Treating Psychological Trauma and Depression after Severe Burn Injury

Yulia Gavrilova, Ph.D.

Department of Psychiatry & Behavioral Sciences

Department of Surgery

Medical University of South Carolina

BBH
Burn Behavioral Health

MUSC Health
Medical University of South Carolina

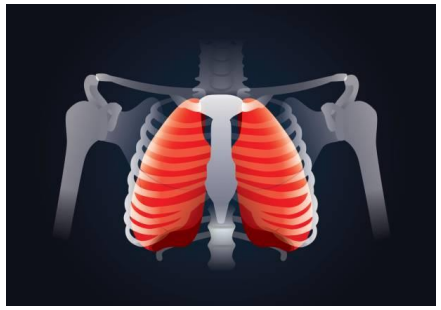
THE SOUTH CAROLINA BURN CENTER

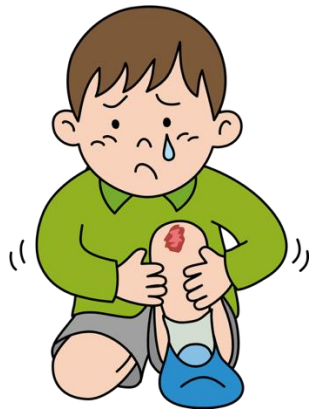
muscShawn Jenkins Children's Hospital
Medical University of South Carolina

Disclosures

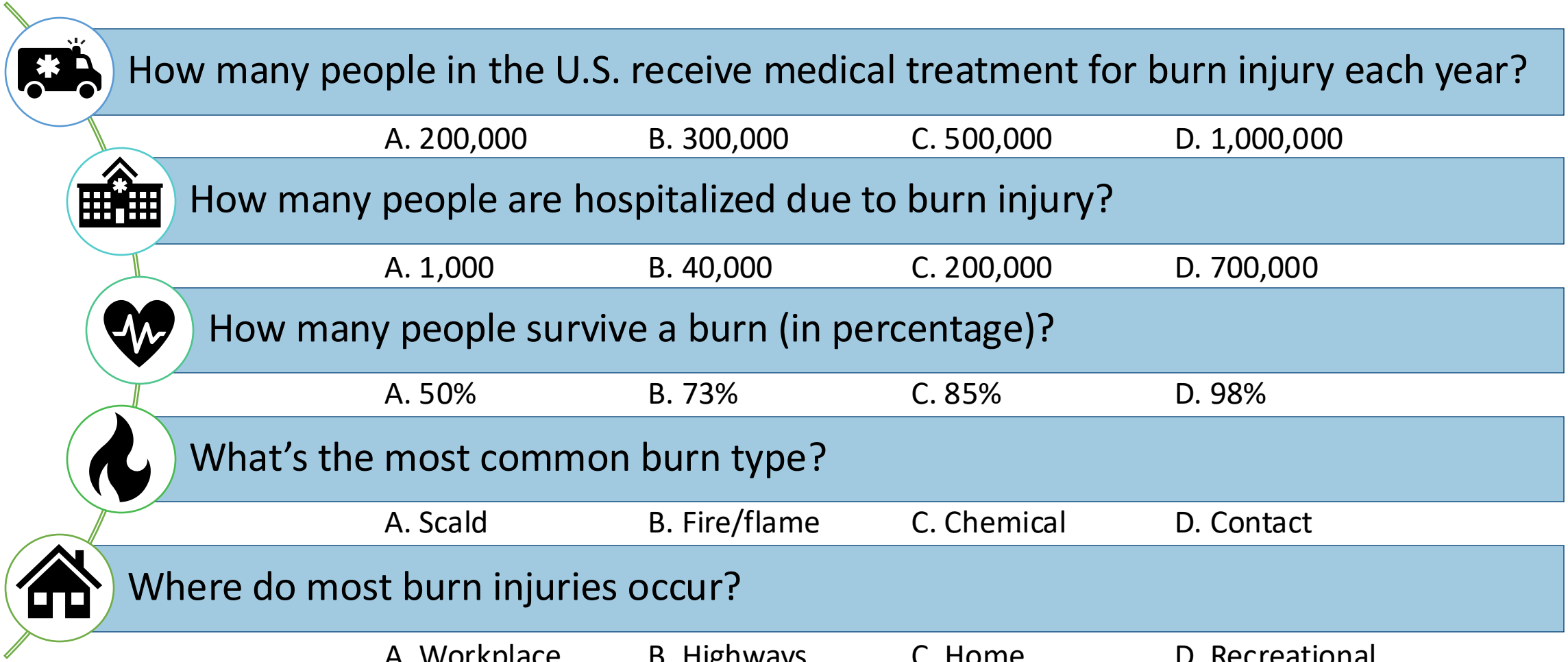
- Director of Burn Behavioral Health
- Co-developer of Teleburn Optimized Burn Intervention (TOBI) app
- No financial disclosures

Burn Types





Burn Incidence Facts Quiz



How many people in the U.S. receive medical treatment for burn injury each year?

A. 200,000 B. 300,000 C. 500,000 D. 1,000,000

How many people are hospitalized due to burn injury?

A. 1,000 B. 40,000 C. 200,000 D. 700,000

How many people survive a burn (in percentage)?

A. 50% B. 73% C. 85% D. 98%

What's the most common burn type?

A. Scald B. Fire/flame C. Chemical D. Contact

Where do most burn injuries occur?

A. Workplace B. Highways C. Home D. Recreational

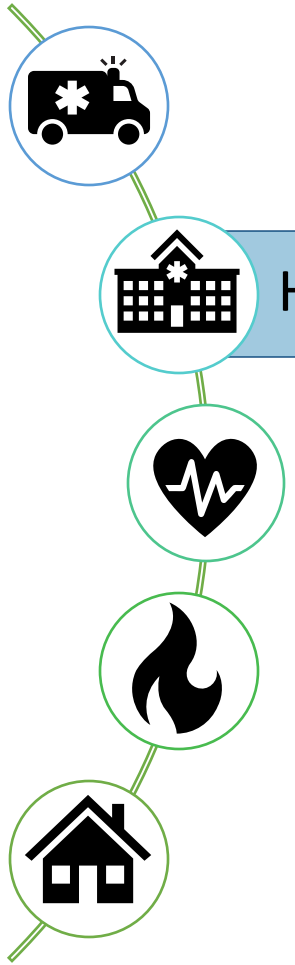
Burn Incidence Facts Quiz

How many people in the U.S. receive medical treatment for burn injury each year?

A. 200,000 B. 300,000 C. 500,000 D. 1,000,000

Source: ABA Burn Incidence Fact Sheet, 2024

Burn Incidence Facts Quiz



How many people are hospitalized due to burn injury?

