The first volume of the Australian Journal of Physiotherapy was published in 1954. Forty years later the Editorial Board committed to providing an electronic version of the abstracts of the Journal for the 40th year anniversary.

The 40 year index was released at the 12th International Congress of the World Confederation for Physical Therapy in Washington in June 1995. This was the precursor of the AJP foray into electronic publication of the Australian Journal of Physiotherapy.

The release of the extended version of the 40 year index (up to 1999) provides electronic access to all the volumes of the Australian Journal of Physiotherapy. The Australian Journal of Physiotherapy is listed on Medline and abstracts from 1996 are available electronically at PubMed


Readers are directed that manuscripts prior to 1978 (Volume 24) did not have abstracts and keywords at the time of printing. Therefore, for these earlier manuscripts, the abstracts are summaries written by the Editorial Board members in 1994.

It is hoped that the contents of these pages serve as a research and historical resource of the Australian Journal of Physiotherapy.

Dr Garry T Allison

The extent to which verticality perception influences posture and movement is of considerable importance to the physiotherapist. To determine the relative contributions and proprioceptive systems to visuo-spatial perception after stroke and the relationship of verticality perception to body alignment and utilisation of space during movement, a study was undertaken in the Department of Physiotherapy, University of Queensland.

Forty stroke patients, divided into experimental groups on the basis of quality of verticality perception, were selected for study, while 22 `non-stroke’ subjects, matched for age and sex, formed a control group. Measurements were taken of proprioception, body alignment, utilisation of space during movement, verticality perception and duration of post rotational nystagmus. Analyses of the correlations between these various modalities revealed those features which are of most significance to the perception of verticality, posture and movement of the stroke patient. From these results, implications for the physiotherapy management of the stroke patient with problems in verticality perception, body alignment and utilisation of space during movement, have been drawn. Keywords: *Cardiovascular Disorders; Posture; Proprioception*


A mercury strain gauge was used to analyse the affects of passive movement techniques upon the anterior cruciate ligament. One post-mortem subject was studied. Posterior-anterior pressures, with knee flexed to 90 degrees and medially rotated, revealed the most significant displacement of the anterior cruciate. It is suggested that combined movements may play a significant role in treatment of the knee joint. Keywords: *Anterior Cruciate Ligament; Knee; Ligaments*


Community based health care should be orientated to local needs for preventative medicine and should be accessible to all. The bias in health care provision at large central institutions produces an uneven delivery of service dependent upon the nature of the disease. Keywords: *Community Medicine; Health Services; Preventive Medicine*


Spasticity of central origin following brain-damage prevents efficient functional movement. Inhibitory weight-bearing plasters can be applied to allow the patient to learn to move more normally while the spasticity is being controlled. This article is a summary of a case study where weight-bearing plasters were used with good results. Keywords: *Brain Injuries; Casts, surgical; Muscle Spasticity*

A brief synopsis of the development of manipulative therapy is given. An argument for specialisation and its concept to the consumer is advanced.

Keywords: History of Medicine; Manipulation, orthopedic; Specialties, medical


The hand appears to be the most common part of the body involved in burns as it is used to shield the body from the burning agent or to extinguish the effects elsewhere on the body. The saying the "next to life there are hands" demonstrates the importance that is placed upon the use and need of one's hands in order to carry out everyday tasks of normal living. In order to manage burns to the hands, the effects of the injury and the aftermath must be understood and one must not only consider the hands, but the patient as a whole. The regime of treatment used at the Prince of Wales Burns Unit involving nursing care and physiotherapeutic techniques, is outlined, and the need for understanding of the pathophysiology of burns in order to correctly manage the burned hand is emphasised.

Keywords: Burns; Burn Units; Hand


Recreation is a significant element of preventative health care, used by community health centres as an aid to rehabilitation, moderation of stress and maintenance of health. Although the amount of leisure available to the people is increasing, many are unable to take full advantage of it due to inadequate recreational education or other causes. Community health centres have an educative responsibility in this regard especially towards the unemployed. These centres organise therapeutic and socialising groups for patients in need. Examples are given. Recreational activities are also useful in the relief of stress, during breaks in production in work-places. The principles of safety need to be taught as an essential part of recreational education and the fitness of participants needs to be ensured by screening school children. The planning and erection of playground equipment needs supervision by competent professionals who exist in community health centres. The conclusion recommends that safety check lists be available for all normal recreations and that everyone should receive adequate education to enable successful participation in recreational activities.

Keywords: Community Medicine; Health Services; Preventive Medicine; Recreation


Recreation consists of an activity or experience usually chosen by the participant, either because of the immediate satisfaction to be derived from it, or because the individual perceives some personal or social values to be achieved by it. It is usually enjoyable, and when it is conducted as part of organised community or agency services, it is designed to meet constructive and socially worthwhile goals of the individual participant, the group and society at large.

Keywords: Community Medicine; Handicapped; Recreation

Treatment by passive movement has been shown to be a useful method when compared to other treatment procedures (Edwards 1969). It is however still empirical in nature. Part of the reason for this is because definite movement patterns related to pathology are still unclear. This can produce confusion when one is selecting a technique as very often there appears to be no relationship between the restricted movement the patient may exhibit and the technique chosen. It is suggested that detailed examination related to the combining of different movements will allow a more accurate choice of technique to be made. Under these circumstances the therapist should be able to predict the effect of a treatment technique. Progression of a treatment is also more logical as it depends on progressing the position of the joint to the position which is most painful as the movement pattern improves, rather than increasing the vigour to the technique.

**Keywords**: Backache; Cervical Vertebrae; Pain; Spine


The purpose of this study was to analyse, by electromyographic technique, abdominal muscle activity in exercises commonly advocated as being effective in improving abdominal muscle performance. In general, exercises from the lying position were found to involve the rectus abdominis and oblique muscles more than those exercises from standing, sitting or kneeling positions. Further, among exercises from lying, ‘trunk on legs’ and ‘trunk plus legs’ involved these muscles more than ‘legs on trunk’ exercises. With pregnancy and in the puerperium there was a change in the pattern of abdominal muscle involvement in exercises from the lying position, suggesting that the traditional division of exercise lists into ‘antenatal’ and ‘postnatal’ is not optimal: the demarcation “circumnatal” (around the time of birth) and “abnatal” (remote from the time of birth) would appear to be more appropriate. Details are given of the method of assessment of exercises, data analysis and interpretation of results. The findings have implications for the selection of exercises for clinical use in obstetric physiotherapy.

**Keywords**: Electric Stimulation Therapy; Muscles; Pregnancy


Starting in utero, where movement is essential for the development of normal joints, a pattern is set up which is repeated through life. The evolution of the species is mirrored in the development of the individual, and movement, exercise and neuromuscular development form a central theme. The major skeletal changes are related to the changes in age. The emergence of disease patterns, the progress of the ageing process and the factor influencing morbidity and mortality are discussed. The role of the therapist as an expert in exercise, both prophylactic and therapeutic, is emphasised and particular attention is paid to the widening opportunities outside the sphere of the traditional clinical setting.

**Keywords**: Exercise; Movement; Physical Therapy


This paper presents a review of recent literature concerning the possible mechanisms by which
EMG biofeedback treatment may aid in the rehabilitation of the stroke patient, and the practical application of this technique. Among the studies reviewed there is a general consensus that biofeedback training enables some patients, whose performance has previously plateaued, to gain a degree of control of hypertonic muscle groups, and increased contraction in paretic groups thus improving function. However, there still remains a number of questions to be answered and limitations to be considered.

Keywords: **Biofeedback (Psychology); Cerebrovascular Disorders; Rehabilitation**


The neurological, sensory, motor and general developmental progress of 135 infants born more than five weeks before term was studied. Over a period of 12 months, 122 infants had post-term evaluations at one, four, eight and 12 months. These were carried out using both a standardised infant ability scale and a graded neuro-sensory and motor assessment. The abilities of the age adjusted pre-term infants compared favourably with the standardised scale of expected age normal abilities. Developmental aspects of tactile, proprioceptive, vestibular and eye movement responses showed some interesting trends. There was some persistence of primitive motor reflexes and an apparent delay in the development of postural reactions. The achievement of the motor milestones such as sitting, crawling, standing and walking did fall within the wide limits of the normal range. Six per cent of the total group had definite neurological handicaps, 16 per cent responded inconsistently during one of the assessments and at 12 months, a further 11 per cent showed evidence of developmental delay.

Keywords: **Infant, newborn; Infant, premature; Psychomotor Performance**
Volume 27. 1981


The paper reviews evidence for the beneficial effects of aerobic exercise on the cardiovascular health of elderly persons. It makes a clear distinction between these benefits and those obtained with the anaerobic routines usually used with this group. It is suggested that physiotherapists have a role now and in the future in developing programs for the growing number of older people in the community. The results obtained by some older exercisers who took part in one innovative program run by the WAIT (Western Australian Institute of Technology) are briefly described.
Keywords: Aging; Exercise; Retirement


Two cases are described, one being breast engorgement three days after delivery, the other an incipient breast abscess four months after delivery. Both were treated successfully with continuous ultrasound.
Keywords: Breast; Ultrasonography


This paper summarises the results of research into the scoliosis screening program undertaken in Western Australian schools over a three-year period from October 1976 to October 1979. It represents the follow-up operating in the spinal deformities clinics chiefly at the Princess Margaret Hospital for Children and also at the Royal Perth (Rehabilitation) Hospital, giving details of numbers seen, sex and age relationship, necessity for review visits and active treatment required. The various treatments are outlined briefly. The optimum school levels at which screening should be carried out have emerged and the program has been altered accordingly as from the beginning of 1980.
This paper concludes that school screening for scoliosis is a worthwhile exercise in preventative medicine.
Keywords: Preventive Medicine; Scoliosis; Spine


A survey was undertaken to investigate the need for counselling services to the partner of a mastectomy patient in terms of improving patient-partner relationships post-operatively. Each was asked to complete, separately, anonymous questionnaires concerning any changes in their relationships following surgery. Particular areas of interest involved the reasons for such changes, what supportive measures had been available, and what supportive measures were needed. The effective response rates were 36 per cent for females and 22 per cent for males. Responses were computerised; the results obtained are listed, and discussed with a view to future needs. It is concluded that recognition of the need for psychological help to both patient and partner is essential, and the need for further research and counsellor training is urgent.

One hundred patients with a wide range of musculoskeletal conditions were treated by interferential therapy, using the Nemecrodyn '8' machine. No control group was used, but marked or complete improvement was achieved in a large percentage of the patients, especially those whose conditions had been of short duration. The use of the “Vector” system enabled a wide area of treatment to be achieved. It was possible for certain patients to exercise while undergoing interferential therapy. Interferential therapy appears to be a most useful form of physiotherapy for many types of conditions, from immediate sports injuries to intransigent chronic conditions.


Physiotherapists use a variety of sensory stimulation in the management of many clinical conditions including disorders of the central nervous system, peripheral nerve lesions and amputations. The rationale underlying these techniques is based on the neurophysiological effects of different types of sensory input on individual receptors and the central nervous system as a whole. In recent years, neurophysiological research has necessitated a critical reappraisal of many old assumptions about the central nervous system. This paper examines the rationale for using vibration in the 'tactile defensive' patient and questions earlier conceptual models. Effects of vibratory stimulation on the nervous system are discussed, with some pertinent methodological considerations.


A program for severely and profoundly handicapped cerebral palsy children aged five to nine years is described. The reasons for its establishment are discussed, together with the measures taken to establish its worth. Issues relevant to the organisation of a team approach are presented. The study supports collaborative team efforts between therapy and teaching professions in the field, and also supports collaborative team efforts between university and clinical personnel, for the purpose of program evaluation.


The inefficiencies of the physiotherapy profession in its attitude to the treatment of pelvic floor insufficiency and urinary stress incontinence are discussed, together with a description of the different types of urinary stress incontinence, their causes and a brief outline of the anatomy of the pelvic floor. The total concept of the authors' treatment regime is described in detail - exercises done per vaginam by the physiotherapists as well as the patient, and the reasons for the choice and application of interferential therapy as an adjunct to these exercises. The authors consider that only physiotherapists possess the necessary combined skills in
kinesiology and electrotherapy, and a knowledge of anatomy, and therefore, physiotherapy is the most appropriate profession to undertake the task of retraining thousands of women who are, at the moment, literally told to “grin and bear it” until their condition is bad enough to warrant surgery, which is often not very effective.

