Paper Reference	Last Name	First Name	Speakers Paper Title	Speakers Theme Description	Session Description
TIS01	Butler	David	The Virtual Hand in the Brain	Therapy - The Virtual Hand	Therapy - The Virtual Hand
TIS02	Finniss	Damien	Complex Regional Pain Syndrome – Concepts of Rehabilitation	Therapy - Complex Regional Pain Syndrome	Therapy - Complex Regional Pain Syndrome
TIS03	Schultz-Johnson	Karen Sarah	The Stiffness Debate - Static Progressive Splinting: A Powerful Tool Against Stiffness	Therapy - The Stiffness Debate	Therapy - The Stiffness Debate
TIS04	MacDermid	Joy	THE STIFFNESS DEBATE	Therapy - The Stiffness Debate	Therapy - The Stiffness Debate
TIS05	Wilton	Judith	THE STIFFNESS DEBATE	Therapy - The Stiffness Debate	Therapy - The Stiffness Debate
TIS06	Morrin	Judith	ACTIVE MOTION : THE PRE-EMINENT MOBILIZER OF STIFF JOINTS - THE STIFFNESS DEBATE	Therapy - The Stiffness Debate	Therapy - The Stiffness Debate
TIS07	Harvey	Lisa	The stiffness debate: mobilizing with active motion only	Therapy - The Stiffness Debate	Therapy - The Stiffness Debate
TIS08	Colditz	Judy	THE STIFFNESS DEBATE: MOBILIZING WITH ACTIVE MOTION ONLY	Therapy - The Stiffness Debate	Therapy - The Stiffness Debate
TIS09	Finniss	Damien	Complex Regional Pain Syndrome – Multidisciplinary Management	Therapy - Complex Regional Pain Syndrome	Therapy - Complex Regional Pain Syndrome
TIS10	Guy	Lynette	Patient-Practitioner Interactions: 'Their future is in your hands'	Therapy - Complex Regional Pain Syndrome	Therapy - Complex Regional Pain Syndrome
TIS11	Withrington	Robin	PHARMACEUTICAL MANAGEMENT OF COMPLEX REGIONAL PAIN SYNDROME	Therapy - Complex Regional Pain Syndrome	Complex Regional Pain Syndrome
TIS12	Butler	David	CRPS -Virtual Body Exercises	Therapy - Complex Regional Pain Syndrome	Therapy - Complex Regional Pain Syndrome
TIS13	Hareau	Janine	Treating CPRS: Some ¨Less¨ Conventional Ideas	Therapy - Complex Regional Pain Syndrome	Complex Regional Pain Syndrome
TIS17	Withrington	Robin	CRPS - Panel Discussion	Therapy - Complex Regional Pain Syndrome	Complex Regional Pain Syndrome
TIS18	Hareau	Janine	CRPS - Panel Discussion	Therapy - Complex Regional Pain Syndrome	Complex Regional Pain Syndrome
TIS19	Gwillam	Lynda	OUTCOME MEASURES FOLLOWING SURGERY TO THE RHEUMATOID HAND	Therapy - Arthritis And Joint Replacement	Arthritis and Joint Replacements
TIS20	Massy-Westropp	Nicola	EVIDENCE FOR CONSERVATIVE INTERVENTIONS FOR INFLAMMATORY ARTHRITIS OF THE HAND	Therapy - Arthritis And Joint Replacement	Arthritis and Joint Replacements
TIS21	Artzberger	Sandra	MANUEL EDEMA MOBILIZATION (MEM). EDEMA REDUCTION FOR SUB-ACUTE HAND ARM EDEMA: EXPLORING PHYSIOLOGICAL RATIONALE, RESEARCH, TECHNIQUE AND CLINICAL APPLICATION	Thereapy - Manual Oedema Mobilisation	Workshop 1 - Manual Oedema Mobilisation
TIS21	Priganc	Victoria	MANUEL EDEMA MOBILIZATION (MEM). EDEMA REDUCTION FOR SUB-ACUTE HAND ARM EDEMA: EXPLORING PHYSIOLOGICAL RATIONALE, RESEARCH, TECHNIQUE AND CLINICAL APPLICATION	Thereapy - Manual Oedema Mobilisation	Workshop 1 - Manual Oedema Mobilisation
TIS21	Rønhøj	Karin Knygsand	MANUEL EDEMA MOBILIZATION (MEM). EDEMA REDUCTION FOR SUB-ACUTE HAND ARM EDEMA: EXPLORING PHYSIOLOGICAL RATIONALE, RESEARCH, TECHNIQUE AND CLINICAL APPLICATION	Therapy - Outcome Measurements	Workshop 1 - Manual Oedema Mobilisation
TIS22	Jerosch-Herold	Christina	SENSIBILITY UPDATE WORKSHOP	Therapy - Sensibility Update	Workshop 2 - Sensibility Update
TIS22	Rosen	Birgitta	SENSIBILITY UPDATE WORKSHOP	Therapy - Sensibility Update	Workshop 2 - Sensibility Update
TIS23	Cunningham	Ben	MANAGEMENT OF INTRA-ARTICULAR JOINT FRACTURES USING EARLY ACTIVE MOVEMENT AND THE DYNAMIC TRACTION SPLINT	Thereapy - Dynamic Traction Splinting for Intra Articular Fractures	Workshop 4 - Dynamic Traction Splinting for Intra Articular Fractures
TIS24	Chinchalkar	Shrikant	PATHOMECHANICS OF DEFORMITIES IN RA WRIST AND HAND	Therapy - Pathomechanics of deformities in the wrist and hand with rheumatoid arthritis	Workshop 3 - Pathomechanics of deformities in the wrist and hand with rheumatoid arthritis

TIS25	Herbert	Rob	Ten steps to enlightenment	Therapy - Research	Therapy - Research
TIS26	Ada	Louise	Ten points to remember when writing up a clinical trial	Therapy - Research	Therapy - Research
TIS27	Green	Sally	Using and Doing Cochrane Systematic Reviews Relevant to Hand Therapy	Therapy - Research	Therapy - Research
TIS28	Flowers	Ken	BIOMECHANICS OF THE WRIST	Therapy - Wrist Instabilities	Wrist Instabilities
TIS29	Herbert	Tim	WRIST INSTABILITY	Therapy - Wrist Instabilities	Wrist Instabilities
TIS30	Prosser	Rosemary	THERAPEUTIC MANAGEMENT OF CARPAL INSTABILITIES	Therapy - Wrist Instabilities	Wrist Instabilities
TIS32	Whiteley	Rod	Invited presentation - title to be confirmed	Therapy - Elbow & Sports Injuries	Elbow & Sports Injuries
TIS34	Blackmore	Susan	MANAGEMENT OF DISTAL BICEPS AND TRICEPS RUPTURES	Therapy - Elbow & Sports Injuries	Elbow & Sports Injuries
TIS35	Ackermann	Bronwen	Focal Hand Dystonia in Musicians. An Application of Psychophysics to Assess Left Hand Movement in Cellists	Therapy - Occupation & Musician's Injury	Therapy - Occupation & Musician's Injury
TIS36	Butler	Katherine	FOCAL HAND DYSTONIA AFFECTING MUSICIANS: AN OVERVIEW OF CURRENT TREATMENT TECHNIQUES	No Theme Allocated	Occupational And Musicians Injuries
TIS36a	MacDermid	Joy	Validation of Scales - Therapy	Therapy - Outcomes	Outcomes
TIS37	Li-Tsang	Cecilia	OUTCOMES, EFFICACY AND EVIDENCE BASED PRACTICE IN HAND THERAPY	Therapy - Outcomes	Outcomes
TIS38	Boland	Robert	Accuracy of Phalen's and Sensory Testing in Diagnosis of Carpal Tunnel Syndrome	Therapy - Nerve Injuries	Therapy - Nerve Injuries
TIS39	Thomas	Dominique	APPLICATION OF NEUROMUSCULAR ELECTRICAL STIMULATION IN HAND THERAPY: RATIONALE, INDICATIONS AND APPLICATIONS	Therapy - Nerve Injuries	Nerve Injuries
TIS40	Lanzetta	Marco	THE INTERNATIONAL REGISTRY ON HAND AND COMPOSITE TISSUE TRANSPLANTATION: FUNCTIONAL RESULTS OF THE WORLD EXPERIENCE ON HAND ALLOGRAFTS	Therapy - Major Trauma	Major Trauma
TIS40A	Urso	Graziella	Rehabilitation in Hand Transplantation	Therapy - Major Trauma	Major Trauma
TIS41	van Velze	Corrianne	THE SEVERELY INJURED HAND - A HAND THERAPIST'S CHALLENGE	Therapy - Major Trauma	Major Trauma
TIS42A	Flowers	Ken	Clinical Examination of the Wrist: EXAMINATION AND PROVOCATIVE TESTING OF THE RADIAL SIDE OF THE WRIST	Therapy - Clinical Examination Of The Wrist	Workshop 5 - Clinical Examination Of The Wrist
TIS42B	Prosser	Rosemary	Clinical Examination of the Wrist: The Midcarpal Joint	Therapy - Clinical Examination Of The Wrist	Workshop 5 - Clinical Examination Of The Wrist
TIS42C	Berthe	Alain	CLINICAL EXAMINATION OF THE WRIST: The Ulnar side of the wrist	Therapy - Clinical Examination Of The Wrist	Workshop 5 - Clinical Examination Of The Wrist
TIS43	Whiteley	Rod	Throwing Injuries To The Elbow – Differential Diagnosis And Management Common Pitfalls	Workshop 6: Throwers' Elbow	Workshop 6: Throwers' Elbow
TIS44	Wilton	Judith	TORQUE TRANSMISSION SPLINT - RADIAL NERVE PARALYSIS	Therapy - Splinting for Radial Nerve Palsy -No Strings Attached!	Workshop 7 - Splinting for Radial Nerve Palsy -No Strings Attached!
TIS45	Allingham	Craig	Shoulder Rehabilitation - Activity, Exercise or Training?	Shoulder	Shoulder
TIS46	Werman	Joel	Scapular Dyskinesia	Shoulder	Shoulder
TIS47	Ginn	Karen	EMG Investigations into Dynamic Shoulder Stability and the Validity of "Supraspinatus" Tests	Shoulder	Shoulder
TIS48	Chinchalkar	Shrikant	PATHOMECHANICS AND MANAGEMENT OF COMPLICATIONS FOLLOWING FLEXOR TENDON REPAIR	Therapy - Therapy For Tendon Repairs	Therapy Following Tendon Surgery
TIS49	Rouzaud	Jean-Claude	EXTENSOR LESION : DYNAMIC VERSUS STATIC SPLINTING	Therapy Following Tendon Surgery	Therapy Following Tendon Surgery
TIS50	Frampton	Victoria	THE ROLE OF THE EXTENDED SCOPE PRACTITIONER IN RHEUMATOLOGY	Therapy - Free Papers	Free Papers

