation One Week
7) Pulmonary medicine One Week

Students who are posted outside should attend Theory classes, Journal club and case presentation daily at the Department of Rheumatology in the afternoon.

Rheumatology Department:
OP/Wards/Laboratory Nine Months

Muskuloskeletal Ultrasonography 2 months & Clinical immunology Laboratory posting 2 months included in nine months

Third Year:
Rheumatology Department-
OP/Wards/Laboratory One year
Laboratory – 2 months included in one year
Besides the above, Synovial aspirations, Intra articular injections, Kidney biopsies, interpretation of X-rays, CT Scan, M.R.I, and Ultrasound are to be undertaken.

**Academic Activities:**
- Journal Club (once a week)
- Seminar (once a week)
- Subject Review (once a week)
- Clinical case presentation and discussion (once a week)
- Clinical grand rounds (once a week)
- Interdepartmental discussions (Radiology, Pathology etc)
- Basic training courses in Biostatistics, Research methodology, Scientific writing, Laboratory Immunology and Molecular biology.
- Conferences/Workshop/symposia in the relevant areas
- Guest lectures by external subject specialists

**Maintenance of log book/portfolio:** Every D.M. Rheumatology student should maintain a log book

**DISSERTATION:**
Every D.M. Rheumatology student should do a Dissertation in Rheumatology and Immunology. Submission of Dissertation to the University is mandatory for appearing. D.M. Rheumatology University Examination.

**DM Training Curriculum**
Theoretical training
1. Basic Principles in Rheumatology:-
   a) Biology of Joints
   c) Connective tissue:- Normal and Pathological synovial tissue - collagen - collagenses

d) Formation and resorption of bone - bone as a tissue and an organ.


f) Nerve: Neuropathies of special interest in Rheumatology - laboratory investigations – painbath ways

g) Synovial physiology

h) Collagen in normal and diseased connective tissue:- Chondrocyte structure and function - articular cartilage.


**Diagnostic Procedures:**

a. Synovial fluid aspiration

b. Aspiration and injection of joints and soft issue

c. Rheumatoid factor - latex, Rosewallar, Elisa, Nephelometry

d. Antinuclear antibodies

e. Antiphospholipid antibodies

f. Nuclear and Cytoplasmic antibodies - ANCA

g. Anti Streptococcal antibodies

h. Acute phase reactants
i. Synovial biopsy  
j. Radiology of joints  
k. Radio Isotopic assessment of joints and bones - C.T.; MRI in Rheumatology - Ultrasonogram of joints and soft tissues.
l. Arthrography - Thermography - Arthoroscopy  
m. HLA Typing  
n. Immuno Fluorescence  
o. Elisa  
p. Immunoblotting  
q. Polymerase Chain Reaction (PCR)  
r. Neuromuscular testing, Electrophysiology  
s. Biological markers of rheumatic diseases

1. **Differential approach to major rheumatic syndrome:**
Examination of Joints:- Acute and chronic monoarticular arthritis - Polyarthritis - temporomandibular joint diseases-shoulder and neck pain -low back pain - foot pain - the fibro-myalgia syndrome – skin and rheumatic diseases - eye and rheumatic diseases – neurologic manifestations - cardiac manifestations pulmonary manifestations of connective tissue diseases - arthritis and gastrointestinal and liver diseases - nutrition and rheumatic diseases -Psychosocial aspect of rheumatic diseases - kidney and rheumatic diseases.

2. **Clinical Pharmacology in Rheumatic diseases:-**

3. **Specific articular and connective tissue diseases:-**
Rheumatoid arthritis - Felty's syndrome – Sjogren's syndrome - spondyloarthropathy - ankylosing spondylitis - Reiter's syndrome, reactive arthritis - HLA B 27 related and non-

4. **Medical orthopaedics and rehabilitation:**

Sports Medicine - entrapment neuropathies - chronic pain syndromes and management - Physiotherapy - occupational therapy - health outcome assessment - rehabilitation of patients with rheumatic diseases

5. **Reconstructive surgery in rheumatic diseases:**

Practical Knowledge

I. Laboratory techniques (hands-on experience)
   a) Indirect immunofluorescence method for detection of
      a. anti-nuclear, anti-smooth muscle, anti-parietal cell and anti-mitochondrial antibodies by using rat liver, stomach and kidney sections as substrates
      b. ANA and anticentromere antibodies on Hep-2 cell line and
      c. ANCA
   b) Nephelometry for the estimation of serum complements (C3, C4) and immunoglobulins (IgG, IgM, IgA, IgE)
   c) ELISA technique for the estimation of ANA, anti-ds-DNA, ACLA and ANCA
   d) Immunoblot for ANA profile
   e) Serum electrophoresis and immunofixation for myeloma screening
   f) Polarizing microscopy for detection of crystals in synovial fluid
   g) Lupus anticoagulant assay
   h) HLA typing (serological and molecular)
   i) Multitest CMI testing
   j) NBT test for evaluation of phagocytic function
   k) Enumeration of lymphocyte subsets in peripheral blood using flow cytometry
   l) Lymphoproliferation assay
   m) PCR standardization and optimization

