

Field Hygiene:

The Intersection of Training, Readiness, Leadership, and Caring for Soldiers

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For the most part, field hygiene is an individual Soldier responsibility. Not to be simply conflated with field sanitation or handwashing before chow, field hygiene often occurs as the fourth priority of work. It frequently consists of hoping to have time to brush your teeth and shaving with uncomfortably cold water, primarily so the command sergeant major does not find you unshaven in the field. These activities normally take place after three hours of sleep while your Meal, Ready to Eat (MRE) is heating up and just before the range or training area goes hot. This scenario reflects reality for many of our Soldiers in a high operations tempo (OPTEMPO) training environment; it is also hospitalizing our Soldiers. Relegating field hygiene to an afterthought unnecessarily reduces readiness, degrades training value, and undermines Army senior leaders who prioritize preserving our #1 resource, the Soldier. While tough, realistic training is a top priority, simple solutions can dissolve the fictitious zero-sum game that has been created between tough, realistic training and Soldier well-being.

As an Army leader, I am interested in addressing this subject for the protection of our Soldiers — and because it almost cost my life. In March 2019, I was part of National Training Center (NTC) Rotation 19-05 at Fort Irwin, CA. I began experiencing symptoms on Training Day 11, and within four hours I was evacuated to Weed Army Community Hospital with a 104-degree temperature. Within 12 hours, I became septic and needed emergency surgery. The on-call Army surgeon saved my life.¹ I was infected with Necrotizing Fasciitis (flesh-eating bacteria) — accompanied by its 30-percent fatality rate.² I was air transferred to a civilian hospital and underwent multiple surgeries and operations, including a skin graft. My chain of command was incredibly supportive. The brigade commander personally ensured my wife was on an airplane within 12 hours out of fear I would not recover. For 17 days I was an inpatient, being treated with three of the strongest intravenous antibiotics available. In the end I survived, with permanent disability in my dominant hand. I was fortunate; that same year one service member died and another lost his leg from the same bacterial threat.³⁻⁴



The above photos show the author's finger following initial surgery (36 hours after first symptom); 24 hours later, after arrival at Sunrise Hospital in Las Vegas; 10 days later, before final surgery, debridement, and skin graft; and then two hours following another surgery and skin graft.
(The first photo is courtesy of Dr. P.J. Chandler; other photos are courtesy of author.)

After two years of reflection on these three cases, I was left with four questions:

- Is this a subset of a larger issue?
- What is the cost to the Army?
- Are we missing this in our risk management?
- How can we mitigate the risk without impacting training?

Is There an Issue?

Necrotizing Fasciitis is a severe bacterial infection, one of many skin and soft tissue infections (SSTIs). From 2013-2016, there were 282,571 SSTIs reported by medical providers across the active-duty military.⁵ That number accounts only for those service members (SMs) who sought treatment and amounted to 558 infections per 10,000 SMs/year or 5.6 percent per year.⁶ There were an additional 10,904 infections in the deployed environment, which amounted to 460 infections per 10,000 SMs/year or 4.6 percent per year.⁷ Stated more clearly, each year 5.6 percent of home-station service members and 4.6 percent of deployed service members developed an infection requiring treatment. Of those, 238,925 required treatment by a medical provider (as opposed to a combat medic).⁸ Those 238,925 cases of SSTIs resulted in 395,361 office visits and 19,213 hospital bed days.⁹

In a separate data analysis from 2017-2020, there were 90,251 infections across all U.S. Army components. Those infections resulted in 123,698 doctor visits and 7,240 hospital bed days.¹⁰ In the active-duty Army, that amounted to 337 infections per 10,000 SMs/year or 3.4 percent.¹¹ These numbers account only for reported incidents and do not account for where the infections took place. SSTIs are more likely to occur where infrequent handwashing and bathing, abrasions, environmental contamination, and close Soldier proximity are more frequent. This suggests that SSTIs are more likely to occur in a field environment amongst maneuver forces. This assertion is supported by the study's finding that eight of the top 10 sites for SSTI rates housed brigade combat teams: Fort Benning (1), Fort Bragg (2), Fort Hood (3), Fort Campbell (6), Fort Bliss (7), Fort Sill (8), Fort Carson (9), and Fort Stewart (10) were all in the top 10 for case rates in the Army.¹² Considering environmental factors and duty-station infection rates, it is likely the problem for active-duty maneuver forces in a field training environment is well above 3.4 percent.¹³

What is the Cost?

As I considered potential costs, I began to realize how complicated the issue is. I identified the following categories of cost: treatment dollars, readiness while deployed, Soldier well-being, duty days/training days and unit medical readiness, and schoolhouse dollars and certifications.

