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Rochester Institute of Technology

A Thesis Submitted to the Faculty of
College of Imaging Arts & Sciences
In Candidacy for the Degree of
Master of Fine Arts
in Medical Illustration

First Aid When and Where You Need It,
Development of First Aid Self-Care,
Patient Education for Web and Mobile Devices

By
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September 4, 2008

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Abstract

Health care is undergoing a revolution as patients have access to more and more information via Internet by the use of computers and mobile devices. In recognition of the rapidly growing need for patient first aid education, a collection of first aid self-care animations was created to improve treatment decisions and outcome safety. These animations are available for people via VisualDxHealth, a consumer focused website developed by Logical Images, Inc. The objective of the project was to produce simple and easy to understand first aid animations for a specific target audience. The production pipeline started with meeting with the client, drawing storyboards, deciding the art direction, animating, testing and ended with the final output. Working through this pipeline was beneficial to the workflow of the thesis. It allowed to manage my time more effectively to the production of the project and had more successful results. A combination of three-dimensional models and two-dimensional computer graphics were used in creating the animations. The project included an evaluation to determine how well learners accessing this site understood the instructions. The test group included a specific target audience determined by Logical Images, Inc. which was women between the ages of 30-50 years, who have a college degree and may be looking online for health information for themselves or family members. The results were recorded, analyzed and used during the revision stages for the animations. The project concluded with the final production of self-care animations for Blister, Foreign Objects in Eyes, Skin , Mouth and Nose, Wound, Nosebleed, Splinter and Tick Bite.

Thesis Proposal

Health care is undergoing a revolution as patients have access to more and more information via Internet by the use of computers and mobile devices. In recognition of the rapidly growing need for patient first aid education, I will create a collection of first aid self-care animations to improve treatment decisions and outcome safety. These animations will be essential information available for people via VisualDxHealth, a consumer focused website developed by Logical Images, Inc. Their objective is the development of clear, concise and easy to understand first aid steps so the viewer can administer them promptly and effectively. This project will also investigate the design requirements of mobile devices in hopes of permitting access to the information wherever and whenever needed.

While static visualization may provide people with the knowledge to complete a process, animation provides a superior method of teaching a complex process occurring over time. The project will include an evaluation to determine how well learners accessing this site understood the instructions. The test group will include a specific target audience to be determined by Logical Images, Inc. The results will be recorded, analyzed and used during the revision stages for the animations. A combination of three-dimensional models and two-dimensional computer graphics will aid in creating the animations. The computer graphics will be produced in Maya, Poser, After Effects and Flash with final outputs of .swf files. The animations will also be illustrated with little or no text to permit communication with an international audience.

Background

From prehistoric cave paintings to anatomical drawings of human dissections during the Renaissance, to present day digital representations of anatomy, medical illustrators have always had the same objective of educating others. Medical illustration has always been an instructional art form, but with new technologies medical illustration can be interactive learning experience for learners. Creating an efficient illustration requires a clear understanding of the information to be communicated as well as a visual plan for making the message obvious to the target audience. With the access to high-end three-dimensional and simulation technology and development tools for creating interactive and simulation products, medical illustrators have the ability to create a greater variety of visual explanations than they can with traditional art media (ACM SIGGRAPH, 2005).

One area of medical illustration is medical animation. It is a tool to show how a particular drug interacts within the body or to educate a patient about a surgical procedure they may have. The main objective of these animations is to tell an educational story. The most effective animations engage the viewers so that they have a better understanding of a certain process. Pharmaceutical companies use medical animation in their own marketing, advertising and educating medical professionals and patients. One cannot turn on a television or go on the Internet without seeing some kind of advertisement for the newest allergy drug on today's market. As more and more interactive services are put online, there will be an even greater demand for services that medical illustrators can provide to clients.

With society becoming more and more technologically

confident, people everywhere are now carrying video capable personal digital assistants, PDAs. These little devices are electronic organizers that are portable, easy to use and capable of sharing information with personal computers. Personally I think we will start seeing these devices becoming a possible venue for communication with the consumer. I can imagine these being used to store animations that may need to teach or refresh medical professionals about a process or surgical steps. Medical Illustrators may even get into designing interactive flash cards for learning anatomy and also for the general public a series of basic first aid animations depicting the correct way of administering self-care. In an emergency situation these would be very beneficial to society, especially since more and more people are carrying video-capable cell phones and personal digital assistants. These devices provide immediate access to instructional animations, permitting effective treatment of time sensitive emergencies.

Medical illustrators are going to have to keep adapting their visual solutions as their intended audience keeps up with the technological advances in our society. With the rise of technology, computer graphics will play a crucial role in these new visual solutions in medical illustration.

The Artist and Client

Logical Images, Inc. is a company in Rochester, New York that develops image-intensive recognition and visual knowledge software. Some of their products include VisualDx, visual clinical decision support software and VisualDx Dental, oral clinical decision support software. They also have developed VisualDxHealth, a consumer-focused website providing health information. Art Papier, MD, founded the company.

Dr. Papier is the Chief Scientific Officer of Logical Images, Inc. and coordinates product research and design. He is also an Associate Professor in Dermatology and Medical Informatics at the University of Rochester School of Medicine.

When I first met with Dr. Art Papier concerning the first aid animation project, we sat and discussed a broad overview of the project. He had a vision of the animations being quick, very simple, and easy to understand. He introduced me to Rory Burrill, who acted as the project manager. The project had many topics that were being considered for animating for the VisualDxHealth website. Some of those topics included animal bites, bruises, burns, fainting, frostbite, heat stroke, shock, and unconsciousness. I met with Rory and we talked about what we thought were the topics that would be most valuable to animate for the public and decided that the following six animations would be great candidates: Blister, Foreign object, Splinter, Wound, Tick Bite and Nosebleed.

The first step for me as the artist was to find out all the specifications for the animations' final output. I contacted Andy Ballerstein, Logical Images' web development engineer, and discussed

the application of how the animations would be inserted into the website. At that point in time, Logical Images, Inc. did not have Flash in their website but, intended to include Flash files with the development of first aid self-care animations. It was decided that the final output I would give them would be Flash .swf (Shockwave Flash) files. The choice to use .swf files coincided with an earlier decision to communicate almost exclusively with images and little or no text. These final animated outputs would then allow international communication. Also with .swf files, they will be able to easily incorporate them into the Logical Images' video player, which will load the appropriate animation based on the users' selection. Logical Images can also easily insert disclaimer information and any additional information for the viewer to assist them in self-care first aid. Andy also gave me specific dimensions for the animations, which were 320 pixels by 240 pixels. This dimension is universally standard for web-based video.

As the project began, I was given documentation about each topic and the script for each animation. This was the basis of my storyboards. I created simple pencil sketches in a comic book like sequence illustrating the key steps of each animation. There was some repetition between the animations, for example sterilization of instruments and washing hands. Instead of redrawing those scenes, I created a global storyboard that would be used for any animation containing these repetitive elements. The overall purpose of these illustrations was to clearly convey my vision and ideas to the client. After finishing the storyboards, it was time to present my ideas to Rory and the entire team at Logical Images, Inc. My storyboards were beneficial because it allowed everyone on the team to contribute ideas and

thoughts before the production stage started.

Most of the storyboards were accepted with few revisions. However as I look back over the course of making the animations they were still a few revisions made after the final storyboards were made. The foreign object animation went through a major revision based on experiences that Manasi Lagrigan MD had as a resident. The first storyboard I presented had a nail in the posterior side of the forearm. We discussed the odds of a nail actually piercing the skin in that area. Dr. Lagrigan mentioned how when she was a resident in the emergency room, she would see construction workers coming in with nails in their legs. This was common because they would be working on top of a ladder with the nail guns strapped to their tool belt with no safety on. When they slip or fell the nail would go off shooting them in the leg. After hearing this, we as a group decided to change the insertion of the nail to the side of the leg. This led to another issue of clothing, which would add to the step of cutting and removing the cloth around the nail to the animation. I suggested showing the character with shorts to eliminate the additional steps.

