Mental Health in Burn Survivors

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1 Introduction

Worldwide, there has been an overall trend towards a decreased incidence of burns as well as reduction in their severity. This has often lead to decreased lengths of stay and reduced mortality from burns [1]. This positive trend is likely secondary to the prevention programs developed and the astounding advances made with regard to treatment. Albeit, achievements in public health and surgical procedures have led to the establishment of new challenges in terms of rehabilitation and social reintegration.

A significant number of survivors, in fact, experience difficulties adapting and are ultimately affected by one or more disabling mental health disorders [2]. The disabilities ensuing from burns, in addition to disfigurement, often bring about stigmatization and social exclusion. The research conducted on the quality of life of major burn survivors over the medium and long term is quite telling, with serious injuries and psychological issues being the two most significant factors [3–5]. Mental health conditions in burn survivors can be associated with longer lengths of stay in hospital and worse medical outcomes such as increased burn wound infections, nutritional deficiencies, and skin graft failures [6].

The psychological issues associated with major burns are frequent, complex and varied, and go well beyond post-traumatic stress disorder (PTSD) [7]. For this reason, burn survivors need personalized mental health care from the moment they are admitted to the care unit until their reintegration into the community [8]. Therefore, addressing the often complex mental health needs of burn survivors is imperative in managing their pathway towards recovery. Integration of caregivers specialized in mental health on the burn health care team is another key element to optimize their recovery.

This chapter aims to identify the primary psychiatric and psychological issues touching burn survivors as well as the mental health interventions that can help facilitate the recovery of burn survivors and their loved ones.

2 Profile of Burn Victims

The majority (70%) of major burn survivors in developed countries are men [9]. It has been suggested that this may be due to the fact that men

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are more likely to take part in risk-taking behaviors than their female counterparts [9, 10] and over-representation in high-risk positions (e.g., roofers, electricians, machinists in the chemical industry).

In addition to risk-taking and hazardous jobs, there are also cases where a person's skills or judgment are compromised, such as when they drink alcohol or use drugs [11, 12]. One-third of the persons admitted to burn units are either under the influence or suspected to have been under the influence (of drugs or alcohol) at the time of the event [13, 14]. Moreover, the instances of major burns associated with drinking are on the rise [15]. In the United States, the number of patients admitted for major burns who tested positive for cannabis grew substantially over the last decade, from 6% in 2002 to 27% in 2011 [16].

One-third of major burn survivors present with premorbid mental problems that may affect cognitive processes such as attention and judgment or are linked to impulsive behaviors, and therefore increase the risk of injury [12, 13, 17]. While self-immolation is generally seen to constitute an extreme means of political protest, persons who set themselves on fire, whether or not they are suicidal, also generally suffer from a mental health disorder [18, 19]. A recent study done in Ontario showed that there was an increase in the rates of mental health visits to the emergency room in the 12 weeks prior to a burn injury, indicating the importance of addressing mental health needs as a possible public health preventative measure for burns [20].

A burn injury can also occur when a person's state of awareness is compromised due to another medical issue such as epilepsy or diabetic hypoglycemia. Also, persons whose reaction time is diminished due to a loss of mobility (e.g., paralysis, advanced age) have a higher risk of suffering burns. In regions with extremely cold seasons, the homeless, the mentally ill or persons who are intoxicated will often experience frostbite [21].

It appears that major burns are more likely to occur among the most vulnerable members of the population, as well as those in a socially precarious situation (e.g., persons with little or no education, the unemployed or those with a low income, single mothers, the homeless, new immigrants and members of certain ethnic minority groups) [22]. It thus bears remembering that burn survivors have problems that are both complex and varied, and which must be addressed through personalized care.

3 Traumatic Experience Associated with a Burn Injury

An injury is deemed traumatic when it is life-threatening or at the least, sufficiently severe to require that the victim receive emergency care or be admitted to a hospital care unit [23]. Burn injury is a type of traumatic injury. It is common for burn survivors to report feeling extremely scared or powerless at the time of the events, when they did not know whether they would be disfigured, disabled, or even survive. Feeling as though one's life is threatened increases the risk of a person experiencing psychological complications [24, 25].

The arrival of rescuers on the scene does not necessarily equate the end of the traumatic experience. Several patients have spoken of being highly stressed at the time of their admission to the care unit. A stay in the intensive care unit (ICU) can also contribute to the traumatic experience. Persons receiving critical care are three times more likely to develop PTSD than those for whom this type of care is unnecessary [26]. Treating major burns can be very difficult, even traumatic, specifically due to the intense pain and repeated surgical procedures [27], which can even include amputation of a limb. Also, finding oneself in delirium, especially when accompanied by psychotic symptoms such as intense paranoia or scary hallucinations, can prove to be a traumatic experience [28].

4 Early Psychological Reactions

Intense emotional reactions are often observed in the hours and days following a burn injury [29]. A study on this topic revealed that during the first

2 weeks after being burned, 76% of participants claimed to have difficulty falling or staying asleep, 59% stated that they relived the event, 40% felt intense distress when reminded of the event, 29% had nightmares or bad dreams, 50% claimed to avoid any feelings or thoughts of the event, and 27% refused to speak of the event [30]. Half of the persons involved also experienced some type of dissociation (distorted perception of time, blackouts, or memory gaps).

