

Functional Model for Reduction of Pediatric Radial Head Subluxation

[Team Website Link](#)

Date: October 2nd, 2026 - October 8th, 2026

Client: Dr. Carey Wagoner - cwagoner@wisc.edu

Advisor: Dr. Melissa Skala

Team Members:

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Problem statement

Radial head subluxation, commonly known as nursemaid's elbow, is a frequent pediatric injury predominantly in children ages 1-3 that requires proper manipulation of the elbow and forearm for successful reduction. Orthopedists must learn the two techniques for reducing nursemaid's elbow: hyperpronation and supination-flexion. Maneuvers such as these require appropriate positioning, rotation, and force to return the radial head to its normal position. However, opportunities to practice these methods are limited, which creates a need for a reusable pediatric elbow simulation model. The model should replicate the correct anatomical demographics, appropriate elbow biomechanics, and provide feedback, such as a "click," to help medical professionals safely and accurately practice the skills needed to reduce nursemaid's elbow.

Brief status update

The team brainstormed some alterations for the project and organized a preliminary report. Additionally, with the research the team has done, materials have been ordered to start fabricating a prototype. The team plans to begin ordering more materials and fabricating in the Makerspace in the coming weeks.

Difficulties / advice requests

There are no difficulties at this time.

Current Design

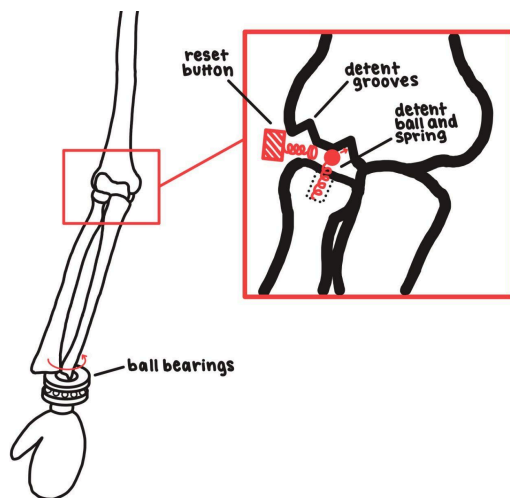


Figure 1. Detent Arm Design

Materials and Expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Mechanism's										
Reset Mechanism	A detent pin reset mechanism	WHLLING	B0CWR9RSDC	Amazon	B0CWR9RSDC	10/2/2026	1	\$9.99	\$9.99	Link
Detent Ball	spring-loaded detent ball	Harfington	B0FRGDVB1M	Amazon	B0FRGDVB1M	10/2/2026	1	\$7.19	\$7.19	Link
Ball and Socket	self-lubricating ball join + rod-end fitting	uxcell	B0CT2GFR1D	Amazon	B0CT2GFR1D	10/2/2026	1	8.79	\$8.79	Link
Skin/Muscles										
Platinum Cure Silicone	20 oz translucent silicon mold-making kit	Let's Resin	B07V5FPWC	Amazon	B07V5FPWC	10/2/2026	1	\$17.69	\$17.69	Link
Foam	Customizable foam sheet	Amgo	B0FFLGCTFK	Amazon	B0FFLGCTFK	10/2/2026	1	\$14.00	\$14.00	Link
								TOTAL:	\$57.66	

Major team goals for the next week

1. Order any materials that cannot be purchased from the Makerspace.
2. Begin prototyping the elbow model and make a list of fabrication steps.
3. Schedule next meeting with Dr. Wagoner to receive feedback on the prototype/materials.
4. Continue research to better understand designs and mechanisms.

Next week's individual goals

- Siya Agarwal
 - Continue further into research on ways to fabricate detent mechanism, attachable piece, and reset mechanism
 - Make a definitive plan for fabrication and clarifying design into a CAD model
 - Use feedback from Preliminary Report to rework final design or adjust fabrication steps
- Maddie Kaltman
 - Work on new CAD models for “bones”
 - Do more research on mechanisms
 - Flesh out potential fabrication and testing methods
- Jacqueline Sceats
 - Begin prototyping elbow model when the pieces arrive
 - Work on new CAD models that will function with the elbow joint mechanism
- Addison Dowe
 - Work on CAD model for the mold to create the skin
 - Start to experiment with platinum cure silicone
 - Continue to research materials for muscles
- Jason Yang
 - Continue research
 - Research the existing product
 - Researching how to make a reliable ligament and possible materials.
 - Find more research to fill the knowledge gap on the elbow mechanisms
 - Continue working on polishing the designs.
- Dante Tripathi
 - Begin creating prototype
 - Begin working on CAD model

Timeline

Task	September				October					November				December	
	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11
Project R&D															
Empathize	X	X	X												
Background...			X	X	X										
Prototyping															
Testings															
Deliverables															
Progress Reports	X	X	X	X	X										
Prelim presentation					X										
Final Poster															
Meetings															
Client		X			X										
Advisor	X	X	X	X											
Website															
Update	X	X	X	X	X										

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Created a preliminary report to go over our initial design ideas and receive feedback.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Siya Agarwal	10/02 - 10/08	- Worked on report - Dove further into research on reset mechanism and wedge cam - Started looking into more materials to order for fabrication, specifically the reset mechanism	- 1.5 hours - 0.5 hour - 0.5 hour	2.5 hours	17 hours
Maddie Kaltman	10/02 - 10/08	- Worked on testing and discussion sections of preliminary report - Conducted more research on mechanism and 3D printing filaments	- 1.5 hour - 1 hour	2.5 hours	14.5 hours
Jacqueline Sceats	10/02 - 10/08	- Worked on the preliminary report and did more research to accurately describe fabrication methods - Researched materials to order for prototyping the design	- 1.5 hours - 1 hour	2.5 hours	15 hours
Addison Dowe	10/02- 10/08	- Worked on preliminary report - Did research to find materials and techniques to create the skin of our model	- 1.5 - 1	2.5	14.5 hours
Dante Tripathi	10/02- 10/08	- Worked on Preliminary report - Researched	-1 hr -1 hr	2 hr	12 hours
Jason Yang	10/02- 10/08	- Working on improving the designs - Worked on a preliminary design report. - Researching more on elbow mechanisms	0.5 Hr 1 Hr 1 Hr	2.5Hr	15.5 Hr