

# The Role of Expeditionary Dentistry in Large-Scale Combat Operations

Lt. Col. Andres Mendoza, DDS, U.S. Army

Maj. Ross Cook, DMD, U.S. Army

**L**arge-scale combat operations (LSCO) will strain patient evacuation and medical logistics in the future.<sup>1</sup> Contested airspace and theater access will limit aeromedical evacuation that was routinely employed during counterinsurgency operations. Historically, during Operation Iraqi Freedom (OIF), soldiers could return to their units within three days if they were evacuated to a dentist for treatment.<sup>2</sup> Alternately, if there was no dental support within the area of operations, then it took up to ten days for a soldier to return to duty.<sup>3</sup> This presents a critical workforce shortage in the case of a low-density military occupation specialty such as operating room technician. Loss of even one soldier can severely reduce the combat effectiveness of a small fire team such as a mortar crew or machine-gun team. Since dental services will be limited during the early phases of an operation, ten days is a more realistic projection for a soldier's period of unavailability.

Dental disease nonbattle injuries (DNBI) are defined as any dental emergency requiring treatment by a dental officer in theater. These emergencies include but are not limited to oral infections or abscesses, fractured facial bones, fractured teeth, and severe dental caries. If the rates of dental DNBI during LSCO are comparable to counterinsurgency operations in Iraq and Afghanistan,

then the implications are costly. John Simecek et al. predicted that dental DNBI can be as high as 183 per 1,000 soldiers, or 18 percent.<sup>4</sup> Clinton Murray et al. tracked the variety of patients treated at a Role 2 medical facility and observed that 19 percent were dental patients.<sup>5</sup> We must also consider the dental readiness of Army National Guard and Army Reserve soldiers since these components may be activated in LSCO. During Operation Enduring Freedom (OEF), the Army Reserve and Army National Guard had a 51 percent and 73 percent greater risk of a dental emergency, respectively.<sup>6</sup>

We can extrapolate these overall figures to align with the new concept of the division as the unit of action.<sup>7</sup> This robust division is projected to have a population of twenty thousand fighting soldiers and fifteen thousand supporting soldiers. In a division of thirty-five thousand soldiers, if 19 percent of the population requires dental services, then we can anticipate approximately 6,650 dental patients. The division as a unit of action requires updating the basis of allocation of dental services from the BCT-centric model, which only authorized one dental team within the brigade support battalion.

## Recommendations

Dental emergencies introduce risk to units in a theater of operations. Commanders and medical



Capt. Earle Yeamans, 1st Infantry Division dentist, and his assistant, Spec. 5 Richard Ackley (*wearing glasses, on left*) treat a 1st Infantry Division infantryman on a defensive perimeter 21 October 1968 at Di An base, Vietnam, while others wait their turn for checkups, fillings, drillings, and extractions. Three times a month, Yeamans and Ackley hoisted their six hundred-pound portable dentist's office aboard a helicopter and traveled to field locations where they stayed for three or four days, examining every man in the unit and scheduling appointments. (Photo by Bob Cutts, courtesy of *Stars and Stripes*)

planners should consider that dental emergencies can degrade combat effectiveness based on the volume of casualties and the period of unavailability during treatment. In preparation for LSCO, dental services require updated training programs and refocused leadership. Dental officers should be prepared with an emphasis in hands-on training and casualty response. Special operations forces (SOF) support provides a model for dental utilization in austere environments, with an emphasis on mobility and emergency medical training. To align with the division as the unit of action, dental services will require leadership at the division surgeon level. A division dental surgeon can integrate dental support within a theater of operations and develop procedures for mass casualty (MASCAL) events. Lastly, a consultant for expeditionary dentistry

to the Office of the Surgeon General can lead at the strategic level to guide efforts toward equipment modernization and curriculum development.

**Hands-on training.** The general dentist (63A) and comprehensive dentist (63B) serve in operational billets within U.S. Army Forces Command (FORSCOM) and SOF. In previous years, these dental officers were able to attend the Brigade Dental Surgeon Course (BDSC) at Camp Bullis, Texas. This five-day course, discontinued in 2015, trained dentists to use expeditionary dental equipment in austere conditions and prepare for casualty response scenarios. The need to develop and prepare junior dental officers is critical, since 41 percent of the Army Dental Corps officers have five years or less of experience.<sup>8</sup> These officers have no operational experience from OIF and very little experience

from OEF deployments. The BDSC course provided training in vital aspects of fieldcraft such as equipment sterilization and the conduct of medical civic action programs. It also afforded dental officers with previous OEF and OIF experience an opportunity to mentor course attendees and share lessons learned.

