MEDICAL EXPLORER
The Timmy Foundation

We were not all born to be doctors and nurses, but we were all born to be healers.

— Charles J. Dietzen, MD
THE BIG IDEA
Young people can be inspired to change the world through medical science investigation, international case studies, and service projects.

“We can do no great things, only small things with great love.”
— Mother Teresa

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The Timmy Foundation is a 501(c)(3) nonprofit organization based in Indianapolis and dedicated to supporting health care and education initiatives in developing countries. Charles J. Dietzen, M.D., founded the organization in 1997. Dr. Chuck, as he is called, named the foundation after his brother Timmy, who lived only four days. Because of volunteer support and donated items, 97 percent of charitable contributions to the foundation go to its programs. There are only three full-time employees at the foundation because of substantial help from its volunteers. Numerous volunteer opportunities for all ages are available. Contact The Timmy Foundation World Headquarters at 22 East 22nd Street, Indianapolis, IN 46202; (317) 920-1822; fax (317) 920-1821; www.timmyfoundation.org
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INTRODUCTION

When I was a child my mother encouraged me to eat the food I had left on my plate by telling me that there were starving children in India and China. My response to that comment was, “Great! Let’s mail it to them.” As I got older, I realized this was not a practical solution to the problem. Mashed potatoes and sauerkraut do not fit neatly into envelopes. In elementary school I heard more and more about people in need and I wanted to help. I wanted to be offered the opportunity to make a difference in the world. When those opportunities presented themselves, they needed to be as real as possible in order to touch my heart and move me to action. That motivation is central to the work of The Timmy Foundation. We hope to inspire young people to change the world for the better, and they are certainly meeting our expectations. Our young volunteers have made great contributions to help others in many locations within the United States and abroad. Their compassion is inspirational to all of us. We also have a great group of adults who mentor our young people and encourage their social outreach. We at The Timmy Foundation are fully aware that we cannot reach all of the children who are in need throughout the world, but we know, too, as Mother Teresa said, “It is not my job to be successful, it is my job to be faithful.” We hope to create a ripple effect, setting off a wave of compassion that will sweep across the planet and touch everyone in such a way that they, too, begin to do good works to help others in need and discover that, in fact, healing is a mutual experience.

— Charles J. Dietzen, M.D.
Founder & President,
The Timmy Foundation

WHAT’S AHEAD

The goal of the Medical Explorer curriculum is to transform students and teachers from spectators into participants. The lessons are designed so that students participate in case studies, medical evaluations, treatment plans, and service projects. The case studies provided are modeled after real people in real places. The information that students learn is real and provides tools that they will apply in further studies or service projects. Students will learn skills and have experiences that can reach beyond the walls of their classrooms or the borders of their states and nations. Students begin their work through case studies that represent children in areas of the world without adequate medical services and nutrition. The children’s profiles are based on experiences at international sites served by The Timmy Foundation and are represented through case studies containing clinical narratives for students to use. Clinical medicine is hands-on medicine. Students participating in this project will learn to work together on a science service project that has the power to change lives. The Timmy Foundation hopes to provide opportunities for students to make positive differences that improve the lives of others around the world and in their own backyard. This project helps students achieve academic standards in Language Arts, Science (Biology) and Social Studies (World Geography). Specific academic standards are listed with each lesson. A complete listing of the Indiana Academic Standards is located at http://ideanet.doe.state.in.us/standards/welcome.html.
THE TIMMY FOUNDATION WAS FOUNDED IN 1997 TO CHANNEL RESOURCES TO SUSTAINABLE HEALTH PROJECTS IN DEVELOPING COUNTRIES.

OUR VISION: A world in which basic health care and education are available to all children.

OUR MISSION: Building healthy futures worldwide, one child at a time. We accomplish this by strengthening community-based health and education initiatives and by empowering young people to share their energy and compassion. The Foundation’s work is dedicated as a living legacy to all of Dr. Chuck’s pediatric hospice patients.

Since its humble beginnings, the foundation has served thousands of children and the communities in which they live in Central, South, and North America, the Caribbean, Africa, and Asia. The mission is achieved through collaborative partnerships that provide health care and deliver relevant medical and educational resources. The work does not duplicate the efforts of other individuals and organizations but instead supports them by matching resources to the needs.

While working in India in 1997, Dr. Chuck had the great blessing of meeting Mother Teresa. She stressed the importance of giving hope to the people we could not cure. She said, “We can do no great things, only simple things with great love.” The Foundation invites you to be a part of the efforts to extend this philosophy by reaching out to those in need. Help the Foundation provide services that are small but mean the world to others. Join the volunteer family and experience the heartfelt joy and love that comes from serving others.

More information about The Timmy Foundation is located in Lesson 3: People Like You Making a Difference! and at the foundation Web site: http://www.timmyfoundation.org.
LESSON 1
CASE STUDY
Jamison - Haiti

LESSON 2
SEVEN CASE STUDY NARRATIVES
Timmy Foundation’s International Partners
Haiti, Dominican Republic, Ecuador, Honduras, Jamaica, USA, Guatemala

LESSON 3
People Like You Making a Difference!
Student Service Project

Model Medical Inquiry: Evaluation, Assessment, and Treatment Plan
Guided Medical Science Inquiry: Medical Evaluation: History and Physical Exam
Student Consultation Teams: Medical Vocabulary, Epidemiology, Geography, Economics, and Culture
Medical Assessment & Confirmation
Consultation Teams: Research Disease and/or Condition
Student Consultation Teams Treatment Plan: Hygiene, Vaccinations, Nutrition, Medical Treatment, Surgical Treatment
Model Surgical Procedures
LESSON 1
CASE STUDY NARRATIVE:
JAMISON — A YOUNG HAITIAN BOY

In this lesson students meet a young boy named Jamison who lives in Haiti. Students will work in consultation teams to investigate his history and environment, assess his medical condition, and recommend a possible treatment plan. The case study includes clinical information. Clinical medicine is the hands-on encounter between a patient and a health care provider. The case study narratives do not contain X-rays, laboratory reports, or follow-up tests like those that are typically ordered in the United States. In this lesson the students are modeling a health care worker solving a medical problem. This lesson is intended to provide students with experiences and skills to use in future case studies in Medical Explorer and in the real world. The best science is that which we experience and put to use in our daily lives.
PROCEDURE
Students follow specific steps to investigate and evaluate Jamison's condition. The steps lead toward a diagnosis and treatment plan for Jamison, utilizing aspects such as Jamison's medical history and physical examination. Students read and study the provided medical evaluation narrative that describes Jamison and his condition. Students work together in Consultation Teams to complete the investigation.

The project includes:
- a medical evaluation
- a research project of selected topics about the child’s region and epidemiology
- a medical assessment
- an outlined treatment plan

PROJECT STEPS
A. Case Study Narrative  
B. Consultation Team — Research Tasks  
C. Consultation Team — Present Research  
D. Medical Assessment  
E. Additional Consultation Team Research  
F. Outline Treatment

INVESTIGATION QUESTIONS
- Where does Jamison live?  
- What are the customs of his culture? What language does he speak?  
- Describe the geography and climate of Haiti.  
- What types of diseases are found in this area?  
- What factors affect Jamison's hygiene and diet?  
- Is potable water available in the area?  
- How does his family make a living?  
- What factors have shaped the history of Haiti?

VOCABULARY
- Acute  
- Allergy  
- Blood pressure  
- Bowel sounds  
- Bruit  
- Caries  
- Cellulitis  
- Clear to auscultation (CTA)  
- Clinic  
- Clubbing  
- Cyanosis  
- Delirious  
- Dentition  
- Disability  
- Dorsiflex  
- Edema  
- Erythema  
- Extraocular  
- Fever  
- Heart rate  
- Homans’ sign  
- Immunization  
- Infection  
- Jugular vein  
- Lymphadenopathy  
- Lymphatic  
- Malnourished  
- Mass  
- Muscle stretch reflex  
- Neurological  
- Normocephalic  
- Organomegaly  
- Osteomyelitis  
- Palpate  
- Paravertebral  
- Plantar flexion  
- Purulent  
- Respiratory rate  
- Retraction  
- Sepsis  
- Subsistence farmer  
- System  
- “tap-tap”  
- Tachycardia  
- Temperature  
- Tibia  
- Trauma  
- Vertebral  
- Vitals

INDIANA ACADEMIC STANDARDS
Science — Biology: B.1.17, B.1.20
Language Arts: 9.1.3, 9.2.3, 9.4.4, 9.4.6, 9.7.16, 10.1.3, 10.4.4, 10.5.6, 10.7.15, 11.1.2, 11.4.7, 11.5.7, 11.7.16, 12.1.2, 12.4.7, 12.5.7
Social Studies — World Geography: WG.2.2, WG.4.7
MEDICAL EVALUATION — HISTORY AND PHYSICAL EXAMINATION

A medical evaluation includes four components: History, Physical Examination, Assessment, and Treatment Plan. Jamison’s medical evaluation follows a traditional approach that health practitioners use to evaluate a patient. In this section of the lesson students review the history and physical exam of the case study.

PART A.
CASE STUDY NARRATIVE: JAMISON

Provide each student with Jamison’s Case Study Narrative. The narrative includes Past Medical History, Family History, Social History, Review of Systems, and the Physical Exam. Each student reads and takes notes in his or her science journal or lab notebook about the case. Read aloud and discuss Jamison’s narrative with the class. Refer to the provided Investigation Questions to help start the discussion. Instruct students to list the facts and factors that are known from Jamison’s narrative. List these on the classroom board and have students write them in their science journals. Refer to the vocabulary list for definitions of medical terms. Ask students to list questions they have about Jamison’s condition.

HISTORY: The goal of taking the patient’s history is to understand the patient’s general background and to list all previous illnesses, accidents, or diseases as well as the medical history of family members. Information about the current condition of the patient’s body systems, such as musculoskeletal, circulatory, neurological, pulmonary, digestive, and lymphatic, also should be noted. Read aloud the patient’s history. Discuss with the class what is significant and what is not known. Students should record their notes in a science journal or lab notebook.

PHYSICAL EXAMINATION: Trained health care providers follow a specific path when examining a patient. The material in the physical exam is presented in the actual medical vocabulary and recording protocols used in medicine. Students will work together to decipher and understand the physical exam. Much of the medical and anatomical information described in the physical exam uses Latin and Greek vocabulary. Work with the class to identify new vocabulary words and list them on the board or chart for easy reference.
PART B.
CONSULTATION TEAM — RESEARCH TASKS

Divide the class into small groups called Consultation Teams to collaborate on assigned tasks. Each group has a specific area of the medical investigation to research. It is important to match students to tasks appropriate for their interest and skill levels. All tasks are essential to completion of the Physical Exam, Assessment, and Treatment. The following tasks are assigned to each Consultation Team.

RESOURCES

Allow time, books, maps, and Internet access for each team to research its subject. Useful online and free resources are found at the end of this lesson and in the Resource Materials. Many of the materials are free to educators. Monitor each team’s progress with the research. Once they have had sufficient time to prepare, bring the teams together for a general meeting. Each Consultation Team should present its findings to the group. Students record notes, findings, and observations in their science journals.

Provide each student with a Physical Exam Translation Form — Jamison. Students use this form to decipher information and write out explanations of the case study narrative in their own words.

TASKS

- MEDICAL VOCABULARY
  
  Medical vocabulary is the key to unlocking and understanding the patient’s physical exam. Use the list of medical vocabulary words and phrases provided at the beginning of this lesson. Have students list in their science journals all vocabulary words that are exceptional or unknown. Most can be defined by consulting a medical dictionary. Assign one Consultation Team to define the words. Instruct students to sort the words into medical, anatomical, and cultural groups. Then the team can prepare a report and poster to present to the class.

- GEOGRAPHY
  
  Determine as a class the location of the country where Jamison lives. Then assign one Consultation Team to research and prepare a presentation and poster of the geography and climate of the area.

- HISTORY
  
  Assign one Consultation Team to research the history of Jamison’s country. Instruct students to prepare a report and poster that identifies past political and cultural factors that have affected the region. The poster should include a timeline that identifies important historic events.
- **SOCIOECONOMIC FACTORS**
  Assign one Consultation Team to research the socioeconomic factors of Jamison’s country. Instruct the students to prepare a report and poster that identifies current political and economic factors that affect the region. The poster can include tables or graphs to present statistics.

- **CULTURE, RELIGION, AND LANGUAGE**
  Assign one Consultation Team to research the culture, language, and religion of the region. They should determine if there are subcultures or dialects unique to Jamison’s village. Students should illustrate their research in posters, dioramas, or other visual or audiovisual products.

- **EPIDEMIOLOGY AND TRAUMATOLOGY**
  Assign one Consultation Team to research diseases found in the region. This is an important task because it will define the direction of the remainder of the class investigation. Students prepare a report and a poster to list and define as many diseases as possible commonly found in the region. Also, students should be guided to investigate possible traumas likely to occur in the region, including those related to pregnancy and childbirth.
PART C.
CONSULTATION TEAM
— PRESENT FINDINGS
Once students have completed their research, they should prepare a class presentation. Each group should present its materials and take questions from the class. Direct the discussion. Focus on any areas or facts that are related among the teams, such as geography, climate, and epidemiology. Help students to connect that information to details found in the physical exam. Students may need to redirect their research to address aspects of the physical exam. The goal of this part of the lesson is to find information and correlate details to make an accurate assessment of the case study.

PART D.
MEDICAL EVALUATION — ASSESSMENT
Assessing the correct disease or condition of the patient is crucial. Students use the information gathered in parts A, B, and C to make a diagnosis of the possible disease or condition affecting Jamison. Students should suggest two or three possible diagnoses for Jamison. The class must come to consensus on Jamison’s assessment. Facilitate the discussion and ask students to present information in support of their diagnoses.

Once the assessment is determined, confirm it with Physical Exam Translation Form — Jamison Teacher Key. If students did not reach the same conclusion, review the specific disease and Jamison’s history. Update Jamison’s Physical Exam Form with the new information and assessment. The final assessment is in the following form:

“Jamison is a _______ -year-old boy who has ________________________________.”

Teachers may want to enhance this part of the project by bringing in an outside speaker. Contact local health care providers or The Timmy Foundation for additional resources. Invite a local doctor, nurse, or health care provider into the class to assist with the assessment of the subject. The school nurse can be an excellent resource for this project.
Students need to return to their research on the disease with which Jamison has been diagnosed. Allow the Consultation Team or others to direct further study. Students should aim to become amateur experts in order to provide an effective treatment plan. New information should be continually updated in students’ science journals and presented in poster form for the benefit of their peers.

