Horizon Hip Prosthetic Team **Final Presentation**





Entrepreneurial Leads:
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Team Mentor:
Dante Archangeli

Who Are We?
Team 525

We help active hip disarticulation amputees restore their mobility and lifestyle!

Who are our customers?

The Problem & Pain

- People with hip disarticulation amputations struggle with limited mobility and stability. Current prosthetics are passive, energy-inefficient, and can't fully support daily movements like walking or climbing stairs.

The Goal & Gain

- Create a powered hip prosthesis that supports a 90 kg user and eliminates lethargy in walking, stair use, and sitting or standing — all while remaining lightweight, efficient, and natural in motion.

How We Will Help

- We're developing an active, motor-driven prosthesis with smart control sensors and lightweight materials. Partnering with Next Step Prosthetics and using modeling tools like MATLAB and SolidWorks, we aim to build and test a working prototype by Spring 2026.

Customer Discovery Interviews:

Person	Role
1. Rosie	End User
2. Dr. Dante Archangeli	Decision Maker
3. Dr. Reza Razavian	Decision Maker
4. Jillian Okimoto, CPO	Recommenders
5. Alec McMorris	End User
6. Maggie Lewis	Recommenders
7. Mike Kayser, CPO	Recommenders
8. Dr. Laura Reese	Influencer
9. Ed Sisson, CPO	Recommenders
10. Karen Edwards	Decision Maker
11. Kodi Nixon	Decision Maker
12. William McComas, CTPO	Influencer
13. Andres A.	Decision Maker
14. David Willy	Influencer
15. Dr. Tim Becker	Influencer
16. Dr. Zach Lerner	Influencer

Here's What We Thought:

- **Prosthetic walking would be straightforward:**
  We assumed that once a prosthetic was fitted properly, users would be able to walk naturally without major complications. We didn't yet realize how common challenges like hip circumduction or balance issues could be.
- **Adding weight to the leg would make it feel more natural:**
  We thought that mimicking the weight of a real limb would improve comfort and stability. We later learned that even small increases in weight can make walking more difficult and tiring for users.
- **Front-loaded designs were the best option:**
  Our early thinking was that placing components toward the front improved control and alignment. We didn't consider that positioning parts differently such as underneath could create better balance and walking motion.
- **A simple, sleek design was enough to appeal to users:**
  We believed that a visually clean, lightweight prosthetic would automatically attract users and make recovery easier. We didn't yet recognize how important ease of learning, comfort during rehabilitation, and user trust are in the adoption process.
- **Weight was the only major performance factor:**
  We focused mainly on reducing total weight, assuming that lighter meant better. We overlooked how weight distribution within the prosthetic affects motion, comfort, and long-term wearability.
- **Regulations and standards wouldn't be a major barrier:**
  We expected that once a design worked mechanically, it could easily move toward production. We didn't anticipate how strict medical device standards, certifications, and testing requirements would shape design decisions.

Major Lessons We Learned:

- **Lessons from our interviews:**
  - **Users**
    - Biggest problem is ability to walk without hip circumduction
    - Despite devices weighing less than a normal leg it's still heavy. As light as possible it best.
    - Position of some devices are on the front would be better if they were underneath or somehow else
  - **Decision makers**
    - A sleek simple design is something that they look for as it's easier to get users on board.
    - How easy is it in the recovery phase for patients to learn with.
  - **Influencers & Recommenders**
    - Weight is a major issue.
    - Distribution of weight within the forces of the leg.
    - Standards and regulations in place for medical devices.