Treatment dollars: A typical outpatient medical visit can range anywhere from \$200-\$700 per visit.¹⁴ Based on 2017-2020 statistics, there were 123,698 outpatient visits across all U.S. Army components for SSTIs.¹⁵ Using a low-end figure of \$250 to avoid any argument, that translates to a cost of \$30.9 million. This number does not account for any service members who were treated without military knowledge, outside of the military healthcare system. Additionally, among that same population, there were a total of 7,240 hospital bed days (meaning patients admitted overnight).¹⁶ A search of a variety of reputable websites yielded a low-end cost for a hospital bed day of approximately \$3,000. The low-end total for hospital bed days is about \$21.7 million. The cumulative cost for treatment of military healthcare system reported infections from 2017-2020 was about \$52.64 million. These low-end estimates are further supported by a peer-reviewed journal that determined the four-year cost at initial entry training sites alone was \$48 million.¹⁷ Based on the previous discussion, estimates should slant toward the active-duty maneuver force, meaning high-end estimates may be closer to accurate than the low-end estimate of \$52.6 million.

Readiness of deployed units: From 2013-2016 there were 10,906 cases of SSTIs in the deployed population, which amounted to a 4.6 percent infection rate/year.¹⁸ If a maneuver company with 100 personnel deployed for a year, it would have roughly four Soldiers off mission due to SSTIs alone. Many of these cases will require 7-10 days with open wound(s) and antibiotics. Those four Soldiers would each require an average of two doctor's visits to the battalion surgeon.

Soldier well-being: Although this cost is not quantifiable, it is equally important. In my case, I lost the use of part of my hand, can't grip a golf club, have permanent nerve damage, and will inevitably qualify for disability. Also immeasurable were the psychological effects on my extended family as they feared the worst for several days as I recovered in the hospital. The same can be said for the Gold Star Family of the less fortunate service member

mentioned earlier in this article. All leaders should endeavor to do what they can to ensure our Soldiers exit the service as close as possible to the health conditions with which they entered. Any Soldier who leaves the service with degraded health, or even has a temporary degradation in health, is a cost that should be considered and avoided.

Duty days/training days: From 2017-2020, there was a 3.4-percent case rate per year across Army components.¹⁹ In a company of 100 Soldiers, the commander will train without three or more Soldiers per year for an undetermined period of time.²⁰ Those may be platoon leaders, gunners, or squad leaders. These leaders will likely be precluded from field environments for 7-10 days, may have open sore(s), require antibiotic treatment, and require two doctor's visits. If each patient has seven limited duty days, the U.S. Army loses 631,757 training days to SSTIs every four years or 157,939 days per year. Additionally, each of these SSTIs will carry either a temporary or permanent profile and impact medical readiness and deployability to varying degrees.

Schoolhouse dollars and certifications: Reconsider the top 10 installations for case rates and consider the schoolhouses that are represented (Forts Benning, Bragg, Hood, Jackson, Leonard Wood, Campbell, Bliss, Sill, Carson, Stewart).²¹ If a Soldier is unable to graduate due to missing 7-10 field days, there is an associated cost. Any of the following are possible: the Soldier is missing from the unit longer due to recycle, which then requires additional funding and time for a new course slot; the Soldier returns to unit without qualification; a lieutenant arrives late to first BCT, hindering the unit and professional development; a requirement to send a replacement Soldier to gain certification, creating gaps in additional skill identifier (ASI) coverage in a unit; and a temporary loss of promotion readiness pending school completion. When a Soldier lost his leg at Fort Benning in 2019, they identified that the streptococcus bacteria that caused it had spread to 60 other Soldiers. In addition to the financial cost of treating those 60 Soldiers, there was an additional cost in time and money when leaders decided to preventively treat 10,000 Soldiers at Fort Benning with antibiotics.²²

What about Risk Management?

Some leaders view additional constraints and risk mitigation as obstructions to their training efforts — they are wrong. Risk management is an enabler to organizational readiness, and the third principle of risk management is “accept no unnecessary risk.”²³ As the 40th Chief of Staff of the Army GEN James C. McConville stated, “People are always my #1 priority: Our Army's people are our greatest strength and our most important weapons system.”²⁴ It is worth the time and effort to invest in his priorities.

There is clearly a risk associated with SSTIs; the next question is how to address it. First, identify the hazard. Using specific language from Army Techniques Publication (ATP) 5-19, *Risk Management*, the hazard or source in this case is bacteria; the mechanism is cuts, abrasions, trauma, or germ spread. The outcome is skin and soft tissue infections in troops. Assessing the hazards in accordance with ATP 5-19, this would be classified as frequent; the severity would be moderate, resulting from the likelihood of losing duty days due to injury/illness. Based on Table 1-1 in ATP 5-19, SSTI carries a high risk. That classification should frighten leaders or at the very least cause hesitation and reflection. How many training events have I supervised with a high-risk hazard without controls or mitigation in place? I immediately think back to every risk assessment I've seen in the last 15 years. I am certain I never saw SSTIs on a risk assessment or risk management worksheet.

