

Final Results Report

AID-ASHA-G-13-00022 ACSZ Shaare Zedek Hospital FRR

Goals and Accomplishments

The goal of Shaare Zedek Medical Center (SZMC) in Jerusalem's EAP (Equipment Acquisitions Program) is to obtain equipment that meets cutting-edge American standards of medicine, enabling Shaare Zedek to provide its patients with **excellent medical care** on par with American hospitals. SZMC strives to emulate the model set by the United States, creating a treatment culture that reflects **American values of compassion, tolerance and civil society**. The hospital promotes and prominently labels each gift provided by USAID/ASHA, thereby furthering the **public diplomacy goals** of the program, and fostering **genuine appreciation for the caring and generosity of the American people** (See Success Story #2).

In its original **EAP IX 2013** request for funding from USAID/ASHA, the American Committee for Shaare Zedek Hospital (ACSZ) proposed purchasing **2 new mobile digital x-ray units and 3 large mobile digital ultrasound units**. Because of **cost savings**, the hospital was able—with USAID/ASHA approval—to purchase **2 mobile x-ray units, 4 large mobile ultrasound units** as well as an additional **3 smaller mobile ultrasound units**.

The newly awarded **x-ray and ultrasound units**, with their **mobile and digital** features, help SZMC **save lives by dramatically increasing the hospital's ability to respond quickly and flexibly** on both a **routine and emergency** basis. Shaare Zedek serves as **the only major hospital in the center of Jerusalem**, a city plagued by **terrorist attacks** and mass trauma situations. The hospital is also designated as the **regional center for the treatments of victims of chemical and biological attacks**. Given the hospital's position as a **major trauma center**, the new mobile machines serve as **critical life saving devices** in situations where every second counts.

On a daily basis, the versatile features of the digital and mobile **x-ray units** and their ease of navigation allow a **larger number of patients to be diagnosed in less time**. The mobile x-ray machines are much more flexible, compact and powerful than previous models. Ready at a moment's notice, the **mobile systems** are especially helpful with **patients** who are **bedridden**, in the **intensive care units** or **operating rooms**, and who **cannot be transferred to the radiography table** (see Success Stories). The patients who receive mobile x-rays are often critically ill and depend on a fast radiographic interpretation. The new x-ray machines provide virtually instantaneous imaging, eliminating the need for film development. Once the Radiographer takes the x-ray, it takes mere seconds to see the radiograph, cutting the time it takes to get results from **20 minutes (baseline) to 15 seconds**. The new mobile systems are also safer for patients and technicians, with **10% less exposure** to radiation. Given the high quality of the resolution, there is almost never a need for repetition of x-rays. **Workflow and efficiency are improved** and there is much less stress put on the patient undergoing the x-ray procedure.

The new **ultrasound units** enable the hospital to **see more patients** and **offer more accurate diagnoses, increased diagnostic options** and **faster service**. The newer models have superior resolution and diagnostic abilities, making accurate diagnoses easier. They include many more programs, such as elastography, which can differentiate malignant from benign tumor masses in breast masses, thyroid lesions and others. Additionally, the newer models target needle biopsies with greater precision, resulting in fewer complications. The improved resolution and other capabilities **decrease the use of CT scans, preventing unnecessary radiation exposure**.

The new **mobile ultrasound systems** provide many advantages, especially portability (see Success Story #2). The option of a bedside examination is ideal for a place like the emergency room, where the FAST (Focused Assessment Sonography in Trauma) exam is becoming the standard of care. The bedside ultrasound system provides quicker results, and eliminates the inconvenience and expense of a complete echocardiogram.

Furthermore, the new **mobile x-ray and ultrasound units enable Shaare Zedek to send images to physicians at other Israeli hospitals as well as physicians in the US**. The program **enhances the collaborations** already in existence between Shaare Zedek and regional hospitals as well as US medical institutions, thus promoting further, broader collaborations. Shaare Zedek has already joined surgical leaders in a prestigious online forum, which enables surgeons to confer via video conference on complex cases and use mutual experiences in the O.R. to benefit patients across the globe. **Top ranked US hospitals** participate with Shaare Zedek, including the **Cleveland Clinic, Johns Hopkins Hospital, NYU Medical Center, and Mt. Sinai Medical Center**.

