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Prevention and Control of Malaria in Pregnancy

Learner's Guide

Fourth Edition, 2021

Jhpiego is an international, nonprofit health organization affiliated with Johns Hopkins University. For more than 40 years, Jhpiego has empowered frontline health workers by designing and implementing effective, low-cost, hands-on solutions to strengthen the delivery of health care services for women and their families. By putting evidence-based health innovations into everyday practice, Jhpiego works to break down barriers to high-quality health care for the world's most vulnerable populations.

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Access to clinical and community maternal, neonatal and women's health services

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Abbreviations and Acronyms

ACT	artemisinin-based combination therapy
ANC	antenatal care
COVID-19	corona virus disease, the illness caused by SARS-CoV-2
EDD	estimated date of delivery
ANC	antenatal care
IPTp	intermittent preventive treatment of malaria in pregnancy
IRS	indoor residual spraying
ITN	insecticide-treated net
LLIN	long-lasting insecticide-treated net
LMP	last menstrual period
MIP	malaria in pregnancy
RDT	rapid diagnostic test
SP	sulfadoxine-pyrimethamine
WHO	World Health Organization

Introduction

Workshop Overview

This workshop will be conducted based on the assumption that people participate in training because they:

- Are interested in the topic.
- Wish to improve their knowledge or skills and thus their job performance.
- Want to be actively involved in workshop activities.

For this reason, the workshop materials focus on the learner. The facilitator and the learner use a similar set of learning materials. The facilitator works with learners as an expert on the workshop topic and guides the learning activities.

Learning Approaches

Mastery learning: By the end of the course, 100% of those trained will have mastered the desired competencies and be able to demonstrate the desired performance.

Adult learning principles:

- Training builds on the learner's abilities and is designed or revised to recognize the learner's experience and expertise.
- Training is designed and continuously revised to ensure that it is efficient, effective, and relevant.
- Training actively involves learners in setting their learning goals and assessing their progress.

Apprenticeship: Cognitive apprenticeship is a process that focuses on making complex skills easy for a learner to observe and learn. In the cognitive apprenticeship process:

- The mentor (or trainer) demonstrates steps and models behaviors for the apprentice (or learner).
- The mentor explains his or her decisions and thought processes while working.
- The apprentice (learner) practices alongside the mentor, getting continual mentoring and coaching.

Over time, as the apprentice (learner) becomes more competent, he or she performs more and more independently.

Humanism: The humanistic approach reduces learner stress and protects the safety and dignity of the learners and clients involved in the learning process. The approach involves practicing and mastering clinical services in simulation with anatomic models, if appropriate, before working with clients to reduce the risk of client harm or discomfort. Learners gain confidence by practicing in a safe environment.

Modular: A modular approach allows instructors and learners to focus on one topic at a time, build on their current knowledge, and move to the next course with more confidence and competence.
Workshop Syllabus

Workshop Description

The Prevention and Control of Malaria in Pregnancy workshop is intended for skilled providers, including midwives, nurses, clinical officers, medical assistants, etc., who provide antenatal care (ANC). The workshop provides learners with the knowledge and skills needed to prevent, recognize, and treat malaria in pregnancy (MIP) as they provide ANC services.

Since the goal is to deliver these services as part of routine ANC, this guide recommends ANC as the main platform for the integration of evidence-based care for pregnant women. The 2016 World Health Organization (WHO) recommendations on ANC state: "ANC provides a platform for important health care functions, including health promotion, screening and diagnosis, and disease prevention. It has been established that by implementing timely and appropriate evidence-based practices, ANC can save lives. Crucially, ANC also provides the opportunity to communicate with and support women, families and communities at a critical time in the course of a woman's life" (WHO 2016). The updated ANC recommendations support the WHO 2012 policy recommendation for intermittent preventive treatment of malaria in pregnancy with sulfadoxine-pyrimethamine (IPTp-SP) (WHO 2013b).

Workshops may include one or more days of guided clinical observation and practice. In such cases, the facilitator will provide information regarding that component separately.

Workshop Goals

- Prepare skilled providers to educate and counsel women about how to prevent MIP.
- Prepare skilled providers to administer appropriate IPTp-SP to pregnant women.
- Provide skilled providers with the knowledge necessary to recognize and treat uncomplicated malaria in pregnancy.
- Provide skilled providers with the knowledge necessary to recognize severe malaria in pregnant women, deliver a loading dose of the appropriate medication, and refer the women to a higher level of care.

Learning Objectives

By the end of this workshop, the learner will be able to:

1. Define ANC and list the main goals of ANC.
2. Discuss adaptations to ANC necessitated by the COVID-19 pandemic.
3. Discuss the timing of ANC contacts.
4. Describe the essential elements of a birth preparedness/complication readiness plan.
5. Describe health system factors to support recordkeeping for ANC.
6. Define malaria and describe its transmission.
7. Describe the effects of malaria globally and in his or her own country.
8. Compare the effects of malaria in areas of stable and unstable transmission.
9. List the effects of malaria on pregnant women and their babies.
10. Describe the effects of malaria on pregnant women living with HIV.

11. Discuss integration of MIP and prevention of mother-to-child transmission (PMTCT) services into ANC.
12. Describe the three-pronged approach to malaria prevention and control according to the WHO MIP strategy (WHO 2012b).
13. List the elements of counseling women about the use of insecticide-treated nets (ITNs)—more specifically, long-lasting insecticide-treated nets (LLINs)—for IPTp and other means of malaria prevention.
14. Describe the use of SP for IPTp, including dosage, timing, and contraindications.
15. Discuss indoor residual spraying (IRS) and other ways to prevent malaria.
16. Assist the pregnant woman to make a birth preparedness and complication readiness plan.
17. Explain why self-diagnosis/treatment may lead to treatment failure or recurring infection.
18. Describe the types of diagnostic tests available for malaria, including their advantages and disadvantages.
19. Identify causes of fever during pregnancy other than malaria.
20. List the signs and symptoms of uncomplicated and severe MIP.
21. Describe the treatment for uncomplicated and severe MIP.
22. Explain the steps to appropriately refer a pregnant woman who has severe malaria.
23. If the workshop includes a clinical component, practice conducting initial and follow-up ANC contacts; targeting prevention, diagnosis, and treatment of uncomplicated malaria; and diagnosis, stabilization, loading dose, and referral for severe malaria.

Training/Learning Methods

- Illustrated interactive presentations
- Large- and small-group discussions
- Case studies
- Role-plays
- Group activities

Learning Materials

The learning materials for this workshop include:

- **Reference manual** for learners and facilitators: Prevention and Control of Malaria in Pregnancy
- **Learner's guide** containing the course syllabus, schedule, knowledge assessments, case studies, role-plays, and checklists
- **Presentation graphics:**
  - Module One: Antenatal Care
  - Module Two: Transmission of Malaria
  - Module Three: Prevention of Malaria
  - Module Four: Diagnosis and Treatment of Malaria

Learner Selection Criteria

Workshop learners must be practicing health care providers or administrators of health care facilities that provide ANC services.

Workshop Duration

The workshop duration is 2 days. The optional clinical observation and practice may last for 1 or more days, depending on the needs of the learners and availability of the clinical facility/facilities.

Suggested Workshop Composition

- 20 learners
- One or two facilitators (up to four facilitators if a clinical component is included)

Sample Workshop Schedule

Prevention and Control of Malaria in Pregnancy Workshop		
Day 1	**Day 2**	**Days 3 and 4 (optional)**
AM (4 hours) • Welcome, introductions, norms, and learners' expectations • Workshop overview and objectives • Review of workshop materials • Preworkshop knowledge assessment • Identification of individual and group learning needs Tea Break **Module One: Antenatal Care** • Illustrated presentation, brainstorming, discussion • Role-play • Demonstration and skills practice, including recordkeeping (recordkeeping exercise)	AM (4 hours) • Review of agenda • Discussion: initial and follow-up antenatal care (ANC) contacts **Module Four: Diagnosis and Treatment of Malaria** • Illustrated presentation • Discussion • Brainstorming activity • Malaria treatment: • Illustrated presentation • Discussion • Case study Tea Break Malaria diagnosis and treatment: • Skills practice • Caring for a woman with uncomplicated malaria	AM (4 hours) Clinical observation and practice: • Preclinical meeting • Guided clinical activities and provision of ANC to clients
PM (3 hours) **Module Two: Malaria Transmission** • Illustrated presentation • Group discussion **Module Three: Malaria Prevention** ITNs: • Illustrated presentation • Group activity Tea Break IPTp-SP: • Illustrated presentation • Case study Birth preparedness and complication readiness: • Case study Review of day's activities	PM (3 hours) Referring a woman with severe malaria: • Illustrated presentation • Discussion • Clinical drill Implications for practice: • Discussion • Preparation of action plans • Postworkshop knowledge assessment • Workshop evaluation (if no clinical component) • Closing (if no clinical component)	PM (2 hours) Clinical conference: • Review experiences of each group • Recordkeeping and referral notes with client transfer (severe malaria) • Workshop evaluation • Closing

Prevention and Control of Malaria in Pregnancy Workshop		
Day 1	**Day 2**	**Days 3 and 4 (optional)**
Assignments: In reference manual review Table 2, Components of ANC contacts (for pregnant women in moderate- to high- transmission areas), and compare content of initial and follow-up ANC contacts. Review checklists for first and follow up ANC contacts.		

Learning Methods

Illustrated Interactive Presentations

Facilitators will use interactive presentations to provide information about specific topics. The content is based on, but not necessarily limited to, the information in *Prevention and Control of Malaria in Pregnancy* (the reference manual). Learners should read relevant sections of the reference manual (and other resource materials, if used) before each session.

During presentations, the facilitator will ask questions of learners and encourage learners to ask questions at any point. The facilitator will also stop at predetermined points to discuss issues and information of particular importance in the context of the learners' country and experience with MIP.

Case Studies

Case studies help learners practice clinical decision-making skills. For each case study, a key lists the expected responses. The facilitator will be thoroughly familiar with these responses before introducing the case studies. Though the key contains "likely" answers, other answers provided by learners during the discussion may be equally acceptable. The technical content of the case studies is taken from *Prevention and Control of Malaria in Pregnancy* (the reference manual).

Role-Plays

Role-plays help learners practice interpersonal communication skills. Each role-play requires the participation of two or three learners, with the other learners observing. Following completion of the role-play, the facilitator will questions to guide the discussion.

Skills Practice

This portion of the workshop focuses on observation and classroom practice of the skills needed to educate clients about malaria and recognize, treat, and refer clients with malaria.

The checklists contain the key steps or tasks required to perform a skill or activity in a standardized way. They outline the correct steps and the sequence in which they should be performed (for skill acquisition), and measure progress in small steps as the learner gains confidence and skill (skill competency). Once learners become confident in performing a skill during classroom practice, they can use the checklists to rate each other's performance.

If the workshop includes clinical observation and practice sessions with clients, learners are grouped in teams. One learner acts as the skilled provider and carries out the ANC visit, while the other learners observe and use the checklist to evaluate the provider's performance. During this phase, the facilitator is always present in the clinic and supervises at least one client encounter for each learner.

Clinical Drills

Clinical drills provide learners with opportunities to observe and take part in an emergency rapid response system. Frequent drills help to ensure that each member of the emergency team knows his or her role and is able to respond rapidly.

By the end of the workshop, learners should be able to conduct drills in their own facilities.

Preworkshop Knowledge Assessment

The objective of the preworkshop knowledge assessment is to assist the facilitator and the learners by determining what the learners, individually and as a group, know about malaria in pregnancy. The assessment helps the facilitator identify topics that need additional emphasis during the workshop. The individual results help the learners focus on their learning needs and alert them to the content that will be presented in the workshop.

The relevant learning objectives are noted for each statement on the assessment.

Instructions: In the space provided, print a capital T if the statement is true or a capital F if the statement is false.

	T or F	
Antenatal Care		
1. A minimum of eight antenatal contacts is advised for women who register for care in the first trimester of pregnancy.		Learning Objective 3
2. When providing health education, first address the woman's specific questions, problems, or concerns.		Learning Objective 4
3. Recognizing early signs of problems or disease is an essential part of antenatal care contacts.		Learning Objective 1
4. ANC services must consider adaptations to ensure the safety of providers and clients during the COVID-19 pandemic.		Learning Objective 2
Malaria Transmission		
5. Flies can transmit malaria by landing on food eaten by pregnant women.		Learning Objective 6
6. Malaria parasites can attack the placenta and interfere with its function, leading to poor growth of the fetus.		Learning Objective 9
7. Women in their first pregnancy are at higher risk of developing complications of malaria in pregnancy, compared to women who have had more than two babies.		Learning Objective 9
8. Pregnant women living with HIV have a higher risk of malaria infection than women who do not have HIV.		Learning Objective10
Malaria Prevention		
9. Insecticide-treated nets reduce the number of mosquitoes in the house, both inside and outside the net.		Learning Objective 13
10. Intermittent preventive treatment should be given to all eligible pregnant women, even if they have no symptoms of malaria.		Learning Objective 14
11. The first dose of intermittent preventive treatment with sulfadoxine-pyrimethamine can be given at the beginning of the second trimester of pregnancy.		Learning Objective 14
Malaria Diagnosis and Treatment		
12. Changes in behavior, such as drowsiness or confusion, could be symptoms of severe malaria.		Learning Objective 20
13. Pregnant women diagnosed with malaria should never be given artemisinin-based combination therapy.		Learning Objective 21

Brainstorming Activity for ANC

Time Needed: 5–10 minutes

Learners will name practices performed routinely in antenatal clinics and list them on a flip chart. The facilitator will ask learners to discuss each of these practices to determine its contribution to improved outcomes for the mother and her newborn. Learners will be encouraged to talk about how to eliminate unnecessary practices in their own settings to make more time for ANC and counseling about birth planning and malaria.

Role-Play for ANC

Purpose

The role-play provides an opportunity for learners to understand the importance of individual counseling and health education, using good interpersonal skills, and supporting/encouraging women to seek information.

Directions

Two learners will be selected to perform the roles of a skilled provider and an ANC client. Learners will have a few minutes to prepare for the activity by reading the background information provided below. The remaining learners, who will observe and discuss the role-play, also should read the background information.

Roles

Skilled provider: The provider is an experienced provider who has good interpersonal skills.

ANC client: Ngone, a 21-year-old woman, is pregnant for the first time. She is 28 weeks pregnant.

Situation

Ngone has come to the ANC clinic 5 days before her second antenatal appointment. She appears very anxious and explains that the midwife advised her to return if she had any concerns. She tells the provider that she has several questions about changes and discomforts in her body.

Ngone describes the symptoms of one or two common discomforts of pregnancy, such as constipation and low back pain. The provider takes a targeted history and performs a targeted physical exam to rule out conditions requiring care beyond the scope of basic ANC. The provider determines that Ngone has some common discomforts of pregnancy and gives her the information necessary to deal with her symptoms.

Checklist for Initial ANC Contact

(For use by the learner for practice and by the facilitator to assess competency)

Place a "✓" in case box if step/task is performed satisfactorily, an "**X**" if it is performed unsatisfactorily, or **N/O** if not observed.
Satisfactory: Performs the step or task according to the standard procedure or guidelines.
Unsatisfactory: Is unable to perform the step or task according to the standard procedure or guidelines.
Not Observed: Step or task not performed by participant during evaluation by trainer.

