



USAID
FROM THE AMERICAN PEOPLE

PRIMARY HEALTH
CARE PROJECT



وزارة الصحة
دائرة الصحة العامة

TRAINING CURRICULUM ON COMMUNICABLE DISEASES CONTROL GUIDELINES

DISCLAIMER

This guideline has made possible through support provided by the U.S. Agency for International Development (USAID) under Primary Health Care Project in Iraq (PHCPI) implemented by University Research Co., LLC. This guideline has been developed in Iraq in close collaboration with the Ministry of Health (MoH) in December, 2012

Table of Contents

Preface	3
Introduction	4
Part I: Trainer's Guide	6
Approaches to Training and Learning	8
Knowledge, skills and attitudes	9
Methods	10
Evaluation	21
Form 1: END OF COURSE EVALUATION QUESTIONNAIRE	24
Form 2: END OF MODULE EVALUATION QUESTIONNAIRE	31
Form 3: QUICK FEEDBACK FORM.....	34
Form 4: TRAINING SKILLS CHECKLIST	36
SYLLABUS/PROGRAM.....	40
Part Two:	45
Training Modules.....	45
Module One	46
Session 1: basic concepts of Communicable diseases.	47
Session1.2: Acute Flaccid Paralysis, Anthrax and Cholera	58
Session 1.3: Assess Crimean-Congo Hemorrhagic Fever, Diphtheria, Influenza H1n1, H5n1 and Plague.	72
Session1.4: Assess Pertussis, Acute Poliomyelitis, Rabies and Rubella	92
Poisoning	92
Session 1. 5: Meningococcal Disease, Malaria, Measles, Tetanus and Food poisoning	114
Specific objectives of the session	114
Module Two	140
Session 2.1: Assess Acute Diarrhea.....	141
Session 2.2: Cutaneous Leishmaniasis	146
Session 2.3: Assess Visceral Leishmaniasis	153
Module Three: Monthly Reporting Communicable Diseases	160
Session 3.1: Assess Viral Hepatitis, Brucellosis, Chicken Pox and Echinococcosis (hydatid Disease).....	161
Session 3.2: Assess Leprosy, Mumps, Schistosomiasis and Thescariasis	186
Session 3.3 : Assess Trichuriasis, Strongyloidiosis, Enterobiasis, Cestodiasis (Hymenolepis) and Taeniasis (taenia saginata).....	213
Session3. 4: Assess Amebiasis, Giardiasis, Acute Lower Respiratory Infections (ALRI), Toxoplasmosis and Typhoid and Paratyphoid fever.....	236

Preface

There have been considerable achievements in Iraq as a result of the implementation of the primary health care (PHC) strategy. Despite this laudable initiative, problems persist in the accessibility and quality of PHC services. Health systems and programs are often blamed for inefficiency and ineffectiveness; therefore, their reorganization and reorientation remains a priority.

The setbacks have been partly attributed to the security situation and lack of resources. However, much has to do with poor management, especially in the organization of PHC clinics and the difficulties faced in translating PHC principles and health sector reform proposals into practice. These problems can be attributed to the lack of appropriate knowledge, skills, attitudes and capacities among those who are responsible for managing and service providing in PHC facilities, health systems and programs. The gaps which exist between what PHC clinic physicians have been trained for and what they are required to do pose one of the major issues to be addressed in order to achieve the health sector reform objectives outlined by the Ministry of Health (MoH).

To respond to need for capacity building in leadership and management, as well as the implementation of health programs and delivery of essential services, the United State Agency for International Development (USAID), represented by the Primary Health Care Program in Iraq (PHCPI), has developed this training program. This training program focuses on the knowledge, skills, and attitudes required of communicable diseases assessment for physicians in PHCC to cope with their challenging new roles and tasks. This will increase their work efficiency and allow them to better serve the communities with whom they work.

Introduction

The first edition of the communicable diseases control guidelines, published in 1999, was widely appreciated and has been used as a reference for more than a decade. Given that Iraq is currently experiencing a period of growth, development, and reform, we feel it is an opportune time to write the second edition of these guidelines. This is an ongoing and evolving process – we hope to continue editing the guidelines every three years to provide medical and paramedical staff with the most up-to-date information as they work to promote public health, deal with outbreaks of communicable diseases, and improve early detection and surveillance systems through Iraq.

The guidelines cover the diseases that are currently included in the Iraq surveillance system. These diseases are broken down into three main groups:

- Group 1: Immediate Notification Diseases
- Group 2: Weekly Reported Diseases
- Group 3: Monthly Reported Diseases

Each individual guideline also includes:

1. Identification of the disease (Case Definition of Suspected, Probable, and Confirmed cases).
2. Infectious agent
3. Occurrence
4. Reservoir
5. Mode of Transmission
6. Incubation Period
7. Period of Communicability
8. Susceptibility and resistance
9. Methods of Control, which include:
 - a. Preventive Measures
 - b. Control of patient, contacts, and immediate environment
 - c. Epidemic measures
 - d. Disaster implications
 - e. International measures
10. Management of the disease, including treatment, and case and contact management.

Program Objectives

This training program gives participants the systematic knowledge regarding how they need to perform these tasks. The course covers essential contents including communicable diseases assessment for physicians in PHC facilities including diagnosis, clinical management, and reporting. The course uses problem-oriented, participant-centered, gender/diversity-sensitive, self-directed, experiential learning methods, and focuses on the development of practical knowledge and skills to create a strong link with the actual working practice of the participants. The exchange of ideas, personal experiences and perspectives are part of the learning process.

The training program will contribute to improving the quality of health services at district and PHC facility level by enabling participants to apply effective knowledge, skills and attitudes in order to prepare them to take part in a leading role in the health system.

Emphasis is placed on multidisciplinary, cross-sectorial and community oriented approaches and strategies as a frame to develop quality health care in all its dimensions: “equitable, accessible, acceptable, appropriate, comprehensive, effective and efficient”⁶

Participants will improve their communication and presentation skills, as well as learn the basic principles of infection prevention and control..

Target Groups

Target groups of the training itself are physicians in PHCCs in Iraq (national, district and PHC facility level).

Due to the participatory methods used during the course, the number of participants should not exceed 25.

Part I: Trainer's Guide

This training curriculum is a guide to assist trainers in improving health care by training health professionals in the Basics of Management and Administration of Primary Health Care Centers (PHCCs).

Materials in this document are designed for training service providers who work at a variety of health facilities in Iraq, but most importantly for those involved in the management of the PHCCs. The modules can be used to train health professionals, physicians, nurses, midwives and other health workers in group training or, with adaptation, as a basis of individualized or self-directed learning.

Trainers implementing this course should be thoroughly familiar with the policies, strategies, guidelines and procedures. Because the PHCCs' functions and procedures are based on this training course along with the skills in the practices described. The trainers need to have a positive attitude about the participants and their training work.

Training may be implemented either off-site or on-site. In off-site training, a group of participants come together from several health facilities and then return home to apply what has been learned. Off-site training may be the most appropriate way to reach individuals from many small sites. On-site training refers to training held in a health facility team where the participants work. Both types of training can be very effective. When training is conducted off-site, it may be more difficult to observe actual clinical settings. On the other hand, when training takes place on-site, there may be interruptions due to participants being called away for other responsibilities.

How to Use the Manual

This manual is designed as a working instrument for trainers and facilitators. It can also be used as a planning tool for PHC and district health managers. The module schedule contains a condensed summary of the contents organized in units and is meant as a check list for the facilitator/s before and during the course. The time indicated for each unit is an average time span based on experience, and can vary according to the composition and dynamics of each respective group.

The manual is divided into two parts. The first part is an introduction to the training course giving an overview over the rationale, objectives, and target groups for the course. It includes the present section on recommendations on how to use the manual, introducing the structure, training methods and course schedule. It also contains information on how to organize a workshop / training course and concludes with some recommendations on the limitations of the document and how to deal with them.

The second part presents the actual training contents, methods, didactic materials and additional literature recommended for each content area, organized/compiled in the different modules of the program. Every training course starts with the introduction of participants and team presenting the course objectives, contents, methods and program and allowing

participants to express their expectations and fears.

The course content is presented according to five broad content areas (modules), subdivided into different sessions:

Overall learning objectives: states the objectives to be achieved at the end of the module in terms of knowledge, skills and competence.

Schedule: gives an overview over the time span, methods, materials and recommended content for each session / topic and states the specific objectives of each session.

Sessions: are subdivisions/sessions of the module that follow a logical flow to develop the content of the module.

Specific objectives of the sessions: relate to the content and the expected level of competence to be achieved and can also be used as basis for the development of exam questions.

Background information for the facilitator: includes background information important for the facilitator to develop the content of the module, necessary and recommended definitions, concepts, theory and its applications.

Exercises: describe practical applications of the theory and are meant to facilitate the learning process through experiential approaches: role plays, games, etc. (see list of exercises).

Handouts: are the essential documentation for the participants about the content of the session / module stating the objectives, listing the key words, developing the concept / theory of the content, and giving recommendations for further reading.

References: additionally recommended literature, articles and books, which are related to the content of the module.

Structure of the Training Course

The training course has been planned as a five days course. However, it is also possible to shorten the course due to limited time and / or to select modules according to learning objectives and needs. As well the time can be expanded in order to deal more in depth with the content and allow for more exercises, practical, field work.

The time frame of the training course consists of six working hours per day. These hours are divided into two morning and two afternoon sessions. Each session normally has duration of 2 hours. The number of course trainers/ facilitators can range from one to two per course according to the requirements. Also, for special topics, external resource persons should be asked to lecture and work with the group in their respective areas of expertise. The trainee - facilitator ratio should be 15 to one, a ratio of 20 or 25 to one still being acceptable. The total number of participants should not exceed 25.

The course structure and training methods not only allow for the development of knowledge, skills, competence and change of attitudes of the participants. The course concept is also designed to be put into practice by participants after the training during their supervisory work or by organizing their own training courses. Therefore this manual is not only a facilitator's manual, but also a supervisor's manual.

Approaches to Training and Learning

The training course outlined in this document is based on adult learning principles, competency-based training and performance improvement. Selected elements of the strategies that guided the development of this material and should guide its implementation and use are listed below.

How people learn best

People learn best when the following conditions are met:

- Participants are motivated and not anxious, know what is expected of them and treated with respect
- Information and skills are interesting, exciting, meaningful, and build on what participants already know, encourage problem-solving and reasoning
- Experiences are organized, logical, practical, include a variety of methods, and protocols and procedures are available
- New learning experiences are relevant to work and training needs of participants, and are applied immediately
- Training involves every participant in active practice and participants share responsibility for learning
- Training is a team activity, including trainers and co-trainers, providing participants with a variety of experiences and limiting trainer's biases
- The trainer acts as a facilitator of the learning process rather than a teacher who "spoon feeds" the learner
- The role and responsibilities of the trainers/facilitators and those of the participants/learners are clearly defined with:
 - The facilitators responsible for providing the learners with the necessary opportunities to acquire the knowledge and skills necessary to perform the tasks for which they are being trained
 - The facilitators responsible for providing the learners with the necessary opportunities to be exposed to the attitudes necessary to implement the acquired skills in a systematic manner and initiate the process of internalizing these attitudes
 - The learner remains responsible for her/his learning

The transactional relationships between the learners and the facilitators are at the level of adult to adult characterized by mutual respect and support

- Trainers are knowledgeable and competent in the subject matter and skills, use a variety of training methods, pay attention to individual participants' concerns, and provide motivation through feedback and reinforcement
- Participants must be selected according to specific criteria, such as the relevance of the training content to the job expectations/tasks
- Participants must have the necessary prerequisite level to enable them to benefit from the learning experience
- Feedback is immediate and focused on behavior that the participants can control
- Assessment of learning and skills is based on objectives that the participants understand

Knowledge, skills and attitudes

This course aims to improve health care by changing health workers' knowledge, skills and attitudes.

- Knowledge includes the facts that the participants need to know to perform their jobs.

Tips on increasing **knowledge** through training

- Start with what the participants already know or have experienced
 - Use a variety of educational resources, including participatory activities that require participants to use their knowledge
 - Use learning aids
 - Review and summarize often
 - Assess knowledge to verify learning
- Skills include the specific tasks that participants need to be able to perform.

Tips on increasing **skills** through training

- *Describe the skill*
 - *Provide protocols and procedures*
 - *Demonstrate the skill*
 - *Have participants demonstrate the skill*
 - *Verify that each skill is practiced correctly*
 - *Assess skill by observation using a checklist*
- Attitudes affect behaviors, such as whether learned skills are applied and interactions with clients.

Tips on changing **attitudes and behavior** through training

- *Provide information and examples*
- *Include direct experience*
- *Invite discussion of values, concerns and experience*
- *Use role plays and brainstorming*
- *Model positive attitudes*
- *Assess changes in attitude by observing behavior*

Methods

The training will use a participatory and “hands on” approach where the role of the trainers is to facilitate learning by the participants. The responsibility for learning remains with the participants.

Participants learn more and stay engaged in learning activities when they play an active role in their learning and a variety of training methods are used. The following methods are recommended in the curriculum/modules.

Selected Training Methods

Brainstorming	Individual assignments	Return demonstration
Case study	Individual exercises	Role play
Clinical session	Interview	Self-directed activities
Demonstration	Lecture-Discussion	Small group discussion
Discussion	Mini-lecture	Simulation
Field visits	Observations	Small group exercises
Plenary group exercises	Pairs exercises	Summary
Group assignments	Presentation	Survey
	Questions and answers	Team building exercises
	Research	

In each module or session

This document contains an outline of a training plan for each of the key areas of content.

Each module contains the following sections:

- Front page with a module number, module objectives, module content by session and an estimated duration for the module.
- Session plans covering the various content areas.

Each session contains the following sections:

- **Trainer Preparation:** This section lists the specific preparations that trainers should make for the session. Preparations for every session include:
 - Making sure the room is properly arranged
 - Ensuring that markers and flip chart or a writing board with chalk or markers are available
 - Reviewing the training plan
 - Reviewing steps for the methods used in the training session
 - Ensuring that the resources needed to facilitate the learning process are available including copying materials that participants need
- **Methods and Activities:** This section lists the methods and activities that are used in the module. General instructions for methods that are frequently used are included in this introductory material. Instructions for participatory activities are included in the training plan.
- **Resources:** The relevant reference materials/handouts and other resources needed are listed here.
- **Evaluation/assessment:** Evaluation methods for the knowledge or skills included are listed. Questionnaires and skills checklists are included where needed.
- **Estimated Time:** The time that each session/module will require depends upon the particular group of participants, the amount of time available and other constraints. The module gives a general time range to allow for flexible scheduling.
- **Training Plan:** This section gives the specific learning objectives or purpose of a session, the key **”must know”** content, and the appropriate training methods and activities for each objective. All modules include one or more activities that give participants structured, participatory practice with the content of the module.
- **Handouts:** When specific activities require handouts, these are included after the training plan and should be copied before the session in which they will be used.

- **Questionnaires:** Each session/module includes a questionnaire that is tied to the learning objectives and a key with the correct answers. It is not appropriate to assign a pass or fail designation to the questionnaire. Instead, use the questionnaire as a learning tool. It must be used for **formative evaluation**. If participants are not certain of the answers, they should be encouraged to use the training resources to find the correct answer. Answer key must be given to the participants after finishing the processing of the responses.
- **Skills Checklists:** Each session that includes skills objectives includes a skills assessment checklist. The checklist is used by the trainer to evaluate the participant's skill based on observation of the specific steps included in the skill. The skills checklists are also used by each participant to assess their performance and take charge of their own learning. They can also be used by other participants for peer assessment. It is recommended that these checklists not only be used during training to assess the acquisition of skills, but also for post training evaluation and supervision.

Note: There are various possible formats for modules and sessions. Provided the necessary information is included for the trainer to use, the selection of format will depend on how comfortable the trainers are in using it.

Methods frequently used in this curriculum

Instructions for methods used frequently in this training course are included here. Activities for specific methods are included with the sessions where they are used.

Mini-lecture

Trainer makes a short (5 to 15minutes) presentation using the materials available. Mini-lectures are used to provide information and knowledge. They insure that all participants have an adequate level of information and insure standardization and uniformity of this information. Mini-lectures should be kept short and should be followed by questions and answers for clarification to enable participants to better understand the content of the session/module and clarify issues, and questions and answers for evaluation to ensure comprehension.

Questions and Answers (Q&A)

Questions and answers sessions are used to recall information or elicit participants' knowledge (in introductory sessions in order to assess training needs), for clarification (to ensure that participants understand information/content), presentation of information (to elicit information that participants may already know) and evaluation (to assess acquisition of knowledge and fill gaps in participants' knowledge).

Steps for Questions and Answers for clarification

1. Trainer asks participants if they have questions
2. If a participant has a question, trainer asks another participant to answer
3. If the participant's answer is correct and complete, trainer reinforces

4. If the participant's answer is incorrect and/or incomplete, trainer may ask questions that lead the participant to a more correct answer or ask another participant to answer
5. If the answer is still incorrect and/or incomplete after two or three trials, trainer corrects and/or completes and informs the participants where to find the information
6. If there are no questions, trainer asks questions to verify knowledge and follows the same steps (3, 4, 5)

Steps for Questions and Answers to elicit information from participant (s)

1. Trainer asks participants questions
2. If a participant's answer is correct and complete, trainer reinforces
3. If the participant's answer is incorrect and/or incomplete, trainer may ask questions that lead the participant to a more correct answer or ask another participant to answer
4. If the answer is still incorrect and/or incomplete after two or three trials, trainer corrects and/or completes and informs the participants where to find the information

Steps for Questions and Answers for evaluation

1. Trainer asks participants questions
2. If a participant's answer is correct and complete, trainer reinforces
3. If the participant's answer is incorrect and/or incomplete, trainer may ask questions that lead the participant to a more correct answer or ask another participant to answer
4. If the answer is still incorrect and/or incomplete after two or three trials, trainer corrects and/or completes and informs the participants where to find the information

Brainstorming

Brainstorming is an excellent way to find out what participants already know and gaps in their knowledge. Brainstorming brings participants experience into the classroom and lets the participants know that their experience is valuable.

Brainstorming is also a very effective way for problem solving.

A brainstorming session should always end with a summary.

Steps for brainstorming

1. Trainer asks an open-ended question
2. Participants shout out their answers or ideas:
 - Until no more ideas are generated, or at least every participant has a chance to
 - contribute or time allocated has run out
 - No ideas are discarded criticized or analyzed, but clarifying questions can be
 - asked
3. Trainer records ideas on newsprint or in another format where all can see them
4. Trainer leads a discussion of each of the ideas generated
5. Trainer clearly marks ideas that are agreed upon

6. Trainer summarizes or asks participants to summarize points of agreement
7. Trainer moves to the next question only after finishing discussion of previous question
8. Ideas generated in brainstorming can be used for summarizing, as input to group exercises, and to relate content to participant experience

Case study

A case study is method of training whereas data/information about a case, preferably a real one or based on one, is presented to the participants for review and analysis. It includes specific questions to be answered. Case studies are a very effective way to allow participants to practice using information to solve problem, the highest level of knowledge objective. They are also effective in providing participants opportunities to explore their attitudes and confront/compare them with other participants and trainers' attitudes. Moreover case studies allow for the identification of gaps in knowledge.

Participants, individually or in small groups are asked to study the case and prepare responses to the questions. The responses are then processed. During the processing the trainer must encourage and ensure that all participants get a chance to provide inputs. Processing can be done using questions and answers and/or discussion.

The questions must be answered in an orderly manner in the sense that each question must be answered fully and the inputs summarized before moving to the next question. Answer key must be given to the participants after the processing of the case study.

Case studies can be presented in different format. They can be based on the presentation of a real patient, the files of a patient, a written description of a case, an illustration such as a photograph or slides of a case, or a video.

This method is not used in this curriculum but trainers can develop case studies based on local conditions/data as additional exercises if time permits.

Discussion

Discussion is indicated when the outcome is not predetermined in advance and is "still negotiable". Therefore using discussion to provide "scientific" knowledge/information or a decision that has already been made and not to be changed can lead to frustration.

Discussion in plenary or in small groups is recommended to explore attitudes, values and opinions. It is also indicated to confront/compare different options of "doing things" ensuring that the "why" is covered.

During the discussion the trainer's role is to facilitate the process, and ensure that the discussion remains "on track" and that every participant gets a chance to contribute.

When small groups do not have the same assignment/topic to discuss, each group presents their output(s) and discussion follows immediately after the presentation before moving to the next group. Time management is essential to ensure that no group gets "short changed" and has ample time for the presentation and discussion.

If all the groups have the same assignment, all groups present before discussion takes place. Only clarification questions are allowed during the presentation. Processing the output(s) must focus on the points of agreement before moving to the differences.

If time does not allow for all groups to present, one group can present and the other groups complete from their own group's output before discussion starts.

Every discussion must be followed by a summary.

Demonstration

Demonstration is a very effective way to facilitate learning of a skill or initiation of the development of an attitude. The facilitator should use this method to show the skill(s) and/or the attitude(s) addressing more than one sense at a time. Often a demonstration can effectively replace a presentation provided the facilitator explains as s/he is doing.

A demonstration should always be followed by a Q/A for clarification session before the learners are required to do a return demonstration.

Steps for a demonstration

1. Trainer assembles resources needed for the demonstration
2. Trainer ensures that participants are ready, can hear and see
3. Trainer explains what s/he is going to do
4. Trainer instructs participants on what is expected of them (e.g. to observe closely, to take notes if appropriate, to use the skills checklist when appropriate etc.)
 - To prepare for the Q/A, and
 - Because they are required to do return demonstration(s) for practice
5. Trainer demonstrates while explaining the skill(s)/attitude necessary for each step of the procedure being demonstrated
6. Trainer conducts a Q/A for clarification at the end of the demonstration

Return demonstration

Return demonstrations provide the learners with the opportunity to practice the skills necessary to perform the procedures they are being trained on. The trainer must ensure that each learner/participant has the opportunity to practice **enough times to reach a preset minimum acceptable level of performance.**

Steps for a return demonstration

1. Trainer reminds participants of what is expected of them:
 - To practice the procedure/skills
 - To observe when others are practicing to be able to ask for clarification
 - To observe when others are practicing to be able to provide feedback and peer evaluation
2. Trainer divides participants into small groups, if more than one workstation.

(**Note:** each workstation requires at least one facilitator/trainer).

3. Participants take turns practicing the procedure/skills
4. Trainer ensures that all participants can hear and see
5. While each participant is practicing trainer can provide guidance as necessary provided it does not interfere with the process and confuse the participant
6. After each participant, trainer solicits feedback from other participants
7. After feedback from other participants, trainer reinforces what is correct and corrects and/or completes feedback
8. Each participant needs to practice more than once or until control of the skill, as time permits
9. If participant(s) need more than time permits, trainer arranges for additional practice opportunities

Simulation/simulated practice

A simulated practice is a very effective method to allow participants to practice procedures/skills in an environment that recreates as closely as possible the “real world” without the stress involved in practicing procedures/skills that they do not control yet in the field. It is recommended to have participants practice on models before they do perform the procedure/ use the skill in the work place. During a simulation the participant practices tasks that are part of her/his actual role in the workplace or that s/he will perform in the job s/he is being trained for.

Use the same steps as for a demonstration/return demonstration practice.

Role play

Role plays are a very effective method to practice procedures/skills in the training room. They are especially effective to practice procedures/skills that deal with human interactions such as health education and counseling sessions. They are also very effective when the learning objective deal with attitudes.

In a role play participants “play roles” that are not necessarily their roles in the “real world”. Often they are asked to play the role of someone they would be dealing with. In this case it is called “role reversal” or “reverse role play”. This allows the participants to explore and discover how other perceive/live the interaction.

A role play must always be processed to analyze the lessons learned.

Summary

Every time a training method allows for inputs through exchanges between the trainer(s) and the participants and between the participants themselves, it must be followed by a summary session to “tie up the loose ends” and provide the participants with clear answers. If this does not happen there is the likelihood that the participants will forget the “correct” answers.

A summary can be done by the trainer to ensure that there are “no loose ends”. If time permits, it is recommended to use the summary for evaluation. In this case the trainer can use the Q/A method.

Steps for a summary for evaluation

1. Trainer asks a participant to summarize
2. Trainers reinforces if the summary is correct/complete
3. Trainer asks another participant to correct/complete if the summary is incorrect/incomplete
4. Trainer repeats steps 2 and 3
5. Trainer corrects/completes if after 2 or 3 trials the summary is still Incorrect/incomplete.

Discussion Lecture

Discussion Lecture: It is introducing of scientific material to the listeners and involving them in the discussion and exchanging viewpoints, raising questions and answering them and this leads to enriching the training process and increasing the chances of its success. The main difference between it and the short lecture is that the trainees are given the chance for questioning and discussion during the lecturing

Discussion lecture uses the principles of the lecture and discussion together in applying this method.

Privileges of the discussion lecture:

1. Drawing the trainees attention because it is a method of communication between the two sides in more than one direction
2. Increasing the interaction between the trainees and trainer and among trainees themselves
3. Allowing the exchange of viewpoints
4. Operating according to the rules and principles of seniors education
5. Allowing the provision of information and decision taking in the same session

Faults of discussion lecture:

1. Discussion may lead to the deviation from the basic subject and this neglecting the fundamental points of the subjects
2. It cannot be used in gaining the skills
3. It may lead to open the door of the discussion about information and firm decisions that cannot be changed and this leads to disappointment

Discussion leads to taking collective or individual decisions within joint framework

Summary: Discussion and lecture of discussion

Discussion lecture

Introducing scientific material and involving the trainees in discussion, exchanging viewpoints, raising questions and answering them

Privileges of discussion lecture

- Drawing trainees attention
- Increasing interaction
- Allowing exchange of expertise
- Operating on the bases of seniors teaching
- Joining information provision and taking the decision

Faults of discussion lecture

- It may lead to deviation from subject
- It cannot be used in gaining skills
- It may lead to open the discussion about information or decisions which not allowed to be changed

Discussion

It is a method of exchanging information conducted under the supervision of a guide and it is done in a small or large group to reach a decision

Discussion Privileges

- Giving the chance to express views
- Drawing participants attention
- Allowing exchange of knowledge and skills
- Giving a chance to raise and answer questions
- Helping to solve problems
- Learning to decision making

Fields of using discussion

- To apply information
- To establish humanitarian relations among trainees
- To exchange knowledge and expertise
- To discuss work problems
- To give the opportunity to express viewpoint
- To train how to take the decision unanimously
- To know the attitudes
- To prepare plans of work and projects

Faults of discussion

- It leads to deviation from subject
- It requires longer time
- It requires expertise and knowledge
- Some group members may control discussion
- Some problems in which no one is interested may be raised
- It is not appropriate for large groups
- It may possibly lead to conflicts
- It needs a trainer with a skill of managing discussion

Discussion

Discussion is:

- 1. Open**
- 2. Guided**

Evaluation

Evaluation of learning and training objectives

Evaluation or assessment of learning and of training objectives allows trainers, program managers and participants to know how successful a training program has been. On-going evaluation and assessment allows trainers to identify gaps in learning and to fill those gaps. Evaluation also assists in revising learning experiences for later trainings.

Many strategies can be used to evaluate learning. Some of the most useful methods include:

- **Knowledge assessments:** Written or oral questions that require participants to recall, analyze, synthesize, organize or apply information to solve a problem. The knowledge component of a skill objective should be assessed prior to beginning skill practice in a training room or clinical session.
- **Questionnaires:** Written exercises that assist trainers and participants to identify and fill gaps in knowledge. Questionnaires can be administered as self-assessments. In some situations, it may be reasonable to have participants use course materials or to work together on questionnaires.
- **Skill checklists:** Observation of a participant performing a skill and assessment of the performance using a checklist. Simulated practice (using real items or models in a situation that is similar to actual practice) should ideally be assessed prior to beginning clinical practice with clients. Checklists should be used by the trainer and other participants to observe simulated (training room) performance and actual practice and provide feedback to help improve the performance. The checklists can also be used by the participant for self-assessment. During the training participants should be trained on how to use the checklists and encouraged to use them after the training to continue assessing their own performance and improving it.

Additional techniques for evaluation include: projects, reports, daily reflection, on-site observation, field performance, and discussion.

Each training module includes assessment of learning methods and tools:

- Questions and Answers should be used to frequently identify gaps in knowledge and fill them.
- Questionnaires are included with every module and can be used for self-assessment. To use them as self-assessment, participants fill out the questionnaire and then use any course materials to check their own answers. Trainers should work with participants filling out the questionnaires to make sure that all gaps in knowledge are filled before practicing and evaluating skills. When time permits, process responses in plenary to address any issues and fill the gaps in knowledge. At the end of this activity the answer key needs to be distributed to the participants.

- Skills Checklists are included for each of the skills that are included in this training curriculum. Participants can use the Skills Checklists as learning guides during practice sessions in training room or clinical sessions. To evaluate skills, trainers should generally observe participants three times with coaching as needed to ensure the skills are learned.

Evaluation of the participants

The evaluation of the learning by participants will be done through questions and answers, synthesis of sessions done by selected participants, self-assessment following the micro-sessions, peer assessment through feedback provided by other participants following the micro-sessions and assessment of performance by facilitators.

Each participant will practice more than once, preferably three times” the use of the curriculum to plan, organize, conduct and evaluate the training through simulated micro-sessions. A checklist will be used both by participants for self and peer assessment, and by the facilitators.

Videotaping the micro sessions or at least significant segments of the micro sessions and reviewing the taped segments after each session will enable the participants to assess their own progress in terms of acquisition of training/facilitation skills. This approach to evaluation although time consuming is very effective in helping participants assess their own performance and stabilize feedback received from their peers and from the trainers/facilitators.

Post training evaluation of the learners must be conducted within three (3) to six (6) months after the end of the training. Further post training evaluation and follow-up can be integrated into routine supervision. It is highly recommended to use the skills checklists used during the training for post training evaluation and follow-up.

Evaluation of the training

The “End of Training” evaluation can be done through a questionnaire (form 1) whereby the participants are asked to respond and express their opinions about various aspects of the workshop, such as organization, the process, the facilitation, and a general assessment.

The “End of module” evaluation can be done through a questionnaire (form 2) whereby the participants are asked to respond and express their opinions about various aspects of the module, such as the relevance of the module objective to the course ones, the relevance of the content to the objectives, the adequacy of the content, the presentation of the content, the effectiveness of the methodology, the facilitation and the sequencing of the content.

A confidence/satisfaction index can be calculated to determine how confident the learners feel that they acquired the knowledge and skills necessary to perform the tasks they have been trained for, and how committed they feel to using those skills to ensure the quality of the services they are to provide. The confidence index applies to the training objectives and acquisition of skills and knowledge and to the degree to which the participants feel that they able to apply what they have learned during the training. The satisfaction index applies to the organization and implementation of the training.

The items are labeled in the form of statements followed by a scale 5 (Strongly Agree), 4 (Agree), 2 (Disagree), and 1 (Strongly Disagree), where 5 represents the highest level of satisfaction/confidence (agreement with the statement) and 1 represents the lowest. The participants are asked to select the level that expressed their opinion best. A space for comments is provided after each statement.

The confidence and satisfaction indices are calculated by multiplying the number of respondents by the correspondent coefficient in the scale, then adding the total. The total is multiplied by 100. The product is divided by the total number of respondents to the statement multiplied by 5. 60% represents the minimal acceptable level and 80% a very satisfactory level of performance.

For example, if the total number of respondents is 19 and 7 of them selected 5 on the scale, 6 selected 4, 4 selected 2, and 2 selected 1, then the index will be $(5 \times 7) + (4 \times 6) + (2 \times 4) + (1 \times 2)$ multiplied by 100, divided by (5×19) . A 100% index would be if the total number of respondents selected 5. In this case it would be 95. In this example the index is 72.63%.

The training content and process are evaluated on a continuing basis through daily evaluations using methods such as “things liked the best” and “things liked the least” and/or “quick feedback” forms. The facilitators will use the results of this evaluation during their daily meeting to integrate the feedback and adapt the training to the participants needs.

“Where Are We?” sessions will be conducted with the participants to assess the progress in content coverage and process towards reaching the training goals and learning objectives.

Comments are analyzed and categorized. Only significant comments, those mentioned more than once and/or by more than one participant, are retained. The facilitators need to use the results of this evaluation during their daily meeting to integrate the feedback and adapt the training to the participants needs. Feedback and assessment of training experiences allows trainers and program managers to adapt training to better meet participants’ needs. Trainers can also assess their own performance in facilitating the learning experience of participants using a standardized “facilitation skills” checklist (form 4).

Form 1: END OF COURSE EVALUATION QUESTIONNAIRE

TRAINING CENTER

DATE

COURSE TITLE:

INSTRUCTIONS

This evaluation will help adapt the course to your needs and to those of future participants.

It is anonymous. Please respond freely and sincerely to each item. The items are labeled in the form of statements followed by a scale where:

- 5 = **strong** agree
- 4 = agree

- 2 = disagree
- 1 = **strongly** disagree

Please circle the number that expresses your opinion; the difference between **strongly** agree and agree, and between **strongly** disagree and disagree are a matter of intensity.

Add your comments in a specific and concise manner, in the space provided after each statement. If that is not sufficient feel free to use extra paper. If you select 2 or 1, make sure to suggest how to make the situation better, practical, and offer solutions.

N.B: Course goals objectives and duration will vary based on the type of training conducted.
Adapt the form to each specific course by including in it the relevant course items.

COURSE GOALS

The Course Achieved Its Goals

1. To provide the participants with the opportunities to acquire/update the knowledge and skills necessary to:

1.1 Play an effective role as a member of the PHC Center team to improve the quality of care and services	5-4-2-1
Comments:	
1.2 Use the team approach to solve problems at the PHC center level	5-4-2-1
Comments:	
2. Provide the participants with opportunities to be exposed to and initiate the development of attitudes favorable to the systematic use of the knowledge and skills acquired in team building and problem solving to improve the quality of care and services	5-4-2-1
Comments:	

COURSE OBJECTIVES

1. The course helped me reach the stated objectives:

1.1 Apply the team approach principles to play an effective role as a member of the Model PHC Center service delivery team	5-4-2-1
Comments:	
1.2 Use the team approach to implement the problem solving cycle to solve service delivery and management problems at the PHC Center level	5-4-2-1
Comments:	
1.3 Explain the importance of being an effective team member of the Model PHC Center to improve the quality of care and services	5-4-2-1
Comments:	
1.4 Explain the importance of using the team approach to implement the problem solving cycle to solve service delivery and management problems at the Model PHC center	5-4-2-1
Comments:	

2. The course objectives are relevant to my job description / task I perform in my job 5-4-2-1

Comments:

3. There is a logical sequence to the units that facilitates learning 5-4-2-1

Comments:

ORGANIZATION AND CONDUCT OF THE COURSE

1. Time of notification was adequate to prepare for the course 5-4-2-1

Comments:

2. Information provided about the course before arriving was adequate 5-4-2-1

Comments:

3. Transportation arrangements during the course were adequate (if applicable) 5-4-2-1

Comments:

4. Training site (Training Center) was adequate 5-4-2-1

Comments:

5. The educational materials (including reference material) used were adequate both in terms and quantity and quality in relation to the training objectives and content 5-4-2-1

Comments:

6. The methodology and technique used to conduct the training were effective in assisting you to reach the course objectives 5-4-2-1

Comments:

7. Clinic/ practice site, as applicable, was adequate 5-4-2-1

Comments:

8. Relationships between participants and course managers and support staff were satisfactory 5-4-2-1

Comments:

9. Relationships between participants and trainers were satisfactory and beneficial to learning 5-4-2-1

Comments:

10. Relationships between participants were satisfactory 5-4-2-1

Comments:

11. The organization of the course was adequate (Time, breaks, supplies, resource materials) 5-4-2-1

Comments:

Additional comments:

GENERAL ASSESSMENT

1. I can replicate this training in my future work 5-4-2-1

Comments:

2. I would recommend this training course to others 5-4-2-1

Why or Why Not?

3. The duration of the course (10 days) was adequate to reach all objectives and cover all necessary topics 5-4-2-1

Comments:

General comments and suggestions to improve the course (Please be specific)

Form 2: END OF MODULE EVALUATION QUESTIONNAIRE

COURSE: DATE:

MODULE NUMBER & TITLE:

INSTRUCTIONS

This evaluation is intended to solicit your opinions about the modules. Your feedback will help adapt the course to your needs and to those of future participants. It is anonymous. Please respond freely and sincerely to each item. The items are labeled in the form of statements followed by a scale where:

- 5 = **strongly** agree
- 4 = agree

- 2 = disagree
- 1 = **strongly** disagree

Please circle the number that best expresses your opinion; the differences between **strongly** agree and agree, and between **strongly** disagree and disagree are a matter of intensity.

Add your comments in a specific and concise manner in the space provided after each statement. If that space is not sufficient feel to use extra paper. If you select 2 or 1, make sure to write specific comments on how to improve the module.

EVALUATION ITEMS

1. The module objectives are relevant to the course objectives Comments:	5- 4- 2- 1
2. The content / topics covered in the unit are relevant to the objectives Comments:	5- 4- 2- 1
3. The content / topics were adequate to help me achieve the objectives	5- 4- 2- 1

Comments:	
4. The content / topics were clear and well-presented Comments:	5- 4- 2- 1
5. The training methods and activities were effective in facilitating learning Comments:	5- 4- 2- 1
6. The training methods and activities were conducted adequately to facilitate learning Comments:	5- 4- 2- 1
7. These are important topics that will enable me to better perform my job Comments: (specify these points)	5- 4- 2- 1
8. There is a logical sequence to the sessions and topics that facilitates learning Comments:	5-4- 2- 1
9. There are certain topics that need further clarification	5- 4- 2- 1

Comments: (specify these points)	
10. The training materials and resources provided were adequate Comments:	5- 4- 2- 1
11. Training materials and resources were provided on time to facilitate learning Comments:	5- 4- 2- 1
1. The training materials and resources used were adequate to facilitate my learning Comments:	5-4-2-1
14. The training site was adequate Comments:	5- 4- 2- 1
5. The clinic/ practice site was adequate (if applicable) Comments:	5- 4- 2- 1

General comments (if any not covered):

Form 3: QUICK FEEDBACK FORM

TRAINING COURSE: DATE:
LOCATION:

MODULE NUMBER AND TITLE:
SESSION NUMBER AND TITLE:

INSTRUCTIONS

This evaluation is anonymous. Please respond freely and sincerely to each item. The items are labeled in the form of statements followed by a scale where:

5 = **strongly** agree

4 = agree

2 = disagree

1 = **strongly** disagree

Please circle the description that expresses your opinion best; the difference between strongly agree and agree, and between strongly disagree and disagree are a matter of intensity.

Add your comments in a specific and concise manner, if you have any, in the space provided after each statement. If that space is not sufficient feel free to use extra paper. If you selected 2 or 1 please make sure to give comments (e.g. why? Solutions?)

1. The session objectives are relevant to the tasks in the job description

5- 4- 2- 1

COMMENTS

2. The methods/learning activities were adapted to the objectives 5- 4- 2- 1

COMMENTS

3. The materials provided were adequate to cover all of the content 5- 4- 2- 1

COMMENTS

4. The time allocated to the session was adequate to cover all the topics 5- 4- 2- 1

COMMENTS

5. The facilitation (conduct of the session) helped reach the session objectives 5- 4- 2- 1

COMMENTS

6. The content of the training was clearly presented 5- 4- 2- 1

COMMENTS

7. The materials/resources were used in a way that helped me learn 5- 4- 2- 1

COMMENTS

8. There are points of content that need further clarifications
(Specify what specific content areas)

Other comments:

Form 4: TRAINING SKILLS CHECKLIST

This checklist is used with the relevant curriculum to give feedback on the trainer's performance.

The checklist contains a list of items to be observed:

- If they are observed a check mark (√) is entered in the column observed under **adequate** or **inadequate** depending on the performance.
- Comments are entered in the appropriate column to clarify/specify what is observed or not observed.
- Is not observed a check mark (√) and comments are entered in the appropriate columns.

The finding and comments are analyzed and discussed with the trainers supervised. Any immediate corrective action(s) taken and further action(s) needed must be entered in the spaces provided.

The trainers supervised must be given an opportunity to comment and the comments must be entered in the appropriate space. The form must be dated and signed by the trainer and the supervisor. It is then filed in the trainer's file for future follow-up and reference.

Legend: A = Adequate NA = NOT adequate NO = NOT observed

Items	Observed		NO	Comments
	A	NA		
1. <u>Planning of the session</u> <ul style="list-style-type: none"> • Relevant sessions plan selected from curriculum • Organization conduct and evaluation of training in conformity with curriculum (based on observation during the session) 				
2. <u>Organizing the session</u> <ul style="list-style-type: none"> • Arrive before beginning of session • Ensure that all training resources are in place • Ensure that equipment is in working condition • Ensure that training site is set up in accordance with the requirements of the training objective (s) and methodology • Prepared/rehearsed for the training (based on observation of mastery in conducting activities and using resources during training) 				
Items	Observed			Comments

	A	NA	NO	
<p>3. Conducting the session</p> <p>3.1 Introduction</p> <ul style="list-style-type: none"> • Introduce oneself <ul style="list-style-type: none"> - Name - Job - Experience relevant to topic • Introduce/let team members introduce themselves • Module: <ul style="list-style-type: none"> - Introduce topic - Present objective - Clarify topic and objectives - List sessions - Establish linkage with job/task • Session <ul style="list-style-type: none"> - Introduce topic - Present objectives - Clarify topics and objectives - Establish linkage with module - Establish linkage with preceding session(s) - Explain methodology • Present evaluation methodology • State estimated duration <p>3.2 Facilitation skills</p> <p>➤ Clarifying</p> <ul style="list-style-type: none"> • Make sure participants are ready before starting on any content item • Make sure participants can hear: <ul style="list-style-type: none"> - Trainer - Other participants • Make sure participants can see: <ul style="list-style-type: none"> - Writing - Illustrations/ educational aids - Trainer - Each other • Make sure s/he look at participants • Make sure s/he can hear participants • Use appropriate educational material • Summarize after each content topic item before moving to next topic • Use examples relevant to objectives, content, and participants learning. 				
Items	Observed		NO	Comments
	A	NA		

<p>➤ <u>Ensuring Active Participation</u></p> <ul style="list-style-type: none"> • Ask participants questions • Allow participants to ask questions • Allow participants to question/discuss/make contributions • Ensure that all participants contribute • Provide participants with opportunities to practice • Adapt to participants' learning capability (speed, learning activities, use of educational material) • Encourage participants through: <ul style="list-style-type: none"> - Listening - Letting participants complete their interventions - Not being judgmental - Maintaining cordial relationships with participants <p>➤ <u>Mastering Training</u></p> <ul style="list-style-type: none"> • Conduct the learning activities as per session plan • Use the training resources/ materials as per plan • Cover content adequately (relevant, clear, concise, complete, concrete, credible, consistent and correct) • Follow curriculum for learning/training activities • Use content as per curriculum <p>1. <u>Evaluating learning/training process</u></p> <ul style="list-style-type: none"> • Check that participants understand • Check that participants learn skills • Provide supportive feedback by: <ul style="list-style-type: none"> - Reinforcing the positive learning - Correcting any errors - Correcting any incomplete learning • Listen to participants comment about one's performance (without making it personal) • Adapt one's performance based on feedback from participants • Allow participants to answer questions asked by the group. 				
---	--	--	--	--

Additional comments or observations

Analysis of findings

Action (s) taken

Further action (s) needed

Trainer's comments

Date:

Trainer's name & signature

Supervisor's name & signature

SYLLABUS/PROGRAM

TRAINING OF PHC CENTERS MANAGERS ON Communicable Diseases Control

GOALS:

- To provide participants with opportunities to acquire/update the knowledge, skills necessary to assess communicable diseases according to the agreed upon Guidelines on Communicable Diseases Control.
- To initiate the development of acquired attitudes, to improve the quality of medical care in general and communicable diseases assessment and control in particular, in Primary Health Care Centers in Iraq.