Keywords: Pelvis; Stress; Urinary Incontinence; Urination Disorders


This is the first paper of a two-part paper. Part I describes the basis for decision making in research. The basic statistical procedures that provide the foundations for more advanced statistical techniques, the rationale underlying hypothesis testing, the nature of probability and its relevance to the normal curve, and the meaning of tests of significance and level of significance are discussed. These concepts provide the foundation for an understanding of the interpretation of decision rules and tests of significance, topics that are discussed in Part II of the paper. All concepts and procedures are discussed in terms of their clinical relevance to the practising physical therapist.

Keywords: Clinical Competence; Decision Making; Research


This is Part II of a two-part paper. Part I laid the foundation for what is discussed here - decision making and its interpretation. Included are discussions of decision rules and their relevance to the research process, the meaning of decision errors, how to interpret tests of significance and how to distinguish between statistical significance and practical significance. An understanding of the concepts and techniques presented in Parts I and II of this paper will enable clinical therapists to evaluate more judiciously the clinical importance of research papers in physical therapy as well as to better prepare them to design and conduct their own clinical research projects.

Keywords: Clinical Competence; Decision Making; Research


This paper is the first in a series summarising recent developments in our understanding of pain mechanisms. While neural mechanisms must exist for the two components (perception and aversion) of pain experience, the prime role of pain systems is still unclear. The major difficulties encountered in experimentally evaluating pain are considered briefly, as it is essential that these be appreciated by workers in this field. General sensory mechanisms are briefly summarised, including factors determining whether conscious awareness of a stimulus site localisation. Nociceptors (“pain” receptors) are considered in terms of their structural characteristics and fibre groups. Although it is still unclear precisely how nociceptors are activated, their known functional characteristics probably provide the basis for distinguishing stabbing from burning pain, and for the sensations associated with primary hyperalgesia.

Keywords: Nociceptors; Pain; Pain Measurement

This paper reviews some major advances in our understanding of the organisation of afferent pain pathways, and relates these and other findings to the limited success rate achieved by various surgical interventions used in the treatment of chronic intractable pain. First-order pain afferents, many of which use the transmitter substance P, may enter the spinal cord via both the dorsal and ventral roots. After terminating superficially in the dorsal horn, information may apparently ascend to higher centres via numerous pathways, some of which are contralateral some ipsilateral. The preferred route to the primary somatosensory cortex appears to be the contralateral spinothalamic tract, but alternate pathways may be recruited following anterolateral cordotomy or thalamotomy. In addition to divergence of the central pain pathways and the presence of ventral root afferents, other factors considered that may contribute to surgical failure include denervation supersensitivity, the occurrence of prolonged spontaneous injury discharge, and divergence of the peripheral branches of nociceptive fibres.

Keywords: Afferent Pathways; Pain; Pain Measurement


Rehabilitation as a movement has grown out of the needs of disabled persons, which are different from those of the sick. Rehabilitation is developing into an holistic concept, which focuses on the whole person, not just on his or her physical or mental handicap. An holistic approach towards disabled persons and their rehabilitation is based on an awareness of the functional interdependence of psychological, physical, social and vocational factors in human health, illness and recovery. The physical, functional, psychological and social impact, which a stroke can have on a person, is described to illustrate the complexity of the disabling process, and the need for all rehabilitation team members to share holistic goals.

The benefits of rehabilitation are maximised by an holistic approach, which aims at enabling persons with disabilities to function in society to the fullest physical, mental and social and vocational usefulness of which they are capable.

Keywords: Handicapped; Holistic Health ; Rehabilitation


Longitudinal movement of the radius, in relation to the ulna, occurring during abduction and adduction of the elbow, and during radial and ulnar deviation of the wrist, was examined roentgenographically on five students. A fixation device was designed to stabilise the humerus while the passive movements were carried out, and all measurements were done with the arm in 0 degrees extension. The average movement from full adduction to full abduction was 10.4 degrees and, at the same time, the radius moved an average of 1.6mm distally in relation to the ulna. When the wrist was moved from full radial deviation to full ulnar deviation the radius moved an average of 0.1mm in relation to the ulna. The importance of assessing passive accessory movements at the elbow in the examination and treatment of elbow lesions is discussed.

Key words: Elbow; X-rays


Quick icing has been reported as an easy and satisfactory method for facilitating muscle activity,
even though the duration of stimulus is brief. The experiments described here attempted to evaluate whether application of ice to a limb for a short time could significantly alter the temperature of the skin to which the ice was applied and consequently lower the temperature of the underlying muscle. Normal subjects were used for the experiments and skin temperatures were measured at 30-second intervals after the completion of quick icing procedures. A 7 degrees C (mean) decrease of skin temperatures remained significantly depressed during the next four minutes. It is proposed that this depression of skin temperature would be a sufficient stimulus to alter the excitability of spinal motor-neurons, in a manner similar to the excitability of spinal motor-neurons, in a manner similar to the excitability changes that occur when a limb is immersed in an ice-water bath.

Keywords: Ice; Muscles; Skin Temperature


Many studies attest to low levels of compliance behaviour by receivers of health care instructions. The present study investigated this problem in the context of physiotherapy at eight Sydney hospitals or centres. The primary objective was to examine parents' perception of their compliance behaviour, frequency of execution in relation to family size or passing time, expectations of a program, and importance attributed to the program. It was found that mothers regarded home treatment programs as substantially valuable, and not only devoted two hours each day to execution but continued to do this over many years, in spite of problems. One may conclude that English-speaking mothers who elect to keep their child in a physiotherapy program in metropolitan Sydney appear eager to participate in the program and cooperate with the physiotherapist.

Keywords: Home Care Services; Pediatrics; Physical Therapy


A physiotherapist is concerned with the development or restoration of a quality of movement that enables the individual to take advantage of learning experiences and to perform activities of daily living. The paediatric physiotherapist is concerned with the development of children up to school age.

The development of normal movement is a chain of events, with each link being a milestone. This chain begins in the uterus, and does not reach its peak until late in adolescence, with particular physical skills not being fully developed until adulthood. For the chain to be strong each link must be tried and tested. If one link is not attained or poorly practised, then it will be weak and the whole chain may be out of balance.

Keywords: Child Development; Movement; Pediatrics
Volume 28. 1982


Australia has an electricity mains supply that differs from those of most countries. Safety standards relating to both the mains supply and mains-powered apparatus also differ. This paper describes the mechanism of electric shock and methods of shock protection - core-balance relays, protected earth-free supplies and equipotential earthing are considered. Australian safety standards as applied to earthed mains-powered apparatus are summarized. Particular attention is given to class A and B treatment areas and electromedical apparatus having a patient circuit. Class A, B and Z patient circuits are described.

Keywords: Electric Stimulation Therapy; Electricity; Physical Therapy


The application of hydrocollator packs carries an inherent danger of overheating, which must be avoided. While a variety of temperatures and coverings for the packs has been reported, it has been stated that a bright red skin colour may be indicative of skin damage. It has also been stated that a therapeutically desirable rise in skin temperature would be one to over 40 degrees C during the treatment. In this study hydroupack applications to the lumbar region of the back were assessed for onset of sensation after application, and at intervals thereafter for skin temperature, skin colour, and subjective sensation of warmth. The lack of co-relation found between these variables suggests that in clinical work in observation of the skin and also a subjective report, should be obtained at frequent intervals for at least the first nine minutes after application. The need for a rise in skin temperature above 40 degrees C is questioned.

Keywords: Heat; Skin; Thermal Conductivity


Eighteen months after the completion of their training in 1978, 62 per cent of BAppSc (Cumberland) graduates in physiotherapy responded to a questionnaire investigating their work experiences, attitudes and plans. All except 8 per cent were currently employed, and 15 per cent had experienced involuntary unemployment. Satisfaction with the job and career choice was high but there was least gratification regarding work aspects considered the most important. The most frequently cited work stressors were feelings of inadequacy, depression and irritation regarding patients and work overload. The majority of graduates planned to specialise and undertake further study. Many were undecided in their attitudes toward their profession and 39 per cent had not joined the Association. Some attitude changes had occurred since graduation.

Keywords: Career Choice; Employment; Physical Therapy; Work


As educational services accept responsibility for the provision of appropriate education for a wider range of disabled children, therapists and other support personnel will increasingly be called upon to work in an educational model. Team approaches - multidisciplinary, interdisciplinary or
transdisciplinary - provide effective ways of organising staff to service the educational system. The therapists and other support professionals within the teams may work in at least three ways: traditionally; as a consultant; or as a resource person/information source. The advantages and disadvantages of each role are discussed.

Keywords: Child Health Services; Education; Handicapped


A condition described as transient dystonia which may have long term effects on the development of prematurely born infants has been reported in the literature. This study investigated the significance of this condition in 85 high risk infants. The infants were divided into those displaying dystonic and non-dystonic features at four months after expected date of delivery. Neuro-sensory motor status and the developmental quotient of each infant were assessed at 4, 12 and/or 18 months. The condition was present in 22 per cent of the group and developmental deviations were more marked in infants identified as dystonic compared with the non-dystonic. An increased percentage of normal responses by 18 months suggested that the condition may be transient. Implications for physiotherapy involve the recognition and selective treatment of dystonic infants.

Keywords: Child Development; Infant; Infant, premature; Psychomotor Disorders


The hyperkinetic syndrome is a feature of present times. This paper gives a brief survey of literature concerning the problem together with some details about causes, treatments, and methods of assessing the quantity and quality of the excessive movement. Although physiotherapists cannot treat the basic causes, they may give assistance by assessing the nature of the excessive movement and explaining this to teachers and parents, as well as helping with any co-existing clumsiness.

Keywords: Child Behavior; Child Behavior Disorders; Child Development; Hyperkinesis


Two hundred and thirty-eight preschool children were divided into four groups according to the method of referral. Chi-square analysis following a clinical examination in the preschool showed highly significant differences between the groups, particularly in proprioceptive, vestibular and related functioning. Achievement and classroom behaviour in Grade 1, examined in a structured teacher interview, showed highly significant differences between the groups in general performance, English, mathematics, general knowledge and behavioural characteristics. Formal educational assessment in Grade 2 indicated a similar pattern, except that children referred by guidance and medical officers (group 4) deteriorated, and randomly sampled children with vestibular and proprioceptive dysfunction on the preschool examination (group 2) improved.

Keywords: Child Behavior; Child Behavior Disorders; Child Development

An objective test of hand function, standardised for adults in the USA, has been adapted and standardised for the normal adult population of the Brisbane metropolitan area. Test items have been chosen to correspond as accurately as possible with the original test items, and all are readily available. The Australian version is quick to administer, and comprises eight test items, chosen to provide a broad sampling of hand function. Percentile norms are provided for dominant and non-dominant hands for men and women in various age-groups, ranging from 16 to 90 years.

Keywords: Activities of Daily Living; Hand; Handicapped


The two purposes of this paper relate to Man in or beyond his fifth decade. The first purpose is to detail the 'abnormalities' which can be found by palpation examination of the cervical spine posteriorly, and the second is to try to explain what the finds indicate. The “ideal” spine, the “abnormal” spine and three groups of the “average” spine are defined.

The method of examining the cervical spine by palpation techniques is detailed. Discussion centres around what is normal for an ideal spine and the average spine and what it is that changes when the average spine becomes “abnormal”. The associated “new” and “old” tissue changes are discussed in relation to the common findings in the upper, middle and lower cervical spine.

Keywords: Cervical Vertebrae; Palpation; Spine


This paper considers some of the developments in knowledge and understanding of the phenomenon of pain. The “pain-gate” theory and the descending pain suppression mechanisms are mentioned briefly. A number of mechanisms are suggested whereby interferential therapy may relieve pain. A brief description of the interferential stimulus and its potential for utilising the mechanisms described in earlier sections is given. suggestions are made concerning the frequencies used for gaining this pain relieving effect.