How Do We Mitigate without Impacting Training?

In the case of SSTIs, hazard controls fall neatly into “Educational (Awareness) Controls” and “Hazard Elimination Controls.” There is an NCO professional development (NCOPD) and combat medic responsibility associated with SSTI prevention. NCOs and combat medics share a responsibility to educate and enforce good field hygiene. This not only involves brushing teeth and shaving but also cleaning your body, changing socks and undergarments, and cleaning your hands. Most SSTIs occur on extremities. NCOs checking socks, boots, and feet used to be commonplace, and medical experts agree that catching these infections early is key. There is no reason why NCOs and combat medics cannot ensure Soldiers are taking the time to use baby wipes and hand sanitizer as well as change undergarments. Incorporating these into medic training, NCOPDs, and risk management planning will help ensure they happen.

Within the hazard elimination controls in ATP 5-19 are engineering, administrative, and personal protective equipment (PPE). Showers would fall within engineering. In some training environments showers are feasible, and in

others they are not. If they are available, leaders should not view them as a luxury; they should view them as a risk control mechanism. Squad leaders should ensure their Soldiers are showering not only to prevent risk to the Soldier, but more importantly, to prevent the spread of bacteria like streptococcus and staphylococcus within the formation.²⁵ If showers are not available, then wipes and hand sanitizer fall into the PPE category.

Wipes should be an enforced item on a packing list; their daily usage in the field should be enforced as well. For long duration training environments (i.e., NTC, Joint Readiness Training Center [JRTC], and Ranger School), units should consider budgeting hygiene kits. I recommend that every NTC and JRTC rotation purchases ~10,000 hospital bathing wipe kits. That is roughly two kits per Soldier and would allow them to bathe twice during rotation, cleansing themselves entirely with wipes that provide enhanced protection. National stock numbers (NSNs) for products such as Medline™, Readybath™, and Theraworx™ are already in the Army supply system. Brooke Army Medical Center at Fort Sam Houston, TX, is currently issuing the “Medline Ready Bath Select Bathing Clothing” available at \$45 per 30 pack.²⁶ Issuing two packs per Soldier for 20 CONUS training center rotations per year for four years would cost about \$1.8 million. That cost is considerably less than the low-end treatment cost of \$46.4 million... and notably, is less than the combined cost associated with myself, the Soldier who lost his leg, and the service member who lost his life. Army hospitals issue wipes like these frequently because their patients are at higher risk and cannot shower. As evidenced throughout this article, our Soldiers are at higher risk the longer they are in the field. In fact, Soldiers are at a 21-percent higher risk than civilians in general.²⁷ In light of this, it could be negligent to not provide an on-hand, improved product for our Soldiers and enforce usage, as risk increases over time at CTC rotations. Future studies should consider broadening this recommendation to include high-risk populations like basic trainees. Usage of wipes transitions to the administrative controls to SSTIs.

As part of “making risk decision,” commanders get to determine how to integrate this. At a gunnery density, as an example, it can be as simple as: “After 72 hours, we will conduct a 30-minute pause. No activities are permitted during that time other than field hygiene. Leaders will ensure all Soldiers clean themselves and change undergarments.” Every commander has either a senior line medic, physician’s assistant (PA), or physician. Those individuals can advise the command on when to take precautions, how often, if precautions are necessary, and the risk level based on training duration and environmental conditions. Regardless of what advice commanders receive, the important part is that it is their risk decision to make until they delegate it. NTC already has breaks in training; there are safety stand downs, maintenance stand downs, after action reviews (AARs), and live-fire transitions. The Operations Group and rotational unit have a variety of condition checks that are communicated over radios. There would be no impact to training to issue two sets of hospital wipes to each Soldier in the rotational unit bivouac area (RUBA) and use an already scheduled training pause and conditions check to enforce their usage.

Would Mitigation Measures Work?

In conducting research for this article, I interacted with multiple health professionals. Each of them in their own way said this question was not worth researching because it was already answered. The conversation went something like this:

Me: “Will cleaning your body prevent SSTIs?”

Doctor: “Yes, that’s not even a question.”

Me: “How do you know?”

Doctor: “Really? Because cleaning yourself reduces bacteria, and bacteria cause infection.”

Me: “Is that common knowledge?”

Doctor: “Yes.”