With the storyboards finalized, preproduction started with concentrating on one topic at a time. First an animatic, a simplified animation focusing on imagery and timing of the steps, was made and presented to the team. We would discuss the steps and make any suggestions to improve its clarity and another round of revisions would be made for the final output.

Topics

Tick Bite

The tick was created as a three-dimensional model using polygons in Maya. I created a UV map, which is part of a technique to apply a two-dimensional image to a three-dimensional object. U and V are the texture coordinates of the transformed object and are comparable to the X, Y and Z coordinates of three-dimensional objects in the modeling space. The two-dimensional image was produced using a Photoshop shading network, which consisted of layers for the color, diffuse, specular and bump map parameters of the shading node within Maya. The human model was from Poser and I altered the texture map to create the redness around where the tick was inserted into the model's arm. Other models used in this illustration were the bar of soap and the alcohol bottle, which were created in Maya, and imported into Poser as an .obj file, an object file that stores data of a three dimensional object, for the scene.

In animating the tick bite, I created a common background to be used in all animations, a basic light blue to dark blue gradient. I imported this jpeg file into Poser as my background image and parented it to the camera's movement so that when the camera was animated the background would stay consistent. Within Poser, there are animation controls that control key frame selection over a period of time to animate your model, lights and camera. There is a parameter/properties panel that gives you dials to control specific joint movements. Through this panel, I set the imported model of soap as a child of the movement of the model's left hand so when I animated the left arm the bar of soap followed. After posing the character and setting up the

camera movements, I rendered a series of images out using FireFly, a render engine included within Poser. The tick was rigged and animated in Maya and rendered out using Mental Ray to create a series of png images.

Flash was used to composite the different layers together. Also the tweezers were made in Flash as two layers so that the instrument would look as if it was holding the tick as it was being pulled out. The stage size in Flash was set to 320 pixels by 240 pixels and the frame rate was set to 12 frames per second.

I had to classify how to represent the size of the tick in relation to the model based on information provided by Logical Images, Inc. The tick itself can be quite small or rather large. Fully developed ticks have 8 legs, but may have only 6 visible legs early in its developmental stage. Ticks have a small head in comparison to their round body, which is usually covered by a hard, thick outer shell. Also, the site of the tick bite typically looks like a small, reddish area that may or may not be raised, similar to a mosquito bite. Within days, weeks, or even months, tick bites may develop as a larger red ring, often looking like a bull's-eye (Logical Images 2007). We want the viewer to remove the tick as soon as possible and within 24 hours of attachment. I illustrated it to look more like a mosquito bite that is red and slightly swollen to show the head is burrowed into the skin.

Foreign Object

Foreign Object had been illustrated as full color still images when they were presented to the team. It was discussed if the static images demonstrated the first aid procedure to the viewer effectively

or whether animation should be used. Was there a benefit to animating the events in between the two images? They decided not to animate and leave the images as static. As I discuss later on, within the testing for the images it seems they were correct in making the assumption that the viewer would understand what to do in that emergency.

Splinter Removal

At a meeting before the start of the splinter animation, it was discussed that it would have to be animated in two parts because the sterile tweezers may or may not work in removing the splinter and a needle would have to be used.

The three-dimensional forms from this animation were the figure model from Poser, the alcohol bottle and the sink, which was modeled and textured in Maya and imported into Poser. The tweezers, needle and splinter were created in Flash as vector images. In making this animation I used the same background to import into Poser, key framed the animation and rendered out the images using FireFly. Flash again was used to composite all the artwork together with all the same dimensions and frame rate as tick bite.

Wound

In the wound animation, the same character model as in the tick bite was used. The texture of the model was altered twice for this animation. I had to add a bloody wound on his arm and also had to make another version that was still wounded but not heavily bleeding for later part during the animation. A three-dimensional model of a cloth was made in Maya and imported into Poser. It was made a child

of the figure's left hand so it followed its movement. One problem I encountered while animating in Poser was the arms crashing into the body of the figure while the model raised his arms for the elevation step. I used Photoshop to paint every image in the sequence over the areas where the model's arm was folding into the models' body so the movement seemed more realistic and natural. Again the same steps were executed in rendering from Poser and into Flash for compositing together the layers.

Nosebleed

Since children seem more prone to getting nosebleeds, a child figure was used from Poser for the animation. At first I only changed the texture file for the figure's face adding blood under the nose in Photoshop. But after showing it to the team at Logical Images, I also added blood to the boy's shirt to add a little more realism to the scene. The entire image sequence was animated only using Poser and imported into Flash to create the final .swf file. After completing the key steps of stopping a nosebleed, it was hard to see exactly what the hands were doing so I added a scene at the end of the animation with close up of the boy's face.

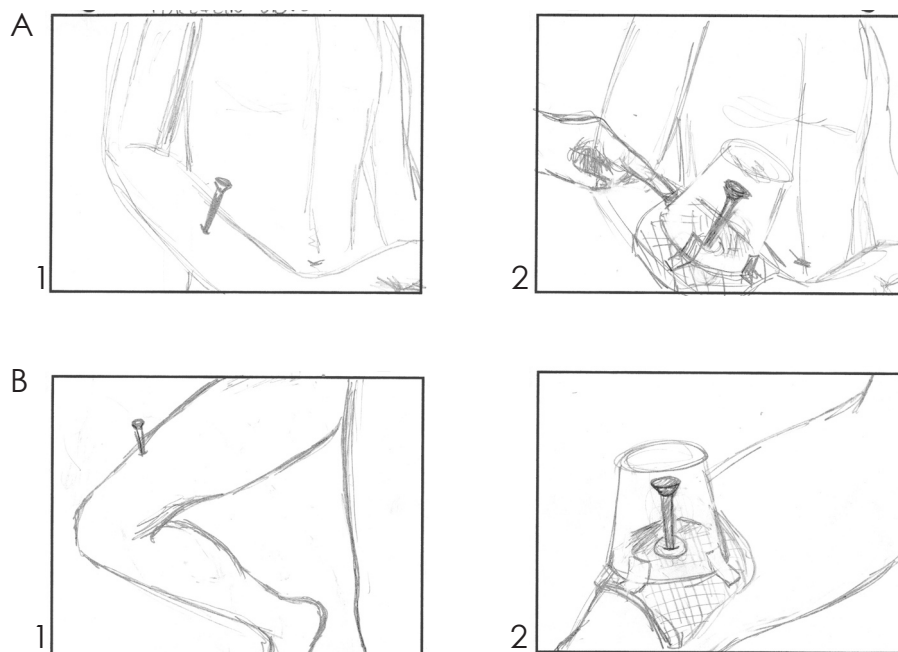
Blister

For the blister animation, two additional still images were created to show a blister you can drain versus infected blisters that need professional medical care. Only blisters that look like they will pop on their own should be drained, unless the blister appears infected or you have a fever, multiple, grouped blisters, diabetes, or poor circulation

(Logical Images, Inc. 2007). We needed to show the viewer a clear example of which blister is okay to drain and which one is not before we show the animation. The three-dimensional models in this animation are the figure from Poser, the blister, ointment tube, and alcohol bottle from Maya. I used Illustrator to create the lettering on the ointment tube and the alcohol wipe. To create the drainage of the blister from the prick of the needle, I used Photoshop to make three sequential images of the drainage. And finally everything was composited using Flash.

