

Name of the block	Block1
Name of the Elective	Nutritional Biochemistry: Measurement and Clinical Correlations
Location of Hospital lab or research facility	Clinical Biochemistry, DMCH
Name of internal preceptor (s)	Dr. Pranshu Dhingra
Name of external preceptor (if applicable)	None
Learning objectives	At the end of two weeks, the student should be able to :- • Describe commonly used laboratory apparatus and equipment. • Elaborate precautions to be taken in Biochemistry Lab and principles of Good Lab Practices (GLP). • Describe the pre analytical, analytical and post analytical processes involved in biochemistry lab. • To understand the biochemical basis, methods of estimation, and clinical significance of nutritional parameters, and to correlate their altered levels with various disease states • Correlate altered biochemical values with health and disease. • Explain the quality control process of the tests done in clinical biochemistry. • Describe the errors (Pre analytical, analytical and post analytical) which can occur in lab. • Describe the steps of spill management and different types of code used. • Describe biohazardous and non-biohazardous waste and their management in biochemistry lab.
Number of students that can be accommodated	4
Prerequisites for elective	Understanding and knowledge of: • Principles of photometry techniques • Clinical utility of different biochemical parameters in health, nutritional status, and diseases
Learning resources for students	• Practical Handbook of Biochemistry • Textbook of Medical Laboratory Technology by Godkar • Harrison's Principles of Internal Medicine
List of activities of student participants	• Work daily under supervision to observe and learn the working principles of autoanalyzers and immunoassay platforms used for estimation of: Vitamin D, Vitamin B12, Folate, Iron profile (Serum iron, TIBC, Transferrin, Ferritin), Serum Calcium and Phosphorus, Serum and Urine Copper, Serum Ceruloplasmin.

Logbook-cum-Portfolio

Elective Module: Nutritional Biochemistry: Measurement and Clinical Correlations

	• Learn the importance of laboratory safety practices • Learn the pre-analytical, analytical, and post-analytical phase specific to nutritional assays. • Observe the basis and rationale of selecting specific biochemical tests for assessment of nutritional deficiencies and metabolic disorders. • Work daily with a supervisor to correlate altered biochemical values with clinical conditions • Interpret reference ranges, Deficiency states and toxicity levels for each parameter. • Learn the importance of quality control • Identify common analytical and pre-analytical errors in nutritional testing and learn their corrective and preventive measures. • Learn about biomedical waste management specific to biochemistry laboratory • Case Work-up and Presentation • Nutritional rickets/osteomalacia • Anemia of varied etiology • Wilson's disease
Portfolio entries required	• Documentation of worked up cases • Documentation of presentation done
Log book entry required	Completion of posting signed by preceptor with a "meets expectation(M) grade"
Assessment	• Attendance • Performance of assigned tasks. • Pre and post-test on the assigned elective • Performance in mock up drill in spill management, waste management and different activities on good lab practices. • Presentation of worked up cases in department.

Logbook-cum-Portfolio

Elective Module: Nutritional Biochemistry: Measurement and Clinical Correlations

Several analytical techniques are used for the estimation of nutritional parameters. Chemiluminescence assays are highly sensitive immunoassays used for measuring vitamins such as Vitamin B12 and Vitamin D, and ferritin. Immunoturbidimetric assays estimate nutritional proteins like albumin, transferrin, and C-reactive protein by measuring turbidity formed due to antigen–antibody reactions. Spectrophotometric methods are commonly used for routine parameters such as iron profile, calcium, and phosphorus.

These laboratory assays are clinically important for the diagnosis and monitoring of nutritional deficiencies, assessment of metabolic and chronic diseases, and evaluation of response to nutritional therapy or supplementation. They are also widely used in public health screening programs and research studies.

As an undergraduate medical student, learning about laboratory techniques used for nutritional assessment helps build a strong foundation in clinical biochemistry. Understanding the principles, advantages, limitations, and potential sources of error of these assays enables accurate interpretation of laboratory reports and supports better clinical decision-making. This knowledge is also valuable for future clinical practice, research and preventive health care focused on nutrition-related disorders. Students will be familiarized with pre-analytical processes such as sample collection, labeling, storage and centrifugation, along with analytical processes for estimation of nutritional biochemical parameters with quality assurance, scope of errors and their management and reporting of results.