A. 1,000

B. 40,000

C. 200,000

D. 700,000

Burn Incidence Facts Quiz

How many people survive a burn (in percentage)?

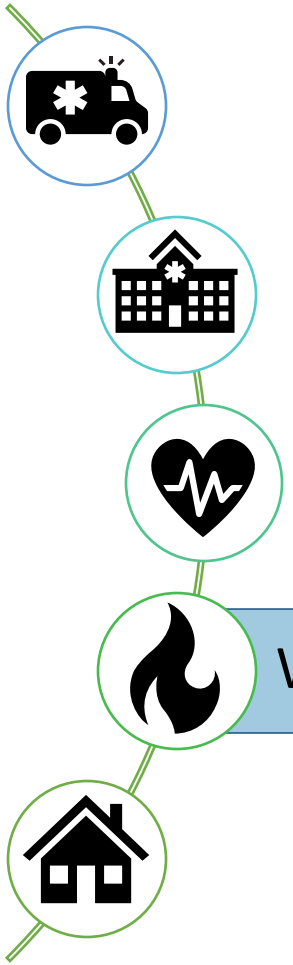
A. 50%

B. 73%

C. 85%

D. 98%

Prevalence of Burn Injury Quiz



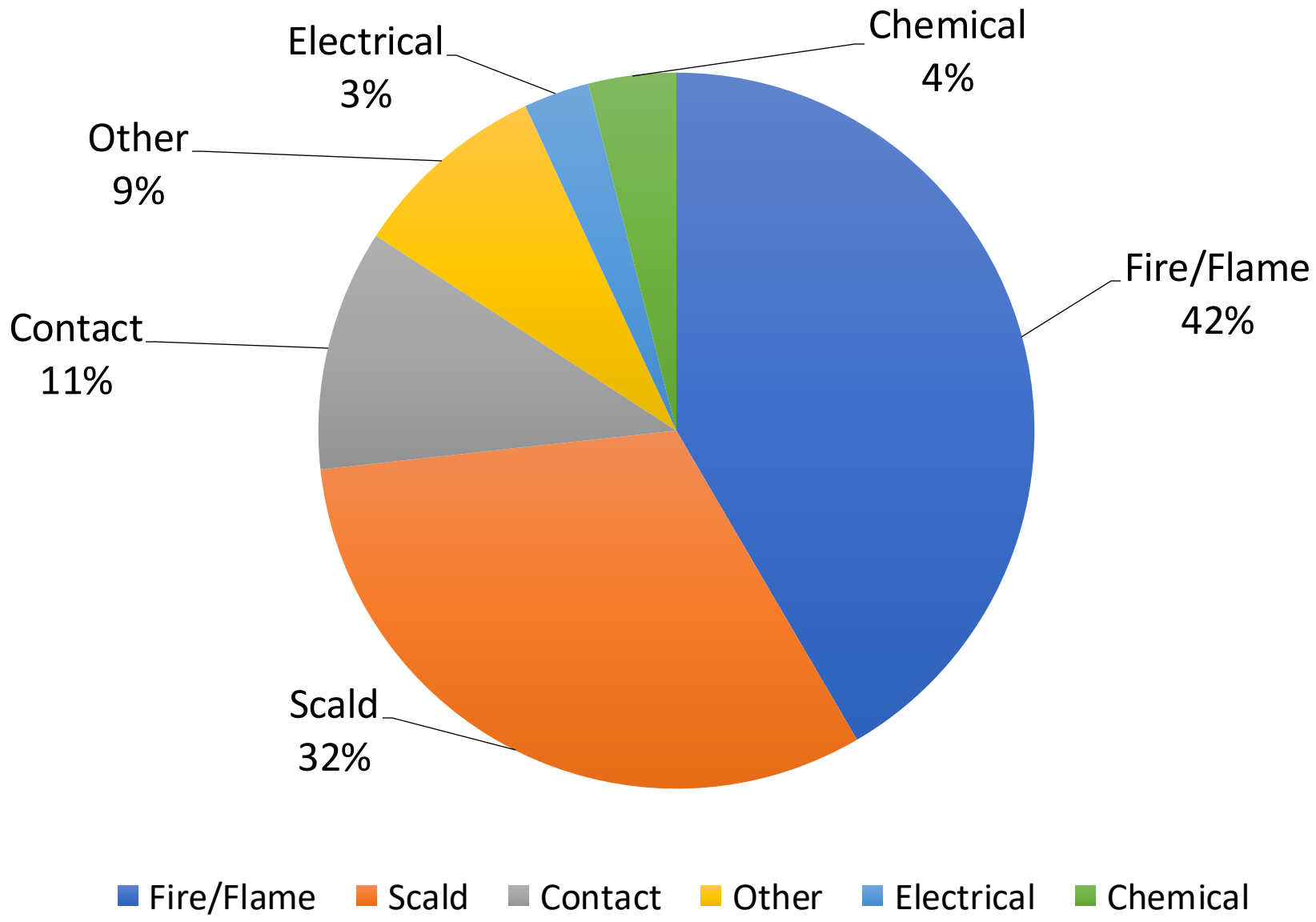
What's the most common burn type?

A. Scald

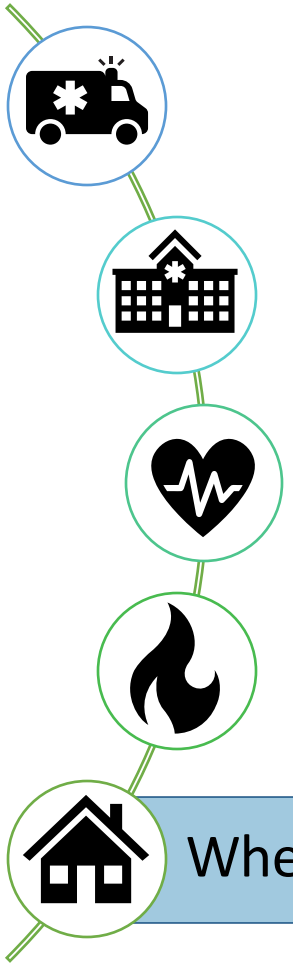
B. Fire/flame

C. Chemical

D. Contact


Electrical
3%
Chemical
4%
Other
9%
Fire/Flame
42%
Contact
11%
Scald
32%
Fire/Flame
Scald
Contact
Other
Electrical
Chemical

Burn Incidence Facts Quiz



Where do most burn injuries occur?