TIS51	Colditz	Judy	CLINICAL EXAMINATION OF LUMBRICAL AND INTEROSSEOUS MUSCLE TIGHTNESS	Therapy - Intrinsic Muscle Testing	Workshop 8 - Intrinsic Muscle Testing
TIS52	Merry	Cathy	Low-tech therapy for high-tech results	Therapy - Low Tech Therapy For High Tech Results (Practical)	Workshop 9 - Low Tech Therapy For High Tech Results (Practical)
TIS52	van Velze	Corrianne	Low-tech therapy for high-tech results	Therapy - Low Tech Therapy For High Tech Results (Practical)	Workshop 9 - Low Tech Therapy For High Tech Results (Practical)
TIS54	Gandfors	Megan	DYNAMIC ROTATION ASSIST SPLINT	Therapy - Splinting 3	Workshop 11 - Splinting 3
TIS54	Van Lede	Paul	DYNAMIC ROTATION ASSIST SPLINT	Therapy - Splinting 3	Workshop 11 - Splinting 3

TIS01

The Virtual Hand in the Brain

David Butler

Noi Group, Adelaide, Australia

Rehabilitation practice is based upon a set of paradigms such as biomechanics, motor control and pathoanatomy, which evolve over time in relative importance and need. Perhaps we cling to some for too long for political and personal reasons. Professional conceptual change is not easy.

This presentation is about the paradigm of representation or neuromatrix, using the hand and its representations in the brain as an example. It is argued that representation should be a critical paradigm when rehabilitation involves altered pain states, although it is applicable to other coping systems such as the motor, autonomic, immune, endocrine and language systems. Despite the rapid accumulation of neuroscience knowledge exposing the limitations of current practice, paradigms shifts are slow to occur.

The function of a neurone is to represent other cells; working together they represent body parts and function. In many pain states, the neural representations of the status of body parts in the peripheral and central nervous systems may be more faulty than the tissues they serve.

The known effects of injury, disease and altered use of the hand to their brain representations are summarised and current and future possible management strategies aimed at the representation are outlined. These strategies include threat reducing neuroscience education, regaining laterality, context variable virtual body exercises and the use of mirrors.

Many questions arise and are discussed in the presentation. What does the representation paradigm tell us about existing and future clinical practice and research strategies? Can we extract novel management tools from it? Do rehabilitation professions need to adjust their declarative knowledge.? Can a new paradigm lift clinical expectation? Why do many clinicians resist change?

TIS02

Complex Regional Pain Syndrome – Concepts of Rehabilitation

Damien G Finniss 1

University of Sydney Pain Management and Research Centre, Royal North Shore Hospital, St Leonards, Sydney, NSW, Australia

Complex Regional Pain Syndrome (CRPS) is a term used to describe a variety of pain conditions that occur following an injury. There is an assortment of clinical signs and symptoms that have predominance towards the distal limbs. The pathophysiology of CRPS is not fully understood, however, it is believed to be a systemic disease involving both the central and peripheral nervous systems. Improved understanding of the pathophysiology of CRPS have led to recent advancements in management, however, there is still a need for increased experimental and clinical trials with larger subject numbers.

Concepts of rehabilitation for CRPS have changed in recent times as our understanding of both the pathophysiology of the syndrome and the impact of pain on movement has improved. Rehabilitation of CRPS now has several areas of focus, including the musculoskeletal system, the peripheral and central nervous systems and function. Therefore an integrated approach to management is necessary, where emphasis is not only placed on the affected limb(s) but the underlying changes in the central nervous system.

TIS03, TIS04, TIS05

The stiffness debate: Mobilizing splinting – when more action in required

Judith Wilton 1, Joy McDermid 2, Karen Schultz Johnson 3

1 *Hand Rehabilitation Specialists, Perth, Australia*
2 McMaster University, Hamilton, Ontario, Canada
3 Rocky Mountain Hand Therapy, Edwards, Colorado, USA

Splints that apply force to influence stiff tissues have been around since the time of Hippocrates. Practitioners, be they surgeons, therapists or orthotists, have used knowledge of anatomy, kinesiology, and deforming influences of numerous pathologies to develop splints to facilitate recovery of normal motion of injured tissues. While the method of application of force has not varied greatly, except in refining the elastic and non-elastic traction components, springs, and turnbuckles, our understanding of the amount of force and duration of force application has changed with advances in knowledge of tissue histology and reparative processes. Current understanding is that forces need to be of sufficient magnitude and duration to influence the degradation of old collagen and lying down and bonding of new collagen in patterns compliant to the stress.

Splinting to resolve joint stiffness is based on the principle that low force sustained for an extended period of time provides the mechanical trigger for biological activity in the recovery tissue extensibility and motion.

Evidence provides a persuasive argument when choosing between opposing interventions. It is our position that the strongest evidence for increasing joint motion supports the need for a deforming load low stress that can be achieved with splinting but not with intermittent functional or therapeutic movement. In 2004 a systematic review was conducted by Michlovitz et al to determine which interventions were efficacious for increasing range-of-motion. Overall, the quantity and quality of evidence were moderate to low. Sackett's levels 2b, 3, and 4 evidence showed that joint mobilization, a supervised exercise program, and splinting can all increase joint range of motion.

We will show that clinical and basic research with the greatest credibility supports the need for splinting as an integral part of therapy in mobilizing stiff tissues in the upper limb.

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TIS06, TIS07, TIS08

The stiffness debate: mobilizing with active motion only

Judy Colditz 1, Lisa Harvey 2, Judith Morrin 3

1 HandLab, Raleigh, NC, USA
2 Rehabilitation Studies Unit, Faculty Of Medicine, University Of Sydney, NSW, Australia
3 Therapy 4 Hands, Liverpool, NSW, Australia

Therapists believe that stiff joints must be passively mobilized to create the potential for active motion. This debater suggests that active motion alone can effectively mobilize any stiffness amenable to non-surgical mobilization. In such cases measurements show that active motion always precedes passive range of motion even though only active motion is applied.

A simple approach of blocking all normal joints a muscle/tendon unit crosses demands that force of the muscle be directed where it is most needed, thereby mobilizing the stiffest joint/s. In the recently injured hand this can be done with a variety of splinting techniques but in joints with a hard-end-feel, a cast more successfully provides the adequate duration to create change.

When comparing this technique of redirecting active motion to passive range of motion (PROM) there are numerous advantages:

1. Active motion involves repatterning of the motor cortex which does not occur with PROM and is primary to the patient being able to move independently in a productive pattern.
2. Tissues are mobilized in reciprocal directions, allowing two opposing motions to be gained simultaneously which is not possible with mobilization splinting.
3. Moving stiffer joints results in local edema reduction whereas mobilization splinting can increase local edema.
4. Tissues mobilized with AROM have reduced inflammation and pain.
5. Scientific studies examining response to PROM stiffness suggest negative response to PROM.

Using this technique requires therapists to be willing to contradict some commonly held treatment principles:

- Never lose one motion while gaining another
- Never immobilize the MP joints of a stiff hand in extension
- Never restrict any joint motion in the stiff hand
- Never restrict treatment to one goal at a time rather than multiple goals simultaneously.

TIS06, TIS07, TIS08

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TIS09

Complex Regional Pain Syndrome – Multidisciplinary Management

Damien G Finniss

University of Sydney Pain Management and Research Centre, Royal North Shore Hospital, St Leonards, Sydney, NSW, Australia

Complex Regional Pain Syndrome (CRPS) is a term used to describe a variety of pain conditions that occur following an injury. There is an assortment of clinical signs and symptoms that have predominance towards the distal limbs. The pathophysiology of CRPS is not fully understood, however, it is believed to be a systemic disease involving both the central and peripheral nervous systems. Improved understanding of the pathophysiology of CRPS have led to recent advancements in management, however, there is still a need for increased experimental and clinical trials with larger subject numbers.

