



**Engineering World Health Summer Institute  
Guatemala 2019  
Final Report**

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## Executive Summary

The 2019 EWH January Institute in Guatemala, our fifth year holding this program, was a great success. This year the program was held in partnership with only Rochester Institute of Technology; George Mason University will be re-joining the program next year. We had 10 participants: 6 male and 4 female, all undergraduates, 9 from Rochester Institute of Technology and 1 from Catholic University of America.

Unlike our longer Summer Institutes, participants in these programs take a semester-long course at their home university to prepare for the repair work on the program. Upon arriving in Guatemala, the participants spend the first week of the program in intensive language, cultural, and technical trainings conducted in Quetzaltenango. The participants stay in homestays during this time. To provide more cultural immersion, the group went on an excursion to Lake Atitlan while on the program. After their first week of training, the participants traveled to their hospital placements.

**The participants were placed in 3 hospitals throughout Guatemala. Collectively, they repaired 69 pieces of equipment. Equipment ranged in complexity from microscopes to anesthesia machines.**

One notable, high impact repair moment was when our students were working in the operating room of their hospital. They said that nearly every piece of equipment they fixed was put to immediate use within the OR.

In summary, the Guatemala program was highly productive and made a genuine contribution to health care delivery in the hospitals served.

## Types of Medical Equipment Repair

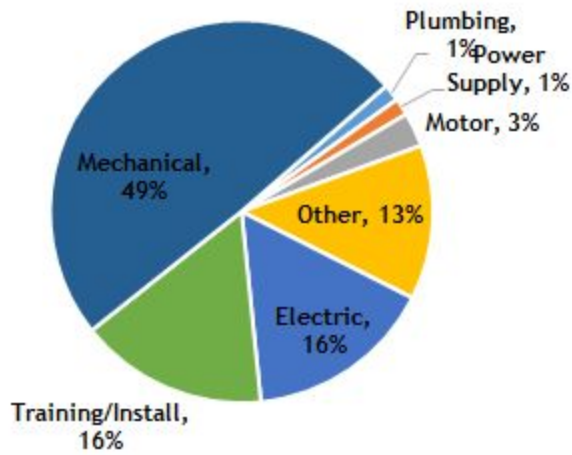
The 10 participants repaired or completed preventative maintenance on 69 pieces of medical and hospital equipment, totaling approximately USD \$138,000 [1] of equipment repair service.

### Repairs/Maintenance by Type of Equipment

Type of Equipment	Total Pieces	Type of Equipment	Total Pieces
Anesthesia Machine	2	Microscope	1
Aspirator/Suction Machine	3	Nebulizer	2
Bed, delivery	11	Operating Table	1
Blood Pressure Device, Automatic	5	Pulse Oximeter	3
Blood Pressure Device, Manual	5	Scale (laboratory and in wards)	2
Centrifuge (electric or hand operated)	1	Stethoscope	1
ECG	1	Television	1
Electrosurgery Machine*	2	Thermometers	1
Furniture	7	Ultrasound machine (imaging)	2
Incubator (infant)	1	Ventilator	1
Infant Warmer (Radiant or other)	1	X-Ray Film View Box	1
Lamp, surgical	1	Other	13

\*User training and/or low voltage and peripherals repairs only

Percentage Breakdown of Repairs by Type of Fix  
2019 January Institute, Guatemala



## Secondary Projects

Each team is encouraged to complete a secondary project for their hospital during their placement. Through interviews with hospital staff, the participants identify a need in the hospital and find a creative way to meet that need.

### Hospital 1

This group painted tires in the playground in front of the clinic. A previous group had installed the tires to make a “tractor,” so this group decided to add the paint to make it look like a tractor. A previous group had also installed tires under the monkey bars to provide added cushion, so this group painted the tires as a rainbow.



They also added a play area with frogs made out of tires. They bolted them together and primed the tires with white paint then painted them green. They then cut out circles from contact paper and painted them to make eyes. They used silicone to attach the eyes to the tire.



## Hospital 2

The 2018 Summer Institute group made a tire swing as their secondary project, but it had fallen down. This group put the tire swing back up with chains and rope, then used the extra rope to add a double-dutch area to the hospital playground.



## Participant Debriefs and Feedback

Engineering World Health seeks not only to assist the hospitals in which our participant volunteers work, but also to influence the volunteers' own development as engineers and as global citizens. Our participant feedback was very positive. When asked if they would recommend the program, all participants answered "yes." Some of the words used to describe the program were worthwhile, inspiring, reflective, educational, and humbling. The On-the-Ground-Coordinators received excellent feedback. One participant described his work in the hospital as "truly life changing" and many participants reflected that they felt they had many big accomplishments over the short time of the program. One student stated "[this program] gave me hands on experience that is hard to find in the United States." Another said "The most valuable part of the trip was learning how wrong someone can be about something. When I first was thinking about the trip, I expected to be in a desert, in an adobe hut with little access to water. When I arrived, I was greeted with a city much like the ones in the US with a developed electrical and plumbing system. I learned quickly that the difference between the US and Guatemala was not found in appearance, but in accessibility...As I sat on the plane on the way home, I began to think about everything I came into Guatemala thinking and realized quickly that 95% of it was wrong and the last 5% was still up in the air."

## Acknowledgements

The On-the-Ground-Coordinators were Paul Kline and Thomas Ryan. Language and cultural training were provided by Do Guatemala. Thank you to Juan Mario for providing additional support to our participants while they were working in the hospitals.

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[1] EWH estimates the mean value of each repair at USD\$2000