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HOW BYSTANDERS CAN SAVE LIVES IN MEDICAL EMERGENCIES

The Med Tac training program teaches non-medical bystanders the life-saving steps they can administer to individuals experiencing health crises in the critical minutes before first responders arrive.

By William Adcox, Dr. Gregory Botz, Charles Denham III & Dr. Charles Denham II

IT IS ONLY A MATTER OF TIME before you encounter a medical emergency, either on campus or in your private life. When a health crisis happens — whether you are a teacher/faculty member, staff member, student, law enforcement officer, medical professional, administrator or just a concerned citizen — you are the first responder. On average, it will take 10 minutes for professional first responders to arrive.

The most common types of emergencies you or someone you know or love will face are sudden cardiac arrest, choking and drowning, opioid overdose, anaphylaxis and allergic reactions, major trauma and bleeding, common accidents, non-traffic related vehicular accidents, and bullying and workplace violence.

What would you do if you encountered one of these emergencies? Are you ready to respond appropriately? Are others in your organization prepared? Major

disaster and accident studies reveal that, when situations like these happen, we behave better — and worse — than we hope. In an emergency, humans sometimes fight, some take flight, but most often ... we freeze.

The purpose of this article is to introduce a global bystander care training program that focuses on responding to medical emergencies in the vital first few minutes before professional first responders arrive on scene. The training initiative is the Medical Tactical Certificate Program, called Med Tac for short. Many elements of the program may be found in other standalone individual initiatives. However, as a fully integrated program tackling the most common causes of preventable death together, it may be the first its kind.

While we were developing an active shooter program in the Texas Medical Cen-

ter, we consulted Michael Dorn, an internationally recognized authority on campus safety. He expressed his frustration with the focus on active shooter attacks and the lack of awareness of the many more deaths at schools and campuses from other causes, such as cardiac arrest, fatal allergic reactions, overdoses, choking and more.

Our research of the literature and consultation of leading experts confirmed the staggering number of deaths and injuries that can be prevented or mitigated by non-medical bystanders in the precious minutes *before* professional first responders arrive. Our integrated founding programs tackling these causes together began in schools, scout groups and the MD Anderson Cancer Center. The work has expanded to four states. We have an active R&D program, are producing a documentary and developing specialty programs for lifeguards, divers, aviation and corpo-

rations. We are looking for great partners and invite school district, university and healthcare leaders to join us.

HOW MED TAC BEGAN

It all started with Cub Scouts and elementary and middle school students when we tested whether children could learn CPR/AED and Stop-the-Bleed techniques. Then when David Beshk — an award-winning teacher and one of our instructors — saved a life during an emergency using a skill he learned and learned to teach just three days earlier, we knew we had something.

In Beshk's case, an unconscious victim was found lying on his back while vomiting, which significantly increased the risk for choking and aspiration. A crowd of bystanders, including several medical professionals, stood by, not knowing what to do. Relying on his training, Beshk used an intervention that reduces the risk for choking and aspiration called the "recovery position" — a method of saving an unconscious victim who is vomiting by keeping their airway clear.

As our momentum grew, we learned more about the first few minutes of emergencies and how medical evidence supports, in fact calls for, bystander care.

We expanded the program to older students, Boy Scouts and families wanting to improve their disaster preparedness skills. We were surprised by how fast they learned and became competent with such skills. We now deliver training to college students at some of our leading universities and faith-based organizations. We have developed a comprehensive program for law enforcement and security professionals at one of our global medical centers.

Our leadership team includes national medical leaders and educators, simulation experts and law enforcement threat experts who have tackled the most frequent, severe and preventable causes of harm to children and adults with one integrated approach.

