Edition 2080

PEN-Plus Training

For Management of Severe & Chronic NCDs in the First Level Referral Hospitals of Nepal



LEARNERS GUIDE



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Disclaimer

This Manual is provided solely as a preliminary draft copy for the PEN-Plus Training of Trainers and is intended exclusively for piloting purposes at the PEN-Plus sites. The content and information contained within this Manual are subject to change and revision.

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Welcome

Welcome! Trainers, Mentors, Faculty members, and Health care providers to the Pen Plus Training Course Blended Learning. You have been selected to attend this exciting new course, which combines:

- A self-paced, interactive knowledge update through self-paced learning, completing the exercises and Virtual sessions. Followed by group-based learning (on-the-job training).
- On-site Skills development and practice (skills standardization) in the classroom
- **Practice with the client in the clinical setting and individual coaching** by the trainer (a mentor).

As a learner, you will continually be assessed throughout the course in a variety of ways. Ultimately, once you have completed the practice component of the course, the facilitator will determine if you have achieved the essential core competencies to become a qualified service provider.

What Is Blended Learning?

Innovative, technology-supported learning tools and methods can be mixed with more traditional training approaches to increase the efficiency and effectiveness of a learning event—the ultimate goal being to minimize the amount of time providers must spend away from the job, in a group-based learning activity. This mixing of training approaches is called—blended learning and can be constructed in many different ways. It can be a formal learning arrangement—such as a computer- or Web-based program to be completed—or more informal, such as through relationships, conversations, self-study and independent research.

This approach is appropriate in the context of this particular Training —that is:

- There is a need
- **Resources are available**—Necessary technologies and equipment, as well as people who know how to use them, are available;
- Learners are deemed willing and able to commit to self-paced learning— Although independent learning is a hallmark of adult learning theory, this remains a serious consideration; and

Learners have the experience and technical competency needed to be successful using this approach.

Contents of the Package

The learner's clinical skills course Welcome Package includes:

- PEN Plus clinical protocol as a reference manual. This document will serve as a valuable reference both during the course and when you are providing clinical care
- This Participant handbook, which includes key information about the course, the course syllabus and a range of tools that you'll need to navigate through this course. This contains a self-paced learning outline and exercises to be completed.

Background and Introduction

What is PEN-Plus?

The PEN-Plus is a model for integrated health service delivery for severe or advanced chronic NCDs at the first-referral hospital built upon the WHO-PEN intervention. It incorporates integrated care teams to provide chronic care for below listed severe NCDs at first-level (district) hospitals-

- Endocrinology: Type I and Type II Diabetes Mellitus (DM)
- Cardiovascular: Rheumatic Heart Diseases (RHDs), Congenital Heart Diseases (CHDs), Hypertension, Ischemic Heart diseases
- Respiratory: Chronic Respiratory Diseases (CRDs)- asthma, COPD
- Hematology: hemoglobinopathies-Sickle Cell Disease (SCD), thalassemia
- Oncology: Cervical Cancer, Breast Cancer, Childhood cancer

By implementing this approach, with some modifications based on the context of the Nepalese health system and practices, can advance toward universal health coverage (UHC) for NCDs by strengthening the model of delivery of NCD services and the referral chain. To achieve this human resource development, and providing support to vulnerable patients and their families will be key. This approach will also expedite the process of decentralizing service delivery at the district hospital level regarding the common NCDs. PEN-Plus also aims to train and mentor the WHO-PEN mid-level providers to maintain the continuum of NCD care, to systematize a hierarchy of referral chain from PHCC to the first level center and then to the higher center, and ultimately protect the vulnerable population from financial hardship.

The rationale for PEN-Plus:

WHO-PEN provides basic NCD services for cardiovascular diseases (CVDs), Diabetes Mellitus, Chronic respiratory diseases, and cancer at the PHCC level in Nepal. There is still a gap in managing severe and complicated NCDs management at the first level of referrals. which compels individuals living in resource-poor settings to travel a long distance to the higher referral centers and spend out of pocket to avail of the services. Eventually, this has led to a huge disparity in service delivery when it comes to severe NCDs at the lower levels of health care in the country. Hence, this calls for an urgent need for the expansion of the services available in WHO-PEN to meet the prevailing health inequity. The PEN-Plus aims to sufficiently equip the first-level referrals with essential resources to establish them as PEN-Plus NCD clinics providing health services for the management of severe NCDs in the resource-constrained areas of the country.

This proposal aims at tailoring an exemplary integrated health service delivery system with PEN-Plus at the first-level referral hospitals. This will also help to reduce the case load of referral hospitals. This country-level partnership project could be a guiding stone for changing the narrative around NCD service delivery in Nepal. It would be a way forward to UHC, achieving SDG targets for the coming years, and would also build a foundation for the nationwide scale-up of a decentralized NCDs delivery system.

Relation between PEN and PEN-Plus

PEN-Plus aims at decentralizing NCD-related services and ensuring capacity building at the first-level referral hospitals of Nepal. As PEN-Plus builds upon the existing PEN intervention at the PHCC level, NCD cases from the PHCC/basic hospital level will be able to seek care for more severe and chronic NCDs at the first-level referral (district) hospital and follow up at the PHCC/ basic hospital whenever applicable. Similarly, the first-level referral (district) hospital could ensure early screening and diagnosis and timely referral of more complicated and advanced cases to the tertiary-level referral hospital without overburdening them. This maintains a continuum of care below the first level referral and above as well for NCD care services provision.



Course Description:

This training package is developed for health care providers (MDGPs, MD consultants, and Medical Officers) working in the first-level referral (district) hospitals of Nepal, where the PEN Plus program is implemented. The course focuses on providing competencies needed for standardized management of advanced and chronic NCDs such as Acute rheumatic fever (ARF), rheumatic heart disease (RHD), hypertension (HTN), congenital heart disease (CHD), hemoglobinopathies l(sickle cell disease (SCD), Thalassemia), common cancers (Cervical, breast, and common childhood cancers), Chronic respiratory diseases (asthma, Chronic obstructive pulmonary disease), and type 1 and 2 diabetes mellitus.

Training approach



Course Goal:

To prepare competent healthcare providers (MDGPs, MD consultants, and Medical Officers) working in the first-level referral (district) hospitals who will be able to provide quality of care in the following advanced and chronic NCDs:

- Acute rheumatic fever (ARF)
- Rheumatic heart disease (RHD)
- Hypertension (HTN)
- Congenital heart disease (CHD)
- Hemoglobinopathies (Sickle cell disease (SCD) and Thalassemia)
- Cervical, breast, and childhood cancers
- Chronic respiratory diseases (asthma, Chronic obstructive pulmonary disease)
- Type 1 and 2 diabetes mellitus

Course Competencies:

The desired core competencies required of qualified service providers are to be able to:

- 1. Assess, diagnose, and manage the cases of Type I and Type II Diabetes Mellitus (DM) and it's complications in child and adolescent, adult.
- 2. Assess, diagnose and manage the cases of Rheumatic Heart Diseases (RHDs), Congenital Heart Diseases (CHDs), Hypertension, Ischemic Heart diseases in child, adolescent and adult
- 3. Assess, diagnose and manage the cases of Chronic Respiratory Diseases (CRDs)- asthma, acute exacerbation of asthma, COPD and acute exacerbation of COPD in child ,adolescent and adult
- 4. Assess, diagnose and manage the cases of Sickle Cell Disease (SCD) and Thalassemia and their complications in child, adolescent and adult
- 5. Assess, diagnose, basic management and timely referral of the cases of Cervical Cancer, Breast Cancer and common Childhood cancer (Leukemia, lymphoma, retinoblastoma, wilms tumor, tumors of central nervous system)
- 6. Identify, provide initial counselling and appropriate referral for common neurodevelopmental disorders (Autism, Attention deficit Hyperactive disorder, Seizure disorder, and)
- 7. Provide counselling support to the client and families

Course objectives:

After the completion of this course, learners will be able to:

- 1. Describe the concept of Pen Plus program
- 2. Carry out history taking in child , adolescent and adult
- 3. Perform the physical examination in child , adolescent and adult NCDs
- 4. Identify the investigation needed in child , adolescent and adult
- 5. Diagnose the NCDs among child, adolescent and adult
- 6. Screen the listed conditions among the routine OPD child , adolescent and adult patients
- 7. Provide Management based on clinical protocol for the above-mentioned NCDS for child, adolescent and adult
- 8. identify cases with complications of above mentioned NCDs in child, adolescent and adult
- 9. Manage the cases with complications for above mentioned in child, adolescent and adult
- 10. Communicate risk to the NCD patients and counsel them on the long-term management of NCDs
- 11. Provide appropriate referral to tertiary level hospital based on their need
- 12. Identify the safe transport of referred pediatric cases
- 13. Document and report the services provided

Learning Objectives

Learning objectives from all modules

Module 1: Respiratory diseases

A. Bronchial Asthma

- 1. Enumerate the risk factors of Bronchial Asthma
- 2. Describe the clinical features of bronchial Asthma and COPD
- 3. Conduct the pulmonary function test (Spirometry & Peak Expiratory Flow Meter) and Interpret the report
- 4. Outline the differential diagnoses of Bronchial asthma and differentiate Asthma from its differential diagnosis
- 5. Assess the severity of Bronchial Asthma
- 6. Manage case of Bronchial Asthma using SMART therapy
- 7. Operate Respiratory devices
- 8. Manage acute severe Bronchial Asthma
- 9. Provide patient education on -Self monitoring and How to control the trigger of Bronchial Asthma

B. COPD

- 1. Describe the clinical features of COPD
- 2. Screen the COPD cases using Gold criteria
- 3. Conduct the pulmonary function test (Spirometry Peak expiratory flow meter)
- 4. Interpret the chest X-ray and pulmonary function test and laboratory parameter report
- 5. Diagnoses COPD
- 6. Differentiate the COPD from its mimicker
- 7. Assess the severity of COPD
- 8. Describe Pharmacotherapy and Nonpharmacological management of COPD
- 9. Outline the long-term oxygen therapy in COPD
- 10. Describe management of Acute exacerbation of COPD
- 11. Outline the Pulmonary rehabilitation.

Module 2: Cardiovascular diseases

- A. Acute rheumatic fever and Rheumatic heart disease
 By the end of this module participants will be able to –
- Enumerate the Clinical features of Rheumatic Fever
- Diagnose Rheumatic Fever cases
- Outline treatment Of Acute Rheumatic Fever
- Describe Prevention of Rheumatic Fever

B. Hypertension

By the end of this module participants will be able to -

- Describe the clinical features of hypertension
- Identify the target organ damage secondary to hypertension
- Diagnose hypertension based on clinical features
- Describe the management of Hypertension
- Identify the Secondary cause of Hypertension

C. Ischemic heart disease

By the end of this module participants will be able to -

- List Clinical features of Chronic Stable Angina and Acute coronary syndrome
- Describe the risk factor for Ischemic heart disease
- Identify Electrocardiogram changes in Ischemic Heart disease
- Outline the utility of cardiac biomarker for diagnosis of ACS
- Identify the role of Echocardiography in IHD
- Describe the management of Ischemic heart Disease Congenital heart disease:

By the end of this module participants will be able to -

- Describe symptoms and signs to suspect congenital heart Disease
- Identify Electrocardiogram and X-ray Chest features of Common Congenital Heart disease
- Outline the Management of Hyper cyanotic spells

Module 3: Endocrinology

A. Diabetes type I and Type II

By the end of this module participants will be able to

- Describe the pathogenesis of type 1 and type 2 diabetes mellitus
- Enlist clinical presentation of diabetes mellitus
- Carry out Screening of asymptomatic patients
- Interpret the fasting, post prandial blood glucose and HBA1C report
- Interpret the 75-g oral glucose tolerance test report for diagnosing gestational diabetes mellitus
- Interpret blood pressure, lipid profile report
- Identify Pre-diabetes, Diabetes Mellitus and Gestational Diabetes
- Anticipate and diagnose hypoglycemia
- Outline the Assessment of glycemic targets and individualization
- Initiate Pharmacotherapy in diabetes mellitus
- Initiate insulin therapy in diabetes mellitus
- Screen for complications
- Prescribe medical nutrition therapy, exercise and behavioral therapy
- Counsel patients on non-pharmacological therapy

Module 4: Cancer

By the end of this module participants will be able to -

- Identify risk factors for common cancers.
- Differentiate between Invasive and preinvasive cancers.
- Enlist common signs and symptoms associated with cancer.
- Differentiate between screening and early diagnosis
- Enlist common childhood cancers.
- Describe sign and symptoms associated with some common childhood cancers and importance of early referral.
- Identify warning signs and symptoms associated with childhood cancer and the need for early referral.
- Counsel the parents of the children prior to referral who are newly diagnosed or receiving cancer treatment.
- outline difference between benign and malignant breast lump.
- Describe various risk factors associated with breast cancer.
- Describe the steps of self breast examination and clinical breast examination
- Enumerate the risk factors for oral cancer.
- Identify common pre-cancerous lesions and cancerous lesion of oral cavity.
- Provide Behavourial counseling with regards to risk factor for oral cancer.
- outline difference between benign disorders of cervix and cervical malignancy.
- Identify risk factors associated with cervical cancer.
- Interpret the results of cervical cancer screening with VIA.
- Describe Preventive measure of cervical cancer including vaccination for cervical cancer prevention
- Define Palliative care and common symptoms for palliation encountered in cancer patients.
- -Define pain and assessment of pain via pain tools.
- Describe Management of pain with 3 ladder pattern of pain management.
- Identify Dosing of all form of Morphine along with assessment of morphine dose for breakthrough pain.
- Identify Management of common adverse events of morphine

Module 5: Hemoglobinopathies

A. Sickle cell disease

By the end of this module participants will be able to -

- Describe the burden of SCD in the World and Nepal
- Outline the pathogenesis of SCD
- Describe the different genetic and environmental factors affecting clinical features of SCD
- Ouline the differences of Genotypes and haplotypes in SCD
- Screen asymptomatic patients/clients
- Interpret CBC, PBS, Reticulocyte count, Sickling test, sickle solubility test, Hb Electrophoresis test and different Hb HPLC reports, report for diagnosing SCD
- identify Sickle cell trait, beta Thalassemia trait, beta thalassemia major, Hb E disease and trait, other haemoglobinopathies, Probability of Alpha thalassemia(HbH disease) from Hb HPLC reports
- Describe the Anticipating and diagnosing sickle cell trait in SCD patients after blood transfusion
- Outline Assessment of treatment nd individualization

- Identify initiation of Pharmacotherapy(Hydroxyurea) in SCD
- Describe Titratation and monitoring toxicity of hydroxyurea therapy in SCD
- Screen for acute painful complications of SCD
- Prescribe Pain killer safely and adequately in chronic pain and acute pain in SCD
- Demonstrate HB HPLC reporting technique
- Demonstrate different Hb HPLC reports and uses
- Demonstrate genetic counseling regarding risk of SCD/Haemoglobinopathy
- Demonstrate counseling regarding pain management pharmacological management of SCD

B. Thalassemia

By the end of this module participants will be able to -

- Describe the burden of Thalassemia in the World and Nepal, Micromapping
- Ouline the pathogenesis of Thalassemia
- Describe the clinical features of Thalassemia
- Identify Alpha and beta Thalassemia
- Carry out Screening of asymptomatic patients/clients
- Interpret CBC, PBS, Reticulocyte count, , Hb Electrophoresis test and different Hb HPLC reports for diagnosing Thalassemia
- Make diagnosis of beta Thalassemia trait, beta thalassemia major, Hb E disease and trait, other haemoglobinopathies, Probability of Alpha thalassemia(HbH disease) from Hb HPLC reports
- Identify Need of genetic testing for alpha thalassemia diagnosis
- Describe Prenatal diagnostic features
- Outline Assessment of treatment and individualization
- Initiate Iron chelation in Thalassemia
- Titrate and monitor toxicity of Iron chelation therapy in Thalassemia
- Demonstrate HB HPLC reporting technique
- Demonstrate different Hb HPLC reports and uses
- Demonstrate genetic counseling regarding risk of Thalassemia/Haemoglobinopathy

Demonstrate counseling regarding pharmacological management of Thalassemia

Course duration:

Self-paced learning – 1 month with virtual session upon completion of each module Onsite group-based training

Training Methods-

- Virtual sessions
- Interactive presentations
- Demonstrations
- Discussions
- Case studies and role-plays
- Skills-practice with coaching and feedback
- Clinical simulations

Certification criteria:

To be awarded a certificate of completion, the participant must achieve all criteria -

• Complete the pre-course knowledge assessment

- Complete self paced learning as per provided outline
- Attend all the virtual sessions
- Attend all session of onsite group based sessions total days with hours
- Score 85% in final knowledge assessment of all the modules
- Perform skill satisfactorily and satisfactory completion of logbook

Trainer's criteria:

- Trainers/Mentors must have an MD in respective subjects (Internal medicine, Cardiology, endocrinology, oncology, hematology, pulmonology, pediatrics, Cardiology in pediatrics, in pediatric endocrinology, pediatric oncology, pediatric hematology, and pediatric pulmonology).
- Physician, general practitioners, pediatrician with skills standardization in PEN-Plus with CTS/TOT.
- They must be currently providing service at PEN Plus site with 2 co-training experiences.

