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Maternal and Child Survival Program

Obstetric Ultrasound Capacity Assessment in the Context of an Outbreak of Zika Virus Infection

Tools and Operational Guidance

www.mcsprogram.org

Maternal and Child Survival Program (MCSP) is a global United States Agency for International Development (USAID) initiative to introduce and support high-impact health interventions in 25 priority countries to help prevent child and maternal deaths. MCSP supports programming in maternal, newborn, and child health, immunization, family planning and reproductive health, nutrition, health systems strengthening, water/sanitation/hygiene, malaria, prevention of mother-to-child transmission of HIV, and pediatric HIV care and treatment. MCSP will tackle these issues through approaches that also focus on household and community mobilization, gender integration, and digital health, among others.

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Operational Guidance

Introduction

In the United States, the use of ultrasonography to evaluate for fetal abnormalities consistent with congenital Zika syndrome (CZS) has been recommended for all pregnant women with suspected Zika virus (ZIKV) infection, regardless of laboratory findings.[1] Recommendations from the World Health Organization (WHO) and the Pan American Health Organization (PAHO) have also called for routine ultrasound for pregnant women living in areas of autochthonous transmission of ZIKV.[2] However, the quality of ultrasound assessment is highly dependent on the skills of the sonographer or sonologist and the technical capacity of his/her equipment. Moreover, some features associated with CZS may not be easily recognized or are difficult to distinguish from abnormalities caused by other antenatal infections (e.g., rubella, toxoplasmosis, syphilis, cytomegalovirus). Challenges in identifying CZS before childbirth may impede health care providers' ability to provide appropriate care to pregnant woman with ZIKV infection. Such care includes comprehensive counseling on the following: (1) the prognosis associated with delivery of an infant with possible or probable CZS; (2) family preparation for support of infants and children with special needs; and (3) options for management of pregnancies affected by anomalies, within the local context. On a health systems level, an awareness of health facility capacity to identify suspected CZS, based on ultrasound findings, can contribute to improvements in care and referral patterns for pregnant women. However, this information should also inform larger strategies for quality improvement in the experience and content of comprehensive obstetric services to ensure that all women receive essential, high quality, and lifesaving antenatal care.

Origin and Use of Assessment Tools

Recognizing the role of quality obstetric ultrasound evaluation in the care of pregnant women living in areas affected by the ZIKV epidemic, the United States Agency for International Development (USAID) called on its implementing partners to perform a rapid, five-country capacity assessment of both ultrasound providers and ultrasound equipment, in collaboration with United States and regional professional societies.[3] The goal of this assessment, which was completed in 2017, was to generate actionable information for country governments and other implementing partners to improve referral pathways for pregnant women with ZIKV infection, including referral to facilities with capacity for the evaluation of possible CZS. To facilitate the implementation of this capacity assessment, the four tools included in this document were created:

- **Ultrasound Clinical Practice Interview**, for assessing staffing, referral practices, and client volume
- **Ultrasound Clinical Provider Interview**, for assessing components of examinations for clients with suspected or confirmed ZIKV infection
- **Ultrasound Service Delivery Observation**, for assessing obstetric ultrasound examination based on clinical observation
- **Ultrasound Equipment and Environment of Care Assessment**, for assessing the type and functionality of ultrasound equipment, image storage and sharing capacity, and environmental and infection control practices

These tools are now being made available for future ultrasound capacity assessments. Prior to such an assessment visit, clear objectives, an analysis plan, and a results dissemination plan should be outlined and

[1] Centers for Disease Control and Prevention (CDC). "Zika virus: Clinical management of pregnant women with possible Zika virus infection." *CDC 24/7: Saving Lives, Protecting People™*. www.cdc.gov/zika/hc-providers/pregnant-women/prenatal-care.html (accessed June 7, 2017).
[2] WHO. "Pregnancy management in the context of Zika virus infection," Interim guidance update 13 May 2016, WHO/ZIKV/MOC/16.2 Rev. 1. apps.who.int/iris/bitstream/10665/204520/1/WHO_ZIKV_MOC_16.2_eng.pdf (accessed June 7, 2017).
[3] USAID will not fund purchase of ultrasounds nor support funding of training related to ultrasound.

agreed upon by all involved parties—including assessment team members, sponsors of the work, and any relevant country government partner(s).