A. Workplace

B. Highways

C. At home

D. Recreational

South Carolina Burn Center

- Est. 2020
- 25 beds across 2 hospitals
- STBICU and step-down unit
- Avg of 50 clinic visits weekly
- Multidisciplinary team
- Inpatient → outpatient continuum

MUSC Health
Medical University of South Carolina

THE SOUTH CAROLINA BURN CENTER

muscShawn Jenkins Children's Hospital
Medical University of South Carolina

MUSC Health Burn Center high performing in quality and survival outcomes

Helen Adams | April 01, 2022

Understanding Burn Injuries

- Burn injuries can be caused by any trauma mechanism (explosion, MVC, fall)
- Burn = severe skin damage that causes the affected skin cells to die
- Burn depth classifications:
  - 1st Degree: Epidermal
  - 2nd Degree: Partial-thickness
  - 3rd Degree: Full-thickness
  - 4th Degree: Full-thickness extending beyond the skin into tendons and bones

- % of Total Body Surface Area (TBSA) burned = # of hospitalization days
- Prolonged admissions are common

The Physical Toll of Burn Recovery

Wound care	Debridement, excision, and closure
Topical treatments	Medicated dressings, skin substitutes
Skin grafting	Often multiple procedures
Hydrotherapy & wound vacs	Promote healing
Scar management	Laser therapy, compression garments
Rehabilitation	Daily physical & occupational therapy
Nutritional support	High-calorie needs, NG tube feeds
Respiratory support	Intubation, ventilators for inhalation injuries
Pain management	Intensive, ongoing, multimodal

Burn Survivors and Mental Health

Physical recovery is a focal point of burn care

Emotional recovery is sometimes delayed or overlooked

Unaddressed mental health needs can lead to:

- Prolonged hospital stays
- Poor treatment adherence
- Complications
- Readmissions
- Problems with rehabilitation
- Development of psychiatric disorders
- Difficulty reintegrating into daily life
- Higher healthcare costs
- Increased staff burden

Burn Survivors and Mental Health

Pre-existing: Prior psychiatric problems are common in 2/3 of patients

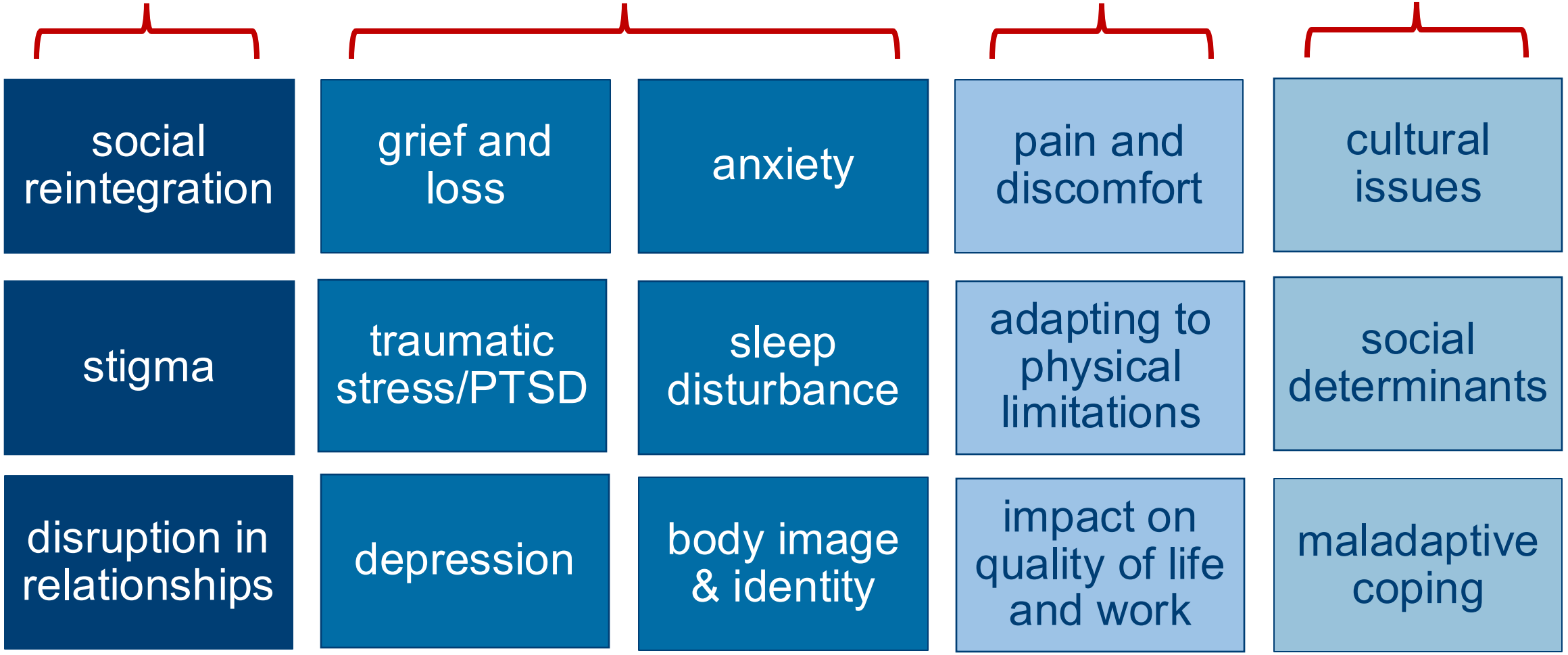
Post-injury: Many develop new psychiatric symptoms and disorders

