
Neck and referred arm pain may arise from either somatic or neural tissues. Clinicians use the subjective nature of a patient's pain to aid the differentiation of the origin of the referred pain but little evidence has been presented to support the reliability of this practice. For this reason, 42 subjects with neck-arm pain were studied. They were subgrouped according to their neurological status in order to investigate whether differences existed between the groups in the descriptive nature and distribution of pain. Subjects with and without neurological signs were found to have no significant differences in the pain characteristics of area, region of greatest intensity, quality, depth and pain localisation ($p > 0.05$).

Keywords: Arm; Pain; Neck


The purpose of this study was to examine the peak and average torques produced by the knee extensors during continuous concentric-eccentric cycles at angular velocities of 45, 90, 135, and 180/s. Forty-one healthy females (mean age 26 years) were tested through the range of 80 to 10 flexion on a computerised dynamometer. Peak torques were significantly greater than average torques, and eccentric torques were significantly greater than concentric torques at all angular velocities ($p < 0.01$). As angular velocity increased, concentric peak and average torques decreased, (-26 per cent and -21 per cent, respectively), whereas eccentric torques varied only slightly (3 per cent and 5 per cent, respectively). The extent to which eccentric testing may provide additional information about muscle performance and aid in clinical decisions requires further study.

Keywords: Kinetics; Knee; Muscles


Lighting is one of several factors in an individual's working environment. The provision of 'good' lighting may assist in minimising fatigue, which, if present, can inhibit a worker's efficiency. Fatigue must be addressed in many ways. For an operator of a visual display unit (VDU), lighting factors which may assist performance include a clear screen image without reflections or glare, appropriate ambient light and a view to look at. There are also large differences in the needs of individuals of various ages.

Recommendations about ambient lighting are conflicting. If tasks are screen-based only, lower levels than for general tasks are advocated. Appropriate lighting for any one situation must be determined after a thorough analysis of the task and the individual.

Keywords: Human Engineering; Lighting; Occupational Health


Marketing is now a vital issue for all sectors of the physiotherapy profession. Changing public
attitudes to health care, increasing competition from many quarters, advances in medical science and progressive deregulation of the profession are some of the trends necessitating a marketing orientation. Marketing is essentially about the management of the relationship between physiotherapists and their clients, where clients may be patients, doctors, employers, rehabilitation providers or others. Marketing enables physiotherapists to increase their understanding of clients' needs and to use this information to improve the quality, delivery and value of their product. Marketing of physiotherapy services offers important benefits to the community, to those who refer patients to physiotherapists, to individual practitioners and to the profession itself.

Keywords: Marketing of Health Services; Physical Therapy


In an uncontrolled clinical trial, 116 patients from a general population were treated with the McConnell program for patello-femoral pain syndrome. This program, consisting of a detailed knee assessment and treatment using a taping technique for pain relief, isometric and eccentric exercise, produced excellent to good results in 86 per cent of patients within five treatments and maintained those results one year after the cessation of treatment. Sex, current activities, duration of symptoms, abnormal foot pronation, iliotibial tract and hamstring tightness and other positive passive movement tests had no effect on the outcome of the treatment. Patients over 38 years of age had only an equal chance of being pain free with five treatments. The presence of concurrent lumbar symptoms increased the time required for positive response to the treatment ($p < 0.001$).

Keywords: Knee; Pain; Patella


The aim of this study was to assess the practical aspects of transcutaneous electrical nerve stimulation (TENS) and its effectiveness in relieving pain in an Australian public hospital labour ward. Thirty women volunteered from the Antenatal classes to use TENS in labour and took part in a pre-labour TENS session. Evaluation was made by use of the numerical pain rating scale and two questionnaires. The results showed a high level of patient and staff satisfaction and a statistically significant change in pain perception when subjects acted as their own controls. Significantly less pethidine was used by the study group compared to a matched comparison group. It was recommended that information be provided to midwives and clients on TENS analgesia, and that it should be available as a choice in a public hospital labour ward.

Keywords: Labor; Pain; Transcutaneous Electric Nerve Stimulation


This study examined the inter-therapist reliability of the slump test. Six pairs of physiotherapists tested a total of 93 patients currently receiving treatment for lumbar and/or lower limb symptoms. Each pair performed two slump tests on patients during a normal clinical visit. The slump test was positive if the patients' symptoms were reproduced, and subsequently decreased with cervical extension. A second definition of positive slump required decreased symptoms and increased knee extension with cervical extension. The results indicated that the slump test was high inter-therapist reliability which is consistent with reliability findings for related clinical tests of pain.

