

## SUBJECT INDEX

### A

#### AMPUTATION

##### Bilateral leg traction method

Traction for the bilateral lower extremity amputee: A World War II improvisation. Holscher EC, 20(1):92-94, 1983.

##### Canine studies of an amputation-avoidance technique

Effect of lumbar sympathectomy on muscle blood flow: Distribution of perfusion measured by hydrogen clearance in skeletal muscle. Lee BY *et al.*, 24(3):2-8, 1987.

##### Predicting successful level

Fluorometric prediction of successful amputation level in the ischemic limb. Silverman DG *et al.*, 22(1):23-28, 1985.

*Subjects:* Patients (N=39) who underwent lower limb amputation.

*Results:* Retrospective evaluation of amputations' success led to conclusion that the method of fluorometric prediction tested against alternate methods "... should prove a valuable adjunct in the assessment of the dysvascular extremity."

##### Value of prompt prosthetic fitting

Immediate, early, and late postsurgical management of upper-limb amputation. Malone JM *et al.*, 21(1):33-41, 1984.

##### VA research priorities

Research on what? Todd SP, Jr. *et al.*, 21(1):2-3, 1984.

#### AMPUTEES

##### Below-knee temporary leg

Scotchcast® PVC interim prosthesis for below-knee amputees. Wu Y *et al.*, 18(2):40-45, 1981. (A Technical Note)

##### EPP upper-limb prosthesis control

An analysis of extended physiological proprioception as a

prosthesis-control technique. Doubler JA *et al.*, 21(1):5-18, 1984.

##### Evaluation: Needs and problems

Evaluation of problems and needs of veteran lower limb amputees in the San Francisco Bay area during the period 1977-1980. Hoaglund FT *et al.*, 20(1):57-71, 1983.

*Subjects:* (N=179) veterans, 74 percent service-connected traumatic, 23 percent dysvascular, etc.

*Results:* "The most striking finding from the survey is the high incidence of residual limb discomfort." (Discussion pp. 68-69.)

*Activity levels and functional status:* Tables 5-10, pp. 60-62.

*SACH foot:* Contribution to gait abnormalities is discussed.

##### Gait with new foot

Development and preliminary evaluation of the VA Seattle Foot. Burgess EM *et al.*, 22(3):75-84, 1985.

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

##### Patient tissue/socket data for CAD/CAM

A pulsed-Doppler ultrasonic system for making non-invasive measurements of the mechanical properties of soft tissue. Krouskop TA *et al.*, 24(2):1-8, 1987.

##### Ready-to-use sockets via CAD/CAM

Computer-aided design of a prosthetic socket for an above-knee amputee. Krouskop TA *et al.*, 24(2):31-38, 1987.

##### Single-muscle five-state control

Multistate myoelectric control: The feasibility of five-state control. Richard PD *et al.*, 20(1):84-86, 1983.

##### Skeletal attachment of artificial limbs

A future prosthetic limb device. Hall CW, 22(3):99-102, 1985.

##### "Strider" signals weightbearing and hip-extension angle

A preliminary report on the use of a practical biofeedback

device for gait training of above-knee amputees. Flowers WC *et al.*, 23(4):7-18, 1986.

## AUDITORY BRAIN STEM

### When auditory nerves have been severed

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

*Subjects:* (N = 7) Adults deafened by bilateral acoustic tumors. One subject has been receiving electrical stimulation for 5 years.

*Device:* The CEP (central electroauditory prosthesis) which is undergoing long-term clinical trials under FDA Investigational Devices Exemption (IDE), uses a bipolar surface electrode assembly mounted on a woven dacron mesh pad. An early percutaneous carbon plug is being replaced by a transcutaneous magnetic induction coupling system.

*Results:* Preliminary findings suggest that the system is feasible in humans as "a viable alternative for totally deaf individuals who cannot benefit from cochlear implants."

## B

## BEDS

### Mattress overlays for

#### Support systems for

Effectiveness of mattress overlays in reducing interface pressure during recumbency. Krouskop TA *et al.*, 22(3):7-10, 1985.

#### Simple bench-test predicts performance

Factors affecting the pressure distributing properties of foam mattress overlays. Krouskop TA *et al.*, 23(3):33-39, 1986.

## BIBLIOGRAPHIES

### Behavioral vital signs

Functional assessment: An annotated bibliography. Allen L *et al.*, 23(2):78-85, 1986. (Reprinted from *Interconnector* 8(1), 1985, UCIR, Michigan State University, East Lansing, MI.)

### Books in 29 pertinent categories

Physical medicine and rehabilitation reading list. Katz RT, 23(4):41-48, 1986.

### Digital aid database search

Literature search of publications on digital hearing aids. Nowotarski H, 24(4):293-304, 1987.

### Joint implant references

Key references in biomaterials: Bone/biomaterial interface in orthopedic joint implants. Gruen TA *et al.*, 23(2):59-77, 1986.

*References:* 428 entries from the literature ranging from histology through adhesives, interface biomechanics, clinical experience, techniques.

## BIOMATERIALS

### Bone-interfacing, in skeletal attachments

#### Skin-interfacing, in skeletal attachments

A future prosthetic limb device. Hall CW, 22(3):99-102, 1985. (A Technical Note)

### Hip prostheses showed flaws and defects

Metallurgical analysis of five failed cast cobalt-chromium-molybdenum alloy hip prostheses. Cook SD *et al.*, 23(4):27-36, 1986.

### Joint implant interfaces

Key references in biomaterials: Bone/material interface in orthopedic joint implants. Gruen TA *et al.*, 23(2):59-77, 1986.

## BLOOD FLOW

### Canine studies of lower-limb perfusion

Effect of lumbar sympathectomy on muscle blood flow: Distribution of perfusion measured by hydrogen clearance in skeletal muscle. Lee BY *et al.*, 24(3):1-8, 1986.

## BRAILLE

### Printed braille, via tactual aid

Text-scanning patterns of blind readers using Optacon and braille. Hislop DW *et al.*, 22(3):54-65, 1985.

**C****CASTS****Walking**

Walking casts: Effect on plantar foot pressures. Birke JA *et al.*, 22(3):18-22, 1985.

**COCHLEAR PROSTHESES****An alternative to a cochlear prosthesis**

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

(See also: **Auditory Brain Stem.**)

**Design considerations for**

Compression systems for hearing aids and cochlear prostheses. White MW, 23(1):25-39, 1986.

**Evaluation by Connected Discourse Tracking**

Evaluation of a cochlear prosthesis using connected discourse tracking. Levitt H *et al.*, 23(1):147-154, 1986.

**COCHLEAR IMPLANTS****Speech communication research**

Speech communication for the deaf: Visual, tactile, and cochlear implant. Pickett JM, 23(1):95-99, 1986. (A review of current electronic-device R&D)

**COMPUTERS****Abilities detected by computer-aided measurement**

New motor control assessment techniques for evaluating individuals with severe handicaps. Rudin NJ *et al.*, 24(3):57-74, 1987.

**In Audiology: Clinical implications**

Digital technology and clinical practice: The outlook for the future. Neuman AC, 24(4):1-6, 1987.

**Digital controller design study**

An adaptable optimal controller for electric wheelchairs. Brown KE *et al.*, 24(2):87-98, 1987.

**The digital role in Audiology**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**Hearing aid fitting, controlled**

Development of an ear-level digital hearing aid and computer-assisted fitting procedure: An interim report. Engebretson AM *et al.*, 24(4):55-64, 1987.

**Hearing aid noise filter types tested**

The effect of filtering on the intelligibility and quality of speech in noise. Neuman AC *et al.*, 24(4):127-134, 1987.

**Hearing aid simulation**

Compression systems for hearing aids and cochlear prostheses. White MW, 23(1):25-39, 1986.

A digital master hearing aid. Levitt H *et al.*, 23(1):79-87, 1986.

(See also: **Hearing Impairment: Evaluating aids by digital simulation.**)

**Information service system**

Automated retrieval of information on assistive devices (ARIAD). Szeto AYJ *et al.*, 18(2):27-34, 1981. (A Technical Note)

ARIAD is a set of computer programs developed at the Biomedical Engineering Dept., Louisiana Tech University, Ruston, LA 71272.

Features: minimized staffing requirements and computer-aided matching of end-user needs and a particular device, etc.

**Microprocessor-controlled robot arm**

Early clinical evaluation of a robot arm/worktable system for spinal cord injured persons. Seamone W *et al.*, 22(1):38-57, 1985.

**Middle-ear measurements**

Digital instrument for measurement of aural acoustic immittance: A preliminary report. Robinette LN, *et al.*, 23(2):34-47, 1986. (A Technical Note)

**Myoelectric prosthesis, control with**

Digital approaches to myoelectric state control of prostheses. Philipson L *et al.*, 18(2):3-11, 1981.

**Noise-blocker on CMOS chip evaluated**

A single-microphone-based self-adaptive filter of noise from speech and its performance evaluation. Graupe D *et al.*, 24(4):119-125, 1987.

**Noise cancellation: Computation beyond existing technology?**

Evaluation of adaptive multimicrophone algorithms for hearing aids. Chazan D *et al.*, 24(4):111-118, 1987.

**PC and software help find best interface**

Evaluating manual control devices for those with tremor disability. Riley PO *et al.*, 24(2):99-110, 1987.

**Rehabilitative assets**

The practical use of microcomputers in rehabilitation. Vanderheiden GC, 19(1):1-5, 1982.

**Residual-limb CAD data via ultrasound**

A pulsed Doppler ultrasonic system for making non-invasive measurements of the mechanical properties of soft tissue. Krouskop TA *et al.*, 24(2):1-8, 1987.

**Simulation of devices in software**

Digital approaches to myoelectric state control of prostheses. Philipson L *et al.*, 18(2):3-11, 1981.

**Speech intelligibility running measure**

The short-time articulation index. Kates JM, 24(4):271-276, 1987.

**Speech processing for cochlear implant**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986. (A Technical Note)

**Speech-segment, recognition by**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

**Socket test of CAD/CAM successful**

Computer-aided design of a prosthetic socket for an above-knee amputee. Krouskop TA *et al.*, 24(2):31-38, 1987.

**Velocity feedback wheelchair controller**

An adaptable optimal controller for electric wheelchairs. Brown KE *et al.*, 24(2):87-98, 1987.

**VisiCalc<sup>®</sup> supplies words for paralyzed user**

A new communications technique for the nonvocal person, using the Apple II computer. Seamone W, 19(1):28-33, 1982. (A Technical Note)

**Wearable microcomputer to correct plegic or paretic gait**

Preliminary testing of a dual-channel electrical stimulator for correction of gait. Bogataj U *et al.*, 24(3):75-79, 1987. (A Technical Note)

**Weightbearing and hip-angle trainer**

A preliminary report on the use of a practical biofeedback device for gait training of above-knee amputees. Flowers WC *et al.*, 23(4):7-18, 1986.

**Word communication for multiply handicapped**

Microprocessor-based communications system for the nonverbal person with serious motor handicaps. Pollak IV, 19(1):7-17, 1982.

**CUSHIONS****Layer system for W/C cushion design**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

**Pressure measurements**

Evaluation of transducer performance for buttock/cushion interface pressure measurements. Reddy NP *et al.*, 21(1):43-50, 1984.

(See also: **Pressure on Flesh.**)

**D****DIABETES****Plantar ulcers in**

Walking casts: Effect on plantar foot pressures. Birke JA *et al.*, 22(3):18-22, 1985.

**DIGITAL DEVICES****Five steps that led to the digital master hearing aid**

Experiments with a programmable master hearing aid. Levitt H *et al.*, 24(4):29-54, 1987.

**Hearing aid noise filters tested**

The effect of filtering on the intelligibility and quality of speech in noise. Neuman AC *et al.*, 24(4):127-134, 1987.

**For hearing aids: Precision prescribing**

Spectrum shaping with hardware digital filter. Studebaker GA *et al.*, 24(4):21-28, 1987.

**Hearing aid testing and prescription**

Experiments with a programmable master hearing aid. Levitt H *et al.*, 24(4):29-54, 1987.

**Hearing in noise: Wearable system**

Effect of two-microphone noise reduction on speech recognition by normal-hearing listeners. Schwander T *et al.*, 24(4):87-92, 1987.

**Inner-ear measurements**

Digital instrument for measurement of aural acoustic immittance: A preliminary report. Robinette LN *et al.*, 23(2):34-47, 1986. (A Technical Note).

**Noise-blocker on CMOS chip evaluated**

A single-microphone-based self-adaptive filter of noise from speech and its performance evaluation. Graupe D *et al.*, 24(4):119-125, 1987.

**Wearable digital hearing aid**

Development of an ear-level digital hearing aid and computer-assisted fitting procedure: An interim report. Engbretson AM *et al.*, 24(4):55-64, 1987.

**DIGITAL PROCESSING****The advantages for hearing aids**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**Analog-to-digital conversion explained**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**Clinical implications for Audiology**

Digital technology and clinical practice: The outlook for the future. Neuman AC. 24(4):1-6, 1987.

