American Burn Association

*Occupational Therapy & Physical Therapy*

Special Interest Group

Chicago, IL

Tuesday, April 21, 2015

**KEEP CALM AND RESEARCH ON**
AMERICAN BURN ASSOCIATION’S
OT/PT SPECIAL INTEREST GROUP
CHICAGO, IL
TUESDAY, APRIL 21, 2015

Chair: Lynne Benavides, OTR/L, CHT
Rhode Island Hospital, Providence, RI
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Vice Chair: Andria N. Agraz, PTA, CLT
Richard M. Fairbanks Burn Center, Indianapolis, IN
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Co-Chair: Jennie McGillicuddy, OTR/L
UCSD Medical Center, San Diego, CA
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Making Evidence from Your Intervention.
The Importance of Research in the Burn Rehabilitation Profession.

This special interest group will target/describe how to start and progress from idea, to poster, to manuscript and beyond. It features state of the science and clinical pearls on edema interventions and exercise.

Objectives
- How to get started on and progress through burn rehabilitation research – including posters, and oral presentations of case studies, case series and beyond
- Identify and understand current interventions for and science available on treatment of edema following burn injury
- Identify and understand the value of exercise for the patient following burn injury
AGENDA

8:00 – 9:10  Welcome & Business Meeting

1. Announcements
2. MAC Update
3. Burn Rehabilitation Coalition
4. Abstract Manuscript Submission Updates
5. Burntherapist.com update
6. Barbara Knothe Burn Therapist Achievement Award
7. Introduction of Topics and Speakers

9:10 – 10:00  The Research Process: An Overview and Tips on Where to Begin
Bernadette Nedelec, BSc OT (c), erg., PhD

10:00 – 10:10  Questions

10:10 – 10:30  Break – Refreshments provided by Bio Concepts, Inc.

10:30 – 11:20  Making Evidence from Your Intervention - Exercise Training in Patients with Severe Burns
Oscar E. Suman, Ph.D.,MS

11:20 – 11:30  Questions

11:30 – 12:20  Edema Management
Dana Nakamura, OTR/L, CLT

12:20 – 12:30  Questions, Final Comments and wrap up.
Correlative Session Presentations

Thursday, April 23, 2015, 10:00 AM – 12:00 PM

63: Social Participation of Burn Survivors: A Conceptual Framework
M. Marino, MPH, M. Soley Bori, MS, F. Amaya, MPH, M. Rossi, BA, M. Slavin, PT, PhD, C. M. Ryan, MD, J. C. Schneider, MD, A. Acton, RN, BSN, A. M. Jette, PT, PhD, L. E. Kazis, ScD Boston University, Boston, MA; Shriners Hospitals for Children-Boston, Massachusetts General Hospital, Harvard Medical School, Boston, MA; Spaulding Rehabilitation Hospital, Harvard Medical School, Boston, MA; Phoenix Society for Burn Survivors, Grand Rapids, MI

67: Urban Frostbite 2014: One University Burn Center’s Experience
D. S. Shenaq, MD, A. O’Connor, MSN, M. Teele, PT, M. Robinson, MS OTR/L, L. J. Gottlieb, MD, FACS, D. Musgrove, BA The University of Chicago, Chicago, IL

73: National Burn Therapist Competency Guidelines - are we using them?
I. S. Parry, MS, PT, S. Sen, MD, FACS, T. L. Palmieri, MD, FACS, FCCM, D. G. Greenhalgh, MD, FACS
Shriners Hospital for Children, Northern California, Sacramento, CA

76: Treating Neuropathic Pain in Burn Survivors: A Case Series
V. Calva, BSc, OT, A. Chouinard, BSc, PT, M. A. Couture, MSOT, E. Godbout, MSOT, A. De Oliveira, BSc, L. LaSalle, MD, B. Nedelec, PhD Villa Medica Rehabilitation Hospital, Montreal, QC, Canada; McGill University, Montreal, QC, Canada

79: Differential Assessment of Distal Interphalangeal Joint Flexion Limitation of Burned Fingers
U.S. Army Institute of Surgical Research, JBSA Fort Sam Houston, TX; Independent Contractor, Portland, OR; University of Utah, Salt Lake City, UT; University of Utah, Salt Lake City, UT

Friday, April 24, 2015, 9:00 AM – 9:15 AM - Plenary Session:

85: Small and Large Burns Alike Benefit from Lengthier Rehabilitation Time
U.S. Army Institute of Surgical Research, JBSA Fort Sam Houston, TX; Independent Contractor, Portland, OR; University of Utah, Salt Lake City, UT

Friday, April 24, 2015, 10:00 AM – 12:00 PM

125: Use of Fibrin Glue for Split Thickness Skin Graft Fixation Allows Early Mobilization without Graft Loss
S. A. Rotta, MD, E. Labonte, PT, A. St. Clair, OT, J. Laird, RN, K. Connolly, PA-C, R. E. Crombie, MD, A. Savetamal, MD, Bridgeport Hospital, Bridgeport, CT
Poster Presentations

Wednesday, April 22, 2015, 12:30 PM – 1:30 PM

231: Use of Fractionated CO2 Lasers in Hypertrophic Burn Scars
K. G. Siwy, OTR/L, MS, K. C. Lee, MD, M. B. Donelan, MD, R. R. Anderson, MD, R. L. Sheridan, MD, FACS
Shriners Hospitals for Children-Boston, Boston, MA; Massachusetts General Hospital, Boston, MA; MGH: Wellman Center for PhotoMedicine, Boston, MA

233: Expansion of the Burn Rehabilitation Therapist Competency Tool to Include Long Term Rehabilitation/Outpatient
L. Forbes, OTR/L, MSc, I. S. Parry, MS, PT, D. J. Lorello, PT, DPT
Health Sciences Centre, Winnipeg, MB, Canada; Shriners Hospital for Children - Northern California, Sacramento, CA; Arizona Burn Center, Phoenix, AZ

