In recent years, many independent adults have indicated a need for a method of accurately controlling the doses of their intravenous medications. Millions of people rely on self-medicating techniques that require the use of syringes. Those suffering from type II diabetes, and are therefore insulin dependent, or stroke patients, who use precautionary heparin injections, are some of the patients who most commonly use syringes. Self-dosing can be problematic for many people; especially those who are elderly, visually impaired, or hearing impaired, or suffer from arthritis, Parkinson’s disease, partial paralysis, or the loss of motor skills due to a stroke, heart attack, or other physical ailments. Clearly, there is a need for a reliable, easy-to-use, and inexpensive product to accurately fill syringes with insulin or heparin in a timely manner.

Products currently on the market require patients to mechanically fill their syringes, using their fine motor skills to control the syringe mechanism. This method increases the risk of errant dosing by relying on the patient’s physical ability to perform the dosing correctly. The current products, therefore, do not accommodate patients that lack the necessary fine motor skills. The product proposed here will provide a digital self-dosing device that will accommodate many of the physical limitations mentioned above, while remaining affordable and competitive in today’s market.

This new product has several important design criteria. It needs to be accessible for people who are hearing impaired, vision impaired, and who lack certain motor functions. It must also be stable for those patients who may experience tremors, and must not demand a large physical effort, in order to accommodate those who have been weakened by a stroke, heart attack, or other ailments.

The product we are proposing here will employ a digital dosage display with easy-to-use buttons to increase and decrease the volume of medication by one unit, or 0.01 cc. The product’s digital display will be controlled by a microprocessor, which will be connected to an electrical system with rechargeable batteries. The product will employ a gear system that will accurately draw the syringe to deliver a reliable dose to any patient. Once complete, the projected cost of the product will be between $40-60. Our team projects that the design of the product will be completed by December 2004, and the product will be ready for testing by March 2005. The team members who will be working toward these goals are:

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Each of these project engineers is excited to be a part of such a meaningful and necessary product. The faculty advisor responsible for overseeing the development of this product is Dr. John D. Enderle (jenderle@bme.uconn.edu). Our team looks forward to the opportunity to move forward with the product described here, and we hope that the 2004-2005 National Student Design Contest will provide the outlet needed for the development of this product.