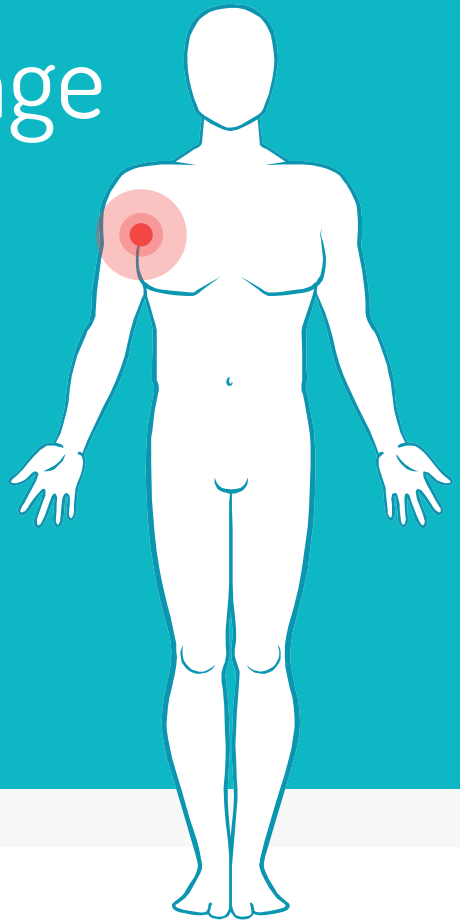
BETiC Medical Innovation Challenge
Ergonomic Crutch Design



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Team

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WHY THIS PS?

Understanding Crutch Users

Who our users are?

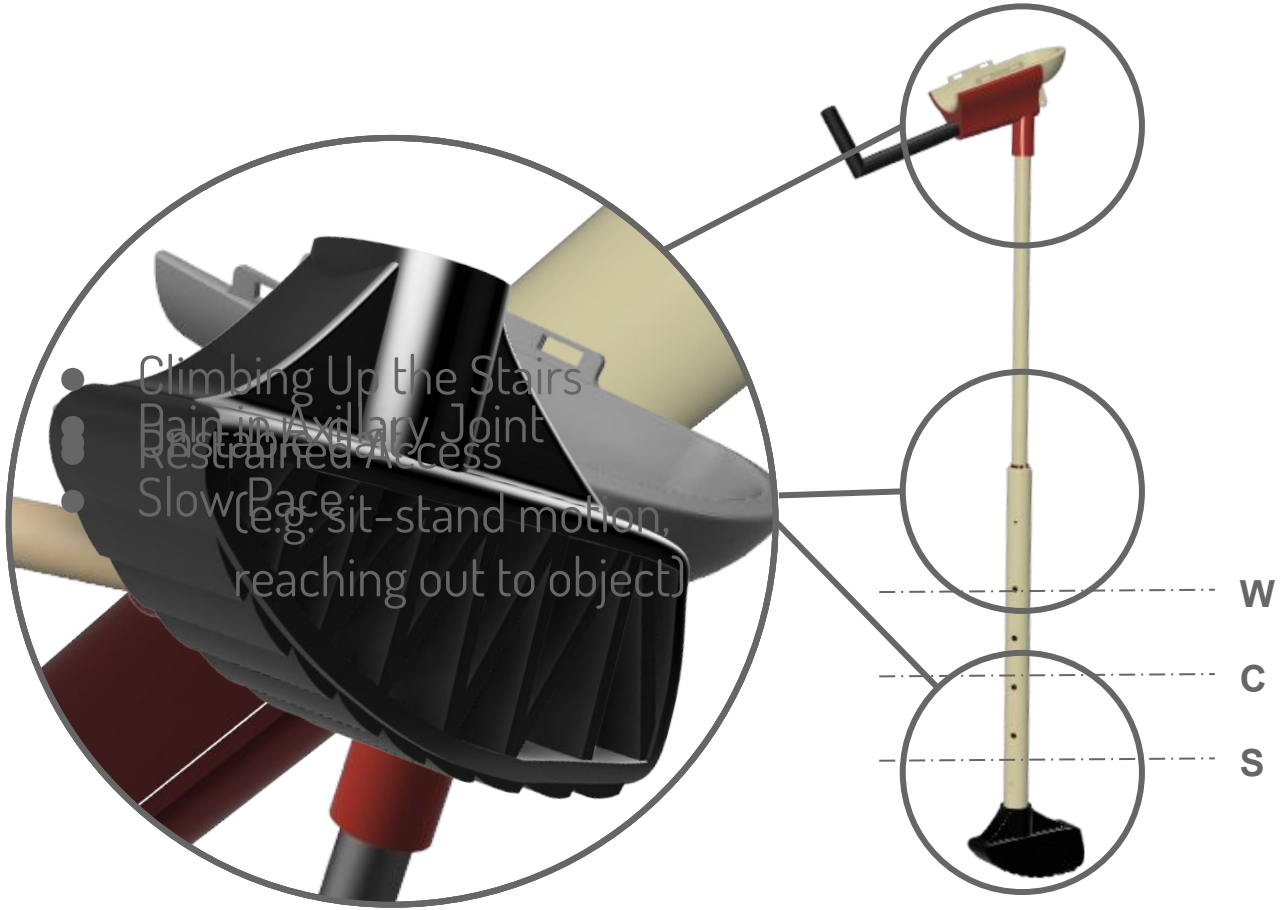
- ❏ Osteoarthrosis and Allied Disorders
- ❏ Orthopedic Impairment of Lower Extremity
- ❏ Absence or Loss of Lower Extremities
- ❏ Rheumatoid Arthritis
- ❏ Cerebral Palsy
- ❏ Intervertebral Disc Disorders

