## **Details Of The Course**

#### **MSc In Clinical Nutrition**

Name of the Course: M.Sc. in clinical nutrition

Level of the Course: M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER FACULTY OF MEDICAL SCIENCES

Nature of the course: Full time

**Duration of the course:** 2 years

Student intake per year: 6

Pattern of the course: Annual

#### **Eligibility criteria for admission:**

Candidates for admission to the M.Sc., (CLINICAL NUTRITION) DEGREE COURSE UNDER FACULTY OF MEDICAL SCIENCES should have passed Degree in any one of the following courses from a recognized institute with minimum 50% mark.

B.Sc., Food Science and Nutrition

B.Sc., Clinical Nutrition

B.Sc., Home Science (with majors in Nutrition and Dietetics)

BSc Nursing or MBBS.

Admission procedure: Entrance test and Personal interview

Fees: Tuition fees Rs 30,000/year

#### Course Objectives: At the end of the course the student should be able to

- 1. Explain the role of nutrition in health
- 2. Physiological, anthropometric and biochemical assessment of the nutritional status.
- 3. To plan a therapeutic diet according to the individual or patients requirement in disease conditions.
- 4. Monitor and evaluate nutrition therapy
- 5. Educate the patients and family regarding nutritional care to be followed
- 6. Logistics of enteral and parenteral nutrition.

- 7. Therapeutic diet counseling of patients in the outpatient department
- 8. Basic concepts of neutraceuticals and their applications.

# <u>Course structure (curriculum) and faculty requirement including collaborating departments</u>

#### **Curriculum:** Attached Annexure no: 1

#### Faculty for the course: Chief coordinator- Professor Ramesh R

#### **Coordinator- Dr Reeta R**

Faculty: Prof. Saha S, Prof. Srinivasan A R, Dr. Sathish B M, Dr. Swetha K

**Collaborating departments:** Departments of Biochemistry, Nursing and Dietetics.

<u>Institutes/Universities in India offering similar courses:</u> The Tamil Nadu DR. M.G.R. Medical University, Chennai, Sri Ramachandra University/SRMC&RI Porur, Chennai, T.N

#### **Career Prospects/ Placement opportunities:**

As Faculty in training institutes for clinical nutrition.

Placement in R and D laboratories

As professional nutritional and diet consultants in healthcare set ups /corporate organizations/NGOs/industries/independent practice and geriatric homes.

**Any Other salient feature that you wish to state:** There are very less number of Universities in India offering MSc clinical nutrition, which is an upcoming branch. Many corporate laboratories industries and R & D centres are establishing branches in India in the recent past. There is always increased demand, competition & urge to improve their own quality. Hence there is lots of scope and opportunity for those who are willing to perceive this course

## Course syllabus(Curriculum):

<u>Practical's and projects if any, details of the same</u>: Each student must submit the project under a guide at the end of the course (at last 2 months before the send up examination) for the partial fulfilment of the degree. The project will be evaluated by the internal and the external examiner during the final practical Exams.

#### **Evaluation pattern**

#### • Examinations

Duration of theory examination for all the papers will be three hours each. Practical and viva examinations for MSc - clinical nutrition are conducted on two consecutive days.

• **Internal assessment:** Internal Assessment will be based on formative assessment examinations, projects, log books, records, presentation of seminars and journal clubs and work assessment during clinical postings and tutorials. In the case of candidates who fail in the University examination, fresh internal assessment marks can be sent based on improved performance.

#### • Examiners

There shall be four examiners for practical and viva, Two Internal and two external. External examiner should be a regular teaching faculty of any medical college with either a MD degree or MSc. PhD in Biochemistry/clinical nutrition and should be Associate Professor and above. Theory paper should be valued by both external and internal examiners.

#### • Question paper setters

Should be a regular teaching faculty of any medical college with either a MD degree or MSc.PhD in Biochemistry/clinical nutrition.