One of the critical features of CRPS management is early diagnosis and implementation of specific management strategies. When diagnosis is delayed and the condition is present for some time, multidisciplinary assessment and management is critical.

This session will address current concepts in the management of CRPS with an emphasis on multidisciplinary management. New concepts in rehabilitation for both individual practitioners and multidisciplinary teams will be discussed. Medical and non-medical strategies will be presented and two brief case studies will be presented.

TIS10

Patient-Practitioner Interactions: 'Their future is in your hands'.

Dr Lynette Guy

WorkCover NSW Research Centre of Excellence, Newcastle University, Ourimbah, NSW. Australia

Purpose of the study: This study examined the meanings associated with chronic pain. It also explored what participants saw as 'barriers' to success . Method: This qualitative interpretive study undertook in-depth interviews with: chronic pain patients; rehabilitation clients with chronic pain; a focus group interview with a chronic pain support group; and interviews with medical practitioners as well as allied health practitioners. Results : Patient outcomes were identified in relation to those who were: '*Empowered*', '*Disempowered*', or '*Angry and intent on seeking revenge'.* Findings showed that role of social factors, particularly perceptions of social support and interactions with treating practitioners were key factors that influenced patient outcomes. Socio-economic and occupational factors were also predictive of whether patients were likely to be successful or not, rather than attendance at multidisciplinary pain management or different types of treatment interventions. Conclusions : Rather than the effects of bio-medical interventions and pain management programs, the role of reciprocal interactions with treating practitioners were major determinants in the development and maintenance of disability, pain and dysfunction in this population. Therapists should not underestimate their ability to influence barriers to success.

TIS11

Pharmaceutical management of complex regional pain syndrome

Robin Withrington

East Kent Hospitals NHS Trust Kent UK

The origin of Complex Regional Pain Syndrome (CRPS) is diverse. The approach to management therefore needs to take a number of components into consideration. This paper will discuss the suitable pharmaceutical interventions that are indicated. The choice of treatment will depend on the stage and classification of the syndrome and the choice of interventions will be linked with the other modalities of treatment.

The talk will include a review of the recent clinical research in the area.

TIS12

CRPS -Virtual Body Exercises

David Butler

Noi Group, Adelaide, Australia

Virtual body exercises are aimed at altered brain representations of body parts and their functions. In this session, virtual body exercises appropriate for the severely injured/disabled hand are demonstrated via the sequence of restoration of laterality, motor imagery and mirror therapy. Optimal motor output appears to be compromised by pre motor matrices and novel therapies based on the neuromatrix paradigm are now emerging.

TIS13

Treating CPRS: Some ¨less¨ conventional ideas

Janine Hareau

Clínica de Rehabilitación de la Mano, Montevideo, Uruguay

Over 250 cases of CPRS were seen in our Hand Clinic in the last two years. Ages varied from 15 to 70 but our wider population was from 30 to 55, 90% active women.

The approach that we use in treating CPRS does differ from the conventional approach that we have seen in other countries. I hope that these few ideas will help others in the treatment of CPRS.

Patients come to the Clinic sent by the MD as soon as the first symptoms of abnormal pain or swelling occur. So treatment starts very early and this is **key factor Nº1**. (Early treatment for us is less than a week).

The approach to the patient is **key factor Nº 2.** The patient has to trust you.

No need to give too much information at the beginning

Take your time with the patient

Let them know that you know what is going on with them and that you can help them

Be gentle and supportive, for the next two or three weeks you are in control

Try to find out their hobbies and taste of food, overload their senses in a positive way

Treatment: Treat you patient on a nice place, better if they can lie down. Put on top of them a cozy warm blanket if possible. Avoid touching the painful area, start working distally

Key factor Nº 3 start your treatment using the MEM protocol

MEM: We have been using Manual Edema Massage (Sandy Artzberger´s technique) for over 7 years with incredible results. We look for an overload of the lymphatic system and for painful areas far away from the main painful area. We start proximal to distal. We teach the patient simple UE ex´s to perform at home in order to increase pumping of the area. We bandage our patients. We put them on a walking protocol

TIS19

Outcome measures following surgery to the rheumatoid hand

Lynda Gwilliam

Wightington Hospital, Wigan. England

The measurement of outcomes following surgery to the rheumatoid hand is a clinical priority for hand surgeons and hand therapists since they guide clinical practice. Traditionally this has followed a biomedical and biomechanical orientation largely because loss of function has been defined by impairment only. The World Health Organization (2001) International Classification of Functioning, Disability and Health has produced a shift in the focus of outcome measures that are more meaningful to the patient. Loss of function is measured in objective terms; disability is the effect of functional loss upon an individual and will vary according to the patient's capacity to adapt to the tasks needed. Measuring the outcome of a single surgical intervention, when many joints and tendon structures are involved, is extremely difficult to perform. The variety of outcome measures following hand surgery has led to different perceptions of the benefits of some procedures. Since individuals present for surgery with often individual and unique concerns, conventional outcome tools are relatively insensitive to change in these circumstances notwithstanding there may be a considerable benefit to the patient. Therefore allowing the individual to create their own patient specific outcome measure is one way of addressing this issue of outcomes and identifying the net gain as perceived by the patient. The questions to be answered before treatment are "what's the problem" and "how bad is it?" and after the intervention the questions are "is the disability less than it was?" and "are you satisfied with the improvement?" These questions, if asked and recorded in a structured manner, can provide a patient specific outcome tool suitable for measuring outcomes following surgery to the rheumatoid hand.

TIS20

Evidence for conservative interventions for inflammatory arthritis of the hand

Nicola Massy-Westropp

School of Health Sciences, University of South Australia

The purpose of this review is to determine the most effective conservative treatments for the relief of pain, prevention of damage and increase of function of the hand in patients with inflammatory arthritis.

Electronic databases were searched between 1990 and 2006, for studies of any design that reported the efficacy of splinting, modalities, work simplification, joint protection or education for patients with inflammatory arthritisof the hand. Accepted studies were appraised for the strength and level of the evidence provided, rigor of methods, and generalisability of findings, with criteria applicable to each specific study design.

Pharmaceutical treatment, mostly in the form of disease-modifying drugs, have reduced the severity and progression of inflammatory arthritis for many patients, but there are other who or do not benefit, or only partially benefit from pharmaceutical control of the disease. Many studies about splinting and modalities report short-term pain relief from, but long-term benefits are poorly supported or not investigated. Studies suggesting long-term benefits to patients' quality of life, advocate training patients self-manage their disease and be pro-active and independent in managing symptoms and crises.

Despite the very variable nature of patient's symptoms and patterns of disease, there are many reliable, valid and practical outcome measures for therapists to use in recording their patient's progress. Therefore it is both possible and vital to report and summarise findings so that future patients may make the most informed decisions.

TIS21

Manuel Edema Mobilization (MEM). Edema reduction for sub-acute hand arm edema: Exploring physiological rationale, research, technique and clinical application

Sandra Artzberger [1] , Karin Ronhoj [2] , Victoria Priganc [3]

[1]Cedar Haven Rehabilitation Agency, West Bend Wisconsin USA
[2]Arhus Sygehus, Aarhus University Hospital ,Arhus, Denmark
[3]University of Southern Maine, Lewiston, Maine, USA

Manual Oedema Mobilization (MEM) was introduced to Hand Therapists by Sandra Artzberger, MS, OTR, CHT, CLT from the USA in 1995 as a method to reduce sub-acute and chronic hand/arm oedema by specifically activating the lymphatic system. This workshop is designed to explore the MEM concept in four components. The first component is an introduction to the concept of MEM. The second component explores the physiological rationale underlying the four premises of MEM: light massage, diaphragmatic breathing, exercises, and pump points. The third component involves the presentation of two research studies that explored the efficacy of MEM. The first research study will be presented by Karin Ronhoj, OT, CHT CLT from Denmark. This study was a single blinded randomized controlled clinical trial. A total of 30 patients with sub-acute hand/arm edema after a fracture were divided into two groups. Group A included 15 patients that received traditional edema treatment whereas Group B included 15 patients that received a modified MEM sequence. The study compared the effect of traditional edema treatment against a modified MEM sequence. Outcomes compared were a reduction in edema and pain, and increased range of motion and activity of daily living. Interim study results will be completed and statistical outcomes presented at the workshop. The second research study will be presented by Victoria Priganc, MS, OTR, CHT, CLT from the USA. This research study was a single-subject, A-B design study that examined the efficacy of MEM on decreasing edema, decreasing pain, and increasing ROM. Five subjects completed the study. Following establishment of a stable baseline, each subject received MEM for 1-week. The baseline and treatment/intervention phases were then analyzed statistically. In four of the five subjects, the edema reduction was statistically significant. The final workshop component teaches participants four physiological based MEM treatment techniques related to above research.

