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Please include the title, journal and year, vol etc.  
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Online access to the Journal of Hand Therapy continues to be available. It can be accessed through the NZAHT website. Click on the link.

We now have a subscription to the Journal of Hand Surgery (American volume). Please see the contents of the journals below. Articles cannot be viewed online but you can look at the contents there. If there are any you like the look of, let me know and I can send them out to you.  
http://www.sciencedirect.com/science/journal/03635023
Contents Pages for Journal of Hand Surgery Mar and Apr 2010


1. Masthead
   Page A2

2. Editorial Board
   Page A4

3. Table of Contents
   Pages A7, A9, A11

4. Instructions to Authors
   Pages A18-A22

Presidential Address

5. Bridges to Our Future
   Pages 529-533
   L. Andrew Koman

Scientific Articles

6. Collagenase Injection as Nonsurgical Treatment of Dupuytren's Disease: 8-Year Follow-Up
   Pages 534-539.e1
   Andrew J. Watt, Catherine M. Curtin, Vincent R. Hentz

7. Mechanical Strength of the Side-to-Side Versus Pulvertaft Weave Tendon Repair
   Pages 540-545

8. A Biomechanical Assessment of Repair Versus Nonrepair of Sheep Flexor Tendons Lacerated to 75 Percent
   Pages 546-551
   Roger Haddad, Peter Scherman, Tim Peltz, Sean Nicklin, William R. Walsh
9. The Effect of Epitendinous Suture Technique on Gliding Resistance During Cyclic Motion After Flexor Tendon Repair: A Cadaveric Study
Pages 552-558
Tamami Moriya, Chunfeng Zhao, Kai-Nan An, Peter C. Amadio

10. Ultrasonographic Assessment of Long Finger Tendon Excursion in Zone V During Passive and Active Tendon Gliding Exercises
Pages 559-565
Jan-Wiebe H. Korstanje, Ton R. Schreuders, Jors van der Sijde, Steven E.R. Hovius, Johan G. Bosch, Ruud W. Selles

11. Prospective Outcomes of Stage III Thumb Carpometacarpal Arthritis Treated With Arthroscopic Hemitrapeziectomy and Thermal Capsular Modification Without Interposition
Pages 566-571
Scott G. Edwards, Peter N. Ramsey

12. A Cemented Surface Replacement Prosthesis in the Basal Thumb Joint
Pages 572-579
J. van Rijn, T. Gosens

13. Blinded, Prospective, Randomized Clinical Trial Comparing Volar, Dorsal, and Custom Thermoplastic Splinting in Treatment of Acute Mallet Finger
Pages 580-588
Jeffrey Pike, Kishore Mulpuri, Mark Metzger, Gordon Ng, Neil Wells, Thomas Goetz

14. Custom-Made Splint Treatment for Osteoarthritis of the Distal Interphalangeal Joints
Pages 589-593
Masayoshi Ikeda, Takayuki Ishii, Yuka Kobayashi, Joji Mochida, Ikuo Saito, Yoshinori Oka

15. Complications of Open Trigger Finger Release
Pages 594-596
Ryan Will, John Lubahn

16. Comparison Between Locking and Non-Locking Plates for Fixation of Metacarpal Fractures in an Animal Model
Pages 597-603
Sabine Ochman, Stephanie Doht, Juergen Paletta, Martin Langer, Michael
17. Morphometric Analysis of Potential Osteochondral Autografts for Resurfacing Unicondylar Defects of the Proximal Phalanx in PIP Joint Injuries
Pages 604-610
J.D. Hernandez, T.G. Sommerkamp

18. Biomechanical Comparison of Dorsal Nail Plate Versus Screw and K-Wire Construct for Extra-Articular Distal Radius Fractures in a Cadaver Bone Model
Pages 611-618
Daniela Klitscher, Isabella Mehling, Lukas Nowak, Tobias Nowak, Pol M. Rommens, Lars P. Müller