Long-term: 1/3 will experience long-term mental health difficulties

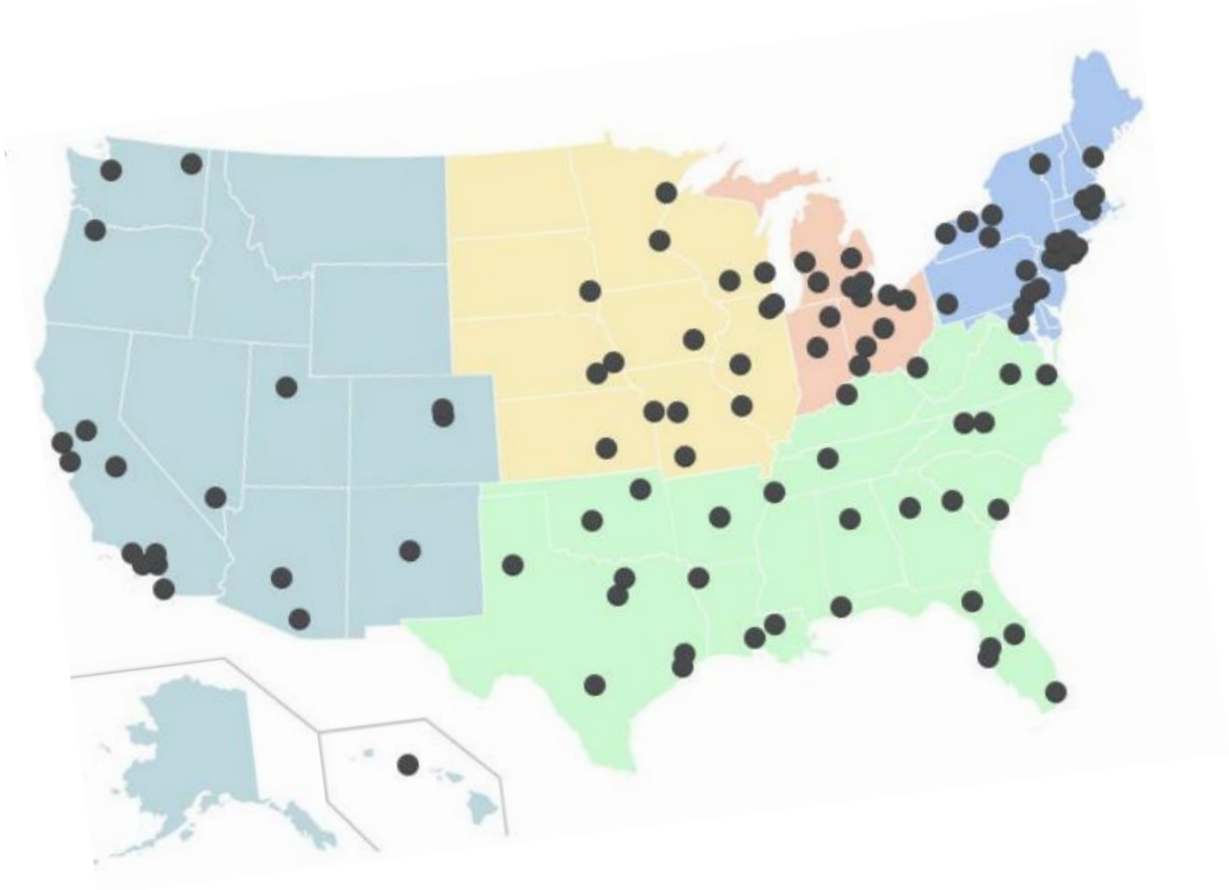
Up to 45% develop PTSD, 54% develop Depression, 25% develop Anxiety

Chokshi et al., 2022; Wang et al., 2024; Giannoni-Pastor et al., 2016; Thombs et al., 2006; Maes et al., 2000

Psychosocial Barriers to Recovery



Unmet Mental Health Needs in U.S. Burn Centers



- Only 25% of respondents from U.S. burn centers reported having structured inpatient screening; 11% for outpatients
- Only 39% of respondents from U.S. burn centers reported having at least .25 FTE psychologist

Lawrence et al., 2016

- 62% of ABA respondents indicated their institution formally screened for ASD and/or PTSD

Smith et al., 2021

Call to Action

VERIFIED
American Burn Association
BURN CENTER

Burn Center Verification Review Program

Section 16: Community Reintegration

16.1	The burn center provides coordinated transition of care to the outpatient status.	1
16.2	The burn center follows >75% of all patients who transition to the outpatient setting.	1
16.3	A burn therapist is available in the outpatient clinic to provide services, including follow up, as needed.	1
16.4	The burn center provides brief psychological screening/intervention.	1
16.5P	The burn center provides evaluation of patient developmental status (for children).	2
16.6	The burn center provides timely access to reconstructive surgery.	2
16.7	The burn center facilitates access to peer-to peer and burn survivor resources for patient and family support. Provides access to peer support (such as but not exclusively a Phoenix Society SOAR program).	1

Smith et al., 2021

MUSC Health Medical University of South Carolina
THE SOUTH CAROLINA BURN CENTER
musc Shawn Jenkins Children's Hospital Medical University of South Carolina

The Problem

Untreated psychiatric symptoms are associated with poor outcomes

Can't reliably predict who will develop psychiatric symptoms

Patients don't actively seek help

Need to provide universal screening & early intervention during hospital admission

Limited resources, staffing, & expertise at burn centers

At-risk patients go on to develop psychopathology that requires intensive treatment

South Carolina ranked 49th in the nation for mental health access

Clinicians lack sufficient training

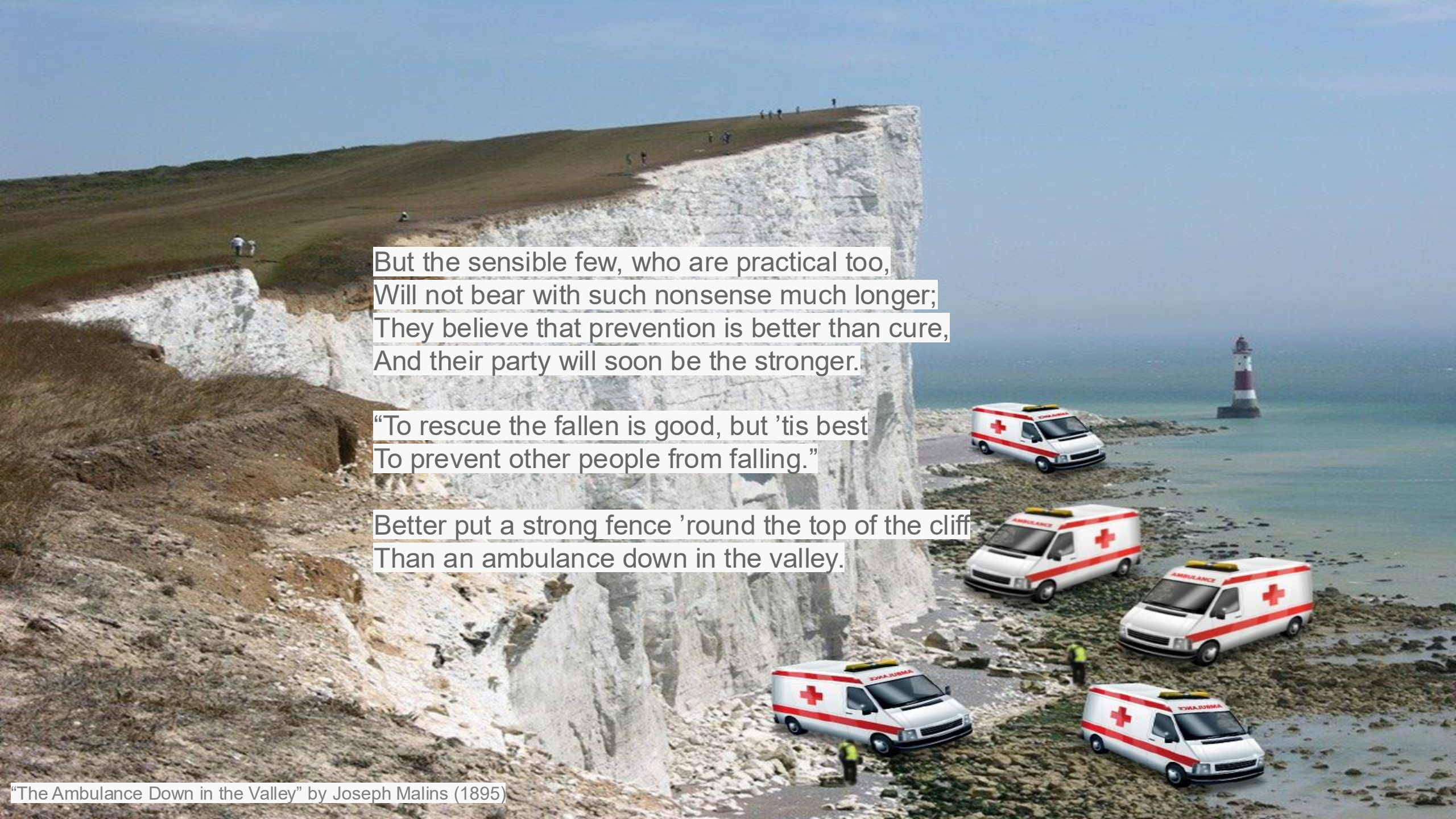
“The Ambulance Down in the Valley” by Joseph Malins (1895)