Participant's criteria:

- MD General practice, Internal medicine, pediatrics
- MBBS graduate (Medical officers)
- Registered in NMC

Learning resource package (LRP):

The trainer's guide consists of an introduction, schedule, detailed session plans, skill checklist, and algorithms. The participants' handbook will consist of an introduction, schedule and reference materials for each session, skill checklist, exercises, and algorithms.

Evaluation

- Pre-course knowledge assessment at the beginning of the course to assess the knowledge of the participants.
- Self-Paced learning and exercise
- Post-course knowledge assessment at the end of each module using MCQs
- Skill performance using checklist
- Logbook evaluation for the satisfactory achievement of specified competencies will be evaluated for ECG and ECHO skills.
- Decision-making by evaluation using case studies
- Attitude (professionalism) evaluation by using role-plays and real client practice

Self - Paced Course Outline

Using the Self-Paced

The self-paced course is structured for self-study and supported by your facilitator (mentor). Activities are listed in a suggested weekly schedule; however, learning should be done whenever you have the opportunity. You may not be able to complete all activities in the suggested week, and this is all right. Try to make use of the meeting with your facilitator virtually also to get answers to your questions and clarify information to help you.

Steps to Follow during Self-Paced Learning

- 1. Receive the training materials.
- 2. Pen Plus Protocol—Reference Manual
- 3. Participants handbook
- 4. Communicate with your trainer/mentor, as per the requirement.
- 5. Read all chapters from Pen plus *Protocol* and complete all exercises and case studies in the Participants handbook (in the spaces provided), as instructed in the course outline.
- 6. If you have any queries, make a note to discuss them with your facilitator during the virtual session and group-based training.

Note that all exercises and case studies are in this guide (after each course outline for each chapter)

List of equipment and supplies required for the training

| S.N. | Items | Numbers | | |
|-------------|--|---------|--|--|
| Respiratory | | | | |
| 1 | Spirometry | 2 | | |
| 2 | Peak flow meter | 2 | | |
| 3 | Respiratory device: MDI, MDI with spacer, Rotahaler, revolizer | 2 | | |
| 4 | Mouthpiece spirometer per device | 50 | | |
| 5 | Mask for MDI per device | 50 | | |
| | Cardiology | | | |
| 1 | ЕСНО | 1 | | |
| 2 | ECG | 1 | | |
| 3 | BP cuff and stethoscope | 2 | | |
| 4 | Lab reports for discussion | 2 | | |
| 5 | WHO risk prediction chart | 15 | | |
| | Endocrinology | | | |
| 1 | Glucometer with battery | 2 | | |
| 2 | Spirit swab | 50 | | |
| 3 | Strips | 50 | | |
| 4 | Needle | 50 | | |
| 5 | Insulin injector | 2 | | |
| 6 | Insulin vial | 2 | | |
| Hematology | | | | |
| 1 | Hb HPLC | 2 | | |
| 2 | Lab reports for discussion | 2 | | |
| | Oncology | | | |
| 1 | Ophthalmoscope | 2 | | |

Schedule of PEN-Plus Training

Self-paced and Virtual Sessions of all modules

| Duration | Activities |
|------------|--------------------------------------|
| 1 day | Official Launch of PEN-Plus Training |
| | |
| 3 days | Module 1 self paced |
| 7 days | Module 2 self paced |
| 3 days | Module 3 self paced |
| 75 minutes | Module 1 virtual session |
| 75 minutes | Module 2 virtual session |
| 76 minutes | Module 3 virtual session |
| 3 days | Module 4 self paced |
| 3 days | Module 5 self paced |
| 4 days | Module 6 self paced |
| 75 minutes | Module 4 virtual session |
| 76 minutes | Module 5 virtual session |
| 77 minutes | Module 6 virtual session |
| 1 day | Training Assessment(Online test) |

On-Site sessions on all modules

| Time | Minutes | Activities/Content |
|--------------|--------------|--|
| Day One | | |
| 08:00-08:15 | 15 | Registration with Tea |
| 08:15-08:35 | 20 | Opening session and introduction |
| 08:35-09:00 | 25 | Objectives and importance of PEN-Plus ToT |
| 09:00-09:15 | 15 | Pre-test assessment |
| Module 1: Br | onchial asth | ma |
| 09:15-10:15 | 60 | Case scenario |
| 10:15-11:40 | 85 | Skill session: Spirometry, peak flow meter, MDI, MDI with spacer, rotahaler, revolizer, MDI with spacer with baby mask |
| 11:40-12:20 | 40 | Healthy Lunch |
| 12:20-12:35 | 15 | Role play on patient education and counselling |
| 12:35-13:05 | 30 | Role play on SMART therapy for Bronchial asthma |
| Module 1: Ch | ronic obstru | ictive pulmonary disease |
| 13:05-13:35 | 30 | Case scenario |
| 13:35-13:50 | 15 | Tea Break |
| 13:50-14:20 | 30 | Role play for smoking cessation therapy |
| Module 2: Ca | rdiovascula | r diseases |
| 14:20-15:00 | 40 | Hypertension: Case scenario |
| 15:00-15:40 | 40 | Role play on DASH diet |

| 15:40-17:05 | 85 | Acute rheumatic fever (ARF) and Rheumatic heart disease (RHD): Case scenario | |
|------------------|----------------|--|--|
| 17:05-17:45 | 40 | Healthy Snacks | |
| Day Two | | | |
| 7.45-8.00 | 15 | Registration with Tea, Welcome and Review of Previous Day | |
| 8:00-9:10 | 70 | Congenital heart disease: Case Scenario | |
| 15:00-16:00 | 60 | Ischemic heart disease (IHD): Case scenario | |
| 16:00-17:15 | 75 | Ischemic heart disease (IHD): Case scenario | |
| 17:15 onwards | | Healthy Snacks | |
| Day Three | | | |
| Module 3: En | docrinology (I | Diabetes mellitus) | |
| 7.45-8.00 | 15 | Registration with Tea, Welcome and Review of Previous Day | |
| 8.00-8.30 | 30 | Role play: Diabetes self management education | |
| 8.30-9.00 | 30 | Role play: Diabetic foot | |
| 15.00-15.20 | 20 | Group Discussion: Diabetes advocacy for prevention of DM and obesity in society | |
| 15.20-15.40 | 20 | Group discussion: Complications of diabetes | |
| 15:40-17:00 | 80 | Case scenarios (Scene 5-8) | |
| 17:00 onwards | | Healthy Snacks | |
| Day Four | | | |
| 7.45-8.00 | 15 | Registration with Tea, Welcome and Review of Previous Day | |
| 8:00-9:00 | 60 | Case scenarios (Scene 9-11) | |
| 15:00-16:00 | 60 | Case scenarios (Scene 9-13) | |
| 16:00-16:30 | 30 | Skill session: Demonstration of glucometer use, insulin injection technique | |
| 16:30 onwards | | Healthy Snacks | |
| Day Five | | | |
| Module 4: Or | ncology | | |
| 7.45-8.00 | 15 | Registration with Tea, Welcome and Review of Previous Day | |
| 8:00-8:05 | 5 | Introduction to Oncology Onsite Learning | |
| 8:05-8:15 | 10 | Introduction of the cancer and risk factors associated with common cancers. | |
| 8:15-8:45 | 30 | Introduction to childhood cancers and danger signals warranting early referral to tertiary centers. | |
| 8:45-9:15 | 30 | Role play | |
| 15:00-15:15 | 15 | Case scenario | |
| 15:15-16:25 | 70 | Introduction of the breast cancers and risk factors associated with the breast cancer: Case scenario | |

| 16:25-16:35 | 10 | Introduction of oral cancer, its risk factors and identification of pre-cancerous and cancerous lesions: Case scenario | |
|------------------|---------------|---|--|
| 16:35-17:15 | 40 | Introduction of cervical cancer, its risk factors, signs/symptoms and screening with VIA: Case scenario | |
| 17.15 17.20 | 5 | Introduction to Palliative care, pain and management of | |
| 17:13-17:20 | | | |
| onwards | | Healthy Snacks | |
| Day Six | | | |
| Module 5: He | emoglobinop | oathies | |
| 7.45-8.00 | 15 | Registration with Tea, Welcome and Review of Previous Day | |
| 8.00-8.10 | 10 | Introduction to Onsite Learning | |
| 8.10-8.30 | 20 | Case scenario | |
| 8.30-8.55 | 25 | Role play: Thalassemia counselling | |
| 8.55-9.00 | 5 | Review of the day | |
| 15:00-15:10 | 10 | Introduction to Onsite Learning SCD | |
| 15:10-15:40 | 30 | Discuss the following using PowerPoint slides: Interpreting the Lab Reports | |
| 15:40-16:00 | 20 | Role play 1 | |
| 16:00-16:20 | 20 | Role play 2 | |
| 16:20-16:30 | 10 | Case Study | |
| 16:30-16:45 | 15 | Genetic counselling using Thalassemia/ SCD Kundali | |
| 16:45-17:05 | 20 | Exercise of probability using Punnet square | |
| 17:05 onwards | | Healthy Snacks | |
| Day Seven | | | |
| Module 6: Es | sentials of C | are and Practice | |
| 7.45-8.00 | 15 | Registration with Tea, Welcome and Review of Previous Day | |
| 8.00- 8.05 | 5 | Introduction to Onsite Learning | |
| 8.05- 8.20 | 15 | Activity 1: Barriers of Communication | |
| 8.20- 8.30 | 10 | Activity 2- Modeling Effective Communication Skill | |
| 8.30- 8.40 | 20 | Activity 3: First Level Response | |
| 8.40- 8.55 | 15 | Activity 4. Psychoeducation and Summarize the session | |
| Module 6: No | eurodevelop | mental disorders | |
| 15.00-15.20 | 20 | A brief introduction to the outline of the sessions Activity 1: Identifying Intellectual Disability | |
| 15.20-15.35 | 15 | Activity 2: Identifying Autism Spectrum Disorder | |

| 15.35-15.50 | 15 | Activity 3: Identifying Attention Deficit Hyperactivity Disorder |
|-------------|----|---|
| 15.50-16.15 | 25 | Activity 4: Epilepsy |
| 16:15-17:15 | 60 | Case scenario |
| 17:15-18:15 | 60 | Case scenario |
| 18:15-19:00 | 45 | Closing |
| 19:00 | | Healthy Snacks |
| onwards | | incurring shacks |

Module-1: Respiratory diseases

| Self-Paced Learning: Bronchial Asthma | | | |
|---------------------------------------|--|-------------------------|--|
| Check box | Торіс | Materials and resources | |
| | Read the definition, risk factors, signs and symptoms of Bronchial asthma from page no 18-19 | PEN-Plus Protocol | |
| | Read the process, prerequisite and interpretation of Spirometry and the peak expiratory flow meter from page no 19-20 Watch the provided video on spirometry and peak flow meter | PEN-Plus Protocol | |
| | Read the diagnosis, differential diagnosis and assessment of severity of Bronchial asthma from page no 21 | PEN-Plus Protocol | |
| | Read the pharmacotherapy, patient education and smart therapy of Bronchial asthma from page no 22-23 | PEN-Plus Protocol | |
| | Read the process of correctly using MDI, MDI with spacer, rotahaler, and revoliser from page no 29-30 Watch the provided video for use of MDI | PEN-Plus Protocol | |
| | Complete the exercise of Module 1 given in this chapter Note: List your queries on the subject matter and exercises to be discussed with the trainer during virtual session | | |

| Self-Paced Learning: COPD | | | |
|---------------------------|---|-------------------------|--|
| Check box | Торіс | Materials and resources | |
| | Read the definition, risk factors, symptoms and signs of COPD from page no 31 | PEN-Plus Protocol | |
| | Read the process, prerequisite, and interpretation of Spirometry and Chest X-ray from page no 32-33 Watch the provided video on spirometry and peak flow meter | PEN-Plus Protocol | |
| | Read the GOLD screening of COPD from page no 32 | PEN-Plus Protocol | |
| | Read the interpretation of lab reports (CBC, ABG, ECHO) from page no 32 | PEN-Plus Protocol | |
| | Read the diagnosis, differential diagnosis and assessment of the severity of COPD using mMRC grading of COPD from page no 32-33 | PEN-Plus Protocol | |
| | Read the pharmacotherapy and non-pharmacotherapy management of COPD from page no 33-40 | PEN-Plus Protocol | |
| | Complete the exercise of Module 1 given in this chapter Note: List your queries on the subject matter and exercises to be discussed with the trainer during the virtual session | | |

Definition: Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation, defined by the history of respiratory symptoms, such as wheezing, shortness of breath, chest tightness and cough, that may vary over time, and in intensity, together with variable expiratory airflow limitation.

Peak Flow Meter: The peak expiratory flow meter device is an inexpensive tool used for monitoring treatment response in patients with Bronchial Asthma and COPD. Treatment dose adjustments may be decided by use of the peak flow meter at home by the patient, and in the health care facility.

Module 1 Exercises

Question 1- Among the following mentioned, which inhaler device would you choose for a 5-year-old boy with Bronchial Asthma?

- 1. Pressurized metered dose inhaler plus dedicated spacer with mouthpiece
- 2. Pressurized metered dose inhaler plus dedicated spacer with face mask
- 3. Nebulizer with Face mask
- 4. Nebulizer with the mouthpiece

Question 2- 20 years Patient has a respiratory rate of 25 rpm, HR 115 bpm, and oxygen saturation of 93%, and complains of breathlessness and chest tightness. The choice of treatment would be:

- a. Initiate oxygen therapy, oral Prednisolone stat, SABA 4-10 puffs by pMDI with spacer every 20 minutes for one hour, assess response after one hour, discharge if saturation 95% and above.
- b. Refer to high care without delay
- c. Stat oral Prednisolone, SABA 4-10 puffs by pMDI with spacer every 20 minutes for one hour, assess response after one hour, discharge if saturation 95% and above.
- d. Initiate oxygen therapy, nebulized salbutamol, and ipratropium, Inj hydrocortisone and admission.