Keywords: Electric Stimulation Therapy; Pain; Nervous System


School screening of adolescents reveals a high prevalence of mild rotational deformity. The objective of screening is to prevent serious deformity by regular review of these children, early recognition of progression and provision of spinal bracing for curves greater than 25 per cent. Two per cent of students screened in the age range 11-13 years have curves greater than 10 per cent but only two per thousand screened require active treatment. A program of exercise combined with bracing until skeletal maturity is reached obviates the need for major surgery. Indications for follow-up and treatment are reviewed, and some current concepts of the aetiology of idiopathic scoliosis are examined with particular emphasis on the relationship between scoliosis and growth.

Keywords: Exercise; Musculoskeletal Diseases; Scoliosis; Spine

Birth experiences of 94 primiparous women who had attended birth preparation classes, were compared to a control group of 22 women of similar age and parity who had not attended classes. The results revealed that in contrast to the control group, women who had attended classes were of higher socioeconomic status, were more likely to have the child's father present at birth, felt more prepared for the birth, and were somewhat more positive to the idea that women should have a choice between home birth and hospital birth. However, there were not differences between the groups regarding the frequency of interventions in labour, the length of the labour, the pain experienced and their feelings of satisfaction. Thus, no substantial effect of childbirth education was evident in the management and experiences of the birth.

Keywords: Labor; Pregnancy; Prenatal Care


A study was conducted to look into the characteristics of back pain among pregnant upper class Nigerian women and to examine the reducing influence of antenatal physiotherapy. Of the 99 subjects who completed the questionnaire, 52 had attended antenatal physiotherapy and 47 had not. The results showed that a total of 89 (89.8 per cent) had experienced back pain within the “very mild” to “severe” range; onset of pain was usually around the sixth and seventh month of pregnancy and was mostly felt in the evening. Increasing parity and age seemed to be associated with increasing back pain. Pain was aggravated by tiredness, and about one third of the subjects obtained relief by placing a small pillow behind their back when sitting. Subjects who attended antenatal physiotherapy fared significantly better than those who did not as regards the prevalence of back pain.

Keywords: Backache; Pain; Pregnancy


Inter-observer and intra-observer reliability tests have been investigated for the passive ranges of glenohumeral abduction, lateral rotation with arm by the side and both lateral and medial rotation with the upper arm abducted to 90 degrees, using the hydrogoniometer. This device allows accurate quantification of glenohumeral movement and is most appropriate for the physiotherapy profession as an inexpensive, simple measuring device.

Keywords: Joints; Movement; Shoulder


Non-verbal behaviour forms the major part of communication; responses in interactions are based on the subconscious perception and interpretation of non-verbal messages. Through intuition and experienced, most physiotherapists develop the skills necessary to aid their understanding of the behaviour and responses of patients. Increased awareness of non-verbal skills and the importance of their use will enhance both the physiotherapist-patient relationship and the quality of treatment. This paper discusses the relevance of these skills and the rationale for their implementation in a professional setting.

A physiotherapy stroke audit was conducted over a twelve month period on all stroke patients discharged from the rehabilitation wards of the Bendigo Home and Hospital for the Aged meeting the criteria. The audit methods is described. Analysis of results revealed problem areas in documentation, outcome, complications and integrated care. A second audit was done over the following six months to assess the value of physiotherapy measures taken to improve outcome and integrated care and to lessen complications. A third audit is in process to accumulate objective information regarding stroke outcome and to test the effectiveness of a physiotherapy project to improve integrated care.

Keywords: Aged; Cerebrovascular Disorders; Rehabilitation


That physiotherapists recognise that need to pursue their professional knowledge is reflected in the large number of educational courses available. However, we know little of the involvement of the physiotherapy population in these programs, or whether behavioural change is occurring as a result of participation. Many of the problems associated with continuing education are explored, particularly in the area of participation, motivation, isolation, and design of programs. Some possible solutions are offered, together with suggestions for future programs, designed to overcome these hypothetical problems. Above all, the author stresses the need for objective information as a pre-requisite for planning successful continuing education programs.

Keywords: Education; Education, medical; Education, medical, continuing


In-service education is one component or method of continuing education. This paper discusses the development of an in-service training program for intern physiotherapists which is being conducted at the Prince Henry and Prince of Wales Hospitals in Sydney. The basic philosophy behind the program is the proposition that the intern year for physiotherapists should be both a year of service and a total learning experience aimed at providing a transition between student training and independent professional responsibilities and capabilities. Accordingly the program was planned to provide training for the interns which would assist them in developing clinical expertise in the task of a junior physiotherapist. The program is proving to be a useful component of the overall learning experiences available to the 19 intern physiotherapists who are allocated to these hospitals each year.

Keywords: Education, medical; Education, medical, continuing; Inservice Training


Officials from nine of the 12 Sydney first grade Rugby League football clubs were interviewed to
determine what their clubs offered their athletes regarding sports injury management. This survey describes the different personnel used by the clubs, and their roles in injury treatment and physical conditioning programs.

It is concluded that some clubs are advancing in the areas of immediate injury treatment and injury prevention, but that the majority have deficiencies in their programs related to these areas. It is also suggested that sports medical care and knowledge in this and similar sports would benefit by a greater involvement of a wider range of health professionals, to add to that already provided by medical doctors.

Keywords: Athletic Injuries; Sports; Sports Medicine


Leprosy in the past has been shrouded in mystery and characterised by deformity. While much more is known of the disease today, allowing the majority of patients to be treated without undue difficulty, physiotherapy in leprosy has grown out of a need to prevent, minimise and correct deformities caused by the disease. This paper presents the aetiology of deformity in leprosy and outlines the role of physiotherapy in the management of leprosy patients with neuritis and permanent paralysis. It also describes physiotherapy in tendon transfer surgery and emphasises the need for a domiciliary treatment program to suit the leprosy endemic areas in the Northern Territory of Australia.

Keywords: Abnormalities; Leprosy; Neuritis; Paralysis

Electromyography can be a useful tool for the physiotherapist to obtain information about the timing or magnitude of muscle activity when investigating the neuromuscular reflexes, muscle performance or patterns of movement. The quality of the signal recorded is dependent on the correct siting of electrodes, adequate skin preparation and the characteristics of the EMG machine itself. In order to accurately interpret the EMG data the use must be able to recognise artefacts which may distort the recording, and must also choose a processing technique which is appropriate for the particular application. This paper reviews all these areas and provide an introduction to EMG techniques for the intending user.

Keywords: Electromyography; Muscles; Research; Skin


Seven newly purchased therapeutic ultrasound transducers were tested using a radiation pressure balance and steel baffles in compliance with Australian Standard Specification T40-1969. Total acoustic output at maximum meter settings, and effective transducer radiating areas were measured. Only one transducer demonstrated the output values nominated by the manufacturer. Two had an appropriate relationship between effective areas and total output, though these values were not those stated by the manufacturer. The remaining four had effective radiating areas below the Australian Standards Association tolerance. Three of these had an otherwise acceptable power output and one had a very low output. These data substantiate the need for adequate testing facilities to be available for physiotherapists using ultrasound clinically.

Keywords: Transducers; Ultrasonics; Ultrasonography


Physiotherapists are often involved in the post-operative management and rehabilitation of the lower limb amputee. Seldom, however, does one see the usual presentation of peripheral vascular disease - ischaemia of the muscles on exercise, ie: intermittent claudication. This article discusses a technique for demonstrating limitation in exercise blood flow - the basis of this symptom. Thallium 201 scanning is extensively used in demonstrating areas of reduced blood flow to one important muscle, the heart, and this technique can be extrapolated to the muscles of the leg. Twenty-two patients being studies with Thallium-201 for suspected coronary artery disease had the muscles of the lower limb scanned with a gamma camera. The photographs obtained form the basis of this article.

Keywords: Amputation; Peripheral Vascular Disease; Postoperative Care


The observation that wheelchairs often failed to provide the mobility and support needed by patients
with neuromuscular disability facilitated this study. Three groups of subjects with multiple sclerosis, spinal cord injury and muscular dystrophy were examined to determine their various disabilities and anthropometric measurement. These were then compared with wheelchair dimensions in an endeavour to determine whether the problem was wheelchair design or poor prescription. An evaluation of wheelchair use was also included.

Results showed that several wheelchair dimensions including seat depth, arm rest height, backrest height and lack of contour support failed to match the sample population, indicating the need for greater care in selection of wheelchairs for patients with neuromuscular disabilities in addition to the need for design revision.

Keywords: Handicapped; Neuromuscular Diseases; Wheelchairs


Negative or narrow attitudes toward the physically disabled can be detrimental to success in rehabilitation, yet programs aimed at improving attitudes frequently fail. An 18 hour program aimed at increasing first-year physiotherapy students' knowledge of the disabled and reasons for negative attitudes was evaluated. At course commencement when compared with an Australia-wide sample, students revealed more positive attitudes regarding the needs but not the characteristics of the disabled. At course completion students perceived the disabled as more similar to other people in their characteristics and needs. Students felt less ignorant about disability and exhibited more of a coping perspective: pitying and admiring the disabled less and fearing disability less. They still experienced guilt and discomfort regarding interaction.

Keywords: Attitude of Health Personnel; Handicapped; Professional-Patient Relations


Early research studies have suggested that learning gains accompany improvement in neurological factors after developmental physiotherapy treatment, and some physiotherapists consider that adequate sensory motor system is of primary importance in the utilisation of full learning abilities. To determine the existence of any link between these two, a study was undertaken to evaluate educational progress of children with both MCD and learning difficulties: the experimental group received continuous physiotherapy management for six months and the control group received no physiotherapy, if possible, while all continued their remedial education program. Analysis of school performance data revealed that the educational progress in most areas assessed by teachers was significantly greater for the children in the experimental group than for the control group. This paper describes the study and compares the scholastic achievement of children, with and without physiotherapy intervention.

Keywords: Attention Deficit Disorder with Hyperactivity; Child development; Handicapped; Learning Disorders


Basic human posture should be derived from the principal movement pattern, namely gait. Since we stand on one leg for most of the time during walking, the stance on one leg should be considered to
be the typical posture in man; the postural muscles are those which maintain this posture. 

Keywords: Gait; Muscles; Posture


The hypothesis that stroke patients could learn a perceptual motor skill by developing a strong perceptual trace with practice was tested. Ten spastic stroke patients and sixteen normal subjects were observed while they learned a novel self-paced linear displacement task. The criterion movement was the displacement of an object with the affected leg (in the case of stroke patients) and left leg (in normal subjects), to a designated target. Visual, auditory, kinaesthetic as well as knowledge of result information was available to the subjects. The results showed that stroke patients were able to reduce their movements errors as a function of practice by developing and strengthening their perceptual trace. This technique may be adapted for the modification of the motor behaviour of stroke patients.

Keywords: Cerebrovascular Disorders; Movement; Muscle Spasticity


The use of therapeutic measures which are designed primarily to modulate pain has highlighted the need for an accurate and reliable method of pain assessment in the physiotherapy department. Some psychological considerations of pain are reviewed and different methods of pain assessment are described and discussed. The need for a practical pain assessment tool is emphasised in the ongoing assessment of the patient by the physiotherapist. A pain assessment model is proposed which can incorporate a Visual Analogue Scale, a record of analgesic intake and a record of the patient's activity level. These parameters can be recorded and displayed in graph form, which provides a clear picture of symptom relief and treatment effectiveness over a period of time.

Keywords: Analgesia; Pain; Pain Measurement


Spastic equinus, resulting from severe head injury in children, can greatly impede their rehabilitation. The use of a temporary tibial nerve block to negate the neurological component of the equinus, prior to the application of inhibitory plasters, is described and the rationale detailed. Subsequent physiotherapy management, including the application of the plasters, is discussed. Two clinical case studies are given to highlight the aspects involved.