**Distortion in hearing aids**

Towards a general measure of distortion. Levitt H *et al.*, 24(4):283-292, 1987.

**Evaluating aids by digital simulation**

A digital master hearing aid. Levitt H *et al.*, 23(1):79-87, 1986.

**Hearing aids database search**

Literature search of publications on digital hearing aids. Nowotarski H, 24(4):293-304, 1987.

**For hearing aids: Precision prescribing**

Spectrum shaping with a hardware digital filter. Studebaker GA *et al.*, 24(4):21-28, 1987.

**Hearing in noise: Wearable system experiment**

Use of an adaptive noise canceler as an input processor for a hearing aid. Weiss M, 24(4):93-102.

**Noise: cancellation vs. suppression**

Application of adaptive signal processing to speech enhancement for the hearing impaired. Chabries DM *et al.*, 24(4):65-74, 1987.

**Real-time intelligibility approximation**

The short-time articulation index. Kates JM, 24(4):271-276, 1987.

**Simple signal for profoundly impaired**

A microprocessor-based acoustic hearing aid for the profoundly impaired listener. Rosen S *et al.*, 24(4):239-260, 1987.

**Speech processing discussed**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**Speech processing: Distortion visualized**

Speech distortion measures for hearing aids. Williamson MJ *et al.*, 24(4):277-282, 1987.

**Speech processing: High C/V ratio**

The effects of increasing consonant/vowel intensity ratio on speech loudness. Montgomery AA *et al.*, 24(4):221-228, 1987.

**Speech processing: Rehearsal for real-time**

Speech-cue enhancement for the hearing impaired: Amplification of burst/murmur cues for improved perception of final stop voicing. Revoile SG *et al.*, 24(4):207-216, 1987.

**DRIVER TRAINING****Evaluator/trainer, indoor**

Aid for training and evaluation of handicapped drivers. Reger SI *et al.*, 18(2):35-39, 1981. (A Technical Note)

*Subjects:* (N=9) persons with traumatic tetraplegia of 5 to 41 months duration; levels of injury were from C5-6 to C8.

*Device:* Described as "...a realistic driver-evaluator and training aid for persons requiring medical authorization for driving."

## DRIVING

### Quadriplegic prospective-driver evaluation

A simulator for objectively evaluating prospective drivers of the Scott Van. Hogan HA *et al.*, 19(1):19-27, 1982.

## E

## ELECTRIC WHEELCHAIRS

### A cure that usually works

Powered wheelchair bucking. Bennett L, 24(2):81-86, 1987.

### Putting user's weight into control algorithm

An adaptable optimal controller for electric wheelchairs. Brown KE *et al.*, 24(2):87-98, 1987.

### VA Standards for

Veterans Administration Standards for Electrically Powered Wheelchairs. Reprinted from *Federal Register* of December 15, 1981 (Vol. 46, No. 240). 19(1):130-138, 1982.

(See also: **Engineering; Evaluation; Spinal Cord Injury; and Wheelchairs.**)

## ELECTRODES

(See also: **FES.**)

### Brain stem stimulation technique

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

### Multiple implantation for FES gait

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

## Rectal stimulating probes

Electrostimulation of erection and ejaculation and collection of semen in spinal cord injured humans. Warner H *et al.*, 23(3):21-31, 1986.

## EMG

### Muscular synergy patterns in

Electromyographic patterns in adult locomotion: A comprehensive review. Shiavi R, 22(3):85-98, 1985.

### "Myobeeper" exam for best possible sites

New motor control assessment techniques for evaluating individuals with severe handicaps. Rudin NJ *et al.*, 24(3):57-74, 1987.

### Toward a normative EMG database for gait

Electromyographic gait assessment, Part 1: Adult EMG profiles and walking speed. Shiavi R *et al.*, 24(2):13-23, 1987.

### Very slow normal gait vs. hemiparetic

Electromyographic gait assessment, Part 2: Preliminary assessment of hemiparetic synergy patterns. Shiavi R *et al.*, 24(2):24-30, 1987.

## ENGINEERING

### Algorithm-on-chip for tiny hearing aid

Development of an ear-level digital hearing aid and computer-assisted fitting procedure: An interim report. Engebretson AM *et al.*, 24(4):55-64, 1987.

### Audio systems distortion

Towards a general measure of distortion. Levitt H *et al.*, 24(4):283-292, 1987.

### Causes and cure for bucking wheelchairs

Powered wheelchair bucking. Bennett L, 24(2):81-86, 1987.

### Clinical Team Role

Comments for a new generation of rehabilitation engineers. Foort J, 22(1):2-8, 1985. (A Guest Editorial)

### Developing a digital W/C controller

An adaptable optimal controller for electric wheelchairs. Brown KE *et al.*, 24(2):87-98, 1987.

**Digital signal processing explained**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**Flesh data for socket CAD/CAM**

A pulsed-Doppler ultrasonic system for making non-invasive measurements of the mechanical properties of soft tissue. Krouskop TA *et al.*, 24(2):1-8, 1987.

**Flesh shape/pressure data is critical**

Computer-aided design of a prosthetic socket for an above-knee amputee. Krouskop TA *et al.*, 24(2):31-38, 1987.

**For hearing aids: Precision prescribing**

Spectrum shaping with a hardware digital filter. Studebaker GA *et al.*, 24(4):21-28, 1987.

**How technology transfer can happen**

Selected perspectives on a quarter-century of rehabilitation engineering. Mann RW, 23(4):1-6, 1986.

**Popping a wheelie: Two equations**

A theory of wheelchair wheelie performance. Kauzlarich JJ *et al.*, 24(2):67-80, 1987.

**Sophisticated "Piezoplate" for bone nonunion**

Design considerations in development of a prototype piezoelectric internal fixation plate: A preliminary report. Cochran GVB *et al.*, 24(2):39-50, 1987.

**Standard for W/C transport safety**

Development of an Australian Standard for wheelchair occupant restraint assemblies for motor vehicles. Fisher WE *et al.*, 24(3):23-34, 1987.

**EVALUATION****Algorithms evaluated via software**

Digital approaches to myoelectric state control of prostheses. Philipson L *et al.*, 18(2):3-11, 1981.

**Amputation level prediction**

Fluorometric prediction of successful amputation level in the ischemic limb. Silverman DG *et al.*, 22(1):23-28, 1985.

**Battery types compared (wheelchair)**

Wheelchair batteries: Driving cycles and testing. Kauzlarich JJ *et al.*, 20(1):31-43, 1983.

**Casters tested for shimmy (wheelchair)**

Wheelchair caster shimmy and turning resistance. Kauzlarich JJ *et al.*, 21(2):15-29, 1984.

**Cochlear implant, preliminary clinical**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986. (A Technical Note)

**Cochlear prosthesis**

Evaluation of a cochlear prosthesis using Connected Discourse Tracking. Levitt H *et al.*, 23(1):147-154, 1986.

*A method* for representing prosthesis-based improvements which takes learning effects into account is developed and discussed.

**Compression hearing aids**

Multichannel syllabic compression for severely impaired listeners. DeGennaro S *et al.*, 23(1):17-24, 1986.

**Computer simulation in hearing aid design**

A digital master hearing aid. Levitt H *et al.*, 23(1):79-87, 1986.

**Device field-test in a clinical setting**

A myofeedback instrument for clinical use. McCarthy CF *et al.*, 21(2):39-44, 1984.

A new low-cost, lightweight, compact audio-electromyographic threshold device is field-tested in six busy medical centers.

Six first-generation devices were field-tested by physical therapists; recommendations of therapists were incorporated in a second-generation unit and six of them were field-tested.

**Earmold location for tactile element**

Development and preliminary evaluation of an earmold sound-to-tactile aid for the hearing impaired. Weisenberger JM *et al.*, 24(2):51-66, 1987.

**Effects of joystick type on tremor**

Evaluating manual control devices for those with tremor disability. Riley PO *et al.*, 24(1):99-110, 1987.

**EPP control for prosthesis**

Design and evaluation of a prosthesis control system based on the concept of extended physiological proprioception. Doubler JA *et al.*, 21(1):19-31, 1984.

**FM auditory trainers**

Speech perception through FM auditory trainers in noise and reverberation. Picard M *et al.*, 23(1):53-62, 1986.

**Foot's effect on gait sport agility**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

**Four simulated noise filters tested**

The effect of filtering on the intelligibility and quality of speech in noise. Neuman AC *et al.*, 24(4):127-134, 1987.

**Hearing aid: Compression's limitations**

Two-state compression of spectral tilt: Individual differences and psychoacoustical limitations to the benefit from compression. Haggard MP *et al.*, 24(4):193-206, 1987.

**Hearing-aid concept for profoundly deaf**

Multichannel compression processing for profound deafness. Villchur E, 24(4):135-148, 1987.

**Hearing aid simulation**

Compression systems for hearing aids and cochlear prostheses. White MW, 23(1):25-39, 1986.

**Hearing-aid telecoil and phone receiver types**

Inductive coupling of hearing aids and telephone receivers. Stoker RG *et al.*, 23(1):71-78, 1986.

**Listening systems compared**

Comparison of amplification systems in a classroom. Nabelek AK *et al.*, 23(1):41-52, 1986.

**Lower limb amputee problems**

Evaluation of problems and needs of veteran lower limb amputees in the San Francisco Bay Area during the period 1977-1980. Hoaglund FT *et al.*, 20(1):57-71, 1983.

**Mattress overlays**

Effectiveness of mattress overlays in reducing interface pressures during recumbency. Krouskop TA *et al.*, 22(3):7-10, 1985.

**Middle-ear measurement**

Digital instrument for measurement of aural acoustic immittance: A preliminary report. Robinette LN *et al.*, 23(2):34-47, 1986. (A Technical Note)

**Multichannel hearing aid**

Speech discrimination with an 8-channel compression hearing aid and conventional aids in the background of speech-band noise. Yund EW *et al.*, 24(4):161-180, 1987.

**Noise blocker for hearing aids**

A single-microphone-based self-adaptive filter of noise from speech and its performance evaluation. Graupe D *et al.*, 24(4):119-125, 1987.

**Noise cancelling for hearing aids**

Evaluation of adaptive multimicrophone algorithms for hearing aids. Chazan D *et al.*, 24(4):111-118, 1987.

**Orthotic shoe insoles**

Compressive behavior after simulated service conditions of some foamed materials intended as orthotic shoe insoles. Campbell GJ *et al.*, 21(2):57-65, 1984. (A Technical Note)

*Mechanical characteristics* of a large group of soft-tissue supplements.

**Predicting driving ability**

Aid for training and evaluation of handicapped drivers. Reger SL *et al.*, 18(2):35-39, 1981. (A Technical Note)

**Preliminary tests, two-microphone hearing aid**

Multimicrophone adaptive beamforming for interference reduction in hearing aids. Peterson PM *et al.*, 24(4):103-110, 1987.

**Pressure-on-flesh measurements**

Evaluation of transducer performance for buttock-cushion interface pressures measurements. Reddy NP *et al.*, 21(1):43-50, 1984.

Two types of semiconductor transducers and two types of pneumatic transducers were bench-tested. *In vivo* tests used wick catheters in the human thigh as a control to evaluate an air-cell type transducer.

**Prospective drivers, paraplegic**

A simulator for objectively evaluating prospective drivers of the Scott Van. Hogan HA *et al.*, 19(1):19-27, 1982.

**Prosthetic foot (VA Seattle Foot)**

Development and preliminary evaluation of the VA Seattle Foot. Burgess EM *et al.*, 22(3):75-84, 1985.

**Robotic arm/worktable system**

Early clinical evaluation of a robot arm/worktable system for spinal cord injured persons. Seamone W *et al.*, 22(1):38-57, 1985.

*Part I:* Developmental case study 1974-1982 (pp. 38-46).

*Part II:* Clinical evaluation program: Richmond VAMC (N=9); Cleveland VAMC (N=7); and Baltimore-Washington area (N=4) (pp. 47-57).

*Patient-by-patient* summary of patient characteristics and evaluation results are supplied.

**Speech acquisition aid**

Vibrotactile stimulation: Case study with a profoundly deaf child. Geers AE, 23(1):111-117, 1986.

**Speech processing: Intelligibility for sensorineurals**

Design and evaluation of a two-channel compression hearing aid. Moore BCJ, 24(4):181-192, 1987.

**Speech-processing strategies explored**

Multiband compression limiting for hearing-impaired listeners. Bustamante DK *et al.*, 24(4):149-160, 1987.

**Study of FES gait effects**

Biomechanical and physiological evaluation of FES-activated paraplegic patients. Isakov E *et al.*, 23(3):9-19, 1986.

**Tactile sentence identification aid**

Continuing evaluation of the Queen's University tactile vocoder. 2: Identification of open set sentences and tracking narrative. Brooks PL *et al.*, 23(1):129-138, 1986.