Learner_____ Date Observed _____

Checklist for First ANC Contact (Many of the following steps/tasks can be performed simultaneously.)					
Step/Task	**Cases**				
PREPARATION					
1. Prepare necessary equipment for antenatal care: weighing scale, blood pressure apparatus, stethoscope, thermometer, measuring tape, fetoscope, iron/folic acid tablets, tetanus toxoid/syringe, SP tablets, clean cup and drinking water, exam table/step stool, urine protein test, hemoglobin test, syphilis test, HIV rapid diagnostic test, malaria rapid diagnostic test, soap/water/towel, exam gloves, sharps box, bucket for used instruments, waste bucket, ANC record, and clinic card.					
2. Greet woman and companion of woman's choice (if she so desires) respectfully and with kindness, and offer them a seat. Tell her/them what you will do and answer her questions.					
3. Provide continual emotional support and reassurance.					
SKILL/ACTIVITY PERFORMED SATISFACTORILY					
HISTORY					
1. Do rapid initial assessment: Ask the woman how she is feeling and respond immediately to any urgent problems.					
2. Obtain the woman's personal information: name, age, address, and phone number.					
3. Ask her name, age, number of previous pregnancies and dates of deliveries, complications/outcomes, and number of living children.					
4. Ask about use of alcohol, tobacco, or unprescribed medications/traditional remedies.					
5. Ask if she is currently breastfeeding.					
6. Ask if she has allergies to any medications or food.					
7. Ask about her menstrual periods: how often they occur, whether they are regular, how long they last, and amount of flow.					
8. Ask about contraceptive history, including use of lactational amenorrhea method or other modern methods, and when the woman started and discontinued the methods.					

Checklist for First ANC Contact (Many of the following steps/tasks can be performed simultaneously.)					
Step/Task	**Cases**				
9. Ask the date of the **first day** of her last normal menstrual period (LMP) and about any bleeding since that time.					
10. Ask if she has had problems in this pregnancy, such as bleeding or cramping.					
11. Ask if she has had a pregnancy test in this pregnancy, the date, and the results.					
12. Ask if she has had an obstetric ultrasound scan in this pregnancy, the date, and the results.					
13. Ask if she has noted fetal movement (quickening) and, if so, the date it began.					
14. Calculate gestational age and estimated date of delivery (EDD). (Use a pregnancy wheel, or take the date of the **first day** of the LMP, subtract 3 months, and add 7 days; for example, first day of LMP is March 1, 2015; EDD = December 8, 2015). Correlate this information with findings from physical exam (and ultrasound scan, if applicable) to arrive at a final estimate of gestational age and EDD.					
15. Ask about tetanus immunization status.					
16. Ask about general health problems and whether she has been or is being treated for hypertension, heart disease, anemia, malaria, diabetes, HIV, tuberculosis, etc. Screen for TB (ask about persistent cough, fever, night sweats, blood-tinged sputum).					
17. Ask about use of SP in this pregnancy.					
18. Ask about use of a long-lasting insecticide-treated net (LLIN).					
19. Ask about gender -based violence or abuse and social support to deal with it.					
20. Ask about any other problems or concerns not covered already.					
21. Ask the woman what questions she has and provide clear answers.					
22. Record information on the ANC card and/or clinic record and client-held case notes, if applicable.					
SKILL/ACTIVITY PERFORMED SATISFACTORILY					
PHYSICAL EXAM					
1. Wash and dry hands.					
2. Ask the woman if she needs to empty her bladder and, if necessary, instruct her to save urine for testing for proteinuria.					
3. Take her vital signs if not already done (blood pressure and pulse; temperature if indicated).					
4. Assist her onto the exam table/bed.					
5. Observe her general appearance.					
6. Check conjunctiva and palms for pallor.					
7. Assess face and hands for edema.					

Checklist for First ANC Contact (Many of the following steps/tasks can be performed simultaneously.)						
Step/Task	**Cases**					
8. Check breasts and nipples for lesions.						
9. If uterus is at umbilicus or higher, listen for fetal heart with fetoscope.						
10. Examine abdomen and fundal height in relation to symphysis pubis and umbilicus (13–20 weeks); use abdominal palpitation or measure with measuring tape after 20 weeks.						
11. If the woman states that she is having problems, put exam gloves on both hands and examine external genitalia for bleeding, discharge, and lesions.						
12. Remove gloves by turning them inside out. Dispose of them in trash. Wash hands with soap and water, and dry them.						
13. Inform the woman of the results of the exam; record information on the ANC card and/or clinic record and the client-held case notes, if applicable.						
SKILL/ACTIVITY PERFORMED SATISFACTORILY						
SCREENING TESTS/TREATMENTS						
1. Wash and dry hands. Put on exam gloves.						
2. Counsel the woman on tests that will be done and answer any questions she has.						
3. Draw blood for screening tests: hemoglobin, syphilis, HIV, and malaria rapid diagnostic test, as appropriate.						
4. Dispose of syringe/needles/lancets in sharps box; label samples and ensure that they are taken to the appropriate place for processing.						
5. Remove gloves, and wash and dry hands.						
6. Provide first tetanus toxoid immunization, if indicated.						
7. If the woman is in the second trimester (13 weeks gestation or more), and if she has not had SP within the last month and is not on co-trimoxazole or taking >5 mg of folic acid, counsel her on need for SP and provide SP under directly observed therapy using a clean cup and drinking water. (Decontaminate cups after use and store in a clean place.)						
8. Provide an LLIN, and counsel the woman on the importance of using it every night and how to use it.						
9. If not done previously, if less than 24 weeks, and if available, obtain obstetric ultrasound scan.						
10. 10. Counsel her about the need for iron/folic acid and provide sufficient iron and folic acid tablets (30–60 mg elemental iron; 0.4 mg folic acid) to last until the next contact.						
11. Record the test results, immunization, and provision of SP, LLIN, and iron/folic acid on the ANC card/clinic record and the client-held case notes, if applicable.						
SKILL/ACTIVITY PERFORMED SATISFACTORILY						

Checklist for First ANC Contact (Many of the following steps/tasks can be performed simultaneously.)					
Step/Task	**Cases**				
FORMULATE PLAN OF CARE					
Based on the results of the woman's history, physical exam, and screening test, formulate a plan of care to address any problems or needs.					
Discuss the plan of care with the woman and answer any questions she has.					
SKILL/ACTIVITY PERFORMED SATISFACTORILY					
COUNSELING					
1. Counsel the woman on birth preparation/complication readiness, including danger signs and what to do if they occur.					
2. Counsel her on daily use of iron/folic acid tablets.					
3. Educate the woman about prevention of malaria infection (cause of malaria and its effects on mothers and babies, use of ITNs every night, benefits of IPTp-SP throughout the pregnancy, and signs of malaria and what to do if they occur).					
4. Counsel the woman on other issues relevant to the woman's plan of care and ensure that you have answered any questions she has. Include health education and health promotion on healthy eating, physical activity, and healthy timing and spacing of pregnancies.					
5. Set the date of the next ANC contact and ensure that the woman understands the importance of continued ANC, which includes SP at not less than monthly intervals.					
6. Thank the woman for coming to the antenatal clinic.					
SKILL/ACTIVITY PERFORMED SATISFACTORILY					

Checklist for Follow-Up ANC Contacts

Place a "✓" in the case box if the step/task is performed satisfactorily, an "**X**" if performed unsatisfactorily, or **N/O** if it is not observed.

Satisfactory: Performs the step or task according to the standard procedure or guidelines.

Unsatisfactory: Is unable to perform the step or task according to the standard procedures or guidelines.

Not Observed: Step or task not performed by learner during evaluation by facilitator.

Learner's name:_____ Date observed: _____

Checklist for Follow-Up ANC Contacts				
Step/Task	**Cases**			
GETTING READY				
1. Prepare the necessary equipment and supplies.				
2. Greet the woman respectfully and with kindness.				
3. Ask if she has experienced any danger signs or symptoms and address them immediately (vaginal bleeding, severe headache/blurred vision, fever, convulsions, persistent cough, fever, night sweats, blood-tinged sputum, etc.).				
4. Listen to the woman and respond attentively to her questions and concerns.				
5. Ask about any previous antenatal care during this pregnancy.				
STEP/TASK PERFORMED SATISFACTORILY				
HISTORY TAKING				
1. Ask the woman whether she has had any problems since her last contact and if she has received care from another provider.				
2. Ask whether her personal information or daily habits have changed and whether she has been unable to carry out any part of the plan of care.				
3. Inquire about nightly use of an insecticide-treated net (ITN).				
STEP/TASK PERFORMED SATISFACTORILY				
PHYSICAL EXAMINATION				
1. Wash hands thoroughly.				
2. Measure blood pressure and pulse. Measure temperature if necessary. Perform a focused head-to-toe examination.				
3. Inspect the abdomen.				
4. Palpate the abdomen and note uterine size, fetal heart rate, fetal movements, and fetal position (after 36 weeks).				
5. Perform an external genital examination, if indicated.				
STEP/TASK PERFORMED SATISFACTORILY				

Checklist for Follow-Up ANC Contacts				
Step/Task	**Cases**			
POSTEXAMINATION TASKS				
1. Dispose of waste materials in a leakproof container or plastic bag.				
2. Remove gloves and discard them in a leakproof container or plastic bag.				
3. Wash hands thoroughly.				
STEP/TASK PERFORMED SATISFACTORILY				
TESTING				
1. Conduct tests as indicated or needed. If tests for HIV and syphilis have not been performed, they should be done at this contact.				
STEP/TASK PERFORMED SATISFACTORILY				
COUNSELING AND HEALTH EDUCATION				
1. Discuss the woman's birth preparedness and complication readiness plan.				
2. Provide health education and health promotion counseling on healthy eating, physical activity, healthy timing and spacing of pregnancies, and preventing malaria infection.				
3. Provide appointment for next antenatal contact.				
STEP/TASK PERFORMED SATISFACTORILY				
PROVISION OF CARE				
1. If the woman is in the second trimester of pregnancy (13 weeks) or beyond, administer intermittent preventive treatment of malaria in pregnancy with sulfadoxine-pyrimethamine (IPTp-SP) by directly observed therapy, three tablets with clean cup and water. Ensure that it has been at least 1 month since her last dose. Do not administer SP if the woman is in the first trimester of pregnancy, but inform her when she should receive the first dose of IPTp-SP. Do not administer if she is taking co-trimoxazole prophylaxis and/or if she is taking > 5 mg of folic acid.				
2. If the woman has not received an ITN, provide one now or provide her with information about where to obtain one and how to use it.				
3. Give immunizations and other prophylaxis (e.g., tetanus toxoid, iron 30–60 mg/folic acid 0.4 mg, presumptive treatment for hookworm, iodine, etc., per country guidelines). If IPTp-SP is administered and only a high dose of folic acid (≥ 5 mg) is available, withhold folic acid for 2 weeks, or per country guidelines.				
4. Record all findings and medications prescribed/dispensed on the woman's ANC card and/or clinic card and client-held case notes, if applicable (IPTp-SP 1, IPTp-SP 2, etc.).				
STEP/TASK PERFORMED SATISFACTORILY				

Recordkeeping Exercise

This exercise may be used as a small- or large-group activity, or as an evening assignment to be discussed with the group the next day.

Small-group activity: Learners should read the case scenario individually and answer the questions as a group. Groups will share and discuss their answers.

Large-group activity: Learners should read the case scenario individually. Brainstorm and discuss their answers.

Evening assignment: Learners should read the case scenario and answer the questions. The next day, the facilitator will lead a group discussion about the answers.

Case Scenario

Jasmine is 21 years old and about 20 weeks pregnant. This is her second pregnancy. She has had one spontaneous abortion. Jasmine goes to the ANC clinic for the first time. She has not experienced any problems during this pregnancy.

Jasmine has never had any serious disease in the past. The first day of her last menstrual period was about 5 months ago. Her periods had been regular and lasted for about 4 days. Jasmine's body temperature is normal, her blood pressure is 120/80 mm Hg, and her pulse is 80 beats per minute. Jasmine's conjunctivas are slightly pale. She says that she has been bitten many times by mosquitoes.

The provider palpates her abdomen, finds her uterus at the level of the umbilicus, and hears the fetal heart at 140 beats per minute. Jasmine states that she feels the baby's movements. These findings confirm a gestational age of 20 weeks.

The provider completes Jasmine's physical examination by taking blood for hemoglobin, administering syphilis and HIV testing, and giving her the first dose of tetanus toxoid immunization and enough iron (30–60 mg) and folic acid (0.4 mg) tablets to last until her next contact. The provider will recommend an obstetric ultrasound scan (according to country policy and if it is available) to confirm gestational age and to identify multiple pregnancy and fetal anomalies. The provider also gives her three SP tablets for prevention of malaria. Jasmine swallows them with a cup of clean water as the provider observes. The provider tells Jasmine that she will receive IPTp-SP at each scheduled ANC contact, but not more often than monthly, up to the time she gives birth. To decrease the risk of getting malaria, the provider explains the possible complications that can arise with the mother and baby if the mother contracts malaria while pregnant. The provider emphasizes the need to use an ITN every night to avoid bites by malaria-carrying mosquito.

The provider informs Jasmine about her next ANC contact. Jasmine will go to her mother's home for 6 weeks. The provider and Jasmine agree that the next contact will be at about 26 weeks of pregnancy, or earlier if Jasmine experiences danger signs.

Questions

1. **Is it necessary for the provider to fill out information about Jasmine's contact in any register or individual record forms? Why or why not?**

   Yes, the provider should complete whatever individual records and registers are routinely used in the health facility and those carried by the woman. Information should include findings about the woman's medical history, results of her physical exam, and all medications and treatments given to the woman, such as tetanus toxoid injection, iron/folic acid tablets, and IPTp.
   Counseling provided about important topics such as MIP should be noted as well. This is the best way for all providers to ensure that women are receiving appropriate and complete care during their pregnancies.

2. **How would the provider benefit by maintaining information about Jasmine? How would Jasmine benefit? What is the benefit to the district health management team?**

   When the provider completes the record with the dates and results of Jasmine's medical history and physical exam, s/he will supply vital information for use by all the skilled providers who will take care of Jasmine for the entire antenatal period, as well as during childbirth and the postpartum period. This information will help to correctly determine when to give the next dose of tetanus toxoid and the next dose of IPTp-SP. This benefits Jasmine because she will receive the correct medications at the appropriate times, thus decreasing her risk of acquiring tetanus and malaria. The district health management team can perform audits of these records to make sure that providers are giving medications at the proper times in pregnancy and in the appropriate amounts. They can also ascertain that women are receiving important counseling about preventive measures, such as the use of ITNs, and thus be able to gather statistics on the number of pregnant women in their district who are benefiting from these interventions.

3. **Identify all of the information that the provider should record.**

   - The woman's medical history, past obstetrical history, date of the first day of her last menstrual period (in order to calculate gestational age), and whether the woman feels fetal movement
   - Information from the physical exam, especially blood pressure and the size of the uterus, to confirm gestational age
   - Counseling given to the mother about how to avoid MIP by taking IPTp-SP and using ITNs, and about birth preparedness and complication readiness
   - Medications and treatments given, such as tetanus toxoid, iron/folic acid, and IPTp-SP (There are two instances in which SP is **NOT** given: if the woman is receiving folic acid in doses ≥ 5 mg and if the woman is receiving co-trimoxazole prophylaxis.)
   - Tests performed, such as hemoglobin, syphilis, and HIV, with results
   - Identification of problems and treatment provided; documentation of any referrals made
   - Date of next ANC contact

Group Discussion about Malaria Transmission

Directions

Learners should read the question and list their responses individually. The facilitator asks learners to share their responses and leads the discussion.

Question

An 18-year-old woman who is 26 weeks pregnant with her first child has come to the clinic to register. She tells you that she heard on the radio that malaria can cause problems during pregnancy. In the space provided below, list at least four key issues you will discuss with this young woman about MIP and why.

Case Study 1: Conducting an ANC Contact

Directions

The learners will be divided into small groups. Learners should read and analyze this case study individually and then answer the case study questions as a group. The groups should then share their answers.

Case Study

Hawa is 24 years old. She is 16 weeks pregnant with her second child. Her last pregnancy was 2 years ago, and it was uneventful. She lives in a small town, about 5 kilometers from the maternity clinic. She is a part-time teacher at a nursery school that is 3 kilometers from her home. Her husband works 45 kilometers away and returns home late in the evening. Hawa arrives today for her first ANC contact with a complaint of slight dizziness. She has walked to the clinic.