VARIOUS ORGANIZATIONS PILOTED THE APPROACH

The initiative for children and youth is starting its second year with after-school and summer-school programs. Our Boy Scout program enables scouts to fulfill the

The 8 Most Common Preventable Health Hazards

Med Tac students learn how to recognize and reduce harm from the most common preventable health hazards to children and adults. These hazards include:

- ◆ **Sudden Cardiac Arrest (SCA):** In the United States, more than two lives can be saved every hour with bystander care, and one quarter of the children who experience an SCA do so on the playing field. For SCA, students learn "hands only" CPR, how to use an automatic external defibrillator (AED) and how to make an effective 911 call. To fulfill the requirements to receive our certificate of completion, the participants must earn or provide documentation of successful completion of CPR/AED training such as the Heartsaver AED/CPR certificate offered by the American Heart Association or the equivalent from the American Red Cross. Med Tac trainers must maintain instructor status with these organizations. They can either provide the CPR/AED training themselves or enlist a local qualified instructor to deliver the course curriculum.
- ◆ **Choking and Drowning:** For choking, Med Tac students practice the lifesaving Heimlich Maneuver, which saves on average 13 U.S. lives per day. For drowning victims, they learn how to integrate water-related rescue practices, how to perform CPR, and how to work with lifeguards and first responders by providing supportive bystander care. These skills, on average, save more than eight lives every day in our country.
- ◆ **Opioid Overdose:** Students learn about prevention approaches and opioid-reversal agents. For young students, we cover opioids at a high level. For older youth and college students, we provide much more detailed content including the recent threats of fentanyl and carfentanil, and we describe the potency of these compounds as well as the risk of inhalation and dermal absorption. We also cover the use and mechanism of action of naloxone, the opioid-reversal agent, in detail.
- ◆ **Anaphylaxis:** For life-threatening allergies and anaphylaxis, students learn about using epinephrine auto-injectors such as EPI Pens. We address the issues regarding the need for more than one dose and why students need to keep epinephrine auto-injectors with them during drills, sports and offsite field trips.
- ◆ **Major Trauma and Bleeding:** Every hour in the United States a life can be saved by properly treating severe bleeding. For major trauma, as with all the high impact health hazards, students learn scene safety, especially in light of more frequent active shooter events. We teach the entire Stop-the-Bleed curriculum where students learn how to use pressure, pressure bandages, wound packing and tourniquets to address severe bleeding. Immersive simulation exercises are undertaken throughout the course to simulate time-critical, stressful and challenging situations in order to build "mental muscle memory" that students can fall back on during real events.
- ◆ **Common Accidents:** For certain common home and campus accidents, they learn scene safety and how to prevent injuries and infections.
- ◆ **Non-traffic Related Vehicular Accidents:** The frequency of drive-over accidents at schools prompted us to learn about how to prevent non-traffic drive-over accidents and teach bystander care at the scene.
- ◆ **Bullying and Workplace Violence:** Students will learn the importance of preventing and mitigating bullying and how it can lead to harm and even death. We take an age-appropriate and audience-appropriate approach to addressing "Bullycide," cyberbullying, and abuse of power by peers and staff.

PHOTO COURTESY DR. CHARLES DENHAM II



Med Tac began with Cub Scouts and elementary and middle school students who were taught CPR/AED and Stop-the-Bleed techniques.

requirements for important merit badges such as the First Aid, emergency preparedness and lifesaving badges.

We launched our program for young adults at Stanford University with students from medical schools and undergraduate programs, including student athletes from multiple sports. The program delivers content uniquely suited to college students with emphasis on the most common accidents occurring in their age group in campus communities and in membership organizations such as sororities and fraternities. Specific content areas include alcohol and substance abuse issues, as well as the most common causes of severe trauma in their age group. A recurring student-led program has been launched at the University of Florida.

The weekend family program trains families in disaster preparedness as well as



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Med Tac Lifeline Behaviors where they earn CPR/AED and Stop-the-Bleed certificates for successfully completing the curricula in these lifeline behaviors. This program allows Boy Scouts to fulfill all their requirements for their emergency preparedness merit badge, which includes a family emergency preparedness plan and gear pack.

A program for law enforcement officers and first responders was launched with the University of Texas Police Department at the MD Anderson Cancer Center. It is the most tactical of our programs with comprehensive attention to active shooter events.

A special program for Eagle Scout candidates who want to launch a Med Tac program in their community is being developed to guide them in the implementation of this lifesaving program locally.

KidLeaders is a mentorship program including but not limited to scouts that will help grade school students understand the core values and behaviors of great leaders.