LEARNING OBJECTIVES

At the end of the training the participants will be able to:

1. Diagnose correctly according to the agreed upon CDC- Communicable Diseases Control Guidelines.
2. Report correctly according to the agreed upon CDC-Communicable Diseases Control Guidelines.
3. Manage correctly according to the agreed upon CDC-Communicable Diseases Control Guidelines.

CONTENT/TOPICS

The following content/topics will be covered:

- Basic concepts of Communicable Diseases Control.
- Immediate notification communicable diseases.
- Weekly reporting communicable diseases.
- Monthly reporting communicable diseases.

METHODOLOGY

The training will use a participatory and “hands on” approach where the role of the trainers will be to facilitate learning by the participants. The responsibility for learning remains with the participants.

To ensure that this happens, a variety of training methods will be used:

- Individual assignments (e.g. reading assignments)
- Small-group work and Q/A in plenary
- Small-group work and Q/A in plenary for clarification
- Q/A in plenary for discussion
- Lecturer - Discussion
- Brainstorming
- Mini lectures
- Exercises

To assist the participants in going through the learning process, the following reference materials were provided:

- Proposed syllabus
- Handouts on team building and problem solving

All the reference documents will be read by the participants as an individual assignment, clarified in plenary session and small group discussions, and used to prepare, conduct, and evaluate the practical sessions.

SCHEDULE

1- Training Workshop schedule

This schedule is a proposed draft which should be discussed and finalized with participants:

- Day one:
 - Opening
 - Introduction
 - Agreement on principles of evaluation
 - Schedule
 - Principles of adult learning
 - Goals and Objectives of training
- Day two:
 - Module one.
- Day three :
 - Module one-continue.
 - Module three.
- Day four:
 - Module four.
- Day five:
 - Module four-continue.
 - Comprehensive review of the workshop
 - End of training course evaluation
 - closure

2- Daily schedule

Schedule will include 6 hours of training room structured activities. Starting and ending times, and specific daily schedules will be discussed and finalized with the participants.

Evening Assignments include continuation of individual reading and preparation.

EVALUATION

1. Evaluation of the training

The “end of training” evaluation will be done through a questionnaire whereby the participants are asked to respond and express their opinions about various aspects of the workshop, such as organization, the process, the facilitation, and a general assessment.

The confidence index applies to the training objectives and acquisition of skills and knowledge and to the degree to which the participants feel that they are able to apply what they have learned during the training. The satisfaction index applies to the organization and implementation of the training.

“Where Are We?” sessions will be conducted with the participants to assess the progress in content coverage and process towards reaching the training goals and learning objectives.

2. Evaluation of the participants

The evaluation of the learning by participants will be done through questions and answers, summaries of sessions done by selected participants, self-assessment following the practice sessions, peer assessment through feedback provided by other participants following the practice sessions and assessment of performance by facilitators.

Each participant will practice the various skills, preferably more than once.

Limitations of this manual

Although the authors have put substantial effort in making the manual simple and practical, we are well aware that for those limited to only reading the text, exercises, and explanations, it will be rather difficult to conduct the course without previously having experienced the training development process. We have therefore tried to give special attention to the description of the procedure of every module. This is done in order to give in this part of the modules practical hints, examples and a detailed guideline for their development. Experienced trainers and facilitators will find it much easier to use the manual, than those having their first training experience.

It is often thought that participatory teaching and learning methods are more relaxing for the trainers when participants themselves are expected to develop the contents in small working groups. This is definitely not the case. A lecture is a continuous presentation, given in a predetermined time span and participants are not expected to interrupt the presenter. Participants listen and may be only required to put forward questions in the end. The lecturer does not need more than technical competence on the topic and some presentation skills.

Participatory training and learning methods are much more open and flexible. Often they present a challenge to the facilitators by raising new topics, which may not adhere to the

readily retrievable knowledge of the facilitator:

- In terms of the necessary continuous monitoring of the learning process to keep participants on track while allowing some space for related topics important to the participants;
- In terms of analytical and systematic competence to be able to summarize important learning results or to guide participants themselves to summarize their learning;
- In terms of monitoring group dynamics and intervening in conflict situations.

Organizers of the training course should be aware of these training style differences and might decide on a more traditional course setting if the above mentioned competences are not well developed in the trainers' team. It is recommended to consider these reflections in the planning of the workshop/training course.

Part Two:
Training Modules

Module One

Module Objectives:

at the end of this module the participant will be able to:

1. Diagnose correctly according to the agreed upon CDC Communicable Diseases Control Guidelines.
 2. Report correctly according to the agreed upon CDC Communicable Diseases Control Guidelines.
 3. Manage correctly according to the agreed upon CDC Communicable Diseases Control Guidelines.
-
- **Session 1:** Basic Concept Of Communicable Diseases
 - **Session 2:** Assess the Acute Flaccid Paralysis, Anthrax and Cholera
 - **Session 3:** Assess Crimean-Congo Hemorrhagic Fever, Diphtheria And Influenza H1n1, H5n1
 - **Session 4:** Assess Plague, Pertussis (Whooping Cough), Acute Poliomyelitis, Rabies, Rubella (German measles).
 - **Session 5:** Assess Meningococcal Disease, Malaria, Measles, Tetanus and Food poisoning.

Evaluation/ Assessment

Questions and answers, participants' summaries, trainer's evaluation

Estimated Training Time

8 Hours and 15 min .

Module 1

Session 1: basic concepts of Communicable diseases.

Objectives:

- define communicable diseases, list infectious agents
- Describe endemic, epidemic in communicable disease.
- explain prevention and control measures in communicable diseases
- demonstrate how communicable disease spread

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

1 hour and 45 min

Session Plan 1:

Objectives	Content	Methods
Trainers Introduction (10 min)		Introduction exercise
1.1.1 Define communicable diseases, list infectious agents (10 min)	Are illnesses that spread from one person to another? Infectious agents: Infectious agents: <ul style="list-style-type: none"> • viruses (e.g., "colds," chicken pox, hepatitis A & B, HIV), • bacteria (e.g., "strep," tuberculosis), or • fungi (e.g., ringworm, thrush), and • Parasites (e.g., giardia, pinworms, scabies, head lice). 	Brain storming & Exercise word scramble E1.1.1
1.1.2 Explain natural history of communicable diseases (10 min)	The sequence of events that happen one after another, over a period of time, in a person who is not receiving treatment: <ul style="list-style-type: none"> • Exposure • Infection • Manifestation (outcome) 	Mini – lecture
1.1.3 Describe endemic, epidemic in communicable diseases. (10 min)	Endemic: communicable diseases persist in a community at a relatively constant level for a very long time, number of individuals affected remains approximately the same. Epidemic: Numbers affected by some communicable diseases can undergo a sudden increase over a few days or weeks, or the rise may continue for month or years.	Q/A
1.1.4 Explain prevention and control measures in communicable diseases (10 min)	Prevention: applied before the occurrence of a communicable disease to protect a community, reduce the number of cases- (vaccination). Control measure: applied when the communicable disease occurs and is identified in an individual, to reduce the severity of the disease in that person, prevent transmission of the infectious agent to other members of the community- (treatment for disease).	Discussion
1.1.5 Demonstrate how communicable diseases spread (10 min)	<ul style="list-style-type: none"> • Respiratory: nose, mouth and lungs. • GIT: mouth, stomach, intestines and bottoms. • Dermatologic: skin and hair Blood born: blood through the body.	Colored cards exercise E 1.1.6

Introduction Exercise

Who Has Had This Experience?

Purpose: This activity is a brief "icebreaker" to help participants recognize the impact of communicable diseases on their daily lives.

For this activity, you will need:

- One copy of Handout A: Who Has Had This Experience? for each participant
- Pens/pencils

Step 1: Explain that this exercise helps us get to know each other through discussing some of our experiences with communicable diseases.

Trainers Note: *Participants may feel uncomfortable discussing some communicable diseases or have concerns about confidentiality. Encourage participants to discuss these issues only to the extent to which they feel comfortable.*

Step 2: Ask participants: What are communicable diseases? (*see* Background Information)

Step 3: Distribute Handout A: Who Has Had This Experience? Give participants a minute to review the questions on the worksheet.

Step 4: Have participants take 5-10 minutes to mingle with each other, introduce themselves, and discuss some of their experiences with communicable diseases. Participants should sign their names on other participants' worksheets next to an experience that they have had.

Step 5: After most people have completed their worksheets, have participants return to their seats. Ask participants:

- What were some common experiences or practices?
- What were less common experiences or practices?
- Were there some diseases that you felt ashamed of having? Did that affect the way you dealt with having those diseases? How?
- Were there some diseases that you felt angry about or blamed others for spreading? Did that affect the way you dealt with the diseases? How?
- How can we make the management of communicable diseases more effective in Head Start?

Points to Consider:

- Communicable diseases are illnesses that spread from person to person. They are the most common cause of illness in young children.
- All of us do many things each day to prevent and manage communicable diseases-both at home and at work.
- Head Start staff and families have some similar and some different experiences, information, fears, and questions about communicable diseases. We can learn from reflecting on our own experiences, sharing them with others, and asking questions.
- Fear, anger, blame, and denial are common responses to communicable diseases, but they make us deal poorly with our illnesses. Acceptance and information can help us manage these diseases more effectively.
- To manage communicable diseases effectively, Head Start programs need clear health policies, up-to-date information, and sensitive communication among staff, parents, and children about communicable diseases.

i. Exercise: Define communicable disease.

WORD SCRAMBLE

Unscramble the words below and write the correct word in the space provided. Use the words in the Word Bank to help you.

WORD BANK

1. m r e g _____
2. e e s a i d s _____
3. i o n c c a v n i a t _____
4. s f i u d l _____
5. h r o v i s u n r i _____
6. p m i c s c o e r _____
7. b c t a a r i e _____
8. s u i v r _____
9. n i i f e t o n c _____
10. m m n o o d c c l o _____

common cold
bacteria
disease
fluids
germ
infection
microscope
rhinovirus
vaccination
virus

1.1.6 Exercise: How do communicable diseases spread?

Colored cards exercise

Purpose: This activity helps participants understand how communicable diseases spread and why they spread so widely.

For this activity, you will need:

- Flip chart paper
- Colored markers (red, blue, brown, green)
- Key to Activity 4: A: Communicable Diseases in Children; Key to Activity 4: B: How Communicable Diseases Spread (for trainer only)
- One index card and pen/pencil for each participant
- Overhead projector and transparency

Preparation Note: Before the activity:

- Copy the chart on *Communicable Diseases in Children* (Key to Activity 4: A) onto an overhead transparency.
- Copy the outline of the human body (Key to Activity 4: B) onto flip chart paper.
- Separate out eight of the index cards:
 - On four cards, write a small letter in the lower right corner: "R" on one, "G" on another, "D" on another, and "B" on another
 - On four cards, write a small letter "H" in the lower left corner
- Review Appendix *Communicable Disease Fact Sheets*

Step 1: Explain to participants that this activity helps them understand how communicable diseases spread.

Step 2: Briefly review the four main ways that communicable diseases are spread (respiratory, gastrointestinal, dermatologic, and blood-borne), common examples of the diseases, general symptoms of the diseases, and specific ways they spread in Head Start programs.

Step 3: Explain that, for each type of disease, the germs are carried by and spread from specific parts of the body.

- Respiratory (blue): nose, mouth and lungs
- Gastrointestinal (brown): mouth, stomach, intestines, bottom
- Dermatologic (green): skin, hair Blood borne (red): blood throughout the body

Emphasize that *all* of the different germs can be carried on one part of the body-the hands. Color the hands with all of the colors.

Step 4: Explain to participants that they will play a game to see how quickly communicable diseases spread.

Step 5: Distribute an index card to each participant (Make sure that the eight index cards with letters on them are distributed). Ask participants to stand up, mingle with each other, and do the following:

- Introduce yourselves to someone and shake hands with them. Write your name on the other person's index card. Then return the card to the owner.

Tell participants that they will have one minute to do this as many times as possible. When the minute is up, have everyone sit down together.

Step 6: Ask the person who has an "R" in the lower right corner of his card to stand up. Explain that he has a respiratory disease-a cold-and got germs on his hands from blowing his nose.

Ask all participants who shook his hand and have his name on their cards to stand up. Explain that they caught his cold. Ask them all to continue to stand up.

Step 7: Ask the person who has a "G" in the lower right corner of her card to stand up. Explain that she has a gastrointestinal disease-diarrhea-and got germs on her hands from going to the bathroom.

Ask all participants who shook her hand and have her name on their cards to stand up. Explain that they caught her diarrhea. Ask them all to continue to stand up.

Step 8: Ask the person who has a "D" in the lower right corner of his card to stand up. Explain that he has a dermatologic disease-scabies-and got germ on his hands from scratching his rash.

Ask all participants who shook his hand and have his name on their cards to stand up. Explain that they caught his scabies. Ask them all to continue to stand up.

Step 9: Ask the person who has a "B" in the lower right corner of her card to stand up. Explain that she has a blood-borne disease-hepatitis B-and got germs on her hands from cutting her hand on a piece of glass.

Ask all participants who shook her hand and have her name on their cards to stand up. Explain that they caught her hepatitis B because they had a cut on their hand that allowed infected blood to enter their system. Ask them all to continue to stand up.

Step 10: Have participants look around the room. Ask: What do you observe?

Step 11: Ask for all participants who have an "H" in the lower left corner of their cards to raise their hands. Explain that they did *not* catch the disease because of good hand washing-they washed their hands at the proper time and so did the other people. Ask them to sit down.

Step 12: Ask: What did you observe about the spread of diseases through this activity?

Points to Consider:

- The majority of illnesses spread in early childhood programs are respiratory, gastrointestinal, and dermatologic diseases. The spread of blood borne diseases is extremely rare.
- When only a few individuals have communicable diseases, they can spread widely among a group of people, for example, among children and adults in a Head Start program. The more people have close contact with each other, the more germs and diseases can spread.
- A few simple prevention measures, such as hand washing, can reduce the spread of disease.

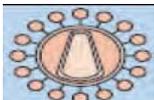
1.1.1. Communicable Diseases and Infectious Agents

Communicable diseases are illnesses that spread from one person to another. They are also called contagious or infectious diseases. Communicable diseases are caused by germs and tiny bugs. The germs are so small that they can only be seen with a microscope, not with the naked eye. The germs and bugs are categorized as:

- viruses (e.g., "colds," chicken pox, hepatitis A & B, HIV),
- bacteria (e.g., "strep," tuberculosis), or
- fungi (e.g., ringworm, thrush), and
- parasites (e.g., giardia, pinworms, scabies, head lice).

Illnesses caused by bacteria, fungi and parasites always need medical evaluation and antibiotic treatment. Many illnesses caused by viruses are mild and go away on their own, but some need medical evaluation and treatment.

NOTE: Some illnesses and health conditions are not communicable and do not spread from one person to another. Examples of these include asthma, allergies, seizures, cerebral palsy, and blindness.

Type of infectious agent	Number of cells	Visibility	Examples	
Helminths	many	Visible with the naked eye	Ascaris worm causes ascariasis. Its length reaches 15–30 cm	
Protozoa	1	Visible with a standard microscope	Plasmodium falciparum causes malaria	
Bacteria	1	Visible only with a special microscope; much smaller in size than protozoa	Vibrio cholera causes cholera	
Viruses	0	Visible only with a special microscope; much smaller in size than bacteria	HIV causes AIDS	

(Adapted from the Open University, 2007, Water and Health in an Overcrowded World, Chapter 2)

1.1.2 Natural History of Communicable Diseases

The natural history of a communicable disease refers to the sequence of events that happen one after another, over a period of time, in a person who is not receiving treatment.

Recognizing these events helps you understand how particular interventions at different stages could prevent or control the disease. Events that occur in the natural history of a communicable disease are grouped into four stages: exposure, infection, infectious disease, and outcome.

Stage of exposure

In the stage of exposure, the susceptible host has come into close contact with the infectious agent, but it has not yet entered the host's body cells.

Examples of an exposed host include:

- . a person who shakes hands with someone suffering from a common cold
- . a child living in the same room as an adult with tuberculosis
- . a person eating contaminated food or drinking contaminated water.

Stage of infection

At this stage the infectious agent has entered the host's body and has begun multiplying. The entry and multiplication of an infectious agent inside the host is known as the stage of infection. For instance, a person who has eaten food contaminated with *Salmonella typhi* (the bacteria that cause typhoid fever) is said to be exposed; if the bacteria enter the cells lining the intestines and start multiplying, the person is said to be infected. At this stage there are no clinical manifestations of the disease, a term referring to the typical symptoms and signs of that illness. Symptoms are the complaints the patient can tell you about (e.g. headache, vomiting, dizziness). Signs are the features that would only be detected by a trained health worker (e.g. high temperature, fast pulse rate, enlargement of organs in the abdomen).

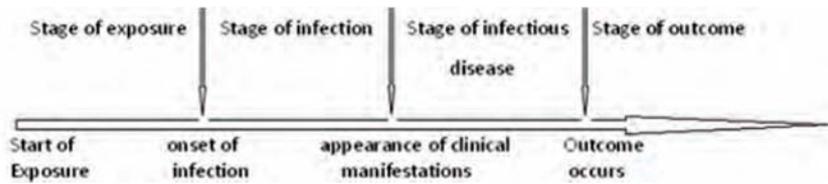
Stage of infectious disease

At this stage the clinical manifestations of the disease are present in the infected host. For example, a person infected with *Plasmodium falciparum*, who has fever, vomiting and headache, is in the stage of infectious disease – in this case, malaria. The time interval between the onsets (start) of infection and the first appearance of clinical manifestations of a disease is called the incubation period. For malaria caused by *Plasmodium falciparum* the incubation period ranges from 7 to 14 days.

Remember that not all infected hosts may develop the disease, and among those who do, the severity of the illness may differ, depending on the level of immunity of the host and the type of infectious agent. Infected hosts who have clinical manifestations of the disease are called active cases. Individuals who are infected, but who do not have clinical manifestations, are called carriers. Carriers and active cases can both transmit the infection to others.

Stage of Outcome

At this stage the disease may result in recovery, disability or death of the patient. For example, a child who fully recovers from a diarrheal disease, or is paralyzed from poliomyelitis, or dies from malaria, is in the stage of outcome. In the next study session you will learn how communicable diseases are classified, and about the main types of prevention and control measures.



1.1.3 Endemic and Epidemic Diseases.

Not all communicable diseases affect a particular group of people, such as a local community, a region, a country or indeed the whole world, in the same way over a period of time. Some communicable diseases persist in a community at a relatively constant level for a very long time and the number of individuals affected remains approximately the same. These communicable diseases are known as endemic to that particular group of people; for example, tuberculosis is endemic in the population of Ethiopia and many other African countries. By contrast, the numbers affected by some communicable diseases can undergo a sudden increase over a few days or weeks, or the rise may continue for months or years. When a communicable disease affects a community in this way, it is referred to as an epidemic. Malaria is endemic in some areas of Ethiopia, and it also occurs as epidemics due to an increase in the number of cases suddenly at the beginning or end of the wet season.

A Case refers to an individual who has a particular disease.

1.1.4 Prevention and Control Measures in Communicable Diseases

The health problems due to communicable diseases can be tackled by the application of relatively easy measures at different levels of the health system. Here, we will use some examples at the individual and community levels, which are relevant to your work as a Health Extension Practitioner. Some measures can be applied before the occurrence of a communicable disease to protect a community from getting it, and to reduce the number of cases locally in the future. These are called prevention measures. For example, vaccination of children with the measles vaccine is a prevention measure, because the vaccine will protect children from getting measles. Vaccination refers to administration of vaccines to increase resistance of a person against infectious diseases. Once a communicable disease occurs and is identified in an individual, measures can be applied to reduce the severity of the disease in that person, and to prevent transmission of the infectious agent to other members of the community. These are called control measures. For example, once a child becomes infected with measles, treatment helps reduce the severity of the disease, and possibly prevents the child's death, but at the same time it decreases the risk of transmission to other children in the community. In this context, treatment of measles is considered a control measure.

1.1.5. Communicable Diseases spread

Germ s that cause communicable diseases are found in and on people, animals, food, water, air, and dirt. Most of the germ s are carried in human "body fluids"-blood, mucus, saliva, vomit, stool, urine, and discharges from the eyes and skin lesions. Most communicable bug s are carried on the skin and hair.

Germ s spread when the body fluids of one person get into the body of another person. Most communicable bug s spread by getting onto the skin or hair.

Communicable diseases can be categorized by the way they spread:

- **Respiratory** diseases (e.g., colds) affect the head and chest. They are spread by:
 - coughing, sneezing, and breathing,
 - touching nasal mucus, saliva, and eye discharge.
- **Gastrointestinal** diseases (e.g., infectious diarrhea) affect the stomach and intestines. They are spread by:
 - touching stool, vomit, or contaminated surfaces,
 - eating food contaminated by stool,
 - drinking or bathing in water contaminated by stool.
- **Dermatologic** diseases (e.g., ringworm) affect the skin and hair. They are spread by:
 - touching skin or hair,
 - sharing items such as clothes, hats, towels, and hairbrushes that touch skin or hair.
- **Blood-borne** diseases (e.g., hepatitis B) affect the entire body. They are spread by:
 - getting blood onto broken skin,
 - receiving blood transfusions,
 - sharing needles used for injections, piercing, or tattoos,
 - having sexual contact that shares body fluids.

The majority of illnesses spread in early childhood programs are respiratory, gastrointestinal, and dermatologic diseases. The spread of blood-borne diseases is extremely rare.

Session1.2: Acute Flaccid Paralysis, Anthrax and Cholera

Specific objectives of the session

At the end of the session the participants will be able to:

- Assess Acute Flaccid Paralysis
- Assess Anthrax
- Assess Cholera

Trainer preparation

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

Questions and answers, discussion in plenary (case study)

Resources

- Reference material/handouts: Communicable Diseases Control Guidelines
- Other: MoH documents, markers, masking LCD projector

Evaluation/assessment

Questions and answers, trainer's observation

Trainer

Experienced with Communicable Diseases Control primary health care in Iraq

Estimated training time

1 hour and a half

Session Plan 2:

Objective	Content	Methods/ Activities
1.2.1 List Communicable Diseases for Immediate Notification (5 min)	<ul style="list-style-type: none"> • Acute Flaccid Paralysis • Anthrax • Cholera • Crimean-Congo Hemorrhagic Fever • Diphtheria • Influenza H1N1, H5N1 • Plague • Pertussis (whooping cough) • Acute poliomyelitis • Rabies • Rubella (germen measles) • Meningococcal disease • Malaria • Measles • Tetanus • Food poisoning 	Questions and answers
1.2.2 AFP (Acute Flaccid Paralysis) (15 min)	ICD-10 AFP AFP surveillance is surveillance for all suspected or possible polio cases. <ul style="list-style-type: none"> • Case classification <u>AFP case</u> <u>Contact</u> Types of AFP surveillance <ol style="list-style-type: none"> 1. <u>Routine surveillance for AFP (“zero reporting”)</u> 2. <u>Active surveillance for AFP</u> 3. <u>Active AFP case finding</u> <ul style="list-style-type: none"> • Key components to Acute Flaccid Paralysis surveillance • Key indicators of surveillance performance • Management of this disease 	Mini lecture

<p>1.2.3 Anthrax 1.2.3 a Define, Classify, Identify infectious agent and occurrence.</p> <p>(5 min)</p>	<p>ICD-10 A22 Identification (definition)</p> <ul style="list-style-type: none"> • Anthrax is an acute bacterial disease usually affecting the skin • Has an acute onset, several clinical forms: <ol style="list-style-type: none"> 1. Localized form (cutaneous) 2. Systemic forms • pulmonary (inhalation) • Gastro-intestinal • Meningeal <p>Case classification:</p> <ol style="list-style-type: none"> 1. <u>Suspected case</u>: compatible with clinical description, has an epidemiological link to a confirmed or suspected animal case, or contaminated animal product. 2. <u>Probable case</u>: a suspected case, has positive reaction to allergic skin test (in non-vaccinated individuals). 3. <u>Confirmed case</u>: Positive serology (PCR, ELISA, IFAT). <p>Laboratory criteria for diagnosis:</p> <ol style="list-style-type: none"> 1. Isolation of <i>Bacillus anthracis</i> 2. Demonstration of <i>B. anthracis</i> 3. Positive serology <p>Infectious agent : <i>Bacillus anthracis</i>, a gram-positive, encapsulated, spore forming, non-motile aerobic rod.</p> <p>Occurrence:</p> <p><u>Agricultural anthrax</u>: among-veterinarians, agricultural workers, butchers. <u>Industrials anthrax</u>: from exposure to contaminated wool, goat hair, or leather goods.</p>	<p>Mini lecture</p>
<p>1.2.3 b Explain reservoir, mode of transmission, incubation period, period of communicability, susceptibility and resistance</p> <p>(10 min)</p>	<p>Reservoir: Dried or processed skins and hides of infected animals may harbor spores for years. Spores also remain viable in contaminated soil for many years.</p> <p>Mode of transmission:</p> <ol style="list-style-type: none"> 1. Through skin lesions 2. Gastrointestinal anthrax 	<p>Discussion Lecture.</p>

1.2.2. Acute Flaccid Paralysis (AFP) Surveillance

ICD-10 AFP

It is an essential strategy of Polio Eradication Initiative (PEI), which aims to look for wild poliovirus circulation in the community, to investigate all possible polio cases. AFP surveillance is surveillance for all suspected or possible polio cases. Its purpose is to detect areas and groups where poliovirus transmission is occurring or likely to occur and to allow supplementary immunization to be focused where needed.

Case classification

AFP case: Any patient under 15 years of age with acute, flaccid paralysis, or any person of any age in whom a clinician suspects polio.

Contact: A contact is defined as a child less than 5 years of age who has been in direct contact with the index AFP cases within one week prior to the onset of paralysis and/or within two weeks after onset of paralysis.

Types of AFP surveillance

4. Routine surveillance for AFP (“zero reporting”)

Immediate notification of AFP in children <15 years of age is required. AFP should also be included in the weekly and monthly reporting system. When no case of AFP is detected, reporting units should still send weekly and monthly reports indicating zero cases.

5. Active surveillance for AFP

Active surveillance is a strategy to actively collect information by visiting health facilities. A designated person should make visits to sites likely to have cases of acute polio, such as hospitals and rehabilitation centers. An active surveillance focuses mainly on hospitals, because most children with sudden paralysis will be admitted to hospitals or end up in hospitals because of referral.

6. Active AFP case finding

Looking for AFP cases in the community.

Key components to Acute Flaccid Paralysis surveillance

- Detect and investigate all cases of AFP in children <15 years.
- Collect 2 stool specimens, collected at least 24 hours apart, within 14 days of onset of paralysis.
- Conduct virological testing of stool specimen *in WHO-accredited lab*.
- Conduct 60 day follow-up for residual paralysis.
- Classify cases according to WHO scheme.

Key indicators of surveillance performance

- Non-polio AFP rate (Target: 2/100000 population <15 years annually)
- 2 stool specimens collected more than 24 hours apart and within 14 days from date of onset of paralysis. Each specimen of adequate volume (8-10g), packed and shipped in a cold box, and arriving within 3 days of collection to the lab in good condition (Target: 80%)

1.2.2.d .Management of this disease¹

- One in 200 infections leads to irreversible paralysis, usually in the legs. This is caused by the virus entering the blood stream and invading the central nervous system. As it multiplies, the virus destroys the nerve cells that activate muscles. The affected muscles are no longer functional and the limb becomes floppy and lifeless – a condition known as acute flaccid paralysis (AFP). All cases of acute flaccid paralysis (AFP) among children under fifteen years of age are reported and tested for poliovirus within 48 hours of onset.
- Around 40% of people who survive paralytic polio may develop additional symptoms 15–40 years after the original illness. These symptoms – called post-polio syndrome – include new progressive muscle weakness, severe fatigue and pain in the muscles and joints.
- There is no cure for polio, only treatment to alleviate the symptoms. Heat and physical therapy is used to stimulate the muscles and antispasmodic drugs are given to relax the muscles. While this can improve mobility, it cannot reverse permanent polio paralysis.
- Polio can be prevented through immunization. Polio vaccine, given multiple times, almost always protects a child for life.

¹ The Global Polio Eradication Initiative, 2010. <http://www.polioeradication.org/Polioandprevention.aspx>

Anthrax²

ICD-10 A22

1.2.3. a. Identification

Anthrax is an acute bacterial disease usually affecting the skin, and rarely involving the respiratory or intestinal tracts. Most forms of the disease are lethal. Anthrax affects both humans and other animals. Anthrax has an acute onset characterized by several clinical forms. These include:

3. Localized form (cutaneous): skin lesion usually on an exposed part of the body such as the face, the neck or arm, evolving over 7 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by edema that may be mild to extensive.
4. Systemic forms
 - 4.1. pulmonary (inhalation), characterized by brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea, and high temperature, with Chest X-ray evidence of mediastinal widening.
 - 4.2. Gastro-intestinal: characterized by abdominal distress, with nausea, vomiting, anorexia and followed by fever.
 - 4.3. Meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms, commonly noted in all systemic infection.

Case classification:

4. Suspected case: A case that is compatible with the clinical description and has an epidemiological link to confirmed or suspected animal cases or contaminated animal product.
5. Probable case: A suspected case that has a positive reaction to allergic skin test (in non-vaccinated individuals)
6. Confirmed case: Positive serology (PCR, IFAT, ELISA)

Laboratory criteria for diagnosis:

4. Isolation of *Bacillus anthracis* from a clinical specimen (blood, lesions, discharges).
5. Demonstration of *B. anthracis* in a clinical specimen by microscopic examination of stained smears (vesicular fluid, blood, cerebrospinal fluid, pleural fluid, stools).
6. Positive serology (ELISA, Western blot, toxin detection, chromatographic assay, fluorescent antibody test (FAT)).

Note: It may not be possible to demonstrate *B. anthracis* in clinical specimen if the patient has been treated with antimicrobial agents.

² WHO Initiative for Vaccine Research (IVR): Zoonotic diseases, updated 2009.

http://www.who.int/vaccine_research/diseases/zoonotic/en/index1.html

Infectious agent

Bacillus anthracis, a gram-positive, encapsulated, spore forming, non-motile aerobic rod.

Occurrence

Cases of anthrax, 2000-2009

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cases	0	0	0	0	0	0	0	0	42	3

Agricultural anthrax occurs especially among veterinarians, agricultural workers and butchers, and industrial anthrax, resulting from exposure to contaminated sheep wool or goat hair that are processed into yarns used in the textile and carpet industry, as well as cattle hides that are processed into leather goods, or bones used for the manufacture of gelatin and/or fertilizer.

1.2.3 b. Reservoir

Dried or otherwise processed skins and hides of infected animals may harbor spores for years. Spores also remain viable in contaminated soil for many years.

Mode of transmission

1. Through skin lesions by contact with tissues of infected animals (cattle, sheep, goats, etc.)
2. Gastrointestinal anthrax: through ingestion of contaminated food (uncooked meat) or inhalation of spore-laden dust.

Incubation period

Most cases occur within 2-7 days of exposure; however, an incubation period of up to 60 days is possible.

Period of communicability

There is no evidence of direct spread from person to person. Articles and soil contaminated with spores may remain infective for years.

Susceptibility and resistance

The case fatality rate of cutaneous anthrax usually is about 20% if untreated. Systemic infection resulting from inhalation causes a case fatality rate of 100% and gastrointestinal causes death in 25% to 75 % of cases, if untreated. Recovery is usually followed by prolonged immunity.

1.2.3 c. Methods of control

Preventive measures:

- Educate employees who are handlers of potentially infected articles in the proper care of skin abrasions.
- Ensure proper ventilation in hazardous industries and use of protective clothing.
- Sterilize hair, wool or hides, bone meal or other feed of animal origin prior to processing.
- Use vaporized formaldehyde for terminal disinfection of textile mills contaminated with *B. anthracis*.
- Deeply bury carcasses with quicklime at site of death, if possible. Do not necropsy or burn on open field.
- Decontaminate soil or discharges with quicklime, or preferably bury deeply with carcass.
- Vaccinate all animal at risk, and revaccinate annually.

Control measures

- Treatment of the patient (penicillin is drug of choice, tetracycline, erythromycin, chloramphenicol, ciprofloxacin could be used).
- Arrange isolation of patient in hospital, soiled articles require pressure steam sterilization or incineration.
- Contacts tracing.

1.2.3.d .Management of the disease³

Mild uncomplicated cases

- In mild uncomplicated cases of cutaneous anthrax, penicillin V, 500 mg, taken orally every 6 hours for 5-7 days is adequate, but the treatment usually recommended is 3 to 7 days of intramuscular procaine penicillin, 600 mg (1 million units), every 12.24 hours or intramuscular benzyl penicillin (penicillin G), 250 000 units at 6 hourly intervals.
- Cutaneous lesions usually become sterile within the first 24 hours of such regimens but, although early treatment will limit the size of the lesion, it will not alter the evolutionary stages it must go through.

Severe or potentially life-threatening cases

- In severely affected patients or when pulmonary or gastrointestinal anthrax is suspected, the initial treatment is penicillin G, 1200 mg (2 million units) per day by infusion or by slow intravenous injection (<300 mg/min) every 4-6 hours until the patient's temperature returns to normal; at this point treatment should continue in the form of intramuscular procaine penicillin administered as described above. Streptomycin, 1.2 g per day intramuscularly, may act synergistically with penicillin.
- General measures for treatment of shock may be life saving since death is due, at least in part, to toxin-induced shock. Intubation, tracheotomy or ventilatory support

³ WHO. "Guidelines for the Surveillance and Control of Anthrax in Humans and Animals." 3rd Edition. 2012. <http://www.who.int/csr/resources/publications/anthrax/WHO EMC ZDI 98 6/en/>

may be required in the event of respiratory problems, and vasomotor support with dopamine may be necessary when there is hemodynamic instability.

- Primary hematological, renal or liver function disorders are not generally seen.

Alternatives to penicillin

- In the event of allergy to penicillin, several antibiotics are effective alternatives, including tetracyclines, chloramphenicol, gentamicin and erythromycin. Of the tetracycline family, tests in animals have indicated doxycycline is very effective and that the quinolone, ciprofloxacin may also be suitable.
- Trimethoprim is not effective.

Note: Coordination between Agriculture and Health Ministries is essential.

Ref: WHO Initiative for Vaccine Research (IVR): Zoonotic diseases, updated 2009.

http://www.who.int/vaccine_research/diseases/zoonotic/en/index1.html



A skin lesion caused by anthrax

⁴ CDC/ James H. Steele

1.3.1. Cholera

ICD-10 A00

1.3.1.a .Identification

Cholera is an acute bacterial enteric disease characterized in its severe form with sudden onset, profuse painless watery stools (rice-water stool), nausea and profuse vomiting. Spasmodic abdominal pain might occur. Severe muscle cramps in extremities may be due to electrolyte disturbance. In untreated cases, rapid dehydration, acidosis, circulatory collapse, hypoglycemia in children and renal failure may occur. Death results within a few hours in 50% of severe cases, however, if proper treatment is started early, mortality may reach only 1%.

Cholera is essentially the only diarrheal disease where patients can become severely dehydrated in less than six hours. No one who arrives at a treatment center and is still breathing should die of cholera.

Case classification

1. Suspected case: Any case complains of acute watery diarrhea without pain, +/- vomiting, regardless of patient age.
2. Probable case: Any suspected case with severe dehydration, or death due to acute watery diarrhea.
3. Confirmed case: A suspected case with isolation of *Vibrio cholera* O1 or O139 from stools.
4. Carrier: Asymptomatic person *Vibrio cholera* isolated from his or her stool

Infectious agent

Vibrio cholerae serogroup O1 and O139. Serogroup O1 occurs as two biotypes- classical and El Tor- each of which occurs as 3 serotypes (Inaba, Ogawa and rarely Hikojima). A serogroup is defined by its agglutination with a specific antiserum. If the strain does not agglutinate with the antisera; it is known as a non-O1, non-O139 *vibrio cholera* (NAG). The cholera toxin is primarily responsible for fluid loss.

Occurrence

Cholera is one of the oldest and best-understood epidemic diseases. Epidemics and pandemics are strongly linked to the consumption of unsafe water and food, poor hygiene, poor sanitation and crowded living conditions.

1.3.1.b. Reservoir

Humans only.

Mode of transmission

Consumption of food or water contaminated directly or indirectly with stool or vomitus of a case (e.g. stored unsafe water in highly populous areas because bacteria can stay in water for a long time).

Incubation period

From few hours to 5 days. Range 1-3 days.

Period of communicability

As long as stools are positive, usually only a few days after recovery.

Susceptibility and resistance

Variable; gastric achlorhydria increases the risk of illness, and breastfed infants are protected. Severe cholera occurs significantly more often among persons with blood group O. Infection with either *V.cholera* O1 or O139 results in a rise in agglutinating and antitoxic antibodies, and increased resistance to re-infection.

1.3.1. c. Methods of control

Preventive measures

- Simple improvement in water, hygiene, and sanitation can significantly reduce the incidence of cholera and other diarrheal diseases.
- Wash hands with soap after using toilets and latrines, before preparing food, and before eating.
- Boil water or disinfect water with chlorine solution.
- Only eat freshly cooked food.
- Do not defecate near water sources.
- Use latrines and keep them clean.
- Encourage breastfeeding throughout infancy; boil all milk and water used for infant feeding.

Control measures

All cases should be reported by health care providers.

Surveillance procedures:

- Reporting: patients with suspected or confirmed cholera should be reported immediately to DSU, GSU, and CSU.
- Case investigation: all suspected cases should be immediately investigated by DSU in collaboration with the Communicable Disease Program. Case investigation forms should be completed and immediately sent to the Communicable Disease Program and CSU. It is important to coordinate surveillance efforts with the Central Public Health Laboratory to ensure appropriate collection and handling of laboratory specimens.

Laboratory procedure: Fresh stool samples taken in Cary-Blair media and cultures in alkaline peptone water should be sent at room temperature to common labs for a maximum of 6 hours.

Data analysis: Routine weekly and monthly reporting of aggregate data is recommended from peripheral level to intermediate and central levels. Immediate notification for every case to CSU is required. Zero reporting is mandatory when there is no case.

Actions to be taken:

- The most important action for managing patients with cholera and other severe dehydrating diarrheal diseases is rapid and appropriate rehydration to make up for the fluid losses that have occurred prior to coming for treatment, and maintenance hydration to compensate for the ongoing fluid losses. This is done by either ORS or intravenous fluids according to dehydration status.
- **For cases:** Oral rehydration therapy is the main stay of therapy for patients with acute watery diarrhea. Antimicrobial therapy is an important adjunct to oral rehydration therapy of patient with cholera.
- **For contacts:** Surveillance for acute disease should be conducted among contacts who shared food or water with cholera patients. In settings where household transmission is likely, contacts should be treated with prophylactic antibiotics.

Epidemic measures

Health education and improving sanitation are effective containment measures.

Disaster implications

Outbreak risks are high in endemic areas if large groups of people are crowded together without a sufficient quantity of safe water, adequate food handling, or sanitary facilities.

International measures

1. Governments are required to report cholera cases due to *V.cholera* O1 and O139, and outbreaks or epidemics of acute watery diarrhea, to WHO when they are unusual or unexpected, or when they present significant risk of international spread or of international travel or trade restrictions (International Health Regulations 2005).
2. International regulations states that information should include number of new cases, number of deaths, age distribution, and hospital admissions.
3. Measures applicable to ships, aircraft and land transport arriving from cholera areas are to be applied within the framework of the revised International Health Regulations 2005.
4. International travelers: cholera vaccination proof is not required as a condition for entry by any country.

1.3.1 d. Management of the disease⁵

- Efficient treatment resides in prompt rehydration through the administration of oral rehydration salts (ORS) or intravenous fluids, depending of the severity of cases. Up to 80% of patients can be treated adequately through the administration of ORS (WHO/UNICEF ORS standard sachet).
- Very severely dehydrated patients are treated through the administration of intravenous fluids, preferably Ringer lactate. Appropriate antibiotics can be given to severe cases to diminish the duration of diarrhea, reduce the volume of rehydration fluids needed and shorten the duration of *V. cholerae* excretion.
- For children up to five years, supplementary administration of zinc⁶ has a proven effective in reducing duration of diarrhea as well as reduction in successive diarrhea episodes. In order to ensure timely access to treatment, cholera treatment centers should be set up among the affected populations whenever feasible.



A person with severe dehydration due to cholera - note the sunken eyes and decreased skin turgor which produces wrinkled hands.

⁵ WHO. "Prevention and control of cholera outbreaks: WHO policy and recommendations." 2012. <http://www.who.int/cholera/technical/prevention/control/en/index4.html>

⁶ <http://phil.cdc.gov>

Session 1.3: Assess Crimean-Congo Hemorrhagic Fever, Diphtheria, Influenza H1n1, H5n1 and Plague.