Dentists attached to a BCT may now attend the Brigade Health Provider Course, which provides an overview of brigade-level responsibilities and operations but does not include hands-on training. Hands-on training is critical as we prepare for the realities of prolonged field care. James A. Nicholson, Justin N. Searor, and Andrew D. Lane estimated that dental patients would account for 17 percent of all prolonged field care casualties, preceded by wounded-in-action and orthopedic injuries, respectively.<sup>9</sup> With limited ability to evacuate patients to a treatment facility, patients will begin to accumulate between Role 1 and Role 2. Dental treatment teams must be prepared to perform battlefield circulation down to the point of need. This can mitigate the period of unavailability previously discussed. An expeditionary course with a curriculum focused on field equipment utilization in austere environments and casualty response training will prepare dental officers for battlefield circulation.

**Lt. Col. Andres Mendoza, U.S. Army,** is an instructor at the Captains Career Course, Medical Center of Excellence, Fort Sam Houston, Texas. He holds a Doctor of Dental Surgery from the University of Texas Health Science Center San Antonio and a master's degree in oral biology from the Uniformed Services University of Health Sciences. He previously served as group dental surgeon, 5th Special Forces Group (Airborne), with deployments to Afghanistan, Jordan, and Turkey.

Indeed, an expeditionary dental course could

**Maj. Ross Cook, U.S. Army,** is a comprehensive dentist at the Dental Health Activity, Fort Bragg, North Carolina. He holds Doctor of Dental Medicine from the University of Kentucky and a master's degree in oral biology from the Uniformed Services University of Health Sciences. He previously served as group dental surgeon, 10th Special Forces Group (Airborne), with deployments to Afghanistan, Tajikistan, Chad, and Niger.

serve as a template to train all providers prior to an operational assignment.

**Special operations forces support as a model for expeditionary dental services.** Historically, SOF have deployed dental services across the competition and conflict continuum. During competition, dental officers engage with partner nations to build mutual trust and confidence. These activities nest within humanitarian and civic assistance and building partner-nation military medical capacity under the framework of global health engagement.<sup>10</sup> Since 2001, dental officers assigned to Special Forces groups have also deployed during conflict to support operational detachment alphas in Afghanistan and Iraq. In this context, dental officers would treat indigenous populations during village stability operations and partner-nations across multiple areas of responsibility. Dental support helps build rapport, which SOF can then leverage as these relationships become established.

Dental officers attached to SOF have developed techniques to provide care in austere environments using lightweight field equipment and limited resupply. These best practices are relevant to LSCO and can guide training to improve expeditionary dentistry in support of conventional maneuver units. Dental services within the division area of operations must also be mobile and scalable in order to perform battlefield circulation with a limited footprint. Dental officers in support of SOF attend additional medical training, such as the Tactical Combat Medical Care Course, in preparation for their deployments. Oftentimes, the Special Forces medical sergeant is the best-trained medical provider at remote camps and fire bases. Therefore, it is critical for any provider performing battlefield circulation to be prepared for a medical emergency in these austere environments.

According to Army Techniques Publication 4-02.19, *Dental Services*, dentists are expected to augment medical personnel during MASCAL events.<sup>11</sup> The Canadian forces attribute their high casualty survival rates to the training of all combatants in tactical combat casualty care (TCCC), not only their medics.<sup>12</sup> In a 2011 study, it was also shown that 87 percent of combat casualties died in the pre-hospital setting before patients reached surgical care.<sup>13</sup> The pre-hospital environment, or Role 1 and Role 2, is where 63A and 63B dentists are most frequently utilized. U.S.





Army Rangers attribute their high survival rates to implementation of the Ranger First Responder program, which also trained all personnel in TCCC.<sup>14</sup> Additionally, this program stressed the “repetitive hands-on applications of TCCC lifesaving skills.”<sup>15</sup> All providers on the battlefield, regardless of their area of concentration, should be prepared and trained to serve as a first responder. TCCC should be included within the individual critical task lists for dental officers to ensure these perishable skills are properly maintained versus hastily conducted prior to deployment. Doing so would prepare dental officers for MASCAL events they may encounter during battlefield circulation in LSCO and multi-domain operations (MDO).

**Division dental surgeon: a leader to integrate dental support.** The Dental Corps lost key billets across FORSCOM with the removal of the division dental surgeon position. This position was likely cut as a result of the Army Modernization Plan of 2005, when several positions were reallocated to allow for the addition of more BCTs.<sup>16</sup> In response to the Budget Control Act of 2011, the Army announced in 2013 it would deactivate and reorganize ten BCTs.<sup>17</sup> When these BCTs were

Capt. Tran Quach-Miller, a dentist with 626th Brigade Support Battalion, 3rd Brigade Combat Team, 101st Airborne Division, cleans Sgt. 1st Class Robert Brady's teeth on 22 March 2008 at Camp Striker, Iraq. (Photo by Staff Sgt. Tony M. Lindback, 302nd Mobile Public Affairs Detachment)

deactivated, the dental positions were removed, and dental services have remained unrepresented within each division surgeon cell since 2005. This presents a critical leadership gap. If the division will serve as the decisive maneuver element in LSCO, then the division surgeon's section will require a division dental surgeon to integrate this medical function within the area of operations. A division dental surgeon can improve integration amongst the varied dental services that exist within the division footprint—the brigade support medical company, the dental company area support, and the field hospitals—to restore combat effectiveness. Better integration within this medical function could facilitate returning more soldiers to duty.