#### • Setting up of Question Paper

Each theory paper will be of 3 hours duration with a Maximum of 100 marks. Theory paper in all the subjects will consist of 2 sections -

Section A & B. Each section carries 50 marks and shall consist of an essay question with 10 marks, 7 question carrying 4 marks each and 6 questions carrying 2 marks each. Section A & & & B will have to be answered in separate answer books.

**Failed Candidates:** Candidate failing to secure minimum pass (50%) in any paper (Theory or practicals) shall reappear for both theory and practicals.

# **References:**

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI, SHIVAJI UNIVERSITY, KOLHAPUR, MEDVARSITY & APOLLO HOSPITALS

# **Reference Books**

- 1. Lubert Stryer 'Biochemistry'
- 2. Medical Textbook of Biochemistry Chaterjee.
- 3. Lehninger A. L. (1990) 'Principles of Biochemistry' New Delhi CBS Publisher and Distributor.
- 4. Modern Nutrition in Health and Disease 10<sup>th</sup> edition by Maurice E. Shils
- 5. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
- 6. Nutritional biochemistry of vitamins David a bendor.
- 7. Achayya, K.T.:(1998) A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
- 8. Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
- 9. Research Methodology By C.R Kothari
- 10. International Life Sciences Institute Present Knowledge in Nutrition latest edition
- 11. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised Enlarged) Bapp Co. 1985.
- 12. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
- 13. Robinson, Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co. 1986.
- 14. Davis J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2<sup>nd</sup> edition, W.B. Saunders Co.
- 15. Davidson's Human Nutrition Geissler.
- 16. Nutrition and Biochemistry for Nurses by Jacob Anthikad
- 17. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
- 18. Thomas, B.: Manual of Dietetic Practice, 1996.
- 19. L. MatareseGottschlich Contemporary Nutrition Support Practice, Saunders 1998
- 20. ASPEN; Nutrition Support, Dietetics
- 21. Clinical dietetics and nutrition by F.P Antia and Philip Antia.

#### Journals:

- 1. Nutrition Reviews
- 2. Journal of Nutrition
- 3. American Journal of Clinical Nutrition
- 4. British Journal of Nutrition
- 5. European Journal of Clinical Nutrition
- 6. International Journal of Vitamin and Nutrition Research
- 7. Nutrition Research
- 8. Ann Nutr Metab
- 9. Indian Food Packer, All Indian Food Preserves Association, Delhi.

- 10. Journal of Dairy Science.
- 11. Advances in Food Research
- 12. Indian Council of Medical Research. Nutritive Value of Indian Foods Latest Publication.
- 13. Indian Council of Medical Research. Recommended Dietary Intakes for Indians Latest Recommendations.
- 14. World Reviews of Nutrition and Dietetics.
- 15. WHO Technical Report Series

#### **Composition of board of studies:**

Dr Ramesh R MD Biochemistry, Professor and head Dept of biochemistry (MGMCRI)

Dr Asmathulla MD biochemistry Associate professor (SMVMC)

# Annexure no: 1

## **SYLLABUS**

#### **MSc clinical nutrition**

#### FIRST YEAR (2 PAPERS)

#### TOTAL MARKS: 500

- **PAPER-1:** National and international recommendation of nutrient requirements, carbohydrates, proteins, lipids, water, research methodology and biostatistics. (100 marks)
- **PAPER-2:** Vitamins and minerals, Food components other than essential nutrients, (100marks)
- Practicals: 200 marks

Internal Assessment 50 marks (Theory 25 + Practicals 25)

VIVA 50 marks

#### SECOND YEAR

#### TOTAL MARKS: 500

#### **Theory**

- **PAPER-1:**Applied nutrition and Medical nutritional therapy(100 marks)
- PAPER-2: Nutritional Care in Disease. (100 marks)
- Practicals: 200 marks
- VIVA : Dissertation Viva 30 marks + Theory Viva 20 marks ( 50 marks)

**Internal Assessment 50 marks (Theory 25 + Practicals 25marks)** 

#### **COURSE CONTENT**

#### FIRST YEAR

**PAPER 1:** Basic nutrition(National and international recommendation of nutrient requirements, carbohydrates, proteins, lipids, water), research methodology and biostatistics. (100 marks)

## <u>UNIT I</u>

#### **Basic nutrition**

## National and international recommendation of nutrient requirements:

- a) Recommendations for Indian by the ICMR
- b) FAO/WHO expert committee recommendations.