Basic Assessment

1. What will you include in your initial assessment of Hawa and why?
2. What particular aspects of Hawa's physical examination will help you make an evaluation or identify her problems/needs, and why?
3. Which screening procedures/laboratory tests will you include (if available) in your assessment of Hawa and why?

Evaluation

You have completed your assessment of Hawa. Your findings include the following:

Hawa's temperature is 37 degrees C, her blood pressure is 110/72 mm Hg, and her pulse is 84 beats per minute. Her hemoglobin is 11 g/dL. She states that she left home this morning without eating breakfast so she would not be late to the clinic. She had slight nausea earlier in her pregnancy, but this has stopped. She explains that she eats irregular meals due to her work and the distances she must walk. Hawa has felt fetal movement (quickening) for the last several days.

Her physical examination is normal, and the size of her uterus corresponds to the gestational age based on last menstrual period.

4. Based on these findings, what is Hawa's diagnosis and why?

Care Provision

5. Based on your diagnosis, what is your plan of care for Hawa and why?

Follow-Up

Hawa returns for her second ANC visit at 20 weeks. She reports no danger signs, and she states that she is eating nutritious foods regularly throughout the day. She has had no further episodes of dizziness. She sleeps under an ITN every night. She and her husband have asked a neighbor with a car if they would be willing to take Hawa to the health center where she has chosen to have her baby. This same neighbor would be willing to take her to the district hospital if she has complications.

6. Based on these findings, what is your continuing plan of care for Hawa and why?

Case Study 2: Conducting an ANC Contact

Directions

The learners will be divided into small groups. Learners should read and analyze this case study individually and then answer the case study questions as a group. The groups should then share their answers.

Case Study

Thandi is 19 years old and has been married for a year. She arrives for her first contact at the ANC clinic because she suspects she is pregnant. Thandi's husband works in a distant city and is home only on weekends. His mother lives nearby and comes often to check on Thandi. Her mother-in-law has already advised her son and Thandi to have the traditional birth attendant, who lives very close, attend the birth.

Basic Assessment

1. What will you include in your initial assessment of Thandi and why?
2. What particular aspects of Thandi's physical examination will help you make an evaluation or identify her problems/needs, and why?
3. What screening procedures/laboratory tests will you include (if available) in your assessment of Thandi and why?

Evaluation

You have completed your assessment of Thandi, and your findings include the following:

Thandi's history and physical examination reveal no abnormalities. The size of the uterus is compatible with the date of her last menstrual period (14 weeks). Her rapid plasma reagin and HIV tests are negative, and her hemoglobin is 10.5 g/dL.

4. Based on these findings, what is Thandi's diagnosis and why?

Care Provision

5. Based on your diagnosis, what is your plan of care for Thandi and why?

Follow-Up

Thandi returns to the antenatal clinic at 20 weeks gestation, accompanied by her mother-in-law. She states that she feels well and feels the baby moving. She is taking her iron/folic acid tablets daily and trying to eat foods containing iron. The results of her history and physical examination are normal. She is given her second dose of IPTp-SP, three tablets with a clean cup and water, and is observed while taking it. She uses an ITN every night. She states that she and her mother-in-law have discussed the provider's suggestions about making a birth plan and using a skilled provider at the time of birth. Her mother-in-law would like to ask the provider some questions about these points.

6. Based on these findings, what is your continuing plan of care for Thandi and why.

Case Study 3: Treating a Client Who Has Malaria

Directions

The learners will be divided into small groups. Learners should read and analyze this case study individually and then answer the case study questions as a group. The groups should then share their answers.

Case Study

Aminah is 30 years old. She is approximately 24 weeks pregnant with her second baby. She comes to the antenatal clinic for the first time complaining of fever for the last 2 days. Aminah and her family moved to the area 6 months ago. She has never suffered from malaria.

Basic Assessment

1. What will you include in your initial assessment of Aminah and why?
2. What particular aspects of Aminah's physical examination will help you make an evaluation or identify her problems and needs, and why?
3. What screening procedures and laboratory tests will you include (if available) in your assessment of Aminah and why?

Evaluation

You have completed your assessment of Aminah, and your main findings include the following:

Aminah states that she has felt well during this pregnancy and began having fever yesterday morning. She states that she does not have other symptoms, such as visual changes, cough, difficulty urinating, abdominal pain, or leaking of fluid. She has not had convulsions or loss of consciousness. She has not taken any medication.

Aminah is fully conscious and able to walk. Her temperature is 38.7° degrees C, her blood pressure is 122/68 mm Hg, her pulse rate is 92 beats per minute, and her respiration rate is 18 breaths per minute. Aminah is pale, her mouth and tongue are dry, and her eyes are mildly sunken. Her fundal height is 23 cm (which is compatible with the date of her last menstrual period), and fetal heart tones are 140 beats per minute.

Her hemoglobin is 10.5 g/dL; the thick blood film test for malaria is positive. The tests for syphilis and HIV are negative.

4. Based on these findings, what is your diagnosis of Aminah and why?

Care Provision

5. Based on your evaluation, what is your plan of care for Aminah and why?

Checklist for Treatment of Uncomplicated Malaria and Referral for Severe Malaria

Place a "✓" in the case box if the step/task is performed satisfactorily, an "**X**" if it is performed unsatisfactorily, or **N/O** if it is not observed.

Satisfactory: Performs the step or task according to the standard procedure or guidelines. **Unsatisfactory:**

Is unable to perform the step or task according to the standard procedures or guidelines. **Not Observed:**

Step or task not performed by learner during evaluation by facilitator.

Learner's name:_____ Date observed: _____

Checklist for Treatment of Uncomplicated Malaria and Referral for Severe Malaria				
Step/Task	**Cases**			
GETTING READY				
1. Greet the woman respectfully and with kindness.				
2. Ask if she has experienced any danger signs or symptoms and address them immediately. Ask about her general well-being.				
STEP/TASK PERFORMED SATISFACTORILY				
DIAGNOSIS OF MALARIA				
1. Ask her if she has any complaints, such as fever or recent history of fever. Ask her if she has had symptoms of severe malaria, including impaired consciousness/coma, convulsions, prostration/generalized weakness, or respiratory difficulty.				
2. If she answers yes to any of the questions in #1, perform microscopy, if available, or a malaria rapid diagnostic test. If positive, confirm malaria disease.				
3. If no signs/symptoms of severe malaria are present, confirm uncomplicated malaria, perform physical exam as described below and treat per the case management job aid (see see Figure 11 in reference manual).				
4. If signs/symptoms of severe malaria are present, confirm severe malaria and treat per the case management job aid (see see Figure 11 in reference manual).				
5. Listen to the woman and her family, and respond to their concerns and questions.				
STEP/TASK PERFORMED SATISFACTORILY				
PHYSICAL EXAMINATION				
1. Wash your hands thoroughly.				
2. Note the woman's general appearance and measure her axillary temperature, blood pressure, pulse, and respiratory rate. Check her level of consciousness and check for pallor, dry mouth, jaundice, etc.				
3. If the woman is attending the routine antenatal clinic and is in stable condition (i.e., uncomplicated malaria is confirmed), provide treatment as necessary and complete other ANC tasks (see checklists for ANC).				
STEP/TASK PERFORMED SATISFACTORILY				
TREATMENT OF UNCOMPLICATED MALARIA				

Checklist for Treatment of Uncomplicated Malaria and Referral for Severe Malaria				
Step/Task	**Cases**			
If microscopy or rapid diagnostic tests are positive for malaria and the woman does not have any of the danger signs listed above that suggest severe malaria, diagnose uncomplicated malaria and treat according to the case management job aid (see see Figure 11 in reference manual).				
STEP/TASK PERFORMED SATISFACTORILY				
COUNSELING AND HEALTH EDUCATION FOR UNCOMPLICATED MALARIA				
1. Instruct her on how to take additional drugs that are prescribed: • If axillary temperature is ≥ 38 degrees C, give paracetamol 500 mg: two tablets every 6 hours until her temperature returns to normal.				
2. Educate her about malaria prevention and control, possible side effects of drugs, etc.				
3. Counsel her on ITN use and, if she does not have one, provide an ITN or voucher to purchase one.				
4. Advise her to come back to the facility within 48 hours or at any time if she feels worse.				
5. Record relevant information and medications given in the woman's ANC card and/or clinic card and client-held case notes, if applicable.				
STEP/TASK PERFORMED SATISFACTORILY				
REFERRAL FOR ALLERGIES TO ANTIMALARIALS				
1. If she is allergic to antimalarials, refer her immediately to a higher level of care for appropriate treatment.				
REFERRAL FOR SEVERE MALARIA				
2. If she has any of the danger signs listed under History and Physical Examination, and microscopy and/or rapid diagnostic test are positive, diagnose **severe malaria** and: • Explain the situation to the client and her family. • Give her prereferral treatment according to the case management job aid (see Figure 11 in reference manual) if she has not yet taken any medication.				
3. Refer immediately. • Write a referral note. • Record information on the woman's ANC card and/or clinic record and client-held case notes, if applicable.				
STEP/TASK PERFORMED SATISFACTORILY				

Group Activity for Malaria Diagnosis and Treatment

The purpose of this activity is to help learners become used to asking questions and looking for key physical signs when a pregnant woman presents with symptoms of malaria. The activity will also help them know how to give the correct medication and when to refer the woman.

Learners will be divided into four groups as follows:

- Group 1: History
- Group 2: Physical exam
- Group 3: Treatment
- Group 4: Referral

Groups 3 and 4 will receive additional information about the case on a card from the facilitator.

The facilitator will read the case description to the groups.

Each group will have 10 minutes to list the actions to be performed for their category of care. For example, Group 1 lists all relevant and important questions to ask a woman who may have malaria. Group 2 lists the necessary components of an examination for a woman who may have malaria. Group 3 lists treatment options based on the additional information provided to them. Group 4 lists diagnosis and management plans based on the additional information provided to them.

Each group will present their list to the larger group, which will suggest additional actions to complete the list, if necessary.

Clinical Drill for Severe Malaria

Clinical drills provide learners with opportunities to observe and take part in an emergency rapid response system. Ideally, unscheduled emergency drills should be included in the workshop. Frequent drills help ensure that all members of the emergency team know their role and are able to respond rapidly. By the end of the workshop, learners should be able to conduct drills in their own facilities.

Directions

The facilitator will write each role on a separate card (see below). Learners will be selected to play the roles. The selected learners will receive the cards the day before the simulation is scheduled so they have time to prepare.

At the time the simulation is scheduled, the facilitator rings a small bell. The learners should immediately assume their roles and demonstrate the actions needed to respond to the patient's condition.

At the end of the simulation, the facilitator and learners should discuss the simulation and identify any steps or tasks that could be done more effectively or rapidly.

Roles

Role 1: Thandiwe, the patient

Thandiwe is 32 weeks pregnant. She was treated for uncomplicated malaria 2 days ago and returns to the clinic complaining of symptoms that are getting worse. While the provider is obtaining her history, Thandiwe collapses and begins convulsing.

Role 2: Family member accompanying Thandiwe to the clinic

Role 3: Skilled provider

- Conducts rapid initial assessment, including blood pressure, pulse, respirations and temperature. Orders a malaria RDT and uring for protein testing.
- When exam and test results are given, diagnoses probable severe malaria.
- Directs health staff (see below).
- Gives diazepam to treat convulsions.
- Begins treatment according to case management job aid:
  - Parenteral artesunate 2.4 mg/kg IV bolus or IM as a loading dose, **or**
  - If artesunate is unavailable, intramuscular artemether is given, and if this is unavailable, then parenteral quinine is started immediately until artesunate is obtained.
- Writes referral note on flip chart (includes patient's name, age, gravida; para; and number of weeks pregnant; presenting symptoms; diagnosis; treatment provided; and facility to which patient is being referred).

Role 4: Health staff

- Takes vital signs frequently. Assures good positioning of woman to guard airway. Protects from harm if convulsing. Gives oxygen.
- Starts IV fluids.
- Escorts family members away from bed so health providers can manage care. Keeps patientand family informed of situation.
- Arranges transportation for referral.
- Replenishes supplies/medications on emergency tray after use.

Action Plan for Learners

Learner Name:_____ Country of Residence:_____ Name of Facility: _____

Workshop Attended:_____ Date: _____

Based on what you learned during this workshop, please write down three things that you would like to change at your facility over the next year to improve prevention and treatment of malaria during pregnancy using the platform of antenatal care.

Goal #1 _____

Goal #2 _____

Goal #3 _____

My Support Team Network:

Supervisor:_____ Trainer:_____ Coworker(s): _____

Challenges to Address: (Describe the barriers that must be eliminated or reduced and how this will be done.)

Goal #1 _____

Activities/Steps	Date Planned	Responsible Person	Resources	Date Completed
1.				
2.				
3.				

Goal #2 _____

Activities/Steps	Date Planned	Responsible Person	Resources	Date Completed
1.				
2.				
3.				

Goal #3 _____

Activities/Steps	Date Planned	Responsible Person	Resources	Date Completed
1.				
2.				
3.				

Postworkshop Knowledge Assessment

This knowledge assessment is designed to help the learners check their progress. By the end of the workshop, all learners are expected to achieve a score of 85% or better.

Read each question and circle the letter (a, b, or c) of the correct answer.

ANC

1. What is the best time for the first antenatal contact?
    a. When the woman has vaginal bleeding
    b. Before the sixth month of pregnancy
    c. As soon as the woman thinks she may be pregnant
2. Topics for antenatal health education and counseling should:
    a. Be the same at each ANC contact.
    b. Address the woman's individual needs and concerns.
    c. Include only what the provider thinks is important.
3. Early detection of complications and disease involves:
    a. Obtaining the woman's history, performing a targeted physical exam, and obtaining necessary tests
    b. Basing diagnoses on signs and symptoms alone
    c. Explaining that the patient may not be susceptible to malaria because of where she lives
4. In response to the COVID-19 pandemic, ANC providers should:
    a. Continue providing services as usual
    b. Ensure modifications to ANC to protect clients as well as providers
    c. Instruct women to stay away from all health care services while they are pregnant

Transmission of Malaria

5. Mosquitoes transmit malaria by:
    a. Laying eggs with mosquito parasites
    b. Biting people
    c. Contaminating food that people eat
6. Malaria parasites in the blood of a pregnant woman:
    a. Interfere with the transfer of nutrients (food) to the baby.
    b. Improve the blood flow to the placenta.
    c. Improve the flow of oxygen to the baby.

7. Among pregnant women, those at highest risk of malaria are:
    a. Women having their third pregnancy
    b. Women having their first pregnancy
    c. HIV-negative women

Prevention of Malaria

8. The benefit of an insecticide-treated net is that it:
    a. Reduces the number of mosquitoes in the house, both inside and outside the net.
    b. Can be used for catching fish.
    c. Will last for at least 10 years.
9. SP should not be given to pregnant women who are:
    a. Allergic to sulfa drugs
    b. Less than 24 weeks pregnant
    c. More than 36 weeks pregnant

Treatment of Malaria

10. The treatment of uncomplicated MIP should include:
    a. First-line treatment according to national guidelines
    b. SP
    c. Withholding iron supplementation
11. If a woman with severe malaria is referred for treatment, the provider should:
    a. Tell the family they should be at the referral facility by the next day.
    b. Give a loading dose of the appropriate medication prior to referral.
    c. Make sure the family knows what to tell the providers at the referral facility.

Prevention and Control of Malaria in Pregnancy
Workshop Evaluation

Please answer all questions by circling the letter that corresponds to your answer.

1. Please indicate your occupation:
    a. Nurse
    b. Midwife
    c. Obstetrician/doctor
    d. Other health care worker
    e. Administrator
2. Please indicate the extent to which this workshop met your expectations:
    a. Exceeded my expectations.
    b. Met my expectations.
    c. Did not meet my expectations.

