AMRITA VISHWA VIDYAPEETHAM

PROGRAM
DM ENDOCRINOLOGY

(Revised with effect from 2016-2017 onwards)

Contents

GOAL

To create specialists in the field of endocrinology

Program Outcomes

PO1. Competency to make a correct diagnosis of common Endocrine problems.
PO2. Ability to plan, arrange, execute and interpret endocrine investigations.
PO3: Performance skill for diagnostic and therapeutic interventions in Endocrinology
PO4: Familiarity with the pattern of Endocrine problems of the community, should be able to identify and plan research proposals

Programme Specific Outcomes

PSO1: Ability to elicit a proper history and relevant clinical findings
PSO2: Ability to interpret results of hormonal assays
PSO3: Ability to plan and carry out special diagnostic tests often in conjunction with other departments
PSO4: Familiarity with basic procedures of relevance like USG and FNA thyroid
PSO5: Familiarity with the use of devices of relevance to endocrinology practice like continous glucose monitoring system and insulin pump
PSO6: Good communication skills
PSO7: Ability to train paramedical staff in imparting basic patient education regarding common endocrine problems

COURSE CONTENTS

A. Basic sciences

1.Human anatomy relevant to Endocrine clinical practice- Anatomy of various Endocrine glands, blood supply and their developments

2.Human physiology related to Endocrinology – Mechanism of action of different hormones – Peptide hormones and steroids, Genetic control of hormonogenesis

3.Clinical Pharmacololgy- related to Endocrinology and Diabetes drugs

4.1.Nutrition- Normal requirements, assessment of nutritious status, calculation of calories and calorie counting

B. Endocrinology

1.Hypothalamous and Pituitary – Neuro Endocrinology, Anterior pituitary, Posterior Pituitary.

2.Thyroid – Thyrotoxicosis, Hypothyroidism, Thyroiditis, Nodular goiters and Thyroid Neoplasia
Disorders of Carbohydrate metabolism – Diabetes Mellitus Type 1 & 2 , Complications of Diabetes, Hypoglycemias,

3.Disorders of Lipid metabolism – Obesity- Hyperlipidemias

4.Poly endocrine disorders – Multiple endocrine neoplasia

5Adrenal – Adrenal cortical disorders, Adrenal Medullary diseases, Endocrine Hypertension.

6.Reproductive system- Sexual differentiation, Testicular disorders, Ovarian disorders, Hormonal contraception, sexual dysfunction in men and women, disorders of sex development, disorders of puberty.

7.Endocrinology of normal growth and Aberrant growth disorders

8.Mineral Metabolism – Hormones and Disorders of Mineral Metabolism, Metabolic bone disease, Hypo & Hyper parathyroidism
Para endocrine syndromes, Hormonal manifestations of malignancy, Carcinoid tumors and carcinoid syndromes.

9.Endocrinology of HIV and AIDS
10.Gastro intestinal hormones and Gut hormones
11.Endocrine changes of pregnancy
12.Endocrinology of aging
13.Immuno endocrinopathy syndrome.

Training period will be 3 years. Training and examination must be over within this period.

THESIS

Each candidate is expected to undertake 2 research projects under the guidance of the consultants. The candidates have to submit the research project within 6 months of joining and get the approval of the ethics committee. Project must be over and thesis submitted within 2-½ year after joining the course

METHODS OF TRAINING

3 year training will be full time residency programme and all the candidates are expected to stay in the campus.

Clinical training: - Candidates will be posted for 3 months in out patients and rotated with the wards for 3 months.

During the OP posting in the first year the candidate will be sitting with a consultant and will not be doing independent OP disposal. During the second and third year, they can see independently the OPD cases but before making the final decision they should get the consultant's opinion.

They will have to attend the specialty clinics like Paediatric Endocrinology, Gynec Endocrinology, Growth clinic, Pituitary clinic and Thyroid cancer clinic.

During the ward posting, they will be responsible for all the patients admitted under the unit. They should be filling the case records, planning and executing the investigations and presenting the cases at the time of ward rounds to the Consultants.