234: Therapy Services Embedded in the Burn Clinic: A Patient’s Perspective
K. LaPratt, MS OTR/L, D. O. Murray, MSPT, M. A. Pressman, PhD, S. C. Osborn, RN, K. J. Richey, RN, BSN, G. A. Holloway, MD, FACS, D. M. Caruso, MD, FACS, Arizona Burn Center, Phoenix, AZ

235: Use of Restorative Technician Increases Structured Activity Time for Patients Admitted to a Burn Unit
M. Giffhorn, PT, DPT, A. Garlock, MS OTR/L, S. Harrison, PT, DPT, Loyola University Medical Center, Maywood, IL

236: Development of an Evidence-Based Precepting Program for the Burn Rehabilitation Department
V. J. Barrera-Garcia, COTA, S. A. Zayas, PTA, K. Valdez-Delgado, BSN, W. S. Dewey, PT, E. A. Mann-Salinas, RN, PhD, USAISR Burn Center, San Antonio, TX

238: Revised Case Study: The Current Effects of Skin Cell Isolation Grafting including Length of Stay Data on Therapy Interventions
P. A. Malie, OTR/L, MOT, UPMC Mercy Hospital of Pittsburgh, Pittsburgh, PA

240: Review of Range of Motion Outcomes Utilizing Fast Track System of Burn Care
J. Bucher, OTR/L, G. J. Carrougher, RN, MN, A. Dai, None, T. N. Pham, MD, FACS, N. S. Gibran, MD, FACS
University of Washington Burn Center at Harborview Medical Center, Seattle, WA

241: Retrospective Look at Early Ambulation for Patients with Lower Extremity Autografting
D. J. Lorello, DPT, D. O. Murray, MSPT, M. D. Peck, MD, ScD, FACS, M. A. Pressman, PhD, M. R. Matthews, MD, FACS, D. M. Caruso, MD, FACS, K. N. Foster, MD, MBA, FACS
Arizona Burn Center, Phoenix, AZ
242: A soft casting technique to manage pediatric hand burns: Less pain, greater gain
C. L. Nederveld, BSN,RN, S. L. Moulton, MD, FACS, T. Boulter, OTR/CHT, A. Barron, BA
Children's Hospital Colorado, Aurora, CO

243: Use of gel combination with pressure to increase comfort & compliance in facial burn scar management
J. Kemp-Offenberg, OTR/L, N. Musslewhite, OTR, M. Serghiou, OTR, MBA, L. K. Branski, MD
Shriners Hospitals for Children Galveston, Galveston, TX

245: Is Compression Necessary for Early Mobilization Following Skin Grafting of Lower Extremity Burns?
E. LaBonte, MSPT, A. St. Clair, MS OTR/L, K. Connolly, PA-C, J. Laird, BSN,RN, S. A. Rotta, MD, A. Savetamal, MD, FACS
CT Burn Center at Bridgeport Hospital, Bridgeport, CT

246: Serial casting of axillary burns: a pilot quality improvement study
University of Utah, Salt Lake City, UT

Friday, April 23, 2015 12:30 PM – 1:30 PM

350: Evaluation of Educational Outreach Efforts in Honduras and Their Impact on Pediatric Burn Care
M. R. Metivier, BSN,RN, C. Macner, PT, DPT, R. L. Sheridan, MD, FACS, K. Prelack, PhD, RD, M. Dylewski, PhD, RD
Shriners Hospital for Children - Boston, Boston, MA

369: Therapeutic Benefits of a Wilderness Kayaking Adventure for Adult Burn Survivors
H. D. Christians, MOT, J. R. Antick, PhD, B. Manulik, MPH, M. Reimann, MBA, N. A. Kemalyan, MD, FACS
Legacy Health Oregon Burn Center, Portland, OR; LEAP (Life Expanding Adventure Program), Portland, OR

370: Facilitated Group Writing: A Processing Tool for Aftercare
M. Krueger, MSW, H. D. Christians, MOT, R. Steely, BA, N. A. Kemalyan, MD, FACS
Legacy Health Oregon Burn Center, Portland, OR; Write Around Portland, Portland, OR

387: Use of the AM-PAC in the Burn Population
L. C. Ware, BSc, OT, S. Vocke, DPT, G. Andre, MS OTR/L, M. Bernard, MPT, M. Ober, BSc, OT, J. Marchica, DPT
Johns Hopkins Burn Center, Baltimore, MD

388: Efficacy of chest physical therapy for burn patients with inhalation injury
T. Kubo, PT, MS, A. Osuka, MD, PhD, K. Tabira, PT, PhD, F. Toda, MD, PhD, M. Ueyama, MD, PhD
Japan Community Health Care Organization, Nagoya, Japan; Graduate School of Health Science Kio University, Nara, Japan
389: Impact of Corrective Cosmetics on Quality of Life and Self-Perception in Children with Burn Scars
T. Bui, OTR/L, MOT, I. S. Parry, MS, PT, S. Sen, MD, FACS, D. G. Greenhalgh, MD, FACS, T. L. Palmieri, MD, FACS, FCCM Shriners Hospital for Children Northern California, Sacramento, CA

392: Heterotopic Ossification: What About Botox?
S. Fletchall, OTR/CHT, W. L. Hickerson, MD, FACS Firefighter's Regional Burn Center, Memphis, TN

393: Yoga for Burn Survivors: Impact on range of motion, cardiovascular function and quality of life
C. Miller, PT, S. Tremblay, PT, E. Dideon-Hess, MSW, S. A. Blome-Eberwein, MD
Lehigh Valley Hospital, Allentown, PA
The BurnTherapist.com web site — is the first site dedicated to the work and endeavors of Burn Occupational & Physical Therapists in an effort to develop outcome based research and clinical improvements for all burn survivors. We are committed to fostering collaborative networking relationships among burn therapists as well as developing clinical research, treatment innovations and improvement in service delivery and care at local, national and international levels.