Question 3- Specify the type of risk factor as modifiable (M) or non-modifiable (NM)

| S.no | Risk factors | Туре |
|------|-----------------------------|------|
| a) | Tobacco | |
| b) | Atopy | |
| c) | Family history | |
| d) | Obesity | |
| e) | Age | |
| f) | Cow-milk | |
| g) | Respiratory viral infection | |
| h) | Allergens | |

Question-4 All of the following are risk factors for COPD except:

- 1) Exposure of certain gases or fumes in workplace
- 2) Smoking
- 3) Physical inactivity
- 4) Frequent use of cooking fire without proper ventilation

Question-5 Verify whether each statement below is true or false.

| S. no | Statement | True/False |
|-------|---|------------|
| a) | The presence of post-bronchodilator FEV1/FVC <0.7 suggests persistent | |
| | airflow limitation | |
| b) | Hyperinflated lung, a flattened diaphragm, and hyperlucency can be | |
| | appreciated in Bronchiectasis | |
| c) | Chronic bronchitis is defined as a persistent cough for 3 months in 2 | |
| | consecutive years | |
| d) | Predominated symptoms of chronic bronchitis is shortness of breath | |
| e) | Long Term monotherapy with oral corticosteroid is an alternative in old | |
| | patient | |
| f) | Theophylline is safe to use because of its efficacy and less adverse effect | |
| g) | Group A (low symptoms, low risk) patients are treated with short-acting | |
| | Beta Agonist (SABA) | |

| h) | If a patient has asthma attacks at least once a week and no nocturnal awakenings, symptomatic management with Salbutamol is the treatment of choice. | |
|----|--|--|
| i) | A 40-year-old male has daily asthmatic attacks with 4-5 times nocturnal awakening per month, he would be treated as a severe case of asthma. | |

Circle the correct answer

Question 6- All are the indications for hospitalization during exacerbation of COPD except

- 1) Marked reduction in activities of daily living due to dyspnea
- 2) Altered Sensorium
- 3) Respiratory rate 30/min
- 4) Peripheral Cyanosis

Question7- Discharge criteria for COPD from the hospital includes all except:

- 1) Partial or complete resolution of the symptoms
- 2) No Cyanosis
- 3) Systolic blood pressure > 90 mmHg
- 4) RR >30/min

Question 8- Complete the table 5A's intervention for smoking cessation

| Ask | |
|---------|--|
| Advise | |
| Assess | |
| Assist | |
| Arrange | |

Question 9 – List the key elements of patient education

| • | |
|---|--|
| • | |
| • | |
| • | |

Case scenarios:

Question 1: An 11-year-old male presents to the emergency with shortness of breath, chest tightness and cough associated with wheezing since 5 days which has worsen since 3 days.

a. Enlist the symptoms noticed. Answers:

b. What history do you like to ask to establish the diagnosis of bronchial asthma? **Answers:**

c. What are the clinical examination will you carry out and what are the expected findings? Fill in the table below.

| Clinical examinations | Expected findings |
|-----------------------|-------------------|
| | |
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| Clinical examinations | Expected findings | |
|-----------------------|-------------------|--|
| | | |
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| | | |

d. What diagnostic tests would you like to carry out and list the expected findings?

| Diagnostic tests | Expected findings |
|------------------|-------------------|
| | |
| | |
| | |

Question 2: A 24-year-old female with a history of bronchial asthma presented to Emergency with increased shortness of breath for 2 days.

Examination findings are:

Respiratory rate: 34/min, Pulse: 120/min, Spo2: 88%

Respiratory examination: Bilateral polyphonic wheeze

A. Enlist the abnormal findings in the above case. What other history would you like to ask and what would be your differential diagnosis?

Answers:

B. What other examination and its findings would you like to look for?

| Clinical examinations | Expected findings |
|-----------------------|-------------------|
| | |
| | |
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| | |

C. Classify the severity of this case

Scenario 1: The patient has such episodes of shortness of breath around 2 times a week with no night-time awakening. On spirometry, the FEV is >80%

| Components | Classification of Asthma severity>12 years of age | | | |
|--------------------------|---|------------------------------|------------------------|------------------------|
| | Intermittent | Mild persistent | Moderate persistent | Severe persistent |
| Symptoms | ≤2days/week | >2 days/week but not daily | Daily | Continuous |
| Nighttime awakening | ≤2 days/month | 3-4/month | >1/Week but nightly | Nightly |
| Use of reliever medicine | ≤2 days/week | >2days/week but not daily | Daily | Several times a day |
| Lung function* | FEV1>80% | FEV1>80% | FEV1: 60-80% | FEV1<60% |

Answer:

Scenario 2: The patient has such episodes of shortness of breath with cough and chest tightness daily on exertion and has to wake up at least 2 times in a week in the middle of sleep and is relived only with medication.

| Components | Classification of Asthma severity>12 years of age | | | |
|-----------------------------|---|-------------------------------|------------------------|---------------------|
| | Intermittent | Mild persistent | Moderate persistent | Severe persistent |
| Symptoms | ≤2days/week | >2 days/week but not daily | Daily | Continuous |
| Nighttime awakening | ≤2 days/month | 3-4/month | >1/Week but nightly | Nightly |
| Use of reliever medicine | ≤2 days/week | >2days/week but not daily | Daily | Several times a day |
| Lung function* | FEV1>80% | FEV1>80% | FEV1: 60-80% | FEV1<60% |

Answer:

Question 3: 59-year-old male was brought to the emergency department with complaints of increased shortness of breath. He has shortness of breath on climbing stairs or on exertion. He has to take a rest in the middle. He has been having these symptoms since past 1 month but didn't visit the doctor. He has a history of smoking since the past 40 years and smokes at least 10 cigarettes a day since the past few months. He consumes alcohol once in a week during gatherings. His father died of cardiovascular disease. He does not know the exact type.

- A. Enlist the symptoms noticed.
- B. What history do you like to ask to establish the diagnosis of COPD?
- C. What are the clinical examination will you carry out and what are the expected findings? Fill in the table below.

| Clinical examinations | Expected findings |
|------------------------------|-------------------|
| | |
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| Clinical examinations | Expected findings |
| | |
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| | |

What diagnostic tests would you like to carry out and list the expected findings?

| Diagnostic tests | Expected findings |
|------------------|-------------------|
| | |
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D. What are the differential diagnosis?

Answers:

Module 1 Checklist for Using Spirometry

S for Satisfaction and U for unsatisfactory

| S.N | Necessary Prerequisites | Cases | |
|-----|---|-------|--|
| 1) | The participant ensures the patient is stable | | |
| 2) | The participant assures smoking is withheld for at least 4 hours prior to the spirometry. | | |
| 3) | The participant makes certain the age is more or equal to 5. | | |
| 4) | The participant makes sure inhaler therapy is withheld for 4 hours | | |
| 5) | The participant makes sure proper instruction is given prior to the procedure | | |
| 6) | The participant ensures any sort of physical exercise is avoided on the day of spirometry | | |
| 7) | The participant ascertains that the patient avoids heavy meals prior to spirometry | | |
| | Following steps to be followed | | |
| 1) | The participant ensures the patient sits up straight. | | |
| 2) | The participant makes sure of a good seal around the mouthpiece | | |
| 3) | The participant assures to encourage the patient to blow out hard as fast as possible | | |
| 4) | The participant makes sure to count exhaling till the the patient can't blow. | | |
| 5) | The participant makes certain the patient blows out hard as fast as possible. | | |
| 6) | The participant assures that the patient continues exhaling till the patient can't blow. | | |
| 7) | The participant ascertains the patient expires continuously for at least 6 seconds. | | |
| 8) | The participant ensures to repeat the above process at least 3 technically acceptable times. | | |
| 9) | The participant assures to repeat the test after 10-15 minutes of administration of 2-4 puffs of salbutamol to check reversibility. | | |

Checklist for Using Meter Dose Inhalation

| S.N | Steps of using Meter Dose Inhalation | Cases | |
|-----|---|-------|--|
| | | | |
| 1) | The participant ensures to remove the cap from MDI and spacer. | | |
| 2) | The participant makes sure to shake MDI for 5 sec before using. | | |
| 3) | The participant makes certain MDI is inserted into the spacer. | | |
| 4) | The participant makes sure to attach the mask to the other side of the spacer. | | |
| 5) | The participant ascertains to make a tight seal of mask over nose and mouth of the child. | | |
| 6) | The participant encourages the patient to breathe out. | | |
| 7) | The participant assures MDI to be pressed. | | |
| 8) | The participant assures the patient to breathe in and out for 10 seconds | | |
| 9) | The participant makes sure the patient holds their breath for 10 seconds | | |
| 10) | The participant makes certain to repeat as necessary. | | |

Checklist process of Nebulization

| S.N | Nebulization Process | Case | es | |
|-----|---|------|----|--|
| 1) | The participant makes sure their hand has been washed well. | | | |
| 2) | The participant assures the nebulizer machine, tubing, medicine cup, and mouthpiece or mask are put together | | | |
| 3) | The participant ensures to put the prescribed amount of medicine into the nebulizer cup | | | |
| 4) | The participant makes sure the patient places mouth- piece in and close the lips around it to form a tight seal | | | |
| 5) | The participant ascertains to turn on the nebulizer machine. | | | |
| 6) | The participant makes sure to take the normal breath through the mouth until the medicine cup is empty. | | | |
| 7) | The participant assures to take out mouth-piece (or remove your child's mask) and turn the machine off | | | |
| 8) | The participant makes sure the patient rinses the mouth with water and spit it out if the medicine used is inhaled corticosteroid | | | |

Steps for Peak expiratory flow meter

| S.N | Peak expiratory flow meter | Cases |
|-----|---|-------|
| 1) | The participant assures a clean mouthpiece is connected | |
| 2) | The participant makes sure to set the marker at ZERO | |
| 3) | The participant ascertains the patient stands up or sits upright | |
| 4) | The participant encourages to take a deep breath and hold it | |
| 5) | The participant assures the mouthpiece is placed in and a tight seal formed around it | |
| 6) | The participant makes sure the patient breathes hard and as fast as possible | |
| 7) | The participant ascertains to observe and record the recording | |
| 8) | The participant assures the process is repeated 3 times and the highest record should be recorded | |
| 9) | The participant assures to interpret the result Green zone (80-100%), Yellow zone (50-80%), and Red zone (less than 50%). | |

Checklist for Metered dose inhaler with spacer

| S.N | Steps for Metered dose inhaler with spacer | Cases | | |
|-----|---|-------|--|--|
| 1) | The participant makes sure the inhaler is shaken well for 5 seconds. | | | |
| 2) | The participant assures to remove the cap from the inhaler and insert the inhaler's mouthpiece into the flat end of the spacer. | | | |
| 3) | The participant ascertains the cap is removed from the spacer mouthpiece. | | | |
| 4) | The participant makes sure the patient places the mouthpiece of the spacer between teeth and close the lips around it. | | | |
| 5) | The participant ensures the patient presses the top of the inhaler and they are encouraged to breathe slowly in. | | | |
| 6) | The participant ascertains the patient holds the breath for 5-10 seconds. takes the spacer out of the mouth and breathes out away from the mouthpiece | | | |
| 7) | The participant makes sure the patient rinses mouth after use. | | | |

Checklist for Rotahaler inhalation

| SN | Steps for Rotahaler inhalation | Cases |
|----|--|-------|
| 1) | The participant ascertains to unscrew the cover and hold the rotahaler vertically | |
| 2) | The participant makes sure the rotacap is firmly pressed such that top end of rotacap is in level with the top of the hole. | |
| 3) | The participant makes certain that the patient holds the mouthpiece firmly with one hand and rotate its base | |
| 4) | The participant assures the patient breathes out gently and not inside the inhaler. | |
| 5) | The participant ascertains the mouthpiece is gripped between the teeth and sealed with the lips around it. | |
| 6) | The participant makes sure the patient breathes in through the mouth as deeply as they can | |
| 7) | The participant makes sure the patient removes the rotahaler from mouth and holds the breath for at least 10 seconds or as long as they feel comfortable | |
| 8) | The participant assures that the patient exhales out and repeat above steps if more than one dose is required | |

Module 2: Cardiovascular Diseases

Self-Paced Learning: Cardiovascular

| Session | Торіс | Materials and resources | |
|---------|---|-------------------------|--|
| 1 | Hypertension | | |
| | Read the definition, etiopathogenesis, signs and symptoms, of hypertension from page no 42 and 49-50 | PEN-Plus Protocol | |
| | Read the steps of BP measurement and its diagnosis from page 42-44, 50-51 | PEN-Plus Protocol | |
| | Learn about the WHO Cardiovascular risk prediction chart from page no 167-170 | PEN-Plus Protocol | |
| | Read the management and complication of hypertension from page no 45-47, 51-53 | PEN-Plus Protocol | |
| | Read about hypertensive emergency, its signs, and symptoms, diagnosis, and management protocol from page no 47-48, 52-53 | PEN-Plus Protocol | |
| 2 | Acute rheumatic Fever (ARF) and Rheumatic Heart Disease | | |
| | Read the definition of ARF, etiopathogenesis, signs and symptoms from page no 54-55 and 60 | PEN-Plus Protocol | |
| | Read the diagnosis and management from page no 60-63 | PEN-Plus Protocol | |
| | Read about the preventive approach of ARF and RHD from page no 57-59 | PEN-Plus Protocol | |
| 3 | Ischemic Heart Disease (IHD) | | |
| | Read the definition of IHD, its types, and etiopathogenesis of IHD from page no 6 Learn the signs and symptoms of stable IHD from page no 64 and acute coronary syndrome (ACS) from 67 | PEN-Plus Protocol | |

| | Read the diagnostic approach, and major ECG changes for stable IHD and ACS from page no 64-70 | PEN-Plus Protocol |
|---|---|--|
| | Read the cardiac biomarker for diagnosis of ACS from page no 70 | |
| | Read the management approach for stable IHD and ACS from page no 64-65 and 67-70 | |
| | Read the approach to the management of a patient with chest pain from page no 66 | |
| | | |
| 4 | Congenital Heart Disease | |
| 4 | Congenital Heart Disease Read about congenital heart diseases, and its types (cyanotic and acyanotic) from page no 78 | PEN-Plus Protocol |
| 4 | Congenital Heart DiseaseRead about congenital heart diseases, and its types (cyanotic and acyanotic) from page no 78Read about the signs and symptom and management approach to congenital heart disease from page no 78-79 | PEN-Plus Protocol PEN-Plus Protocol |
Module 2 Exercises: Cardiovascular Diseases

Question 1: According to the Jones Criteria, which of the following sets of symptoms would indicate a positive diagnosis for Rheumatic fever? Select all that apply.

- A. Carditis, fever, and an elevated WBC count
- B. Positive strep throat culture, arthritis, chorea
- C. Recent scarlet fever, carditis, fever, arthralgia
- D. Elevated C-reactive protein, carditis, fever

Answer:

Question 2: Match the following

| Carditis | Rash that blanches on pressure |
|-------------------------|---|
| Arthritis | Aimless involuntary movement of arms, legs, trunk, and facial muscles |
| Sydenham's Chorea | Painless firm and freely movable nodules under the skin |
| Subcutaneous Nodules | Manifest as shortness of breath, paroxysmal nocturnal dyspnea and palpitation |
| Erythema Marginatum | Involvement of joints of hands and feet |

Question 3: Indicate which statement are True for the given scenarios:

Hypertension is defined based on office BP as:

- a. SBP of \geq 140 mmHg or DBP of \geq 90 mmHg measured on 1 occasion.
- b. SBP of \geq 140 mmHg and/or DBP of 90 mmHg measured on 2 to 3 visits on different days.
- c. SBP of \geq 130 mmHg or DBP of 85 mmHg measured on 2 to 3 visits on different days.
- d. SBP of \geq 130 mmHg and/or DBP of \geq 85 mmHg measured on 1 occasion.

Answer:

Question 4: How would you define the quality of ischaemic chest pain? **Answer:**

| | | •••••• | •••••• | | |
|--------|------|--------|--------|--------|-------|
| •••••• | | •••••• | ••••• | •••••• | ••••• |
| •••••• | | •••••• | •••••• | •••••• | ••••• |
| | | | | | |
| | | | | | |
| | | | | | |

Question 5: All are true regarding hypercynotic spell except

- 1) A spell may be triggered by any event that slightly decreases oxygen saturation (e.g., crying, defecating)
- 2) characterized by paroxysms of hyperapnea (rapid and deep respirations), irritability , increasing cyanosis
- 3) Placing infants in a knee-chest position or older children usually squat helps in managing symptoms
- 4) Mid diastolic rumbling murmur best heard by bell of sthethoscope

Answer:

Question 6: Verify whether each statement below is true or false.

| | Statement | True/False |
|----|--|------------|
| a) | High-sensitivity cardiac troponin is more sensitive than creatinine kinase isoenzyme (CK-MB) in detecting myocardial infarctions | |
| b) | Echocardiography is routinely indicated as a first-line test for diagnosis of ACS | |
| c) | Thrombolytic Therapy is indicated in STEMI patient with Symptom onset less than 12 hrs and where PCI facility not available | |
| d) | Stable angina is manifested as retrosternal chest pain, precipitated by exercise, cold emotional stress | |
| e) | Prednisolone are prescribed to patient who have severe carditis not responding to aspirin | |
| f) | Duration of Benzathine penicillin prophylaxis in ARF is 3 year or until 12 year whichever is longer | |
| g) | Common acyanotic Heart defects include Tetralogy of Fallot, Total anamolous pulmonary venous connection, Transposition of Great arteries | |
| h) | Congenital heart disease may occur in children with genetic and chromosomal anomaly such as Down Syndrome, Turner Syndrome, Noonan Syndrome, Marfan Syndrome , etc | |
| i) | Pan systolic murmur heard in left sternal border in an atrial septal defect patient | |

Case scenarios:

1. A woman bring her 12 weeks' old girl with complaints of poor feeding, irritable and labored breathing. The baby was born at 32 weeks preterm. How would you approach to this case? Write down all the steps.

