



engineering**worldhealth**

ACTIVITIES FOR EWH CHAPTERS

Starting and Operating an EWH Chapter

Our Mission is to inspire, educate, and empower the biomedical community to improve health care delivery in the developing world.

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Engineering World Health

Chapter Overview

Engineering World Health Chapters enable students to contribute to the mission of EWH. Chapter members learn about health care challenges unique to the developing world and apply their technical skills to support improvements. More specifically, EWH Chapters provide members with enhanced opportunities to participate in EWH activities, such as traveling to developing countries to work in hospitals, designing novel medical technologies appropriate for resource-poor settings, and repairing medical devices for use in developing countries.

EWH Chapter members have the opportunity to:

- **Design novel technology** – Each year EWH sponsors a design competition for Chapters which focuses on developing technology for low-resource settings. The EWH Projects That Matter list is a good starting point. EWH can provide design advice as the project advances.
- **Teach STEM curricula to K-12 students** – Many Chapter members volunteer with elementary, middle, and high school students to introduce them to STEM education and careers, as well as the challenges STEM fields can help solve. EWH provides free activities on our website and can connect Chapters with local schools.
- **Build EWH Kits** – A great activity to start your chapter, Kit building sharpens technical engineering skills and brings Chapter members together. Finished Kits can be returned to EWH and used for our BMET training programs in countries like Cambodia and Nigeria.
- **Evaluate and Repair Equipment** – Chapters can partner with local hospitals and non-profits to evaluate and repair medical equipment before it is donated to the developing world.

We describe these activities in more detail below. Core activities set EWH Chapters apart from other campus groups. There are many other activities that your Chapter can host: we encourage creativity and find that Chapters are always coming up with new and exciting ways to achieve EWH's goals.

EWH Chapters may be organized in one of two ways: as a university-funded Chapter or as a student-funded Chapter. These are described in detail below.

For a university-funded Chapter, the university or department pays annual fee for the Chapter affiliation, which includes the benefit of unlimited student members, 11 t-shirts, and a \$200 reduction in the registration fee for the EWH Design Competition. In 2014, fees for a university-funded Chapter affiliation are \$600.

The second way to form a Chapter requires a minimum of three students who become affiliates by paying fees of \$35 each per year. More details on student affiliation are on the next page.



Engineering World Health

How to Start and Operate an EWH Chapter

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To form an EWH Chapter, university students need to:

- Find core members of whom at least three will pay \$35 in fees to become EWH affiliates or discuss becoming a university-funded Chapter with your department. Visit: [the EWH website](#) - for more details.
- Find a faculty advisor.
- Appoint a president, vice-president and treasurer (all of whom should be EWH affiliates).
- Submit a Chapter Agreement and pay affiliation fees through our website. ([see Start or Renew a Chapter](#)) We can also send an invoice if preferred. Hold a general interest meeting and submit a Chapter Roster ([see Start or Renew a Chapter](#))
- Plan activities for the first semester or first year.

Find core members:

The first step is to find a core group of people to become members of the EWH Chapter—people who are willing to become the leaders of something new on campus while having some fun. You need a minimum of three people willing to pay the \$35 affiliation fees. Ask the faculty if they know of any students who might be interested, or ask if they will announce an organizing meeting in their classes. Talk to the leaders of other engineering student organizations like BMES and IEEE.

If you are having trouble getting the core membership together, you may want to run a trial activity. Often the best way to get people interested in your organization is to let them get a taste of its potential. A first activity could include a short presentation about biomedical engineering and developing countries (EWH can help by providing some PowerPoint slides for this, or possibly a speaker), followed by an activity. Choose something easy, fun and connected to the EWH mission, perhaps an EWH Kit build. You can contact EWH about purchasing Kits to build, educational medical devices designed by EWH (* to be used for educational purposes only.) With a handful of fliers posted around the university, you will usually get enough attendance to find four or five other students who share your enthusiasm for improving the quality of health care in developing countries.

Your Chapter may have members who are not EWH affiliates, but we encourage all of your members to become affiliated. If you can persuade your university or department to pay the EWH University Chapter affiliation fees, this kind of membership includes an unlimited number of students who may participate, plus additional benefits ([see the EWH website](#).)