**Tactile word identification aid**

Continuing evaluation of the Queen's University tactile vocoder. 1: Identification of open set words. Brooks PL *et al.*, 23(1):119-128, 1986.

**Value of prompt prosthetic fitting**

Immediate, early, and late postsurgical management of upper limb amputation. Malone JM *et al.*, 21(1):33-41, 1984.

**"Tracking"--an aid-evaluation tool**

Evaluation of a cochlear prosthesis using connected discourse tracking. Levitt H *et al.*, 23(1):147-154, 1986.

**VA Rehab R&D, new unit**

The new evaluation unit of the Veterans Administration's Rehabilitation Research and Development Service. Reswick JB, 22(1):31-36, 1985. (A Special Article)

*Purpose:* To assist at every stage in the process from research-in-progress to manufacturers getting into production commercially.

*A list* identifies 10 prototype devices or systems already in some stage of evaluation by this new unit at time of writing.

*Information* for researchers and developers whose project is approaching prototype stage is included.

**Weightbearing and hip angle gait trainer**

A preliminary report on the use of a practical biofeedback device for gait training of above-knee amputees. Flowers WC *et al.*, 23(4):7-18, 1986.

**Wheelchair accessory**

Evaluation of a curb-climbing aid for manual wheelchairs: Considerations of stability, effort, and safety. Szeto AYJ *et al.*, 20(1):45-56, 1983.

**F****FEET****Effect on gait and sport agility**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

**Orthotic insole materials**

Compressive behavior after simulated service conditions of some foamed materials intended as orthotic shoe insoles. Campbell GJ *et al.*, 21(2):57-65, 1984. (A Technical Note)

**Plantar foot pressures**

Walking casts: Effect on plantar foot pressures. Birke JA *et al.*, 22(3):18-22, 1985.

*Subjects:* (N=6) Normals.

*Sites:* Four sites on the right foot while walking in a standard shoe, in a conventional padded cast, in a total-contact cast, and again in a shoe.

*Plantar foot pressures during walking:* "Significant differences were found between the mean relative pressure walking in shoes compared with casts."

**Viewing device shows sole pressure points**

Measurement of pressure under leprotic feet using a barograph. Patil KM *et al.*, 24(2):9-12, 1987.

**FERROGRAPHY****Monitoring wear in prosthetic or natural knee joints**

The wear-particles of synovial fluid: Their ferrographic analysis and pathophysiological significance. Evans CH *et al.*, 18(2):13-26, 1981. (A Technical Note)

**FES (FUNCTIONAL ELECTRICAL STIMULATION)****Biped gait in paraplegia**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

**Everyday home-wearable gait aid**

Preliminary testing of a dual-channel electrical stimulator for correction of gait. Bogataj U *et al.*, 24(3):75-79, 1987.

**Gait, restoration of**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

(See also: **Spinal Cord Injury.**)

**Leg propulsion of wheelchair**

Locomotion via paralyzed leg muscles: Feasibility study for a leg-propelled vehicle. Glaser RM *et al.*, 20(1):87-92, 1983. (A Technical Note)

**1025 electrodes, 6 subjects, 38 months**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

**Practical implications in four patients**

Biomechanical and physiological evaluation of FES-activated paraplegic patients. Isakov E *et al.*, 23(3):9-19, 1986.

**Strengthening paralyzed muscles**

A system for evaluation and exercise-conditioning of paralyzed leg muscles. Gruner JA *et al.*, 20(1):21-30, 1983.

**Sequences for gait**

(See also: **Gait, synthesis of.**)

**FOREIGN RESEARCH****Yugoslavia, research from**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface-electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

**Australian hearing aid design**

Updated performance requirements for hearing aids (Australian NAL). Macrae J *et al.*, 23(3):41-56, 1986.

**Australian Standard (wheelchair safety)**

Development of an Australian Standard for wheelchair occupant restraint assemblies for motor vehicles. Fisher WE *et al.*, 24(3):23-34, 1987.

**German wheelchair lever drive**

Technological and physiological characteristics of a newly developed hand-lever drive system for wheelchairs. Engel P *et al.*, 23(4):37-40, 1986.

**From India: Visual pressure-level indicator**

Measurement of pressure under leprotic feet using a barograph. Patil KM *et al.*, 24(2):9-12, 1987.

**FRACTURES****Piezoelectric bone plate for nonunion**

Design considerations in development of a prototype piezoelectric internal fixation plate: A preliminary report. Cochran GVB *et al.*, 24(2):39-50, 1987.

**G****GAIT****Blind traveler's gait recorded**

Measuring gait-related blind mobility performance. Hollyfield RL *et al.*, 22(3):66-74, 1985.

**Building a normative gait database**

Electromyographic gait assessment, Part 1: Adult EMG profiles and walking speed. Shiavi R *et al.*, 24(2):13-23, 1987.

**Comparing normal and hemiparetic gait**

Electromyographic gait assessment, Part 2: Preliminary assessment of hemiparetic synergy patterns. Shiavi R *et al.*, 24(2):24-30, 1987.

**Foot's effect on gait and agility**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

**Portable weightbearing and hi-angle trainer**

A preliminary report on the use of a practical biofeedback device for gait training of above-knee amputees. Flowers WC *et al.*, 23(4):7-18, 1986.

**Restoration of, in paraplegia**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

**Toward energy-efficient FES gait**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

**Ultrasonic data generation in gait**

Qualitative and quantitative gait phase analysis by continuous monitoring of inter-ankle distance. Pinzur MS *et al.*, 21(2):50-53, 1984. (A Technical Note)

**Wearable home gait corrector**

Preliminary testing of a dual-channel electrical stimulator for correction of gait. Bogataj U *et al.*, 24(3):75-79, 1979. (A Technical Note)

(See also: **Locomotion.**)

**GERIATRICS****Hearing aid with adaptive noise cancelling**

Application of adaptive signal processing to speech enhancement for the hearing impaired. Chabies DM *et al.*, 24(4):65-74, 1987.

**Hearing aid with adaptive noise cancelling**

Improvement in speech intelligibility in noise employing an adaptive filter with normal and hearing impaired subjects. Brey RH *et al.*, 24(4):75-86, 1987.

**Hearing aid: Intelligibility for sensorineurals**

Design and evaluation of a two-channel compression

hearing aid. Moore BCJ, 24(4):181-192, 1987.

**Hearing in noise: Wearable system**

Effects of two-microphone noise reduction on speech recognition by normal-hearing listeners. Schwander T *et al.*, 24(4):87-92, 1987.

**Pressure on flesh**

The effectiveness of preventive management in reducing the occurrence of pressure sores. Krouskop TA, 20(1):74-83, 1983.

**Pressure sores**

Effectiveness of mattress overlays in reducing interface pressures during recumbency. Krouskop TA *et al.*, 22(3):7-10, 1985.

**Seating: Pressure on flesh**

Skin blood flow changes and tissue deformations produced by cylindrical indentors. Sacks AH *et al.*, 22(3):1-6, 1985.

(See also: **Spinal Cord Injury.**)

**H****HANSEN'S DISEASE****Plantar ulcers in**

Walking casts: Effect on plantar foot pressures. Birke JA *et al.*, 22(3):18-22, 1985.

**Pressure sensor for foot sole**

Measurement of pressure under leprotic feet using a barograph. Patil KM *et al.*, 24(2):9-12, 1987.

**HEARING IMPAIRMENT****Audiologists getting power to do more**

Digital technology and clinical practice: The outlook for the future. Neuman AC, 24(4):1-6, 1987.

**Calibrating complex aids by "cancellation"**

A cancellation technique for the amplitude and phase calibration of hearing aids and nonconventional transducers. Levitt H, 24(4):261-270, 1987.

### Classroom listening system

Induction loop listening system designed for a classroom. Letowski TR *et al.*, 23(1):63-69, 1986.

*Subjects:* (N=10) hearing impaired with mild-to-moderate hearing loss not using aids, and hearing aid users (N=10) with moderate hearing loss.

*Design principles* are discussed in context of an actual loop installation in a medium-size classroom. Basic advantages and limitations of this type of system are listed and discussed.

*Results:* Mean average discrimination scores with and without babble are provided and compared with PA system result for both subject groups together.

(ATBCB) The Architectural and Transportation Barriers Compliance Board rulings requiring this or alternate types of systems are noted.

### Cochlear implant evaluation

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986. (A Technical Note)

*Subjects:* Profoundly-totally postlingually deaf adults (N=37).

*Purpose of paper:* "...to provide a description of a technologically advanced 22-electrode speech-feature-extraction type cochlear prosthesis, and to present some preliminary results of the clinical study to date." (Begun in 1982)

### Cochlear prosthesis evaluation

Evaluation of a cochlear prosthesis using Connected Discourse Tracking. Levitt H *et al.*, 23(1):147-154, 1986.

*Subjects:* (N=5) fitted with the Nucleus multi-channel prosthesis with 22-electrode array implanted in cochlea.

*Presentation of results:* A method for representing prosthesis-based improvements, which takes learning effects into account, is developed and discussed.

*Connected Discourse Tracking:* a technique for evaluating overall communication ability, is analyzed and its characteristics are examined.

### Compression aids compared

Multichannel syllabic compression for severely impaired listeners. DeGennaro S *et al.*, 23(1):17-24, 1986.

*Subjects:* (N=2) 29-year-old women with severe bilateral sensorineural hearing loss of congenital origin.

*Devices:* Three compression systems were used, which placed 25, 50, or 90 percent of the shorter

amplitude distributions in each of 16 frequency bands within the listener's residual auditory area.

A comparison linear-amplification system was also employed.

### Compression system design

Compression systems for hearing aids and cochlear prostheses. White MW, 23(1):25-39, 1986.

### Digital aid database search

Literature search of publications on digital hearing aids. Nowotarski H, 24(4):293-304, 1987.

### Digital aids: New forms of distortion

Towards a general measure of distortion. Levitt H *et al.*, 24(4):283-292, 1987.

### Digital technology: Effect on R&D

A guide to this issue. Levitt H, 23(1):ix-xii, 1986.

### Evaluating aids by digital simulation

A digital master hearing aid. Levitt H *et al.*, 23(1):79-87, 1986.

*Computer simulation No. 1:* A conventional master hearing aid, simulated, demonstrates application of computer control in prescriptive fitting of conventional aids.

*Computer simulation No. 2:* Demonstrating a hypothetical aid that would automatically reduce background noise by means of digital signal processing techniques.

### Family of aids for a population (Australia)

Performance requirements for hearing aids. Dillon H *et al.*, 23(1):1-15, 1986. (A Special Article)

### Family of aids: Design change (Australia)

Updated performance requirements for hearing aids. Macrae J *et al.*, 23(3):41-56, 1986.

### FM auditory trainers

Speech perception through FM auditory trainers in noise and reverberation. Picard M *et al.*, 23(1):53-62, 1986.

### Frequency resolution: Role in hearing

Auditory filtering and the discrimination of spectral shapes by normal and hearing-impaired subjects. Turner CW *et al.*, 24(4):229-238, 1987.

**Hearing aids: Design, simulation**

Compression systems for hearing aids and cochlear prostheses. White MW, 23(1):25-39, 1986.

*Background:* Theory of compression systems, single- and multiple-channel systems, comparisons.

*Simulation in software* used to compare system types and design approaches.

*Results:* Design considerations for optimum multi-channel systems are identified.

**Hearing aid distortion**

Speech distortion measures for hearing aids. Williamson MJ *et al.*, 24(4):277-282, 1987.

**Hearing aids: High C/V ratio**

The effects of increasing consonant/vowel intensity ratio on speech loudness. Montgomery AA *et al.*, 24(4):221-228, 1987.

**Hearing aids: Speech-processing**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

*Subjects:* (N=15) for study of syllables with vowel-duration enhancement; (N=14) for study of syllables with enhanced spectral clues. Both groups of subjects were undergraduate students with moderate to profound hearing loss.

*Studies* of the effects of enhancement of real-time spectral and temporal acoustic cues to recognition of speech.

*Comments:* Possible need for training for users of future hearing aids that digitally enhance speech segments.

**Hearing aids: Use with telephone**

Induction loop listening system designed for a classroom. Letowski TR *et al.*, 23(1):63-69, 1986.

*Subjects:* (N=36) Twelve each in moderate (precipitous), moderate (gradual) and severe hearing loss categories.

*Evaluations:* Telephone receiver types (N=4), and hearing aids (N=9) represent a range of telecoil locations, types, and orientations.

**Hearing in noise: Wearable system experiment**

Use of an adaptive noise canceler as an input processor for a hearing aid. Weiss M, 24(4):93-102, 1987.

**Interdisciplinary introduction to the field**

Hearing impairment and sensory aids: A tutorial review. Levitt H, 23(1):xiii-xviii, 1986.

**Listening systems compared**

Comparison of amplification systems in a classroom. Nábelek AK *et al.*, 23(1):41-52, 1986.