Keywords: Equinus Deformity; Head Injuries; Rehabilitation


A clinical trial involving rheumatoid arthritis patients hospitalised due to an exacerbation of their disease, was initiated in order to determine whether EMG biofeedback when used in conjunction with isometric exercise enhanced quadriceps strengthening. The parameters of muscle bulk,
strength and motor unit activity were measured before, during and after the trial to determine any improvements occurring. Results showed that in predominantly elderly patients there was no significant increase in quadriceps strengthening when EMG biofeedback was used. Further, for subjects under 45 years of age, EMG biofeedback was not shown to effect significant improvement. Keywords: Biofeedback; Clinical Trials; Electromyography; Rheumatic Diseases


The excitability of the stretch reflex is used as a measure of tone. The muscle spindle is the receptor for the stretch reflexes which may be phasic or tonic in nature. This paper provides a theoretical background through an overview of published studies as a basis for the understanding of the contribution of the muscle spindle to both the phasic and tonic stretch reflexes. Keywords: Movement; Muscles; Research; Reflex, stretch


This paper describes the treatment and management of boys with Duchenne Muscular Dystrophy at the Regency Park Centre for Young Disabled in Adelaide, South Australia. We have not been convinced that some of the active management programs advocated elsewhere are effective. Our philosophies and practices reflect a relaxed environment which emphasises achievement and freedom of choice. Keywords: Child Development; Handicapped; Muscular Diseases; Muscular Dystrophy


The main effects and interaction of pulse duration and pulse charge on sensory, motor and painful stimulation were examined on six male subjects. Surface electrodes were placed over the triceps brachii muscle. Pulse duration was varied between and 1000µs. Peak current, muscle torque and four excitatory responses were determined. Sequential order of sensory, motor and painful stimulation was evidenced. Selective excitation of these different physiological responses was easier and required less charge as pulsed duration became shorter. The greatest non-painful torque was reached at 100µs pulse duration. The most suitable range for motor stimulation was 20 to 200µs. For painful stimulation, a 5 to 10µs duration was favoured. A range of 20 to 100µs was recommended for sensory stimulation. Keywords: Electricity; Electric Stimulation Therapy; Transcutaneous Electric Nerve Stimulation


Nine long-stay psychiatric patients, known to have had little organised exercise for some years, were involved in a program of group physical activity for fourteen weeks following tests for body mobility as typified by range of head movement, length of stride and ability to raise the arms above the head.
Positive physical gains were demonstrated relative to a non-exercising control group when tests were repeated at the end of the program, and greatest benefit appeared to be derived by patients whose diagnosis included a degree of retardation or dementia. Every test subject exhibited some improvement in social behaviour, at least whilst in the group situation.

Keywords: Behavior; Exercise; Psychiatry


Field interaction between two applied interferential fields has been investigated in a homogenous water medium. Previous published theoretical explanations of interferential beats by Nemec (1967) and Hansjurgens (1974) used very simplistic assumptions for slowly varying fields. This present study describes the expected beating patterns without recourse to over simplification. At each point in the medium two vector directions (Ω) and magnitudes (R) for 100 per cent beating are predicated to occur. Good agreement (r > 0.93) between predicted and measured values of R and Ω indicated the theoretical approach used was valid and in some cases gives different results than previous field distribution descriptions.

Keywords: Electricity; Electric Stimulation Therapy

During the XII Commonwealth Games held in Brisbane in 1982, Australian physiotherapists provided a host service which treated nearly one thousand competitors and officials. This service, which was offered at both Games villages and sporting venues, required extensive planning over a two and a half year period. Appropriate staffing, equipment and space allocation was needed to cater for the wide variety of expected injuries. The services were well utilised which justified the efforts of the organisers and physiotherapists involved in the host team.

Keywords: Athletic Injuries; Sports Medicine; Physical Therapy


At the XII Commonwealth Games held in Brisbane in 1982, Australian physiotherapists as members of the host nation's medical division, treated the injuries of competitors from the ten sports contested. The nature and incidence of the injuries treated by the host physiotherapists is tabulated and comment is made regarding several significant features. Implications for the management skills of physiotherapists required either to travel with teams or work as host physiotherapists are made. Furthermore, the utilisation of equipment is indicated. Overall the paper provides a resource to assist in future planning for such events in respect to physiotherapy manpower, expertise and equipment needs.

Keywords: Athletic Injuries; Sports Medicine; Physical Therapy


Student evaluations of a simulated case conference in a rehabilitation setting were discussed and analysed, on the basis of the proposition that role-playing and simulated gaming are educational techniques of value in the training of health professionals. Eighteen fourth-year physiotherapy students responded positively in terms of insights gained from participation in a simulated group exercise. Students expressed interest in similar exercises to enable them to gain further insights into specific situations of relevance to their future professional lives.

Keywords: Education, medical; Rehabilitation; Students, health occupations


Following early diagnosis of Adolescent Idiopathic Scoliosis (AIS) it is very difficult to predict whether the curve will continue to increase and to what extent.

A cross-sectional study was conducted to investigate the implications of depth and width dimensions of individual vertebral bodies in adolescents with mild and severely progressive scoliosis. Results revealed a tendency for depth/width ratios in severe AIS to increase, and those with mild scoliosis to decrease from 13 to 15 years of age. This was proposed as a basis for an additional tool for diagnosis of severely progressive AIS.

Keywords: Scoliosis; Spinal Diseases; Spine

The term stress can be used to refer to a generalised somatic response, involving hormonal activity, which renders an individual ready to react to a wide range of events. With continued stress there can result a wide range of pathological developments, including physical and psychological symptoms. This paper will review the social and psychological factors which appear to increase the stress response and will also examine some of the physical consequences of exposure to stress-inducing agents. Emphasis will be given to the possibilities that stress may result from common experiences of living in modern complex society. Individual differences need to be considered as moderators of stress, and also the means whereby people may be taught to cope with stress.

Keywords: Activities of Daily Living; Psychology; Stress


This paper describes a survey of childbirth practices in Melbourne hospitals. Information was collected from 27 of Melbourne's 34 hospitals with obstetric beds. The survey concentrated on aspects of the management of labour and the newborn where patients could expect to exercise a degree of choice.

The survey found large variations in the degrees of choice offered to patients in different categories of hospital on more than half the questionnaire items. Patients in large public hospitals were in general given the largest range of choice, followed by private hospital patients. Patient choice was very restricted in most small public hospitals.

Keywords: Infant, newborn; Labor; Obstetrics; Prenatal Care


The transient and variable nature of abnormal or deviant neuro-developmental signs during the early post-term months of `high risk’ infants, has been recognised. Careful longitudinal follow-up of these children is indicated. This study investigates the neuro-sensory-motor and general developmental progress over four years, of a group of children who were identified as `dystonic’ at the adjusted age of four months.

The developmental performance of these 15 children was compared with a matched group of children. The results indicated that at four years of age the `dystonic’ group of children were developmentally less competent and more variable in all areas assessed than their `non-dystonic’ peers. Only one child was ultimately diagnosed as cerebral palsy indicating the transient nature of quite marked early signs. The implications for possible problems at school emphasise the need for continued follow-up of this group of children.

Keywords: Child Development; Infants; Pediatrics; Psychomotor Performance


In transcutaneous nerve stimulation current is supplied to the patient using surface electrodes which make electrical contact via wetted sponges or a conductive gel. This paper reports measurements of
the electrical characteristics of ten commercially available gels. Five are recommended by the manufacturers as being suitable for electrode coupling only, three are recommended for ultrasound coupling only and two are designated 'dual purpose'. Marked differences in electrical conductivity are found. Both the dual purpose and ultrasound gels are found to be electrically inferior to 'electrode only' gels. The results are discussed in relation to different electrode types and in comparison with saline moistened sponges.

Keywords: Electric Stimulation Therapy; Transcutaneous Electric Nerve Stimulation


To evaluate the areas of labour-related anxiety and so more precisely direct child-birth training, women attending the ante-natal classes at Moorabbin Hospital were requested to rank an anxiety questionnaire. Two hundred of these anxiety lists, 100 of primigravida and 100 of multigravida women, were submitted to Analysis of Variance. Prime concern for all women was shown to be the welfare of the baby. On the items of self-concern, significant differences were indicated on the basis of parity. Separate training for the two parity groups is suggested. Behaviour modification techniques for inclusion in the training classes are discussed.

Keywords: Anxiety; Obstetrics; Pregnancy; Prenatal Care


The maximum flexor and extensor peak torques about the knee joint of 17 male and 17 female subjects were determined using a Cybex isokinetic dynamometer. These values were used to evaluate the influence of changing joint angular-velocity and the ratio of peak hamstrings torque to peak quadriceps torque. Additionally, an assessment of the influence of gravity on the recorded peak torques, and thus the ratio, was made. Values for the flexion-extension ratio corrected for gravity were found not significantly different at the measured joint angular-velocities whereas the values of the ratio not corrected for gravity were found significantly different at increasing joint angular-velocities. It is necessary that the physiotherapist recognise the importance of the influence of gravity when recording forces developed in the vertical plane.

Keywords: Exercise; Kinetics; Muscles


Commercially produced cold packs, which may be refrigerated to simulate ice packs, are preferred by many physiotherapists for cooling treatments. In the experiments described here, the efficiency of cold packs and ice packs was determined by measuring their effects on skin temperature and the conduction velocity of motor nerve fibres. Although the commercially available cold pack did alter the measured physiological variables, ice was found to be the more effective method of cooling superficial and possibly deep tissue.

Keywords: Cold; Ice; Skin

Increasing age is usually associated with a decline in the amount of habitual exercise activity of an individual in western society. While this reflects a decline in physical capacity, it is in large part due to socio-cultural pressures and expectations. The preservation of any function, intellectual or physical, is dependent upon the use that is made of that function, and the physiotherapist with a unique background in human movement and pathology has a vital role in the prescription and supervision of exercise with the elderly. Exercise has demonstrable effects on skeletal health and bone maintenance, muscle bulk and strength, the ranges of movements of joints, cartilage compliance, soft tissue extensibility, neuronal efficiency and cardiopulmonary fitness. This paper considers some of the physical aspects of ageing on body tissues together with the actual and potential role of physiotherapy in the health education and treatment of elderly people.

Keywords: Aged; Exercise; Movement


A quality continuing education program may be seen as one which is of a high standard, relevant and viable. Efforts made to ensure the quality of continuing education should be directed towards these three ends. Where possible learners should be involved in program planning, implementation and evaluation and should be encouraged to put their learning into practice.

This paper explores the issues and practicalities involved in attempts to ensure the quality of educational activities provided for qualified professionals by groups or bodies who are concerned with the professionals by groups or bodies who are concerned with the professional development and quality of service of both individuals and professional groups.

Keywords: Education, medical, continuing; Students, health occupations


The lay public's medical knowledge is acquired from three sources: the lay consultation and referral service, the media and the practitioner. Satisfaction with and continued utilisation of a health care service may depend on congruence between patients' beliefs about the cause of illness and practitioners' conditions of care. The results of a recent survey indicate that the information to which patients with spinal pain had access, was inadequate for them to acquire accurate knowledge of the basis for their pain and physiotherapists' conditions of care. It is suggested that more accurate information on the mechanisms of spinal pain, volunteered by physiotherapist during the encounter, would be in the interests of the lay public and the physiotherapy profession.