In addition to post-traumatic reactions, major burn survivors are likely to present a wide variety of emotional reactions such as sadness, anger, guilt, and fear [29]. Depressive reactions are very common in people who have suffered severe burns. This emotion can be linked to various losses: a home that has burned to the ground, the inability to continuing doing one's job, the amputation of a limb, disfigurement, the death of a loved one, etc. Experiencing pain, particularly when it is constant or in the background and linked to therapeutic actions, has a significant impact on a patient's mental state. Other factors that can impact a burn survivor's morale include a limited social or support network, being far from home or family, and work-related problems.

5 Mental Health Disorders

While most of the studies conducted addressed the psychological after-effects of severe burns on patients, around one-third of survivors present with a premorbid mental disorder, and more specifically depression or substance abuse [31, 32]. Other issues include psychosis, personality disorders, and neurocognitive disorders [14, 33, 34]. The *de novo* psychiatric disorders observed most frequently after major burns are delirium, post-traumatic stress disorder (PTSD), and major depressive disorder (MDD) [35]. Their usual occurrence and associated symptoms are depicted in Fig. 1. Other mental health problems can surface during the year after the event, among them general anxiety disorder, social anxiety disorder, alcohol or drug use disorders, sleep disorders, body dysmorphic disorder, and sexual dysfunctions.

One of the major challenges faced by health care teams involves identifying those hospitalized patients with the greatest risk of developing a mental health disorder in the first year after suffering major burns. These patients should be the first to benefit from specialized early interventions.

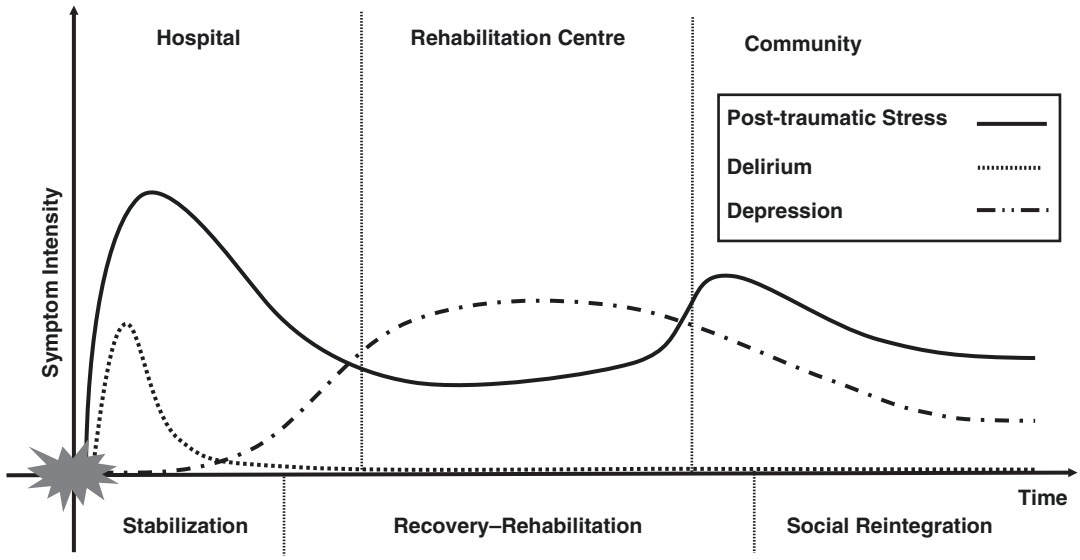

Fig. 1 Evolution of Psychiatric Symptoms after Burn Injury. (Adapted from Bergeron [36])

Table 1 Clinical characteristics of acute mental health presentations following a burn

Characteristic	Delirium	Acute stress disorder	Depression
Initial presentation	Reduced awareness of environment	Fear	Dysphoria
Onset	Acute	Acute	Discreet
Evolution	Fluctuating	Persistent	Persistent
Vigilance	Disturbed	Enhanced	Normal
Attention	Disturbed	Diminished	Diminished
Orientation	Disturbed	Normal	Normal
Memory	Disturbed, weak encoding	Traumatic memories sharp and overwhelming or fragmented	Unequal, inconsistent
Speech	Incoherent	Coherent with fears and apprehensions	Coherent with ruminations
Affect	Labile	Terrorized, anxious	Sad, diurnal variation
Psychomotor activity	Increased or diminished	Increased, especially with stimuli evoking trauma Slower with dissociation	Slower
Perception	Frequent hallucinations, illusions, or paranoia, generally unconnected to trauma	Flashback, occasional hallucinations or illusions, generally connected to trauma	Usually normal, occasional hallucinations or delusions, generally mood-congruent
Sleep	Sleep-wake cycle reversal	Nightmares, insomnia	Insomnia or hypersomnia

Adapted from Bergeron [48]

5.1 Delirium

Delirium, as a manifestation of cerebral suffering, is an acute confusional state that develops over a short period of time and shifts in intensity over a period of 5–15 days or longer. A delirious patient is less aware of his environment and may also experience disorientation as to time, place, and person. Their ability to think, pay attention, and create memories is disturbed, and he may present with hallucinations, delusions (usually paranoid), and agitation. There are three subtypes of delirium, classified by psychomotor activity: hyperactive, hypoactive, and mixed.

A person with hyperactive delirium is agitated, sometimes aggressive and has a high degree of emotional lability. This type of patient will not cooperate with medical caregivers, to the point of striking them, and can display behavior such as pulling out various tubes or IVs. A traumatized victim exhibiting hypervigilance and flashbacks could be mistakenly diagnosed as suffering from delirium. Hypoactive delirium, as its name indicates, is generally associated with an overall drop in activity or unusual apathy. It is often mistakenly diagnosed as depression. Lastly, there is the mixed subtype, which comprises an amalgam of the previous two subtypes of delirium. Table 1 compares the respective characteristics of delirium, acute stress disorder, and depression to allow for more easily distinguishing them.