Pipeline

Artist Storyboards and the Script from the client



Self Care

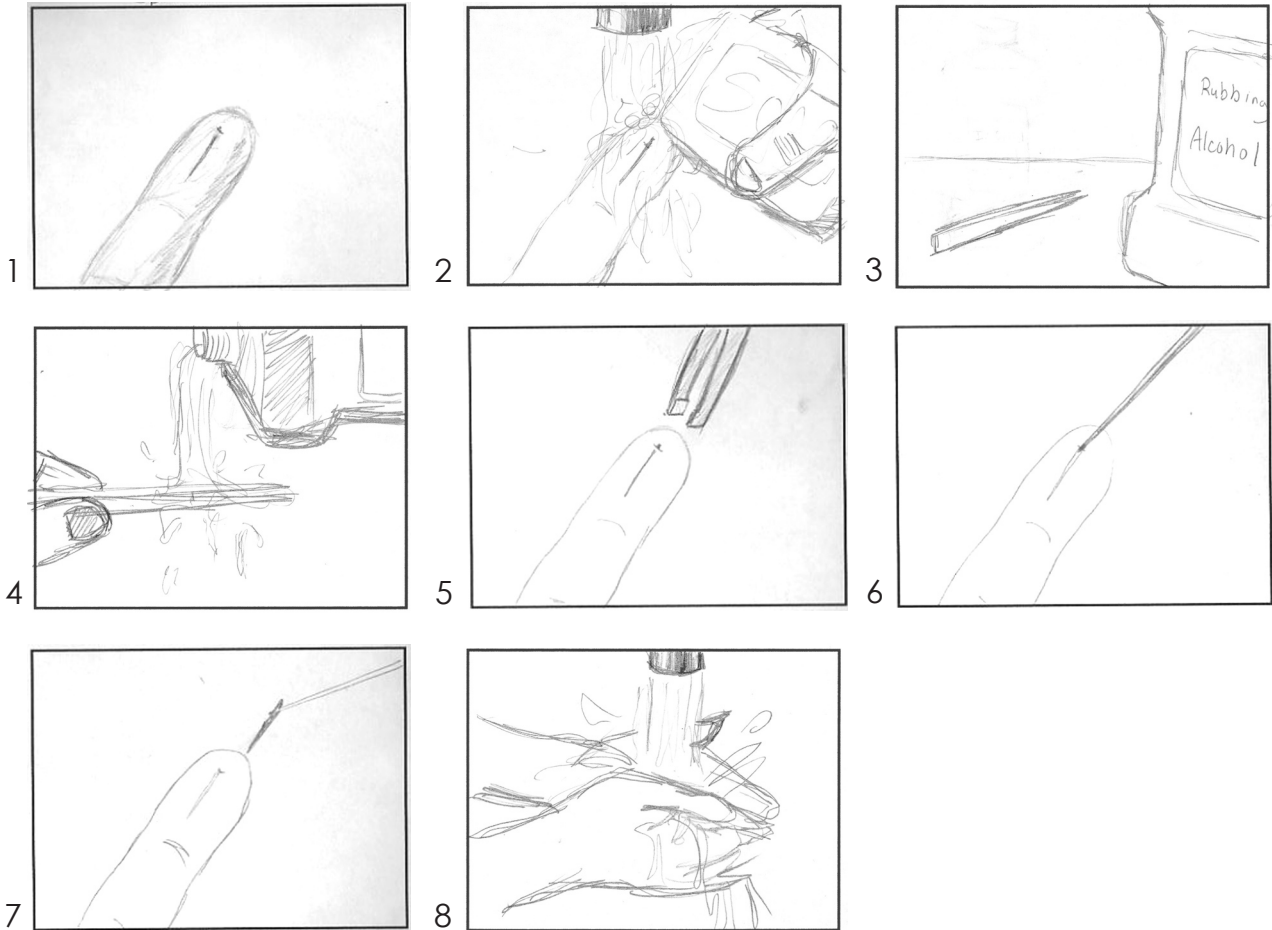
In the case of a foreign object in skin, the following first aid

measures should be taken while awaiting medical care:

1. Leave the object in place.
2. If necessary, carefully cut away any clothes from the affected area.
3. Thoroughly wash hands, and put on sterile gloves if available.
4. Immobilize the foreign object with a paper cup, rolled bandages, etc.

(Logical Images, Inc. 2007)

Splinter



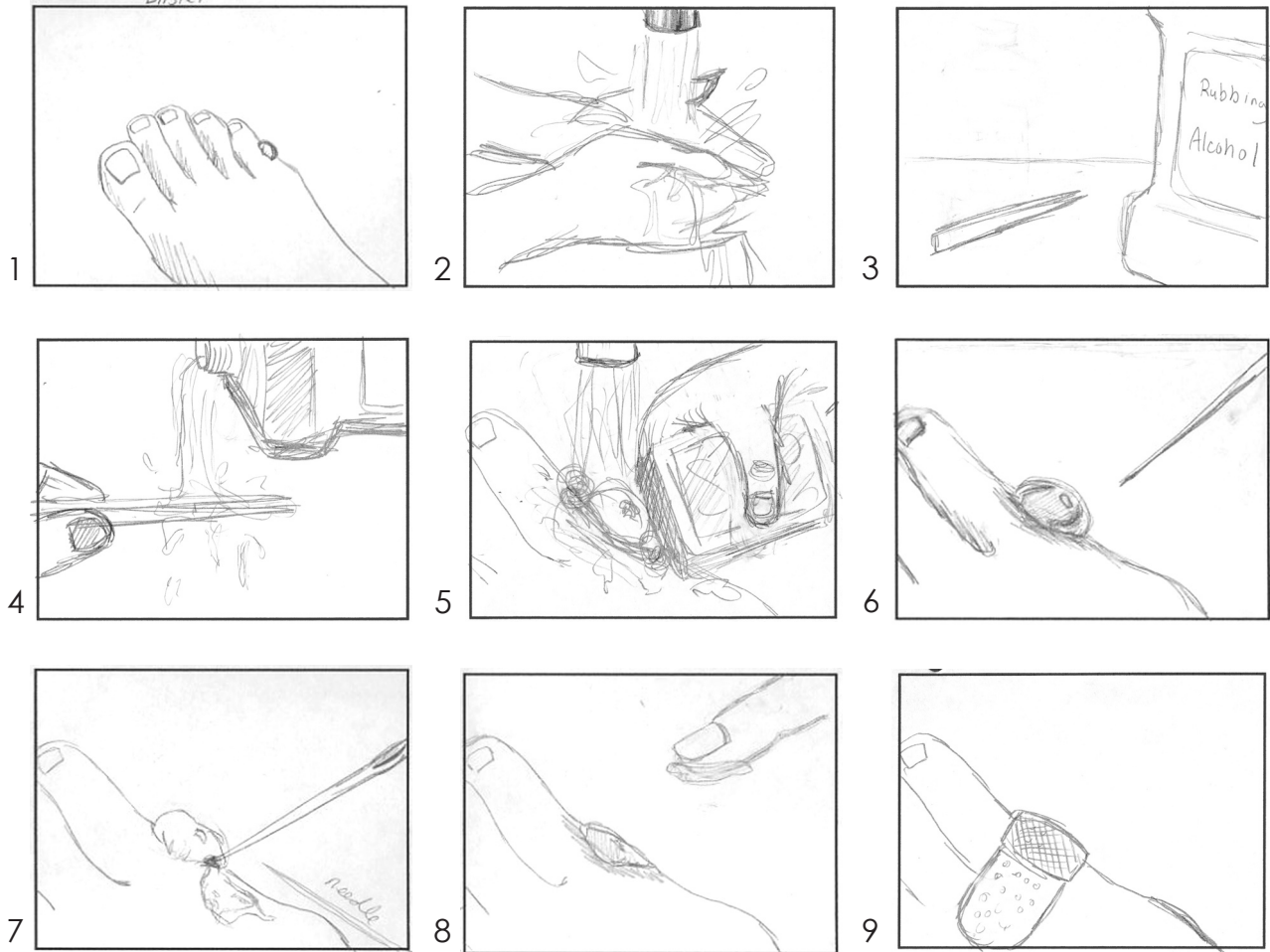
Self-Care

Self-care measures to remove a splinter are as follows:

1. Wash hands.
2. Clean tweezers and a needle by boiling them or by pouring antiseptic solution (ex, isopropyl alcohol) over them, and let them dry.
3. With the tweezers, attempt to pull the splinter out the same direction and angle that it went in the skin.
4. If the tweezers cannot remove the splinter because the tip is not accessible, use the needle to make a small hole above the splinter and/or use the needle to lift the splinter out.
5. Once the splinter is fully out, wash the area and bandage it with a clean, dry dressing.