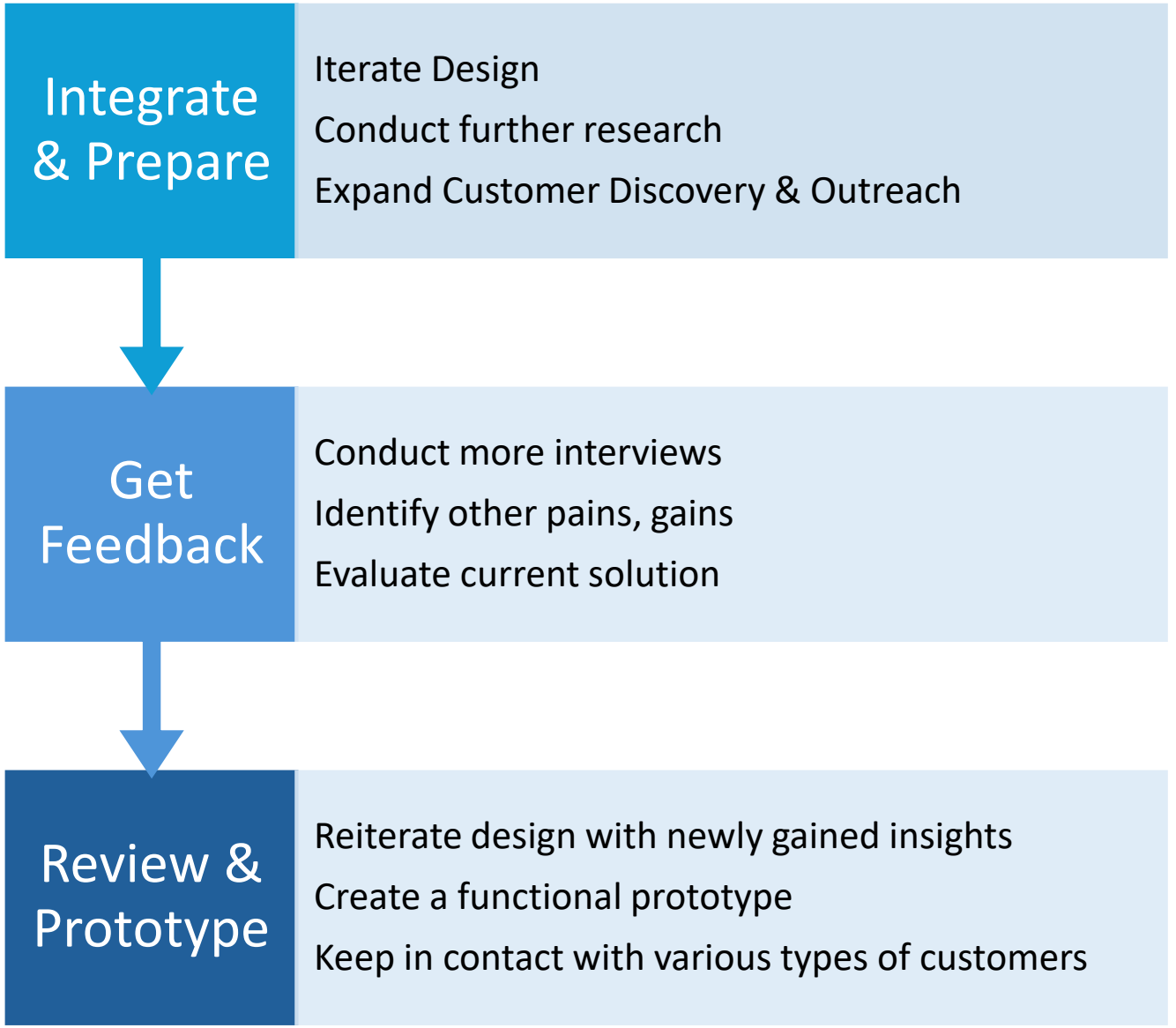
- **Key Course Takeaways:**
  - A thorough, dive-in approach to all problems, pains, and gains get to the solution that actually helps (Why, Why, Why?)
  - Don't be afraid of learning that your idea is bad. You can learn what the market actually needs.
  - Don't assume you know what people need.
  - Embrace calling people you have never met. Fill awkwardness by asking questions

Where We Are:

This is our current design, based on our interviews here is what we've changed;

- Add additional attachment bracket below the waist belt.
- We removed any extra weight we could.
- Waist mounted motor for a more accurate center of location.

What Comes Next?



Thank You!