Students are expected to provide a treatment plan that fosters improvement and healing for Jamison. Contact medical resources online or in the community to assist with this aspect of the project. The Timmy Foundation will provide sources to consult. The following is a list of the general treatment areas that can be addressed.

- **EDUCATION AND PUBLIC HEALTH**
  Students can outline and suggest preventive measures that can be taken to remove, reduce, or eliminate risk factors. It is important that treatment plans take into consideration cultural factors, customs, and local resources. In addition, most successful educational plans contain retraining opportunities and ongoing assessment. Areas that may be included in any general education treatment plan are diet, hygiene, safe living conditions, effective sanitation, and clean water.

- **NUTRITION**
  Nutrition is sometimes overlooked or ignored in a treatment plan, but a plan that includes good nutrition can be the most productive. All other treatment aspects depend on good nutrition to allow the body to heal. Without good nutrition and clean water, a patient can easily relapse. Students must research the sources of food and clean water available to the patient. A good nutrition plan must also take into account accepted customs and cultural factors. Students consult with dieticians online or locally to develop a nutrition plan to fit the needs and resources of the patient. This part of the treatment plan must be coordinated with “Education and Public Health” because of the overlapping issues of clean water and effective sanitation.

**NOTE FOR THE TEACHER**

Jamison’s condition is an open fracture with osteomyelitis. Jamison had trauma from a motor vehicle accident that caused his tibia to break through the skin. This had never been treated over a 2 1/2 year period, resulting in osteomyelitis, infection within the bone.

Allow enough time for all Consultation Teams to research and complete their tasks as well as for teacher review of their work. Student materials are presented in written reports, audiovisual presentations, posters, and/or oral presentations to the class.
MEDICINE

Many diseases found outside of the United States can be eradicated with medicines readily available here. Students should investigate the types of medicines used to combat the diseases they identify. They should learn the treatment protocols, dosages, side effects, and other pertinent information about the medicine. The cost and availability of drugs vary considerably from country to country. Students must research what these would be in the United States and in the patient’s country. They should also learn what conditions are required to insure that the drug will be effective in treating the disease. In addition, students should be aware of patient health literacy issues, such as adherence to treatment plans over time and actual consumption of prescribed drugs.

EQUIPMENT

Many injuries or diseases cause drastic changes in the patient’s quality of life. In the United States medical equipment is used to compensate for an injury or condition. Wheelchairs, crutches, eyeglasses, prosthetic limbs, and other items are commonplace in our communities. This equipment may be an integral part of a treatment plan. Students should research various types of equipment that would help with the patient’s disease. A complete report should include the cost, maintenance, and availability of the medical equipment both in the United States and in the patient’s country. In addition, students should prepare an outline or lesson plan on how to teach the patient to use the equipment.

SURGERY

Injuries and diseases often result in the need for one or more surgeries to make corrective repairs to damaged tissues, organs, or systems. Students must research any surgical procedures that are needed to stop, slow, or reduce the spread of the disease. Review these with trained medical staff either online or locally. The Timmy Foundation is a resource to locate medical staff.

Once the class has reviewed the different types of treatments they should suggest at least one treatment plan for Jamison. Students may recommend a multi-step treatment plan. The teacher should consult Physical Exam Translation Form — Jamison Teacher Key to confirm the treatments selected. Treatment plans can be reviewed with medical staff from local resources or with volunteers from The Timmy Foundation.
STUDENT CASE STUDY NARRATIVE — JAMISON

Jamison is a 10-year-old Haitian boy who came to the clinic at Haitian Academy. He reports that he had injured his leg in a “tap-tap” bus accident 2½ years earlier. He had been unable to walk on the injured leg for several months and noticed that the skin broke open where he presumed he had fractured his leg. Since that time he has had a lot of purulent drainage from the wound. He spikes fevers on occasion and at times is delirious with these fevers. He reports that he is very ill during these times but usually recovers. He is now able to bear weight on the leg but it is significantly deformed.

HISTORY

Allergies: No known allergies.
Surgery: No history of surgery.
Medical: Jamison reports that he has had no immunizations. He does have a fever on occasion but reports no headaches.
Medications: none

FAMILY MEDICAL HISTORY
None provided.

SOCIAL HISTORY

Jamison lives in a rural area. His family members are subsistence farmers. They live in the lowlands of Haiti. Jamison had worked in the past as a sugar cane cutter. He reports they have no water within the home. They typically buy filtered water. He has limited ability to bathe.

REVIEW OF SYSTEMS (ROS)

Jamison has never attended school. He had no developmental problems as a child. He has been healthy other than the leg.
**STUDENT CASE STUDY**  
**PHYSICAL EXAM TRANSLATION FORM — JAMISON**

Write in your own words an explanation of what is covered in the Physical Exam.  
Use this form to write your Assessment and Treatment plan for the case study.

<table>
<thead>
<tr>
<th>Person Completing Form: _______________________________</th>
<th>Date: ________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>School: _______________________________</td>
<td>Grade: ________________</td>
</tr>
<tr>
<td>Patient’s Name: _______________________________</td>
<td></td>
</tr>
<tr>
<td>Patient’s Residence: _______________________________</td>
<td></td>
</tr>
</tbody>
</table>

**PHYSICAL EXAMINATION** *(use more space if needed)*

| General: _______________________________ |  |
| Skin and lymphatics: _______________________________ |  |
| Head, eyes, ears, nose, and throat: _______________________________ |  |
| Neck: _______________________________ |  |
| Chest: _______________________________ |  |
| Cardiovascular: _______________________________ |  |
| Abdomen: _______________________________ |  |
| Back and extremities: _______________________________ |  |
| Neurological: _______________________________ |  |

**ASSESSMENT**

“Jamison is a ______ year-old boy who has ____________________________.”

**TREATMENT PLAN** *(use more space if needed)*

| Education: _______________________________ |  |
| Medicine: _______________________________ |  |
| Equipment: _______________________________ |  |
| Surgery: _______________________________ |  |
| Nutrition: _______________________________ |  |
| Socioeconomic issues: _______________________________ |  |
PHYSICAL EXAMINATION

Vitals: Increased heart rate.

General: Jamison is a 10-year-old Haitian boy who came to the clinic at Haitian Academy. He reports that he had injured his leg in a "tap-tap" bus accident 2½ years earlier. He had been unable to walk on the injured leg for several months and noticed that the skin broke open where he presumed he had fractured his leg. Since that time he has had a lot of purulent drainage from the wound. He spikes fevers on occasion and at times is delirious with these fevers. He reports that he is very ill during these times but usually recovers. He is now able to bear weight on the leg but it is significantly deformed. He is also cachectic. This term indicates he is very slim, almost appearing wasted away. This can result from either malnutrition, chronic illness (2½ year infection), or a combination of the two.

Skin/Lymphatics: Skin is clear with the exception of a large lesion over the right area. Lymphatics from the lower leg drain to this area. The groin area make sense because the lymphatics from the lower leg drain to this area. No vertebral or paravertebral tenderness means no evidence of the muscles working extra hard around the rib cage to pull air in.

Abdomen: Soft, nontender, with positive Symmetrical without retraction. No costovertebral angle tenderness on percussion. No murmur or gallop means that the heart is beating faster than normal (above 100 beats per minute). This can result from numerous states. Jamison may have a fast heartbeat from his fever or dehydration (which can be caused by fever). No murmur or gallop means that there was no heart sound heard with the stethoscope. No costovertebral angle tenderness on percussion means no tenderness over the vertebrae of the spine or the muscles on either side of the spine. No costovertebral angle tenderness on percussion means no tenderness over the area of the kidneys when this is tapped. No clubbing, cyanosis, or edema of extremities means that he does not have enlarged fingertips nor are the fingertips and toes blue as in cyanosis. There is edema or swelling from the infection in the right leg. The Homans’ sign was negative on both legs, which means when the foot was pointed up toward the head, Jamison did not have any pain in the back of his leg. This test is used to identify blood clots in the legs. No erythema tells us that the leg was not red.

Neurological: Jamison is alert and oriented. Cranial nerve examination revealed no abnormality. Muscle stretch reflexes were normal with the exception of the right lower extremity. He had limited muscle stretch reflex at the knee. He reports decreased sensation over the foot at this time, particularly between the large toe and second toe. He had limited ability to plantar flex and dorsiflex the foot. He has difficulty also with extension of the right knee. Otherwise, Jamison has normal strength and sensation throughout. Limited muscle stretch reflex at the knee may indicate some nerve damage in this area. This can be the result of swelling in the area causing nerves to be compressed and not function appropriately. This also explains why he has decreased sensation in his toes. The limited ability to plantar or dorsiflex the foot and extend the knee is a result of the broken bone. The muscles used in these actions attach to the tibia primarily, which is now broken. Also, pain and swelling can limit movement.
Open fracture with osteomyelitis.

Jamison had trauma from a motor vehicle accident that caused his tibia to break through the skin. This had never been treated over a 2 1/2 year period, resulting in osteomyelitis, infection within the bone.

**TREATMENT PLAN**

**Education:** The family is notified that Jamison has osteomyelitis of the right leg. This is an infection of the bone, which is the tibia in this case. Moreover, he also has an open fracture of his right tibia. This means that the skin overlying the fracture was broken as well. The break in the skin allowed bacteria to enter Jamison’s leg and cause an infection. The body tries to fight infections with the immune system. Many of Jamison’s symptoms (fevers, swollen leg, enlarged lymph nodes, and purulent drainage) are related to his body’s attempt to fight off the infection. Episodes of “spiking fevers and acting delirious” are symptomatic of another type of infection – sepsis. This is when infection enters the blood stream. It can be extremely serious and sometimes fatal. Therefore it is very important that Jamison promptly receive the appropriate treatment.

**Osteomyelitis:** Osteomyelitis is an infection within a bone. This often results from injuries in which a bone is broken along with the skin overlying it. If left untreated, this can result in recurrent sepsis, or infection of the blood. Antibiotics and sometimes surgery are required to treat the infection.

**Medicine:** We would treat Jamison in the clinic with antibiotics. He would need an injection of antibiotics into a muscle (IM, intramuscular) along with oral (p.o.) antibiotics. He may benefit from pain medication as well. Eventually intravenous antibiotics would be used.

**Equipment:** He would benefit from bandages to wrap his leg. Also crutches may help him get around in the short term. Long term he will require his leg to be amputated, and therefore, will need a prosthetic limb to walk.

**Surgery:** Jamison’s leg would be amputated above the infection site and he would be treated with intravenous antibiotics.

**Nutrition:** Jamison was noted to be cachectic or extremely thin and wasted in clinic. This can result from malnutrition, among other things. He will also need proper nutrition to help support his immune system fighting the infection and help heal after the surgery. He should receive a multivitamin daily for as long as possible. Also, if the family does not have enough food, then some should be provided. Access to clean drinking water is always important.

**Socioeconomic Issues:** Students should consider the cost of amputation and antibiotics in the U.S. compared to Haiti. Can he get the surgery in Haiti? Would it be better to bring him to the United States? The antibiotics and surgery will certainly be cheaper in Haiti. He should be able to get the procedure done in a large city.

**Present Findings**

Students should prepare a final presentation for the case study. This presentation will include reports from the Consultation Teams and can include participation from local health care providers and representatives from The Timmy Foundation.
TEACHER RESOURCES
This Medical Explorer mirrors real medical investigations. In medical and other science investigations, the paths chosen often lead to new topics and unexpected discoveries. Encourage your students to ask questions, try new ideas, and work with others. Students will be challenged by the new material and topics that they uncover in researching information about the case studies. Sorting through it all may be difficult for some students and teachers. The Timmy Foundation is an excellent place to start to find medical resources for your classroom. The foundation will be able to provide information, contacts for speakers, and much more. The following is a list of outstanding free online resources and publications that can be used with this project.

MEDICAL EXPLORER
THE TIMMY FOUNDATION
Topics of Interest
- Body Systems
- Cells
- Immunization and vaccination
- Hygiene
- Diet and nutrition
- Genetics (human genome)
- Cultural and languages
- Medical ethnology
- Medical abbreviations and terminology

ONLINE RESOURCES
- CalTech Precollege Science Initiative: Human Body Under Attack
  http://www.capsi.caltech.edu/
- Centers for Disease Control and Prevention
  http://www.cdc.gov/
- Children's Museum of Indianapolis — Agricultural Biotechnology Unit of Study, Genetics and Cell Biology
- Global Polio Eradication
  http://www.polioeradication.org
- Indiana AHEC Program — Student Resources on Health Careers
  http://www.ahec.iupui.edu/studentresources/default.htm
- MedLine Plus: Health Topics
- MedLine Plus: Medical Encyclopedia
- MedLine Plus: Medical Dictionary
- Museum of Science & Industry: Live . . . From the Heart
  http://www.msichicago.org/ed/educ_liveheart.html
- National Academies Press
  www.nap.edu
- National Institutes of Health Curriculum Supplements — High School
  http://science.education.nih.gov/CurriculumSupplements/highschool.htm
- National Institutes of Health Curriculum Supplements — Middle School
  http://science.education.nih.gov/CurriculumSupplements/middleschool.htm
- National Heart, Lung, and Blood Institute — Diseases and Conditions Index
- Science, Medicine, and Animals: Teacher’s Guide
  http://orsted.nap.edu/books/0309101174/html
- The Timmy Foundation
  http://www.timmyfoundation.org
- United States Department of State — International Travel Information
- WISE: Web-Based Inquiry Science Environment
  http://wise.berkeley.edu/
- World Health Organization
  http://www.who.int/en/
LESSON 2
CASE STUDY NARRATIVES

In Lesson 1 students participated in a guided medical investigation of Jamison to determine his medical condition and treatment plan. In this lesson, students follow the same medical investigation steps to complete new case studies. The case studies are based on experiences from The Timmy Foundation’s international partners. Each case study represents a specific disease or condition endemic to the region. The clinical information in each case study narrative represents a typical patient. Students work in Consultation Teams to complete the investigations.

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Seven different medical cases are presented. Each one starts with a Student Case Study Narrative containing the clinical history and physical exam of the patient. The second handout is the Student Case Study Physical Exam Translation Form that students use to complete the medical evaluation, assessment, and treatment plan on selected patients. The third handout is the Teacher Key Physical Exam Translation Form that contains the assessments for all seven of the case study patients. The last two case studies, Maria and Juan, present a special medical investigation. They both suffer from cerebral palsy caused by a cerebrovascular vascular accident (CVA); one from trauma and the other from a disease.