#### **Human Energy Requirements**

- Energy : some basic concepts
- Definition and components of energy requirements
- ✤ Factors affecting energy expenditure and requirement.
- Factors affecting BMR
- ✤ Factors affecting the thermic effects of food
- ✤ Factors affecting the energy expended in physical activity.

#### Methods of estimation of energy expenditure and requirements:

- ✤ Direct calorimetry
- ✤ Indirect calorimetry
- ✤ Double labeled water (DLW) Technique
- ✤ Heart Rate Monitoring (HRM) method
- ✤ Factorial estimation of total energy expenditure.

#### Energy requirements and dietary energy recommendation.

- Energy requirements of infants
- Energy requirements of children and adolescents
- Energy requirements of adults.

- Energy requirements during pregnancy.
- Energy requirements during lactation.
- Energy imbalance an overview

#### Carbohydrates

- \* Classification of Carbohydrates
  - Based on degree of polymerization.
  - Classification based on digestive fate of carbohydrates.

#### Function

- Digestion and absorption
- Metabolic utilization of carbohydrates
- Regulation of blood glucose concentration

#### ✤ Dietary fibre

- Components of dietary fiber
- Preparation of fiber
- Effects of dietary fiber
- Potential health benefits of dietary fiber
- Recommended intake of fiber.

#### **Resistant starch:**

- Factory affecting and influencing Resistant starch content of foods.
- Potential health benefits.

## Fructo oligosaccharides

- ✤ Glycemic index
- ✤ Factors affecting glycemic index of foods.
- ✤ GI in chronic diseases.

## Carbohydrate requirement

✤ Modification of carbohydrate intake for specific disorders

#### Proteins

- Classification
- Food sources
- Digestion, absorption and transport of amino acids and proteins

#### Functions

- > Methods of determination of proteins and amino acid content in foods.
- > Improvement of quality of proteins in the diet.
- Methods of estimating and assessing protein requirements at different stages of life cycle.
- Nutritional requirements and recommended allowances for proteins and amino acids.
- Protein deficiency

# Lipids

Fats: Some Basic facts

Types of fats and its metabolism

- Classification of fats and fatty acids
- Digestion of fats
- ✤ Absorption of fats
- Transport and storage of fats in the body

## Function of fats and oils

- ✤ Adults
- Pregnancy & Lactation
- ✤ Infancy
- Young and older children

## **Excessive fat intake**

- Changing trends in dietary intake.
- ✤ Diseases: Association and preventive measures.

## Water:

(An Essential but overlooked)

- Functions of water in the today
- ✤ Water distribution and compartments of body water.
  - Compartment of body water
  - Factors influencing water distribution

## Water Balance

- ✤ Water intake
- ✤ Water Output
- ✤ Regulation of water balance
- Requirements of work

## **Dehydration / edema**

# **RESEARCH METHODOLOGY**

- Basic principles of biostatistics and research methodology, sample size calculation analysis of data, , types of studies randomization, clinical trials,
- Basic reviewing quantitative and qualitative literature. carry out an appropriate, rigorous review of the literature; and understand the strengths and weaknesses of different methods of identifying, assessing and synthesizing literature.
- Planning the review: the role of the literature review and specification of the task
- Identification of relevant literature, both published and unpublished: developing a search strategy and using bibliographic databases.
- Appraising the literature: methods for assessing the quality of quantitative and qualitative research.

- Synthesizing the evidence: integration of the evidence using both quantitative and qualitative methods; principles of meta-analysis.
- Formulating recommendations and writing the review.