19. Rotational Fluoroscopy Assists in Detection of Intra-Articular Screw Penetration During Volar Plating of the Distal Radius
Pages 619-627
Matthew L. Tweet, Ryan P. Calfée, Peter J. Stern

20. Wrist Tendon Forces During Various Dynamic Wrist Motions
Pages 628-632
Frederick W. Werner, Walter H. Short, Andrew K. Palmer, Levi G. Sutton

21. Symptomatic Flexor Carpi Radialis Brevis: Case Report
Pages 633-635
Arkaphat Kosiyatrakul, Suriya Luenam, Sunya Prachaporn

22. Osteoid Osteoma of the Trapezium: Case Report
Pages 636-638
Bora Bostan, Cengiz Sen, Taner Gunes, Mehmet Erdem, Resit Dogan Koseoglu

23. Biomechanical Comparison of Contemporary Clavicle Fixation Devices
Pages 639-644
Timothy Renfree, Bryan Conrad, Thomas Wright

Evidence-Based Medicine

24. Journal CME Instructions
Page 645

25. Diagnosis of Carpal Tunnel Syndrome
Pages 646-648
Steven J. McCabe
26. **Surgical Management of Ulnocarpal Impaction Syndrome**
   Pages 649-651
   Matthew J. Boardman, Joseph E. Imbriglia

27. **Journal CME Questions**
   Page 651

Surgical Technique

28. **Nonvascularized Toe Phalangeal Transfer and Distraction Lengthening for Symbrachydactyly**
   Pages 652-658
   Ryan W. Patterson, William H. Seitz Jr

29. **Reverse Homodigital Dorsoradial Flap for Thumb Soft Tissue Reconstruction: Surgical Technique**
   Pages 659-662
   Manuel Hrabowski, Oliver Kloeters, Günter Germann

In Brief

30. **Board Certification: Important and Changing**
   Pages 663-664
   John Gray Seiler III, Shep Hurwit

31. **Journal CME Questions**
   Page 665

32. **How Plastic Surgery–Trained Hand Surgeons Fulfill Maintenance of Certification Requirements**
   Pages 666-667
   Don Lalonde, R. Barrett Noone, Terry Cullison

Current Concepts

33. **Compressive Neuropathies of the Upper Extremity: Update on Pathophysiology, Classification, and Electrodiagnostic Findings**
   Pages 668-677
   Minal Tapadia, Tahseen Mozaffar, Ranjan Gupta

34. **Current Concepts of the Treatment of Adult Brachial Plexus Injuries**
   Pages 678-688
   Jennifer L. Giuffre, Sanjiv Kakar, Allen T. Bishop, Robert J. Spinner, Alexander Y. Shin
35. **Journal CME Questions**
   Page 688

Book Review

   Page 689
   Ryan Calfee

Letters to the Editor

37. **Proprioception of the Wrist Following Posterior Interosseous Sensory Neurectomy**
   Pages 690-691
   Elisabet Hagert

38. **In Reply**
   Page 691
   Ryan W. Patterson, Monica Van Niel, Patty Shimko, William H. Seitz Jr, Carter Pace

39. **Molecular Events of Cellular Apoptosis and Proliferation in the Early Tendon Healing Period**
   Pages 691-692
   Frank Unglaub, Maya B. Wolf, Adrian Dragu, Raymund E. Horch

40. **In Reply**
   Pages 692-693
   Ya Fang Wu, Chuan Hao Chen, Yi Cao, Bella Avanessian, Xiao Tian Wang, Jin Bo Tang

41. **Mallet Finger Injuries**
   Page 693
   Helen Eva Segmueller

42. **In Reply**
   Pages 693-694
   Charles Leinberry
1. **Masthead**
   Page A2

2. **Editorial Board**
   Page A4

3. **Table of Contents**
   Pages A7, A9, A11

4. **Instructions to Authors**
   Pages A18-A22

Scientific Articles

5. **Publication Bias in Kienböck's Disease: Systematic Review**
   Pages 359-367.e5
   Lee Squitieri, Elizabeth Petruska, Kevin C. Chung