THIS IS SCIENCE. DON’T TAKE MY WORD FOR IT. TRY IT YOURSELF!
— Rick Crosslin, Teacher

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MEDICAL VOCABULARY

Abdomen, Acute, Allergy, Bactrim, Bladder, Blood pressure, Bounding, Bowel sounds, Breech presentation, Bruit, Cachectic, Cerebrovascular accident (CVA), Caries, Clear to auscultation (CTA), Clinical, Clubbing, Contracture, Cranial nerve, Cyanosis, Dentition, Disability, Distention, Distress, Dorsiflex, Edema, Erythema, Excoriation, Extraocular, Fever, Flaccid, Flex, Fluence, Gastrocnemius, Goiter, Hamstring, Heart disease, Heart rate, Hemiparesis, Holosystolic murmur, Homans’ sign, Human immunodeficiency virus (HIV), Hyperpigmented, Immunization, Infection, Jugular vein, Lesion, Liver, Lymph node, Lymphadenopathy, Lymphatic, Malaria, Malnourished, Mass, Midwife, Muscle stretch, Reflex, Neurological, Normocephalic, Organomegaly, Palpate, Paravertebral, Penicillin, Perfusion, Pitting edema, Plantar, Potable, Purulent, Rales, Rehabilitation, Respiratory rate, Retraction, Rhinorrhea, Scoliosis, Sickle-cell anemia, Spastic gait, Sputum, Sternal, Suprapubic, System, Systolic ejection murmur, Tachycardia, Temperature, Trauma, Tuberculosis, Upper respiratory infection (URI), Urinary tract infection (UTI), Vaccination, Vertebral, Vitals

NOTE FOR THE TEACHER

Health care professionals often use the following abbreviations. They are used in prescribing medicines. Students and teachers benefit from understanding the following:

<table>
<thead>
<tr>
<th>Latin Phrase</th>
<th>Shortened form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>quaque hora</td>
<td>qh</td>
<td>every hour</td>
</tr>
<tr>
<td>quaque die</td>
<td>qd</td>
<td>every day</td>
</tr>
<tr>
<td>bis in die</td>
<td>bid</td>
<td>twice a day</td>
</tr>
<tr>
<td>ter in die</td>
<td>tid</td>
<td>three times a day</td>
</tr>
<tr>
<td>quater in die</td>
<td>qid</td>
<td>four times a day</td>
</tr>
<tr>
<td>pro re nata</td>
<td>prn</td>
<td>as needed</td>
</tr>
<tr>
<td>ante cibum</td>
<td>ac</td>
<td>before meals</td>
</tr>
<tr>
<td>post cibum</td>
<td>pc</td>
<td>after meals</td>
</tr>
<tr>
<td>per os</td>
<td>po</td>
<td>by mouth</td>
</tr>
<tr>
<td>nihil per os</td>
<td>npo</td>
<td>nothing by mouth</td>
</tr>
<tr>
<td>signetur</td>
<td>sig</td>
<td>let it be labeled</td>
</tr>
<tr>
<td>statim</td>
<td>stat</td>
<td>immediately</td>
</tr>
<tr>
<td>ad libitum</td>
<td>ad lib</td>
<td>as desired</td>
</tr>
<tr>
<td>hora somni</td>
<td>hs</td>
<td>at bedtime</td>
</tr>
<tr>
<td>cum</td>
<td>℃</td>
<td>with</td>
</tr>
<tr>
<td>sine</td>
<td>Ｓ</td>
<td>without</td>
</tr>
<tr>
<td>guttæ</td>
<td>gtt</td>
<td>drop(s)</td>
</tr>
<tr>
<td>semis</td>
<td>ss</td>
<td>one-half</td>
</tr>
<tr>
<td>et</td>
<td>et</td>
<td>and</td>
</tr>
</tbody>
</table>

MATERIALS

- Internet access
- Science journal
- Medical dictionary (book or online)
- World maps
- Poster board
- Art materials
- Student handouts: Student Case Study Narratives
- Kirsten: An African-American in the USA
- Maria: A Young Girl from Guatemala
- Juan: A Young Boy from Guatemala
- Student Case Study Physical Exam Translation Form
- Teacher Key Physical Exam Translation Form
- Medical Evaluation Assessment and Scoring Rubric
- Lucia: A Haitian Girl in the Dominican Republic
- Luis: A Little Boy Living in Urban Ecuador
- Juanita: A Girl from Honduras
- Roberto: a Jamaican boy
LESSON 2

INVESTIGATION QUESTIONS

- Where does the child live?
- What are the customs of his or her culture? What language does he or she speak?
- Describe the geography and climate of the area where the child lives.
- What types of diseases are found in this area?
- What factors affect the child’s hygiene and diet?
- Is potable water available in the area?
- How does the child’s family make a living?
- What factors have shaped the history of the area where the child lives?

PROCEDURE

Case Study Narrative
Students select a case study to investigate. Provide each group with a “Student Case Study Narrative” and a “Student Case Study Physical Exam Translation Form” handout.

Review with the class the project steps used in Lesson 1. Students should write the steps in their science journals. It is recommended that students partner with local health care professionals for assistance or consultation. The Timmy Foundation provides medical information and resources for this project. In addition, online resources are provided in the Resource Materials section.

PROJECT STEPS

A. Case Study Narrative
B. Consultation Team — Research Tasks
C. Consultation Team — Present Research
D. Medical Assessment
E. Additional Consultation Team Research
F. Outline Treatment

FOR EACH CASE, STUDENTS WILL:

- analyze a case study narrative, history and physical exam
- work in consultation teams
- learn medical vocabulary
- Investigate host country’s:
  - geography
  - socioeconomic culture and language
  - history
  - epidemiology
- write a medical assessment
- confirm with “Teacher Key Physical Exam Translation Form”
- form a class consensus for assessment

PRESENT FINDINGS

Once students complete the research they should present their findings to the class. Teachers should contact The Timmy Foundation to share the project findings and presentation.

INDIANA ACADEMIC STANDARDS

Science — Biology: B.1.17, B.1.20

Language Arts: 9.1.3, 9.2.3, 9.4.4, 9.4.6, 9.7.16, 10.1.3, 10.4.4, 10.5.6, 10.7.15, 11.1.2, 11.4.7, 11.5.7, 11.7.16, 12.1.2, 12.4.7, 12.5.7

Social Studies — World Geography: WG.2.2, WG.4.7
STUDENT CASE STUDY NARRATIVE — LUCIA: A HAITIAN GIRL IN THE DOMINICAN REPUBLIC

Lucia is a 12-year-old Haitian girl who lives in the Dominican Republic. She was seen at the Crossroads Clinic. She came from approximately 12 miles away to be evaluated. She had to be carried part of the time due to shortness of breath. Lucia indicates that she often has swelling of her ankles and will cough with difficulty breathing. She cannot keep up with her peers.

PAST MEDICAL HISTORY

Allergies: No known allergies.
Surgeries: No history of surgery.
Illnesses: Lucia has had difficulty with breathing and swelling of the legs. She reports that she has had upper respiratory infections in the past. She does not believe she has malaria.
Medications: None

FAMILY MEDICAL HISTORY

Lucia’s mother has malaria. Her grandfather reportedly is being treated for HIV and tuberculosis.

SOCIAL HISTORY

Lucia lives in a shack on an exposed landfill. She typically gets her food from items that have been thrown into the waste by people from the nearby city. Lucia and her family live in the lowlands. There is significant heat and humidity in the area. She has very poor hygiene and little or no water. In fact, often they try to catch rain water as delivery of water by truck is often unreliable. She has had no access to education. Her brother works as an indentured servant for a sugar cane plantation owner. His is the only income for the family. He makes less than one U.S. dollar a day.

REVIEW OF SYSTEMS (ROS)

Lucia reports she often gets short of breath when walking up the mountain. She has had a cough but no sputum. She does note swelling of her ankles on occasion. She does not recall any time as a child when her joints caused her problems.

PHYSICAL EXAM

Vitals: Heart rate – 136
Respiratory rate – 32
Blood pressure – 112/80
Temperature – 98.9°F

General: Lucia is very small for her age. She is short in stature and extremely thin.

Skin and Lymphatics: Skin is clear without evidence of breakdown. No lymphadenopathy palpated.

HEENT (Head, eyes, ears, nose, throat): Normocephalic without lesions. Eyes — pupils equally round and reactive to light with extraocular muscles intact. Ears, nose, throat — there is discharge from the left ear. She also has rhinorrhea.

Neck: Supple without mass or goiter. No lymphadenopathy or jugular vein distention. No bruit auscultated.

Chest: Symmetrical without retraction. She does have rales at the bases bilaterally.

Cardiovascular (CV): Tachycardia with a 3/6 systolic ejection murmur heard best at the upper left sternal border radiating up to the neck.

Abdomen: Soft, nontender, with positive bowel sounds. The liver is 3 cm below the right costal margin.

Back and Extremities: No vertebral or paravertebral tenderness on palpation. No costovertebral angle tenderness on percussion. No cyanosis of extremities at this time. She does have pitting edema of the lower extremities and clubbing of the fingers.

Neurological: Lucia is alert and oriented. Cranial nerve examination revealed no abnormality. Muscle stretch reflexes were normal. Lucia has normal strength and sensation throughout.
STUDENT CASE STUDY
PHYSICAL EXAM TRANSLATION FORM — LUCIA

Write in your own words an explanation of what is covered in the Physical Exam. Use this form to write your Assessment and Treatment plan for the case study.

| Person Completing Form: _______________________________ | Date: __________________ |
| School: __________________________ | Grade: __________ |
| Patient’s Name: __________________________ | Patient’s Residence: __________________________ |

PHYSICAL EXAMINATION *(use more space if needed)*

| General: __________________________ |
| Skin and lymphatics: __________________________ |
| Head, eyes, ears, nose, and throat: __________________________ |
| Neck: __________________________ |
| Chest: __________________________ |
| Cardiovascular: __________________________ |
| Abdomen: __________________________ |
| Back and extremities: __________________________ |
| Neurological: __________________________ |

ASSESSMENT

“Lucia is a ______-year-old girl who has __________________________.”

TREATMENT PLAN *(use more space if needed)*

| Education: __________________________ |
| Medicine: __________________________ |
| Equipment: __________________________ |
| Surgery: __________________________ |
| Nutrition: __________________________ |
| Socioeconomic issues: __________________________ |
**TEACHER KEY**

**PHYSICAL EXAM TRANSLATION FORM — LUCIA**

Students write in their own words an explanation of what is covered in the Physical Exam.

Students will use this form to write their Assessment and Treatment Plan for the case study.

Person Completing Form: **Teacher Key** ○ Patient's Name: **Lucia** ○ Patient's Residence: **Dominican Republic**

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**PHYSICAL EXAMINATION**

**Vitals:** Increased heart and respiratory rate

**General:** Lucia is short in stature and thin when compared to other children her age.

**Skin and lymphatics:** Normal.

**HEENT:** Normocephalic means that the head is normal in size and shape. The eyes are normal. Discharge from the left ear indicates that there is likely an infection within the ear canal. Rhinorrhea means that Lucia has a runny nose. The runny nose and ear infection are likely caused by the same bug. However, they do not have any relation to her primary condition.

**Neck:** Normal.

**Chest:** No retraction means that extra muscles around the rib cage are not working hard to help assist breathing. Rales are a crackling noise – like a bowl of Rice Krispies. This is heard at the bottom of both lungs in Lucia. This sound usually indicates fluid in the lungs, which is not normal. Heart problems can lead to fluid accumulating in the lungs. (If the pump does not work then fluid backs up into the lungs.)

**Cardiovascular:** Lucia is extremely tachycardic, indicating a very fast heart rate. She is also noted to have a heart murmur. It is 3/6, which indicates the loudness of the murmur (1/6 is barely audible with the stethoscope and 6/6 is audible without a stethoscope). Systolic ejection murmur describes when the murmur occurs during the heartbeat. This murmur occurs when the ventricles contract (systole) and blood is forced through a damaged valve. This helps identify what is causing the murmur, which can result from damaged valves or holes in the heart.

**Abdomen:** The liver is 3 cm below the bottom of the ribs (costal margin). It should not be below the ribs. This indicates an enlarged liver. Many things can cause a liver to enlarge – infections, tumors, etc. In Lucia's case, the enlarged liver could be secondary to her heart problems (fluid backs up into the liver, similar to what happens in the lungs).

**Back and extremities:** No pain when the spine or muscles around the spine were touched. No costovertebral angle tenderness indicates the kidneys are normal. Fingers and toes are not blue or cyanotic. Pitting edema of the lower extremities means Lucia's feet and ankles are swollen. This is due to fluid backing up from a bad heart as well. When you push on the swelling it feels like mashed potatoes and the imprint of your finger stays in the skin, making small pits. Clubbing in the fingers mean the fingertips are enlarged and the nails are more curved. This condition can be seen in long-standing (chronic) heart, lung, and liver problems.

**Neurological:** Normal.

**ASSESSMENT**

Lucia is a 12-year-old Haitian girl with congenital heart disease. Congenital heart disease refers to any symptomatic heart disease present from the time of birth.

**TREATMENT PLAN**

**Education:** Lucia’s family will be told she has congenital heart disease. The heart disease is responsible for her inability to keep up with her friends. Due to the heart disease she tires easily and her legs swell from time to time. More advanced equipment will be needed to make a more specific diagnosis. Therefore, Lucia will need to be referred to a doctor who deals only with the heart, a cardiologist. If she needs to have surgery to correct the problem, a cardiovascular surgeon will be consulted.

**Congenital Heart Disease:** This is a large category of diseases, all of which result in the heart pumping inefficiently. This causes fluid to back up into the lungs, liver, and legs. Also, the heart cannot pump enough blood to meet the body’s demands. This leads to Lucia becoming tired more quickly than her classmates and friends. A cardiologist will be consulted and take detailed pictures and ultrasound of the heart to identify Lucia’s problem.

**Medicine:** If too much fluid builds up in her lungs, Lucia’s breathing can become a problem. If available, we may give her a diuretic (water pill) to help her get rid of the excess fluid.

**Equipment:** She does not need any equipment at this point.

**Surgery:** Lucia will likely need surgery. A cardiovascular surgeon can repair damaged heart valves or holes in the heart.

