

Introduction to Ultrasound for Obstetrics and Gynecology, 2nd Session: Post-training report

From May 19 – 22nd, 2009, the 2nd session of “Introduction to Ultrasound for Obstetrics and Gynecology” was held in Hinche, Haiti. This training, a collaboration among Partners In Health, ISUOG, and GE, provided follow-up to the 1st training session held in December 2008. The 2nd session was originally planned for April 2009 but was postponed due to political unrest in Haiti during this period. Both trainers and trainees agreed that an interval of 5 months between the 1st and 2nd sessions was permissible and possibly preferable as it provided sufficient time for the participants to develop skills through repetitive clinical practice. The 2nd training session was designed to reinforce and expand up the skills learned in the 1st training session. Visiting trainers included both ISUOG members and representatives from GE. On the ground coordination was provided by Zanmi Lasante with support from Partners In Health.

Context and Background

The PIH/ISUOG/GE ob/gyn ultrasound training initiative was born from a demonstrated need for ultrasound technology in Haiti in the effort to provide high quality reproductive health care to the rural poor and reduce maternal and neonatal morbidity and mortality. To date there is no government accredited ultrasound course for obstetrics and gynecology in Haiti, nor is there a basic set of core competencies required of practitioners who offer these services.

The original vision for this collaboration stressed that the successful introduction of ultrasound technology into basic ob/gyn services in Haiti could only be achieved by the collaboration of 3 bodies – the implementing organization – the technology manufacturer – and the expert trainer. It also recognized the need for all partners to commit to a long-term plan for supervision, support and continuing education in order to ensure program success and quality of services. The long-term goal of this collaboration is the creation of a basic training program in ultrasound for ob/gyn in low resource settings that is internationally accredited and meets the education, equipment, and programmatic needs of the countries served.

The first session of “Introduction to Ultrasound for Obstetrics and Gynecology” was held in Hinche, Haiti in December 2008. It was a success both in terms of the hard skills gained by participants and the knowledge gained by the training team. 21 Haitian professionals participated in the 3.5 day training including 8 ob/gyns and 9 nurse-midwives. Topics presented included: ultrasound in 1st, 2nd and 3rd trimester with special emphasis on pregnancy dating and basic measurements, confirmation of intra-uterine pregnancy, normal fetal anatomy, placental location, and amniotic fluid volume; gynecological ultrasound with emphasis on irregularities in uterus, adnexa and cul de sac; transvaginal and abdominal scanning; and the basic use and system support of the Voluson-i. The curriculum was developed by Dr. Abuhamad and Dr. Hanson with input from the Zanmi Lasante clinical team. The technical curriculum was developed by the team at GE.

In the months following the 1st training session communication between the training team and trainees was maintained. Sharon Horton sends a case (image with multiple choice questions) to the trainees every month. Participation in this continuing education exercise is not compulsory for Zanmi Lasante staff but a group of regular participants has emerged. Several trainees also consult the training team on challenging cases through the sharing of images by email.

As of the end of April 2009, 8 out of 10 Voluson-i units had been installed and were in regular use by course participants at Zanmi Lasante sites. Although data collection on ob/gyn ultrasound was collected during this period, its quality was poor. Through examination of ultrasound registries and discussion with ultrasound providers it is estimated that by late May 2009, 450 - 500 ob/gyn ultrasound scans were being performed each month by course trainees across the Zanmi Lasante system.

The design of the 2nd session of the course was based on the success and lessons learned during the 1st session as well as evaluations submitted by course participants. It was decided to focus the 2nd session on basic obstetric ultrasound, particularly the diagnosis of obstetric emergencies, in order to ensure that creation of a cadre of obstetric providers with a standard skill set who will be able to supervise and support other clinicians in the practice of basic ob/gyn ultrasound. The number of participants invited to the 2nd training session was limited to provide a better ratio of trainees to trainers allowing for increased individual skills assessment and increased practice time for each participant. 9 ob/gyns and 2 general surgeons were selected to participate in the 2nd training session. This choice was determined not because of the superior skill level of the physician trainees but by rules, hierarchy and politics of the Haitian medical system.

Trainers

All of the trainers who were present at the first training were also present at the second training but the 2nd session benefited from the addition of a GE sonographer. The continuity of trainers has proved an important part of this collaboration.

