

I would not change a thing!

Amy J. Goldberg, MD, FACS, Philadelphia, Pennsylvania

I am humbled and honored and want to thank the EAST Career Development Committee for the invitation to give the Orien's lecture. I am grateful for all of my Temple colleagues who are in attendance today.

Before I begin our journey, we are all missing Dr. David Feliciano today and will every day. He mentored and mentors all of us and will continue to do so in his writings. He will always be in our hearts.

I've been at Temple University Hospital for 30 years. We see about 40% penetrating trauma. About 3/4 come by police or private vehicle. That means we always must be ready. Half of our patients have suffered violent injury, whether that's a gunshot wound, a stab wound or an assault. We see way too much gun violence. What I'm going to tell you about today is something that you might not be able to read in a textbook or journal. I will share some of my struggles as we try to do these very difficult jobs. In 2010, when the Chilean miners were interviewed after their rescue, it was the youngest miner who had struggled the most. He had said that the devil and God were with him. That's exactly how I feel throughout the highs and lows of trauma surgery. "The devil and God are with me."¹ Being a trauma surgeon is incredibly hard. The question is, why trauma?

First, I absolutely love team. Trauma is the ultimate team specialty. It's everybody, from the paramedics/police to everyone in the ER, the laboratory, the blood bank, nurses, physical and occupational therapists. Sorry to share this with you, but the trauma surgeon may not be the most important part of the team. It's critical for us to understand the importance of the team.

Second, I love anatomy. When I chose surgery, I did so for the privilege of seeing the human body in a way other physicians never do.

Third, I love patient care. And lastly, I love education. This is something we all have in common. Our love of team, anatomy, patient care, and education. This is what we do every day.

Where did my love of team come from? It came from my love of sports. I went to Marple Newtown Senior High School in Broomall, PA and played field hockey, basketball, and track for 3 years, varsity. I would have done anything for my teammates. I don't think we should take for granted that this is our culture. We do team. We do team for each other and for our patients.

I went to college at Penn. I was a psych major. I loved studying human nature and systems. As a freshman, I went out for the field hockey team. The coach told us to run a mile in under 6 minutes. I was a sprinter in high school. But when the coach says run a mile under 6 minutes, you train, and you run a mile under 6 minutes. I ran 5:59. You need to have mental strength so that your mind doesn't tell your body there's no way you can do it. We all have incredible mental strength in the trauma roles that we play.

I went to medical school at Mount Sinai. After a successful academic career in high school and at Penn, I got to Mount Sinai and struggled. I came home at Thanksgiving and told my Dad that I was thinking of dropping out of medical school. I got the help I needed. I understood that life is a journey and Mount Sinai was just the first quarter of my academic journey. The game is long, and you must be resilient, and you must stay in the game.

At each of these institutions I learned something (Fig. 1). From Marple Newtown, I learned team. From Penn I learned mental strength. And, from Mount Sinai I learned resilience. You all know team, mental strength and resilience, because this is who you are. This is who we all are. We do this for the benefit of our patients and our patients' families, and we do this for each other. Many of our patients are young, and success to them is not just getting out of the trauma bay or out of the operating room, success to our patients is getting back into society the way they were before they were injured.

I was fortunate to match at Temple University Hospital for my general surgery residency. You end up where you are meant to be. I was meant to be at Temple. I'm so grateful that I recognized it. You find your place.

On my very first day at Temple, we took ATLS.² I was mesmerized. Mesmerized by how ATLS was started. The story of Dr. Steiner in 1976, an orthopedic surgeon who was in a plane crash. His wife died and three of his children were seriously injured. He said, "When I can provide better care in the field with limited resources than what my children and I received at the primary care facility, there's something wrong with the system and the system has to be changed."² I love systems. ATLS provides the framework for the care of critically injured patients. Even now, as I head to the trauma bay on call, I say out loud, "airway, breathing, circulation, disability exposure." I see myself performing well in the trauma bay, our team functioning well and the patients doing well. When I am lost, I go back to airway, breathing, circulation, disability exposure, the ultimate system.

From Temple I went to Shock Trauma, arriving before Tom Scalea had been named chief. Within a month, a patient arrived that shaped my career for 30 years. He was shot on a Sunday night. We didn't typically see penetrating trauma patients on

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Address for correspondence: Amy J. Goldberg, MD, The Marjorie Joy Katz Dean, Lewis Katz School of Medicine at Temple University, 3500 N. Broad Street, Suite 1143, Philadelphia, Pennsylvania, 19140; email: amy.goldberg@tuhs.temple.edu.

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Figure 1. Education institutions that taught me life lessons. <https://mnhs.mnsd.org/>. <https://www.upenn.edu/>. <https://icahn.mssm.edu/>.

