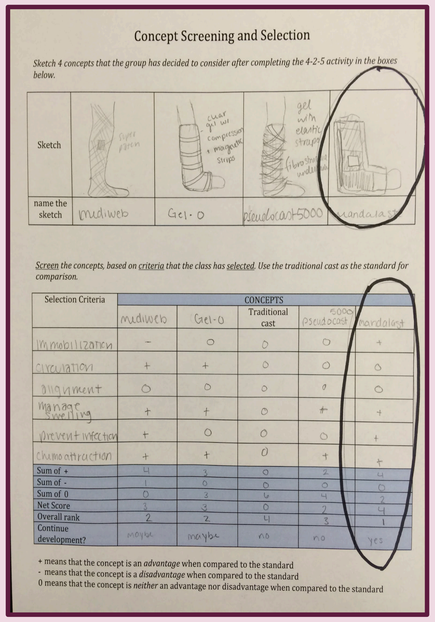
MediWeB

MOTHERS OF FRACTURES

https://drive.google.com/open?id=0B_0l25JlPOq6RFlhaTMwLVJUQzA

MISSION STATEMENT

Our product promotes faster, healthier, and more comfortable healing for a fractured bone. A person would benefit from having the MediweB because it's features help fractures heal faster, healthier, and more comfortably when compared to the bulky, itchy, inaccessible traditional plaster casts. This product's success will benefit those who seek a better cast, up to 4.4 million people a year (CDC), as an alternative to the traditional plaster cast.

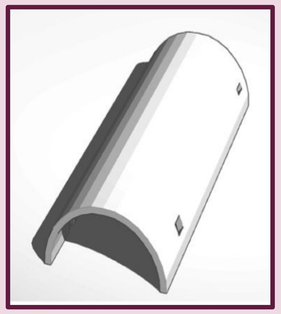


CONCEPT SELECTION

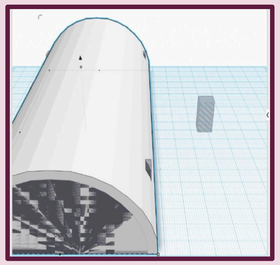
- After the 4-2-5 activity, the group chose 4 top sketches and named them.
- Each sketch was screened on a number of criteria the group chose
- The traditional cast was chosen as the standard for comparison, and each caste was rated on a +/- system, depending on if each feature was fulfilled better or worse than the traditional cast.
- The MediWeB had the highest score of +'s , and it was chosen.

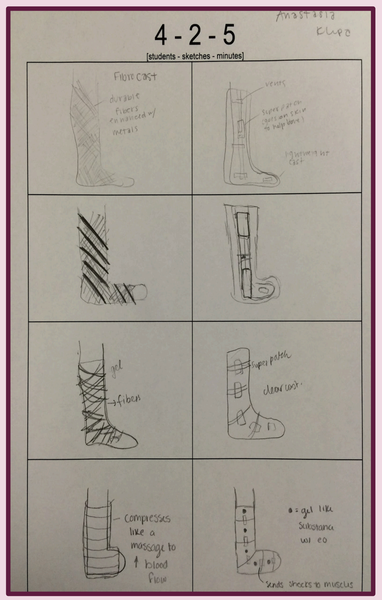
CONCEPT GENERATION

- The four designers sketched out two designs each.
- Each paper was passed around, and each person added their own personal touch to each design. This generated 8 designs per person, and a total of 32 sketches.
- Through this method, each designer could see the changes added by the other members, enhancing their own design.