TIS21

Manuel Edema Mobilization (MEM). Edema reduction for sub-acute hand arm edema: Exploring physiological rationale, research, technique and clinical application

Sandra Artzberger [1] , Karin Ronhoj [2] , Victoria Priganc [3]

[1]Cedar Haven Rehabilitation Agency, West Bend Wisconsin USA
[2]Arhus Sygehus, Aarhus University Hospital ,Arhus, Denmark
[3]University of Southern Maine, Lewiston, Maine, USA

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TIS22

Sensibility update workshop

Christina Jerosch-Herold[1],Birgitta Rosén[2]

1 Institute of Health, University of East Anglia, Norwich, UK
2 Department of Hand Surgery, Malmö University Hospital, Malmö, Sweden

This workshop will present an update on research into methods for sensibility assessment and sensory re-learning and re-education following peripheral nerve injuries to the hand. The focus will be to facilitate the integration of research findings into clinical practice.

Essential components of assessment of hand function after peripheral nerve injury are discussed including a critical review of standardisation, validity and reliability of instruments for assessment of specific and integrated sensory and motor function of the hand.

Recent advances in neuroscience and cognitive science have opened new possibilities for improvement of sensory recovery after nerve repair, especially with respect to functional sensibility. Sensory re-learning and re-education following peripheral nerve injuries in the hand will be discussed with a focus on cortical remodelling and how brain plasticity can be harnessed to improve the functional outcome of nerve repair. The critical timing of sensory re-learning is highlighted, differentiating between 'Phase 1'(before any reinnervation has occurred in the hand) and 'Phase 2' (when some reinnervation of the hand has occurred). There is evidence to suggest that strategies to enhance the recovery during both of these two phases and to initiate sensory re-education very early, i.e. in Phase 1, during the first postoperative days improves the outcome of nerve repair.

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TIS23

Management of intra-articular joint fractures using early active movement and the dynamic traction splint

Ben Cunningham

1 Resolve Hand Therapy Specialists, Melbourne, Australia.
2 Alfred Hospital, Melbourne, Australia.

Intra-articular fractures have traditionally been treated with k-wires, lag screws, immobilisation, complicated traction systems or joint replacement. In the plastic surgery department of The Alfred hospital we have used a variety of different treatment methods for these types of fractures. Common complications of these treatment methods are joint stiffness, reduced range of movement and traumatic arthritis. Several authors have reported good functional outcomes from the use of early active motion within a dynamic traction splint. The dynamic traction splint is easily made for the patient in Hand Therapy and reduces surgery time while also enabling the patient to exercise comfortably post surgery. One of the main advantages of the splint is patient compliance with the wearing and exercise regime once the splint is fitted. At the Alfred Hospital we have adapted that original design to include intra-articular fractures of the metacarpo-phalangeal joint in the fingers and the carpo-metacarpal joint in the thumb. This workshop describes the injury type and the splint choice. Participants will be shown fabrication techniques and the rehabilitation program will be discussed.

TIS24

Pathomechanics of Deformities in RA Wrist and Hand

Shrikant J. Chinchalkar

Hand Therapy Division, Hand & Upper Limb Center, St. Joseph's Health Care, London, Ontario, CANADA

The rheumatoid hand presents many challenges to clinicians. As the disease process progresses, certain mechanical changes occur at various joints leading to sequential collapse at the joints occurring either proximally or distally. This collapse has a debilitating effect on the joint ligamentous complex, as well as at the tendinous and articular level. Therefore, classically these changes are commonly termed as "Zig-Zag Deformities in RA". The common pathological situations seen in RA hands include: carpal collapse; ulnar drift of the MCP joints; subluxation of the MCP joints with or without articular changes; boutonnière and swan neck deformities of the digits and ruptures of the tendons. Hand Therapists treating this population are greatly challenged in protection of the joints, and conserving energy while maintaining optimal function. If an understanding of sequential patterns of changes in RA are understood (by the therapists), then an appropriate treatment program could be implemented to maximize the function of the joints and at the same time prolong the disturbances occurring at the various other joints. The implementation of treatment may involve splinting and other therapeutic methods. A hand therapist treating the RA population considered for surgical intervention will be well prepared to provide input to the surgeons regarding the status of the joints and tendons as well as the post-operative care required by these clients. A one and half hour instructional course will discuss the details of progression of pathomechanics affecting the wrist and hand. The presentation will also include a classification of swan neck deformities according to the stages, and systematic treatment of each stage.

TIS25

Ten steps to enlightenment

Rob Herbert

University of Sydney, Sydney, Australia

Randomised controlled trials provide the only robust methodology for testing the effectiveness of health care interventions. In recent years a small number of hand therapy interventions and hand surgery procedures have been subjected to randomised controlled trials.

The best randomised trials incorporate a range of features that minimise bias, maximise precision of estimates of effects of intervention, and are relevant for clinical decision-making. In this paper I describe ten characteristics of clinical trials that reduce bias, maximise precision and ensure relevance. Researchers should incorporate these characteristics in trial protocols and readers of reports of clinical trials should look for the presence or absence of these features in trial reports.

Bias is minimised by prior specification of hypotheses, true (concealed) randomisation to intervention and control groups, blinded assessment of outcome (and where possible also of patients, therapists and statisticians), completeness of follow-up, and adherence to a stopping rule. Precision is achieved with sufficient sample size and efficient statistical analysis. Trials are most useful when the intervention is applied well, when they measure outcomes that are of immediate importance to patients (such as quality of life) and when the trial report provides an adequate description of the intervention and participants.

TIS26

Ten points to remember when writing up a clinical trial

Louise Ada

School of Physiotherapy, The University of Sydney, Sydney, Australia

Writing up a clinical trial clearly can mean that it is reviewed and published more quickly, that the information is easily incorporated into systematic reviews, and of course most importantly, that it is read and understood by many people. Here are 10 things to do when writing up a clinical trial which will make all of these more likely to happen:

1. Include as much information in the title as possible
2. State the specific research questions in the introduction
3. Include a design subheading in the method section
4. State the sample size calculation process
5. Make one of the figures a flow of participants through the trial
6. Make one of the tables the baseline characteristics of the participants
7. Make the other table contain scores, within group differences and between group differences
8. Write clearly repeating key terms
9. Submit the CONSORT statement with your manuscript
10. Check that everything is included to enable scoring the trial for validity

TIS27

Using and Doing Cochrane Systematic Reviews Relevant to Hand Therapy

Sally Green

Australasian Cochrane Centre, Monash University, Melbourne, Australia

The Cochrane Collaboration is an international not-for-profit organisation which aims to help clinicians, consumers and policy-makers make well-informed decisions about healthcare by preparing, maintaining and promoting the accessibility of systematic reviews of the effects of health care interventions. Using evidence from high quality research to inform healthcare decisions has the potential to deliver the best possible practice. However, incorporating research into practice can be challenging for the busy clinician. Systematic reviews aim to inform and facilitate the uptake of research evidence into practice by providing a synthesis of all relevant studies addressing a clinical question, enabling increased and efficient access to evidence. The aim of this session is 1) to provide an introduction to Cochrane systematic reviews and the steps involved in conducting a systematic review, 2) to discuss the relevance of Cochrane systematic reviews to hand and upper limb rehabilitation, and 3) to provide an overview of the benefits and challenges involved in using and doing systematic reviews.

TIS28

Over view of carpal kinematics

Ken Flowers

Current Clinical Concepts, San Francisco, USA

Purpose: to acquaint audience with the biomechanics of what Linscheid calls the most complex joint in the body. The importance of ligaments and a strategically situated scaphoid in controlling the central carpal column (the lunate in particular) and thus carpal stability will be the focus of this PowerPoint presentation. References will be made to various kinematic theories, including the traditional two horizontal rows vs. the three Columns of Taleisnik vs. the single Oval Ring of Lichtman.

TIS29

Wrist instability; A personal perspective.

Tim Herbert

Emeritus Consultant, Sydney and St Lukes Hospital Hand Units, Sydney, Australia

Instability of the wrist is a common, and frequently disabling, condition. However, it is often difficult to diagnose, and even more difficult to treat - why is this?

It seems to me that there are a number of different reasons:

- **Definition** - there is little agreement over what, exactly, is wrist instability.
- **Diagnosis** - too much reliance is placed on radiological diagnosis
- **Description** - current terminology is confused (and confusing!)
- **Disregard -** current treatment options often fail to take into account the 'collagen profile' of the patient, and the ways that this can affect both the choice of procedure, as well as the post-operative management.

In order to develop a rational approach to the diagnosis and treatment of wrist instability, it is important to remember: firstly, that instability is, by definition, a clinical diagnosis, and secondly, that it is a progressive condition, ranging from mild joint laxity to a fixed carpal collapse deformity, with secondary osteoarthritis. With this in mind, a simple, clinically based, classification of wrist instability is proposed:

Stage 1: Joint subluxes under stress

Stage 2: Subluxed; can be reduced manually

Stage 3: Fixed carpal collapse deformity

Stage 4: Arthritic; SLAC wrist

By combining this simple classification with a better awareness of the patients collagen profile and expectations, I believe that both the diagnosis and the treatment

TIS30

Therapeutic management of carpal instabilities

R Prosser

Sydney Hand Therapy & Rehabilitation Centre, Sydney, Australia

Carpal instability is a common cause of pain and impairment of the wrist. Common symptoms include pain, a weakness of grip and an inability to stabilize the wrist under load.