(Logical Images, Inc. 2007)

Blister



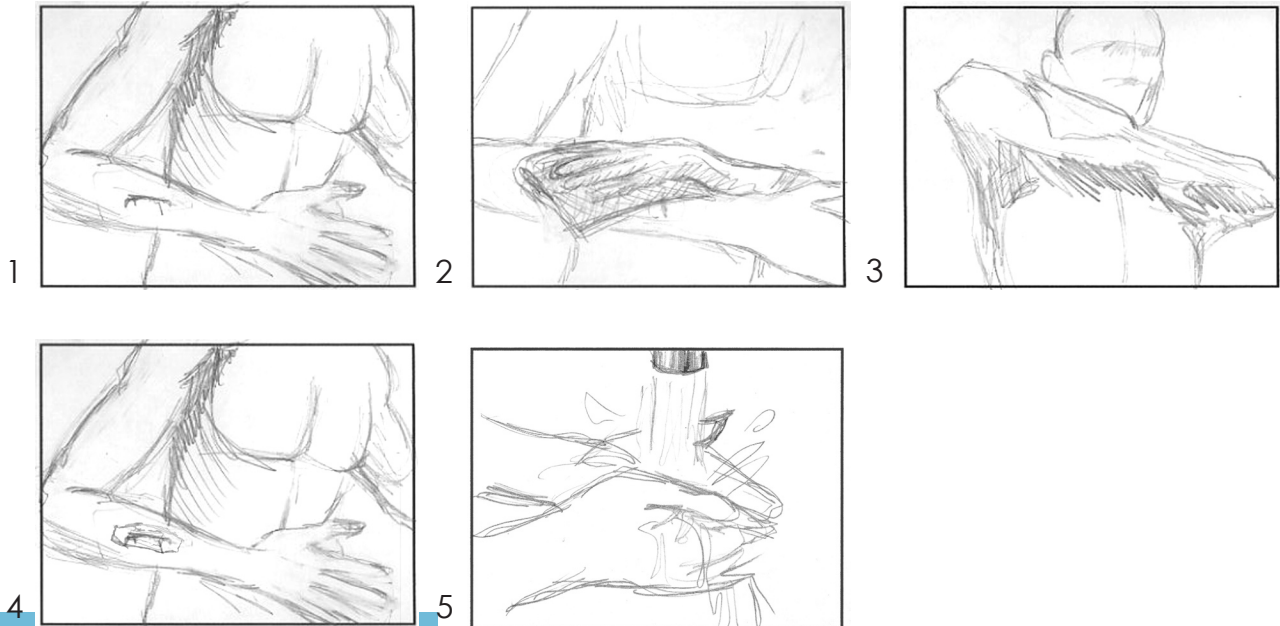
Self-Care

Blisters often go away on their own without needing any care, and the skin over the blister is its best defense against infection. If the blister is large or painful, however, you can drain the blister in such a way as to relieve the discomfort and hopefully avoid infection. Note: Only blisters that look like they will pop on their own should be drained, unless the blister looks infected or you have a fever, multiple or grouped blisters, diabetes, or poor circulation.

1. Clean hands and the affected area with soap and warm water.
2. Apply rubbing alcohol to the affected area.
3. Wipe a needle with rubbing alcohol to sterilize it.
4. Puncture the blister with the sterilized needle at its edge, making the hole big enough to drain fluid.
5. Let the fluid drain, making sure to leave the overlying skin in place. Note: This skin will help prevent infection.
6. Apply a triple antibiotic ointment (e.g., Neosporin®) to the blister, and bandage the affected area.
7. Once the overlying skin has dried, allow it to fall off naturally or use sterilized scissors to cut the dead skin off. Apply triple antibiotic ointment and a bandage, if necessary.

(Logical Images, Inc. 2007)

Wound

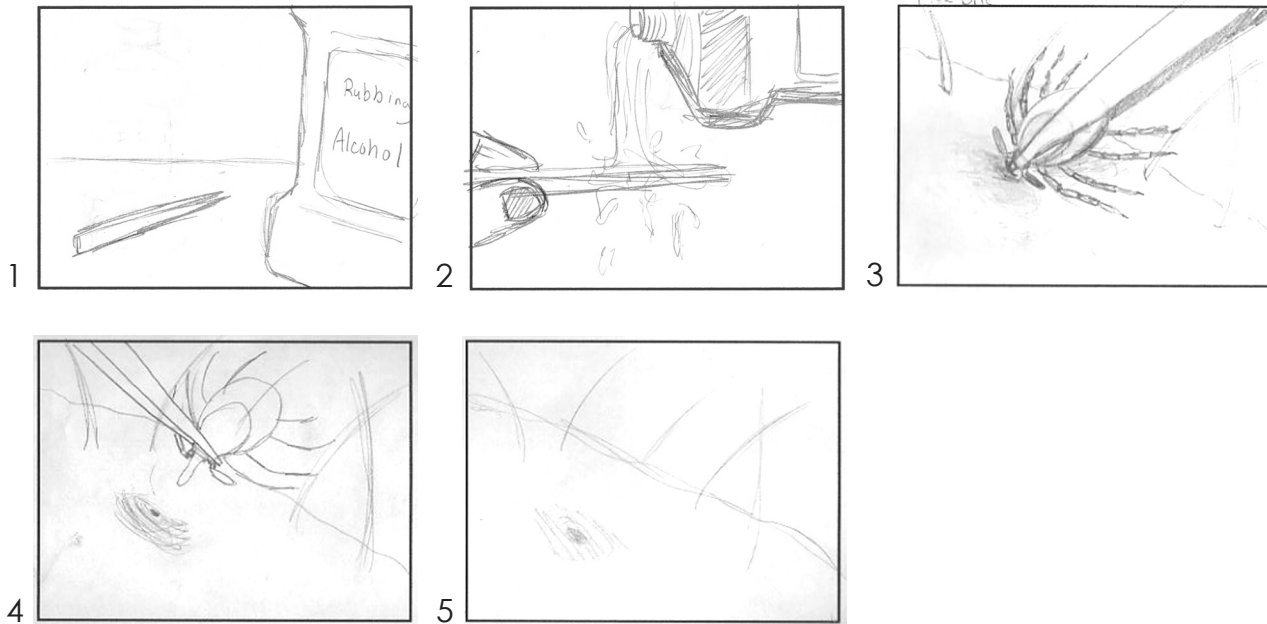


General guidelines for cleaning and dressing a wound are as follows:

1. Thoroughly wash the wound with mild soap and rinse with running water. Remove any debris, if necessary.
2. Blot the wound dry with sterile gauze or a clean cloth.
3. Bandage the wound with a sterile covering (e.g., Band-Aid® if the wound is small or sterile gauze or clean cloth if the wound is larger), making sure to cover the entire wound. Adhere the bandage snugly, but do not cut off circulation.
4. Wash your hands again after administering first aid.
5. Watch for signs of infection to the wound, such as swelling, redness, warmth, and oozing.