Sunday nights. The 16-year-old patient sustained a gunshot to his abdomen. We did airway, breathing, circulation, disability, exposure. The patient lost his pulse in the admitting area. We performed an emergency department thoracotomy, placed an aortic cross-clamp, cardiac activity returned, and we went to the OR several feet away. The entire team did what we had been trained to do. At exploration, the patient had an injury to his aorta at the bifurcation and the right common iliac artery and injury to the IVC at the bifurcation, and the left common iliac vein and a through and through injury to his colon. (Fig. 2) We repaired the transverse colon, repaired the IVC, ligated the left common iliac vein, performed an aorta by common iliac bypass graft with Dacron. The patient did great and walked out of the hospital. I was ecstatic.

When I saw him in the clinic on a Thursday in the middle of the day, I asked him if he was in school. He said that he was not. We had discharged him home without any resources or support. My surgery felt so inconsequential. I wondered, who was paying attention to inner city gun violence? And the answer 30 years ago was no one.

Thirty years later, we are not where we need to be. We hear about all the mass shootings, but we don't hear about the mass shootings in our urban trauma centers. The question was then and still is, what's the solution? There's no vaccine, right? We see what we can do when there's a pandemic. We saw that a vaccine can be developed quickly. But there is no vaccine for gun violence, because it's not really a problem that crosses all socioeconomic status, all races and all education levels. This really haunted me.

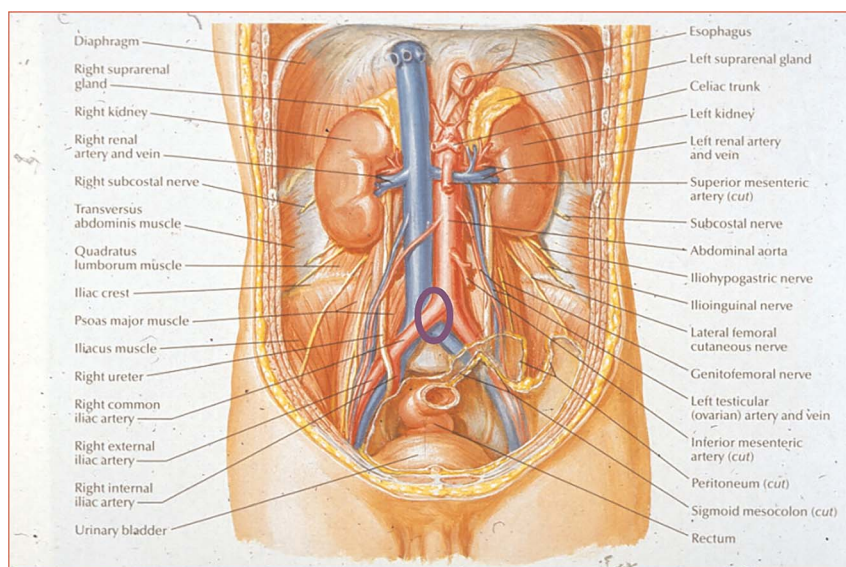


Figure 2. Shock Trauma Fellowship at University of Maryland. "Netter medical illustration used with permission of Elsevier. All rights reserved." For web-based credits please use the following HTML: Netter medical illustration used with permission of Elsevier All rights reserved.

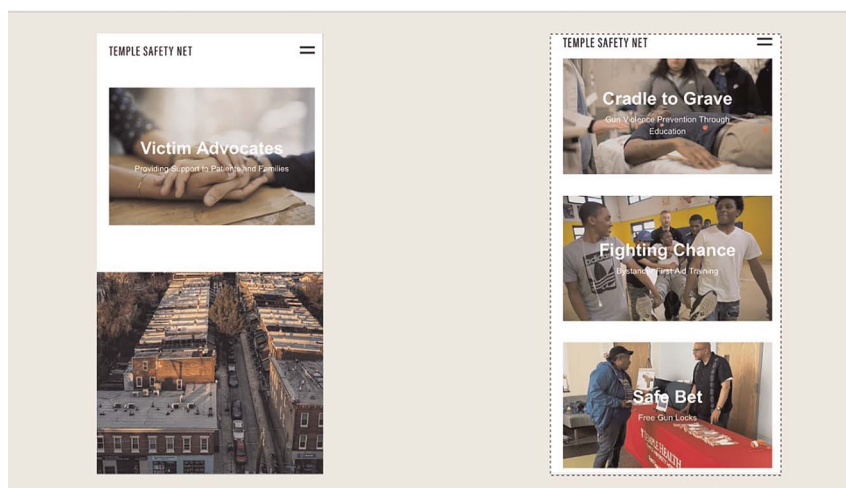


Figure 3. Victim advocacy programs at Temple University. <https://www.templestafesafetynet.org/>.