Specific objectives of the session

At the end of the session the participants will be able to:

- ASSESS CRIMEAN-CONGO HEMORRHAGIC FEVER
- ASSESS DIPHTHERIA
- ASSESS INFLUENZA H1N1, H5N1
- ASSESS PLAGUE

Trainer preparation

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

Questions and answers, discussion in plenary (case study)

Resources

- Reference material/handouts: Communicable Diseases Control Guidelines
- Other: MoH documents, markers, masking LCD projector

Evaluation/assessment

Questions and answers, trainer's observation

Trainer

Experienced with Communicable Diseases Control primary health care in Iraq

Estimated training time

1 hour and a half

<p>1.3.1 c describe methods of control, laboratory procedures, epidemic measures, disaster implications, international measures (10 min)</p> <p>1.3.1 d Explain Clinical Management (5 min)</p>	<p>3-12 days. Depends on the mode of acquisition of the virus</p> <p>Period of communicability :</p> <p>Cattle, sheep and goats, are viromic for around 1 week after becoming infected.</p> <p>Susceptibility and resistance: Recovery is slow, begins on the 9-10 day after the onset of illness. Case fatality rates in hospitalized patients, from 9% to as high as 50%.</p> <p>Methods of control</p> <ol style="list-style-type: none"> 1. Case detection 2. Isolate suspected human cases 3. Tics control measures 4. Check for the close contacts 5. Rapid information to veterinary department <p>Management of the disease:</p> <ol style="list-style-type: none"> 1. General supportive therapy is the main stray. 2. The antiviral drug (ribavirin): oral, intravenous. 3. The value of immune plasma. 	<p>Brain storming.</p> <p>Discussion.</p>
---	---	---

<p>1.3.2. Diphtheria 1.3.2. a Define, Classify, Identify infectious agent and occurrence. (10 min)</p>	<p>ICD-10 A36 Identification : Upper respiratory tract illness with laryngitis or pharyngitis or tonsillitis, plus adherent membranes on tonsils or nasopharynx Case classification</p> <ol style="list-style-type: none"> 1. Suspected case: not applicable. 2. Probable case: case that meets the clinical description. 3. Confirmed case: probable case confirmed by laboratory (isolation of C.diftiriae) from a clinical specimen, or epidemiologically linked to confirmed case. 4. Carrier: presence of C.diftiraea in nasopharynx, but no symptoms. This case should not be reported as a probable or confirmed case. <p>Infectious agent: Bacterium Corynebacterium diphtheriae Occurrence:</p> <ul style="list-style-type: none"> • Defteria is endemic in Iraq. • Look relevant table. 	<p>Mini Lecture.</p>
<p>1.3.2. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance (10 min)</p>	<p>Reservoir: Humans are the only known reservoirs. Mode of transmission:</p> <ul style="list-style-type: none"> • Contact (usually direct, rarely indirect) with respiratory droplet of a case or carrier. • Rarely through foodstuffs (raw milk as a vehicle). <p>Incubation period: Usually 2-5 days, or longer. Period of communicability :</p> <ul style="list-style-type: none"> • Untreated patients-for 2-3weeks. • Rarely chronic cases-for 6 months, or more. • Usually not contagious 48 hours after antibiotics initiation. <p>Susceptibility and resistance : Those who are not completely immunized and have been exposed to a carrier or diseased person. Methods of control:</p>	<p>Discussion Lecture.</p>

<p>1.3.2. c describe methods of control, epidemic measures,</p> <p>(10 min)</p>	<ul style="list-style-type: none"> • Immunization (primary prevention). • Rapid investigation and treatment of contacts (secondary prevention of spread). • Early diagnosis, case management (tertiary prevention of complications and deaths). <p>Epidemic measures:</p>	<p>Brain storming.</p>
<p>1.3.2. d Explain Clinical Management</p> <p>(10 min)</p>	<p>Do not wait for laboratory results before starting treatment/control activities.</p> <p><u>Case management:</u> Antibiotic treatment with antitoxin, initiated immediately -for a total period of 14 days.</p> <p><u>Close contacts:</u></p> <ul style="list-style-type: none"> • Surveillance for 7 days for all persons with close contact, regardless of vaccination status. • All must receive single dose of benzethine penecilline. • Adult contacts must avoid contact with children. 	<p>Discussion.</p>
<p>1.3.3. Influenza H1N1, H5N1</p> <p>(10 min)</p>	<p>ICD-10 J09: Avian ICD-10 J10: Seasonal ICD-10 J11: Virus Not Identified</p> <p>Identification Viral infection that affects mainly the nose, throat, bronchi and, occasionally, lungs.</p> <p>Case classification Confirmed case: a person with an acute respiratory illness, laboratory confirmed influenza A (H1N1) by viral culture, or four-fold rise in swine influenza A (H1N1) virus-specific neutralizing antibodies.</p>	
<p>1.3.3. a Define, Classify, Identify infectious agent and occurrence.</p> <p>20min.</p> <p>(10 min)</p>	<p>Suspected case: a person with acute febrile respiratory illness, onset within 7 days of close contact with a person, who is a confirmed case of influenza A (H1N1) virus infection.</p> <p>Close contact: a person within about 6 feet of an ill person who is a confirmed or suspected case of influenza A (H1N1) virus infection.</p> <p>Infection agent : Influenza viruses</p> <p>Occurrence: Annual outbreaks of influenza occur most commonly during autumn and winter months.</p>	<p>Mini Lecture.</p>

<p>1.3.3. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance</p> <p>(10 min)</p>	<p>Reservoir: H1N1 infects birds, people. All birds are thought to be susceptible to infection.</p> <p>Mode of transmission: Transmitted from person to person via droplets and aerosols produced when infected people cough or sneeze.</p> <p>Incubation period: About 2 days</p> <p>Period of communicability : Persons with pandemic influenza A (H1N1) virus infection should be considered potentially contagious for up to 7 days following illness onset</p> <p>Susceptibility and resistance:</p> <ul style="list-style-type: none"> • Most people recover from H1N1. • Large numbers might need hospital treatment. • Some may die due to complications: children younger than age two, adults age 65 or older, People of any age with chronic heart, respiratory illnesses. <p>Methods of control :</p> <p>Preventive measures</p> <p>Management:</p> <p>-Mild illness: -Pregnant women: -Infants and very young children: -In general: -In hospital:</p>	<p>Discussion Lecture.</p> <p>Brain storming.</p> <p>Discussion.</p>
<p>1.3.3. c Describe methods of control</p> <p>(10 min)</p>		
<p>1.3.3. d Explain Clinical Management.</p> <p>(10 min)</p>		

<p>1.3.4. Plague</p> <p>1.3.4. a Define, Identify infectious agent and occurrence. (10 min)</p> <p>1.3.4. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance (10 min)</p> <p>1.3.4. c Describe methods of control. (10 min)</p> <p>1.3.4. d Explain clinical management. (5 min)</p>	<p>ICD-10 A20</p> <p>Identification A specific zoonosis disease characteristic with rapid onset of fever, chills headache, severe malaise prostration</p> <p>Infectious agent : <i>Yersinia pestis</i>, the plague bacillus</p> <p>Occurrence: There have been no reported cases in Iraq.</p> <p>Reservoir:</p> <ul style="list-style-type: none"> ▪ Wild rodents ▪ Rabbits, hares and domestic cats <p>Mode of transmission:</p> <ul style="list-style-type: none"> ▪ Transmitted from rodent to human ▪ Human-to-human transmission <p>Incubation period: From 1-7 days</p> <p>Period of communicability: Patients with pneumonic plague are infectious until completion of at least 48 hours of appropriate antibiotic therapy</p> <p>Susceptibility and resistance:</p> <ul style="list-style-type: none"> • <i>Y. pestis</i> is extremely virulent organism mostly impair the host innate immunity response <p>Methods of control: Report immediately. Use a safe pesticide to rid the patient of flees. Hospitalize& isolate the case. Concurrent disinfection of sputum, purulent discharges and solid articles. Terminal clean.</p> <p>Management of the disease:</p> <ul style="list-style-type: none"> ▪ Specific therapy: <i>Aminoglycosides</i> ▪ Supportive therapy: ▪ Treatment of plague during pregnancy and in children: ▪ Prophylactic therapy: ▪ Hospital precautions: 	<p>Mini Lecture. 15min.</p> <p>Discussion Lecture.</p> <p>Brain storming.</p> <p>Discussion.</p>
---	--	--

1.3.1 .Crimean-Congo Hemorrhagic Fever

ICD-10 A98

1.3.1 a. Identification

A viral disease with sudden onset of fever, malaise, weakness, irritability, headache, pain in limbs and bleeding tendency manifested at fourth day of illness, which may include epistaxis, bleeding gum, G.I.T or urogenital tract bleeding, echymosis and purpura (spots with bruising patches on skin), and bleeding from the site of injection.

Case definitions

Suspected case: Fever with acute hemorrhagic symptoms with history of contact with animal.

Probable case: Suspected case plus history of contact with confirmed human case.

Confirmed case: Suspected case with laboratory confirmatory tests. Diagnosis confirmed by C.F.T, IFAT, ELISA.

Infectious agent

The Crimean-Congo hemorrhagic fever virus (*Bunyaviridae Nairovirus*)

Occurrence

Situation analysis in Iraq of HF, 2000 – 2011

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	4	6	6	2	2	0	0	3	0	2	10	6

In 2010, an outbreak in Ninawa province occurred. No. of confirmed cases were 10 and one case occurred in Duhok province. 3 of these cases died. Death rate is 10 – 30% in Iraq.

1.3.1 b. Reservoir

Tick (*Hyalomma marginatum*) are both a reservoir and a vector, domestic animals (sheep, goats and cattle) may act as amplifying transmission host during epizootics.

Mode of transmission

4. By bite of infective *Hyalomma marginatum*.
5. Nosocomial infection.
6. Butchering infected animal: spread by infected fluid especially blood through direct contact with injured or scratch human skin.

Incubation period

3-12 days. Depends on the mode of acquisition of the virus. With tick bite: 1 to 3 days, up to 9 days. Following contact with infected blood or tissues: 5 to 6 days, upto12 days.

Period of communicability

Domestic animals, such as cattle, sheep and goats, are viremic (virus circulating in the bloodstream) for around one week after becoming infected with ticks.

Susceptibility and resistance

Recovery is slow, begins on the ninth or tenth day after the onset of illness. Case fatality rates in hospitalized patients have ranged from 9% to as high as 50%.

1.3.1 c. Methods of control⁷

1. Case detection and report to Health Department in the province within 24 hours by telephone or E-mail and also to CDC.
2. Isolate suspected human cases and confirmed cases in the hospitals with control measures to protect medical and paramedical contacts.
3. Tics control measures
4. Check for the close contacts in patient's house under medical supervision by nearby PHC. Contacts with tissue or blood exposure from patients with suspected or confirmed cases should be followed up with daily temperature and symptom monitoring for at least 14 days after the exposure.
5. Rapid information to veterinary department to take action by using tick insecticides on the infested animal at the patient's house.

1.3.1 d. management of the disease⁸

- General supportive therapy is the mainstay of patient management in CCHF. Intensive monitoring to guide volume and blood component replacement is required.
- The antiviral drug ribavirin has been used in treatment of established CCHF infection with apparent benefit. Both oral and intravenous formulations seem to be effective.
- The value of immune plasma from recovered patients for therapeutic purposes has not been demonstrated, although it has been employed on several occasions.

Ref: WHO Initiative for Vaccine Research (IVR): updated 2009.
http://www.who.int/csr/disease/crimean_congoHF/en/index.html

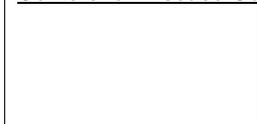
⁹

Isolated male patient diagnosed with Crimean-Congo hemorrhagic fever

⁷ WHO Initiative for Vaccine Research (IVR): updated 2009.
http://www.who.int/csr/disease/crimean_congoHF/en/index.html

⁸ WHO. "Crimean-Congo haemorrhagic fever." November 2001.
<http://www.who.int/mediacentre/factsheets/fs208/en/>

⁹ Centers for Disease Control and Prevention's Public Health Image Library (PHIL)



1.3.2 .Diphtheria

ICD-10 A36

1.3.2.a Identification

Upper respiratory tract illness with laryngitis or pharyngitis or tonsillitis, plus adherent membranes on tonsils or nasopharynx.

Case classification

1. Suspected case: not applicable.
2. Probable case: Case that meets the clinical description
3. Confirmed case: Probable case confirmed by laboratory (isolation of *C. diphtheriae* from a clinical specimen), or epidemiologically linked to a laboratory-confirmed case.
4. Carrier: presence of *C. diphtheriae* in nasopharynx but no symptoms. **NOTE: persons positive with *C. diphtheriae* identification but who do not meet the clinical descriptions (asymptomatic carriers) should NOT be reported as probable or confirmed cases.**

Infectious agent

Bacterium *Corynebacterium diphtheriae*

Occurrence

Diphtheria is endemic in Iraq¹⁰.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	34	33	-	-	17	6	6	3	6	13	2	4

1.3.2.b Reservoir

Humans are the only known reservoirs.

Mode of transmission

- Contact (usually direct, rarely indirect) with the respiratory droplets of a case or carrier
- In rare cases, the disease may be transmitted through foodstuffs (raw milk has served as a vehicle)

Incubation period

Usually 2-5 days, occasionally longer.

¹⁰

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

Period of communicability

Untreated patients are infectious for 2 to 3 weeks - until virulent bacilli have disappeared from discharges and lesions. The rare chronic carrier can shed bacilli for 6 months or more. The disease is usually not contagious 48 hours after antibiotics are instituted.

Susceptibility and resistance

People most susceptible to infection are those who are not completely immunized and have been exposed to a carrier or diseased individual.

1.3.2 c. Methods of control.

The control of diphtheria is based on 3 measures:

1. Ensuring high population immunity through vaccination (primary prevention).
2. Rapid investigation and treatment of contacts (secondary prevention of spread).
3. Early diagnosis and proper case management (tertiary prevention of complications and deaths).

Preventive measures (Immunization)

- Doses of 0.5 ml DTP intramuscularly in outer part of thigh, according to national schedule
- If immunization is started later, there must still be an interval of 4 weeks between doses.
- Immunization to be completed preferably before the age of 6 months (26 weeks).
- DTP vaccine must be stored between +2°C and +8°C.
- DTP vaccine can be given to immunocompromised children up to 7 years old; Td vaccine can be given to immunocompromised adults.

Control measures (Case management)

Diphtheria antitoxin and antibiotic therapy are the cornerstone of therapy for diphtheria. The antibodies only neutralize toxin before its entry into cells, and is therefore critical that diphtheria antitoxin be administered as soon as a presumptive diagnosis has been made.

Antibiotic therapy, by killing the organism, has three benefits:

- The termination of toxin production
- Amelioration of the local infection
- Prevention of spread of the organism to uninfected persons

Do not wait for laboratory results before starting treatment / control activities.

Patients

Diphtheria antitoxin IM (20,000 to 100,000 units) in a single dose, immediately after throat swabs have been taken. Procaine penicillin G IM (25,000 to 50,000 units/kg/day for children; 1.2 million units/day for adults in 2 divided doses) **or** parenteral erythromycin (40-50 mg/kg/day with a maximum of 2 g/d) until the patient can swallow; **then** Oral penicillin V (125-250 mg) in 4 doses a day, **or** oral erythromycin (40-50 mg/kg/day with a

maximum of 2 g/d) in 4 divided doses. ***Antibiotic treatment should be continued for a total period of 14 days.*** Isolation: strict (pharyngeal diphtheria) or contact (cutaneous diphtheria) for 14 days. *Note:* Clinical diphtheria does not necessarily confer natural immunity, and patients should therefore be vaccinated before discharge from a health facility.

Close Contacts

Surveillance for 7 days for all persons with close contact, regardless of vaccination status, and throat culture. All must receive a single dose of benzathine penicillin G IM (600,000 units for children < 6 years; 1.2 million units for 6 years or older). If culture is positive, give antibiotics as for patients above.

Carriers

All must receive a single dose of benzathine penicillin G IM (600,000 units for children < 6 years; 1.2 million units for 6 years or older).

Epidemic measures

- Inform the Health Authorities if one or more suspected cases are identified.
- Confirm the suspected outbreak, following WHO guidelines.
- Investigate any probable case: check if it fulfills the case definition, record date of onset, age and vaccination status.
- Confirm the diagnosis: collect both nasal and pharyngeal swabs for culture and swabs from any wounds or skin lesions. If appropriate facilities are available, determine the biotype and toxigenicity of *C. diphtheriae*.
- Identify close contacts and define population groups at high risk. Adult contacts must avoid contact with children and must not be allowed to undertake food handling until proven not to be carriers.
- Implement outbreak response measures. Give priority to case management and immunization of population in areas not yet affected where the outbreak is likely to spread.
- Immunize the population at risk as soon as possible, especially children. In an epidemic involving adults, immunize groups that are most affected and at highest risk. Repeat immunization procedures 1 month later to provide at least 2 doses to recipients.
- In epidemic situations, preferably Td vaccine (a combination of diphtheria and tetanus toxoids with reduced diphtheria content) should be given.
- To ensure safety of injection during immunization, auto disable syringes and safety boxes are recommended. Safe disposal of used sharps should be ensured.

1.3.2 d. Management of the disease¹¹

Case Management

- If diphtheria is strongly suspected, specific treatment with antitoxin and antibiotics should be initiated immediately.
- ***Do not wait for laboratory results before initiating treatment.***
- I.M. antitoxin is the mainstay of treatment: 20 000 to 100 000 units in a single dose, immediately after throat swabs have been taken.
- Antibiotics are necessary to eliminate the organism and prevent spread; they are not a substitute for antitoxin treatment.
- Recommended dose regimens are:
 - procaine penicillin IM (25 000 to 50 000 units/kg/day for children; 600 000 units/kg/day for adults in 2 divided doses) **or** parenteral erythromycin (40-50 mg/kg/day) with a maximum of 2 g/d until the patient can swallow **then**
 - oral penicillin V (125-250 mg) in 4 doses a day **or** erythromycin (40-50 mg/kg/day in 4 divided doses)
- Antibiotic treatment should be continued for 14 days
- *Note: Clinical diphtheria does not necessarily confer natural immunity, and patients should therefore be vaccinated before discharge from a health facility*

Management of close contacts

- Close contacts include household members and other persons with a history of direct contact with a case, as well as health care staff exposed to oral or respiratory secretions of a case
- All should be clinically assessed for symptoms and signs of diphtheria and kept under daily surveillance for 7 days from last contact with the case
- Adult contacts must avoid contact with children and must not be allowed to undertake food handling until proven not to be carriers
- All must receive a single dose of benzathine penicillin G IM (600 000 units for children)

¹¹ WHO. "Communicable Disease Toolkit Iraq Crisis: Case Management of Epidemic-Prone Diseases" March 2003. <http://www.who.int/infectious-disease-news/IDdocs/whocds200317/7casemg.pdf>

1.3.3. Influenza H1N1, H5N1

ICD-10 J09: Avian

ICD-10 J10: Seasonal

ICD-10 J11: Virus Not Identified

1.3.3 a Identification

Viral infection that affects mainly the nose, throat, bronchi and, occasionally, lungs. Although uncomplicated influenza-like illness (fever, cough or sore throat) has been reported in many cases, mild respiratory illness (nasal congestion, rhinorrhea) without fever and occasional severe disease also has been reported. Other symptoms reported with swine influenza A virus (H1N1) infection include vomiting, diarrhea, myalgia, headache, chills, fatigue, and dyspnea. Conjunctivitis is rare, but has been reported. Severe disease (pneumonia, respiratory failure) and fatal outcomes have been reported with swine influenza A virus infection.

Case classification

Confirmed case: of influenza A (H1N1) virus infection: a person with an acute respiratory illness with laboratory confirmed influenza A (H1N1) virus infection at CDC by viral culture or four-fold rise in swine influenza A (H1N1) virus-specific neutralizing antibodies.

Suspected case: of influenza A (H1N1) virus infection: a person with acute febrile respiratory illness with onset within 7 days of close contact with a person who is a confirmed case of influenza A (H1N1) virus infection.

Close contact: a person within about 6 feet of an ill person who is a confirmed or suspected case of influenza A (H1N1) virus infection.

Infection agent

Influenza viruses: Type A, B and C. Most common cause of annual outbreaks and epidemics are Type A and B.

Influenza A virus subtypes reported in severe epidemics includes avian H5N1, H7, and swine H1N1 and H3N2 viruses.

Occurrence

Annual outbreaks of influenza occur most commonly during autumn and winter months.

Influenza A can cause severe epidemics (as well as severe worldwide epidemics; or pandemics) among all ages. Influenza B viruses in general are associated with less severe epidemics (chiefly among children) than influenza A viruses, they have not caused pandemics. Influenza C virus causes only mild disease and has not been associated with widespread epidemics or pandemics.

1.3.3. b Reservoir

Influenza type A infects multiple species including people, birds, pigs, horses, and other animals. Wild birds are the natural hosts for these viruses. All birds are thought to be susceptible to infection with avian influenza, though some species are more resistant to infection than others. Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics.

Influenza B viruses are usually found only in humans.

Mode of transmission

Seasonal Influenza or pandemic H1N1 is transmitted from person to person via droplets and aerosols produced when infected people cough or sneeze.

Avian influenza A (H5N1) virus transmission occur through bird-to-human: Direct contact with infected poultry, or with surfaces and objects contaminated by their droppings, is the main route of transmission to humans.

Incubation period

About 2 days

Period of communicability

Persons with pandemic influenza A (H1N1) virus infection should be considered potentially contagious for up to 7 days following illness onset. Persons who continue to be ill longer than 7 days after illness onset should be considered potentially contagious until symptoms have resolved. Children, especially younger children, may be contagious for longer periods.

Non-hospitalized ill persons or are confirmed or suspected cases of swine influenza A (H1N1) virus infection are recommended to stay at home (voluntary isolation) for at least the first 7 days after illness onset except to seek medical care.

Susceptibility and resistance

Annual outbreaks of influenza are due to minor changes in the surface proteins of the viruses that enable the viruses to evade the immunity humans have developed after previous infections with the viruses or in response to vaccinations. When a major change in either one or both of their surface proteins occurs spontaneously, no one will have partial or full immunity against infection because it is a completely new virus. If this new virus also has the capacity to spread from person-to-person, then a pandemic is most likely to occur.

While most people recover from a bout of influenza, there are large numbers of people who need hospital treatment and some may die due to complications especially children younger than age two, adults age 65 or older, and people of any age with chronic heart and respiratory illnesses.

1.3.3. c Methods of control

Preventive measures

- People should cover their mouth and nose with a tissue when coughing, and wash their hands regularly.
- The most effective way to prevent the disease or severe outcomes from the illness is vaccination. Vaccination should be considered for high-risk groups.

1.3.3.d Management of the disease¹²

- Mild illness continues to characterize most cases, and basic supportive care (to relieve aches or fever) is sufficient for most people. However, health care providers should give all of their patient's guidance on how to recognize signs of progressive illness, and when to seek medical attention.
- For pregnant women, WHO advises early antiviral treatment for suspected or confirmed pandemic influenza illness?
- Infants and very young children (those under 2 years of age), especially those with underlying conditions, should also be treated with antiviral medication if warning symptoms arise.
- In general, antiviral treatment recommendations are:
 - Patients who have severe or progressive illness should be treated with antiviral medication as soon as possible.
 - People with mild symptoms but who are at higher risk for severe illness (e.g. pregnant women, infants and young children, and those with chronic lung problems) should start antiviral treatment as soon as possible.
 - Antiviral treatment is not necessary for people have uncomplicated, or mild, illness and are not in a high risk group for severe illness.
 - Mothers who are breastfeeding can continue breastfeeding while ill and receiving antiviral treatment.
- In hospital settings, health providers should monitor oxygen levels closely and supplement oxygen as needed, following guidelines. When pneumonia is present patients should be treated with both antiviral medication and antibiotics as early as possible.

¹² WHO. "Clinical management of human infection with pandemic (H1N1). November 2009. http://www.who.int/csr/resources/publications/swineflu/clinical_management_h1n1.pdf

1.3.4 Plague

ICD-10 A20

1.3.4 a Identification

A specific zoonosis disease characteristic with rapid onset of fever chills headache, severe malaise prostration. The disease can occur in 3 forms: 1) Bubonic form: extreme painful swelling of lymph glands (buboes); 2) Pneumonic form: cough with blood- stained sputum, chest pain, and difficult breathing; and 3) Sepsis: circulatory collapse, coagulopathy, hemorrhage, respiratory distress, shock, and organ failure, leading to death.

The disease involves rodents (reservoir) and their fleas (vector) which transfer the bacterial infection to various animals and to people.

Laboratory diagnosis: microscopic finding of the gram-negative bipolar coccobacilli in clinical specimen (bubo aspirate, sputum, tissue or blood) or antigen or antibody detection in clinical specimens using IFAT, ELISA.

Note: It is subjected to international health regulation.

Infectious agent

Yersinia pestis, the plague bacillus.

Occurrence

There have been no reported cases in Iraq.

1.3.4 b Reservoir

- Wild rodents are the natural vertebrate reservoir of plague.
- Rabbits, hares and domestic cats may also be a source of infection.

Mode of transmission

- Transmitted from rodent to human by the bite of an infected flea vector.
- Human-to-human transmission comes from inhalation of infected droplets spread by coughing patients with plague pneumonia or pharyngitis or by direct contact with pus from suppurating buboes.

Incubation period

From 1-7 days; may be a few days longer in immunized individuals. For primary plague pneumonia, usually shorter.

Period of communicability

Fleas may remain infective for months under suitable conditions of temperature and humidity. The most communicable form is pneumonic plague; overcrowding facilitates transmission. Patients with pneumonic plague are infectious until completion of at least 48 hours of appropriate antibiotic therapy. Patients with draining buboes are communicable until lesions are surgically excised or heal.

Susceptibility and resistance

Y. pestis is extremely virulent organism mostly results from its virulence factors that impair the host innate immunity response. The case fatality rate is close to 50-100% if no antibiotic treatment is given within the first 48 hours following symptoms onset.

1.3.4.c. Methods of control¹³

1. Report to local health authority, CDC urgently by phone or e-mail.
2. Use a safe insecticide to rid the patient (including clothing and baggage) of fleas.
3. Hospitalize & isolate the case.
4. Concurrent disinfection of sputum, purulent discharges and soiled articles.
5. Terminal clean.
6. Handle bodies of plague victims with strict aseptic precautions.
7. Streptomycin is the drug of choice, gentamycin could be used when streptomycin is not available, tetracyclines and chloramphenicol are alternative choices.
8. Investigation of the contacts and search for the source of infection.

1.3.4. d. Management of the disease ¹⁴

- When a diagnosis of human plague is suspected on clinical and epidemiological grounds, appropriate specimens for diagnosis should be obtained immediately and the patient should be started on specific antimicrobial therapy without waiting for a definitive answer from the laboratory.
- Suspect plague patients with evidence of pneumonia should be placed in isolation, and managed under respiratory droplet precautions.
- **Specific therapy**
 - **Aminoglycosides: streptomycin and gentamicin:** Streptomycin is the most effective antibiotic against *Y. pestis* and the drug of choice for treatment of plague, particularly the pneumonic form. Therapeutic effect may be expected with 30 mg/kg/day (up to a total of 2 g/day) in divided doses given intramuscularly, to be continued for a full course of 10 days of therapy or until 3 days after the temperature has returned to normal. Gentamicin has been found to be effective in animal studies, and is used to treat human plague patients.

¹³ WHO Initiative for Vaccine Research (IVR): Zoonotic diseases, updated 2009.
http://www.who.int/vaccine_research/diseases/zoonotic/en/index1.html

- **Supportive therapy**
 - The clinician must prepare for intense supportive management of plague complications, utilizing the latest developments for dealing with Gram-negative sepsis. Aggressive monitoring and management of possible septic shock, multiple organ failure, adult respiratory distress syndrome (ARDS) and disseminated intravascular coagulopathy should be instituted.
- **Treatment of plague during pregnancy and in children**
 - With correct and early therapy, complications of plague in pregnancy can be prevented. The choice of antibiotics during pregnancy is confounded by the potential adverse effects of three of the most effective drugs. Streptomycin may be ototoxic and nephrotoxic to the fetus. Tetracycline has an adverse effect on developing teeth and bones of the fetus. Chloramphenicol carries a low risk of "grey baby" syndrome or bone-marrow suppression. Experience has shown that an aminoglycoside judiciously administered is effective and safe for both mother and fetus, and in children. Because of its safety, intravenous or intramuscular administration, and ability to have blood concentrations monitored, gentamicin is the preferred antibiotic for treating plague in pregnancy.
- **Prophylactic therapy**
 - Persons in close contact with pneumonic plague patients, or persons likely to have been exposed to *Y. pestis*-infected fleas, to have had direct contact with body fluids or tissues of a *Y. pestis*-infected mammal, or exposed during a laboratory accident to known infectious materials should receive antibiotic preventive therapy, if the exposure was in the previous six days. The preferred antimicrobials for preventive or abortive therapy are the tetracyclines, chloramphenicol, or one of the effective sulfonamides.
- **Hospital precautions**
 - Standard patient-care precautions should be applied to management of all suspected plague patients. These include prescribed procedures for hand washing, wearing of latex gloves, gowns, and protective devices to protect mucous membranes of the eye, nose and mouth during those procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions and excretions. Additionally, a patient with suspected respiratory plague infection should be specifically managed under respiratory droplet precautions, including management in an individual room, restriction of movement of the patient outside the room, and masking of the patient as well as persons caring for the patient until the patient is no longer infectious.

Ref: WHO Initiative for Vaccine Research (IVR): Zoonotic diseases, updated 2009.
http://www.who.int/vaccine_research/diseases/zoonotic/en/index1.html



14

Acral necrosis of the nose, the lips, and the fingers and residual ecchymoses over both forearms in a patient recovering from bubonic plague that disseminated to the blood and the lungs.

¹⁴ <http://emedicine.medscape.com/article/967495-overview>

Session1.4: Assess Pertussis, Acute Poliomyelitis, Rabies and Rubella

Poisoning

Specific objectives of the session

At the end of the session the participants will be able to:

- Assess Pertussis (Whooping Cough)
- Assess Acute Poliomyelitis
- Assess Rabies
- Assess Rubella (German Measles)

Trainer preparation

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

Questions and answers, discussion in plenary (case study)

Resources

- Reference material/handouts: Communicable Diseases Control Guidelines
- Other: MoH documents, markers, masking LCD projector

Evaluation/assessment

Questions and answers, trainer's observation

Trainer

Experienced with Communicable Diseases Control primary health care in Iraq

Estimated training time

1 hour and a half

Session Plan 4:

<p>1.4.1. c Describe methods of control.</p> <p>(10 min)</p>	<p>Period of communicability:</p> <p>Pertussis is highly communicable in the early catarrhal stage. Untreated patients may be contagious for up to 3 weeks</p> <p>Susceptibility and resistance:</p> <p>Anyone who has not had pertussis previously or who has not received the pertussis vaccine can get the disease</p> <p>Methods of control:</p> <ul style="list-style-type: none"> • Preventive measures (Immunization) • Control measures (Case management) • Epidemic measures <p>Priority must be given to:</p> <ul style="list-style-type: none"> ▪ Protecting children less than 1 year old, pregnant females in the last 3 weeks of pregnancy because of the risk of transmission to the newborn. ▪ Stopping infection among household members, particularly children, less than 1 year, pregnant women in the last 3 weeks of pregnancy. 	<p>Brain storming</p>
<p>1.4.1. d Explain Clinical Management</p> <p>(10 min)</p>	<p>Management of the disease:</p> <ul style="list-style-type: none"> • Case management • Contact Management 	<p>Discussion.</p>
<p>1.4.2. Acute Poliomyelitis</p> <p>1.4.2. a Define, Identify clinical features, infectious agent and occurrence.</p> <p>(10 min)</p>	<p>ICD-10 A80</p> <p>Identification</p> <p>Poliomyelitis is a highly contagious disease caused by poliovirus.</p> <p>Clinical features:</p> <ol style="list-style-type: none"> 1. Unapparent infection without symptoms 2. Minor illness (abortive poliomyelitis) 3. Non-paralytic poliomyelitis 4. Paralytic poliomyelitis <p>Infectious agent:</p> <p>Poliovirus is a member of the enterovirus subgroup, family Picornaviridae</p> <p>Occurrence: Table-Polio in Iraq.</p>	<p>Mini Lecture.</p>

<p>1.4.2. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance</p> <p>(10 min)</p> <p>1.4.2. c Describe methods of control.</p> <p>(10 min)</p> <p>1.4.2. d Explain Clinical Management</p> <p>(5 min)</p>	<p>Reservoir: Humans, usually persons with an in apparent infection</p> <p>Mode of transmission: Fecal-oral transmission</p> <p>Incubation period: Typically 6 to 20 days</p> <p>Period of communicability : is present in respiratory secretions for about a week and in the feces for up to six weeks after onset of illness</p> <p>Susceptibility and resistance: Paralytic poliomyelitis is fatal in 2%-10% of cases. More than 95% of vaccinated individuals develop long-lasting immunity</p> <p>Methods of prevention: Oral Poliovirus Vaccine (OPV)</p> <p>Management of the disease:</p> <ul style="list-style-type: none"> • All cases of (AFP) among children under 15 years, reported, detected for poliovirus virus within 48 hours of onset. • <u>Post- polio syndrome-symptoms15-40 years after the original illness.</u> • There is no treatment for polio, only to alleviate the symptoms. • Polio vaccine, given multiple times almost always protects a child for life. 	<p>Discussion Lecture.</p> <p>Brain storming.</p> <p>Discussion.</p>
---	---	--

<p>1.4.3. Rabies 1.4.3. a Define, Identify clinical features, infectious agent and occurrence</p> <p>(10 min)</p>	<p>ICD-10 A82 Identification: Apprehension, headache ,indefinite sensory changes, fever, malaise, water, air phobia, and paralysis Case classification :</p> <ul style="list-style-type: none"> • <i>Suspected</i>; a case compatible with the clinical description. • <i>Probable</i>: not applicable. • <i>Confirmed</i>: a suspected case with special laboratory investigations. <p>Laboratory criteria for diagnosis:</p> <ul style="list-style-type: none"> • Direct florescent antibody (FA) - post mortem, from brain tissue. • FA- anti mortem, by skin or corneal smear. • FA positive in mice or sucking mice. • PCR-identification of viral antigens. • Direct fluorescent antibody testing. <p>Infectious agent: <i>A rhabdovirus of the genus Lyssavirus</i></p> <p>Occurrence: Table- cases of rabies in Iraq.</p>	<p>Mini Lecture.</p>
<p>1.4.3. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance</p> <p>(10 min)</p>	<p>Reservoir: Rabies is primarily a disease of animals Mode of transmission:</p> <ul style="list-style-type: none"> • Transmitted by the virus-laden saliva of a rabid animals introduced via bite or scratch. • Dogs and cats are the main urban vectors. • Person to person transmission via saliva is theoretically possible but has never been documented. <p>Incubation period: Usually (2-8) weeks Period of communicability :Rabid dogs, cats are considered communicable <u>no more</u> than 10 days prior to symptom onset Susceptibility and resistance: All age groups are susceptible, however, most common in people younger than 15 years.</p>	<p>Discussion Lecture.</p>
<p>1.4.3. c Describe methods of control</p> <p>(10 min)</p>	<p>Methods of control:</p> <ul style="list-style-type: none"> • Report to local health authority, CDC. • Post –exposure vaccination of bitten people at day (0, 3, 7, 14, 28) of bite. • Vaccination of the domestic cats, dogs. • Contact isolation for respiratory secretions for duration of illness. • <u>Stay dog control.</u> • Take contact precautions, when nursing a case of rabies. 	<p>Brain storming.</p>

<p>1.4.3. d Explain clinical management. (5 min)</p> <p>1.4.4. Rubella (German measles) (10 min)</p> <p>1.4.4. a Define, Classify, Identify infectious agent and occurrence (10 min)</p>	<p>Management of the disease:</p> <ul style="list-style-type: none"> • Treatment after exposure • Local treatment of the wound • Recommended treatment <p>ICD-10 B06: Rubella (German Measles) ICD-10 P35: Congenital Rubella Syndrome (CRS)</p> <p>Identification: Rubella is a mild febrile viral disease with a diffuse punctuate and maculopapular rash</p> <p>Case classification</p> <ul style="list-style-type: none"> ▪ <u>Suspect</u>: any generalized maculopapular rash with fever, lymphadenopathy. ▪ <u>Probable</u>: a case that meets the clinical case definition, has no or noncontributory serological or virological testing, and is not epidemiologically linked to a laboratory confirmed case. ▪ <u>Confirmed</u>: laboratory confirmed, or that meets the clinical case definition and is epidemiologically linked to a laboratory. <p>Infectious agent: Rubella virus (family togaviridae; genus Rubivirus).</p> <p>Occurrence:</p> <p>Table-Rubella in Iraq.</p>	<p>Discussion.</p> <p>Mini Lecture.</p>
--	--	---

<p>1.4.4. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance</p> <p>(10 min)</p>	<p>Reservoir: Infected humans</p> <p>Mode of transmission:</p> <ul style="list-style-type: none"> • Contact with nasopharyngeal secretions of infected person. • Droplet spread, direct contact with patients. • Infants with Congenital Rubella Syndrome. <p>Incubation period: 14-21 days.</p> <p>Period of communicability : 1 week before and at least 4 days after onset of rash</p> <p>Susceptibility and resistance:</p> <ul style="list-style-type: none"> • Immunity is usually permanent after infection • Immunity after immunization may depend on contact with endemic cases. • Infants born to immune mothers are • Protected for 6-9 months. 	<p>Discussion Lecture.</p> <p>Brain storming.</p>
<p>1.4.4. c Describe methods of control</p> <p>(10 min)</p>	<p>Methods of control:</p> <ul style="list-style-type: none"> ▪ Preventive measures ▪ Control measures ▪ Epidemic measures 	<p>Questions and Answers.</p>
<p>1.4.4.d Explain clinical management.</p> <p>(5 min)</p>	<p>Management of the disease: No specific treatment is available</p>	

1.4.1 Pertussis (whooping cough)

ICD-10 A37

1.4.1 a .Identification

A highly contagious upper respiratory tract bacterial infection. Clinically has 3 stages; the initial **catarrhal stage** is characterized by the insidious onset of coryza (runny nose), sneezing, low-grade fever, and a mild, occasional cough, similar to the common cold. The cough gradually becomes more severe and irritating.

After 1-2 weeks, the second, or **paroxysmal stage**, begins. The patient has bursts, or paroxysms, of numerous, rapid coughs, apparently due to difficulty expelling thick mucus from the tracheobronchial tree. At the end of the paroxysm, a long inspiratory effort is usually accompanied by a characteristic whoop. In younger infants, periods of apnea may follow the coughing spasms, and the patient may become cyanotic (turn blue).

In the **convalescent stage**, recovery is gradual. The cough becomes less paroxysmal and disappears over 2 to 3 weeks. However, paroxysms often recur with subsequent respiratory infections for many months after the onset of pertussis. Fever is generally minimal throughout the course of pertussis.

Pneumonia is a relatively common complication (reported 21.7% of cases in developed countries); otitis, hemorrhages (subconjunctival petechiae and epistaxis), convulsions, encephalopathies and death occur more rarely. The disease lasts 4 to 8 weeks. Complications are more frequent and severe in younger infants. Older persons (i.e. adolescent and adults), and those partially protected by the vaccine usually have milder disease.

Clinical case definition

- A case diagnosed as pertussis by a physician, **or**
- A person with a cough lasting at least 2 weeks **with at least one** of the following symptoms:
 - Paroxysms (i.e. fits) of coughing
 - Inspiratory “whooping”
 - Post-tussive vomiting (i.e. vomiting immediately after coughing)

Case classification

Clinical case: A case that meets the clinical case definition.

Confirmed case: A clinical case that is laboratory confirmed (isolation of *Bordetella pertussis*, detection of genomic sequences by PCR, or positive paired serology).

Infectious agent

Bacterium: *Bordetella pertussis*

Occurrence

Pertussis in Iraq¹⁵.

15

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	407	2922	-	-	78249	1050	3128	3140	2311	5471	2034	2019

1.4.1.b Reservoir

Humans are the only hosts.

Mode of transmission

- Primarily by direct contact with discharges from respiratory mucous membranes of infected persons via the airborne route.
- Even though the disease may be milder in older persons, these infected persons may transmit the disease to other susceptible persons, including non-immunized or under-immunized infants. Adults are often found to be the first case in a household with multiple pertussis cases.

Incubation period

Usually 7-10 days, rarely more than 14 days.

Period of communicability

Pertussis is highly communicable in the early catarrhal stage. Communicability gradually decreases after the onset of the paroxysmal cough. Untreated patients may be contagious for up to 3 weeks after the onset of paroxysmal cough in the absence of treatment or up to 5 days after onset of treatment.

Susceptibility and resistance

Anyone who has not had pertussis previously or who has not received the pertussis vaccine can get the disease. Immunity following disease or vaccination is not lifelong. Older children, adolescents and adults can become susceptible to pertussis five-to 10-years after their last dose of pertussis-containing vaccine.

1.4.1.c .Methods of control 16

Preventive measures (Immunization)

The administration of vaccines is the most rational approach to pertussis control. Active primary immunization against *B. pertussis* infection with whole-cell vaccine (wP) is recommended in association with the administration of diphtheria and tetanus toxoids (DTP). No single antigen pertussis vaccine is available. Although the use of acellular vaccines (aP) is less commonly associated with adverse reactions, price considerations affect their use, and wP vaccines are the vaccines of choice for most countries, including Iraq. In general, pertussis vaccine is not given to persons 7 years of age or older, since reactions to the vaccine (convulsions, collapse, high temperature) may be increased in older children and adults. The efficacy of the vaccine in children

who have received at least 3 doses is estimated to be 80%: protection is greater against severe disease and begins to wane after about 3 years.

Control measures (Case management)

Erythromycin or erythromycin estolate or – in case of allergies to erythromycin – trimethoprim-sulfamethoxazole (contraindicated during pregnancy) should be administered for 7-14 days to all **cases** and close **contacts** of persons with pertussis, regardless of age and vaccination status. Doses recommended by the Iraqi Ministry of Health are 40 mg/kg/day for children and 1 g/day for adults. Drug administration both (1) modifies the course of illness (if initiated early), and (2) eradicates the organism from secretions, thereby decreasing communicability. Symptomatic treatment and supportive case-management.

Epidemic measures

The highly contagious nature of the disease leads to large numbers of secondary cases among non-immune contacts. Prophylactic antibiotic treatment (erythromycin) in the early incubation period may prevent disease, but difficulties of early diagnosis, costs involved and concerns related to the occurrence of drug resistance all limit prophylactic treatment to selected individual cases.

Priority must be given to:

- Protecting children less than 1 year old and pregnant females in the last 3 weeks of pregnancy because of the risk of transmission to the newborn.
- Stopping infection among household members, particularly if there are children aged less than 1 year and pregnant women in the last 3 weeks of pregnancy.

The strategy relies on chemoprophylaxis of contacts within a maximum delay of 14 days following the first contact with the index case. Index cases must avoid contact with day-care centers, schools and other places regrouping susceptible individuals for up to 5 days after the beginning of treatment or up to 3 weeks after onset of paroxysmal cough, or till the end of cough, whichever comes first. All contact cases must have their immunization status verified and brought up to date.

1.4.1 d. Management of the disease¹⁶

- **Case management:** Antibiotic treatment (Azithromycin, Clarithromycin, Erythromycin, TMP-SMX). Note: cases should be commenced on antibiotic therapy on clinical suspicion to reduce the risk of transmission (only commence if within 21 days of onset of symptoms i.e. coryza). Exclude from childcare, pre-school, school or work until 5 days of antibiotic treatment is complete.
- **Contact Management:** Identify high risk household contacts and provide chemoprophylaxis
 - Children <24 months with less than 3 doses of pertussis vaccine received (also provide chemoprophylaxis to all household members).
 - Pregnant women in the last month of pregnancy (also provide chemoprophylaxis to all household members).

Ref: <http://www.cdc.gov/pertussis/clinical/features.html>

Epidemiology and Prevention of Vaccine-Preventable Diseases The Pink Book: Course Textbook - 12th Edition (April 2011)



A young boy coughing due to pertussis

¹⁶ "Clinical and Public Health Management of Pertussis". Government of South Australia, 2009.

<http://www.dh.sa.gov.au/pehs/PDF-files/PertussisFlowChart-CDCB-091229.pdf>

¹⁷ <http://phil.cdc.gov/phil/home.asp>

1.4.2 Acute Poliomyelitis

ICD-10 A80

1.4.2 .a. Identification

Poliomyelitis is a highly contagious disease caused by poliovirus.