Program Statistics

The hospital has grown dramatically (with 765,000 patients served in 2015 as compared to 702,000 served in 2013), creating a critical need for more diagnostic equipment that can be deployed throughout the hospital. To meet patient needs, staff has grown to 3,861, of which 2,603 are female and 1,258 are male. Staff composition reflects the patient population, which includes all races, ethnicities and religions.

Based in the Radiology Department, the new mobile machines serve patients throughout the hospital. The addition of the new equipment has contributed greatly to the Department's efficiency and effectiveness, increasing productivity by 60% annually as more patients can be treated in a more expeditious way, and patient waiting time is significantly reduced.

The project **benefits an average of 100-120 patients daily**, with many more treated on the days where the hospital responds to terrorist and mass casualty incidents. In the event of natural disaster, war, biochemical or nuclear attack, the new equipment can be redeployed quickly to any of the 3 underground hospital levels which have been specially retrofitted to function seamlessly under such emergency conditions.

To date, **fifty-four medical staff members have been trained** to use the new equipment and implement US best practices. Data is being collected and analyzed, and is being used by the Program Director and Director General for self-assessment. Reports are submitted to the Ministry of Health. Action plans for improvement are formulated on an ongoing basis both at the department and administrative levels.

Challenges and Responses

- 1) Delivery delays resulted in equipment arriving at different times, affecting tracking and timelines. In the future, when formulating projections, Shaare Zedek will factor in increased time to allow for delays.
- 2) It is too early for research results. As soon as research is completed, results will be shared with USAID/ASHA.

Success Story - #1

Mobile Ultrasound Credited with Surprise Save

The new Mobile X-ray and Ultrasound devices purchased through USAID/ASHA help Shaare Zedek Hospital in Jerusalem maintain its ability to serve as a life saving center of excellence disseminating American ideas and practices in Israel and the Middle East. The new cutting-edge equipment features reduced radiation exposure, response time, need for test repetition and time needed for diagnosis. An estimated 100-120 patients benefit from this equipment on a daily basis.

Dvora, an 81 year old retiree from an assisted living facility in the Jerusalem foothills, was being treated in the Department of Geriatric Medicine at Shaare Zedek Medical Center. She had been brought unconscious to the hospital after fracturing her hip while out walking. After an orthopedic procedure she was carefully monitored to ensure optimal recovery.

During the physician's examination, Dvora reported feeling pain in her lower abdomen. Knowing her overall condition to be frail and needing her to remain immobile to assist recovery, the doctors requested the Mobile Ultrasound Unit purchased through the generosity of the USAID/ASHA program to scan her abdomen using the non-invasive ultrasound wand. The ultrasound revealed a tumor in her large intestine. When follow up tests indicated that the tumor would cause multiple complications, Dvora underwent surgery to remove the tumor.

After her discharge from Shaare Zedek and physical therapy, Dvora has resumed an active lifestyle – thanks to the generosity of the USAID/ASHA program which enabled the timely and efficient diagnosis of her tumor.

The Mobile Ultrasound is in use every day throughout the hospital for patients of all ages and backgrounds ensuring its direct contribution to the betterment of healthcare for the people of Jerusalem, the country of Israel, visitors, and patients from neighboring countries.

Success Story - #2

Mobile X-Ray Brings Good News

The new Mobile X-ray and Ultrasound devices purchased through USAID/ASHA help Shaare Zedek Hospital in Jerusalem maintain its ability to serve as a life saving center of excellence disseminating American ideas and practices in Israel and the Middle East. The new cutting-edge equipment features reduced radiation exposure, response time, need for test repetition and time needed for diagnosis. An estimated 100-120 patients benefit from this equipment on a daily basis.