    Please explain: _____

    _____

    _____

3. List the sessions(s) that you found most useful:

    _____

    _____

    _____

4. List the sessions(s) that you found least useful:

    _____

    _____

    _____

5. List other topics you would like to be included:

    _____

    _____

    _____

6. List two practices that you learned in this workshop that you will try to implement in your own clinical sites:

    _____

    _____

    _____

7. The workshop was (please circle one):
    a. Too long
    b. Too short
    c. The right length
8. Please rate the usefulness of the following learning tools by checking the appropriate box.

Learning Tools	Very Useful	Useful	Not Useful	Comments
Large-group discussions				
Small-group discussions				
Role-plays				
Case studies				
Clinical practice (if you went to a clinical site)				

9. Please rate the usefulness of the workshop materials by checking the appropriate box.

	Very Useful	Useful	Not Useful	Comments
Learner's guide				
Reference manual				
Learning guides and checklists				

10. The facilitators used a variety of training techniques, including demonstration, coaching, feedback, group discussion, and others. Which did you find the most useful?

_____

_____

_____

11. Were any of the training techniques useful or helpful? Which ones? Why?

_____

_____

_____

12. What suggestions do you have for improving the workshop? Please be specific.

_____

_____

_____

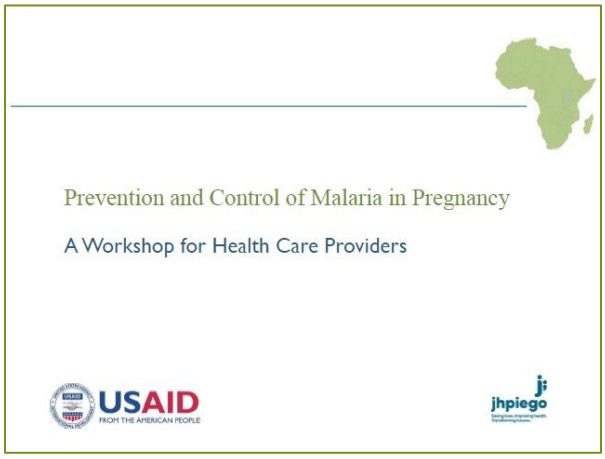
Malaria in Pregnancy Optional Clinical Observation and Practice

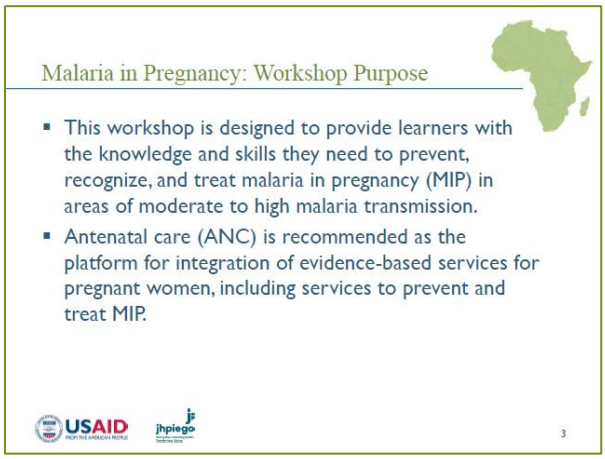
Record of ANC Clients Seen

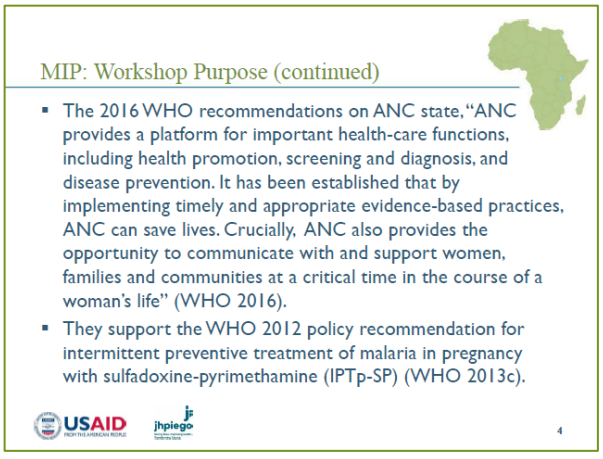
Each learner attending the optional clinical observation and practice portion of the Prevention and Control of Malaria in Pregnancy workshop should use this form to record the clients seen. A sample entry is provided as an example. Return the completed form to the facilitator at the end of the clinical sessions.

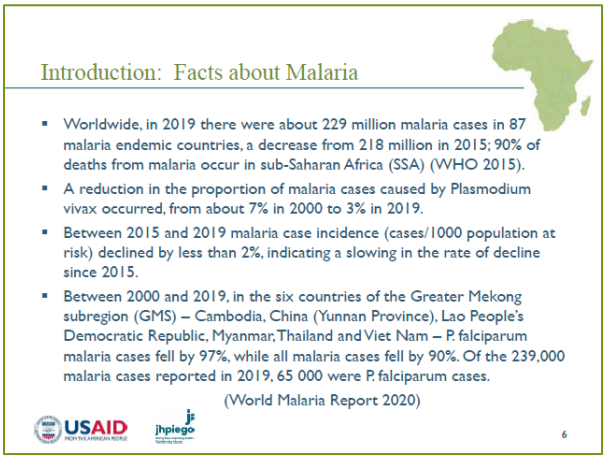
Date	Client Age	Duration of Pregnancy (in Weeks)	Type of Contact (and Consultation)	Comments	Signature of Facilitator
10/1/16	30	22	Antenatal • Malaria counseling • First dose of IPTp-SP	Client does not sleep under ITN. Was advised to get an ITN and use it throughout pregnancy and thereafter.	

Presentation Thumbnails









Prevention and Control of MIP

Module 1: ANC

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ANC: Module 1 Learning Objectives

- Define ANC and list the main goals of ANC.
- Describe WHO's three-pronged approach to MIP.
- Discuss the timing of ANC contacts.
- Discuss modifications to ANC necessitated by the COVID-19 pandemic.
- Describe the essential elements of a birth preparedness/complication readiness plan.
- Describe health system factors to support recordkeeping for ANC.

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Group Education in ANC Clinic in Ghana

Antenatal care: Ghana
Photo by: William Brieger/Jhpiego

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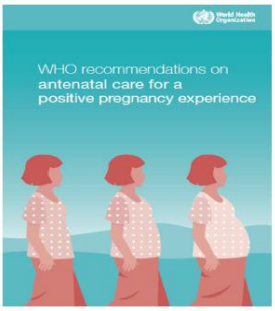
Improving the Experience of ANC: The 2016 WHO Recommendations



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Background: Revised WHO Recommendations for ANC

- The purpose of the 2016 WHO recommendations is to:
  - Place the woman at the center of care.
  - Promote innovative, evidence-based approaches to ANC.
  - Enhance the woman's experience of pregnancy and ensure that babies have the best possible start in life.
  - Align with the Sustainable Development Goals to expand care beyond survival, prioritizing person-centered health and well-being, not only the prevention of death and morbidity.

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Content of the 2016 WHO Recommendations for ANC

- Divided into five categories and contains 39 recommendations.
- Specific recommendations will be cited in this workshop as they pertain to routine ANC and prevention and treatment of MIP.

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Focused ANC versus Current WHO Recommendations

Until the release of the 2016 WHO recommendations for ANC, the most commonly used approach was focused ANC, which centered on a woman's needs but relied on fewer visits. The new recommendations call for a minimum of eight contacts during pregnancy to improve perinatal outcomes and maternal satisfaction.

Timing of ANC Contacts

- A minimum of eight ANC contacts is recommended to reduce perinatal mortality and improve women's experience of care.
- The word "visit" is replaced with "contact" to imply active engagement between the pregnant woman and her health care provider.

Box 5: Comparing ANC schedules

WHO FANC model	2016 WHO ANC model
First trimester	
Visit 1: 8–12 weeks	Contact 1: up to 12 weeks
Second trimester	
Visit 2: 24–26 weeks	Contact 2: 20 weeks Contact 3: 26 weeks
Third trimester	
Visit 3: 32 weeks	Contact 4: 30 weeks
Visit 4: 36–38 weeks	Contact 5: 34 weeks Contact 6: 36 weeks Contact 7: 38 weeks Contact 8: 40 weeks
Return for delivery at 41 weeks if not given birth.	

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Settings for ANC

"Contact" can be adapted to local contexts through community outreach programs and lay health worker involvement.

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Components of ANC

- The components of ANC include:
  - Risk identification
  - Prevention and management of pregnancy-related or concurrent diseases
  - Health education and health promotion

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Risk Identification

ANC promotes targeted assessment, during which the health care provider interviews, examines, and tests the woman to determine her risk of developing pregnancy-related complications and conditions that are common in the population being served.

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Prevention and Management of Pregnancy-Related or Concurrent Diseases

- The following antenatal complications are major causes of maternal and newborn mortality:
  - Hemorrhage
  - Fetal malposition/malpresentation
  - Pre-eclampsia/eclampsia
  - Sepsis/infection
  - Malaria
  - HIV/AIDS

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Prevention and Management of Pregnancy-Related or Concurrent Diseases (continued)

- Targeted assessment includes detection of signs and symptoms of pregnancy-related complications (such as placental abruption) and/or pre-existing diseases (such as diabetes). The health care provider also manages these complications or provides initial management and stabilization, including lifesaving measures as needed.
- Facilitating management or referral to a higher level of care is an important role of the ANC provider.

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Health Education and Health Promotion

- ANC promotes setting aside time during each contact to discuss important health issues.
- The health care provider should ensure that the woman and her family have the information they need to make healthy decisions during pregnancy, childbirth, and the postpartum/newborn period, and sufficient guidance in applying that information in their particular situation.

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Health Education and Health Promotion (continued)

- Important aspects to include in each ANC contact are:
  - Healthy eating
  - Care for common discomforts
  - Avoiding use of potentially harmful substances (alcohol and tobacco, and drugs not prescribed by the provider)
  - Handwashing and personal hygiene
  - Physical activity and rest
  - Sexual relations and safer sex
  - Early and exclusive breastfeeding
  - Family planning/healthy timing and spacing of pregnancies

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Health Education and Health Promotion (continued)

- Birth preparedness and complication readiness is an intervention included by WHO as an essential element of the ANC package (WHO 2015d). If a woman is well prepared for normal childbirth and possible complications, she is more likely to receive the timely care from a provider that is needed to protect her overall health, and possibly save her life and the life of her newborn.
- The birth plan helps to ensure that necessary preparations for normal childbirth are made well in advance of the estimated delivery date. Since every woman and her family must be prepared to respond appropriately in an emergency, the birth plan should also address complication readiness (see reference manual for details).

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Health Education and Health Promotion (continued)

- Major components of the birth plan include:
  - Choosing a health care provider to attend the birth
  - Place of birth
  - Transportation for normal birth and in case of emergencies/referrals
  - Funds for normal birth and complications/emergencies
  - Decision-making
  - Support during birth and at home after the birth
  - Identifying a blood donor
  - Items for a clean and safe birth
  - Signs of labor and danger signs

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Health Education and Health Promotion (continued)

- Danger signs in pregnancy
  - Vaginal bleeding
  - Difficulty breathing
  - Fever
  - Severe abdominal pain
  - Severe headache/blurred vision
  - Convulsions/loss of consciousness
  - Persistent cough, night sweats, blood-tinged sputum
  - Labor pains/loss of amniotic fluid before 37 weeks

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Health Promotion Messages Specific to MIP

In areas with a malaria risk, pregnant women and their families should receive the following health care, messages, and counseling:

- IPTp-SP (in areas of moderate to high transmission) works to protect against malaria and its complications. Women should be counseled about the importance of returning for continued ANC contacts.
- The 2012–2013 WHO recommendations for pregnant women, including the following:
  - As early as possible during the second trimester (13 weeks and after), give IPTp-SP, three tablets at one time (each tablet contains sulfadoxine 500 mg/pyrimethamine 25 mg), using directly observed therapy.
  - IPTp-SP should be given at each scheduled ANC contact, at least 1 month apart.
  - The last dose of IPTp-SP can be administered until the time of delivery without safety concerns.

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Health Promotion Messages Specific to MIP (continued)

- SP can be given on an empty stomach or with food.
- Folic acid at a daily dose equal to or above 5 mg should not be given with SP because it counteracts SP's efficacy as an antimalarial.
- A daily dose of iron and folic acid supplementation in pregnant women at the dose of 30–60 mg of elemental iron and 0.4 mg of folic acid is recommended. Combined, the two will help reduce the risk of low-birthweight infants, maternal anemia, and iron deficiency at term.
- SP should not be administered to women living with HIV who are receiving co-trimoxazole prophylaxis.

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Health Promotion Messages Specific to MIP (continued)

- Provide info on ITNs, such as:
  - Where to find them
  - How to use them effectively
  - How they work
  - Their benefits and safety for the pregnant woman and fetus in malaria risk areas
- ITNs should be provided to women as early in the pregnancy as possible. Ideally, all women should sleep under ITNs so they are protected even before they become pregnant.

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Health Promotion Messages Specific to MIP (continued)

- Women with suspected malaria must go immediately to a health facility, and compliance with the treatment regime must be ensured (see Appendix B for WHO/USAID/MCSP *Implementing Malaria in Pregnancy Programs in the Context of World Health Organization Recommendations on Antenatal Care for a Positive Pregnancy Experience*).
- Malaria prevention: What the woman and her family can do to minimize mosquito bites.

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Other Vital Components of ANC

- Prevention of tetanus and anemia:
  - Tetanus toxoid immunization
  - Daily oral iron and folic acid supplementation with 30–60 mg of elemental iron and 0.4 mg of folic acid
  - Preventive treatment for hookworm infection in endemic areas, after the first trimester

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Other Vital Components of ANC (continued)

- Prevention of mother-to-child transmission of HIV (PMTCT):
  - In high-prevalence settings (less than 5% HIV prevalence in the population that is being tested), provider-initiated testing and counseling for HIV should be done routinely in all ANC settings.
  - In low-prevalence settings, provider-initiated testing and counseling can be considered for pregnant women in ANC settings as a key component in the effort to eliminate mother-to-child transmission of HIV.
  - Integrate HIV testing with syphilis, as relevant to the setting.
  - Strengthen the underlying maternal and child health systems.

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Other Vital Components of ANC (continued)

- Many men are uncertain about how they can contribute to a healthy outcome for their partners and their babies. Depending on the woman's preference and cultural norms, a man can be encouraged to:
  - Support and encourage the woman throughout pregnancy.
  - Ensure adequate rest and healthy eating.
  - Provide financial support for normal birth, complications, and care of the newborn.
  - Help the woman make a birth and complication readiness plan.

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Other Vital Components of ANC (continued)

- Encourage the woman to attend the antenatal clinic as early as possible in pregnancy and then as recommended thereafter.
- Encourage the woman to take her SP under provider supervision.
- Make sure the woman has an ITN and sleeps under it every night before, during, and after pregnancy.
- Use condoms consistently and correctly to prevent sexually transmitted infections/HIV.
- Accompany his partner to the health facility and during childbirth.

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Scheduling and Timing of Antenatal Contacts

- Appropriate scheduling depends on the woman's gestational age and individual needs. For women whose pregnancies are progressing normally, WHO now recommends a minimum of eight ANC contacts (WHO 2016c).

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Scheduling and Timing of Antenatal Contacts (continued)

- These contacts may take place at or around the times listed:
  - **First contact:** Ideally, this contact should take place in the first trimester (by 12 weeks).
  - **Second and third contacts:** Two contacts should take place in the second trimester, ideally at 20 and 26 weeks.
  - **Fourth through eighth contacts:** These should take place at about 30, 34, 36, 38, and 40 weeks.
- If the woman has not given birth by 41 weeks, she should be referred for delivery.

