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Recognizing the long-term sequelae of burns as a chronic medical condition

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Abstract

As medicine continues to advance, many individuals are living longer with injuries previously considered life threatening. These individuals often face numerous long-term physical and psychological sequelae associated with their injury that persist through the course of their lives. Recently, other injury populations have begun to think of their condition as “chronic”. Using data collected from the Burn Model System National Database, a framework for the reconsideration of burn injury as a chronic condition is proposed.

Seventy years ago, even moderate burn injuries presented considerable risk of death despite medical treatment [1]. Today, despite much improved mortality rates, the burn care community is still defining expected recovery and the long-term symptom complex of the burn survivor. To provide the optimum quality of care, it is necessary for clinicians, insurers, employers, as well as burn survivors and their families to better understand the breadth of symptoms after burns. While some symptoms are commonly reported, other more insidious symptoms occur that are not typically recognized as an outcome of burn injury [2]. Furthermore, many symptoms are described that do not have a well-defined pathophysiology

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related to the burn injury, such as fatigue, pain, itch, and cognitive impairments [3]. Other fields of medicine have recently advocated to describe specific injuries as chronic conditions, including traumatic brain injury [4]. Considering burn injury as a chronic condition provides a framework for the medical management of burn recovery that includes survivors' long-term needs [5].

In 1993, the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) established the Burn Model System (BMS) to improve the lives burn survivors [6]. The BMS National Database is the largest collection of long-term outcomes data in the field of burns. This report reviews self-reported symptoms from the BMS database as an initial step toward delineating the persistent symptom complex that characterizes burns as a chronic condition [7]. Twenty-two binary review of systems questions administered at three follow up time points (6, 12, and 24 months after injury) were examined from August 2015 – August 2017. At all time points, the most prevalent physical sequela was paresthesia (defined as numbness in the burn scar). Most symptoms reported by participants persisted for the entire 2-year period after burns. Furthermore, over one-quarter of the population reported the following symptoms at all time points: numbness in hands and/or feet, joint pain, hot and cold intolerance, balance trouble, and memory difficulty. The frequencies of all symptoms are detailed in Fig. 1.

Previous studies in the burn survivor population corroborate the symptoms reported in the BMS Database. Recent literature notes a lack of effective treatments for numbness and paresthesias in areas affected by the burn [8]. Long term skin and musculoskeletal sequelae were corroborated in a cohort of burn survivors with severe burns at an average of 17 years after injury and findings of this study were reinforced with physical exam findings [9]. Recent research has demonstrated a physiologic link between thermoregulatory impairments and the lack of sweat glands exhibited in severe burns [10]. In regard to neurocognitive outcomes, researchers have documented impairments with autobiographical memory recall and ability to communicate memories efficiently [11]. In addition to the symptoms included in the BMS database, systematic reviews have identified the following persistent conditions: fatigue, sleep difficulty, tachycardia, chest pains, palpitations, hypertrophic scarring, dyschromia, altered skin texture/durability, renal insufficiency, kidney stones, incontinence, weight gain/loss, dissatisfaction with appearance, post-traumatic stress, depression, anxiety, itch, pain, grief, dysphagia, pulmonary embolism, constipation, change in appetite, contracture, and heterotopic ossification [12]. It is important to recognize both the debilitating nature and long-term complexity of these health problems. Fig. 2 illustrates the array of persistent symptoms identified from the BMS database as well as other publications. Due to the diversity and ongoing nature of symptoms and conditions experienced after a burn injury, it is critical to adequately represent the extent of burn sequelae.

Failure to identify burn injury as an acute condition that evolves into a chronic stage is an impediment to establishing a truly comprehensive system of care. Recognition of the chronic nature of burn symptoms will enable clinicians to address the significant, long-term, and degenerative aspects of the condition. The traumatic brain injury chronic condition literature provides evidence of improved quality of care through treatment of comorbid conditions and

aging [4]. In burns, research highlights the interrelated nature of physical and psychosocial comorbidities, and that these complications changes over time [13]. The degenerative aspects of a burn injury manifest as an increased susceptibility to new comorbidities as well as worsening of preexisting comorbidities [14]. There are several benefits to reframing burn injury as a chronic condition. For one, the standardized collection of longitudinal outcome data would enable care providers to identify and target complications based on prevalence and risk assessment. Furthermore, applying a comprehensive system of preventative care has the potential dual benefit of improving wellness of the burn survivor population and reducing long-term medical expenses. To advance the quality of care for burn recovery it is necessary to more adequately define the long-term symptom complex and consider burn injury as chronic a condition.