We also highlight the achievements of Burn Occupational & Physical Therapists as part of the American Burn Association's Occupational & Physical Therapist Special Interest Group through the yearly Barbara Knothe Burn Therapist Achievement Award. We are a resource for therapist driven research and collaboration to provide the best treatment outcomes for the patients that we serve.

Burn Clinical Pearls (formerly Splinting Quarterly)
Each Quarter (January, April, July & October) we will highlight a splinting endeavor that has been created to work with a challenging surgical intervention or as a result of a unique patient need or request. New designs as well as modifications to an existing, established design are welcomed. Post-operative splints as well as adaptive device splints, casting and any other type of ADL modification gladly are welcome. We will also be archiving all of the submissions so that we can maintain a resource of burn splinting knowledge. Contribute to the accumulated knowledge and submit your splint design to today!

Go to the web site www.BurnTherapist.com and get involved!
Helen D. Christians, MOT/L has been an Occupational Therapist for over 31 years and she has been practicing in burns continuously for the last 28 of those years. Helen obtained her Master’s of Occupational Therapy Degree from Texas Women’s University in 1983. She has been the cornerstone of the burn rehabilitation team at the Legacy Oregon Burn Center since 1986 and has left an indelible mark on the rehabilitation program as both a mentor to colleagues and inspiration to burn survivors. Helen has been fundamentally involved in every aspect of the burn rehabilitation program and currently coordinates the After Care Support Programs as well as the Behavior & Enhancement Skills Training (BEST) programs in conjunction with the Phoenix Society for Burn Survivors. She has been active member of the American Burn Association for over 27 years and has presented at both local and regional burn conferences continuously since 2006 in addition to Oregon Occupational Therapy conferences. Some of the topic areas of Helen’s recent research and investigation include facial scar assessment techniques and the use of a 3-D color digital scanner to assess face and neck scars. In addition to her numerous work responsibilities in burns, she has served on a volunteer mission to Zambia via the International Burn Outreach Program of the American Burn Association in 2011.

Helen has been a stalwart advocate for the burn survivor throughout her career and this is where her passion lies. In her early life, when she learned of a tragic fire in a local school where many children lost their lives, she was drawn to burns to be an advocate as well as a motivator – to help others survive and achieve beyond their potential no matter what the circumstances. She recognizes that recovery from a major burn injury is a lifelong process and she takes part in both leading and supporting throughout this often challenging journey. Helen makes a conscious and continuous effort to bring the family of the burn survivor into the rehabilitation process. She has been instrumental in pushing the envelope for activities – including annual wilderness rafting adventures and programs focused on effective adjustment to trauma for the burn survivor. Helen routinely takes the less traveled path and forges through the more difficult aspects of burn care – to address issues such as reaction to visible scars and the impact of intimacy and after care support mechanisms – to be an advocate and a guide along the way to helping both children and adult survivors’ achieve their rehabilitation goals.

Helen is a take charge person and believes that the best way to get the work done is by rolling up your sleeves and getting involved. She is not one for seeking recognition but rather takes enjoyment in seeing the results of her efforts in the enduring, fully functional burn survivor. Moreover, Helen is a stalwart example of a perennial burn clinician and continues to be an inspiration to the community of burn survivors as a resilient beacon of burn rehabilitation success.
2015 OT/PT SIG Committee

Lynne Benavides, OTR/L, CHT received her degree in Occupational Therapy in 1990 from Quinnipiac College. She became a Certified Hand Therapist in 2002. Lynne has worked at Rhode Island hospital for 25 years and joined the burn team at the onset of her career. She worked in the acute care setting for 10 yrs and in the outpatient setting for the past 15 years. She has been involved in 2 International outreach missions for burn care and has presented at many multidisciplinary conferences including the Northeast Regional Burn Conference and at the New England Hand Society annual meeting. She is thrilled to be able to be a part of the OT/PT SIG.

Andria N. Agraz, PTA, CLT is a Physical Therapist Assistant and Certified Lymphedema Therapist and has been a member of the Richard M. Fairbanks burn rehab team since 2009. Andria has worked in the areas of acute care and outpatient therapy and has been on 2 mission trips to El Salvador to promote and educate burn care and burn therapy. She is a member of the American Burn Association and really enjoys the time spent at conferences learning about new ideas and meeting the clinicians that make burn care so special. Andria has given several guest lectures to the University of Indianapolis PTA program in the area of Lymphedema and assists with the burn therapy lectures as well. In her free time she spends most days with her family and reading wherever she can find a comfy spot. She is excited to be a part of the OT/PT Special Interest Group and is honored to be current Vice-Chair.

Jennie McGillicuddy, OT lives in San Diego, California but is originally from Louisiana. She completed her undergraduate degree and graduate training at Louisiana State University. She currently works at UCSD Medical Center; primarily in the Burn Unit. She enjoys the challenges that each day presents when treating those individuals with serious burns. Jennie enjoys running, cooking, hiking, yoga, and reading. She is excited to be current Co-Chair of the OT/PT SIG!
2015 OT/PT SIG Presenters

Bernadette Nedelec is an Associate Professor and the Director of the Occupational Therapy Program at McGill University, Montreal, Canada. She graduated as an Occupational Therapist in 1983 and worked in a number of positions, one of which was the University of Alberta Hospital where she worked with burn survivors and patients who had sustained hand injuries for almost 10 years. She completed a PhD in Experimental Surgery in 1997 and post-doctoral training in 1999. She currently conducts her research at the Montreal Burn Centre with her research office located at Villa Medica Rehabilitation Hospital. Her current research projects focus on: 1) the evaluation of clinical instruments used to quantify hypertrophic scar and its associated symptoms, 2) the efficacy of treatment interventions employed to minimize this pathology and its associated morbidities, 3) practice issues related to evidence-based practice in burn survivor rehabilitation, and 4) the comprehensive evaluation of the short- and long-term consequences of burn injuries in adults.