One of the candidates will be the on call for the Endocrinology consultation both for the casualty and for the other departmental Endocrine consultations. This routine call duty will be rotated among the P.G candidates.

All the P.G candidates will be given practical training in Endocrine procedures like FNAC Thyroid, Continuous Glucose Monitoring System, Insulin pump and Endocrine stimulation and suppression tests and also basic O.P.D footcare procedures like callus scraping

All the candidates will be posted during the second year of training in hormonal assay lab, Cytogenetic lab, Molecular Biology lab etc;

Method of training includes:

1. Bed side ward rounds by consultants every working day

2. Bed side teaching clinic twice a week
3. Journal club twice a week
4. Seminars once a week
5. Endo-Nuclear Medicine discussion once in a month
6. Endo-Pathology conference once in a month
7. Endo-Radiological conference once in a month
8. Endo-Neurosurgery conference once in a month
9. Telemedicine conference with outside institutes once in a month

Courses:

Course I Basic science related to Endocrinology (Code DMEN1)

CO1: Knowledge of Human anatomy relevant to Endocrine clinical practice- Anatomy of various Endocrine glands, blood supply and their developments
CO2: Knowledge of Human physiology related to Endocrinology – Mechanism of action of different hormones – Peptide hormones and steroids, Genetic control of hormonogenesis
CO3: Knowledge of Clinical Pharmacololgy- related to Endocrinology and Diabetes drugs
CO4: Knowledge of Nutrition- Normal requirements, assessment of nutritious status, calculation of calories and calorie counting

Basic sciences

1.**Human anatomy relevant to Endocrine clinical practice**- Anatomy of various Endocrine glands with their blood supply and their developments

2.Human physiology related to Endocrinology – **Mechanism of action of different hormones such as Peptide hormones and steroids**.Role of genetics in hormonal control

3.Clinical Pharmacololgy- related to Endocrinology and Diabetes drugs

4.1.**Nutrition- Basic requirements**, assessment of nutritious status, Calorie counting and estimation

Course II Clinical Endocrinology (Adult) – Code DMEN2

CO1: Knowledge about the diseases affecting hypothalamus, pituitary, parathyroid and thyroid. Para endocrine syndromes, Hormonal manifestations of malignancy, Carcinoid tumors and carcinoid syndromes.
CO2: Knowledge about the disorders affecting the metabolism of carbohydrate and lipids.
CO3: Knowledge about poly endocrine disorders, disorders involving adrenal and reproductive system.
CO4: Endocrinology of HIV and AIDS
CO5: Endocrinology of aging.

.Hypothalamous and Pituitary – Neuro Endocrinology, Anterior pituitary, Posterior Pituitary.

Thyroid – **Thyrotoxicosis, Hypothyroidism, Thyroiditis, Nodular goiters and Thyroid Neoplasia**
Disorders of Carbohydrate metabolism – Diabetes Mellitus Type 1 & 2 , Complications of Diabetes, Hypoglycemias,

Disorders of Lipid metabolism – Obesity- Hyperlipidemias

Poly endocrine disorders – Multiple endocrine neoplasia
Endocrinology of aging

Course III Clinical Endocrinology (Pediatrics & gynec) - DMEN3
CO1: Endocrinology of normal growth and aberrent growth disorders. Para endocrine syndromes, Hormonal manifestations of malignancy, Carcinoid tumors and carcinoid syndromes.
CO2: Knowledge about the disorders affecting the metabolism of carbohydrate and lipids.
CO3: Knowledge about poly endocrine disorders, disorders involving adrenal and reproductive system.
CO4: Endocrine changes of pregnancy
CO5: Endocrinology of HIV and AIDS, Immuno endocrinopathy Syndrome.

Adrenal – Adrenal cortical disorders, Adrenal Medullary diseases, Endocrine Hypertension.
Congenital Hypothyroidism
.Reproductive system- **Sexual differentiation**, Testicular disorders, Ovarian disorders, Hormonal contraception, sexual dysfunction in men and women, disorders of sex development, disorders of puberty.