6. **The Incidence of Intrinsic and Extrinsic Ligament Injuries in Scaphoid Waist Fractures**
   Pages 368-374
   Peter Jørgsholm, Niels O.B. Thomsen, Anders Björkman, Jack Besjakov, Sven-Olof Abrahamsson

7. **Surgical Treatment of Pediatric Posttraumatic Palmar Midcarpal Instability: Case Report**
   Pages 375-378
   Kent H. Chou, Franklin H. Chou, Robert J. Goitz

8. **A Cost-Utility Analysis of Nonsurgical Management, Total Wrist Arthroplasty, and Total Wrist Arthrodesis in Rheumatoid Arthritis**
   Pages 379-391.e2
   Christi M. Cavaliere, Kevin C. Chung

9. **Arthroscopically Guided Osteotomy for Management of Intra-Articular Distal Radius Malunions**
   Pages 392-397
   Francisco del Piñal, Leopoldo Cagigal, Francisco J. García-Bernal, Alexis
10. **Comparison of Functional Outcome After Volar Plate Fixation With 2.4-mm Titanium Versus 3.5-mm Stainless-Steel Plate for Extra-Articular Fracture of Distal Radius**
   Pages 398-405
   J. Sebastiaan Souer, David Ring, Stefan Matschke, Laurent Audige, Marta Maren-Hubert, Jesse Jupiter

11. **Congenital Pseudarthrosis of the Radius Treated With Gradual Distraction and Free Vascularized Fibular Graft: Case Report**
    Pages 406-411
    Alexandros E. Beris, Marios G. Lykissas, Ioannis Kostas-Agnantis, Theofanis Vasilakakos, Marios D. Vekris, Anastasios V. Korompilias

12. **Trans-Web Approach for Fixation of Avulsion Fractures of the Proximal Phalangeal Base: Report of Two Cases**
    Pages 412-414
    Eichi Itadera, Yuta Muramatsu, Masataka Shibayama, Yasuhiro Oikawa, Hideshige Moriya

13. **Acellular Dermal Regeneration Template for Soft Tissue Reconstruction of the Digits**
    Pages 415-421
    John S. Taras, Anthony Sapienza, Josh B. Roach, John P. Taras

14. **Irreducible Dislocation of the Thumb Interphalangeal Joint With Digital Nerve Interposition: Case Report**
    Pages 422-424
    Samir R. Shah, Randy Bindra, Justin W. Griffin

15. **Rotation in the Interphalangeal Thumb Joint In Vivo**
    Pages 425-429
    Barbara Jemec, Liaquat Suleman Verjee, Abhilash Jain, Fiona Sandford

16. **Responsiveness of the Michigan Hand Outcomes Questionnaire and the Disabilities of the Arm, Shoulder, and Hand Questionnaire in Patients With Hand Injury**
    Pages 430-436
    Yi-Shiung Horng, Ming-Chuan Lin, Chi-Tzu Feng, Chi-Hung Huang, Hsin-Chi Wu, Jung-Der Wang

17. **Percutaneous Carpal Tunnel Release Compared With Mini-Open Release Using Ultrasonographic Guidance for Both Techniques**
    Pages 437-445
18. Intrinsic Hand Muscle Reinnervation by Median-Ulnar End-to-Side Bridge Nerve Graft: Case Report
Pages 446-450
M. Magdi Sherif, Adel H. Amr

19. Recurrence of Giant Cell Tumors in the Hand: A Prospective Study
Pages 451-456
Jeffrey Williams, Arielle Hodari, Peter Janevski, Aamir Siddiqui

20. Quantitative Measurements of the Volume and Surface Area of the Radial Head
Pages 457-463
Thierry G. Guitton, Huub J. van der Werf, David Ring

