

## Design and Development of a Device to Transport Patient on Wheel Chair along Stairways



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**Abstract:**

In densely populated areas of society; old buildings can't be re-developed just because they are without lift or elevators. So in order to increase patients comfort a stair climbing wheel chair would meet the mobility needs. This project proposes a new innovative, low cost and simple design of stair climbing wheel chair which helps the patients to move more flexibly and comfortably. A planetary gear mechanism is used to meet the requirement.

By conducting literature review, it was identified that there are many stair climbing chairs available in the market but there is no low cost stair climbing wheel chair available for the patient. To understand the user and then environment, data collection was carried out with patients of different government hospitals. It was seen that patients are moved for different activities like x-ray, scanning, and operation for which they use different lifts and ramps for the execution of particular task. By taking the users voice into consideration QFD was developed and from which PDS was generated. It was decided to design stair climbing wheel chair by considering functionality, ergonomics and safety.

Three different concepts of stair climbing wheel chair were generated meeting the PDS. Different features and facilities were provided for carrying out all different activities of patients. One concept was selected as final concept and iterated. A working model was made in 1:1 scale to validate the concept and feedback collected from the users was satisfactory.



**Stair climbing wheel chair**



**Stair climbing wheel chair shows adjustable foot rest, patient document box, glucose holding stand and calling bell features**



**Stair climbing wheel chair - working model in 1:1 scale**