## **BIOSTATISTICS**

- Introduction to Biostatistics
- ✤ Definition, role of statistics in health science and health care deliverySystem
- Sampling Population, sample, sampling, reasons for sampling, probability and nonprobability sampling
- Methods of probability sampling-simple random, stratified, systematic procedure, merits and demerits. Use of random number table.
- Organization of data
- ✤ Frequency table, histogram, frequency polygon, frequency curve, bar diagram, pie chart
- Measures of location Arithmetic mean, median, mode, quartiles and percentiles – definition, computation (for raw data ), merits, demerits and applications.
- Measures of variation:Range, inter –quartile range, variance, standard deviation, coefficient of variation- definition, computation (for raw data), merits, demerits and applications.skewness and kurtosis.
- ✤ Basic probability distributions.
- Concept of probability distribution. Normal, Poisson and Binomial distributions, and application. Concept of sampling distributions. Standard error and confidence intervals.
- Tests of significance :
- Basic of testing of hypothesis Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.
- Tests of significance (parametric) t test (paired and unpaired), Chi square test and test of proportion.
- Correlation and Regression :
- Scatter diagram, concept and properties of correlation coefficient, examples (No computation Simple correlation) Pearson's and spearman's, testing the significance of correlation coefficient.
- ✤ Linear and multiple regressions.

Paper II: Vitamins and minerals, Food components other than essential nutrients (100marks)

# <u>Unit II</u>

## Fat and water soluble Vitamins

- Introduction, physiological roles, bioavailability, requirements food sources deficiency and toxicity.
- ✤ Interactions with other nutrients

## Minerals

- Introduction, physiological roles, bioavailability, requirements food sources deficiency and toxicity.
- ✤ Interactions with other nutrients

## Food components other than essential nutrients:

- ✤ Introduction
- ✤ Functional foods

## Classification

- ✤ Bioactive substance from plant food.
- Non glycosides in edible oils

**Probiotics and Prebiotics** 

Prebiotics

- Definition and characteristics
- Probiotics: dietary sources and their mode of action / effect

## Prebiotics:

- Definition and characteristics
- Prebiotics: dietary sources and their mode of action / effect

## Polyphenols

- Definition and classification.
  - Bioavailability of polyphones
- ✤ Influence of Polyphenols on macro and micro nutrients and minerals.
- Health benefits of Polyphenols

# Phytoestrogens

Dietary sources and chemical forms

# Other dietary factors with antinutrional effects.

- Protease inhibitors
- ✤ Saponins
- Amylase inhibitors
- Lectins and hemagglutinins
- Phytates

# Food additives

Definition and Needs for food additives

Different food additives

Additives and food safety, unintentional additives.

# **Reference Books**

22. Lubert Stryer 'Biochemistry'

- 23. Medical Textbook Of Biochemistry Chaterjee.
- 24. Lehninger A. L. (1990) 'Principles of Biochemistry' New Delhi CBS Publisher and Distributor.
- 25. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
- 26. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
- 27. Nutritional biochemistry of vitamins David a bendor.
- 28. Achayya, K.T.:(1998) A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
- 29. Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
- 30. Research Methodology By C.R Kothari
- 31. International Life Sciences Institute Present Knowledge in Nutrition latest edition
- 32. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised Enlarged) Bapp Co. 1985.

#### SECOND YEAR

**PAPER 1:** Applied nutrition and Medical nutritional therapy (100 marks)

## UNIT III

#### **Applied Nutrition**

- 1. Menu Planning Rationale for menu planning
- 2. Factors affecting food choice
  - o Nutritional factors
  - Other factors

Exchange list Vs food composition tables for menu planning

- Steps in the development of exchange list

## **Planning for adults**

Based on Recommended daily allowances

#### **Pregnancy and lactation**

#### Physical changes during pregnancy

- Expansion in plasma volume and red cell mass
- Hormonal profile in pregnancy
- Placental transfer of nutrients
- Maternal weight gain.