Answers:

History:

Clinical examination:

Diagnostic tests:

Initial management:

2. 8 years male, a known case of RHD, presents to he emergency department with shortness of breath even on rest with cough for 1 week. How would you approach to this case?

Answers:

History:

Clinical examination:

Diagnostic tests:

Initial management:

Handout 1: Electrocardiogram (ECG)

Introduction: Electrocardiogram is transthoracic interpretation of electric activity of heart over time captured and externally recoded by skin electrodes for diagnosis on human heart. It consists of the 12 lead electrode that records the electrical activity of the heart.

Electrode positions: limb electrode positions Limb electrode positions:

- Right arm limb lead (RA, red) right forearm, proximal to wrist
- Left arm limb lead (LA, yellow) left forearm, proximal to wrist
- Left leg limb lead (LL, green) left lower leg, proximal to ankle
- Right leg limb lead (RL, black) right lower leg, proximal to ankle

Procedure of Electrocardiograph

- Place the patient in supine or semi-fowler position.
- Instruct the patient to place their arms down by their side and relax their shoulder.
- Make sure the patient's legs are uncrossed.
- Remove any electrical device such as cell phone away from the patient as they may interfere with the machine.
- If one gets artifact in the limb leads, try having the patient sit on the top of their hands.
- Be aware of the artifact which are the electrographic alteration such as patients movement, loose electrodes, improper grounding.

View of the heart through different leads

| View of the heart | Leads |
|-------------------|---------------------|
| Inferior | II III aVF |
| Lateral | I aVL aVR $V_5 V_6$ |
| Anterior | V ₃ V4 |
| Septal | $V_1 V_2$ |







Fig: Normal PQRST ECG wave complex

Standard ECG recording settings:

Paper speed – 25mm/sec Voltage gain – 10mm/mV The best way to interpret an ECG is by observing the following pattern step by step: Rate Rhythm Cardiac axis P –wave PR-interval QRS complex ST segment QT interval (including T and W wave) Other ECG sign

Rate: As a general interpretation look at the lead II and the number of squares between RR interval. Using the following formula calculate the rate.

Rate: <u>300</u> Number of BIG SQUARE between RR interval **OR**,

Rate: 1500 Number of SMALL SQUARE between RR interval

Rhythm: Normal sinus rhythm characterized by a usual rate between 60-99 bpm every P wave followed by a QRS complex and every QRS preceded by P wave. The normal duration of PR interval is 3-5 small square boxes. The P wave is upright in lead I and II.

Cardiac axis: Look at the QRS complex of lead I, II and III.

| Axis | Lead I | Lead II | Lead III |
|----------------------|----------|----------|-------------------|
| Normal | Positive | Positive | Positive/Negative |
| Right axis deviation | Negative | Positive | Positive |
| Left axis deviation | Positive | Negative | Negative |

- **Right axis deviation**; Normal finding in children and tall young adults, COPD, left posterior hemi block, Wolf Parkinson white syndrome, anterolateral MI
- Left axis deviation: Normal variation in pregnancy, obesity, Ascites, abdominal distention, tumor, Left anterior hemiblock, Left ventricle Hypertrophy, Inferior MI
- **P-wave:** Normal P wave 3 small squares wide and 2.5 small squares high. Always positive in lead I and negative in avR, commonly bi-phasic in lead V₁.

- **P-pulmonale:** Tall peaked P wave. Generally due to the large right atrium.
- **Biphasic P wave:** Terminal Negative deflection more than 40ms wide and more than 1 mm deep is an ECG sign of left atrial enlargement
- **P mitrale:** Wide P wave often bifid, may be due to mitral stenosis.
- **PR interval:** Normal PR interval 3-5 small squares (120-200ms) Long PR interval may indicate heart block Short PR interval may indicate Wolf Parkinson white
- QRS complex:
 - Normal QRS width 70-100 ms
 - Narrow complexes (<100 ms) supraventricular in origin

Broad complexes (>100ms) may be ventricular in origin and can be seen in bundle branch block, Hyperkalemia, or sodium channel blockade

- **ST segment:** Connects QRS complex and T wave and has the duration of 0.005 to 0.150 sec (5 to 150ms)
- Elevated ST segment:
 - Acute myocardial infraction
 - Coronary vasospasm (Prinzmetal angina)
 - Pericarditis
 - Brugada syndrome
 - 0
- **Depressed** ST segment: Myocardial ischemia without infraction
 - Acute posterior wall MI
 - QT interval: Normal QT value ranges from 350 -450 ms for adult male and 360-460 for adult female
 - Prolonged QT: Hypokalemia
 - o Hypocalcaemia
 - o Hypomagnesium
 - 0
- Short QT:
 - o Hypercalcaemia
 - Congenital short QT syndrome
 - Digoxin effect

ECG in some pathological conditions

- 1) Left ventricular Hypertrophy: Thickening of walls of the lower left chamber i.e. left ventricle and uncontrolled hypertension is the most common cause of Left ventricular Hypertrophy. ECG Changes:
 - Large R wave in the left-sided lead (V5,V6, I and aVL) and deep S wave in right-side lead (V1-V2)
 - Prolong QRS duration
 - P-mitrale
 - Left axis deviation
 - QT prolongation

2) Acute Coronary Syndrome: Range of thrombotic coronary artery diseases including Unstable angina and both ST elevated MI and Non ST elevated MI

ECG changes:

- T wave tenting or inversion
- ST-segment elevation or depression
- Pathological Q wave

3) Congenital Heart Disease

ECG changes

| 1 month to 6 month | Decrease in right ward axis (+90 but up to 125) R/S ratio in V2 is close to 1.R/S ration in V1 is >1 R wave dominant in V4 and V1 |
|-----------------------|--|
| 6 month to 3 years | QRS axis <+90 R/S ratio in V1 1<br R relatively dominant in V6 Biventricular hypertrophy in pericardial leads |
| 3 years to 8 years | Adult R/S progress in precordial leads Dominant S in right precordial leads and Dominant R in left precordial leads Q in left precordial area relatively large <5mm |

4) Rheumatic Heart Disease

ECG changes

Depends upon structure involved and the extent of cardiac damage

- Sinus tachycardia i.e. P wave may be hidden in the preceding T wave producing camel hump.
- Prolongation of PR interval
- AV conduction block

Handout 2: Echocardiography

Introduction

Echocardiography is a kind of ultrasound test that uses high-pitched sound waves to produce image of the heart. The sound wave are sent through a device called a transducer and are reflected off the various structure of heart. It is the most commonly used comprehensive cardiac imaging modality and is often the first test of choice for assessing cardiac structure and function. When compared with other imaging methods, echocardiography can be performed quickly at bedside, with minimal patient inconvenience or risk, and provides immediate clinically relevant information at relatively low cost.

Components:

- 1) Pulse generator: applies high amplitude voltage.
- 2) Transducer: converts electrical energy to mechanical (ultrasound) energy and vice versa

- 3) Receiver: detects and amplifies weak signals
- 4) Display: displays ultrasound signals into variety of modes
- 5) Memory: stores video display

Types:

- 1) Transthoracic
- 2) Transesophgeal
- 3) Stress
- 4) Doppler.

Indication

- Echocardiography provides detailed data on cardiac structure, including the size and shape of cardiac chambers,
- Provides information on the morphology structure and function of cardiac valves.
- Non-invasive assessment of systolic-diastolic function and intracardiac hemodynamics.
- Signs and symptoms or previous tests indicating possible cardiac structure disease.
- Information on the pericardial sac covering the heart
- Evaluation of cardiac mass (suspected tumor or thrombus)
- Evaluation of initial known or suspected cardiomyopathy.

Procedure

- A standard echocardiogram is also known as transthoracic echocardiogram or cardiac ultrasound
- The subject is asked to lie down in the semi-recumbent position on his left or right side with the head elevated.
- The left arm is tucked under the head and the right arm lies along the right side of the body
- Standard positions on the chest wall are used for the placement of transducers called "echo windows"

Basic Principle of Echocardiography

Principle of image generation

Echocardiography is based on the standard principles of ultrasound imaging in which high-frequency sound waves in the 1 to 10 MHz range are emitted from piezoelectric crystals housed in a transducer, traverse through internal body structures, interact with tissues, reflect to the transducer, and are then processed by microcomputers to generate an image. Ultrasound machines measure the time required for sound waves to reflect from structures and return to the transducer, and use this data to calculate the depth of reflecting structures. This information is used to generate scan lines that depict both location (depth of reflection) and amplitude (intensity of reflection).

Various body tissues conduct sound differently. Some tissue absorbs sound waves while other reflects them. The density of tissue dictates the speed at which the echoes return. The denser the tissue is the brighter white it will appear and the brightest white being the bone, Fluid is always black and Tissue is gray.

View in Echocardiography

- Each view is described using three components
- Transducer position or window: e.g. Parasternal view, apical view, subcostal view
- Echocardiographic Imaging plane: Long axis view, Short axis view, four-chamber view
- Region or structured visualized: Two chamber view, Aortic view, Mitral view

Other view: Right ventricular outflow view, SC inferior vena cava view, SC abdominal aorta Long axis, Suprasternal notch view.

Things to keep in mind when performing an echo exam

- 1. Is the image of good quality (clarity, depth, and on-axis)?
- 2. Which cardiac structures are visualized (or not visualized)?
- 3. Is the LV function abnormal?
- 4. Is significant mitral stenosis present? (2/3 criteria)
- Is the RV significantly dilated? (≥ 1.5x aortic root size on parasternal long axis; larger than LV in apical view)
- 6. Is a large pericardial effusion present?
- 7. Is the IVC >2 cm in diameter?

Echo findings in some pathological condition

1) Cardiomyopathy

Usually on ECHO:

- a. The left ventricle looks more round
- b. There is decreased squeeze of the left ventricle (ejection fraction is low (< 50%)

2) Mitral stenosis

Thickening and restriction of mitral valve mobility

- a. Restriction and immobility of the posterior leaflet can be seen.
- b. "Elbow deformity" of the anterior leaflet is very common.
- c. Calcification appears white on echo. Thickening of the mitral valve compared to the aortic valve.

These features are generally easily appreciated in the **parasternal long-axis** view of echocardiography

Assessing right ventricular size:

- In cases of right heart failure, the right ventricle may appear enlarged on the parasternal longaxis view
- Normally, the right ventricle is roughly the same size as the aortic root and the left atrium. If the right ventricle is >1.5x the size of the aortic root on the parasternal long-axis view, it is dilated.
- On the apical 4 chamber, the right ventricle should not be larger than the left ventricle

3) Pericardial Effusion

• Pericardial effusions appear as an extra layer of fluid around the heart that appears black.

- This can be seen best in the subcostal view, parasternal long axis and apical 4-chamber view.
- A pericardial effusion causing a dilated IVC and symptoms of heart failure needs an immediate referral for pericardiocentesis.

4) Rheumatic heart disease

- The mitral orifice is markedly narrowed with a "fish mouth" shape.
- The left atrium is dilated and its endocardium is thickened.
- Mitral valve leaflets thickening and calcification with restriction of motion

5) Acute myocardial Infraction

Echocardiography in acute myocardial infarction is useful for the identification of regional wall motion abnormalities and complications

6) Regional wall motion abnormalities

Wall motion abnormalities localize to the territory of the occluded coronary vessel, and may include:

- absence or reduction of systolic thickening
- decreased motion: hypokinetic, akinetic, dyskinetic (systolic bulging) and aneurysmal Over time, infarcted areas will appear thinned and fibrotic

Complication

- systolic and diastolic dysfunction
- acute MR from papillary muscle rupture
- VSD
- pericardial effusion
- tamponade from free wall rupture
- mural thrombus
- ventricular aneurysm and pseudoaneurysm

Congenital Heart Disease

- 1) Atrial septal defect
- 2) Ostium primum defect
 - Absence of the primum septum at the AV junction or crux of the heart
 - In primum ASD,a cleft in anterior leaflet of the mitral valve may be seen in parasternal short axis view
- 3) Ventricular septal defect
- Subcoastal view is the best
- Echo drop out of the ventricular septum. The finding of a **T sign** in the apical view increases the specificity of the diagnosis

Module 2 Checklist

Checklist for WHO Risk Prediction Chart

Tick S for satisfactory and U for Unsatisfactory

| S.N | WHO Risk Prediction chart | Case | es | |
|-----|--|------|----|--|
| 1) | The participant assures proper selection of the appropriate chart using epidemiological sub-region and depending on the presence or absence of diabetes. | | | |
| 2) | The participant ascertains to select either male or female tables. | | | |
| 3) | The participant makes sure to select smoker or nonsmoker boxes. | | | |
| 4) | The participant ensures to select age group box (if age is 50- 59 years select 50) | | | |
| 5) | The participant makes sure to look within the box for the nearest cell where the individual's systolic blood pressure (mm Hg) crosses | | | |
| 6) | The participant ensures to look within the box for the nearest cell where the individual's total blood cholesterol level (mmol/l) crosses | | | |
| 7) | The participant assures to observe the colour of the cell which will determine the 10-year cardiovascular risk. | | | |

Checklist for Blood Pressure measurement

| S.N | Prerequisite for blood pressure measurement | Case | es | |
|-----|---|------|----|--|
| 1) | The participant assures that the patient avoids caffeine, exercise, and smoking for at least 30 min before measurement. | | | |
| 2) | The participant makes sure the patient is relaxed and is sitting in a chair (feet on floor, back supported) for more than 5 mins. | | | |
| 3) | The participant ensures the patient has emptied their bladder. | | | |
| 4) | The participant makes sure neither the patient nor the observer talks during rest period or during measurement. | | | |
| 5) | The participant makes sure to remove the thick clothing covering the location of cuff. | | | |

| Step | Steps for blood pressure measurement | | | | |
|------|--|--|--|--|--|
| 1) | The participants make certain the patient's arm is supported (e.g. resting on a desk). | | | | |
| 2) | The participant ascertains the middle of the cuff is positioned on the patient's upper arm. | | | | |
| 3) | The participant makes sure to use the correct cuff size such that the bladder encircles 80% of the arm | | | | |
| 4) | For auscultatory determinations, the participant makes sure a palpated estimate of radial pulse obliteration pressure is used to estimate SBP and the cuff is inflated 20– 30 mm Hg above. | | | | |
| 5) | For auscultatory readings, The participant assures cuff pressure is deflated at the 2 mm Hg per second, listening for Korotkoff sounds | | | | |
| 6) | The participant makes certain to record SBP and DBP on the onset of first Korotkoff sound and the disappearance of all Korotkoff sounds. | | | | |
| 7) | The participant ascertains BP is recorded in both arms. If the difference between two arms is more than 15 mmHg, the measurement is repeated. If the difference persists, the blood pressure of the arm with high recording is considered. | | | | |
| 8) | The participant ensures to take a second measurement if the blood pressure in the clinic is 140/90 mm Hg or higher, If the two are substantially different, a third measurement is taken. The lower of the last 2 measurements is recorded as clinic blood pressure. | | | | |

ECG CHECKLIST

Click S for satisfactory and U for unsatisfactory

| S.N | Procedure for ECG | Cases |
|-----|---|-------|
| 1) | The participants ensure all the jewelry or lockets is removed | |
| 2) | The participants make sure all the clothes is removed above the waist and covered with a gown or sheet and exposing only the necessary skin | |
| 3) | The participants ascertain to maintain the privacy of the patient. | |
| 4) | The participants ensure the patient is in supine or semi fowler position | |
| 5) | The participant assures the patient has placed their arms down by their side and relaxed their shoulder. | |
| 6) | The participants ascertain the patient's legs are uncrossed | |
| 7) | The participants ensure the electrodes are attached to the chest, arms and legs | |
| 8) | The participants make sure to remove any electrical device such as a cell phone away from the patient as they may interfere with the machine. | |
| 9) | The participants ascertain the patient is lying down calm with no movement, electrodes are well placed and no improper grounding | |