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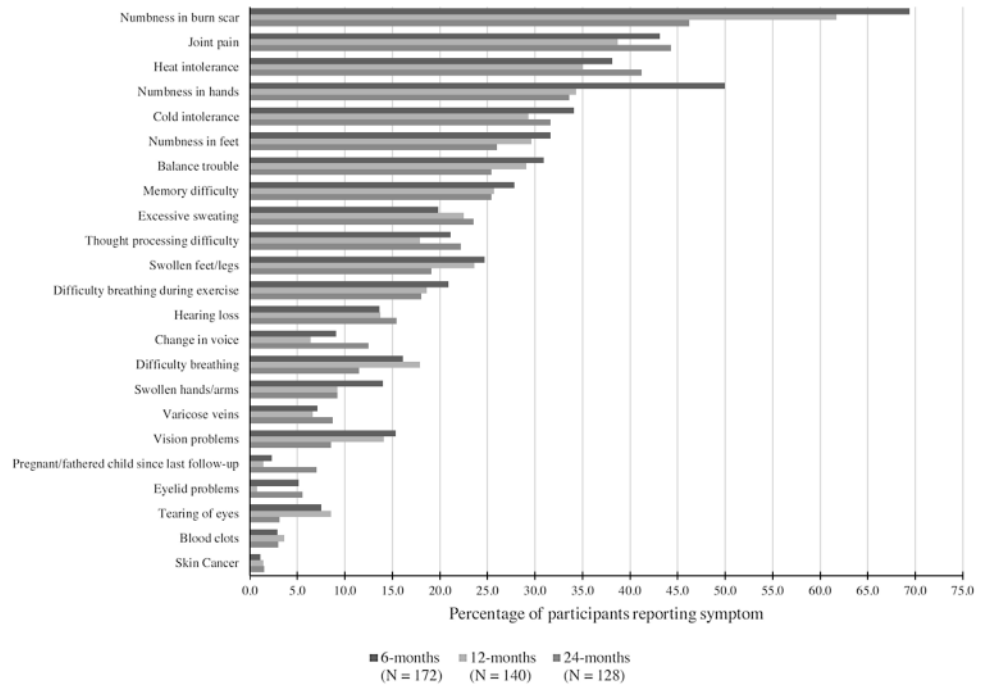


Fig. 1 – Percentage of Burn Model System Database participants reporting burn-related symptoms over time.

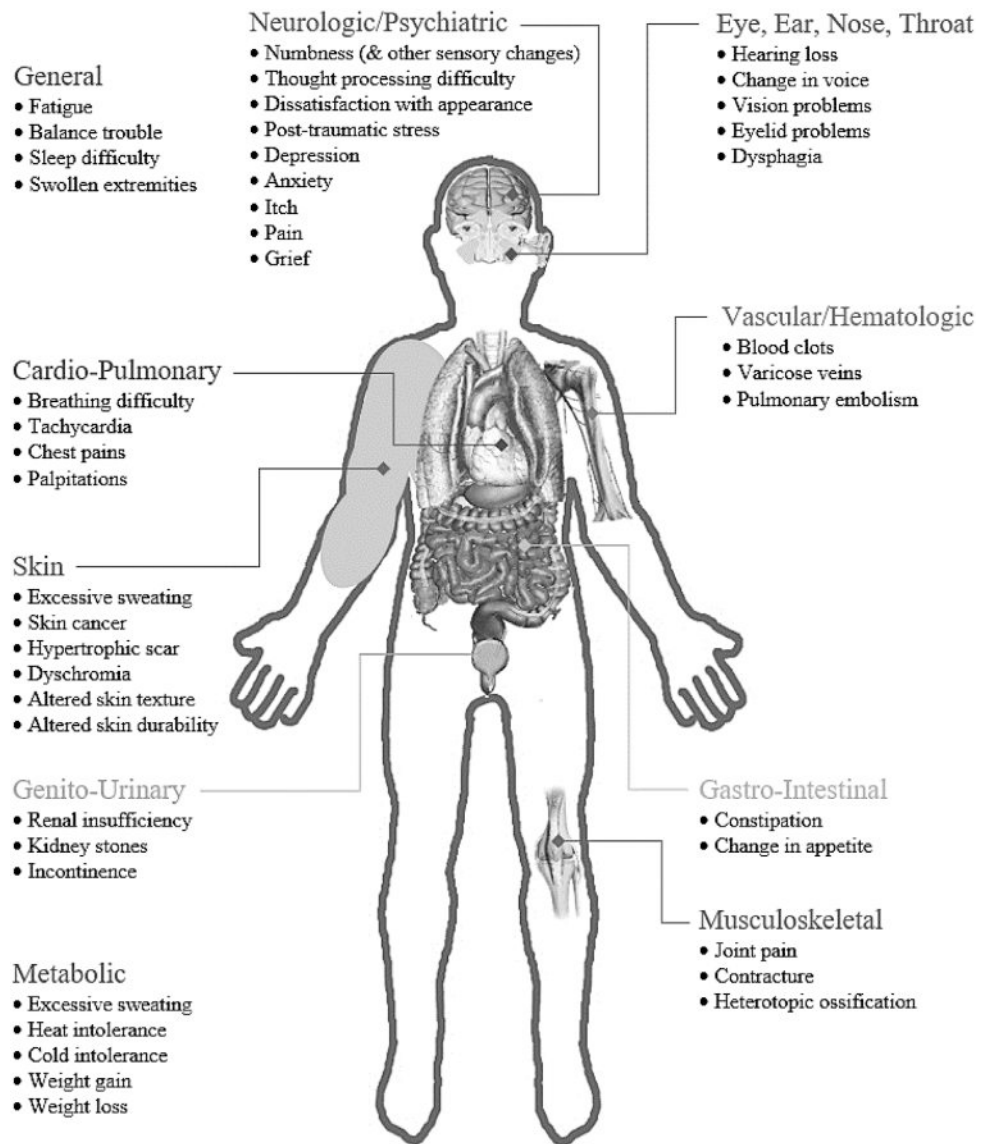


Fig. 2 –.
Potential long-term symptoms and other sequelae experienced by burn survivors.