#### Nutritional needs during pregnancy

Maternal nutrition and fetal outcome:

- Pre Pregnancy weight and fetal outcome
- Pre pregnancy height and fetal outcome
- BMI and other anthropometric measures as applicable
- ✤ Weight gain during pregnancy and fetal outcome,
- ✤ Maternal dietary intake and fetal outcome.
- ✤ Non-nutritional factors: Antenatal care, age, heavy physical work and intra uterine infections.
- \* Nutritional assessment and guidance in prenatal care.
- ✤ Nutritional management of high risk pregnancies.

#### Lactation

- Physiology
- ✤ Human milk composition and infant growth and development
- ✤ Malnutrition- Effects on milk and effects on mothers.
- Nutrient requirements during lactation
- Dietary management
- Other concern during breast feeding

#### Infants and preschool children

Growth and development:

- Physiological changes
- ✤ Growth monitoring
- ✤ Health monitoring
- ✤ Nutrient needs and recommended dietary allowances.
- Diet and feeding patterns
  - Feeding 0-6 months infant
  - Feeding 6-12 months infant
  - Feeding preschoolers

Problems of infants and preschoolers nutrition.

## Older children and adolescents

- Changes in physical development and body composition.
- ✤ Sexual maturity
- Psycho social changes.

Nutrient needs and recommended dietary intakes.

- Diet and dietary patterns
- Problems of older children and adolescent nutrition.

## **Geriatric population**

- Definition of old age
- Nutrition and ageing
- ✤ Physiological changes associated with ageing.
- Changing body composition and techniques for measuring body composition.

Nutritional requirements and dietary modification in the diet of the olderly

Guidelines for planning balanced diet for elderly

#### Sport Nutrition

- Introduction
- Evaluation and growth of sports nutrition as a discipline
- ✤ Anthropometric and physiological measurement.
  - Various techniques for measuring body composition.
  - Work capacity

#### **Physical fitness**

- Parameter of fitness
- Fitness tests

#### Nutritional requirements for extreme environments

General adaptive mechanisms to environmental extreme and role of nutrition in successful acclimatization.

- ✤ Health Hazards associated with high altitude
- Nutritional requiremens in high altitude

Nutritional requirements in high cold and polar envelopment

- Nutritional requirements in hot environments
- Nutritional requirements for space missions

#### Nutritional regulation of Gene Expression, Epigenetic & Nutrigenomics

- ✤ Introduction
- ✤ Gene Expression- An overwiew
- \* Role of specific nutrients in controlling gene expression
- Proteins
- ✤ Lipids
- ✤ Minerals
- ✤ Vitamins

## Immunonutrition

- ✤ Role of specific nutrients in immune suppression.
- Role of nutrients in immune promotion

Functional foods and nutriacuticles in health disease

- ✤ History
- Definition
- Classification
- Physiological effects, effects of human health and potential applications in risk reduction of diseases.

## **Medical Nutrition therapy**

- 1. Definition
- 2. Nutritional screening
- 3. Nutritional care process
  - Nutritional Assessment

- ✤ Nutritional diagnosis
- ✤ Nutritional Intervention
- Monitoring and evaluation

#### **Nutritional Intervention – Diet Modification:**

- > Adequate normal diet as basis for therapeutic diets
- Diet prescription
- Modification of normal diet.
- > Nomenclature of diet adequacy in standard hospital diet.
- > Psychological factors in feeding the sick person.
- Interaction among drugs, food nutrients and nutritional status
- Effects of drugs on food intake nutrient absorption, Metabolism and requirements.
- Drugs affecting intake of food and nutrients

Absorption

Metabolism and excretion

Nutritional status

• Effect of food, nutrients and nutritional status on absorption and metabolism of drugs.