In 1917 the French Army had already mandated standards for daily cleaning of the feet and hands, daily bathing, weekly showering, and frequent washing and changing of uniforms.²⁸ These standards were proper then and should be integrated and enforced now. Given the medical advances of the early 1900s, if the Army has gone 100 years in reverse with regards to field hygiene, we are probably doing it wrong.

Per ATP 5-19 the risk is high, and these solutions meet the requirements of being feasible, acceptable, and suitable. The support is available, controls are explicit, and standards are clear. Training can be conducted in-house, leaders

should be ready and willing, and individual Soldiers should be disciplined to execute.

Conclusion

Skin and soft tissue infections affect more than 22,500 Soldiers per year, which costs the government well over \$12 million per year.²⁹ Deployed forces consistently operate at a 4.6-percent degradation due to SSTIs while separating numerous “Soldiers for Life” with degraded quality of health. The Army hemorrhages 157,939 limited duty days per year along with other unquantifiable training and schoolhouse costs attributed to SSTIs.

GEN McConville’s #1 priority is the Soldier. This article has identified SSTIs as an often unaddressed, expensive, and preventable risk to his #1 priority. There are only three reasons to overlook the threat that SSTIs pose in risk management: ignorance, apathy, or negligence. If readers made it this far in the article, then ignorance is no longer an option. Field hygiene is where leaders, training, readiness, and caring for Soldiers intersect. In a training environment, caring leaders set and enforce standards that build and maintain readiness and keep our Soldiers safe. Maneuver leaders owe their Soldiers hospital-free training exercises.

Notes

¹ Dr. P.J. Chandler, Weed Army Community Hospital, Fort Irwin, CA.

² Current mortality estimates are 24-34 percent according to the Center for Disease Control (CDC), although they can be as high as 74 percent if treatment is delayed.

³ Meghann Myers, “Basic Trainee Got Strep, Then Lost His Leg to Flesh-Eating Bacteria. Now His Treatment Is Under Investigation,” *ArmyTimes* (4 April 2019), accessed from <https://www.armytimes.com/news/your-army/2019/04/04/basic-trainee-got-strep-then-lost-his-leg-to-flesh-eating-bacteria-now-his-treatment-is-under-investigation/>.

⁴ Meghann Myers, “Her Son Died of a Flesh-Eating Infection. Now a Marine Mom Wants Justice,” *Military Times* (15 November 2019), accessed from <https://www.militarytimes.com/news/your-military/2019/11/15/her-son-died-of-a-flesh-eating-infection-now-a-marine-mom-wants-justice/>.

⁵ Shauna Stahlman, Valerie F. Williams, Gi-Taik Oh, Eugene V. Millar, and Jason W. Bennett, “Skin and Soft Tissue Infections, Active Component, U.S. Armed Forces, 2013-2016,” *Medical Surveillance Monthly Report* 24(7) (July 2017): 2-11.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Armed Forces Health Surveillance Division, Defense Medical Surveillance System, as of 25 January 2021.

¹¹ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ It is impossible to develop hard numbers because costs vary based on the facility, location, medications required, x-ray requirement, labs, and severity. This range was developed based on searches of reputable insurance and hospital sites.

¹⁵ Defense Medical Surveillance System.

¹⁶ Ibid.

¹⁷ Stephanie M. Morrison, “Cost-Effectiveness Analysis of Hygiene-Based Strategies Aimed toward Prevention of SSTI and MRSA-Associated SSTI among U.S. Active Duty Army Trainees,” (diss., Uniformed Services University of the Health Sciences, 2015).

¹⁸ Stahlman et al., “Skin and Soft Tissue Infections,” 2-11.

¹⁹ Defense Medical Surveillance System.

²⁰ The three Soldier approximation is significantly underestimated due to service in a maneuver unit with long duration field training time.

²¹ Ibid.

²² Myers, “Basic Trainee Got Strep.”

²³ Army Techniques Publication 5-19, *Risk Management*.

²⁴ GEN James C. McConville, “40th Chief of Staff of the Army’s Initial Message to the Army Team.”

- ²⁵ Elias B. Chahine and Allana J. Sucher, "Skin and Soft Tissue Infections," *PSAP – Infectious Diseases* (2015): 5-26.
- ²⁶ Cost is based on open market and does not account for bulk contract pricing.
- ²⁷ Stahlman et al., "Skin and Soft Tissue Infections," 2-11.
- ²⁸ Saville C. Thorndike, "Military Sanitation in the Present War," *American Journal of Public Health* Vol. VII, No. 6 (June 1917): 527-547.
- ²⁹ Derived from four-year statistics mentioned earlier in the article.

Editor's Note

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