ECHO CHECKLIST

Click S for satisfactory and U for Unsatisfactory

| S.N | Trans thoracic ECHO procedure | Cases | |
|-----|--|-------|--|
| 1) | The participants make sure the patient is lying down in semi-recumbent with his/her head elevated | | |
| 2) | The participant assures the left arm is tucked under the head and the right arm lies along the side of the body | | |
| 3) | The participants ascertain that standard positions on the chest wall are used for the placement of transducers called "echo windows" | | |

Module -3 Diabetes Mellitus

| Self-Pace | Self-Paced Learning: Diabetes Mellitus | | | | |
|--------------|---|-------------------------|--|--|--|
| Check box | Торіс | Materials and resources | | | |
| | Read the definition, etiopathogenesis, and signs and symptoms of Diabetes Mellitus from page no. 150-151 | PEN- Plus Protocol | | | |
| | Review the Overall approach to patients with Diabetes Mellitus with the help of the provided flow diagram from page no. 152 | PEN- Plus Protocol | | | |
| | Read how to make the diagnosis of different types of Diabetes Mellitus from page no. 153 | PEN- Plus Protocol | | | |
| | Read the Criteria defining pre-diabetes and its Threshold, Criteria defining Diabetes and its Threshold, Atypical forms of Diabetes Mellitus, Stating their salient features from page no. 153-154 | PEN- Plus Protocol | | | |
| | Read how to diagnose Gestational Diabetes Mellitus from page no. 155 | PEN- Plus Protocol | | | |
| | Read how to take the Clinical history and perform a physical examination in a patient with Diabetes Mellitus from page no. 155-156 | PEN- Plus Protocol | | | |
| | Read about Assessment of Glycemic targets (HbA1c) including timing and Glycemic target goals from Page no. 156-157 | PEN- Plus Protocol | | | |
| | Read about Diabetes care and Approach to diabetic patients with hypoglycemia from Page no. 158 | PEN- Plus Protocol | | | |
| | Read about Prevention of hypoglycemia and Management from Page no. 159-163 | PEN- Plus Protocol | | | |
| | Read about Intensification of Type II Diabetes Mellitus treatment from Page no. 163 | PEN- Plus Protocol | | | |
| | Read about the Intensification of Type I Diabetes Mellitus treatment from Page no. 164 | | | | |
| | Read about Insulin delivery techniques and Glucometer use from page no. 164-165 | PEN- Plus Protocol | | | |
| | Watch the provided video on Insulin delivery techniques and Glucometer use | | | | |
| | Go through the checklist of the above skills in your learner's guide | | | | |
| | Read about Diet, physical activity, and Behavioural Therapy for Glycemic control from Page no. 165-166 | | | | |

| Read about the Assessment and Management of Associated Co-morbidities as well as Treatment targets for common co-morbidities associated with diabetes from page no. 166-167 | PEN- Plus Protocol |
|--|--------------------|
| Go through the WHO/ISH Risk Prediction for cardiovascular risk evaluation (both Laboratory-based and Non-laboratory- based Risk charts) from page no. 167-170 | PEN- Plus Protocol |
| Read about the screening for complications, Management of complications of diabetes with pregnancy, and Gestational Diabetes Mellitus from page no. 171 | PEN- Plus Protocol |
| Read about Hyperglycemic Emergencies (Diabetic ketoacidosis, Hyperglycemic Hyperosmolar state) from page no. 172 | PEN- Plus Protocol |
| Read about Pediatric Diabetes from page no. 173-186 | PEN- Plus Protocol |
| Complete the exercise of Module 3 given in this chapter | |
| Note: List your queries on the subject matter and exercises to be discussed with the trainer during the virtual session | Duration:30 mins |

Module 3 Exercises

Answer the following MCQ's

Question 1- Diabetes Mellitus that develops as a result of autoimmunity against beta cells that produce insulin resulting in a complete or near-total insulin deficiency state is known as:

- a) Type I DM
- b) Type II DM
- c) Both a and b
- d) None

Question 2- Which of the following falls under clinical presentation in a patient with DM: (Multiple answers possible)

- a) Triad of polyuria, polyphagia and polydipsia
- b) non-healing foot ulcer
- c) Infections eg. in the genital area (vulvovaginitis, balanitis)
- d) detected during a routine checkup in asymptomatic adults

Question 3- All of the following risk factors should be considered in an adult with overweight or obesity except:

- a) First-degree relative with diabetes
- b) History of accidents in remote past
- c) Women with polycystic ovary syndrome
- d) Good Physical activity

Question 4- Following are the features suggestive of Type I Diabetes Mellitus. (Multiple answers possible)

- a) Younger age at diagnosis (<30 years)
- b) Lower BMI ($\leq 25 \text{ kg/m2}$)
- c) Unintentional weight loss
- d) Ketoacidosis

Question 5- Following are the atypical forms of DM except?

- a) Maturity Onset Diabetes of Young (MODY)
- b) Latent Autoimmune Diabetes of Adulthood (LADA)
- c) Type I and II DM
- d) Ketosis Prone Type II Diabetes

Question 6- Which of the following groups of drugs causes weight gain in a patient with DM?

- a) Biguanides
- b) SGLT2 inhibitors
- c) DPP4 inhibitors
- d) Sulphonylureas

Question 7- The duration of action of human regular insulin is:

- a) 10-12 hrs
- b) 5-8 hrs
- c) 30 mins
- d) 1-2 hrs

Question 8- Smoking cessation and abstinence from tobacco products fall under which of the following category?

- a) Medical therapy
- b) Nutrition therapy
- c) Physical activity
- d) Behavior therapy

Question 9- Before applying the WHO/ISH Risk Prediction chart to estimate the 10-year cardiovascular risk of an individual, the following information is necessary:

- a) Presence or absence of diabetes
- b) Gender, Age, Total blood cholesterol
- c) Smoker or non-smoker and Systolic blood pressure (SBP)
- d) All of the above

Question 10- Screening of the following complications is expected to be done at least annually.

(Multiple answers possible)

- a) Diabetic retinopathy
- b) Diabetic neuropathy
- c) Diabetic foot
- d) Diabetic kidney disease

Question 11- First-line treatment in the management of Diabetes with pregnancy and Gestational diabetic Mellitus is

- a) Patient Education
- b) Metformin
- c) Medical nutritional therapy
- d) Counseling

State whether True or False:

Question 12- Diabetic Ketoacidosis (DKA) can be the first presentation of DM in older adults.

- a) True
- b) False

Question 13- Patients with a previous history of hypoglycemia are not considered as vulnerable groups.

- a) True
- b) False

Question 14- Sulfonylureas can be prescribed in patients with a risk of hypoglycemia.

- a) True
- b) False

Fill in the blanks.

Question 15- HbA1c test in diabetes gives a piece of good information regarding the blood sugar control of patients of prior______ months.

Question 16

Assessment of glycemic targets in patients who are meeting treatment goals^{*} and who have stable glycemic control should be done every ______month.

Question 17

In patients with Hyperglycemic hyperosmolar state, patients present with extreme hyperglycemic state i.e blood glucose more than _____ mg/dl

Match the following

Question 18

| 1. | Vital signs | i) Acanthosis nigricans | |
|----|------------------|---------------------------------|-------|
| | | | |
| 2. | Foot examination | ii) Visualization of the retina | with |
| | | the optic disc, macula, and ve | ssels |
| 3. | Skin examination | iii) Hypertension | |
| 4. | Fundoscopy | iv) Deep tendon reflexes | |

| Question19: Hypoglycemia | |
|--------------------------------|--|
| 1. Symptoms | a. 15-20g pure glucose |
| 2. Blood glucose level | b. altered consciousness and confusion |
| 3. Oral glucose administration | c. less than 54 mg/dl |
| 4. Intravenous glucose | d. 25% dextrose 100ml |
| administration | |

Question 20- Match the following about Exercise prescriptions for different groups of people.

| a) Children adolescents | and | 1) 60 minutes per day or more of moderate or vigorous- intensity aerobic activity, with vigorous muscle- strengthening activities at least 3 days/ week |
|----------------------------|-----|--|
| b) Older adults | | 2) 150 minutes or more of moderate to vigorous- intensity ofaerobic activity per week |
| c) Adults | | 3) Flexibility and balance training2-3 times per week |

Case Questions

Question 21- A 45-year-old obese female is asymptomatic. She came to your health care center for regular screening for diabetes. She comes to you with a blood glucose report of FBS: 115 mg/dl and PPBS: 182 mg/dl.

a. What is your diagnosis?

.....

b. How will you treat the patient?

Question 22

A child, with a known case of diabetes, has presented to your hospital with clinical features suggesting DKA. His random blood sugar is 400mg/dL and urinary ketones are significantly raised.

a. What are the features favoring the diagnosis of DKA?

b. What are the other findings that you will look to decide whether he needs to be treated in the intensive care unit?

Checklist for Insulin Injection Technique

Tick S for Satisfactory and U for Unsatisfactory

| S. No. | Prerequisites for Insulin Injection Technique | Cases |
|--------|---|-------|
| 1) | The participant ensures that he/she washes hands before proceeding. | |
| 2) | The participant ensures that the cloudy insulin vial is gently rolled at least 10 times and checked to ensure that it has a consistently milky white appearance. | |
| 3) | The Participant ensures that the insulin is administered in the subcutaneous tissue, or the fatty layer under the skin and not at intramuscular sites. | |
| 4) | The participant ensures the new needle is used with each injection. | |
| 5) | The participant makes sure that he/she knows well the common areas for insulin injection which includes the back of the arm, abdomen, upper buttocks, and outer part of the thighs. | |
| 6) | The participant makes sure that he is aware that it is important to choose a different site each time while injecting insulin. | |
| | Steps for Insulin Injection | |
| 1) | The participant makes sure that he always washes hands and picks a clean injection site. | |
| 2) | The participant makes sure that the cloudy insulin is properly mixed as per instructions above. | |
| 3) | The participant makes sure that the Insulin injection site is rotated. | |
| 4) | Site rotation is important to prevent lipohypertrophy. | |
| 5) | The participant makes sure that the injections are given at a 90-degree angle and held for 10 seconds. | |
| 6) | The participant makes sure that he uses his thumb to move the pen down slowly, the needle is withdrawn, pen needle is removed and disposed off properly. | |
| 7) | The participant makes sure that he/she can well identify the presence of lipohypertrophy or injection site infection. (Lipohypertrophy appears as soft, smooth raised areas several centimeters in breadth. Re-use of needles or continued injection in the same location can lead to skin infection) | |

Checklist for Glucometer use

Tick S for Satisfactory and U for Unsatisfactory

| S. No. | Prerequisites for Glucometer use | Cas | es | |
|---------|---|-----|----|--|
| 1) | The participant ensures that he performs hand hygiene. | | | |
| 2) | The participant ensures that he reviews the patient's medical history and current medications because if the patient is receiving anticoagulant therapy, it may result in prolonged bleeding at the puncture site requiring pressure to the site. | | | |
| 3) | The participant ensures that he assesses the patient thoroughly for signs and symptoms of hyperglycemia or hypoglycemia to correlate data to pursue acute action due to an onset of symptoms. | | | |
| 4) | The participant ensures that he gathers supplies: nonsterile gloves, alcohol swab, lancet, 2" x 2" gauze or cotton ball, reagent strips, and blood glucose meter | | | |
| Steps f | or Blood glucose monitoring using a glucometer | | | |
| 1) | The participant ensures that the patient washes his hands with soap and warm water and dries (or wipe with an alcohol swab and let it dry) | | | |
| 2) | The participant ensures that the patient is positioned comfortably in a semi-upright position in a bed or upright in a chair. | | | |
| 3) | The participant ensures that he encourages the patient to keep his hands warm. | | | |
| 4) | The participant ensures that the test strip is taken out, placed in a glucometer and waits for blood drop to show. | | | |
| 5) | The participant ensures that the finger is pricked. Use the side, not the Centre. | | | |
| 6) | The participant ensures that the fingers are rotated and the drop of blood is squeezed, wiped away with cotton, then holds the second drop of blood to the side of the test strip. | | | |
| 7) | The participant waits for the glucometer to finish reading and display the results. | | | |
| 8) | The participant ensures that he reads the results on the unit display. | | | |
| 9) | The participant ensures that he turns off the meter and disposes of the test strip, $2'' \ge 2''$ gauze, and lancet. | | | |
| 10) | The participant ensures that he uses caution with the lancet to prevent an unintentional sharps injury. | | | |
| 11) | The participant ensures that he removes gloves. | | | |

| 12) | The participant ensures that he performs hand hygiene. | | |
|-----|--|--|--|
| 13) | The participant ensures that the patient is assisted to a comfortable position and the test results are reviewed with the patient. | | |
| 14) | The participant ensures that he asks if the patient has any questions, and thank them for their time. | | |

Module 4: Oncology

Self-Paced Learning Outline: Oncology

| Session | Topic | Materials and |
|---------|---|---------------------|
| | L L | resources |
| | Read the introduction of cancer, risk factors, difference between invasive and preinvasive cancers, common signs and symptoms and difference between screening and early diagnosis from page no: 107-110 | PEN- Plus Protocol |
| | Read introduction to childhood cancers and, common childhood cancers, sign and symptoms, danger signals warranting early referral to tertiary centers from page no: 111-119 | PEN-Plus Protocol |
| | Read the introduction of breast cancer, risk factors, differentiating points between benign and malignant breast lump from page no:120-128 | PEN- Plus Protocol |
| | Read the introduction of oral cancer, its risk factors and identification of pre-cancerous and cancerous lesion from page no: 129-132 | PEN- Plus Protocol |
| | Read the chapter of cervical cancer, differentiating points between benign disorders of cervix and cervical malignancy, risk factors associated with cervical cancer from page133-139 | PEN - Plus Protocol |
| | Read the chapter on palliative care, common symptoms for palliation encountered in cancer patients, define pain and assessment of pain via pain tools, management of pain with 3 ladder pattern of pain management, dosing of all form of Morphine along with assessment of morphine dose for breakthrough pain, management of common adverse events of morphine from page no:140-148 | PEN - Plus Protocol |
| | Complete the exercise of Module 4 given in this chapter | |
| | Note: List your queries on the subject matter and exercises to be discussed with the trainer during the virtual session | |

Module 4 Exercises

Question 1: Below are the risk factors for cancer. Differentiate and enlist in the concerned column.

Age, medications, sex, safer sex, race and ethnicity, alcohol use, tobacco use, family history, and genetics (e.g., changes in DNA), Obesity, physical inactivity, poor dietary habits.

| Modifiable Risk factors | Non-modifiable Risk factors |
|-------------------------|-----------------------------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Question 2:

Following are the signs and symptoms of the possible enlisted cancers. Match the following

| Signs and symptoms | Cancers |
|--|--------------------------------|
| PV discharge/ bleeding | Stomach or pancreatic cancer |
| Palpable breast lump | Prostate cancer |
| Painful neck nodes | Cervical Cancer |
| Oral sores/ ulcerations | Breast cancer |
| Chronic cough/ Haemoptysis | Colon or rectal cancer |
| Difficulty urinating (weak stream) | Head and neck cancers/Lymphoma |
| Persistent vomiting, nausea, early satiety | Lung cancers |
| Difficulty defecating or blood in stool | Brain tumor |
| Whitish hue to the pupils, squint, pain, bulging eyes | Stomach or Pancreatic cancer |
| Persistent headache, change in mental function, focal weakness | Retinoblastoma |

Question 3:

Fill in the blanks

| A | focuses on detecting symptomatic patients as early as possible. |
|-----|--|
| Β. | |
| inc | lividuals to identify those having cancers before any symptoms appear. |

C..... requires ensuring rapid patient presentation, diagnosis and treatment as soon as first symptoms appear.

Dis relevant to all types of cancer

E..... is relevant to a subset of cancer types only – namely cervical, colorectal and breast cancers.

Question 4:

True or false

- a. Cancer is always fatal. (.....)
- b. Cancer is contagious. (.....)
- c. All lumps are cancer. (.....)
- d. Chemotherapy and radiotherapy will kill you. (.....)

Question 5:

Choose the top five childhood cancers from the given list and write them below.