Ethics Approval, Confidentiality, Consent, and Data Collection

Formal **ethics approval** (by an institutional review board or ethics committee) should be sought for all human subjects research. A non-human subjects research determination may be obtained for quality improvement activities, but such determination should be clarified before the design and implementation of an assessment visit. In the absence of an ethics approval permitting such data collection, no names, other personal identifiers, or other information from clients/client records nor product bar codes from equipment should be collected for the assessment database. In addition, the **confidentiality** of all participating facility staff and their clients must be ensured. For example, tablet computers, which may be used for recording collected data, should be password-protected and remain in the custody of the assessment team at all times.[4] Also, before all assessment activities, all assessment participants should provide **consent** (verbal or written, as permitted by relevant ethics approval) for participation after being read a standard consent script.[5] Finally, **data collection** may be completed on paper-based forms or via tablet using SurveyCTO (Cambridge, MA, USA). SurveyCTO is a mobile-based system that allows collection of answers to closed-end questions, free-text responses, and photos. (Requests for access to the electronic mobile system should be sent to info@mcsprogram.org.) At the end of each assessment visit, data should be checked for completeness and accuracy. Surveys should be uploaded and rechecked for completeness.

Contributors to Design of the Assessment Tools

The **Maternal and Child Survival Program** (MCSP) is a global USAID cooperative agreement aimed at introducing and supporting high-impact health interventions in 25 priority countries. MCSP engages governments, policymakers, private sector leaders, health care providers, civil society, faith-based organizations, and communities to adopt and accelerate proven approaches to reduce major preventable causes of maternal, newborn, and child mortality. The program works to achieve this aim by improving coverage and quality of health services along the household-to-hospital continuum.

The objective of **USAID's Applying Science to Strengthen and Improve Systems (ASSIST) Project** is to improve the quality and outcomes of health care and other services by enabling host country providers and managers to apply the science of improvement. The project seeks to build the capacity of host country service delivery organizations in USAID-assisted countries to improve the effectiveness, efficiency, client-centeredness, safety, accessibility, and equity of health and family services they provide. USAID ASSIST also seeks to institutionalize the capacity to improve quality through competency development at the pre- and in-service levels, as well as to engage with host country governments at the policy level.

The **American Institute of Ultrasound in Medicine** (AIUM; Laurel, MD, USA) aims to advance the safe and effective use of ultrasound in medicine. AIUM is a multidisciplinary professional association dedicated to advancing its mission by providing education, fostering best practices, and facilitating research. The core values of AIUM include quality of practice, collaboration, education, research, and leadership.

The **Society for Maternal–Fetal Medicine** (SMFM; Washington, DC, USA) aims to lead the global advancement of women's and children's health through pregnancy care, research, advocacy, and education. SMFM is dedicated to improving maternal and child outcomes and raising the standards of prevention, diagnosis, and treatment of maternal and fetal disease through support for the clinical practice of maternal–fetal medicine, research, education/training, advocacy, and health policy leadership.

[4] SurveyCTO, further discussed later in the document, encrypts Internet communications with Secure Sockets Layer (SSL) technology, which protects data security during upload.

[5] An example of a provider consent script is included in this document on the first page of the first assessment tool; an example of a client consent script precedes the third tool.

Assessment Team

An obstetric ultrasound capacity assessment may benefit from a well-staffed, multidisciplinary team. **Table 1** outlines suggested roles within an assessment team.