(Logical Images, Inc. 2007)

Tick



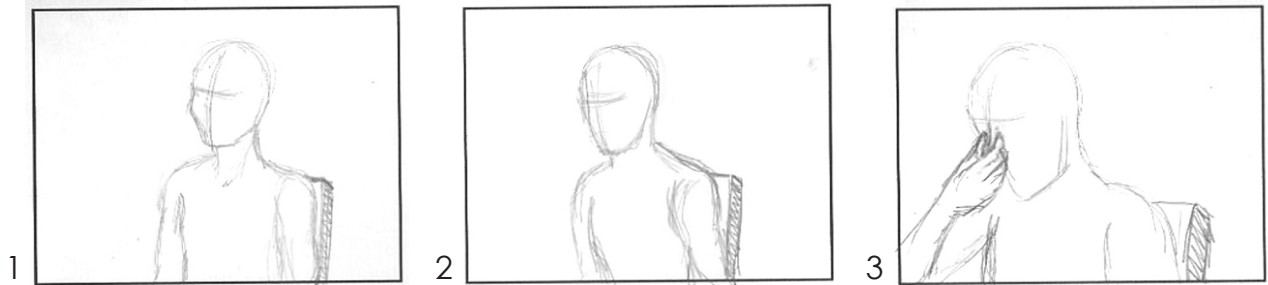
Self-Care

To remove an embedded tick:

1. With tweezers, grasp the tick as close to its head or mouth as possible, and pull it straight out with a slow and steady motion. Be careful not to leave the head embedded in the skin, and make sure all parts of the tick are completely removed. Note: Be sure to not twist the tick body as you pull it out.
2. Wash the area completely with soap and water.

(Logical Images, Inc. 2007)

Nosebleed



Self-Care

The following self-care measures are recommended:

1. Have the person suffering the nosebleed sit upright and lean forward. He/she should breathe out of his/her mouth.
2. If there are any clots in the nostril, have the person gently blow them out.
3. Firmly pinch the soft part of the nose, and place a cold compress on the bridge of the nose. This should be done

continuously for 15 minutes. Do not release the pressure on the nose.

4. If the person's nose is still bleeding, repeat the above steps one more time.

Note: If the person's nose is still bleeding after repeating the above steps one time, seek medical care.

(Logical Images, Inc. 2007)

Art Direction

I needed to create a consistent look for the series of animations: simple, clean, and easy to understand. Three-dimensional models were created in Maya and Poser. Textures for the models were created and/or altered in Photoshop. Vector artwork was done in Flash and Illustrator.

Testing

Bases on market research Logical Images, Inc. knows that the target audience for their www.visualdxhealth.com website is women between the ages of 30 and 50 years of age, who have a college degree and use broadband internet to go online for health information for themselves or family members. I made a survey for women of this target group to complete online. The test subjects never saw any of the production work for the animations before answering this survey. They were instructed to watch each animation and write down what the instructions were to treat each type of injury. I used five testing subject because it was a manageable amount of answers to evaluate and also I had a team of about five to six people periodically reviewing the animations at Logical Images, Inc.

Testing Results

Test Subject 1: a female between the ages of forty one and fifty, with two Master degrees and cable Internet.

Answers for the steps of each Animation:

Foreign Object:

1. Only one still image.

(Subject failed to read the instructions to roll over the image to see the next still image)

Splinter (successful tweezers):

1. Wash area with soap and water.

(Failed or forgot to finish writing in the steps)

Splinter (unsuccessful tweezers):

1. Wash problem area w/ soap and water.
2. Sterilize equipment (tweezers were, but needle was not shown).
3. Remove splinter.
4. Wash again w/ soap and water.

Blister:

1. Sterilize needle.
2. Wash area w/ soap and water.
3. Insert needle into blister.
4. Put some sort of antibiotic cream on area.
5. Put on an adhesive bandage.

Wound:

1. Wipe blood (possible apply pressure?)
2. Put on bandage.

Tick:

1. Clean tweezers w/ alcohol.
2. Pull tick out.
3. Wash area w/ soap and water.

Nosebleed:

1. Lean forward.
2. Apply pressure to middle of nose.

Test Subject 2: a female between the ages of forty one and fifty, with a Master degree and DSL Internet.

Answers for the steps of each Animation:

Foreign Object:

1. Don't remove the object.
2. Cover it to protect the area.

Splinter (successful tweezers):

1. Wash wound site.
2. Clean the tweezers with alcohol.
3. Remove the splinter with tweezers.

Splinter (unsuccessful tweezers):

1. Wash wound site.

2. Clean the needle with alcohol.
3. If tweezers don't work, use tip of the needle to lift the splinter from the wound.

Blister:

1. Clean your hands.
2. Clean the needle with alcohol.
3. Clean the blister.
4. Use the needle to puncture the blister at the base.
5. Apply ointment.
6. Cover with a bandage.

Wound:

1. Cover the wound with clean cloth.
2. Elevate.
3. Cover the wound with a bandage.
4. Wash hands.

Tick:

1. Clean tweezers with alcohol
2. Remove entire tick
3. Clean sound site with soap and water

Nosebleed:

1. Lean forward.
2. Pinch nose.

Test Subject 3: a female between the ages of thirty and forty, with a Master degree and cable Internet.

Answers for the steps of each Animation:

Foreign Object:

1. Put a cup over object and secure with tape.
2. Go to emergency room?

Splinter (successful tweezers):

1. Clean splinter area with alcohol swab.
2. Clean tweezers with alcohol.
3. Use tweezers and pull out splinter.
4. Wash hands.

Splinter (unsuccessful tweezers):

1. Clean splinter area.
2. Clean tweezers and/or needle with alcohol.
3. Try tweezers first, and then needle if tweezers won't remove.
4. Use needle to dig around and pull out splinter.
5. Wash hands.

Blister:

1. Wash hands.
2. Clean needle with alcohol.
3. Wash blister area.
4. Use needle to poke blister to drain.
5. Cover area with bandage.

Wound:

1. Cover wound area with sterile pad.
2. Apply pressure.
3. Apply bandage.
4. Wash hands,

Tick:

1. Use alcohol to clean tweezers.
2. Use tweezers to pull out the whole tick.
3. Wash area where tick was removed.

Nosebleed:

1. Have patient with nosebleed sit down.
2. Tell patient to lean forward and pinch nose closed

Test Subject 4: a female between the ages of forty one and fifty, with a Bachelor degree and DSL Internet.

Answers for the steps of each Animation:

Foreign Object:

1. Tape a cup over the object.
2. Should the patient walk around or lie down?

Splinter (successful tweezers):

1. Wash the wound.
2. Pour water over tweezers
3. Remove splinter with tweezers
4. Wash hands.

Splinter (unsuccessful tweezers):

1. Wash wound.
2. Put water over tweezers.
3. Try to pull out the splinter first with the tweezers.
4. Try to pull out with a needle
5. Wash hands.

Blister:

1. Wash your hands.
2. Pour water over a needle.
3. Wash the blister area.
4. Prick the blister with the needle.
5. Put something on the blister with your finger.
6. Apply a band-aid.

Wound:

1. Apply a bandage over the wound.
2. Elevate your arm.
3. Apply a large band-aid and wash hands.

Tick:

1. Pour water over the tweezers,
2. Pull out bug.
3. Wash the wound.

Nosebleed:

1. Sit down.
2. Put your head forward.
3. Touch the sides of your nose

Test Subject 5: a female between the ages of thirty and forty, with a Master degree and DSL Internet.

Answers for the steps of each Animation:

Foreign Object:

1. Don't remove the object.
2. Cover it to protect the area.

Splinter (successful tweezers):

1. Wash the wound.
2. Pour alcohol over tweezers
3. Remove splinter with tweezers
4. Wash hands.

Splinter (unsuccessful tweezers):

1. Wash wound.
2. Put alcohol over tweezers and needle.
3. Try to pull out the splinter first with the tweezers and if don't work use a needle to lift out splinter.
4. Wash hands.