Pages 464-467
Thierry G. Guitton, David Ring

Evidence-Based Medicine

22. Journal CME Instructions
Page 468

23. Low-Level Laser Treatment
Pages 469-471
Joshua G. Bales, Roy A. Meals

24. Journal CME Questions
Page 472

25. More Experiments
Page 473
David Ring

Surgical Technique

26. Reconstruction of the Hypoplastic Thumb
Pages 474-479
Terry R. Light, John L. Gaffey

27. Correction of the Typical Cleft Hand
Pages 480-485
Joseph Upton, Amir H. Taghinia
In Brief

28. Chemistry and Mechanics of Commonly Used Sutures and Needles
   Pages 486-488
   Daniel E. Firestone, Anthony J. Lauder

29. Journal CME Questions
   Page 488

30. Electrocautery Use in Hand Surgery: History, Physics, and Appropriate Usage
    Pages 489-490
    Christopher Cox, Jeffrey Yao

Current Concepts

31. Treatment of Acute Peripheral Nerve Injuries: Current Concepts
    Pages 491-497
    Jonathan Isaacs

32. Journal CME Questions
    Page 498

33. Neuromas of the Hand and Upper Extremity
    Pages 499-510
    Jonathan Watson, Mark Gonzalez, Alex Romero, James Kerns

Letters to the Editor

34. Computer-Assisted Navigation of Volar Percutaneous Scaphoid Placement
    Page 511
    Musa Citak, Karsten Knobloch

35. In Reply
    Pages 511-512

36. Small Finger Metacarpal Neck Fractures
    Page 512
    Jeffrey E. Budoff

37. In Reply
    Page 513
    Pedro K. Beredjiklian
38. **Two-Dimensional Versus Three-Dimensional Computed Tomography**
   *Page 513*
   Viroj Wiwanitkit

39. **In Reply**
   *Pages 513-514*
   Anneluuk Lindenhovius, David Ring
Journal Article Review by Jo Fisk

Neuromas of the Hand and Upper Extremity  
Watson, J., Gonzalez, M., Romero, A., Kerns, J.  
Journal of Hand Surgery (Euro) 2010;35A:499-510

This article describes the cause and treatment of neuromas. It is well written and easy to follow, giving a little more detail on events but not too much biochemistry to make it confusing. The following is a brief summary.

The formation of a neuroma occurs as a result of abnormal nerve regeneration following a peripheral nerve lesion.

The causes of neuroma include:

- Chronic irritation
- Pressure
- Stretch
- Poor repair of nerve lesions or previous neuromas
- Laceration
- Crush or blunt trauma.

A neuroma forms as a result of fascicular escape. Yuksel et al (1997) hypothesised that the undamaged perineurium is an impenetrable barrier for regenerating axons, but when damaged, fascicular escape can occur. I.e. The regenerating axon escapes into the surrounding epineural tissue in a disorganized fashion, accompanied by proliferating fibroblasts, Schwann cells and blood vessels.

**Stretch**

Sunderland describes a nerves response to stretch. The fascicles are firstly eliminated due to the stretch whilst the nerve fibres remain tension free within the fascicle. With continued stretching, the fibres progress from straightening to stretching to rupture. The rupture of the perineurium eliminates the barrier for the axons within, allowing them to escape, forming a neuroma.

**Pressure**

When pressure is applied to a nerve, the epineurium functions as a shock absorber, cushioning the fascicles and their contained nerve fibres. When the pressure damages the epineurium, fascicular escape can occur.

**Poor repair of nerve lesions**

Can occur from dissection, mobilization, preparation of nerve ends and apposition of nerve ends. Damage to vessels from the above can lead to scarring.
**Trauma**
Acute injury can damage and prevent the regenerating axons from reaching the distal stump, leading to disorganized nerve fibre growth and neuroma formation. Infection, ischaemia and scarring can also promote the formation of a neuroma.