Med Tac students learn how to recognize and reduce harm from the most common preventable health hazards to children and adults. (See *Most Common Preventable Health Hazards on p. 13*)

THE 4 ELEMENTS OF THE PROGRAM

There are four major elements to our enterprise model that allow us to take Med Tac to a global scale. We leverage technology and leaders in communities to pro-

vide the program to grade schools, scouting groups and faith-based organizations at zero cost to them.

1. Bystander Care: Our global bystander care training program development focuses on the vital first few lifesaving minutes before professional first responders arrive. The curriculum is continually updated to mirror the latest evidence-based medicine guidelines and developments accepted by national emergency medicine and critical care organizations.

2. Blended Learning: We use a blended learning approach of online knowledge transfer, complemented by onsite skill training and deliberative practice led by local trainers. The program is designed to be free to grade schools, scouting organizations and faith-based institutions for the online component. The only costs to them are for local, qualified instructors who are engaged and paid directly by them. The online content can be taken anywhere and at any time through mobile technologies.

FAST FACT: IF EFFECTIVE BYSTANDER CARE CAN BE DELIVERED TO VICTIMS EXPERIENCING A MEDICAL EMERGENCY WITHIN 3 MINUTES, SURVIVAL AND PERMANENT HARM CAN BE DRAMATICALLY AND POSITIVELY IMPACTED.

3. Immersive Simulation: Simulation techniques using real-life scenarios improve reaction during high stress crises. Scenarios include making 911 calls, communicating with first responders, key task assignments, performing CPR and using AEDs, practice caring for severe bleeding, using epinephrine auto-injectors and us-

ing opioid-reversal agents.

4. Team of Teams and Network of Networks: Our model enables us to tap existing training networks of educators and membership organizations such as schools, scouts, clubs and faith-based platforms. We leverage a multigenerational team from local networks to meet the needs of the broad age range of our students.

Our funding support to date has been solely by founder philanthropy with no direct or indirect financial support from

healthcare device or pharmaceutical companies. We will be seeking funding from sources with a zero conflict of interest profile to allow us to scale globally without real or perceived conflict of interest.

DOCUMENTARIES PROVIDE SUPPORT FOR THE PROGRAM

Members of our team have produced global documentaries for the Discovery Channel including *Chasing Zero: Winning the War on Healthcare Harm* and *Surfing the Healthcare Tsunami: Bring Your Best*

Board. Our work calls on expert contributors to deliver a call to action that supports bystander care in the future film and media described below.

◆ **3 Minutes and Counting Documentary:** This film uses real-life stories to motivate the public and leaders of institutions to start and support programs in their own communities. We are taking real facilities and creating simulation models to identify the best combination of trained bystanders and properly positioned supplies

Specialty Programs Target Specific Environments

Here are other environments where bystander care can have significant impact. These programs listed here are scalable and adjusted to the organization and environment. They are evidence based and data driven.

- ◆ **LIFEGUARD – SURF INITIATIVE:** Three of our R&D regions have extensive coastlines with millions of citizens exposed to dangers related to waterways and water sports every year. We have established R&D and training relationships with lifeguard organizations in Hawaii and California. This has led us to target injuries that occur and hazards that exist on our beaches. Lifeguards can be very effective Med Tac instructors, who welcome the opportunity to teach in their communities.
- ◆ **DIVERS INITIATIVE:** Scuba divers and dive instructors make excellent Med Tac students and teachers. Safety is the bedrock of scuba training. The principles we teach are entirely consistent with the world-class PADI core curriculum, and our online training program mirrors their learning management approach. It was natural to develop a Med Tac program specifically for divers and dive instructors that addresses the specific emergencies they will encounter. Two of our founders are PADI Certified Rescue Divers. The youngest, Charles Denham III, who is a Boy Scout, is one of our junior instructors and is introducing Med Tac to scout groups.
- ◆ **AVIATION:** Emergencies happen frequently during the more than 42,700 flights handled by the air traffic control system every day in the United States. Dr. Gregory Botz and colleagues at MD Anderson are pioneering a training program to address inflight emergencies. There are at least 70 inflight health emergencies involving a passenger or pilot every day that pose unique challenges and opportunities for bystander care that can be undertaken to support flight crews.
- ◆ **LAW ENFORCEMENT AND SECURITY:** Chief William Adcox and his team at the UT Police Department serving the University of Texas MD Anderson Cancer Center and the University of Texas Health Science Center at Houston are pioneering a Med Tac program to specifically address the needs of



Schools and universities that have surfing teams can apply Med Tac's Life-guard-Surf Initiative.

major medical centers and healthcare institutions. It is the most robust blend

of the best medical practices and tactical practices of first responders. Alumni of the program have already saved lives with skills taught in the class.