*Subjects:* Four groups were tested: Young normal-hearing adults (N=10); Hearing impaired not using aids (N=10); Hearing aid users (N=10); and, Elderly (N=9).

*Systems compared:* Audio induction loop, FM radio, and infrared-light-transmitted sound were compared with a PA system.

**Matching aids to a population**

Performance requirements for hearing aids. Dillon H *et al.*, 23(1):1-15, 1986. (A Special Article)

*Purpose:* The work reported had as its aim the determination of specifications for hearing aids to be issued by the National Acoustic Laboratories (NAL) of Australia.

*Population served:* Veterans, pensioners, children.

*Requirements:* Hearing aid frequency responses, SSPL characteristics, compression limiting, directional response, and internal noise are examined.

**Middle-ear measurements**

Digital instrument for measurement of aural acoustic immittance: A preliminary report. Robinette LN *et al.*, 23(2):34-47, 1986.

*Development of techniques* for measurement of aural acoustic immittance is reviewed. Measurement characteristics of selected AAI instruments are compared.

*Digital and analog* AAI instruments are operationally assessed.

**Speech communication aids**

Speech communication for the deaf: Visual, tactile, and cochlear-implant. Pickett JM, 23(1):95-99, 1986. (A review of current electronic device R&D)

**Multichannel aid found effective**

Speech discrimination with an 8-channel compression hearing aid and conventional aids in background of speech-band noise. Yund EW *et al.*, 24(4):161-180, 1987.

**Noise-blocker for hearing aids**

A single-microphone-based self-adaptive filter of noise

from speech and its performance evaluation. Graupe D *et al.*, 24(4):119-125, 1987.

#### **Noise cancellation real-time test**

The short-time articulation index. Kates JM, 24(4):271-276, 1987.

#### **Noise cancellation vs. suppression**

Application of adaptive signal processing to speech enhancement for the hearing impaired. Chabries DM *et al.*, 24(4):65-74, 1987.

#### **Noise cancelling: Reverberation is the problem**

Improvement in speech intelligibility in noise employing an adaptive filter with normal and hearing impaired subjects. Brey RH *et al.*, 24(4):75-86, 1987.

#### **Noise: The effort to cancel it out**

Evaluation of adaptive multimicrophone algorithms for hearing aids. Chazan D *et al.*, 24(4):111-118, 1987.

#### **Noise filter types tested**

The effect of filtering on the intelligibility and quality of speech in noise. Neuman AC *et al.*, 24(4):127-134, 1987.

#### **Noise reduction: Multimicrophone experiment**

Multimicrophone adaptive beamforming for interference reduction in hearing aids. Peterson PM *et al.*, 24(4):103-110, 1987.

#### **Prescriptive fitting: Five experiments**

Experiments with a programmable master hearing aid. Levitt H *et al.*, 24(4):29-54, 1987.

#### **A preview of future aid systems**

Development of an ear-level digital hearing aid and computer-assisted fitting procedure: An interim report. Engebretson AM *et al.*, 24(4):55-64, 1987.

#### **Profound deafness aid concept**

Multichannel compression processing for profound deafness. Villchur E, 24(4):135-148, 1987.

#### **Simple signal for profoundly impaired**

A microprocessor-based acoustic hearing aid for the profoundly impaired listener. Rosen S *et al.*, 24(4):239-260, 1987.

#### **Speech intelligibility in noise**

Effects of two-microphone noise reduction on speech

recognition by normal-hearing listeners. Schwander T *et al.*, 24(4):87-92, 1987.

#### **Speech & language development aid**

Vibrotactile stimulation: Case study with a profoundly deaf child. Geers AE, 23(1):111-117, 1986.

*Subjects:* (N=2) profoundly deaf girls, one described in the literature and one tested by the author during the period of speech and language development.

*Device:* Single-channel body-worn vibrotactile device: Bone vibrator held on sternum. Subject received the aid at age 29 months.

#### **Speech perception in noise**

Speech perception through FM auditory trainers in noise and reverberation. Picard M *et al.*, 23(1):53-62, 1986.

*Subjects:* Experiment One: young adults (N=8) with no history of ear pathology. Experiment Two: young adults (N=40) with no history of ear pathology.

*Experiment One:* Speech intelligibility using auditory trainers in FM and conventional modes in degraded listening environments.

*Experiment Two:* Comparison of four different auditory trainers, in both modes, all in degraded listening environments.

*Practical non-classroom use* of FM auditory trainers is discussed: Suggestion is made for addition of FM receiver to conventional hearing aids.

#### **Speech processing: A boost for consonants**

Speech-cue enhancement for the hearing impaired: Amplification of burst/murmur cues for improved perception of final stop voicing. Revoile SG *et al.*, 24(4):207-216, 1987.

#### **Speech processing: Compression benefit limit**

Two-state compression of spectral tilt: Individual differences and psychoacoustical limitations to the benefit from compression. Haggard MP *et al.*, 24(4):193-206, 1987.

#### **Speech processing: Distortion shown**

Speech distortion measures for hearing aids. Williamson MJ *et al.*, 24(4):277-282, 1987.

#### **Speech processing: Intelligibility for sensorineurals**

Design and evaluation of a two-channel compression hearing aid. Moore BCJ, 24(4):181-192, 1987.

### Speech-processing strategies explored

Multiband compression limiting for hearing-impaired listeners. Bustamante DK *et al.*, 24(4):149-160, 1987.

### Speech processing: Strength for consonants

Consonant burst enhancement: A possible means to improve intelligibility for the hard of hearing. Guelke RW, 24(4):217-220, 1987.

### Speech production training

The use of visual and tactile sensory aids in speech production training: A preliminary report. McGarr NS *et al.*, 23(1):101-109, 1986.

*Reports:* Preliminary data from the first year of a long-term study.

*Subjects:* Hearing-impaired children (N=20) all aided binaurally and all with speech "too high-pitched" or "flat and monotonous."

*Results:* Effects of tested training modes on subjects' control of average speech pitch and intonation contour are reported.

### Tactile aid evaluation (1)

Continuing evaluation of the Queen's University tactile vocoder. 1: Identification of open set words. Brooks PL *et al.*, 23(1):119-128, 1986.

*Subject:* (N=1) normal-hearing female graduate student experienced on the tactile vocoder but without lipreading training.

*Device:* Fourth-generation tactile vocoder design that processes acoustic waveform into 16 filter channels, each of which activates a vibrator on the skin surface. A wearable version of the device is an ultimate research goal.

*Research design:* 3,000-word list not shown to subject. Subject's ability to identify words was tested using tactile vocoder alone, lipreading alone, and lipreading enhanced by the tactile vocoder.

### Tactile aid evaluation (2)

Continuing evaluation of the Queen's University tactile vocoder. 2: Identification of open set sentences and tracking narrative. Brooks PL *et al.*, 23(1):129-138, 1986.

*Subject:* (N=1) The same normal-hearing female graduate student subject of Evaluation 1 (words).

*Research design:* 2,000 open set English sentences presented under lipreading alone and lipreading plus tactile-vocoder conditions.

*Tracking:* Reception of ongoing speech evaluated by time needed to repeat phrases verbatim in lipreading

alone and lipreading plus vocoder modes.

### Tactile aids for understanding speech

Speech communication aids for the deaf: Visual, tactile, and cochlear-implant. Pickett JM, 23(1):95-99, 1986. (A review of current electronic device R&D)

### Tactile lipreading aid tested

Tracking skill of a deaf person with long-term tactile aid experience: A case study. Cholewiak RW *et al.*, 23(2):20-26, 1986.

*Comparison* of performance across three languages with and without a tactile aid in a trilingual profoundly deaf subject.

*Tactile aid:* Kanievsky wearable vibrotactile device with separate wrist vibrators transducing outputs from broadband and from higher-frequency sound.

### Tactile stimulation at ear-canal site

Development and preliminary evaluation of an earmold sound-to-tactile aid for the hearing impaired. Weisenberger JM *et al.*, 24(2):51-66, 1987.

### Tactile supplements to lipreading

Lipreading with tactile supplements. Boothroyd A *et al.*, 23(1):139-146, 1986.

*Subjects:* (N=2) normal-hearing female graduate students without formal training in lipreading.

*Devices compared:* A single-channel and an eight-channel vibrating-solenoid skin display of fundamental voice frequency.

### Telephone coupling to hearing aids

Inductive coupling of hearing aids and telephone receivers. Stoker RG *et al.*, 23(1):71-78, 1986.

### Training for hearing aid users

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

### Veterans' (Australian) aid requirements

Performance requirements for hearing aids. Dillon H *et al.*, 23(1):1-15, 1986. (A Special Article)

### Visual aids for

Speech communication for the deaf: Visual, tactile, and cochlear implant. Pickett JM, 23(1):95-99, 1986. (A review of current electronic device R&D)

**What "digital" means to hearing aids**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**When cochlear stimulation can't help**

Electrical stimulation of auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

**HIP PROSTHESES****Factors in success and failure**

Clinical performance of endoprosthetic and total hip replacement systems. Sandborn PM *et al.*, 24(3):49-56, 1987.

**Flaws, defects, and mistakes**

Metallurgical analysis of five failed cast cobalt-chromium-molybdenum alloy hip prostheses. Cook SD *et al.*, 23(4):27-36, 1986.

**I****IMPLANTS****Bone/biomaterial interface (bibliography)**

Key references in biomaterials: Bone/biomaterial interface in orthopedic joint implants. Gruen TA *et al.*, 23(2):59-77, 1986. (A Bibliography)

**Brain stem implant in deafened adults**

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

**Calibrating bone-conduction implant**

A cancellation technique for the amplitude and phase calibration of hearing aids and nonconventional transducers. Levitt H *et al.*, 24(4):261-270, 1987.

**Calibrating nonconventional transducers**

A cancellation technique for the amplitude and phase calibration of hearing aids and nonconventional transducers. Levitt H *et al.*, 24(4):261-270, 1987.

**Central auditory nervous system implant**

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

**Cochlear implant evaluation**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986.

(See also: **Cochlear** and **Hearing Impairment**.)

**Hip devices: Success or failure**

Clinical performance of endoprosthetic and total hip replacement systems. Sandborn PM *et al.*, 24(3):49-56, 1987.

**Hip flaws, defects, and mistakes**

Metallurgical analysis of five failed cast cobalt-chromium-molybdenum alloy hip prostheses. Cook SD *et al.*, 23(4):27-36, 1986.

**Multiple fine-wire electrodes for FES**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

**Piezoplate for bone nonunion**

Design considerations in development of a prototype piezoelectric internal fixation plate: A preliminary report. Cochran GVB *et al.*, 24(2):39-50, 1987.

**INFORMATION****Rehabilitation, service system for**

Automated retrieval of information on assistive devices (ARIAD) Szeto AYJ *et al.*, 18(2):27-34, 1981. (A Technical Note)

**ISCHEMIA****Lower limb amputation**

Fluorometric prediction of successful amputation level in the ischemic limb. Silverman DG *et al.*, 22(1):23-28, 1985.

**When arterial reconstructure isn't feasible**

Effect of lumbar sympathectomy on muscle blood flow: Distribution of perfusion measured by hydrogen clearance in skeletal muscle. Lee BY *et al.*, 24(3):1-8, 1987.

**J****JOINTS****Bone/biomaterial interface (bibliography)**

Key references in biomaterials: Bone/biomaterial interface in orthopedic joint implants. Gruen TA *et al.*, 23(2):59-77, 1986.

**Flaws, defects, and mistakes**

Metallurgical analysis of five failed cast cobalt-chromium-molybdenum alloy hip prostheses. Cook SD *et al.*, 23(4):27-36, 1986.

**Joint replacement success or failure**

Clinical performance of endoprosthetic and total hip replacement systems. Sandborn PM *et al.*, 24(3):49-56, 1987.

**Wear-monitoring prosthetic and natural diarthrodial joints**

The wear-particles of synovial fluid: Their ferrographic analysis and pathophysiological significance. Evans CH *et al.*, 18(2):13-26, 1981. (A Technical Note)

*Subjects:* (N=50) samples of synovial fluid aspirates (human knee). Animal model preliminary results noted.

*Diagnostic and predictive technique potentials.*

**K****THE KNEE****Monitoring change in natural or prosthetic knee joints**

The wear-particles of synovial fluid: Their ferrographic analysis and pathophysiological significance. Evans CH *et al.*, 18(2):13-26, 1981. (A Technical Note)

(*See also: Orthotics.*)

**L****LIPREADING****Hearing-aid concept for profoundly deaf**

Multichannel compression processing for profound deafness. Villchur E, 24(4):135-148, 1987.

**Performance with a tactile aid**

Tracking skill of a deaf person with long-term tactile aid experience: A case study. Cholewiak RW *et al.*, 23(2):20-26, 1986.

**Speech and language acquisition aid with**

Vibrotactile stimulation: Case study with a profoundly deaf child. Geers AE, 23(1):111-117, 1986.

