Strong Medicine 2-10-2014 Interview with Dr Alasdair Conn

EMILY HARRISON: OK, so this is Emily Harrison, and today is February 10, 2014. I am here with Dr. Alasdair Conn, in Ruth Sleeper Hall, at Mass General Hospital. We're going to record an interview as part of the Strong Medicine Oral History Project. Dr. Conn, do I have your permission to record this interview?

ALASDAIR CONN: Yes, please go ahead.

HARRISON: Thank you. So, we're conducting this interview to create a permanent historical record of the Boston Marathon Bombings and their aftermath. We'll spend much of our time together today talking about your experiences of what happened that day and in the weeks, days, months that followed, but we also want this interview to make sense to people decades from now, so we're going to start with a bit of background about you.

CONN: OK.

HARRISON: So, could you begin by telling me about yourself? Where you're from, what your educational background is?

CONN: Sure. So, my accent will have already betrayed, and you'll actually find I was born in the United Kingdom. Born in the middle, in Yorkshire, childhood down the -- the south, in Devonshire, but went to medical school in

Edinburgh. After medical school, did my internships there, and wasn't sure what I was going to do as a career, and came to the States. I worked as a sort of research fellow in a place that everybody now knows as the Shock Trauma Unit in Baltimore. This is a hospital facility affiliated with the University of Maryland, which is basically a trauma unit. It's one of the granddaddies of trauma units in the United States. I stayed there for a bit over a year, decided I was going to stay this side of the Atlantic.

HARRISON: And about what year was that?

CONN: And -- I came across in '72.

HARRISON: OK.

CONN: Then, went through surgical training in Toronto, Canada, and went through a surgical residency there and completed that in 1978. And then, the world was my oyster, and I decided to go back to Maryland and again work for the Shock Trauma Unit. That was early 1979. And got very interested in EMS. Maryland is unique -- it has a, at this time, a statewide helicopter program, supported through the Maryland State Police, who are cross-trained as paramedics. And I was very interested in what happens to patients before they get to the hospital. Befriended them, we got on famously, and became the medical director of the

Maryland State Police. And then they wanted to upgrade their training to paramedics, and I said, "Well, we can do that." I was young and foolish at the time because they said, "Well, we don't have any law establishing paramedics in the State of Maryland," so we introduced the law. And it passed in Annapolis, and then I became the state EMS director, and that's basically writing the policies, the protocols for all of the EMTs and all of the paramedics in Maryland, which is an extremely interesting and increasingly important job.

What happens to stroke patients, heart attacks, multiple trauma, before they get to the hospital? And then in 1985, was invited to come to Boston to set up what is now the Boston MedFlight program. We started out with one helicopter. The concept was that there are many major hospitals in Boston, but we're not going to have one helicopter for Mass General and another one for Boston Medical Center and another one for Brigham Women's -- no, no, no. We're going to have one program that serves a critical care need, transport needs, of all of the hospitals. And I was asked to come set that up. That was in 1985. We started with one helicopter. We're now up to three helicopters, four critical care ground ambulance, and

an aircraft for the more long-distance work, and I'm still involved in that program.

And then, about 25 years ago, I was asked to come and set up a new department, the Department of Emergency Medicine, at Mass General. It was new. Most cases, at that time, in academic centers, emergency medicine was a subdivision of either medicine or surgery, just like nephrology or cardiology is a subset of medicine, and thoracic surgery or trauma surgery is a subset of surgery. This was a move to set up a new Department of Emergency Medicine, and I commenced that now 25 years ago. I've just stepped down a few months ago, following the marathon, and I'm now the Chief of Emergency Medicine Emeritus here at the MGH.

And still involved in getting patients to where they need to go. Hospitals are very complex organizations, and I think it should be [00:05:00] simpler for a referring physician or a patient's family to say, "This is what is wrong with my loved one or my patient, where do I -- how do I get access to the doctor who can best manage this particular clinical problem?" So, that's a project I'm continuing to be involved in.

HARRISON: OK, thank you. I'm interested, I think it will be interesting, thinking forward in the interview, about change over time. Do you know what it was or can you

speculate on what it was about -- was it 1985, you said, that they decided to put together the Emergency Medicine Department?

CONN: Right.

HARRISON: Can you think about what it might have been at that time that may have sort of instigated that -- that movement to do that?