In 2004, I was appointed Chief of Trauma at Temple. Shortly thereafter, I hired Scott Charles, our Trauma Outreach Manager. Off we went creating programs that have grown and are still thriving. (Fig. 3) We've tried to address gun violence on many levels. Our Cradle to Grave program educates participants about the realities of gun violence. What we see in our trauma bays are not Facebook pictures of people who have been shot. People need to see what bullets really do to bodies. I can't help but think that's why Congress has done nothing. That's why there are no commonsense gun laws. People need to see the damage these guns do...not in a disrespectful way or by doing something of which families wouldn't approve of. But people need to be educated on the true realities of gun violence.

A predecessor to the American College of Surgeon's monumental Stop the Bleed program, our Fighting Chance program not only trains our community on bleeding control techniques, it also educates them about what to do when they hear gunshots in their neighborhood. It is common to find AEDs in suburban settings, but arrhythmias aren't what's killing young people in our community.

We also do something very simple. Our Safe Bet program passes out gun locks to decrease the unintentional injury and death that far too commonly impacts children in the home.

We have a robust victim advocacy program. Victim advocates are embedded in our hospital and trauma bays 24/7, providing assistance and support to our patients and their families in the immediate aftermath of violence. Even before our patients are discharged, they are connected to resources by our case managers, offered employment assistance by the workforce development specialist, and provided bedside counseling from a therapist to help them address their acute stress and trauma.

Let's turn the clock back a bit. I started my first and only job at Temple University Hospital in 1993. I am here to tell you ... when you start..the learning curve is vertical. I know I was well trained, but it is vertical. You must be prepared. When I trained, nobody shared this. I'm going to share some of my experiences with you.

Bleeding Patients Belong in the Operating Room

No matter how comfortable or uncomfortable you are with the case. In December 1993, this patient walked into the hospital.

When patients walk into the hospital, everybody expects that they're walking out. He had a gunshot wound to his right mandible and mouth with pulsatile bleeding. I wanted to go to IR for embolization. I didn't want to go to the OR and do a neck exploration. But we went to the OR and ligated his external carotid artery and repaired his pharynx...we're not trained on every single possible case out there. There isn't AI for trauma surgeons that will replace us. But you have been trained on all different parts of every operation and you need to synthesize and bring it all together. You need to remember that the external carotid artery sits medial in the neck and look for those first branches before ligating it. *Some bleeding does stop, but that's low pressure, venous bleeding.*

Hope Is Free

This next case I'm not ever going to forget. I am now into my first decade of practice. It's 2001. Our 76ers were in the playoffs. A 17-year-old patient arrives who was struck by a car driven by his brother. He was next to a dumpster passing his urine when his brother didn't realize the car was in reverse and hit him. The force was so great that his small bowel and colon eviscerated out a hole in the abdominal wall. On exploration he had blunt disruption of his left common iliac vein, internal iliac vein, and external iliac vein. We exposed the vessels, tried to suture them closed and packed. His hemoglobin at one point was 3.4. I was so discouraged. When I told his father there wasn't anything more we could do and his prognosis was grave, his father responded that his son was strong. Some days later, after his son was returned to the operating room for pack removal, I ran into his father who said to me, "I told you my son was strong." *Hope is free.*

We Don't Play God

We take care of the patients in front of us. This patient arrived soon after I was named the Chief of Trauma. He sustained a gunshot wound of the abdomen and presented in cardiac arrest secondary to abdominal exsanguination. We opened his chest in the trauma bay, got return of his blood pressure and went to the OR. At exploration he had an injury to his SMA and SMV. We placed a vascular clamp at the root of the mesentery to control

bleeding. He also had injuries to his transverse colon and 3rd portion of his duodenum. The vascular surgeon shunted both the SMA and SMV and we completed damage control. The patient returned to the OR for saphenous vein grafts of the injured vessels. The bypasses go down. The small bowel dies, and we perform a duodenal colonic anastomosis and place him on TPN. I was devastated. I contacted our transplant surgeons to hopefully get him listed for a small bowel transplant. At our M&M, one of our senior surgeons asks why we didn't let him die. I felt awful. He gets discharged home and, about a year later, I run into his mother in the lobby. She stops me to say hi and tells me he had a small bowel transplant and is doing well. I was grateful.

Don't Underestimate the Patient

Atul Gawande's book *Checklist Manifesto* illustrated this.³ The first chapter describes how skyscrapers are built...expect the worst and prepare for it. I learned this when the next patient arrives by helicopter. As a reminder, about three quarters of our penetrating trauma patients come by private vehicle, police or walk in. He was shot through and through his upper left arm and left chest. The CXR revealed a bullet overlying the heart. There was no hemothorax or pneumothorax.

I didn't expect the worst. I got a lateral CXR. FAST revealed a large pericardial effusion. Thoracotomy revealed a posterior left ventricular gunshot wound. The bullet had come through his arm, into his axilla and into the posterior aspect of his heart. The anesthesiologist suggested fluoroscopy to confirm that the bullet was indeed in the heart. It was.