Additionally, the division dental surgeon could serve as the lead for MASCAL and triage planning and



## Capt. Benjamin Lewis Salomon

1 September 1914–7 July 1944

Front-line dental surgeon Capt. Benjamin Lewis Salomon posthumously received the Medal of Honor in 2002 for exceptional bravery during the Battle of Saipan in World War II. On 7 July 1944, Salomon was serving at Saipan in the Marianas Islands as the dental surgeon for the 2nd Battalion, 105th Infantry Regiment, 27th Infantry Division. When Japanese soldiers overran the hospital, he provided cover fire to allow the safe evacuation of the wounded, although he had no hope for personal survival. Salomon killed as many as ninety-eight Japanese troops before dying of seventy-six bullet wounds and countless bayonet wounds. Salomon's extraordinary heroism and devotion to duty reflect the highest traditions of military service. He was one of only three Jewish Americans and the only dentist to receive the Medal of Honor for actions during World War II.

(Photo courtesy of the AMEDD Center of History & Heritage)

coordination within the division surgeon's section. Dental officers have adequate medical training and administrative experience to serve in this role for a division staff. At the brigade support battalion, company-grade dental officers traditionally serve as the triage officer alongside a senior medic or nurse. This tactical experience, paired with professional education, prepares a field-grade dental officer for these additional responsibilities. In LSCO, we must change our approach to triage under the constraints of limited resupply, contested air evacuation, and simultaneous MASCAL events. A division dental surgeon could take the lead to develop MASCAL and triage plans within the division. Similarly, with their experience in patient hold, a division nurse could lead efforts in prolonged field care. This would empower the division surgeon and deputy surgeon to focus their efforts on command and control, treatment, and evacuation.

**Consultant for expeditionary dentistry.** By 2028, dental officers with far-forward operational experience from OEF and OIF deployments will have left active duty or retired. This represents a growing knowledge gap for the Army as valuable institutional experience is lost. A consultant for expeditionary dentistry to the Office of the Surgeon General is needed to document best practices, preserve lessons learned, and maintain operationally focused training. The consultant would also advocate for dental billets across FORSCOM and SOF while advising the Dental Corps-specific branch proponent officer on individual critical tasks lists for dental officers. The position should be a collateral duty for a field-grade, operationally experienced dental officer to ensure the Dental Corps is retaining knowledge while moving toward an MDO-capable force. This role will become more critical as strategy changes and as dental services undergo modernization.

## Conclusion

Previous authors anticipate that dental patients can account for 17 to 19 percent of all patients in theater.<sup>18</sup> We can extrapolate these percentages to align with the new concept of the division as the unit of action. Within a division of thirty-five thousand soldiers, there could be up to 6,650 dental





DNBI. These soldiers would subsequently be absent from the battlespace for three to ten days during evacuation and treatment.<sup>19</sup> To mitigate the risk associated with the volume of these patients, dental officers must be formally trained to perform battlefield circulation in austere environments down to the point of need. Dental officers must also be prepared for casualty response they will encounter during circulation. To

achieve the goal of an MDO capable and ready force by 2028/2035, we must lean toward hands-on training.<sup>20</sup> A division dental surgeon can integrate dental services within the area of operations and take the lead for MASCAL planning and coordination. Lastly, a consultant for expeditionary dentistry can provide strategic guidance for curriculum development, equipment modernization, and individual critical tasks lists. ■