CONN: Why was it come-- Why was it --

HARRISON: Yeah.

CONN: So --

HARRISON: Why 1985? Why in that particular time, in this particular place?

CONN: So, it's multiple things, as it always is. So, the first one is that emergency medicine was a growing specialty. It's still growing. We have about 32,000 physicians who work in emergency departments in the United States, and of those, about 16,000 today are board-certified. They've had training in emergency medicine, or they've challenged the boards, been grandfathered in, that way. That grandfather clause, by the way, is closed. And it's increasing in importance. So, one of my sayings many years ago, when I -- when I came here was, "Where do patients -- Where are the patients that are up there -- Where are they at their sickest?" And the answer is in the

emergency department, in the operating room, and in the intensive care unit. That's where their blood pressure is low, their physiological parameters are changing very fast. But where, in the old paradigm, where were the most experienced staff? Well, they were on Monday morning ward rounds at eight o'clock in the morning. But emergency medicine and critical care changed minute to minute. And we needed to have a lot more supervision by senior clinicians, 24 hours a day. So, now, many groups are advocating 24-hour presence of emergency physicians in emergency departments, 24-hour presence of intensivists, 24/7, there needs to be a senior anesthesiologist in the operating room, if you need an operation at three o'clock in the morning. And by the way, an experienced surgeon, as well, because those we know contribute to improved outcomes. A recent paper, guess what, and I think this was published in *Lancet*, the outcome, if you have a cardiac arrest on the weekend is -- in a hospital -- is not as good as if you have your cardiac arrest during the week. We need to fix that.

And that, I know, at MGH, they said, "We need to have better coverage in the emergency department, and potentially we need to have a training program in emergency medicine." So, it's a coalition of those things coming

together that I think that the Board of Trustees and the senior management said, "It's time to change and we need to create a separate department."

HARRISON: OK. Thank you. If you could say -- now, I'm going to shift towards talking about the marathon and the events surrounding the marathon -- to set sort of a baseline for people listening to this interview, can you talk about what a Marathon Monday any other year, if there were things that a Marathon Monday looked like from your place at work?

CONN: So, I'm going to tackle that in two issues. The first one is that we've always enjoyed, in Boston, an extremely tight and collaborative relationship with our EMS colleagues. That is relatively unique.

Not in all large cities does that very strong relationship... For example, the chairperson of the Disaster Committee, the Boston EMS Disaster Committee, has, for the last 18 years, been Maryfran Hughes, the nurse manager of the emergency department at MGH. I know most of the senior paramedics and certainly the senior management of Boston EMS on a first-name basis, and they know me. We know -- We've done drills, etc., etc. So, there's that as a sort of background.

On a normal Marathon Monday, we don't gear up, especially. We do know that we're going to get a lot of runners. Many

years ago, it was with the dehydration, electrolyte abnormalities, exhaustion. Over the years, the -- there -- they've prepared tents along the way that have physicians, paramedics, nurses, so the things like heat exhaustion can be treated locally, at the tent. And not many [00:10:00] people need to go to the hospitals. Yes, it -- when we've have some -- we had a patient about two or three years ago who wanted to run the marathon, and as he crossed the finish line, he had his fatal cardiac arrest.

HARRISON: Oh, dear.

CONN: We always have patients like that, or the more severe patients. So, we're accustomed to it. It's a light day because it's a public holiday. However, we do have a number of patients from the marathon. So, there was no need for us to gear up or relax our standard. We treated it like a normal Monday.

The other thing I would say, in terms of preparation, is that -- and I date this in actual fact to 9/11/2001. Because at that time, all hospitals have a disaster plan. And when the Twin Towers fell, we heard initially that they were going to evacuate about 40 casualties by train to -- to Boston. And all the Boston hospitals tried to prepare for that. We have enough staff, we have enough beds, we didn't have enough ventilators. And so, we activated our

disaster plan, and we all congregated together, the chiefs of service, the CEO, and we tried to work through the issues. And to be honest, it was found wanting. There was very little coordination between the hospitals. We could certainly manage multiple casualties pretty well, but we couldn't manage a major influx of critical patients from another environment. And so, we changed our -- our disaster planning, from that moment. And the first thing we did was we all went through, the entire hospital at MGH and all of the other hospitals, went through hospital incident command system training.