Table 1. Suggested Roles of Ultrasound Assessment Team Members

Position	Scope
Ultrasound/ Maternal–Fetal Medicine Specialists (2)	• Attends all team meetings and assigned site visits • Acts as decision-maker regarding technical content for answers to assessment tool questions • Works with Technical Lead to complete new data entry to tablets by end of each day (e.g., if answers need to be transferred from paper to tablet) • Contributes to discussions with government representatives during site visit
Technical Lead	• Attends all team meetings and assigned site visits • Is responsible for adherence to assessment plan and assessment tools • Works with Specialist(s) to complete data entry to tablets by end of each day • Contributes to discussions with government representatives during site visit
Program Lead	• Coordinates team activities in-country, including meetings, site visits, and any meetings with government and/or external partners • Drafts and circulates meeting minutes for all meetings • Acts as point person for in-country logistics • Coordinates with In-Country Lead regarding logistics and communications • Ensures that tablets for data collection are available, charged, and secure during visit • Transports tablets to/from Headquarters • Drafts, collects input on, revises (as needed), and submits joint trip report
In-Country Lead	• Attends all meetings and site visits • Assists in accessing and obtaining copies of policy and national guidance documents related to topics relevant to Zika and obstetric ultrasound (e.g., Zika, antenatal care) • Arranges in-country travel logistics (flights, hotels, in-country transportation) • Coordinates site visits at national/local levels and manages agendas for each site • Assists in identification of alternate site if site visits are canceled for any reason • Coordinates/facilitates meetings conducted during country assessment visits with the Ministry of Health • Contributes to conversations with key stakeholders in-country, including the Ministry of Health, national and regional professional associations, relevant technical working groups, and representatives from obstetric ultrasound practices • Coordinates with Program Lead regarding logistics

1. Ultrasound Clinical Practice Interview

Participant Consent

Before the practice interview, all assessment participants should provide **consent** (verbal or written, as permitted by relevant ethics approval) for participation after being read a standard consent script. An example script for providers is shown below.

Example Script for Providers

READ TO PROVIDER before the interview/observation:

Hello, I am [NAME OF INTERVIEWER/OBSERVER] and [a doctor, nurse, etc.]. I am representing [NAME OF ORGANIZATION] (Note: Explain briefly what the project is about). We are conducting an assessment of obstetric ultrasound capacity found at health facilities in [COUNTRY NAME] with the goal of recording important information about the ultrasound services available. I would like to ask you about the ultrasound practice at this facility and observe your consultations with clients to understand how services are provided here.

Information from this observation is confidential. Neither your name nor that of the client will be recorded. The information acquired during this observation may be used by [INSERT APPLICABLE ORGANIZATIONS] to improve services.

Do you have any questions for me? If at any point you feel uncomfortable, you can ask me to leave. However, we hope you won't mind our observing your consultation.

Do I have your permission to be present at this consultation?

Practice Interview Tool

1. **In general, what type of obstetric ultrasound does this practice provide?**
   A. Basic obstetric ultrasound
   B. Referral-level obstetric ultrasound
   C. A and B

2. **Does this ultrasound practice receive financial support from the Ministry of Health or Social Welfare?**
   A. No
   B. Yes
      i. Completely funded by government
      ii. Partially funded by government

3. **How many providers perform obstetric ultrasound at this facility? [Number field]**

4. **How many providers interpret obstetric ultrasound at this facility? [Number field]**

5. **Are clients charged for obstetric ultrasound at this facility?**
   A. No
   B. Yes
      i. How much? [Text field, for description of sliding scale or special context]

6. **Has this practice ever referred obstetric ultrasound clients to another practice with more expertise in obstetric ultrasound**?
   A. No (Skip to #8.)
   B. Yes (Check all that apply.)
      ☐ Suspected abnormalities of fetal growth (e.g., intrauterine growth restriction)
      ☐ Suspected fetal malformation
      ☐ Suspected abnormalities of amniotic fluid
      ☐ Evaluation with Doppler
      ☐ Other (specify): _____

7. **How often are clients referred to other ultrasound providers with more expertise?**
   A. About weekly or more frequently
   B. About monthly
   C. Less than monthly

8. **In your experience, what is the wait time for clients to be seen at a referral center?**
   A. Same day
   B. Within about a week
   C. Other (specify): _____

9. **What is the typical cost of transport for clients traveling to the center you typically use for referral?**
   A. How much? [Text field]
   B. Don't know