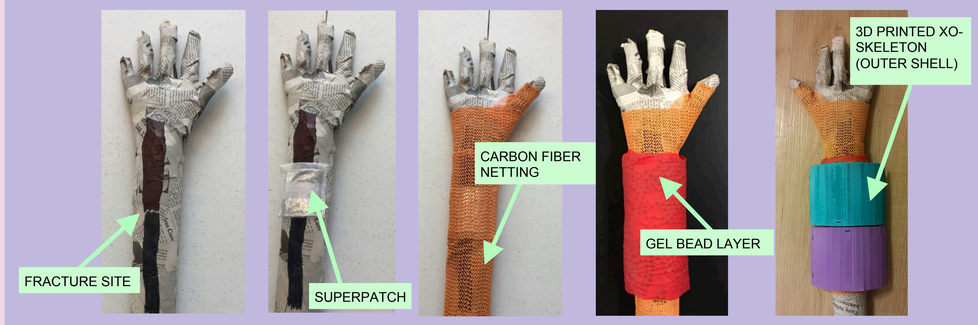


THinker Cad program used to 3D print XO Skeleton





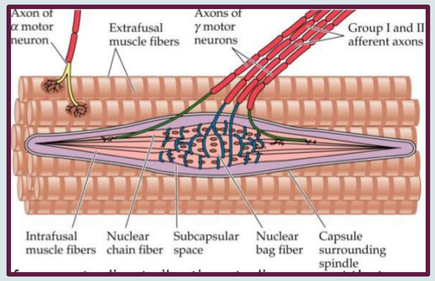
USER NEEDS	SPECIFICATIONS	TEST RESULTS
The design keeps the fracture immobilized at the joint.	The rigid Web layer extends 2 inches past the nearest joint.	Measurements will be taken to ensure the design extends 2 inches above the nearest joint.
The design is water resistant. **	XO skeleton is made of waterproof materials.	The design will be submerged in water for 30 minutes at 75 degrees Farienheit.
The design promotes circulation.	Gel beads vibrate at 30-40Hz.	Stethoscopes will be utilized to show healthy blood flow patterns.
The design keeps the bones in the correct healing position.	The Web stabilizes the injury are so that bones do not deviate from 1-2 degrees of normal healing position	X-rays will be used to determine the bone's alignment throughout the healing process.
The design allows for potential infections to be cleaned and examined.	Removable XO skeleton and Gel Bead layer with transparent fiber netting.	The design is able to be removed
The design reduces swelling and inflammation.	Refrigeratable Gel bead layer maintains 0 degrees Celsius or lower for 20-30 minutes.	Using the design visibly shows a reduction in swelling and redness.
The design utilizes chemoattraction.	Capacitive coupling model sends electricity through fracture site at 60Hz.	Voltmeters will be attached so both sides of the Super Patch to ensure currents of 1-10mV/cm.
The design ensures that pressure is applied.	Customized form fitting casts are generated for each consumer.	Each patient will have exact measurements taken so that the cast fits properly.
The design provides comfort to the patient. ** **=user desire, not scientific need	Design is more lightweight and breathable than the typical plaster cast.	A survey asking patients to rate comfort levels (1-10) of the design rated the MediWeB at an 8.



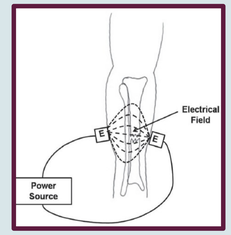
PROCEDURE

PROTOTYPES

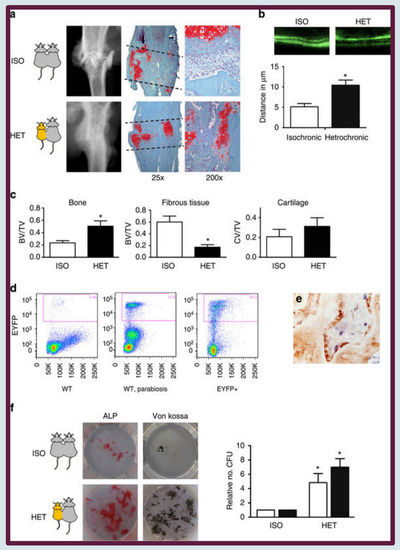
- Super Patch
  - Based off a well-known model of electric stimulation called capacitative coupling
    - sends constant electric waves at 60 kilohertz
      - This targeted stimulation causes *Chemoattraction*
        - proteins and cells migrate to the injured area, which accelerates the healing process
    - Non-invasive, painless
    - Promotes soft tissue repair and reduces chances of muscular atrophy
- Vibrating Beads
  - Localized vibration therapy
    - stimulates circulation and the production of osteoblasts
      - Oxygen and appositional growth
- Essential oils
  - Safe, natural
    - Inclease bloodflow, reduce inflammation and aching
      - Ie: Peppermint and Eucalyptus

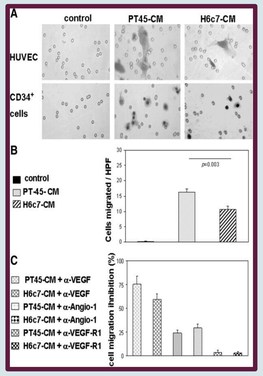


Capacitative coupling model utilized in Superpatch

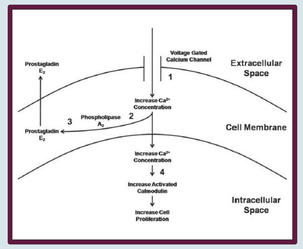


Acute direct vibration quickly relaxes muscles





A variety of graphs and charts illustrating chemoattraction



FUTURE MODIFICATIONS

- To make the cast cheaper than the traditional plaster cast that costs $2,500 on average, the patient will rent the super patch, so the doctor will not have to purchase it every time, which minimizes cost
- The outermost layer will be printed from a 3D printer to eliminate manual labor.
- The carbon fiber netting is also inexpensive, costing only about $3 square foot. (OnineFabricsStore.net)
- As new technology develops (for example, our gel bead layer that has the capability of cooling and vibrating) and existing technology improves, the features of the cast have the possibility of improving more and more.