Blister:

1. Wash your hands.
2. Pour alcohol over a needle.
3. Clean the blister area.
4. Prick the blister with the needle near the base.
5. Put ointment on the blister.
6. Apply a band-aid.

Wound:

1. Apply a clean cloth over the wound with pressure.
2. Elevate your arm.
3. Bandage wound.
4. Wash your hands.

Tick:

1. Pour alcohol over the tweezers,
2. Pull out entire tick.
3. Wash the wound.

Nosebleed:

1. Sit down and put your head forward.
2. Apply pressure to bridge of nose.

Testing Conclusion and Revisions

Foreign Object

Based on the data collected from our test subject users it was necessary to add text to the end of the series of images to tell the user to immobilize the foreign object and seek immediate medical care.

Splinter

Based on the data collected from my testing, I decided to combine the successful tweezers with the unsuccessful tweezers animation as one animation versus two separate ones. I thought it would be clearer to show the tweezers successfully removing the splinter

and also showing a scenario where the aid of a needle was needed in the removal. A few test subjects also missed the needle being sterilized most likely because the needle was placed underneath the tweezers. I resolved this problem by switching the placement of each instrument so the needle was on top of the tweezers and would be clearer for the viewer. Test subject 4 thought she was looking at water being poured over the instruments in all the animations. She claimed that she couldn't see what was written on the bottle shown. The rest of the testers did not have this issue but I still considered maybe she has a visual problem and others may as well. I went back into my texture map for the bottle and made the text bigger and also brought the bottle closer to the viewer on screen so it would be more legible.

Blister

Most of the testers understood all of the steps intended for this animation. Two of them did not indicate exactly where to prick the blister to drain it but the other three testers did. Test subject 2 did not understand that antibiotic ointment was used after the blister had been drained. I added a cut scene of a tube of antibiotic ointment to avoid any confusion about what type of cream to apply.

Wound

Two of the five test subjects answered correctly for this animation. Test subject 1 and 3 missed elevation of the wound. Test subject 2 stated she was confused on the steps and asked if they were out of order. We discussed this as a group at Logical Images and there are many variations of wounds and different approaches to each type.

A decision was made to go with a general wound, which the most important step is to stop the bleeding first and washing your hands would be the last step. Since testers also failed to make note of holding pressure for a period of time, I added a gray transparent screen with a clock that animated from the top of the hour to a quarter past before the model lowered his arm.

Tick

All testing subjects answered the correct steps for proper removal of a tick. Two out of the five noted that the entire tick was removed while the others did not. This is subject to interpretation. They may have also understood that but failed to write it down as an answer. I did present the information to Logical Images and it was decided that the animation would stay the same but they would add a disclaimer screen to stress the point of removing the tick by grasping it close to its head to remove the entire tick.

Nosebleed

Testing for this animation was generally successful. Two of the five testers failed to mention sitting down as the first step but the majority did make note of it. I also realized I needed to indicate a sense of time passage for the pinching the bridge of the nose. So like I did in the wound animation, I added a gray transparent screen with a clock that animated from the top of the hour to a quarter pass.

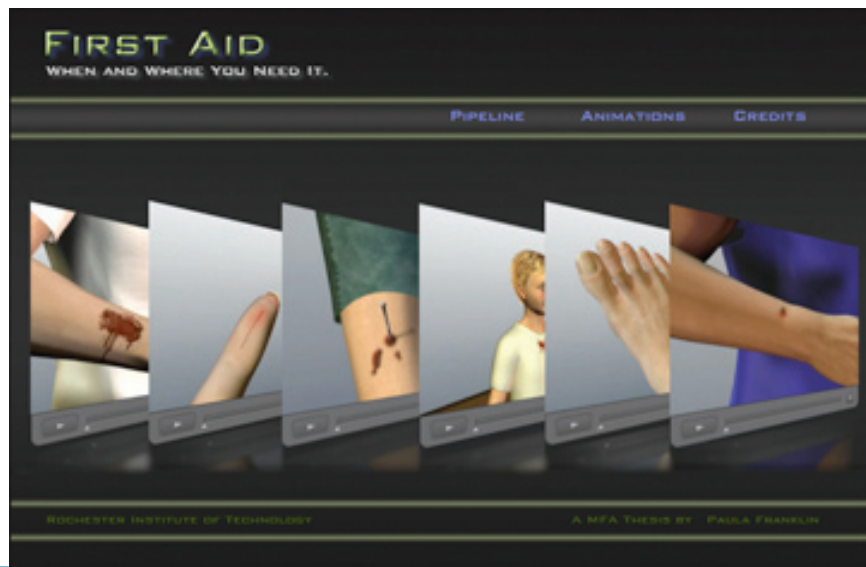
Output

The six animations were completed and given to the client as .swf files so that they could add disclaimer notices and warnings for the viewer. They should be up online at www.visualdxhealth.com sometime the summer of 2008 and hopefully also available for download for mobile devices.

Thesis Exhibition

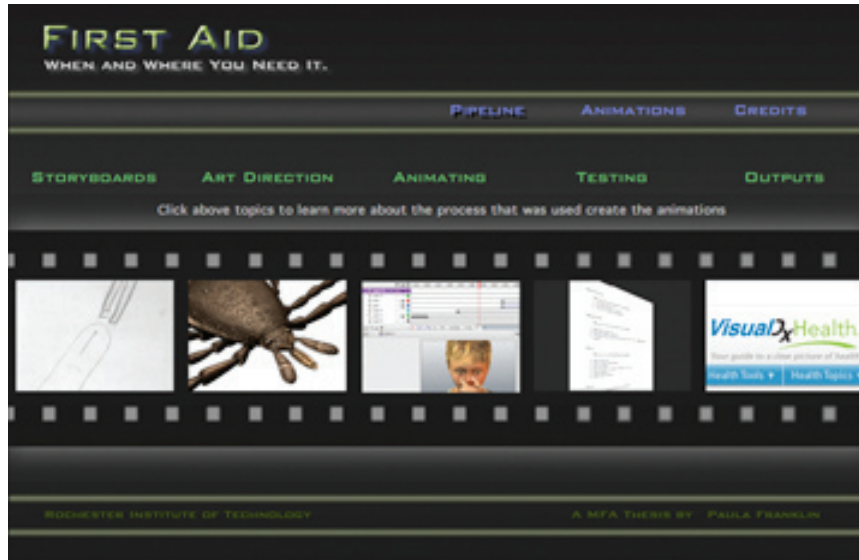
The thesis exhibition is the visual results of the thesis exploration. A display exhibited in the Bevier Art Gallery, showing the thesis body of work during the Spring Quarter of the second year of the MFA program.

For the Graduate Fine Art Thesis Show, I created a Flash projector file and a series of posters to exhibit my thesis, "First Aid: When and Where You Need It." When one first uses the application, they are introduced to a preview of the finalized first aid animations. There is also a navigation bar containing three topics; pipeline, animations and credits, the user can choose to explore.