When the patient looks worse post-op than they did in the trauma bay, something's wrong. In 2013, we used to do call Friday-Sunday. On this Friday night/Saturday morning, this patient arrived with a gunshot wound to his back with the 22-caliber bullet palpable anteriorly. At exploration, he had an injury to his colon and duodenum. We primarily repaired both and resected a segment of omentum. On Sunday, when I came back in, he looked worse. When the patient looks worse, what do you

do? We took him back to the operating room. A small piece of omentum had necrosed. Dead tissue, no matter the size, makes patients ill. When the patient looks worse, something's wrong.

10,000 Hours

I loved Malcom Gladwell's book, *Blink*.⁴ It does take 10,000 hours of practice, deliberate focus, or the equivalent of 10 years to master a skill. It's like the *Highlight* magazine in pediatricians' offices. (Fig. 4) You find objects embedded within the diagram. When you're a young trauma surgeon in the trauma bay, you see one thousand points of interest looking to narrow it to one hundred, to get to ten that you only need to focus on. Thirty years later, I see ten points of interest, to get to five to get to one. As you gain experience, you learn what to focus on.

When Do We Change Practice?

I want to close with one last question, when do we change practice as trauma surgeons? We change practice when we know that we need to do things differently. We've been applying ACLS principles to the care of penetrating trauma patients and we can do better. Many of you may not know MASH, but it was a great television show. One night when Hawkeye was dejected after losing a number of patients, Colonel Blake said to him, "Hawkeye there are certain rules about war and rule #1 is young men die and rule #2 is doctors can't change rule #1." All of us know that doctors can change rule #1. We must. We need to begin to change how our hypotensive, penetrating trauma patients are transported to our trauma centers.

Mattox published his findings in the *New England Journal of Medicine* in 1994.⁵ In 2006 when Mike Rotunda was the President of EAST, Mark Seamon and I were talking about how we don't have as many emergency department thoracotomy survivors. Mark wrote a number of papers showing that the more procedures performed in the field, the worse outcomes the patients have.⁶ Sharven Taghavi a decade ago, presented our paper on permissive hypoventilation.⁷ Swine that received positive pressure ventilation, whether by endotracheal intubation or bag

Focus/Distraktion

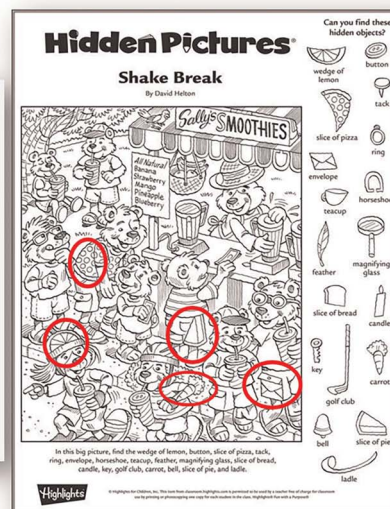
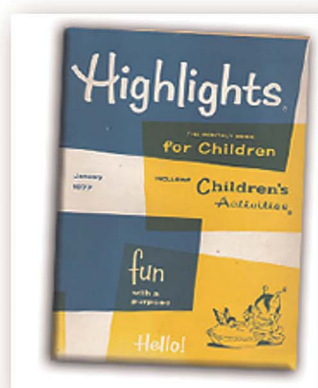


Figure 4. Learning what to focus on. *Highlight* magazine—January 1971. © Highlights for Children, Inc., Columbus, Ohio. All rights reserved.

valve mask ventilation, didn't have a survival advantage and they actually had worse perfusion to their organs.

So why haven't we changed practice? The Philadelphia trauma directors and surgeons recognized it was time for a change. We developed the Philadelphia Immediate Transport in Penetrating Trauma Trial. We met with the mayor, the police commissioner, and the fire department chief. With Zoe Maher's leadership, we were granted exception from informed consent. We were ready to start our prospective randomized trial. Then COVID came. We still can't be seeing patients coming to our trauma centers with IVs and endotracheal tubes. This has to stop. Hypotensive penetrating patients in cities with trauma centers need to be transported immediately.

In closing, keep this in mind. Be open to learning every day. Know who you are, follow your heart, know what your values are. Create and embrace your culture. There will be both physical and emotional fatigue. Develop your supports. Mental health and mental strength are critical. Share your struggles, don't keep them in. Express vulnerability, it's healthy and good leadership.

I cannot tell you how honored I am to speak with all of you this morning. Thank you so very much.

DISCLOSURE

Conflicts of Interest: Author Disclosure forms have been supplied and are provided as Supplemental Digital Content (<http://links.lww.com/TA/D714>).

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