

Self-injury Inhibitor

There are approximately 50,000 autistic and retarded people in the United States alone and a good number of them engage in self-injurious behavior, principally compulsive headbanging. New hope for these people is offered by an automated unit called the Self-Injurious Behavior Inhibiting System (SIBIS). It is based on the space technology of telemetry, the wireless relay of coded symbols used for accurate communication between Earth and orbit.

SIBIS was developed in a collaborative effort by The American Foundation for Autistic Children, The Johns Hopkins University Applied Physics Laboratory (APL) and Human Technologies, Inc., St. Petersburg, Florida. The system performed extremely well in clinical trials conducted in 1987-88 and it is now commercially available by prescription.

The accompanying photo shows the components of



SIBIS. The stimulus module at left is worn on the upper arm or leg. The headgear includes an impact detector (top) and a transmitter (at back of head). When there is a blow to the head, it is sensed by the impact detector, which generates a coded signal that is automatically transferred to the stimulus module. The latter unit immediately delivers a mild electrical stimulus to the skin for less than one-tenth of a second. The stimulus is sufficient to halt the headbanging. A microcomputer keeps track of the number of impacts and stimulations, allowing measurement of a user's progress.

Because self-injurious behavior is potentially life threatening, it is often necessary to use physical restraints or protective equipment (such as a helmet) on these individuals. SIBIS allows the self-injurious to live without such restraints.

A predecessor device was invented by Mooza V.P. Grant, president of The American Foundation for Autistic Children and co-founder—with husband Leslie—of that organization. The Grants have two autistic daughters, one of whom is self-injurious. In 1970, after years of experimentation, Mrs. Grant developed a hard-wired device that used an accelerometer to detect headbanging and trigger a mild stimulus. The device immediately terminated her daughter's headbanging and has continued to do so ever since.

Later, on NASA recommendation, Mrs. Grant asked APL to develop a more compact, state of the art device. Under the direction of Robert E. Fischell, APL employed the miniaturization techniques for which it is widely known and designed the telemetry-based SIBIS. Development of SIBIS was funded by APL and Human Technologies, Inc., with assistance from the Public Welfare Foundation, C. R. Bard Company and the Oxford Instrument Company. ▲