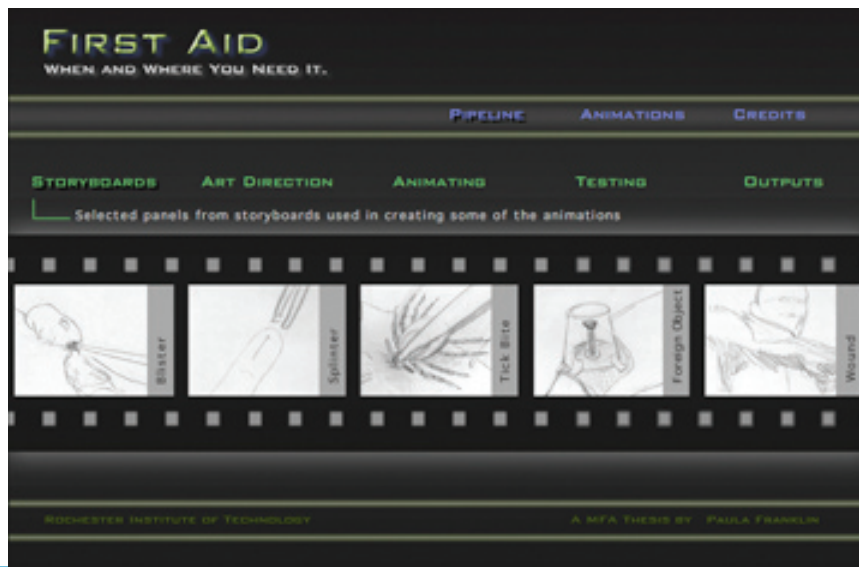
Pipeline

This section tells the story of how I developed the series of animations. It contains further subtopics of the Storyboards, Art Direction, Animating, Testing, and Outputs.



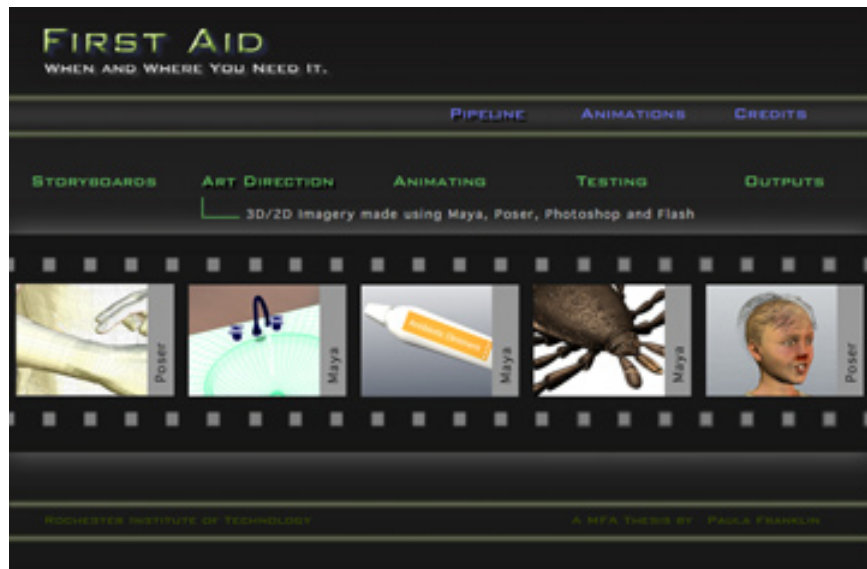
Storyboards

This section demonstrates a glimpse of a panel for the animations. The storyboard is meant to show the client the key important steps of the animation.



Art Direction

After storyboards were approved, the final look of the animations had to be considered. The animations were designed to look clean, well illustrated and easily recognized. As the artist, I had to decide which software to use to help me achieve this look. As shown in the Flash projector, I chose Poser, Maya, Illustrator, and Photoshop. I created three-dimensional models in both Poser and Maya and textured them using Photoshop and Illustrator.



Animating

I used the following software in animating the storyboards:
Poser, Maya, Flash and After Effects.



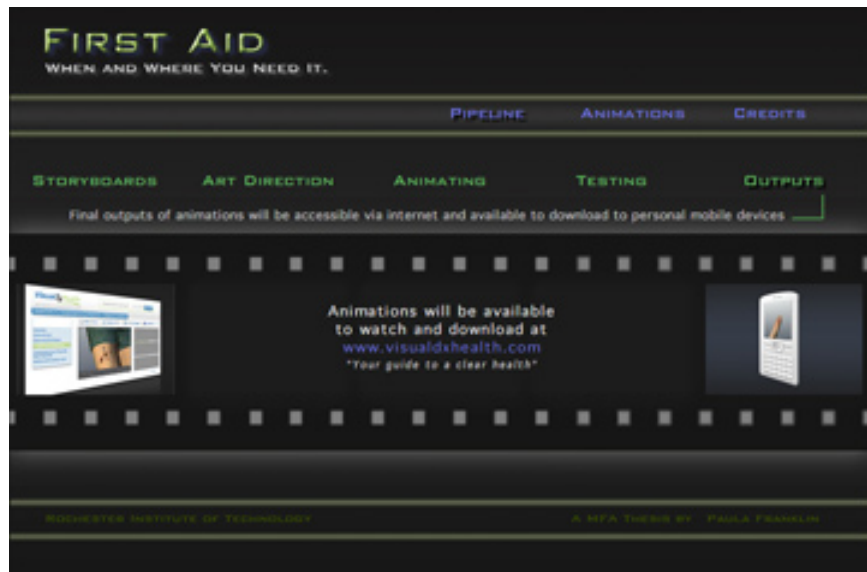
Testing

The target audience was women between the ages of 30-50 years, who have a college degree and may be looking online for health information for themselves or family members. I found five test subjects and had them access the animations online and answer the question of what are the steps of each animation.



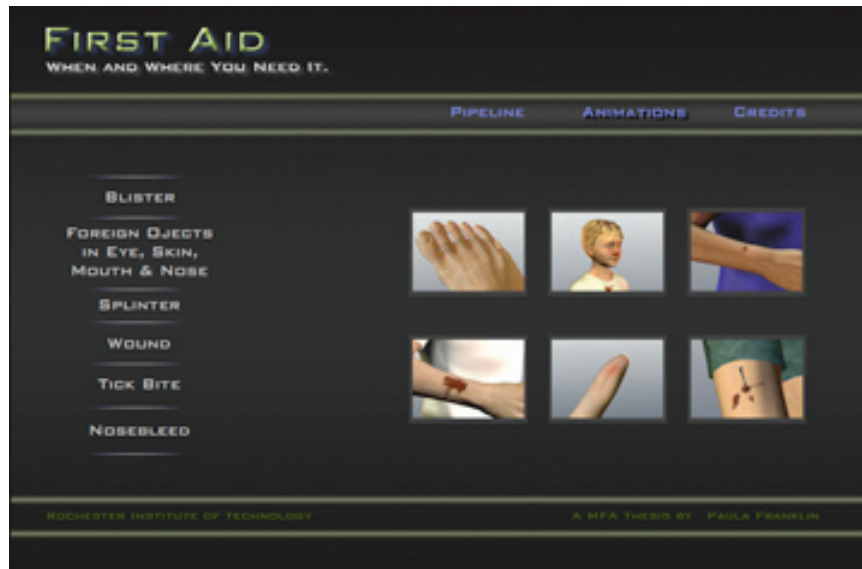
Outputs

The six animations will be online at www.visualdxhealth.com to view and also available for download for mobile devices in the future.