Delirium is often observed in persons hospitalized for severe burns, as the result of major medical comorbidities (inflammation, infection, shock, hypoxemia, etc.) and the large doses of analgesics (especially opiates) administered. Moreover, substance abuse (alcohol, tobacco, drugs) or neurocognitive problems—two issues associated with delirium—are often observed among this group.

The reported prevalence rates vary between 15% and 77% [35, 37–39], with the highest rates found among ventilated burn survivors [40]. It is estimated that around 20% of major burn survivors will become delirious while hospitalized. This phenomenon is usually linked to a poor prognosis, namely a higher mortality and an extended hospital stay. While delirium is usually a reversible acute illness, the elderly often exhibits a worsening of premorbid dementia or persistent cognitive problems [41, 42]. Some high-voltage electric burn survivors also mention having persistent cognitive problems [43].

A person who suffers from delirium is generally not able to differentiate between perceptions (paranoia) and reality, which may lead to feeling threatened, powerless, and terrified. Memories of fear or psychosis (associated with delirium) increase the risk of developing a post-traumatic stress disorder [44]. While it is infrequent, burn survivors can develop PTSD associated with delirium experience.

5.2 Post-traumatic Stress Disorder

As described earlier, post-traumatic reactions are frequent and expected, but more severe responses may occur. It is estimated that around 15% of major burn survivors will develop an acute stress disorder (ASD), i.e., a psychiatric disorder having occurred in the first 4 weeks after a traumatic event. A diagnosis of post-traumatic stress disorder (PTSD) will rest on similar symptoms but cover a period of more than 1 month. PTSD is slightly more prevalent (20%) than ASD among burn survivors, partially explained by delayed presentation.

In fact, studies report between 2% and 30% of burn survivors will suffer from an acute stress disorder (ASD) and between 9% and 45% meet the criteria for PTSD during the year following the traumatic event [45]. This percentage varies from one study to another, depending on the tools used and the size of the sample. Both disorders are diagnosed if post-traumatic symptoms cause significant distress or interfere in patient's capacities to participate in his recovery. These symptoms are in five categories: arousal, intrusion, avoidance, negative mood and cognition, and dissociation.

Arousal manifests itself as high alertness, hypervigilance, irritability, and insomnia. The burn survivor remains on guard against (often undefined) threats and may also be startled by unexpected noises. Intrusive distressing memories may occur spontaneously as nightmares or flashbacks but also may be triggered by anything that is reminiscent of fire such as a red light or hot drink. Many patients claim to be very upset when they relive the event, which leads them to avoid doing so. An avoidance reaction should be suspected if the victim apologizes repetitively for not being able to share the story of the event that has caused the burn injury. Persistent negative emotional states (fear, anger, or guilt) and beliefs about oneself or the world interfere with recovery and capacity to receive empathetic support from loved ones. Finally, dissociative symptoms present usually early after the trauma as being in a daze or memory gaps.

5.3 Major Depressive Disorder

Between 4% and 10% of major burn survivors will present with a major depression in the year following their injury [46]. A significant percentage (22–54%) of burn survivors will exhibit symptoms of depression, even if they fail to meet all of the diagnostic criteria for depression. Suicidal ideations may develop in burn survivors and it is associated with pain severity experienced at hospital discharge [47]. In addition, rates of self-harm have been shown to increase significantly following a burn injury [20]. It is important that the burn survivor be screened for depression and that treatment should be offered accordingly.

5.4 Risk Factors Associated with Psychopathology After a Burn Injury

The primary risk factors observed among major burn survivors and drawn from two literature reviews [49, 50] and one meta-analysis [45] are listed in Fig. 2. Studies focus mostly on PTSD symptoms but also on depression and anxiety. The factors considered as being the most likely to predict a burn survivor's psychological evolution do not include burn severity indicators (such as total body surface area burned and duration of the hospital stay) [45, 50]. These findings underscore personal characteristics such as gender and personality, the pain experienced and factors that play a role in one's ability to adapt to the event (e.g., mental problems, social support, adjustment styles).