#### Nutritional Management in critical care

- \* Nutritional screening and nutritional Status assessment of critically ill.
- Nutritional requirement according to the critical condition

#### Nutritional support systems:

Enteral and parenteral nutrition support

#### **Enteral Nutrition**

- > Site
- ➢ Size of the tube
- ➢ Feed-types
- Complications

#### **Parenteral Nutrition**

- ➤ Type
- ➢ Composition
- ➢ Complications

#### PAPERII: Nutritional care in disease.

## <u>UNIT IV</u>

#### Nutritional care in disease condition

#### Nutritional management in infection and fever

- ✤ Defense mechanism
- Metabolic changes during infection
- Classification and entity of fever infection
- Typhoid/ TB / parasitic infestation/ Aids

#### Nutritional management of physiological stress

Nutrition in wound healing

Surgery: Pre and post surgical dietary management

Burns

- Classification
- ➤ Complication
- Dietary management
- Trauma: Dietary management
- Sepsis: Dietary management

#### Nutritional management of GI diseases:

Physiological and functional changes and impact on Nutritional status

#### Diseases of Esophagus and stomach

- Esophagitis(GERD)
- Dyspepsia
- > Peptic ulcer
- ➢ Gastritis
- Gastrectomy: Dumping syndrome

#### **Intestinal diseases**

- ➢ Flatulence
- > Diarrhea
- > Constipation, Hemorrhoids, Diverticular disease
- Duodenal ulcer
- > Inflammatory Diseases of Bowl: Crohn's disease and ulcerative colitis
- Irritable bowl syndrome
- > Colostomy
- ➢ Ileostomy

## Malabsorption syndrome

- Celiac disease (Tropical sprue)
- ➢ Steatorrhoea
- Intestinal Brush border diseases

## **Protein losing enteropathy**

## Nutritional Management in diseases of the liver, Pancreas and Biliary system Pathophysiology of liver diseases:

Progression of liver disease, Metabolic and nutritional Implications, Role of specific nutrients and alcohol in liver diseases.

Nutritional care in liver disease in the context of results of specific liver function tests.

Viral hepatitis, cirrhosis of Liver, Hepatic encephalopathy, Wilsons disease.

Liver transplant

**Diseases of Gall bladder and pancreas** – pathophysiologic changes, Metabolic and Nutritional implications:

- Biliary dyskinesia
- Cholelithiasis
- > Cholecystitis
- Cholecystectomy
- Pancreatitis
- Zollinger Ellison syndrome

## Nutritional management of metabolic disease 1: Diabetes and hypoglycemia

Prevalence and classification Of DM

- Etiology
- Physiological symptoms and disturbances
- Diagnosis and tests used
- Complications

# **Management of Diabetes Mellitus**

## Nutritional therapy

- > Diet Plan Food exchange list, Glycemic index, CHO counting.
- > Meal planning with and without insulin, during sickness
- > Artificial sweeteners and sugar substitutes.
- Drugs and insulin
- ➢ Exercise

**Hypoglycemia:** Classification, symptoms, Fasting hypoglycemia, Postprandial or reactive hypoglycemia, early alimentary and late reactive hypoglycemia, Idiopathic hypoglycemia. Dietary treatment in reactive hypoglycemia.

# Nutritional management of metabolic disease: II Gout and inborn error of metabolism Gout:

- Role of proteins and purine
- ➢ Etiology
- Symptoms and complications
- Dietary management

## Inborn errors of metabolism

- > PKU
- > MSUD
- > Tyrosinosis
- ➢ Homocystinurias
- Glycogen storage disorders
- ➢ Galactosemia
- Organic acidurias
- > Other types

## Nutritional Management on Weight imbalance

- Regulation of food intake and pathogenesis of obesity and malnutrition and starvation.
- > Weight Imbalance: prevalence and classification.
- > Guidelines for calculating desirable body weight.
- Control of appetite and food intake: Neural count, Hormonal count, Insulin, estrogen and other types of peptide hormones.