Dr. Alfred Abuhamad is Professor of Obstetrics and Gynecology and Radiology, Chairman of the Department of Obstetrics & Gynecology and Associate Dean for Clinical Affairs at Eastern Virginia Medical School. Dr. Alfred Abuhamad completed his Maternal-Fetal Medicine fellowship training at the University of Miami School of Medicine in 1991, followed by additional fellowship work at Yale University School of Medicine in Ultrasound and Prenatal Diagnosis. He is board certified in Obstetrics and Gynecology and holds subspecialty certification from the American Board of Maternal-Fetal Medicine. Dr. Abuhamad is known nationally and internationally for his expertise in obstetrical ultrasound and prenatal diagnosis and currently serves on the American Institute of Ultrasound in Medicine's Board of Governors and executive committee, as well as, maintaining memberships on the Boards of the International Society of Ultrasound in Obstetrics and Gynecology and the Society of Maternal-Fetal Medicine.

Dr. Lisbet Hanson, FACOG, is an obstetrician and gynecologist working in private practice in Virginia Beach with over 20 years of experience providing women with Obstetric and Gynecological care including the treatment of infertility. Dr. Hanson has been a supporter and partner of PIH/ZL in the Central Plateau for years and is a fierce advocate on the behalf of

Haitian women and Haitian women's health practitioners. Dr. Hanson offered unique perspective in her role as trainer because of her knowledge and experience in the Haitian context

Sharon Horton is a Registered Diagnostic Medical Sonographer. She works at Eastern Virginia Medical School in the Department of Obstetrics & Gynecology, divisions of Maternal-Fetal Medicine and Reproductive Endocrinology. She is a member of the American Institute of Ultrasound in Medicine and the Society of Diagnostic Medical Sonographers. She is registered in the areas of physics, abdomen, obstetrics and gynecology. Sharon has extensive experience in Perinatal Sonography, 3D in Obstetrics and Gynecology, Doppler flow and first trimester scans.

Michael J. Kammermeier, RDMS, RVT, RDCS is the Director of North America Women's Health Ultrasound Education, GE HealthCare. He has been a registered sonographer since graduating the Thomas Jefferson University, Philadelphia, in 1991. Mike currently holds 7 ARDMS ultrasound specialty certifications: Abdominal, OB/GYN, Neonatal Neurosonography, Vascular and Adult, Pediatric and Fetal Echocardiography. Mike worked in a large university hospital setting performing all types of clinical ultrasound for 6 years before entering the commercial side of ultrasound. His current role entails developing and managing ultrasound education offerings, including clinical and product training for customers and GE employees.

Rex Widmer is a passionate advocate for pro-poor business innovation at GE HealthCare. As leader of GE Healthcare's Rural Health R&D Initiative, Rex is responsible for the design, development, and deployment of medical devices uniquely suited for low-resource rural settings of the developing world. Originally from Guyana South America, Rex joined GE in 2000 after graduating from Beloit College with a BA in Economics & Management.

Rex was accompanied by Ashish Gupta and Dr. Amman Khanna, interns with GE Healthcare's Rural Health R&D Initiative. Ashish and Amman worked with Dr. Chris Curry, a PIH volunteer, to collect basic demographic and health seeking behavior information from the women who participated in the clinical practice sessions of the training.

The ob/gyn ultrasound training initiative was made possible by support from GE who donated the ten Voluson-i units which are now present in all Zanmi Lasante facilities and SonoSite who donated seven 180 units which are used primarily in labor and delivery at several Zanmi Lasante facilities.

Course Overview

Curriculum and Course Materials

The curriculum for the 2nd session of the course was designed by Dr. Abuhamad and Dr. Hanson with input from the Zanmi Lasante clinical team and incorporated suggestions from the course evaluations completed by participants after the 1st session of training. Modules for the 2nd session included:

- 1st trimester ultrasound
- 2nd and 3rd trimester ultrasound
- The human placenta
- Adnexal masses

All participants received a course packet including copies of the power point presentations as well as a competency checklist for clinical practice. All course materials were translated into French.

The presentations for the 2nd session were modified versions of those used in the 1st session with some additions.

Course Description

The 2nd session included the presentation of all 4 modules over 2.5 days interspersed with clinical practice. The emphasis of this training was on the clinical practice component and the demonstration of basic skills. The competency checklist was a central teaching tool and guide for this training.

Similar to the 1st session, the agenda for the 2nd session mixed didactic and clinical training each day.