10. About how long does it take to travel to the center using public transportation?

A. Less than half a day
B. About half a day
C. About a day
D. More than a day

11. Does this practice typically receive referrals from other obstetric ultrasound providers?

A. No
B. Yes (Specify about how many providers refer to this practice.) [Number field]

12. In general, does this practice serve a particular catchment area?

A. No
B. Yes (specify): _____

13. What types of providers refer to this practice? (Check all that apply.)

☐ Health care providers who don't provide obstetric ultrasound
☐ Health care providers who do provide obstetric ultrasound
☐ Other (specify): _____

14. In general, how many clients are referred (from outside the facility) to this practice in a month? Specify: _____

15. Is there an appointment system for obstetric ultrasound at this facility?

A. No
B. Yes

16. In general, are clients who come to this facility to be seen for obstetric ultrasound seen within the same day?

A. No
B. Yes

17. Has this practice performed obstetric ultrasound for any clients with suspected Zika virus exposure?

A. No
B. Yes

18. Does the practice have protocols or guidelines that inform management of clients with suspected or confirmed Zika virus infection?

A. No
B. Yes (specify) [Text field, for name(s) of policy(s) and author(s); take photos of cover sheets and/or policies, if feasible.]

19. What is the typical frequency of ultrasound exams for an individual client at this facility?

A. One time
B. Serial (specify frequency):
   i. More frequently than monthly
   ii. About monthly
   iii. Other (specify): _____

20. Who performs the obstetric ultrasound exams at this facility?

21. Provider 1 (For each provider, ask questions #21–27 in this tool.)

22. Degree:
A. Medical (specify specialty): _____
B. Midwifery
C. Other (specify): _____
D. Don't know (need this option for providers who are not present during assessment)

23. Obstetric ultrasound training (Check all that apply.)
☐ During pre-service education
☐ After pre-service education
☐ Don't know

24. Ultrasound certifications [Text field]

25. Years of ultrasound practice [Number field]

26. Has this provider had specific training for identification of Zika virus-affected fetuses?
A. No
B. Yes (Check all that apply.)
☐ Webinar
☐ In-service training
☐ Other (specify): _____
☐ Don't know

27. Approximately what percentage of time does this provider spend on providing obstetric ultrasound?

28. Who interprets the obstetric ultrasound exams performed at this facility? (Check all that apply.)
☐ Nurse
☐ Doctor
☐ Other (specify): _____
☐ Comment: _____

29. Is amniocentesis available to clients at this center?
A. No
B. Yes (specify):
i. In this practice
ii. Not in this practice, but in this facility
iii. In another facility

30. Is amniocentesis performed for clients with suspected or confirmed history of Zika virus infection at this center?
A. No
B. Yes

31. Is magnetic resonance imaging (MRI) available to clients at this center?

A. No (Skip to #13.)
B. Yes (specify):
   i. In this practice
   ii. Not in this practice, but in this facility
   iii. In another facility

32. Is MRI performed for clients with suspected or confirmed history of Zika virus infection at this center?

A. No
B. Yes

33. How often are obstetric ultrasound clients seen at this practice?

A. Every day
B. Less than every day (specify): _____

34. What is the typical number of obstetric ultrasounds performed per day on a day when they are performed? [Number field]

35. About how many transabdominal exams are performed per day? [Number field]

36. Are transvaginal scans provided at this practice?

A. Yes
   i. If yes, about how many per day? [Number field]
B. No (If no, specify why; check all that apply.)
   ☐ No functioning endovaginal probe
   ☐ Clients decline
   ☐ Providers don't have training
   ☐ Other (specify): _____

COMMENTS:

2. Ultrasound Clinical Provider Interview

Participant Consent

Before the provider interview, all assessment participants should provide **consent** (verbal or written, as permitted by relevant ethics approval) for participation after being read a standard consent script. An example script for providers is included before the first assessment tool.

Provider Interview Tool

1. What components of ultrasound examination would you provide for a woman referred because of suspected or confirmed Zika virus infection? (DO NOT PROMPT. Within each section, check all that apply.)