Oscar Suman received his PhD in Exercise Physiology from the University of Wisconsin-Madison. He has worked in the field of physiology for over 17 years. He is certified as a Clinical Exercise Specialist and has extensive expertise in exercise prescription and testing for functional status, body composition (DEXA), and indirect calorimetry for estimating basal metabolic rate and energy expenditure. He has been at Shriners Hospitals for Children-Galveston for 14 years. His research has focused on identifying therapeutic interventions that are clinically relevant and useful in promoting full rehabilitation and recovery in severely burned children. As such, I have been intimately involved in assessing cardiopulmonary and muscle function of burned patients at the whole-body level, and also how these functions or interventions translate into improvements in the physiological status, quality of life, and psychosocial health of children who have experienced severe burns. He is principal investigator or co-investigator on several NIH-funded awards, including a P50, and an R01, as well as on other federal grants. He is full professor at the University of Texas Medical Branch and Co-director of the Burn Center Research Management Office, as well as Associate Director of Research at SHC-Galveston and the Director of the Children’s Wellness Center.
Dana Nakamura, OTR/L, CLT has been in Burn care for 30 years. Following graduation from the University of Puget Sound in Tacoma, WA, she worked at Harborview Medical Center in Seattle, WA from 1985-2006 in Rehabilitation Medicine and the University of Washington Burn Center. In 2007, Dana moved to Winston Salem, NC to establish the burn therapy program at Wake Forest Baptist Medical Center. She has been a member of the ABA since 1988; served on the MAC, ARC and Education committees and PT/OT SIG chair, and is the 2008 recipient of the Barbara Knothe Award. Dana reviews manuscripts for Burns and the Journal of Burn Care & Research. She currently serves as co-chair for the Southern Region Rehab Symposium, ABLS instructor, “It Happened in Seconds” Firefighter Burn Injury Awareness Training instructor, Phoenix Society SOAR Program Coordinator and Trainer, Victim2Victor Burn Support Group organizer and facilitator and Executive Board Member of the Piedmont Firefighter’s Burned Children’s Fund. She teaches in the OT programs at Winston Salem State University and Cabarrus College of Health Sciences. In her spare time, she enjoys knitting, crocheting, canning and crafting for her Annual Holiday Craft fundraiser for burn patient/family needs.

Dana’s research interests include edema management and complementary/alternative medicine for pain management. She is honored to be part of this year’s PT/OT SIG program, and thanks the committee for the opportunity to share knowledge and experience. Feel free to contact Dana at dynakamu@wakehealth.edu.
The Research Process: An Overview and Tips on Where to Begin

by Bernadette Nedelec, BSc OT (c), erg., PhD
The Research Process: an overview and tips on where to begin

Bernadette Nedelec
BSc OT (c), erg., PhD
STEP 1: Identify the research question
STEP 2: Design the Study
STEP 3: Conduct the Study
STEP 4: Data analysis
STEP 5: Communication

(Portney and Watkins 2009)
STEP 1: Identify the research question

Identify the research problem (Mayo et al. 2013)

STEP 2: Design the Study

STEP 3: Conduct the study

STEP 4: Data analysis

STEP 5: Communication

(Portney and Watkins 2009)
Identify the Research Problem

• Formulate your research question
  – Make sure you take time to clearly articulate your question
  – Novice researchers tend to make it too broad
  – Make it narrow enough that it is answerable
• What exactly do you want to know?
Identify the Research Problem

- What do you want to know?
  - Population
    - Adults, children, both
    - All burn survivors admitted to your unit, all burn survivors discharged home, all burn survivors who develop a joint contracture
  - Intervention/exposure
    - Treated/untreated
    - No depression/mild depression/severe depression
    - Time
  - Comparison
  - Outcome measure(s)
    - Make sure this is part of your literature review
    - Use valid, reliable, responsive measures that have been described in the literature and their clinimetric properties examined.
STEP 1: Identify the research question

Identify the research problem

Review of Literature: Theoretical framework

STEP 2: Design the Study

STEP 3: Conduct the study

STEP 4: Data analysis

STEP 5: Communication

(Portney and Watkins 2009)
Literature Review

• Thoroughly review the literature prior to starting a study
  – TIPS:
    • You literature review should examine all aspects of your research question
    • See if you have access to an academic librarian
    • Have students do this as part of their clinical training
    • If you do not have access to online journals at your burn center investigate whether you can through your local university program

• Confirm that there is an identified gap in the literature
STEP 1: Identify the research question

- Identify the research problem
- Review of literature: Theoretical framework
- Interpret variables
- State hypotheses: Specify purpose

STEP 2: Design the Study

- Design the protocol

STEP 3: Conduct the study

STEP 4: Data analysis

STEP 5: Communication

(Portney and Watkins 2009)
Types of Research

Descriptive
- Describe Populations

Exploratory
- Find Relationships
  - Cohort Studies
  - Case-control Studies
  - Correlational/Predictive Research
  - Methodological Research
  - Historical Research
  - Normative Research
  - Qualitative Research
  - Descriptive Surveys
  - Case Study

Experimental
- Cause and Effect
  - Randomized Controlled Trials
  - Quasi-Experimental
  - Single-subject Design

Systematic Reviews
- Meta-Analyses of Exploratory and Experimental Studies

Portney and Watkins 2009
STEP 1: Identify the research question

- Identify the research problem
  - Review of literature: Theoretical framework
  - Interpret variables
    - State hypotheses
      - Specify purpose
      - Design the protocol

STEP 2: Design the Study

- Collect data: Reduce data
  - Analyze data
    - Interpret findings
  - Report findings
    - Suggestions for further study

STEP 3: Conduct the study

STEP 4: Data analysis

STEP 5: Communication

(Portney and Watkins 2009)
Where to begin?