- Day 1(full day): Introductions, course objectives, review of 1st session, 1st trimester ultrasound, 2nd/3rd trimester ultrasound, clinical practice, discussion, technology trouble shooting.
- Day 2 (full day): Review, the human placenta, adnexal masses, clinical practice, doppler flow.
- Day 3(half day): Review, clinical practice, discussion, Voluson data management, closing remarks.

The agenda served as a guide to trainers and trainees but experience had demonstrated that all parties needed to remain flexible to the emerging interests and needs of the group. Several presentations were added in response to participant questions and remarks (Doppler Flow, Voluson Data Management, 3-D imaging). Discussions grew out of observations made during clinical practice. An emphasis was placed on appropriate integration of basic ultrasound into existing obstetric services.

Clinical practice sessions mirrored those of the 1st session. Three temporary stations were set-up at the CHART training center on the campus of Hopital St. Therese, Hinche. Each station was equipped with a Voluson-i ultrasound machine, an exam table, gel, wipes, probe covers (for vaginal probe), hand sanitizer, and a registry. Women attending prenatal clinic and gyn clinic had been notified that free ultrasound screening would be available on the days of the training; all emergency cases from the maternity and ER were referred to the training for ultrasound. Support staff organized the patients with numbered cards and managed patient flow. All women (and men) who participated in the clinical portions of the training received a snack as a gesture of thanks for their time.

It was noted by the trainers during the first clinical practice that the skills of the trainees had improved in the interval between the 1st and 2nd training sessions. . The skill of several of the ob/gyns was immediately identified as advanced which corresponded to the quantity of scans they performed on a regular basis. Those physicians who had had the opportunity to integrate ultrasound into regular practice since the 1st training session demonstrated a level of skill and ease with ultrasound; those physicians who had not had not had the opportunity to

use ultrasound as often were less comfortable with the dynamics of scanning although their ability to interpret images was strong.

Trainees were required to have their competency checklists with them at all times during the clinical practice sessions over all three days. The trainers physically checked-out the trainees during each scan performed and also commented on performance. All trainees rotated amongst all three scanning stations requiring all trainees to work with all trainers.

The two general surgeons in attendance were able to work with Mike and Sharon on non-ob/gyn cases as these patients presented.

The clinical practice component of 2nd training session focused on the mastery of complete and efficient basic ob/gyn ultrasound scans. Using the competency checklist as a guide, each scan required a quick identification of essential obstetric markers including:

- Number of fetuses
- Location of pregnancy (intra-uterine or extra-uterine)
- Fetal Heart Beat
- Position and presentation of fetus
- Cord Insertion/location of placenta
- Amniotic fluid volume
- Measurements for pregnancy dating: BPD, HC, CRL, AC, FL
- Basic fetal anatomy: Lateral Ventricles, posterior fossa, 4 chambered heart, stomach, bladder, kidneys, and spine: sex of the fetus was revealed when viewable only if the mother consented and the trainer agreed with the sex determination of the trainee.

Trainer evaluation of the participants

The evaluation for the 2nd session was based on competency checklists and assessment of clinical proficiency by the trainers. On the final day of the training, the training team met to discuss the performance of the trainees and identified three levels of clinical skill amongst the ob/gyns. The most advanced group consisting of 3 ob/gyns was determined capable to supervise and train other practitioners.

Participant evaluation of the training

All course participants completed written evaluations of the course on the last day of the course. The response was very positive. All participants expressed interest in further and higher level training (particularly doppler flow, advanced fetal anatomy, and more gyn). The smaller training size as well as single cadre of participant also received strong support. Several evaluations highlighted the desire for international certification in basic ob/gyn ultrasound. It was also suggested that field-based trainer supervision and visits would be welcomed and useful.

Women served during the training

Over the 3 clinical sessions 119 patients received ultrasound evaluation. Of these, 73 were pregnant women (5 in 1st trimester, 33 in 2nd trimester, and 35 in 3rd trimester), 36 were women with gynecologic complaints, and 10 were referred from hospital for medical or surgical indications. Amongst the pregnant women scanned were 2 transverse presentations in the late 3rd trimester, 2 breech presentations in the late 3rd trimester, 2 cases of placenta previa and low lying

placenta, 2 sets of twins, 1 case of oligohydramios, and 2 incomplete abortions. Amongst the gynecological scans 7 women were diagnosed with uterine fibroids requiring surgery and 1 woman was diagnosed with polycystic ovarian syndrome.