Keywords: Pain; Professional-Patient Relations; Spine


Responses to a questionnaire by 71 private practitioners indicated that the average practitioner was aged 38.6, graduated in 1967, had worked professionally for 14.8 years of which 8.8 years were spent in private practice. Some respondents (19 percent) owned multiple practices, 48 per cent employed other therapists and 30 per cent had specialised practices. The average practice treated 93 patients a week in 40 minute consultations. The average respondent used 2.5 techniques from other areas of health care and owned 8 machines. Doctors referred 88 per cent of patients but 47.5 per cent of practitioners reported good effects from first contact status. Membership of professional associations was high. Female therapists were more likely to practice part-time and had less
affiliations with community groups.
Keywords: Career Choice; Private Practice; Professional Practice; Questionnaire


This paper concerns wheeled mobility aids, or “Chariots of Freedom”. Wheelchairs are the most commonly used wheeled mobility aids. The rationale for mobility management at Regency Park Centre for Young Disabled is based on the research findings of others, research at the Centre into seating for children with cerebral palsy and children with Duchenne muscular dystrophy, and our development of a Skill Evacuator and Trainer, and a crashworthy restraint for wheelchair occupants in motor vehicles. In summary, wheeled mobility aids, and wheelchairs in particular, while entailing responsibilities, present a form of liberation from dependence for disabled children.
Keywords: Handicapped; Movement; Psychomotor Disorders


The gerontology course taught in the Physical and Occupational Therapy Program, McGill University, was scrutinised using a) knowledge identified by researchers as necessary for professionals tending the aged and b) the results of a questionnaire administered to graduates working with the aged. Researchers revealed that professionals should be able to provide support for the aged and their families, frequently evaluate their problems, encourage their independence and avoid stereotyping them. Results of the questionnaire showed that graduates prioritised the amount of time they spent on various tasks in this order; listening, talking to clients, consulting with team members and lastly performing physiotherapeutic tasks. An approach to multidisciplinary services is described which would ensure quality care for the aged and enhanced the accessibility of these services.
Keywords: Aged; Geriatrics; Questionnaire


This study investigated the first five years of developmental progress of a group of pre-term infants. Of an initial group of 136 surviving infants born five or more weeks before term in Brisbane in 1975, more than 82 per cent were assessed regularly through their pre-school years. Results indicated that a normal sequence of development was followed by the majority of the children. Although the incidence of cerebral palsy, speech difficulties and minor motor incoordination was higher than average, all but two children were ready to enter school with their peers. Except for a small group of neurologically related signs, factors predictive of development at five years generally differed with age. Regular comprehensive developmental assessment is recommended for identification of age related problems.
Keywords: Child Development; Infant, premature; Pediatrics

Recent studies on the effects of passive movement on the maintenance of nutrition and the repair of articular cartilage are related to pain relief by passive movement treatment techniques. The techniques for patients with severe intra-articular pain are described and compared with treatment techniques for patients with chronic intra-articular pain. The suggested importance of tensional forces in the maintenance of periarticular structures forms basis for discussion of the passive treatment techniques utilised for patients with pain from ligamentous or capsular damage, or change, in both the recent and the chronic stage.

Keywords: Motion Therapy, continuous passive; Pain; Physical Therapy


Career development of 62 female physiotherapists was surveyed 5 years after graduation, in this fourth stage of a longitudinal study: 87.1 per cent were currently employed. Job satisfaction was high was work involvement. About half had specialised and the majority had attended short courses, workshops and seminars. Work pressure (too much to do and too little time) was the most frequently rated work stressor. The physiotherapists reported themselves being in good health, experiencing little role conflict and moderate satisfaction from various areas of their lives. As in previous surveys they indicated that they planned to have an average of 3 children and interrupt their careers while the children were young.

Keywords: Career Choice; Education, medical, continuing; Specialties, medical; Stress


In asthma, the bronchial muscle is hyper-irritable, making asthmatics susceptible to a wide variety of external and endogenous trigger factors normally experienced by us all. The level of hyper-irritability determines the risk of developing bronchospasm on exposure to the trigger factors. Bronchial muscle tone is in part maintained by vagal nerves. Emotional factors can act as triggers for bronchospasm through these nerves, particularly in patients with the greatest hyper-irritability. Asthma itself may arouse hostilities in parents, peers, and therapists. By definition asthma can therefore be considered psychosomatic, but because of current usage this term does not help good medical management. The complex interplay between the organic abnormality in asthma and the psychosocial environment should always be carefully considered.

Keywords: Asthma; Psychosomatic Medicine; Respiration Disorders


Facet movements in the mid-cervical spine (C2-C4) were examined on two cervical columns from preserved cadavers. The dissected columns were clamped to allow manual movement of one vertebra on the fixed vertebra beneath. Pins were inserted to mark the position of the facets, and movement changes
recorded photographically; 160 measurements were taken from these photographs. The study showed that the facets of the free vertebra could be moved to either side in relation to the facets of the fixed vertebra. Furthermore during movements simulating lateral flexion and rotation, sideways translation of the facets was found to be part of the complex three dimensional motion.

Keywords: Cervical Vertebrae; Research; Spine


Physiotherapists have an important role to play in the rehabilitation of patients with chronic obstructive pulmonary disease. Individually-tailored programs including the following components, namely education, exercise, secretion removal, breathing 'training', home programs, ventilatory muscle training, medications, support systems and counselling can provide subjective and objective benefits for these patients in the planning, implementation and evaluation of the program and to encourage them to develop self-help skills. Guidelines for designing a pulmonary rehabilitation program are outlined, and pertinent literature reviewed.

Keywords: Lung Diseases; Pulmonary Heart Disease; Respiration


Normal notochordal and vascular attrition leaves weak spots in intervertebral discs through which intravertebral prolapse of disc material frequently occurs. Some varieties of prolapse cause somatic spinal pain. Asymmetrical and asynchronous growth of normal vertebral arches rotates thoracic vertebral bodies slightly to the left in infants and to the right in adolescents. Primary vascular asymmetry could cause the observed vertebral asymmetry.

Luschka's joints develop in the cervical spine during childhood and give some protection against postero-lateral disc prolapse, but cervical zygapophyseal joints give little protection to the disc in sagittal plane changes from a coronal orientation in infants to a biplanar coronal and sagittal orientation in adults, which enables the joints to restrain both rotation and excessive flexion. This explains the observed pattern of stress related age changes in the joints.

Keywords: Intervertebral Disc; Lumbar Vertebrae; Spine


The posterior elements of the vertebral column are innervated by branches of the dorsal rami of the spinal nerves, while the intervertebral discs and related ligaments are innervated by various branches of the ventral rami and sympathetic nervous system.

A knowledge of this nerve supply forms the basis for a systematic classification of the possible sources of primary spinal pain, and the basis for several diagnostic techniques that use needles to provoke and anaesthetise putative sources of pain. In particular, the demonstration of a nerve supply to intervertebral discs vindicates the concept that these structures intrinsically may be sources of pain.

Keywords: Intervertebral Disc; Ligaments; Nervous System; Spine

During standing, the electromyographic (EMG) activity of erectors spinae is minimal. However, this activity increases when an object is held in front of the body. The size of the EMG responses to this loading is dependent on both the weight of the object and the position of its centre of mass relative to the lumbosacral junction. Interpretation of EMG results becomes complex when movements of large amplitude are involved. Problematically, erectors spinae become electrically silent during trunk flexion, at a position which requires high tension in post-vertebral structures. This emphasises that EMG does not record the state of passive connective tissue tension, which is sufficient to support the vertebral column in some flexed postures.

Keywords: Connective Tissue; Electromyography; Spine


The articular triad of the intervertebral disc and the two synovial zygapophyseal joints at the same vertebral level, allows the spine its considerable mobility, while providing support and protection. The principal structural changes which occur to the elements of the articular triad in old age are an increase in the convexity, central height and increased swelling and fibrillation of zygapophyseal joint cartilage with expansion of joint margins by osteophytes. These changes are directly responsible for the reduction in the ranges of all lumbar movements in old age. Advanced osteoarthrosis in old age is not accompanied by bony sclerosis, because of the generalised osteopenia of old age.

Keywords: Aged; Lumbar Vertebrae; Spine


A pilot study using four subjects was conducted to investigate a proposed method of measuring 'in vivo' lumbar zygapophyseal intracapsular pressures. The authors were interested in establishing whether a resting pressure could be measured, and to observe pressure changes within the lumbar zygapophyseal capsules with fluid injection and with a range of active and passive movements including manipulative techniques.

The results indicated that the apparatus could effectively measure intracapsular pressure changes on injection and lumbar movements. Significant pressure changes with specific localised manipulative therapy techniques were demonstrated. A resting intracapsular pressure reading was not obtainable. Further controlled studies using this approach could provide valuable anatomical and clinical knowledge for the future.

Keywords: Lumbar Vertebrae; Manipulation, orthopedic; Spine


An observational study was performed on nulliparous labour pain in an area with a low epidural rate
which facilitated the comprehensive assessment of pain. Patients who had attended antenatal physiotherapy classes showed consistently less reaction to pain while experiencing the same level of perceived pain as the untrained. Duration of the first stage was the main factor associated with high pain levels. There was some evidence that training was particularly effective when there were foetal positional problems.

Keywords: Labor; Obstetrics; Pain; Prenatal Care


In a retrospective study problem orientated physiotherapy records were examined on 156 consecutive stroke patients admitted to medical wards and referred to the physiotherapy department. The purpose of the study was to identify from the problem lists those problems physiotherapists are dealing with in stroke care. There were 1338 problems recorded, and these were divided into 16 clinically meaningful subgroups. Three of the sixteen subgroups accounted for 60.2 percent of all the problems recorded, namely lack of voluntary movement and mobility in general (25.7 per cent), imbalance in muscle tone (19.5 per cent), and problems in maintaining balance (15.0 per cent). On discharge only 34.1 per cent of all problems were reported to be resolved. There was wide variation in the success rate claimed with different problems.

Keywords: Cerebrovascular Disorders; Movement; Rehabilitation


A covert monitoring procedure was employed to encourage a stroke patient to 'self-monitor' two parameters of her walking performance outside the physiotherapy department. The patient was aware that her walking would be monitored, but not of the identity of the monitors. After 12 days of covert monitoring, the two gait parameters, width of base and step length, were observed to be consistently within the specified limits. The covert monitoring procedure was thus successful in promoting consistent performance of a newly acquired gait beyond the physiotherapy department.

Keywords: Cerebrovascular Disorders; Gait; Walking


A number of studies which have examined reliability of spinal assessment procedures in manual therapy are reviewed. The tests examined were Passive Accessory Intervertebral Movements, Passive Physiological Intervertebral Movements, Straight Leg Raise and Forward Flexion. In general, tests of pain were found to be much more reproducible than tests of compliance. Straight Leg Raise and Forward Flexion tests were consistently more reliable than the Passive Intervertebral Movement tests. Possible explanations for these findings are advanced. The role of tests of compliance based on passive intervertebral movements in clinical decision-making may need to be re-examined. An appendix on reliability theory is included for the uninitiated reader.

Keywords: Decision Making; Intervertebral Disc; Reproducibility of Results; Spine

The Slump Test is becoming more widely accepted as an examination and treatment procedure for all levels of the vertebral column. The test is essential for a fuller recognition of the factors contributing to some patients' disorders. This paper describes the test, the normal pain response, predictable findings on examination, and use of the test in treatment.

Keywords: Diagnosis; Pain; Spine


The origin and early clinical use of 'therapeutic' ultrasound are reviewed and theories about the mechanism of action of ultrasound are traced and discussed. Changes of emphasis which have taken place in the empirically-based use of ultrasound are described. Some experimental evidence about the effect of ultrasound on tissue healing in vivo is presented, which indicates the need for controlled clinical trials in physiotherapeutic practice.

Keywords: Electric Stimulation Therapy; Ultrasonography


The stimulation of motor nerves to produce muscle contraction in normally innervated muscles is a long established part of orthodox physiotherapy. Recently however, a revival of interest in the area has occurred, particularly in the USA. Recent research has indicated that such stimulation can improve muscle strength, reduce muscle spasm and modulate spasticity, in addition to the more usual re-educative role of electrical stimulation. The concept of functional electrical stimulation (FES) seems destined to become an integral part of many programs for the neurologically handicapped patient.

This paper described the technique of motor stimulation using interferential currents. The stimulating parameters and electrode placement are considered, along with a detailed explanation of the pre-modulated system of electrode arrangement.

Keywords: Electric Stimulation Therapy; Muscles; Psychomotor Disorders
Volume 32. 1986


Eighty-six intubated infants with hyaline membrane disease were randomised to have either 0.5 ml saline, or nothing inserted down the endotracheal tube (ETT) prior to 4-hourly suctioning. The aim of the study was to determine if routine saline instillation was of benefit in maintaining ETT patency. The endpoint was (1) when the staff caring for the patient considered the secretions were increasing with the likelihood of the ETT blocking, or (2) the tube was presumed blocked and on removal was blocked. Four infants with a 2.5mm ETT the mean hour of the endpoint was 13.5 if no saline was used and this was increased to 77.6 if saline was used (p < 0.05). There was no difference with either a 3.0 or 3.5mm ETT if saline was used or not.