**Nutrition:** Lucia’s diet consists of food from the landfill she lives on. Obviously this is not adequate. Both her heart disease and malnutrition have caused Lucia to be smaller than other children her age. She will need vitamins, a supply of drinking water, and assistance with food. She should also be advised to avoid salt, which can worsen fluid buildup in the body.

**Socioeconomic Issues:** Students must consider how best to get Lucia to the heart specialists. The heart surgery may require a specialist in the United States.
STUDENT CASE STUDY NARRATIVE —
LUIS: A LITTLE BOY LIVING IN URBAN ECUADOR

Luis is 5 years old. He came to the Tierra Nueva Clinic at a local elementary school. Luis’ father asked if we had any medicine for leg pain and cough. He reports that Luis cannot keep up with the other children and often is coughing. He can run only for a short distance before he has to squat down. He has had no history of infection. His father indicates that he has been told that Luis has heart disease, but he cannot afford the surgery as it costs five times what he makes in a year and he has four other children to feed.

PAST MEDICAL HISTORY
Allergies: No history of allergies.
Surgeries: No history of surgery.
Medical: As above.
Medications: None

FAMILY MEDICAL HISTORY
No history of heart disease in the rest of the family. No one has malaria although there is an aunt who lives in the lowlands in the forest who has a history of malaria. Luis has visited there in the past.

SOCIAL HISTORY
Luis lives in an apartment in South Quito. His parents work in the market. They make only $900 a year. Luis seldom goes out of the home as he is not able to keep up with the other children and will get in distress. Quito is 9,600 feet above sea level. There is a significant amount of pollution in the city. Luis does attend school when he is feeling well. The family can get a limited supply of bottled water from the local shop. Luis’ nutrition is significantly limited also.

REVIEW OF SYSTEMS (ROS)
Luis has had problems eating. He has always been much smaller than other children his age. His older brother and sister look after him and carry him up steep cliffs because climbing causes him a significant amount of leg pain and shortness of breath. He has had a fever recently but has only minimal upper respiratory infection symptoms (URI) at this point.

PHYSICAL EXAM
Vitals: Heart rate – 120
Respiratory rate – 24
Blood pressure – 100/70
Temperature – 98.6°F
General: Luis is very small for his age. He appears to be only 2 or 3 years old although he is 5.
Skin and Lymphatics: Skin is clear without evidence of breakdown. No lymphadenopathy palpated.
HEENT (Head, eyes, ears, nose, throat): Normocephalic without lesions. Eyes — pupils equally round and reactive to light with extraocular muscles intact. Ears, nose, throat — normal.
Neck: Supple without mass or goiter. No lymphadenopathy or jugular vein distention. No bruit auscultated.
Chest: Symmetrical without retraction. He does have some coarse upper respiratory breath sounds and decreased aeration in the bases of the lungs.
Cardiovascular (CV): Tachycardia with a 3/6 holosystolic murmur. A thrill was appreciated over the chest. Pulses are bounding bilaterally.
Abdomen: Soft, nontender, with positive bowel sounds. The liver was 2 cm below the right costal margin.
Back and Extremities: No vertebral or paravertebral tenderness on palpation. No costovertebral angle tenderness on percussion. No clubbing, cyanosis, or edema of the extremities.
Neurological: Luis is alert and oriented. Cranial nerve examination revealed no abnormality. Muscle stretch reflexes were normal. Luis has normal strength and sensation throughout.
STUDENT CASE STUDY
PHYSICAL EXAM TRANSLATION FORM — LUIS

Write in your own words an explanation of what is covered in the Physical Exam.
Use this form to write your Assessment and Treatment plan for the case study.

Person Completing Form: __________________________________________ Date: ______________

School: __________________________________________________________ Grade: __________________

Patient’s Name: ____________________________________________________

Patient’s Residence: _________________________________________________

PHYSICAL EXAMINATION (use more space if needed)

General: ____________________________________________________________

Skin and lymphatics: _________________________________________________

Head, eyes, ears, nose, and throat: ______________________________________

Neck: ____________________________________________________________________

Chest: ___________________________________________________________________

Cardiovascular: ___________________________________________________________________

Abdomen: ____________________________________________________________________

Back and extremities: __________________________________________________________________

Neurological: ___________________________________________________________________

ASSESSMENT

“Luis is a ______-year-old boy who has ___________________________________________”

TREATMENT PLAN (use more space if needed)

Education: _____________________________________________________________________

Medicine: _____________________________________________________________________

Equipment: _____________________________________________________________________

Surgery: _____________________________________________________________________

Nutrition: _____________________________________________________________________

Socioeconomic issues: ___________________________________________________________________
PHYSICAL EXAMINATION

Vitals: Increased heart rate

General: Luis is very small in stature.

Skin and lymphatics: Normal.

HEENT: Normocephalic means that the head is normal in size and shape.

Neck: Normal.

Chest: The coarse breath sounds are likely due to an upper respiratory infection or cold. Decreased aeration (airflow) can also be due to infection or asthma.

Cardiovascular: Tachycardia indicates the heart is beating too fast. The heart murmur signifies an abnormality in the heart's structure. This could be a damaged valve or a hole in the heart. The thrill (turbulent blood flow) is a vibration that can be felt when one places a hand on Luis' chest. Thrills are associated with defects in the heart as well. Luis also has very strong pulses.

Abdomen: Normal except for a slightly enlarged liver. The liver can be felt 2 cm below the bottom of the last rib (costal margin). This is likely associated with his bad heart. The heart is not pumping blood as well, so some blood can back up into the liver.

Back and extremities: Leg pain from heart disease and lack of oxygen.

Neurological: Normal.

ASSESSMENT

Luis is a 5-year-old from Ecuador with congenital heart disease. Congenital heart disease is diagnosed when heart disease has been present since birth.

TREATMENT PLAN

Education: Luis' family will be told he has congenital heart disease. The heart disease is responsible for his inability to keep up with friends. Due to the heart disease he tires easily. More advanced equipment will be needed to make a more specific diagnosis. Therefore, Luis will need to be referred to a doctor who deals only with the heart, a cardiologist. If he needs to have surgery to correct the problem, a cardiovascular surgeon will be consulted.

Congenital Heart Disease: This is a large category of diseases, all of which result in the heart pumping inefficiently. This causes fluid to back up into the lungs, liver, and legs. Also, the heart cannot pump enough blood to meet the body's demands. This leads to Luis becoming tired more quickly than his classmates and friends. A cardiologist will be consulted and take detailed pictures and ultrasound videos of the heart to identify Luis' problem.

Medicine: He may need an antibiotic for the upper respiratory tract infection; however, surgery is the definitive treatment for the heart condition.

Equipment: He does not need any equipment at this point.

Surgery: Luis will likely need surgery. A cardiovascular surgeon can repair damaged heart valves or holes in the heart.

Nutrition: Luis is malnourished. His heart disease and malnutrition have caused him to be smaller than other children his age. Luis will need vitamins, a supply of drinking water, and assistance with food.

Socioeconomic Issues: Students must consider how best to get Luis to the heart specialists. Can they raise and/or donate the money for the procedure? His father cannot afford the surgery, but the procedure probably can be done in Ecuador. If not, then the heart surgery may require a specialist in the United States.
STUDENT CASE STUDY NARRATIVE — JUANITA: A GIRL FROM HONDURAS

Juanita is a 12-year-old girl who came to the clinic at the Sociedad Amigos De Los Niños. She lives in a hut near the sugar cane fields. She has a history of shortness of breath, particularly when they are burning the sugar cane. She reports that she often has coughing episodes and on occasion coughs up a lot of mucus. On occasion she has fevers. She typically cannot keep up with the other children in the village because she gets very short of breath. She has not been seen by a doctor in the past.

PAST MEDICAL HISTORY
Allergies: No history of allergies.
Surgeries: No history of surgery.
Medical: As above.
Medications: None

FAMILY MEDICAL HISTORY
None provided.

SOCIAL HISTORY
Juanita lives in a mountainous region but her home is located in a valley near some sugar cane fields. She drinks bottled water from the nearby mission. There is limited air pollution with the exception of the burning of the sugar cane fields. Although Juanita is 12 years old she is in Grade 3. She is behind in school because she has taken care of her younger sister since the death of their mother.

REVIEW OF SYSTEMS (ROS)
Juanita reports no pain in the joints. She experiences shortness of breath only during the rainy season. She is able to climb the mountains on occasion but is sometimes limited by her shortness of breath.

PHYSICAL EXAM
Vitals: Heart rate – 140
Respiratory rate – 40
Blood pressure – 130/86
Temperature – 100.2°F

General: Juanita is very small for her age. She is very thin and has a low-grade fever. Her breathing is fast and labored.

Skin and Lymphatics: There is a circular hypopigmented lesion over the right cheek. This measures approximately 1.5 cm in diameter. Lymphadenopathy palpated in the neck.

HEENT (Head, eyes, ears, nose, throat): Normocephalic without lesions. Eyes — pupils equally round and reactive to light with extraocular muscles intact. Ears, nose, throat — the tonsils are enlarged.

Neck: Supple without mass or goiter. Lymphadenopathy is present. Lymph nodes are tender to palpation. There is no jugular vein distention. No bruit auscultated.

Chest: Symmetrical retractions at this time. There is an end-expiratory wheeze.

Cardiovascular (CV): Tachycardia without murmur or gallop. Pulses bounding bilaterally.

Abdomen: Soft, nontender, with positive bowel sounds. Juanita is using her abdominal muscles to breathe.

Back and Extremities: No vertebral or paravertebral tenderness on palpation. No costovertebral angle tenderness on percussion. No clubbing, cyanosis, or edema of the extremities.

Neurological: Juanita is alert and oriented. Cranial nerve examination revealed no abnormality. Muscle stretch reflexes were normal. Juanita has normal strength and sensation throughout.
# STUDENT CASE STUDY

## PHYSICAL EXAM TRANSLATION FORM — JUANITA

Write in your own words an explanation of what is covered in the Physical Exam.
Use this form to write your Assessment and Treatment plan for the case study.

<table>
<thead>
<tr>
<th>Person Completing Form:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>School:</td>
<td>Grade:</td>
</tr>
</tbody>
</table>

### PHYSICAL EXAMINATION

**General:**

**Skin and lymphatics:**

**Head, eyes, ears, nose, and throat:**

**Neck:**

**Chest:**

**Cardiovascular:**

**Abdomen:**

**Back and extremities:**

**Neurological:**

### ASSESSMENT

“Juanita is a _____-year-old girl who has ________________________________________.”

### TREATMENT PLAN

**Education:**

**Medicine:**

**Equipment:**

**Surgery:**

**Nutrition:**

**Socioeconomic issues:**
PHYSICAL EXAMINATION

Vitals: Increased heart and respiratory rate. She also has a low-grade temperature.

General: Juanita is small for her age.

Skin and lymphatics: A circular, hypopigmented lesion is noted. This indicates a mark on Juanita's cheek that is lighter than the skin surrounding it. The lesion could be a fungal infection of the skin.

HEENT: The head is normal size and shape. Eyes are normal, but Juanita's tonsils are enlarged. Tonsils are located on the sides of the back of the throat. They are made of lymph tissue, like a lymph node, and swell up when someone has an infection.

Neck: Lymph nodes around the neck are enlarged. This would go with the enlarged tonsils as evidence that Juanita's immune system is fighting an infection.

Chest: Retractions indicate that accessory muscles are being used to breathe. Normally, just the diaphragm (muscle beneath the lungs) is used to breathe. However, if you are exercising hard or have lung disease breathing becomes more difficult, then other muscles assist your diaphragm. These abdominal muscles are in the rib cage and neck. She also has “end-expiratory wheezing.” When listening to Juanita's lungs with a stethoscope, the doctor can hear a wheeze at the very end of her exhalation. This generally means that some of the airways in the lungs are too constricted – causing the air to "wheeze" as it passes through the narrowing.

Cardiovascular: Her heart is beating faster than normal, but no murmurs or other abnormal sounds are heard with the stethoscope.

Abdomen: Normal.

Back and extremities: Normal.

Neurological: Normal.

ASSESSMENT

Juanita is diagnosed with asthma. This is a reactive airway disease that can be caused by any sort of irritant in the air.

TREATMENT PLAN

Education: Juanita's family will be told she has asthma. This is a disease of the lungs. More specifically, asthma is classified as a reactive airway disease. In this case, her lungs react to the burning of sugar cane. This makes it difficult for Juanita to breathe and to keep up with her peers. She can be treated with an inhaler, but removing or avoiding the irritant is extremely important.

Asthma (Reactive Airway Disease): This is a chronic or long-standing condition that affects the lungs. There is a series of tubes that leads from your mouth and nose to the bottom of the lungs. In asthma, these tubes become very sensitive. The air is filled with small particles, which are mostly harmless to us as we breathe. For asthmatics, these particles can irritate their lungs, causing the tubes to swell. This makes it harder for air to pass through the tubes. Irritants can range from pollen, dust, or animal dander to the smoke of burning sugar cane. Treatment is very important. The tubes can be irritated enough that they may completely close, causing the patient to stop breathing. No cure exists for asthma, but with medications and avoiding those irritants, most people with asthma can function normally.

Medicine: Juanita will be given an inhaler or “puffer.” These inhalers contain a medication that causes the tubes to open up and allow for improved breathing. She will also be given an antibiotic for upper respiratory infection.

Equipment: She does not need any equipment at this point.

Surgery: No surgery is needed.

Nutrition: Juanita's small size leads us to believe that she is malnourished. She should be given a supply of vitamins to take every day. Also, the family may need some assistance buying groceries; however, this type of help is not a long-term solution.

Socioeconomic Issues: A big issue for Juanita is the smoke from the burning sugar cane near her home. She will continue to have asthma attacks as long as she is around that irritant. Ideally we would want to move her away from the burning sugar cane, but is this feasible for her family? How else could we help her?
STUDENT CASE STUDY NARRATIVE —
ROBERTO: A JAMAICAN TODDLER

Roberto is a 2-year-old Jamaican boy with cerebral palsy. He has been rather healthy. He recently was weaned from breast feeding and is now eating some solid foods. Roberto has been able to maintain his weight. His mother’s only concern today is the fact that he has an abnormal patch on his chest. He has been scratching this and it is now open and seems to be both painful and itchy.

5 cm in diameter. There is significant erythema and a purulent discharge with some excoriations. No lymphadenopathy was palpated.

