



Bladder Monitor

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NASA ULTRASOUND
TECHNOLOGY ENABLED
DEVELOPMENT OF A
NEEDED BLADDER
SENSING DEVICE

Loss of the sensation of bladder fullness is a common clinical problem often seen in patients suffering from spinal cord injury, stroke aftermath and diabetes mellitus; additionally, a lack of understanding of the sensation is found in some mentally retarded people. The problem is often accompanied by urinary incontinence, which is not only lifestyle-limiting but can be a serious health problem when retention causes urine backup into the kidneys and induces infection.

The need for a compact, easy-to-use, bladder fullness sensing device led to a collaborative development effort between Langley Research Center and The Arc (formerly the Association for Retarded Citizens), with assistance from the NASA Technology Applications Team, Research Triangle Institute, North Carolina. The multiyear effort, supported by the National Institute of Disability and Rehabilitation Research, focused on use of Langley's advanced ultrasonics technology to produce a method of sensing bladder volume.

The collaboration resulted in successful test of a prototype system in 1989 and NASA and The Arc concluded an agreement assigning to the organization the licensing rights for medical applications. The Arc sublicensed the rights to Diagnostic Ultrasound Corporation (DxU), Kirkland, Washington, which conducted additional research and combined the NASA technology with its own technology for commercial marketing.

Above, a model displays DxU's BladderScan™ Monitor, which continuously records and

monitors bladder fullness and alerts the wearer or caretaker when voiding is required. Shown in closeup below, the sensor is no longer than a deck of cards; it is held against the lower abdomen by a belt and connected to the monitor by a short flexible cable. The sensor obtains bladder volume data from sound waves reflecting off the bladder wall.

The monitor can be worn externally with a shoulder strap or concealed beneath the wearer's clothing. The patient records void history by touching appropriate color-coded buttons to report time and amount of void plus the patient's ability to predict onset; the monitor provides a printout for the physician or caregiver. Central monitoring systems are planned for use in long term care settings, so nurses can intervene on a timely basis to assist with individual toileting needs. ●

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