Keywords: Hyaline Membrane Disease; Infant, newborn; Pediatrics


Thoracic kyphosis, lumbar lordosis and pelvic tilt were measured in standing in one hundred and three adolescent females, using a specially designed inclinometer. Indices of the muscle lengths (abdominals, erector spinae, iliopsoas, gluteals, rectus femoris and hamstrings) were measured using inclinometry and goniometry and expressed as angles of joint position. Multiple regression analysis revealed that the of erector spinae length was negatively correlated with lumbar lordosis ($r = -0.24$, $p < 0.05$). The abdominal length was positively correlated with lumbar lordosis ($r = -0.209$, $p < 0.05$), and the hamstring length was negatively correlated with lordosis ($r = -0.213$, $p < 0.05$).

No muscle length was significantly related to pelvic tilt. A negative association between the degree of thoracic kyphosis and the abdominal length was found ($r = -0.245$, $p < 0.05$).

Keywords: Adolescence; Muscles; Spine


Reports of metered inaccuracy in 'therapeutic' ultrasound unit output had been made since 1962, but have tacitly been accepted, perhaps due to the universal lack of appropriate testing facilities. Factors of treatment selection subject to instrumental error include during to application, operating frequency, intensity, plus output. Metered errors in space-averaged intensity are common and are the most difficult to detect without specialised equipment which is rarely available. Couplants, essential for ultrasound transmission, can be a source of acoustic power loss if incorrectly used. Beam profiles demonstrate the rapid spatial variations in the near (Fresnel) zone, necessitating soundhead movement during treatment. Ultrasound physics must be understood, but professional integrity should demand better output testing facilities and equipment for clinical treatment.

Keywords: Physical Therapy; Ultrasonography


The use of electrical stimulation in rehabilitation is a long established procedure for the
management of a wide variety of musculoskeletal problems. This paper reviews important findings from studies on the electro-motor stimulation (EMS) of human muscles. It is particularly concerned with the results of EMS in normal subjects and in the rehabilitation setting, focusing on the stimulus parameters and training protocols used by various authors. A brief account is also given of some of the physiological effects of EMS on muscle. Attention is drawn to the urgent need for a more systematic approach to establish the optimal stimulation and training parameters. These factors must be considered when evaluating studies concerned with the efficacy of EMS-based rehabilitation programs.

Keywords: Electric Stimulation Therapy; Muscles; Rehabilitation


The efficacy of electrical muscle stimulation to restore motor function was investigated in 15 males who described prior knee surgery/injury. Persisting strength imbalance between limbs related also to reduction in cross-sectional area of the affected quadriceps, as assessed by computed tomograph of the midthigh. Subjects underwent a four-week program of daily electro-motor stimulation with repeated assessment of force production by the knee extensors, correlated with surface electromyography. Results showed no change in quadriceps cross-sectional area over the course of the study, however, significant improvements in forced production for both limbs were achieved, accompanied by alteration in motor unit activation (synchronisation) may account for the improvements, as opposed to a marked morphological contribution.

Keywords: Electric Stimulation Therapy; Electromyography; Knee Injuries; Muscles


Two studies are reported in which the elbow flexor and extensor muscle groups and the quadriceps femoris muscle group in fifteen normal female subjects were tested under voluntary and electrically stimulated conditions. The torque produced during a maximum voluntary contraction (MVC) at each of six pre-determined joint angles was compared to the torque produced in maximum tolerated contractions (MTC) by two types of electrical stimulation (conventional interferential and high voltage stimulation). Results indicated a significant difference \( p < 0.01 \) between the mean torque values produced by the MVC at all angles tested compared to the MTC. At the most favourable angle for producing an MTC, a mean torque of between 45 and 55 per cent of an MVC for the elbow flexor and extensor muscles, and 65 to 74 per cent for the quadriceps femoris muscle may be expected from both the high voltage and interferential stimulators.

Keywords: Arm; Electric Stimulation Therapy; Electromyography; Leg; Muscles


A variety of electrical stimulators were used to produce a maximum tolerable contraction (MTC) in the non dominant quadriceps femoris muscle group of 14 normal female subjects. This was compared to each subject's maximum voluntary contraction (MVC). A robotic dynamometer (Kin-
Com) was used to control and measure joint angle and isometric torque production. Results indicated considerable variation in the torque produced by each subject under the different stimulation conditions. In general there were no significant differences in the force produced by each type of stimulator. However, significant differences were observed between all MTCs and MVC. Several subjects achieved a contraction under electrical stimulation in excess of their MVC.

**Keywords**: Electric Stimulation Therapy; Electromyography; Leg; Muscles


No acceptable scientific explanation has yet been found to account for the success of such remote treatments as acupuncture and connective tissue massage which do not conform to the recognised distribution of segmental reference. This paper is the result of clinical observations over the past seven years, revealing previously unsuspected effects from applying various treatments to the area of the sympathetic dorso-lumbar outflow for a wide variety of painful conditions. An hypothesis is offered which may account for those remote effects hitherto poorly understood.

**Keywords**: Alternative Medicine; Pain; Spine


Some of the claims for the effects, and mechanisms for the relief of pain of spinal origin, which have been attributed to spinal manipulative therapy are reviewed. Most of these are still to be adequately investigated experimentally; the few which have been specifically investigated have not been supported.

It is hypothesised that an effective, albeit often temporary, decrease in patients' perception of pain may be a result of two ordered events. The first is inhibition of reflex muscle contraction which is maximally mediated by joint afferents with end of range passive joint movement. The second is a hysteresis effect for neural discharge in joint afferents which may be produced with maintained or repetitive end of range passive joint movement.

**Keywords**: Analgesia; Manipulation, orthopedic; Pain; Spine


The phenomenon of shoulder pain of cervical origin being reproduced on shoulder movement is clinically recognised. The action of the shoulder girdle muscles is a hypothetical cause of the cervical stress.

This study examined the mode and degree of levator scapulae activity during shoulder activity. Electromyography and x-ray were used to measure levator scapulae activity and length. The results of the study show that levator scapulae contracts concentrically during the first 90 degrees of shoulder abduction and eccentrically during the second 90 degrees.

The action of levator scapulae may be responsible for the application of force on the cervical spine during shoulder abduction. This force might cause cervical joint tissue distortion and pain if a pathological state was present.

**Keywords**: Cervical Vertebrae; Pain; Shoulder

Considerable concern has been expressed about the effect of respiratory therapy on intracranial pressure (ICP) in the acute stage of head injury. A study was performed to evaluate the effects of respiratory therapy techniques on the level of ICP in neurosurgical patients. Twenty subjects were studied in both the paralysed and non-paralysed states. Their intracranial pressures were monitored during periods of no treatment (the control), during the application of individual respiratory techniques and during a complete respiratory treatment. Analyses revealed that total treatment time is a crucial factor in the level of ICP. Patients with a high resting ICP are more vulnerable to large increases, prolonged manual hyperinflation raises ICP level and suctioning, in particular, causes dramatic increases in ICP.

Keywords: Head Injuries; Intracranial Pressure; Respiratory Therapy; Respiration


Thirty-two Western Australian shearers were surveyed in 1984 to determine the incidence of back problems. It was found that twenty-nine (90 per cent) of the respondents surveyed either currently had back pain, or had suffered from back pain recently. The pain was almost exclusively of an intermittent nature, suggesting a mechanical problem. Most respondents had sought medical help for their problem. Very few shearers had been seen by physiotherapists in country areas. Shearing involves bending, twisting, lifting and dragging. It is considered that the heavy physical demand and static postures during the shearing process bear a strong relation to the incidence of back pain among shearers. A recently developed device called a 'Warrie Back Aid' was used by five of the respondents, who all reported considerable symptomatic relief.

Keywords: Backache; Posture; Spine


Advance planning and preparation for retirement organisation are necessary for transitional ease, so that ageing persons are accepted as a normal and necessary community resource. Ageing people with increased leisure time perform useful voluntary work in which opportunities exist for study, activities and participation in mutual support groups. The needs of ageing people are similar to those of everyone but with some ergonomic intervention to supplement physical deficits. The interface between these needs and existing community caring service is considered.

Adequate housing, accessibility to town facilities and transport, mobility and mental function, including decrements, are discussed. Recommendations are made for unification and funding of existing and desirable support services for ageing people. Inventories and check lists are included in the Appendices.

Keywords: Aged; Human Engineering; Retirement

A recent overseas study tour provided an opportunity for observation of the physiotherapist as one of a team concerned with health care in the workplace. This paper presents impressions gained during visits to some overseas institutions and industries in Scandinavia and the United Kingdom. A number of roles are possible for the physiotherapist in the workplace, but the nature of the contribution made varies between countries. The special features of physiotherapy practice in some overseas industries, the practical problems faced by the physiotherapist in implementing ergonomic principles and some of the solutions devised by physiotherapists are described.

Keywords: Health Care; Human Engineering; Physical Therapy; Work


This paper aims to describe some of the current literature on work breaks and to discuss important issues related to work breaks for keyboard operators. The relationship between work breaks and fatigue is examined, as well as the relationship between fatigue and injury. From the present literature available, there is no evidence to support any particular work/rest regime to reduce fatigue. Physiological studies support the concept of short frequent pauses (micropauses) as being the most effective way of reducing neuromuscular fatigue. No universal regime will be suitable for every keyboard situation. Prescribed regimented work breaks have many disadvantages and should be avoided if possible in favour of work breaks that are spontaneous or designed into the work.

Keywords: Fatigue; Human Engineering; Repetitive Strain Injury; Work


Many of the keyboard and technical staff of a university with a large component of research activity, have presented to the Health Service with discomfort in the neck, shoulders and upper limb. A description of the university organisation is offered to suggest possible reasons for the high incidence. Strategies that were undertaken to confront the problem are presented. The advantages of prevention rather than intervention are yet again demonstrated.

Keywords: Fatigue; Human Engineering; Repetitive Strain Injury; Work


A review of current literature concerning the aetiology, diagnosis, role and involvement of physiotherapists in the treatment of repetitive strain injury (RSI) is presented as a basis for investigation. To determine the modes of treatment used by physiotherapists in the management of RSI and to analyse their efficacy, a questionnaire was designed. Forty centres were surveyed and the results are presented. Information concerning the most commonly encountered conditions, treatment given, and physiotherapists' opinions on prevention, patient education and further training in RSI management was also sought. An attempt is made to define the role of the physiotherapist in the recognition, treatment and education aspects of over-use injury, and recommendations for further research and physiotherapy involvement are presented.
Patellofemoral pain syndrome can be a difficult condition to manage effectively. The success rate of most treatment regimes has been poor and in the long term, the condition frequently recurs. The author has developed a treatment program which has a 96 per cent success rate. Long term follow up of patients after 12 months demonstrated that all patients reviewed have remained pain free. The program involves two major components: a thorough understanding of the mechanics of the patellofemoral joint so that an adequate assessment of the patent’s lower limb can be made, and context specific training of certain muscles which contribute to patellar alignment. This training must be relatively pain free so that muscle control can be enhanced.

Keywords: Knee; Leg; Pain; Patella

An outline is given of the possible effect passive movement has on pathological conditions involving cervical nerve roots in order to cause a resolution of the condition. Techniques for the treatment of arm pain conditions such as repetitive strain injury (RSI), which are accompanied by signs of abnormal brachial plexus tension, are described. The techniques are outlined in order to give the clinician further insight into an understanding of cervical nerve root conditions and an increased range of treatment choice.

Keywords: Arm; Brachial Plexus; Pain; Repetition Strain Injury

In 1983, during the winter Saturday afternoon season at the Western Australian Matthews Netball Centre, 3108 players participated in the netball competition. The study examines the incidence of netball injuries and conditions related to these injuries. One hundred and fifty eight injuries were surveyed throughout this 14 week season. Each injured player filled in the first two pages of the questionnaire; the final page was filled in by the physiotherapist. Data was compiled and processed using the SPSS systems file including frequencies and cross tabulations. Many statistically significant results were recorded and recommendations for further investigation are included.

Keywords: Sports; Sports Medicine; Wounds and Injuries

Research in physiotherapy often necessitates measurement of the intensity of clinical pain. Numerous methods have been devised and recommended for this purpose. However, many are time consuming and unnecessarily complex both to carry out and analyse. The absolute visual analogue scale (AVAS) is a simple and adequate measure of pain intensity.