When shoulder movements become restricted in all directions, the literature reports that contracture of the joint capsule is not present in every case. These findings suggest different underlying pathology in some cases, which restricts shoulder movements in a manner resembling contracture. In order to investigate the concept of another mechanism, fourteen patients were selected with a specific pattern of shoulder stiffness: a gross restriction of lateral rotation associated with only moderate restrictions of abduction and medial rotation. The patients were treated with mobilisation of the lower cervical spine, which resulted in an improvement in the range of lateral rotation of the shoulder, the most restricted movement. These results suggest a correlation between the cervical spine and shoulders with this pattern of movement restrictions.

Keywords: Cervical Vertebrae; Shoulder; Spine


This Keynote Address considers issues around “The Healthy Australian”, the theme of the 1988 APA National Conference.

The concept of the New Public Health requires physiotherapists to review the role they traditionally have held in health care delivery, and to address some key issues in order to meet the needs of their patients and clients more effectively. These issues include developing the most appropriate client/professional relationship, and considering the main elements in education for health and in supporting clients achieve effective coping skills. This paper also addresses some practicalities in legitimising physiotherapists’ involvement in disease prevention and health promotion, and in working with clients in ways that allow a balance of responsibility to be shared appropriately by both parties.

Keywords: Health Services; Health Services Needs and Demands; Public Health


Infants who are born prior to 40 weeks gestation frequently demonstrate a rate of development which is different from that evidenced by their term born peers. This is true particularly for those infants who have no abnormalities which would interfere with their development but who are both very preterm (of 32 weeks gestation or less) and of very low weight at birth (1500 grams or less). Stimulation aimed at overcoming the negative aspects of preterm birth and enhancing the development of preterm born infants has been widely recommended. The evidence which supports the idea of such intervention is conflicting and based on inconclusive data. The purpose of the review is to identify those aspects of early stimulation programs which have been of measurable benefit to preterm born subjects. From this basis it should be possible to isolate optimal forms of stimulation to guide those who seek to provide these infants with assistance designed to maximise their developmental potential.

Keywords: Child Development; Infant, premature; Intensive Care, neonatal; Pediatrics
The Neuro-Sensory Motor Developmental Assessment (NSMDA) has been developed to meet the need for a progressive developmental assessment of infants and children. In this study a cohort of 148 preterm infants was assessed at 1, 4, 8, 12, and 24 months adjusted age. The results were used to classify the subjects as having normal, suspect or abnormal developmental status. The scores for each time were correlated with outcome scores at 24 months. Part One of this paper includes a description of the development and administration of the NSMDA. Longitudinal and cross correlations of scores were analysed and shown to be highly significant over the first two years of testing, thereby establishing the basis for validity and predictability of the NSMDA.

Keywords: Child Development; Pediatrics; Psychomotor Performance

The Neuro-Sensory Motor Developmental Assessment (NSMDA) has been developed to meet the need for a progressive evaluation of infants and children. The content and administration of the NSMDA has been addressed in Part One of this paper. In this study the NSMDA was used to assess a cohort of 148 preterm infants at 1, 4, 8, 12, and 24 months. Results recorded at each assessment were compared with developmental outcome at 24 months. This paper provides statistical evidence of the NSMDA's validity. Verification in terms of predictive validity (sensitivity/specificity), and concurrent validity is described. Although early NSMDA scores were significantly correlated with outcome at two years, 8 months was found to be the optimal age for accurately discriminating between children who demonstrated normal or abnormal developmental status.

Keywords: Child Development; Pediatrics; Psychomotor Performance

The philosophy and practice of conductive education is explored and the application of some of these principles to a residential/educational setting is investigated. Special attention is given to improving the efficiency and effectiveness of the existing service delivery for a group of twelve moderately to severely physically and intellectually disabled children aged between three and six years. Results obtained from evaluation of the task series are related to the child's ability to initiate movement and suggest improvement over time. Changes reported by team members such as improved communication, a positive environment, positive expectations and improved integration of treatment and services are discussed. Continued investigation is warranted.

Keywords: Child Development; Handicapped; Movement

Australia experienced its largest Legionnaires' disease epidemic in Wollongong, mid 1987. This paper presents an overview of Legionnaires' disease followed by details of the Wollongong epidemic including areas of particular interest to the physiotherapist, with comparisons of milder and severe cases. Unlike other epidemics, females outnumbered males. Predisposing factors of increasing age, cigarette smoking, respiratory and medical conditions were found. Except cigarette smoking, these factors and initial chest radiograph involving two or more zones, were significant features of the severe group. Patients in these categories require careful monitoring. Blood gases demonstrated consistent hypoxaemia and hypocapnoea. Seventy-eight per cent of cases recorded little or no sputum and implications for treatment are discussed. Impressions and fears of the epidemic are presented and recommendations made.