Clinical features:

5. *Unapparent infection without symptoms*: Up to 95% of all polio infections are unapparent or sub clinical. Estimates of ratio of unapparent to paralytic illness vary from 50:1 to 1000:1(usually 200:1).
6. *Minor illness (abortive poliomyelitis)*: Approximately 5% of polio infections consist of nonspecific illness without clinical or laboratory evidences of central nervous system invasion and is characterized by complete recovery in less than one week. Three syndromes observed with this form of poliovirus infection, which are upper respiratory tract infection (sore throat and fever), gastrointestinal disturbances (nausea, vomiting, abdominal pain, constipation or, rarely diarrhea), and influenza-like illness. These syndromes are indistinguishable from other viral illnesses.
7. *Non-paralytic poliomyelitis*: Non-paralytic aseptic meningitis usually following several days after a prodrome similar to that of minor illness occur in 1%-2% of polio infections. These symptoms will last from 2 to 10 days followed by complete recovery.
8. *Paralytic poliomyelitis*: Less than 2% of all polio infections result in a flaccid paralysis. Paralytic symptoms generally begin 1 to 10 days after prodromal symptoms and progress for 2 to 3 days. Generally, no further paralysis occurs after the temperature returns to normal. The prodrome may be biphasic, especially in children, with initial minor symptoms separated by a 1 to 7 days period from more major symptoms. Additional prodromal signs and symptoms can include a loss of superficial reflex initially increased deep tendon reflexes and severe muscle aches and spasms in the limbs or back. The illness progresses to flaccid paralysis with diminished deep tendon reflexes, which reaches plateau without change for days or weeks and is usually asymmetrical. Patients do not experience sensory loss or changes in cognition. Many persons with paralytic poliomyelitis recover completely and, in most, muscle function returns to some degree. Patients with weakness or paralysis 12 months after onset will usually be left with permanent residua. Depending on the sites of paralysis, poliomyelitis can be classified as spinal, bulbar, or spino-bulbar disease.

Infectious agent

Poliovirus is a member of the enterovirus subgroup, family Picornaviridae. There are three poliovirus serotypes (P1, P2, and P3). There is minimal heterotypic immunity between the three serotypes.

Occurrence

Polio in Iraq¹⁸

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cases	4	0	0	0	0	0	0	0	0	0	0

Above refers to all polio cases (indigenous or imported), including polio cases caused by vaccine derived polio viruses (VDPV); it does not include cases of vaccine-associated paralytic polio (VAPP) and cases of non polio acute flaccid paralysis [AFP].

1.4.2 b. Reservoir

Humans, usually persons with an in apparent infection. Enteroviruses are transient inhabitants of the gastrointestinal tract, and are stable at acid PH.

Mode of transmission

Fecal-oral transmission: transmitted when people drink water or eat food contaminated by feces (or stools) which carry the virus? Can also be transmitted through droplet spread of respiratory secretions of an infected person. Infants shedding virus in the feces after having received OPV have been the source of exposure for susceptible adults giving child care.

Incubation period

Typically 6 to 20 days, range 3 to 35 days.

Period of communicability

Persons with polio are most contagious shortly before and after the onset of symptoms. The virus is present in respiratory secretions for about a week and in the feces for up to six weeks after onset of illness. Persons with asymptomatic infections are also communicable.

Susceptibility and resistance

Paralytic poliomyelitis is fatal in 2%-10% of cases. More than 95% of vaccinated individuals develop long-lasting immunity. Heat, formaldehyde, chlorine, and ultraviolet light rapidly inactivate the poliovirus. Overcrowding and poor sanitation provide opportunities for exposure to infection.

¹⁸

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

1.4.2.c. Methods of prevention¹⁹

Oral Poliovirus Vaccine (OPV): Trivalent OPV contains live attenuated strains of all three serotypes of poliovirus. Live attenuated polioviruses replicate in the intestinal mucosa and lymphoid cells, and in lymph nodes that drain the intestine. Vaccine viruses may spread from the recipient to contacts. Persons coming in contact with fecal material of a vaccinated person may be exposed and infected with vaccine virus. After complete primary vaccination with three doses of OPV, > 95% of recipients develop long-lasting immunity to all three poliovirus types. Approximately 50% of vaccine recipients develop antibody to all three serotypes after a single dose of OPV. OPV induces immunity of the gastrointestinal tract that provides a substantial degree of resistance to re-infection with poliovirus. It contains neomycin and streptomycin.

1.4.2 d. Management of the disease²⁰

- One in 200 infections leads to irreversible paralysis, usually in the legs. This is caused by the virus entering the blood stream and invading the central nervous system. As it multiplies, the virus destroys the nerve cells that activate muscles. The affected muscles are no longer functional and the limb becomes floppy and lifeless – a condition known as acute flaccid paralysis (AFP). All cases of acute flaccid paralysis (AFP) among children under fifteen years of age are reported and tested for poliovirus within 48 hours of onset.
- Around 40% of people who survive paralytic polio may develop additional symptoms 15–40 years after the original illness. These symptoms – called post-polio syndrome – include new progressive muscle weakness, severe fatigue and pain in the muscles and joints.
- There is no cure for polio, only treatment to alleviate the symptoms. Heat and physical therapy is used to stimulate the muscles and antispasmodic drugs are given to relax the muscles. While this can improve mobility, it cannot reverse permanent polio paralysis.
- Polio can be prevented through immunization. Polio vaccine, given multiple times, almost always protects a child for life.

Ref: <http://www.polioeradication.org/Polioandprevention.aspx>

¹⁹ <http://www.polioeradication.org/Polioandprevention.aspx>

²⁰ The Global Polio Eradication Initiative, 2010. <http://www.polioeradication.org/Polioandprevention.aspx>



²¹ A child with a deformity of her right leg due to polio

²¹ [Centers for Disease Control and Prevention's Public Health Image Library](#)

1.4.3. Rabies

ICD-10 A82

1.4.3.a. Identification

A fatal acute viral disease caused by rabies virus, a *rhabdovirus* of the genus *Lyssavirus*, whose first symptoms may be apprehension, headache and indefinite sensory changes, fever, malaise, water and air phobia, and paralysis. It is transmitted in the saliva of infected animals, most commonly through bites. Rabies is an acute encephalomyelitis that almost progresses to coma or death within 10 days after the first symptoms.

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: Not applicable.

Confirmed: A suspected case by especial laboratory investigation

Laboratory criteria for diagnosis

One of the following:

- Detection of rabies viral antigens by direct florescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem).
- Detection by FA on skin or corneal smear (collected ante mortem).
- FA positive after inoculation of brain tissue, saliva or CSF in cell culture, in mice or in sucking mice.
- Detectable rabies-neutralizing antibody titer $>$ or $= 10.5$ in the CSF of an unvaccinated person.
- Identification of viral antigens by PCR on fixed tissue collected post mortem or in a clinical specimen (brain tissue or skin, cornea or saliva).
- Isolation of rabies virus from clinical specimen and confirmation of rabies viral antigens by direct fluorescent antibody testing.

Infectious agent

A *rhabdovirus* of the genus *Lyssavirus*.

Occurrence

Cases of Rabies, 2000-2009

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	14	7	11	12	21	29	18	24	16	27	29	8

1.4.3.b. Reservoir

Rabies is primarily a disease of animals, particularly wild and domestic canine species, cats, bats, and other biting animals.

Mode of transmission

- It is transmitted by the virus-laden saliva of a rabid animal introduced via bite or scratch.
- Dogs and cats are the main urban vectors.
- Person to person transmission via saliva is theoretically possible but has never been documented.

Incubation period

Usually two to eight weeks, but can occur from five days to over a year depending on factors such as severity, site of wound and infective dose. Very long incubation periods of up to six years or more have been reported.

Period of communicability

Rabies virus is present in saliva, CSF, and neurologic tissues of infected patients who are in the final (clinical) stage of disease. Rabid dogs, cats are considered communicable no more than 10 days prior to symptom onset. Little or nothing is known about how early communicability starts in other species, including humans.

Susceptibility and resistance

All age groups are susceptible, however, most common in people younger than 15 years.

1.4.3. c .Methods of control²²

- Report to local health authority, CDC.
- Post-exposure vaccination of bitten people at day (0, 3, 7, 14, 28) of bite.
- Vaccination of the domestic dogs and cats by veterinary hospitals.
- Contact isolation for respiratory secretions for duration of illness.
- Stray dog control.
- Take contact precautions (gloves, gown and mask) when nursing a case of rabies.

²² WHO Initiative for Vaccine Research (IVR): Zoonotic diseases, updated 2009.
http://www.who.int/vaccine_research/diseases/zoonotic/en/index1.html

1.4.3.d. Management of the disease²³

- **Treatment after exposure:** Effective treatment soon (within a few days, but as soon as possible) after exposure to rabies can prevent the onset of symptoms and death. Post-exposure prevention consists of local treatment of the wound, administration of rabies immunoglobulin (if indicated), and immediate vaccination.
- **Local treatment of the wound:** Removing the rabies virus at the site of the infection by chemical or physical means is an effective means of protection. Therefore, prompt local treatment of all bite wounds and scratches that may be contaminated with rabies virus is important. Recommended first-aid procedures include immediate and thorough flushing and washing of the wound for a minimum of 15 minutes with soap and water, detergent, povidone iodine or other substances that kill the rabies virus.
- **Recommended treatment:** The recommended post-exposure prophylaxis depends on the type of contact with the suspected rabid animal (see table).

Table: Recommended post-exposure prophylaxis for rabies infection

Category of exposure to suspect rabid animal	Post-exposure measures
Category I – touching or feeding animals, licks on intact skin (i.e. no exposure)	None
Category II – nibbling of uncovered skin, minor scratches or abrasions without bleeding	Immediate vaccination and local treatment of the wound
Category III – single or multiple transdermal bites or scratches, licks on broken skin; contamination of mucous membrane with saliva from licks, exposures to bats.	Immediate vaccination and administration of rabies immunoglobulin; local treatment of the wound

Other factors that should be taken into consideration when deciding whether to initiate post-exposure prevention include:

- the likelihood of the implicated animal being rabid
- the clinical features of the animal and its availability for observation and laboratory testing.

In developing countries, the vaccination status of the suspected animal alone should not be considered when deciding whether to initiate prophylaxis or not.

²³ WHO. "Rabies Fact Sheet." September 2011. <http://www.who.int/mediacentre/factsheets/fs099/en/>

1.4.4. Rubella (German measles)

ICD-10 B06: Rubella (German Measles)

ICD-10 P35: Congenital Rubella Syndrome (CRS)

1.4.4.a Identification

Rubella is a mild febrile viral disease with a diffuse punctuate and maculopapular rash. Up to 50% of persons with acquired rubella have asymptomatic infections. Young children usually have little or no prodrome, while adolescents and adults often report 1–5 days of low grade fever, malaise, and anorexia. Lymphadenopathy (usually suboccipital, postauricular, and posterior cervical) is a major clinical manifestation and may last several weeks. Fever rarely persists beyond the first day of rash.

The maculopapular rash appears first on the face and spreads down the body. Lesions are pink and rarely coalesce. The rash of acquired rubella typically lasts 3 days, spreading and fading more quickly than the rash caused by measles.

It can cause congenital rubella syndrome (CRS) in the infant born to a pregnant woman infected with rubella. CRS includes low birth weight, eye defects (cataracts, microphthalmia, glaucoma, retinopathy), sensorineural deafness, cardiac defects (patent ductus arteriosus, peripheral pulmonary artery stenosis), central nervous system defects (microencephaly, mental retardation), hepatitis, thrombocytopenic purpura, splenomegaly, and bone lesions. Deafness is the most common manifestation of CRS, and is sometimes the only manifestation.

Case classification

Suspect: any generalized maculopapular rash with fever, lymphadenopathy

Probable: a case that meets the clinical case definition, has no or noncontributory serological or virological testing, and is not epidemiologically linked to a laboratory confirmed case.

Confirmed: a case that is laboratory confirmed (isolation of rubella virus or significant rise in rubella antibody level by standard serologic assay, or positive serologic test for rubella IgM antibody) or that meets the clinical case definition and is epidemiologically linked to a laboratory - confirmed case.

Infectious agent

Rubella virus (family *togaviridae*; genus *Rubivirus*).

Occurrence

In the absence of generalized immunization rubella occurred worldwide at endemic level with epidemics every 5-9 years. Large rubella epidemics resulted in very high levels of morbidity.

Rubella in Iraq²⁴.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	1612	91	-	-	383	99	72	51	110	167	15	20

1.4.4.b. Reservoir

Infected humans.

Mode of transmission

- Contact with nasopharyngeal secretions of infected person.
- Infection by droplet spread or direct contact with patients.
- Infants with CRS shed large quantities of virus in their pharyngeal secretions and urine and serve as a source of infection to their contacts.

Incubation period

14-21 days.

Period of communicability

1 week before and at least 4 days after onset of rash; infants with CRS may shed virus for months after birth.

Susceptibility and resistance

- Immunity is usually permanent after natural infection and thought to be long-term, probably lifelong.
- Immunity after immunization, but this may depend on contact with endemic cases.
- Infants born to immune mothers are ordinarily protected for 6-9 months, depending on the amount of maternal antibodies acquired transplacentally.

24

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

1.4.4.c Methods of control²⁵

Preventive measures

- Educate the general public on modes of transmission and stress the need for rubella immunization.
- WHO recommend that all countries assess their rubella situation and, if appropriate, make plans for the introduction of rubella vaccine.
- In case of infection with wild rubella virus early in pregnancy, culturally appropriate counseling should be provided. Abortion may be considered in those countries where this is an option.
- Immune globulin (IG) given after exposure early in pregnancy may not prevent infection or viremia, but it may modify or suppress symptoms.

Control measures

- Report to local health authority: All cases of rubella and of CRS should be reported.
- Isolation: In hospitals, patients suspected of having rubella should be managed under contact isolation precautions; attempts should be made to prevent exposure of non-immune pregnant women.
- Concurrent disinfection: Not applicable.
- Quarantine: Not applicable.
- Immunization of contacts: will not necessarily prevent infection or illness.
- Investigation of contacts and source of infection: identify pregnant female contacts, especially those in the first trimester. Such contacts should be tested serologically for susceptibility or early infection (IgM antibody) and advised accordingly.

Epidemic measures

- Prompt reporting of all confirmed and suspected cases.
- The medical community and general public should be informed about rubella epidemics in order to identify and protect susceptible pregnant women.

1.4.4.d Management of the disease

- No specific treatment is available. Symptomatic/supportive treatment should be given.

Ref: Epidemiology and Prevention of Vaccine-Preventable Diseases The Pink Book: Course Textbook - 12th Edition (April 2011)

²⁵ Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book: Course Textbook - 12th Edition (April 2011).



26

Rash of rubella on skin of child's back. Distribution is similar to that of measles but the lesions are less intensely red.

²⁶ http://phil.cdc.gov/PHIL/Images/03052002/00002/PHIL_712_lores.jpg

Session 1. 5: Meningococcal Disease, Malaria, Measles, Tetanus and Food poisoning

Specific objectives of the session

At the end of the session the participants will be able to:

- Assess Meningococcal Disease
- Assess Malaria
- Assess Measles
- Assess Tetanus
- Assess Food Poisoning

Trainer preparation

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

Questions and answers, discussion in plenary (case study)

Resources

- Reference material/handouts: Communicable Diseases Control Guidelines
- Other: MoH documents, markers, masking LCD projector

Evaluation/assessment

Questions and answers, trainer's observation

Trainer

Experienced with Communicable Diseases Control primary health care in Iraq

Estimated training time

2 hours

<p>1.5.1. c Describe methods of control (10 min)</p> <p>1.5.1 d Explain clinical management (5 min)</p>	<p>Methods of control:</p> <ol style="list-style-type: none"> 1. Preventive measures: <ul style="list-style-type: none"> ▪ Vaccination ▪ Chemoprophylaxis 2. Control measures 3. Epidemic measures: <ul style="list-style-type: none"> ▪ Vaccination ▪ Refugee camp population ▪ General population ▪ Chemoprophylaxis ▪ Diagnosis ▪ Treatment: <p>Management of the disease Is a medical emergency, admission is a must, antibiotic treatment as soon as possible- after performing lumbar puncture. Range of antibiotic treatment.</p>	<p>Brain storming.</p> <p>Discussion.</p>
<p>1.5.2. Malaria 1.5.2 a Define, Classify, Identify infectious agent and occurrence. (10 min)</p>	<p>ICD-10 B50: Falciparum ICD-10 B51: Vivax ICD-10 B52: Malaria ICD-10 B53: Ovale ICD-10 B54: Unspecified Malaria Identification: A parasitic infections disease, 4 human types of malaria. Differentiation impossible without laboratory studies Clinical manifestations Rapidly rising temperature, with shaking, chills, muscle pains, back pain, nausea, headache, episode frequently ends with profuse sweating. Complications: coma, acute encephalopathy, cerebral edema, vomiting, renal failure, severe anemia, thrombocytopenia, pulmonary edema, shock, acidosis, coagulation defects, respiratory failure, liver failure and death Case definition: A patient exposed to malaria, hospitalized for a febrile disease with no obvious cause. Case classification <u>Suspected case:</u> Detection of Plasmodium species by rapid diagnostic antigen testing, without confirmation</p>	<p>Mini Lecture.</p>

<p>1.5.2 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance.</p> <p>(10 min)</p>	<p>by microscopy, or nucleic acid testing in any person. <u>Confirmed case:</u></p> <ul style="list-style-type: none"> • Identification of malaria in blood films. • PCR is the most sensitive method. • Antibodies, by IFA after first week of infection. May persist for years. <p>Infectious agent:</p> <ol style="list-style-type: none"> 1. P. Falciparum: the most serious malarial infection; eradicated in Iraq since the 1950s. 2. P. Vivax: most common in Iraq 3. P. Ovale 4. P. Malaria <p>Occurrence: Iraq now can be considered as free of malaria since 2008 in the phase of elimination,</p> <p>Reservoir: Humans are the main reservoir for the parasite</p> <p>Modes of transmission: By the bite of infected female anopheles mosquitoes</p> <p>Incubation period:</p> <p>P. falciparum: 8-14 days P. vivax and P. ovale: 12-18 days P. malariae: 8-14 days</p> <p>Period of communicability :</p> <ul style="list-style-type: none"> • Plasmodium developmental changes in a competent mosquito-1week to 1month. • Untreated, insufficiently treated patients – source for mosquito infection for many years. • Transfusional transmission- as long as asexual forms in the circulating blood. • Stored blood can remain ineffective for at least a month. <p>Susceptibility and resistance: Susceptibility is universal except in humans with specific genetic traits. In Iraq: sickle cell anemia, thalassemia, glucose-6-phosphate dehydrogenase (G6PD) deficiency</p>	<p>Discussion Lecture.</p> <p>Brain storming.</p>
---	--	---

<p>1.5.2. c describe methods of control (10 min)</p> <p>1.5.2. d Explain clinical management (5 min)</p>	<p>Methods of control</p> <ul style="list-style-type: none"> ▪ Preventive measures ▪ Control measures ▪ Epidemic measures ▪ Disaster implications ▪ International measures: <ul style="list-style-type: none"> -Important international measures -In special circumstances <p>Management of the disease: The best available therapy is tremisinin based combination therapy (ACT). Treatment solely on the basis of symptoms- only when parasitological diagnosis is not possible.</p>	<p>Discussion.</p>
<p>1.5.3. Measles</p> <p>1.5.3. a Define, Classify, Identify infectious agent and occurrence. (10 min)</p> <p>1.5.3. b Explain reservoir, mode of transmission, incubation period, period of communicability and</p>	<p>ICD-10 B05</p> <p>Identification Acute systemic viral infection. Prodromal phase (1–7 days). Fever 103- 105F in stepwise fashion. Followed by the onset of cough, coryza (runny nose), or conjunctivitis. <u>Koplik spots</u> (pathognomonic for measles).</p> <p>Clinical case definition: Any person with fever, generalized maculopapular (<u>non-vesicular</u>) rash and cough, coryza (runny nose) or conjunctivitis (red eyes). Or Any person in whom a clinical health worker suspects measles infection</p> <p>Case classification: <u>Clinically confirmed</u>: a case that meets the clinical case definition. <u>Laboratory confirmed</u>: only for outbreak confirmation, during the elimination phase.</p> <p>Infectious agent: Measles virus (genus <i>Morbillivirus</i>, family <i>Paramyxoviridae</i>).</p> <p>Occurrence: Primarily in late winter and spring. Table: measles in Iraq.</p> <p>Reservoir: Humans. Asymptomatic carrier state has not been documented.</p> <p>Mode of transmission:</p> <ul style="list-style-type: none"> ▪ Airborne ▪ Direct contact <p>Incubation period: 10-12 days Period of communicability:</p>	<p>Mini Lecture.</p> <p>Discussion Lecture.</p>

<p>susceptibility and resistance. (10 min)</p> <p>1.5.3. c describe methods of control (10 min)</p> <p>1.5.3. d Explain clinical management</p>	<p>Most infectious from 4 days before the rash until 1-2 days after rash onset. Susceptibility and resistance : <u>Highly contagious</u>, one person can infect <u>90%</u> of the people close to that person who are <u>not immune</u>.</p> <p>Methods of control: Preventive measures Control measures Epidemic measures</p> <p>Management of the disease: -Supportive care- good nutrition, adequate fluid intake, and treatment of dehydration (ORS), antibiotics to treat eye, ear infections, pneumonia. -All children in developing countries diagnosed with measles should receive two doses of vit.A, given 24 hours apart.</p>	<p>Brain storming.</p> <p>Discussion.</p>
<p>1.5.4. Tetanus 1.5.4. a Define, Classify, Identify infectious agent and occurrence. (10 min)</p> <p>1.5.4. b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p>	<p>ICD-10 A35: Tetanus ICD-10 A33: Neonatal Tetanus Identification: Painful muscular contractions, primarily of the masseter and neck muscles, secondarily of trunk muscles. In older children, adults- abdominal rigidity. Generalized spasms, frequently induced by sensory stimuli, typical features of the tetanic spasm are “<u>risus sardonicus</u>”.</p> <p>Infectious agent: <i>Clostridium tetani</i>, the tetanus bacillus</p> <p>Occurrence:</p> <ul style="list-style-type: none"> • More common in agricultural regions. • Parenteral use of drugs by addicts. • In rural, tropical areas people, especially newborns are at risk. <p>Table: Tetanus in Iraq.</p> <p>Reservoir: Intestines of horses and other animals, including humans.</p> <p>Mode of transmission: Through a puncture of wound, after surgical procedures.</p> <p>Incubation period: Usually 3–21 days</p>	<p>Mini Lecture.</p> <p>Discussion Lecture.</p>

<p>1.5.4. c Describe methods of control (10 min)</p> <p>1.5.4. d Explain clinical management (5 min)</p>	<p>Period of communicability : No direct person-to-person transmission.</p> <p>Susceptibility and resistance: Transient passive immunity follows tetanus immune globulin (TIG), or tetanus antitoxin (equine origin).</p> <p>Methods of control:</p> <ul style="list-style-type: none"> ▪ Preventive measures ▪ Control measures <p>Management of the disease:</p> <ul style="list-style-type: none"> ▪ Neonatal tetanus ▪ Wound-related tetanus 	<p>Brain storming.</p> <p>Discussion.</p>
<p>1.5.5 Food Poisoning</p> <p>1.5.5 a Define, Classify, Identify infectious agent and occurrence. (10 min)</p> <p>1.5.5 b Describe methods of control (10 min)</p> <p>1.5.5 c Explain clinical management. (5 min)</p>	<p>ICD-10 A02 & A05</p> <p>Identification Frequent and inaccurate term of food intoxication. It is an illness acquired through consumption of contaminated food.</p> <p>Case classification</p> <p><u>Suspect case:</u> sudden onset, with severe nausea, vomiting diarrhea, fatigue, seizure, abdominal cramps, symptoms of dehydration, bloody stool.</p> <p><u>Confirmed case:</u> isolation of (Staph. aureus Clost.perfringens, or enterotoxin) from suspected vomit or stool or food.</p> <p>Methods of control: Any suspected cases should be reported. Case investigation should be conducted. Samples of food vomit and stool should be collected. Instructions to contacts: not to eat suspected food.</p> <p>Management of the disease: Most cases are self-limited- specific treatment is not required. Only 10% of cases require antibiotic treatment.</p>	<p>Mini Lecture.</p> <p>Discussion Lecture.</p> <p>Brain Storm</p>

1.5.1. Meningococcal Disease

ICD-10 A39

1.5.1.a. Identification

Clinical case definition

Invasive meningococcal disease most commonly presents as meningitis, meningococemia, or both. Symptoms of meningococcal meningitis include sudden onset of fever (>38.5 °C rectal or >38.0 °C axillary) and one or more of the following: nausea, vomiting, photophobia, neck stiffness, altered mental status, other meningeal sign. Symptoms of meningococemia (septicemia) include acute onset of fever often accompanied by hypotension and shock, and may include a petechial or purpuric rash, purpura fulminans, and multiorgan failure.

In patients under one year of age, suspect meningitis when fever is accompanied by bulging fontanelles.

Case classification

Suspected: a case that meets the clinical case definition

Probable: a suspected case as defined above, and turbid CSF (with or without positive Gram-stain), or ongoing epidemic and epidemiological link to a confirmed case.

Confirmed: a suspected or probable case with laboratory confirmation (positive CSF antigen detection or positive culture)

Infectious agent

Bacterium: *Neisseria meningitidis* serogroups A, B, C, Y, W135

Occurrence

No data available.

1.5.1. b. Reservoir

Humans are the only reservoirs.

Mode of transmission

Transmission occurs through respiratory droplets or by direct contact with nasopharyngeal secretions from a colonized person – symptomatic or otherwise.

Incubation period

Between 2-10 days, usually 4 days.

Period of communicability

The most important source of infection are asymptomatic carriers. Persons can transmit the organism to others as long as meningococci are present in nasal or pharyngeal secretions. Cases should be considered infectious from the time they are exposed until 24 hours after initiation of treatment or chemoprophylaxis with appropriate antibiotics. Contacts exposed to the patient 7-10 days or more before his/her onset of illness are not at significantly increased risk.

Susceptibility and resistance

Close contacts of a case are at increased risk of becoming colonized/infected and developing illness. The attack rate for household contacts of cases is 500–800 times the rate that for the general population. Risk of disease in close contacts is highest during the 10-day period following exposure.

1.5.1.c .Methods of control²⁷

Preventive measures

- **Vaccination:** to prevent secondary cases around a sporadic case of meningococcal disease, vaccine can be used for close contacts of patients with meningococcal disease due to A, C, Y, or W135 serogroups.
- **Chemoprophylaxis:** the aim of chemoprophylaxis is to prevent secondary cases by eliminating nasopharyngeal carriage. To be effective in preventing secondary cases, chemoprophylaxis must be initiated as soon as possible (i.e. not later than 48 hours after diagnosis of the case). Its use should be restricted to close contacts of a case, which are defined as:
 - Household members (i.e. persons sleeping in the same dwelling as the case)
 - Institutional contacts who shared sleeping quarters (i.e. for boarding-school pupils, roommates; for military camps, persons sharing a barracks);
 - Nursery school or childcare centre contacts (i.e. children and teachers who share a classroom with the case);
 - Others who have had contact with the patient's oral secretions through kissing or sharing of food and beverages.

The drugs recommended by the Iraqi Ministry of Health are Rifampin (children and adults) or Ciprofloxacin (adults only).

²⁷ Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book: Course Textbook - 12th Edition (April 2011).

Control measures

Meningococcal disease (either meningitis or septicemia) is potentially fatal and should always be viewed as a medical emergency. The Iraqi Ministry of Health recommends that any suspected case should be referred to a hospital immediately. Admission to a hospital or health centre is necessary for diagnosis by **lumbar puncture and CSF examination**. Lumbar puncture must be done as soon as meningitis is suspected, prior to starting antibacterials. As infectivity of patients is moderate and disappears quickly following antimicrobial treatment, isolation of the patient is not necessary.

Antimicrobial therapy must be instituted as soon as possible after lumbar puncture (without waiting for laboratory results), and should be combined with supportive treatment. Initial antimicrobial therapy should be effective against the three major causes of bacterial meningitis until bacteriological results are available. Once diagnosis of meningococcal disease has been established, many antimicrobials can be used: either *penicillin* or *ampicillin* is the drug of choice. *Chloramphenicol* is a good and inexpensive alternative. The third-generation cephalosporins, *Ceftriaxone* and *Cefotaxime*, are excellent alternatives but are considerably more expensive. A seven-day course is still the general rule for the treatment of meningococcal disease (beyond the neonatal period). The long-acting (oily) form of chloramphenicol has also been shown to be effective.

Epidemic measures

- **Vaccination:** a mass vaccination campaign, if appropriately carried out, is able to halt an epidemic of meningococcal disease. Laboratory diagnosis and confirmation of epidemic serogroups will guide the type of vaccine needed, either meningococcal polysaccharide bivalent A/C (if serogroup A or C is confirmed as the epidemic serogroup), or meningococcal polysaccharide tetravalent vaccine A/C/Y/W135 (if serogroup W135 or Y is confirmed). Vaccination will be concentrated in the area where the epidemic is maximal.
- **Refugee camp population:** Following confirmation (serogroup identified) of two cases, mass vaccination is recommended if the serogroup/s identified is/are included in either the bivalent (A/C) or tetravalent (A/C/Y/W135) vaccine. At risk populations (e.g. 2-30 years of age) should be given priority.
- **General population:** If an outbreak is suspected, vaccination should only be considered after careful investigation (including confirmation and serogroup identification) and the assessment of the population group at highest risk.
- **Chemoprophylaxis:** chemoprophylaxis of contacts of meningitis patients is NOT warranted during an epidemic for several reasons. In small clusters or outbreaks among closed populations (e.g. extended household, boarding schools), chemoprophylaxis may still be appropriate.
- **Diagnosis:** as the flood of patients could make the routine use of lumbar puncture to confirm meningitis impossible, every suspected case of meningitis should be considered and treated as one of meningococcal meningitis.
- **Treatment:** simplified treatment protocols are appropriate: long-acting oily chloramphenicol intramuscularly (100 mg/kg up to 3 grams in a single dose) is the drug of choice for all age groups, particularly in areas with limited health facilities.

1.5.1.d. Management of the disease²⁸

- Meningococcal disease is potentially fatal and should always be viewed as a medical emergency. Admission to a hospital or health centre is necessary, although isolation of the patient is not necessary. Appropriate antibiotic treatment must be started as soon as possible, ideally after the lumbar puncture has been carried out if such a puncture can be performed immediately. If treatment is started prior to the lumbar puncture it may be difficult to grow the bacteria from the spinal fluid and confirm the diagnosis.
- A range of antibiotics can treat the infection, including penicillin, ampicillin, chloramphenicol and ceftriaxone. Under epidemic conditions in Africa in areas with limited health infrastructure and resources, oily chloramphenicol or ceftriaxone are the drugs of choice because a single dose has been shown to be effective on meningococcal meningitis.

²⁸ WHO. "Meningococcal meningitis Fact Sheet." December 2011.
<http://www.who.int/mediacentre/factsheets/fs141/en/index.html>

1.5.2 .Malaria

ICD-10 B50: Falciparum

ICD-10 B51: Vivax

ICD-10 B52: Malaria

ICD-10 B53: Ovale

ICD-10 B54: Unspecified Malaria

1.5.2.a. Identification

A parasitic infections disease; with 4 human types of malaria causing symptoms sufficiently similar to make species differentiation impossible without laboratory studies. The most prominent feature of malaria is fever. Classic descriptions of fever with a regular recurring pattern every two or three days is not usually present when the disease begins. Irregular fever also may occur due to mixed infections and ineffective use of prophylactic drugs and partial treatment. Patients commonly feel well on the days when fever is absent. A presumptive diagnosis of malaria should be made for any person with a high fever who has been to a malarious area until proved otherwise, particularly with recent travel. Early diagnosis with prompt appropriate treatment is essential as malaria can be a fatal disease. If the initial blood film is negative for malarial parasites it should be repeated within 12–24 hours and preferably when the temperature is rising. One negative test does not exclude the diagnosis, particularly if the patient has taken antibiotics which may result in partial treatment of the infection.

Clinical manifestations

The rapidly rising temperature is commonly associated with shaking chills, muscle pains, back pain, nausea and headache, and the episode frequently ends with profuse sweating. Other symptoms may include confusion or other neurological signs, diarrhea, dark urine, jaundice, cough and respiratory distress.

Complications

The following severe complications may occur, usually with *P. falciparum* infections: coma, acute encephalopathy, cerebral edema, vomiting, renal failure, severe anemia, thrombocytopenia, pulmonary edema, shock, acidosis, coagulation defects, respiratory failure, liver failure and death. Atypical presentations can occur which predominantly involve a diarrheal illness and have resulted in delayed diagnosis and death. Other infections such as the bacterial infection typhoid fever may occur concurrently. These should be looked for, especially if the patient fails to respond well to appropriate treatment. Individuals, who are partially immune or have been taking anti-malarial chemoprophylaxis, may show an atypical clinical picture with wide variations in the incubation period. Malaria due to species other than *P. falciparum* is generally not life threatening except in the very young, very old and those with immunodeficiency or other concurrent disease.

Case definition

A patient exposed to malaria who is hospitalized for a febrile disease with no obvious cause.

Case classification

Suspected case: Detection of Plasmodium species by rapid diagnostic antigen testing without confirmation by microscopy or nucleic acid testing in any person (symptomatic or asymptomatic)

Confirmed case: the confirmation is through:

- Identification of malaria parasites in blood films. Repeated microscopic examinations every 12–24 hours may be necessary because the blood density of parasites varies and parasites are often not demonstrable in films from patients recently or actively under treatment.
- Detection of plasmodia antigens in the blood by PCR is the most sensitive method, but is not generally available in diagnostic laboratories.
- Antibodies, demonstrable by IFA, may appear after the first week of infection but may persist for years, indicating past malarial experience; thus antibody determinations are not helpful for diagnosis of current illness.

Infectious agent

5. *P. Falciparum*: the most serious malarial infection; eradicated in Iraq since the 1950s.
6. *P. Vivax*: most common in Iraq
7. *P. Ovale*
8. *P. Malaria*

Occurrence

Iraq now can be consider as free of malaria since 2008 in the phase of elimination, and we are waiting the certification for that from WHO, there is strong supervision efforts by members of malarial section of CDC –Baghdad to the all parts of Iraq especially on the northern and southern parts.

1.5.2.b. Reservoir

Humans are the main reservoir for the parasite.

Modes of transmission

Transmission occurs by the bite of infected anopheles mosquitoes (female).

Incubation period

Malarial species	Incubation period
<i>P. falciparum</i>	8-14 days
<i>P. vivax and P. ovale</i>	12-18 days
<i>P. malariae</i>	8-14 days

Period of communicability

- 1) Plasmodium parasites must undergo developmental changes in a competent mosquito host before being passed back to another human; this takes from a week and a month. Human are communicable to mosquitoes when gametocytes are present in blood.
- 2) Untreated or insufficiently treated patients may be a source of mosquito infection for several years in *P. malariae*, up to 5 years in *P. vivax*, and generally not more than 1 year in *P. falciparum* malaria; the mosquito remains infective for life.
- 3) Transfusional transmission may occur as long as asexual forms remain in the circulating blood (with *P. malariae*, up to 40 years or longer).
- 4) Stored blood can remain infective for at least a month.

Susceptibility and resistance

Susceptibility is universal except in humans with specific genetic traits. In Iraq, genetic traits that may modify disease expression include 1) sickle cell, 2) thalassemias, 3) glucose-6-phosphate dehydrogenase (G6PD) deficiency. The immune-suppressed persons living in endemic areas appear to be at increased risk of more frequent and higher density infections, and may show decreased response to any malarial therapy.

1.5.2.c. Methods of control

Preventive measures

1. Avoid being bitten by mosquitoes, especially between dusk and dawn (personal protection) is the first line of defense against malaria. Other measures include: wearing long cloth, insect repellents, sprays, removing mosquito breeding places or water collections near the house and use insecticide-treated mosquito nets (ITNs).
2. Chemo-prophylactic: given for the travelers going to known malarial area or countries included (Iran, Pakistan, Philippines, India, Thailand and other south east of Asia, all African countries except the north part of Africa and Yemen).
3. Immediately seeking diagnosis and treatment if any suggestive sign and symptom of malaria develops.

Control measures

Isolation of the case is not required. Generally if the species cannot be identified with confidence, the patient should be treated as for the most serious infection with *P. falciparum*. This can be applied especially on the imported cases of malaria. On the other hand, as we know, the existing species of malaria in Iraq is *P. vivax* so the regime of treatment is as shown below: Radical treatment of all positive cases by Chloroquine tablet; base dosage is:

1 st day	2 nd day	3 rd day	4 th day	17 th day
4 tabs. Initially then 2 tabs after 6 hrs.	2 tabs	2 tabs	Primaquine tab. (15 mg one tab/ day for 14 day	Last dose of Primaquine tab in order to reduces the risk of relapses of disease

Epidemic measures

We need rapid and vigorous action and effective treatment of all cases; as mass treatment, full coverage vector control measures should be instituted. Usually, evening fogging, indoor residual spraying is preferred because of its rapid effect; this may be followed by the use of insecticide treated bed nets and anti-larval measures.

Disaster implications

Disasters may lead to malaria epidemics as a result of population movements, ecological changes, breakdown of health services, and other factors. So we need urgent or emergency interventions to be made in the malarial sections of the provinces and apply control measures including early effective treatment and vector control, insecticide-treated nets, indoor residual spraying, fogging - evening thermal and cold type, distribution of mosquito nets and health education.

International measures

1) Important international measures include the following:

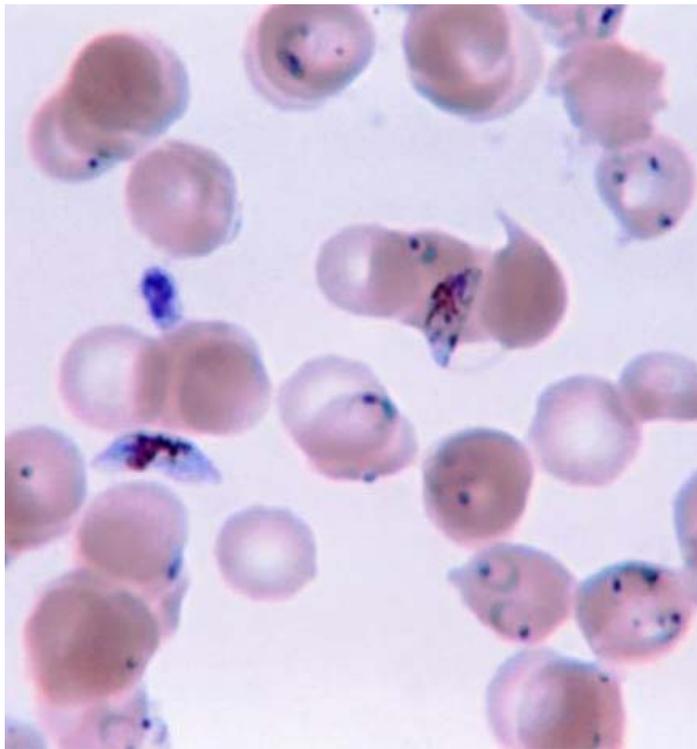
- a) Disinsectization of aircraft before boarding passengers or in transit, using a residual spray application of an effective insecticide;
- b) Disinsectization of aircraft, ships and other vehicles on arrival if the health authority at the place of arrival has reason to suspect importation of malaria vectors;
- c) Enforcing and maintaining rigid anti-mosquito sanitation within the mosquito flight range of all ports and airports.

2) In special circumstances:

Administer antimalarial drugs to potentially infected migrants, refugees, seasonal workers and persons taking part in periodic mass movement into an area or country where malaria has been eliminated.

1.5.2.d. Management of the disease²⁹

- The best available treatment, particularly for *P. falciparum* malaria, is artemisinin-based combination therapy (ACT).
- WHO recommends that all cases of suspected malaria be confirmed using parasite-based diagnostic testing (either microscopy or rapid diagnostic test) before administering treatment. Results of parasitological confirmation can be available in 15 minutes or less. Treatment solely on the basis of symptoms should only be considered when a parasitological diagnosis is not possible.



30

Ring-forms and gametocytes of *Plasmodium falciparum* in human blood

²⁹ WHO. "Malaria Fact Sheet." April 2012. <http://www.who.int/mediacentre/factsheets/fs094/en/index.html>

³⁰ <http://en.wikipedia.org/wiki/File:Plasmodium.jpg>

1.5.3.Measles

ICD-10 B05

1.5.3.a. Identification

Acute systemic viral infection. The prodromal phase lasts 2–4 days (range 1–7 days). It is characterized by fever, which increases in stepwise fashion, often peaking as high as 103°–105°F. This is followed by the onset of cough, coryza (runny nose), or conjunctivitis. Koplik spots, a rash (enanthem) present on mucous membranes, is considered to be pathognomonic for measles. It occurs 1–2 days before the rash to 1–2 days after the rash, and appears as punctate blue-white spots on the bright red background of the buccal mucosa.

The measles rash is a maculopapular eruption that usually lasts 5–6 days. It begins at the hairline, then involves the face and upper neck. During the next 3 days, the rash gradually proceeds downward and outward, reaching the hands and feet. The maculopapular lesions are generally discrete, but may become confluent, particularly on the upper body. Initially, lesions blanch with fingertip pressure. By 3–4 days, most do not blanch with pressure. Fine desquamation occurs over more severely involved areas. The rash fades in the same order that it appears, from head to extremities.

Complications include diarrhea, dehydration, stomatitis, inability to feed, and bacterial infections (skin and elsewhere).

Clinical case definition

Any person with fever and generalized maculopapular (non-vesicular) rash and cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes). OR

Any person in whom a clinical health worker suspects measles infection.

Case classification

Clinically confirmed: a case that meets the clinical case definition

Laboratory confirmed: (only for outbreak confirmation and during the elimination phase): A case that meets the clinical case definition and is laboratory confirmed (presence of measles-specific IgM antibodies); A case meeting clinical definition and epidemiologically linked by direct contact to a laboratory-confirmed case in which rash onset occurred 7-18 days earlier.

Infectious agent

Measles virus (genus *Morbillivirus*, family *Paramyxoviridae*)

Occurrence

Measles in Iraq³¹.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	726	4088	-	-	9081	908	474	230	5494	30328	492	1021

In temperate areas, measles disease occurs primarily in late winter and spring.

31

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

1.5.3 b. Reservoir

Humans. Asymptomatic carrier state has not been documented.

Mode of transmission

- Airborne by droplet spread; or
- Direct contact with the nasal and throat secretions of infected persons or via object (e.g. toys) that has been in close contact with an infected person

Incubation period

After infection there is an asymptomatic incubation period of 10-12 days, with a range from 7 to 18 days from exposure to the onset of fever.

Period of communicability

Measles is most infectious from 4 days before the rash until 1-2 days after rash onset.

Susceptibility and resistance

Measles is highly contagious one person can infect 90% of the people close to that person who are not immune. Measles is more severe in malnourished children, particularly those with vitamin A deficiency. The case-fatality rate may be as high as 25%.

1.5.3. c. Methods of control³²

Preventive measures

Iraq has a routine immunization policy which requires a dose of single antigen measles vaccine at 9 months, a dose of MMR (measles-mumps-rubella vaccine) at 15 months, and another dose of MMR at school entry. However, supplementary measles immunization campaigns may be required in order to reduce the risk of a measles outbreak.

Control measures

For uncomplicated cases: Give Vitamin A immediately upon diagnosis and ensure the child receives a second dose the next day (can be given to mother to administer at home). Advise the parent to treat the child at home (control fever and provide nutritional feeding).