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Scheduling and Timing of Antenatal Contacts (continued)

- WHO recommends that, in areas of moderate to high malaria transmission in Africa, IPTp-SP should be given to all pregnant women at each scheduled ANC contact, starting as early as possible in the second trimester, provided that the doses of SP are given at least 1 month apart.
- WHO recommends a package of interventions for preventing MIP, which includes promotion of ITNs and IPTp-SP. To ensure that pregnant women in endemic areas start SP as early as possible in the second trimester, policymakers should ensure health system contact with women at 13 weeks gestation.

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Nigerian Federal Ministry of Health Poster

Example of one country's plan:

- Three ways to prevent malaria during pregnancy:
  1. ITNs
  2. IPTp-SP
  3. Case management, for women with malaria symptoms

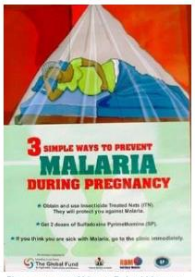

Photo courtesy of Nigeria Federal Ministry of Health

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Scheduling and Timing of Antenatal Contacts (continued)

- Please see the reference manual, Table 1. 2016 ANC contact schedule with timelines for implementation of malaria in pregnancy interventions for thorough review of the eight recommended ANC contacts and MIP-related interventions.

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Scheduling and Timing of Antenatal Contacts (continued)

- The period between 13 and 20 weeks is a critical period for irreversible negative consequences of MIP, when parasite densities are highest and major benefit can be achieved from malaria prevention.
- For effective MIP programming, a contact with the provider early during the second trimester (between 13 and 16 weeks) is critical to ensuring timely access to the first dose of IPTp-SP for maximal impact.
- While the practice in many countries is to give the first dose of IPTp-SP at quickening (woman's first awareness of fetal movement), this can leave the pregnant woman and fetus unprotected for several weeks, depending on variations in women's perception of quickening (WHO 2017).

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Scheduling and Timing of Antenatal Contacts (continued)

- A *Toolkit to Improve Early and Sustained Intermittent Preventive Treatment in Pregnancy (IPTp) Uptake* has been developed to assist providers in assessing gestational age in the second trimester (USAID and MCSP 2017).
- An important component of the toolkit is the job aid, Prevention of Malaria during Pregnancy: Administer IPTp-SP Starting at 13 Weeks, which can be found in Appendix B of the reference manual.

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Scheduling and Timing of Antenatal Contacts (continued)

- Also see the reference manual, Table 2. Components of antenatal care contacts (for pregnant women in moderate- to high-transmission areas), for a full description of ANC interventions by trimester and ANC contact.

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ANC in the context of the COVID-19 pandemic

- The impact of SARS-CoV-2, the new strain of coronavirus responsible for COVID-19, has led to the disruption of provision of health care services globally, resulting in an increase in the number of deaths from non-COVID-19 causes
- Equitable access to health services is threatened as clients fear use of or are barred from routine health services, and human resources and commodities are redirected to care for those affected with COVID-19 (WHO 2020d).
- In a multinational study of pregnant women in 18 countries, women with COVID-19 were at increased risk of morbidity and mortality, including preterm birth; newborns of women with COVID-19 had significantly higher severe morbidity and mortality compared with newborns of women without COVID-19 diagnosis (Villar 2021). Thus, care during pregnancy, labor, birth and the postpartum period must remain a priority of the health system.

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ANC in the context of the COVID-19 pandemic: important considerations

- Women have concerns about the safety of care in health facilities, including exposure to COVID-19. It is therefore vital to adapt ANC services to continue to serve and protect providers and clients. (WHO 2020b, TIPTOP 2020, RBM 2020a).
- Important considerations include:
  - Distancing of two meters
  - Infection prevention and control: hand hygiene; appropriate use of personal protective equipment (PPE), including cloth face coverings for clients, and gloves, masks, face shields, and gowns for providers, depending on the service provided
  - Surface and environmental cleaning and disinfection

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ANC in the context of the COVID-19 pandemic: important considerations (continued)

- Establish effective patient flow (screening, triage, and targeted referral) at all levels
  - Reorganize to include a screening area at the facility entrance and use standard operating procedures to isolate staff and clients with suspected or confirmed COVID-19.
  - Develop a system to direct clients with danger signs (obstetric and/or COVID-related) to appropriate services for management.
  - Develop a patient flow system that minimizes contact between clients.
  - Consider use of a booking system for appointments (clinical consultation, medication pickup, and laboratory work) to help minimize crowding and wait times.

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ANC in the context of the COVID-19 pandemic: offsite triage

- Offsite triage
  - Consider triage via phone if clients have access to one and are willing to communicate with health care providers in this manner. To support triage by phone, a specific format should be developed and followed for each call. During each call, the provider should ask about and provide counseling on: danger signs, nutrition, rest, hygiene, birth preparedness/complication readiness, ITN use, presence of depression or anxiety.

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ANC in the context of the COVID-19 pandemic: onsite screening and triage

- Onsite screening and triage:
  - Ensure hand hygiene at facility entrances (i.e., handwashing stations and/or alcohol-based hand rub) for all clients. Ask clients to wear cloth face coverings. Healthcare workers should wear face masks and perform hand hygiene after each client encounter.
  - Identify clients with respiratory symptoms and/or respiratory distress and isolate them while immediately directing them to the appropriate service for clinical evaluation, and follow up with/refer and manage as needed.

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ANC in the context of the COVID-19 pandemic: onsite screening and triage (continued)

- Perform temperature checks for clients and their companions at the facility entrance, isolating anyone with a temperature ≥38° C; assess clinical symptoms (especially respiratory distress), and/or contact with persons with suspected or confirmed COVID-19 using a simple checklist. Clients with suspected or confirmed COVID-19 should be isolated immediately. Note that because at least 30% of clients with COVID-19 do not have symptoms, use of masks and social distancing is imperative.
- In areas of malaria transmission, all clients with fevers should be screened for malaria using rapid diagnostic tests (RDTs), and clients with malaria should receive prompt case management. Clients may be infected with both COVID-19 and malaria, but until the diagnoses are established, providers should minimize exposure of clients diagnosed with malaria to COVID-19.

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ANC in the context of the COVID-19 pandemic: onsite screening and triage; considerations specific to ANC services

- Provide a comfortable, well-ventilated waiting area, ideally a separate waiting area for potentially ill clients, or at least an area where distancing can be ensured.
- Minimize involvement of nonclinical staff in triage, and provide training for them on COVID-19 triage, screening, standard precautious, and PPE, with direct communication and support to clinical backstop.
- Considerations specific to ANC services:
  - Deliver ANC according to national guidelines to the extent possible, making modifications as needed to protect clients and encourage ANC attendance.

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ANC in the context of the COVID-19 pandemic: considerations specific to ANC services (continued)

- Where comprehensive facility-based services are disrupted, prioritize ANC contacts for low-risk pregnant women during the third trimester and for all pregnant women who are assessed as high risk, including women with comorbidities, women who are underweight or overweight, adolescent girls, women at risk of common maternal mental health conditions, and other vulnerable groups.
- Ensure that women adapt birth preparedness and complication readiness plans to consider changes to services, and that they are aware of danger signs signaling immediate need to contact a health provider: bleeding, respiratory difficulties, high fever, severe headache, etc.

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ANC in the context of the COVID-19 pandemic: considerations specific to ANC services (continued)

- Discontinue group counseling and group ANC sessions until related restrictions are lifted or until appropriate PPE and distancing measures can be ensured. Prioritize ANC counseling messages to shorten sessions.
- During individual counseling, maintain a 1- to 2-meter distance between the health care worker and client (in the client's home, community, or facility), and maintain this distance between clients in waiting areas and queues.
- Where possible, use a simple booking system for appointments, or increase frequency of ANC sessions, to decrease client volume per ANC session.

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ANC in the context of the COVID-19 pandemic: considerations specific to ANC services (continued)

- Discuss the most common symptoms of COVID-19 infection (fever, fatigue, cough, and shortness of breath) with clients. Other symptoms may include loss of appetite, malaise, muscle pain, sore throat, nasal congestion, headache, diarrhea, nausea, and vomiting. Some people may not have signs or symptoms of COVID-19 infection, but can still pass the infection to others.
- Counsel pregnant women to maintain a distance of 2 meters from everyone (except intimate household members without symptoms) or per national guidance. Encourage use of face coverings at all times outside the home (WHO 2021).

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ANC in the context of the COVID-19 pandemic: considerations specific to ANC services (continued)

- Perform physical exams respectfully and quickly to minimize close contact to the extent possible, using appropriate PPE.
- Offer ITNs at the first contact, along with 2–3 months of recommended micronutrient supplements.
- Communicate specific dates for return to ANC to receive IPTp-SP by directly observed therapy monthly, if possible.
- Ensure supplies of clean drinking water and cups, or ask clients to bring their own water and cups.
- Ensure targeted outreach strategies are implemented where coverage and care seeking have declined.

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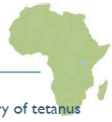
ANC in the context of the COVID-19 pandemic: considerations specific to ANC services (continued)



- Plan for catch-up of missed ANC contacts, including delivery of tetanus toxoid vaccines and HIV and syphilis testing. Establish mechanisms for ensuring continued early delivery of missed contacts or content.
- Consider relocating ANC from hospital environments to the community and where possible, recommend a route to the ANC clinic that bypasses other areas of the facility that may expose the client to COVID-19.
- Provide a "one-stop" contact, that is, combine services such as tests and medication administration at the same contact to reduce the number of visits women must make to the facility.
- Follow country guidelines on vaccination of pregnant and breastfeeding women against COVID-19.

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Recordkeeping for Antenatal Contacts and Malaria Prevention Activities

The following are necessary:

- Adequate monitoring of the woman's condition
- Continuity of care
- Effective communication among health care providers and among health care sites (if referred)

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Recordkeeping Responsibilities

- Health facility:
  - Establishes and maintains a record for every woman and newborn who receives care.
- Provider:
  - Gathers information, records it, refers to it, and updates it at the time of each contact.
  - Ensures that information is accurate and clearly written.
- Woman:
  - Should be encouraged to keep her ANC card or booklet in a safe place. She should bring it to every contact and to the facility for labor and birth.

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Recordkeeping Procedure

Record **all** information on the ANC card and clinic card:

- First ANC contact:
  - History
  - Physical examination
  - Testing/screening as appropriate (e.g., malaria, HIV, TB)
  - Provision of care, including IPTp, tetanus toxoid, and iron/folate
  - Discussion of health messages, including birth plan, malaria prevention (use of ITNs), and danger signs
  - Date of next ANC contact

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Recordkeeping Procedure (continued)

- Subsequent ANC contacts:
  - Interim history
  - Targeted physical examination, testing
  - Provision of care, including IPTp-SP, if appropriate
  - Discussion of health messages (including review/revision of birth plan)
  - Counseling/testing for HIV, if not done previously or if woman requests it
  - Date set for next ANC contact

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Maintaining antenatal care records in Nigeria

Photo by: William Brieger/Jhpiego

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Respectful Maternity Care

- One of the major reasons that women do not attend ANC or give birth in facilities is the perceived lack of respectful treatment by providers. The White Ribbon Alliance worked with global organizations to formulate the *Respectful Maternity Care: Universal Rights of Childbearing Women* (2011) charter, which includes:
  - Freedom from harm
  - Right to information, informed consent and refusal, and respect for choices and preferences, including companionship during maternity care
  - Confidentiality and privacy

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Respectful Maternity Care (continued)

- Dignity, respect
- Equality, freedom from discrimination, and equitable care
- Right to timely health care and to the highest attainable level of health
- Liberty, autonomy, self-determination, and freedom from coercion

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Respectful Maternity Care (continued)

- Respectful maternity care considers the woman to be an active participant in her health, with rights and values that must be respected. It applies to assistance by a provider throughout the continuum of care, from ANC to labor, birth, and postnatal care.
- It includes the recognition of women's preferences and needs. Active steps must be taken to ensure and monitor for respectful maternity care, prevent disrespect and abuse, and take action to address them if they occur, ideally through facility-based quality improvement approaches.
- For further information on quality improvement, please refer to the WHO's *Standards for Improving Quality of Maternal and Newborn Care in Health Facilities.*

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Respectful Maternity Care (continued)

- Part of respectful maternity care is the use of positive interpersonal communication skills during every encounter with clients, including:
  - Ensuring auditory and visual privacy during the ANC contact
  - Speaking in a quiet, gentle tone of voice, using easily understood terms and language
  - Listening to the woman/family and responding appropriately (active listening)
  - Encouraging them to ask questions and express concerns

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Respectful Maternity Care (continued)

- Allowing them to demonstrate understanding of information provided
- Observing for unusual signs
- Explaining all procedures/actions and obtaining permission before proceeding
- Showing respect for cultural beliefs and social norms
- Being empathetic and nonjudgmental
- Avoiding distractions while conducting the contact
- Thanking the client and reminding her when to come again

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Respectful Maternity Care (continued)

Remember:

- Respectful care is a lifesaving skill.
- The treatment of and care for each client should result in her choosing to return to your facility for care whenever needed.

Pregnant woman riding on bicycle to antenatal care contact.
Photo by: Peter Chisambiro

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Prevention and Control of Malaria in Pregnancy

Module 2: Malaria Transmission

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Malaria Transmission: Module 2 Objectives

- Define malaria and how it is transmitted.
- Describe the extent of malaria in Africa in general and in your own country.
- Compare the effects of malaria in areas of stable and unstable transmission.
- List the effects of malaria on pregnant women, their unborn babies, and the community.
- Describe the effects of malaria on pregnant women living with HIV/AIDS.
- Discuss integration of MIP and PMTCT services into ANC.

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Malaria Transmission: Background

Caused by *Plasmodium* parasites:

- *Plasmodium falciparum:*
  - These are the most common type in much of Africa.
  - Causes the most severe disease.
- *Plasmodium vivax*
- *Plasmodium ovale*
- *Plasmodium malariae*
- *Plasmodium knowlesi* (occurs naturally in monkeys in Southeast Asia but is now known to cause disease in humans)

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Malaria Transmission: Background (continued)

- Malaria is spread by female *Anopheles* mosquitoes infected with parasites.
- *Anopheles* mosquitoes are usually active at night.
- Malaria parasites reproduce in human blood.
- A mosquito bites an infected person, is infected with parasites, and then goes on to bite and infect another person.

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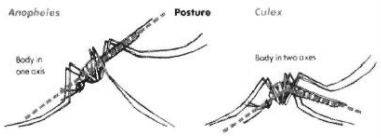
Anopheles Mosquito

Anopheles mosquitoes differ from other mosquitoes in the way their body is positioned. The body of the *Anopheles* mosquito points up in the air in one line, but the body of other mosquitoes is bent, and the rear end points down.



Source: WHO 2004C.

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Factors Affecting Transmission

- Breeding sites
- Type of vector
- Parasites
- Climate
- Population

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Breeding Sites

- Stagnant or slow-flowing bodies of water:
  - Small ponds, ditches, pits, and canals
  - Swamps, reservoirs, and rice fields
  - Pools of water after rain
  - Uncovered water tanks
  - Streams with slow-flowing water along banks
  - Water-filled animal hoof prints
  - Objects that collect water: empty tins, containers
  - Holes in tree trunks

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Types of Vector

- The principal vector is the *Anopheles* mosquito.
- Different *Anopheles* species exist in different parts of the world.
- Some *Anopheles* species are more efficient in transmitting malaria than others.

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Parasites and Climate

- Enough parasites must exist in the human population to infect the mosquito.
- The environmental temperature must average at least 18–20°C and humidity must stay above 60% for the mosquito to survive and the parasite to develop.
- The warmer the weather, the faster the development of the parasite.

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Population

- In Africa, *Anopheles* mosquitoes do not fly farther than about 1–2 km from their breeding sites unless they are aided by wind.
- People must be near or within a short distance of these breeding sites to be bitten by the infected mosquito.