**Chronic irritation**
This leads to perineural scarring.

This article discusses the two classifications of nerve injuries in relation to the development of neuromas – Seddon (Neuropraxia, axonetmesis and neurotmesis) and Sunderland (first, second, third, fourth and fifth degree). Seddons neuropraxia and axonetmesis, and Sunderlands first and second degree injury are less likely to result in neuroma formation as the endoneural tube remain in continuity.

**Pathology**
Common findings of neurons are nerve fibres and regenerating fascicles in various stages of maturation, scar tissue, disorganization of nerve fibres and possible regeneration into overlying skin.
A terminal neuroma occurs when following a transaction of a peripheral nerve, the ends are not united.
The size of the neuroma depends on the amount of axonal ingrowth, number of fibroblasts, Schwann cells and blood vessels present, response to movement, infection or foreign bodies and nutritional status.

The article describes the process of nerve regeneration as described by Lundborg (2000). This describes growth factors and receptors, signaling and gene activation. In summary, here are a few key points:
Following axonal transaction, distal parts of the axon disintegrate and wallerian degeneration occurs. The remnants of axons are digested by macrophages. Schwann cell activity increases, forming columns of cells (bands of Bungner). Growth factors are released and bind to receptors, intracellular signaling occurs and there is gene activation. The regenerating axons advance along the Schwann cell surface, picking up factors bound to the growth receptors, transferring into growth cones. Microspikes explore the microenvironment and assist in determining growth direction. Other factors that influence the guidance are tissue specificity, fascicular or trunk nerve specificity, sensory versus motor specificity, topographic specificity and end organ specificity.
*(the article describes this in more detail)*

The article describes the pain experiences as a result of neuromas. The 2 processes provoking pain are persistent mechanical or chemical irritation of the axons within the neuroma and the development of spontaneous sensory symptoms caused by persistent stimulation of axons within the neuroma, dorsal root ganglion, dorsal horn of spinal cord.
*(This is discussed in much more detail and discusses the changes which may be responsible for the development of chronic pain).*
Diagnosis of a neuroma is based on palpation of a discrete area of tenderness that results in distally radiating pain in the distribution of the peripheral nerve plus a site distal to the site of the positive Tinel's which has altered sensation. Sood et al (1998) described 4 types of pain associated with neuromas – spontaneous pain; pain on pressure, pain on movement of adjacent joints and painful hyperaesthesia on light touch. Hendler's back pain rating scale (1996) can be used to evaluate pain associated with a neuroma. This consists of 3 components
  - A body diagram
  - A numerical scale
  - A list of pain descriptors.
The score achieved is used to determine if they will have a good response to surgery.

Treatment of neuromas
Conservative
  - Desensitization
  - Padded finger stalls
  - Pain medication
Surgery (if no improvement in 6/12)
  - Transposition into muscle – to place transected end of sensory nerve away from an area that is subject to repeated trauma, movement and mechanical stimuli, to release tension on the nerve, and to prevent regeneration of the nerve into skin.
  - Transposition into vein – to place transected end of sensory nerve into the lumen of veins.
  - Burying in bone – this is the oldest technique.
  - Centrocentralization – This involves the coaption of two nerve cords of central origin or coaption of one nerve if the fascicles are split into two equal sizes. The anastomosis is able to withstand the forces of nerve growth and grows towards each other, overlap and cease to grow further once overlapped by 2-5 mm.
  - Coverage with flaps or vascularised tissue – to allow wrapping and a well vascularised surface for nerve glide.
  - Nerve stripping – the neuroma is freed from the surrounding tissue. The nerve is dissected and tractioned until the nerve is disconnected and slide away from the main trunk.
  - Silicone rubber capping – caps are placed over the resected proximal nerve stump to contain the neuroma and decrease the amount of fibrous tissue reaction
  - Re-resection
  - Re-repair of poorly repaired nerve

I thought this was a really interesting article giving me just a little bit more knowledge on neuromas and hopefully I will be able to explain it a little better to patients. If you would like a copy of the article, let me know. Joanne.Fisk@cdhb.govt.nz
Free Paper Abstract Submission

- Before submitting your abstract, please read “NZAHT guideline for free papers”
- Please use the template below to submit your abstract.
- **Deadline:** Your abstract must be received by 5pm **1 July 2010.**
- Please e-mail your abstract to the convener: Alieke van Middelaar **aliekev@middlemore.co.nz**
- Your abstract will be included in the conference hand book.