Haematological (Leukaemia/lymphomas) Sarcomas(Bony/soft Tissue) Cervical Cancers Lung cancers Retinoblastomas Breast Cancers Gall Bladder Cancers Ovarian Cancers Central Nervous system Tumors Stomach Cancers Colorectal Cancers Oral Cavity Cancers Renal Tumours(Wilm's Tumor) Answers:

1. 2. 3. 4. 5.

Question 6: Write the diagnosis:



Answer:

Question 7:

From the following risk factors of breast cancer. Differentiate and enlist in the concerned column. Gender, nulliparous, age, Oral contraceptives, genetic risk factors, alcohol intake, obesity, Physical inactivity, race and ethnicity, not breastfeeding, benign breast conditions.

| Modifiable risk factors | Non-modifiable risk factors | | | | |
|-------------------------|-----------------------------|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Question 8:

Differentiate the following features of breast cancer and enlist in the concerned column.

Hard Consistency, No nipple retraction, Smooth and rubbery, Can have nipple retraction, Painless (pain in 1/1000), May have yellow/green nipple discharge, May have unilateral, bloody nipple discharge, Often painful, Well-defined, can cause dimpling of the skin, Irregular edge, Fixation to skin or chest wall, Easily moves under the skin, Skin dimpling unlikely

| Benign | Malignant | | | | |
|--------|-----------|--|--|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Question 9:

True or false about the risk factors of oral cancer

- 1. Betel quit/ gutkha / chewing tobacco (khaini) doesn't cause oral cancer. (....)
- 2. Chronic mouth ulcer especially in those with major risk factors could also be the risk factor/symptom of oral cancer. (...)
- 3. High alcohol consumption (synergistic with tobacco) can cause oral cancer. (....)

Question 10:

Below are the pictures of the various kinds of oral lesions. Identify and name it.











Answers:

- A.
- В.
- C.
- D.
- E.

Question 11

True or false.

- a. The most important risk factor for cervical cancer is infection by the human papilloma virus (HPV). (.....)
- b. Having early sexual activity /early marriage and having multiple sexual partners is not a risk factor for cervical cancer. (.....)
- c. High-risk sexual behavior is an important risk factor for cervical cancer. (.....)
- d. Immunodeficiency virus (HIV), the virus that causes AIDS, damages the immune system and puts women at higher risk for HPV infections. (.....)
- e. Smoking, an unhealthy diet, and having a family history of cervical cancer can cause cervical cancer. (.....)

Question 12:

Fill in the blanks.

- 1. The most important primary prevention for cervical cancer is
- 2. WHO's current guidelines recommend that young adolescent girls between 9 and 14 years receive doses of vaccine at the intervals of months to be fully protected.
- 3. Other primary preventive strategy includes

a..... b..... c..... d.... e...

- 4. Secondary prevention means in terms of cervical cancer.
- 5. The screening strategy for cervical cancer includes:

a..... b..... c....

Question 13

Below is the 3 ladder pattern for pain management. Fill the box with appropriate medications.



| Step 1 | l | • • • • • • • • • • • • • | ••••• | | |
|--------|---|-------------------------------|-----------|------|--|
| Step 2 | 2 | • • • • • • • • • • • • | ••••• | | |
| Step 3 | 3 | | | | |

Case Scenarios: Question 1:

Mrs XXX is 40 years now and was married about 5 years back. She has recently lost her mother after 3 years long fight with breast cancer which was diagnosed at an advanced stage. Her mother's sister was also diagnosed with breast cancer at the age of 43 years and with ovarian cancer at the age of 45 years. She is worried that she might as well be a victim of breast cancer and comes to you for further suggestions.

- How would you suggest her to proceed forward to allay her fears?

Answers:

Question 2:

XXX is a 10-year-old child. He reports to you with swelling around the neck, axilla, and inguinal region progressing in size for the last 8 months. 8 months back he had visited a Primary health care Center locally with complaints of night fever, some weight loss and mild neck swelling. Given his family history of Tuberculosis and an inconclusive FNAC from the neck Lymph node, he was started with Antitubercular medications. Following this, initially, his symptoms were stable, but however, for the last 4 months his swelling in the neck has been increasing and there has been newly appearing swelling in the axilla and inguinal region. He has lost considerable weight. Lately, his mother also noticed abdominal swelling. CT evaluation reveals enlarged bilateral neck nodes, right axillary nodes, enlarged liver and spleen and bilaterally enlarged inguinal nodes. A biopsy from the neck node reveals non-Hodgkin's lymphoma. Bone marrow aspiration and biopsy were suggestive of infiltration of marrow by the cancerous cell.

Can you enumerate the reason for the delays in his diagnosis?

Answers:

Question 3:

30 yrs single female, presents with complaints of a smelly, yellow vaginal discharge with slight dysuria for 1 week.

She denies vulvar itching, pelvic pain or fever. She says she had 2 sex partners over the last 6 months and did not use condoms. She however used contraceptives for birth control. On

Examination:

Vitals were stable.

Per speculum Examination: Reveals moderate amount of frothy, yellowish, malodorous discharge without any visible cervical mass or easily induced cervical bleeding. Bimanual Examination was normal without uterine or adnexal tenderness.

Q) What do you think is the cause?

Answer:
Q)You perform a KOH wet mount and a saline wet mount of cervical secretions. What could be the findings?

Q)Would you offer her cervical cancer screening? If yes, when and why? If not why?

Question 4: You are called to the ER to evaluate a 10-year-old boy who has been tired for 2 weeks and his parents noticed that he becomes short of breath when he walks upstairs to go to his bedroom. At first glance, you notice that he has some shortness of breath when he is placed in the supine position and feels slightly better in propped up position.

On Examination:

Temp: 38.7C, Pulse: 100b/min, BP: 110 /70, Spo2: 88% at RA Eye: No pallor, No icterus

Tongue: Moderate dehydration present

Neck: Multiple Bilateral cervical palpable. Maximum size 4cm feels rubbery. No palpable LN elsewhere. In addition there is engorged neck veins bilaterally.

Lab Tests: Hb 10, TLC: 10,000 Differentials Neutrophils: 80%, Lymphocytes 20%, ESR 20, urea/Creatinine: 50/1.3, Na/K:135/4.5, LDH: 2000.



Q) What is your possible diagnosis? Answer:

Q) What would be your initial management? Answer:

CHECKLIST FOR BREAST EXAMINATION

PARTICIPANT_____ Date Observed

| STEP/TASK | | ASES | |
|--|--|------|--|
| Tick "S" for satisfactory and "U" for unsatisfactory | | | |
| 1. Greet the woman respectfully and with kindness. | | | |
| 2. Tell the woman you are going to examine her breasts. | | | |
| 3. Ask the woman to undress from her waist up. Have her sit on the examining table with her arms at her sides. | | | |
| 4. Wash hands thoroughly and dry them. If necessary, put on new examination surgical gloves on both hands. | | | |
| Examine and compare both sides. Start examination of the normal side. History Taking(ask about hormone replace therapy, family history of breast cancer) | | | |
| BREAST EXAMINATION | | | |
| 1. <u>Inspection</u> Look at the breasts and note any differences in: | | | |
| Shape (symmetry and contour) size nipple and areola: | | | |
| position, size, shape, surface and any discharge | | | |
| • Skin changes: | | | |
| dimpling, puckering ,engorged veins ,thickening and nodularity, discolorations, ulceration, cancer en cuirasse ,peau d'orange and scares of previous operation | | | |
| Make sure that you expose the undersurface of the breast and note any abnormalities hidden. | | | |
| • Swelling(mass or lump) • The arms: | | | |
| Edema, distended veins and muscle wasting or weakness. | | | |
| 2. look for asymmetry of the nipple ,areola or the breast in all the following positions: a) the patients hands should rest on her thighs b) the hands are firmly pressed onto the hips c) the arms are raised up and both the palms are placed behind the head | | | |

| d) | the patient leans forwards | | | | | |
|---------------------|---|--|--|--|--|--|
| e) | finally, make the patient lie down on a couch with a pillow | | | | | |
| | below her chest | | | | | |
| 3. | Palpation: | | | | | |
| | - Start with the normal side first to have a standard for comparison. | | | | | |
| | - Palpate first by the palmer surface of fingers (the flat of the hand) | | | | | |
| | then by the tip of the fingers | | | | | |
| | - Palpate each quadrant, the axillary tail and the axilla | | | | | |
| Δ | Palpate in all five positions from (a) to (e) | | | | | |
| т . с | | | | | | |
| 5. | Any mass is verified for : | | | | | |
| | • Site (position: which quadrant?) | | | | | |
| | • Tenderness | | | | | |
| | • Temperature | | | | | |
| | • Size | | | | | |
| | • Shape | | | | | |
| | • Surface | | | | | |
| | • Edge | | | | | |
| | • Consistency | | | | | |
| | Mobility and Relation to the surrounding: | | | | | |
| | (a) Relation the breast tissue: hold the breast with one hand and | | | | | |
| | try to move the mass with other hand. | | | | | |
| | (b) Relation to the nipple: hold the nipple with one hand and try | | | | | |
| | to move the mass with the other hand. | | | | | |
| | (c) Relation to the muscle: ask the patient to rest her hand on her | | | | | |
| | hip with the arm relaxed. Hold the lump and estimate its | | | | | |
| | mobility in two perpendicular directions. Now ask the patient | | | | | |
| | to press her hand against her hip to contract the pectoral | | | | | |
| | muscles, and re-estimate the degree of mobility of the lump. | | | | | |
| | (d) Relation to the chest wall: fixity to the chest wall results in | | | | | |
| | loss of all mobility irrespective of muscular contraction | | | | | |
| | (e) Relation to the skin: try to ninch the skin off is it attached to | | | | | |
| | the lump? Then move the lump and observe the breast for | | | | | |
| | tethering or fivity | | | | | |
| (| | | | | | |
| 0. | Express the areola for any discharge from the hipple | | | | | |
| 7. | Examine the axilla for nodes: | | | | | |
| • | The arm is elevated and the hand is insinuated in its extreme apex | | | | | |
| | then the arm is lowered to relax the axillary fascia and the nodes are | | | | | |
| | palpated against the chest wall for their consistency, mobility, | | | | | |
| | matting, distribution and number. | | | | | |
| • | The groups are: | | | | | |
| the | e pectoral(or anterior)group the central group | | | | | |
| the | e posterior (or subscapular) group the lateral (brachial or humeral) | | | | | |
| | group the apical (infraclavicular) group | | | | | |
| • | The patient is examined both from front (for palpation of the central, | | | | | |
| | pectoral, apical and lateral groups) and from the back (for palpation | | | | | |
| | of the subscapular nodes). | | | | | |
| • | The right axilla is examined by the left hand, and vice versa. | | | | | |
| 0 | | | | | | |
| δ. | raipate the supraciavicular lossae: | | | | | |

| Can be done from front each at a time or from behind Simultaneously examined and compared. | | | |
|--|--|--|--|
| | | | |
| 9. After completing the examination, have woman cover herself. Explain any abnormal findings and what needs to be done. If the examination is normal, tell the woman everything is normal and healthy and when she should return for a repeat examination | | | |
| 10. Examination of a male breast is carried out in the same way as in the female. | | | |

VIA Clinical Skills Checklist

PARTICIPANT_____ Date Observed_____

| Steps | | Cas | ses | |
|--|---|-----|-----|---|
| Client Assessment (Tick "S" for satisfactory and "U" for unsatisfactory) | 1 | 2 | 3 | 4 |
| 1. Greet the woman respectfully and introduce yourself | | | | |
| 2. Explain why the VIA test is recommended and describe the procedure | | | | |
| 3. Tell her what findings might be and what follow-up or treatment might be | | | | |
| necessary | | | | |
| Getting Ready | | | | |
| 4. Check that instruments and supplies are available | | | | |
| 5. Ensure that the light source is available and ready to use | | | | |
| 6. Check that the woman has emptied her bladder | | | | |
| 7. Ask her to undress from the waist down | | | | |
| 8. Help her onto the examining table and drape her | | | | |
| 9. Wash hands thoroughly with soap and water and dry with clean, dry, cloth or air dry. Palpate the abdomen | | | | |
| 10. Put one pair of clean, single use gloves Visual Inspection with Acetic Acid | | | | |
| 11. Inspect external genitalia | | | | |
| 12. Explain the importance of cervical cancer screening | | | | |
| 13. Insert speculum and adjust it so that the entire cervix can be seen | | | | |
| 14. Fix the speculum blades in the open position so that the speculum will remain in place with the cervix in view | | | | |
| 15. Move the light source so that you can see the cervix clearly | | | | |
| Examine the cervix for cervicitis, ectropion, polyp/ growth, Nabothian cysts or ulcers | | | | |
| Use a cotton swab to remove any discharge, blood or mucus from the cervix. Dispose of swab in a leak-proof container or plastic bag | | | | |

| Steps | Cas | es | |
|---|---------|----|--|
| 18. Identify the cervical os, the squamocolumnar junction (SCJ) and the transformation zone | | | |
| 19. Soak a clean swab in 5% acetic acid and apply it to the cervix. | | | |
| Dispose of the swab in a leak-proof container or plastic bag | | | |
| 20. Wait at least 1 minute, and observe the cervix for aceto-white changes | | | |
| 21. Inspect the SCJ carefully | | | |
| · Check whether the cervix bleeds easily | | | |
| \cdot Look for any raised and thickened white plaques or aceto-white Epithelium | | | |
| 22. As needed, reapply acetic acid on swab on the cervix with a clean swab to remove mucus, blood or debris. Dispose of swab in a leak-proof container of a plastic bag | | | |
| 23. When visual inspection has been completed, use a fresh swab to remove any remaining acetic acid from the cervix and vagina | | | |
| Dispose of the swab in a leak-proof container of a plastic bag | | | |
| 24. Remove the speculum | | | |
| If the VIA test is negative or positive, place in 0.5% chlorine solution for 10 minutes for decontamination | | | |
| Post-VIA Tasks | | | |
| 25. Wipe the light source with 0.5% chlorine solution or alcohol | | | |
| 26. Immerse both gloved hands in 0.5% chlorine solution. Remove gloves by turning them inside out. | | | |
| · If disposing of gloves, place them in leak-proof container or plastic bag | | | |
| If reusing surgical gloves, submerge in 0.5% chlorine solution for 10 minutes for decontamination | | | |
| 27. Wash hands thoroughly with soap and water and dry with clean, dry cloth or air-dry | | | |
| 28. If the VIA test is negative, ask the woman to sit up, get down from the examining table and get dressed. | | | |
| 29. Record the VIA test results and other findings in the woman's record. | | | |
| • If aceto-white change is present, draw a map of the cervix and the diseased area on the record | | | |

| Steps | | Case | es | |
|---|--|------|----|--|
| 30. Discuss the results of the VIA test and pelvic examination with the woman and answer any questions. | | | | |
| · If the VIA test is negative, tell her when to return for repeat VIA testing. | | | | |
| If the VIA test is positive or cancer is suspected, discuss the recommended next steps. | | | | |
| · After counselling, provide treatment or refer. | | | | |

Handouts for Cervical cancer

Diagnosis screening methods

Following are the standard screening methods

- 1. Visual Inspection with Acetic Acid (VIA)
- 2. Pap's Smear/cytology-based screening
- 3. High-risk Human Papilloma Virus DNA testing (HrHPV)

Pre-requisite for the screening test

- 1. Avoid sexual contact two days before the planned test.
- 2. Avoid vaginal douching or any medication application before the test.
- 3. The test cannot be done during the active period/bleeding.
- 4. Lady should not be having any antibiotics during the test.

Pap's Smear/Cytology based screening

Pap smear is recommended where technical and laboratory facilities are available for taking the cervical smear, study under the microscope by the pathologist and providing the results. Although Pap smear is the standard screening method for cervical cancer screening it is not an appropriate tool for large-scale national screening programs due to its technical difficulty. It can be done and advised where available. The Pap test is around 80% sensitive and can detect pre-cancer lesions 10-12 years before the development of invasive cancer.