Find a faculty advisor

Gaining the support and commitment of a faculty advisor is essential to success. You must have a faculty advisor to be recognized as an official EWH Chapter. He or she can help you secure space for meetings and activities, solve problems, and interact with your school's administration. He or she may also help you raise funds from your department or university. Try to select an advisor with whom you have had contact and who you believe will be interested in helping developing countries.

Appoint Chapter Officers

Your Chapter must have a minimum of three officers: President, Vice President, and Treasurer. Here's a simple summary of the duties of each officer:

- **President** - interacts with the school administration, EWH headquarters, and any outside organizations the Chapter may wish to work with. Plans and organizes Chapter meetings and events with help from the other Chapter members.
- **Vice President** - assists the president in his or her duties and acts as the leader of the Chapter in situations where the president is unavailable.
- **Treasurer** - keeps track of the Chapter's finances and raises funds to support Chapter activities. The treasurer may wish to form a Fundraising Committee to assist in these efforts.

The Chapter may have additional officers: some Chapters have appointed secretaries, webmasters, or fundraisers. With a Chapter that is just becoming established, it is often easier for the core group of EWH affiliates to decide among themselves who will fulfill each role. If you have a larger membership forming, you may decide to hold elections for each officer position. Regardless, we suggest Chapters hold elections for officers after their first year. Keep in mind that all Chapter officers should be fee-paying EWH affiliates.

Submit Chapter Forms

The two forms you need to fill out to become officially recognized as a Chapter by EWH are available [on the website](#).

- The Chapter Agreement spells out the relationship between your Chapter and EWH headquarters, lists the benefits provided to Chapters in good standing, and outlines the actions a Chapter must take to remain in good standing. This agreement can be submitted online by a Chapter officer or advisor.
- The Chapter Roster lists the Chapter members who have decided to become fee-paying EWH affiliates, including at minimum, the president, vice president, and treasurer. We also request contact information for the faculty advisor and each EWH affiliate in your Chapter. If you are a university-funded Chapter, list the t-shirt sizes for 10 members and the advisor; also, include the mailing address for the Chapter. We will mail the shirts, along with the text book and a sample Kit, once the roster has been submitted.

Pay your fees to EWH

You can pay Chapter Fees online ([here](#)) or we can send you an invoice. Once you fill out the Chapter Agreement ([here](#)), we will contact you to send an invoice if we have not received a PayPal payment.

You can also pay fees by writing a check to Engineering World Health and mailing to:

Engineering World Health
The Prizery, Suite 200
302 East Pettigrew Street
Durham, NC 27701, USA

Plan activities

The activities you choose will depend on the interests of your members and the opportunities available at your school or in your town. EWH offers many interesting activities for Chapter members, and you may be able to think of your own activities that help your affiliates reach their goals of helping people, both in developing countries and in your local community. Read the [Chapter Activities](#) overview, and check the details about each activity given in these guidelines.

To keep your Chapter vibrant and productive, plan and conduct at least two activities each academic year. EWH is available to advise on ideas and planning and to help with technical issues that may arise.

Branding your Chapter

As Engineering World Health grows and gains new Chapters around the world, it becomes increasingly important for us to present a consistent, recognizable brand. At the same time, we appreciate the individuality and creativity we've seen displayed in Chapter-designed logos. Keeping both EWH's global brand and individual Chapters' enthusiasm in mind, EWH is instituting a new Chapter branding policy as of August 2014:

While Chapters are free to design and display their own logos, EWH asks that they also display the standard EWH logo and web address (www.ewh.org) along with any individualized Chapter logos on any printed or other public materials (banners, posters, fliers, etc.), as well as on Chapter websites.

The EWH logo should never be scaled down smaller than 0.5". When resizing, hold down the shift key to maintain the proper proportions. Never alter the colors or any other aspect of the EWH logo.



More notes about operating a successful Chapter:

Fundraising

Chapters are encouraged to raise and bank their own funding to support their activities and cover any expenses they might incur. For fundraising ideas, see page 13 of the Guidelines, or see [the website Chapter Fundraising](#) page.

