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The Big Picture: Using the Nevada Hospital Association's Burn Watch Board to Understand Capacity

Tracking the number of hospital beds available at any given time is a daunting task, and burn beds are no exception. ASPR TRACIE met with Dr. Christopher Lake, who has worked at the Nevada Hospital Association for more than a decade, developing programs that can help healthcare facilities better prepare for and respond to disasters. He provided a tour of the Burn Watch Board—launched just prior to the wildfires that devastated Maui and now used by more than 350 users per day across the U.S.—describing its features and future.

■ Dr. John Hick, ASPR TRACIE Senior Editor (JH)

How and when was this tool developed?

■ Christopher Lake (CL)

We created the Burn Watch Board for several reasons. First, ASPR's Hospital Preparedness Program grant recipients are required to have a burn surge plan. Nevada is also home to the annual Burning Man, an outdoor fire festival attended by nearly 80,000 people in the Black Rock Desert. Since we don't have any burn centers in northern Nevada, we need to understand regional burn bed capacity. For many years, Annette Newman (University of Utah Community Outreach /Burn Disaster Coordinator and American Burn Association (ABA) Western Region Burn Disaster Consortium Coordinator) and I conducted a burn bed poll days before the annual Burning Man festival. We contacted all the western states' burn centers who reported back their immediately available and surge information (either via a group call-in line or direct one-on-one telephone calls). Data was then transferred to an Excel spreadsheet. This process was time-consuming and needed to be updated; we knew we needed improvements.

The Nevada Hospital Association (NHA) already had a robust capability to collect and display hospital data, as we had developed a comprehensive system to monitor respiratory viruses, supply chains, and personal protective equipment (PPE) effectiveness early during the COVID-19 pandemic. Working with different verticals within a healthcare system, such as intensive care units (ICUs), as opposed to collecting aggregate complete hospital information, was already being accomplished. To collect the needed data and display improvements, we took the existing spreadsheet's data points and pivoted our medical intelligence system to focus on burn center metrics.

The Burn Watch Board comprises the Burn Surge Board and the Burn Status Board, which are part of our association's more extensive system to track various healthcare issues. We created the Burn Surge Board first, and it was in beta

Email watchboard@nvha.net to request an account.

Burn Watch Board Training Videos

Burn Surge Board: <https://youtu.be/fynjKEgZRPE>

Entering Burn Data: https://youtu.be/5_x1Is9w3E4



test mode when the wildfires broke out in Maui. Only the American Burn Association's (ABA) Western Region used the board at that time. We went live during the Maui fires, and for the first time, we knew what the surge capacity was, and everybody with access could see it. The ABA quickly recognized this approach as a best practice, and now we are working toward adding every burn center in North America to the system.

■ JH

What are the unique features of the board?

■ CL

In the past, Annette and I had held exercises where we practiced evacuating a burn center, and one lesson we learned was that there were no standardized definitions for patient severity. So, the Western Region Burn Disaster Consortium created standard definitions, grouping patient conditions by color using a standard traffic light protocol. A consensus group of SMEs developed the definitions, including burn surgeons, burn nurse leaders, and various emergency managers.

- Green patients have less than 10% of their total body surface area (TBSA) affected by 2nd/3rd degree burns, no inhalation injury, no endotracheal tube (ETT), are normotensive, and have a Glasgow Coma Scale (GCS) score of > 14.
- Yellow patients have between 10-20% TBSA affected by 2nd/3rd-degree burns, suspected inhalation injury, or possibly require ETT, are normotensive, and have GCS > 14.
- Red patients have >20% TBSA 2nd/3rd degree, burns with trauma and/or compromised airways.

There was also no facility standard for determining the age at which a patient was deemed "pediatric," so the SME group determined that patients up to 14 years old would be classified as such. This decision was informed by the Advanced Burn Life Support (ABLS) Course fluid resuscitation recommendations at the time. These definitions were then added to the watchboard system so that users knew precisely the level of surge capability and capacity any facility could provide.