Endocrinology of normal growth and Aberrant growth disorders
Diabetes in pediatric age group and the quality of life on a long term basis
Delayed secondary sexual characteristics in adolescents
Mineral Metabolism – Hormones and Disorders of Mineral Metabolism,
Metabolic bone disease, Hypo & Hyper parathyroidism
Para endocrine syndromes, Hormonal manifestations of malignancy, Carcinoid tumors and carcinoid syndromes.

Endocrinology of HIV and AIDS
Gastro intestinal hormones and Gut hormones
Endocrine changes of pregnancy
Immuno endocrinopathy syndrome.

Course IV Recent Advances in Endocrinology – Code DMEN4
CO1: Updated knowledge of technologies used in Endocrinology
CO2: Updated knowledge on the drugs used in the practice of Endocrinology

CO3: Knowledge about the recent published research papers in the subject.

Role of cytokines in the pathogenesis of CAD in Type 2 Diabetes
HIV endocrinopathy
GH doping
Newer modes and efficacy of glucose monitoring devices and insulin delivery devices
Islet transplantation- the feasibility and long term prognosis
DPP 4 inhibitors
Recombinant insulin
Critical appraisal of recombinant PTH and its use in osteoporosis
Metformin in pregnancy
Hypothyrodism and pregnancy
Anorexigenic peptides

Soft Skills (Code: DMEN5) Elective Course
CO1: Competency to conduct a clinical research.
CO2: Acquisition of pedagogical skills for students (MBBS, Specialities)
CO3: Ability to work as a member of a healthcare team.
CO4: Communication skills with patients, caregivers and colleagues including non medical staff.
CO5: Attitude to be a lifelong learner.

SCHEME OF EXAMINATION

Examination

At the end of 3 years of training candidates have to appear the university Examination. The examination consists of theory, clinical and Viva voce.

Theory examination consists of 4 papers of 3 hour duration each. Each paper may consist of 10 short notes of 10 marks each or 1 essay of 30 marks and 7 short notes of 10 marks each.

Paper –1 – Basic science related to Endocrinology – 100 marks
Paper –II – Clinical Endocrinology (Adult)– 100 marks
Paper –III- Clinical Endocrinology (Paediatrics & Gynec) – 100 marks
Paper –IV – Recent advances in Endocrinology – 100 marks

Clinical examination : This will be conducted after the theory paper is over. The exam consists of one long case of Diabetes and five medium cases of Endocrine problems and 3 clinical spotters.

The Viva Voce exam may conducted after the clinical examination and it must be centered on practical management problems.

The candidates can be cleared to have passed the exam if they achieve 50% of marks in each segment of the examination.

Board of Examiners

The setting up of theory question papers, evaluation of theory paper and assessment of other clinical examination and viva voce must be done by a set of 4 examiners. Out of these 4 examiners, maximum of 2 can be from the department as internal examiners. The other external examiners must be selected from the panel of examiners approved by the university. To become a member of the panel, they must be Professor/Additional Professor in a recognized university with DM degree in Endocrinology.

Log Book

During the course of the training the candidate should maintain a log book, which should include the details of each posting, cases presented for the clinics, Endocrine procedures undertaken by the candidate, the journal club and seminars presented by the candidates Also details of the conference attended and presentations made by the candidates must be documented in the log book. The log book must be finally signed by the Head of the Department before submitting for the final examination.

Internal Assessment

All the candidates will be assessed routinely, but a 6 monthly official assessment and recording is done by the HOD. This will include a theory paper on a selected topic and viva voce. Also the candidate will be evaluated on the following criteria.