#### **Obesity:**

- ➤ Etiology
- ➢ Energy balance
- $\succ$  Health risks

#### Management

- Diet and lifestyle modification
- Evaluation of some common diets
- > Preventive aspects

#### Underweight

- ➢ Etiology
- Diet management

#### Nutritional management of eating disorders

- Anorexia Nervosa
- Bulimia

#### Nutritional management in coronary heart disease

Pathogenesis, role of nutrients in prevention and management – Nutritional and metabolic implications of dyslipidemias.

#### CHD

- > Prevalence
- Etiology and risk factors
- Diagnostic tests
- Nutrition management

#### Common disorders of CHD and Nutrition management

- > Dyslipidemias
- Atherosclerosis
- ➢ Hypertension
- > IHD
- ≻ CCF
- Rheumatic heart disease

#### Nutrition Management of Renal Disease

**Diseases of renal system:** etiology and pathogenesis: change in function with progression of diseases, metabolic and nutritional implications.

Clinical and metabolic manifestations

Diagnostic tests

## Types

- Acute and chronic nephritis
- > Nephrotic syndrome
- Renal Failure: Acute and chronic
- > ESRD

## Nutritional management in cancer

Cancer: Pathogenesis and progression of cancer

Role of Nutrients and food additives in cancer therapies and their nutritional implications.

# Types

- > Symptoms
- Diagnosis
- Cancer therapies: Nutritional implications
- Dietary management

# Nutrition management in Diseases of nervous system and musculoskeletal system

- > Dysphagia
- ➢ Epilepsy
- Hyperkinetic behavior syndrome

# Etiology dietary treatment in arthritis and osteoporosis

# Nutritional management in Allergy

- Definition, symptoms mechanism of food allergy
- Biochemical and immune testing (Brief)
- Elimination diets
- ➢ Food selection
- > Food allergy in infancy: Milk sensitive enteropathy, intolerance to breast milk.
- Prevention of food allergy
- ۶

# **Reference books**

- 1. Modern Nutrition in Health and Disease 10<sup>th</sup> edition by Maurice E. Shils
- 2. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
- 3. Nutritional biochemistry of vitamins David a bendor.
- 4. Achayya, K.T.:(1998) A Historical Dictionary Of Indian Foods, Oxford Publishing Co.
- 5. Mahindru, S.N. (2002). Food Additives Characteristics, Detection and Estimation, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
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- 9. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
- 10. Robinson, Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co. 1986.
- 11. Davis J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2<sup>nd</sup> edition, W.B. Saunders Co.
- 12. Davidson's Human Nutrition Geissler.
- 13. Nutrition and Biochemistry for Nurses by Jacob Anthikad
- 14. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
- 15. Thomas, B.: Manual of Dietetic Practice, 1996.
- 16. L. MatareseGottschlich Contemporary Nutrition Support Practice, Saunders 1998
- 17. ASPEN; Nutrition Support, Dietetics
- 18. Clinical dietetics and nutrition by F.P Antia and Philip Antia.

#### **PRACTICALS: First Year**

- 1. Characterization and Quantification of carbohydrates, protein and lipids.
- 2. Determination of saponification number and iodine number from oils
- 3. Milk analysis physical and chemical(adulteration and contamination)
- 4. Analysis of food substance
- 5. Food fortification
- 6. Problems on calorie requirements
- 7. Plan and prepare weaning foods.
- 8. Assessing nutrition status using ABCD parameters.
- 9. Using different malnutrition assessment tools SGA, MUST etc.,
- 10. Planning and preparation of liquid diet.
- 11. Preparation of formulae for enteral feeding HOME based combination feeds, supplement feeds.