“The Ambulance Down in the Valley” by Joseph Malins (1895)

“The Ambulance Down in the Valley” by Joseph Malins (1895)

“The Ambulance Down in the Valley” by Joseph Malins (1895)

“The Ambulance Down in the Valley” by Joseph Malins (1895)

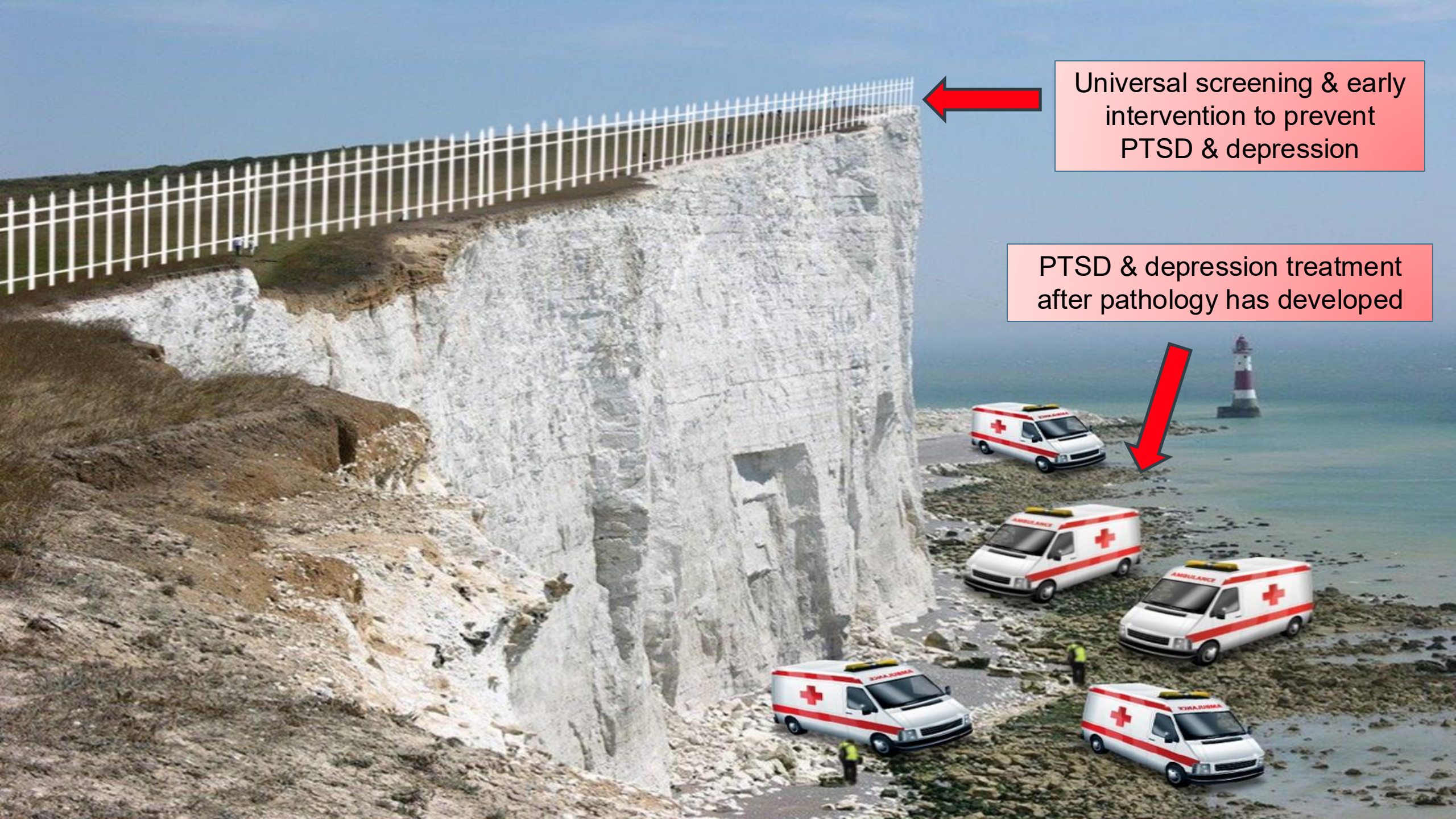


“The Ambulance Down in the Valley” by Joseph Malins (1895)

Universal Screening = Secondary Prevention

"Given the potential benefits to trauma survivors and society, the development of effective preventive interventions should be given greater priority."