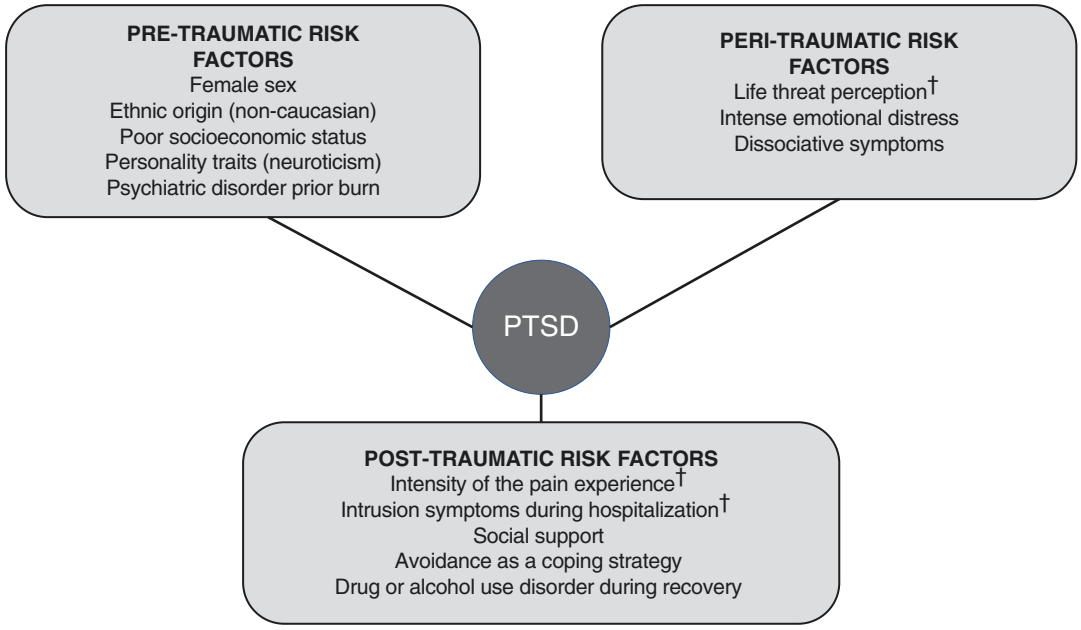

Fig. 2 Factors associated with an increased risk to develop PTSD in burn survivors. (Adapted from Bond and Bergeron [52])

Although few protective factors have been identified thus far, a more beneficial element was observed in patients with a stable social network [7]. Conversely, a "negative" social support system appears to be closely linked to more severe post-traumatic symptoms [51]. Problems getting used to changes in one's appearance and burn scars has recently been identified as another predictor of PTSD [24].

Summary Box: Sects. 1–5

While the experience of burn injury is associated with intense psychological reactions that will usually vanish over time, burn survivors have a higher rate of premorbid mental health problems, and a higher lifetime risk of mental health disorders. The most common *de novo* mental health conditions seen after burn injury are delirium, post-traumatic stress disorder, and major depressive disorder. Mental health conditions in burn survivors can be associated with worse medical outcomes, longer hospital length of stay, and poorer quality of life. As a result, it is imperative that the mental health needs of the burn survivor are addressed to optimize the recovery process.

6 Mental Health Care on a Burn Unit

Mental health evaluation and monitoring of burn survivors should be systematic, proactive, and focused on prevention, particularly given that the approach that favors waiting has been proven ineffective [7, 27, 53]. The initial assessment need not be carried out by a mental health expert and can be initiated by any member of the care team.

The term "psychological care" was proposed to describe the set of psychological interventions designed to support burn survivors during their recovery [49]. This term seeks to standardize psychological interventions and in so doing, intimates that they could be beneficial for all burn survivors. Despite numerous attempts to describe the psychological care that should be extended to

major burn survivors [7, 8, 10, 27, 29, 53, 54], a unique intervention model has yet to be created.

Based on the scientific literature and our professional experience, the following interventions are recommended and conducted depending on a burn survivor's needs:

- Develop a relationship built on trust
- Appreciate patient history and risk factors
- Evaluate and normalize early psychological reactions
- Provide psychological first aid tailored to the hospital setting
- Foster social support
- Support the management of pain, anxiety, insomnia, and delirium
- Administer adjunctive pharmacological treatment

Nurses and rehabilitation team members, given their close proximity to these patients, are often the best persons to deliver general psychological care such as empathic listening and reassurance, meeting basic needs, providing information on initial psychological reactions and labeling them as normal, teaching pain and anxiety management techniques, coaching loved ones on how to provide social support and overseeing the completion of screening questionnaires.

6.1 Hospital-Based Psychological First Aid

The belief that victims should be encouraged to talk about their experience as soon as possible after a traumatic event is still alive and well in the general population as well as among medical personnel. However, numerous studies have revealed that not only do debriefing interventions fail to reduce the risk of developing PTSD among participants, but they can also increase it, compared with the control group [55, 56].

Psychological First Aid (PFA) has been developed as an alternative approach that combines a series of strategies designed to improve the coping ability of trauma victims while promoting resilience [57]. When caring for burn survivors, all health care professionals can employ those strategies outlined in Table 2.

Table 2 Hospital-based psychological first aid for burn survivors

Contact and engagement	• Introduce yourself (name, title, and role) • Focus on the present and reassure the victim • Ask whether there is anything you can do to help • Suggest having a short conversation • Explain the upcoming steps
Safety and comfort	• Ensure that the patient is physically comfortable • Alleviate pain • Protect the patient from additional stressors
Stabilization	• Calm the patient when he is in distress or seemingly on guard • Orient if confused • Listen to the spontaneous recounting of events, losses, worries, difficulties, and emotions, all without ever pushing a patient to provide specific details about these occurrences or feelings
Information gathering on current needs and concerns	• Ask questions regarding a patient's immediate needs and worries • Identify any related questions or concerns • Flag any discrepancies between the concerns of the burn survivor and those of his loved ones • Ask questions about cultural differences based on the burn survivor's ethnic origin or beliefs, to allow for making any necessary adjustments to the care provided
Practical assistance	• Offer practical help with immediate short-term needs (e.g., getting the patient a glass of water, contacting his loved ones) • Ensure that the details regarding the burns, the care received and other needs have been obtained, or followed up

(continued)

Table 2 (continued)

Information on coping	• Validate the patient's emotional reactions • Discuss the reactions to stress, and specifically how they are normal and expected • Reassure the patient that everyone recovers at their own pace • Advice how reactions observed will fade away, especially if they are accepted rather than avoided • Respect the coping strategy chosen by the burn survivor, including denial during the first few weeks after the burn • Promote self-control by encouraging the patient to rally and to start performing small tasks • Promote a regular routine and scheduled (hence predictable) health care • Identify the triggers that remind the patient of the traumatic event and teach emotional self-control skills • Identify avoidance behaviors and if appropriate, teach the principles of exposure
Connection with social supports	• Encourage and facilitate connections with loved ones • Provide support to loved ones and emphasize that their well-being is a key component to helping the patient
Connection with other professionals or organizations	• Reach out to physicians or other professionals to take steps with regard to a specific need • Contact professionals involved with the patient prior to the traumatic event • If necessary, refer the patient to specialized mental health services in his region • Cooperate with community workers and organizations involved in the patient's psychosocial support and social reintegration

Adapted from Bond and Bergeron [58]

6.2 Supporting the Supporters

One of the key aspects of caring for burn survivors is the support of spouses and loved ones [8]. Caregivers must ensure that loved ones are not neglecting their own fundamental needs [59], such as eating or sleeping. This is particularly critical when we consider that adequate social support is known to be one of the most important factors in post-burn recovery [60–62] and appears to protect survivors from PTSD [63].