When and who to do the Pap test:

- 1. This is recommended for all ladies after 2 years of initiation of sexual activity and all 30-60 years of eligible ladies as per national cervical cancer screening and prevention guidelines.
- 2. This test is done every year for three consecutive years and if all tests are negative then scheduled screening every 5 years till women reaches 60 years of age. If positive follow treat guideline for pre-cancer lesions.
- 3. Patients with HIV and on immunosuppression should do this test frequently as per the physician's advice. (6 months to 1 year)

Method:

The lady will be kept in a lithotomy position. Sim's speculum to be inserted and have a clear view of the cervical os. Look for any discharge or abnormality. If signs of infection or bleeding is noted stop the procedure and provide the treatment for the condition the lady is having. If no any abnormality then take the cervical smear using Ayer's spatula and brush from both ectocervix and endo-cervix. Make a smear on the glass slide fix this with formalin and air dry and transfer to the lab for the cytology study and reporting. This is very simple and reproducible test and is done on OPD basis.

If the test comes negative, lady will be in follow-up. If positive, she needs to be seen by an Oncologist or Gynecologist for a Colposcopy examination and the confirmation of the finding followed by appropriate treatment. Sometimes lady need to undergo a biopsy from the suspicious area/lesion.

Visual Inspection with Acetic Acid (VIA):

The National Guideline for Cervical Cancer Prevention and Screening in Nepal-2010 mandates that VIA will be used at all levels from the primary health care center (PHCC) to the tertiary level. The test can be performed by the trained health workers and the nursing staff in the

primary care setting. The results are immediately available and further management can be decided.

Visual inspection of the cervix using acetic acid means looking at the cervix with a naked unaided eye to detect abnormalities after the application of dilute (3–5%) acetic acid or vinegar over the cervical os. The abnormal area turns aceto white, which means there is HPV infection. 98% of this kind of aceto-white lesions resolves on its own as any other sexually transmitted infection (STIs). In few cases who may have persistent infection may give rise to precancerous lesion and then invasive cancer over 10-12 years from the initial infection. So counselling remains an important tool here and advice lady not to panic and to be on regular follow-ups of 6 months to one year to see the progress. This again is a very simple and easy test that can be conducted in mass screening camps and on a routine basis on hospitals and PHCs.

High-risk Human Papilloma Virus DNA Testing (HrHPV):

More than 98% of Cervical cancer is caused by HPV infection. Two high-risk HPV strains (16 and 18) cause more than 70% of cervical cancers but can be treated if detected early enough. Revised NCCP guideline also recommends the use of HPV DNA tests where available and applicable. HPV_DNA is the gold standard method and screening tool. NCCP also advocates the use of HPV-DNA self-sampling kit for the easy and inclusive test for all eligible women.

Module 5: Hemoglobinopathies

Self-Paced Learning Outline: Thalassemia

| Checkbox | Торіс | Materials and resources |
|----------|---|--------------------------|
| | Read about the Introduction of Thalassemia from Page no. 95 | PEN- Plus Protocol |
| | Read about Thalassemia in Nepal from Page no 96 | PEN- Plus Protocol |
| | Read about the Molecular basis and classification of Thalassemia from Page no. 96 | PEN- Plus Protocol |
| | Read signs and symptoms of Thalassemia from Page no. 99 | PEN- Plus Protocol |
| | Read how to make the diagnosis and manage Thalassemia from Page no. 99-102 | PEN- Plus Protocol |
| | Read the complications of Thalassemia from Page no. 102-104 | PEN- Plus Protocol |
| | Read about the Prevention of Thalassemia from Page no. 104 | PEN- Plus Protocol |
| | Complete the exercises given this Module Note: List your queries on the subject matter and exercises to be discussed with the trainer during the virtual session | Time allocation: 30 mins |

Module 5 Exercises- Thalassemia

Select the correct answer

Exercise 1: Thalassemia is mainly divided into? (Multiple answers possible)

- a) Alpha
- b) Delta
- c) Gamma
- d) Beta

Exercise 2: Pallor and splenomegaly in Thalassemia Intermedia becomes evident

- a) After 6 months
- b) After 1 year
- c) After 2 years
- d) Late adulthood

Exercise 3: All of the following applies for the diagnosis of B Thalassemia except:

- a) History of repeated anemia
- b) Failure to thrive
- c) Repeated infections
- d) Single episode of jaundice

Exercise 4: Identify the false lab diagnosis in the case of Thalassemia from the list provided below:

- a) Hb $\leq 9 \text{ g/dl}$
- b) MCV low<78 fl and MCH- low<27pg
- c) MCHC- low or normal
- d) WBC & Platelets massively diminished

Exercise 5: True regarding Peripheral Blood Smear (PBS) of Thalassemia is:

- a) Gross anisopoikilocytosis
- b) Tear drop cells and target cells
- c) Basophilic stippling
- d) All of the above

Exercise 6: How often can we depend on Hb Electrophoretic results for the diagnosis of Thalassemia?

- a) Always
- b) Sometimes
- c) usually
- d) Maybe

Exercise 7: Final diagnosis of alpha Thalassemia is:

- a) Clinical
- b) Based on suspicions
- c) Genetic
- d) Based on history

Exercise 8: Current, most common and evidence-based management strategies for Thalassemia will be:

- a) Chronic transfusion therapy
- b) Iron chelation
- c) Transplant
- d) Gene therapy

Exercise 9: Identify the true statements regarding blood transfusion in Thalassemia from the list provided below: (Multiple answers possible)

- a) An early and appropriate transfusion program is a pillar of care for children with betathalassemia major and in some children with beta-thalassemia intermedia.
- b) Transfusion is beneficial because it alleviates symptomatic anemia
- c) Shortens life
- d) Transfusion suppresses ineffective erythropoiesis

Exercise 10: All of the following are criteria for initiating transfusion therapy in Thalassemia except:

- a) Confirmed diagnosis of Thalassemia
- b) Haemoglobin level (Hb) <70 g/l on single occasions
- c) Haemoglobin >70 g/l with significant symptoms of anemia
- d) Haemoglobin >70 g/l with poor growth/failure to thrive

Exercise 11: Patients with transfusion-dependent Thalassemia ideally should receive leuko-reduced ______

- a) White blood cells
- b) Red blood cells
- c) Plasma
- d) Platelets

Exercise 12: Key for the safety of blood transfusion is:

- a) Material and colour of the bag
- b) Location of blood bank
- c) Haemovigilance and adverse events reporting
- d) Patients choice and privacy

Exercise 13: Following are the complications of Thalassemia.

- a) Transfusion-transmitted infections and transfusional iron overload
- b) Toxicities of iron chelation therapy and Bacterial infections
- c) Cardiac, liver and bone complications
- d) All of the above

Exercise 14: Main cause of iron overload in Thalassemia major is:

- a) GI absorption
- b) Blood transfusion therapy
- c) Oral iron intake
- d) Intravenous iron

Exercise 15: The diagnosis and monitoring of iron overload are based on the complementary use of the following parameters.

- a) Serum ferritin
- b) Liver Iron concentration (LIC)
- c) Myocardial iron
- d) All of the above

Exercise 16: All of the following are examples of iron chelators except:

- a) Deferoxamine
- b) Deferasirox
- c) Dolutegravir
- d) Deferiprone

Exercise 17: Vaccination visit that can be used for hemoglobinopathy screening is:

- a) JE vaccination
- b) PCV vaccination
- c) BCG vaccination
- d) MR vaccination

Match the following

Exercise 18:

| 1. | Beta-Thalassemia major | a. Enlarged |
|----|--------------------------|----------------------------|
| 2. | Facial change | b. mild persistent anemia |
| 3. | Spleen and liver changes | c. frontal bossing |
| 4. | Beta Thalassemia minor | d. manifest after 6 months |

Exercise 19: Match the following with regards to Thalassemia:

| 1) Acute complications | a) Hemochromatosis |
|---|--|
| 2) Common cause of death | b) Sepsis secondary to increased susceptibility to infection |
| Cause of death in post | c) Congestive |
| splenectomized patient | heart failure |
| 4) Multiorgan | d) severe anemia |
| failure due to | with CCF |

State whether True or False

Exercise 20: Alpha Thalassemia is usually caused by deletions of one or more of the 4 alpha globin genes (2 on each chromosome)

- a) True
- b) False
- c) Maybe
- d) Rarely

Exercise 21: Uncontrolled transfusional iron overload increases the risks of heart failure, endocrine damage, liver cirrhosis and hepatocellular carcinoma.

- a) True
- b) False
- c) Partially correct
- d) None

Fill in the blanks:

Exercise 22: Genetic diagnosis of B Thalassemia is needed for ______ diagnosis.

Exercise 23:

Q. Transfuse every 2-5 weeks, maintaining pre-transfusion hemoglobin above ______g/l or up to ______g/l for patients with cardiac complications.

Case Scenario

Exercise 24: A 19-year-old, Yadav boy, who is asymptomatic found to have an Hb HPLC report of Beta Thalassemia trait. His parents are worried about his Thalassemia status.

a. How to counsel?

.....

b. How to treat?

.....

| Checkbox | Торіс | Material & |
|----------|---|------------------|
| | | resources |
| | Read the introduction and forms of SCD from Page no. 84 | PEN- Plus |
| | | Protocol |
| | Read about signs and symptoms of SCD from Page no. 85 | PEN- Plus |
| | | Protocol |
| | Read how to make diagnosis of SCD from Page no. 86 | PEN- Plus |
| | | Protocol |
| | Read the Complications of SCD from Page no. 87-89 | PEN- Plus |
| | | Protocol |
| | Go through table 45: Recommendations on common health | PEN- Plus |
| | topics related to SCD | Protocol |
| | Read how to diagnose SCD along with clinical features and | PEN- Plus |
| | investigations | Protocol |
| | Read how to screen and do Genetic counseling of SCD from | PEN- Plus |
| | Page no. 91 | Protocol |
| | Read about Punnet square and its uses from page no. 91-92 | PEN- Plus |
| | | Protocol |
| | Read about the Management and Referral criteria of SCD | PEN- Plus |
| | from Page no. 93 | Protocol |
| | Read about the indications of Hydroxyurea, and evaluation | PEN- Plus |
| | of patient before initiating Hydroxyurea in SCD, from Page | Protocol |
| | no. 94 | |
| | Complete the exercises given in this module. | |
| | Note: List your queries on the subject matter and exercises | Time allocation: |
| | to be discussed with the trainer during virtual session | 30 mins |

Self-Paced Learning Outline: Sickle Cell Disease (SCD)

Module 5 Exercises- SCD Select the correct answer Exercise 1: What kind of inheritance does SCD follow?

- a. Autosomal dominant inheritance
- b. X- linked recessive inheritance
- c. X- linked dominant inheritance
- d. Autosomal recessive inheritance

Exercise 2: What is the life span of RBC in SCD patients?

- a. 100-120 days
- b. 150-200 days
- c. 50-60 days
- d. 10-20 days

Exercise 3: Choose the most important screening method in SCD.

- a. Family and premarital screening
- b. Prospective screening
- c. Retrospective screening
- d. Mass screening

Exercise 4: Choose the correct options from below with regard to Sickle Cell Trait.

(Multiple answers possible)

- a. Person carrying only one allele of sickle cell mutation
- b. Sickle cell trait is not a disease
- c. Generally asymptomatic and does not need any treatment
- d. Family screening and premarital screening is needed

Exercise 5: Following may be regarded as the Differential Diagnosis of SCD.

(Choose the 3 correct options from the list given below)

- a. Thalassemia
- b. RTA
- c. Malaria
- d. Berger's disease
- e. Autoimmune Hemolytic anemia
- f. Cancer

Exercise 6: What are the indications for starting Hydroxyurea in adult patients with SCD?

(Multiple answers possible)

- a. Three or more hospitalizations for a vaso-occlusive crisis in the past 12 months
- b. Severe or recurrent acute chest syndrome
- c. Sickle cell-associated pain that affects daily activities and quality of life
- d. Mild chest symptoms

Exercise 7: What is the minimum duration of treatment with Hydroxyurea?

- a. 3 months
- b. 6 months
- c. 12 months
- d. As and when needed

Exercise 8: All the statements below are true regarding the management of SCD in pregnancy except.

- a. Stop Hydroxyurea before planning pregnancy
- b. Continue Tab Folic acid 5 mg, 1 Tab OD throughout pregnancy
- c. Tab Aspirin 75 mg, 1 Tab OD from second trimester till delivery
- d. Monitoring is not mandatory

Exercise 9: What are the danger signs to be aware of in SCD?

- a. severe pain and fever
- b. dyspnea and severe lethargic condition
- c. altered sensorium, severe pain abdomen
- d. All of the above

State whether True or False

Exercise 10: Mark "T" against the options that are true with regard to SCD.

- a. Never asymptomatic ()
- b. recurrent bone and joint pain ()
- c. anemia, jaundice, fever, gallstone ()
- d. stroke in childhood are rare in Nepal ()

Exercise 11: Is Hydroxyurea effective immediately after administration?

- a. True as the effect is visible instantaneously
- b. False as it takes several weeks to be fully effective

Fill in the blanks:

Exercise 12: ______ community is the most affected community in SCD in Nepal.

Exercise 13: Starting dose of Hydroxyurea in t/t of SCD is ______.

Match the following:

Exercise 14:

| a. Drug-reducing vaso occlusive event in SCD | 1. Aplastic crisis |
|---|--------------------------------|
| b. Chronic complication of SCD | 2. Hydroxyurea |
| c. Acute complication of SCD | 3. Avascular necrosis of femur |
| d. Important test to diagnose SCD | 4. Hb HPLC |

Case Scenario

Exercise 15: 18 years old Mr. Tharu, unmarried whose Hb electrophoresis shows sickle cell trait and he is worried about sickle cell status.

Q1. How do you counsel?

Module 6: Essentials of Care and Practice and Neurodevelopmental Disorders

Self-Paced Learning: Essentials of Care and Practice

| Session | Торіс | Material & resources |
|---------|---|----------------------|
| 1 | Read Introduction to Essentials of Care and Practice (ECP) from page no 6 | PEN-PLUS Protocol |
| 2. | Read the components, general Principles of ECP- Effective Communication Skills, Promotion of Respect and Dignity from page no 6-8 | PEN PLUS Protocol |
| 3. | Read the topic Essentials of Clinical Practice from page no: 8 and read how to conduct physical health assessment, conduct mental health assessment, management of physical health conditions and NDDs and how to refer to higher center when needed for further management on page 8,9,12,14 | PEN PLUS Protocol |
| 4. | Read the topic Psychosocial Intervention and read how to pyschoeducate the carer, provide guidance on C &A well- being, provide guidance on improving behavior, assess for and manage stressors, reduce stress and strengthen social supports, liaise with teachers and other school staff, link with other available resources in the community, initiate pharmacological treatment where applicable on page no: 9-15 | PEN PLUS Protocol |
| | Complete the exercises 1-7 given in this module. Note: List your queries on the subject matter and exercises to be discussed with the trainer. | |

Module 6 Exercises (Essentials of Care and Practice)

Question 1- Effective communication skills includes:

- a. Getting all information from the caregiver
- b. Getting all information from the C&A
- c. Active listening
- d. Instructing the C&A and carer strictly so that they follow the treatment advised.

Question 2 - The following is true regarding the promotion of respect and dignity of C&A

- a. All information shared by C&A should be shared with the carer.
- b. All the decisions regarding treatment should be made by the health care professional and the carer, on behalf of C&A
- c. Use of technical language is important to explain the health condition to the C&A and carer.
- d. C&A should have access to supported decision-making options, and their assent should be taken during assessment and treatment.

Question 3: Which of the following is a helpful way to start an assessment for the health condition?

- a. Be welcoming, and introduce yourself in a culturally appropriate manner.
- b. Explain that confidentiality is limited and may need to be broken.
- c. Ask several closed-ended questions to efficiently elicit the main reason for the presentation.
- d. Spend time assessing C&A, to help identify the condition.

Question 4: Which of the following might you include when taking a psychosocial history?

- a. Perform a physical examination and basic laboratory tests
- b. For a young child and adolescent girl, have another female staff member present
- c. For an adolescent, have the caregiver present
- d. Ask about current stressors, coping methods and social support

Question 5: Which of the following situations with a child or adolescent would require urgent action?

- a. A child discloses to you that they are being sexually abused.
- b. A parent discloses to you that their child was born with HIV and is currently receiving treatment.
- c. A child has considerable difficulty with daily functioning.
- d. A child shows disobedient or defiant behavior

Question 6: Which of the following is good advice for any C&A with CAMH disorder?