Howlett & Stein, 2016


Universal screening & early intervention to prevent PTSD & depression
PTSD & depression treatment after pathology has developed

The Solution: Building the Fence

- As a new burn center, we set out to bridge this gap in South Carolina
- Goal: Create a self-sustaining, evidence-based mental health program
- Burn Behavioral Health (BBH)

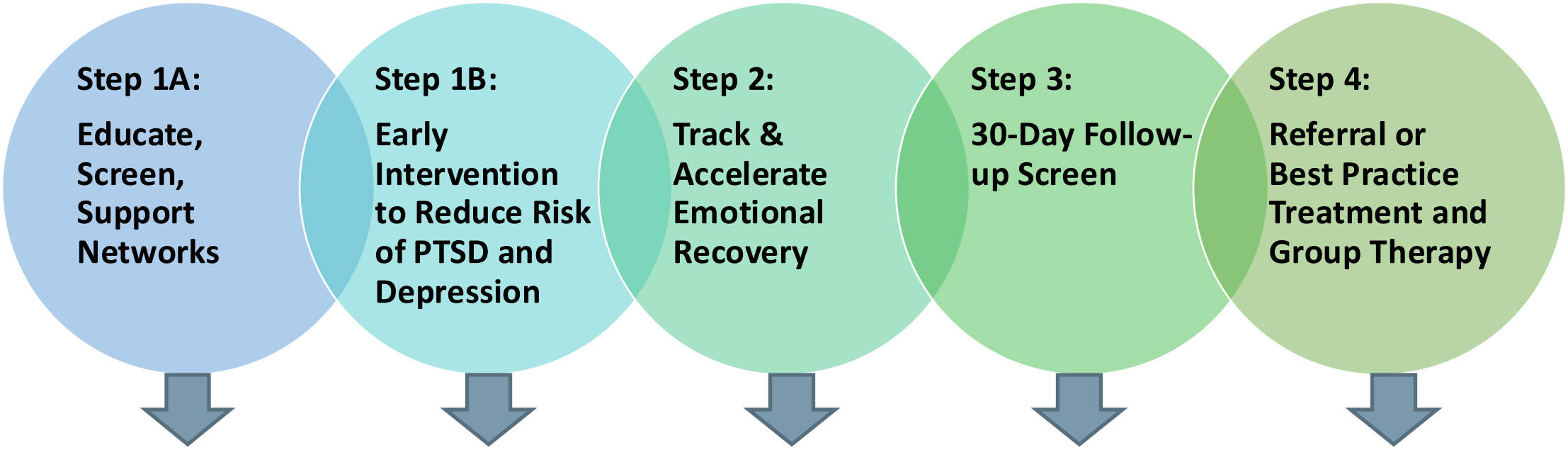
Burn Behavioral Health (BBH)

- Stepped-care program for burn survivors: Inpatient → Outpatient
- Population: Adults with burn injuries, other trauma, and medical conditions
- Scope: Trauma/PTSD, depression, anxiety, adjustment
- Full range of services
  - Screening and early intervention
  - Diagnostic assessment
  - Individual and group psychotherapy
- In-person and telehealth modalities
- Focus on promoting physical recovery and psychosocial rehabilitation

Burn Psychologist Role

Clinical Integration	Fully embedded in burn center: daily multidisciplinary rounds and outpatient burn clinic
	Conduct screening, assessment, therapy, and crisis intervention – working with patients & family
	Support with pain, trauma, grief, mood, anxiety, body image, and discharge readiness
Team Support & Education	Consultations with team and nursing staff
	Debrief staff after critical events (e.g., patient death)
	Provide education and supervision to trainees, interns, residents, and staff
Leadership & Program Development	Direct Burn Behavioral Health (BBH) program operations
	Develop protocols, resources, metrics; lead program development and evaluation, QI initiatives
	Coordinate survivor peer support and community reintegration events
Research & Advocacy	Lead and collaborate on burn-related research projects
	Contribute to national guidelines and task forces (ABA, firefighter initiatives)
	Promote trauma-informed care culture and integrated models of care in burn field

Burn Behavioral Health: Program Structure and Measures



Risk Assessment:
- Risk of PTSD/Dep
- Social Support
- SI / HI / Self-harm
- Substance use
- Mental health history
- Outlook / resilience

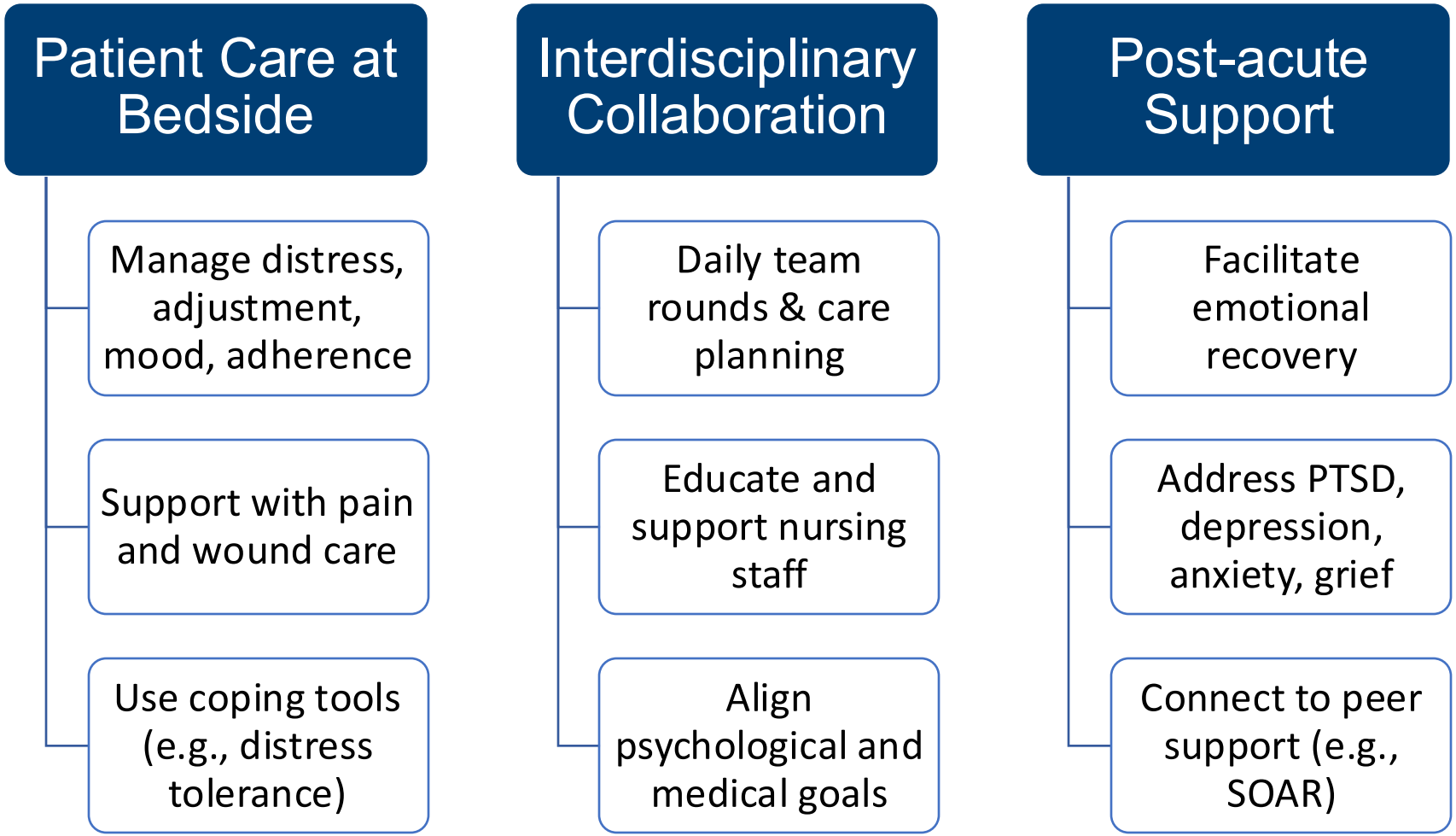
Brief Evidence-Based Interventions:
- Relaxation / Mindfulness
- Behavioral Activation
- Distress Tolerance
- Exposure / Reducing Avoidance
- Motivational Interviewing, etc.