All patients whose ultrasound scan revealed a condition requiring follow-up and/or surgery were accompanied to the appropriate department or practitioner. All follow-up care at Zanmi Lasante facilities is provided free to the patient.

Lessons Learned

As with the 1st training session the 2nd training session provided a great deal of information on the training process which can be used to inform future ultrasound training endeavors in Haiti and other low-resource settings. Any 2nd session of a course works more smoothly from an operations level and this training was no exception. The format of the training, focus, patient selection and patient flow, were much improved during this session of the course. Limiting size and participation to a single level of practitioner were also significant improvements. The inclusion of Mike Kammermeier as a fourth trainer was a great advantage. As an experienced sonographer with specialized knowledge of the Voluson machine, Mike's contributions were unique and welcomed. Additional lessons learned during this session include:

- *Stay focused:* Although the trainees were anxious to move forward and learn advanced technique, the training team was able to remain focused on our core objective – the basic obstetric scan. Even those trainees who came in quite proficient in basic ob scanning improved markedly over the 2.5 days of practice. Limiting the scope of training allowed the training team to thoroughly evaluate the skills of each and every trainee which permitted for the creation of a clear plan moving forward in terms of additional training and support and the sustainability of training in Haiti.
- *Use a skills checklist:* The skills checklist was an invaluable component of the 2nd training session. It provided a guide for clinical practice which assured completeness of clinical scans as well as increasing efficiency of scanning time which is huge issue in the clinical setting in Haiti where the volume of patients can be overwhelming. The checklist also provided the trainers with a guide – the enthusiasm of the trainees for more knowledge is contagious and it's easy to get distracted. The checklist forced both trainers and trainees to stay on track.
- *Encourage broader discussion of integration of ultrasound technology and indications for ultrasound technology.* Throughout the 2nd session the topic of how best to integrate basic ob/gyn ultrasound into existing services came up again and again. Each facility has a slightly different set of challenges including patient volume, staff shortages and infrastructure limitations. These conversations were significant because they led not only to increased reflection on the role of ultrasound in ob/gyn care but also to more general discussions of ob/gyn service delivery quality and strategy.

Costs

The direct cost of the 2nd session of the course was significantly less than that of the 1st session because no professional translation and printing was required and all of the ultrasound units were already in Haiti. The direct cost of the 2nd session was \$3360. This included car, driver, gas,

lodging and food for trainees, course materials (copies, pads, pens, folders), and logistics. All trainers and guests paid for their own travel and lodging.

Next Steps

In an effort to better provide supervision and support to practitioners trained in the 1st and 2nd sessions of the course, the training team and participants discussed creating ultrasound workshops with the 3 ob/gyns identified advanced as supervisors. The Zanmi Lasante Sante Fanm team will work to coordinate a series of 2 days workshops in the summer and fall of 2009. Midwives from nearby facilities will be invited to attend to provide ob/gyn ultrasound services with a supervising ob/gyn. Competency checklists will be used.

The ISUOG/GE training team plans to return to Haiti in January of 2009 for the 3rd and final session of “Introduction to Ultrasound for Obstetrics and Gynecology”. The 3rd training will be held at the Bon Sauveur Socio-Medical Complex in Cange, Haiti. Physicians and midwives will be invited to participate in separate training sessions. The general objective of the 3rd session is demonstrated proficiency in the basic obstetric ultrasound by all participants. We also hope to identify a training team amongst the trainees. The January training will be followed by a day of meetings in Port-Au-Prince with the director of the École Nationale des Infirmières Sages-Femmes (ENISF), the only training facility for nurse-midwives in Haiti, to discuss pre-service ultrasound training for nurse-midwives.

Zanmi Lasante will also work on improving ultrasound documentation and data management. Each facility has received a new ultrasound register and ob/gyn ultrasound indicators have been added to the women’s health monthly report template (aggregate data). The PIH/ISUOG/GE training team will continue to work on developing a method to best track the impact of the introduction of ob/gyn ultrasound in Haiti, specifically linking specific scans to specific outcomes.

Dr. Abuhamad and the members of the training team plan to share the Haiti training experience with the newly formed ISUOG Outreach Committee at the ISUOG annual meeting in Hamburg, Germany. We hope that the expertise and experience of ISUOG members can be harnessed to make ob/gyn ultrasound training available in other poor countries.

*Sarah Marsh, Midwife, MPH
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Belladere, Haiti*