What problems do they face in common?

- ❏ Pain at Axillary Joints
- ❏ Restrained Access
- ❏ Slower Pace
- ❏ Climbing Up the Stairs
- ❏ Unstable Gait
- ❏ Limited Adaptability

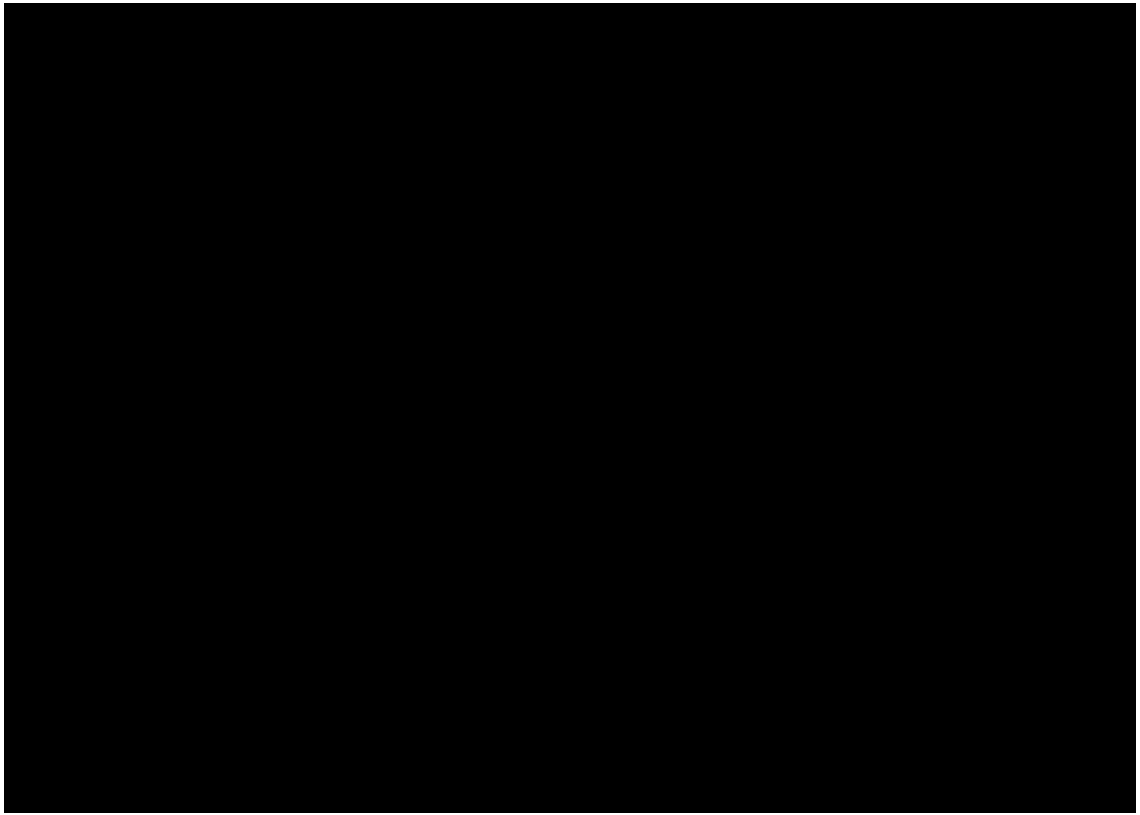
OUR APPROACH

Our Design


Climbing Up the Stairs
Pain in Axillary Joint
Restrained Access
Slow Pace
(e.g. sit-stand motion, reaching out to object)
W
C
S