Automated
- Text-based program
- Coping tips

Symptom Measures:
- PTSD
- Depression

Diagnostic Assessment & Evidence-Based Treatments:
- Individual
- Group
- Telehealth option

BBH Services Across the Burn Continuum



BBH Services:
Early Psychological Intervention & Engagement

Building Therapeutic Rapport in Acute Care

- Use "foot-in-the-door" strategies to gradually build trust
- Motivational Interviewing, especially for difficult/painful tasks
- Many patients require multiple sessions tailored to risk and need
- Engage family members and caregivers early in recovery

Continuity of Psychological Care

- Many survivors lack access to trauma-informed mental health care
- In-house mental health services and warm handoffs to specialists are critical
- Encourage connection to peer support networks (e.g., Phoenix Society, TSN)

Program Evaluation

Burn patients
(*N* = 1,203)

Admitted to Burn Center at academic medical center

Assessed by Burn Behavioral Health within 30 days

Results: Demographics

- February 2021 - November 2024
- 1,203 adult patients identified as eligible for BBH services

Demographics	**Frequency or Mean (*M*) & Standard Deviation (*SD*)**
Age	*M = 46.08, SD = 18.04, range: 16 - 102 years*
Sex	Male: N = 802 (67%)
Race	White: 53%, Black: 38%; Multicultural/Other: 6%
Ethnicity	Non-Hispanic: 93%
ICU Admission	*N = 244 (22%)*
TBSA	*M = 6.78%, SD = 10.06, range: 0 – 92%*
Burn Type	18% flame, 16% scald, 16% flash, 15% contact, 14% grease, 7% friction, 6% chemical, 2% electrical, 6% other
Burn Depth	2nd degree: 42%; Any 3rd degree: 58%

Results: Clinical Outcomes

Eligible patients (*N*=1,203)

Acute Hospitalization Phase

84% were enrolled and completed initial screening

44% screened positive

53% received early intervention (95% of at-risk)

68% enrolled in symptom self-monitoring

Post-Acute Phase (>30 Days Post-Injury)

62% completed 30-day follow-up screen

21% screened positive for depression or PTSD

23% were connected to additional services (82% of symptomatic patients)

30-day screening rate is 39% in the literature

Ruggiero et al., 2020

Up to 45% = PTSD
Up to 54% = Depression
36% of trauma patients

Chokshi et al., 2022; Ruggiero et al., 2020

"I think without help from Burn Behavioral Health, I would never have been able to move on from blaming myself for my injury. I never would've been able to return to doing any of my passions and I probably would have withdrawn from everyone I love. I think I could've easily lost myself."

"Without Burn Behavioral Health I wouldn't be as far along with my recovery. They provided me with the tools and resources to help me manage my emotional recovery."

"I believe I wouldn't have recovered properly if it wasn't for the program. It completely changed my outlook on mental health and put me on the correct and healthy path to recovery."

You are not alone in this journey to recovery with Dr. G and her team."

Patient Testimonials

Conclusions

Early screening & intervention identify & address psychological needs in burn patients

The stepped-care model improved access and quality of mental health care

Patients who completed the program had lower rates of depression and PTSD than expected in the literature