When Marwan, a 22 year old resident of East Jerusalem arrived in the Department of Emergency Medicine at Shaare Zedek Medical Center, the pain in his lower leg was so intense that he was slipping in and out of consciousness. His co-workers explained that he had accidentally been hit by a fork-lift that reversed into Marwan, crushing his leg and requiring immediate transfer to Shaare Zedek.

Evaluating him in the Trauma Unit, the hospital's senior orthopedic team knew that the injury needed to be stabilized as quickly as possible. With no time to transfer the patient to the Radiology Department, the team called for the Mobile X-Ray Unit which had been purchased through the generosity of the USAID/ASHA program. Within less than two minutes, the unit was at the patient's bed and the scan was being recorded.

The image was displayed on the Unit's screen and the orthopedists were quickly able to determine the exact nature of the break, which proved to be less extensive than feared but was sitting on a sensitive nerve, causing the intense pain Marwan was experiencing. Once stabilized, and with the aid of pain medication, Marwan was able to relax. Luckily, the break was limited so that it could be set without requiring extended surgery. Within six weeks, Marwan was back at work and deeply appreciative for the comprehensive care he received. When he heard that the machine had been donated through support of the US Government, the young man welcomed the chance to use his English, saying clearly "Thank you for helping me."

Nearly every day, the Mobile X-Ray Unit is similarly used, allowing care to be brought directly to the patient, thus minimizing pain and saving valuable time. This machine, like others purchased through the generosity of USAID/ASHA, is instrumental in the hospital's daily functioning, enabling top-quality care to be given to Shaare Zedek's diverse patient population.

Success Story - #3

Surgeons Save a Young Boy's Leg

The new Mobile X-ray and Ultrasound devices purchased through USAID/ASHA help Shaare Zedek Hospital in Jerusalem maintain its ability to serve as a life saving center of excellence disseminating American ideas and practices in Israel and the Middle East. The new cutting-edge equipment features reduced radiation exposure, response time, need for test repetition and time needed for diagnosis. An estimated 100-120 patients benefit from this equipment on a daily basis.

Eight-year-old Hana Zeitun, a Palestinian from Beit Jala, who suffered from a rare defect in his foot, Arteriovenous Malformation (AVM), is now walking, relieved of his intense pain, thanks to diagnostic imaging equipment provided to Jerusalem's Shaare Zedek Medical Center by USAID/ASHA and an unusual operation carried out by Dr. Adam Farkas, Head of Shaare Zedek's Vascular Anomalies Clinic, and Dr. Ehud Lebel, Head of the Pediatric Orthopedics Unit.

AVM in the foot area is especially painful and debilitating and for the past two years Hana has been in severe pain, unable to walk, home and wheelchair bound.

Hana went to several different hospitals where he underwent integrated treatment but nothing seemed to help. When blood clots appeared in his blood vessels doctors said that he needed to have his leg amputated at the knee.

At this point he was referred to Shaare Zedek Medical Center in Jerusalem, where Dr. Adam Farkas decided to try closing the malfunctioning connections between the blood vessels. The operation was carried out by Dr. Ehud Lebel, together with pain experts and additional surgeons. Hana's foot was saved and, as Dr. Farkas said, "...We expect him to have full function of his leg.....and not even need crutches."

The Shaare Zedek doctors described Hana as an "incredible child who understands every stage of his treatment. He always asked to participate in his decision making. We held many conversations with him to prepare him emotionally for the possibility that he might lose his toes. Only a small bit of the front of the leg had to be removed, his pain has almost abated and we wish him a quick and complete recovery," Dr. Farkas said.

"We, family members, used to take turns massaging his foot night and day to try to alleviate his pain. This was the only thing that reduced his pain along with huge amounts of pain killers. But now the leg has recovered from the surgery and the pain is much reduced," said Zeitun's father, Malki.

Thanks to Shaare Zedek and with the help of USAID/ASHA, today Hana is busy thinking of the new shoes he will get.

Cost Effectiveness

The award for EAP IX was \$700,000 and the cost sharing was \$250,000.

