



Restroom Assistant for a Woman with Special Needs



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Background: The team is working for a woman who, because of her medical condition is unable to execute proper post-toileting hygiene. She was born with quadriplegic cerebral palsy and scoliosis, and suffers from secondary joint contractures and weakness which impairs her balance, precision control of her arms, and general mobility. She has tried many different methods, however the only arrangement that truly works for her is human assistance, usually provided by her mother. She wants to be more independent, and that begins with gaining independence in the bathroom.

Objectives: The goal of this project is to design and build a system which will allow our customer to independently use the bathroom and maintain post-bathroom hygiene.

Results: Thus far, a list of customer requirements have been developed that includes the cost of the system, the predicted ability of use, the ability to be portable for one of the designs and comfortable and usable for the home design. Each member of the team developed a design concept using both creative thinking and systematic design methods. These include what has come to be defined as the home and portable designs. Ultimately these designs were chosen due to their feasibility and portability.

The initial planning phase will involve subsystem level testing in the lab and bidet testing in the customer's home. The tests will conclude with an integrated proof-of-concept test

of all parts assembled in one use. Subsequent testing will involve more forces and moments that will be applied on the parts. The goal of this project is to create a useable model for the customer at home and for portable use. Deliverables will include calculations demonstrating feasibility, and plans and a bill of materials that will allow the customer to recreate the system if proven effective and useful.



Figure 3. The Design Team.