Registering as a student organization

We recommend that your EWH Chapter register with the Office of Student Organizations (or similar) at your school. Becoming a student organization will typically give you benefits at your school, including an annual budget, a bank account, and opportunities to advertise your group and recruit Chapter members.

Leadership elections and changes

EWH recommends that Chapters hold elections in the spring for the president, vice-president and treasurer who will take over in the summer. This allows the new leaders to prepare to take charge in the fall. The summer is a great time to plan the next year's activities.

Once the leadership change occurs, please notify EWH headquarters. You may even consider submitting the Chapter Roster and fees for the following academic year in the spring to avoid the crunch at the

beginning of the following school year. If there are changes in the officers or in the faculty advisor at any time of the year, please communicate the change to EWH headquarters as soon as possible and provide the full contact information of the new officer(s) or faculty advisor.

Communicating with EWH

We request that you stay in touch with us about your Chapter's activities throughout the year. Your Chapter may have new and exciting ideas that may be useful to us and to other Chapters. We will highlight our Chapters in our newsletter, on the EWH Facebook page, and on our website, so please send photos and stories about your activities! We are very interested in your activities and overall Chapter experience, as your success as a Chapter contributes to the overall success of EWH.

We also encourage Chapter members to follow our social media in order to stay current on global health news and EWH programs.

- Twitter: @EngrWorldHealth
- Facebook: <https://www.facebook.com/engineeringworldhealth>
- Tumblr: <http://engineeringworldhealth.tumblr.com/>
- Flickr: http://www.flickr.com/photos/duke_ewh/

Send all hard copy documents to:

Engineering World Health, The Prizery, Suite 200, 302 East Pettigrew Street, Durham, NC 27701.

For all issues related to your Chapter, please direct emails to Chapters@ewh.org to reach EWH staff.



Engineering World Health Design Innovative Technology

A well-designed and carefully considered technology appropriate for use in resource-poor settings can have a tremendous impact on the ability of a developing country hospital or clinic to deliver health care. Your Chapter may find a design project to be a fun and intellectually stimulating activity. You might also want to speak with your engineering faculty about offering EWH design projects as options to fulfill requirements for senior design projects for teams and individuals. In this way you can offer an interesting alternative design project for the students at your school and harness students' energies designing technologies for the benefit of under-resourced communities.

Projects that Matter:

Through interviews with health care providers in developing countries, EWH identifies health care challenges specific to the developing world and new technologies that can deliver the most positive impact for patients. From this first-hand knowledge, EWH compiles and posts an annual list of design challenges: Projects That Matter.

Two special types of projects are included in our Projects That Matter list:

Legacy projects—These are projects where significant progress has been made, but not enough to complete the project. We can supply the details for each project upon request. It is possible that a past design was capable of partially addressing the challenge. Perhaps the design needs more rigorous field testing, or perhaps a certain modification or improvement needs to be made to prior work. These legacy projects can be very high impact with comparatively little additional effort.

Research Projects—Sometimes a request for a device reaches EWH, but there is so little work done in the area that the project isn't yet ready for design. For these instances, we broadcast a research project to groups that can gather the preliminary information necessary before a design project can begin.

Please contact EWH (Chapters@ewh.org) before beginning a design to address the Projects That Matter list, so we can share updates or clarifications on the design criteria and/or past work on the project.

Many of the designs we receive for Projects That Matter come from our university Chapters through EWH Design Competition entries. At least one member of a Design Competition team (see below) must be a member (affiliate) of an EWH Chapter.

EWH Design Competition:

EWH offers an annual Design Competition open exclusively to EWH Chapters. Winners receive cash prizes to fund further development of their Chapter. Participants are invited to display their winning designs at the annual BMES conference where EWH presents the cash awards.

- **The EWH Design Competition** - In 2009, EWH launched an annual design competition that is directed at the needs of developing country health care.. Design Teams may research areas of need to address through their projects and propose their own ideas and designs, or they may consult the EWH Projects That Matter list for ideas.