The caregiver can use threats or physical punishment if a child has problematic behavior.

- a. The caregiver should remove the child from mainstream school as soon as possible.
- b. The caregiver can use other aids such as television or computer games instead of spending time with the child.
- c. The caregiver should give loving attention to the child every day and look for opportunities to spend time with them.

Question 7: Which of the following should be given as advice to an adolescent with a mental or behavioral disorder?

- a. They should avoid community and other social activities as much as possible.
- b. They should avoid the use of drugs, alcohol and nicotine.
- c. They should avoid school if it makes them anxious.
- d. They should avoid being physically active for more than 30 minutes each day

Neurodevelopmental Disorders

| Self-Pace | Self-Paced Learning: Neurodevelopmental Disorders | | | | | |
|-----------|---|-----------------------|--|--|--|--|
| Session | Торіс | Material & resources | | | | |
| 1. | Read the definition and common features of | PEN PLUS Protocol | | | | |
| | Neurodevelopmental disorders- Intellectual Disability, | | | | | |
| | Autism Spectrum Disorder, Attention Deficit Hyperactivity | | | | | |
| | Disorder, and Epilepsy on page no: 188 | | | | | |
| Selt-Pa | ced Learning: Intellectual Disability, Autis | m Spectrum Disorder | | | | |
| Self-Pace | ed Learning: Intellectual Disability (ID), Autism Spectrum Disc | order (ASD) | | | | |
| Session | Торіс | Materials & resources | | | | |
| 1 | Read the normal developmental milestones in children, | PEN PLUS Protocol | | | | |
| | epidemiology, etiology/ risk factors, clinical features and | | | | | |
| | subtypes on page no:189-193 | | | | | |
| 2 | Read the introduction, epidemiology, clinical features of | PEN PLUS Protocol | | | | |
| - | ASD onpage no: 194-195 | | | | | |
| 3 | Read now to assess for ID and ASD using assessment | PEN PLUS Protocol | | | | |
| 4 | Tiowchart 195-196 | | | | | |
| 4 | Read the management of ID and ASD. Read now to | PEN PLUS Protocol | | | | |
| | pyschoeducate to carer, provide guidance on C&A | | | | | |
| | wellbeing, provide carer support, extensive engagement | | | | | |
| | and stimulation, liaise with teachers and other school staff, | | | | | |
| | for Speech and Hearing Evaluation refer CSA with to | | | | | |
| | higher contex for further evaluation, refer C&A with to | | | | | |
| с С | Read the Follow up section for ID and ASD and learn how | DEN DUUS Protocol | | | | |
| 5 | to assess improvement and review management plan | PEN PLOS PIOLOCOI | | | | |
| | monitor child development for under 5 year old child | | | | | |
| | explore and address psychosocial stressors in the home | | | | | |
| | school or work environment including exposure to violence | | | | | |
| | or other forms of maltreatment assess opportunities for | | | | | |
| | the child/adolescent to participate in family and social life | | | | | |
| | assess carer's needs and support available to the family. | | | | | |
| | monitor attendance at school on page no. 198 | | | | | |
| | | | | | | |
| | Complete the exercise from Question 1 to Question 10 | | | | | |
| | helow | | | | | |

Exercise of Neurodevelopmental Disorders

Question 1: Match the following Developmental Milestones with the respective chronological age:

| Chronological Age | Developmental Milestones |
|-------------------|---|
| 3 months | Sits without support, Monosyllables, Smiles at mirror image |
| 6 months | Neck holding, Turns towards sound, babbling, Recognizes mother, social |
| | smile |
| 9 months | Stands without support, walks with support, picks up things with finger and |
| | thumb, speaks words, |
| 12 months | Walks without support, may walk up stairs, scribbling, several words speech, |
| | simple pretend play like feeding a doll. |
| 18 months | Stands with support, moves things smoothly from one hand to other, begins |
| | picking up things with finger and thumb, bisyllable speech, afraid of |
| | strangers |
| 2 years | Rides tricycle, walks up and down steps with one foot on each step, copies |
| | circle, builds tower of more than 6 blocks, uses 2-3 sentences at a time, takes |
| | turns in playing games with others. |
| 3 years | Hops, may skip, swings, climbs, copies triangles and other geometric shapes, |
| | tells simple stories with full sentences, sings, dances, acts, recognizes |
| | gender, and differentiates between real and make-believe. |
| 4 years | Kicks ball, walks up and down stairs with two feet on each step, copies |
| | straight lines, builds a tower of more than 4 blocks, uses 2-4 word short |
| | sentences, plays besides other children |
| 5 years | Hops, stands on one foot for 2 seconds, copies some capital letters, tells |
| | stories, sings songs from memory, make-believe play, prefers to play with |
| | other children than alone, can't tell between real and make-believe. |

Question 2: Which one of the following is not a preventable/ treatable cause of Intellectual disability?

- a. Hypothyroidism
- b. Iodine deficiency
- c. Fetal Alcohol Syndrome
- d. Retts Syndrome

Question 3: Which of the following criteria can be used to define Intellectual disabilities?

- a. Significantly below average intellectual functioning (IQ less than 70)
- b. Impairments in adaptive functioning generally
- c. These deficits should be manifest before the age of 18 years
- d. All of the above

Question 4: Match the following intellectual disability level with the respective IQ score:

| Intellectual Disability Level | IQ Score |
|-------------------------------|--------------|
| Mild ID | Less than 20 |
| Moderate ID | 20-35 |
| Severe ID | 35-50 |
| Profound | 50-70 |

Question 5: Early manifestation of symptoms such as severe impairment in social interaction and in communication can be diagnosed as which of the following?

- a. Autism Spectrum Disorder
- b. Infantile amnesia
- c. Cerebral palsy
- d. Intellectual Disability

Question 6: The core features of autism spectrum disorders are all except:

- a. Difficulties in social interaction
- b. Difficulties in social communication
- c. Presence of restricted, repetitive behaviors
- d. Difficulty in Feeding

Question 7: The ratio of Autism in boys to girls is:

- a. 4:1
- b. 3:1
- c. 2:1
- d. 1:1

Question 8: Which of the following regarding intellectual disability (ID)/ autism spectrum disorder (ASD) is TRUE?

- i. Medications can cure ID/ ASD. (.....)
- ii. The child will eventually attain normal milestones after some years. (.....)
- iii. C&A with ID/ASD need training and support from different service providers. (.....)
- iv. C&A with ID/ ASD should be institutionalized instead of managing in the community. (.....)

Question 9: What is the general management protocol for Intellectual Disability/ Autism Spectrum Disorder? Answers:

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Question 10. What are the important considerations during follow up visits? **Answers:**

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Self-Paced Learning: Attention Deficit Hyperactivity Disorder (ADHD)

| Session | Торіс | Material & resources |
|---------|---|----------------------|
| 1. | Read the definition, features of ADHD and its epidemiology on page no. 199 | PEN PLUS Protocol |
| | Read the Etiology/ risk factors, clinical features and subtypes, assessment of ADHD using the assessment flowchart 200-201 | PEN PLUS Protocol |
| | Read the management of ADHD and learn how to psycho educate to carer, provide guidance on C&A wellbeing, provide guidance on improving behavior, assess for and manage stressors, reduce stress and strengthen social supports, liaise with teachers and other school staff, link with other available resources in the community, initiate pharmacological treatment (after consultation from consultant/ specialist) and offer follow up on page no: 202-203 | PEN PLUS Protocol |
| | Read how to follow up for ADHD, and learn to assess improvement, monitor adherence to intervention, monitor child development for under 5- year-old child page no 204 | PEN PLUS Protocol |
| | Complete the exercises from questions no 1 to 5. | |

Exercise:

Question 1: Choose the best answer:

- A. ADHD has to begin before the age of
- a. 7 years
- b. 12 years
- c. 15 years
- d. 18 years
- B. Which of the following is not a core symptom of ADHD?
- a. Inattention
- b. Hyperactivity
- c. Impulsivity
- d. Aggression
- C. The prevalence of ADHD in C&A is
- a. 2.5%
- b. 5%
- c. 7.5%
- d. 10%

Question 2: Please write down the following answer:

The different sub-types of ADHD are:

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Question 3: Write down the general protocol for the management of ADHD in C&A: Answers:

Question 4: Treatment of ADHD can be done with

- i. Fluoxetine
- ii. Levetiracetam
- iii. Atomoxetine
- iv. Risperidone

Question 5: What are the considerations for follow-up in C&A with ADHD?

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Self-Paced Learning: Epilepsy

| Session | Торіс | Material & resources |
|---------|--|----------------------|
| 1. | Read the definition, epidemiology of epilepsy on page 205 | PEN PLUS Protocol |
| 2. | Read the etiology, risk factors and clinical features of GTCS, the difference between seizures and pseudo-seizures 206-207 | PEN PLUS Protocol |
| 3. | Read the management of emergency presentation of seizure page no 207-208 | PEN PLUS Protocol |
| 4. | Read the assessment of epilepsy using the assessment flowchart on page no: 208 | PEN PLUS Protocol |
| | Read the management of epilepsy, and learn to provide psychoeducation to carer, C&A on epilepsy, promote functioning in daily activities and community life, provide carer support, liaise with teachers and other school staff to manage seizure at home and school, and educate on when to seek help, provide pharmacological treatment, refer C&A with Epilepsy to higher center for further evaluation and management when needed on page 209- 211 | PEN PLUS Protocol |
| 6 | Read the follow up session and learn to assess improvement, review adherence to medications, and evaluate side –effects of medications including adverse effects and idiosyncratic reactions. Adjust medication dose when needed, monitor child development for under 5 year old child, promote functioning in daily activities and community life, review management plan and monitor adherence to psychosocial interventions, Consider medication discontinuation when appropriate, refer to higher centre for further evaluation and management when needed on page 211-212 | PEN PLUS Protocol |
| | Complete the exercise: From Question 1 to 11 | |

Exercises:

Question 1: The prevalence of Epilepsy in the general population is

- a. 1%
- b. 3%
- c. 5%
- d. 10%

Question 2: Epilepsy is characterized by

- a. Recurrent unprovoked seizures
- b. Seizures during infections and fevers
- c. Seizures due to metabolic disorders
- d. Seizures due to parasitic infestations of brain

Question 3: Which of the following differentiates a seizure and from a pseudoseizure? Unlike pseudoseizures, seizures have

- a. Different presentations during different episodes
- b. Episodes lasting many minutes to hours.
- c. Abnormal body and limb movement, abnormal talk
- d. Trauma/ injury, incontinence of urine/ stool during episodes.

Question 4: Are all seizures due to Epilepsy?

- a. Yes.
- b. No

Question 5: What is your understanding of the terms seizure and epilepsy?

Answer:

Question 6: Seizure in a pregnant adolescent girl should arouse the suspicion of?

- a. Electrolyte dysregulation due to vomiting
- b. Diabetes mellitus in pregnancy
- c. Pseudoseizure due to stress during pregnancy
- d. Eclampsia during pregnancy

Question 7: What is the loading dose of Phenytoin for status epilepticus?

- a. 5-10 mg/kg
- b. 10-15 mg/ kg
- c. 15-20 mg/kg
- d. 20-25mg/kg

Question 8: What is the emergency management protocol for an episode of seizure?

Answer:

Question 9: Anti-epileptics..

- a. Need to be taken life-long.
- b. Need to be increased in dose periodically due to tolerance
- c. Can be stopped by the patient within a month after being seizure-free.

d. Can be stopped under consultation after the patient is seizure-free for at least 2 years.

Question 10 : What are the considerations during follow-up for a C&A with epilepsy? Answer

| •••••• | •••••• | •••••• | •••••• | • | ••••• |
|--------|--------|--------|---|---|-------|
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Question 11: Which of the following is true?

- a. C&A with epilepsy should not play competitive sports
- b. C&A with epilepsy should not be sent to school until there are no seizure episodes.
- c. C&A with epilepsy should not marry in the future, as this causes their children to have seizures.
- d. C&A with epilepsy can go to school regularly while still under treatment.

Effective communication skill checklist

| Steps /Performance | Performa | nce level | |
|---|----------|-----------|--|
| 1. Receives patient warmly Introduce yourself Greeting voice Is empathetic Rapport building | | | |
| 2. Appropriate sitting position (L-shaped position /90 degrees) is used | | | |
| 3. Provider demonstrates openness Arms open Open posture | | | |
| 4. Providers is leaning forward | | | |
| 5. Eye contact is maintained appropriately | | | |
| 6. Provider is relaxed | | | |
| 7. Provider is using effective questioning | | | |
| 8. The provider is paraphrasing the communication periodically | | | |
| 9. The provider is repeating keywords | | | |
| 10. The provider is reflecting his/her feeling | | | |
| 11. The provider summarizes the communication | | | |
| 12. Provides appropriate support as appropriate - Medical care Psychological care Information Appropriate referral (need-based) | | | |

Annex-1

Approach to a patient with Hemoglobinopathies (Thalassemia and Sickle cell Disease)

Approach to screening



Annex-2

Case Vignettes for Neurodevelopmental Disorders:

- 1. **Intellectual Disability:** Suman, 6-year-old child from Nuwakot was going to school for 2 years in a government school. When he was in school, his teachers recognized that he was unable to learn as other kids of his class. As per his mother, Suman had started to walk at around 2 years and started speaking first word around 20 months. Currently, he can move freely as other kids of his age, but he has poor fine motor skills. He cannot hold pencil properly and cannot remove shoes, clothes etc. Speech and language skills are inadequate for his age; currently, he can speak short sentences using 2-3 words. He has difficulties in comprehending instructions. He is unable to express his needs and difficulties, so he becomes easily irritable. At times he has been bullied by peers for his disorganized behaviors. These days he has been more stubborn and impulsive at times especially when his demands are not met. Parents are worried about Suman being more dependent on them which is increasing their workload. Suman needs assistance in activities of daily living like eating, dressing, grooming, bathing and taking care at toilet. He is unable to do age appropriate behaviors.
- 2. Autism Spectrum Disorder: Sujita, 4 year-old girl from a city, lives with her parents. The parents are concerned that she has not spoken well even at this age, and only speaks occasionally when she wants something, and even then only in few words. She does not show interest towards other people, doesn't make eye contact, doesn't play with other children. She prefers to play alone by herself, and her play is also peculiar. She likes to arrange spoons, forks and other utensils in straight lines, she also aligns her dolls, crayons, pencils, etc. If it is attempted to join her, she gets irritable and goes away. She mostly doesn't respond to her name being called, and parents even wondered if she had hearing problems. But she dislikes sounds like those from the vacuum cleaner or pressure cooker, and runs away closing her ears with her hands when that happens. She also spends a lot of time watching cartoons on TV or similar videos on mobile phones. When she is excited, she flaps her hands, and makes fists, and screams. She was recently placed in playgroup, but she has not adjusted well, and the school says it is difficult to manage her.
- 3. Attention-Deficit Hyperactivity Disorder: Jagat, a 9-year-old boy and the eldest of three children, was stubborn and argumentative at home. He was reported by his parents to be 'always on the go '/ 'chuk-chuke' and had exhibited difficult behavior even as a baby. At his primary school, teachers were concerned about his behavior. He had difficulty waiting his turn, was always disorganized and was extremely restless. In the playground, Jagat was often in trouble. He was not perceived to be the one who started conflict situations, but he was recognized by some of his peers as a boy whom it was easy to wind up or trigger. He was of average ability, but his progress at school was poor and his attainments were a few years behind his chronological age.
- 4. Epilepsy: 14-year-old female child, from a rural background, studying in grade 8, parents are

farmers, has episodes of loss of consciousness with up rolling of eyes, stiffening of body, jerky movement of limbs, tongue bite, with occasional passing of urine during those episodes. These can happen anytime, anywhere, even happened during sleep. Occasionally, if she hadn't eaten well or slept well, the episodes would occur again. The child had these episodes for 2 years, with a frequency of 3-4 episodes per year. Following the onset of the symptoms, the child was taken to various faith healers, and various 'puja's were done believing it was the result of past sins, and that an evil spirit had possessed her. The child was not sent to school anymore, because everyone in school would tease her and even teachers didn't want her to come to school, fearing other children would also catch the problem. The child would stay in the house, and work in the fields.
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