1. Soundness of knowledge
2. Punctuality and promptness
3. Keenness to learn
4. willingness to work
5. Application and judgment
6. Initiative and reliability
7. clinical skills & ability to express
8. Behaviour with patients,relatives, collegues and staff

MODEL QUESTION PAPER

Paper –1 – Basic science related to Endocrinology – 100 marks

Write short notes on

1) Adiponectin
2) Assessment of insulin sensitivity
3) Hypothalamo pituitary adrenal axis effect of ageing
4) Estrogens and bone health
5) Iodine cycle
6) Incretins
7) Vitamin D receptor gene polymorphism
8) Calcium sensing receptor Role in disease
9) Hook effect
10) Sperm autoimmunity

Paper –II – Clinical Endocrinology (Adult)– 100 marks

1)Vitamin D deficiency in tropics
2)Subclinical hypothyroidism
3)Evaluation of ACTH dependent Cushing
4)Adrenal imaging
5)Pathophysiology of hypoglycemia unawareness
6) Bairiatric Surgery
7)Management of Graves ophthalmopathy
8)Noninvasive vascular assessment in diabetes
9)Management of asymptomatic hyperparathyroidism
10) Adult growth hormone deficinecy

Paper –III- Clinical Endocrinology (Paediatrics & Gynec) – 100 marks

1)Management of infertility in PCOS
2)Androgen insensitivity syndrome
3)Evaluation and management of central precocious puberty in a 3 year old girl
4) Prevention of Type 1 diabetes
5)Diagnosis of 11 beta hydroxylase deficiency
6)Pitfalls of GH stimulation tests
7)Thyroid dysfunction in pregnancy
8) Neonatal Diabetes
9)GH therapy for Turner
10)Neonatal hypocalcemia

Paper –IV – Recent advances in Endocrinology – 100 marks

1)Role of cytokines in the pathogenesis of CAD in Type 2 Diabetes
2)HIV endocrinopathy
3)GH doping
4)Newer modes and efficacy of glucose monitoring devices and insulin delivery devices
5)Islet transplantation
6)DPP 4 inhibitors
7)Glitazones where we stand now?
8)Critical appraisal of recombinant PTH and its use in osteoporosis
9)Metformin in pregnancy
10)Anorexigenic peptides

List of Books

Must Read

Williams Text book of Endocrinology
Harrison's Textbook of Medicine
Nelson's Textbook of pediatrics
Degroot
Pickup and Williams
Joslin's Textbook of Diabetes

Refer

Degroot
Sperling Pediatric Endocrinology
Ingbar Thyroid
Meena Desai Pediatric Endocrinology
Levines Practical Manual on Endocrinology

List of Journals

Foreign
Journal of Clinical Endocrinology and Metabolism
Clinical Endocrinology
Endocrine Reviews
NEJM
Lancet
Diabetes Care
Thyroid
Journal of bone and mineral research
Calcific tissue international
Nature

Nature clinical practice of endocrinology and metabolism
Pituitary
JAMA
BMJ

Indian

National Medical Journal of India
Indian Journal of Endocrinology
Thyroid Research and Practice

AMRITA VISWA VIDYAPEETHAM UNIVERSITY

AMRITA SCHOOL OF MEDICINE

DM IN ENDOCRINILOGY

LOGBOOK

DEPARTMENT OF ENDOCRINOLOGY & DIABETES
AIMS, KOCHI – 41

Date:……

CERTIFICATE

Certified that Dr. …… has completed 3 years of DM Training Programme in Endocrinology, conducted by this Institute during the period from…… to……

Head of Department
Dept. of Endocrinology
AIMS, Kochi

Prof. of Endocrinology
Dept. of Endocrinology
AIMS, Kochi

Principal
AIMS, Kochi

Medical Director
AIMS, Kochi

Index

DM Training Programme

Weekly <u>academic schedule</u>

Monday	Seminar	:8.00 am – 9.00am
	Ward rounds	:9.00 am – 12.30 pm
	Out patients	:9.00 am – 3.00 pm