The appropriate treatment depends on accurate diagnosis of the problem. The therapist must obtain the history of the complaint, the location and intensity of pain, mechanism of injury if there is one, range of movement active and passive, grip strength, if giving way occurs and responses to the special wrist tests.

Special wrist tests include;

- Scaphoid shift test.
- Lunotriquetral Ballottement.
- TFCC.
- Triquetroulna (critical test)
- Midcarpal stress test.
- DRUJ stress test.

My treatment philosophy for an instability is to:

1. Avoid aggravating activity or postures.
2. Stabilise as is necessary with splinting, relative to the patients needs.
3. Improve dynamic stability with an exercise programme, isometric and eccentric strength.

Prosser R: Management of Carpal Instabilities In Rehabilitation of the Hand & Upper Limb. Eds, Prosser R & Conolly WB, Butterworth Heinemann, Edinburgh, 2003, pp 148-159.

TIS32

Throwing Related Injuries to the Elbow – old traps for young players.

Rod Whiteley

University of Sydney, Sydney, Australia

Whilst overuse elbow injuries are often encountered in physiotherapy practice, and the aetiology and pathology of these are relatively well understood, injuries to the throwing athlete's elbow present a unique spectrum of pathology related to a mechanism not routinely seen in other activities.

Unfortunately, several serious conditions frequently encountered in the management of the injured throwing athlete may mimic more benign conditions seen more commonly in clinical practice. The recognition of these injuries (including but not limited to ulnar collateral ligament injury, radio-capitellar overload, olecranon stress and occult fractures, and ulnar nerve injury) requires specific examination and investigation not normally performed to identify features associated with so-called 'Valgus Extension Overload' spectrum of injuries.

The intention of this session is to provide the clinician inexperienced in dealing with throwing injuries an overview of the examination, diagnosis, and management of throwing-related elbow injuries likely encountered in practice with a particular attention paid to the differential diagnosis with more commonly seen conditions.

TIS34

Management of distal biceps and triceps ruptures

Susan Blackmore

The Philadelphia Hand Center, Philadelphia, PA USA

A review of the literature identifies significant variability in the post-operative management of distal biceps and triceps ruptures. A suggested post-operative plan is introduced based on the timetable for tendon healing.

Back

TIS35

Focal Hand Dystonia in Musicians. An Application of Psychophysics to Assess Left Hand Movement in Cellists

Bronwen Ackermann 1 , Roger Adams 1 , Kolodziej, I 2

1 *University of Sydney, Sydney, Australia*
2 *Liverpool Hospital, Sydney, Australia*

Focal hand dystonia is a task-specific disorder of sensorimotor integration, resulting in abnormal twisting, cramping motions when attempting to perform a previously skilled movement. Reports of this disorder occurring in musicians appear more frequently than in the general population, probably reflecting the complexity of the neuromuscular skills involved in playing music. The disorder most commonly affects male musicians at 40-50 years of age, and may prematurely end a playing career. Research to date has focussed on understanding the mechanisms behind the disorder in order to apply this knowledge to generate approaches to treatment. One area of interest has been in the role of proprioception in focal hand dystonia. Preliminary research has indicated that proprioception is impaired in focal hand dystonia. A case study research project was conducted on a 47 year old male cellist with left focal hand dystonia to investigate the potential role of proprioception. A psychophysical testing device was used to evaluate absolute judgements in finger movements of the left hand using the height and tension of a cello string on an experimental cello, with a stepper motor attached as the measuring instrument. Preliminary investigations found that measures obtained with this device were impaired for the affected fingers compared to an unaffected finger. Following a period of intensive re-training, readings had improved and this was supported by improvements in subject report and a dystonia rating scale. A subsequent trial aimed to establish normative data for this device using female and male cellists and non-musicians. It was found that females alone showed an improvement in scores on the psychophysical device as a result of musical training, while the male musicians did not. A possible implication of this psychophysical finding is that it is reduced use of proprioception in musical performance by males that may predispose some to dystonia.

Ref:
Ackermann B and Adams, R (2004) Finger Movement Discrimination in Focal Hand Dystonia: case study of a cellist. *Medical Problems of Performing Artists* 20 (2): 77-81.

TIS36

Focal Hand Dystonia Affecting Musicians: An Overview of Current Treatment Techniques

Katherine Butler

The Princess Grace Hospital, London, United Kingdom

In 1911 Oppenheim coined the term 'dystonia' to describe disordered motor control, characterized by an association of hypotonia and tonic muscle spasm. Focal hand dystonia is one form of this disorder in which symptoms are often task specific and occur during skilled movements such as writing (writer's cramp) or playing a musical instrument (musician's cramp).

Much research has been performed on the pathophysiology of dystonia, but the underlying mechanisms still remain unclear. Hypothesis about functional central nervous system alterations continue to gain more reliability. Scientific treatment-based publications on focal dystonia are sparse, and progresses in evidence based treatment options are necessary in order to assist this patient group. This paper will review the literature, documenting dystonia classification criteria, manifestations, pathophysiology and treatment techniques for musicians affected by focal hand dystonia.

Current treatments include: oral medications, botulinum toxin (botox) injections, surgery and rehabilitative therapies. Discussion of evidence surrounding each treatment option and clinical implications will follow. Some of the rehabilitative therapies that will be covered include: sensory re-education, sensory motor retuning, rest, splintage and limb immobilisation. Future research areas relating to focal hand dystonia and the musician will be mentioned.

TIS37

Outcomes, efficacy and evidence based practice in hand therapy

Cecilia Li-Tsang

Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong.

The practice of Evidence-based medicine was proposed in the early 80s, when accountability for treatment procedures was advocated to stem the rising health care costs. There is a great demand for clinicians to search for the best evidence and to incorporate into clinical practice for better outcomes.
This paper is to review the development and process of evidence-based practice in the area of hand rehabilitation. Concepts on outcomes, efficacy and evidence based practice in the field of hand rehabilitation would be discussed in details.
Some major problems were identified in the process of EBP. Problems related to research on hand rehabilitation include documentation of hand function, administration of randomized clinical trial (RCT) and the variation of treatment interventions. Problems of practicing EBP in hand therapy relate to lack of resources of updated information on research outcomes, variations of clients conditions, administrative procedures, policies etc were also reviewed and discussed.
Research on hand evaluation and rehabilitation should be further encouraged Hand therapists are also recommended to practice EBP through searching and critical appraisal of past research papers on their methodology, clinical evidence and recommendations.

TIS38

Accuracy of Phalen's and Sensory Testing in Diagnosis of Carpal Tunnel Syndrome

Robert Boland 1,2,3 ,Matthew Kiernan 1,2,4

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3. Faculty of Health Sciences, University of Sydney, School of Physiotherapy, Lidcombe, Australia
4 University of New South Wales, Sydney, Australia.

Introduction: Carpal Tunnel Syndrome (CTS) is the commonest entrapment neuropathy, and involves the median nerve at the wrist. Patients with CTS frequently report symptoms in the proximal thenar eminence. It is possible that such symptoms manifest in patients with more severe CTS that may be more accurately diagnosable in the clinic, without the need for nerve conduction studies (NCS).

Methods: Responses to pinprick testing over the thenar eminence and to Phalen's test were bilaterally assessed in patients with CTS, and compared with results from NCS. Twenty-six patients with i) nocturnal symptoms in the palmar hand and ii) electro-diagnostic confirmation of CTS in at least one hand were included, yielding a sample of 42 symptomatic and 10 asymptomatic (contralateral) hands. Sensitivity, specificity, and likelihood ratios were determined for each test.

Results: Phalen's test had a sensitivity of 0.68, specificity of 0.73, and a positive likelihood ratio of 2.52. Pinprick testing had lower sensitivity (0.12), but high specificity (0.99), and a positive likelihood ratio of 12. There was no difference in nerve conduction parameters between hands with and without sensory deficit.

Conclusions: These findings demonstrate that the combination of nocturnal waking, symptoms in the palmar hand, and a positive Phalen's test detected almost 70% of patients with electrodiagnostically demonstrable CTS. Sensory testing was of limited value in detecting CTS. However, a sensory deficit over the proximal thenar eminence was more specific for CTS than Phalen's test, even though the palmar cutaneous branch of the median nerve (PCBMN) that does not course through the carpal tunnel supplies this area. These findings infer that the PCBMN may be affected in some cases of CTS, and surgeons and therapists should consider this in patients who report symptoms in the proximal palm before or after surgery

Back

TIS39

Application of neuromuscular electrical stimulation in hand therapy: Rationale, indications and applications.

Dominique Thomas

Centre Grenoblois de reeducation de la main, Grenoble, France

Electrical stimulation is widely accepted for pain control (TENS), as active neuroprothesis for motor control of upper motor neurone lesion (FES) or for athletes muscle reinforcement. However, Neuromuscular electrical stimulation (NMES) of normally innervated muscles groups is still not widely used in Hand Therapy, even though it is the only modality which brings at the same time motor, analgesic and biofeedback effects. A successful application depends on motor point location, electrodes size and revisiting anatomy in terms of electrical current flow. Deep muscles such as the index FDP which cannot be reached from the anterior aspect can be reached from the posterior aspect of the forearm through diagonal electrode placement or through direct stimulation of nerve trunks. Modern stimulators deliver biphasic currents. This allows stimulating simultaneously agonistic extrinsic and intrinsic muscles groups. Once application techniques are under control, therapists realize that NMES facilitates rehabilitation and becomes indispensable in many protocols. Few studies compared the effectiveness of NMES associated or not with active exercise to active exercise alone. One was published in 1986 by Thomas, the last one by Boisgonthier in 2006 for his BA thesis in Physical Therapy. When correctly applied there is no doubt that NMES improves AROM more than active exercise alone. Indications for applying NMES are the same as for active exercise, providing that bone and soft tissues can sustain the additional stress. Most electrode placements will be demonstrated through clinical examples.