PROOF OF CONCEPT

Testing Our Model

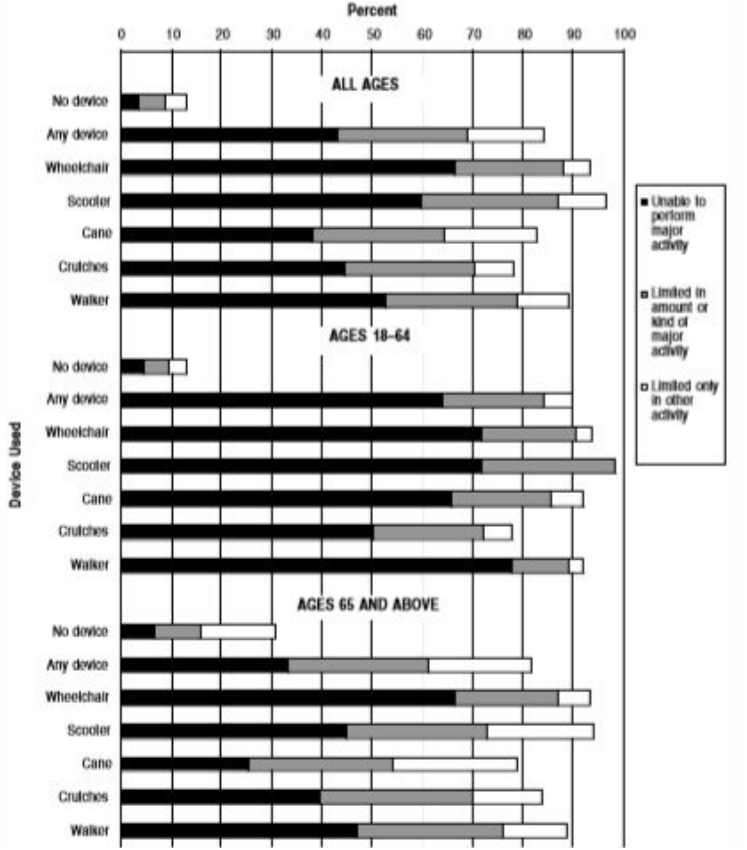


FUTURE GOALS

Design Alterations

- Weight reduction through extensive research on materials.
- Introduction and testing of a more robust height adjustment mechanism.
- Biomechanical analysis followed by design optimisation through experimentation with our current model.
- Improving ergonomics hence freeing the user from the crutch.

Commercial Potential



Type of crutch	Approx cost
Simple Axillary Crutch	INR 1500 for 1 pair
Forearm Crutches	INR 3000 for 1 pair
M+D elbow crutch	USD 300 for 1 pair (INR 21000)
Our Crutch	**INR 4000** for 1 pair

THANK YOU

Sources and References

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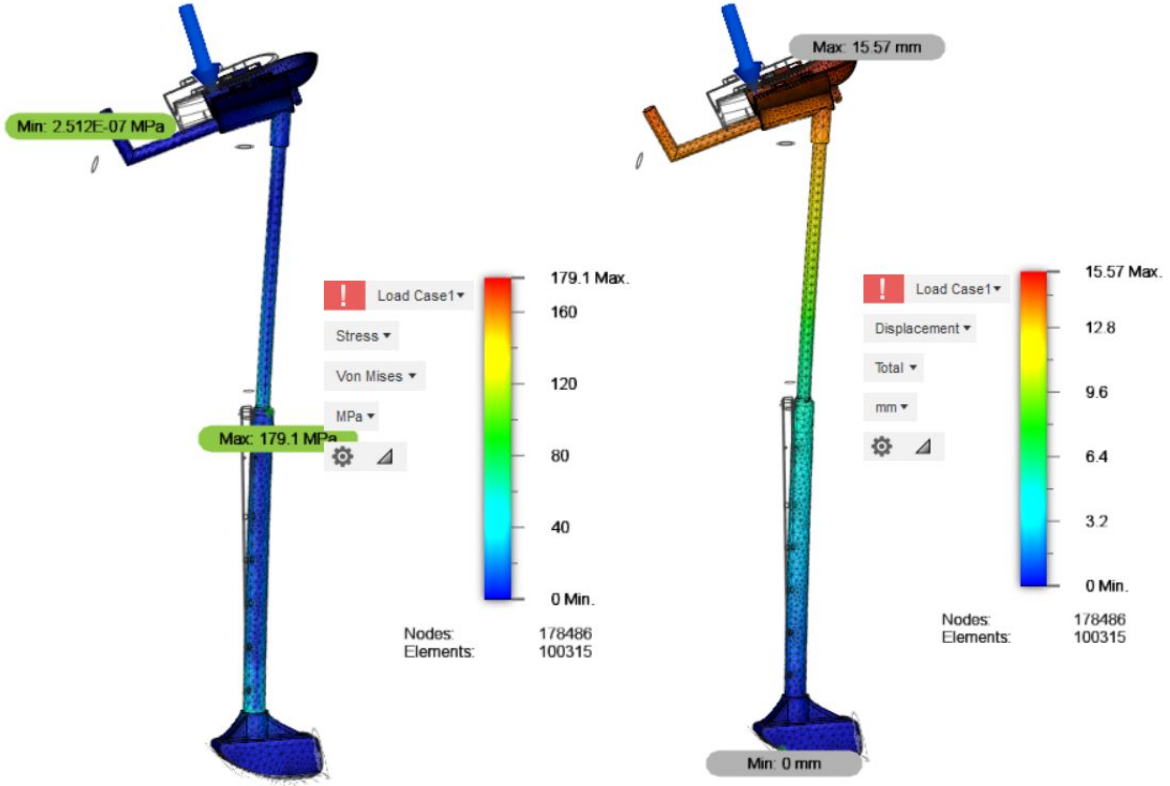
Mechanical Analysis