	Evening Case Discussion	:4.00pm – 5.00 pm
Tuesday	Medical Specialty Meeting /Topic presentation	8.00 am – 9.00 am
	Ward rounds	:9.00 am – 12.30 pm
	Out patients	:9.00 am – 3.00 pm
	Evening Case Discussion	:4.00pm – 5.00 pm
Wednesday	Journal Club	:8.00 am – 9.00 am
	Ward rounds	:9.00 am – 12.30 pm
	Out patients	:9.00 am – 3.00 pm
	Evening Case Discussion	:4.00pm – 5.00 pm
Thursday	Interdepartmental meeting	:8.00 am – 9.00 am
	Ward rounds	:9.00 am – 12.30 pm
	Out patients	:9.00 am – 3.00 pm
	Evening Case Discussion	:4.00pm – 5.00 pm
Friday	Teaching Rounds	:8.00 am – 9.00 am
	Ward rounds	:9.00 am – 12.30 pm
	Out patients	:9.00 am – 3.00 pm
	Evening Case Discussion	:4.00pm – 5.00 pm
Saturday	Case Presentation	:8.00 am – 9.00 am
	Ward rounds	:9.00 am – 12.30 pm
	Out patients	:9.00 am – 3.00 pm
	Evening Case Discussion	:4.00pm – 5.00 pm

JOURNAL CLUB

Journal to be covered:

1. Journal of Clinical Endocrinology and Metabolism

2. Clinical Endocrinology
3. Thyroid
4. New England Journal of Medicine
5. The Lancet
6. British Medical Journal
7. Journal of Pediatric Endocrinology and Metabolism
8. Current opinion in Endocrinology
9. Journal of Associations of Physicians of India
10. Journal of American Medical Association
11. Endocrinology and Metabolism Clinics of North America
12. Archives of Diseases in Children
13. Science Direct
14. Annals of Internal Medicine

LAB POSTING

Biochemistry lab : Period of posting

Hormonal lab : Period of posting

Animal House : Period of posting

Sl. No.	Hormonal test	Methodology	Q.C Details (Quality control details)

Sl. No.	Biochemistry test	Methodology	Q.C Details (Quality control details)

TEACHING ACTIVITY

Regular classes for:

Example as give below:

MD Trainees (General Medicine)

MBBS students

MSc Diabetes students

Diabetes Educators Trainee

Podiatry Assistants Trainee

INTERDEPARTMENTAL MEETINGS

1. Neurology
2.

Sl. No.	Date	Cases discussed	Consultant Supervised

2. Radiology

Sl. No.	Date	Cases discussed	Consultant Supervised

3. Pathology

Sl. No.	Date	Cases discussed	Consultant Supervised

4. Nuclear Medicine

Sl. No.	Date	Cases discussed	Consultant Supervised

TELEMEDICINE MEETINGS

Sl. No.	Date & Time	Name of the Institute	Details of cases discussed

FNAC THYROID

Sl. No	Name	MRD Number	Clinical Diagnosis	FNAC Report

DYNAMIC TESTS

1. Growth hormone suppression tests

Sl.No.	MRD Number	Clinical Diagnosis

2. Growth hormone stimulation tests

Sl.No.	MRD number	Clinical Diagnosis

3. Insulin tolerance test

Sl.No.	MRD number	Clinical Diagnosis

4. Cushings work up

Sl.No.	MRD number	Clinical Diagnosis

5. IPSS

Sl.No.	MRD number	Clinical Diagnosis

6. ACTH Stimulation test

Sl.No.	MRD number	Clinical Diagnosis

7. Saline loading

Sl.No.	MRD number	Clinical Diagnosis

8. Post meal C peptide testing

Sl.No.	MRD number	Clinical Diagnosis

9. Prolonged fasting for evaluation of hypoglycemis

Sl.No.	MRD number	Clinical Diagnosis

10. HCG stimulation test

Sl.No.	MRD number	Clinical Diagnosis

11. Water deprivation tests

Sl.No.	MRD number	Clinical Diagnosis

12. Continuous Glucose Monitoring system

Sl.No.	MRD number	Clinical Diagnosis

13. Insulin pump

Sl.No.	MRD number	Clinical Diagnosis

14. Arterial stimulation venous sampling

Sl.No.	MRD number	Clinical Diagnosis

CASE PRESENTATIONS

Sl. No.	Name	MRD No	Diagnosis

SEMINARS/ TOPIC PRESENTATIONS

Sl.No.	Topic	Moderator

OUTSIDE POSTING DETAILS

(Other Institutional visit for training

PERIODIC EXAMINATIONS

Sl.No.	Month and Year	Topic	Score

CONFERENCE PARTICIPATION

NATIONAL

Date	Conference	Organizers	Venue

REGIONAL

Date	Conference	Organizers	Venue

PAPERS PRESENTED

Date	Paper	Nature	Conference	Venue

Other Presentations

1.