- ◆ **YOUTH MENTORSHIP PROGRAM:** Given the high health hazard target of bullying, Charles Denham III, our youngest team member, is working with instructor David Beshk to create a curriculum developed for kids, by kids, called the KidLeaders program and a leadership program called LEAD to Serve. The core content will help build a mentorship network to combat the precursors to bullying and suicide. It will be taught with age-appropriate bystander care.
- ◆ **HEALTHCARE SECURITY MINISTRIES:** The team members are helping train security staff and healthcare volunteers at houses of worship. Although infrequent, active shooter and opioid overdose events have occurred enough to expose significant vulnerabilities. The Med Tac team is undertaking a Boy Scout project to identify what religious institutions need to do to be prepared and equip bystanders with the training and supplies needed to administer care within 3 minutes of victim discovery. The concept of a Rapid Response Team used by hospitals to rescue patients in distress is being explored for faith-based organizations that combines medical and security personnel who can respond together for certain emergencies.
- ◆ **CORPORATE PROGRAMS:** The Med Tac Team is exploring the opportunities to help enterprises serving the public, such as hospitality and restaurant businesses with what they need to care for their staff and patrons before professional first responders arrive. Some sectors are more common sites for mass casualty and active shooter events.

PHOTO COURTESY DR. CHARLES DENHAM II



Supply kits/care packs like the ones pictured here continue to be developed for any bystander care emergency, in addition to packs for specific use in the lifeguard-surf, divers, aviation and health ministries specialty programs. Med Tac is even developing modified golf carts with AEDs and emergency response gear onboard.

to enable delivery of lifesaving bystander care within 3 minutes of an event and until professional first responders arrive in 8-10 minutes.

♦ **Video Stories:** Our learning management approach uses the power of stories to communicate concepts, illustrate tools and describe resources. We are continuously capturing stories and adding them to our multimedia curriculum.

♦ **Immersive Simulation Scenarios:** The many stories used in our online training allow us to develop simulation scenarios, putting students in real-life situations that apply and reinforce key concepts. We use techniques pioneered in aviation and other industries to drive retention and competency impact.

START A MED TAC PROGRAM OF YOUR OWN

Although the Med Tac Team won the 2018 Pete Conrad Global Patient Safety Award for its work, we believe any community, inspired by the “all teach — all learn” mantra, can easily start a program like ours. We challenge others to start similar initiatives or join us in this cause.

We believe the CPR/AED/First Aid pro-

grams of the American Heart Association are excellent. Instructors of those programs are ideally suited to engage with campus programs. Further, the Stop-the-Bleed program sponsored by the American College of Surgeons is also excellent when it is taught as designed. The combination of these two programs can dramatically improve the



PHOTO COURTESY DR. CHARLES DENHAM II

The University of Texas Police Department serving the UT MD Anderson Cancer Center and the UT Health Science Center at Houston are pioneering a Med Tac program to specifically address the needs of major medical centers and healthcare institutions. Chief William Adcox and the security team at MD Anderson are pioneering the new study domain of inside and outside threats to the caregivers who serve, the patients they serve and the property they need to deliver their care.

frequency and effectiveness of bystander responses to emergencies.

Recent studies have shown that bystander skills degrade over time, so try to assure “competency-currency.” Regular, repeated training, with deliberate practice of bystander care skills, complemented by readily accessible emergency care supplies, is the winning combination for a campus team to help serve those entrusted in their care.

Remember, odds are that a medical emergency will happen on your campus and your students, clinicians, public safety officers, teachers, staff members and administrators will be the immediate responders until professional help can arrive. Med Tac can provide them with the skills they need to respond appropriately and save lives.

For more information about Med Tac visit med-tac.org or email info@med-tac.org. **CS**

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