• Do Not Try This on Your Own
• Create your Research Team
  – Establish partnerships/collaborations
    • Researchers within your burn centre
    • Rehabilitation researchers at local university programs
    • Academic librarians
    • Students (professional entry level, Master’s research programs, PhD students)
    • Statisticians
    • Researchers from other centres with whom you share common interests
  – Look for mentors
    • ABA Rehabilitation Committee Mentor List
    • ABA Research Committee
      – melissa.pressman@mihs.org
      – robert.cartotto@sunnybrook.ca
Consider Replicating Existing Studies

- Godleski M et al. 2014 (Clinical outcomes from a foam wedge splinting program for axillary contracture prevention in the intensive care unit)
  - Prospective case series
  - Sample: 10 patients with burn in axilla or axillary region
  - Outcome measures: ROM, pain, FIM, satisfaction questionnaire
  - Exposure: time (foam abduction wedge splint)
Tips

- There is a NEED to replicate existing studies, so do not be shy to do so
  - Advantages
    - The method has already been described
    - May provide confirmation of their findings
    - Authors commonly provide discussion about study weaknesses which may provide you with an opportunity to improve upon their study
    - Opportunity to contrast different treatment approaches (i.e. a unit that never positions the axilla in abduction)
Examples of Case Studies

- Coons D and Godleski M 2013
  - Retrospective, case study
  - Sample: 2 burn survivors with HO
  - Outcome measures: elbow ROM
  - Exposure: time (aggressive passive stretch)
  - Comparison: before and after treatment
Tips

- Innovative approaches may be publishable
- A thorough review of the literature is essential since case studies must be novel
- Prospective case studies are advantageous
  - Careful consideration of outcome measures
  - Single-subject, A-B design (Priganc et al. 2008)
    - Establishes stable baseline outcome prior to treatment initiation (independent variable)
Examples of Case Studies

• Schneider JC et al. 2014
  – Prospective, pre-post design
  – Sample: burn survivors admitted to IP rehab
  – Outcome measures: ROM (shoulder, elbow, hip, knee), Jebsen Hand Function Test, Berg Balance Scale
  – Exposure: time (OT/PT 3h/d, 5d/week)
  – Comparison: admission/discharge
  – Results: all outcomes significantly improved with time

• NOTE: first examination in the literature of the effect of IP burn-specific functional outcomes
Tips

- Prospective design supports more rigorous data collection
  - Systematic data collection is imperative
  - Clinicians commonly believe that systematic rigorous data collection is happening consistently, however, the reality is........
- Pre-post design documents change with time
- Consider whether you have an opportunity to create a case-control study
Examples of Qualitative Research

• **Davis T et al.** (Making meaning in a burn peer support group: qualitative analysis of attendee interviews)
  
  – Nonrandom, purposive, convenience sample of adult burn survivors
  
  – Sample: 6 burn survivors
  
  – Data collection: Guided interviews exploring their experience in a support group (triangulated with key informant interviews and support group observations)
  
  – Data analysis: Content analysis based on grounded theory (extract themes)
Tips

• Qualitative methodology varies depending upon the theoretical perspective
• Commonly used for topics that have not previously been well developed
• Explores the lived experience of individuals in a very holistic, ecological manner
• Triangulation of data commonly incorporated
Example of Predictive Research

- **Gangemi EN et al. 2008** (Epidemiology and risk factors for pathologic scarring after burn wounds)
  - Retrospective analysis
  - Sample: 703 burn survivors (2440 burn sites)
  - Outcome measures: clinical scar observation
  - Comparison: scar formation/clinical characteristics
Tips

• Studies of this nature can take years to complete (i.e. data collection 1994-2006 published in 2008 = 14 years)
• Provides rich data set ⇒ strong conclusions
Example of a RCT

- Lorello D et al. 2014 (Results of a prospective randomized controlled trial of early ambulation for patients with lower extremity autografts)
  - Prospective, RCT
  - Sample: 31 burn survivors with L/E grafts
  - Outcome measures: graft loss, ambulation time, pain (VAS), length of stay
  - Comparison: Standard care (ambulation post-op day 5) versus early ambulation (POD 1)
Tips

• RCTs usually build on data that provides positive outcomes or the need for a controlled study
• Requires the ability to randomize participants to treatment and control/comparison group
• Can be very difficult studies to perform so are not recommended as a starting point without advanced research training or support
Focus on your Strengths

• Hypothesis testing is part of your everyday clinical practice – build upon that experience
• Clinical data – your systematic approach to evaluating patient outcomes is a potential gold mine
• You know what your recruitment possibilities would be for a prospective study – use that knowledge to your advantage
• Develop your research team
References

- Lorello DJ et al. Results of a prospective randomized controlled trial of early ambulation for patients with lower extremity autografts. J Burn Care Re 35:431-6, 2012
Making Evidence From Your Intervention – Exercise Training in Patients with Severe Burns

by Oscar E. Suman, Ph.D.,MS
Making Evidence From Your Intervention—Exercise Training in Patients With Severe Burns

O.E. Suman, Ph.D., M.S.
Professor
The University of Texas Medical Branch, Department of Surgery

Director of the Children’s Wellness and Exercise Center
Associate Director of Research
Shriners Hospitals for Children
Galveston, Texas

ABA-Chicago, April 2015
OBJECTIVES

- After the presentation, I hope that you will:

  1. Appreciate the importance of research in the burn rehabilitation profession
  2. Be able to discuss steps involved in getting started on an idea, and progress from idea, to manuscript and beyond
  3. Be able to discuss at least one example of an exercise intervention, rationale, methods, results
• Characteristics of the response to severe burns

  • Catabolism (1)
  • Hypermetabolism (2)
  • Insulin Resistance (3)
  • Bone loss (4)

There is a problem

Exercise Training??

