



'LIVING WELL' AFTER BURN INJURY: USING CASE REPORTS TO ILLUSTRATE LIFE CHANGING CONTRIBUTIONS FROM THE BURN MODEL SYSTEM RESEARCH PROGRAM

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The Burn Model System (BMS) program has been funded since 1993 by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR). This review reports on BMS contributions that have impacted functional recovery of individuals with a significant burn injury. A review of 125 BMS publications identified 38 unique contributions grouped within 7 domains (Table).

DOMAINS	CONTRIBUTIONS WITH ATTRIBUTION	DOMAINS	CONTRIBUTIONS WITH ATTRIBUTION
Treatment	<ul style="list-style-type: none"> Custom-fit pressure garment helpful for people with moderate to severe postburn scarring¹ Immersive virtual reality reduces pain during active range of motion (ROM)² Transcranial direct current stimulation (tDCS) ineffective for postburn itch³ Beta-blockers minimize postburn metabolic response and modulates cutaneous response to injury⁴ Oxandrolone/Propranolol (OxProp) improves scarring and psychosocial outcomes in pediatric burn survivors⁵ A community-based exercise program effective for severely burn injured children⁶ and adults⁷ 	Peer Support & Aftercare	<ul style="list-style-type: none"> Peer support for adult burn survivors improves social interaction³⁰ Telemedicine between burn center and rehabilitation hospital streamlined patient care and reduced healthcare costs, while maintaining quality of care and patient satisfaction³¹ Adult burn survivors who attended peer support - better LIBRE scores in Social interaction, Social activities, and Work and employment³²
Assessment Measures	<ul style="list-style-type: none"> Perceived Stigmatization Questionnaire (PSQ), Social Comfort Questionnaire (SCQ)⁸ and Community Integration Questionnaire-13 validated in burn survivors⁹ Heterotopic Ossification risk-assessment scale developed¹⁰ Young Adult Burn Outcomes Questionnaire (YABOQ) developed¹¹ The 5-D Itch Scale¹² and Satisfaction With Life Scale (SWLS)¹³ validated with burn survivors and psychometrics improved Life Impact Burn Recovery Evaluation (LIBRE) that assesses social participation developed in collaboration with The Phoenix Society for Burn Survivors¹⁴ 	Long-term Functional Outcomes	<ul style="list-style-type: none"> Cognition after burn injury worse than other non-neurologic injury populations in the inpatient rehabilitation setting³³ Best post-injury outcomes for young, married, employed and higher functioning at time of admission to inpatient rehabilitation³⁴ Older age, worse mental health, and pre-burn unemployment related to dissatisfaction with life which progressively gets worse¹³ Satisfaction with life after burn is consistently lower compared to others¹³ Most joint contractures are mild to moderate in severity; 1/3 of patients have at least 1 contracture at time of hospital discharge³⁵
Sequelae	<ul style="list-style-type: none"> Two-year prevalence estimated for postburn itch in pediatric burn survivors¹⁵ Long-term prevalence estimated for postburn itch, fatigue, depression, sleep problems, neuropathy in adult burn survivors¹⁶⁻¹⁹ Lower health-related quality of life (QoL) after major burn injury, similar to traumatic brain injury (TBI)²⁰ 25% of burn survivors have cognitive deficits at time of discharge from inpatient rehabilitation²¹ Inpatient complications (UTI, VTE, pulmonary and renal failure) associated with lower long-term QoL²² Heterotopic Ossification may lead to elbow flexion contractures¹⁰ Larger burn size and longer hospital length of stay associated with more severe contractures; early intervention is essential^{23,24} Good prognosis for burn-related mononeuropathy²⁵ Positive outcomes (modified grasp, ADL independence) identified following significant and severe hand burns²⁶ Routine outpatient screening for depression is important²⁷⁻²⁹ 	Employment	<ul style="list-style-type: none"> Return to Work (RTW) less likely for those with sleep disturbance and chronic pain³⁶ Pre-burn employment status is strongest predictor for postburn employment and RTW³⁷⁻³⁹ Intervention bundle leads to greater RTW for those with Workers' Compensation insurance coverage in Washington State⁴⁰ Early (physical) and late (psychosocial & environmental) barriers to RTW identified for those working prior to injury^{38,41} Less likely to be employed 12 months postburn: adults with burn-related amputation^{39,42}, older individuals³⁹, females³⁹, those with long acute hospitalizations³⁹ and those with high pain interference at hospital discharge³⁹ Inpatient rehabilitation settings (vs. skilled nursing facilities) associated with greater likelihood of employment at 1-year^{34,43} Adults with work-related burns report worse scores on the LIBRE Work and Employment scale Profiles⁴⁴
Injury & Recovery Research	<ul style="list-style-type: none"> The fibroproliferative red Duroc porcine model validated as a large animal model for burn wound research⁴⁵⁻⁵¹ Best practices for participant retention identified for longitudinal burn outcomes research⁵² 		

On November 20, 2015 at the age of 27 Chris sustained a 70% TBSA burn from a gas explosion in Kotzebue, Alaska. He is married with 2 young children.

Early initiation of beta-blockers by UW team⁴

'Emphasis on scar tissue massage and stretching helped with long-term healing and combatting further contractures. Knowledgeable [physical and occupational] therapists prepared me for my at-home regimen.'^{23,24}

*'The neuropathic pain and itching did affect my ability to sleep soundly, which did negatively impact my sleep schedule. For me, this was the second major factor with RTW [return to work]'*³⁶

62 days of inpatient care; 18 days intubated & ventilated; 10 days of inpatient rehabilitation



Initial field assessments determined that Chris required specialized burn care; he was air evacuated to Harborview Medical Center (HMC) in Seattle, WA.

*'I think meeting all of these criteria provided me an incentive to get through the rehab quicker to get back to my work, family, and former hobbies.'*³⁴ - Concerning the finding that survivors who are young, married, employed and higher functioning at time of admission to inpatient rehabilitation demonstrate best outcomes

*'I did experience a noticeable reduction in burn scar hypertrophy when I wore the pressure garments for extended periods.'*¹

*'I did read about other burn survivor stories on social media. This helped with not only my social interactions, but also to know that the associated mental trauma was normal with the injury and healing.'*³⁰

*'Telemedicine sessions with HMC saved me \$1,000 round trip flights from rural Alaska.'*³¹

REFERENCES



The value of any clinical research must have relevance to the lives of the study population



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