Keywords: Fatigue; Human Engineering; Repetitive Strain Injury; Physical Therapy


The female-dominated professions in health care are not as powerful as the male-dominated medical profession. This paper suggests that the key factor in shaping the discrepancies in pay, status and power between medicine and the female-dominated professions is gender. It is argued that physiotherapy developed as a profession for middle-class women and that family responsibilities continue to take priority over professional responsibilities for the majority of physiotherapists. Physiotherapy enjoys higher occupational prestige than social work, speech therapy, occupational therapy and nursing and it is suggested that physiotherapy has achieved this status through recruitment of women from middle and upper middle class backgrounds. The history of physiotherapy is the history of a middle class feminine profession.

Keywords: Career Choice; Physical Therapy; Women
Volume 33. 1987


The main aim of this study was to monitor changes in joint flexibility over 24 hours in 25 subjects. Measurements of finger tip to floor, lumbar flexion, lumbar extension, passive straight leg raising and glenohumeral lateral rotation at 90 degrees abduction were taken every two hours during the 24 hour cycle.

The presence of circadian rhythms in flexibility were established by graphic analysis of the results. These were shown to exist in all measurements, the most strong being finger tip to floor the most weak glenohumeral lateral rotation.

The study also investigated grip strength over 24 hours and disclosed a circadian pattern in which there was a considerable fall in strength during the early hours and rapid rise after 0600 hours.

Keywords: Circadian Rhythm; Hand; Joints


To determine the nature of the postural changes in women during pregnancy, the degrees of lordosis, kyphosis and pelvic inclination in 34 pregnant women were measured progressively. The incidence of low back pain at each of the three occasions was also monitored. Analyses revealed that significant increases occurred in the lumbar and thoracic curvatures and that 82 per cent of the women experienced back pain at some stage during their pregnancy. However, no significant relationship was revealed between posture and back pain and the study did not support the frequently made assertions that back pain in pregnancy is due to an increase in lordosis.

Keywords: Backache; Lordosis; Posture; Pregnancy


Knowledge of the activities performed by managers forms the basis for management training yet little is known of tasks performed by managers in the health service. A study was performed to identify the managerial role of three physiotherapists randomly selected from eleven physiotherapists in charge of large hospital departments who had taken part in a previous study to establish a profile of perceived tasks.

Analysis revealed that the key roles of resource allocator, monitor and leader were similar to other middle managers, verbal contacts were typical of managers at all levels and clinical work caused role ambiguity.

The study indicated areas where the head physiotherapist's performance could possibly be improved together with suggestions for management training and the selection of future head physiotherapists.

Keywords: Administrative Personnel; Health Occupations; Hospital Department; Physical Therapy

The use of functional electrical stimulation (FES) in the treatment of neurological conditions has an extensive history, one that has seen great advances in recent years. Developments in this area of rehabilitation are outlined and avenues for future research and clinical study suggested. The application of FES to the neurological patient may be of considerable benefit alongside conventional facilitatory/inhibitory techniques. The physiotherapist is ideally placed to participate in studies of this modality to determine its role in clinical practice.
Keywords: Electric Stimulation Therapy; Extremities; Neurology; Rehabilitation


The interest in electro-motor stimulation as a strengthening modality has promoted many recent studies. Unfortunately, ambiguity rather than clear directions for future research and clinical practice have emerged. Problems are identified with strength testing methods and in non-standardisation training programs and stimulus parameters, suggesting the need for minimum requirements when reporting these studies. It is hoped that suggestions presented in this paper will result in more careful research designs, improved inter-study comparison and more appropriate clinical protocols.
Keywords: Electric Stimulation Therapy; Electromyography; Research


The estimation of muscle cross-sectional area (CSA) by anthropometric measurements is insensitive for objective clinical research. However computed tomography (CT) enables specific muscle imaging for accurate CSA determination. This study, involving 15 males with previous knee injuries, examined the repeatability of bilateral CT in calculating mid thigh muscle densities (Hounsfield units: HU) and quadriceps atrophy. Significant differences between limbs in strength (p < 0.0001), CAS (p < 0.001) and HU (p < 0.05) were observed. Prior to a four week electro-motor stimulation (EMS) program, a significant correlation between force and quadriceps CAS existed which diminished over time. Neurogenic contributions to improved strength were demonstrated in the absence of increased CSA. These data suggest CAS is no a reliable predictor of strength potential in atrophic muscle. Computed tomography scanning provides an accurate, repeatable method for standardised tissue density and muscle CAS assessment.
Keywords: Anthropometry; Knee Injuries; Muscles


To develop Australian normative data for ankle invertors and evertors, 40 subjects aged between 18 and 34 years were tested using Cybex II. Issues examined were the relationships between body weight and peak torque, peak torque values of evertors/invertors at specific velocities, and body weight and endurance. Mean absolute peak torque values at specific velocities and percentage changes in endurance performance at 120 degrees/sec were established. Results showed a significant correlation between body weight and absolute peak torque. Sex had a significant effect on these values. The ration evertors/invertors had significant linearity with the test velocities.
indicating a constant ratio of these muscles irrespective of velocity. No significant relationship was found between body weight and endurance.

Keywords: Ankle; Kinetics; Psychomotor Performance


A study of the degree of accessory movements available in the sternoclavicular and acromioclavicular joints as a result of passive movement is presented. Using the common terms of hypomobility, normal and hypermobility and defining another set of terms - the pure, mixed and heterogenous triplets - findings based on a sample of 64 children indicate that the sternoclavicular joints, in comparison to the acromioclavicular joints, are decisively less mobile; are more uniformly constrained in their linear motions along the relevant anatomical planes; and exhibit a higher degree of left/right symmetry.

The significance of these findings both from the biomechanical and clinical aspect is discussed.

Keywords: Clavicle; Joints; Shoulder


A diagnostic model for understanding the group of patients described as having repetitive strain injury (RSI) is outlined.

Five diagnostic categories are suggested together with guidelines for the management of each group. The importance of viewing the patients in category 5, 'Non-Specific Regional Pain', as chronic pain patients is emphasised, together with the more detailed description of their management.

Keywords: Human Engineering; Pain; Repetitive Strain Injury


Responses to a survey comparing the background and career attitudes of incoming physiotherapy students in 1976 and 1986 indicated that female students in 1986 were more ambitious, more committed to full time careers, attached greater importance to professional recognition, pay and promotion, had more egalitarian attitudes toward women's role, had fewer romantic attachments and wanted fewer children. Responses of male students in 1986 revealed that they were older than women students, were somewhat more ambitious and conservative and were more concerned with their surrounding and freedom at work.

Keywords: Career Choice; Physical Therapy; Students


Neurological assessment at preterm age of 105 infants born at < 34 weeks gestation is discussed. The development of the asymmetrical tonic neck reflex (ATNR) was studies. There was no consistent post-menstrual age at which the seven allocated grades occurred. The diagnostic
The significance of the preterm ATNR response for motor development (until 2 years) was considered. The incidence of an imposable reflex dominating spontaneous movement was significantly different \( (p < 0.001) \) in the normal \( (n = 89) \) versus the abnormal development group \( (n = 16; 13 \) having spastic cerebral palsy). The inclusion of observation of the quality of movement for this reflex could provide useful information in neurological assessment of preterm infants.

**Keywords:** Cerebral Palsy; Infant, premature; Neurology; Pediatrics


Although many factors have been thought to contribute to the development of minimal cerebral dysfunction (MCD), the aetiology of the condition has not been clearly specified. The existence of MCD can be associated with behavioural, emotional or educational problems, so that control of contributing factors can have important implications for the child.

As part of a broad study of MCD carried out in the Department of Physiotherapy, University of Queensland, historical data were collected for 1,020 children who attended the MCD clinic. A comparison of the incidence of each of these factors with that in the normal population, highlighted a number of features which could bear further study.

**Keywords:** Attention Deficit Disorder; Behavior; Child Development


Diathermy is a common treatment modality used to relieve pain through localised heating. This paper briefly discusses the mechanisms through which heat is generated in tissue and the absorption characteristics of the applied electromagnetic radiation. The adverse effects of this radiation are reviewed with particular emphasis on the current exposure limits for operators and non-patients in the vicinity of diathermy devices.

The newly introduced codes of practice for the 'Safe Use of Shortwave (Radiofrequency) and Microwave Diathermy' are also discussed.

**Keywords:** Diathermy; Heat; Pain


This article describes the comprehensive assessment of the peripheral circulation. With greater understanding of haemodynamics and the mechanisms of circulatory dysfunction associated with disease and normal processes such as ageing, physical therapists are in a better position to assess and treat circulatory impairment. Since adequate circulation is fundamental to function, circulatory assessment is an integral component of any assessment regardless of whether vascular dysfunction is a primary problem. Some tests that are performed in peripheral vascular laboratories are described, as well as those tests that can easily be performed by therapists. The interpretation of the results of these tests and the implications for more rational physical therapy treatment are described.

**Keywords:** Blood Circulation; Haemodynamics; Physical Therapy

This paper looks at the development and implementation of a course, Coordinated Rehabilitation, given in the final year of an existing three year BSc curriculum in physical therapy. Preparatory developmental planning for the unit included a review of problem areas in medical curricula and the use of a content grid which facilitated integration of the course into the curriculum. Results of the grid, which gave information about the depth and sequence of material already covered, formed the basis of the course content. The objectives, structure and evaluation procedures are described, as well as the teaching strategies and learning activities selected for the students. The paper ends with a summary of students’ reactions to the course.

Keywords: Education; Physical Therapy; Students


This paper addresses the kinds of decisions physiotherapists in Victoria are making about their clients, including those presenting with referral and those presenting to the physiotherapist as first contact. A survey of private practitioners provided data concerning the incidence of primary contact practice and the source and content of medical referrals.

The incidence of primary contact practice and the management of these clients is documented and discussed with respect to the physiotherapists’ referral relationship with medical practitioners. Medical referrals are described and the physiotherapists' compliance with treatment prescription is discussed. Implications for optimal decision-making are discussed in relation to biased choice.

Keywords: Career Choice; Clinical Protocols; Physical Therapy; Private Practice


Sixty-four children with minimal cerebral dysfunction (MCD) were studied to evaluate the effectiveness of using a developmental physiotherapy approach to treatment. Assessments of the children's performance in major areas of neurological development were made initially and after six months. In addition, a twelve months assessment allowed a determination of whether early progress was maintained after cessation of treatment.

Analyses of results revealed that physiotherapy treatment does ameliorate the neurodevelopmental programs seen in children with MCD, and that beneficial effects are well established after six months. On cessation of treatment, the children maintained the better level of functioning for a further six months in comparison to the control group. Resolution of neurological problems after a relatively brief period of physiotherapy justifies this form of intervention for children with MCD.

Keywords: Attention Deficit Disorder; Behavior; Child Development; Neurology


With an ageing Australian population, exercise programs for the elderly and frail elderly are becoming increasingly more important. It is suggested that gentle water exercise is the most appropriate form of activity for frail elderly, and therefore, a pilot program was conducted and evaluated. The results show a statistically significant positive increase on a scale of affect on a pre-and post-program questionnaire ($f = 7.35, p < 0.05$).
Participants also reported other benefits from the program. While no objective physical measurements were made, the psychological benefits of the program were identified as important factors motivating the frail elderly to commence, and maintain, regular physical activity, and ultimately be more independent in activities of daily living.

**Keywords:** Aged; Exercise; Frail Elderly; Hydrotherapy


Nineteen healthy volunteers each received six, five-minute ultrasound treatments at sonation intensities of 0.0, 0.5, 1.0, 1.5, 2.0 and 2.5 W/cm², applied along the proximal forearm segment of the ulnar nerve, over an area of approximately 4.5 times the area of the ultrasound application head. Sensory and motor nerve conduction velocities responded similarly, but not identically to ultrasound. All clinical intensities, with the exception of 0.5 W/cm² (< 0.10), were associated with significantly increased velocities. Subcutaneous tissue temperatures were directly related to sonation intensity, although significantly increased temperatures were not observed until 1.5 W/cm² intensity was used. The effectiveness of clinical applications of ultrasound in pain relief cannot be attributed to a decrease in nerve conduction velocity of the faster conducting A-fibres, which are evaluated using standard nerve conduction techniques.