Keywords: Legionella; Legionnaires’ Disease; Respiratory Disorders


The anatomical relationships between the humerus and scapula were examined in the ‘locking’ and ‘quadrant’ positions of the glenohumeral joint together with capsular influences on the shape of the ‘quadrant’. The glenohumeral joints of four embalmed cadavers were dissected to define capsular attachments and fibre directions. Selected bony and soft tissue landmarks were marked for reference. Four abduction angles were selected to represent ‘locking’ and parts of the ‘quadrant’. A measuring board was designed to allow quantification and standardisation of all test positions. The results show that a ‘locking’, the posterosuperior tip of the glenoid contacted the humeral head in all specimens. During the ‘quadrant’, a number of soft tissues around the joint were found to be either stretched or compressed. The capsule was found to influence the shape of the ‘quadrant’, and capsular stretch was noted anteriorly and inferiorly. The findings are discussed in relation to clinical implications.

Keywords: Physical Therapy; Shoulder


The effect of different training intensities on maximum voluntary isometric contraction (MVIC) strength was examined in a three week voluntary isometric exercise program. Eighteen healthy university students were randomly assigned to one of three training groups: Low Intensity (LI), High Intensity (HI) and Maximal Effort (ME) groups. The LI and HI groups trained by producing voluntary isometric knee extension torques equivalent to 25 per cent and 50 per cent of MVIC strength, respectively. The ME group produced maximal effort contractions during training. Only the HI and ME groups demonstrated significant (p<0.05) isometric strength gains. The HI group produced the greatest strength gain (45.8 per cent of MVIC), followed by the ME group (31.3 per cent) and the LI group (22.3 per cent). No significant strength retention, cross transfer or isokinetic strength were seen in any group. The strength improvements were of the same magnitude as those previously obtained using electro-motor stimulation at equivalent training intensities.

Keywords: Exercise; Kinetics; Muscles

The outcome following rehabilitation for 92 vascular amputees admitted to the Queen Elizabeth Geriatric Centre, Ballarat, between 1 January 1982 and 31 December 1987 is presented.

Data includes age, sex, concomitant disease, mortality, length of hospital stay and acceptance of prosthesis. Statistical analysis reveals no predictive factors for mobility levels attained by amputees other than amputation type, no predictive factors for acceptance of prostheses, and no predictive factors for total length of hospital stay. As a consequence, the Queen Elizabeth Geriatric Centre will continue the practice of admitting all amputees who wish to use artificial limbs to the prosthetic program, regardless of age of concomitant disease.

Keywords: Aged; Amputation; Artificial Limbs; Rehabilitation


The functional anatomy of the nervous system includes mechanisms to allow adaption to body movements. Injury or impairment of these mechanisms may lead to symptoms. Clinicians using tension tests as part of assessment and treatment have noted that altered nervous system movement and extensibility is a very frequent finding in many disorders.

This paper describes a new model for assessment and treatment of mechanical disorders of the nervous system that is based on clinical observations and interpretations of anatomical, biomechanical and pathological literature. A broad approach is outlined which provides an insight into the possible mechanisms by which the nervous system can be responsible for symptom production. The concepts of intraneural and extraneural pathology are put forward and related to assessment and treatment.

Keywords: Biomechanics; Movement; Nervous System


Awareness of minimal cerebral dysfunction (MCD) in children has increased in recent years and suitable management programs have been developed. However, there has been less recognition that appropriate assessment and treatment might be provided for adults showing characteristic signs of MCD. A preliminary study was therefore carried out to ascertain the nature of the neurological deficits in adults presenting for assessment and to determine their responsiveness to treatment. A comparison of information relating to background features and neurological assessment with data collected from a reported study of MCD children revealed marked similarities between the two groups and demonstrated that major deficits in MCD children can continue to adulthood, creating functional difficulties in such important areas as reading, writing, spelling, memory and co-ordination.

Keywords: Attention Deficit Disorder with Hyperactivity; Neurology; Physical Therapy


The year 1988 marked the 50th anniversary of the commencement of physiotherapy education at
The University of Queensland. A survey was conducted to record the work profiles and histories of Queensland graduates. Surveys were sent to 1,689 of the 1,897 graduates with a good response rate of 62.5 per cent.

In 1987, 80 per cent of respondents were practising as physiotherapists, being reasonably evenly distributed between hospital practice, private practice and other more community based centres. With the exception of recent decade graduates, half of these predominantly female physiotherapists worked in a part-time capacity.

The results of this survey do not reveal major manpower wastage. Although temporary absences from the profession for family reasons were common, only 15.1 per cent of all respondents have permanently withdrawn from the profession.

Keywords: Career Choice; Education; Physical Therapy