TIS40

The international registry on hand and composite tissue transplantation: Functional results of the world experience on hand allografts

Marco Lanzetta , Palmina Petruzzo, Jean-Michel Dubernard, Frederic Schuind, Raimund Margreiter

International Registry on Hand and Composite Tissue Transplantation, Milan, Italy and Lyon, France

Since May 2002 all groups performing hand transplantations have supplied detailed information to the International Registry on Hand and Composite Tissue Transplantation. This report provides a review of all hand transplants performed to date.

From September 1998 to February 2006 eighteen male patients underwent 24 hand/forearm/digit transplantations (eleven unilateral and four bilateral hand transplantations, two bilateral forearm transplantations, one thumb transplantation). The level of amputation was mostly at the distal forearm or wrist. Patient average age was 32.Time since hand loss ranged from 2 months to 22 years. Immunosuppressive therapy included tacrolimus, mycophenolate mofetil, rapamycin and steroids; polyclonal or monoclonal antibodies were used for induction. Topical immunosuppression was administered in some patients. Follow-up period ranged from 34 to 85 months.

Acute rejection episodes occurred in 12 patients within the first year. Rejection was completely reversible in all compliant patients. Side-effects included opportunistic infections and metabolic complications. No life-threatening complications or malignancies were reported. All patients had achieved protective sensation and in 17 of them also discriminative sensation. Extrinsic and intrinsic muscle recovery enabled patients to perform most daily activities.

Patient survival was 100%. Graft survival was 100 % at 1 and 2 years. Two cases of graft failure at a later date occurred and were caused by severe inflammation and progressive rejection in a non-compliant patient. In addition, 6 hands were lost due to a rejection process as the Chinese recipients did not take their immunosuppressive treatment. These failures were communicated in January 2006.

TIS40a

Rehabilitation in hand transplantation

Graziella Urso

Il Carrobiolo Rehabilitation Centre, Monza, Milan, Italy

Introduction: This presentation will discuss aspects of the rehabilitation of the transplanted hand. Initially, a post-operative replantation protocol was utilized; however, it was immediately noted that the rehabilitation of the transplanted hand required a different protocol.

Methodology: The program is long and complex. A team approach which includes the therapist, surgeon, anesthesiologist, and psychologist is essential.

Frequency of Treatment: First 6 weeks the patient was seen twice-a-day 7 days-a-week. From 6 weeks to 8 months the patient was treated 5 days-a-week. At 9 months the patient was treated 3 times-a-week or more if needed. Consideration of the time passed between the amputation and the transplantation is important with regards to viable musculo-tendinous units and the patient's ability to incorporate the hand as a functional part of the body.

Recovery: The patient has achieved full awareness of the hand as a functional part of his body. The patient is able to use the hand bilaterally and has achieved a good degree of grasping control. He still has difficulties in controlling the thumb due to the lack of a balance between the intrinsic and extrinsic muscles. A hand based thumb spica splint was fabricated in order to place the thumb in a functional position and prevent contracture of the first web space.

Conclusion: There is a fundamental difference between the rehabilitative treatment of the transplanted hand and that of the replanted hand. The transplanted hand has not endured acute trauma; therefore, treatment does not focus on controlling edema or articular stiffness. This undoubtedly speeds up the first stage of treatment and allows the patient and therapist to concentrate on rehabilitating the functional aspect as soon as possible. Therapy is focused on improving motor control, preventing compensatory behaviors and increasing cognitive awareness of the transplanted hand by reintegrating it in daily activities.

TIS41

The severely injured hand – A hand therapist's challenge

Corrianne van Velze

Department of OccupationalTherapy, University of Pretoria, South Africa.

One of the most challenging aspects of hand therapy is to assist a patient who has sustained a major hand injury, where multiple systems are involved, in achieving a functional hand. In these cases, close cooperation between patient, surgeon and therapist is essential. Treatment should not be limited to physical aspects alone. Psycho-social aspects also require ongoing attention and all patients require extensive support from their therapist. Most patients require long term treatment, which highlights the importance of a good interpersonal relationship between therapist and patient.

Treatment goals include the restoration of functional motion, strength and sensibility, while at the same time controlling the formation and remodeling of scar tissue.

The key elements of therapy are:

- Understanding and appreciating the healing process.
- Being able to apply a logical treatment plan and know when to apply the different treatment modalities.
- Frequent communication between all role players.
- Attention to the psycho-social needs of the patient and his/her family.
- Respecting pain and ensuring that the treatment does not increase the pain.
- Instituting a skills retraining programme at the appropriate time.

This presentation will attempt to guide therapists in the approach of these difficult cases. Emphasis will be placed on practical suggestions and examples, illustrated by case histories.

Fixed treatment protocols are not encouraged, as no two injuries are ever the same. Intervention should be designed for individual patients, depending on their injuries, life roles and home circumstances.

TIS42a

Examination and provocative testing of the radial side of the wrist.

Ken Flowers

Current Clinical Concepts & The JOURNAL of HAND THERAPY

Therapist's examination of the radial side of the wrist with an emphasis on provocative testing for carpal instabilities. Supporting carpal kinematics will accompany presentation.

- CMC Grind
- Finkelstein Manoeuvre
- Lunate tenderness
- Scaphoid palpation
- Scapholunate Interval
- Scaphoid Shift Test
- 3rd Finger Resistance Test

TIS42b

Clinical examination of the wrist – The midcarpal joint

R Prosser

Sydney Hand Therapy & Rehabilitation Centre, Sydney, Australia

Midcarpal instability may present with pain on the ulnar side of the wrist, weakness of grip and an inability to stabilize the wrist under load particularly with ulnar deviation.

The cause of midcarpal instability is ill defined. Synovitis perhaps with midcarpal "wear and tear" with increasing laxity is proposed by several authors as the cause of joint aggravation and pain.

Biomechanically there is a dynamic flexion deformity of the proximal row as the distal row translates volarly. As the wrist goes into ulnar deviation the distal row abruptly reduces and the proximal row "jumps" into extension. This is termed the catch up clunk.

Accurate assessment is essential. This should include; inspection, posture or deformity should be noted, range and strength recorded and particular attention to palpation and the wrist ligament / stability tests.

The midcarpal shift test as described by Lichtman involves a volar directed force dorsally on the capitate; the wrist is then axially loaded and then moved from radial deviation to ulnar deviation. The test is positive if there is a clunk and the symptoms the patient is complaining of are reproduced. A midcarpal ballotment test may also be performed.

Conservative management involves avoiding aggravating activity, stabilization with a wrist ulnar carpal support as necessary, exercise to improve stability and proprioceptive training.

TIS42c

Clinical Examination of the Wrist – The Ulnar Side

Alain Berthe

Cabinet liberal, France

The tests for the ulnar side of the wrist will be described and demonstrated. Participants will then be able to practice these tests.

They will include:

- TFCC test – Glide test and compression test
- Ulnar snuff box palpation
- Lunotriquetral Allotment (Reagan test)
- DRUJ test and piano key test
- Ulnar carpal critical test (Relocation test)
- ECU test for subluxation
- GRIT test

TIS43

Throwing Injuries To The Elbow – Differential Diagnosis And Management Common Pitfalls

Rod Whiteley

University of Sydney, Sydney, Australia

Elbow injuries represent the equal most common cause for presentation in throwing athletes. Most commonly these athletes present with medial elbow pain which may arise from a variety of structures. Clinically accurate diagnosis is imperative for the subsequent treatment strategies will vary substantially, and what may seem a benign course of, say watchful waiting, can prolong the course of recovery or even prevent it in some cases. Commonly, throwers with medial elbow pain will be referred with a diagnosis of "Golfer's elbow". It should be recalled that such a diagnosis will present with physical findings of painfully reduced forearm flexor strength, local tenderness, and the absence of a positive Moving Valgus Stress Test. Clinically this is unusual in the extreme.

An understanding of throwing injuries to the elbow requires an understanding of the mechanics of overarm throwing - especially: shoulder rotational range; the mechanism of the conversion of shoulder rotational and horizontal adduction movement into elbow extension largely in the absence of elbow extensor activity; and the importance of trunk rotation in the initiation of these activities. The structures commonly injured vary significantly in the presence of skeletal maturity in comparison to early adolescence, and the management of injuries similarly varies significantly.

This workshop will discuss aspects of the aetiology, examination, and treatment of commonly seen elbow problems in the throwing athlete.