That's still being modified, but let me give you an example of how it was uncoordinated. We were going to run out of ventilators, so the head nurses in the intensive care unit were all calling their counterparts in the city, saying, "Can you -- Can we borrow some ventilators?" They were calling us. The respiratory therapists were doing it, the physicians were doing it. Lots of phone calls were going backwards and forwards, everybody with the best intent, no organization.

And what we did was we learnt from the fire service. And I've said before, you know, you hear about on the news that, you know, if there's a bad forest fire in California and they brought in firefighters from Idaho and Utah and

Arizona, and then you think, “Well, how do you know that they’re familiar with the equipment?” Who -- If they get injured, how does that work? Does their insurance cover it? Who now fights the fires in Colorado and Utah and Idaho? Who keeps tabs of this, in terms of money? How much does it cost? Where does the money come from? And all of those things have been sorted out in so-called incident command structure. And they know there’s one person in charge of fighting the fire.

There’s one person in charge of recruiting supplies and additional personnel as needed. There’s another person who makes sure they’ve got the right training and the right equipment, so they’re familiar with the environment. There’s another person arranging for hotels and sleeping quarters and ATMs and food and all that stuff. So, we went through incident command training, and any time somebody alerts the disaster, there’s a property, we all have responsibilities. We know what to do. We know who’s in charge. And we know how the system works. And soon after that, we began to have drills not only within the hospital, but throughout Boston.

So, one of them, for example, was Operation Prometheus, which was -- the scenario was a dirty bomb exploding at Logan Airport, and hundreds of casualties, all of which

were contaminated, and all of which needed good healthcare. And it was a city-wide project, and again, every time we drilled, we learned something new. Many of the patients, for example, who arrive, arrive with no identification, and they're unconscious.

So, how do you identify them? How do you manage how they get their blood supply? Blood and their drugs and everything else? How do you identify them? How do you coordinate with somebody who's now calling in to all the hospitals, saying, "Have you got my loved one?" Many of which were being yet to be identified. And then we learn from real disasters, like the Rhode Island fire, [00:15:00] that tragic event in which over 100 people died of multiple burns, were flown out from Rhode Island to the burn centers in New England and beyond. And that was obviously a -- a real-life drill, but again, we activated that disaster plan.

HARRISON: Yeah. And that was, I think, in the pre-interview questionnaire, you noted that started around 2001, with September 11, post-September 11.

CONN: Yeah, yeah.

HARRISON: And continued up until 2013?

CONN: Yes. And one of the things, hospitals get approved, as you may know, by a group called the Joint Commission.

We get inspected every three years, and one of the things we have to do is have either a real or a simulated drill of a disaster twice a year, and they're very specific on, again, regular drills. Well, we also learnt from other -- other tragedies around the world. So, for example, we learnt from the Israelis. We were pretty confident because we thought we could manage, oh, five, six major casualties at once, and the Israelis said, well, they have a bomb that somebody explodes on a bus about every six weeks, so their hospitals have to manage 50 to 70 casualties. And we wanted to learn how they managed that. And we invited three of their physicians to come across in 2005, look at our disaster plan, critique it, and again, we learnt from that. "Faster, faster," they said, "Faster. You're doing all the right things, but you're doing some of it wrong." And we learnt, and we changed that disaster plan, and certainly that helped.

HARRISON: Could you give me some specific examples of things that (overlapping dialogue; inaudible) --

CONN: Sure. One of the things that they said was that you need to have a senior physician who is experienced doing the triage, the sorting out of the walking wounded, from the really severely ill. They did it in the parking lot. We did not, but we learnt from that, and so, again, on

Marathon Monday, within minutes, we had a senior physician in the ambulance bay and a senior physician at the walk-in entrance. And every patient that said, "I'm from the marathon," anyone in the environment, they were immediately assessed. We used to do a pretty in-depth examination, and they said, "No, this is a 10 to 15 seconds with the experienced clinician. They can make a decision that's correct 98-99% of the time. Don't bother with the three to five minute interview or the examination. Go with your gut because you will be soon overwhelmed with patients." And that, again, paid dividends at -- on Marathon Monday.