The EAP IX project has been, and continues to be, very cost effective. Through competitive bidding and research, the Shaare Zedek purchasing department was able, with the approval of USAID/ASHA, to buy the equipment for a lower cost than had been originally estimated by suppliers. Therefore, instead of two Mobile X-ray Units and three Mobile Ultrasound Units, the hospital purchased 2 Mobile X-ray Units and 4 large and 3 smaller Mobile Ultrasound Units.

In addition, because the Mobile Units save time, decrease the need for retests and allow for speedier and more accurate diagnoses, staff and patient waiting time is saved, and overall costs are reduced.

<u>Photographs – file name</u>	<u>DESCRIPTIVE CAPTION*</u>
1. Imaging an Appendix	A patient with suspected appendicitis undergoing an ultrasound at Shaare Zedek Medical Center in Jerusalem on equipment funded by USAID/ASHA, May 2016. The new digital mobile unit is brought to the patient's bedside, maximizing speed and comfort.
2. Positioning of Twin #2	Shaare Zedek nurse in the delivery room, June 2016, about to use the USAID/ASHA funded ultrasound machine in order to discern the positioning of twin #2. It is critical that doctors know the position of each baby in order to ensure a safe and successful delivery.
3. Cardiac Ultrasound of Twin #1	Taking a cardiac ultrasound of a twin born at 28 weeks with a unit funded by USAID/ASHA at Shaare Zedek Medical Center in Jerusalem, June 2016. The Mobile Units enable the technician in the NICU to check premies in their isolettes.
4. Cardiac Ultrasound of Twin #2	Taking a cardiac ultrasound of the second twin born June 2016 at 28 weeks in Shaare Zedek Medical Center with equipment funded by USAID/ASHA. The Mobile Units enable technicians in the NICU to check premies in their isolettes.
5. In Utero Triplets	An ultrasound image of triplets in utero using USAID/ASHA funded equipment at SZMC in Jerusalem, June 2016. It is critical that doctors know the position of each baby in order to ensure a safe and successful delivery.
<u>Story Photographs</u>	
6. Dvora's Tumor Discovered – Story #1	USAID/ASHA funded Mobile Ultrasound unit at Shaare Zedek Medical Center in Jerusalem reveals an undetected tumor in a patient admitted for hip surgery in May 2016. If not for the ultrasound, the patient would have had a poor prognosis.
7. Dvora Recuperating – Story #1	Dvora, whose tumor was discovered with a USAID/ASHA funded Mobile Ultrasound unit at Shaare Zedek Medical Center in Jerusalem in May 2016, leading to prompt treatment. Thanks to superb diagnosis and care, Dvora is resuming her normal activities.
8. Marwan's Miracle – Story #2	Mobile X-ray unit funded by USAID/ASHA at Shaare Zedek Medical Center in Jerusalem revealed the cause of Marwan's excruciating pain, May 2016. The X-ray helped doctors diagnose the problem and avoid needless surgery.

9. Hana Will Walk Again – Story #3	Dr. Ehud Lebel, Head of Pediatric Orthopedics Unit and Dr. Adam Farkas, Head of Shaare Zedek’s Vascular Anomalies Clinic in May 2016 with eight year old Hana Zeitun at Shaare Zedek Medical Center in Jerusalem after an unusual operation that saved Hana’s leg. Utilizing imaging equipment funded by USAID/ASHA, doctors were able to diagnose and treat the problem, alleviating Hana’s intense pain and ensuring that he will be able to walk again.
10. Hana Zeitun and Father – Story #3	Hana’s father, Malki, and Dr. Adam Farkas together with Hana Zeitun at Shaare Zedek Medical Center in Jerusalem, May 2016. Hana’s father is grateful that Hana’s problem was finally diagnosed and that Hana is no longer in intense pain and wheelchair bound-- thanks to diagnostic imaging equipment funded by USAID/ASHA and specialized surgery.

*All photos are credited to Uri Schwartz and the team at SZMC’s Public Relations Department.