To be eligible to enter the Design Competition, at least one member of the Design Team must be a member of an EWH Chapter in good standing (affiliation paid). There are cash prizes for the top three winning teams. Participating teams are invited (but not required) to create a multi-disciplinary Design Team that brings engineering students together with industry engineers who have expertise in industrial design, social entrepreneurship, business planning, etc.

Please visit ewh.org for the latest details about the Design Competition, or email info@ewh.org for more information.



Engineering World Health Kit Builds & STEM Education

EWH develops and sells Kits which provide students with hands-on training that promotes understanding of important biomedical engineering concepts and the practical electronic fabrication skills needed by both engineers and technicians. Chapters may use Kits as a fun group activity or as part of a service project to introduce K-12 students to STEM education and careers. The Kits make an excellent educational tool because, in addition to requiring the builder to learn practice technical skills, they reinforce interdisciplinary academic connections between technology and its capacity for social good.

****EWH Kits are an educational tool only and are not to be used for any other purpose, including any medical, diagnostic or other laboratory applications.***

For information about our Kits and a current listing of Kits for sale, please visit www.ewh.org. Chapters in good standing are eligible for a price discount on all Kits. Discounts for buying in bulk are also available. Any profits from Kit sales, after covering production costs, helps fund EWH's BMET Training programs in the developing world. If you would like more information, please send an email to Kits@ewh.org or order from the EWH website using the [EWH order form](#).

STEM Education:

While EWH focuses on finding solutions to health care delivery challenges, we also recognize the importance of fostering the next generation of engineers. Our STEM education program aims to show K-12 students how engineering might be used to address the world's problems, as well as what they could learn and accomplish in a STEM field.

With funding from Biogen Idec, EWH has designed STEM curricula for K-12 students. EWH Chapters can use these curricula to partner with local schools, summer camps, scouting groups, Boys and Girls Clubs and after-school programs to bring quality STEM experiences to young students.

Many universities are supportive of student involvement in the local community, and this is a terrific way for a university to show commitment to its community. (And working on STEM projects may help students persuade their university to pay Chapter affiliation fees!)



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Engineering World Health Equipment Evaluation and Repair

Evaluating and possibly repairing medical equipment bound for developing countries is one of the most interesting and rewarding activities a Chapter can undertake. Some hospitals in developed countries replace medical equipment with newer models as often as every three or four years. This creates a large surplus of medical equipment that has been decommissioned from developed world hospitals, and much of this equipment is still serviceable. Numerous charities have formed to manage equipment donations, shipping donations to hospitals and clinics in developing countries where it can improve the ability of local health care providers to offer diagnosis and treatment to their patients. In many cases, these charities do not have the means to evaluate and repair equipment before shipment. As a result, the World Health Organization (WHO) estimates that as much as 80 percent of donated equipment does not work in developing countries. In fact, much of the donated equipment is not working before it is donated. By working with equipment donation charities, EWH Chapters can help improve this situation.

There are numerous reasons that donated medical equipment might not be functional. Sometimes the solutions are quite simple—the equipment may be missing an essential accessory, such as a power cable, patient electrode cables for an ECG, or an arm cuff for a non-invasive blood pressure (NIBP) machine. Sometimes the machine is actually functional, but the group that delivers it and the developing world technicians are not able to get it to work due to a lack of experience with the machine and/or suitable documentation to determine its proper operation.

EWH Chapters can provide equipment evaluation services to charities and other donating organizations to ensure that the equipment they ship is functional, complete, and packaged in such a way to facilitate its proper implementation in the developing world. Chapters can accomplish these goals by ensuring that each piece of donated equipment is functional and has all of its essential accessories shipped with it. It is also best if Chapters can talk with the people who will deliver the equipment and make sure they understand how to use it properly. Providing an operator's manual from the manufacturer or simple usage instructions in the native language of the target hospital can also increase the chances of the equipment being put into service.

In addition to helping developing country hospitals, equipment evaluation benefits EWH student volunteers by giving hands-on experience with medical equipment, experience that contributes to advanced technical skills and knowledge. These activities are excellent preparation for students applying to the EWH Summer Institute.

Starting an equipment evaluation and repair program at your Chapter:

There are several issues to resolve before you begin an equipment evaluation program at your Chapter.