A. Gestational age

B. Biometry
- ☐ Biparietal diameter (BPD)
- ☐ Head circumference (HC)
- ☐ Abdominal diameter/circumference (AD/AC)
- ☐ Femur length (FL)
- ☐ Estimated fetal weight (EFW)
- ☐ Cerebellum

C. Amniotic fluid volume

D. Placenta
- ☐ Location
- ☐ Calcifications

E. Fetal heart/cardiac evaluation
- ☐ Four-chamber view (pericardial effusion)

F. Fetal brain (standard planes/images of the fetal brain) (**OK TO PROMPT** — what planes and which structures or abnormalities?)

i. What planes would you image?
- ☐ Axial (number and location[s]/imaged structures)
- ☐ Sagittal (number and location[s]/imaged structures)
- ☐ Coronal (number and location[s]/imaged structures)

ii. Which structures/abnormalities would you identify and/or evaluate?
- ☐ Lateral ventricles (ventriculomegaly)
- ☐ Cerebellum
- ☐ Cavum septi pellucidi
- ☐ Corpus collosum (callosal dysgenesis)
- ☐ Calcifications/echogenicities (subcortical, cortical, periventricular, cerebellar)
- ☐ Increased extra-axial fluid
- ☐ Enlarged cisterna magna

- ☐ Other brain abnormalities (**OK TO PROBE** — which ones?)
  a. Sulci/gyri
  b. Cysts (periventricular/intraventricular)
  c. Schizencephaly
  d. Other (specify): _____
- ☐ Face
  a. Orbits (cataracts)
  b. Facial profile
- ☐ Abdomen/liver
- ☐ Extremities (arthrogryposis)

2. How is microcephaly diagnosed in fetuses in this practice?

A. > 1 standard deviation (SD) below mean for head circumference
B. > 2 SD below mean for head circumference
C. > 3 SD below mean for head circumference
D. > 4 SD below mean for head circumference
E. > 5 SD below mean for head circumference
F. Other (specify): _____
G. No particular criteria are used

COMMENTS:

3. Ultrasound Service Delivery Observation

Participant Consent

Before the service delivery observation, all assessment participants should provide **consent** (verbal or written, as permitted by relevant ethics approval) for participation after being read a standard consent script. An example consent script for providers is included before the first assessment tool; an example script for clients is shown below.

Example Script for Clients

READ TO CLIENT before the observation:

Hello, I am [NAME OF OBSERVER] and a [doctor, nurse, etc.]. I am representing [INSERT NAME OF ORGANZATION] (Note: Explain briefly what the project is about). We are conducting an assessment of obstetric ultrasound capacity found at [INSERT NAME OF FACILITY] with the goal of recording important information about the ultrasound services available. I would like to observe your care during your ultrasound exam to better understand how delivery services are provided in this facility.

Information from this observation is confidential. Neither your name nor that of the client will be recorded. The information acquired during this observation may be used by [INSERT APPLICABLE ORGANIZATIONS] to improve services.

Do you have any questions for me? If at any point you feel uncomfortable, you can ask me to leave. However, we hope you won't mind our observing your consultation.

Do I have your permission to be present at this consultation?

Service Delivery Observation Tool

Observation 1 (may be repeated with relevant permissions)

Note: Encourage the provider to talk through the examination, during or after the scan, to facilitate assessment.

1. **Was this a limited or specialized obstetric ultrasound (i.e., was it restricted to a very specific indication or procedure)?**
   A. No
   B. Yes (Check all that apply.)
      - ☐ Verify fetal heart activity
      - ☐ Verify fetal presentation
      - ☐ Suspected anomaly
      - ☐ Fetal Doppler ultrasound
      - ☐ Biophysical profile
      - ☐ Amniotic fluid (without other components of biophysical profile)
      - ☐ Fetal echocardiogram
      - ☐ Biometric measurements
      - ☐ Amniocentesis
      - ☐ Other (specify): _____
2. **Was gestational age assessed?**
   A. No
   B. Yes (specify weeks and days) [Text field]
3. **Specify trimester:**
   First
   A. Did you (the observer) note omission of any component of a standard obstetric ultrasound in the first trimester?
      i. No
      ii. Yes (Check all that apply.)
         - ☐ Presence of gestational sac
         - ☐ Size of gestational sac
         - ☐ Location of gestational sac
         - ☐ Number of gestational sac(s)
         - ☐ Presence of a yolk sac
         - ☐ Presence of embryo/fetus
           a. If embryo/fetus was present, assessment of cardiac activity by 2-dimensional (2D) video clip or M-mode imaging
         - ☐ Examination of uterus
         - ☐ Examination of cervix (if this was feasible)
         - ☐ Examination of adnexa (if this was feasible)
         - ☐ Examination of cul-de-sac region
         - ☐ Other (specify): _____