For cases with non-severe eye, mouth or ear complications: Children can be treated at home. Give Vitamin A immediately upon diagnosis and ensure that the child receives a second dose the next day (can be given to mother to administer at home). If pus draining from the eyes, clean eyes and treat with 1% tetracycline eye ointment. If mouth ulcers, treat with gentian violet. If pus draining from the ear, clean ear discharge and treat with antibiotics for 5 days (amoxicillin –1st line- or cotrimoxazole-2nd line-,

³² WHO-recommended standard of selected vaccine preventable diseases;

http://www.who.int/immunization_monitoring/diseases/measles_surveillance/en/index.html

as per national ARI policy and IMCI guidelines). Treat malnutrition and diarrhea, if present, with sufficient fluids and high quality diet.

For cases with severe, complicated measles (any general danger signs, clouding of cornea, deep or extensive mouth ulcers, pneumonia): Refer urgently to hospital. Treat pneumonia with an appropriate antibiotic. If clouding of the cornea or pus draining from the eye, clean eyes and apply 1% tetracycline eye ointment. If the child has any eye signs indicating Vitamin A deficiency (i.e. night blindness, Bitôt spots, conjunctival and corneal dryness, corneal clouding or corneal ulceration), then he or she should receive a third dose of Vitamin A 2-4 weeks later.

Epidemic measures

- Inform the Health Authorities if one or more suspected cases are identified.
- Confirm the suspected outbreak, following WHO guidelines.
- Investigate suspected case: check if it fulfills the case definition, record date of onset, age and vaccination status.
- Confirm the diagnosis: collect blood specimen from 3-5 initial reported cases.
- Assess the extent of the outbreak and the population at risk.
- Implement outbreak response measures:
 - Give priority to proper case management and immunization of groups at highest risk (e.g. children 6 months – 5 years) as soon as possible in neighboring areas not yet affected by the outbreak and where the outbreak is likely to spread.
 - Promote social mobilization of parents in order to assure previously unvaccinated children 6 months – 5 years of age are immunized.
 - The presence of several cases of measles in an emergency setting does not preclude a measles immunization campaign. Even among individuals who have already been exposed to, and are incubating the natural virus, measles vaccine, if given within three days of exposure, may provide protection or modify the clinical severity of the illness.
 - Isolation is not indicated and children should not be withdrawn from feeding programs.

1.5.3.d. Management of the disease³³

- Severe complications from measles can be avoided through supportive care that ensures good nutrition, adequate fluid intake and treatment of dehydration with WHO-recommended oral rehydration solution. This solution replaces fluids and other essential elements that are lost through diarrhea or vomiting. Antibiotics should be prescribed to treat eye and ear infections, and pneumonia.
- All children in developing countries diagnosed with measles should receive two doses of vitamin A supplements, given 24 hours apart. This can help prevent eye damage and blindness. Vitamin A supplements have been shown to reduce the number of deaths from measles by 50%.



A person infected with measles

³³ WHO. "Measles Fact Sheet." April 2012. <http://www.who.int/mediacentre/factsheets/fs286/en/index.html>

³⁴ [Centers for Disease Control and Prevention's Public Health Image Library](#)

1.5.4.Tetanus

ICD-10 A35: Tetanus

ICD-10 A33: Neonatal Tetanus

1.5.4.a.Identification

An acute disease induced by an exotoxin of the tetanus bacillus, which grows anaerobically at the site of an injury. The disease is characterized by painful muscular contractions, primarily of the masseter and neck muscles, secondarily of trunk muscles. A common first sign suggestive of tetanus in older children and adults is abdominal rigidity, though rigidity is sometimes confined to the region of injury. Generalized spasms occur, frequently induced by sensory stimuli; typical features of the tetanic spasm are the position of opisthotonos and the facial expression known as “risus sardonius.” History of an injury or apparent portal of entry may be lacking. The case-fatality rate ranges from 10% to over 80%, it is highest in infants and the elderly, and varies inversely with the length of the incubation period and the availability of experienced intensive care unit personnel and resources. Attempts at laboratory confirmation are of little help. The organism is rarely recovered from the site of infection, and usually there is no detectable antibody response.

Infectious agent

Clostridium tetani, the tetanus bacillus.

Occurrence

The disease is more common in agricultural regions and in areas where contact with animal excreta is more likely and immunization is inadequate. Parenteral use of drugs by addicts, particularly intramuscular or subcutaneous use, can result in individual cases and occasional circumscribed outbreaks. In rural and tropical areas people are especially at risk, and tetanus neonatorum is common. The disease is sporadic and relatively uncommon in most industrial countries.

Tetanus (total) in Iraq³⁵.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	-	-	-	-	17	21	9	17	18	34	25	29

Neonatal Tetanus in Iraq³⁶.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	37	22	-	-	16	18	9	6	9	17	11	10

³⁵

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

³⁶

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

1.5.4.b. Reservoir

Intestines of horses and other animals, including humans, in which the organism is a harmless normal inhabitant. Soil or fomites contaminated with animal and human feces. Tetanus spores, ubiquitous in the environment, can contaminate wounds of all types.

Mode of transmission

Tetanus spores are usually introduced into the body through a puncture wound contaminated with soil, street dust or animal or human feces; through lacerations, burns and trivial or unnoticed wounds; or by injected contaminated drugs (e.g. street drugs). Tetanus occasionally follows surgical procedures, which include circumcision and abortions performed under unhygienic conditions. The presence of necrotic tissue and/or foreign bodies favors growth of the anaerobic pathogen. Cases have followed injuries considered too trivial for medical consultation.

Incubation period

Usually 3–21 days, although it may range from 1 day to several months, depending on the character, extent and location of the wound; average 10 days. Most cases occur within 14 days. In general, shorter incubation periods are associated with more heavily contaminated wounds, more severe disease and a worse prognosis.

Period of communicability

No direct person-to-person transmission.

Susceptibility and resistance

Susceptibility is general. Active immunity is induced by tetanus toxoid and persists for at least 10 years after full immunization; transient passive immunity follows injection of tetanus immune globulin (TIG) or tetanus antitoxin (equine origin). Infants of actively immunized mothers acquire passive immunity that protects them from neonatal tetanus. Recovery from tetanus may not result in immunity; second attacks can occur and primary immunization is indicated after recovery.

1.5.4.c. Methods of control

Preventive measures

1. Educate the public on the necessity for complete immunization with tetanus toxoid, the hazards of puncture wounds and closed injuries that are particularly liable to be complicated by tetanus, and the potential need after injury for active and/or passive prophylaxis.
2. Universal active immunization with adsorbed tetanus toxoid (TT), which gives durable protection for at least 10 years; after the initial basic series has been completed, single booster doses elicit high levels of immunity. In children under 7, the toxoid is generally administered together with diphtheria toxoid and pertussis vaccine as a triple (DTP or DTaP) antigen, or as double (DT) antigen when contraindications to pertussis vaccine exist.
3. Prophylaxis in wound management: Tetanus prophylaxis in patients with wounds is based on careful assessment of whether the wound is clean or contaminated, the immunization status of the patient, proper use of tetanus toxoid and/or TIG, wound cleaning and, where required, surgical debridement and the proper use of antibiotics.

Control measures

1. Report to local health authority.
2. Isolation: Not applicable.
3. Concurrent disinfection: Not applicable.
4. Quarantine: Not applicable.
5. Immunization of contacts: Not applicable.
6. Investigation of contacts and source of infection: Case investigation to determine circumstances of injury.
7. Specific treatment: TIG IM in doses of 3000–6000 IU. If immunoglobulin not available, tetanus antitoxin (equine origin) in a single large dose should be given IV following appropriate testing for hypersensitivity. Metronidazole, the most appropriate antibiotic in terms of recovery time and case-fatality, should be given for 7–14 days in large doses; this also allows for a reduction in the amount of muscle relaxants and sedatives required. The wound should be debrided widely and excised if possible. Wide debridement of the umbilical stump in neonates is not indicated. Maintain an adequate airway and employ sedation as indicated; muscle relaxant drugs together with tracheostomy or nasotracheal intubation and mechanically assisted respiration may be lifesaving. Active immunization should be initiated concurrently with treatment.

1.5.4.d. Management of the disease³⁷

- **Neonatal tetanus**
 - Disinfection of umbilical cord
 - Sedation
 - Anti-tetanus serum and antibiotics
 - Breast-milk through naso-gastric tube

- **Wound-related tetanus**
 - Adequate wound disinfection and debridement
 - Sedation
 - Anti-tetanus serum and antibiotics



38

An infant suffering from neonatal tetanus

³⁷ Johns Hopkins and the International Federation of Red Cross and Red Crescent Societies. "Control of communicable diseases in emergencies." *Public health guide to emergencies*. 2nd edition. 2008. Pp.360-361.

³⁸ [Centers for Disease Control and Prevention's Public Health Image Library](#)

1.5.5. Food Poisoning

ICD-10 A02 & A05

1.5.5.a. Identification

It is a frequent and inaccurate term of food intoxication which is an illness acquired through consumption of contaminated food. Outbreaks due to food consumption are suspected when an illness of short incubation period occurs after the consumption of contaminated food. It could be caused by:

1. Chemical contaminants such as heavy metals and organic compounds or
2. The more frequent causes of foodborne illnesses are:
 - a) Toxins elaborated by bacterial growth in the food before consumption (*Clostridium botulinum*, *Staphylococcus aureus*, and *Bacillus cereus*; scombroid fish poisoning- associated not with a specific toxin but with elevated histamine levels) or in the intestines (*Clostridium perfringens*).
 - b) Bacterial, viral, or parasitic infections (Brucellosis, *Campylobacter enteritis*, diarrhea caused by *Escherichia coli*, hepatitis A, listeriosis, trichinosis, and infection with *Vibrio*).
 - c) Toxins produced harmful algal species or present in specific species (puffer fish poisoning, AZP).

Food borne disease is recognized by the occurrence of illness within short period (few hours to few weeks) after a meal.

Case classification

Suspect case: sudden onset (duration according to causes mentioned above) with severe nausea and vomiting, diarrhea, fever, fatigue, seizure, abdominal cramps, dry mouth, difficulty in swallowing and speaking, lowered blood pressure, blurred vision, and/or bloody stool.

Confirmed case: isolation of causative agent from suspected food, vomitus or stool (*Staph. aureus*); identification of bacteria in a culture from the suspected food or patient stool (*Clostridium perfringens*); enterotoxin detection in the suspected food; suspect case among food poisoning cases sharing the same food, with at least one lab confirmed case.

NOTE: infectious agent, occurrence, reservoir, mode of transmission, incubation period, period of communicability, susceptibility and resistance will all depend on the exact causative agent. General methods of control are discussed below.

1.5.5.b.Methods of control

Any suspected food poisoning cases should be reported immediately to health authority and a case investigation should be conducted for all suspect and confirmed cases. Samples of stool, vomit, and suspected food should be collected. Instructions to contacts: not to eat suspected food.

1.5.5.c.Management of the disease³⁹

Because most cases of acute gastroenteritis are self-limited, specific treatment is not necessary. Some studies have quantified that only 10% of cases require antibiotic therapy.

- The main objective is adequate rehydration and electrolyte supplementation. This can be achieved with either an oral rehydration solution (ORS) or intravenous solutions (e.g., isotonic sodium chloride solution, lactated Ringer solution). Strict personal hygiene should be practiced during the illness.
 - Oral rehydration is achieved by administering clear liquids and sodium-containing and glucose-containing solutions. A simple ORS may be composed of 1 level teaspoon of salt and 4 heaping teaspoons of sugar added to 1 liter of water.
 - The use of ORS has reduced the mortality rate associated with cholera from higher than 50% to less than 1%.
 - ORS also is indicated in other dehydrating diarrheal diseases.
 - ORS promotes cotransport of glucose, sodium, and water across the gut epithelium, a mechanism unaffected in cholera.
 - The World Health Organization (WHO) recommends a solution containing 3.5 g of sodium chloride, 2.5 g of sodium bicarbonate, 1.5 g of potassium chloride, and 20 g of glucose per liter of water.
- Intravenous solutions are indicated in patients who are severely dehydrated or who have intractable vomiting.

³⁹ Gamarra, Roberto M. "Food Poisoning Treatment and Management." *Medscape*. Updated: March 19, 2012.

<http://emedicine.medscape.com/article/175569-treatment>

Module Two

Module Two: Weekly Reporting Communicable Diseases

Module Objectives: at the end of this module the participant will be able to:

- 1- Assess acute diarrhea
- 2- Assess cutaneous Leishmaniasis
- 3- Assess the visceral Leishmaniasis

- **Session 1:** Assess Acute Diarrhea
- **Session 2:** Assess Cutaneous Leishmaniasis
- **Session 3:** Assess Visceral Leishmaniasis

Evaluation/ Assessment

Questions and answers, participants' summaries, trainer's evaluation

Estimated Training Time

1 Hour and a half

Module 2

Session 2.1: Assess Acute Diarrhea

Objectives: at the end of this session participants will be able to:

- Define Classify, Identify infectious agent and occurrence.
- Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance
- Describe methods of control
- Explain clinical management.

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

35 min

<p>2.1.3 Describe methods of control (10 min)</p> <p>2.1.4 Explain clinical management. (5 min)</p>	<p>Methods of control</p> <p>All depend on the causative agent.</p> <p>Management of the disease⁴⁰</p> <p>The main objective is adequate rehydration and electrolyte supplementation.</p> <p>Strict personal hygiene should be practiced during the illness.</p>	<p>Brain Storming</p> <p>Discussion</p>
---	--	---

2.1.1 Acute Diarrhea

ICD-10 A09

2.1.1 .a .Identification

It is defined as passage of loose or watery stools at an increased frequency from normal (as 3 or more loose or watery stools per 24 hours). It is associated with other systemic or gastrointestinal symptoms including vomiting, fever, dehydration and electrolyte disturbances.

From practical clinical point, diarrheal illnesses can be divided into 3 clinical presentations:

1. Acute watery diarrhea (including cholera), lasting less than 14 days.
2. Acute bloody diarrhea (dysentery), lasting less than 14 days. Bloody diarrhea is that when the loose or watery stool contains visible red blood.
3. Persistent diarrhea, lasting 14 days or longer.

Infectious agent

Acute diarrhea may be caused by different bacterial (cholera, shigella, salmonella, E coli, Yersinia), viral (Rotavirus) and parasitic (giardia) enteric agents. The most common pathogens for acute watery diarrhea:

4. Rotavirus
5. ETEC (Enterotoxigenic Escherichia coli)
6. Vibrio cholerae - most important cause of epidemic watery diarrhea in developing countries due to high rate of morbidity and mortality. ETEC can also cause epidemic diarrhea, but its treatment is essentially the same as cholera.

NOTE: Occurrence, Reservoir, Mode of transmission, Incubation period, period of communicability, susceptibility and resistance, and methods of control all depend on the causative agent.

2.1.4. Management of the disease⁴¹

The main objective is adequate rehydration and electrolyte supplementation. This can be achieved with either an oral rehydration solution (ORS) or intravenous solutions (e.g., isotonic sodium chloride solution, lactated Ringer solution). Strict personal hygiene should be practiced during the illness.

- Glucose-containing solutions. A simple ORS may be composed of 1 level teaspoon of salt and Oral rehydration is achieved by administering clear liquids and sodium-containing and 4 heaping teaspoons of sugar added to 1 liter of water.
- The use of ORS has reduced the mortality rate associated with cholera from higher than 50% to less than 1%.
- ORS also is indicated in other dehydrating diarrheal diseases.
- ORS promotes cotransport of glucose, sodium, and water across the gut epithelium, a mechanism unaffected in cholera.
- The World Health Organization (WHO) recommends a solution containing 3.5 g of sodium chloride, 2.5 g of sodium bicarbonate, 1.5 g of potassium chloride, and 20 g of glucose per liter of water.

(A) Lupoid leishmaniasis with scarring due to previous *L tropica* infection and the presence of red/brown papules at the periphery of the scar. (B) Lupoid leishmaniasis with scarring due to previous *L tropica* infection, and two red/brown nodules at the superior and inferior poles, of the scar on the left cheek of a 9 year old boy from Afghanistan

⁴¹ Gamarra, Roberto M. "Food Poisoning Treatment and Management." *Medscape*. Updated: March 19, 2012. <http://emedicine.medscape.com/article/175569-treatment>

Module 2

Session 2.2: Cutaneous Leishmaniasis

Objectives: at the end of this session participants will be able to:

- Define Classify, Identify infectious agent and occurrence.
- Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance
- describe methods of control
- Explain clinical management.

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

35 min

Session Plan 2:

OBJECTIVE	CONTENT	Methods/ Activities
<p>2.2.1 Cutaneous Leshmaniasis</p> <p>2.2.1 Define, Classify, Identify infectious agent and occurrence.</p> <p>(10 min)</p>	<p>ICD-10 B55.1</p> <p>Identification A protozoan disease of skin and mucous membranes caused by species of the genus <i>Leishmania</i>.</p> <p>Single, multiple skin lesions starts with a papule, enlarges and <u>typically</u> becomes an indolent ulcer (wet ulcer with bad odour in <i>L. major</i> or dry type ulcer with smaller size in <i>L. tropica</i>). <u>Laboratory criteria for diagnosis</u>: positive parasitology</p> <p>Case classification</p> <p>WHO operational definition: A person showing clinical signs (skin or mucosal lesions), with parasitological confirmation of the diagnosis (positive smear or culture) and/or, for mucocutaneous leishmaniasis <u>only</u>, serological diagnosis.</p> <p>Infectious agent</p> <ol style="list-style-type: none"> 1. <i>Leishmania tropica</i> parasite 2. <i>Leishmania major</i> parasite <p>Occurrence: Mostly in Meysan, Diala, Salahedin. Table: Cutaneous Leshmaniasis,</p>	<p>Mini Lecture</p>

<p>2.2.2 Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance</p> <p>(10 min)</p>	<p>Reservoir Dogs, rodents, jackals, and humans.</p> <p>Mode of transmission From the reservoir host by the bite of infected female sand fly</p> <p>Incubation period From one month or less</p> <p>Period of communicability They are usually most active at dawn, dusk and during the night, or if they are disturbed in their hiding places.</p> <p>Susceptibility and resistance Geographical distribution is limited by the distribution of the sand fly, its susceptibility to cold climates, its tendency to take blood from humans or animals</p>	<p>Discussion Lecture.</p>
<p>2.2.3 describe methods of control</p> <p>(10 min)</p>	<p>Methods of control</p> <ul style="list-style-type: none"> • Case detection • Two round spraying yearly • Fogging • Rodent control measures • Stray dogs control measures, • Specific treatment <p>Management of the disease</p>	<p>Brain storming.</p>
<p>2.2.4 Explain clinical management.</p> <p>(5 min)</p>	<p><u>Medicines:</u> Meglumine antimoniate ,Sodium stibogluconate,Other drugs AmphotericinB</p> <p>Cure rates are high with proper treatment, before the occurrence of the immune system damage, disfigurement.</p>	<p>Discussion.</p>

2.2.1 .Cutaneous Leishmaniasis

ICD-10 B55.1

2.2.1 .a .Identification

A protozoan disease of skin and mucous membranes caused by species of the genus *Leishmania*.

Single or multiple skin lesions starts with a papule that enlarges and typically becomes an indolent ulcer (wet ulcer with bad odour in *L. major* or dry type ulcer with smaller size in *L. tropica*). Lesions may heal spontaneously within weeks to months or last for a year or more leaving permanent scars on skin. Multiple ulcers following scarring may lead to skin deformity. Areas affected are mostly face and upper arms (uncovered areas in the body). The healing may last 3 – 6 months and may be more, leaving immunity for many years.

Affects all ages and sexes equally.

Laboratory criteria for diagnosis

- positive parasitology (stained smear or culture from the lesion)
- mucocutaneous leishmaniasis only: positive serology (IFA, ELISA).

Case classification

WHO operational definition:

A case of cutaneous leishmaniasis is a person showing clinical signs (skin or mucosal lesions) with parasitological confirmation of the diagnosis (positive smear or culture) and/or, for mucocutaneous leishmaniasis only, serological diagnosis.

Infectious agent

3. *Leishmania tropica* parasite
4. *Leishmania major* parasite

Occurrence

Cases of Cutaneous Leishmaniasis, 2000-2009

Year	2005	2006	2007	2008	2009
Cases	2435	1339	626	1250	2055

Cases are reported in all provinces except Erbil, Dahuk

The cases registered mostly in Maysan, Diyala, Salahedin.

2.2.1 .b.Reservoir

Dogs, rodents, jackals, and humans.

Mode of transmission

From the reservoir host by the bite of infected female sand fly.

Female sandflies pick up parasite (amastigote or LD bodies) while feeding on an infected host. Parasite undergo morphological change to become flagellate, development and multiplication in the gut of sandflies and move to mouthparts.

Incubation period

From one month or less; may be up to one month to one year.

Period of communicability

Sand fly activity occurs in humid conditions when there is no rain or wind. They are usually most active at dawn, dusk and during the night, or if they are disturbed in their hiding places (animal burrows, holes in houses and other relatively cool, humid locations) in the daytime.

Susceptibility and resistance

Geographical distribution of leishmaniasis is limited by the distribution of the sand fly, its susceptibility to cold climates, its tendency to take blood from humans or animals. Risk factor is the movement of susceptible populations into endemic areas, including large-scale migration of populations for economic reasons. Poverty and malnutrition play a major role in the increased susceptibility. Immunosuppression due to HIV predisposes to progression to visceral form.

2.2.1 .c.Methods of control⁴²

1. Case detection and rapid treatment from hospital and dermatological department weekly and monthly.
2. Two round spraying yearly by insecticide with residual action to control vector (sand fly) in the affected areas.
3. Fogging by especially machine at evening in the affected areas.
4. Rodent control measures.
5. Stray dogs control measures.
6. Specific treatment mainly with pentavalent antimony compounds (pentostam) either by local infiltration around the lesion or systemic route in multiple lesions as follows (20 mg/ kg/ day) for 2 weeks.

2.2.1 .d.Management of the disease⁴³

- Medicines called antimony-containing compounds are the main drugs used to treat leishmaniasis. These include:
 - Meglumine antimoniate
 - Sodium stibogluconate
- Other drugs that may be used include:
 - Amphotericin B
 - Ketoconazole
 - Miltefosine
 - Paromomycin
 - Pentamidine
 - Cure rates are high with the proper medicine. Patients should get treated before damage to the immune system occurs. Cutaneous leishmaniasis may lead to disfigurement.

⁴² http://www.who.int/leishmaniasis/cutaneous_leishmaniasis/en/index.html

⁴³ "Leishmaniasis". *New York Times Health Guide*. Reviewed by: Dr. David C. Dugdale, 24 August 2011. <http://health.nytimes.com/health/guides/disease/leishmaniasis/overview.html>



44

(A) Lupoid leishmaniasis with scarring due to previous *L tropica* infection and the presence of red/brown papules at the periphery of the scar. (B) Lupoid leishmaniasis with scarring due to previous *L tropica* infection, and two red/brown nodules at the superior and inferior poles, of the scar on the left cheek of a 9 year old boy from Afghanistan

⁴⁴ <http://adc.bmj.com/content/90/5/530/F3.large.jpg>

Module 2

Session 2.3: Assess Visceral Leishmaniasis

Objectives: at the end of this session participants will be able to:

- Define Classify, Identify infectious agent and occurrence.
- Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance
- describe methods of control
- Explain clinical management.

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

35 min

Session Plan 3:

OBJECTIVE	CONTENT	Methods/ Activities
<p>2.3.1. Visceral Leshmaniasis</p> <p>2.3.1. Define Classify, Identify infectious agent and occurrence.</p> <p>(10 min)</p>	<p>ICD-10 B55.1</p> <p>Identification A protozoan disease of skin and mucous membranes caused by species of the genus <i>Leishmania</i>.</p> <p><u>Laboratory criteria for diagnosis:</u> positive parasitology</p> <p>Case classification</p> <p>A person showing clinical signs (skin or mucosal lesions), with parasitological confirmation of the diagnosis (positive smear or culture) and/or, for mucocutaneous leishmaniasis <u>only</u>,</p> <p>ICD-10 B55.0</p> <p>Identification Usually affects younger ages (below 5 years) in both sexes, most commonly from rural affected areas.</p> <p>Death rate usually is 10 – 30% , may be more in advanced cases, especially without or delay treatment.</p> <p>Clinical description</p> <p><u>Clinical:</u> gradual, or sudden, persistent, regular fever. Hepatosplenomegaly, lymphadenopathy, anemia, leucopenia, thrombocytopenia, progressive emaciation, general weakness, brownish skin coloration abdomen enlargement.</p> <p><u>Lab diagnosis:</u> direct bone marrow smear, smear culture 3N media, with</p>	<p>Mini Lecture</p>

<p>2.3.2 Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance (10 min)</p> <p>describe methods of control (10 min)</p>	<p>(IFAT-ELISA-Rk39 dipstick).</p> <p>Infectious agent</p> <p>Intercellular protozoa of the genus Lishmaniasis (<i>L.donovani</i> or <i>L.infantum</i>).</p> <p>Intercellular protozoa of the genus <i>Leishmania</i> (<i>L.donovani</i> or <i>L.infantum</i>)</p> <p>Occurrence Cases are reported in all provinces except Erbil, Dahuk, and Sulaymania. Mostly in Babil, Diyala, and Basrah.</p> <p>Reservoir Dogs, Rodents, Jackals, Foxes</p> <p>Modes of transmission From the reservoir host by the bite of infected female sand fly</p> <p>Incubation period Usually from 1-3 months</p> <p>Period of communicability Sand fly activity occurs in humid conditions when there is no rain or wind</p> <p>Susceptibility and resistance</p> <p>Geographical distribution of leishmaniasis is limited by the distribution of the sand fly, its susceptibility to cold climates, to take blood from humans or animals.</p> <p>Methods of control</p> <ol style="list-style-type: none"> 1. Case detection 2. Two round spraying 3. Fogging 	<p>Discussion Lecture</p> <p>Brain storming</p>
---	--	---

<p>2.3.3 Explain clinical management.</p> <p>(5 min)</p>	<ol style="list-style-type: none"> 4. Rodent control measures. 5. Stray dogs control measures 6. Specific treatment <p>Management of the disease</p> <p>Medicines</p> <ul style="list-style-type: none"> ○ Amphotericin B ○ Meglumine antimoniate ○ Sodium stibogluconate <p>Other drugs</p> <ul style="list-style-type: none"> ○ Amphotericin B ○ Ketoconazole ○ Miltefosine ○ Paromomycin ○ Pentamidine <p>Cure is high with the proper medicine, before damage to the immune system.</p>	<p>Discussion</p>
--	---	-------------------

2.3.1.Visceral Leishmaniasis

ICD-10 B55.0

2.3.1.a .Identification

Disease affects usually younger ages (below 5 years) in both sexes. The patients most commonly are from rural affected areas.

Death rate usually is 10 – 30% and may be more in advanced cases and especially without or delay treatment.

Clinical description

Clinical: systemic disease characterizes by gradual or sudden onsite fever which is persistent and regular. Other associate features include: hepatosplenomegaly, lymphadenopathy, anemia, leucopenia, thrombocytopenia and progressive emaciation and general weakness, brownish coloration of skin with progressive enlargement of abdomen.

Lab diagnosis: direct smear from the bone marrow (to find parasite amastigote), with bone marrow smear culture 3N media to find promastigote-with serological test (IFAT-ELISA-Rk39 dipstick).

Infectious agent

Intercellular protozoa of the genus Leishmania (L.donovani or L.infantum)

Occurrence

Cases of Visceral Leishmaniasis, 2000-2009

Year	2005	2006	2007	2008	2009
Cases	2028	1443	782	1041	1433

Cases are reported in all provinces except Erbil, Dahuk, and Sulaymaniya

The cases registered mostly in Babil, Diyala, and Basrah.

The disease increase usually in autumn and winter every year and prevalent in the middle and south provinces of Iraq

2.3.1.b .Reservoir

Dogs, Rodents, Jackals, Foxes

Modes of transmission

From the reservoir host by the bite of infected female sand fly.

Female sandflies pick up parasite (amastigote or LD bodies) while feeding on an infected host. Parasite undergo morphological change to become flagellate, development and multiplication in the gut of sandflies and move to mouthparts.

Incubation period

Usually from 1-3 months. (Range: 2 week-one year).

Period of communicability

Sand fly activity occurs in humid conditions when there is no rain or wind. They are usually most active at dawn, dusk and during the night, or if they are disturbed in their hiding places (animal burrows, holes in houses and other relatively cool, humid locations) in the daytime.

Susceptibility and resistance

Geographical distribution of leishmaniasis is limited by the distribution of the sand fly, its susceptibility to cold climates, its tendency to take blood from humans or animals. Risk factor is the movement of susceptible populations into endemic areas, including large-scale migration of populations for economic reasons. Poverty and malnutrition play a major role in the increased susceptibility.

2.3.1.c.Methods of control⁴⁵

1. Case detection and rapid treatment from hospital and dermatological department weekly and monthly.
2. Two round spraying yearly by insecticide with residual action to control vector (sand fly) in the affected areas.
3. Fogging by especially machine at evening in the affected areas.
4. Rodent control measures.
5. Stray dogs control measures.
6. Specific treatment mainly by pentavalent antimony compounds (pentostam) by systemic route as follows (20 mg/ kg/ day) for 28 days.

⁴⁵ http://www.who.int/leishmaniasis/cutaneous_leishmaniasis/en/index.html

2.3.1.d. Management of the disease⁴⁶

- Medicines called antimony-containing compounds are the main drugs used to treat leishmaniasis. These include:
 - Meglumine antimoniate
 - Sodium stibogluconate
- Other drugs that may be used include:
 - Amphotericin B
 - Ketoconazole
 - Miltefosine
 - Paromomycin
 - Pentamidine

Cure rates are high with the proper medicine. Patients should get treated before damage to the immune system occurs.

⁴⁶ "Leishmaniasis". *New York Times Health Guide*. Reviewed by: Dr. David C. Dugdale, 24 August 2011. <http://health.nytimes.com/health/guides/disease/leishmaniasis/overview.html>.

Module Three: Monthly Reporting Communicable Diseases

Module Objectives: at the end of this module the participant will be able to:

1. Assess The Brucellosis
2. Assess The Chicken Pox
3. Assess The Echinococcosis (Hydatid Disease)
4. Assess The Leprosy
5. Assess The Mumps
6. Assess Schistosomiasis
7. Assess The scariasis
8. Assess Theancylostomiasis (Hookworm Disease)
9. Assess The Trichuriasis
10. Assess The Strongloidiosis
11. Assess The Enterobiasis
12. Assess The Cestodiasis (Hymenolepis)
13. Assess The Taeniasis (Taenia Saginata)
14. Assess The Amoebiasis
15. Assess The Giardiasis
16. Assess The Acute Lower Respiratory Infections (Alri)
17. Assess The Toxoplasmosis
18. Assess The Typhoid And Paratyphoid Fever

- **Session 1:** Assess Acute Diarrhea
- **Session 2:** Assess Cutaneous Leishmaniasis
- **Session 3:** Assess Visceral Leishmaniasis

Evaluation/ Assessment

Questions and answers, participants' summaries, trainer's evaluation

Estimated Training Time

9 hours, 30min.

Module 3

Session 3.1: Assess Viral Hepatitis, Brucellosis, Chicken Pox and Echinococcosis (hydatid Disease)

Objectives: at the end of this session participants will be able to:

- Assess Viral Hepatitis
- Assess The Brucellosis
- Assess The Chicken Pox
- Assess The Echinococcosis (Hydatid Disease)

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time:

2 hours

Session Plan 1:

OBJECTIVE	CONTENT	Methods/ Activities
<p>3.1.1. viral hepatitis</p> <p>3.1.1 a Define, Classify, Identify infectious agent and occurrence</p> <p>(10 min)</p>	<p>ICD-10 B15: Acute Hepatitis A ICD-10 B16: Acute Hepatitis B ICD-10 B17: Other Acute Viral Hepatitis ICD-10 B18: Chronic Viral Hepatitis ICD-10 B19: Unspecified Viral Hepatitis</p> <p>Identification 1) Hepatitis Types A and E <i>Clinical features</i> These share same clinical course; no evidence of chronic form. Infection occurs in childhood and young adults asymptotically or with a mild illness- may be detectable only through laboratory tests of liver function. Laboratory Diagnosis of types A and E: Acute Hepatitis A: demonstration of serum IgM anti-HAV detectable 5–10 days after exposure.. Acute hepatitis E: presence of IgM anti-HEV or exclusion of other causes of hepatitis, especially hepatitis A, by serological means. Hepatitis Types B, and C <i>Clinical features</i> Usually asymptomatic. In those with clinical illness, onset is usually insidious, with anorexia, vague abdominal discomfort, nausea and vomiting, sometimes arthralgia, rash, often progressing to jaundice. Fever may be absent or mild <u>Type D:</u> The delta agent is a defective virus. It occurs in 2 forms, either coinfection or superinfection with hepatitis B virus. It is prevented through the prevention of Hepatitis B. Laboratory Diagnosis of types B and C: <u>Type B:</u> serum HBsAg positive from several weeks before onset of symptoms to days, weeks or months after onset; it persists in chronic infections <u>Type C:</u> antibody to the hepatitis C virus (anti-HCV) - by the enzyme immunoassay (EIA) and the recombinant immunoblot assay Case definition An acute illness that includes malaise, extreme fatigue, fever, nausea and sometimes vomiting and upper right quadrant abdominal tenderness, then</p>	<p>Mini Lecture</p>

<p>3.1.1 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance.</p> <p>(10 min)</p>	<p>dark urine followed by jaundice.</p> <p>Case classification <u>Suspected case</u> <u>Probable case</u> <u>Confirmed case</u> <u>Chronic Hepatitis B cases</u> <u>Chronic Hepatitis C</u></p> <p>Infectious agent Hepatitis A virus (HAV) Hepatitis B virus (HBV) Hepatitis C virus (HCV): Hepatitis E virus (HEV): Occurrence</p> <p>Reservoir Type A: Humans, rarely chimpanzees and other primates. Types B and C: Humans. An animal reservoir in nature has not been recognized. Type E: Man is the natural host; some non-human primates, e.g. chimpanzees. Natural infections have been described in pigs, chicken and cattle, particularly in highly endemic areas.</p> <p>Mode of transmission Types A and E Types B and C</p> <p>Incubation period Type A: Average 28–30 days (range 15–50 days). Type B: Usually 45–180 days, average 60–90 days. Type C: Ranges from 2 weeks to 6 months; commonly 6–9 weeks. Type E: The range is 15 to 64 days; the mean varied from 26 to 42 days in various epidemics.</p> <p>Period of communicability Type A: maximum infectivity during the latter half of incubation continues for few days after onset of jaundice. Type B: All HBsA-positive persons are potentially infectious. Type C: From 1 or more weeks before onset; may persist indefinitely. Type E: Not known.</p> <p>Susceptibility and resistance</p>	<p>Discussion Lecture</p>
---	---	-------------------------------

<p>3.1.1 c describe methods of control (5 min)</p>	<p>For all types, susceptibility is general. Immunity against HBV is believed to persist for at least 15 years after successful immunization. Methods of control</p> <ul style="list-style-type: none"> • Preventive measures Types A and E Type B Type C • Control measures Types A, B, C and E • Epidemic measures Types A and E Types B and C • Disaster implications Types A and E Types B and C • International measures: Types A and E: None. Types B and C: Ensure adequate virus inactivation for all internationally traded biological products. 	<p>Brain Storming</p>
<p>3.1.2 Brucellosis 3.1.2. a Define, Classify, Identify infectious agent and occurrence (10 min)</p>	<p>ICD-10 A23</p> <p>Identification A systemic zoonotic bacterial disease caused by <i>Brucella</i> species.</p> <p>Clinical features Acute or insidious onset, continued, intermitted or irregular fever of variable duration, profuse sweating <u>particularly at night</u>, fatigue, anorexia, weight loss, headache, arthralgia and generalized aching, local infection of various organs</p> <p>Case classification <u>Suspected</u>: a case compatible with the clinical description, epidemiologically linked to suspected or contaminated animal products. <u>Probable</u>: a suspected case with positive Rose Bengal test. <u>Confirmed</u>: a suspected or probable case, laboratory confirmed through isolation of Brucella.</p> <p>Infectious agent <i>B. abortus</i>, <i>B. melitensis</i>, <i>B. suis</i>, and <i>B. canis</i></p> <p>Occurrence: Worldwide, it used to be an occupational hazard, in farm workers, veterinarians, and abattoir workers. Table: case of brucellosis</p>	<p>Mini Lecture</p>

<p>3.1.2 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p> <p>3.1.2 c describe methods of control (10 min)</p> <p>3.1.2 d explain clinical management (5 min)</p>	<p>Reservoir Infection can be transmitted from cattle, goats, sheep, dogs, and swine.</p> <p>Mode of transmission</p> <ul style="list-style-type: none"> • Contact with infected animal tissues, blood, urine, vaginal discharges, aborted animal fetuses, placentae, ingestion of raw milk and dairy products from infected animals without boiling or pasteurizing milk used. • Inhalation in laboratory workers. <p>Incubation period There is no evidence of communicability from person to person.</p> <p>Susceptibility and resistance Severity and duration of clinical illness are subject to wide variation. Duration of acquired immunity is uncertain.</p> <p>Methods of control</p> <ul style="list-style-type: none"> a- Preventive measures b- Control measures <p>Management of the disease Usually a combination of rifampicin and doxycycline for 6 weeks to prevent reoccurring. Recovery from (few weeks- several months). Mortality-less 2%, usually with endocarditis.</p>	<p>Discussion Lecture</p> <p>Brain Storming</p> <p>Discussion</p>
---	---	---

<p>3.1.3 Chicken Pox</p> <p>3.1.3 a Define, Classify, Identify infectious agent and occurrence</p> <p>(10 min)</p>	<p>ICD-10 B01: Chicken Pox ICD-10 B02: Herpes Zoster</p> <p>Identification Clinical features <u>Varicella (chickenpox)</u> <u>Herpes Zoster(shingles)</u></p> <p>Method of diagnosis</p> <ul style="list-style-type: none"> • isolation of the virus in cell cultures • visualization by electron microscopy • serological tests for antibodies • immunofluorescence on lesion swab or fluid • nucleic acid testing or PCR. <p>Infectious agent Human herpes virus 3 (alpha) or varicella zoster virus (VZV).</p> <p>Occurrence Highly contagious, mild, endemic in the population. Epidemics during winter, early spring. More than 90% children under 15 years of age. Shingles-20% of people</p>	<p>Mini Lecture</p>
<p>3.1.3 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance.</p> <p>(10 min)</p>	<p>Reservoir <u>Humans</u> are the <u>only</u> reservoir of the virus, and disease occurs only in humans.</p> <p>Mode of transmission Mainly person to person by, airborne respiratory droplets, direct contact with vesicle fluid of chickenpox cases, or contact with the vesicle fluid of patients with herpes zoster</p> <p>Incubation period usually 14-16 days Communicable(1-5) days before the onset of the rash, continuing until all lesions are crusted</p> <p>Susceptibility and resistance Universal among previously not infected.</p>	<p>Discussion Lecture</p>
<p>3.1.3 c Describe methods of control</p> <p>(10 min)</p>	<p>Methods of control Control measures</p>	<p>Brain Storming</p>
<p>3.1.3 d Explain clinical management</p> <p>(5 min)</p>	<p>Management of the disease Children: symptomatic treatment. Adults, immunocompromised persons: intravenous acyclovir. For Zoster cases-Varicella-zoster immune globulin (VZIG).</p>	<p>Discussion</p>

<p>3.1.4.Echinococcosis (Hydatid disease) 3.1.4 a Define, Classify, Identify infectious agent and occurrence (10 min)</p>	<p>ICD-10 B67 Identification A space occupying disease, in humans caused by the larval stage of the dog tapeworm, <i>Echinococcus granulosus</i>. The signs, symptoms and extent of disease are determined by the size and location of the unilocular cysts (hydatid cyst) that are characteristic of this disease. Case classification <i>Suspected</i>: clinically suspected case, with history of contact to animals or animal viscera. <i>Probable</i>: diagnosis by plain x-ray, ultrasound or CT, casoni test <i>Confirmed</i>: Laboratory (PCR , IFAT , ELISA)</p>	<p>Mini Lecture</p>
<p>3.1.4 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p>	<p>Infectious agent <i>Echinococcus granulosus</i> Occurrence Table: Cases of hydatid disease. Reservoir Dogs and foxes. Major intermediate hosts include goats, sheep, and cattle.</p>	<p>Discussion Lecture</p>
<p>3.1.4 c Describe methods of control (10 min)</p>	<p>Mode of transmission By hand-to mouth transfer of tapeworm eggs from dog faces. Incubation period Variable, from months to years. Period of communicability Not communicable through person-to-person transmission</p>	<p>Brain Storming</p>
<p>3.1.4 d Explain clinical management (5 min)</p>	<p>Susceptibility and resistance Adults (ages 15-49) are more often infected than children. Methods of control Preventive measures Control measures Management of the disease Mebendazole, albendazole are the only effective drugs.</p>	<p>Discussion</p>

1.4.4. Viral Hepatitis

ICD-10 B15: Acute Hepatitis A

ICD-10 B16: Acute Hepatitis B

ICD-10 B17: Other Acute Viral Hepatitis

ICD-10 B18: Chronic Viral Hepatitis

ICD-10 B19: Unspecified Viral Hepatitis

3.1.1..a .Identification

1) Hepatitis Types A and E

Clinical features

These share same clinical course; no evidence of chronic form. Infection occurs in childhood and young adults asymptotically or with a mild illness- may be detectable only through laboratory tests of liver function.

Onset of illness in adults is usually abrupt with fever, malaise, anorexia, nausea and abdominal discomfort, followed within a few days by jaundice. The disease varies in clinical severity from a mild illness lasting 1–2 weeks to a severely disabling disease lasting several months. Prolonged, relapsing hepatitis for up to 1 year occurs in 15% of cases. Convalescence is often prolonged. In general, severity increases with age, but complete recovery without sequelae or recurrences is the rule. Case-fatality for Hepatitis A is normally low, 0.1%–0.3%; it can reach 2.7% for adults over 50; persons with chronic liver disease have an elevated risk of death from fulminant hepatitis A. The case-fatality rate for HEV is similar to that of hepatitis A except in pregnant women, where it may reach 20% among those infected during the third trimester of pregnancy.

Laboratory Diagnosis of types A and E:

Acute Hepatitis A: demonstration of serum IgM anti-HAV detectable 5–10 days after exposure.. Acute hepatitis E: presence of IgM anti-HEV or exclusion of other causes of hepatitis, especially hepatitis A, by serological means.

2) Hepatitis Types B, and C

Clinical features

Usually asymptomatic. In those with clinical illness, the onset is usually insidious, with anorexia, vague abdominal discomfort, nausea and vomiting, some- times arthralgia and rash, often progressing to jaundice. Fever may be absent or mild. Less than 10% of children and 30%–50% of adults with acute hepatitis B virus (HBV) infection show icteric disease.