Mechanical Analysis

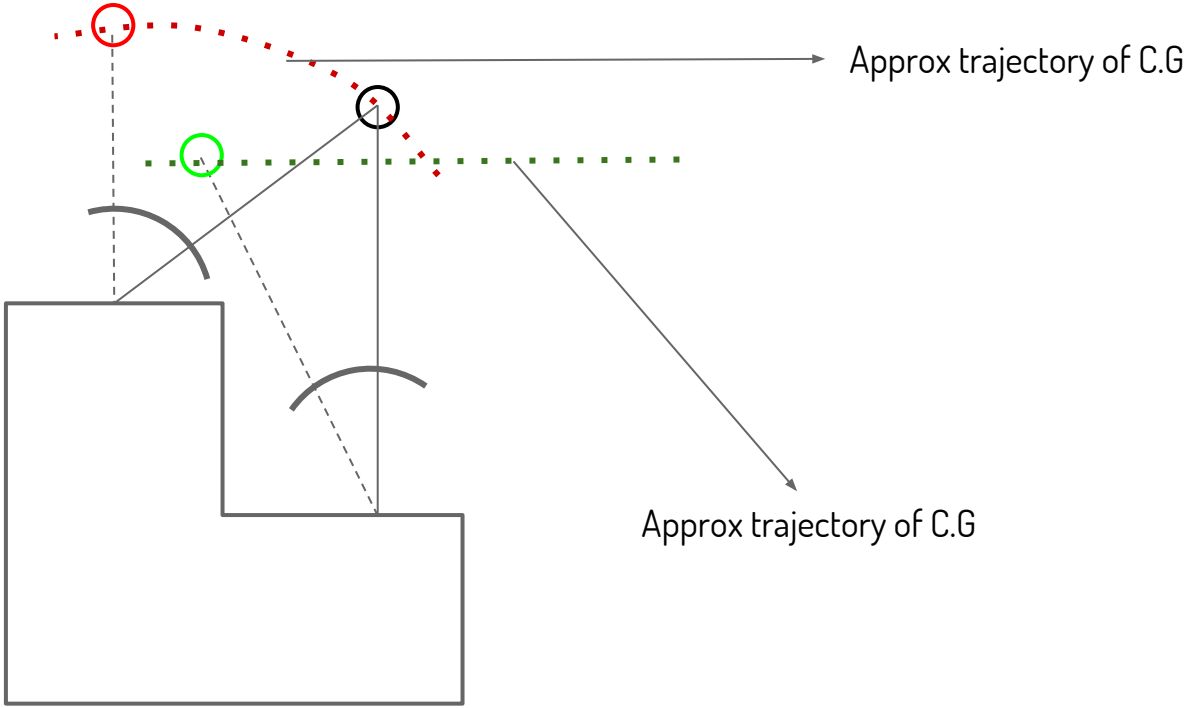


*diagram for representational purposes only

Market Analysis

Table H. Leading conditions† associated with the use of crutches, all ages.

	Condition	Persons (1000s)	Proportion of device users (%)
	All conditions	492	100.00
1	Osteoarthrosis and allied disorders	59	11.92
2	Orthopedic impairment of lower extremity	55	11.09
3	Absence or loss of lower extremity	47	9.45
4	Chronic injuries or late effects of injuries	40	8.04
5	Orthopedic impairment of back or neck	25	4.98
6	Rheumatoid arthritis and other inflammatory polyarthropathies	21	4.33
7	Cerebral palsy	20	4.02
8	Orthopedic impairment of hip and/or pelvis	19	3.92
9	Intervertebral disc disorders	17	3.43
10	Other paralysis	11 *	2.32 *

†Conditions reported as the main cause of functional or activity limitation (see text).
*Standard error exceeds 30 percent of the estimate.

Alternative Mechanisms

References：https://www.youtube.com/user/thang010146