PUBLICATIONS

Sl.No.	Journal Name	Volume & Page	Article Name

STUDY PROJECT – 1

INTRODUCTION

AIM AND OBJECTIVES

METHODS

RESULTS

DISCUSSION

CONCLUSIONS

REFERENCES

ASSESSMENT

STUDY PROJECT – 2

INTRODUCTION

AIM AND OBJECTIVES

METHODS

RESULTS

DISCUSSION

CONCLUSIONS

REFERENCES

ASSESSMENT

Level of experience		
Numerical Score		
Negligible	0	
Useful experience	1	
Competent under supervision	2	

Fully competent	3	

Diabetes	Trainees assessment
Diagnosis and management of type 2 diabetes	
Diagnosis and management of type 1 diabetes	
Foot care in DM	
Hypertension in DM	
Dyslipidemia	
Renal Complications	
Ocular Complications	
Neuropathy	
Vascular Complications	
Management of Diabetes in Elderly	
Management of Diabetes in children	
Management of Diabetic Pregnancy	
Management of Diabetic Ketoacidosis	
Management of Hyperosmolar Non Ketotic Coma	
Management of Diabetes in a Surgical patient	
Diabetes education	
Nutrition in Diabetes	

Adrenal Disorders	Trainees Assessment
Investigation and management of Cushing's Syndrome	
Investigation and management of Addison's disease	
Investigation and management of secondary hypoadrenalism	
Glucocorticoid replacement therapy and withdrawal from steroid therapy	
Endocrine Hypertension	
Diagnosis and management of pheochromocytoma	
Diagnosis and management of hyperaldosteronism	
Puberty and Growth Disorders	

Investigation and management of a short stature	
Investigation and management of delayed puberty	
Investigation and treatment of precocious puberty	
Growth hormone treatment of GHD and other disorders	

Hypothalamic – Pituitary Disorders	**Trainee's Assessment**
Diagnosis, investigations and management of hypopituitarism	
Diagnosis and management of a patient with a pituitary mass	
Diagnosis and management of Diabetes Insipidus	
Diagnosis and management of hyperprolactinemia	
Diagnosis and management of Acromegaly	
Disorders of Sex Differentiation	
Understanding of normal sex differentiation	
Investigation and management of ambiguous genitalia	
Diagnosis, management and follow up Congenital Adrenal Hyperplasia	
Thyroid Disorders	
Investigation and management of a thyroid nodule	
Investigation and management Congenital hypothyroidism	
Investigation and treatment of Hypothyroidism	
Investigation and treatment of Hyperthyroidism	
Diagnosis and management of thyroid cancer	
Diagnosis and management of thyroiditis	

Disorders of Mineral Metabolism	**Trainee's Assessment**
Investigation and management of hypo and hypercalcemia	
Investigation and management of hypophoshatemia	
Investigation and management of rickets	
Management of Hypercalcemic crisis	
Vitamin D and Calcium treatment	
BMD measurement by DEXA	

Diagnosis and management of osteoporosis	
Miscellaneous Endocrine Disorders	
Investigation and management of MEN 1 and MEN 2	
Investigation and treatment of ectopic hormone production	
Investigation of Hypoglycemia	
Peptide secreting tumors of gastrointestinal tract	
Assessment and management of Obesity &Eating disorders like Anorexia nervosa, Bulmia	
Neonatal Disorders	
Neonatal hypoglycemia	
Neonatal hypercalcemia	

I confirm that the experience above has been acquired and that a satisfactory level of competence has been demonstrated **Signature of Educational supervisor** **Date**
YEARS OF TRAINING : three years