HARRISON: Yeah. So, I think we've set up a good context now for actually talking about Marathon Monday itself. Could you just tell me what happened that day? I mean, start with what -- what happened in the morning. How did you know, what's looking (overlapping dialogue; inaudible) --

CONN: Well, it was a relatively quiet day in the emergency department. Mondays, surprisingly, are usually the busiest for an emergency department. You might think why, and that's because patients often say, "Well, I know I've had the fever or the cough or the cold over the weekend, but doctor, I didn't want to worry you, so I'm calling you at eight o'clock on Monday morning." (laughter) And they say, "Go to the emergency department." So, Monday is

usually a busy day. It was a little bit quieter because as I have indicated, it's a holiday in Boston and the state offices are closed. And we're busy, emergency departments have this unfortunate concept of overcrowding patients. Patients often wait for many hours to get a bed upstairs, and I often have to explain to patients, you know, "You booked into the hotel, you're in the hotel lobby, all the rooms are filled, we have to wait until somebody is discharged. The room needs to be cleaned and restocked, and then you can go off to your room. It's like that in a hospital.

So, we usually have a number of patients waiting for beds, particularly early in the morning, before the discharges. We try to discharge patients in the morning or early afternoon. So, it was a busy day, but nothing *in extremis*. I wasn't working clinical that day, but it's not a hospital holiday, so all of the nurses are doing, all the physicians are on duty. And I was sitting in my office, and my pager went off. And the pager said that Boston EMS is doing a ring-down, and what is our capacity? And what a ring-down is -- and we practice this every morning at nine o'clock, made sure that all of the communications, the radios are working -- is [00:20:00] there's been a severe incident, we want to know what your capacity is in the emergency

department. We have a protocol. It's 10 severely injured, 20 injured but not critical, and unlimited walking wounded. It's unusual for Boston EMS to call that out unless there's a real disaster. So, I was paged and they said, "We don't know of anything going on, but they're doing the ring-down. So, something is happening, and we think it's something at the Boston Marathon." I did three things: I first of all looked at the bed census on my computer in my office, and was aghast to see that of the 47 bays in the emergency department, we had one open bay. The second thing I did was call the incident commander of the hospital, in case we need to activate the disaster plan. I didn't want to page -- pages sometimes aren't picked up -- I didn't want to send the email -- they might not read the email for hours -- I wanted to physically speak with them. So, I spoke to Ann Prestipino and said, "Ann, sorry to drag you out of a meeting, there's something happening at the Boston Marathon. I don't know what, we're trying to find out, I think we may need to activate our disaster plan soon. I'll keep you posted."

And the other phone call I made was to George Velmahos, who's our chief of trauma. George had been working overnight, been on call the previous night, and was preparing to go home. I didn't realize until later that in

actual fact, his son came in to see his father and have breakfast with him, and then said he wanted to go to the finish line at the Boston Marathon to see the runners finish. But I called George and got him just about a few minutes to 3:00. And I said, "George, I know you want to go home, I know you were on duty last night. There's something happening at the finish line at the Boston Marathon, and I don't want you to leave the building. We may need you, your team, and every backup team that you can activate." And again, to his credit, he said, "I'm there." He hung up the phone and I know immediately came -- alerted his crew and immediately came to the emergency department. I then went to the emergency department. The first thing that happened, it's fortuitous, is that we did have some beds upstairs in the hospital, and many of the doctors and nurses -- and especially the medical service -- they came down to the emergency department and went from bay to bay and said, "This patient needs to be admitted. We'll just take him upstairs. We know you need the beds." And the doctors and the nurses wheeled those patients out. They didn't leave a report, they just took the notes, etc., and they said, "We'll catch up." And they were able to empty our acute area of the emergency department within about 10 or 15 minutes. It was just magnificent.

HARRISON: And then how many bays do you have, afterwards?

CONN: We have 16 in that acute area. So, 'round about just a few minutes after 3:00, patients were being taken out of the emergency department and taken upstairs. I went through to apportion the administrative side of the emergency department, if you like. That's where the people do the registration, etc. And I said, "Well, what have we heard?" And they said, "There's been an explosion." I said, "Well, we better activate the disaster plan," and they said, "We did it, two or three minutes ago." And then my pager went off and said, "Disaster plan is activated, please report to disaster stations." That, again, it's -- it's, again, a sophisticated system. We can alert about 1,000 people, probably more, and that senior staff -- nurses, physicians, administrative support, police and security, buildings and grounds -- 1,000 people, their pager goes off, their cell phone goes off, we send out an email, their home phone number goes off, and it's all, "This is a disaster, please respond."