- What groups might your Chapter want to partner with?
- Who will instruct Chapter members in the evaluation of medical equipment and/or supervise equipment evaluation sessions?
- When and where will evaluation sessions take place?

Starting an equipment evaluation program at your Chapter will take some determination and a significant amount of preliminary legwork. This type of program might not work for every Chapter, but for some Chapters, it becomes a central focus that can be quite rewarding.

EWH can help your Chapter find a local charity with which to partner. You might investigate local connections available through your university, or even try some Google searches to identify local charities. Still, it may not be possible to find a suitable partner for every Chapter, depending on the unique situation at each location.

***PLEASE NOTE THAT ENGINEERING WORLD HEALTH IS NO LONGER ABLE TO RECEIVE DONATED MEDICAL EQUIPMENT OR SUPPLIES COLLECTED BY EWH CHAPTERS.**

Resources for successful equipment evaluation and repair:

We recommend that you purchase the book *Medical Instrumentation in the Developing World* by our chief technical advisor, Professor Robert Malkin. This book is an essential guide for evaluating and repairing medical equipment for the developing world, and we send a copy with each of the EWH Summer Institute participants on their hospital visits. It contains useful information about the proper function of each type of equipment you are most likely to encounter, along with detailed instructions about how to determine whether it is working and how to fix it. The book can be ordered from the EWH website ([here](#)). EWH Chapters in good standing receive a discount on book orders. University-funded Chapters will receive one free copy.

Other useful resources can be provided by the equipment manufacturers. Many types of equipment come with instructions adhered to the machine or attached in the machine in the form of sliding pull-out cards. If possible, track down the operator's manual from the organization that received the equipment donation or the hospital that originally donated it. This might not always be possible, so you may have to resort to looking for informational materials online. If you contact the manufacturer and explain the charitable purpose of your work with their equipment, they will sometimes agree to send you a free copy of their operator's manual, or service manual if repairs are necessary.

EWH strongly recommends that you have an advisor present at all equipment evaluation and repair sessions. This person can be your faculty advisor or another qualified faculty member. You may wish to find a professional engineer or biomedical equipment technician in addition to or instead of a faculty advisor at these events. EWH can try to help you identify a local engineer or technician who is interested in working with your Chapter.

Establishing a successful equipment evaluation program at your Chapter will take a considerable amount of effort and planning. You may find that it is beyond the scope of what is reasonable for your Chapter to accomplish, especially as you are first starting your Chapter. Still, the potential benefits of this work to the developing world can be quite substantial.



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Fundraising

EWH Chapters may want to raise their own funds to cover affiliation fees and to offer exciting activities. We recommend that Chapters attempt to secure funding from sources within their school to cover annual Chapter fees so these costs will not fall to the individual members. Other costs could include travel, purchasing Kits, food for meetings or celebrations, or tools or parts for technology design or equipment evaluation. There are also fees for special EWH programs such as the Design Competition. Please note that University Affiliation will significantly reduce these fees for your Chapter. In the past, Chapters have had success securing funding in the following ways:

Academic Departments or School of Engineering

Most academic departments and schools have a budget for student programs and activities. Talk to your faculty advisor about the best way to request funding from these sources and try to secure university funding for your Chapter's annual affiliation. Be sure to point out the benefits available to the Chapter, including 10 student affiliations, and reduced prices and fees for EWH Kits and the EWH Design Competition. If your school is not interested in a university affiliation, it may still be able to provide your Chapter with an annual budget.

Student Organizations

Once your organization is registered with your office of Student Organizations (or similar) it is typically eligible for an annual stipend from the university.

Corporate Sponsorship

Many engineering companies give donations to raise their profile and promote goodwill in their communities. In the past, local corporations have given significant grants to support EWH Chapters in design projects or Kit builds. Who are the engineering leaders in your community? We would be happy to help you approach them.

Fundraising Events

You can also host an event on or near your campus to raise funds for your Chapter. Planning an event can be hard work, but it can be a good way for Chapters to make money. Fundraising events can have the additional benefit of raising awareness about your Chapter at your school and providing a platform for finding new Chapter members. See fundraising ideas [here](#).