Severity ranges from unapparent cases detectable only by liver function tests to fulminating, fatal cases of acute hepatic necrosis. The case-fatality rate is about 1%; higher in those over 40. Fulminant HBV infection also occurs in pregnancy and among newborns of infected mothers. The risk of developing chronic infection varies inversely with age; occurs among about 90% of infants infected at birth, 20%–50% of children infected from 1 to 5 years, and 1%–10% of persons infected as older children and adults. Persons with chronic infection may or may not have a history of clinical hepatitis. About one-third have elevated aminotransferases; biopsy

findings range from normal to chronic active hepatitis, with or without cirrhosis. An estimated 15%–25% of persons with chronic HBV infection will die prematurely of either cirrhosis or hepatocellular carcinoma.

Onset of acute hepatitis C is usually insidious, with anorexia, vague abdominal discomfort, nausea and vomiting; progression to jaundice less frequent than with hepatitis B. Asymptomatic in more than 90% of cases or mild, a high percentage (50%–80%) develop a chronic infection. Of chronically infected persons, about half will eventually develop cirrhosis or cancer of the liver.

Type D: The delta agent is a defective virus. It occurs in 2 forms, either coinfection or superinfection with hepatitis B virus. It is prevented through the prevention of Hepatitis B.

Laboratory Diagnosis of types B and C:

Type B: serum HBsAg positive from several weeks before onset of symptoms to days, weeks or months after onset; it persists in chronic infections. The presence of HBsAg indicates that the person is potentially infectious.

High titers of IgM anti-HBc occur during acute infection—IgM anti-HBc usually disappears within 6 months but can persist in some cases of chronic hepatitis; this test may reliably diagnose acute HBV infection.

Anti HBcIgG replaces anti HBcIgM and continues forever.

Type C: antibody to the hepatitis C virus (anti-HCV) - by the enzyme immunoassay (EIA) and the recombinant immunoblot assay. These tests do not distinguish between acute, chronic, or resolved infection. Acute or chronic HCV infection in a patient with a positive EIA test should be confirmed by a sensitive HCV RNA assay. Quantitative determination of HCV levels provides information on the likelihood of response to treatment in patients undergoing antiviral therapy. Liver biopsy can provide direct histological assessment of liver injury due to HCV but cannot be used to diagnose HCV infection.

Genotyping of HCV infection is important from epidemiological and treatment point of view.

Case definition

An acute illness that includes malaise, extreme fatigue, fever, nausea and sometimes vomiting and upper right quadrant abdominal tenderness, then dark urine followed by jaundice.

Case classification

Suspected case: A case compatible with clinical description.

Probable case: A Suspected Case + Positive Bile pigment in urine and elevated serum bilirubin and liver enzymes (ALT, SGPT and Serum Alkaline Phosphatase).

Confirmed case: Probable/suspected case with positive specific serological tests. This is most commonly done by detecting Anti-HAV, HBsAg, Anti-HCV, and Anti-HEV. This can be done by different methods and the most famous one is ELISA method. In addition great increase of liver enzymes like alanine transaminase (ALT), serum alkaline phosphatase and SGOT etc.

Chronic Hepatitis B cases: Any patient with positive HBsAg for more than 6 months and is considered as a case of chronic carrier state.

Note: The patient should be tested for other markers (HBeAg, Anti- HBcIgM, and Anti- HBe) to determine the health status and infectivity level. Positivity for HBeAg indicates high infectivity while positivity for Anti- HBcIgM means acute infection.

Positive Anti- HBe means less Infectivity.

Chronic Hepatitis C: Any patient who is positive for HCV Abs should be referred to the specialist center for more evaluation because positivity for HCV Abs cannot differentiate infection from immunity and needs further investigations. PCR is very necessary to identify such cases.

Infectious agent

Hepatitis A virus (HAV): RNA virus, family *Picornaviridae*.

Hepatitis B virus (HBV): a *hepadnavirus*, partially double-stranded DNA virus composed of nucleocapsid core (HBcAg), surrounded by an outer lipoprotein coat containing the surface antigen (HBsAg). 8 main genotypes (A-H).

Hepatitis C virus (HCV): RNA virus, genus *Hepacavirus*, *Flaviviridae* family. At least 6 genotypes and approximately 100 subtypes.

Hepatitis E virus (HEV): a spherical, nonenveloped, single-stranded RNA virus, family *Hepeviridae*.

Occurrence

Type A: Iraq is considered highly endemic as indicated by 96.4% prevalence of Anti HAV Abs.

Type B: Iraq is considered with low endemic with HBsAg prevalence was 1.6% in 2006.

Type C: In the Middle East, the prevalence of anti-HCV ranges from 1% to more than 12%. In Iraq, the prevalence of anti HCV Abs was found to be 0.4%.

Type E: The prevalence of Anti HEV Abs in Iraq in 2006 was about 20%.

Rate of occurrence for various types of viral hepatitis in Iraq from 2005 to 2010 can be summarized in the following table:

year	population	Occurrence rate (per 100000)				Notice
		A	B	C	E	
2005	27962968	7.41	3.89	2.36	NA*	Difference is due to the availability of the testing materials especially for A & E. *Not Available due to the unavailability of the kits.
2006	28810441	11.44	4.19	1.67	NA	
2007	29682081	7.87	2.78	1.55	NA	
2008	30577798	3.19	3.36	1.46	NA	
2009	31496406	5.13	6.00	1.78	0.55	
2010	32437949	13.08	4.49	1.76	0.66	

3.1.1..b.Reservoir

Type A: Humans, rarely chimpanzees and other primates.

Types B and C: Humans. An animal reservoir in nature has not been recognized.

Type E: Man is the natural host; some non-human primates, e.g. chimpanzees. Natural infections have been described in pigs, chicken and cattle, particularly in highly endemic areas.

Mode of transmission

Types A and E: Person-to-person by the fecal-oral route. Common source outbreaks related to contaminated water; food contaminated by infected food handlers, including foods not cooked or handled after cooking; raw or undercooked mollusks harvested from contaminated waters; and contaminated produce such as lettuce and strawberries. Hepatitis E may in fact be a zoonotic infection with coincident areas of high human infection.

Types B and C: Transmission occurs by percutaneous (IV, IM, SC, intradermal) and permucosal exposure to infective body fluids. Because HBV is stable on environmental surfaces for at least 7 days, indirect inoculation of HBV can occur via inanimate objects. Fecal-oral or vector-borne transmission has not been demonstrated. Major modes of HBV transmission include sexual or close household contact with an infected person, perinatal mother-to-infant transmission, injecting drug use and nosocomial exposure. Transmission of HBV in households primarily occurs from child to child. Communally used razors and toothbrushes have been implicated as occasional vehicles of HBV transmission in this setting. Perinatal transmission is common, especially when HBV-infected mothers are also HBeAg-positive.

HCV is primarily transmitted parenterally. Sexual and mother-to-child have been documented but appears far less efficient or frequent than the parenteral route.

Incubation period

Type A: Average 28–30 days (range 15–50 days).

Type B: Usually 45–180 days, average 60–90 days.

Type C: Ranges from 2 weeks to 6 months; commonly 6–9 weeks.

Type E: The range is 15 to 64 days; the mean varied from 26 to 42 days in various epidemics.

Period of communicability

Type A: maximum infectivity occurs during the latter half of incubation and continues for a few days after onset of jaundice (or during peak aminotransferase activity in anicteric cases). Most cases are probably noninfectious after the first week of jaundice.

Type B: All persons who are HBsAg-positive are potentially infectious.

Type C: From one or more weeks before onset of the first symptoms; may persist in most persons indefinitely. Peaks in virus concentration appear to correlate with peaks in ALT activity.

Type E: Not known. HEV has been detected in stools 14 days after the onset of jaundice and approximately 4 weeks after oral ingestion of contaminated food or water; it persists for about 2 weeks.

Susceptibility and resistance

For all types, susceptibility is general. Immunity against HBV is believed to persist for at least 15 years after successful immunization.

3.1.1.c. Methods of control

Preventive measures

Types A and E:

1. Educate the public about good sanitation and personal hygiene: hand washing and safe disposal of feces.
2. Provide proper water treatment and distribution systems and sewage disposal.
3. Hepatitis A vaccine is recommended in high risk groups. High-risk groups include the following:
 - i. People with chronic liver disease or clotting factor disorders, men who have sex with men, injecting drug users, handling HAV in research laboratory settings;
 - ii. In outbreak situations: community and the feasibility of rapidly implementing a widespread vaccination program.
4. Oysters, clams and other shellfish from contaminated areas should be heated to a temperature of 85°–90°C (185°–194°F) for 4 minutes or steamed for 90 seconds before eating. In endemic areas, travelers should take only hot or bottled beverages and hot, well-cooked food.

Type B:

1. Vaccination
 - a) Hepatitis B vaccine: anti-HBs or anti-HBc testing is not required prior to immunization. Pregnancy is not a contraindication for receiving hepatitis B vaccine. Vaccine in Iraq is routinely given to newborn immediately after birth at the delivery room with subsequent doses at 2 months and 6 months of age. For infants born to HbsAg positive women, the schedule should be birth, 1–2 and 6 months of age. These infants should also receive 0.5 ml of HBIG.
 - b) All household contacts who test negative for HbsAg should receive 3 doses of the vaccine.
 - c) In addition, persons at high risk who should routinely receive pre exposure hepatitis B immunization include: a) health care and public safety workers who are likely to handle blood or body fluids (midwives etc.); b) clients and staff of institutions for the developmentally disabled; c) hemodialysis patients; d) patients with bleeding disorders who receive blood products; e) high risk occupations (tattooists, hairdressers etc.).
2. a) Screening for a) all pregnant women for the presence of HbsAg. B) Preoperative patients for HbsAg. C) All foreigners who seek residency in Iraq and prevent giving them residency.
3. Use adequately sterilized syringes and needles (including acupuncture needles); use disposable equipment whenever possible. Discourage tattooing; enforce aseptic sanitary practices in tattoo parlors, including proper disposal of sharps.
4. In blood banks, all donated blood should be tested for HbsAg; reject donors with a history of viral hepatitis (positive HBsAg and Anti- HCV Ab), those who have a history of injecting drug use or show evidence of drug addiction or those who have received a blood transfusion or tattoo within the preceding 6 months.

5. Maintain surveillance for all cases of post transfusion hepatitis; keep a register of all people who donated blood for each case. Notify blood banks of potential carriers so that future donations may be identified promptly.
6. Nowadays, there is general agreement among public health authorities, that HBV-positive health care workers should not perform exposure-prone surgery or similar treatment of patients.

Type C: General control measures against HBV infection apply except for vaccination as there is no available vaccine for Hepatitis C.

Control measures

Types A, B, C and E:

- 1) Report (weekly and monthly) to local health authority.
- 2) Isolation: **For proven hepatitis A and E**, enteric precautions during the first 2 weeks of illness, but no more than 1 week after onset of jaundice; the exception is an outbreak in a neonatal intensive care setting, where prolonged enteric precautions must be considered.
For Hepatitis B and C: Universal precautions to prevent exposures to blood and body fluids.
- 3) Concurrent disinfection: **For Hepatitis A and E:** Sanitary disposal of feces, urine and blood.
For Hepatitis B and C: disinfection of equipment contaminated with blood or infectious body fluids.
- 4) Quarantine: for A, B, C and E are not applicable.
- 5) Immunization of contacts:

- **Type A:** Active immunization should be given as soon as possible, but no later than 2 weeks after exposure. Passive immunization with IG (IM), 0.02 ml/kg of body weight, should be given as soon as possible after exposure, but also within 2 weeks. Hepatitis A vaccine and IG are not indicated for contacts in the usual office, school or factory settings. **IG should be administered to previously unimmunized persons in the situations listed below**, preferably together with hepatitis A vaccine given concurrently at a separate injection site:
 1. Close personal contacts, including household, sexual, drug using and other close personal contacts.
 2. Attenders at day care centers if one or more cases of hepatitis A are recognized in children or employees or if cases are recognized in 2 or more households of attenders prophylaxis may be given to classroom contacts of an index case.
 3. In a common source outbreak, if a food handler is diagnosed with hepatitis A, hepatitis A vaccine and IG should be administered to other food handlers in the same establishment.
 4. Other unimmunized (not infected previously, not vaccinated) high risk groups e.g. blood disorders that require frequent blood transfusions, Hepatitis B and C patients, renal dialysis patients, immunocompromised patients, etc.
- **Type B:** Products available for post exposure prophylaxis include HBIG and hepatitis B vaccine. When indicated, administer HBIG as soon as possible after exposure in the following situation:
 - a) Infants born to HBsAg positive mothers should receive a single dose of vaccine within 12 hours of birth and HBIG (0.5 ml IM), the first dose of vaccine to be given concurrently

with HBIG but at a separate site; second and third doses of vaccine (without HBIG) 2 and 6 months later.

- b) After percutaneous (e.g. needle stick) or mucous membrane exposures to blood that might contain HBsAg, a decision to provide post exposure prophylaxis must include consideration of: i) whether the source of the blood is available; ii) the HBsAg status of the source; iii) the hepatitis B immunization status of the exposed person.

For previously unimmunized persons exposed to blood from an HBsAg positive source, a single dose of HBIG (0.06 ml/kg, or 5 ml for adults) should be given as soon as possible, but at least within 24 hours of high-risk needle-stick exposure, and the hepatitis B vaccine series should be started. If active immunization cannot be given, another dose of HBIG should be given 1 month after the first. HBIG is not usually given for needle stick exposure to blood that is not known or highly suspected to be positive for HBsAg, since the risk of infection in these instances is small; however, initiation of hepatitis B immunization is recommended if the person has not previously been immunized.

For previously immunized persons exposed to an HBsAg positive source, post exposure prophylaxis is not needed in cases with a protective antibody response to immunization (anti-HBs titer of 10 milli-IUs/mL or greater). For persons whose response to immunization is unknown, hepatitis B vaccine and/or HBIG should be administered.

- c) After sexual exposure to a person with acute HBV infection, a single dose of HBIG (0.06 ml/kg) is recommended if it can be given within 14 days of the last sexual contact. For all exposed sexual contacts of persons with acute and chronic HBV infection, vaccine should be administered.

- **Type C:** Available data indicate that post exposure prophylaxis with IG is not effective in preventing infection.
- **Type E:** No products are available to prevent hepatitis E.
 - 6) Investigation of contacts and source of infection: **For types A, B, C and E:** Search for missed cases and maintain surveillance of contacts in the patient's household or, in a common source outbreak, people exposed to the same risk.
 - 7) Specific treatment:
- **Types A and E:** None.
- **Types B and C:** for acute cases: none. Alpha interferon, lamivudine and adefovir have been licensed for treatment of chronic hepatitis B. Candidates for therapy should have liver biopsy evidence of chronic hepatitis B; treatment is most effective in individuals in the high-replicative phase (HBeAg positive) of infection because they are the most likely to be symptomatic, infectious and at risk of long-term sequelae. Approximately 10% of patients who respond lose HBsAg 6 months after therapy. Lamivudine has fewer side-effects and is easier to administer, but has a modest efficacy rate, requires long-term treatment to maintain response, and is associated with a high rate of viral resistance, particularly when prolonged. Adefovir is an antiviral drug active against both wild-type and lamivudine-resistant HBV, and has an antiviral activity similar to that of lamivudine. For the treatment of chronic hepatitis C, highest response rates (40–80%) have been achieved with a combination therapy of ribavirin and slow-release interferons (“pegylated interferons”), making it the treatment of choice. Determination of genotype influences treatment decisions. However, these medications have significant side-effects that require careful monitoring. Ribavirin is a teratogen; thus pregnancy should be avoided during treatment. Corticosteroids and acyclovir have not been effective.

Epidemic measures

- **Types A and E:**
 - Identify the population exposed. Eliminate common sources of infection.
 - Effective use of hepatitis A vaccine in community-wide outbreak situations requires the identification of an appropriate target group for immunization, the initiation of immunization early in the course of the outbreak and the rapid achievement of high (approximately 70% at least) first-dose vaccine coverage levels. Specific outbreak control measures must be tailored to the characteristics of hepatitis A epidemiology and of the existing hepatitis A immunization program, if any, in the community.
 - Make special efforts to improve sanitary and hygienic practices to eliminate fecal contamination of foods and water.
 - Outbreaks in institutions may warrant mass prophylaxis with hepatitis A vaccine and IG.
- **Types B and C:** When 2 or more cases occur in association with some common exposure, search for additional cases. Institute strict aseptic techniques. If a plasma derivative such as antihemophilic factor, fibrinogen, pooled plasma or thrombin is implicated, withdraw the lot from use and trace all recipients of the same lot in a search for additional cases.

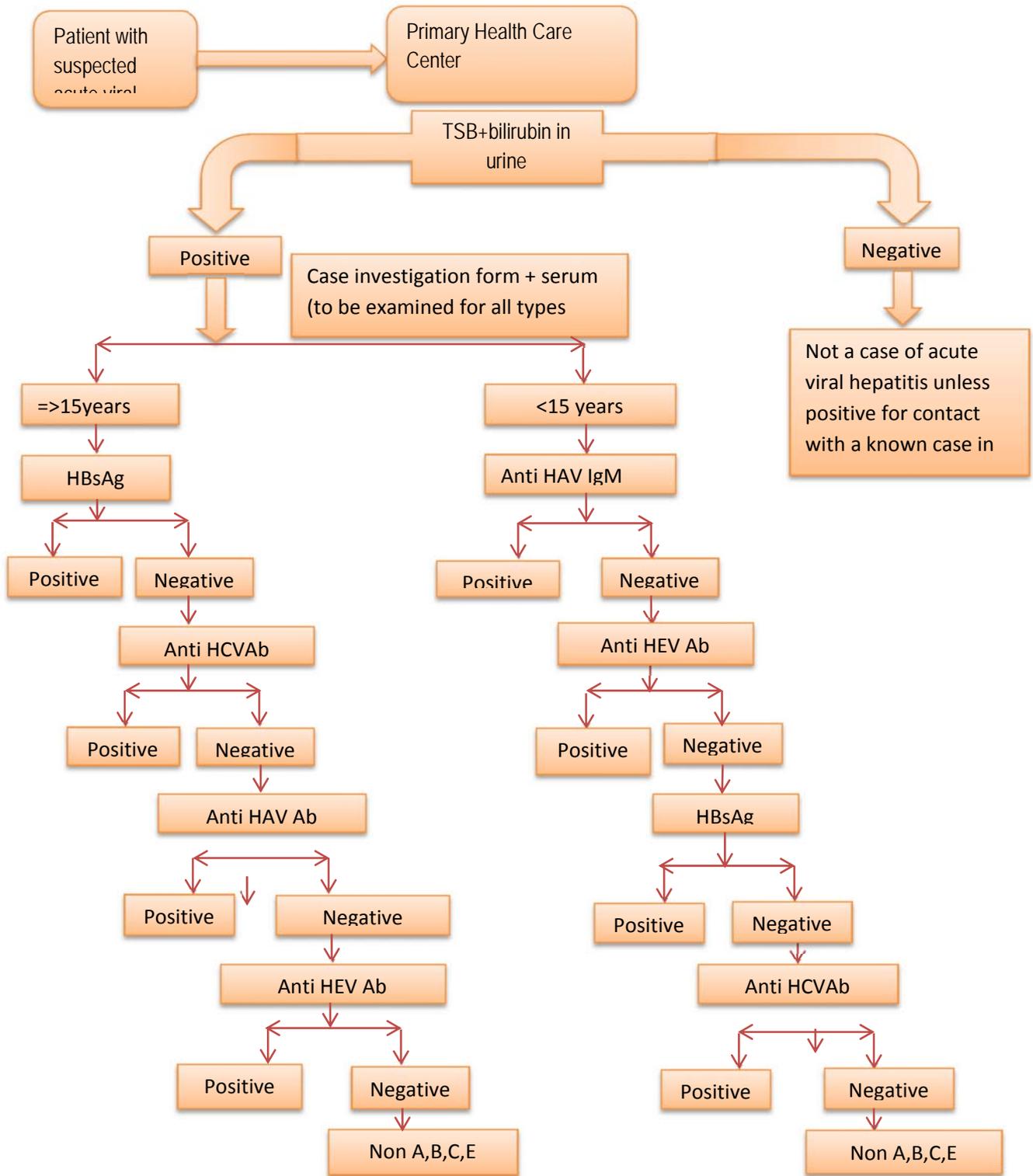
Disaster implications

- **Types A and E:** Hepatitis A is a potential problem in large collections of people with overcrowding, inadequate sanitation and water supplies; if cases occur, increased efforts should be exerted to improve sanitation and safety of water supplies. Mass administration of hepatitis A vaccine, which should be carefully planned, is not a substitute for environmental measures.
- **Types B and C:** Relaxation of sterilization precautions and emergency use of unscreened blood for transfusions may result in an increased number of cases.

E. International measures:

- **Types A and E:** None.
- **Types B and C:** Ensure adequate virus inactivation for all internationally traded biological products.

1.4.4.d. Management of the disease⁴⁷



⁴⁷ Designed by the Communicable Disease Control Center, MOH, Iraq

- **Hepatitis A:** There is no specific treatment for hepatitis A. Recovery from symptoms following infection may be slow and take several weeks or months. Therapy is aimed at maintaining comfort and adequate nutritional balance, including replacement of fluids that are lost from vomiting and diarrhea.⁴⁸
- **Hepatitis B:** There is no specific treatment for acute hepatitis B. Care is aimed at maintaining comfort and adequate nutritional balance, including replacement of fluids that are lost from vomiting and diarrhea. Chronic hepatitis B can be treated with drugs, including interferon and anti-viral agents, which can help some patients. Treatment can cost thousands of dollars per year and is not available to most patients in developing countries. Liver cancer is almost always fatal, and often develops in people at an age when they are most productive and have family responsibilities. In developing countries, most people with liver cancer die within months of diagnosis. In higher income countries, surgery and chemotherapy can prolong life for up to a few years in some patients. Patients with cirrhosis are sometimes given liver transplants, with varying success.⁴⁹
- **Hepatitis C:** Interferon and ribavirin-based therapy has been the mainstay of HCV treatment. Unfortunately, interferon is not widely available globally, is not always well tolerated, some genotypes respond better than others, and many people who take it do not finish their treatment. While HCV is generally considered to be a curable disease, for many persons this is not a reality. Fortunately, scientific advances and intense research and development have led to the development of many new oral antiviral drugs for HCV infection. The future seems to hold great promise for HCV specific oral drugs that will be more effective and better tolerated. Much still needs to be done to ensure that these advances lead to greater access and treatment globally.⁵⁰
- **Hepatitis E:** Hepatitis E is a viral disease, and as such, antibiotics are of no value in the treatment of the infection. There is no hyperimmune E globulin available for pre- or post-exposure prophylaxis. HEV infections are usually self-limited, and hospitalization is generally not required. No available therapy is capable of altering the course of acute infection. As no specific therapy is capable of altering the course of acute hepatitis E infection, prevention is the most effective approach against the disease. Hospitalization is required for fulminant hepatitis and should be considered for infected pregnant women.⁵¹

⁴⁸ WHO. "Hepatitis A Fact Sheet." May 2008.

<http://www.who.int/mediacentre/factsheets/fs328/en/index.html>

⁴⁹ WHO. "Hepatitis B Fact Sheet." August 2008.

<http://www.who.int/mediacentre/factsheets/fs204/en/index.html>

⁵⁰ WHO. "Hepatitis C Fact Sheet." June 2011.

<http://www.who.int/mediacentre/factsheets/fs164/en/index.html>

⁵¹ WHO. "Hepatitis E Fact Sheet." January 2005.

<http://www.who.int/mediacentre/factsheets/fs280/en/index.html>

3.1.2 Brucellosis

ICD-10 A23

3.1.2 .a. Identification

A systemic zoonotic bacterial disease caused by *Brucella* species.

Clinical features

An illness characterized by acute or insidious onset, with continued, intermitted or irregular fever of variable duration, profuse sweating particularly at night, fatigue, anorexia, weight loss, headache, arthralgia and generalized aching. Local infection of various organs may occur. Fever is the most common symptom and may be associated with a variety of other complaints. Osteo-articular complications are common (20 – 60% of cases).

Case classification

Suspected: A case that is compatible with the clinical description and is epidemiologically linked to suspected or contaminated animal products.

Probable: A suspected case that has a positive Rose Bengal test.

Confirmed: A suspected or probable case that is laboratory-confirmed through isolation of *Brucella* spp. From clinical specimen or *Brucella* agglutination titer (e.g., standard tube agglutination tests: SAT > 160 IU) in one or more serum specimens obtained after onset of symptoms or ELISA (IgA, IgG, IgM) 2-mercaptoethanol test, complement fixation test, (FAT), and radio immunoassay for counter-immunoelectrophoresis (CIEP).

Infectious agent

B. abortus, *B. melitensis*, *B. suis*, and *B. canis*.

Occurrence

Worldwide, especially in Mediterranean Countries of Europe, North and East Africa, and Central Asia. The organism and source of infection varies according to geographical area. Brucellosis used to be an occupational hazard in farm workers, veterinarians, and abattoir workers.

Cases of brucellosis, 2000-2011

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	8026	8166	417	535	7261	7061	5171	6124	6857	6947	7399	7064

1.4.2 .b. Reservoir

Infection in humans can be transmitted from cattle, goats, sheep, dogs, and swine.

Mode of transmission

- Contact with infected animal tissues, blood, urine, vaginal discharges, and aborted animal fetuses and especially placentae; also by ingestion of raw milk and dairy products from infected animals without boiling or pasteurizing milk used.
- Inhalation in laboratory workers.

Incubation period

Variable and difficult to ascertain. Usually 5 to 60 days; can be several months.

Period of communicability

There is no evidence of communicability from person to person.

Susceptibility and resistance

Severity and duration of clinical illness are subject to wide variation. Duration of acquired immunity is uncertain.

3.1.2 .c.Methods of control**Preventive measures**

- Education the public: Avoid drinking untreated, unpasteurized milk or eating dairy products from such milk. Boiling milk is effective when pasteurization is not available.
- Educate farmers and handlers of potentially infected animals to reduce exposure and exercise care in handling placentae, discharges and fetuses.
- Search for and investigate livestock at risk of infection.

Control measures

- Report to local health authority.
- Specific treatment: Doxycycline 100mg twice daily for 6 weeks.
- Inform the Department of Agriculture and municipality.
- Enquire into source of infection and trace infection to common source.
- Recall incriminated products. Stop distribution of milk and milk products unless pasteurization is instituted.

3.1.2 .d.Management of the disease⁵²

- Usually, doxycycline and rifampin are used in combination for 6 weeks to prevent reoccurring infection. Depending on the timing of treatment and severity of illness, recovery may take a few weeks to several months. Mortality is low (<2%), and is usually associated with endocarditis.

⁵² Centers for Disease Control and Prevention. "Brucellosis." December 2007.
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/brucellosis_g.htm#istreatment

3.1.3 .Chicken pox

ICD-10 B01: Chicken Pox

ICD-10 B02: Herpes Zoster

3.1.3.a. Identification

Clinical features

Varicella (chickenpox): Chickenpox generally presents with a low-grade fever, malaise and a rash. The rash is firstly maculopapular then becomes vesicular (blistered) and progresses to crusted lesions over about five days. Lesions appear in three or four crops. They are most numerous on the trunk and less so on the face, scalp, limbs and mucous membranes of the mouth. Some cases (about 5%) are subclinical or exceedingly mild in nature. Adults tend to suffer with more severe disease than children. Rarely, the disease may be fatal. Complications include secondary bacterial infection of the skin lesions, primary varicella pneumonia, aseptic meningitis, encephalitis and Reye's syndrome (acute encephalopathy with fatty infiltration and dysfunction of the liver). Newborns and immunosuppressed patients are at greatly increased risk of severe chickenpox.

Herpes zoster (shingles): Herpes zoster or shingles is characterized by a predominantly unilateral vesicular eruption within a dermatome. It is often associated with severe pain that may precede lesions by 48–72 hours. The rash lasts up to several weeks depending on severity. The rash is often more widespread and persistent in immunosuppressed patients. Patients must be carefully evaluated to ensure that there is no eye involvement when the rash involves the ophthalmic area of the face. Specialist treatment is mandatory in this case as blindness can result.

Incidence increases with age and children under 12 are rarely affected unless immunosuppressed or infected as infants. A debilitating complication of herpes zoster in many (especially elderly) patients is prolonged pain (post-herpetic neuralgia) which may persist for months after resolution of the skin lesions.

Method of diagnosis

Confirmation of the diagnosis is generally only required when the clinical picture is atypical. It is made by:

- isolation of the virus in cell cultures
- visualization by electron microscopy
- serological tests for antibodies
- immunofluorescence on lesion swab or fluid
- nucleic acid testing or PCR.

Infectious agent

Human herpes virus 3 (alpha) or varicella zoster virus (VZV).

Occurrence

Chickenpox is a highly contagious but generally mild disease and is endemic in the population. It becomes epidemic among susceptible individuals mainly during winter and early spring. More than 90% of cases are children under 15 years of age. Herpes zoster (shingles) occurs in 20% of people, mostly when they are elderly due to the reactivation of latent virus from the dorsal root ganglia.

3.1.3 .b.Reservoir

Humans are the only reservoir of the virus, and disease occurs only in humans.

Mode of transmission

Chickenpox transmission is mainly person to person by airborne respiratory droplets but also by direct contact with vesicle fluid of chickenpox cases, or contact with the vesicle fluid of patients with herpes zoster. Indirect contact occurs through articles freshly soiled by discharges from vesicles of infected persons. Scabs are not infective.

Incubation period

The incubation period is from two to three weeks, usually 14-16 days. This may be prolonged in immunosuppressed persons or following immunoglobulin administration as passive immunization against varicella.

Period of communicability

Usually communicable for one to two days (up to five days) before the onset of the rash, continuing until all lesions are crusted. Communicability may be prolonged in patients with altered immunity. Those with zoster are considered infectious for a week after lesions appear.

Susceptibility and resistance

Susceptibility to chickenpox is universal among those not previously infected. Over 80% of non-immune household contacts of a case of chickenpox will become infected. Patients who are at high risk of severe disease/complications if they do not have immunity include: infants less than one month old, pregnant women and immunosuppressed individuals including those with hematological malignancies, on chemotherapy, high dose steroids or with HIV infection.

3.1.3 .c.Methods of control⁵³

⁵³ <http://ideas.health.vic.gov.au/bluebook/chicken-pox.asp>

Control measures

- Symptomatic management of cases: Tepid bathing or cool compresses may help to alleviate itching.
- Children with chickenpox should be excluded for at least five days after the rash appears. A few remaining scabs are not a reason for continued exclusion. Children with shingles can attend school if the lesions can be covered adequately however exclusion from swimming and contact sports should be advised for seven days after the rash appears.
- Advise adults to stay away from work for the same period
- Avoid contact with high risk susceptible persons.
- Aspirin should never be given to children with varicella due to a strong association with the development of Reye's syndrome.
- If chickenpox develops in pregnancy, refer within 24 hours of rash onset.

3.1.3.d. Management of the disease⁵⁴

- Primary varicella infection in the healthy child is a rather benign disease that requires symptomatic therapy only. Oral acyclovir should be considered for healthy persons at increased risk of severe varicella infections.
- Adults and immunocompromised persons with chickenpox have a more complicated course than that occurring in children, and therefore, the condition necessitates a more aggressive pharmacotherapeutic approach. Intravenous acyclovir therapy is recommended for patients who are immunosuppressed or immunocompromised.
- Varicella-zoster immune globulin (VZIG) is indicated for use in highly susceptible, VZV-exposed immunocompromised or immunosuppressed populations.

Ref: <http://ideas.health.vic.gov.au/bluebook/chicken-pox.asp>



Child with varicella disease

⁵⁴ Papadopoulos, Anthony J. "Chickenpox Treatment and Management. *Medscape*. Updated: June 20, 2011. <http://emedicine.medscape.com/article/1131785-treatment>

3.1.4. Echinococcosis (Hydatid disease)

ICD-10 B67

3.1.4. a. Identification

A space occupying disease, in humans caused by the larval stage of the dog tapeworm, *Echinococcus granulosus*. The signs, symptoms and extent of disease are determined by the size and location of the unilocular cysts (hydatid cyst) that are characteristic of this disease. Symptoms develop as result of pressure, leakage and rupture of cysts. The most common site for the cysts is the liver; less commonly brain, lungs, kidney and uncommonly the heart, thyroid and bone. Cyst may remain viable or dies and calcifies. They may be detected on routine x-ray.

Case classification

Suspected: clinically suspected case with history of contact to animals or animal viscera

Probable: diagnosis by plain x-ray, ultrasound or CT, casoni test

Confirmed: Laboratory (PCR , IFAT , ELISA)

Infectious agent

Echinococcus granulosus

Occurrence

Cases of hydatid disease, 2000-2011

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	521	27	638	1	579	498	609	793	858	983	1286	1451

3.1.4.b. Reservoir

Dogs and foxes. Major intermediate hosts include goats, sheep, and cattle.

Mode of transmission

Infection occurs by hand-to mouth transfer of tapeworm eggs from dog faces.

The larvae penetrate the intestinal mucosa, enter the portal system and carried to various organs where they produce the cysts. The important life cycle is the dog-sheep-dog.

Incubation period

Variable, from months to years.

Period of communicability

Not communicable through person-to-person transmission. Dogs pass eggs approximately seven weeks after infection. In the absence of reinfection, this ends in about one year.

Susceptibility and resistance

Adults (ages 15-49) are more often infected than children.

3.1.4.c.Methods of control

Preventive measures

- Educate the public on the danger of close association with dogs and on the need to wash hands after contact with dogs.
- Treat infected dogs and destroy unwanted dogs.
- Control slaughter of animals, particularly sheep. The area should be enclosed to prevent the access by dogs and have adequate drainage, an incinerator and/ or disposal pit.

Control measures

- Monthly report of cases to health authority.
- No need for isolation, or concurrent disinfection.
- Surgery is treatment of choice. Mebendazole is used when surgery is contraindicated.
- Household contacts should be examined for evidence of infection.
- Dogs on contact with patient should be investigated.

3.1.4.d.Management of the disease⁵⁵

- Two benzimidazolic drugs, mebendazole and albendazole, are the only anthelmintics effective against cystic echinococcosis. Albendazole and mebendazole are well tolerated but show different efficacy.
 - Albendazole is significantly more effective than mebendazole in the treatment of liver cysts. Benzimidazole treatment alone requires prolonged administration over many weeks, with an unpredictable outcome in terms of response rates in individuals.
 - Treatment with albendazole in *E granulosus* infection can result in an apparent cure in as many as 30% of patients, with a further 40-50% of patients showing

⁵⁵ Brunetti, Enrico. "Echinococcosis Hydatid Cyst Treatment and Management." *Medscape*. Updated: October 19, 2011. <http://emedicine.medscape.com/article/216432-treatment>

objective evidence of response when observed short term. Patients who do not show obvious initial evidence of response may be found to be cured when observed over several years.

- Albendazole efficacy increases with courses of up to 3 months in the more common cyst sites. Overall, albendazole has been demonstrated to be a useful advance in the management of cystic echinococcosis when used as sole treatment or as an adjunct to surgery or other treatments.



Appearance of a typical cyst at removal

⁵⁶ http://en.wikipedia.org/wiki/File:Hydatid_cyst_membrane.jpg

Module 3

Session 3.2: Leprosy, Mumps, Schistosomiasis and Theascariasis

Objectives: at the end of this session participants will be able to:

- Assess The Leprosy
- Assess The Mumps
- Assess The Schistosomiasis
- Assess The Ascariasis
- Assess The Ancylostomiasis (Hookworm Disease)

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

2 hours and a half

Session Plan

OBJECTIVE	CONTENT	Methods/ Activities
<p>3.2.1 Leprosy</p> <p>3.2.1 a Define, Classify, Identify infectious agent and occurrence (10 min)</p> <p>3.2.1 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p> <p>3.2.1 c Describe methods of control (10 min)</p>	<p>ICD- 10 A30</p> <p>Identification Chronic bacterial disease of the skin, peripheral nerves and (in lepromatous patients) the upper airway.</p> <p>Case definition Leprosy cases can be classified as follows:</p> <ul style="list-style-type: none"> • Multibacillary leprosy: more than 5 patches or lesions on the skin • Paucibacillary leprosy: 1 to 5 patches or lesions on the skin. <p>Infectious agent <i>Mycobacterium leprae</i>. This cannot be grown in bacteriological media or cell cultures.</p> <p>Occurrence In 2002, 620 000 of them-90% in Brzil, India, Madagascar, Mozambique, Nepal, Tanzania. Newly few cases in the USA.</p> <p>Reservoir Humans are the <u>only</u> known significant reservoir</p> <p>Mode of transmission Transmitted from the nasal mucosa of a patient to the skin and respiratory tract of another person.</p> <p>Incubation period Ranges from 9 months to 20 years</p> <p>Period of communicability Leprosy is not usually infectious after three months of continuous treatment</p> <p>Susceptibility and resistance Everyone is susceptible to infection</p> <p>Methods of control</p>	<p>Mini Lecture</p> <p>Discussion Lecture</p> <p>Brain Storming</p>

<p>3.2.1 d Explain clinical management (5 min)</p>	<ul style="list-style-type: none"> • Preventive measures • Control measures <p>Management of the disease</p> <p>Multidrug therapy(MDT): dapson, rifampicin and clofazimine.</p>	<p>Discussion</p>
<p>3.2.2 Mumps</p> <p>3.2.2 a Define, Classify, Identify infectious agent and occurrence (10 min)</p> <p>3.2.2 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p>	<p>ICD-10 B26</p> <p>Identification An acute viral disease characterized by fever, swelling and tenderness of one or more salivary glands, usually the parotid and sometimes the sublingual or submaxillary glands.</p> <p>Lab diagnosis: Positive serological test for mumps-specific IgM antibodies, or through isolation of mumps virus from an appropriate clinical specimen (throat swab, urine, CSF)</p> <p>Infectious agent Mumps virus, a member of the family <i>Paramyxoviridae</i>, genus <i>Rubulavirus</i>.</p> <p>Occurrence In temperate climates, winter, spring are peak seasons. Table: Mumps in Iraq.</p> <p>Reservoir Humans.</p> <p>Mode of transmission Airborne or droplet spread; also direct contact with the saliva of an infection person.</p> <p>Incubation period 16-18 days (range 14-25 days).</p> <p>Period of communicability Maximum infectiousness occurs between 2 days before to 4 days after onset of illness. In apparent infections can be communicable.</p> <p>Susceptibility and resistance Immunity is generally lifelong and develops after either in apparent or clinical infections.</p>	<p>Mini Lecture</p> <p>Discussion Lecture</p>

<p>3.2.2 c Describe methods of control (10 min)</p> <p>3.2.2 d Explain clinical management (5min)</p>	<p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures <p><u>Immunization</u></p> <ul style="list-style-type: none"> • Control measures • Epidemic measures <p>Management of the disease</p> <p>There is no specific treatment. In adults-complications: meningitis, and orchitis. Prevention- immunization.</p>	<p>Brain Storming</p> <p>Discussion</p>
<p>3.2.3 Schistosmiasis</p> <p>3.2.3 a Define, Classify, Identify infectious agent and occurrence (10 min)</p> <p>3.2.3 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p>	<p>ICD-10 B65</p> <p>Identification In endemic areas, visible hematuria or positive reagent strip for hematuria, or with eggs of schistosomiasis hematobium in urine.</p> <p>Case classification</p> <ul style="list-style-type: none"> • Probable case any visible hematuria with abdominal pain. • Suspected case any terminal hematuria with the reagent strip associated with abdominal pain. • Confirmed case: microscopic examination showing eggs of schistosomiasis hematobium in urine. <p>Infectious agent Schistosoma hematobium</p> <p>Occurrence In Iraq it is found in the middle and southern regions. The risk groups are farmers and children ages 5-19 years old.</p> <p>Reservoir Humans are the principal reservoir.</p> <p>Mode of transmission Infection from water containing larval forms(circariae) developed in snails. Hatched eggs(miracidea) penetrate into snail hosts. From a snail- circariae penetrates human skin. Then invades all human organs.</p> <p>Incubation period: occur in primary infections 2-6</p>	<p>Mini Lecture</p> <p>Discussion Lecture</p>

<p>3.2.3 c Describe methods of control (10 min)</p> <p>3.2.3 d explain clinical management (5 min)</p>	<p>weeks after exposure</p> <p>Period of communicability Not communicable from person to person, but people with chronic Schistosomiasis may spread the infection by discharging eggs in urine.</p> <p>Susceptibility and resistance Susceptibility is universal. Any resistance developing as a result of infection is variable and poorly defined.</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures <p>Management of the disease Praziquantel is the only available treatment against all forms of schistosomiasis.</p> <p>Groups targeted for treatment are:</p> <ul style="list-style-type: none"> • school-aged children • adults considered to be at risk in endemic areas • entire communities 	<p>Brain Storming</p> <p>Discussion</p>
<p>3.2. 4 Ascariasis</p> <p>3.2.4a Define, Classify, Identify infectious agent and occurrence (10 min)</p>	<p>ICD-10 B77</p> <p>Identification Round worm infection</p> <p>Case classification</p> <ul style="list-style-type: none"> • <u>Suspected case</u> a helminthic infection of the small intestine, generally associated with few or no clinical symptoms. • <u>Probable case</u>: pulmonary manifestations, nutritional deficiency, reports of pancreatitis. Occasional fatal cases in children. • <u>Confirmed case</u>: by identifying eggs in feces, or adult worms passed from the anus, nose , mouth Pulmonary involvement: larva in sputum, gastric washing. <p>Infectious agent <i>Ascaris lumbricoides</i></p> <p>Occurrence: Worldwide, in moist tropical countries exceeds 50%. Highest in children age 3-8.</p>	<p>Mini Lecture</p>

<p>3.2.4 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance.</p>	<p>Reservoir Humans; ascarid eggs in soil.</p> <p>Mode of transmission Mainly in the vicinity of the home, in the absence of sanitary facilities fecally pollute the area; ingesting soil (pica).</p> <p>Incubation period Life cycle requires 4-8 weeks to complete.</p> <p>Period of communicability . life span of adult worms is 12 months; maximum may reach 24 months.</p> <p>Susceptibility and resistance Susceptibility is general.</p>	<p>Discussion Lecture</p>
<p>3.2.4 c describe methods of control</p>	<p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures 	<p>Brain Storming</p>
<p>3.2.4 d explain clinical management</p>	<p>Management of the disease:</p> <p>Infected individuals, domestic animals should be treated with mebendazole or pyrantel pamoat.</p>	<p>Discussion</p>

<p>3.2.5. Ancylostomiasis (Hookworm disease)</p> <p>3.2.5 a Define, Classify, Identify infectious agent and occurrence (10 min)</p>	<p>ICD-10 B76</p> <p>Identification Hookworm disease (Ancylostomiasis, Uncinariasis, Necatoriasis)</p> <p>Case classification</p> <ul style="list-style-type: none"> • <i>Suspect case</i>: a common chronic parasitic with a variety of symptoms. • <i>Probable case</i>: iron deficiency, hypochromic, microcytic anemia, hypoproteinemia, mental and physical development retardation. • <i>Confirmed case</i>: finding hookworm eggs in feces or examination of adult worms, PCR-RFLP. <p>Infectious agent Ancylostoma duodenal, A. ceylanicum, A. braziliense, A. caninum and Necator americanus.</p> <p>Occurrence Endemic in tropical, subtropical countries where sanitary disposal of human feces is not practiced, soil moisture and temperature conditions favor development of infective larvae.</p>	<p>Mini Lecture</p>
<p>3.2.5 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p>	<p>Reservoir Humans for A. duodenale and N. americanus; cats and dogs for A. ceylanicum, A. braziliense and A. caninum.</p> <p>Mode of transmission Eggs in feces are deposited on the ground and hatch; under favorable conditions of moisture, temperature and soil type, larvae develop to the third stage, becoming infective in 7-10 days.</p> <p>Incubation period Few weeks to many months, depending on intensity of infection and iron intake of the host.</p> <p>Period of communicability No person-to-person transmission, but infected people can contaminate soil for several years in the absence of treatment</p>	<p>Discussion Lecture</p>

<p>3.2.5 c Describe methods of control (10 min)</p>	<p>Susceptibility: Universal, no evidence that immunity develops with infection.</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive methods • Control methods • Epidemic measures <p>Management of the disease:</p>	<p>Brain Storming</p>
<p>3.2.5 d Explain clinical management (5 min)</p>	<p>Sanitary disposal of the feces, educational campaign about the proper use of latrines. Treatment: albendazole or mebendazole.</p>	<p>Discussion</p>

3.2.1. Leprosy

ICD-10 A30

3.2.1 .a. Identification

A chronic bacterial disease of the skin, peripheral nerves and (in lepromatous patients) the upper airway. The clinical manifestations of the disease vary in a continuous spectrum between 2

polar forms: i) lepromatous (multibacillary) leprosy: symmetrical and bilateral nodules, papules, macules and diffuse infiltrations, usually numerous and extensive; involvement of the nasal mucosa may lead to crusting, obstructed breathing and epistaxis; ocular involvement leads to iritis and keratitis; ii) tuberculoid (paucibacillary) leprosy: skin lesions single or few, sharply demarcated, anaesthetic or hypoaesthetic; bilateral asymmetrical involvement of peripheral nerves tends to be severe. Borderline leprosy has features of both polar forms and is more labile. Indeterminate leprosy is characterized by hypo pigmented maculae with ill-defined borders; if untreated, it may progress to tuberculoid, borderline or lepromatous disease.