**Simple signal for profoundly impaired**

A microprocessor-based acoustic hearing aid for the profoundly impaired listener. Rosen S *et al.*, 24(4):239-260, 1987.

**Tactile stimulation at ear-canal site**

Development and preliminary evaluation of an earmold sound-to-tactile aid for the hearing impaired. Weisenberger JM *et al.*, 24(2):51-66, 1987.

**Tactile supplements compared**

Lipreading with tactile supplements. Boothroyd A *et al.*, 23(1):139-146, 1986.

**Tactile supplement evaluated (A)**

Continuing evaluation of the Queen's University tactile vocoder. 1: Identification of open set words. Brooks PL *et al.*, 23(1):119-128, 1986.

**Tactile supplement evaluated (B)**

Continuing evaluation of the Queen's University tactile vocoder. 2: Identification of open set sentences and tracking narrative. Brooks PL *et al.*, 23(1):129-138, 1986.

**When cochlear stimulation can't help**

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

**LISTENING SYSTEMS****Audio loop, FM radio, and infrared compared**

Comparison of amplification systems in a classroom. Nabelek AK *et al.*, 23(1):41-52, 1986.

**Classroom system**

Induction loop listening system designed for a classroom. Letowski TR *et al.*, 23(1):63-69, 1986.

**Noise cancellation vs. suppression**

Application of adaptive signal processing to speech

enhancement for the hearing impaired. Chabries DM *et al.*, 24(4):65-74, 1987.

#### **Noise: Two-microphone cancellation system**

Improvement in speech intelligibility in noise employing an adaptive filter with normal and hearing-impaired subjects. Brey RH *et al.*, 24(4):75-86, 1987.

### **LOCOMOTION**

#### **FES-stimulated leg propulsion**

Locomotion via paralyzed leg muscles: Feasibility study for a leg-propelled vehicle. Glaser RM *et al.*, 20(1):87-92, 1983. (A Technical Note)

#### **Measuring blind traveler's gait**

Measuring gait-related blind mobility performance. Hollyfield RL *et al.*, 22(3):66-74, 1985.

#### **Multiple electrodes for energy-efficient gait**

Implantation techniques and experience with percutaneous transmuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

#### **Multistate control, single site**

Multistate myoelectric control: The feasibility of five-state control. Richard PD *et al.*, 20(1):84-86, 1983.

#### **Muscular synergy, patterns in**

Electromyographic patterns in adult locomotion: A comprehensive review. Shiavi R, 22(3):85-98, 1985.

*Purpose:* An attempt to coalesce all of the known results into an informational base on locomotor EMG in adults. It is not intended to be a kinesiology review, the author states.

*Goal:* To foster and support the development of standards for research results and creation of a common database for all investigators in the field.

*Method:* Pattern variations in the literature are discussed and analyzed, standard terminology is reviewed, and the need for time-base and amplitude normalization is supported in the author's conclusion.

*Patterns discussed:* Intrinsic muscles of the foot; ankle dorsiflexors; ankle plantarflexors; anterior thigh musculature; posterior thigh musculature, popliteus; hip joint musculature; and trunk musculature.

#### **Toward more-efficient FES gait**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

#### **Wearable home gait-corrector**

Preliminary testing of a dual-channel electrical stimulator for correction of gait. Bogataj U *et al.*, 24(3):75-79, 1987.

### **M**

### **MATERIALS AND PRODUCTS**

#### **Analog-to-digital conversion explained**

Digital-hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

#### **Bone interfacing biomaterials**

A future prosthetic limb device. Hall CW, 22(3):99-102, 1985.

#### **Cushion life-span study**

The influence of environmental aging upon the load-bearing properties of polyurethane foams. Noble PC *et al.*, 21(2):31-38, 1984.

#### **Discussion (wheelchairs)**

Wheelchair development, standards, progress and issues: A discussion with Colin McLaurin, Sc.D., 23(2):48-51, 1986.

#### **Foam shoe insole materials**

Compressive behavior after simulated service conditions of some foamed materials intended as orthotic shoe insoles. Campbell GJ *et al.*, 21(2):57-65, 1986. (A Technical Note)

#### **Foot, prosthetics, keel for**

Development and preliminary evaluation of the VA Seattle Foot. Burgess EM *et al.*, 22(3):75-84, 1985.

#### **Hip flaws and defects**

Metallurgical analysis of five failed cast cobalt-chromium-molybdenum alloy hip prostheses. Cook SD *et al.*, 23(4):27-36, 1986.

#### **Key references in biomaterials**

Bone/biomaterial interface in orthopedic joint implants. Gruen TA *et al.*, 23(2):59-77, 1986.

**Multimaterial wheelchair cushion**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

**New VA prosthetic foot**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

**Oral orthoses (static)**

Static orthotic devices for the management of microstomia. Carlow DL *et al.*, 24(3):35-42, 1987.

**Oral orthoses (dynamic)**

Dynamic orthotic devices for the management of microstomia. Conine TA *et al.*, 24(3):43-48, 1987.

**Piezoelectric bone plate**

Design considerations in development of a prototype piezoelectric internal fixation plate: A preliminary report. Cochran GVB *et al.*, 24(2):39-50, 1987.

**Polyurethane tires for wheelchairs**

Wheelchair tire rolling resistance and fatigue. Kauzlarich JJ *et al.*, 22(3):25-41, 1985.

**Rubber tires for wheelchairs, solid**

Wheelchair tire rolling resistance and fatigue. Kauzlarich JJ *et al.*, 22(3):25-41, 1985.

**Skin-interfacing biomaterials**

A future prosthetic limb device. Hall CW, 22(3):99-102, 1985. (A Technical Note)

**Sodium fluorescein (dye)**

Fluorometric prediction of successful amputation level in the ischemic limb. Silverman DG *et al.*, 22(1):23-28, 1985.

**Tactaid vibrotactile aid**

Vibrotactile stimulation: Case study with a profoundly deaf child. Geers AE, 23(1):111-117, 1986.

**Telephones and hearing aid telecoil couplings**

Inductive coupling of hearing aids and telephone receivers. Stoker RG, *et al.*, 23(1):71-78, 1986.

**10 polyurethane foams tested**

Factors affecting the pressure-distributing properties of

foam mattress overlays. Krouskop TA *et al.*, 23(3):33-39, 1986.

**Tires for wheelchairs, engineering of**

Wheelchair tire rolling resistance and fatigue. Kauzlarich JJ *et al.*, 22(3):25-41, 1985.

**Users test a W/C handrim**

Users' responses to contoured wheelchair handrims. Gaines RF *et al.*, 23(3):57-62, 1986.

**What digital means to hearing aids**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**MULTIPLY HANDICAPPED****Verbal communication for**

Microprocessor-based communications system for the nonverbal person with serious motor handicaps: A preliminary report. Pollak IV, 19(1):7-17, 1982.

*Access:* special interface provides big (2-inch) depressed keys: more severely handicapped use sip-and-puff, etc.

*Vocabulary:* (N=1000) words stored in 3x3 matrix stacked on three levels.

*Design:* exploits relatively low-cost small personal computer with CRT display.

**Words for a nonspeaking paralyzed patient**

A new communications technique for the nonverbal person, using the Apple II computer. Seamone W, 19(1):28-33, 1982. (A Technical Note)

**MUSCLES****Audiomyofeedback device tested**

A myofeedback instrument for clinical use. McCarthy CF *et al.*, 21(2):39-44, 1984.

**Detecting a usable control muscle**

New motor control assessment techniques for evaluating individuals with severe handicaps: A case study. Rudin NJ *et al.*, 24(3):57-74, 1987.

**EMG patterns in locomotion**

Electromyographic patterns in adult locomotion: A comprehensive review. Shiavi R, 22(3):85-98, 1985.

**Gait, synthesis of, via FES**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

**Muscle patterns and walking speed (normal)**

Electromyographic gait assessment, part 1: Adult EMG profiles and walking speed. Shiavi R *et al.*, 24(2):13-23, 1987.

**Muscle patterns and walking speed (hemiplegic)**

Electromyographic gait assessment, part 2: Preliminary assessment of hemiplegic synergy patterns. Shiavi R *et al.*, 24(2):24-30, 1987.

**Muscle synergies (in normal gait)**

Electromyographic gait assessment, Part 1: Adult EMG profiles and walking speed. Shiavi R *et al.*, 24(2):13-23, 1987.

**Muscle synergies (in hemiparetic gait)**

Electromyographic gait assessment, Part 2: Preliminary assessment of hemiparetic patterns. Shiavi R *et al.*, 24(2):24-30, 1987.

**Strengthening for gait in paraplegia**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

**Strengthening paralyzed muscle**

A system for evaluation and exercise-conditioning of paralyzed leg muscles. Gruner JA *et al.*, 20(1):21-30, 1983.

**Synergy patterns in locomotion**

Electromyographic patterns in adult locomotion: A comprehensive review. Shiavi R 22(3):85-98, 1985.

(See also: **Locomotion.**)

**N****NOMENCLATURE****Analog-to-digital conversion explained**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

**Definitions of words: Disability, handicap, etc.**

Spinal cord injury: A prototype "system" model for the prevention and control of severe disability. Spencer WA *et al.*, 21(2):2-9, 1984.

**NONVOCAL****Word communication for multiply handicapped**

Microprocessor-based communications system for the nonverbal person with serious motor handicaps: A preliminary report. Pollak IV, 19(1):7-17, 1982.

**NUTRITION****In paraplegia**

Assessment of nutritional and metabolic status of paraplegics. Lee BY *et al.*, 22(3):11-17, 1985.

**O****OPTACON****Reading aid, tactual, printed braille**

Text-scanning patterns of blind readers using Optacon and braille. Hislop DW *et al.*, 22(3):54-65, 1985.

**ORIENTATION AND MOBILITY****Assessing results of training**

Measuring gait-related blind mobility performance. Hollyfield RL *et al.*, 22(3):66-74, 1985.

**Measuring blind traveler's performance**

Measuring gait-related blind mobility performance. Hollyfield RL *et al.*, 22(3):66-74, 1985.

(See also: **Visual Impairment.**)

**ORTHOTICS****Knee motion accurately reproduced**

External knee joint design based on normal motion. Walker PS *et al.*, 22(1):9-22, 1985.

*Subjects:* Healthy males (N=8) aged 23 to 41 years, supplementing 14 fresh cadavers.

*Objectives:* To determine three-dimensional knee motion with respect to readily identifiable bony landmarks, and to use the data to design the external joints.

#### **Toward efficient gait, via FES**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

### **ORTHOSES**

#### **Selecting an oral orthosis--1.**

Static orthotic devices for the management of microstomia. Carlow DL *et al.*, 24(3):35-42, 1987.

#### **Selecting an oral orthosis--2.**

Dynamic orthoses for the management of microstomia. Conine TA *et al.*, 24(3):43-48, 1987.

#### **Wearable home gait corrector**

Preliminary testing of a dual-channel electrical stimulator for correction of gait. Bogataj U *et al.*, 24(3):75-79, 1987.

### **P**

### **PARAPLEGIA**

#### **Contoured wheelchair handrim tests**

Users' responses to contoured wheelchair handrims. Gaines RF *et al.*, 23(3):57-62, 1986.

#### **Curb-climbing aid for wheelchairs**

Evaluation of a curb climbing aid for manual wheelchairs: Considerations of stability, effort, and safety. Szeto AYJ *et al.*, 20(1):45-56, 1983.

#### **FES-stimulated legs propel wheelchair**

Locomotion via paralyzed leg muscles: Feasibility study for a leg-propelled vehicle. Glaser RM *et al.*, 29(1):87-92, 1983. (A Technical Note)

#### **Leg-propelled vehicle**

A system for evaluation and exercise-conditioning of paralyzed leg muscles. Gruner JA *et al.*, 20(1):21-30, 1983.

#### **Metabolic and endocrine disorders**

Assessment of nutritional and metabolic status of paraplegics. Lee BY *et al.*, 22(3):11-17, 1985.

#### **Partial sexual rehabilitation**

Electrostimulation of erection and ejaculation and collection of semen in spinal cord injured humans. Warner H *et al.*, 23(3):21-31, 1986.

#### **Toward more efficient FES gait**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

#### **Weightbearing test platform**

Measurement of weightbearing during standing. Poyezdala JJ *et al.*, 21(2):46-49, 1984.

#### **Wheelchair side-slope problem**

Effects of side slope on wheelchair performance. Brubaker CE *et al.*, 23(2):55-57, 1986. (A Technical Note)

### **PRESSURE ON FLESH**

#### **Buttock/cushion measurements**

Evaluation of transducer performance for buttock/cushion interface pressure measurements. Reddy NP *et al.*, 21(1):43-50, 1984.

#### **Cushion life-span study**

The influence of environmental aging upon the load-bearing properties of polyurethane foams. Noble PC *et al.*, 21(2):31-38, 1984.

*Cushion foams stored in the open*, with and without covers, reveal pattern of loss of ability to support weight, even in absence of compression.