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Populations Most Affected by Malaria

- Pregnant women:
  - Are more likely than nonpregnant women to become infected and develop signs and symptoms.
  - Women in first or second pregnancies are more at risk.
- Children under 5 years of age:
  - About 90% of malaria deaths occur in Africa, and the majority are among children under 5 years old (WHO 2014b).
- Unborn babies
- Immigrants from low-transmission areas
- HIV-infected people

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Transmission Levels: Stable Transmission Areas

- Stable transmission areas are places where populations are continuously exposed to a fairly constant rate of malaria infection.
- Immunity develops during childhood.
- Adolescents and adults are partially immune, although they may have a few parasites in their blood.
- Immunity is reduced in pregnancy and can be lost if someone moves out of the high-transmission area for a long time.
- Pregnant women and children in areas of stable transmission have the highest risk of becoming ill from malaria.

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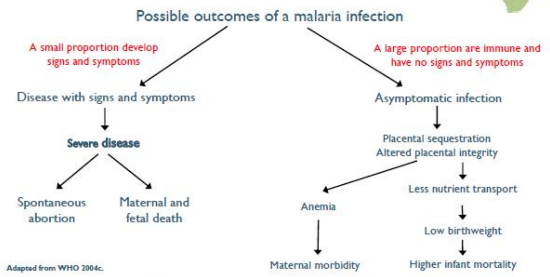
Stable Transmission



Adapted from WHO 2004c.

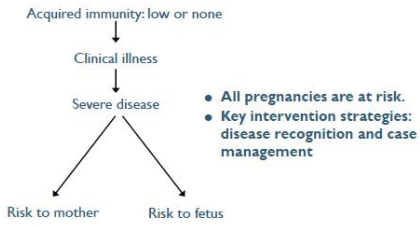
Transmission Levels: Unstable Transmission Areas

- Population is not exposed to malaria very often.
- Malaria is sometimes seasonal (e.g., rainy season).
- Population develops little or no immunity.
- Children and adults, including pregnant and nonpregnant women, are all equally susceptible to malaria.

Transmission Levels: Unstable Transmission Areas (continued)

- MIP can be very serious, and complications may occur in a short time.
- Pregnant women usually present with fever, clinical signs or symptoms, and sometimes severe malaria, which is life threatening.
- Common outcomes of malaria infection in unstable areas include:
  - Abortion
  - Stillbirth
  - Low birthweight

Unstable Transmission



- **All pregnancies are at risk.**
- **Key intervention strategies: disease recognition and case management**

Source: WHO 2004.

Transmission Levels: Mixed Transmission Areas

- Different levels of transmission can occur within a country or region.
- Within a malarious region (such as southern Africa), there can also be malaria-free areas.
- Factors affecting transmission include temperature, humidity, and altitude.
  - The life span of the mosquito is increased with high humidity, while cold weather (below 16°C) slows the development of the malaria parasite.

Effects of Malaria on Pregnant Women

- All pregnant women in malaria-endemic areas are at risk.
- The placenta becomes susceptible to malaria infection at the end of the first trimester (Walker et al. 2014).
- Parasites attack and destroy red blood cells.
- Malaria causes up to 25% of anemia in pregnancy (Schantz-Dunn and Nour 2009).
- Malaria can cause severe anemia.
- In Africa, malaria-related anemia causes up to 10,000 maternal deaths per year (ALMA 2009).

Effects of Malaria on Pregnant Women (continued)

- Approximately 11% of newborn deaths in malaria-endemic African countries are due to low birthweight resulting from *P. falciparum* infections during pregnancy.
- Effects range from mild to severe, depending on the level of malaria transmission in a particular setting and the pregnant woman's level of immunity.
- The level of immunity depends on several factors:
  - Intensity of malaria transmission
  - Number of previous pregnancies
  - Presence of other conditions, such as HIV, which can lower a woman's immune response during pregnancy

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Co-Infections: HIV/AIDS during Pregnancy

- Reduces a woman's resistance to malaria.
- Causes malaria treatment to be less effective.
- Increases:
  - Risk of malaria-related problems in pregnancy
  - Likelihood of developing clinical malaria and death
  - Risk of intrauterine growth restriction
  - Risk of preterm birth
  - Risk of maternal anemia

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Co-Infections: HIV/AIDS during Pregnancy (continued)

- Pregnant women who are co-infected with HIV/AIDS and malaria are at a very high risk for anemia and malaria infection of the placenta.
- Their newborns are therefore more likely to have low birthweight and die during infancy.

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Integration of MIP and PMTCT Services into ANC

- Collaboration between reproductive health programs and HIV/AIDS and malaria control programs is essential so that prevention and treatment of malaria and HIV/AIDS occur at every ANC contact.
- Appropriate diagnostic tools for diseases and for antiretrovirals and antimalarial medications should be available at all levels of the health care system.
- Additional research on interactions between antiretroviral and antimalarial drugs is urgently needed.

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Integrating Malaria and HIV Services: WHO Recommendations

- Protection by ITNs is a high priority.
  - Ensure that HIV-infected women who are also at risk for malaria receive IPTp-SP as early as possible in the second trimester, if they are not already taking co-trimoxazole prophylaxis.
- **Do not** give SP to clients on daily co-trimoxazole.
  - In adults living with HIV/AIDS, daily prophylaxis with co-trimoxazole has shown promise in preventing some infections, including malaria (Anglar et al. 1999; Suthar et al. 2012). Some programs are already using this approach.

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Integrating Malaria and HIV Services: WHO Recommendations (continued)

- Reproductive health programs should collaborate with HIV/AIDS *and* malaria control programs to ensure an integrated service delivery plan.
  - Must ensure harmonization of national policies, guidelines, and training materials to avoid provider confusion and support coordinated implementation of services.
- Counsel and give care directed at preventing and treating HIV/AIDS *and* malaria.
- Appropriate diagnostic tools for both diseases, and antiretrovirals and antimalarials, should be available at all levels of health care system. Follow country guidelines.

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HIV/AIDS and Infant Feeding

- In 2016, WHO released *Guideline: Updates on HIV and Infant Feeding* (WHO 2016b), which includes the following recommendations:
  - Women living with HIV/AIDS should breastfeed for at least 12 months and may continue breastfeeding for up to 24 months or longer (similar to the general population) while being fully supported for antiretroviral therapy adherence (see the WHO *Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infection* [WHO 2016a]).

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HIV/AIDS and Infant Feeding (continued)

- In settings where health services provide and support lifelong antiretroviral therapy, including adherence counseling, and promote and support breastfeeding among women living with HIV/AIDS, the duration of breastfeeding should not be restricted.
- Women known to be living with HIV/AIDS (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter and continuing breastfeeding. Breastfeeding should then only stop once a nutritionally adequate and safe diet without breast milk can be provided.

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HIV/AIDS and Infant Feeding (continued)

- National and local health authorities should actively coordinate and implement services in health facilities and activities in workplaces, communities, and homes to protect, promote, and support breastfeeding among women living with HIV/AIDS.
- Health care providers and women living with HIV can be reassured that antiretroviral therapy reduces the risk of postnatal HIV transmission in the context of mixed feeding. Although exclusive breastfeeding is recommended, practicing mixed feeding is not a reason to stop breastfeeding in the presence of antiretroviral drugs.

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HIV/AIDS and Infant Feeding (continued)

- Women who ***are not*** HIV-infected or whose HIV status is unknown should be:
  - Counseled to exclusively breastfeed their infants for the first 6 months.
  - Counseled to introduce complementary foods while continuing breastfeeding for 24 months or beyond.
  - Offered HIV testing if their HIV status is unknown.
  - Counseled about ways to prevent HIV infection and about available services, such as family planning.
- In addition, health messages should be delivered to the general population so optimal breastfeeding information is understood (WHO 2010a).

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Other Conditions in Pregnancy: Sickle Cell Trait

- According to the Centers for Disease Control and Prevention's birth cohort studies, sickle cell trait provides 60% protection against overall mortality from malaria. Most of this protection occurs between the ages of 2 and 16 months, before the onset of clinical immunity in areas with intense transmission of malaria.
- Despite the fact that they have protection, it is still important for those with sickle cell trait to take IPTp-SP and use ITNs and other preventive measures, such as indoor residual spraying (IRS), for malaria transmission control (World Health Assembly 2006).

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Sickle Cell Disease

- People with sickle cell disease have two abnormal hemoglobin genes in their red blood cells.
- In general, women with sickle cell disease are at higher risk of pregnancy complications. Pregnancy can worsen sickle cell disease, and sickle cell disease can worsen pregnancy outcomes.
- Daily folic acid supplementation (with 1 mg or 5 mg orally) is often prescribed for women with sickle cell disease before and during pregnancy to help them replenish stores lost due to the hemolysis (destruction of red blood cells) caused by sickle cell disease.

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Sickle Cell Disease (continued)

- Unfortunately, global consensus does not exist regarding the optimal regimen for malaria prophylaxis or folic acid supplementation for pregnant women living with sickle cell disease in areas with moderate to high malaria transmission due to a lack of research evidence.
- Women with sickle cell disease must be encouraged to sleep under a long-lasting insecticide-treated net (LLIN) every night. As they are at higher risk of pregnancy complications, efforts should be made to help them access specialty care in obstetrics and hematology, as available, so that specialists can make clinical decisions that consider the individual woman's risks and clinical care needs (CDC 2015).

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Effects of Malaria on Fetus

- During pregnancy, malaria parasites hide in the placenta.
- This interferes with the transfer of oxygen and nutrients to the fetus, increasing the risk of:
  - Spontaneous abortion
  - Preterm birth
  - Low birthweight—**the single greatest risk factor for death during the first month of life**
  - Stillbirth

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Effects of Malaria on Communities

- Causes sick individuals to miss work (and wages).
- Causes sick children to miss school.
- May cause chronic anemia in children, inhibiting growth and intellectual development and affecting future productivity.
- Uses scarce resources.
- Puts strain on financial resources (treatment is more costly than prevention).
- Cost of drugs can be a burden on the community.
- Causes preventable deaths, especially among children and pregnant women.

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Summary: Malaria Transmission

- Malaria is transmitted through female *Anopheles* mosquito bites.
- Pregnant women and children are particularly at risk of malaria.
- Adolescents are at higher risk of MIP.
- Pregnant women in malaria-endemic areas infected with malaria may have no symptoms.
- Women living with HIV have a higher risk of malaria infection.
- Malaria can lead to severe anemia, spontaneous abortion, and low-birthweight newborns.
- Malaria is preventable and treatable.

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Prevention and Control of Malaria in Pregnancy

Module 3: Malaria Prevention

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Malaria Prevention: Module 3 Objectives

- Describe the three-pronged approach to malaria prevention and control according to the WHO's current MIP strategy (WHO 2013c).
- List the elements of counseling women about the use of ITNs—***specifically LLINs***—for IPTp and other means of malaria prevention.
- Describe the use of sulfadoxine-pyrimethamine (SP) for IPTp, including dosage, timing, and contraindications.
- Discuss IRS and other ways to prevent malaria.
- Assist the pregnant woman with preparing a birth preparedness and complication readiness plan.

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WHO/AFRO Malaria Prevention Strategy

- Designed to be appropriate for most African settings, with guidance on adapting it to local situations.
- Based on that fact that most sub-Saharan Africans live in areas of stable transmission.

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WHO: Three-Pronged Approach

- ITNs
- IPTp-SP
- Confirmation of malaria and case management of malaria illness and anemia

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Evidence for WHO's Three-Pronged Approach

- A meta-analysis of national survey datasets showed exposure to IPTp-SP and ITNs to be associated with reductions of newborn mortality and low birthweight under routine program conditions (Eisele et al. 2012).
- The protective role of IPTp-SP in reducing newborn mortality under trial conditions and cost-effectiveness of IPTp during routine ANC services have been demonstrated (Menendez et al. 2010; Sicuri et al. 2010).
- These studies highlight the critical importance of continuing IPTp and ITN use among pregnant women to prevent the adverse consequences of MIP.

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Module Section 3.1

ITNs

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Mother receiving insecticide-treated net in Angola

Photo by: William Brieger/Jhpiego

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ITNs

- ITNs, specifically LLINs, are very effective.
- Mosquitos generally bite at night, when people are asleep.
- ITNs reduce human contact with mosquitoes by:
  - Killing mosquitoes that land on the net
  - Repelling them, thus driving them away from where people are sleeping

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ITNs (continued)

- Prevent physical contact with mosquitoes.
- Kill or repel other insects:
  - Lice
  - Ticks
  - Bedbugs

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Antenatal care nurse with an insecticide-treated net in Mozambique

Photo by: William Brieger/Jhpiego

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ITNs versus Untreated Nets

ITNs	Untreated Nets
▪ Provide a high level of protection against malaria.	▪ Provide some protection against malaria.
▪ Kill or repel mosquitoes that touch the net.	▪ Do not kill or repel mosquitoes that touch the net.
▪ Reduce number of mosquitoes inside and outside the net.	▪ Do not reduce the number of mosquitoes.
▪ Kill other insects, such as lice and bedbugs.	▪ Do not kill other insects, such as lice and bedbugs.
▪ Are safe for pregnant women, young children, and infants.	▪ Are safe for pregnant women, young children, and infants.

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Mother and infant using a bed net in Akwa Ibom State, Nigeria

Photo by: William Brieger/Jhpiego

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Benefits of ITNs

- Prevent mosquito bites.
- Protect against malaria, resulting in less:
  - Anemia (maternal and newborn)
  - Premature and low-birthweight infants
  - Risk of maternal and newborn death
- Help people sleep better.
- Promote growth and development of fetus and newborn.

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Community Benefits of ITNs

- Cost less than treating malaria.
- Reduce the number of people getting sick (children and adults).
- Help children grow to be healthy and help working adults remain productive.
- Reduce number of deaths.

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Where to Find ITNs

- ANC clinics
- General merchandise shops
- Drug shops/pharmacies
- Markets
- Public and private health facilities
- Community health workers
- Nongovernmental organizations and community-based organizations

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How to Use ITNs

- Hang net above bed or sleeping mat.
- Tuck edges under mattress or mat.
- Use every night, all year long.
- Use for everyone, if possible, but give priority to pregnant women, infants, and children.

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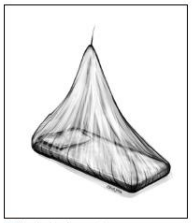
ITNs

ITN tucked under a bed



ITN tucked under a mat

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Caring for ITNs

- Handle net gently to avoid tears.
- Tie net up during day to avoid damage.
- Inspect regularly for holes and repair any holes found.
- Retreat nets regularly if they are not long-lasting so they will stay effective (retreating methods available on WHO website).
- Keep away from smoke, fire, and direct sunlight.

The demand for LLINs has increased rapidly, from 5.6 million in 2004 to 145 million in 2010 (in sub-Saharan Africa).

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LLINs

- A pre-treated, ready-to-use net that lasts between 3 and 5 years (depending on type) and does not require retreatment during that time
- Compared to regular ITNs, LLINs:
  - Usually have a one-time cost.
  - Do not require additional treatments for 3 to 5 years.
  - Save money because there are fewer additional costs associated with retreatment, retreatment campaigns, and additional insecticides.

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LLINs (continued)

- Some studies have shown that for many reasons, LLINs may not last for the intended 3 to 5 years.
- WHO thus recommends that each country conduct its own study to assess net attrition and physical integrity to better plan campaigns to resupply nets (WHO 2013b).

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Module Section 3.2

IPTp-SP

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ANC provision of IPTp-SP by DOT in Senegal

Photo by: Karim Seck/Jhpiego

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IPTp-SP

- IPTp-SP is based on the assumption that every pregnant woman living in an area of high malaria transmission has malaria parasites in her blood or placenta, whether or not she has symptoms of malaria.
- Although a pregnant woman with malaria might not have symptoms, malaria could nevertheless affect her and her fetus.
- Placental infection can begin by the end of the first trimester.

Preventing parasites from attacking the placenta helps the fetus develop normally and prevents low birthweight.