Loved ones, however, can find it hard to take on a caregiver role, likely because they are still recovering from the shock of what occurred [64]. In some cases, the loved one was even present at the time of the event and thus also intimately affected by the traumatic experience. Reactions from loved ones are similar to those of burn survivors: numbness, anxiety, panic, reliving of the event, difficulty concentrating and sleeping, constant state of vigilance, and a tendency to avoid everything associated with the event [59, 64, 65]. Therefore, a critical component in caring for burn survivors is helping their support network.

Loved ones need information to understand what is happening to the burn survivor as well as advice on the best way to help [8, 27]. Some suggest that explaining the recovery steps in cases of major injuries can help loved ones better understand the sequence of future events and foster feelings of hope as well as a greater sense of control [59, 66]. Psychological manifestations experienced by burn survivors, such as delirium, post-traumatic reactions, and feelings of pain, should also be reviewed with loved ones so that they can best help support the recovery of the burn survivor [10].

6.3 Delirium Management

To date, there has been no research on treating delirium among burn survivors. The global management of delirium summarized in Fig. 3 rely on restoring organ function, treating medical conditions (such as infection) and ceasing or reducing medication (such as opiates or benzodiazepines) that may cause delirium. Agitation and psychotic symptoms often call for psychopharmacological treatment but behavioral and environmental interventions should always be part of delirium care.

Non-pharmacological interventions are often grouped in a multicomponent bundle of care and include adequate oxygen delivery, pain relief, hydration, nutritional assistance, sleep management, revision of polypharmacy, regulation of bladder and bowel function, early mobilization, and correction of visual or hearing impairment. This approach has shown a significant reduction in delirium incidence [67–70] and the use of a sys-

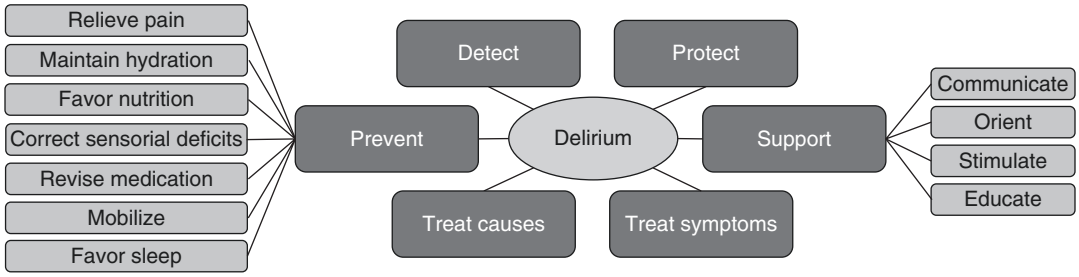

Fig. 3 Comprehensive approaches to managing delirium. (Adapted from Bergeron [73])

tematic multicomponent intervention strategies for the prevention of delirium is recommended.

Systematic detection of delirium with the use of monitoring tools like the Intensive Care Delirium Screening Checklist (ICDSC) [71], the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) [72] enhanced the skills of the medical team to assess this confusional state even with patients mechanically ventilated.

Current evidence does not support the use of antipsychotics for prevention or treatment of delirium, and there are very few clinical studies based on a solid methodology to warrant its use on a regular basis [74–78]. However, if the patient requires rapid management of agitation or experience florid psychosis, haloperidol is widely accepted as a symptomatic treatment.

With a safe QTc interval and constant cardiac monitoring, intravenous haloperidol is the route of choice with regular dosage of 0.5–1 mg every 8–12 h for mild agitation, 2–2.5 mg every 6–8 h for moderate level and 2.5–5 mg (or even 10 mg) to 4–6 h for severe agitation. Haloperidol is usually started with the same dosage range and administrated every 30–60 min to obtain calm. Elderly or frail patients may require only half of those dosages. With appropriate monitoring, intravenous haloperidol may be tolerated for values of QTc superior to 450 ms, but its use is not recommended over 500 ms. When intravenous access is not available or when clinicians prefer to engage the patient in his treatment, enteral haloperidol may be offered before intramuscular, subcutaneous, or intravenous route.

Second-generation antipsychotic drugs such as quetiapine could also help alleviate symptoms of delirium and are less likely to have extrapyramidal adverse effects than haloperidol [76] which may occur more often with younger patients. They may also have less effect on QTc prolongation and risk of life-threatening tachyarrhythmia. The sedative effect of quetiapine can help to facilitate the control of agitation and promote sleep. Low dose of 12.5–25 mg once or twice a day may be sufficient for frail or elderly patients but stronger dose such as 100 mg up to three times a day may be necessary for more severe agitation. Further research is needed on the efficacy of routine use of antipsychotics in the treatment of specific symptoms of delirium like agitation.