#### **Cushions for moderate-or-low-risk users**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

#### **Defect in the system**

Comments on the article: "The effectiveness of preventive management in reducing the occurrence of pressure sores." Brand PW, 20(1):73, 1983.

#### **Foot sole pressure made visible**

Measurement of pressure under leprotic feet using a barograph. Patil KM *et al.*, 24(2):9-12, 1987.

**Mattress-overlay foams tested**

Factors affecting the pressure-distributing properties of foam mattress overlays. Krouskop TA *et al.*, 23(3):33-39, 1986.

**Multi-layer custom cushion system**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

**Orthotic shoe insoles**

Compressive behavior after simulated service conditions of some foamed materials intended as orthotic shoe insoles. Campbell GJ *et al.*, 21(2):57-65, 1984. (A Technical Note)

**Polyurethane foams tested**

Factors affecting the pressure-distributing properties of foam mattress overlays. Krouskop TA *et al.*, 23(3):33-39, 1986.

**Prevention programs**

Effectiveness of mattress overlays in reducing interface pressures during recumbency. Krouskop TA *et al.*, 22(3):7-10, 1985.

**Review of the literature**

The effectiveness of preventive management in reducing the occurrence of pressure sores. Krouskop TA, 20(1):74-83, 1983. (For literature review, see Appendix, p. 77-78)

**PRESSURE SORES**

(See: Pressure on flesh.)

**PROSTHESES****A central electroauditory prosthesis**

Electrical stimulation of the auditory brain stem structure in deafened adults. Eisenberg LS *et al.*, 24(3):9-22, 1987.

**Cochlear, for profound deafness**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986. (A Technical Note)

**Fitting of lower limb prostheses**

Alignment of lower limb prostheses. Zahedi MS *et al.*, 23(2):2-19, 1986.

**Processing strategy for prostheses**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986.

**VA Seattle Foot approved**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

**VA Seattle Foot design**

Development and preliminary evaluation of the VA Seattle Foot. Burgess EM *et al.*, 22(3):75-84, 1985.

*Design criteria:* Initially designed to allow the amputee to run and engage in sports; not necessarily contraindicated for less-active amputees.

*Engineering description:* Foam in the general shape of a human foot: encloses a monolithic composite keel engineered to store potential energy and release kinetic energy.

*Acceptance clinical testing:* Subjects (N=36) are all previous prosthesis users with interest in sports and physical development.

*Current VA test program:* Subjects (N=500) volunteer amputees in 44 VA Medical Centers. Also commercial evaluation program using several hundred feet supplied to prosthetists nationwide.

**Patient tissue data for a CAD/CAM socket**

A pulsed-Doppler ultrasonic system for making non-invasive measurements of the mechanical properties of soft tissue. Krouskop TA *et al.*, 24(2):1-8, 1987.

**Ready-to-use sockets via CAD/CAM**

Computer-aided design of a prosthetic socket for an above-knee amputee. Krouskop TA *et al.*, 24(2):31-38, 1987.

**San Francisco Bay Area amputees**

Evaluation of problems and needs of veteran lower-limb amputees in the San Francisco Bay Area during the period 1977-1980. Hoaglund FT *et al.*, 20(1):57-71, 1983.

**Single-muscle five-state control**

Multistate myoelectric control: The feasibility of five-state control. Richard PD *et al.*, 20(1):84-86, 1983.

*Subject:* Non-amputees (N=7) and amputee, female subject with (N=1) congenital left terminal transverse hemimelia, short below-elbow, who is 48 years of age.

*Circuit:* Block diagram includes necessary feedback circuitry.

**Skeletal attachment of artificial limbs**

A future prosthetic limb device. Hall CW, 22(3):99-102, 1985.

*Subjects:* Spanish goats.

*Comment on:* Research in permanently affixing artificial limbs directly to the skeletal member of the amputated residual limb.

*Bone-interfacing* biomaterials and methods discussed.

*Skin-interfacing* biomaterials and problems discussed.

**Upper-limb fitting "as soon as possible"**

Immediate, early, and late postsurgical management of upper limb amputation. Malone JM *et al.*, 21(1):33-41, 1984.

*Subjects:* (N=47) Amputees of the authors' experience and (N=142) amputees encountered in a review of the literature 1969-1981.

*Purpose:* To analyze the impact of rapid post-operative fitting on upper limb amputation, and to assess general prosthetic prescription and guidelines for upper limb amputees.

**Hip success/failure factors**

Clinical performance of endoprosthetic and total hip replacement systems. Sandborn PM *et al.*, 24(3):49-56, 1987.

**Joint implants (bibliography)**

Key references in biomaterials: Bone/biomaterials interface in orthopedic joint implants. Gruen TA *et al.*, 23(2):59-77, 1986. (A Bibliography)

**Knee joint replacement**

The wear-particles of synovial fluid: Their ferrographic analysis and pathophysiological significance. Evans CH *et al.*, 18(2):13-26, 1981. (A Technical Note)

**Lower-limb prostheses**

Alignment of lower limb prostheses. Zahedi MS *et al.*, 23(2):2-19, 1986.

*Subject:* (N=20) 10 BK and 10 AK amputees, all established, active prosthesis wearers. A total of 283 fittings were made on this group of subjects.

*Objectives:* Repeatability of achieving optimum alignment in a clinical setting was primary concern. A second area of interest was range of alignments acceptable to patients.

*Sockets tested:* BKs were PTB with supracondylar strap suspension; AKs were quadrilateral total-contact suction sockets with uniaxial knee mechanism and constant-friction swing-phase control. All used SACH feet, Otto Boch limbs.

**Monitoring joint prosthetic or natural**

The wear-particles of synovial fluid: Their ferrographic analysis and pathophysiological significance. Evans CH *et al.*, 18(2):13-26, 1981. (A Technical Note)

**Myoelectric control of prostheses**

Digital approaches to myoelectric state control of prostheses. Philipson *et al.*, 18(2):3-11, 1981.

*Subjects:* (N=3) Below-elbow amputees, adult males.

*Design:* Three-state proportional control via micro-computer processing of EMG signals.

*Simulation:* Microcomputer-based device was developed to allow different control algorithms to be examined by changes in computer program instead of in hardware.

**PROSTHETICS****EPP control analyzed**

An analysis of extended physiological proprioception as a prosthesis-control technique. Doubler JA *et al.*, 21(1):5-18, 1984.

*Purpose:* "This research was devoted to an investigation of the practicality and potential effectiveness of applying EPP to the control of upper limb prostheses."

*Prosthesis control...* implemented by providing a man/prosthesis interface in which the signals pertaining to prosthesis operation are coded in terms natural to the residual sensory and neuromuscular systems of the amputated limb.

**EPP upper-limb control applied**

Design and evaluation of a prosthesis control system based on the concept of extended physiological proprioception. Doubler JA *et al.*, 21(1):19-31, 1984.

*Subjects:* non-amputees performed random tracking and blind-positioning experiments.

*Design:* Liberty Mutual Elbow and Northwestern University Wrist were the powered components of the experimental shoulder-disarticulation prosthesis assembled for this research.

*Results:* "clearly demonstrated improved control effectiveness that can be achieved with EPP control..."

### **Fabrication system**

Scotchcast® PVC interim prosthesis for below-knee amputees. Wu Y *et al.*, 18(2):40-45, 1981. (A Technical Note)

*Subject:* (N=25) including two bilateral BK amputees. Longest period of use was 90 days.

*CASTING* the PTB socket and *aligning* the PVC-pylon leg are described and illustrated.

*Features:* Fabrication reduced to "often less than 2 hours," simplified alignment, light weight, comfort for new amputees awaiting a first training leg.

## **Q**

### **QUADRIPLEGIA**

#### **Electric wheelchairs**

Automatic transmission for electric wheelchairs. Reswick JB, 22(3):42-51, 1985.

#### **FES-stimulated legs propel wheelchair**

Locomotion via paralyzed leg muscles: Feasibility study for a leg-propelled vehicle. Glaser RM *et al.*, 20(1):87-92, 1983. (A Technical Note)

#### **VA research priorities**

Research on what? Todd SP, Jr. *et al.*, 21(1):2-3, 1984. (An Editorial)

#### **New-product evaluation problems**

Users' responses to contoured wheelchair handrims. Gaines RF *et al.*, 23(3):57-62, 1986.

#### **Pressure-on-flesh measurements**

Evaluation of transducer performance for buttock/-cushion interface pressure measurements. Reddy NP *et al.*, 21(1):43-50, 1984.

#### **Prospective driver evaluation**

A simulator for objectively evaluating prospective drivers of the Scott Van. Hogan HA *et al.*, 19(1):19-27, 1982.

#### **Robotic arm/worktable evaluated**

Early clinical evaluation of a robot arm/worktable system for spinal cord injured persons. Seamone W *et al.*, 22(1):38-57, 1985.

#### **Van control simulator**

A simulator for objectively evaluating prospective drivers of the Scott Van. Hogan HA *et al.*, 19(1):19-27, 1982.

#### **Wheelchair batteries tested**

Wheelchair batteries: Driving cycles and testing. Kauzlarich JJ *et al.*, 20(1):31-43, 1983.

(See also: **Rehabilitation.**)

## **R**

### **REHABILITATION**

#### **Audiologists getting power to do more**

Digital technology and clinical practice: The outlook for the future. Neuman AC, 24(4):1-6, 1987.

#### **Behavioral vital signs**

Functional assessment: An annotated bibliography. Allen L *et al.*, 23(2):78-85, 1986. (Reprinted from *Interconnector* 8(1), 1985, UCIR, Michigan State University, East Lansing MI.)

#### **A bibliography**

Physical medicine and rehabilitation reading list. Katz RT, 23(4):41-48, 1986.

#### **Definitions of disability, handicap, etc.**

Spinal cord injury: A prototype "System" model for the prevention and control of severe disability. Spencer WA *et al.*, 21(2):2-9, 1984.

#### **Detecting control abilities in motor handicap**

New motor control assessment techniques for evaluating individuals with severe handicaps: A case study. Rudin NJ *et al.*, 24(3):57-74, 1987.

#### **Device and system evaluation**

The new evaluation unit of the Veterans Administration's Rehabilitation Research and Development Service. Reswick JB, 22(1):31-34, 1985.

#### **"Digital"--what it means to hearing aids**

Digital hearing aids: A tutorial review. Levitt H, 24(4):7-20, 1987.

#### **The engineer on the clinical team**

Comments for a new generation of rehabilitation engineers. Foort J, 22(1):2-8, 1985. (A Guest Editorial)

**Hearing aids: toward prescription precision**

Experiments with a programmable digital master hearing aid. Levitt H *et al.*, 24(4):29-54, 1987.

**High-tech hearing aids: user training**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

**Interdisciplinary introduction to hearing impairment**

Hearing impairment and sensory aids: A tutorial review. Levitt H, 23(1):xiii-xviii, 1986.

**Microcomputer impact on**

The practical use of microcomputers in rehabilitation. Vanderheiden GC, 19(1):1-5, 1982. (A Guest Editorial)

*Design attitude:* "Microcomputers represent a pre-made and mass-produced function-block around which specialized aids can be constructed."

*Workplace effects:* Include reducing the disadvantage represented by some sensory and physical deficits, the author reports.

**Partial sexual rehabilitation**

Electrostimulation of erection and ejaculation and collection of semen in spinal cord injured humans. Warner H *et al.*, 23(3):21-31, 1986.

**Portable audio-myofeedback device**

A myofeedback instrument for clinical use. McCarthy CF *et al.*, 21(2):39-44, 1984.

**Prototype system**

Spinal cord injury: A prototype "system" for the prevention and control of severe disability. Spencer WA *et al.*, 21(2):2-9, 1984. (A Guest Editorial)

**Selecting an oral orthosis--1.**

Static orthotic devices for the management of microstomia. Carlow DL *et al.*, 24(3):35-42, 1987.

**Selecting an oral orthosis--2.**

Dynamic orthoses for the management of microstomia. Conine TA *et al.*, 24(3):43-48, 1987.

**Time to re-evaluate sympathectomy?**

Effect of lumbar sympathectomy on muscle blood flow: Distribution of perfusion measured by hydrogen clearance in skeletal muscle. Lee BY *et al.*, 24(3):1-8, 1987.

**Training for hearing aid users**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

**Value of prompt prosthetic fitting**

Immediate, early, and late postsurgical management of upper limb amputation. Malone JM *et al.*, 21(1):33-41, 1984.

**RESEARCH****Discussion (wheelchairs)**

Wheelchair development, standards, progress, and issues: A discussion with Colin McLaurin, Sc.D., 23(2):48-51, 1986.