So, literally within a few minutes, we can activate virtually the entire hospital in terms of something's happening, we need to prepare for this and report to your stations." I went to the -- we had set up our disaster area in the Trustees' Room, and that has numerous computer

outlets and we can look at several TV screens. CNN, Channel 4, Channel 5, Channel 7 -- we're looking at them all. We're also activating Web EOC, Emergency Operations Center, and that's the ability to communicate from both the scene and also from the hospital in basically a continuous blog. So, that was activated at the same time. [00:25:00]

HARRISON: And where is this Trustees' Room that you're talking about?

CONN: It's in the Bulfinch Building. It's used for regular meetings, the Board of Trustees meets there, but we just wheel in and plug in computers and TVs, and it can be activated in about 10 or 15 minutes.

HARRISON: And so, who would be in that room on this --

CONN: It would be the people on the Hospital Incident Command System Chart. So, there will be the incident commander, there will be the chief medical officer, there will be the liaison officer, the people in charge of supplies, of finance, all of those people will be in the room. Police and security, all beginning to work in this new environment and manage the disaster. Do we need more surgeons, do we need more operating rooms, do we need more ventilators? What are we doing with food? How are we going to manage people who need to sleep overnight? All of that. Do we have enough food, medical supplies? All of

that is managed in that room. I -- We had our first patient, who arrived at three minutes -- sorry, 4:03. We learned from the Madrid Train Bombings, and it's common in every disaster, that the first wave of patients never arrives by ambulance. They just arrive. And it's often that the hospital closest to the scene of a major disaster is overwhelmed. People see their loved one injured, well, they just pick them up, put them in their car, and just drive to the nearest hospital, and just turn up.

And that was the case in -- at the Boston Marathon. This was a young man who saw his girlfriend have very severe injuries to her lower extremities. He picked her up. His car must have been nearby. Put her in the car and just drove. And he apologized on the ride, he said, "I think I went through a few red lights. She had zero blood pressure on arrival. Nothing. She'd exsanguinated. We gave her four units of un-cross-matched blood and sent her upstairs to the operating room. About two or three minutes later, a police paddy wagon arrived. Two other patients, again, with traumatic amputations of their lower extremities, and a rather scared firefighter was in the back. He had no equipment. And those were the next two patients.

And again, we'd already allocated patients, we had rooms, they went into the rooms. Tourniquets were applied, x-rays

were obtained, and they went upstairs. By this time, we'd allocated to each room the staff. So, in each room, there will be two nurses, an emergency physician, an emergency medicine resident, a trauma attending, and a trauma surgical resident. And they would be told, "You're getting the next patient. You have to assess them. Don't worry about anything else in the emergency department. Your job is to look after this one patient." And so, we had numerous rooms staffed in this way. Next one, bay four, next one, bay five, next one, bay six. And as the patients rolled in -- and by now, they were coming in by ambulance -- we just allocated into the rooms. We -- I was in the Trustees' Room because I'm the liaison officer, or was the liaison officer to the hospital. And I was responsible for obtaining supplies from other institutions if needed. We broke off, I want to say, about 3:15, 3:20, and agreed to meet again in about 20 minutes.

I went down to the emergency department. It was the acute area, which is where our most severely injured patients go. It has a central nursing station, and you can look around and basically see not all of the rooms, but most of the rooms, you can see who is there. And I looked in room four, and a team was working on a lady who -- a patient who had a traumatic amputation. And I looked in bay five, and

there was another traumatic amputation. And I looked over my shoulder to another room, and there was another patient with a traumatic amputation. And it was -- there was no screaming, there was no yelling, everybody was just doing their job, resuscitating the patient, applying the tourniquets. Some patients arrived with military-type tourniquets, which were lifesaving. Some were just taken a belt to tie, anything, just to try and staunch the bleeding. Those aren't usually as effective as stopping arterial bleeding, which has a higher blood pressure. [00:30:00]

We sent five patients to -- Sorry, six patients to the operating room within 30 minutes, and we only had the identity of one of those patients when they went to the OR. We were doing it all by numbers -- trauma patient 1, trauma patient 2, trauma patient 3, and they were going up to the operating room. Then, the less severely injured just began to arrive. And again, we'd had a -- we have a senior clinician at the ambulance bay and a senior clinician at the walk-in bay. A lot of people with blast injuries -- broken eardrums, for example -- they're not life-threatening, so we sent them -- in our disaster plan, we have a separate area for those people. And obviously, we

called our ear, nose, and throat colleagues to come across and help us manage those types of injuries.