#### PRACTICALS: SECOND YEAR

- 1. Planning enteral feed plan for hypercatabolic condition in adult and pediatric patients.
- 2. Assessing requirements and planning diet for obese and underweight individual
- 3. Preparing high fiber low calorie recipes
- 4. Assessing and planning diets for the following conditions
  - a. IBD celiac disease
  - b. IBS Lactose intolerance
- 5. Plan and prepare diet for those who have fat and protein malabsorption

- 6. Assessing and planning diet for patients with Type I and II DM with and without complications and on different modalities of treatment
- 7. Planning diet for compensated and decompensated Liver failure condition
- 8. Planning diet for individual with hypertension.
- 9. Planning diet for RF
- 10. Planning diet for patient on dialysis (HD & PD)
- 11. Planning diet for post transplant renal patient
- 12. Assessment and planning diet for post burn condition
- 13. Assessment and planning diet for HIV with and without co-morbidities.
- 14. Assess factors contributing for poor nutritional status in cancer patient and plan diet based on the treatment.

#### **Model question paper**

## MSC clinical nutrition

## <u>PAPER – I</u>

(National and international recommendation of nutrient requirements, carbohydrates, proteins, lipids, water, research methodology and biostatistics.)

#### Time: 3hrs

#### Max Marks: 100

# Section A (50 marks)

#### **INSTRUCTIONS:**

- Write section A & B in separate answer booklets
- Mention the question numbers properly
- Mention your roll number and name correctly
- Answer should be brief and relevant, Illustrate your answers
- 1. Enumerate the various components of energy expenditure, highlighting the factors that influence energy expenditure and requirement. (10)

#### Write Short notes

7x4=28

- 2. BMR and factors affecting BMR
- 3. Dietary modifications for the elderly

- 4. Glycemic index and factors affecting glycemic index of foods
- 5. Food additives
- 6. Standard deviation
- 7. Hormonal regulation of blood glucose
- 8. Transport and storage of exogenous lipids

#### Very short answers

#### 6x2=12 marks

- 9. Give the reference range for plasma osmolaliy and list any two codition where plasma osmolality will be increased.
- 10. Name any two hormones which are involved in the regulation of fluid and electrolyte balance and explain how they regulate fluid and electrolyte balance with suitable illustration.
- 11. List the energy source for brain in well fed and fasting condition
- 12. Mention any TWO inhibitors of HMG coA reductase
- 13. Mention the biochemical defect in prion's disease with sutitable example and illustrations
- 14. List any FOUR which are nutrition essential aminoacids.

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## Section B 50 Marks

 How are endogenous cholesterol transported and metabolized in our body. Add a note on reverse cholesterol transport. (1x10=10)

#### Short Answers

#### 4x7=28marks

2. Calculate BMI for 30 year male with height 159 cm and weight 90 kg and mention any two clinical conditions associated with obesity.

- 3. What are protective foods? List any two uses .of the same.
- 4. What do you mean by the term food additive? Give suitable examples
- 5. Potential health benefits of dietary fibre.
- 6. Enumerate the tests of significance and mention in which situation they will be used
- 7. Explain the role of vasopressin in water balance
- 8. Explain the metabolic changes taking place during starvation

#### Very short answers

#### 2x6=12marks

- 9. Define SDA and mention its significance
- 10. Why animal protein is considered superior than plant protein?

- 11. Mention any two biochemical indices to assess the quality of protein.
- 12. Intake of transfatty acid is harmful. Justify the statement?
- 13. What do you mean by the term food fortification? Give two examples
- 14. Justify why cereals and pulses have to be supplemented mutually.

#### Paper II`

- 15. Explain how biochemically you can differentiate between Iron deficiency and megaloblastic anemia.
- **16.** Prescribe a diet plan for a patient with diabetes mellitus .add a note on sweeteners and sugar substitutes
- **17.** (10)
- **18.** Describe the role of nutrients and food additives in cancer. (15+5=20)

6x10=60

#### Write short notes on

- 19. Total Parenteral nutrition
- 20. Malabsorption syndrome
- **21.** Nutritional management of anorexia nervosa
- 22. Phenyketonuria and its nutritional management
- 23. Pre and post surgical dietary management
- 24. Assessment of vitamin A deficiency

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#### Practicals: 100 marks

Duration of exam – one day

1. Assessing the nutritional status of an individual using different malnutrition assessment tools as appropriate.

2. Assessing requirements and planning diet for any one disease condition.