Dexmedetomidine is an alpha 2 agonist sedative agent used in context of critical care that is preferred to benzodiazepines such as midazolam or lorazepam to reduce length of delirium and control agitation [74]. In the cases of delirium associated with alcohol or benzodiazepines withdrawal, lorazepam (0.5–2 mg) or diazepam (2.5–10 mg) is usually utilized with intravenous or enteral route [79]. Using equivalence tables, benzodiazepines are administered according to different approaches with loading dose regimens, fixed dose regimens, or according to withdrawal symptoms and then gradually reduce. Medical teams may be helped by the use of a protocol with the revised Clinical Institute Withdrawal Assessment for Alcohol (*CIWA-Ar*) Scale, but often the contribution of alcohol or sedatives withdrawal is not so clear in the confused burn patient with unknown history of substance abuse. Initial management of agitated patients may require a mix of a benzodiazepine and an antipsychotic. Along with supportive care, thiamine supplementation is also recommended in delirious alcoholic patients.

6.4 Early Psychopharmacotherapy

For patients with a prior history of mental health disorders (such as schizophrenia or major depressive disorder), a consultant psychiatrist will

quickly ascertain whether the existing pharmacological treatment should be maintained or changed in order to prevent the re-emergence of the premorbid psychiatric disorder. In order to alleviate debilitating symptoms such as insomnia, overwhelming anxiety, repeated panic attacks or agitation, a physician could resort to administering a limited amount of a psychotropic agent for a short period of time. Before this type of medication can be prescribed, a comprehensive medical evaluation must be conducted to identify any intolerances or potentially adverse effects.

Treatment of pain and comorbid anxiety is paramount after burn injury. While opiates are considered cornerstone of pharmacologic pain management of hospitalized burn patients [80], the use of adjunct agents is often mandatory [81, 82] and are described in Chap. 8. Patients with high levels of pain and high anticipatory procedural anxiety may benefit from anxiolytic therapy [83].

Benzodiazepines such as midazolam, lorazepam, oxazepam, and clonazepam are frequently prescribed fast-acting antianxiety agents that have proven effective. Like opiates, they can have a depressant effect on a patient's mental state and they should be administered prudently. If taken over lengthy periods, they can cause cognitive problems and addiction. Furthermore, their use is associated with causing or worsening symptoms of delirium and should be avoided or used with caution in critically ill patients or the elderly.

Administering high doses of morphine appears to deter the development of post-traumatic symptoms in children who have been severely burned [84], with the mechanism in play not being uniquely limited to pain relief [84, 85]. On the other hand, a systematic review and meta-analysis of 18 studies involving 5236 patients revealed that benzodiazepines are ineffective for PTSD prevention and treatment, and that the risks associated with their use are greater than any potential short-term benefits [86]. Side effects of benzodiazepines include an increase in the severity of PTSD symptoms; they also promote avoidance behavior and can inhibit the actions of psychotherapeutic processes by numbing all emotions, impeding the formation of new memories (anterograde), and hindering learning. The authors suggest that this class of medication should be contraindicated for patients recently exposed to a trauma or presenting with PTSD. Once again, benzodiazepines use must thus be carefully monitored if needed.

While benzodiazepines do make it easier for patients to fall asleep, they also inhibit deep sleep, which is the most restorative phase. As such, they do not truly improve sleep quality. There are several different options to help treat acute insomnia in burn patients. They could include the use of melatonin or the short-term use of hypnotics such as zopiclone. Antidepressant drugs such as selective serotonin reuptake inhibitors (SSRIs) do not prevent the development of acute stress disorder [87–89] but trazodone or mirtazapine are utilized for their sedating effects as sleeping agents.

Lastly, and especially for patients who suffer from PTSD-induced nightmares, prazosin is an alpha-blocker with potentially interesting applications, supported by evidence-based data [90]. The related hypotension and dizziness dictate that care should be exercised with this use of this medication. The non-selective beta-blocker propranolol lauded over recent years for its impact on post-trauma memory reconsolidation [91, 92], seemingly mitigates some of the physical symptoms of anxiety but does not appear to have any type of protective effect on victims of burn injuries [93–95].

Summary Box: Sect. 6

Addressing mental health needs of burn survivors is a critical aspect of their recovery. Doing so effectively requires a stepped care biopsychosocial approach involving members of an interdisciplinary team as well as the burn survivors' family members who play a crucial role in their recovery. Management of mental health problems on a burn unit can include both psychological and pharmacological treatments. Psychological first aid is an approach that aims to provide emotional support and promote coping. Delirium management should also involve behavioral and environmental approaches, and in the cases of severe agitation can include psychotropic medications such as haloperidol.

7 Systematic Mental Health Follow-Up for Burn Survivors

A team of clinicians and researchers from Australia working with trauma survivors [23] put forth a model of psychological care that rests on personalized risk assessments for each patient while hospitalized, as well as regular re-evaluations (watchful waiting) after their release, in the case of those who exhibit a significant risk of developing a mental problem of some sort (see Fig. 4). The authors suggest a 4-week waiting period after the patient's release before screening, as this will allow any temporary reactions to dissipate. This model is also recommended for burn survivors [96].

7.1 Step 1: Assess the Risk of Psychological Complications

This step, conducted while the patient is hospitalized, is based on the Post-traumatic Adjustment Scale (PAS) [25]. Verified among individuals hospitalized following a serious injury, this is the first self-administered scale that makes it possible to identify persons at risk of developing PTSD or becoming depressed subsequent to a traumatic event. The PAS is not a screening tool, being more focused on prediction. This tool facilitates the quick and systematic evaluation of all patients hospitalized following an injury at a low cost.