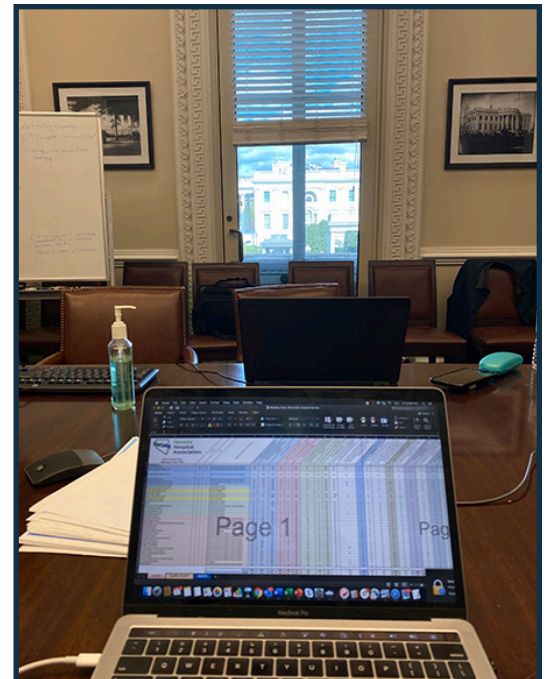
I added filters to the system, including county, state, and ABA region in which the burn center was located; this allows users to pull data for all the burn centers in a specific area. The system also includes the number of beds available with 12 hours' notice (i.e., how these hospitals can surge and open additional beds).

Users can sort the data by hospital trauma level, adult beds available, pediatric beds available, state and county. They can also click on the home icon to access contact information for the hospital. We are in the process of adding contact information for the emergency room, burn centers, and transfer centers.

Those who update their facility's status (typically burn surgeons or nurse leadership) can mark the burn center's current operations as green (functioning normally), yellow (in contingency), or red (in crisis mode).

■ JH

Who are your primary users and who mainly updates the data?



Nevada's Hospital Association started collecting mass casualty burn data after the Las Vegas shooting. During the COVID-19 pandemic, we collected statewide data and used this program to visualize and analyze it. In fact, we were a model for what became the national COVID-19 data tracking board; we sent data to the Vice President's team daily early in the pandemic. We tracked data such as ICU staffing and the effect of using different types of PPE (and for different lengths of time) on healthcare worker illness.



■ CL

Anyone with a bona fide reason can obtain a login. Our users include hospitals, federal government agencies, state agencies, emergency managers, fire chiefs, dispatch centers, and healthcare coalitions. Burn surgeons or designated nursing leaders routinely update the numbers themselves. Open beds mean nothing on a spreadsheet or watch board without any context. Hospitals may have an open bed, but they may not have the necessary staff. We found that automated available bed numbers pulled from a hospital's EHR/EMR provided misleading and unreliable information. In our system, the burn surgeon evaluates the current caseload and knows their capabilities. These units have a finite number of surgeons and specialty staff available. For example, suppose the unit is already managing many high-acuity patients with stretched staff and limited surgeon availability. Because burn care is highly time and resource intensive, this makes it challenging to handle additional cases during a disaster. It doesn't matter if a bed is open and available; the treatment and care capacity may not exist.

■ JH

How can users sort data?

■ CL

We work very closely with our users to ensure that the data can be manipulated in a way that is helpful and practical. Every variable on the spreadsheet is sortable. But first, at the top of the page, users can see the total number of open adult and pediatric burn beds at any time. Next, users can access the data by state, county, and ABA region (currently labeled "coalition"). Users can get a birds' eye view of an entire region, or a more local view, depending on the filters they choose.

Another variable users can sort by is the status of the open, green, yellow, and red beds available within 12 hours' notice. These results show the number of burn patients at a burn center that could be transferred to another ICU) or even med-surge floor, depending on their status and treatment needs.

Users can see bed availability at various levels of trauma centers, and they can see when the data was last updated.

■ JH

How often do users update their facility's data?

■ CL

Facilities update their data once a week on Tuesdays. Various research findings published over the past decade suggest that the average burn patient is hospitalized for 10 days, so we determined that weekly updates provided solid estimates. Data is pulled from the server and the entire system is refreshed every two minutes.

■ JH

What kind of demographic data do burn center users supply when they register?

■ CL

Users typically provide the street address and phone number of the hospital and primary contact. We are currently adding fields to capture the phone number of the burn center, the emergency room, and transfer centers if applicable.

■ JH

When and why did you create the incident Burn Status Board?

■ CL

The Maui wildfires after action report noted that time zone differences created delays, with some responders and contacts resting while others awaited timely updates to guide response. This highlighted the need for regular situational reports to ensure teams have accurate, up-to-date information regardless of time zone. It was also noted that this clear visibility on current needs could reduce calls from well-meaning people seeking ways to assist with patient transfers or care. We added the Burn Status Board after this incident to provide users with a current snapshot of a specific incident, the most affected facilities, and local and state patient load. The Status Board allows users to visualize the available beds, the census at burn centers, the range of patients with highest and lowest TBSA, youngest and oldest patient ages,

the number of patients received from the incident, and whether they were intubated. Burn surgeons we work with recently asked us to add another column on respiratory involvement that will illustrate the number of patients who may eventually need to be intubated, because this variable is highly associated with mortality.