TIS44

Torque Transmission Splint - Radial Nerve Paralysis

Judith Wilton

Hand Rehabilitation Specialists, Perth, Australia

One of the most common peripheral nerve injuries effecting the wrist is that involving the radial nerve. Following injury above the elbow, the characteristic deficit in wrist, finger and thumb extension requires splinting intervention to position the wrist so that innervated flexor muscles can function effectively in grip and pinch. Crochetiere, Granger and Ireland (1975) first described a splint that used active finger and wrist flexor muscle function to effectively substitute for the paralysed extensor musculature without joint immobilisation, or the need for springs or traction lines.

This workshop will outline anatomical and biomechanical principles underlying the design and manufacture of a splint based upon Crochetiere, Granger and Ireland's design. It transmits the torque generated by the active wrist flexors to passively extend the fingers, and the active finger flexors to passively extend the wrist. Participants will have the opportunity to manufacture this torque transmission splint (ASHT Expanded Splint Classification System - [Fess et al 2005]) incorporating a forearm component, outrigger and finger loops. Options for the thumb will be discussed.

Crotchetiere W, Granger CV & Ireland J (1975) The 'Granger' orthosis for radial nerve palsy. *Orthotics and Prothetics***27**:27-31.

Fess EE, Gettle KS, Philips CA & Janson JR. *Hand and Upper Extremity Splinting Principles and Methods*. 4 th ed Elsevier Mosby: St Louis. 2005.

TIS45

Shoulder Rehabilitation - Activity, Exercise or Training?

Craig Allingham

Bond University, Robina, Gold Coast, Australia, Physiocare, Maroochydore, Australia

As more baby boomers present with degenerative, calcific, adherent, impinging and torn shoulder structures physiotherapists are under pressure to provide exercise programs to limit deterioration, prepare for (or avoid) the need for surgery or to maximise functional returns after operative procedures. Effective rehabilitation for shoulder disease, injury or repair is a blend of exercise physiology, biomechanical understanding, motor learning and clinical acumen. Combining these elements, this presentation will offer guidelines and principles for effective and safe exercise for the upper quadrant. Particular emphasis will be given to joint kinematics, scapular control and rotator cuff integration. Examples of early, middle and late stage exercises will be given.

TIS46

Scapular Dyskinesia

Joel Werman

The Oval Physiotherapy & Sports Injuries Centre, Sydney

Alteration of the normal position or motion of the scapulothoracic joint is commonly observed in association with rotator cuff abnormalities and glenohumeral instability. The scapular normally provides a stable platform for glenohumeral function. Scapular dysfunction may arise due to a variety of causes including postural dysfunction, neurological injury or muscular dysfunction. The presence of pain alters neuromuscular control around the scapular, setting up a cycle of muscle imbalance and altered mechanics (scapular dyskinesia), leading to further tissue damage with resultant inflammation and release of pain-mediating substances. These altered patterns of scapular mechanics appear to be employed by the subconscious brain to compensate for underlying pathology. However, the compensation seems to perpetuate rather than solve the problem. Assessment of scapular dyskinesia should commence with an evaluation of the resting position of the shoulder girdle. Dynamic evaluation of active upper limb movements is performed in all planes noting altered recruitment patterns compared to the unaffected side. The Kibler lateral slide test is a useful objective measurement tool. Rehabilitation aims at restoring normal scapular mechanics through isolation of the scapular retractors isometrically whilst performing a variety of limited range exercises. Initial retraining should be performed with minimal or no resistance and no shoulder symptoms. Once neuromuscular recruitment patterns have improved, strengthening in a variety of contexts, consistent with the patient's needs, should be performed – all done with the scapular held in a retracted position in ranges below horizontal and forward of the scapular plane. Successful retraining of the scapular mechanics should see the return of normal recruitment patterns within six weeks on average with a corresponding improvement in symptoms. Late stage rehabilitation to restore strength may take another six weeks.

TIS47

EMG Investigations into Dynamic Shoulder Stability and the Validity of "Supraspinatus" Tests

Karen Ginn 1, Ian Cathers 2, Craig Boettcher 1

1 *Faculty of Medicine , University of Sydney, Sydney, Australia*
2 Faculty of Health Sciences , University of Sydney, Sydney, Australia

Purpose: To investigate 1) the role of the rotator cuff (RC) musclesin maintaining antero-posterior stability at the shoulder 2) how specifically the "empty can" (EP) and "full can" (FC) tests activate supraspinatus.

Methods: The dominant shoulder of 15 normal subjects was examined. EMG activity was recorded from 12 shoulder muscles, including rotator cuff, scapulothoracic and axio/scapulohumeral muscles, during maximal voluntary isometric contractions into shoulder flexion, extension, internal and external rotation and in the EC and FC positions. These tests were performed in random order and the maximum EMG activity for each muscle in each test position for all subjects was calculated.

Results: 1) Activity levels in subscapularis during the extension test were similar to levels recorded during internal rotation tests. Infraspinatus and supraspinatus were activated at similarly high levels during flexion tests. 2) Whilst the activation level of the supraspinatus muscle was high in both the EC and FC tests, there was no significant difference in the level of activity in supraspinatus from that of upper, middle and lower trapezius, serratus anterior, anterior and middle deltoid and subscapularis muscles in both these tests.

Conclusions: 1) The high activity in RC muscles during flexion and extension tasks, suggests that these muscles have a major role to prevent sagittal plane torque producers from destabilizing the shoulder joint in the antero-posterior direction during active movement. Clinical implications: high load shoulder flexion/extension tasks require RC activity levels similar to high load rotation tasks; posterior RC muscles function to prevent anterior translation at the shoulder joint and vice versa; abnormal RC activity is likely to be a major factor in shoulder antero-posterior instability. 2) The EC and FC tests are not specific for supraspinatus activation. The use of clinical tests based on these shoulder positions, to specifically identify supraspinatus pathology, are not valid.

TIS48

Pathomechanics and management of the secondary complications following flexor tendon repair

Shrikant Chinchalkar, Bing Siang Gan, Sarah Baier

Hand and Upper Limb Centre , St. Joseph's Health Care, London, Ontario, Canada

Verdan classified injuries to the flexor tendons based on the anatomical location of transaction. Following repair, a number of management strategies have been developed to maximize the gliding amplitude of the tendons. Nonetheless, despite optimal management, complications arise. If these complications remain untreated, secondary pathomechanical changes will result in a kinematic chain disturbance. An appropriate treatment protocol includes attention to maintenance of integrity of the flexor tendon repair, while avoiding secondary complications due to reduced gliding amplitude. A biomechanical analysis of the dynamics of tendon gliding following repair in the various Verdan zones will be discussed in the context of common complications. This analysis may help in devising an appropriate therapeutic approach to avoid secondary complications following flexor tendon repair.

TIS49

Extensor lesion : Dynamic versus static splinting

Rouzaud JC , AllieuY, Amara B, Meyer G, Dusserre F, Roux JL, Rispe B, Chammas, M

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In 1971 we published our results of 5 years with the use of Jenning's barn wire in suturing extensor tendons without postoperative immobilization. In 1977 we pointed out in a follow up note the risk of infection with the use of this material.In 1972 we started protecting the barb wire suture with a dynamic appliance. Active mobilization became assisted passive mobilization. This method was used in our department until 1979. In 1986 we published a protocol for rehabilitation and splinting for the extensor tendon injuries in zones 5, 6, 7 and 8 and in zones 3 and 4 at the long fingers and thumb level, about 120 cases. The protocol included an reversed Kleinert type dynamic splinting, with a low profile system and a standardized spring according to the zones. The results published at that time and confirmed by a recent study in 1999 show over 90% good and excellent results and slightly less for zones 3 and 4, about 163 cases lesions of extensors lesions. The thumb results are the same as long fingers. An early active mobilization protocol for extensor tendon injuries has been set up since the 1990's.

The present evolution tends to reduce the splinting size to make it more compatible with social life and to resume professional activity early with an efficient protection. We have chosen a static splint for all zones allowing an easier adaptation.

There was a follow-up of 260 patients in order to compare the results between dynamic and static orthosis in all zones and in all fingers so as to evaluate the possibilities of this technique

TIS50

The role of the extended scope practitioner in rheumatology

Victoria Frampton

East Kent Hospitals NHS Trust UK

Many Hand Therapists practice within a surgical environment for pre and post operative assessment and treatment. This paper will evaluate the role of the Extended Scope Practitioner (ESP) in Rheumatology.

This involves the assessment of patients with upper limb musculo-skeletal symptoms referred to a Rheumatology service. Consequently the nature of the referrals is diverse.

The referrals are first contacts, letters of referral having been triaged first by the Consultant Rheumatologist.

Practice includes referral to therapy, injection therapy, requesting investigations and listing for procedures. Although for most Hand Therapists, sub- specialism is a likely pathway, an ESP in Rheumatology has to have a broader approach to diagnosis.

There is a need to be aware of the limitations in specializing and the need to keep a wide scope of practice in order to enrich and enhance our skills and practice.

Preliminary findings of Hand Dominance in Thumb CMC joint arthritis will also be presented.

TIS51

Clinical examination of lumbrical and interosseous muscle tightness

Judy C. Colditz

HandLab, Raleigh, NC, USA

This workshop discusses the rationale for and explains the accurate approach to separately testing interosseous and lumbrical muscle tightness. Following a discussion of the "intrinsic tightness test," (sequence of test positions, position of MP joint extension, inclusion/exclusion of DIP joint, and lack of quantification), a brief review of anatomy will clarify the rationale for separate tests for these muscles.