II. Management of patients with autoimmune rheumatic disorders, allergic diseases and immunodeficiency

III. Practical skills in Rheumatology
   a) Clinical examination with special reference to immunological diseases
   b) Rational use and interpretation of immunological tests
   c) Diagnostic synovial fluid aspiration and examination including polarized light microscopy
   d) Joint and soft-tissue injections with steroids
   e) Diagnosis of allergic diseases by skin prick test (SPT) / patch test
f) Proficiency in the use of immunomodulators and immunosuppressive agents

g) Practical experience in immunotherapeutic procedures (immunosuppression, Plasma exchange, immunoglobulin therapy, allergen immunotherapy (SCT/SLIT) and treatment with monoclonal antibodies and cytokines

h) Basic physiotherapy and rehabilitation skills

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

j) Clinical evaluation of primary and secondary Immunodeficiency

k) Handling of Flow-cytometer, PCR, Electrophoresis, Gel documentation, Nephelometer, ELISA, Polarising and Florescence microscope and Scintillation counter

Performance evaluation during the period of training:

Performance of the student will be evaluated continuously during the course of the DM training program. This will include evaluation of the clinical skills through assessment of proficiency acquired in patient management, therapeutic procedures, clinical case presentations and laboratory work. It will include the following:

1. Regular internal assessment of the performance in teaching programs.

2. Assessment of day to day clinical activities by log book evaluation. This Log Book would be scrutinised and certified by the Head of Department and other Consultants and presented to the external examiners at the time of the final examination.

3. The seminars and the subject reviews presented by the candidate during the training would also be scrutinised and certified by the Head of the Department and other Consultant and presented to the External Examiners at the time of the final examination.

4. Feedback from the external training institutes during external rotation.

5. Six monthly evaluation of academic and clinical competence by theory and practical examination
PATTERN OF EXAMINATION: (As per MCI rule)

Theory – 4 Papers, 100 Marks each Duration: Three hours each

Question Papers (100*4 = 400)

Practical

Clinical and viva voce
Long case
Short cases
Viva voce

Criteria for declaring pass

Minimum (separate)
50% for theory (aggregate of four papers)
50% for clinical
50% for viva voce
acceptance of thesis / dissertation

Paper – I
Applied Basic sciences and Diagnostic Procedures in Rheumatology and Clinical Immunology

Paper – II
Clinical Rheumatology and Clinical Immunology

Paper – III
Clinical Pharmacology Rehabilitation Surgery, Special problems relating to Rheumatic Diseases, Paediatric Rheumatology, Pregnancy and Rheumatic Diseases.

Paper – IV
Recent Advances in Rheumatology and Immunology

Distribution of Marks: *

Two Essays 20 Marks each (20 x 2) 40 Marks
Ten short notes 6 Marks each (10 x 6) 60 Marks

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Total 100 Marks
**Practical / clinical and oral examination**

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<th>No. Of Cases</th>
<th>Duration</th>
<th>Marks</th>
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<td>LONG CASE</td>
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<tr>
<td>SHORT CASES</td>
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<td>(30 Mts Each)</td>
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<tr>
<td>WARD ROUNDS</td>
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<td>(Minimum)</td>
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Practical 100
Oral / Viva Examination 100

Total 400

**PRACTICAL:**

The candidate can be asked to do less time consuming tests like latex agglutination tests like Rheumatoid factor, C.Reactive protein, Anti Streptolyssin O titre and the knowledge of the principles and methodology of any one of the following tests can be evaluated:

1. Rose – Waller Test
2. Immuno fluorescence Tests
3. Enzyme Linked Immuno Sorbent Assay (Elisa)
4. Single Radial Immuno Diffusion
5. Electrophoresis
6. S.D.S PAGE
7. Immuno Blot
8. HLA Typing / Cross Matching
9. Synovial fluid Analysis
10. Crystal Identification
**ORAL:**
1. Pathology Slides
2. X-ray, Ultrasound, CT & MRI interpretation
3. Clinical Oriented problems
4. Topic Discussion
5. Discussion about dissertation

**DISSERTATION:** Approved/Not approved

**MARKS QUALIFYING FOR A PASS:**

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<tr>
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<td>Aggregate</td>
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