■ JH

When would a hospital categorizes itself as “red?” Do you contact them when this happens?

■ CL

Hospitals can go “red” for many reasons, and there is a field users can populate with an explanation behind going red. One burn center recently went red because they were too low on IV fluids to treat burn patients. They updated their status to yellow once they received a shipment and were able to function as a burn center again. On October 8, a facility went red because they chose to evacuate all their burn patients to other facilities to prepare for a hurricane. They changed the status to yellow on the 15th and back to green on the 22nd, when their patient census was manageable again. In other cases, hospitals might be sheltering in place and mark themselves as red.

When users update their status, they can specify what precipitated the update (e.g., wildfire, structure fire, explosion). Users also have the option to check additional comments if they apply (e.g., normal operations, need decompression, burn center is saturated, no trauma patients being received). If pertinent, users can provide attachments to their status updates and specify to whom they should be emailed. Some have attached screenshots of news articles, incident command communication logs, and Excel files to support their internal messaging.

I can sort hospitals by status and will reach out to those in red in addition to contacting their Regional Burn Disaster Coordinator to determine if any assistance is needed with patient load balancing or other resources. This is one way we have continued building our relationships with these burn surgeons and their colleagues who in turn feel comfortable providing us with this type of data.

■ JH

How can this data be used by others, including emergency managers or those in an emergency operations center?

■ CL

Users can download an entire board as a PDF or Excel file, allowing them to share snapshots, conduct further analyses, and create graphs. This facilitates sharing local information with those who need it to make staffing, supply, and space decisions for a healthcare facility or in response to an incident. Authenticated users can also create “factions” which allow them to select specific hospitals, responders, and emergency management staff (e.g., in a specific geographic region) with whom to communicate directly via text message and email.

■ JH

Are there different categories of users, or do all users have the same permissions to update and access data?

■ CL

System users are assigned a role and permissions based on need. For example, users such as federal and state agencies can see the boards and download the necessary information. Hospital burn surgeons or their designated appointee can see the information but can also update their facility status and add attachments. The burn center’s nurse manager can add/ subtract the hospital’s users, reset passwords, and update phone numbers and email addresses. Regional coordinators can send alerts via text and email to system users and other necessary parties.

■ JH

What is the foundation of the program from an IT perspective, and how is the watch board staffed?

■ CL

We use several off-the-shelf and proprietary systems and work with a software design partner. We use a database to populate the fields users see on screen, and our hospital demographic information (e.g., name and primary contact



information) is pulled from Salesforce™. We also maintain the most accurate and largest list of burn nurse leadership and surgeons in the nation. We are planning to eventually add Tableau™ graphing features to the program.

The program is run by one full-time employee (myself) with assistance from the ABA regional coordinators. There is no consistent funding source; we receive funding from grants, private in-kind contributions, and donations.

We are lucky that our ABA regional representatives are dynamic go-getters. These leaders are very passionate about what they do and work with their regional burn centers to ensure everyone who needs this type of burn bed awareness has it at their fingertips.

Together with our subject matter expert cadre, ASPR TRACIE has developed the following new and updated existing resources related to preparing for and responding to an MCBI (listed alphabetically):

- [Burn Mass Casualty Incidents: Triage, Assessment, and Treatment Considerations](#)
- [Burns](#) Topic Collection
- [Burn Considerations for MOCCs](#) (Appendix D of the [Medical Operations Coordination Cells Toolkit](#))
- [Extreme Heat Events: Lessons from Seattle's Record-Breaking Summers](#)
- [Extreme Weather and Healthcare – Are you Ready for a Burn Disaster?](#)
- [Healthcare Coalition Burn Surge Annex Template](#)
 - » [Step-by-Step Guide to Implementing the Coalition Burn Surge Annex TTX Template \(PDF\)](#)
 - » [Using the ASPR TRACIE Burn Surge Templates to Enhance an HCC \(PPT\)](#)
- [Mass Burn Event Overview](#)
- [Natural Disasters](#) Topic Collection
 - » [Lessons Learned: Extreme Heat](#)
 - » [Lessons Learned: Fire/Wildfire](#)
 - » [Plans, Tools, and Templates: Extreme Heat](#)
 - » [Plans, Tools, and Templates: Fire/Wildfire](#)