HEENT (Head, eyes, ears, nose, throat): Normocephalic without lesions. Eyes — dysconjugate gaze. There is right exotropia. Ears, nose, throat — normal.

Neck: Supple without mass or goiter. There is no lymphadenopathy palpated. There is no jugular vein distention. No bruit auscultated.

Chest: Symmetrical without retraction. Clear to auscultation bilaterally. He does have the patch of skin irritation as mentioned above.

Cardiovascular (CV): Normal without murmur or gallop. Pulses equal bilaterally.

Abdomen: Soft, nontender, with positive bowel sounds.

Back and Extremities: Roberto has a slight contracture of the right hamstring and gastrocnemius muscles. He tends to rotate the right lower extremity internally when ambulating. The right arm pulls up into flexion.

Neurological: Roberto is alert and interactive. He is very pleasant. He is able to respond appropriately to questions and uses single word answers. Muscle stretch reflexes were increased throughout. He seems to have difficulty with the use of the right arm and leg but mobilizes rather well. He does not appear to have any word-finding problems nor does he have any evidence of a right visual field cut.

PAST MEDICAL HISTORY

Allergies: No history of allergies.

Surgeries: No history of surgery.

Medical: Roberto had a difficult birth. He seems to be a bit weak on the right side, according to his mother.

Medications: None

FAMILY MEDICAL HISTORY

Roberto’s brother also has a similar lesion but it is smaller and on his face.

SOCIAL HISTORY

Roberto lives with his extended family of ten in a shack in a rural village. His brothers and father are subsistence farmers. They live in the highlands. It is a very humid area and there is limited opportunity to bathe. Roberto’s siblings attend school.

REVIEW OF SYSTEMS (ROS)

Roberto did not bear weight on the right arm initially. In recent months he has begun to bear weight on this arm. He had difficulty crawling and now is able to walk, but his mother reports that he tends to turn the right leg in and does fall often.

PHYSICAL EXAM

Vitals: Heart rate – 92

Respiratory rate – 20

Blood pressure – 96/64

Temperature – 98.8°F

General: Roberto is well developed, well nourished, and in no acute distress. He is very interactive and smiles often.

Skin and Lymphatics: Skin is clear with the exception of the patch over the chest. This measures approximately
STUDENT CASE STUDY
PHYSICAL EXAM TRANSLATION FORM — ROBERTO

Write in your own words an explanation of what is covered in the Physical Exam.
Use this form to write your Assessment and Treatment plan for the case study.

Person Completing Form: ______________________________________________________ Date: ____________________
School: __________________________________________________________ Grade: ____________________
Patient’s Name: __________________________________________________________
Patient’s Residence: ______________________________________________________

PHYSICAL EXAMINATION (use more space if needed)

General: ______________________________________________________________________________
Skin and lymphatics: _____________________________________________________________________
Head, eyes, ears, nose, and throat: ______________________________________________________________________
Neck: _________________________________________________________________________________
Chest: ________________________________________________________________________________
Cardiovascular: __________________________________________________________________________
Abdomen: ______________________________________________________________________________
Back and extremities: _________________________________________________________________________
Neurological: ____________________________________________________________________________

ASSESSMENT

“Roberto is a _____-year-old boy who has ________________________________________________.”

TREATMENT PLAN (use more space if needed)

Education: _______________________________________________________________________________
Medicine: ________________________________________________________________________________
Equipment: ______________________________________________________________________________
Surgery: __________________________________________________________________________________
Nutrition: _________________________________________________________________________________
Socioeconomic issues: _______________________________________________________________________
**PHYSICAL EXAMINATION**

**Vitals:** Normal

**General:** Roberto appears to be of normal size and development.

**Skin and lymphatics:** There is a large spot on his chest. There is erythema or redness around the patch. Also the doctor noted purulent discharge, which is a thick yellowish-green fluid associated with infections. Excoriations are scratch marks due to Roberto's itching.

**HEENT:** The head is normal in shape and size. Dysconjugate gaze tells us that Roberto's eyes do not look in the same direction. Right exotropia means that when he tries to look directly ahead, his right eye will remain deviated to the right, while his left eye will look straight ahead. This has likely been present since birth.

**Neck:** Normal.

**Chest:** He is not having any trouble breathing, and his lungs sound clear when the doctor listens with the stethoscope.

**Cardiovascular:** His heart is beating faster than normal, but no murmurs or other abnormal sounds are heard with the stethoscope.

**Abdomen:** Normal.

**Back and extremities:** A contracture is a tightening of the skin, ligaments, tendons, or muscles that prevents normal range of motion. The calf muscle and "gastro" are the same thing. Contractures can occur after brain injuries. From his history, Roberto may have had a stroke during birth, which may be the cause of his CP. This would account for problems he is having with his right arm and leg.

**Neurological:** The “knee-jerk” reflex is an example of a muscle stretch reflex that doctors check. Increased reflexes means the leg jumps more when the hammer strikes the knee. This indicates a past spinal cord or brain injury (like a stroke). The contractures mentioned above make it difficult for Roberto to use his right arm and leg. People with strokes can sometimes have difficulty with word finding or visual problems.

**ASSESSMENT**

Roberto is a 2-year-old who has tinea corporis with cellulitis. This is a fungal infection, which has subsequently become infected with bacteria. His cerebral palsy is stable.

**TREATMENT PLAN**

**Education:** Roberto's family will be told he has both fungal and bacterial infections on his chest. The patch started out as a fungal infection. Then when Roberto scratched the skin open, bacteria got into the wound, causing a secondary infection. Roberto's lack of bathing led to the initial fungal infection. Mother was instructed on stretching and strengthening exercises for his muscles.

**Medicine:** Roberto will need a topical cream. This should have both hydrocortisone, which reduces inflammation and itching, and Lotrimin, which is an antifungal. He will also need an oral antibiotic such as Keflex.

**Equipment:** He does not require any equipment for the infection. However, he could use some braces (orthoses) for his leg and arm to help treat the contractures. This is not the family's primary concern, and Roberto seems to be getting around better lately.

**Surgery:** No surgery is needed.

**Nutrition:** Roberto is normal size for his age with respect to both height and weight. This is great news — he is not malnourished. We would still provide a vitamin for Roberto and make sure he has a source of clean water.

**Socioeconomic Issues:** After the treatment for this infection, the most important issue is prevention. This requires educating the family about the need for regular bathing to prevent skin infections. Also Roberto should try to come back to clinic in the future to make sure his contractures are not worsening.
STUDENT CASE STUDY NARRATIVE — KIRSTEN: AN AFRICAN AMERICAN IN THE U.S.A.

Kirsten is a 12-year-old African American girl who has a history of sickle-cell anemia. She has had multiple crises in the past with a lot of abdominal pain, for which she has received treatment. Most recently her mother reports that she seemed to be having a crisis and was given some pain medicine before going to bed. The next morning she was noted to have weakness on the right side of the body. She also had difficulty with her speech. She was stabilized and then was to begin rehabilitation.

PAST MEDICAL HISTORY
Allergies: Penicillin — causing a rash.
Surgeries: None
Medical: As above. She has had multiple crises in the past.
Medications: Baby aspirin 1 per day. She is also on Bactrim b.i.d. for a urinary tract infection.

FAMILY MEDICAL HISTORY
Kirsten’s siblings and parents are reportedly healthy.

SOCIAL HISTORY
Kirsten lives at home with her mother, father, and maternal grandmother. Her brother and sister, ages 14 and 15, also live at home. Kirsten attends a local middle school and performs well academically. She is unable to participate in sports. She enjoys playing video games as well as playing the drums.

REVIEW OF SYSTEMS (ROS)
Kirsten has a history of upper respiratory infections in the past. She has been healthy until this most recent event.

PHYSICAL EXAM
Vitals: Heart rate – 96
Respiratory rate – 16
Blood pressure – 112/74
Temperature – 98.7°F

General: Kirsten is well developed and well nourished although she is a bit thin. She is in no acute distress.
Skin and Lymphatics: Skin is clear without evidence of breakdown. No lymphadenopathy was palpated.
HEENT (Head, eyes, ears, nose, throat): Normocephalic without lesions. Eyes — she appears to have a right visual field cut. Ears, nose, throat — normal.
Neck: Supple without mass or goiter. There is no lymphadenopathy palpated. There is no jugular vein distention. No bruit auscultated.
Chest: Symmetrical without retraction. Clear to auscultation bilaterally.
Cardiovascular (CV): Normal without murmur or gallop. Pulses equal bilaterally.
Abdomen: Soft, nontender, with positive bowel sounds. She has a bit of tenderness over the suprapubic area on palpation.
Back and Extremities: No vertebral or paravertebral tenderness on palpation. No costovertebral angle tenderness on percussion. No clubbing, cyanosis, or edema of the extremities.
Neurological: Kirsten is alert but has questionable orientation. She does not seem to understand our questions nor is she able to produce words. She appears to have a right visual field cut as mentioned above. The right arm and leg are flaccid with decreased muscle stretch reflexes. She has limited movement of the right arm and leg. She has some ability to flex the right arm and to extend the right leg. Otherwise, she has a very dense right hemiparesis.
STUDENT CASE STUDY

PHYSICAL EXAM TRANSLATION FORM — KRISTEN

Write in your own words an explanation of what is covered in the Physical Exam.
Use this form to write your Assessment and Treatment plan for the case study.

Person Completing Form: ___________________________ Date: ______________

School: ___________________________ Grade: ______________

Patient’s Name: ___________________________

Patient’s Residence: ___________________________

PHYSICAL EXAMINATION (use more space if needed)

General: ___________________________

Skin and lymphatics: ___________________________

Head, eyes, ears, nose, and throat: ___________________________

Neck: ___________________________

Chest: ___________________________

Cardiovascular: __________________________________________________________________________________

Abdomen: ___________________________

Back and extremities: ___________________________

Neurological: ___________________________

ASSESSMENT

“Kristen is a ______-year-old girl who has _____________________________________________________________,”

TREATMENT PLAN (use more space if needed)

Education: __________________________________________________________________________________

Medicine: __________________________________________________________________________________

Equipment: __________________________________________________________________________________

Surgery: __________________________________________________________________________________

Nutrition: __________________________________________________________________________________

Socioeconomic issues: ___________________________________________________________________________
**TEACHER KEY**

**PHYSICAL EXAM TRANSLATION FORM — KIRSTEN**

Students write in their own words an explanation of what is covered in the Physical Exam.

Students will use this form to write their Assessment and Treatment Plan for the case study.

Person Completing Form: **Teacher Key**  
Patient’s Name: **Kirsten**  
Patient’s Residence: **United States**

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**PHYSICAL EXAMINATION**

**Vitals:** Normal

**General:** Kirsten is normal height and weight (but thin) for a female her age.

**Skin and Lymphatics:** Normal.

**HEENT:** Head is normal in size and shape. Periphereral vision is decreased on the right. This could result from damage to the left side of the brain, like a stroke (consistent with her presentation of right-sided weakness).

**Neck:** Normal.

**Chest:** Kirsten is breathing regularly without difficulty.

**Cardiovascular:** Heart rate is normal and no extra sounds are heard.

**Abdomen:** The suprapubic region is between the belly button and pubic bone. When pushing in this area the doctor can evaluate the bladder, which lies directly below. If there is tenderness, then this may be an indication of an infection in the bladder.

**Back and extremities:** Normal.

**Neurological:** Questionable orientation refers to Kirsten's inability to answer questions oriented to time, place and person (What day is it?, where are you?, and what is your name?). This sort of haze can accompany strokes, as the brain is starved of oxygen for a period of time. It may be caused by damage to the communication center in the left side of the brain. The right visual field deficit is mentioned again, and the doctor notes right arm and leg weakness as well, with decreased reflexes. All of these factors point to a stroke on the left side of the brain. Immediately after a stroke, muscle strength and reflexes are decreased. As time goes on after a stroke, muscle tone increases, contractures can form, and reflexes are drastically increased. Hemiparesis means a weakness of one half of the body.

**ASSESSMENT**

Kirsten had a CVA of the left side of the brain. In this case decreased blood flow has caused an ischemic, or lack of blood flow, injury to the left side of the brain. This resulted in a right hemiparesis, right visual field cut, and aphasia.

**TREATMENT PLAN**

**Education:** Kirsten's family will be told that she had a cerebralvascular accident (CVA), or stroke. This occurs when an area of the brain stops receiving adequate blood flow and is thus starved of oxygen.

**Sickle-Cell Anemia**

Kirsten has sickle-cell anemia. This is a disease that affects red blood cells. These cells carry oxygen around the body. In this disease, the red cells can become malformed into a sickle shape. When this occurs, they do not carry oxygen as well. Moreover, they tend to be stickier and get caught in smaller blood vessels. This leads to parts of the body being deprived of crucial oxygen, which can be deadly. If this occurs in the brain, then a stroke, or CVA, may result. There is no cure for sickle-cell anemia. In fact, it is an evolutionary mutation that helps to protect people from malaria. It is best to try to prevent attacks by staying hydrated, but attacks may occur anyway. Therefore, patients must recognize signs of attacks and go to the hospital.

**Medicine:** She will need to finish the antibiotics for her urinary tract infection. She could also be put on folate supplements, which help with formation of new red blood cells.

**Equipment:** Kirsten will need to begin rehabilitation for the impairments caused by the stroke. She may require braces or other equipment, but therapists will determine that.

**Surgery:** No surgery needed.

**Nutrition:** She should continue to eat a well-balanced diet, and make sure she takes a vitamin every day. Staying well hydrated by drinking plenty of water may help prevent some attacks, but there is no cure.

**Socioeconomic Issues:** Issues for Kirsten may center on her family's ability to pay for rehabilitation, which may be extensive. What students should consider are ways to get Kirsten the treatment she needs if her family cannot pay for it or insurance will not cover it.
STUDENT CASE STUDY NARRATIVE — MARIA: A YOUNG GIRL FROM GUATEMALA

Maria is a 12-year-old girl from a village in the highlands of Guatemala. She came to the clinic today with weakness in the left side of her body. She walks with a limp. Her left foot points in. On occasion she will trip. It appears that her left arm is affected more than her leg. Her mother also reports that Maria has trouble seeing things placed to her left and that she has been like this since birth. Mother reports that the delivery was very difficult. The midwife told her she had a “breech presentation.”

HISTORY

**Allergies:** Peanuts — rash, breathing difficulty one time.

**Surgeries:** None.

**Illnesses:** History of upper respiratory infections. She was treated with herbs. Traditional remedies are used by most of the villagers.