**Side-slope effect on wheelchairs**

Effects of side slope on wheelchair performance. Brubaker CE *et al.*, 23(2):55-57, 1986. (A Technical Note)

**Strategy to exploit technology**

The road ahead: More attention to research strategy will be needed if veterans are to benefit as they should from our blossoming technology and science. Burgess EM, 21(2):10-13, 1984. (A Guest Editorial)

**VA priorities in research**

Research on what? Todd SP, Jr. *et al.*, 21(1):2-3, 1984. (An Editorial)

**VA Rehab R&D, new unit**

The new evaluation unit of the Veterans Administration's Rehabilitation Research and Development Service. Reswick JB, 22(1):31-34, 1985.

**VA role in reading machine research**

Evolution of reading machines for the blind: Haskins Laboratories' research as a case history. Cooper FS *et al.*, 21(1):51-87, 1984 (A Special Article, historical).

**S****SAFETY****Internal stimulation current limits**

Electrostimulation of erection and ejaculation and collec-

tion of semen in spinal cord injured humans. Warner H *et al.*, 23(3):21-31, 1986.

### **Wheelchair bucking causes and cures**

Powered wheelchair bucking. Bennett L, 24(2):81-86, 1987.

### **Wheelchair safety in vehicles**

Development of an Australian Standard for wheelchair occupant restraint assemblies for motor vehicles. Fisher WE *et al.*, 24(3):23-34, 1987.

## **SEATING**

### **Cushion prescription strategies**

The effectiveness of preventive management in reducing the occurrence of pressure sores. Krouskop TA, 20(1):74-83, 1983. (See Appendix, pp. 78-83.)

### **Multi-layer custom cushion system**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

### **Pressure on flesh**

Skin blood flow changes and tissue deformations produced by cylindrical indentors. Sacks AH *et al.*, 22(3):1-6, 1986.

(See also: **Spinal Cord Injury**.)

## **SKIN BLOOD FLOW**

### **Measurement method evaluated**

Fluorometric prediction of successful amputation level in the ischemic limb. Silverman DG *et al.*, 22(1):23-28, 1985.

### **Seating: Pressure on flesh**

Skin blood flow changes and tissue deformations produced by cylindrical indentors. Sacks AH *et al.*, 22(3):1-6, 1985.

(See also: **Spinal Cord Injury**.)

## **SOCKETS**

### **Lower limb prostheses**

Alignment of lower limb prostheses. Zahedi MS *et al.*, 23(2):2-19, 1986.

### **Patient tissue data for CAD/CAM socket**

A pulsed-Doppler ultrasonic system for making non-invasive measurements of the mechanical properties of soft tissue. Krouskop TA *et al.*, 24(2):1-8, 1987.

### **Ready-to-use sockets via CAD/CAM**

Computer-aided design of a prosthetic socket for an above-knee amputee. Krouskop TA *et al.*, 24(2):31-38, 1987.

## **SPEECH**

### **Critical segments for recognition**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

### **Enhancement of intelligibility by hearing aids**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

### **Feature extraction for cochlear prosthesis**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986. (A Technical Note)

### **Perception in noise and reverberation**

Speech perception through FM auditory trainers in noise and reverberation. Picard M *et al.*, 23(1):53-62, 1986.

### **Processing by hearing aids**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

### **Processing strategy for prosthesis**

Nucleus 22-channel cochlear implant: Preliminary observations. Hirshorn MS *et al.*, 23(2):27-33, 1986. (A Technical Note)

### **Speech-analyzing tactile aid**

Tracking skill of a deaf person with long-term tactile aid experience: A case study. Cholewiak RW *et al.*, 23(2):20-26, 1986.

### **Temporal cue enhancement**

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

**Training the deaf to produce speech**

The use of visual and tactile aids in speech production training: A preliminary report. McGarr NS *et al.*, 23(1):101-109, 1986.

**Typical speech spectra for sensorineural hearing impairment (diagram and comment)**

Hearing impairment and sensory aids: A tutorial review. Levitt H, 23(1):xiii-xviii, 1986.

**SPINAL CORD INJURY****Computer provides words**

A new communications technique for the nonverbal person, using the Apple II computer. Seamone W, 19(1):28-33, 1982. (A Technical Note)

*Design:* Unmodified computer running Visicalc® offers more than 30 wpm.

*Input means:* Johns Hopkins University/Applied Physics Lab. Interface card. Generates full ASCII character set from Morse code input.

**Cushion system for moderate-risk users**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

**Electric wheelchair, automatic transmission for**

Automatic transmission for electric wheelchairs. Reswick JB, 22(3):42-51, 1985.

**Energy costs of FES gait**

Biomechanical and physiological evaluation of FES-activated paraplegic patients. Isakov E *et al.*, 23(3):9-19, 1986.

**Experience with the "Center" and "System" concept**

Spinal cord injury: A prototype "System" model for the prevention and control of severe disability. Spencer WA *et al.*, 21(2):2-9, 1984.

*Definitions and background:* The "center" and its place in a "system."

*"Regional center" concept:* Evolution and difficulties in establishing one.

**FES-stimulated legs drive wheelchair**

Locomotion via paralyzed leg muscles: Feasibility study for a leg-propelled vehicle. Glaser RM *et al.*, 20(1):87-92, 1983. (A Technical Note)

*Subjects:* (N = 6) Two quadriplegic and four paraplegic subjects.

*FES-restored leg muscle strength* and endurance applied to locomotion.

**Gait, restoration of**

Gait restoration in paraplegic patients: A feasibility demonstration using multichannel surface electrode/FES. Kralj A *et al.*, 20(1):3-20, 1983.

*Subjects:* (N = 17): Results for three receive individual comment in detail.

*Patients:* Selection criteria covered on pp. 5-6, 12.

*Synthesis of gait:* Timing and coordination of FES sequences; trunk maneuvers; role of patient-initiated events; role of reflex events.

*Muscle re-strengthening* via FES.

*Patient control of FES gait* in walking frame and roller walker; muscle strengthening via FES by patients at home.

**Gait, Synthesis of**

*See: Gait, Restoration of*

**Lever W/C potential**

Lever drive system for wheelchairs. McLaurin CA *et al.*, 23(2):52-54, 1986. (A Technical Note)

**Mattresses, pressure on flesh**

Effectiveness of mattress overlays in reducing interface pressures during recumbency. Krouskop TA *et al.*, 22(3):7-10, 1985.

*Subjects:* (N = 30) Male and female, thin, average, and obese.

*Products:* Seven mattress overlays.

*Evaluation* was accomplished through the use of the Texas Interface Pressure Evaluator (TIPE)

**Nutritional Assessment**

Assessment of nutritional and metabolic status of paraplegics. Lee BY *et al.*, 22(3):11-17, 1985.

*Subjects:* (N = 17) Healthy males with chronic paraplegia who had completed their rehabilitation programs and were receiving regular diet.

*Malnutrition:* "Mild-to-moderate" malnutrition was exhibited by all patients ... "objective evidence of severe malnutrition was lacking..."

*The authors conclude:* "Problems associated with overfeeding and underfeeding of spinal cord injured patients can be prevented by a more precise definition of their caloric requirement."

**Partial sexual rehabilitation**

Electrostimulation of erection and ejaculation and collection of semen in spinal cord injured humans. Warner H *et al.*, 23(3):21-31, 1986.

**Predicting decubitus-ulcer protection**

Factors affecting the pressure-distributing properties of foam mattress overlays. Krouskop TA *et al.*, 23(3): 33-39, 1986.

**Predicting driving ability**

Aid for training and evaluation of handicapped drivers. Reger SI *et al.*, 18(2):35-39, 1981. (A Technical Note)

**Pressure on flesh**

The effectiveness of preventive management in reducing the occurrence of pressure sores. Krouskop TA, 20(1):74-83, 1983.

*Clinical background* since 1975, pp. 74-77 (Appendix).

*Clinic:* Individual patient and multidisciplinary team relationship.

*Results:* Human, medical, financial, over the last 6 years. Cushion prescription strategies are detailed in Appendix, pp. 78-83.

**Pressure on flesh**

Comments on the article: "The effectiveness of preventive management in reducing the occurrence of pressure sores." Brand PW, 20(1):73, 1983.

*Discusses the influence* of such variables as education and staff/patient interaction in the results of prevention programs.

*Suggests the reasons* for the failure to publish data on programs where results obtained depend on "uncontrollable variables."

**Pressure-on-flesh measurements**

Evaluation of transducer performance for buttock/cushion interface pressure measurements. Reddy NP *et al.*, 21(1):43-50, 1984.

**Prevention and control of disability**

Spinal cord injury: A prototype "system" for the prevention and control of severe disability. Spencer WA *et al.*, 21(2):2-9, 1984. (A Guest Editorial)

**Robotic arm/worktable evaluated**

Early clinical evaluation of a robot arm/worktable system

for spinal cord injured persons. Seamone W *et al.*, 22(1):38-57, 1985.

**Seating: Pressure on flesh**

Skin blood flow changes and tissue deformations produced by cylindrical indentors. Sacks AH *et al.*, 22(3):1-6, 1985.

*Subjects:* (N=4), Male, two able-bodied and two with paraplegia.

*Dimensional analysis:* Derivation of a mathematical expression of the effective relationship between skin blood flow and tissue response to loading.

*Authors suggest a relationship by which* skin blood flow measurements are best presented.

**Self-feeding robotic system**

Early clinical evaluation of a robot arm/worktable system for spinal cord injured persons. Seamone W *et al.*, 22(1):38-57, 1985.

**Simple driving simulator**

A simulator for objectively evaluating prospective drivers of the Scott Van. Hogan HA *et al.*, 19(1):19-27, 1982.

*Subjects:* Able-bodied (N=25) as controls: 13 of these also received driving test.

*Severely physically handicapped* (N=9) quadriplegics with partial upper limb loss: All of these received simulator and driving tests.

*Design:* Simulator provides tracking-task test on same uni-lever servocontrol configuration installed in Scott Van.

*Results:* "...the simulator T-scores of the handicapped subjects correlated very well with their driving...T-scores."

**Strengthening muscles by FES**

A system for evaluation and exercise-conditioning of paralyzed leg muscles. Gruner JA *et al.*, 20(1):21-30, 1983.

*Subjects:* With paraplegia (N=2) males; with quadriplegia (N=4) males and females.

*Purpose:* Development of instrumentation and protocols in which FES is used to induce exercise in paralyzed quadriceps muscles, for strength and endurance evaluation and for conditioning.

*Leg-conditioning system* is described which simulates a leg-propelled vehicle (LPG) resembling a wheelchair: System serves to test and prepare paraplegic patients for possible use of such a vehicle.

*Safety and risk emphasized:* Requirements for minimizing risk to subjects performing this type of exercise are strongly emphasized.

#### **Toward energy-efficient FES gait**

Implantation techniques and experience with percutaneous intramuscular electrodes in the lower extremities. Marsolais EB *et al.*, 23(3):1-8, 1986.

#### **Weightbearing test platform**

Measurements of weightbearing during standing. Poyezdala JJ *et al.*, 21(2):46-49, 1984. (A Technical Note)

*Subjects:* Have included paraplegic individuals standing quietly by means of conventional orthoses and by FES stimulation of the quadriceps.

*Device* was built to continuously monitor, display, and output or record the weight borne by each of the lower extremities of disabled individuals while standing.

#### **Wheelchair batteries tested**

Wheelchair batteries: Driving cycles and testing. Kauzlarich JJ *et al.*, 20(1):31-43, 1983.

#### **Wheelchair bucking causes and cures**

Powered wheelchair bucking. Bennett L, 24(2):81-86, 1987.

#### **Wheelchair caster shimmy cure**

Wheelchair caster shimmy and turning resistance. Kauzlarich JJ *et al.*, 21(1):15-29, 1984.

#### **Wheelchair handrim preference study**

Users' responses to contoured wheelchair handrims. Gaines RF *et al.*, 23(2):57-62, 1986.

#### **Wheelchair safety in vehicles**

Development of an Australian Standard for wheelchair occupant restraint assemblies for motor vehicles. Fisher WE *et al.*, 24(3):23-34, 1987.

#### **Wheelchair side-slope effect**

Effects of side slope on wheelchair performance. Brubaker CE *et al.*, 23(2):55-57, 1986. (A Technical Note)

#### **Wheelchair tire design**

Wheelchair tire rolling resistance and fatigue. Kauzlarich JJ *et al.*, 22(3):25-41, 1985.

#### **Wheelchairs (discussion)**

Wheelchair development, standards, progress, and issues: A discussion with Colin McLaurin, Sc.D., 23(2):48-51, 1986.

#### **Wheelchairs, electric**

Veterans Administration Standards for Electrically Powered Wheelchairs. Reprinted from the *Federal Register* of Tuesday, December 15, 1981 (Vol. 46, No. 240). 19(1):130-138, 1982.

### **SPORTS FOR AMPUTEES**

#### **Increased agility in sport activities**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

#### **The need for amputees to run**

Development and preliminary evaluation of the VA Seattle Foot. Burgess EM *et al.*, 22(3):75-84, 1985.

#### **In praise of sports wheelchair design**

Wheelchair prescription: An analysis of factors that affect mobility and performance. Brubaker CE *et al.*, 23(4):19-26, 1986.