## Notes

1. "The Army Health System in Support of U.S. Army Multi-Domain Operations" (white paper, U.S. Army Medical Center of Excellence, JBSA Fort Sam Houston, Texas, May 2020).
2. Paul M. Colthirst et al., "Operational Cost Analysis of Dental Emergencies for Deployed US Army Personnel during Operation Iraqi Freedom," *Military Medicine* 178, no. 4 (April 2013): 427–31, <https://doi.org/10.7205/MILMED-D-12-00431>.
3. Mathieu Gunepin et al., "Medical Evacuation of French Forces for Dental Emergencies: Operation Serval," *Military Medicine* 180, no. 5 (May 2015): 578–81, <https://doi.org/10.7205/MILMED-D-14-00528>.
4. John Simecek et al., "The Incidence of Dental Disease Nonbattle Injuries in Deployed U.S. Army Personnel," *Military Medicine* 179, no. 6 (June 2014): 666–73, <https://doi.org/10.7205/MILMED-D-13-00511>.
5. Clinton Murray et al., "Spectrum of Care Provided at an Echelon II Medical Unit during Operation Iraqi Freedom," *Military Medicine* 170, no. 6 (June 2005): 516–20, <https://doi.org/10.7205/MILMED.170.6.516>.
6. Barbara Wojcik et al., "Risk of Dental Disease Non-Battle Injuries and Severity of Dental Disease in Deployed U.S. Army Personnel," *Military Medicine* 180, no. 5 (May 2015): 570–77, <https://doi.org/10.7205/MILMED-D-14-00364>.
7. *Waypoint in 2028 – Multidomain Operations*, YouTube video, posted by "Army University Press," 3 December 2021, accessed 5 July 2022, <https://www.youtube.com/watch?v=OUZp01Cjdil>.
8. Peter Guevara, "CSBPO Dental Corps Brief" (lecture, Medical Center of Excellence, JBSA Fort Sam Houston, TX, 8 April 2022).
9. James A. Nicholson, Justin N. Searor, and Andrew D. Lane, "Editorial on the Approach to Prolonged Field Care for the Special Forces Medical Sergeant: Balancing the Opportunity Cost," *Journal of Special Operations Medicine* 20, no. 3 (2020): 117–19, <https://www.doi.org/10.55460/N1TD-UE0E>.
10. Department of Defense Instruction 2000.30, *Global Health Engagement (GHE) Activities* (Washington, DC: Department of Defense, 2017), accessed 27 June 2022, [https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/200030\\_dodi\\_2017.pdf](https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/200030_dodi_2017.pdf).
11. Army Techniques Publication 4-02.19, *Dental Services* (Washington, DC: U.S. Government Publishing Office, August 2020), accessed 27 June 2022, [https://armypubs.army.mil/epubs/DR\\_pubs/DR\\_a/ARN30126-ATP\\_4-02.19-000-WEB-1.pdf](https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN30126-ATP_4-02.19-000-WEB-1.pdf).
12. Erin Savage et al., "Tactical Combat Casualty Care in the Canadian Forces: Lessons Learned from the Afghan War," *Canadian Journal of Surgery* 54, no. S6 (2011): S118–23, <https://doi.org/10.1503/cjs.025011>.
13. Brian J. Eastridge et al., "Death on the Battlefield (2001–2011): Implications for the Future of Combat Casualty Care," *Journal of Trauma and Acute Care Surgery* 73, no. 6 Supp. 5 (December 2012): S431–37, <https://doi.org/10.1097/TA.0b013e3182755dcc>.
14. Russ Kotwal et al., "Eliminating Preventable Death on the Battlefield," *Archives of Surgery* 146, no. 12 (December 2011): 1350–58, <https://doi.org/10.1001/archsurg.2011.213>.
15. Ibid.
16. *2005 Posture Statement: Our Army at War—Relevant and Ready... Today and Tomorrow*, 109th Cong., 1st sess. (2005) (statement of Francis J. Harvey and Peter J. Schoomaker), accessed 15 July 2022, [https://www.army.mil/e2/downloads/rv7/aps/aps\\_2005.pdf](https://www.army.mil/e2/downloads/rv7/aps/aps_2005.pdf).
17. C. Todd Lopez, "Brigade Combat Teams Cut at 10 Posts Will Help Other BCTs Grow." Army.mil, 26 June 2013, accessed 15 July 2022, [https://www.army.mil/article/106373/brigade\\_combat\\_teams\\_cut\\_at\\_10\\_posts\\_will\\_help\\_other\\_bcts\\_grow](https://www.army.mil/article/106373/brigade_combat_teams_cut_at_10_posts_will_help_other_bcts_grow).
18. Simecek et al., "The Incidence of Dental Disease Nonbattle Injuries in Deployed U.S. Army Personnel," 666–73; Murray et al., "Spectrum of Care Provided at an Echelon II Medical Unit during Operation Iraqi Freedom"; Nicholson, Searor, and Lane, "Editorial on the Approach to Prolonged Field Care for the Special Forces Medical Sergeant: Balancing the Opportunity Cost," 117–19.
19. Colthirst et al., "Operational Cost Analysis of Dental Emergencies for Deployed US Army Personnel during Operation Iraqi Freedom," 427–31; Gunepin et al., "Medical Evacuation of French Forces for Dental Emergencies: Operation Serval," 578–81.
20. U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *The US Army in Multi-Domain Operations 2028* (Fort Eustis, VA: TRADOC, 2018).