**Medications:** None.

**FAMILY MEDICAL HISTORY**

Father is blind in his left eye due to trauma. María’s 5-year-old brother, Juan, is also weak on the left side of his body. He reportedly does not have any visual problems. Mother often feels very weak as she is still nursing her youngest child. The rest of the family is malnourished but otherwise healthy.

SOCIAL HISTORY

Maria does not attend school due to her disability. Her parents are interested in having her attend a special education school but they cannot afford it. Her father is a general laborer in the village and makes $2 or $3 on a good day. Her mother is busy caring for the family’s seven children. The children range in age from 1 to 12. It is unlikely that Maria will get married and leave home because of her disability.

**REVIEW OF SYSTEMS (ROS)**

Maria is often short of breath while running. She has pain in her left lower back. She denies any bladder infections. On occasion she has slurred speech.

**PHYSICAL EXAM**

**Vitals:** Heart rate – 110
- Respiratory rate – 20
- Blood pressure – 110/70
- Temperature – 98.6°F

**General:** Maria is small for her age.

**Skin and Lymphatics:** There is a patch on the scalp where there is no hair. It measures 1 centimeter in diameter. No discharge, or erythema, and the area was not fluctuant. No lymphadenopathy palpated.

**HEENT (Head, eyes, ears, nose, throat):** Poor dentition, multiple caries, left visual field cut.

**Neck:** Normal.

**Chest:** Symmetrical, CTA (clear to auscultation), no retractions.

**Cardiovascular (CV):** Tachycardia with no murmur. Good perfusion of extremities.

**Abdomen:** Soft and nontender with positive bowel sounds, no mass.

**Back and Extremities:** No vertebral or paravertebral tenderness, slight scoliosis. Contractures of left shoulder, elbow, hip, and knee. No clubbing, cyanosis, or edema of extremities.

**Neurological:** Left hemiparesis with increased muscle stretch reflexes on left. Left visual field cut. Normal sensation throughout the body. Spastic gait noted.
STUDENT CASE STUDY
PHYSICAL EXAM TRANSLATION FORM — MARIA

Write in your own words an explanation of what is covered in the Physical Exam. Use this form to write your Assessment and Treatment plan for the case study.

Person Completing Form: __________________________________________________________ Date: __________

School: __________________________________________________________ Grade: __________

Patient’s Name: __________________________________________________________

Patient’s Residence: __________________________________________________________

**PHYSICAL EXAMINATION** *(use more space if needed)*

General: __________________________________________________________________________

Skin and lymphatics: __________________________________________________________________________

Head, eyes, ears, nose, and throat: __________________________________________________________________________

Neck: __________________________________________________________________________

Chest: __________________________________________________________________________

Cardiovascular: __________________________________________________________________________

Abdomen: __________________________________________________________________________

Back and extremities: __________________________________________________________________________

Neurological: __________________________________________________________________________

**ASSESSMENT**

"Maria is a _______ - year-old girl who has ________________________________________________ ."

**TREATMENT PLAN** *(use more space if needed)*

Education: __________________________________________________________________________

Medicine: __________________________________________________________________________

Equipment: __________________________________________________________________________

Surgery: __________________________________________________________________________

Nutrition: __________________________________________________________________________

Socioeconomic issues: __________________________________________________________________________
PHYSICAL EXAMINATION

Vitals: Increased heart rate.
General: Maria is small in stature.
Skin/Lymphatics: The hairless patch on the scalp is actually a fungal infection called tinea capitis. It is unrelated to her primary diagnosis for this clinic visit.
HEENT: She had multiple cavities, also called caries, and poor dentition, or poor development of the teeth generally. Left visual field cut is significant. This term means that she cannot see things coming in from the left visual area, or the left periphery.
Neck: Normal.
Chest: Clear to auscultation means nothing was heard listening through the stethoscope. No retractions means that there was no evidence of the muscles working extra hard around the rib cage to pull air in.
Cardiovascular: Her heart is beating faster than normal, but no murmurs or other abnormal sounds are heard with the stethoscope.
Abdomen: Normal.
Back/Extremities: A slight scoliosis means that she has a mild curvature of the spine to the side. No vertebral or paravertebral tenderness means no tenderness over the vertebrae of the spine or the muscles on either side of the spine. Contractures of the left shoulder, elbow, hip, and knee means that she has some tightness of the tendons and ligaments so that we are unable to fully extend those joints. No clubbing, cyanosis, or edema of extremities means that she does not have enlarged fingertips, nor are the fingertips and toes blue as in cyanosis. There is no edema, which is a general swelling of the extremities.
Neurological: Left hemiparesis with increased muscle stretch reflexes on the left simply means that she has weakness on the left side of the body and the left leg and arm tend to jump more when reflexes are tested. As mentioned before, she has a left visual field cut, which means she cannot see things to the left while looking forward. She has a spastic gait, meaning a limp because of tightness in the left leg.

ASSESSMENT
Maria is a 12-year-old girl who had a CVA or stroke of the right hemisphere from birth trauma, which also resulted in damage to the right visual pathway. Maria had a right MCA (middle cerebral artery) distribution stroke.

TREATMENT PLAN
Education: The family is notified that Maria had a cerebrovascular injury of the right hemisphere, or the right side, of the brain at the time of birth. A cerebrovascular injury is when a blood vessel breaks or blocks off the brain, causing bleeding or a lack of blood and oxygen to an area of the brain. This loss of blood flow causes brain tissue damage. This damage to the motor cortex, or the area of the brain on the right, controls movement on the left side of the body. Surgery would usually involve lengthening of the calf muscles or the hamstrings on the left.

Cerebrovascular Accident (CVA): A CVA or stroke is an interruption of the blood supply to any part of the brain. If blood flow is stopped for longer than a few seconds, the brain cannot get blood and oxygen. Brain cells can die, causing permanent damage.

Medicine: We would treat Maria with an antispasticity medication such as Baclofen.

Equipment: She would benefit from a brace for the left ankle so that she could walk better.

Surgery: We might consider surgery to lengthen the tendons because she has contractures across the joints on the left side of the body. Surgery would usually involve lengthening of the calf muscles or the hamstrings on the left.

Nutrition: Choking while eating or drinking is sometimes a problem after someone has had a stroke, but Maria reports having no such difficulties. We would encourage her to continue to consume a nutritional diet.

Socioeconomic Issues: Students must consider how medicines, equipment, and surgery will be provided to Maria.
STUDENT CASE STUDY NARRATIVE — JUAN: A YOUNG BOY FROM GUATEMALA

Juan is a 7-year-old boy from a village in the highlands of Guatemala. He came to the clinic today with weakness in the left side of his body. He walks with a limp. His left foot points in. It appears that his left leg is more affected than his arm. Juan’s mother first noted he had weakness on the left side when he was beginning to walk.

HISTORY
Past Medical History: History of upper respiratory infections in the past. He was treated with herbs.
Surgeries: None.
Allergies: None.
Medications: None.

FAMILY MEDICAL HISTORY
Father is blind in his left eye due to trauma. Maria, Juan’s older sister, is also weak on the left side of her body. Juan’s mother often feels very weak because she is still nursing her youngest child. The rest of the family is malnourished but otherwise healthy.

SOCIAL HISTORY
Juan does not attend school due to his disability. His parents are interested in his attending a special education school, but they cannot afford it. His father is a general laborer in the village and makes $2 or $3 on a good day. Juan’s mother is busy caring for the family’s seven children. The children range in age from 1 to 12. When Juan was a toddler, he lived in the rain forest with his mother for three months while she cared for her own mother.

REVIEW OF SYSTEMS (ROS)
Juan is often short of breath while running. He has pain in his left lower back. He also has a history of recurrent fevers.

PHYSICAL EXAM
Vitals: Respiratory rate 16, heart rate 80, blood pressure 116/68, temperature 98.6°F.
General: Juan is small for his age.
Skin and Lymphatics: There is a patch on his face with excoriations. It measures 2 cm in diameter. No fluctuance, discharge, or erythema. No lymphadenopathy palpated.
HEENT (Head, eyes, ears, nose, throat): Poor dentition, multiple caries. Eyes are icteric.
Neck: Normal.
Chest: Symmetrical, CTA (clear to auscultation), no retractions.
Cardiovascular (CV): Normal heart rate and rhythm. Good perfusion of extremities.
Abdomen: Soft and nontender with positive bowel sounds, no mass.
Back and Extremities: No vertebral or paravertebral tenderness. Contractures of left shoulder, elbow, hip, and knee. No clubbing, cyanosis, or edema of extremities.
Neurological: Left hemiparesis with increased muscle stretch reflexes on left. Normal sensation throughout the body. Spastic gait noted.
STUDENT CASE STUDY

PHYSICAL EXAM TRANSLATION FORM — JUAN

Write in your own words an explanation of what is covered in the Physical Exam.
Use this form to write your Assessment and Treatment plan for the case study.

Person Completing Form: ______________________________________ Date: ________________

School: __________________________________________________________ Grade: ______________

Patient’s Name: __________________________________________________________

Patient’s Residence: ________________________________________________________

PHYSICAL EXAMINATION (use more space if needed)

General: ______________________________________________________________

Skin and lymphatics: ______________________________________________________

Head, eyes, ears, nose, and throat: __________________________________________

Neck: __________________________________________________________________

Chest: __________________________________________________________________

Cardiovascular: __________________________________________________________________

Abdomen: __________________________________________________________________

Back and extremities: __________________________________________________________________

Neurological: __________________________________________________________________

ASSESSMENT

“Juan is a ______-year-old boy who has ____________________________________________.”

TREATMENT PLAN (use more space if needed)

Education: __________________________________________________________________

Medicine: __________________________________________________________________

Equipment: __________________________________________________________________

Surgery: __________________________________________________________________

Nutrition: __________________________________________________________________

Socioeconomic issues: __________________________________________________________________
PHYSICAL EXAMINATION
Vitals: Normal.
General: Juan is small in stature relative to his peers.
Skin and lymphatics: He has a patch on the face with excoriations, which are scratch marks. Like his sister, Juan has a fungal infection of the skin, which we would call tinea facies because it is on his face. No fluctuance, discharge, or erythema means there is no swelling, discharge, or redness about this patch. He has no evidence of a bacterial skin infection just the topical fungal infection. No lymphadenopathy palpated means there is no swelling of the lymph nodes to indicate further infection.
HEENT: Juan also has poor dentition, meaning his teeth are poorly developed and not well cared for. He has multiple cavities, or caries. Eyes are icteric, meaning a yellow coloration of the whites of the eyes because of increased bilirubin.
Neck: Normal.
Chest: Symmetrical. Clear to auscultation, no retractions. This is normal.
Cardiovascular: Normal heart rate and rhythm. Good perfusion of extremities. No abnormality noted here. Good perfusion of the extremities means that he has good color and blood flow down to the toes and fingertips.
Abdomen: Normal.
Back and extremities: There are contractures of the left shoulder, elbow, hip, and knee as we saw in Maria because of shortening of the muscles, tendons, and ligaments. No clubbing, cyanosis, or edema of the extremities.

ASSESSMENT
Juan is a 7-year-old boy who had a CVA (cerebrovascular accident) or stroke of the right hemisphere from malaria. Juan has a right ACA (anterior cerebral artery) distribution stroke. Protozoan parasites of Plasmodium species carried by Anopholes mosquitoes cause malarial infection.

TREATMENT PLAN
Education: We will educate the family about malaria and treatment of this infection.
Medicine: Patients are typically treated with a chloroquine medication.
Equipment: Juan would benefit from an ankle-foot orthotic (AFO) or brace for his left foot, to help him walk.
Surgery: Surgery could be considered to reduce the contractures, particularly in the left hamstring and calf muscles.
Nutrition: Juan's family will be instructed on a good nutritional diet for a boy of his age.
Socioeconomic Issues: Students must consider how medicines, equipment, and health care will be provided to Juan.
LESSON 3

PEOPLE LIKE YOU MAKING A DIFFERENCE

The objective of this lesson is to provide role models and inspiration to students to make a difference in the world. The lesson is divided into three parts. The first two sections provide background information about The Timmy Foundation and selected international partners. Students learn about the international partner organizations that the foundation supports. All of these organizations have two things in common: they seek to help others, and they exist because of committed volunteers. The last part of the lesson gives examples of ways students can get involved to make a difference. Students are presented with a list of service projects to support.

STUDENT TASKS

Direct students to find information about The Timmy Foundation at http://www.timmyfoundation.org. Share the following excerpts from the foundation’s Web site. Assign each student or group a section of the material to present to the class. The Timmy Foundation can assist students in finding volunteers who have completed service projects or those who have participated on international mission trips.

Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it’s the only thing that ever has.
— Margaret Mead

THE TIMMY FOUNDATION

— OUR VISION —
A world in which basic health care and education are available to all children.

— OUR MISSION —
Building healthy futures worldwide, one child at a time. We accomplish this mission by strengthening community-based health and education initiatives and empowering people to share their energy and compassion.

The Timmy Foundation partners include international nongovernmental organizations (NGOs) that provide medical care and education to the underserved. The Timmy Foundation has established chapters in universities and high schools throughout the United States. In addition, The Timmy Foundation works with churches and other nonprofit organizations in the United States to improve the health and development of children at home and abroad.
**THE TIMMY FOUNDATION MISSION OBJECTIVES**

- Strengthen community-based health and education initiatives
- Organize international service trips
- Collect and distribute appropriate medicines, medical equipment/supplies, and educational materials
- Provide funds for outreach opportunities
- Advocate for these initiatives and the people they serve
- Empower people to share their energy and compassion
- Promote global awareness and involvement at schools and universities
- Create meaningful international service opportunities for student volunteers
- Encourage life-long commitment to service

**MEDICAL SUPPLY WAREHOUSE**

Another way in which we support our local and international partners is by delivering important medicines and appropriate medical equipment and supplies. We coordinate with our partners to determine their material needs, then collect, organize, and ship accordingly. Some items are hand-carried by our volunteers, while larger items are shipped in crates or containers. Many of the durable goods (wheelchairs, shower chairs, etc.) we collect are distributed in the Indianapolis area to children and seniors in need. Other medical outreach organizations are welcome to shop our warehouse free of charge.