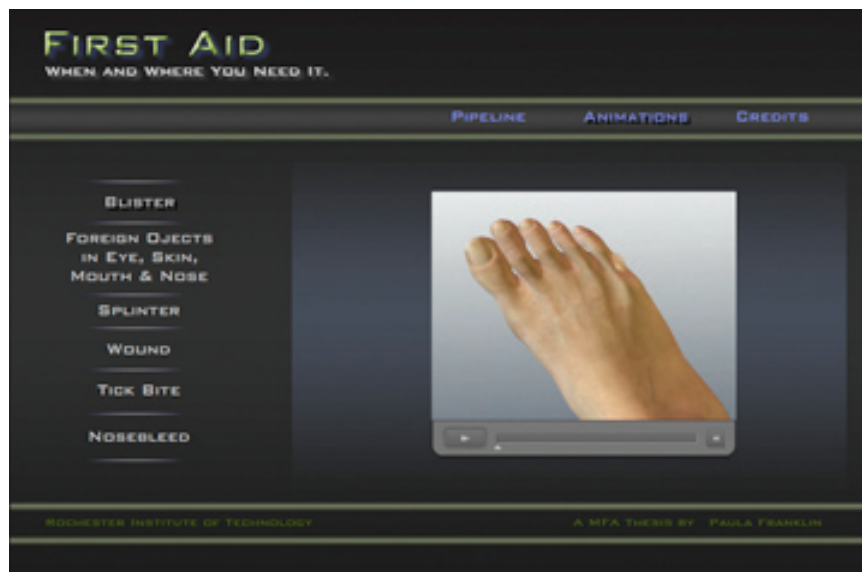


Animations

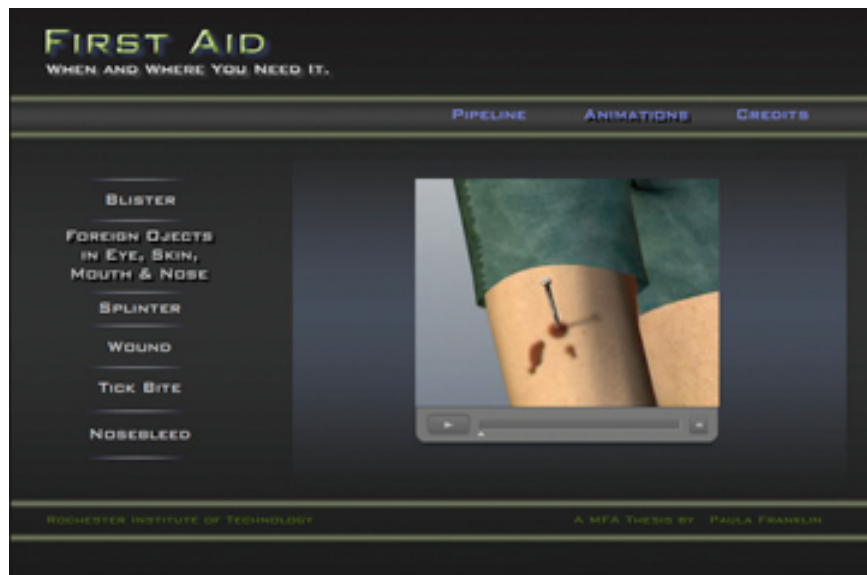
This next page shows the user a submenu list of the following animations: blister, foreign objects in eye, skin, mouth and nose, splinter, wound, tick bite, and nosebleed. When the user clicks on the button the animation that sits angled on the right animates by rotating and coming into view. This effect was done using After Effects. The user then can press the play button to watch the animation.



Blister



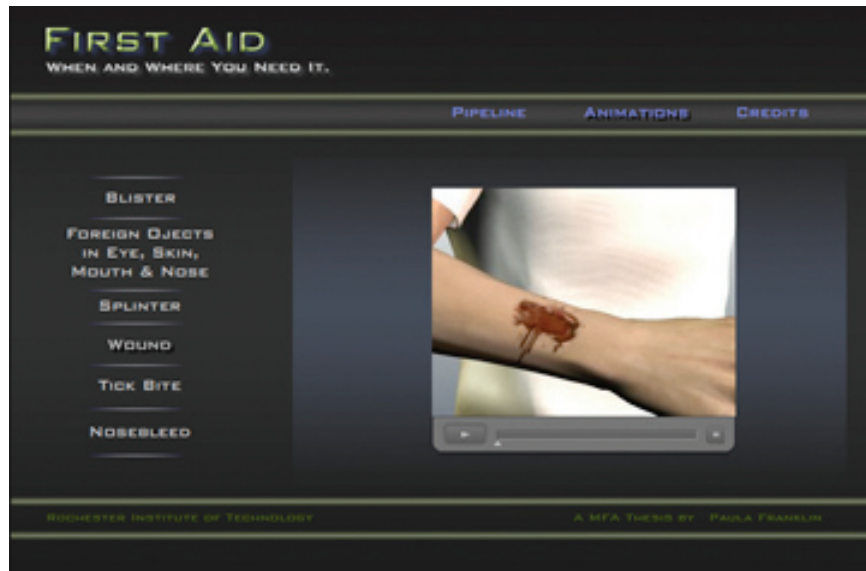
Foreign Objects in Eye, Skin, Mouth and Nose



Splinter



Wound



Tick Bite

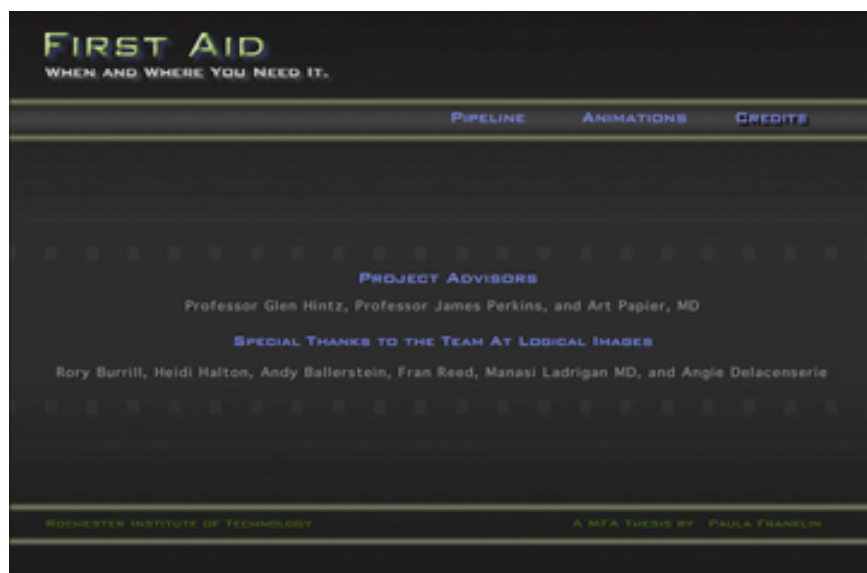


Nosebleed



Credits

Finally the Flash projector ends with a credits page listing my advisors for my thesis and the team at Logical Images, Inc. Project Advisors: Professor Glen Hintz, Professor James Perkins, and Art Papier, MD. Team at Logical Images: Rory Burrill, Heidi Halton, Andy Ballerstein, Fran Reed, Manasi Lagrigan MD, and Angie Delacenserie.



Conclusion

I followed a process in the creation of six self-care first aid animations for Logical Images, Inc. They were created for their consumer website, www.visualdxhealth.com. The objective of the project was to produce simple and easy to understand first aid animations for a specific target audience. My pipeline started with meeting with the client, drawing storyboards, deciding the art direction, animating, testing and ended with the final output. I learned that working through this pipeline was beneficial to the workflow of the thesis. I was able to manage my time more effectively to the production of the project and had more successful results. No pipeline is perfect and can always be improved and adjusted. If I had the chance to do things over I would have done a second survey with same testing subjects to test the revisions I did based on their first survey. Toward the end of the production stages of the project, I learned another piece of software, Adobe After Effects, which could have been beneficial to the beginning stages of the workflow. It is a motion graphic and visual effects software that creates better quality graphics and more organic movements of raster images. Technologies are always advancing so I will always be learning new software and techniques to achieve the best results for projects.

Bibliography

ACM SIGGRAPH, 2005. Medical Illustration & Visualization: Why Do We Use CG and Does It Really Make a Difference in Creating Meaningful Images? <http://www.siggraph.org/s97/conference/panels/t2b.html> (accessed September 27, 2007).

Logical Images, Inc. 2007. Script for series of animations for Blister, Foreign Objects in Eyes, Skin , Mouth and Nose, Wound, Nosebleed, Splinter and Tick Bite.