Second or third trimester

B. Did you (the observer) note omission of any component of a standard obstetric ultrasound in the second/third trimester?
   i. No
   ii. Yes (Check all that apply.)
      - ☐ Fetal presentation
      - ☐ Amniotic fluid volume
      - ☐ Cardiac activity
      - ☐ Placental location
      - ☐ Fetal biometry
      - ☐ Fetal number
      - ☐ Anatomic survey
      - ☐ Maternal cervix
      - ☐ Maternal adnexa
      - ☐ Other (specify): _____

4. **Did the provider adhere to appropriate settings for thermal index and mechanical index?**
   A. No
   B. Yes

5. **What image optimization capability is used by providers? (Check all that apply.)**
   - ☐ Acoustic power
   - ☐ Overall gain
   - ☐ Time gain compensation (TGC)
   - ☐ Depth
   - ☐ Zoom
   - ☐ Focal zones
   - ☐ Mechanical index displayed on image
   - ☐ Thermal index displayed on image
   - ☐ Optimized obstetric presets
   - ☐ N/A

6. **About how long was the obstetric ultrasound exam (minutes)? [Number field]**

7. **Did you (the observer) note any possible errors in obtaining the correct planes for this exam?**
   A. No
   B. Yes (specify): _____

8. **Did you note any possible errors in obtaining the correct images and/or identification of structures for this exam?**
   A. No
   B. Yes (specify): _____

9. **Did you note any possible errors in the use of equipment?**
   A. No
   B. Yes (specify): _____

10. **Was the scan interpreted by the person who performed it?**
    A. No (specify): _____
    B. Yes

11. Did you note any possible errors in generation of the report?

A. No
B. Yes
C. Not sure
D. Not able to assess

COMMENTS:

4. Equipment and Environment of Care Assessment

Participant Consent

Before the equipment/environment assessment, all assessment participants should provide **consent** (verbal or written, as permitted by relevant ethics approval) for participation after being read a standard consent script. An example script for providers is included before the first assessment tool.

Equipment/Environment Assessment Tool

1. **How many ultrasound machines are there? [Number field]**
2. **Number the first machine (answer all of the following questions for each machine).**
   A. Take photos of the machine and transducers (up to three); photos should not include serial number.

   B. According to the provider, what is the condition of this ultrasound system? **Note:** A "partially functional" system means that it is able to perform exams, but there may be some minor problems (e.g., image quality may be suboptimal; a transducer's crystal is not functioning, but the dropout is lateral and does not interfere significantly with imaging; etc.)
      i. Fully functional
      ii. Partially functional
      iii. Not functional
      iv. Functionality not evaluated

   C. Make and model: [Text field]
3. **How many transducers are there? [Number field]**
4. **Number the first transducer (answer all of the following questions for each transducer).**
   A. Take a photo of the transducer.

   B. What type is this transducer?
      i. Transabdominal
      ii. Transvaginal
      iii. Linear
      iv. 3-dimensionsal (3D)/4-dimensional (4D)
      v. Other (specify): _____

   C. What is the transducer's frequency range?
      i. Fill in number and check megahertz (MHz) or Pen/Res/Gen [Number and text fields]

   D. What is the transducer's functionality?
      i. Fully functional
      ii. Partially functional
      iii. Not functional

E. Is this machine currently under a manufacturer's warranty?
   i. No
   ii. Yes
   iii. Don't know

F. If the warranty has expired, is this machine covered by a service contract?
   i. No
   ii. Yes
   iii. Don't know

G. Is there access to a repair service (engineer) to repair this machine?
   i. No
   ii. Yes
   iii. Don't know

H. Does this machine have any signs of problems with electrical and/or mechanical safety?
   i. No
   ii. Yes (Check all that apply.)
      ☐ Frayed cable(s)
      ☐ Damaged monitor
      ☐ Other (specify): _____
   iii. N/A