7.2 Step 2: Set Up Watchful Waiting and a Screening Process

This step is put into place once the patient has been released from the hospital. It solely concerns those people who present a significant risk of developing psychological issues associated with their burns. While the monitoring/follow-up model may initially appear simple, its implementation calls for significant efforts in terms of logistics and acceptability. Mental health monitoring is generally combined with medical follow-up. Table 3 provides a few suggestions [97, 98] regarding screening tools that burn survivors can turn to.

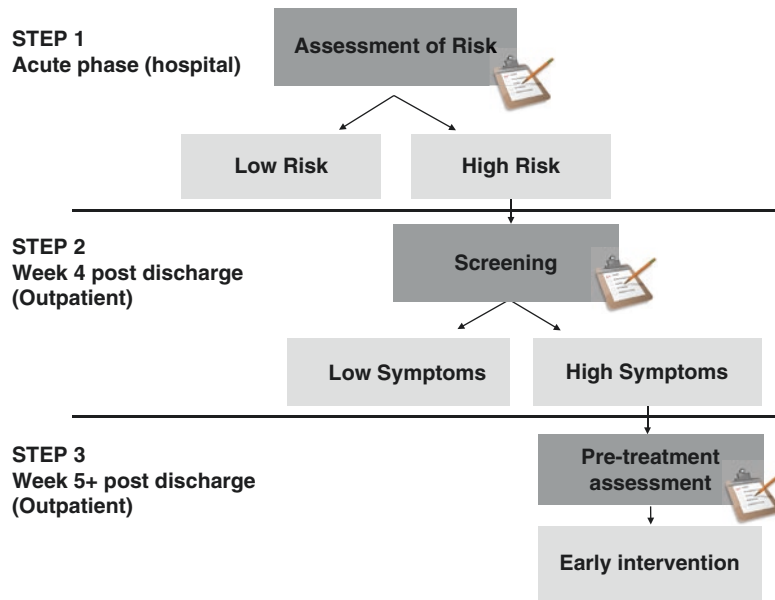

Fig. 4 Model of systematic follow-up for burn survivors (Adapted from O'Donnell et al. [23])

Table 3 Recommended measures to screen for psychological issues related to burns

Element evaluated	Suggested measures
Difficulties specifically associated with the burns	Burn Specific Health Scale-Brief (BSHS-B)[1, 3]
Post-traumatic reactions	PTSD Checklist for DSM-5 (PCL-5)[1, 2, 3]
Depression	Patient Health Questionnaire (PHQ-2, PHQ-9)[1, 2, 3]
Anxiety	Generalized Anxiety Disorder (GAD-7)[3]
Anxiety and depression	Hospital Anxiety and Depression Scale (HADS)[1,3]
Pain	Brief Pain Inventory (BPI, BPI-SF)[2,3]
Sleep disorders	Insomnia Severity Index (ISI)[2,3]

Notes. [1]Measure recommended by the American Burn Association Gibran et al. [97]
[2]Measure recommended by Mason et al. [98]
[3]Measure recommended by the authors of this chapter
Adapted from Bond and Bergeron [99]

Table 4 Key elements of cognitive behavioral therapy (CBT) for burn survivors

Therapeutic	Target
Psychoeducation	PTSD, depression
Relaxation and breathing	PTSD (anxiety and hyperalertness)
Pain management	Pain, depression
Behavioral activation	Depression, social reintegration
Sleep hygiene	PTSD, sleep disorders
Exposure through imagination (memories of the event)	PTSD
Exposition *in vivo*	PTSD, depression, scars, social reintegration
Cognitive restructuring	Inadequate thoughts with regard to one's self (skills, physical attraction), others and the world
Practicing expected social interactions	Appearance and scars, social reintegration

Adapted from Cukor et al. [104], Table 1, p. 186

7.3 Step 3: Provide Early Specialized Treatment to Those Who Need Care

While numerous patients might be helped by low-intensity interventions, such measures may not be adequate for those who suffer from PTSD or a more serious depression. The best practices in terms of care for burn survivors recommend that all persons with a psychiatric or psychological disorder be referred to a specialized mental health care provider [97].

Despite the many challenges encountered during psychological recovery following major burns, research in this field is still at an early stage. To date, there have been no random and controlled studies designed to assess the effectiveness of individual psychotherapy that takes into account the main problems likely to affect burn survivors. In the presence of PTSD, trauma-focused cognitive behavior therapy (TF-CBT) or EMDR (Eye Movement Desensitization and Reprocessing) is recommended [100, 101].

While PTSD is one of the problems that most often develop following major burns [12], various other troubles can also occur, either alone or in comorbidity. The interventions adopted for burn survivors must be tailored to this clientele and address issues such as scarring, body image, chronic pain, and sexuality. This is particularly difficult when we consider that PTSD and difficulties relating to one's image can mutually reinforce one another [102]; this also applies in the case of chronic pain [45]. Table 4 illustrates some of the techniques from CBT that can be utilized in the treatment of patients with complex burns [103].