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Expected Benefits of IPTp-SP per WHO Policy Brief on IPTp-SP (2013c)

- IPTp-SP prevents the adverse consequences of malaria on maternal and fetal outcomes, such as placental infection, clinical malaria, maternal anemia, fetal anemia, low birthweight, and newborn mortality.
- IPTp-SP has recently been shown to be highly cost-effective for prevention of maternal malaria and reduction of newborn mortality in areas with moderate or high malaria transmission.
- Despite the spread of SP resistance, IPTp-SP continues to provide significant benefit, resulting in protection against both newborn mortality (protective efficacy: 18%) and low birthweight (21% reduction) under routine program conditions.

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Expected Benefits of IPTp-SP (continued)

- A recent study by Chico et al. (2017) found that pregnant women who received two or more doses of IPTp-SP were protected not only from adverse outcomes related to malaria but also some sexually transmitted/reproductive tract infections.

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SP Resistance and IPTp-SP

- Evidence shows that SP prevents consequences of malaria in pregnant women who have already had a number of malaria infections and thus a certain level of immunity. It is thought that SP primarily works through a prophylactic effect.
- Recent evidence also demonstrates that SP is associated with higher mean birthweight and fewer low-birthweight births across a wide range of SP resistance levels. Even in areas where a high proportion of *P. falciparum* parasites carry these quintuple mutations, IPTp-SP remains effective in preventing the adverse consequences of malaria on maternal and fetal outcomes (WHO 2013c).

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Past Recommendations for IPTp-SP: Dose and Timing (WHO 2004)

PREVIOUSLY

- All pregnant women were given at least two doses of SP during focused ANC visits, at least 1 month apart.
- The first dose was given no earlier than 16 weeks of pregnancy (or quickening).
- The recommended dose was and remains three tablets via directly observed therapy.

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Current Recommendations for IPT-SP: Dose and Timing (WHO 2013c)

CURRENTLY

- As early as possible during the second trimester, all pregnant women are given IPTp-SP (500 mg/25 mg), three tablets at one time via directly observed therapy.
- IPTp-SP should be given at each scheduled contact, at least 1 month apart, and only after the first trimester.
- The last dose of IPTp-SP can be administered until the time of delivery without safety concerns.
- SP can be given on an empty stomach or with food.

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Giving IPTp-SP in Mozambique

Photo by: William Brieger/Jhpiego

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Before Giving IPTp-SP

- Ensure that the woman is in the second trimester of pregnancy (at least 13 weeks pregnant).
- Inquire about her use of SP within the last month (4 weeks).
- Ensure that she is not on co-trimoxazole or taking other sulfa drugs.
- Counsel that if she takes high doses of folic acid* (≥ 5 mg), she should suspend the folic acid for at least 2 weeks after each SP dose.
- Inquire about allergic reactions to SP or other sulfa drugs (especially severe rashes).
- Explain what you will do and address the woman's questions.
- Provide a cup and clean water.

*WHO recommends folic acid at a dose of 0.4 mg daily during pregnancy.

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Instructions for Giving IPTp-SP

- Directly observe the woman swallow three tablets of SP.
- Record the SP dose on ANC and clinic cards as directly observed therapy.
- Record the SP dose (IPTp-SP1, IPTp-SP2, IPTp-SP3, etc.) in the appropriate registers.
- Advise the woman to return:
  - For her next scheduled contact
  - If she has signs of malaria
  - If she has other danger signs
- Reinforce the importance of using ITNs year-round.

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IPTp: Contraindications to SP

- Do **not** give SP during the first trimester. Be sure the woman is at least 13 weeks pregnant.
- Do **not** give SP to women with a reported allergy to SP or other sulfa drugs. Ask about sulfa drug allergies before giving SP.
- Do **not** give SP to women taking co-trimoxazole or other sulfa-containing drugs. Ask about use of these medicines before giving SP.
- Do **not** give SP more frequently than monthly. Be sure at least 1 month has passed since the last dose of SP.

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IPTp-SP and Folic Acid

- WHO recommends folic acid at a dose of 0.4 mg daily during pregnancy (WHO 2013c).
- Some evidence suggests that high doses (≥ 5 mg) of folate supplementation may reduce the effectiveness of SP for treatment of malaria (Ouma et al. 2006; WHO 2013c).
- Use of recommended folic acid doses (0.4 mg) does not seem to reduce SP effectiveness.
- If folic acid doses ≥ 5 mg are used, instruct pregnant women ***not*** to take folic acid for at least 2 weeks (14 days) after receiving SP.
- Providers should understand and follow local protocols.

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Determining Gestational Age

- The recent WHO policy on administration of IPTp-SP at 13 weeks of pregnancy may present a challenge to providers who are not accustomed to confirming early second-trimester gestation. The following information can serve as a review.

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Determining Gestational Age (continued)

- Take a history.
  - Ask about regularity of menstrual periods, current breastfeeding, and current or past use of contraception.
  - Ask about the date of the first day of the last menstrual period and use a pregnancy wheel or calendar to determine weeks of pregnancy.
  - Ask whether quickening has occurred. If it has, the woman is probably in the second trimester. If she has not noted fetal movement, she is still a candidate for IPTp-SP, if other findings confirm that she is at least 13 weeks pregnant.
  - Information obtained from the history must be correlated with findings from the physical exam.

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Determining Gestational Age (continued)

- Perform an abdominal exam.
  - In the first trimester, the uterus grows from the size of a lemon to the size of a large orange and cannot be palpated abdominally above the symphysis pubis.
  - In the second trimester, the uterus grows to the size of a large mango or grapefruit and can be palpated abdominally about three fingerbreadths above the symphysis pubis.
  - To palpate the uterus, make sure the woman has emptied her bladder.
  - Explain what will be done (and why) before conducting the exam.

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Determining Gestational Age (continued)

- Ask her to lie on her back with support under her head, bend her knees, and keep her feet flat on the bed or exam table.
- Using a firm but gentle touch, place fingers on the pubic bone and walk them up the center of the abdomen until the top of her uterus (fundus) is palpated; it will feel like a hard ball.
- A uterine fundus palpated about three fingerbreadths above the pubic bone is compatible with pregnancy in the second trimester.

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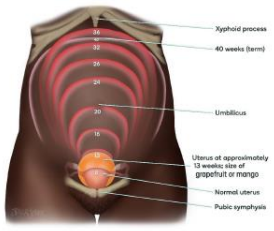
Determining Gestational Age (continued)

Uterine size at 13 weeks on abdominal palpation (about two to three fingerbreadths above the symphysis pubis)



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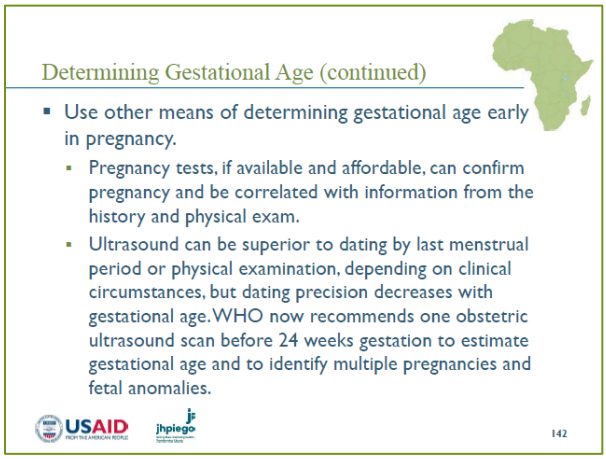
Determining Gestational Age (continued)
Use other means of determining gestational age early in pregnancy.
Pregnancy tests, if available and affordable, can confirm pregnancy and be correlated with information from the history and physical exam.
Ultrasound can be superior to dating by last menstrual period or physical examination, depending on clinical circumstances, but dating precision decreases with gestational age. WHO now recommends one obstetric ultrasound scan before 24 weeks gestation to estimate gestational age and to identify multiple pregnancies and fetal anomalies.
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Module Section 3.3

Health Education for Additional Prevention Methods

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IRS

- The main purpose is to lower malaria transmission by reducing survival of mosquitoes entering houses or sleeping areas.
- IRS is an effective intervention when the following conditions are met:
  - Adequate commitment and social acceptance
  - Enough health system capacity to deliver quality, well-timed coverage to at least 80% of dwellings
  - Credible information about local vectors, especially their insecticide susceptibility, as well as indoor versus outdoor feeding and resting behaviors

Providers should keep up to date about local IRS programs in their areas and educate clients accordingly.

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More Ways to Prevent Malaria

- Cover doors and windows with wire or nylon mesh/nets to prevent mosquitoes from entering the house.
- Avoid going outside after dark. When out in evenings:
  - Wear protective clothing covering arms and legs.
  - Apply chemical mosquito repellent cream on exposed skin surfaces.
  - Use mosquito coils that release smoke. The smoke keeps mosquitoes away or kills them when they fly through it.
- Spray rooms with insecticide before going to bed.
  - This is only effective for a few hours, so spray in combination with other measures, such as screening doors and windows.
- Physically kill mosquitoes indoors by swatting them.

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Summary: Malaria Prevention

- There are many ways of preventing bites and reducing mosquito breeding sites.
- Sleep inside ITNs (with edges tucked under mat or bedding). Where available, LLINs are preferable because they last longer and do not require continuous retreatment.
- Use of IPTp-SP prevents parasites from attacking the placenta.
- IPTp-SP helps prevent malaria and reduces the incidence of maternal anemia, spontaneous abortions, preterm birth, stillbirth, and low birthweight.
- IRS programs can be effective in reducing the number of mosquitoes that transmit malaria. They are not a replacement for ITNs and IPTp-SP, but they support and enhance these efforts.

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Prevention and Control of Malaria in Pregnancy

Module 4: Diagnosis and Treatment of Malaria

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Malaria Diagnosis and Treatment: Module 4 Objectives

- Explain why self-diagnosis and treatment may lead to treatment failure or recurring infection.
- Describe the types of diagnostic tests available for malaria and their advantages and disadvantages.
- Identify other causes of fever during pregnancy.
- List the signs and symptoms of uncomplicated and severe MIP.
- Describe the treatment for uncomplicated MIP.
- Explain the steps to appropriately refer a pregnant woman who has severe malaria.

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Malaria Diagnosis

- Usually based on the patient's signs and symptoms, clinical history, physical examination, and laboratory confirmation of the malaria parasite, if available
- Prompt and accurate diagnosis leads to:
  - Improved differential diagnosis of febrile illness
  - Improved management of nonmalarial illness
  - Effective case management of malaria

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Self-Diagnosis

- Clients who experience symptoms often rely on self-diagnosis and treatment.
- Because symptoms are similar to those of several other common ailments, misdiagnosis is possible.
- Prevalence of asymptomatic infections makes self-diagnosis even more complex.
- Clients might take the wrong medicines, or might take the right medicines but not in the proper dosage or for the recommended duration.

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Self-Diagnosis and Treatment

- If a client has self-treated and presents with malaria symptoms, or she reports that symptoms have worsened or recurred, it is possible that she:
  - Has self-treated with the wrong drug or dosage.
  - Has not completed the treatment.
  - Has been given incorrect treatment instructions (or did not understand instructions).
  - Has received a poor-quality or counterfeit drug (this can happen even at health facilities).
  - Does not have malaria.

Often, clients can purchase drugs—without a prescription or verification of diagnosis—at pharmacies, local shops, roadside kiosks, and other easily accessible locations.

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Module Section 4.1

Diagnostic Tools and Testing

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Diagnostic Testing: Advantages

- Parasitological diagnosis has several major advantages, including:
  - Prevention of wastage of drugs through unnecessary treatment, resulting in cost savings
  - Improvement of care in parasite-positive patients due to greater certainty of malaria diagnosis
  - Prevention of unnecessary exposure to malaria drugs
  - Confirmation of treatment failure

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Methods: Diagnostic Testing

- The two methods of diagnostic testing for malaria are light microscopy and rapid diagnostic testing.
- After a woman presents with malaria symptoms and is tested, results should be available within a short time (less than 2 hours).
- If diagnostic testing is not possible, women must be treated on the basis of clinical diagnosis, but every effort should be made to conduct confirmatory testing.

Source: WHO 2015d

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Diagnostic Testing: Microscopy

Microscopic examination:

- Remains the "gold standard" for laboratory confirmation of malaria.
- Involves examination of the client's blood, spread out as a thick or thin blood smear on a microscopic slide.
- Confirms the presence of malaria parasites and therefore the diagnosis of malaria.
- Is also useful when a client has vague symptoms.

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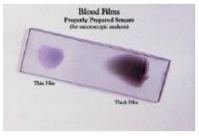
Thin Film

- Is often preferred for routine examination of parasites.
- Makes organisms easier to see so the type of parasite can be identified.
- Is inadequate for detecting low parasite density.



This Giemsa-stained slide depicts an example of properly prepared thick and thin film blood smears to be examined.

Source: Courtesy of CDC Public Health Image Library: http://phil.cdc.gov/phil/home.asp

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Thick Film

- Concentrates the layers of red blood cells on the slide, using about two to three times more blood than the thin film.
- Is better than the thin film in detecting low levels of parasites, and estimating parasite density and reappearance of circulating parasites during relapses.
- Requires experienced technician because scanning for parasites among white blood cells and platelets can be difficult.

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Rapid Diagnostic Testing

- Developed to provide quick, accurate, and accessible malaria diagnosis without the need for laboratory facilities.
- Successful rapid diagnostic testing programs require:
  - A cool chain for transport and storage
  - Training for providers
  - A clear policy on actions to take based on test results

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Maintaining a Cool Chain

- Storage between 2°C and 30°C is recommended by rapid diagnostic test (RDT) manufacturers.
- Expiry dates are generally set according to these conditions.
- If storage temperatures exceed the recommended limits, it is likely that the shelf life of the RDTs will be reduced and sensitivity lost before the expiration date.

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Maintaining a Cool Chain (continued)

- The cool chain starts before shipping from the manufacturer.
  - The shipper or air carrier is notified of temperature storage requirements, which are clearly marked on cartons and documents.
- Ground transportation:
  - Attention must be given to outside temperatures while the vehicle is moving and parked during all stages of delivery.
- Storage:
  - Storage of RDTs at any stage before they reach the final destination should conform to manufacturers' specifications, which are usually ≤ 30°C.

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Indications for Diagnostic Testing

- For pregnant women, a parasitological diagnosis is recommended before starting treatment.
  - Those who live in or have come from areas of unstable transmission are the most likely candidates for severe malaria, which can be life-threatening.
- Diagnostic testing is also used as a test of cure in clients who have been treated for malaria but still have symptoms.
  - If treatment was adequate, clients may have been reinfected or have another problem causing similar symptoms.
  - Remember that counterfeit or poor-quality drugs may also cause treatment failure.

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Module Section 4.2

Clinical Diagnosis

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Types of Malaria

- Uncomplicated:
  - Most common
- Severe:
  - Life-threatening; can affect the brain
  - Pregnant women more likely to get severe malaria than non-pregnant women

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Clinical Signs and Symptoms

- A diagnosis of malaria is based on the patient's symptoms and on physical findings at examination.
- First symptoms of malaria and physical findings often are not specific and are common to other diseases.

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Uncomplicated Malaria: Signs and Symptoms

- The signs and symptoms of malaria are nonspecific.
- Malaria is suspected clinically primarily on the basis of fever or a history of fever (≥ 37.5˚C axillary); anemia may also be present.
- There is no combination of signs or symptoms that reliably distinguishes malaria from other causes of fever. A diagnosis based only on clinical features has very low specificity and can result in overtreatment.

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Severe Malaria: Diagnosis

- In severe malaria (caused by *Plasmodium falciparum*), clinical findings are more striking and may increase the suspicion of malaria.
- Thus, in most cases, the early clinical findings in malaria are not typical and must be confirmed by a laboratory test.