Case definition

A case of leprosy is a person having one or more of the following, who has yet to complete a full course of treatment:

- Hypo pigmented or reddish skin lesion(s) with definite loss of sensation
- Involvement of the peripheral nerves (definite thickening with loss of sensation)
- Skin smear positive for acid-fast bacilli.
- The operational case definition includes retrieved defaulters with signs of active disease and relapsed cases who have previously completed a full course of treatment. It does not include cured persons with late reactions or residual disabilities.

Clinical diagnosis is based on complete skin examination. Search for signs of peripheral nerve involvement (hyperesthesia, anesthesia, paralysis, muscle wasting or trophic ulcers) with bilateral palpation of peripheral nerves (ulnar nerve at the elbow, peroneal nerve at the head of the fibula and the great auricular nerve) for enlargement and tenderness. Test skin lesions for sensation (light touch, pinprick, temperature discrimination). The clinical manifestations can include “reactions” of leprosy, i.e. acute adverse episodes, which are termed erythema nodosum leprosum in lepromatous patients and reversal reactions in borderline leprosy. Differential diagnosis includes many infiltrative skin diseases, including lymphomas, lupus erythematosus, psoriasis, scleroderma and neurofibromatosis. Diffuse cutaneous leishmaniasis, some mycoses, myxoedema and pachydermoperiostosis may resemble lepromatous leprosy, but acid-fast bacilli are not present. Several skin conditions, such as

vitiligo, tinea versicolor, pityriasis alba, nutritional dyschromia, nevus and scars may resemble tuberculoid leprosy.

Laboratory criteria include the presence of alcohol-acid-fast bacilli in skin smears (scrape-incision method). In the paucibacillary form the bacilli may be so few that they are not demonstrable. In view of the increasing prevalence of HIV and hepatitis B infection in many countries where leprosy remains endemic, the number of skin smear sites and the frequency of smear collection should be limited to the minimum necessary. In practice, laboratories are not essential for the diagnosis of leprosy.

Leprosy cases can be classified as follows:

- Multibacillary leprosy: more than 5 patches or lesions on the skin
- Paucibacillary leprosy: 1 to 5 patches or lesions on the skin.

Infectious agent

Mycobacterium leprae. This cannot be grown in bacteriological media or cell cultures.

Occurrence

During 2002, 620 000 persons were diagnosed with leprosy, 90% of them in Brazil, India, Madagascar, Mozambique, Nepal, and in the United Republic of Tanzania. Control has improved with the introduction of multidrug therapy (MDT). WHO has targeted the disease for elimination (less than 1 case/10 000 population) and this has been achieved in 110 out of the 122 countries endemic in 1985. Newly recognized cases in the USA are few and diagnosed principally in

California, Florida, Hawaii, Louisiana, Texas and in New York City, and in Puerto Rico. Most of these cases are in immigrants and refugees whose disease was acquired in their native countries; however, the disease remains endemic in California, Hawaii, Louisiana, Texas and Puerto Rico.

3.2.1. b.Reservoir

Humans are the only known significant reservoirs. There have been reports that disease in armadillos has been naturally transmitted to humans. Naturally acquired leprosy has been observed in a mangabey monkey and in a chimpanzee captured in Nigeria and Sierra Leone, respectively.

Mode of transmission

The mode of transmission is not clearly established. The disease is in all likelihood transmitted from the nasal mucosa of a patient to the skin and respiratory tract of another person. Transmission requires close contact. Although the bacillus can survive up to 7 days in dried nasal secretions, indirect transmission is unlikely.

Incubation period

Ranges from 9 months to 20 years, the average is probably 4 years for tuberculoid leprosy and twice that for lepromatous leprosy

3.5.7 Period of communicability

Leprosy is not usually infectious after three months of continuous treatment with dapsone or clofazimine, or after two to three weeks of treatment with rifampicin.

Susceptibility and resistance

Everyone is susceptible to infection. Household and prolonged close contact especially with a multi-bacillary case seems important. Children aged between five and nine years are at greatest risk. The disease is rarely seen in children under age 3. The risk of progression to leprosy disease following infection is considered to be approximately the same as tuberculosis which is approximately a 10% lifetime risk.

3.5.9 Methods of control⁵⁷

The availability of effective and time-limited ambulatory treatment, with rapid elimination of infectiousness, has changed management. Hospitalization should now be limited only to cases

⁵⁷ <http://ideas.health.vic.gov.au/bluebook/leprosy.asp>

such as the surgical correction of deformities, treatment of ulcers resulting from anesthesia, and severe leprosy reactions.

3.2.1a Preventive measures

- Early detection and treatment of cases.
- Dapsone chemoprophylaxis is not recommended (limited effectiveness and danger of resistance).
- Health education together with counseling of patients and relatives must stress the availability of effective multidrug therapy, the absence of infectivity of patients under continuous treatment and the prevention of physical and social disabilities.
- BCG vaccination only to prevent leprosy: Not recommended.

3.2.1.b Control measures

- 1) Report to local health authority.
- 2) Isolation: Not recommended. No restrictions in employment or attendance at school are indicated.
- 3) Quarantine: Not applicable.
- 4) Immunization of contacts: Not recommended
- 5) Investigation of contacts and source of infection: The initial examination of close contacts can be useful.

3.2.1 Management of the disease⁵⁸

- In 1981, a World Health Organization (WHO) Study Group recommended multidrug therapy (MDT). MDT consists of 3 drugs: dapsone, rifampicin and clofazimine and this drug combination kills the pathogen and cures the patient.
- Since 1995, WHO provides free MDT for all patients in the world, initially through the drug fund provided by the Nippon Foundation and since 2000, through the MDT donation provided by Novartis and the Novartis Foundation for Sustainable Development.



⁵⁸ WHO. "Leprosy Fact Sheet." February 2010.
<http://www.who.int/mediacentre/factsheets/fs101/en/index.html>

3.2.2 Mumps

ICD-10 B26

3.2.2 .a. Identification

An acute viral disease characterized by fever, swelling and tenderness of one or more salivary glands, usually the parotid and sometimes the sublingual or submaxillary glands. Not all cases of parotitis are caused by mumps infection, but other parotitis-causing agents do not produce parotitis on an epidemic scale. As many as 40%–50% of mumps infections have been associated with respiratory symptoms, particularly in children under 5 years. About one-third of exposed susceptible people have in apparent infections; most infections in children under 2 are subclinical.

Mumps can cause sensorineural hearing loss in both children and adults. Pancreatitis, usually mild, occurs in 4% of cases; a suggested association with diabetes remains unproven.

Orchitis, most commonly unilateral, occurs in 20%–30% of affected post pubertal males. Testicular atrophy occurs in about one-third of patients, but sterility is extremely rare. Mumps orchitis has been reported to be a risk factor for testicular cancer.

Symptomatic aseptic meningitis occurs in up to 10% of mumps cases; patients usually recover without complications, though many require hospitalization. Mumps encephalitis is rare (1–2/10 000 cases), but can result in permanent sequelae, such as paralysis, seizures and hydrocephalus; the case-fatality rate for mumps encephalitis is about 1%.

Mumps infection during the first trimester of pregnancy is associated with a high (25%) incidence of spontaneous abortion, but there is no firm evidence that mumps during pregnancy causes congenital malformations.

Lab diagnosis:

Acute mumps infection can be confirmed through: a positive serological test for mumps-specific IgM antibodies, by seroconversion or by a significant (at least 4-fold) rise in serum mumps IgG titer as determined by standard serological assay; or through isolation of mumps virus from an appropriate clinical specimen (throat swab, urine, CSF). In research settings, typing methods can distinguish wild-type mumps virus from vaccine virus.

Infectious agent

Mumps virus, a member of the family Paramyxoviridae, genus Rubulavirus.

Occurrence

In temperate climates, winter and spring are peak seasons.

Mumps in Iraq⁵⁹.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	18720	2780	-	-	15256	3243	1865	1612	1876	2265	1862	1944

1.4.6 .b.Reservoir

Humans.

3.2.2 Mode of transmission

Airborne or droplet spread; also direct contact with the saliva of an infection person.

Incubation period

16-18 days (Range: 14-25 days).

Period of communicability

Virus has been isolated from saliva (7 days before to 9 days after the onset of parotitis) and from urine (6 days before to 15 days after the onset of parotitis). Maximum infectiousness occurs between 2 days before to 4 days after onset of illness. In apparent infections can be communicable.

Susceptibility and resistance

Immunity is generally lifelong and develops after either inapparent or clinical infections.

In the absence of immunization mumps is endemic, with an annual incidence usually greater than 100 per 100 000 population and epidemic peaks every 2–5 years. Serosurveys conducted prior to mumps vaccine introduction found that in some countries 90% of persons were immune by age 15 years, while in other countries a large proportion of the adult population remained susceptible. In countries where mumps vaccine has not been introduced, the incidence of mumps remains high, mostly affecting children 5–9 years. By the end of 2002, 121 countries/territories included mumps vaccine in their

59

http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tsincidencebycountry.cfm?C=IRQ

national immunization schedule. In countries where mumps vaccine coverage has been sustained at high levels the incidence of the disease has dropped tremendously.

3.2.2 .c.Methods of control

3.2.2a Preventive measures

Immunization: Public education should encourage mumps immunization for susceptible individuals. Mumps vaccination is recommended at age 12–18 months, as part of MMR.

Control measures

- Report to local health authority.
- Isolation: Respiratory isolation for 9 days from onset of parotitis. Exclusion from school or workplace until 9 days after onset of parotitis if susceptible contacts (those not immunized) are present.
- Concurrent disinfection: Of articles soiled with nose and throat secretions.
- Quarantine: Exclusion of susceptible from school or the workplace from the 12th through the 25th day after exposure if other susceptible are present.
- Immunization of contacts: Immunization after exposure may not always prevent infection. IG is not effective and not recommended.
- Investigation of contacts and source of infection: Immunization of susceptible contacts.

Epidemic measures

Immunize susceptible, especially those at risk of exposure. Serological screening to identify susceptible is impractical and unnecessary, since there is no risk in immunizing those who are already immune.

1.4.6 .d.Management of the disease

- There is no specific treatment for mumps. The virus usually causes mild disease in children, but in adults can lead to complications, such as meningitis and orchitis. Mumps can be prevented by immunization.



Child with Mumps

3.2.3 .Schistosomiasis

ICD-10 B65

3.2.3 .a. Identification

In endemic areas, visible hematuria **or** positive reagent strip for hematuria, **or** with eggs of schistosomiasis hematobium in urine.

Case classification

- Probable case: Any visible hematuria associated with abdominal pain.
- Suspected case: Any terminal hematuria with the reagent strip associated with abdominal pain.
- Confirmed case: Microscopic examination showing eggs of *schistosomiasis hematobium* in urine.

Infectious agent

Schistosoma hematobium

Occurrence

S. hematobium is found in Africa and the Middle East. In Iraq it is found in the middle and southern regions. The risks groups are farmers and children ages 5-19 years old.

1.4.7 .b. Reservoir

Humans are the principal reservoir.

3.7.5 Mode of transmission

Infection is acquired from water containing free swimming larval forms (cercariae) that have developed in snails. The eggs leave the body mainly in the urine and hatch in water and the liberated larvae (miracidia) penetrate into suitable freshwater snail hosts. After several weeks, the cercariae emerge from the snail and penetrate human skin, usually while the person is working, swimming or wading in water; they enter the bloodstream, are carried to blood vessels of the lungs, migrate to the liver, develop to maturity and then migrate to veins of the abdominal cavity. Adult forms migrate through anastomoses into the vesical plexus of the urinary bladder and eggs are deposited in venules and escape into the lumen of urinary bladder.

Incubation period

Acute systemic manifestations (Katayama fever) may occur in primary infections 2-6 weeks after exposure, immediately preceding and during initial egg deposition.

Period of communicability

Not communicable from person to person, but people with chronic Schistosomiasis may spread the infection by discharging eggs in urine into bodies of water for as long as they excrete eggs; it is common for the infection to last in excess of 10 years. Infected snails will release cercariae for as long as they live, a period that may last from several weeks to about 3 months.

Susceptibility and resistance

Susceptibility is universal any resistance developing as a result of infection is variable and poorly defined.

3.2.3 .c.Methods of control

Preventive measures

- a) Education of the population in endemic areas regarding the mode of transmission and methods of protection.
- b) Safe disposal of urine so that viable eggs will not reach bodies of fresh water containing intermediate snail hosts.
- c) Improvement of irrigation and agricultural practices; reduction of snail habitats by removing vegetation or by draining and filling.
- d) Treatment of snail breeding sites with molluscicides.
- e) Prevention of exposure to contaminated water (e.g., use of rubber boots). To minimize cercaria penetration after brief or accidental water exposure, towel dry skin surfaces that are wet with suspected water and apply 70% alcohol immediately to the skin to kill surface cercariae.
- f) Provision of water for drinking, bathing and washing clothes from sources free of cercariae or treated to kill them. Effective measures for inactivating cercariae include water treatment with iodine or chlorine, or the use of paper filters. Allowing water to stand 48-72 hours before use is also effective.

Control measures

- a) Treatment of patients in endemic areas with praziquantel to prevent disease progression and to reduce transmission by reducing egg passage.
- b) Travelers visiting endemic areas should be advised of the risks and informed about preventive measures.
- c) Reporting to local health authorities and centrally to CDC center by statistical forms.

Epidemic measures

- a) Investigation of contacts and source of infection: Examination for Schistosomiasis and treatment of all who are infected and giving particular attention to children.
- b) Provision of clean water, warning people against contact with water potentially containing cercariae and prohibiting contamination of water.
- c) Treatment of areas that have high snail densities with molluscicides.

3.2.3 .d. Management of the disease⁶¹

- Praziquantel is the only available treatment against all forms of schistosomiasis. It is effective, safe and low-cost. Even though re-infection may occur after treatment, the risk of developing severe disease is diminished and even reversed when treatment is initiated in childhood.
- The WHO strategy for schistosomiasis control focuses on reducing disease through periodic, targeted treatment with praziquantel. This involves regular treatment of all people in at-risk groups. Treatment should be complemented with health education, as well as access to safe water and good sanitation.
- Groups targeted for treatment are:
 - school-aged children in endemic areas;
 - adults considered to be at risk in endemic areas, people with occupations involving contact with infested water – such as fishermen, farmers, irrigation workers – and women whose domestic tasks bring them into contact with infested water;
 - entire communities living in highly endemic areas.
- The frequency of treatment is determined by the prevalence of infection or visible hematuria (in the case of urogenital schistosomiasis) in school-age children. In high transmission areas, treatment may have to be repeated every year for several years.
- The aim is to reduce disease: periodic treatment of at-risk populations will cure mild symptoms and prevent infected people from developing severe, late-stage chronic disease.

⁶¹ WHO. "Schistosomiasis Fact Sheet." January 2012.
<http://www.who.int/mediacentre/factsheets/fs115/en/index.html>



62

Skin vesicles on the forearm, created by the penetration

⁶² Source: CDC

3.2. 4 Ascariasis

ICD-10 B77

3.2. 4 .a. Identification

Roundworm infection

Case classification

- *Suspected case*: A helminthic infection of the small intestine generally associated with few or no overt clinical symptoms.
- *Probable case*: Some patients have pulmonary manifestations caused by larval migration (mainly during reinfections) and characterized by wheezing, cough, fever, eosinophilia and pulmonary infiltration. Heavy parasite burdens may aggravate nutritional deficiency and, if chronic, may affect work and school performance. Serious complications, sometimes fatal, include bowel obstruction by a bolus of worms, particularly in children; or obstruction of bile duct, pancreatic duct or appendix by one or more adult worms. Reports of pancreatitis are increasing.
- *Confirmed case*: Diagnosis is made by identifying eggs in feces, or adult worms passed from the anus, mouth or nose. Intestinal worms may be visualized by radiological and sonographic techniques; pulmonary involvement may be confirmed by identifying *Ascaris* larvae in sputum or gastric washings.

Infectious agent

Ascaris lumbricoides

Occurrence

Common and worldwide, with greatest frequency in moist tropical countries where prevalence often exceeds 50%. Prevalence and intensity of infection are usually highest in children between 3 and 8 years.

3.2. 4 .b. Reservoir

Humans; ascarid eggs in soil.

Mode of transmission

Ingestion of infective eggs from soil contaminated with human feces or from uncooked produce contaminated with soil containing infective eggs, but not directly from person to person or from fresh feces.

Transmission occurs mainly in the vicinity of the home, where children, in the absence of sanitary facilities, fecally pollute the area; heavy infections in children are frequently the result of ingesting soil (pica). Contaminated soil may be carried long distances on feet or footwear into houses and conveyances; transmission of infection by dust is also possible.

Eggs reach the soil from the feces, then undergo development (embryonation); at summer temperatures they become infective after 2-3 weeks and may remain infective for several months or years in favorable soil. Ingested embryonated eggs hatch in the intestinal lumen; the larvae penetrate the gut wall and reach the lungs via the circulatory system. Larvae grow and develop in the lungs, pass into the alveoli 9-10 days after infection, ascend the trachea and are swallowed to reach the small intestine 14-20 days after infection, where they grow to maturity, mate and begin laying eggs 45-60 days after initial ingestion of the embryonated eggs. Eggs passed by gravid females are discharged in feces.

Incubation period

Life cycle requires 4-8 weeks to complete.

Period of communicability

As long as mature fertilized female worms live in the intestine. Usual life span of adult worms is 12 months; maximum may reach 24 months. The female worm can produce more than 200, 000 eggs a day. Under favorable conditions, embryonated eggs can remain viable in soil for years.

Susceptibility and resistance

Susceptibility is general.

3.2. 4 .c. Methods of control

3.8.9a Preventive measures

- 1) Educate the public in the use of toilet facilities.
- 2) Provide adequate facilities for proper disposal of feces and prevent soil contamination in areas immediately adjacent to houses, particularly in children's play areas.
- 3) In rural areas, construct latrines that prevent dissemination of ascarid eggs through overflow, drainage or otherwise. Treating human feces by composting for later use as fertilizer may not kill all eggs.
- 4) Encourage satisfactory hygienic habits on the part of children; in particular, train them to wash hands before eating and handling food.
- 5) In endemic areas, protect food from dirt. Food that has been dropped on the floor should not be eaten unless washed or reheated.
- 6) WHO recommends a strategy focused on high-risk groups for the control of morbidity due to soil-transmitted helminthes.

Control measures

- 1) Report to local health authority: Official report not ordinarily justifiable.
- 2) Isolation: Not applicable.
- 3) Concurrent disinfection: Sanitary disposal of feces.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection.
- 7) Specific treatment: Single-dose oral mebendazole (500 mg), albendazole (400 mg, half dose for children 12-24 months); on theoretical grounds, both are contraindicated during the first trimester of pregnancy unless there are specific medical or public health indications. Erratic migration of ascarid worms has been reported following mebendazole therapy; this may also occur with other medications, or spontaneously in heavy infections. Single-dose pyrantel pamoate (10 mg/kg) or levamisole (2.5 mg/kg) also effective.

Epidemic measures

Survey for prevalence in highly endemic areas, educate the community in environmental sanitation and in personal hygiene and provide treatment facilities. Community treatment for high-risk groups, especially children or for the whole population.

3.2. 4 .d.Management of the disease⁶³

- Infected individuals (and domestic animals) should be treated with medicine to reduce disease transmission. Ascariasis can be effectively treated with mebendazole or pyrantel pamoate.



Ascaris lumbricoides

⁶³ WHO. "Water-related diseases: Ascariasis." 2001.

http://www.who.int/water_sanitation_health/diseases/ascariasis/en/

⁶⁴ http://www.dpd.cdc.gov/dpdx/images/ParasiteImages/A-F/Ascariasis/Ascaris_female.jpg

3.2.5. Ancylostomiasis (Hookworm disease)

ICD-10 B76

3.2.5. a. Identification

Hookworm disease (Ancylostomiasis, Uncinariasis, Necatoriasis)

Case classification

- *Suspect case*: A common chronic parasitic infection with a variety of symptoms, usually in proportion to the degree of anemia.
- *Probable case*: heavy infections, leads to iron deficiency and hypochromic, microcytic anemia, the major cause of disability. Children with heavy long-term infection may have hypoproteinemia and may be retarded in mental and physical development. Occasionally, severe acute pulmonary and GI reactions follow exposure to infective larvae.
- *Confirmed case*: finding hookworm eggs in feces; early stool examinations may be negative until worms mature. Species differentiation requires microscopic examination of larvae cultured from the feces, or examination of adult worms expelled by purgation following a vermifuge. PCR-RFLP techniques allow species differentiation.

Infectious agent

Ancylostoma duodenale, *A. ceylanicum*, *A. braziliense*, *A. caninum* and *Necator americanus*.

Occurrence

Endemic in tropical and subtropical countries where sanitary disposal of human feces is not practiced and soil, moisture and temperature conditions favor development of infective larvae. Also occurs in temperate climates under similar environmental conditions (e.g. mines). Both *Necator* and *Ancylostoma* occur in many parts of Asia (particularly southeastern Asia), the South Pacific and eastern Africa. *N. americanus* is the prevailing species throughout southeastern Asia, most of tropical Africa and America; *A. duodenale* prevails in North Africa, including the Nile Valley, northern India, northern parts of eastern Asia and the Andean areas of South America. *A. ceylanicum* occurs in southeastern Asia but is less common than either *N. americanus* or *A. duodenale*. *A. caninum* has been described in Australia as a cause of eosinophilic enteritis syndrome.

3.2.5.b. Reservoir

Humans for *A. duodenale* and *N. americanus*; cats and dogs for *A. ceylanicum*, *A. braziliense* and *A. caninum*.

Mode of transmission

Eggs in feces are deposited on the ground and hatch; under favorable conditions of moisture, temperature and soil type, larvae develop to the third stage, becoming infective in 7-10 days. Human infection occurs when infective larvae penetrate the skin, usually of the foot; in so doing, they produce a characteristic dermatitis (ground itch). The larvae of *A. caninum* and *A. braziliense* die within the skin, having produced cutaneous larva migrans. Normally, the larvae of *Necator*, *A. duodenale*, *A. ceylanicum* and other *Ancylostoma* enter the skin and pass via lymphatics and bloodstream to the lungs, enter the alveoli, migrate up the trachea to the pharynx, are swallowed and reach the small intestine where they attach to the intestinal wall, developing to maturity in 6-7 weeks (3-4 weeks in the case of *A. ceylanicum*) and typically producing thousands of eggs per day. Infection with *Ancylostoma* may also be acquired by ingesting infective larvae; possible vertical transmission through breast milk has been reported.

Incubation period

Symptoms may develop after a few weeks to many months, depending on intensity of infection and iron intake of the host. Pulmonary infiltration, cough and tracheitis may occur during the lung migration phase of infection, particularly in *Necator* infections. After entering the body, *A. duodenale* may become dormant for about 8 months, after which development resumes, with a patent infection (stools containing eggs) a month later.

Period of communicability

No person-to-person transmission, but infected people can contaminate soil for several years in the absence of treatment. Under favorable conditions, larvae remain infective in soil for several weeks.

Susceptibility

Universal; no evidence that immunity develops with infection.

1.4.9.c. Methods of control

Preventive methods

1. Educate the public to the dangers of soil contamination by human, cat or dog feces, and in preventive measures, including wearing shoes in endemic areas.
2. Prevent soil contamination by installation of sanitary disposal systems for human feces, especially sanitary latrines in rural areas. Night soil and sewage effluents are hazardous, especially where used as fertilizer.
3. Examine and treat people migrating from endemic to receptive non endemic areas.
4. WHO recommends a strategy focused on high-risk groups for the control of morbidity due to soil-transmitted helminthes.

Control methods

- a) Report to local health authority.
- b) Isolation: Not applicable.
- c) Concurrent disinfection: Safe disposal of feces to prevent contamination of soil.
- d) Quarantine: Not applicable.
- e) Immunization of contacts: Not applicable.
- f) Investigate contacts and source of infection.
- g) Specific treatment: Single dose oral treatment with mebendazole, albendazole (half dose for children 12-24 months), levamisole or pyrantel pamoate is recommended; adverse reactions are infrequent. Follow-up stool examination is indicated after 2 weeks, and treatment must be repeated if a heavy worm burden persists. Iron supplementation will correct the anemia and should be used in conjunction with deworming. Transfusion may be necessary for severe anemia. As a general rule, pregnant women should not be treated in the first trimester unless there are specific medical or public health reasons.

Epidemic measures

Prevalence survey in highly endemic areas: provide periodic mass treatment. Health education in environmental sanitation and personal hygiene, and provide facilities for excreta disposal.

3.2.5..d.Management of the disease⁶⁵

Efforts to control hookworm infection include the sanitary disposal of feces and educational campaigns about the proper use of latrines. At this time, the most cost-effective way to control hookworm infection has been through population-wide treatment with either albendazole or mebendazole.



Necator americanus and *Ancylostoma duodenale*

⁶⁵ WHO. "Parasitic Diseases: Hookworm Disease."
http://www.who.int/vaccine_research/diseases/soa_parasitic/en/index2.html

⁶⁶ CDC's [Public Health Image Library](#)

Module 3

Session 3.3 : Trichuriasis, Strongyloidosis, Enterobiasis, Cestodiasis (Hymenolepis) and Taeniasis (taenia saginata)

Objectives: at the end of this session participants will be able to:

- Assess Trichuriasis
- Assess Strongyloidosis
- Assess Enterobiasis
- Assess Cestodiasis (Hymenolepis)
- Assess Taeniasis (taenia saginata)

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

2 hours and a half

Session Plan

Objectives	Content	Methods /Activities
<p>3.3.1 Trichuriasis</p> <p>3.3.1 a Define, Classify, Identify infectious agent and occurrence (10 min)</p> <p>3.3.1 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 min)</p>	<p>ICD-10 B79</p> <p>Identification Whipworm disease</p> <p>Case classification:</p> <ul style="list-style-type: none"> • <i>Suspected case:</i> usually asymptomatic. • <i>Probable case:</i> bloody mucoid stools, diarrhea. Rectal prolapse, clubbing fingers, anemia, hypoproteinemia, and growth retardation- in heavily infected children. • <i>Confirmed case:</i> eggs in feces, or sigmoidoscopy- worms attached to the lower colon wall. <p>Infectious agent <i>Trichuris trichiura</i></p> <p>Occurrence Worldwide, especially in warm, moist regions.</p> <p>Reservoir Humans</p> <p>Mode of transmission Indirect, through pica or ingestion of contaminated vegetables; no immediate person-to-person transmission. Eggs passed in feces require a minimum of 10-14 days in warm moist soil to become infective</p> <p>Incubation period : Indefinite</p> <p>Period of communicability Several years in untreated carriers.</p> <p>Susceptibility and resistance Universal.</p>	<p>Mini Lecture</p> <p>Discussion Lecture</p>

<p>3.3.1 c describe methods of control (10 min)</p> <p>3.3.1 d explain clinical management (5 min)</p>	<p>Methods of control:</p> <ul style="list-style-type: none"> • Preventive measures • Control measures <p>Management of the disease:</p> <p>Mebendazole by mouth 3 days. Albendazole, pyrantel.</p>	<p>Brain Storming</p> <p>Discussion</p>
<p>3.3.2 Strongyloidosis</p> <p>3.3.2 a Define, Classify, Identify infectious agent and occurrence (10 Min)</p> <p>3.3.2 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 Min)</p> <p>3.3.2 c Describe methods of control</p>	<p>ICD-10 B78</p> <p>Identification</p> <p>Case classification:</p> <ul style="list-style-type: none"> • Suspected Case; a symptomatic helminthic infection of the duodenum, upper jejunum. Transient dermatitis on initial infection. • Probable Case: cough, pneumonitis, nausea, abdominal pain, diarrhea, urticaria, weight loss, weakness, constipation. • Confirmed Case: motile larvae in freshly passed stool specimen. Serological tests 80%-85% are positive. <p>Infectious agent</p> <p>Strongyloides stercoralis</p> <p>Occurrence</p> <p>Throughout tropical and temperate areas; more common in warm, wet regions.</p> <p>Reservoir</p> <p>Humans are the principal reservoir, with occasional transmission of dog and cat strains to humans.</p> <p>Mode of transmission</p> <p>Infective (filariform) larvae develop in feces or moist soil contaminated with feces, penetrates the skin, enters the venous circulation and are carried to the lungs</p> <p>Incubation period</p> <p>2-4 weeks; the period until symptoms appear is indefinite and variable.</p> <p>Period of communicability</p> <p>As long as living worms remain in the intestine; up to 35 years in cases of autoinfection.</p> <p>Susceptibility and resistance</p>	<p>Mini Lecture</p> <p>Discussion Lecture</p>

<p>(10 Min)</p> <p>3.3.2 d explain clinical management</p> <p>(5 Min)</p>	<p>Universal.</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures <p>Management of the disease: Ivermectin, thiabendazole and the least effective albendazole.</p>	<p>Brain Storming</p> <p>Discussion</p>
<p>3.3. 3Enterobiasis</p> <p>3.3. 2 a Define, Classify, Identify infectious agent and occurrence</p> <p>(10 Min)</p> <p>3.3. 3 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance.</p> <p>(10 min)</p>	<p>ICD-10 B80</p> <p>Identification</p> <p>Pinworm disease</p> <p>Case classification:</p> <ul style="list-style-type: none"> • <u>Suspected Case:</u> often asymptomatic. Sometimes perennial itching, disturbed sleep. • <u>Probable Case:</u> vulvovaginitis, salpingitis, pelvic, liver granulomata. Possibly appendicitis, anurasis. • <u>Confirmed Case:</u> tape swab or pinworm paddle, repeated 3or more times before accepting negative result. <p>Infectious agent</p> <p>Enterobius vermicularis, an intestinal nematode.</p> <p>Occurrence</p> <p>Worldwide, affecting all socioeconomic classes, with high rates in some areas</p> <p>Reservoir</p> <p>Humans. Pinworms of other animals are not transmissible to humans.</p> <p>Mode of transmission</p> <p>Direct transfer of infective eggs by hand from anus to mouth of the same or another person, or indirectly through clothing, bedding, food or other articles contaminated with parasite eggs.</p>	<p>Mini Lecture</p> <p>Discussion Lecture</p>

<p>3.3. 3 c describe methods of control (10 Min)</p> <p>3.3. 3 d explain clinical management (5 Min)</p>	<p>Incubation period The life cycle requires 2-6 weeks</p> <p>Period of communicability As long as gravid females discharge eggs on perianal skin. Eggs remain infective in an indoor environment for about 2 weeks.</p> <p>Susceptibility and resistance Universal.</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures <p>Management of the disease A single dose of mebendazole or albendazole- kills pinworms (not eggs), repeated after 2 weeks to treat the hatch worms. The entire household is often treated.</p>	<p>Brain Storming</p> <p>Discussion</p>
<p>3.3. 4 Cestodiasis (Hymenolepis) 3.3. 4 a Define, Classify, Identify infectious agent and occurrence (10 min)</p>	<p>ICD-10 B71.0</p> <p>Identification Dwarf tapeworm infection.</p> <p>Case classification:</p> <ul style="list-style-type: none"> • <i>Suspected Case</i>: vague symptoms (abdominal pain, pallor, loss of weight, weakness). • <i>Probable Case</i>: usually asymptomatic. Diarrhea, enteritis in massive infection. • <i>Confirmed Case</i>: microscopic identification of eggs in feces. <p>Infectious agent <i>Hymenolepis nana</i> (dwarf tapeworm), the <u>only</u> human tapeworm without an obligatory intermediate host.</p> <p>Occurrence Cosmopolitan; more common in warm than cold, and</p>	<p>Mini Lecture</p>

<p>3.3. 4 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10 Min)</p> <p>3.3. 4 c Describe methods of control (10 Min)</p> <p>3.3. 4 d Explain clinical management (5 min)</p>	<p>in dry than wet climates</p> <p>Reservoir Humans, possibly mice.</p> <p>Mode of transmission Directly from contaminated fingers, or ingestion of insects bearing larvae.</p> <p>Incubation period Onset of symptoms is variable; the development of mature worms requires about 2 weeks.</p> <p>Period of communicability As long as eggs are passed in feces. Infection may persist for years.</p> <p>Susceptibility and resistance . Universal. Children are more susceptible than adults.</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures <p>Management of the disease</p> <p>Specific treatment: Praziquantel or niclosamide. Albendazole may be considered.</p>	<p>Discussion Lecture</p> <p>Brain Storming</p> <p>Discussion</p>
<p>3.3. 5 Taeniasis (taenia saginata)</p> <p>3.3. 5 a Define, Classify, Identify infectious agent and occurrence</p>	<p>ICD-10 B68.0: Taenia Solium Taeniasis ICD-10 B68.1: Taenia Saginata Taeniasis ICD-10 B69: Cysticercosis</p> <p>3.14.1 Identification Beef tapeworm and pork tapeworm.</p> <p>Case classification:</p> <ul style="list-style-type: none"> • <i>Suspect case</i>: nervousness, insomnia, anorexia, weight loss, digestive disturbances. • <i>Probable case</i>: cerebral involvement Neurocysticercosis. • <i>Confirmed case</i>: proglottids (segments), eggs, or antigens of the worm-in feces or anal swab. Specific diagnosis- morphology of the scolex 	<p>Mini Lecture</p>

<p>3.3. 5 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance.</p> <p>3.3. 5 c describe methods of control</p> <p>3.3. 5 d explain clinical management</p>	<p>and /or gravid proglottids.</p> <p>Infectious agent <i>Taenia solium</i>, the pork tapeworm. <i>T. saginata</i>, the beef tapeworm</p> <p>Occurrence Worldwide.</p> <p>Reservoir Humans- definitive host of both species. Cattle- intermediate hosts for <i>T.saginata</i>, pigs for <i>T. solium</i>.</p> <p>Mode of transmission Infection follows ingestion raw or undercooked contaminated beef.</p> <p>Incubation period From weeks to 10 years or more after infection. Eggs appear in the stool 8-12 weeks after infection with the adult <i>T. solium</i> tapeworm, 10-14 weeks with <i>T. saginata</i>.</p> <p>Period of communicability In humans, infection after ingestion of raw or undercooked beef containing cysticerci, Adult worms develops in the intestine; eggs may remain viable in the environment for months.</p> <p>Susceptibility and resistance Susceptibility is general</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures <p>Management of the disease: Drug of choice: praziquantal- single dose. With active CNS symptoms- praziquantal, albendazole under hospitalization.</p>	<p>Discussion Lecture</p> <p>Brain Storming</p> <p>Discussion</p>
--	--	--

3.3.1 Trichuriasis

ICD-10 B79

3.3.1 .a. Identification

Whipworm disease

Case classification:

- Suspected case: A nematode infection of the large intestine, usually asymptomatic.
- Probable case: Heavy infections may cause bloody, mucoid stools and diarrhea. Rectal prolapse, clubbing of fingers, hypoproteinemia, anemia and growth retardation may occur in heavily infected children.
- Confirmed case: demonstration of eggs in feces or sigmoidoscopic observation of worms attached to the wall of the lower colon in heavy infections.

Infectious agent

Trichuris trichiura

Occurrence

Worldwide, especially in warm, moist regions.

3.3.1 .b. Reservoir

Humans

Mode of transmission

Indirect, particularly through pica or ingestion of contaminated vegetables; no immediate person-to-person transmission. Eggs passed in feces require a minimum of 10-14 days in warm moist soil to become infective. Hatching of larvae follows ingestion of infective eggs from contaminated soil, attachment to the mucosa of the caecum and proximal colon, and development into mature worms. Eggs appear in the feces 70-90 days after ingestion of embryonated eggs; symptoms may appear much earlier.

Incubation period

Indefinite

Period of communicability

Several years in untreated carriers.

Susceptibility and resistance

Universal.

3.3.1.c .Methods of control**3.3.1a Preventive measures**

- 1) Educate all members of the family, particularly children, in the use of toilet facilities.
- 2) Provide adequate facilities for feces disposal.
- 3) Encourage satisfactory hygienic habits, especially hand washing before food handling; avoid ingestion of soil by thorough washing of vegetables and other foods contaminated with soil.
- 4) WHO recommends a strategy focused on high-risk groups for the control of morbidity due to soil-transmitted helminthes, including community treatment.

Control measures

- 1) Report to local health authority.
- 2) Isolation: Not applicable.
- 3) Concurrent disinfection: Sanitary disposal of feces.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection: Examine feces of all symptomatic members of the family group, especially children and playmates.
- 7) Specific treatment: Mebendazole is the drug of choice. Albendazole (half dose for children 12-24 months), and pyrantel are alternative drugs.

3.3.1.d. Management of the disease⁶⁷

- Mebendazole taken by mouth for 3 days is commonly prescribed when the infection causes symptoms. Albendazole (half dose for children 12-24 months) and pyrantel are used as alternative therapies.



Trichuris trichiura egg

⁶⁷ "Whipworm Infection." *A.D.A.M. Medical Encyclopedia*. Updated: September 15, 2010.
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002340/>

3.3.2 Strongyloidiosis

ICD-10 B78

3.3.2 .a. Identification

Case classification:

- Suspected Case: asymptomatic helminthic infection of the duodenum and upper jejunum. Clinical manifestations include transient dermatitis when larvae of the parasite penetrate the skin on initial infection;
- Probable Case: cough, and sometimes demonstrable pneumonitis, abdominal pain (usually epigastric, diarrhea and urticaria; nausea, weight loss, vomiting, weakness and constipation.
- Confirmed Case: identifying larvae in concentrated stool specimens (motile in freshly passed feces), in duodenal aspirates or, occasionally, in sputum. feces may show developing stages of the parasite, Serological tests based on larval stage antigens are positive in 80%-85% of infected patients.

Infectious agent

Strongyloides stercoralis

Occurrence

Throughout tropical and temperate areas; more common in warm, wet regions.

3.3.2 .b. Reservoir

Humans are the principal reservoir, with occasional transmission of dog and cat strains to humans.

Mode of transmission

Infective (filariform) larvae develop in feces or moist soil contaminated with feces, penetrates the skin, enters the venous circulation and are carried to the lungs. They penetrate capillary walls, enter the alveoli, ascend the trachea to the epiglottis and descend into the digestive tract to reach the upper part of the small intestine, where development of the adult female is completed. The adult worm, female, lives embedded in the mucosal epithelium of the intestine, especially the duodenum, where eggs are deposited. These hatch and liberate rhabditiform (non infective) larvae that migrate into the

intestinal lumen, exit in feces and develop after reaching the soil into either infective filariform larvae (which may infect the same or a new host) or free-living male and female adults. The free-living fertilized females produce eggs that hatch and liberate rhabditiform larvae, which may become filariform larvae within 24-36 hours. In some individuals, rhabditiform larvae may develop to the infective stage before leaving the body and penetrate through the intestinal mucosa or perianal skin; the resulting autoinfection can cause persistent infection for many years.

Incubation period

From penetration of the skin by filariform larvae until rhabditiform larvae appear in the feces takes 2-4 weeks; the period until symptoms appear is indefinite and variable.

Period of communicability

As long as living worms remain in the intestine; up to 35 years in cases of autoinfection.

Susceptibility and resistance

Universal.

3.3.2 .c.Methods of control

Preventive measures

- 1) Dispose of human feces in a safe manner.
- 2) Attention to hygienic habits.
- 3) Examine and treat infected dogs, cats and monkeys in contact with people.

Control measures

- 1) Report to local health authority.
- 2) Isolation: Not applicable.
- 3) Concurrent disinfection: Safe disposal of feces.

- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection.
- 7) Specific treatment: Because of the potential for autoinfection and dissemination, all infections, regardless of worm burden, should be treated.

3.3.2 .d. Management of the disease⁶⁸

Ivermectin, thiabendazole and albendazole are the most effective medicines for treating the infection. Albendazole is considered the least effective. Ivermectin, the drug of choice, is not available in all endemic countries. Moreover, the optimal schedule has yet to be defined.



Larva of *Strongyloides stercoralis*, the roundworm that causes strongyloidiasis

⁶⁸ WHO. "Neglected tropical diseases: Strongyloidiasis."
http://www.who.int/neglected_diseases/diseases/strongyloidiasis/en/

3.3.3 .Enterobiasis

ICD-10 B80

3.3.3 .a. Identification

Pinworm disease

Case classification:

- *Suspected Case:* A common intestinal helminthic infection that is often asymptomatic. There may be perianal itching, disturbed sleep, irritability and sometimes secondary infection of the scratched skin.
- *Probable Case:* Other clinical manifestations include vulvovaginitis, salpingitis, and pelvic and liver granulomata. Appendicitis and enuresis have rarely been reported as possible associated conditions.
- *Confirmed Case:* applying transparent adhesive tape (tape swab or pinworm paddle) to the perianal region and examining the tape or paddle microscopically for eggs; the material is best obtained in the morning before bathing or passage of stools. Examination should be repeated 3 or more times before accepting a negative result. Eggs are sometimes found on microscopic stool and urine examination. Female worms may be found in feces and in the perianal region during rectal or vaginal examinations.

Infectious agent

Enterobius vermicularis, an intestinal nematode.

Occurrence

Worldwide, affecting all socioeconomic classes, with high rates in some areas. It is the most common worm infection in other countries of temperate climate; prevalence is highest in school-age children (in some groups near 50%),. Infection often occurs in more than one family member.

3.3.3 .b.Reservoir

Humans. Pinworms of other animals are not transmissible to humans.