Exercise and Definitions

Define your terms!!

Exercise = Any sport or activity that works large groups of muscles, is continually maintained and performed rhythmically, is defined as an aerobic, or cardiovascular, exercise by the American College of Sports Medicine. Resistance training is a form of exercise that is designed to improve muscular fitness by exercising a muscle or a muscle group against external resistance.

Hand grip and pinch strength versus Isokinetic strength using dynamometry.

The treatment of burns: an exercise in emergency surgery.

versus

Structured exercise circuit program for burn patients.
•Exercise and Burns-Literature Review


To replicate or not to replicate. To expand is good, improve is better.
**Exercise**

Bernadette Nedelec– ID the research problem, literature review

Now start to design your study.
Example of a RCT

• Lorello D et al. 2014 (Results of a prospective randomized controlled trial of early ambulation for patients with lower extremity autografts)
  – Prospective, RCT
  – Sample: 31 burn survivors with L/E grafts
  – Outcome measures: graft loss, ambulation time, pain (VAS), length of stay
  – Comparison: Standard care (ambulation post-op day 5) versus early ambulation (POD 1)
Tips

• RCTs usually build on data that provides positive outcomes or the need for a controlled study

• Requires the ability to randomize participants to treatment and control/comparison group

• Can be very difficult studies to perform so are not recommended as a starting point without advanced research training or support
Effects of a 12-wk resistance exercise program on skeletal muscle strength in children with burn injuries

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Suman, Oscar E., Ricarda J. Spies, Mario M. Celis,
Ronald P. Mlcak, and David N. Herndon. Effects of a 12-wk resistance exercise program on skeletal muscle strength in children with burn injuries. J Appl Physiol 91: 1168–1175, 2001.—The postraumatic response to burn injury leads to marked and prolonged skeletal muscle catabolism and weakness, which persist despite standard rehabilitation programs of occupational and physical therapy. We investigated whether a resistance exercise program would attenuate muscle loss and weakness that is typically found in children with thermal injury. We assessed the changes in leg muscle strength and lean body mass in severely burned children with >40% total body surface area burned. Patients were randomized to a 12-wk standard hospital rehabilitation program supplemented with an exercise training program obstacles in allowing the burn victim to return to school and to perform activities of daily living.

Two well-known results of resistive exercise in adults are an increase in muscle strength and hypertrophy (25). Because activities of daily living are integrated functions requiring muscle strength and endurance, an effective resistance exercise program may contribute to the rehabilitation of severely burned children by increasing muscular strength and the capacity to do work (15, 32, 37). Previous studies in nonburned children have demonstrated an increase in muscle strength as a result of resistance exercise (9, 11, 34, 35), although its effects on muscle mass remain controversial (11, 35). Despite the extensive amount of
Introduction

- Background
- Rationale
- Hypothesis
- Purpose
- Objective
Methods or design

- How did you do it. Others need to duplicate if needed.
- Randomized Controlled Trial; blinded
- Inclusion (rationale):
  - 7 to 17 years Old
  - ≥40% TBSA
  - 95% healed or medically cleared for Exercise Tests
- Exclusion (rationale):
  - Pregnancy
METHODS-what, when, where, how

- The Exercise Training Program

- Primary Outcomes
  - Dual X-ray Absorptiometry (DXA or DEXA)
  - Isokinetic Dynamometry
  - Peak Aerobic Capacity \((\text{VO}_2)\)
METHODS

- Statistics - how are you going to assess effects and if the differences between and within the groups are real.

- Bring in Biostats person early!
Results

- What came out of your methods

- Primary Outcomes
  - Dual X-ray Absorptiometry (DXA or DEXA)
  - Isokinetic Dynamometry
  - Peak Aerobic Capacity (VO$_2$)

- Based on stats
Discussion

- Discuss your results
  - Relative to others-why same, why different
  - Why important
  - Limitations
  - Speculate
  - Future considerations
• Aerobic exercises
• Daily-Treadmill, cycling and rowing
• 20-45 minutes
• 60-85% of each individual’s peak aerobic capacity
• Heart rate and perceived exertion
• Evaluated weekly
• Progressive RT
• Weightlifting exercises
• Monday, Wednesday, Friday
• 8-12 repetitions max
• 3 sets / 1-minute rest interval
• Evaluated weekly
• Isokinetic dynamometry
• Speed of 150 degrees per second
• Isolates the knee joint
• Measures peak angular force or peak torque
• Maintaining speed of movement constant
• Dual X-ray Absorptiometry (DXA)
• Two beams of very low level X rays (one low, one high)
• Differentiates between fat, bone and muscle mass
• Peak aerobic capacity
• Open circuit spirometry
• Peak level attained used for relative intensity of the workouts
Effect of Exercise-Training post burn

% Change in LBM (6 to 9 months)

Exercise: n = 19
No Exercise: n = 16

* Denotes significant difference within group; † between groups, p < 0.05.

Effect of Exercise-Training Post Burn

Mean % Change in Muscle Function (6 to 9 Months)

* Denotes significant difference within group; † between groups, p < 0.05

Effect of Exercise-Training Post Burn

Peak Aerobic Capacity
6 to 9 months


* Denotes significant difference within group,
† between groups, p < 0.05
SUMMARY

• Exercise significantly increases both lean mass and muscle strength, in addition to aerobic capacity in burned children.
Effect of exogenous growth hormone and exercise on lean mass and muscle function in children with burns

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Suman, Oscar E., Steve J. Thomas, Judy P. Wilkins, Ronald P. Micak, and David N. Herndon. Effect of exogenous growth hormone and exercise on lean mass and muscle function in children with burns. J Appl Physiol 94: 2273–2281, 2003.—We tested the hypothesis that the administration of recombinant human growth hormone (rHGH) and exercise would increase lean body mass (LBM) and muscle strength in burned children to a greater extent than rHGH or exercise separately. Children, ages 7–17 yr, with >40% body surface area burned, were randomized into groups. One group (GHEX, n = 10) participated in a 12-wk in-hospital physical rehabilitation program supplemented with an exercise program and received 0.05 mg·kg−1·day−1 of rHGH. A second exercising group (SALEX, n = 13) received saline. A third group (GH, n = 10) received a similar dose of rHGH as GHEX and participated in a 12-wk, home-based physical rehabilitation program with-burned children and has been demonstrated to enhance wound healing, increase growth, and attenuate muscle catabolism (1, 27, 40).

The effects of rHGH administered long term (>6 mo) in burned children have also been investigated. In a study that assessed the effects of rHGH administration alone in 12 severely burned children for 1 yr, Hart et al. (15) reported an attenuation of muscle catabolism and osteopenia. However, no assessment of muscle function was done.

Growth hormone is released by both acute and chronic exercise, with the amount and manner of release being dependent on the intensity and duration of exercise (21). Because growth hormone is released with exercise, there has been considerable interest in the use of exercise alone to increase muscle mass, strength,
* Denotes groups in the 12 week exercise program
Other Considerations

Funding

Staff/Personnel

Budget/Resources

Facilities/Equipment

Time
- Introduction, Summary or Abstract
- Background Information
- Objectives
- Significance (rationale/justification)
- Innovation
- Methods
- Evaluation Plan
- Budget and Budget Justification

Funding Opportunities and Notices

- PROGRAM ANNOUNCEMENT (PA)
  Request for Applications (RFA)
  Parent Announcements

- The PAs (have Activity Codes):
  Research (R, P)
  Research Training (T)
  Career Development (K)
  Fellowships (F)
PROGRAM ANNOUNCEMENT (PA) TITLE: INCREASING QUALITY OF LIFE IN MOBILITY DISORDERS

PA NUMBER: PA-02-111


PARTICIPATING INSTITUTES AND CENTERS (ICs):
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) (www.niams.nih.gov)
National Institute of Child Health and Human Development (NICHD) (www.nichd.nih.gov)

THIS PA CONTAINS THE FOLLOWING INFORMATION
- Purpose of the PA
- Mechanisms of Support
- Individuals Eligible to Become Principal Investigators
- Peer Review Process
- Award Criteria
- Research Objectives
- Eligible Institutions
- Submitting an Application
- Review Criteria
- Required Federal Citations
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Edema Management

by Dana Nakamura, OTR/L, CLT
Objectives

- Discuss state of science in edema research and research priorities
- Review lymphatic system and its role in edema development
- Present early edema treatment interventions
- Discuss late edema complications and treatment interventions
- Highlight alternative treatment modalities and techniques
- Discuss burn edema treatment guidelines and competencies

Burn Edema Research

- Importance of edema control in tissue salvage recognized, but specific treatments targeted at edema control had not been critically reviewed
  - Objective: assess the evidence for the effectiveness of local and systemic treatments for edema management immediately after burn injury
  - Extensive online and hand searches completed
  - 8 studies included, each review outcome was based on a small single-facility study
  - Major burn resuscitation including colloid increased lung edema and mortality
  - Continuous administration of vitamin C during burn resuscitation reduces local wound edema and systemic fluid retention
  - Use of electrical stimulation with visual feedback reduced acute hand burn edema and increased AROM
Burn Edema Research: Volume Measurement


Burn Edema Research: Treatment Interventions

- Rivers E, Solem L, Hetzfeld D. Improved management of post-burn edema in the upper extremity using a foam elevation wedge. ABA meeting, Baltimore 1991. (abstract)

Burn Edema Research

- Current trend: measures for post-burn edema and tracking volume changes
- Future Research
  - Focus on multicenter trials
  - Focus on validation of outcome measures in the burn population
  - Burn Therapy studies citing specific techniques and modalities for treatment of post-burn edema
    - Start simple with a case study — SHARE your knowledge and findings
  - Seek out mentors
Burn Edema Research Priorities

- Does acute edema resolve with early pressure application? Does the provision of pressure in the emergent phase lead to a faster decrease in edema than no pressure? If so, what is the minimum pressure required to effect the decrease in edema?
- What is the best position to place extremities to most effectively decrease edema?
- Does AROM assist with edema reduction? Is it more effective than PROM?
- Does a combination of pressure and positioning enhance edema reduction? Does the addition of exercise to these interventions further decrease edema? What is the most effective combination of approaches?


Why Manage Edema?

- Pain
- Compromised circulation
- Soft tissue and joint tightness
- Tissue destruction
- Calcification and increased bone density
- Delayed wound healing
- Fibrosis and scarring
- Decreased ROM
- Prevention of optimal joint position
- Functional limitations

Surgery or additional trauma can cause mechanical insufficiency of lymphatic system

- Left untreated, protein-rich edema elongates diffusion distance and reduces body's defense mechanisms --- increased susceptibility to infections

Anatomy and Physiology of the Lymphatic System

A Review
Lymphatic System

- One-way system
- Starts blindly in the interstitium
- Drains substances the blood system cannot drain

Early Anatomy

- Hippocrates (460-377 B.C.)
- Aristotle (384-322 B.C.)
  spoke of vessels containing
  “white blood” or
  “colorless fluid”
- Sappey (1885)
  Mercury injections to
depict lymphatics
- Bartholin (1652)
  “vasa lymphatica”

Lymphatic System

Initial Lymphatics (capillaries) and Pre-collectors → Collector Lymphatics → Lymph
nodes → Lymph Trunks → Thoracic Duct

*Initial lymphatics/lymph capillaries
- “Net-like” structure which directly/indirectly covers every part of the body except the
  brain and placenta
- Lined most superficial in dermal layer of skin
- Lined with overlapping endothelial cells
- Connective filaments (microfibrils) extend from lymphatics to connective tissue
Changes in Interstitial Pressure

- Changes in interstitial pressure cause the overlapping endothelial cell junctions to open and close, creating a pumping action and admits water and other macromolecules.
- Changes occur from:
  - Movement of connector filaments
  - Light compression
  - Muscle contraction
  - Respiration
  - Pulsation of nearby arteries

Lymphatic Load

- Water
- Proteins
- Cells
- Fat (only in digestive system)

Transport Capacity

- Transport Capacity (TC)
  - The max amount of lymph transported with the Lymphatic System working as hard as possible in a given length of time
- Transport Capacity is normally 10 times higher than the normal amount of Lymphatic Load (LL) produced
Transport Capacity

- Functional Reserve (FR)
- Contraction Frequency of Lymph Collectors

Dynamic Insufficiency

- Ambulation is effective
- Elevation of body part at rest

Mechanical Insufficiency

- Transport Capacity drops below the normal amount of Lymphatic Load
- Causes:
  - Surgery
  - Infections
  - Trauma --- BURN Injury
  - Radiation
  - Congenital malformation
Fluid shift from the circulating plasma
• Increased capillary permeability to fluid and macromolecules
• Increase in hydrostatic pressure inside the perfusing microvessels

Types Of Edema
• Acute edema
  • Transudate edema due to inflammatory phase of wound healing
  • Initial "soft" swelling primarily composed of water and electrolytes
  • Resolves in 2-5 days
  • Treated with elevation and bulky dressings
• Sub-acute and chronic edema
  • Exudate due to high plasma protein content
  • Slow to rebound, viscous
  • Lymphatic vessels reached maximum transport capacity
  • Use of edema reduction techniques that activate the lymphatic system to absorb macromolecules
**Burn Surgery: Insult Added to Injury**

- Burn wound excision
  - Disruption to anatomical structures and function of lymphatic system
  - Decreased efficiency to mobilize fluid
    - Tangential excision \(\rightarrow\) superficial lymphatics
    - Fascial excision \(\rightarrow\) deeper lymphatic structures, possibly even lymph nodes
- Edema may become a chronic problem
- Patient identification and education regarding treatment options critical

**Edema Management and Mobilization**

- **Acute stage**
  - Elevation decreases arterial hydrostatic pressure
  - Bulky dressings provide counter force to decrease excess flow of fluid into tissue
  - Gentle, limited/controlled motion of involved structures (if not contraindicated)

- **Sub-acute phase (fibroplasia stage)**
  - Edema that should have dissipated within 2 days - 2 weeks, remains
  - "Spongy" and "gel-like"
  - Manual edema mobilization appropriate
  - Consider bandaging
    - Coban
    - Low stretch bandages
    - High stretch bandages
Edema Management and Mobilization

• Maturation phase
  • Chronic edema — edema becoming hard, dense "spongy" and eventually fibrotic
  • Manual edema mobilization appropriate
  • Consider the benefits of building up neutral warmth to reduce induration
  • As used in lymphedema treatment: foam inserts, gel sheets to soften scars, elastomer pads, donut support, bandaging
  • Note: first notable change will be softening of edema and pain reduction, then girth reduction

Early Edema Management Modalities and Techniques

• Early positioning and elevation
• Bulky dressings and wraps
• Negative Pressure Wound Therapy (NPWT = V.A.C.)
• Splinting
• Exercise
• Manual Edema Mobilization
• Massage

Later Edema Management Modalities and Techniques

• Massage
• Compression
• Splinting
• Manual edema mobilization (MEM)
• Manual lymphatic drainage (MLD)
• Skin taping
Compression

• To glove or not to glove?
  • LIGHT compression with a loose Isotoner glove okay (can pull at least 1/8” away from fingers)
    • Prevents refill and stimulates lymphatic uptake and flow every time patient contracts muscle
  • “HARD” compression will collapse the lymphatics = no protein molecule re-absorption
    • With hard compression you squeezing out fluid into adjacent interstitial spaces and therefore, no protein absorption
    • Protein molecules remain in the interstitium and one function of these macromolecules is to absorb water = swelling!

Compression Bandaging

• Low Stretch Bandages
  • Resilient Force
  • Low resting (when no muscle contraction) and high working (when muscle contracting)
  • Compressive Force = High Stretch Bandages
    • Potential to exert too much force and collapse the lymphatics
    • Low working and High resting (Ace bandages stretch with contracting muscle and relax with relaxing muscle)
    • Too much pressure can be exerted during relaxation phase

Edema Management Guidelines

  • Clinical practice guidelines designed as practical guide to the relevant clinical knowledge and therapy intervention techniques required for effective patient management
  • Document includes guidelines for edema management
  • www.anzba.org.au
References

• Please refer to reference list in handout
• Includes partial literature search on burn edema, reliability and validity studies of volume measurement, NPWT, treatment modalities

Questions?

Thank you!
Effective  Reliable
Garments For Compression Therapy

Self-certify as a Bio-Concepts Fitter
http://certification.bio-con.com

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