**INTERNATIONAL SERVICE TRIPS**

We enable volunteers to travel with us to strengthen the health and education initiatives of our international partners, such as Fundación Tierra Nueva in Ecuador and the Clinic of the Haitian Academy in Haiti. These service trips are typically one week in length and are paid for by the volunteers themselves. Trip expenses (typically around $1,200 per person, everything included) are kept to a minimum by living in the community with the people we serve. While most of our trips are centered on primary health care outreach, some trips include public health education, dental, construction, medical equipment maintenance, and child development projects. Nonmedical volunteers can serve in our clinics in a variety of capacities: translation, triage, pharmacy assistance, fluoride station, and assistance to health care providers.

**FUNDING FOR OUTREACH GROWTH**

We seek funds to distribute to our international partners for the structural improvement of existing clinics and hospitals, for the general support of child development and education projects, and for the medical needs of impoverished children. For example, we provide monthly support to Quito’s Tierra Nueva hospital, enabling them to offer high-quality health care to those without the ability to pay. We also support the monthly salary of a medical doctor in the Haitian Academy’s clinic. That doctor cares for impoverished patients and mentors Haitian medical students.
Rather than duplicate efforts, The Timmy Foundation chooses to accomplish its mission by partnering with domestic and international organizations already battling to increase the accessibility of high-quality health care and education to the children in their communities. To empower these initiatives, the foundation serves as a resource clearinghouse, seeking financial, material, and volunteer support for their benefit. Below is a selected list of international partners. These partners represent five countries The Timmy Foundation visits on medical missions. These five organizations present unique opportunities for learning and service. The five partners represent different cultures, languages, and geographic environments. They all share our mission to increase high-quality health care and education.

**INTERNATIONAL PARTNERS**

The following list outlines some of the general challenges facing the children that The Timmy Foundation hopes to serve. Each of these countries has outstanding organizations and foundations working to improve the daily living conditions. This is not meant to be a total picture of the country’s resources. It is intended to illustrate some of the problems and conditions that are present in each country.

- **Haitian Academy** — Port-au-Prince, Haiti
  - www.haitianacademy.net

  **SCHOOL DETAILS**

  The Haitian Academy teaches people of all ages, starting with a classical school for Grades K–5 followed by the Haitian equivalents to U.S. middle school and high school, and then higher education through a technical school and a university. The university offers a diverse range of subjects from medicine to business management. Dr. Marie-Pologne Rene founded the academy after visiting her native Haiti.

- **Dominican Crossroads** — Sosua, Dominican Republic
- **Fundación Tierra Nueva** — Quito Sur, Ecuador
- **Sociedad Amigos de Los Niños** — Nuevo Paraíso, Honduras
- **St. Vincent Strambi Clinic** — Bull Savannah, Jamaica

**ENDEMIC DISEASES AND CONDITIONS**

- Typical disease or injury: untreated open fractures; malaria; congenital heart disease; polio
- Urban or rural: shacks; exposed landfills; sugar cane fields
- Mountainous, lowlands or beach
- Heat, humidity
- Poverty, poor hygiene
- Limited nutrition
- Little or no potable water
- Severely limited education
- High crime rate
The Timmy Foundation

DOMINICAN CROSSROADS
Sosua, Dominican Republic
www.dominicancrossroads.com

MEDICAL MINISTRY DETAILS
The Dominican Crossroads ministry compound is located near the village of Sosua, on the north coast of the Dominican Republic, just east of Puerto Plata.

As a part of its mission to serve the poorest of the poor, Crossroads provides basic primary care and medical care referrals to the public hospital and public and private clinics in Montellano and Puerto Plata. As a result of the generosity of persons from throughout the world, Crossroads has established a one-room clinic in the village of Ascension. The clinic serves persons from Ascension and nearby bateyes (shantytowns) and is the base for outreach missions to more distant poor barrios and bateyes on the north coast. Care is also provided to persons who seek help from Dr. Bob at his clinic in Sosua. These two sites allow Dr. Bob and Crossroads volunteers to provide follow-up care to acutely ill persons and those with serious chronic conditions.

Dominicans who live in the bateyes live on the edge of survival. Most are undernourished and vulnerable to infectious diseases and the premature onset of disabling chronic conditions. Although free care is provided at the public clinic and hospital, this care is extremely limited due to the poverty of the country and minimal resources allocated to the public health system. As a result, patients must pay for diagnostic tests, medicine, and food. These costs, plus the cost of transportation to a clinic or the hospital, are impossible to pay for Dominicans who struggle just to provide a small daily ration of rice and beans for their families. Crossroads intervenes by providing basic primary care, filling prescriptions, and covering the costs of diagnostic tests, surgeries, and other treatments when financially possible to do so.

Crossroads’ medical mission is exclusively a volunteer effort, relying on contributions of medicine and monetary donations to support the mission. The most critical need is for financial support to pay for diagnostic tests, treatments, and surgeries. Crossroads works closely with the public clinic and hospital to assure that needed treatments and medicine are provided, and also refers critical and complex cases to a private clinic in Puerto Plata. Physicians at the public hospital and public and private clinics are extremely supportive. However, the need and cost of surgeries and medicines always exceeds the limited funds contributed to the medical mission.

Crossroads welcomes healthcare professionals and student volunteers to assist in its primary care clinic at Ascension and its medical care outreach missions. The objective is to treat those in the greatest need, recognizing that care decisions must take into account cultural factors and lack of access to the high-tech medical resources that most volunteers are accustomed to. For these reasons, groups with physicians and other licensed healthcare professionals work in close collaboration with a Crossroads staff member. Caring for the sickest individuals first assures that clinics are organized in such a way that appropriate triage is undertaken and follow-up care can be provided. Medical, dental, nursing, and other healthcare students are required to work under the direct supervision of a Crossroads staff member.

ENDEMIC DISEASES AND CONDITIONS
- Typical disease or injury: untreated open fractures; malaria; congenital heart disease
- Urban or rural: shacks; exposed landfills; sugar cane fields
- Mountainous, lowlands or beach
- Heat, humidity
- Poverty, poor hygiene
- Limited nutrition
- Little or no potable water
- Severely limited education
Father José Carollo, an Italian-born Catholic priest who moved to Ecuador as a young man, founded the Fundación Tierra Nueva (New World Foundation). A relentless advocate for the poor, Father Carollo moved to southern Quito, the poorest part of Ecuador’s capital city, determined to provide a better life for those who come from scarce economic means. Father Carollo believed that every person, regardless of economic status, deserves a dignified life. His Tierra Nueva Foundation aims to provide that dignified life by working with poor families to improve their physical, economic, emotional, and spiritual well-being. During the more than three decades that Father Carollo ran the Tierra Nueva Foundation, he built a nonprofit, fully functioning medical hospital, two daycare centers, a special education center, a legal services organization, and numerous churches throughout south Quito. When Father Carollo died, in May 2005, the Tierra Nueva Foundation board of directors pledged to continue the work of Padre Carollo, including completion of the 100-bed hospital that was his final dream. Today, the Tierra Nueva Foundation continues to strive to improve the well-being of Quito’s poor, taking up Father Carollo’s creed: “Our life is a gift. We live it in order to return it as a service to the most needy.”

At present, the Tierra Nueva Foundation continues to operate a medical hospital and pharmacy, two daycare centers, a special education center, and a legal services organization while moving forward with the construction of the new “Song for Life” hospital, now approximately two-thirds complete. Each of Tierra Nueva’s organizations is dedicated to reaching out to those with limited economic means through a combination of financial, medical, and legal assistance. Through both international and local collaborations, Tierra Nueva maintains a social work department in each organization, which allows for the foundation to subsidize services for those who could not otherwise pay. Collaborations include private sponsorships and grants, financial assistance from international nonprofits, as well as a medical brigade program that brings doctors and surgeons to Quito to volunteer their services.

The 264-person Tierra Nueva staff serves a community of approximately 600,000 people. This community directly includes all of the neighborhoods of south Quito, and indirectly includes the marginal, rural areas outside of Quito, from which many poor citizens come to the Tierra Nueva Medical Hospital, where they receive follow-up medical care paid in full by The Timmy Foundation’s financial donations to Tierra Nueva. In addition to the donations that support the medical brigades, The Timmy Foundation also donates $2,000 a month to the Tierra Nueva Social Work Department in an effort to subsidize medical services for the south Quito community. The Timmy Foundation also refers international volunteers to Tierra Nueva, where they help in numerous ways to further the goals of Padre Carollo and the entire Tierra Nueva staff.

ENDEMIC DISEASES AND CONDITIONS

- Typical disease or injury: untreated congenital heart disease, strep throat, tuberculosis, and tetanus
- Urban: apartments, markets, and street life
- Mountainous valley (9,600 feet above sea level)
- Low oxygen level, pollution
- Poverty and poor nutrition
- Low humidity
- Bottled water is purchased or local water is boiled
- Required education only to Grade 6
SOCIEDAD AMIGOS DE LOS NIÑOS
Nuevo Paraiso, Honduras
www.saninos.org.hn

MISSION
Sociedad Amigos de los Niños (SAN) is a private nonprofit organization founded in 1966 by Sister Maria Rosa Leggol of the School Sisters of St. Francis. The Mission of Sociedad Amigos de los Niños (SAN) is to provide a nurturing environment for the neglected and impoverished children of Honduras. SAN provides shelter, healthcare, education, training, and the opportunity to live in dignity to children and families ravaged by extreme poverty. SAN addresses their basic needs and at the same time creates the opportunities for each child and young adult to acquire the necessary skills to enjoy a productive and meaningful life. SAN provides the tools for and instills the desire in these children to become self-sufficient, caring, and responsible adults.

FOUNDER
Sister Maria Rosa Leggol was born in 1926 in Puerto Cortes, Honduras. Because of her own experience as an orphan, Sister Maria Rosa has always been concerned with the needs of the poor and was inspired to create better conditions and a more loving environment for the children of Honduras. She became a Franciscan Sister in 1949 in Milwaukee, Wisconsin, after which she returned to continue her work in the hospital “La Policlinic” in Honduras.

In 1964 Sister Maria Rosa rescued her first group of children, who were living in the city jails with their incarcerated parents. That was the beginning of Sociedad Amigos de los Niños and her commitment to create a safe and special place for the orphaned, neglected, and abused children of Honduras. With love, faith, dedication, and hard work, Sister Maria Rosa has directed the rescue and education of more than 35,000 children, who today are productive citizens of Honduras. Sister Maria Rosa continues working as the general director of SAN. She is a founder and active member of the Honduran National Telethon, a foundation that builds and maintains a network of rehabilitation centers for children with disabilities. Sister Maria Rosa has been the recipient of many prestigious awards.

ENDEMIC DISEASES AND CONDITIONS
- Typical disease or injury: severe asthma; trauma; HIV; diphtheria
- Rural: huts; farms; sugar cane fields
- Mountainous
- No potable water
- Air pollution
- Limited education
ST. VINCENT STRAMBI CLINIC
Bull Savannah, Jamaica

MISSION
Dr. Carol has a clinic in Bull Savannah, Jamaica, where she tirelessly tends to the needs of anyone who comes her way. The sheer volume of requests for attention from the amiable rural population is so large that it can be difficult to quantify. Dr. Carol and her assistants treat everything from fungal, bacterial, and viral infections to small lacerations and other minor injuries. The clinic is a converted home, complete with a handful of exam rooms and a makeshift pharmacy for donated remedies. There is even a dental room equipped with two functional chairs and a vacuum system. Patients await their scheduled appointments under a mango tree in Dr. Carol’s side yard. Medical brigades accompanying the doctor attest to seeing hundreds of patients a day.

ENDEMIC DISEASES AND ENVIRONMENTAL CONDITIONS
- Typical disease or injury: fungal infections of the skin; hepatitis
- Rural village: huts; subsistence farming
- Highlands
- Temperate climate, humid
- Educated

PEOPLE LIKE YOU MAKING A DIFFERENCE!

STUDENT TASKS
People like you make significant contributions around the world. There are many things young people can do to help others. Contact the volunteer coordinator at The Timmy Foundation for ideas, guidance, or resources to make the projects real. Review the mission objectives and opportunities available with The Timmy Foundation, including medical supply warehouse, funding outreach, and international service trips. The following list contains suggestions for student service projects. The most important and exciting endeavors are those students create themselves. Share the list with your class. Students may want to work together in pairs or groups, or the whole class may want to collaborate on a joint project.

SERVICE PROJECT
- Start a local Timmy Foundation chapter
- Continue financial support to an NGO (Non-Governmental Organization)
- Monitor and sustain a patient
- Create new Case Study Narratives
- Investigate the impact of governmental policies
- Investigate the impact of corporate policies
- Volunteer
- Create your own service project

Help students find their passion! People of all ages can make a difference and change the world. Lessons like these last a lifetime.

Young people need to understand how powerful they are.

— Charles Dietzen, M.D.
**Abdomen:** The part of the body between the chest and the pelvis but excluding the back; also called belly.

**Acute:** Characterized by sharpness or severity; having a sudden onset, sharp rise, and short course.

**Allergy:** Exaggerated or pathological reaction (such as sneezing, respiratory distress, itching, or skin rashes) to substances, situations, or physical states that are without comparable effect on the average individual.

**Auscultate:** To listen through a stethoscope.

**Bilateral:** Relating to or affecting both the right and left sides of the body or the right and left members of paired organs.

**Bilirubin:** A reddish-yellow pigment that occurs especially in bile and blood and causes jaundice if accumulated in excess.

**Bladder (Urinary):** An expandable membranous sac that serves for the temporary retention of urine.

**Blood pressure:** Pressure exerted by the blood on the walls of the blood vessels and especially the arteries, usually measured on the brachial artery by means of a sphygmomanometer, and expressed in millimeters of mercury.

**Bounding:** Strong and forceful, as in a bounding pulse.

**Bowel sounds:** Abdominal sounds, positive or abnormal, made by the movement of the intestines as they push food through.

**Breech presentation:** Presentation of the fetus in which the buttocks or legs are the first parts to appear at the uterine cervix.

**Bruit:** Any of several generally abnormal sounds heard on auscultation. (Turbulent blood flow in a major vessel.)

**Cachectic:** General physical wasting associated with malnutrition, usually from chronic disease.

**Caries:** Tooth decay or cavities.

**Cerebrovascular accident (CVA):** Also called stroke the sudden diminution or loss of consciousness, sensation, and voluntary motion caused by rupture or obstruction (such as by a clot) of a blood vessel in the brain.

**Clear to auscultation (CTA):** No unusual sounds heard through a stethoscope. Unobstructed breath sounds.

**Clinic:** An institution connected with a hospital or medical school where diagnosis and treatment are made available to outpatients.