Interosseous muscle tightness testing will review:

- Normal function of the interosseous muscle/s during finger flexion
- Accurate testing sequence
- Exclusion of DIP joint
- Determination of accurate MP extension position
- Testing radial vs. ulnar interosseous muscle tightness
- Suggestion of a numerical score to quantify tightness [Interosseous Muscle Elasticity Score (IMES)] for individual digits and for a stiff hand.

Lumbrical muscle tightness testing will review:

- Normal function of the lumbrical during finger flexion
- Circumstances required to test lumbrical tightness
- Accurate testing sequence
- Differentiation of lumbrical-plus and lumbrical tightness
- Observation of paradoxical DIP extension
- Importance of MP hyperextension.

Suggestions for precise positioning and specific splinting to effectively elongate both the interosseous and lumbrical muscles will be discussed.

TIS52

Low-tech therapy for high-tech results

Corrianne van Velze 1, Cathy Merry 2

1Department of Occupational Therapy, University of Pretoria, Pretoria, South Africa
2Hand Injury Trauma Physiotherapy, NSW, Australia

When hand therapy first started, therapists used every-day tools and utensils as therapeutic equipment. These simple tools could be found in kitchen shops and hardware stores and with a little bit of creativity, were adapted to enable many patients to regain their hand function. As the profession developed, many of these "homemade" tools were upgraded and manufactured, using more sophisticated material. Unfortunately, this increased the cost of these tools considerably, making it very expensive for less developed hand therapy centres.

Very expensive computer based equipment is available, which enables the therapist to measure improvement in joint range or muscle power accurately, but somehow the original involvement in activity has been lost.

This workshop will take you back to basics and help you to make use of less sophisticated tools and equipment in your everyday therapy. Therapists are encouraged to look at simple kitchen and DIY tools and see which ones could be used to improve hand function. With a little bit of creativity, the actual results of therapy will not differ much from those centres where money is not an obstacle.

The aims of the workshop are:

- To make therapists aware of different ways of achieving the same aims of therapy using less sophisticated equipment.
- To make therapists aware of the therapeutic value of different objects, which are usually used for other purposes.
- To learn how to adapt and use material off-cuts to make inexpensive, simple therapeutic tools. All examples may be taken home.

This is a creative, fun-filled workshop, which will give participants lots of opportunity to share ideas with therapists from all over the world. It is an ideal time to learn what works from experienced colleagues.

TIS52

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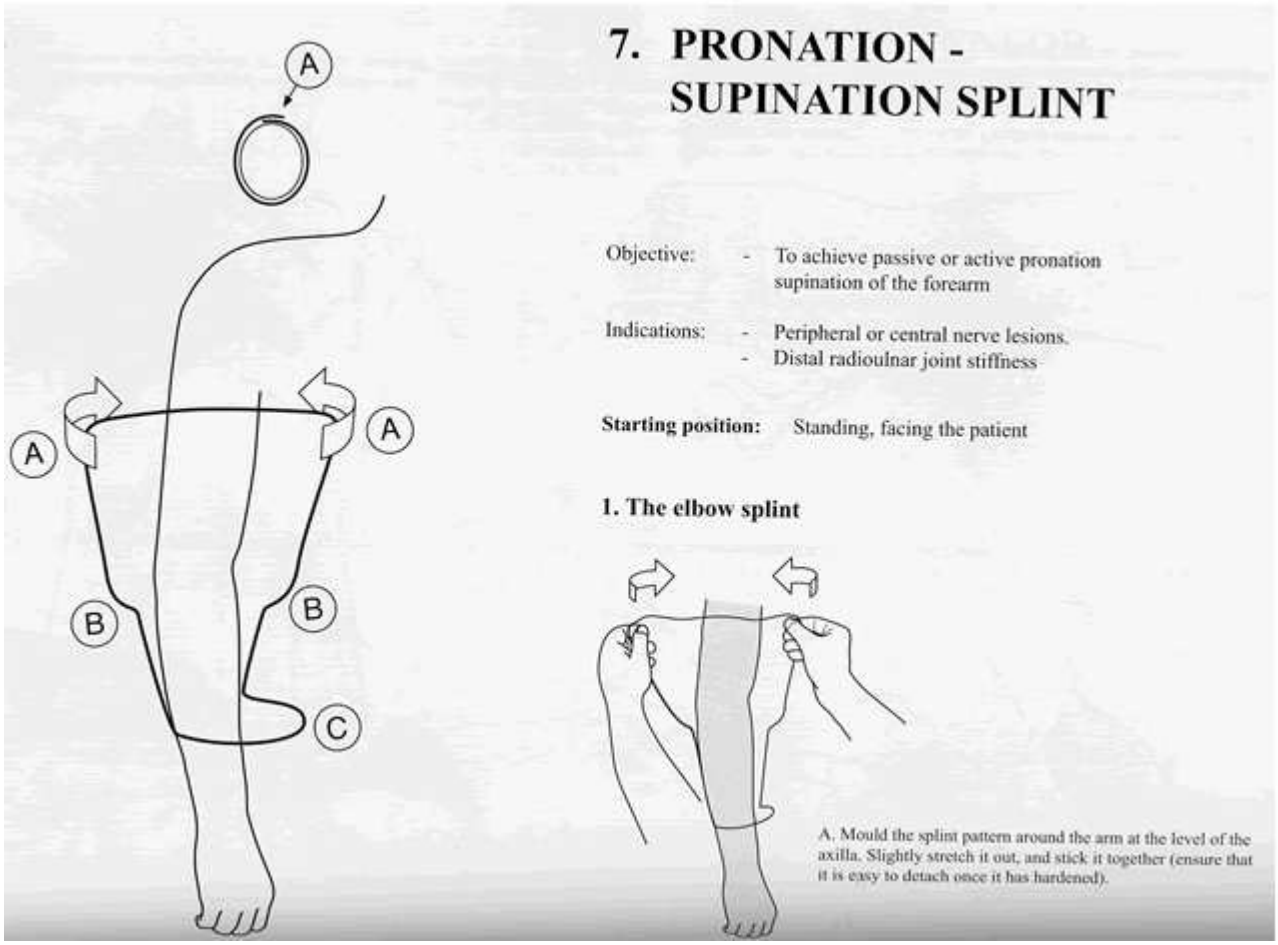
TIS54

Workshop 11 - Dynamic rotation assist splint

Megan Gandfors, Paul Van Lede

(Click on the images below to view the full size image)



7. PRONATION - SUPINATION SPLINT

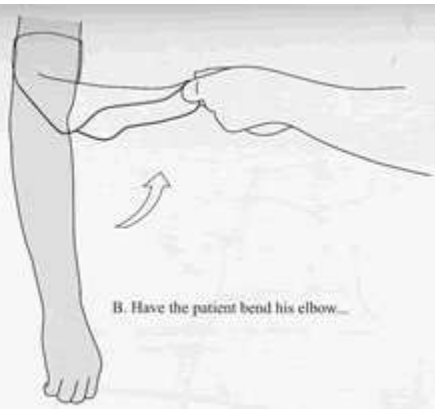
Objective: - To achieve passive or active pronation supination of the forearm

Indications: - Peripheral or central nerve lesions.
- Distal radioulnar joint stiffness

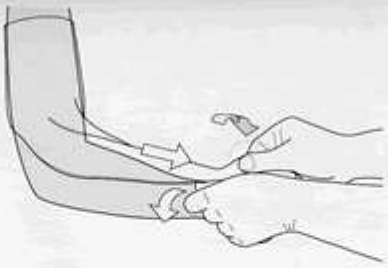
Starting position: Standing, facing the patient

1. The elbow splint

A. Mould the splint pattern around the arm at the level of the axilla. Slightly stretch it out, and stick it together (ensure that it is easy to detach once it has hardened).

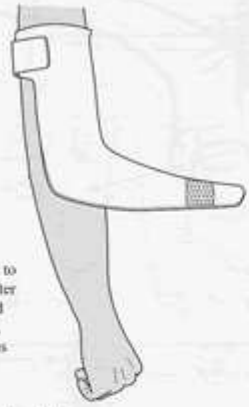


B. Have the patient bend his elbow...



... while the distal portion of the splint is being pulled up to the wrist and attached around it. The material MUST be like a bow string, if not, the pattern must be shortened.

C. Slowly stretch the wings at the height of the elbow in the direction of the olecranon, and stick them together (again, ensure that it is easy to detach once it has hardened).



D. Leave the material to harden completely, after which pull the bonded parts from each other, and cut off any surplus material

Finishing and fixation straps

- The volar side at the proximal end can be shortened, but the distal end must reach up to the wrist. Cut off any surplus material on the sides of the forearm so that only a slightly curved plateau remains, not wider than the wrist.
- Secure proximally with a very broad fixation strap.
- Stick some hook tape as distally as possible.

2. The hand splint

E. Make a circular hand splint as described in splint Nr 4 B
(WRIST IMMOBILIZATION SPLINT)

3. The dynamic element

F. Close the **hand splint** with a broad elastic loop and make 1 or more turns.

G. Hook the loop to the elbow splint (on the radial side to achieve supination, or on the ulnar side to achieve pronation).