Psychotherapy focused on trauma, it must be outlined, is more effective than pharmacologic treatments in PTSD [105]. However, for patients who are more severely affected, pharmacotherapy can bring about a reduction in the intensity of PTSD and depression symptoms and facilitate patient commitment to rehabilitation or psychotherapy. The attending physician or psychiatrist selects a pharmacological agent based on patient needs and preferences and while taking into account guidelines and evidence-based practice developed by experts. Table 5 highlights medications that have first-line evidence in the treatment of MDD [106]

Table 5 Canadian Guidelines for first-line treatment in major depressive disorder (MDD) and post-traumatic stress disorder (PTSD)

First-line evidence	Medication	Daily dosing range
	Selective Serotonin Reuptake Inhibitors (SSRIs)	
MDD, PTSD	Sertraline	50–200 mg
MDD	Citalopram	20–40 mg
MDD	Escitalopram	10–20 mg
MDD, PTSD	Fluoxetine	20–60 mg
MDD, PTSD	Paroxetine	20–50 mg
MDD	Fluvoxamine	100–300 mg
	Serotonin and Norepinephrine Reuptake Inhibitors (SNRIs)	
MDD, PTSD	Venlafaxine XR	75–225 mg
MDD	Desvenlafaxine	50 mg
MDD	Duloxetine	30–60 mg
	Other Antidepressants	
MDD	Bupropion XL	150–300 mg
MDD	Mirtazapine	15–45 mg
MDD	Vortioxetine	19–20 mg

Adapted from Kennedy et al. [106] and Katzman et al. [100]

and PTSD [100]. Serotonin and Norepinephrine Reuptake Inhibitors (SNRIs) deserve special attention given their evidence and safety in treatment of comorbid neuropathic pain in burn survivors [107].

Summary Box: Sect. 7

All burn survivors should be evaluated during acute care for their risk to develop later psychological complications and then reassessed 4 weeks after their discharge from the hospital. For those who have developed mental health problems such as PTSD or depressive disorder, they should be referred to specialized mental health services to obtain evidence-based treatments such as cognitive behavioral psychotherapy, and if necessary psychopharmacotherapy.

8 Post-traumatic Growth

While the majority of this chapter has focused on the mental health challenges faced by burn survivors, it is also important to reflect on the concept of post-traumatic growth (PTG), which has been a recent area of study in this population. The concept of PTG is that positive psychological changes can happen as the result of a traumatic event in domains such as appreciation of life, relationship with others, discovering new possibilities in life, increasing personal strength, and spiritual change [108].

This concept of PTG has been recently studied among burn patients. In a longitudinal study done in Australia, they showed that depression is strongly linked to a lack of PTG, indicating the importance of addressing these symptoms early on in a patient's path towards recovery [109]. Furthermore, it has been shown that the sudden nature of the burn injury and severity and location of the injury can impact PTG. In addition, an integrative literature review of PTG in burn patients illustrated common themes that can support PTG. A model [108] is proposed in Fig. 5.

Chapter Summary

Burn injuries are a devastating experience for victims and their loved ones. They notably have significant impacts on a burn survivor's physical and mental condition. A significant number of survivors will experience difficulties adapting and ultimately, develop one or more disabling psychiatric disorders. The severity of the injuries and psychological issues are the factors with the most significant repercussions on the quality of life of burn survivors. It is imperative that a systematic biopsychosocial approach be taken to help support the mental health challenges faced by burn survivors in their path towards rehabilitation from admission on the burn unit to their social reintegration. Mental health care constitutes a major challenge for caregiver teams throughout the recovery process and its integration must be upheld by a moving and persistent conversation in this regard.

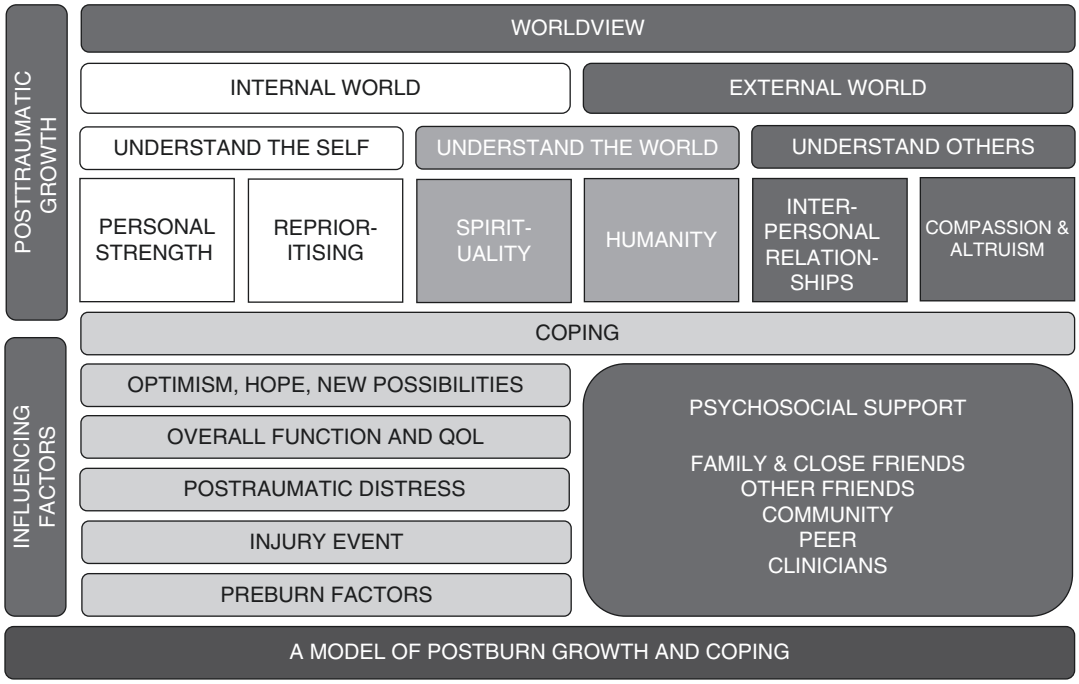

Fig. 5 A model of post-traumatic growth in burn patients. (Adapted from Martin et al. [110])

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