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Severe Malaria: Signs and Symptoms

One or more of the following clinical features in the presence of malaria parasitemia or positive RDT:

- Impaired consciousness/coma
- Prostration/generalized weakness
- Multiple convulsions (more than two in 24 hours)
- Deep breathing/respiratory distress
- Acute pulmonary edema
- Shock (systolic blood pressure < 80 mmHg)
- Acute kidney injury
- Clinical jaundice, evidence of other vital organ dysfunction
- Significant bleeding

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Pre-Referral Treatment for Severe Malaria in Pregnant Women

Administer loading dose of appropriate antimalarial drug and refer the woman

immediately

if you suspect anything other than uncomplicated malaria.

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Recommendations for Clinical Diagnosis

WHO's 2015 recommendations for clinical diagnosis/suspicion of **uncomplicated malaria** in different epidemiological settings:

- In malaria-endemic areas, malaria should be suspected in any patient presenting with a history of fever or temperature ≥ 37.5°C and no other obvious cause.
- In settings where the incidence of malaria is very low, parasitological diagnosis of all cases of fever may result in considerable expenditure to detect only a few patients with malaria. Thus, patients should be identified who may have been exposed to malaria (e.g., have recently traveled to a malaria-endemic area without protective measures) and have fever or a history of fever with no other obvious cause before a parasitological test is conducted.

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Recommendations for Clinical Diagnosis (continued)

- Signs and symptoms of malaria are nonspecific.
- Making a judgment or diagnosis based on clinical features alone has very low specificity, resulting in overtreatment for many.
- Other possible causes of fever and the need for alternative or additional treatment must be carefully considered.
- In all settings, clinical suspicion of malaria should be confirmed with a parasitological diagnosis.
- In settings where parasitological diagnosis is not possible, the decision to provide antimalarial treatment must be based on the prior probability of the illness being malaria.

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Module Section 4.3

Caution: Presumptive Treatment

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Definition: Presumptive Treatment (for Clients)

- Patients who suffer from a fever without an obvious cause are presumed to have malaria and are treated for that disease, based only on clinical suspicion and without the benefit of laboratory confirmation.

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Problems: Presumptive Treatment

- In settings where parasitological diagnosis is not possible, a decision to provide antimalarial treatment must be based on the probability that the illness is malaria.
- Presumptive treatment can lead to incorrect diagnoses and unnecessary use of antimalarial drugs.
  - Results in additional expense and increases the risk of selecting for drug-resistant parasites.
  - For children and pregnant women, it may be the best option when diagnostic testing is not available.

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Fever during Pregnancy

- Temperature ≥ 37.5°C axillary
- May be caused by malaria or:
  - Bladder or kidney infection
  - Pneumonia
  - Typhoid, dengue fever, or yellow fever
  - Uterine infection
  - Viral illnesses
- Careful history and a physical exam are needed to rule out other causes.

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Fever during Pregnancy (continued)

Ask the woman about or examine her for:

- Type, duration, and degree of fever
- Whether she has or has had:
  - Chills or rigors
  - Episodes of a spiking fever
  - Fits or convulsions
- Temperature, blood pressure, pulse, and respiration

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Fever during Pregnancy: Other Things to Ask About

- Signs of severe malaria
- Signs of other infections:
  - Chest pain/difficulty breathing
  - Foul-smelling, watery vaginal discharge
  - Tender/painful uterus or abdomen
  - Urinary frequency/urgency/pain on urination/flank pain
- Any fluid leaking from vagina/rupture of membranes
- Headache
- Muscle/joint pain
- Dry or productive cough
- Other danger signs

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Recognizing Malaria in Pregnant Women

Uncomplicated Malaria

- Signs and symptoms are nonspecific but can include fever ≥ 37.5°C axillary, history of fever, and/or presence of anemia.

Severe Malaria

One or more of the following along with the presence of malaria parasitemia:

- Impaired consciousness/coma
- Prostration/generalized weakness
- Multiple convulsions (more than two in 24 hours)
- Deep breathing/respiratory distress
- Acute pulmonary edema
- Shock (systolic blood pressure < 80 mmHg)
- Acute kidney injury
- Clinical jaundice, evidence of other vital organ dysfunction
- Significant bleeding

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Signs and Symptoms of Uncomplicated and Severe Malaria

Uncomplicated Malaria: One or more of the following clinical features in the presence of malaria parasitemia or positive rapid diagnostic test: Axillary temperature ≥37.5°C, and/or history of recent fever, and/or presence of anemia	Severe Malaria: One or more of the following clinical features or laboratory findings in the presence of malaria parasitemia or positive rapid diagnostic test:	
	Clinical Features:	**Laboratory Findings:**
	• Impaired consciousness/coma • Prostration/generalized weakness • Multiple convulsions (>two within 24 hours) • Deep breathing/respiratory distress • Acute pulmonary edema • Circulatory collapse/shock (systolic blood pressure < 80 millimeters of mercury) • Acute kidney injury • Clinical jaundice and evidence of other vital organ dysfunction • Significant bleeding	• Hypoglycemia (blood glucose < 2.2 millimoles per L or < 40 mg per deciliter) • Metabolic acidosis (plasma bicarbonate < 15 millimoles per L); hyperlactatemia (lactate > 5 millimoles per L) • Severe normocytic anemia (hemoglobin < 7 g per deciliter, packed cell volume < 20%) • Hemoglobinuria • Hyperparasitemia* • Renal impairment (serum creatinine > 265 micromoles per L) • Pulmonary edema (radiologic) • Plasma or serum bilirubin > 50 micromoles per L (3 mg per deciliter) with a parasite count > 100,000 per microliter)

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Module Section 4.4

Case Management of Malaria during Pregnancy

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Case Management Goals: Malaria during Pregnancy

- Despite preventive measures, some pregnant women will still become infected with malaria.
- The goal of malaria treatment during pregnancy is to completely eliminate the infection because having any parasites in her blood can affect the mother and her fetus.

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Case Management Goals: Malaria during Pregnancy (continued)

- Determine whether malaria is uncomplicated or severe:
  - Uncomplicated: Manage according to the case management job aid.
  - Severe: After administering loading dose of appropriate antimalarial drug, refer immediately to higher level of care.

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Case Management: Drugs

- Selection of treatment is based on:
  - The trimester of pregnancy
  - Available drugs
  - Approved drugs for malaria treatment in accordance with national guidelines

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Case Management: Combination Therapy

- *Plasmodium falciparum* has become resistant to single-drug therapy, resulting in ineffective treatment and increased morbidity and mortality.
- WHO now recommends that countries use a combination of drugs to fight malaria.
- Drug resistance is far less likely with combination therapy than with single-drug treatments.

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ACTs: Types of Combination Therapy

Artemisinin-based combination therapies (ACTs):

- The simultaneous use of a drug that includes a derivative of artemisinin along with another antimalarial drug
- Currently the most effective treatment for malaria
- Should be the first-line treatment in the second and third trimesters

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Module Section 4.5

Treatment for Uncomplicated Malaria

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WHO 2015 Recommendations for ACT in Pregnancy

	1ST TRIMESTER	2ND AND 3RD TRIMESTERS / NON-PREGNANT ADULTS[a,d]
FIRST-LINE DRUGS[a]	Oral quinine salt 10 mg/kg every 8 hours for 7 days, PLUS, if available, + clindamycin 10 mg/kg orally twice daily for 7 days ACT is indicated only if this is the only treatment immediately available, or if treatment with 7-day quinine plus clindamycin fails	• Artemether + lumefantrine, OR • Artesunate + amodiaquine[e], OR • Artesunate + mefloquine, OR • Dihydroartemisinin + piperaquine, OR • Artesunate + sulfadoxine-pyrimethamine (SP)[e] Doses of most commonly used ACTs in pregnancy: Artemether/lumefantrine (Coarten): 20 mg/120 mg, 4 tablets orally every 12 hours for 3 days (to be taken after a fat-containing meal or drink); the first 2 doses should, ideally, be given 8 hours apart OR Artesunate/amodiaquine (AS/AQ): 100 mg/270 mg, 2 tablets orally daily for 3 days[d]
SECOND-LINE DRUGS[a]	Artesunate + clindamycin[b] for 7 days OR ACTs recommended as first-line drugs for 2nd and 3rd trimesters if oral quinine is not available or treatment fails	

Abbreviation: ACT, artemisinin-based combination therapy.
a. Refer to country guidelines for first- and second-line drugs.
b. No blister co-packaged forms of artesunate + clindamycin are available. To ensure high adherence to treatment, artesunate and clindamycin should be administered under observation to pregnant women who have failed other ACTs.
c. WHO. 2015. Guidelines for the treatment of malaria. 3rd edition, pp. 33-34.
d. Avoid prescribing amodiaquine-containing ACT regimens, if possible, to HIV-infected patients on zidovudine or efavirenz. (WHO, 2015: Guidelines for treatment of malaria. 3rd edition p. 48.)
e. Artesunate + SP is an approved drug but is not a fixed-dose formulation, and likelier to be ineffective in areas of high SP resistance. Avoid prescribing artesunate + SP to HIV-infected patients receiving co-trimoxazole. (WHO, 2015: Guidelines for treatment of malaria. 3rd edition p. 48, p. 54.)

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Treating Uncomplicated Malaria

- Observe the client taking the first dose of her antimalarial drugs (directly observed therapy) and record the dosages.
- Advise the client to:
  - Complete the course of drugs.
  - Return in 48 hours for follow-up, or sooner if condition worsens.
  - Consume iron-rich foods.
  - Use ITNs and other preventive measures.
- Follow country guidelines with regard to use of IPTp-SP and iron/folic acid during and after treatment of malaria.

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Treating Uncomplicated Malaria (continued)

- Provide first-line antimalarial drugs.
  - Refer to case management job aid.
- Manage fever ≥ 38°C axillary.
  - Tepid sponging; paracetamol 500 mg, two tablets every 6 hours as needed
- Diagnose and treat anemia.
- Provide fluids.

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Module Section 4.6

Management of Severe Malaria

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Severe Malaria: Convulsions or Fits

- If a pregnant woman presents with convulsions, determine whether they are due to malaria or eclampsia.
- Gather information from the following chart to determine the cause of convulsions or fits.

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Determining Causes of Convulsions

Signs/Symptoms	Severe Malaria	Eclampsia
Recent history of fever, chills	Yes	No
Temperature	≥ 37.5° C	< 38° C
Blood pressure	Diastolic < 90 mmHg	Diastolic ≥ 90 mmHg
Proteinuria	No	Yes
Enlarged spleen	Possibly	No
Jaundice	Yes	No

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Other Considerations (CDC 2013)

- If eclampsia is suspected, stabilize and treat with magnesium sulfate per national guidelines, then refer.
- If severe malaria is suspected, stabilize and treat with appropriate antimalarial drug and diazepam, then refer.
- Oral antimalarial drugs are not recommended for the initial treatment of severe malaria.
- If severe malaria is strongly suspected but a laboratory diagnosis cannot be made, collect blood for diagnostic testing. Parenteral antimalarial drugs may be started.

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Severe Malaria: Pre-Referral Treatment (WHO 2015d)

- In the case of antimalarial treatment for severe malaria, the main objective is to prevent death.
- The risk of death from severe malaria is greatest in the first 24 hours.
- Delaying the start of appropriate antimalarial treatment can result in worsening of a woman's condition or even death.
- If possible, start treatment immediately by giving the pregnant woman a loading dose of a parenteral antimalarial before referral: parenteral artesunate, 2.4 mg/kg, IV bolus ("push") or IM injection.

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Stabilize Severe Malaria

Stabilize by providing a loading dose of the appropriate antimalarial drug and refer the woman ***immediately*** if she has any symptoms that suggest severe malaria.

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Stabilization and Pre-Referral Treatment for Severe Malaria

	All Trimester/Nonpregnant Adults
First-Line Drug	Parenteral artesunate 2.4 mg per kilogram IV bolus ("push") injection or IM injection as loading dose.
Second-Line Drug	If artesunate is unavailable, intramuscular artemether should be given, and if this is unavailable, then parenteral quinine should be started immediately until artesunate is obtained.

To view the entire job aid for Treatment of Uncomplicated Malaria Among Women of Reproductive Age, please see the reference manual, Figure 11.

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Referral Preparation

- Explain the situation to the client and her family.
- Give her pre-referral treatment, if possible.
- Help arrange transport to a higher-level facility, if possible.
- Accompany the woman during transport, if possible, and be sure to have sufficient medication available.
- Record the referral information on the ANC card.

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Referral Notes

- Include the following in your referral note:
  - Brief history of client's condition
  - Details of any treatment provided
  - Reason for referral
  - Any significant findings from history, physical exam, or lab tests
  - Highlights of any important details of current pregnancy
  - Copy of client's ANC record, if possible
  - Contact information in case the referral facility or provider has any questions

Source: Adapted from WHO 2015d.

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Recognizing and Reporting Potential Adverse Effects

- Health care providers should understand the potential adverse effects of all medications they administer. This includes those used to treat MIP, although these drugs are generally well tolerated and have no or only mild side effects, if used as directed.
- Women need to know about adverse effects that they might experience and what to do if they occur. Potential adverse effects are summarized in the next slide.

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Recognizing and Reporting Potential Adverse Effects (continued)

- Artemether/lumefantrine: Weakness, headache, dizziness
- Artesunate/amodiaquine: Weakness (mild or severe) headache or dizziness
- Quinine: Buzzing or ringing in the ears or hypoglycemia (when given parenterally)
- Artemisinin: Dizziness, headache, vomiting, diarrhea

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Recognizing and Reporting Potential Adverse Effects (continued)

- Providers should be aware of the pharmacovigilance (drug safety) system in their countries, to which they can report:
  - Adverse effects
  - Other concerns about the medications they administer

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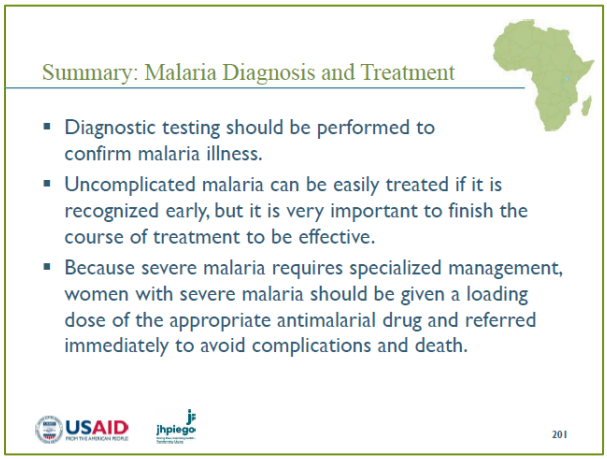
Summary: Malaria Diagnosis and Treatment
Diagnostic testing should be performed to confirm malaria illness.
Uncomplicated malaria can be easily treated if it is recognized early, but it is very important to finish the course of treatment to be effective.
Because severe malaria requires specialized management, women with severe malaria should be given a loading dose of the appropriate antimalarial drug and referred immediately to avoid complications and death.
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Module Section 4.7

Health Education

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Keeping Up to Date

- This malaria workshop and training materials should bring participants up to date on current policies and practices.
- Malaria control is a dynamic field with new discoveries in the area of medicines, insecticides, and other interventions.
- To maintain best practices, health workers need to update themselves through self-learning.

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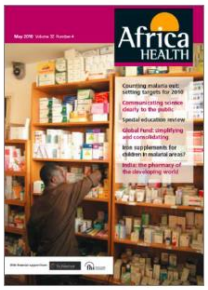
Free Journals/Magazines



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The Internet: Crucial for Continued Self-Learning

- Free online journals
  - *Africa Health*: http://www.africa-health.com/
  - *Malaria Journal*: http://www.malariajournal.com/
- Twitter
  - If you have a twitter account, search for the latest information using: #malaria
- Listserv
  - Sign up for malaria mailings: http://knowledge-gateway.org/malaria

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References and Resources

For all references, see reference manual.

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