**Clinical:** Involving or concerned with the direct observation and treatment of living patients.

**Clubbing:** Showing a bulbous enlargement of the tips of the fingers or toes, with convex overhanging nails.

**Contracture:** A permanent shortening producing deformity or distortion, such as of muscle, tendon, or scar tissue.

**Contralateral:** Occurring on, affecting, or acting in conjunction with a part on the opposite side of the body.

**Costal:** Relating to, involving, or situated near a rib.

**Cranial nerve:** Any of the 12 paired nerves that arise from the lower surface of the brain and pass through openings in the skull to the periphery of the body.

**Cyanosis:** A bluish or purplish discoloration of the skin due to deficient oxygenation of the blood.

**Dentition:** The development and cutting of teeth; the character of a set of teeth, especially with regard to their number, kind, and arrangement.

**Disability:** A physical or mental impairment.

**Distention:** Unusual or abnormal swelling.

**Distress:** Pain or suffering affecting the body, a bodily part, or the mind.

**Dorsiflex:** To flex in a dorsal, or upward, direction.

**Edema:** An abnormal accumulation of watery fluid in connective tissue or a body cavity.

**Epidemiology:** The sum of the factors controlling the presence or absence of a disease or pathogen.

**Erythema:** Abnormal redness of the skin due to capillary congestion, such as in inflammation.

**Etiology:** The cause or causes of a disease or abnormal condition.

**Excoriation:** A raw, irritated lesion; an abraded or chafed area of the skin, often from scratching.
**Extraocular:** Any of six small voluntary muscles that pass between the eyeball and the orbit and control the movement of the eyeball in relation to the orbit.

**Fever:** A rise of body temperature above the normal; an abnormal bodily state characterized by increased production of heat, accelerated heart action and pulse, and systemic debility with weakness, loss of appetite, and thirst.

**Flaccid:** Not firm or stiff.

**Flex:** To move muscles so as to cause flexion of the joints, such as of the knees; to move or tense a muscle or muscle group by contraction.

**Fluctuance:** A wave-like motion that is felt when a fluid-containing structure is palpated.

**Gastrocnemius:** The largest muscle of the calf of the leg that runs from the femur to the Achilles tendon.

**Goiter:** An enlargement of the thyroid gland that is commonly visible as a swelling of the anterior part of the neck.

**Hamstring:** Either of two groups of tendons that run from the upper part of the back of the knee to the back of the thigh.

**Heart disease:** An abnormal organic condition of the heart or of the heart and circulation.

**Heart rate:** A measure of cardiac activity usually expressed as the number of beats per minute.

**Hemiparesis:** Muscular weakness or partial paralysis restricted to one side of the body.

**Human Immunodeficiency Virus (HIV):** Any of several retroviruses that infect and destroy helper T cells of the immune system, causing the marked reduction in their numbers that is diagnostic of AIDS.

**Holosystolic murmur:** An atypical sound heard throughout the entire contraction of the heart ventricles.

**Homans’ sign:** Pain in the calf of the leg, upon dorsiflexion of the foot with the leg extended, that is diagnostic of clotting in the deep veins of the area.

**Hyperpigmented:** Having excessive coloration, as with inflammation.

**Icteric:** Affected with jaundice, a yellowish pigmentation of the skin, tissues, and certain body fluids caused by bile pigment deposits and which follows interference with normal production and discharge of bile (as in certain liver diseases) or excessive breakdown of red blood cells (as after internal hemorrhage or in various hemolytic states).

**Immunization:** Treatment by vaccination.

**Infection:** Contamination by pathogen or disease.

**Jugular vein:** Veins of each side of the neck.

**Lesion:** An abnormal change in structure of an organ or part due to injury or disease.

**Liver:** The largest gland in the human body, which secretes bile and causes important changes in many of the substances contained in the blood that passes through it.

**Lymph node:** Any of the rounded masses of lymphoid tissue that are surrounded by a capsule of connective tissue, are distributed along the lymphatic vessels, and contain numerous lymphocytes which filter the flow of lymph passing through the node.

**Lymphadenopathy:** Abnormal enlargement of the lymph nodes.

**Lymphatic:** Relating to, or produced by lymph, lymphoid tissue, or lymphocytes.

**Malaria:** An acute or chronic disease caused by the presence of sporozoan parasites of the genus *Plasmodium* in the red blood cells, transmitted from an infected to an uninfected individual by the bite of an Anopheline mosquito, and characterized by periodic attacks of chills and fever that coincide with mass destruction of blood cells and the release of toxic substances by the parasite at the end of each reproductive cycle.

**Malnourished:** Supplied with less than the minimum amount of the foods essential for sound health and growth.

**Margin:** The outside limit or edge of something, as in the right costal margin, the outside edge of the rib cage on the right side.

**Mass:** An aggregation of matter.

**Midwife:** A person who assists women in childbirth.

**Muscle stretch reflex:** Contraction in response to stretching within a muscle, often tested by tapping on a tendon with a small rubber mallet.

**Negative bilaterally:** Not occurring on either side.
Neurological: Relating to the nervous system.

Normocephalic: A normal head.

Organomegaly: Abnormal enlargement of the internal organs of the body.

Palpate: To examine by touch.

Paravertebral: Occurring adjacent to the spinal column.

Penicillin: An antibacterial medication made from the molds of the genus Penicillium.

Percussion: The act or technique of tapping the surface of a body part to learn the condition of the parts beneath by the resulting sound.

Perfusion: The pumping of a fluid through an organ or tissue.

Pitting edema: Edema that results in a depression in the tissue.

Plantar: Relating to the sole of the foot.

Potable: Safe to drink.

Pulse: The palpable beat resulting from a regularly recurrent wave of distension in arteries that results from the progress through an artery of blood injected into the arterial system at each contraction of the ventricles of the heart; measured in beats per minute.

Purulent: Containing pus.

Rales: An abnormal sound heard accompanying the normal respiratory sounds on auscultation of the chest.

Rehabilitation: The restoration of a sick or disabled person by therapeutic measures and reeducation to participation in the activities of a normal life within the limitations of the person’s disability.

Relapse: A recurrence of symptoms of a disease after a period of improvement.

Respiratory rate: The speed at which gases move into and out of the lungs, measured per minute.

Retraction: Backward or inward movement of skin or an organ.

Rhinorrhea: Excessive mucous secretion from the nose.

Scoliosis: Lateral curvature of the spine.

Sickle-cell anemia: A chronic hereditary anemia that occurs in some populations and can cause organ failure.

Spastic gait: A manner of walking characterized by spasms of paralyzed muscles.

Sputum: Mucus or other bacterial products produced in diseases of the lungs.

Sternal: Relating to the breastbone.

Suprapubic: Above the pubic bone.

System: A group of body organs or structures that together perform one or more vital functions.

Systolic ejection murmur: An atypical sound of the heart indicating a stenosis, or narrowing. The murmur is caused by turbulent forward blood flow and is graded by volume, 1/6 to 6/6, with 1/6 having the faintest sound.

Tachycardia: Rapid heart rate. Greater than 100 beats per minute in an adult or older child.

Temperature: The degree of heat that is natural to a human body; a normal oral temperature is about 98.6°F.

Thrill: An abnormal fine tremor or vibration in the respiratory or circulatory systems felt on palpation, often associated with a heart murmur.

Trauma: An injury, such as a wound, to living tissue caused by an outside agent.

Triage: A system of classifying sick or injured patients according to the severity of their conditions.

Tuberculosis: Also called TB, a usually chronic disease caused by a bacterium of the genus Mycobacterium, usually communicated by inhalation of the airborne causative agent. It especially affects the lungs but may spread to other parts of the body, and is characterized by fever, cough, difficulty in breathing, and other symptoms.

Upper respiratory infection (URI): Contamination by bacteria or pathogen of the part of the respiratory system including the nose, nasal passages, and nasopharynx.

Urinary tract infection (UTI): Contamination by bacteria or pathogen of the tract through which urine passes and which consists of the kidney, the ureters, the bladder, and the urethra.

Vaccination: The introduction into humans or domestic animals of microorganisms that have previously been treated to make them harmless for the purpose of inducing the development of immunity.

Vertebral: Relating to the spinal column.

Vitals: Short for “vital signs,” the pulse rate, respiratory rate, body temperature, and blood pressure of a person.
ASSESSMENT AND SCORING RUBRIC

This rubric provides a framework for evaluating each student’s performance in completing medical evaluations from the case studies. The lessons will be evaluated on the student’s ability to research, create reports, investigate, and present findings on subjects presented in case studies. The following criteria will be used.

STUDENTS DEMONSTRATE THE ABILITY TO
- read and study the case history of a child
- understand and use medical vocabulary and terminology
- extract important medical history from a provided clinical narrative
- determine significant information from a narrative of a physical exam
- analyze and put into their own words information from a medical evaluation
- work in small Consultation Teams to learn information and share it with the class
- research the climate and diseases endemic to the region
- research the cultural and socioeconomic factors of the region
- investigate long-term and public health issues of the region
- report to the class information collected during research
- write detailed reports about the region where the child lives
- come to a consensus on a medical assessment of the child’s condition
- investigate selected diseases or medical conditions
- investigate selected treatment plans for the child
- outline a treatment plan for the child
- present findings to the class

SCORING RUBRIC
Teachers work with students in Consultation Teams to evaluate and score their ability to complete medical evaluations in this project. Teachers can create or modify the following rubric as needed. A variety of student products are created in this project — posters, reports, oral presentations, medical evaluation forms, timelines, articles, and real service projects. Student progress can be identified at three distinct levels: partial, essential, and exceptional.

PARTIAL:
- Does not complete medical evaluations for Maria and Juan
- Records minimal observations in the science journal
- Demonstrates limited understanding of the medical evaluation process
- Contributes little to the Consultation Team process
- Provides little or no detailed information in Consultation Team presentations
- Does not complete additional case study medical evaluations
- Does not complete service organization reports
- Does not investigate or participate in a service project

ESSENTIAL:
- Generates completed medical evaluations for Maria and Juan
- Makes good observations, records, and notes in the science journal
- Demonstrates a clear understanding of the medical evaluation process
- Makes many contributions to the Consultation Team process
- Provides detailed information in Consultation Team presentations
- Completes one or two additional case study medical evaluations
- Completes one or two service organization reports
- Participates in one service project

EXCEPTIONAL:
- Completes and adds information to the medical evaluations for Maria and Juan
- Generates numerous observations, records, and discoveries in the science journal
- Demonstrates exceptional understanding of the medical evaluation process
- Demonstrates leadership in and provides essential materials to the Consultation Team
- Provides informative and creative input to the Consultation Team presentations
- Completes three or more case study medical evaluations
- Completes all service organization reports
- Creates and facilitates his or her own service project
TOPICS OF INTEREST AND ONLINE RESOURCES

TOPICS OF INTEREST
- Body Systems
- Cells
- Immunization & Vaccination
- Hygiene
- Diet and nutrition
- Genetics (Human Genome)
- Culture and languages
- Medical ethology
- Medical abbreviations and terminology

ONLINE RESOURCES
- CalTech Precollege Science Initiative: Human Body Under Attack
  http://www.capsi.caltech.edu/
- Centers for Disease Control and Prevention
  http://www.cdc.gov/
- Children's Museum of Indianapolis — Agricultural Biotechnology Unit of Study, Genetics and Cell Biology
- Global Polio Eradication
  http://www.polioeradication.org
- Indiana AHEC Program — Student Resources on Health Careers
  http://www.ahec.iupui.edu/studentresources/default.htm
- MedLine Plus: Medical Dictionary
- MedLine Plus: Medical Encyclopedia
- MedLine Plus: Health Topics
- MedLine Plus: Medical Dictionary
- Museum of Science & Industry: Live ... From the Heart
  http://www.msichicago.org/ed/educ_liveheart.html
- National Academies Press
  www.nap.edu
- National Institutes of Health Curriculum Supplements — High School
  http://science.education.nih.gov/Curriculumsdf/highschool.htm
- National Institutes of Health Curriculum Supplements — Middle School
  http://science.education.nih.gov/Curriculumsdf/middleschool.htm
- National Institutes of Health — Diseases and Conditions Index
- Science, Medicine, and Animals: Teacher's Guide
  http://orsted.nap.edu/books/0309101174/html
- The Timmy Foundation
  www.timmyfoundation.org
- United States Department of State — International Travel Information
- WISE: Web-Based Inquiry Science Environment
  http://wise.berkeley.edu/
- World Health Organization
  http://www.who.int/en/
SCIENCE: BIOLOGY

Standard 1 — Principles of Biology
B.1.17 – Understand that and describe how the maintenance of a relatively stable internal environment is required for the continuation of life and explain how stability is challenged by changing physical, chemical, and environmental conditions, as well as the presence of disease agents.
B.1.20 – Recognize that and describe how the human immune system is designed to protect against microscopic organisms and foreign substances that enter from outside the body and against some cancer cells that arise within.

LANGUAGE ARTS

Standard 1 — Reading: Word Recognition, Fluency and Vocabulary Development
9.1.3, 10.1.3, 11.1.2, 12.1.2 – Apply knowledge of Greek, Latin, and Anglo-Saxon roots and word parts to draw inferences about new words that have been created in the fields of science and math (e.g., gene splicing, genetic engineering).

Standard 2 — Reading: Comprehension
9.2.3 – Generate relevant questions about readings on issues that can be researched.

Standard 4 — Writing: Process
9.4.4 – Use writing to formulate clear research questions and to compile information from primary and secondary print or Internet sources.

Standard 5 — Writing: Applications
10.5.6 – Write technical documents, such as a manual on rules of behavior for conflict resolution, procedures for conducting a meeting, or minutes of a meeting.
11.5.7, 12.5.7 – Use precise technical or scientific language when appropriate for topic and audience.

SOCIAL STUDIES: WORLD GEOGRAPHY

Standard 2 — Places and Regions
WG.2.2 – Categorize characteristics of places in terms of whether they are physical (natural) or cultural (human). Know and apply the subcategories of physical and cultural characteristics when describing any given place.

Standard 4 — Human Systems
WG.4.7 – Identify patterns of economic activity in terms of primary (growing or extracting), secondary (manufacturing), and tertiary (distributing and services) activities. Realize that the percentage of the working population in each of these categories varies by country and changes over time, and that the trend everywhere is toward an increase in the percentage involved in providing services. (Economics)