

- 77.10 A NON-VERBAL FORM OF THE STREET SILHOUETTE COMPLETION TEST. Santosh Kumar*, Murray Binder* and Joseph E. Bogen. Ross-Loos Medical Group, Los Angeles, 90017

There is considerable current interest in the design of psychometric instruments which will be differentially affected by lesions of the right cerebral hemisphere. Such tests should have sufficient range that they can be given to both brain damaged and normal populations. The Street silhouette completion test appears particularly promising in this regard except that it requires a verbal reply which disqualifies it whenever there may be significant left hemisphere malfunction, including cases of established or suspected aphasia. A multiple choice read out was developed which permits testing without verbalization. Data to date indicate that scores on this version of the test bear a regular relation to scores on the original test both in neurological hospital and college student populations.

- 78.1 NEUROMUSCULAR PATHOLOGY IN PSYCHOTIC PATIENTS. John W. Crayton and Herbert Y. Meltzer. Dept. of Psychiatry, Pritzker Sch. Med., Univ. Chicago, Chicago, Ill. 60637.

Previous studies (Meltzer, Arch. Gen. Psychiat. 27: 125, 1972) indicated that psychotic patients have histochemical and morphological abnormalities in muscle biopsies from the vastus lateralis muscle which are consistent with a neuropathic neuromuscular disorder. Further information on the validity of this hypothesis has been obtained by light and electron microscopic studies of muscle and intramuscular motor nerve endings in biopsies of peroneus brevis from 20 psychotic and 5 non-psychotic hospitalized patients and 14 normal volunteers. Six (30%) of the psychotic patients had more than 10 small angular fibers in sections examined with histochemical methods and 7 (35%) had extensive Z-band streaming in more than 2% of fibers, both of which are consistent with denervation. Of the 20 psychotic patients, 9 were abnormal by one or both of the two techniques. Only one (7%) volunteer exceeded these criteria ($\chi^2 = 4.943, p < 0.05$). Supravital staining of intra-muscular nerve terminals with methylene blue revealed, in the patient population, extensive neuronal sprouting and terminal branching with the innervation of as many as 18 end plates by a single axon. The terminal innervation ratio (number of end plates/number of axons) was greater than 1.4 in 11 (55%) psychotic patients and 1 (7%) control ($\chi^2 = 6.296, p < 0.01$). Patients with muscle fiber abnormalities consistent with denervation tended to have the highest terminal innervation ratios. The most extensive neuro-muscular pathology was found in 3 chronic schizophrenic patients. The amount of pathology could not be correlated with neuroleptic drug administration. These findings support the hypothesis that psychotic illness can be associated with a peripheral neuropathic process. Supported by grants USPHS MH-18, 396, MH-16, 127, RSDA MH-47, 808 (To H.Y.M.) and State of Illinois 231-12-RD.

- 78.2 EFFECT OF DANTROLENE SODIUM ON HUMAN SKELETAL MUSCLE. Nathaniel H. Mayer* and Richard Herman. Dept. Rehab. Med., Temple Univ. Hlth. Scs. Ctr., Philadelphia, 19140

Previous studies have shown that dantrolene sodium reduces the amplitude of human twitch and tendon jerk contractions and alters the EMG/torque ratio during voluntary contractions. The current study investigated the effect of dantrolene sodium on the contractile properties of human skeletal muscle. Hill's mechanical model of muscle consisting of a contractile component in series with an elastic element was adapted to determine the force-velocity relation of the triceps surae muscle before and after oral loading doses of dantrolene sodium. Percutaneous electrodes were used to stimulate the tibial nerve in the popliteal fossa. Torque developed by the contracting triceps surae muscle was measured by a force transducer. By assuming that the velocity of shortening depends only on the load, it follows that $V = dx/dt = (dx/dP) \cdot (dP/dt)$ where x = displacement of the series elastic component (eq.1). If an element with compliance C is inserted in series between muscle and transducer, then $V = d(x+CP)/dt = (d(x+CP)/dP) \cdot (dP/dt)_C$ (eq.2). This implies that for the same tension P : $dx/dP = C(dP/dt)_C / dP/dt = (dP/dt)_C / (dP/dt)$ (eq.3). The quantities on the right side of eq.3 were determined experimentally, thus enabling calculation of points on the force-velocity curve. Results showed that dantrolene sodium shifted the force-velocity relation of human muscle in the direction of decreased power output. It was also found that dantrolene sodium profoundly affects the maximal rate of rise of muscle tension $[(dP/dt)_{max}]$. These findings are consistent with the hypothesis that dantrolene sodium affects the contractile element of Hill's two component model.

- 78.3 MUSCLE PAIN AND POSTURE OR WHY MOSES NEEDED HELP. Patricia A. McGrath* and Robert M. Steinman. Dept. Psych., U. of Md., College Park, Md., 20742

Deep pain, occurring as a consequence of exercise of ischaemic muscle, was elicited and quantified in a simple reliable way. Observers (without prior experience) were able to consistently report the onset of muscle pain that arose from holding a weight in their outstretched arms. The mean times for pain to develop in the arm muscles varied as a function of the weight held. The heavier the weight, the shorter the time to pain-onset. The time-intensity function for each observer was linear on a semi-logarithmic plot. An analogous weight-holding experiment was performed with the tongue to assess the possible contribution of joint receptors to experimentally produced pain in the arm. Tongue time-intensity functions were similar to those obtained for the arm. The time-intensity relation for muscle pain measured in this manner supports and quantifies Lewis' (1942) earlier observations that muscle pain is caused by the accumulation of some physiochemical substance produced during normal muscle exercise when circulation is occluded. Pain results when the substance accumulates because normal circulation is reduced either by circulatory occlusion (as shown by Lewis) or by postural restrictions as shown in the present experiments. (ref. Lewis, T. Pain. New York: MacMillan Co., 1942.)