### **STANDARDS**

#### **VA standards for electric wheelchairs**

Veterans Administration Standards for Electrically Powered Wheelchairs. Reprinted from the *Federal Register* of December 15, 1981 (Vol. 46, No. 240). 19(1):130-138, 1982.

#### **Wheelchair safety in vehicles**

Development of an Australian Standard for wheelchair occupant restraint assemblies for motor vehicles. Fisher WE *et al.*, 24(3):23-34, 1987.

#### **Wheelchairs (discussion)**

Wheelchair development, standards, progress, and issues: A discussion with Colin McLaurin, Sc.D., 23(2):48-51, 1986.

### **STROKE**

#### **Early and late recovery walking patterns**

Electromyographic gait assessment, part 2: Preliminary

assessment of hemiparetic synergy patterns. Shiavi R *et al.*, 24(2):24-30, 1987.

## T

### TACTILE AIDS

#### Evaluation, word identification

Continuing evaluation of the Queen's University tactile vocoder. 1: Identification of open set words. Brooks PL *et al.*, 23(1):119-128, 1986.

#### Evaluation, sentence identification

Continuing evaluation of the Queen's University tactile vocoder. 2: Identification of open set sentences and tracking narrative. Brooks PL *et al.*, 23(1):129-138, 1986.

#### Printed braille, tactile output

Inkbraille as a potential new reading system for the blind. Hislop DW *et al.*, 21(2):54-57, 1984. (A Technical Note)

#### Reading aids, tactual

Text-scanning patterns of blind readers using Optacon and braille. Hislop DW *et al.*, 22(3):54-65, 1985.

#### Single-channel and eight-channel systems compared

Lipreading with tactile supplements. Boothroyd A *et al.*, 23(1):139-146, 1986.

#### Speech communication aids reviewed

Speech communication for the deaf: Visual, tactile, and cochlear-implant. Pickett JM, 23(1):95-99, 1986. (A review of current electronic-device R&D)

#### Speech and language development with

Vibrotactile stimulation: Case study with a profoundly deaf child. Geers AE, 23(1):111-117, 1986.

#### Tactile stimulation at ear-canal site

Development and preliminary evaluation of an earmold sound-to-tactile aid for the hearing impaired. Weisenberger JM *et al.*, 24(2):51-66, 1987.

#### Training the deaf to produce speech

The use of visual and tactile aids in speech production training: A preliminary report. McGarr NS *et al.*, 23(1):101-109, 1986.

#### Wearable two-output-channel aid

Tracking skill of a deaf person with long-term tactile aid experience: A case study. Cholewiak RW *et al.*, 23(2):20-26, 1986.

### TECHNOLOGY TRANSFER

#### Case studies: How transfer happens

Selected perspectives on a quarter-century of Rehabilitation Engineering. Mann RW, 23(4):1-6, 1986.

### TRACKING

#### Evaluating a tactile aid by tracking

Continuing evaluation of the Queen's University tactile vocoder. 2: Identification of pen set sentences and tracking narrative. Brooks PL *et al.*, 23(1):129-138, 1986.

#### Hearing aid evaluation

Evaluation of a cochlear prosthesis using Connected Discourse Tracking. Levitt H *et al.*, 23(1):147-154, 1986.

#### Pursuit-tracking task, computerized

New motor control assessment techniques for evaluating individuals with severe handicaps: A case study. Rudin NJ *et al.*, 24(3):57-74, 1987.

#### Trilingual subject

Tracking skill of a deaf person with long-term tactile aid experience: A case study. Cholewiak RW *et al.*, 23(2):20-26, 1986.

### TRAINING

#### Driver-training evaluator/aid

Aid for training and evaluation of handicapped drivers. Reger SI *et al.*, 18(2):35-39, 1981. (A Technical Note)

#### Hearing aid users, for use of enhanced sound

Some rehabilitative considerations for future speech-processing hearing aids. Revoile SG *et al.*, 23(1):89-94, 1986.

#### Quadriplegic prospective-driver evaluation

A simulator for objectively evaluating prospective drivers of the Scott Van. Hogan HA *et al.*, 19(1):19-27, 1982.

**Speech processing: user training discussed**

Speech-cue enhancement for the hearing impaired: Amplification of burst/murmur cues for improved perception of final stop voicing. Revoile SG *et al.*, 24(4):207-216, 1987.

**Training the deaf to produce speech**

The use of visual and tactile aids in speech production training: A preliminary report. McGarr NS *et al.*, 23(1):101-109, 1986.

**U****ULCERS****Cushion system for moderate/low risk users**

Development of a modular wheelchair cushion for spinal cord injured persons. Ferguson-Pell M *et al.*, 23(3):63-76, 1986.

**“Effectiveness index” for polyurethane foams**

Factors affecting the pressure-distributing properties of foam mattress overlays. Krouskop TA *et al.*, 23(3):33-39, 1986.

**Plantar foot**

Walking casts: Effect on plantar foot pressures. Birke JA *et al.*, 22(3):18-22, 1985.

**Pressure-level pattern made visible**

Measurement of pressure under leprotic feet using a barograph. Patil KM *et al.*, 24(2):9-12, 1987.

**V****VETERANS****Benefits from science and technology?**

The road ahead: More attention to research strategy will be needed if veterans are to benefit as they should from our blossoming technology and science. Burgess EM, 21(2):10-13, 1983. (A Guest Editorial)

**Hearing aids for (Australian)**

Performance requirements for hearing aids. (A Special Article) Dillon H *et al.*, 23(1):1-15, 1986.

**Lower limb amputees' problems**

Evaluation of problems and needs of veteran lower limb amputees in the San Francisco Bay Area during the period 1977-1980. Hoaglund FT *et al.*, 20(1):57-71, 1983.

**VETERANS ADMINISTRATION****New VA unit's first evaluation**

Evaluation of the Seattle Foot. Reswick JB, 23(3):77-94, 1986.

**Rehab R&D Service, new unit**

The new evaluation unit of the Veterans Administration's Rehabilitation Research and Development Service. Reswick JB, 22(1):31-34, 1985.

**VA research priorities**

Research on what? Todd SP, Jr. *et al.*, 21(1):2-3, 1984. (An Editorial)

**VISUAL IMPAIRMENT****Blind Mobility data generator**

Qualitative and quantitative gait phase analysis by continuous monitoring of inter-ankle distance. Pinzur MS *et al.*, 21(2):50-53, 1984.

**Mobility with visual impairment, measured**

Measuring gait-related blind mobility performance. Hollyfield PL *et al.*, 22(3):66-74, 1985.

*Subjects:* (N = 10) Five blind (long-cane experienced) and five sighted subjects, all of average height.

*Ultrasonic measurement of inter-ankle distance* provides data which can be analyzed to give information about gait of blind subject negotiating a test route.

*Results* suggest the system is useful as an assessment device in research and in rehabilitation training, the authors report.

**Printed braille, tactile output**

Inkbraille as a potential new reading system for the blind. Hislop DW *et al.*, 21(2):54-57, 1984. (A Technical Note)

**Reading aids, tactual**

Text-scanning patterns of blind readers using Optacon and braille. Hislop DW *et al.*, 22(3):54-65, 1985.

*Subjects:* (N = 20) Adult blind subjects who were proficient braille readers; age range was from early

twenties to mid-sixties; all were college graduates.

*Text scanning patterns* for four modes of tactual reading were recorded: embossed braille one-hand; embossed braille two-hand; Optacon/letterprint; and Optacon/inkbraille.

*Recording* of text-scanning behavior was accomplished by detecting instantaneous position of an LED attached to reader's index finger or to Optacon camera.

### Reading machine research history

Evolution of reading machines for the blind: Haskins Laboratories' research as a case history. Cooper FS *et al.*, 21(1):51-87, 1984. (A Special Article, historical)

How more than 20 years of research (1956-1978) with VA support contributed to solving the reading machine problem.

Three major research laboratories (Battelle, Mauch, and Haskins) under VA contracts, aimed at "arbitrary acoustic signal," "spelled speech," and "speech-like output" systems, respectively.

## W

### WHEELCHAIRS

#### Automatic transmission for

(See: **Wheelchairs, electric.**)

#### Battery type comparison

Wheelchair batteries: Driving cycles and testing. Kauzlarich JJ *et al.*, 20(1):31-43, 1983.

*Battery performance of actual wheelchairs* was measured under typical indoor and outdoor conditions. This data was used to derive simulated driving cycles.

*Simulated driving cycles were used* to bench-test four types of wheelchair batteries under various conditions.

*Mathematical methods* of calculating battery performance for specific fluctuating driving cycle, and for selecting most economical battery size for a given daily use cycle, appear in an appendix to this article.

#### Bucking causes and cures

Powered wheelchair bucking. Bennett L, 24(2):81-86, 1987.

#### Caster shimmy cure found

Wheelchair caster shimmy and turning resistance. Kauzlarich JJ *et al.*, 21(2):15-29, 1984.

*Theory and performance* of single-wheel casters for a variety of tires, and a new design (patent pending) using a grooved dual-tread tire or co-rotating caster wheels.

*Design:* Derivation of equations for caster shimmy are presented.

#### Curb climbing aid evaluated

Evaluation of a curb climbing aid for manual wheelchairs: Considerations of stability, effort, and safety. Szeto AYJ *et al.*, 20(1):45-56, 1983.

*Subjects:* Able-bodied (N=18); paraplegic (N=4); and partial C4-C6 quadriplegic (N=1).

*Laboratory evaluation:* Theoretical calculations and experimental methods, "tipover angles" and slip-page.

#### Cushion life-span study

The influence of environmental aging upon the load-bearing properties of polyurethane foams. Noble PC *et al.*, 21(2):31-38, 1984.

#### Design for the engineer

Wheelchair tire rolling resistance and fatigue. Kauzlarich JJ, *et al.* 22(3):25-41, 1985.

*Purpose:* To give the rehabilitation engineer the means for dealing with rolling resistance and fatigue life in the design of wheelchair tires, or in assessing the characteristics of new tire designs or a change in tire materials.

*Materials:* Cured and reinforced natural rubber ("gray rubber") and polyurethane.

*Author* studies rolling resistance of solid "airless" type tires; derives equations for calculating rolling resistance of solid tires and compares theoretical with test data.

#### Discussed with Colin McLaurin

Wheelchair development, standards, progress, and issues: A discussion with Colin McLaurin, Sc.D. (with questions by the Editors of the *Journal*), 23(2):48-51, 1986.

#### Electric wheelchairs, transmission for

Automatic transmission for electric wheelchairs. Reswick JB, 22(3):42-51, 1985.

*Test vehicle:* Three-wheeled commercially available electric wheelchair driven by a single motor and

intended for indoor or outdoor use.

*Test results:* Substantial reduction in operating current and increased distance of operation over a test course, compared with the wheelchair's performance without the automatic transmission, are described.

"*Resatran*" (patent pending) is an automatic torque-responsive variable-speed-ratio transmission prototype designed by the author.

#### **FES-stimulated leg propulsion**

Locomotion via paralyzed leg muscles: Feasibility study for a leg-propelled vehicle. Glaser RM *et al.*, 20(1):87-92, 1983. (A Technical Note)

#### **Leg-propelled vehicle for paraplegia**

A system for evaluation and exercise-conditioning of paralyzed leg muscles. Gruner JA *et al.*, 20(1):21-30, 1983.

#### **Lever drive potential**

Lever drive system for wheelchairs. McLaurin CA *et al.*, 23(2):52-54, 1986. (A Technical Note)

#### **The man-machine control system**

A theory of wheelchair wheelie performance. Kauzlarich JJ *et al.*, 24(2):67-80, 1987.

#### **New German hand-lever design**

Technological and physiological characteristics of a newly developed hand-lever drive system for wheelchairs. Engel P *et al.*, 23(4):37-40, 1986.

#### **Praise for the "sports wheelchair"**

Wheelchair prescription: An analysis of factors that affect mobility and performance. Brubaker CE, 23(4):19-26, 1986.

#### **Side-slope effects studied**

Effects of side slope on wheelchair performance. Brubaker CE *et al.*, 23(2):55-57, 1986. (A Technical Note)

#### **Testing a new handrim shape**

Users' responses to contoured wheelchair handrims. Gaines RF *et al.*, 23(3):57-62, 1986.

#### **VA Standards, electrically powered wheelchairs**

Veterans Administration Standards for Electrically Powered Wheelchairs. Reprinted from *Federal Register* of Tuesday, December 15, 1981 (Vol. 46, No. 240). 19(1):130-138, 1982.

#### **Wheelchair controller runs worktable robot arm**

Early clinical evaluation of a robot arm/worktable system for spinal cord injured persons. Seamone W *et al.*, 22(1):38-57, 1985.

#### **Wheelchair safety in vehicles**

Development of an Australian Standard for wheelchair occupant restraint assemblies for motor vehicles. Fisher WE *et al.*, 24(3):23-34, 1987.