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Other EWH Chapter Activities

EWH Chapters succeed when they offer members opportunities they can't get anywhere else. Chapter activities can improve members' job skills or help them make career choices. Feel free to develop Chapter activities beyond the ones described in these guidelines. Please keep EWH informed about any new ideas for activities that your Chapter develops. A good idea for a new activity at your Chapter may be a good idea for other Chapters as well!

Clinical exposure events

By developing a close relationship with a local hospital, perhaps the teaching hospital of your own university, you can request opportunities for Chapter members to learn more about medical problems, the practice of medicine, and the importance of biomedical engineering to successful outcomes. Clinical exposure is one of the criteria for selection of students for EWH's Summer Institutes abroad. You may be able to arrange visits to the operating room or intensive care unit of the hospital or for your members to spend a day shadowing a surgeon. You can also visit the operating room of the local veterinary hospital.

Language events

Foreign language skills and sensitivity toward other cultures is key to the success of Engineering World Health and other organizations that seek to improve the quality of health care in any developing country. Plan events to help your members develop cultural awareness. Another criteria for selection for the Summer Institute is foreign language exposure. You can simulate language and cultural barriers. For example, invite a guest speaker to come and teach enough vocabulary for very basic communication in a foreign language, perhaps one that nobody knows; then have your members speak and understand each other in order to win some game (Simon Says or any other simple game is sufficient). There are also a number of excellent cross-cultural communication exercises that your group can download from the web.

Visit the sick and help

Visit a nursing home to determine the kinds of equipment being used, and then return to explain equipment to patients who are connected to equipment. Design cards to explain the use to patients. This is great preparation for visiting developing countries, where using the working equipment correctly is half the battle.

Host a forum

Host a forum and invite speakers with expertise in international development, international health, or poverty alleviation to discuss current issues in developing countries. Include participants from developing countries. This is a great way to have your Chapter members understand the context of the EWH mission and the work of the Chapter.

Food night

Prepare food from a specific developing country. Find someone on your campus from that country to help with the preparation. These are great events to couple with a language class. Everyone could learn 5-10 words of a foreign language and play Simon Says in that language. Or, combine food night with a travel photo night. Have your members share photos from their trips overseas. This activity can

be combined with a going-away or homecoming party for members participating in the Summer Institute.



Price List 2014

2014 PRICE LIST:

Benefits for an Individual Student Affiliate: Cost \$35/year

- Access to the EWH Dropbox containing STEM outreach curricula, design projects and Projects That Matter background, teaching materials, and more.
- EWH support and advice on activities, including but not limited to: Design projects, STEM outreach, collaborations with local non-profits, equipment repair and donation preparation, testing and production of products, partnerships and projects abroad.
- Introductions to local medical equipment donation charities.
- Preferential consideration for the Summer Institute Program.

Student-funded Chapter: Cost \$35 per student affiliate, minimum of three individuals.

All Individual Student Affiliate benefits apply, plus:

- Eligibility for the EWH Design Competition.
- Discounts on EWH Kits, textbooks and other teaching materials.
- Recognition on the EWH website.

University-funded Chapter: \$600/year

All Student-funded Chapter benefits apply, plus:

- Unlimited student affiliates.
- \$200 discount for EWH's Design Competition registration fee.
- T-shirts for the faculty advisor and 10 student affiliates, limited to 11 free t-shirts in any one year. (Additional shirts available for purchase on [our gear page](#).)
- A copy of the textbook *Medical Instrumentation in The Developing World*, by Dr. Robert Malkin of Duke University.
- One free EWH Kit.
- Consideration for travel funding for Chapter members to present at a conference or other event on behalf of EWH or the Chapter. Up to three individuals can receive this funding in a given academic year to reimburse travel expenses. Funding can be up to \$125 per year for any individual, for a possible maximum of \$375.

Professional Affiliation: \$300/year

An individual affiliation designed for academic professionals who would like to support EWH and take advantage of EWH resources.

Supporting Affiliation: \$50

An affiliation designed for non-students who wish to support EWH's work with university students, with biomedical engineering technicians training in developing countries, and with all EWH projects that benefit healthcare delivery in the developing world.