<table>
<thead>
<tr>
<th>Title of free paper</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
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<tr>
<td>Objectives</td>
<td></td>
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<tr>
<td>Methodology/Approach</td>
<td></td>
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<tr>
<td>Results/Practice implications</td>
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<td>Conclusion</td>
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<tr>
<td>References</td>
<td></td>
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</tbody>
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**Poster Abstract Submission**

- Before submitting your abstract, please read “NZAHT guideline for posters”
- Please use the template below to submit your abstract.
- **Deadline:** Your abstract must be received by 5pm **1 July 2010**.
- Please e-mail your abstract to the convener: Alieke van Middelaar aliekev@middlemore.co.nz
- Your abstract will be included in the conference handbook.

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<th>Title of poster</th>
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<td>Author(s)</td>
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<td>Conclusion</td>
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<tr>
<td>References</td>
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NZAHT Inc. Guidelines For Poster Presentation

Posters will be displayed during the conference, and we ask if a presenter could be available part of each lunch-time to talk to delegates about their work.

Abstract

Deadline for abstracts about posters to be with organizing committee by 1 July 2010. To be included in conference booklet.

An abstract summarizing the context and findings of the research - maximum of 250 words and referenced must be displayed on poster. Abstracts must be in Word Format, and fit on A4 size of paper, and include Title, Authors, poster description, objectives/ background, procedures, results, conclusions etc. (see Guideline : Format requirements for abstracts.)

REQUIREMENTS

- Size – no larger than 1.2metres X 1.75metres need to be able to read from 2 metres away
- Type – Clear bold print
- Title – Block Capitals
  - Include names of Authors and Institution of origin
  - Acknowledgment of funding sources for research

SUGGESTIONS

- A poster presentation is a visual display describing:
  - a research initiative
  - new ideas
  - innovative practice or programmes
  - case studies
  - surveys or research in the field of Hand Therapy.

NZAHT Inc. Education Committee 2009. Guidelines for Poster presentation
• A great poster is readable, legible, well organized and succinct. Avoid fancy fonts

• Poster layout-use headings of ‘Introductions’, ‘Methods’, ‘Results’ and ‘Conclusions’

• Create a catchy title that reflects the topic

• Provide an overall statement about the topic and situate near the top

• Use pictures/diagrams where able [ensure copyright clearance to use images/photographs] - ideally figures and tables should cover slightly more than 50% of poster area.

• Use Bullet points or short phrases rather than long paragraphs.

• Document important findings and implications for practice.

• Summarize conclusions.

• Include resources/ references

• Remember ‘KISS’ - Keep it simple [excess information can make it too busy and difficult to read].

• Ensure it is visually attractive. Consider the colour scheme (good contrasting colours are easier to read.).

• Ensure font is large enough to be read at a short distance eg 1metre

• Spelling and grammar check.
Guidelines For Free Papers

- ‘Papers’ must be relevant to Hand Therapy and are encouraged from diverse perspectives including:
  - Random controlled trials
  - Clinical evaluations
  - Case studies
  - Surveys/questionnaires

- An abstract summarizing context and findings must be emailed in Word Format and fit on one side of A4 size paper.

  It must include Title/Authors/Affiliations/purpose and relevance/methodology/results/conclusions/main references.

  (See Guideline: Format Requirements for Abstracts)

- 12 mins for verbal presentation, followed by 3 mins questions/discussion [timing will be strictly enforced by chair].

(Conference organizer-Include contact details, closing dates, information about Visual Aids available)

# PRESENTATION SCORING SHEET

<table>
<thead>
<tr>
<th>Quality of content</th>
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**TOTAL SCORE:**

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