Mode of transmission

Direct transfer of infective eggs by hand from anus to mouth of the same or another person, or indirectly through clothing, bedding, food or other articles contaminated with parasite eggs. Dust borne infection is possible in heavily contaminated households and institutions. Eggs become infective within a few hours after being deposited at the anus by migrating gravid females.

Incubation period

The life cycle requires 2-6 weeks. Symptomatic disease with high worm burdens results from successive reinfection occurring within months following initial exposure.

Period of communicability

As long as gravid females discharge eggs on perianal skin. Eggs remain infective in an indoor environment for about 2 weeks.

Susceptibility and resistance

Universal. Differences in frequency and intensity of infection are due primarily to differences in exposure.

3.3. 3 .c.Methods of control

3.3.3a Preventive measures

- 1) Educate the public in personal hygiene, particularly the need to wash hands before eating or preparing food. Keep nails short; discourage nail biting and scratching anal area.
- 2) Remove sources of infection through treatment of cases.
- 3) Daily morning bathing, with showers (or stand-up baths) preferred to tub baths.
- 4) Change to clean underclothing, nightclothes and bed sheets frequently, preferably after bathing.
- 5) Clean and vacuum house daily for several days after treatment of cases.
- 6) Reduce overcrowding in living accommodations.

- 7) Provide adequate toilets; maintain cleanliness in these facilities.

Control measures

- 1) Report to local health authority: Official report not ordinarily justifiable.
- 2) Isolation: Not applicable.
- 3) Concurrent disinfection: Change bed linen and underwear of infected person daily for several days after treatment, avoiding aerial dispersal of eggs. Use closed sleeping garments. Eggs on discarded linen are killed by exposure to temperatures of 55°C (131°F) for a few seconds; either boil bed clothing or use a washing machine on the "hot" cycle. Clean and vacuum sleeping and living areas daily for several days after treatment.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable
- 6) Investigation of contacts and source of infection: Examine all members of an affected family or institution.
- 7) Specific treatment: Pyrantel pamoate, mebendazole or albendazole. Treatment to be repeated after 2 weeks; concurrent treatment of the whole family may be advisable if several members are infected.

Epidemic measures

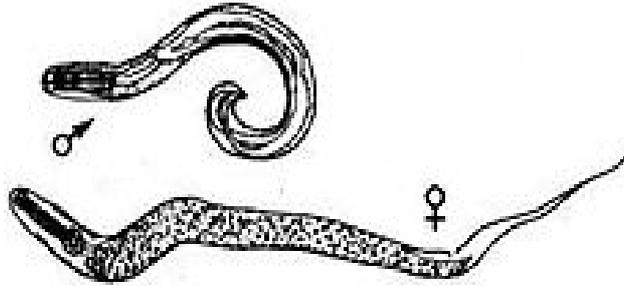
Multiple cases in schools and institutions can best be controlled through systematic treatment of all infected individuals and household contacts.

3.3.3 .d.Management of the disease⁶⁹

- The main treatment is a single dose of either mebendazole or albendazole, which kill the pinworms (not the eggs).
- More than one household member is likely to be infected, so the entire household is often treated. The single-dose treatment is often repeated after 2 weeks. This treats worms that hatched since the first treatment.
- To control the eggs:
 - Clean toilet seats daily
 - Keep fingernails short and clean
 - Wash all bed linens twice a week
 - Wash hands before meals and after using the toilet

⁶⁹ "Pinworms." *A.D.A.M Medical Encyclopedia*. Updated: July 26, 2010.
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002137/>

- Avoid scratching the infected area around the anus. This can cause contamination and fuel transmission.
- Keep hands and fingers away from nose and mouth unless freshly washed. Carry out these measures while family members are being treated for pinworms.



Pinworms (*Enterobius vermicularis*)

3.3.4 .Cestodiasis (Hymenolepis)

ICD-10 B71.0

3.3.4 a. Identification

Dwarf tapeworm infection.

Case classification:

- Suspected Case: abdominal pain and other vague symptoms such as pallor, loss of weight and weakness.
- Probable Case: An intestinal infection with very small tapeworms; light infections are usually asymptomatic. Massive numbers of worms may cause enteritis with or without diarrhea
- Confirmed Case: Microscope identification of eggs in feces confirms diagnosis.

Infectious agent

Hymenolepis nana (dwarf tapeworm), the only human tapeworm without an obligatory intermediate host.

Occurrence

Cosmopolitan; more common in warm than cold, and in dry than wet climates. Dwarf tapeworm is the most common human tapeworm in the USA and Latin America; it is common in Australia, Mediterranean countries, the Near East and India.

3.3.4 .b. Reservoir

Humans, possibly mice.

Mode of transmission

Eggs of *H. nana* are infective when passed in feces. Infection is acquired through ingestion of eggs in contaminated food or water; directly from fecally contaminated fingers (autoinfection or person-to-person transmission); or ingestion of insects bearing larvae that have developed from eggs ingested

by the insect. *H. nana* eggs, once ingested, hatch in the intestine, liberating oncospheres that enter mucosal villi and develop into cysticercoids; these rupture into the lumen and grow into adult tapeworms. Some *H. nana* eggs are immediately infectious when released from the proglottids in the human gut, so autoinfection's or person-to-person transmission can occur.

Incubation period

Onset of symptoms is variable; the development of mature worms requires about 2 weeks.

3.13.7 Period of communicability

As long as eggs are passed in feces. Infection may persist for years.

3.13.8 Susceptibility and resistance

Universal; infection produces resistance to reinfection. Children are more susceptible than adults; intensive infection occurs in immunodeficient and malnourished children.

3.3.4 .c.Methods of control

3.13.9a Preventive measures

- 1) Educate the public in personal hygiene and safe disposal of feces.
- 2) Provide and maintain clean toilet facilities.
- 3) Protect food and water from contamination with human and rodent feces.
- 4) Treat to remove sources of infection.
- 5) Eliminate rodents from home environment.

Control measures

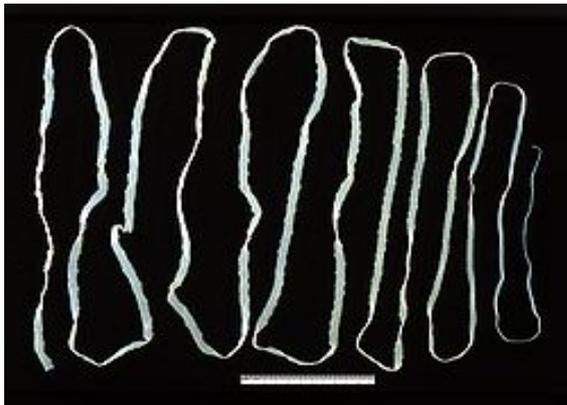
- 1) Report to local health authority: Official report not ordinarily justifiable, Class 5 (see Reporting).
- 2) Isolation: Not applicable.
- 3) Concurrent disinfection: Safe disposal of feces.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection: Fecal examination of family or institution members.

Epidemic measures

Outbreaks in schools and institutions can best be controlled through treatment of infected individuals and special attention to personal and group hygiene.

3.3.4 .d.Management of the disease

Specific treatment: Praziquantel or niclosamide is effective. Albendazole may be considered where intestinal helminthiasis coexist.



Beef tapeworm

3.3.5 Taeniasis (*taenia saginata*)

ICD-10 B68.0: *Taenia Solium* Taeniasis

ICD-10 B68.1: *Taenia Saginata* Taeniasis

ICD-10 B69: Cysticercosis

3.3.5 .a. Identification

Beef tapeworm and pork tapeworm.

Case classification:

- Suspect case: Clinical manifestations of infection with the adult worm, if present, are variable and may include nervousness, insomnia, anorexia, weight loss, abdominal pain and digestive disturbances.
- Probable case: In the presence of somatic cysticercosis, epileptiform seizures, headache, signs of intracranial hypertension or psychiatric disturbances strongly suggest cerebral involvement Neurocysticercosis.
- Confirmed case: Infection with an adult tapeworm is diagnosed by identification of proglottids (segments), eggs or antigens of the worm in the feces or on anal swabs. Specific diagnosis is based on the morphology of the scolex (head) and/or gravid proglottids.

Infectious agent

Taenia solium, the pork tapeworm, causes both intestinal infection with the adult worm and extra intestinal infection with the larvae (cysticerci). *T. saginata*, the beef tapeworm, only causes intestinal infection with the adult worm in humans.

Occurrence

Worldwide; frequent wherever beef or pork is eaten raw or insufficiently cooked and where sanitary conditions are lacking.

3.3.5 .b. Reservoir

Humans are the definitive host of both species. Cattle are the intermediate hosts for *T. saginata* and pigs for *T. solium*.

Mode of transmission

Eggs of *T. saginata* passed in the stool of an infected person are infectious only to cattle, in the flesh of which the parasites develop into cysticercus bovis, the larval stage of *T. saginata*. In humans, infection follows ingestion of raw or undercooked beef containing cysticerci; adult worm develops in the intestine.

Incubation period

Symptoms of cysticercosis may appear from weeks to 10 years or more after infection. Eggs appear in the stool 8-12 weeks after infection with the adult *T. solium* tapeworm, 10-14 weeks with *T. saginata*.

Period of communicability

T. saginata is not directly transmitted from person to person, but *T. solium* may be. Eggs of both species are disseminated into the environment as long as the worm remains in the intestine, sometimes more than 30 years; eggs may remain viable in the environment for months.

3.3.5 Susceptibility and resistance

Susceptibility is general. No apparent resistance follows infection; the presence of more than one tapeworm in a person has rarely been reported.

3.3.5 .c.Methods of control

3.3.5a Preventive measures

- 1) Educate the public to prevent fecal contamination of soil, water, and human and animal food; to avoid use of sewage effluents for pasture irrigation; and to cook beef and pork thoroughly.
- 2) Appropriate measures to protect patients from themselves and their contacts are necessary.
- 3) Freezing beef at a temperature below -5°C (23°F) for more than 4 days kills the cysticerci effectively.
- 4) Inspection of the carcasses of cattle and swine will detect only a proportion of infected carcasses; these should be condemned, irradiated or processed into cooked products.
- 5) Prevent swine access to latrines and human feces.

Control measures

- 1) Report to local health authority: Selectively reportable.
- 2) Isolation: Not applicable. Stools of patients with untreated taeniasis due to *T. solium* may be infective.
- 3) Concurrent disinfection: Dispose of feces in a sanitary manner; emphasize strict sanitation, with hand washing after defecating and before eating, especially for *T. solium*.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection: Evaluate symptomatic contacts.
- 7) Specific treatment: Praziquantel is effective in the treatment of *T.saginata* and *T. solium* intestinal infections. Niclosamide, no longer widely available, is an alternative.

3.3.5 .d.Management of the disease

- Tapeworms are treated with medications taken by mouth, usually in a single dose. The drug of choice for tapeworm infections is praziquantel. Niclosamide can also be used. Patients with active CNS cysticercosis may benefit from treatment with praziquantel or albendazole under hospitalization; a short course of corticosteroids is usually given to control cerebral edema due to dying cysticerci. Where cysticidal treatment is not indicated, symptomatic treatment, such as with anti-epileptic drugs, may bring relief. In some cases surgical intervention may be needed to relieve symptoms.

Module 3

Session3. 4: Amebiasis, Giardiasis, Acute Lower Respiratory Infections (ALRI), Toxoplasmosis and Typhoid and Paratyphoid fever

Objectives: at the end of this session participants will be able to:

- Assess The Amebiasis
- Assess The Giardiasis
- Assess The Acute Lower Respiratory Infections (ALRI)
- Assess The Toxoplasmosis
- Assess The Typhoid and Paratyphoid

Trainers Preparation:

- Review the reading material and the session plan.
- Prepare the presentation as appropriate and as recommended in the method column of the session plan, or write the information on a flipchart or board where all participants can see it.
- Prepare copies of the reference materials/handouts and exercises.
- Arrange the training room.

Methods and activities

- Brain storming
- Questions and answers
- Discussion
- Exercise

Evaluation/assessment

Questions and answers, trainer's observation

Estimated Time

2 hours and a half

Session Plan

OBJECTIVE	CONTENT	Methods/ Activities
<p>3.4.1.Amebiasis</p> <p>3.4.1.a Define, Classify, Identify infectious agent and occurrence. (10min.)</p> <p>3.4.1b.Explain reservoir, mode of transmission, incubation period, period of communicability, susceptibility and resistance. (10min.)</p> <p>3.4.1.c Describe methods of control, laboratory procedures, endemic measures, disaster implications. (10min.)</p>	<p>ICD-10 A06</p> <p>Identification</p> <p>Case classification:</p> <ul style="list-style-type: none"> • <u>Suspected Case</u>: the parasite may act as a commensal or give rise to intestinal or extra intestinal disease. • <u>Probable Case</u>: mostly asymptomatic, intestinal disease varies from acute dysentery: fever, chills, diarrhea, to mild abdominal discomfort, diarrhea containing blood ,mucus. • <u>Confirmed case</u>: microscopic demonstration of trophozoites in fecal specimen. <p>Infectious agent Entamoeba histolytica.</p> <p>Occurrence Mostly a disease of young adults; liver abscesses mainly in males. Rare below age 5, especially below age 2 when dysentery is due typically to shigellae.</p> <p>Reservoir Humans</p> <p>Mode of transmissionIngestion of fecally contaminated food, water containing amoebic cysts.</p> <p>Incubation period Days to several months, years; commonly 2-4years.</p> <p>Period of communicability During the period E. histolytica are passed, which may continue for years.</p> <p>Susceptibility and resistance General. Reinfection has been demonstrated but is apparently rare.</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures • Disaster implications 	<p>Mini Lecture.</p> <p>Discussion Lecture.</p> <p>Brain Storming.</p>

<p>3.4.1.d Explain clinical management. (5min.)</p>	<p>Management of the disease</p> <p>Acute case: metronidazole. Single dose of: Tinindazole, ornidazole. For liver abscess: metronidazole or dehydroemetine plus chloroquine, sometimes surgical aspiration.</p>	<p>Discussion.</p>
<p>3.4.2 Giardiasis</p> <p>3.4.2.a Define, Classify, Identify infectious agent and occurrence. (10min.)</p> <p>3.4.2.b Explain reservoir, mode of transmission, incubation, period of communicability, susceptibility and resistance. (10min.)</p> <p>3.4.2 c describe methods of control. (10min.)</p> <p>3.4.2 d explain clinical management (5min.)</p>	<p>ICD-10 A07.1</p> <p>Identification Case classification:</p> <ul style="list-style-type: none"> • <i>Suspected case</i>: asymptomatic or self-limited diarrhea or chronic diarrhea. • <i>Probable case</i>: weight loss, fatigue, intestinal complaints. • <i>Confirmed case</i>: identification of cysts or protozoites in feces, to rule out the diagnosis- at least 3 negative results are needed. <p>Reservoir Humans; possibly beaver and other wild and domestic animals.</p> <p>Mode of transmission Person- to- person transmission, sometimes anal intercourse.</p> <p>Incubation period Usually 3-25 days or longer; median 7-10 days.</p> <p>Period of communicability Entire period of infection, often months.</p> <p>Susceptibility and resistance Asymptomatic carrier rate is high; infection is frequently self-limited</p> <p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures <p>Management of the disease</p> <p>Drug of choice: metronidazole- 2grams one daily dose, (children 15mg/kg) for 3 days, or tinindazole- one single dose (children 50-75mg/kg).</p>	<p>Mini Lecture.</p> <p>Discussion Lecture.</p> <p>Brain Storming.</p> <p>Discussion.</p>

<p>3.4.3 Acute Lower Respiratory Infections (ALRI) 3.4.3 a Define, Classify, Identify infectious agent and occurrence (10min.)</p>	<p>ICD-10 A49</p> <p>Identification Pneumonia <i>Symptoms:</i> Cough or difficult breathing; <i>Signs:</i> 50 or more breaths per minute for infant's age 2 months up to 1 year, <i>or</i> 40 or more breaths per minute for children age 1 up to 5 years old; and no chest in drawing, general danger signs, strider in calm child or severe malnutrition. Severe pneumonia <i>Symptoms:</i> Cough or difficult breathing and <i>Signs:</i> Chest in drawing and strider in a calm child or severe malnutrition.</p> <p>Very severe disease <i>Symptoms:</i> Cough or difficult breathing <i>Signs:</i> General danger signs: unable to drink or breast feed; convulsions; abnormally sleepy or difficult to wake, strider in a calm child or severe malnutrition. <u>Infants below 2 months of age:</u> Cases are classified as either "Severe Pneumonia" or "Very severe disease",</p> <p>Infectious agent Bacteria mostly: Streptococcus pneumonia, Homophiles influenza, and to a lesser extent Staphylococcus aureus.</p> <p>Occurrence Low temperatures may increase pneumonia in children.</p>	<p>Mini Lecture.</p>
<p>3.4.3 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10min.)</p>	<p>Reservoir Humans are only known reservoir.</p> <p>Mode of transmission Airborne: respiratory droplets.</p> <p>Incubation period Usually 2-5 days.</p> <p>Period of communicability Depends on the infective agent.</p> <p>Susceptibility and resistance Can occur in any one. It occurs more frequently if immune systems are deficient.</p>	<p>Discussion Lecture.</p>

<p>3.4.3 c Describe methods of control (10min.)</p> <p>3.4.3 d Explain clinical management (5min.)</p>	<p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures <p>Management of the disease Antibiotic treatment. <u>Hospitalization</u> -in infants aged <u>two months or younger</u>, very severe cases.</p>	<p>Brain Storming.</p> <p>Discussion.</p>
<p>3.4.4 Toxoplasmosis</p> <p>3.4.4 a Define, Classify, Identify infectious agent and occurrence (10min)</p> <p>3.4.4 b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10min.)</p>	<p>ICD-10 B58</p> <p>Identification The protozoan <i>Toxoplasma gondii</i> infects most commonly warm-blooded animals, including humans; the primary host is the feline (cat) family. Animals are infected by eating infected meat, or by transmission from mother to fetus</p> <p>Clinical features 80% of cases asymptomatic. Symptoms: enlarged lymph nodes, recurrent abortion, in early pregnancy brain, liver, spleen and eye damage. In late pregnancy persistent eye infection for life.</p> <p>Diagnosis: Biopsy, Serological test (IFAT, ELASA)</p> <p>Infectious agent Protozoan <i>Toxoplasma gondii</i></p> <p>Occurrence The disease is reported in all provinces in Iraq, affect mainly females</p> <p>Reservoir Main host is cats; intermediate hosts include sheep and goats.</p> <p>Mode of transmission By eating raw or undercooked meat, ingestion of oocytes in dirt sand pit, blood transfusion, organ transplantation, trans placental transmission.</p> <p>Incubation period 5-23 days</p>	<p>Mini Lecture.</p> <p>Discussion Lecture.</p>

<p>3.4.4 c describe methods of control (10min.)</p> <p>3.4.4 d explain clinical management (5min.)</p> <p>3.4.5 Typhoid and Paratyphoid fever</p> <p>3.4.5.a Define, classify, identify infectious agent and occurrence. (10min.)</p>	<p>Period of communicability Toxoplasmosis is not passed from person-to-person, except of mother-to-child (congenital) transmission and blood transfusion or organ transplantation</p> <p>Susceptibility and resistance General. Asymptomatic pregnant woman can transmit infection to her unborn child</p> <p>Methods of control Health education especially women in child bearing age.</p> <p>Management of the disease Antimalarial drugs and antibiotics. AIDS patients-treatment for as long as their immune system is weak.</p> <p>ICD-10 A01.0: Typhoid Fever ICD-10 A01.1-A01.4: Paratyphoid Fever</p> <p>Identification A systemic bacterial disease with insidious onset of sustained fever, severe headache, malaise, anorexia, relative bradycardia, nonproductive cough in early stage of illness, rose spots on the trunk and constipation more often than diarrhea in adults. Paratyphoid fever presents a similar clinical picture, but tends to be milder, and the case-fatality rate is much lower.</p> <p>Case classification:</p> <ul style="list-style-type: none"> • <u>Suspected case:</u> • <u>Confirmed Case</u> • <u>Carrier</u> <p>Infectious agent</p> <ul style="list-style-type: none"> • <i>Salmonella typhi</i> • : <i>Salmonella paratyphi A</i> <p>Occurrence Worldwide, mostly endemic in many developing countries</p>	<p>Brain Storming.</p> <p>Discussion.</p> <p>Mini Lecture.</p>
--	--	--

<p>3.4.5b Explain reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance. (10min.)</p>	<p>Reservoir Humans, rarely domestic animals for paratyphoid. Mode of transmission Ingestion of food and water contaminated by feces and urine of patients and carriers. Incubation period ; from 3 days to over 60 days Period of communicability As long as bacilli appear in excreta, from first week throughout convalescence (1-2 weeks for paratyphoid). Susceptibility and resistance General and is increased in individuals with gastric achlorhydria and possibly in those who are HIV-positive.</p>	<p>Discussion Lecture.</p>
<p>3.4.5.c Describe methods of Control. (10min.)</p>	<p>Methods of control</p> <ul style="list-style-type: none"> • Preventive measures • Control measures • Epidemic measures • Disaster implications • International measures 	<p>Brain Storming.</p>
<p>3.4.5d Explain clinical management (5min.)</p>	<p>Management of the disease Broad spectrum antibiotics immediately without waiting for confirmatory tests. Therapy should be narrowed once more information is available.</p>	<p>Discussion.</p>

3.4.1..Amebiasis

ICD-10 A06

3.4.1..a.Identification

Case classification:

- Suspected Case: A protozoan parasite infection that exists in 2 forms: the hardy infective cyst and the more fragile potentially pathogenic trophozoite. The parasite may act as a commensal or invade the tissues and give rise to intestinal or extra intestinal disease.
- Probable Case: Most infections are asymptomatic ,Intestinal disease varies from acute or fulminating dysentery with fever, chills and bloody or mucoid diarrhea (amoebic dysentery), to mild abdominal discomfort with diarrhea containing blood or mucus.
- Confirmed case: microscopic demonstration of trophozoites or cysts in fresh or suitably preserved fecal specimens.

Infectious agent

Entamoeba histolytica.

Occurrence

Amebiasis is mostly a disease of young adults; liver abscesses occur predominantly in males. Amebiasis is rare below age 5 and especially below age 2, when dysentery is due typically to shigellae. prevalence rates of cyst passage, usually based on cyst morphology, vary from place to place, with rates generally higher in areas with poor sanitation. In areas with good sanitation, amoebic infections tend to cluster in households and institutions.

3.4.1..b.Reservoir

Humans

Mode of transmission

Mainly through ingestion of fecally contaminated food or water containing amoebic cysts, which are relatively chlorine resistant. Patients with acute amoebic dysentery probably pose only limited danger to others because of the absence of cysts in dysenteric stools and the fragility of trophozoites.

Incubation period

From a few days to several months or years; commonly 2-4 weeks.

Period of communicability

During the period *E. histolytica* are passed, which may continue for years.

Susceptibility and resistance

General. Susceptibility to reinfection has been demonstrated but is apparently rare.

3.4.1.c Methods of control:

Preventive measures

- 1) Educate the general public in personal hygiene, particularly in sanitary disposal of feces and in hand washing after defecation and before preparing or eating food. Disseminate information regarding the risks involved in eating uncleaned or uncooked fruits and vegetables and in drinking water of questionable purity.
- 2) Dispose of human feces in a sanitary manner.
- 3) Protect public water supplies from fecal contamination.
- 4) Treat known carriers; stress the need for thorough hand-washing after defecation to avoid reinfection from an infected domestic resident.
- 5) Health agencies should supervise the sanitary practices of people who prepare and serve food in public eating places and the general cleanliness of the premises involved. Routine examination of food handlers as a control measure is impractical.
- 6) Disinfectant dips for fruits and vegetables are of unproven value in preventing transmission of *E. histolytica*. Thorough washing with potable water and keeping fruits and vegetables dry may help; cysts are killed by desiccation, by temperatures above 50°C (122°F) and by irradiation.
- 7) Use of chemo prophylactic agents is not advised.

Control measures

- 1) Report to local health authority: In selected endemic areas.
- 2) Isolation: For hospitalized patients, enteric precautions in the handling of feces, contaminated clothing and bed linen. Exclusion of individuals infected with *E. histolytica* from food handling and from direct care of hospitalized and institutionalized patients. Release to return to work in a sensitive occupation when chemotherapy is completed.
- 3) Concurrent disinfection: Sanitary disposal of feces.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection: Household members and other suspected contacts should have adequate microscopic examination of feces.

Epidemic measures

Any group of possible cases requires prompt laboratory confirmation to exclude false-positive identification of *E. histolytica* or other causal agents and epidemiological investigation to determine source of infection and mode of transmission. If a common vehicle is indicated, such as water or food, appropriate measures should be taken to correct the situation.

Disaster implications

Disruption of normal sanitary facilities and food management will favor an outbreak of amebiasis, especially in populations that include large numbers of cyst passers.

3.4.1.d Management of the disease

Specific treatment: Acute amoebic dysentery should be treated with metronidazole. In cases of extra intestinal Amoebiasis or refractory intestinal amebiasis, metronidazole should be followed by iodoquinol, paromomycin or diloxanide furoate. Tinidazole and ornidazole are also useful single-dose treatments against luminal and tissue disease. If a patient with a liver abscess continues to be febrile after 72 hours of metronidazole treatment, nonsurgical aspiration may be indicated. Chloroquine is sometimes added to metronidazole or dehydroemetine for treating a refractory liver abscess. Abscesses may require surgical aspiration if there is a risk of rupture or if the abscess continues to enlarge despite treatment. Asymptomatic carriers may be treated with iodoquinol, paromomycin or diloxanide furoate. Metronidazole is not recommended for use during the first trimester of pregnancy.

3.4.2. Giardiasis

ICD-10 A07.1

3.4.2.a Identification

Case classification:

- Suspected case: A protozoan infection principally of the upper small intestine; it can be asymptomatic; or bring on acute, self-limited diarrhea; or lead to intestinal symptoms such as chronic diarrhea.
- Probable case: steatorrhea, abdominal cramps, bloating, frequent loose and pale greasy stools, fatigue, malabsorption (of fats and fat-soluble vitamins) and weight loss. There is usually no extra intestinal invasion, but reactive arthritis and, in severe giardiasis, damage to duodenal and jejunal mucosal cells may occur.
- Confirmed case: identification of cysts or trophozoites in feces (to rule out the diagnosis at least 3 negative results are needed). Because Giardia infection is usually asymptomatic, the presence of *G. lamblia* (in stool or duodenum) does not necessarily indicate that Giardia is the cause of illness. Tests using ELISA or direct fluorescent antibody methods to detect antigens in the stool, generally more sensitive than direct microscopy, are commercially available. Where results of stool examination and antigen assays are questionable, it may be useful to examine for trophozoites from duodenal fluid (aspiration or string test) or mucosa obtained by small intestine biopsy.

Infectious agent

Giardia lamblia (*G. intestinalis*, *G. duodenalis*), a flagellate protozoan.

Occurrence

Worldwide. Children are infected more frequently than adults. Prevalence is higher in areas of poor sanitation and institutions with children not toilet trained, including day care centers. The prevalence of stool positivity in different areas may range between 1% and 30%.

3.4.2.b Reservoir

Humans; possibly beaver and other wild and domestic animals.

Mode of transmission

Person-to-person transmission occurs by hand-to-mouth transfer of cysts from the feces of an infected individual, especially in institutions and day care centers; this is probably the principal mode of spread. Anal intercourse also facilitates transmission.

Incubation period

Usually 3-25 days or longer; median 7-10 days.

Period of communicability

Entire period of infection, often months.

Susceptibility and resistance

Asymptomatic carrier rate is high; infection is frequently self-limited. Pathogenicity of *G. lamblia* for humans has been established by clinical studies. Persons with HIV infection may have more serious and prolonged giardiasis.

3.4.2.c Methods of control

Preventive measures

- 1) Educate families, personnel and inmates of institutions, and especially adult personnel of day care centers, in personal hygiene and the need for washing hands before handling food, before eating and after toilet use.
- 2) Filter public water supplies exposed to human or animal fecal contamination.
- 3) Protect public water supplies against contamination with human and animal feces.
- 4) Dispose of feces in a sanitary manner.
- 5) Boil emergency water supplies. Chemical treatment with hypochlorite or iodine less reliable; use 0.1 to 0.2 ml (2 to 4 drops) of household bleach or 0.5 ml of 2% tincture of iodine per liter for 20 minutes (longer if water is cold or turbid).

Control measures

- 1) Report to local health authority: Case report in selected areas.
- 2) Isolation: Enteric precautions.
- 3) Concurrent disinfection of feces and articles soiled there- with. In communities with a modern and adequate sewage disposal system, feces can be discharged directly into sewers without preliminary disinfection. Terminal cleaning.
- 4) Quarantine: Not applicable.
- 5) Immunization of contacts: Not applicable.
- 6) Investigation of contacts and source of infection: Microscopic examination of feces of household members and other suspected contacts, especially if symptomatic.

Epidemic measures

Institute an epidemiological investigation of clustered cases in an area or institution to determine source of infection and mode of transmission. A common vehicle, such as

water, food or association with a day care center or recreational area must be sought; institute applicable preventive or control measures. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces.

3.4.2.d Management of the disease

Specific treatment: 5-nitroimidazoles: one daily dose of 2 grams metronidazole (children 15 mg/kg) for 3 days, or tinidazole 2 grams in a single dose (children 50-75 mg/kg) are the drugs of choice. Furazolidone is available in pediatric suspension for young children and infants (2 mg/kg thrice daily for 7-10 days). Paromomycin can be used during pregnancy, but when disease is mild, delay of treatment till after delivery is recommended. Drug resistance and relapses may occur with any drug.

3.4.3. Acute Lower Respiratory Infections (ALRI)

ICD-10 A49

3.4.3.a Identification

Pneumonia

Symptoms: Cough or difficult breathing;

Signs: 50 or more breaths per minute for infants age 2 months up to 1 year, *or* 40 or more breaths per minute for children age 1 up to 5 years old; and no chest in drawing, general danger signs, strider in calm child or severe malnutrition.

Severe pneumonia

Symptoms: Cough or difficult breathing and

Signs: Chest in drawing and strider in a calm child or severe malnutrition.

Very severe disease

Symptoms: Cough or difficult breathing

Signs: General danger signs: unable to drink or breast feed; convulsions; abnormally sleepy or difficult to wake, strider in a calm child or severe malnutrition.

Infants below 2 months of age: Cases are classified as either “Severe Pneumonia” or “Very severe disease”, as the illness may progress rapidly in this age group and it may be difficult to differentiate “pneumonia” from other severe conditions requiring inpatient hospital management.

Infectious agent

Bacteria: the most common are likely to be *Streptococcus pneumonia* and *Homophiles influenza* (and *Staphylococcus aureus* to a lesser extent).

Occurrence

Low temperatures, especially in the North, may increase the relative risk of children’s acquiring pneumonia.

3.4.3.b Reservoir

Humans are only known reservoir.

Mode of transmission

Airborne: respiratory droplets.

Incubation period

Depends on the infective agent. Usually 2-5 days.

Period of communicability

Depends on the infective agent. Usually during the symptomatic phase.

Susceptibility and resistance

Pneumonia can occur in anyone. It occurs with increased frequency in individuals whose immune systems are deficient such as malnourished, HIV infected, with diabetes, underlying lung diseases, cancers, and treatment with immunosuppressive drugs. Infants and very young children are highly vulnerable, as are the elderly.

3.4.3.c Methods of control

Preventive measures

- 1) Immunization against measles, diphtheria, and whooping cough are effective in reducing impact of ALRI.
- 2) Health education on early danger signs for prompt care-seeking.
- 3) Adequate feeding, including exclusive breastfeeding to avoid malnutrition.

Control measures

- Priority is early recognition and adequate treatment of cases
- First-line antibiotic for cases in under-fives classified as pneumonia is amoxicillin; second-line antibiotics are cotrimoxazole, ampicillin and, used less frequently, procaine penicillin. The IMCI guidelines under development propose the use of cephalexin and erythromycin as first and second line antibiotics, respectively, for young infants; and intramuscular cefotaxime as pre-referral antibiotic for severe under-five cases that cannot take oral antibiotic (intramuscular benzylpenicillin and gentamicin are options for infants under 2 months of age).
- Supportive measures such as continued feeding to avoid malnutrition, antipyretics to reduce high fever and protection from cold (especially keeping young infants warm) are part of the management.
- Proper advice is given to caretakers of non-severe cases on home care, including compliance with antibiotic treatment instructions.
- Signs of malnutrition are assessed as this increases the risk of death due to pneumonia. Severely malnourished children are referred to hospital.

3.4.3.c Management of the disease⁷⁰

Pneumonia can be treated with antibiotics. These are usually prescribed at a health centre or hospital, but the vast majority of cases of childhood pneumonia can be administered effectively within the home. Hospitalization is recommended in infants aged two months and younger, and also in very severe cases.

⁷⁰ WHO. "Pneumonia Fact Sheet." October 2011.
<http://www.who.int/mediacentre/factsheets/fs331/en/index.html>

3.4.4. Toxoplasmosis

ICD-10 B58

3.4.4.a Identification

A parasitic disease caused by the protozoan *Toxoplasma gondii*. The parasite infects most commonly warm-blooded animals, including humans, but the primary host is the feline (cat) family. Animals are infected by eating infected meat, or by transmission from mother to fetus. Although cats are often blamed for spreading toxoplasmosis, contact with raw meat is a more significant source of human infections in many countries.

Clinical features:

- 80% of cases are asymptomatic.
- Symptomatic patient has enlarged lymph nodes, especially around the neck, muscle pain, intermittent fever and malaise.
- Repeated abortion in child bearing women.
- In early pregnancy brain damage, liver and spleen and eye may occur.
- In late pregnancy may result in persistent eye infection through life.
- Toxoplasmosis acquired after birth usually result in no symptoms or only mild illness.

Diagnosis: Biopsy, Serological test (IFAT, ELASA)

Infectious agent

Protozoan *Toxoplasma gondii*

Occurrence

Situation analysis in Iraq of Toxoplasmosis from 2000 – 2009

The disease is reported in all provinces in Iraq, affect mainly females. High numbers of cases were reported in Erbil (373), Basrah (102), Baghdad Rusafa (55), and Diyala (35) in 2009.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cases	1337	1695	1066	718	610	643	551	660	421	692

3.4.4.b Reservoir

Main host is cats; intermediate hosts include sheep and goats.

Mode of transmission

- Adult most acquire toxoplasmosis by eating raw meat or undercooked meat infected with tissue cyst.
- Children may become infected by ingestion of oocytes in dirt or sand pit after fecal contamination by cats, particularly kitten or other animals.
- Blood transfusion and organ transplantation.
- Trans placental transmission may occur when a woman has a primary infection during pregnancy.

Incubation period

5-23 days

Period of communicability

Toxoplasmosis is not passed from person-to-person, except in instances of mother-to-child (congenital) transmission and blood transfusion or organ transplantation. Kittens and cats can shed millions of oocysts in their feces for as long as 3 weeks after infection. Oocysts shed become infective from 1-5 days later and can remain infective in moist soil or water for over a year. Additionally, oocysts can remain infective in the meat of an infected animal until it is thoroughly cooked.

Susceptibility and resistance

General. Asymptomatic pregnant woman can transmit infection to her unborn child. Infection is often highest in areas of the world that have hot, humid climates and lower altitudes.

3.4.4.c Methods of control

Increase health education of child bearing women and advise them to:

- Cook meat thoroughly and avoid uncooked meat.
- Wear gloves during gardening and wash hands thoroughly after work and before eating.
- Control stray cats.

3.4.4.d Management of the disease⁷¹

- Those without symptoms typically do not need treatment.
- Medications to treat the infection include an antimalarial drug and antibiotics. AIDS patients should continue treatment for as long as their immune system is weak to prevent the disease from reactivating.

⁷¹ "Toxoplasmosis." *A.D.A.M Medical Encyclopedia*. Updated: December 6, 2011.
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001661/>

3.4.5. Typhoid and Paratyphoid fever

ICD-10 A01.0: Typhoid Fever

ICD-10 A01.1-A01.4: Paratyphoid Fever

3.4.5.a Identification

A systemic bacterial disease with insidious onset of sustained fever, severe headache, malaise, anorexia, relative bradycardia, nonproductive cough in early stage of illness, rose spots on the trunk and constipation more often than diarrhea in adults. Intestinal hemorrhage or perforation can occur in 1% of cases. Case fatality rate is 10%-20% without antibiotic therapy and 1% with antibiotic use. Relapse may occur in 15%-20% of patients, but with milder form.

Paratyphoid fever presents a similar clinical picture, but tends to be milder, and the case-fatality rate is much lower.

Case classification:

- Suspected case: Any case having the following features: sustained, non-sweating fever of 38 °C or more, for 3 days or more, abdominal discomfort (abdominal pain, diarrhea or constipation). With 2 or more of the following symptoms: dry non-productive cough, relative bradycardia, anorexia, severe headache.
- Confirmed Case: A suspect or probable case with detection of *S. typhi* or *S. paratyphi* through positive culture of blood, stool, urine or bone marrow (laboratory investigation: culture of blood early in the disease; stool and urine after the first week; or bone marrow culture which provide the best bacteriologic confirmation (90%-95% recovery) even in patients who have already received antimicrobials. Because of its limited sensitivity and specificity, serologic tests (widal test) are generally of little diagnostic value.)
- Carrier: any person discharging bacilli in stool or urine for more than a year following infection.

Infectious agent

- For typhoid fever: *Salmonella typhi*
- For paratyphoid fever: *Salmonella paratyphi A*

Occurrence

Worldwide, mostly endemic in many developing countries, especially in the Middle East. It occurs throughout the year with seasonal increase in summer months.

3.4.5.b Reservoir

Humans, rarely domestic animals for paratyphoid.

Mode of transmission

Ingestion of food and water contaminated by feces and urine of patients and carriers.

Incubation period

Depends on inoculum size and host factors; from 3 days to over 60 days (range 8-14 days). For paratyphoid is 1-10 days.

Period of communicability

As long as bacilli appear in excreta, from first week throughout convalescence (1-2 weeks for paratyphoid).

Susceptibility and resistance

General and is increased in individuals with gastric achlorhydria and possibly in those who are HIV- positive. Relative specific immunity follows recovery from clinical disease, inapparent infection and active immunization. In endemic areas, typhoid fever is most common in preschool children and children ages 5-19 years old.

3.4.5.c Methods of control

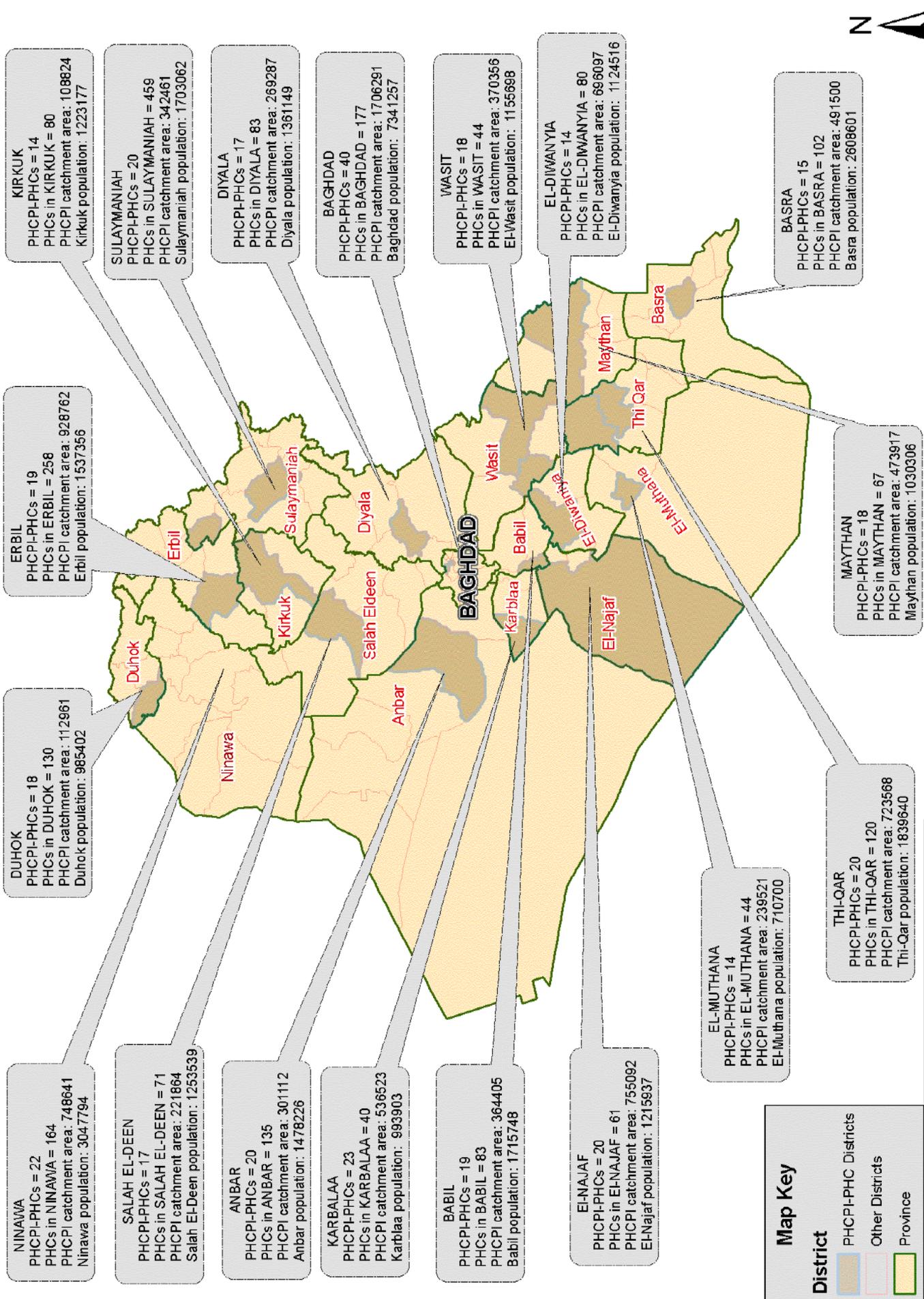
Preventive measures

- 1) Educate the community about the importance of hand washing.
- 2) Dispose human feces in a sanitary manner.
- 3) Protect, purify and chlorinate public water supply.
- 4) Control fly by screening, spraying with insecticides; control fly breeding by frequent collection and disposal of garbage.
- 5) Clean preparation and handling of food.
- 6) Pasteurize or boil all milk and dairy products.
- 7) Good personal hygiene of patient, convalescent and carriers.
- 8) Encourage breast-feeding throughout infancy; boil all milk and water used for infant feeding.
- 9) Periodic examination of the food handlers and exclusion of chronic carriers from work until three consecutive negative stool cultures are obtained (and urine at areas endemic with schistosomiasis) at least one month apart (for acute cases 24 hour apart).
- 10) Immunization of the high risk group.

Control measures

- 1) Suspected cases should be reported from all health care facilities to higher level. Confirmed cases should be investigated using case investigation form; enteric
- 2) precautions for acute cases and should be supervised until 3 consecutive negative cultures of feces (and urine in patients with schistosomiasis) at least 24 hours apart .

PHCPI-PHCs population mapped to IRAQ population



Map Key

District

- PHCPI-PHC Districts
- Other Districts
- Province

U.S. Agency for International Development
Primary Health Care Project In Iraq
<http://phciraq.org/>
www.usaid.gov