I. What image optimization capability is present? (Check all that apply.)
   ☐ Acoustic power
   ☐ Overall gain
   ☐ Time gain compensation (TGC)
   ☐ Depth
   ☐ Zoom
   ☐ Focal zones
   ☐ Mechanical index displayed on image
   ☐ Thermal index displayed on image
   ☐ Optimized obstetric presets
   ☐ N/A

J. What is the overall image quality?
   i. Good
   ii. Average
   iii. Poor
   iv. N/A

K. What imaging modes are available? (Check all that apply.)
   ☐ B-mode
   ☐ M-mode
   ☐ Color Doppler
   ☐ Power Doppler
   ☐ Pulsed-wave (PW) Doppler
   ☐ 3D/4D
   ☐ N/A

L. Are image storage and/or sharing methods available for this machine?
   i. No
   ii. Yes (Check all that apply.)
      ☐ Thermal paper
      ☐ USB device
      ☐ CD/DVD
      ☐ Picture Archiving and Communications System (PACS)
      ☐ Remote over cell, email, Trice imaging, etc.
      ☐ Other (specify): _____
   iii. N/A

M. Are images stored?
   i. No
   ii. Yes
      a. How long do images remain on system before deleting them? [Text field]
      b. Other (specify): _____
   iii. N/A

N. Can this system electronically transfer reports or images directly to the Internet for remote reading?
   i. No
   ii. Yes
   iii. N/A

O. How is the transducer cleaned?
   i. Soap and/or water
   ii. Alcohol-based spray
   iii. Disinfectant wipes
   iv. Soak in a liquid high-level disinfectant
   v. Not cleaned routinely between clients
   vi. Other (specify): _____

P. Are transvaginal transducer covers used (e.g., condom, glove, etc.)?
   i. No (why not?): _____
   ii. Yes
   iii. N/A

Q. What type of coupling agent (e.g., gel) is used?
   i. Ultrasound gel
   ii. Mineral oil
   iii. Other (specify): _____

5. Was the team able to make some assessment of power supply?

A. No
B. Yes
   i. Are all machines protected with an electrical stabilizer?
      a. No
      b. Yes
   ii. Is a generator available for backup power supply?
      a. No
      b. Yes

iii. How frequently does an interruption in the power supply impact the ability to provide client services?
    a. About daily
    b. About weekly
    c. About monthly
    d. Less frequently than monthly
iv. Is solar power available?
    a. No
    b. Yes

6. Is an Internet connection available?

A. No
B. Yes

7. Are ultrasound reports generated?

A. No
B. Yes
    i. What type of report is generated (collect or photograph a blank report if available)?
        a. Handwritten paper report summarizing results
        b. System-generated worksheet
        c. Other (specify): _____
    ii. Is the report archived?
        a. No
        b. Yes
    iii. How is the report archived?
        a. Kept in a system
        b. Backed up to media
        c. Printed out and stored in a facility
        d. Electronic medical record storage
        e. Other (specify): _____
        f. Comment: [Text field]
    iv. Are reports distributed after the exam?
        a. No
        b. Yes (Check all that apply.)
            ☐ Given to client
            ☐ Sent separately to referring provider
            ☐ Other (specify): _____
            ☐ Comment:_____

8. Was team able to assess the environment of care?

A. No
B. Yes
    i. Is there a client bed or table that appears clean and structurally sound?
        a. No
        b. Yes
    ii. Are there measures for privacy available (e.g., private room, dividers, curtains)?
        a. No
        b. Yes

iii. Are any significant safety hazards noted in the environment of care?
   a. No
   b. Yes (Check all that apply.)
      ☐ Biohazards
      ☐ Other (specify): _____
iv. Is the capacity for hand hygiene adequate (e.g., sink or sanitizer in immediate vicinity)?
   a. No
   b. Yes

9. If there was hand hygiene capacity, was it used?

A. No
B. Yes
   i. Is there adequate temperature control (e.g., air conditioning) to prevent systems from overheating?
      a. No
      b. Yes

COMMENTS: