

(TBSA) burns of 10 to 100 percent, were evaluated at discharge from acute care, 6 months, 12 months, and 24 months after burn injury. The rates of improvement differed statistically by size of burn. Maximum improvement was attained by 6 months for 10 to 15 percent TBSA burns, 12 months for 16 to 30 percent burns, 12 months for 31 to 50 percent burns, and 24 months for 51 to 100 percent burns.

McKibben, J., Bresnick, M. (2008) **Acute stress disorder and posttraumatic stress disorder: A prospective study of prevalence, course, and predictors in a sample with major burn injuries.** *Journal of Burn Care And Research*, 29(1), 22-35. [NARIC Accession Number: J54384](#). Project Number: H133A020101; H133A020103.

Abstract: Study examined the utility of self-report measures in detecting acute stress disorder (ASD) and posttraumatic stress disorder (PTSD), and in tracking and predicting PTSD across 2 years after major burn injury. The Stanford Acute Stress Reaction Questionnaire was used to assess ASD symptoms at hospital discharge and the Davidson Trauma Scale was used to assess PTSD symptoms at scheduled follow-ups at 1, 6, 12, and 24 months after burn. The prevalence of in-hospital ASD was 23.6 percent. The prevalence of PTSD was 35.1 percent at 1 month, 33.3 percent at 6 months, 28.6 percent at 12 months, and 25.4 percent at 24 months. The findings indicate that both ASD and PTSD symptoms are common, that ASD symptoms are a risk factor for later development of PTSD, and that levels of PTSD symptoms are very stable for at least the first 2 years after major burn injury.

Schneider, J., Holavanahalli, R. (2008) **Contractures in burn injury part II: Investigating joints of the hand.** *Journal of Burn Care And Research*, 29(4), 606-613. [NARIC Accession Number: J55216](#). Project Number: H133A020104.

Abstract: Demographic and medical data were examined to determine the incidence and severity of hand contractures after burn injury and to determine predictors of contracture development. Data was collected prospectively from 1993 to 2002 for adults admitted to a regional burn center. Primary outcome measures at discharge include the presence of contractures, number of contractures, and the severity of contractures at each of the hand joints: the metacarpal-phalangeal, proximal inter-phalangeal, and distal inter-phalangeal joints of all digits and the wrist joint. Regression analysis was performed to determine predictors of the presence, severity, and number of contractures. Of the 985 patients included in the analysis, 23 percent demonstrated at least one hand contracture at discharge. Those with a contracture average 10 contractures per person. Most contractures were mild or moderate in severity. The wrist was the most frequently affected joint. Significant predictors of contracture development were concomitant medical problems, total body surface area grafted, and the presence of hand burn and hand grafting. Predictors of the number of contractures were length of stay, concomitant medical problems, burn size, and presence of hand burn and grafting.

Gauglitz, G., Herndon, D. (2008) **Insulin resistance postburn: Underlying mechanisms and current therapeutic strategies.** *Journal of Burn Care And Research*, 29(5), 683-694. [NARIC Accession Number: J55651](#). Project Number: H133A020102.

Abstract: Article reviews the mechanisms underlying insulin resistance-induced hyperglycemia postburn and outlines current therapeutic strategies that are being used to modulate hyperglycemia after thermal trauma. The profound hypermetabolic response to burn injury is associated with insulin resistance and hyperglycemia, contributing to the incidence of morbidity and mortality in burn patients. Discussion includes the post-burn metabolic and molecular changes that lead to insulin resistance and the strategies currently used to attenuate the post-burn hypermetabolic response and hyperglycemia.

Zhu, K., Carrougher, G. (2008) **Expression of collagen genes in the cones of skin in the duroc/yorkshire porcine model of fibroproliferative scarring.** *Journal of Burn Care And Research*, 29(5), 815-827. [NARIC Accession Number: J55654](#). Project Number: H133A020103.

Abstract: Study compared collagen gene expression in fibroproliferative healing in the Duroc pigs to nonfibroproliferative healing in the Yorkshire pigs. Shallow and deep dorsal wounds were biopsied at 1, 2, 3, 12, and 20 weeks. Researchers sampled dermal cones by laser capture microdissection, extracted and amplified the RNA, and hybridized Affymetrix Porcine GeneChips. Samples of human hypertrophic scar were obtained approximately 20 weeks postinjury. Genes for further analysis were also restricted with 4 biological criteria, including that the 20-week deep Duroc expression match the human samples. Results indicated that 11 collagen genes and 7 collagen types were differentially over expressed in deep Duroc wounds. The data suggest that collagens I, III, IV, VI, VII, XIV, and XV are involved in the process of fibroproliferative scarring.

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**RehabWire**  
News from the National  
Rehabilitation Information  
Center

The Burn Injury Model Systems  
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## NIDRR Grantees on the Cutting Edge

**University of Washington Burn Model System** *University of Washington* (H133A020103) led by Loren H. Engrav, MD. Theresa San Agustin, MD, Project Officer. Abstract: This model system conducts five research projects: (1) A New Approach to the Etiology of Hypertrophic Scarring develops an increased understanding of hypertrophic scarring. (2) Effect of Virtual Reality on Active Range-of-Motion During Physical Therapy uses distraction via immersive virtual reality as an adjunctive non-pharmacologic analgesic. (3) Determination of Reasons for Distress in Burn-Injured Adults identifies reasons behind a burn survivor's distress at various time-points after hospital discharge. (4) Barriers for Return to Work identifies specific barriers to return to work for burn survivors. (5) Acute Stress Disorder Among Burn Survivors evaluates the effectiveness of cognitive-behavioral therapy, relative to a non-directive, supportive therapy control group, and a national comparison sample in reducing the prevalence of posttraumatic stress disorder diagnosis and symptom severity. Projects 4 and 5 are collaborative. In addition, this project participates in the national database.

Find out more at: <http://depts.washington.edu/uwnidrr/>

**UCHSC Burn Model System Data Coordination Center (BMS/DCC)** *University of Colorado Denver - Anschutz Medical Campus* (H133A070006) led by Dennis C. Lezotte, PhD. Kenneth D. Wood, PhD, Project Officer.

Abstract: The Burn Model System Data Collection Center (BMS/DCC) provides scientific and technical support to the Burn Model Systems' mission, which is "to conduct research that contributes to evidence-based rehabilitation and clinical interventions as well as develop practice guidelines that improve the lives of individuals with burn injuries." The BMS/DCC addresses four important areas in rehabilitation research: project design and management, data management and quality, scientifically appropriate analytical support, and broad dissemination for long-term impact. The data center strives to provide quality support by developing integrated information systems, providing professional consultation, and designing and delivering dedicated training programs. The primary goal is to improve the scientific rigor of clinical and rehabilitation research in the area of burn injury. Areas of specific concern include: collecting multi-site longitudinal outcomes data; coordinating multi-center research data; providing analysis and oversight to achieve scientifically sound multi-center collaborative and site-specific clinical and rehabilitative research; collaborating with other National Data and Statistical Centers to exchange ideas and ensure the most efficient operations; publishing scientifically rigorous articles; and coordinating other effective dissemination strategies. The BMS/DCC consists of two functionally independent but related units, a data administration core and an analytical core. The data administration core continues to support and manage the BMS Level 1 (National) Database while implementing the necessary improvements to ensure quality and scientifically sound data for burn research. In addition, the data administration core implements

Two previous editions of *RehabWire* featured the Spinal Cord Injury and Traumatic Brain Injury Model Systems. Like those projects, the Burn Injury Model Systems research the spectrum of rehabilitation for survivors of burn injuries from point of injury, through hospitalization and therapy, to full participation in the community.

Please note: These abstracts have been modified. Full, unedited abstracts, as well as any available REHABDATA citations, are available at [naric.com](http://naric.com).

Thousands of additional resources on these topics are available from NARIC's resource pages at [www.naric.com/public](http://www.naric.com/public)

The Burn Injury Model Systems research spans the Health and Function, Employment Outcomes, and Participation and Community Living Priorities

web-based data collection and research support tools for collaborative modules and, as needed, assists in the conduct of the site-specific research studies. The analytical core provides statistical support (analysis, consultation, study-design, and study implementation) for projects that use either Level 1 data or data generated from collaborative and site-specific research.

**Find out more at:** <http://bms-dcc.uchsc.edu>

**North Texas Burn Rehabilitation Model System (NTBRMS)** *The University of Texas Southwestern Medical Center* (H133A070024) led by Karen Kowalske, MD Theresa San Agustin, MD, Project Officer.

Abstract: The North Texas Burn Rehabilitation Model System (NTBRMS) includes one collaborative research module project entitled “Axillary Burn Scar Contracture Prevention with Immediate Post-Operative Casting and Splinting”, and two site specific research studies entitled “Biomechanical Properties of Burn Scar” and “Efficacy of Social Interaction Skills Training Post Burn Injury.” The evaluation plan specifically focuses on the overall objectives for demonstration, research, and dissemination with specific quantifiable targets, which are reassessed quarterly. The NTBRMS collaborates with NIDRR-funded Model Systems Knowledge Translation Center (MSKTC) by participating in its systematic reviews of evidence and facilitating knowledge management by identifying the information needs and barriers among the various stakeholders both at national and local levels.

**Find out more at:** <http://www.utsouthwestern.edu/utsw/home/research.ntbrms>

**Pediatric Burn Injury Rehabilitation Model System** *University of Texas Medical Branch* (H133A070026) led by David Herndon, MD. Theresa San Agustin, MD, Project Officer.

Abstract: This program conducts independent and multi-center projects focusing on evaluating and improving the rehabilitation provided to children with burn injuries, striving to decrease disability and improve reintegration into society. The model system includes one collaborative project assessing the efficacy of long term use of propranolol in the treatment of burn injury (in adults and children) with endpoints of improved survivability, improved cardiovascular condition, greater energy, improved muscle endurance, improved growth in children, and decreased anxiety. The project also includes a site-specific study to improve rehabilitative outcomes for children with greater than 40 percent total body surface area burned by combining an anabolic agent (oxandrolone, Ketoconazole, or propranolol) with a 3-month intensive outpatient rehabilitation program. The supervised exercise program has shown to be effective in ameliorating effects of the hypermetabolic response. This project assesses the effectiveness of combining the anabolic agents and the exercise program with the expectation that the effects will be additive and will improve linear growth, bone mass, muscle strength, lean body mass, physical function, and general well-being. The last study, also site specific, is a continuation from the previous funding cycle. It focuses on Acute Stress Disorder (ASD) and Post Traumatic Stress Disorder (PTSD), a problem that impairs the well-being of burn patients. The study follows children with ASD to access the relationship of the two disorders and to elucidate a history of the development of PTSD.

**Johns Hopkins University Burn Injury Rehabilitation Model System (JHU-BIRMS)** *Johns Hopkins School of Medicine* (H133A070045) led by James A. Fauerbach, PhD. A. Cate Miller, PhD, Project Officer.

Abstract: The Johns Hopkins University-Burn Injury Model System (JHU-BIMS) includes three projects: two site-specific randomized, controlled trials (RCT), and one multi-site collaborative study. The first site-specific project is an RCT to test the efficacy of an innovative “Augmented Exercise Program” in enhancing recovery of strength and endurance in those with generalized deconditioning. The second site-specific project is an RCT to test the effectiveness of an intervention entitled “Safety, Meaning, Activation, and Resilience Training” (SMART). SMART is a four-session intervention that aims to reduce acute psychological distress and sleep disturbance and to thereby prevent chronic psychiatric



The American Burn Association sponsors an annual Burn Awareness Week each February. Their website includes prevention campaign packets you can download. The packets include fact sheets and PowerPoint presentations. Topics available include: scald prevention, electrical safety, fire/burn safety for older adults, leaving home safely, gasoline safety, and summer burn safety. These were developed by the ABA along with the US Fire Administration, FEMA, and the Dept of Homeland Security. View and download the presentations at [www.ameriburn.org/preventionEdRes.php](http://www.ameriburn.org/preventionEdRes.php)

### Where Can I Find More?

A quick keyword search is all you need to connect to a wealth of disability and rehabilitation research. NARIC's databases hold more than 75,000 resources. Visit [www.naric.com/research](http://www.naric.com/research) to search for literature, current and past research projects, and organizations and agencies in the US and abroad.



The Cochrane Collaboration of Systematic Reviews of Healthcare Interventions lists 23 reviews for “burn injury.” It also has 11 other reviews, 408 clinical trials, 1 methods study, 4 technology assessments, and 18 economic evaluations.

Abstracts of these and other reviews are freely available at [www.thecochranelibrary.org](http://www.thecochranelibrary.org)

disorders and disability. Pilot data show that SMART effectively reduces post-trauma distress, sleep disturbance, and depression. The third project is a multi-site collaborative module entitled “Long-Term Follow-up of the National Database Sample” that extends follow-up to five years post-burn. The NIDRR funded Burn Model System national database provides an unprecedented opportunity to conduct a prospective, multi-site study to assess the long term needs of burn survivors. The Johns Hopkins Burn Center continues to contribute to the Burn Model System national database, as well.

**Find out more at:** <http://www.hopkinsmedicine.org/burn/research/index.html> and <http://www.hopkinsmedicine.org/burn/research/psqscq.pdf>

**University of Washington Burn Model System** *University of Washington* (H133A070047) led by Loren H. Engrav, MD; Peter C. Esselman, MD. Theresa San Agustin, MD, Project Officer.

Abstract: The University of Washington Burn Model System includes one multi-site, collaborative project, and two site-specific projects. Project 1: Psychological and Social Needs of Long Term Survivors of Major Burn Injury is a collaborative study (lead center Baltimore) to identify the needs of persons 5 and 10 years after injury. Project 2 (Site-Specific): Expanded Delivery Model for Burn Rehabilitation incorporates a novel intervention, an “expanded care provider”, who enables clinicians to “reach out” to individuals with burn injury and for them to “reach in” to care providers whenever care is needed, rather than on a rigid schedule to determine if this improves burn rehabilitation outcomes. Outcomes are assessed using an individualized Goal Attainment Scale and the validated Burn Specific Health Scale. Project 3 (Site Specific): Identification of the Pathways to Scarring utilizes bioinformatics tools to identify gene expression pathways associated with hypertrophic scarring. In addition, we contribute long-term follow-up data to the national database maintained at the University of Colorado in Denver.

**Find out more at:** <http://depts.washington.edu/uwnidrr>

### Current Literature - Selections from REHABDATA

Askay, S., Stricklin, M. (2009) **Using Qmethodology to identify reasons for distress in burn survivors postdischarge.** *Journal of Burn Care And Research*, 30(1),83-91. NARIC Accession Number: J55893. Project Number: H133A020103.

Abstract: Study used the Qsort method to identify the physical, social, and emotional reasons for distress after burn injuries. A total of 69 burn survivors were administered the Beck Depression Inventory, the Davidson Trauma Scale, and the Brief Symptom Inventory at 6 months, 1 year, and 2 years following discharge. Of the 69 patients, 43 scored high enough on the distress scales to go on to complete the Qsort task. A total of 51 Qsorts were completed, factored, and graphically rotated. After identifying 50 possible reasons for distress after discharge, each reason was placed on a laminated game card. A game board was developed that allowed patients to rank order each reason from “not causing distress: to “causing significant distress”. After factor analysis, 3 factors accounted for the sorts across time points, indicating that at least 4 distinct groups of people can be categorized according to the themes raised in rating reasons for distress.

Serghiou, M., Rose, M. (2008) **The WeeFIM instrument—A pediatric measure of functional independence to predict longitudinal recovery of pediatric burn patients.** *Developmental Neurorehabilitation*, 11(1), 39-50. NARIC Accession Number: J53897. Project Number: H133A070047.

Abstract: The WeeFIM instrument was used to evaluate the influence of burn size on functional independence and time to recovery. Participants 6 to 16 years of age, with total body surface area