**Keywords:** Neural Conduction; Pain; Ultrasonography


The past decade in Australia has witnessed the expansion of graduate diploma programs designed for the practising clinician and it seemed timely to assess the effects of this type of post-graduate education. The objective of this study was to compare the clinical behaviour, defined as time allocation between different assessment and treatment procedures, of 16 generalist physiotherapists and 16 manipulative therapists.

The results indicated some significant differences in the treatment choices and time allocation between qualifications groups, as well as some sex based differences. The implications of the finds are discussed with reference to decision making in clinical practice and the development of higher order clinical decision rules.

**Keywords:** Clinical Competence; Decision Making; Private Practice

Continuous foetal heart rate traces were made in 26 low risk patients during static maternal exercises in the supine position, as prescribed in a hospital's antenatal education program. Prior to exercise, foetal heart rate abnormalities were present in four patients. Three of these had an abnormal foetal outcome. During the exercises a further eight cases had reductions in foetal heart rate, variability or reactivity. An abnormal foetal outcome was recorded in two of these cases. The findings indicate uncertainty about the safety of antenatal exercises in the supine position in late pregnancy and, until further studies are available, it is prudent to advocate the practice of all antenatal exercises in a tilted position, and not at all where foetal compromise is suspected. Keywords: Exercise; Fetal Heart; Heart Rate, fetal; Prenatal Care


Methods of electrical stimulation of bone are reviewed for a comparison with the use of interference currents and for a consideration of the possible merits of various methods. A summary is given of results of treatment of 38 patients with delayed or non-union and predisposition to non-union, and the technique used with interferential therapy is described in detail. Results are also given of a study of the effects of stimulation on 11 patients with acute fractures of the tibial shaft, compared with 11 closely matched patients with similar acute fractures who did not receive interferential therapy. The advantages of surgically non-invasive techniques are emphasised and recommendations are made for the use of interference currents prophylactically in specific cases. Keywords: Bone and Bones; Electric Stimulation Therapy; Fractures


Form A of the Attitude Toward Disabled Persons (ATDP-A) scale was used to discover whether physiotherapy students distinguish between personal and professional attitudes toward people with disabilities. Forty fourth-year students successively completed two copies of the ATDP-A scale, one with their professional views. A two-tailed t-test for correlated samples showed that the mean professional score was significantly greater (p < 0.05) than the mean personal score. Results are discussed in terms of inconsistencies in the research literature as well as implications for physiotherapy training programs. Keywords: Attitude of Health Personnel; Handicapped; Students


The role of physiotherapy in the neonatal intensive care unit has historically been mainly associated with the care of the neonate's lungs. Postural drainage coupled with percussion, vibrations and suction are all used in the physiotherapy management of neonatal respiratory disorders. At Monash Medical Centre all elective extubations are performed by the physiotherapist in accordance with the neonatal unit's protocol: this includes four hourly respiratory physiotherapy for the first 24 hours.
after extubation to ensure that post-extubation atelectasis does not occur. In addition to respiratory care, the physiotherapist is also engaged in the assessment and management of neonates with either neurological or musculoskeletal disorders.

**Keywords**: Infant, newborn; Lungs; Respiration Disorders


Stereotypes of therapists were found to contain a 'kernel of truth' in a survey comparing the active and passive leisure pursuits of female physiotherapy (N = 100) and occupational therapy (N = 107) graduates and undergraduates. Physiotherapists had relatively more active leisure patterns as adolescents and undergraduates. Occupational therapists and relatively passive leisure patterns that persisted after graduation. These findings support the spillover hypothesis of work-leisure relationship. Following graduation physiotherapists adopted more passive leisure pursuits which supports the compensation theory of leisure. However, physiotherapy graduates felt deprived of sport and experienced less leisure satisfaction than occupational therapists.

**Keywords**: Occupational Therapy; Physical Therapy; Recreation


The rationale and content for an interdisciplinary communication and interpersonal helping skills program taught to third year physiotherapy students is described, noting in particular the need to integrate a general counselling model with specific interviewing and clinical skills required by physiotherapists. A program evaluation based on the participation of 97 students of several forms evaluating general and specific aspects of the program. Overall, the results were positive and supportive of the rationale and content of the program. A pre- and post-test design was used to assess outcome in terms of student priorities, results of which are discussed with reference to the measuring instrument's focus on rating os performance as distinct from specific behaviours. Directives for the future development of the program are highlighted.

**Keywords**: Education, medical; Interpersonal Relations; Professional Competence


Physiotherapists in Australia have been able to become specialists by a process of specialisation since 1982. The process was designed to achieve certain aims with the majority of the profession supporting the aim of improving quality of care. The implications of the aims for appropriate utilisation of the specialist physiotherapist in today's Australian Society are discussed and a mode of practice is proposed.

**Keywords**: Career Choice; Physical Therapy; Specialties, medical


This study assesses the differences in temperature sensitivity of skin areas. The subjects were
required to associate the water content of test-tubes with the different heat sensations. The side of
the test-tube was placed on the skin area and the temperature was matched with subject's response.
Analyses were limited to the warmth and cold sensations as generalisations can be made from these
in terms of differences in the skin areas in heat perception. In the face, the temperature associated
with warmth was significantly lower than in the forearm and the leg. This trend was different
between the three areas in terms of the cold temperatures. 
The intra-individual difference suggests that results of skin sensation tests should be interpreted
with some caution.
Keywords: Cold; Heat; Sensation; Skin


Elite hockey players of both sexes from the Australian Institute of Sport were assessed for lumbar
spine mobility, trunk flexion and back extensor muscle strength, hamstring flexibility and postural
characteristics over a two year period.
All the athletes were more mobile in rotation than the 'normal' West Australian population, and
demonstrated flexible hamstrings and powerful back extensor muscles; trunk flexion was less strong
initially, but improved after intervention in the form of a specific exercise program, over the
measurement period.
A questionnaire disclosed that low back pain is a common complaint of hockey players, but rarely
required intensive physical and medical treatment.
The term 'hockey player's back' has been coined in recognition of the long flat thoracolumbar spine
frequently noted in these subjects.
Keywords: Muscles; Spine; Sport

Hallam FM and Jull GA (1988): Evaluation of a temporary prosthetic insert in the
rehabilitation of elderly ischaemic below-knee amputees: A pilot study. *Australian Journal of
Physiotherapy* 34: 133-138.

The physiotherapy management of elderly, ischaemic below knee amputees is often compromised
by delayed and/or complicated wound healing. Such patients are often unable to ambulate on a
prosthesis for prolonged periods. Problems concomitant with immobilisation such as weakness,
contractures, and decreased morale tend to arise. This pilot study investigated the efficacy of
incorporating a shaped Dunlopillo insert into a temporary prosthetic socket to allow the at risk
group to ambulate as soon as the sutures were removed regardless of the state of wound healing.
Two parameters were evaluated, namely would healing and stump maturation. A total of eighteen
subjects were observed in a control and an experimental group. Both would healing ($p < 0.05$) and
stump maturation ($p < 0.05$) were significantly enhanced by the inclusion of a Dunlopillo insert.
Keywords: Aged; Amputation; Prosthesis

Herbert R (1988): The passive mechanical properties of muscle and their adaptations to

The length and stiffness of a relaxed muscle are determined by the mechanical properties of its
intramuscular connective tissues and/or intracellular structures. Viscous deformation of these
components of muscle is responsible for the increase in muscle length seen immediately after
stretching, but this increase is transient. Lasting changes in muscle length can only be brought about
by adaptations of the structure of muscle. An understanding of the nature of the stimulus for muscle to adapt can provide therapists with a theoretical basis for therapeutic intervention aimed at producing changes in muscle length.

Keywords: Biomechanics; Connective Tissue; Muscles


The effect of different training intensities of electro-motor stimulation (EMS) on strength gains produced in the quadriceps femoris muscle group was investigated. Twenty-four subjects were randomly assigned to one of three groups: Control (C), Low Intensity (LI) trained at 25 per cent of their maximum voluntary isometric contraction (MVIC), and High Intensity (HI) trained at 50 per cent of MVIC. Results indicated a significant strength improvement in both training groups (P<0.01) following a three week EMS training program. The HI group showed significantly greater strength gains (48.5 per cent) than the LI group (24.2 per cent) (p < 0.01). A significant carry-over effect was also demonstrated in a three-week follow-up period, specifically in the HI group. Positive isokinetic strength changes in the concentric mode were observed in both training groups. In addition, a significant cross transfer effect was demonstrated in the contralateral homologous muscle group (p < 0.01) for both HI and LI groups.

Keywords: Electric Stimulation Therapy; Kinetics; Muscles


Scheuermann's disease (or more correctly, spinal osteochondrosis) is not confined to the thoracic spine: all parts of the spine may be affected. Major signs are endplate irregularity, more than 5 degrees vertebral wedging, and sagittal overgrowth. Minor signs are Schmorl's nodes, anterior flattening of the vertebral endplate, and anterior detachment of a ring apophysis. Symptoms are of little diagnostic value. Scheuermann's affects 20 per cent to 30 per cent of the population; males and females equally.

A hereditary predisposition is a major factor in the aetiology of Scheuermann's disease. There is evidence that this condition follows an autosomal dominant pattern of inheritance.

Treatment consists of either exercises; bracing and exercises; or in very severe cases, surgery.

Keywords: Osteochondritis; Scheuermann’s Disease; Spine


In recent years there has been a considerable change in the skills and qualifications necessary for faculty members in physiotherapy schools. The focus has shifted considerably from a primary emphasis on the clinical ability of all staff, toward the more universal scholastic goals of research, grants, publications, consultancies and teaching skills. From an absolute reliance on medical research, physiotherapy has had to learn how to go about its own research and apply it directly to treatment modalities and clinical programs.

These changes have had a profound and direct effect on the faculty of physiotherapy schools, while the profession as a whole struggles to come to terms with the change. As is the case in other long established professions, physiotherapy is learning to prize scholastic advancement and research as
much as clinical excellence.

Keywords: Clinical Competence; Education, medical; Physical Therapy; Research


The importance of developing a curriculum which satisfies the broad objectives of professional education has been recognised widely. The balance between enhancing scholarship and developing vocational skills, the importance of relevant evaluation of the curriculum, students and teachers and the place of research in current professional education are all matters worthy of consideration by those responsible for professional education. This paper reflects upon the historic attitudes to education and traces the changes in approach which have been necessary to ensure the provision of appropriate learning experiences for students seeking a professional education today.

Keywords: Education, medical; Physical Therapy; Research


This paper reviews some of the literature which relates to physiotherapy clinical supervision. It explores the attitude of therapists to the role of student supervisor and their level of preparedness. Some behaviours for facilitating effective clinical supervision from recent studies of student preferences are presented. Appropriate models of the supervision process for physiotherapy students are given and a grid model is suggested as a possible method of simplifying and evaluating the complex and varied learning environments, interpersonal relationships and behaviours which occur in physiotherapy clinical placements.

Keywords: Clinical Competence; Education; Physical Therapy


The transition from preclinical to clinical education can provoke stress in students. This paper describes the nature of stress and outlines the use of a 'clinical coping workshop' at the University of Queensland, to identify and examine the particular stresses on physiotherapy students facing this transitional experience. Much of the stress experienced by students relates to the new behavioural responses required of them. It is suggested that negotiating an acceptable contract, relating to student and tutor behaviour as much as to educational outcomes, can be helpful and is applicable in the clinical environment. Mutual expectations need to be openly shared in this process.

Keywords: Education, medical, undergraduate; Stress; Students, medical


Behaviour therapy is not used to a great extent in the physiotherapy management of chronic low back pain; yet the clinical research literature indicates that behavioural techniques may assist the maintenance of treatment gains.

Two questionnaires were devised for hospital-based physiotherapy graduates to assess knowledge of behaviour therapy techniques and their relevance to physiotherapy management of the patient with chronic low back pain. Third-year undergraduate physiotherapy students who had just
completed their behaviour therapy course at Cumberland College of Health Sciences, constituted the comparison group. Results showed that the graduates and physiotherapy students had comparable levels of knowledge. Both groups believed that the physiotherapist's use of behaviour therapy techniques was primarily for the purposes of improving the patient's daily activity and muscular state.

Physiotherapy training for the management of this difficult patient group is discussed. Keywords: Behavior Therapy; Education, medical; Health Occupations

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