This evidence-supported, structured program can be scaled to other burn centers

References

1. Herndon, D. N. (2017). *Total burn care* (5th ed.). Elsevier Health Sciences.
2. Choy, K., Dyamenahalli, K. U., Khair, S., Colborn, K. L., Wiktor, A. J., Idrovo, J. P., … & Kovacs, E. J. (2023). Aberrant inflammatory responses in intoxicated burn-injured patients parallel impaired cognitive function. *Alcohol (Fayetteville, N.Y.)*, *109*, 35–41.
3. Dyster-Aas, J., Willebrand, M., Wikehult, B., Gerdin, B., & Ekselius, L. (2008). Major depression and posttraumatic stress disorder symptoms following severe burn injury in relation to lifetime psychiatric morbidity. *Journal of Trauma and Acute Care Surgery*, *64*(5), 1349-1356.
4. McKibben, J. B., Ekselius, L., Girasek, D. C., Gould, N. F., Holzer III, C., Rosenberg, M., ... & Gielen, A. C. (2009). Epidemiology of burn injuries II: psychiatric and behavioural perspectives. *International review of psychiatry*, *21*(6), 512-521.
5. Tarrier, N., Gregg, L., Edwards, J., & Dunn, K. (2005). The influence of pre-existing psychiatric illness on recovery in burn injury patients: the impact of psychosis and depression. *Burns*, *31*(1), 45-49.
6. Low, J. A., Meyer III, W. J., Willebrand, M., & Thomas, C. R. (2018). Psychiatric disorders associated with burn injury. In *Total Burn Care* (pp. 700-708). Elsevier.
7. Obed, D., Schroeter, A., Gruber, L., Salim, M., Krezdorn, N., & Vogt, P. M. (2022). Outcomes following burn injury in intensive care patients with major psychiatric disorders. *Burns, 49*(4), 830–837.
8. Van der Does, A. J. W., Hinderink, E. M. C., Vloemans, A. F. P. M., & Spinhoven, P. (1997). Burn injuries, psychiatric disorders and length of hospitalization. *Journal of Psychosomatic Research*, *43*(4), 431-435.
9. McKibben, J. B., Bresnick, M. G., Wiechman Askay, S. A., & Fauerbach, J. A. (2008). Acute stress disorder and posttraumatic stress disorder: a prospective study of prevalence, course, and predictors in a sample with major burn injuries. J *Burn Care & Research*, *29*(1), 22-35.
10. Patterson, D. R., Everett, J. J., Bombardier, C. H., Questad, K. A., Lee, V. K., & Marvin, J. A. (1993). Psychological effects of severe burn injuries. *Psychological Bulletin*, *113*(2), 362.
11. Palmu, R., Suominen, K., Vuola, J., & Isometsä, E. (2011). Mental disorders after burn injury: a prospective study. *Burns*, *37*(4), 601-609.
12. Ter Smitten, M. H., De Graaf, R., & Van Loey, N. E. (2011). Prevalence and co-morbidity of psychiatric disorders 1–4 years after burn. *Burns*, *37*(5), 753-761.
13. Öster, C., & Sveen, J. (2014). The psychiatric sequelae of burn injury. *General Hospital Psychiatry*, *36*(5), 516-522.
14. Giannoni-Pastor, A., Eiroa-Orosa, F. J., Fidel Kinori, S. G., Arguello, J. M., & Casas, M. (2016). Prevalence and predictors of posttraumatic stress symptomatology among burn survivors: A systematic review and meta-analysis. *Journal of Burn Care & Research, 37*(1), e79-e89.
15. Thombs, B. D., Bresnick, M. G., & Magyar-Russell, G. (2006). Depression in survivors of burn injury: A systematic review. *General Hospital Psychiatry, 28*(6), 494-502.
16. Maes, M., Mylle, J., Delmeire, L., & Altamura, C. (2000). Psychiatric morbidity and comorbidity following accidental man-made traumatic events: incidence and risk factors. *European Archives of Psychiatry and Clinical Neuroscience*, *250*, 156-162.
17. Tedstone, J. E., & Tarrier, N. (1997). An investigation of the prevalence of psychological morbidity in burn-injured patients. *Burns: Journal of the International Society for Burn Injuries*, *23*(7-8), 550–554.
18. Difede, J., Cukor, J., Lee, F., & Yurt, R. (2009). Treatments for common psychiatric conditions among adults during acute, rehabilitation, and reintegration phases. *International Review of Psychiatry*, *21*(6), 559-569.
19. Davydow, D. S., Katon, W. J., & Zatzick, D. F. (2009). Psychiatric morbidity and functional impairments in survivors of burns, traumatic injuries, and ICU stays for other critical illnesses: a review of the literature. *International Review of Psychiatry*, *21*(6), 531-538.
20. Druery, M., Brown, T. L. H., & Muller, M. (2005). Long term functional outcomes and quality of life following severe burn injury. *Burns*, *31*(6), 692-695.
21. Esselman, P. C., Thombs, B. D., Magyar-Russell, G., & Fauerbach, J. A. (2006). Burn rehabilitation: state of the science. *American Journal of Physical Medicine & Rehabilitation*, *85*(4), 383-413.
22. Lawrence, J. W., & Fauerbach, J. A. (2003). Personality, coping, chronic stress, social support and PTSD symptoms among adult burn survivors: a path analysis. *The Journal of Burn Care & Rehabilitation*, *24*(1), 63-72.
23. Low, A. J., Dyster-Aas, J., Willebrand, M., Ekselius, L., & Gerdin, B. (2012). Psychiatric morbidity predicts perceived burn-specific health 1 year after a burn. *General Hospital Psychiatry*, *34*(2), 146-152.
24. Van Loey, N. E., & Van Son, M. J. (2003). Psychopathology and psychological problems in patients with burn scars: epidemiology and management. *American Journal of Clinical Dermatology*, *4*, 245-272.
25. Wiechman Askey, S., & Patterson, D. R. (2008). What are the psychiatric sequelae of burn pain?. *Current Pain and Headache Reports*, *12*(2), 94-97.
26. Wikehult, B., Willebrand, M., Kildal, M., Lannerstam, K., Fugl-Meyer, A. R., Ekselius, L., & Gerdin, B. (2005). Use of healthcare a long time after severe burn injury; relation to perceived health and personality characteristics. *Disability and Rehabilitation, 27*(15), 863-870.
27. Zatzick, D. F., Simon, G. E., & Wagner, A. W. (2006). Developing and Implementing Randomized Effectiveness Trials in General MedicalSettings. *Clinical Psychology: Science and Practice*, *13*(1), 53.
28. O'Donnell, M. L., Bryant, R. A., Creamer, M., & Carty, J. (2008). Mental health following traumatic injury: toward a health system model of early psychological intervention. *Clinical psychology review*, *28*(3), 387-406.
30. Lagomasino, I. T., Zatzick, D. F., & Chambers, D. A. (2010). Efficiency in mental health practice and research. *General Hospital Psychiatry*, *32*(5), 477-483.
31. Lawrence, J. W., Qadri, A., Cadogan, J., & Harcourt, D. (2016). A survey of burn professionals regarding the mental health services available to burn survivors in the United States and United Kingdom. *Burns: Journal of the International Society for Burn Injuries, 42*(4), 745–753.
32. Fakhry, S. M., Ferguson, P. L., Olsen, J. L., Haughney, J. J., Resnick, H. S., & Ruggiero, K. J. (2017). Continuing trauma: The unmet needs of trauma patients in the postacute care setting. *The American Surgeon*, *83*(11), 1308-1314.
33. Reinert, M, Fritze, D. & Nguyen, T. (2021). "The State of Mental Health in America 2022" Mental Health America, Alexandria VA.
34. Ruggiero, K. J., Davidson, T. M., Anton, M. T., Bunnell, B., Winkelmann, J., Ridings, L. E., ... &Fakhry, S. M. (2020). Patient engagement in a technology-enhanced, stepped-care intervention to address the mental health needs of trauma center patients. *Journal of the American College of Surgeons*, *231*(2), 223-230.
35. Stockly, O. R., Wolfe, A. E., Goldstein, R., Roaten, K., Wiechman, S., Trinh, N. H., Goverman, J., Stoddard, F. J., Zafonte, R., Ryan, C. M., & Schneider, J. C. (2022). Predicting Depression and Posttraumatic Stress Symptoms Following Burn Injury: A Risk Scoring System. *Journal of Burn Care & Research: 43*(4), 899–905.
36. Wiechman, S. A., Ptacek, J. T., Patterson, D. R., Gibran, N. S., Engrav, L. E., & Heimbach, D. M. (2001). Rates, trends, and severity of depression after burn injuries. *The Journal of Burn Care & Rehabilitation*, *22*(6), 417-424.
37. Smith, M. B., Wiechman, S. A., Mandell, S. P., Gibran, N. S., Vavilala, M. S., & Rivara, F. P. (2021). Current Practicesand Beliefs Regarding Screening Patients with Burns for Acute Stress Disorder and Posttraumatic Stress Disorder: A Survey of the American Burn Association Membership. *European Burn Journal, 2*(4), 215-225. https://doi.org/10.3390/ebj2040016

Thank you!

- Questions?
- Contact information

gavrilov@musc.edu

@BurnBehavioralHealth

BBH
Burn Behavioral Health