It was interesting because we had the first wave of very severe injuries, and the hospital sort of rallied, and all of those patients were managed. They all went up to the operating room. In fact, Paul Biddinger, who's our director of emergency preparedness and helps coordinate and develop the plans, he in actual fact was working at one of the tents along the way of the marathon. Obviously, his beeper went off. He came in and he said, you know, he was so gratified to see the response because he didn't have to do anything. We'd all trained for it, it worked like clockwork. And he said at the end of the day, "You know, we could have managed more." At the time of the incident, we first heard there were two explosions, and then more worries there was a third. We did hear of another explosion at the Kennedy Library. We thought this was another attack. It turned out to be a minor incident. But we were prepared for not only additional bombs, which we thought might be exploding, we were also prepared for the scenario of somebody drives an ambulance into a hospital and explodes detonators and a device in the ambulance. And that, again, has been a scenario we practice with. One of the hospitals stopped every

ambulance before it went into the emergency department and said, "We need to see some ID. We need to see -- make sure we know who you are," because they were afraid of a terrorist attack, them commandeering an ambulance. We didn't. We know all of the EMTs and paramedics on a first-name basis. But it's something we need to think about in a disaster scenario because that's a very real issue, that somebody might commandeer an ambulance. And of course, immediately afterwards, you know, the state police were here, the local police. It's a little bit unnerving to see state police fully armed outside the entrance of the emergency department, but it's something you have to get used to, yeah.

HARRISON: Yeah. It's -- You know, I wonder if you could talk a bit about what you were thinking and feeling over this time, as the day played out. It's a year after the fact, it's easy to forget that there was very little known about what was actually happening that day, at that time.

CONN: So, the first thing I would say is that I was -- I was gratified by the way the staff responded. It was truly magnificent. And by the staff, I just don't mean in the emergency department. I've already mentioned the physicians and nurses who came down from upstairs and emptied the emergency department. Without that, it would

have been just chaos, it would have been much more challenging. The second thing I would say is that somebody asked me, "Have you seen injuries like this before?" We'd seen certainly very severe injuries, but it was one at a time or two at a time. I'd never seen that number of severely injured patients all at once.

The third comment I would make is I went to the surgical debriefing, which was about seven o'clock that night, and that was when George Velmahos, as the chief of trauma surgery, basically called all of the staff, surgeons, the critical care physicians, into one room and said sort of, "Let's regroup. How many patients have we got, where are they, do we have identification? What's the future needs preparing for tomorrow, etc.?"

And I was very perplexed by the fact that they had -- the vast majority had very bad lower extremity injuries. I couldn't understand that at all. And when you looked at the x-rays and looked at the injuries, there were little ball bearings, there were tacks, there were staples. [00:35:00] They obviously filled the bomb, but I couldn't understand why it was the lower extremity. And it wasn't until I think it was the next day, CNN said -- one of their bomb experts said, "Oh, well, this is a pressure cooker bomb and it was obviously on the ground." Because -- And

these people must have trained in the Middle East because if you've got a pressure cooker, I had one at home, and you fill it with explosives and then add on nails and ball bearings, when the explosions occur, the strongest portion of the pressure cooker is the lid and the bottom, so it explodes sideways.

And so, there were placed on the ground, and so all of the ball bearings and staples and nails went sideways, and basically cut a swathe through the people who were adjacent, and they had injuries to their lower extremities -- except for the unfortunate 10-year-old because he was shorter and obviously had -- I didn't see the autopsy, poor -- poor kid. But he had fatal injuries because he was shorter, standing up and watching the end of the marathon. So, he succumbed at the scene. The fourth thing I would say is it was absolutely unprecedented, the survival. And there are a number of reasons for that, and that's a continued debate in the press. So, the first one is that they had several ambulances at the scene. Jim Hooley is the chief of Boston EMS, was there at the scene. Very experienced. And I've seen the video of the -- of the Boston Marathon. The first explosion occurred at 2:49:34. How do I know that? You remember. He remembered.

Within about 30 to 40 seconds, Boston EMS staff were at the patient, applying tourniquets, controlling the bleeding. Members of the population, the general public alive, knocked down the barricades to go in and -- and help the injured. And there were ambulances at the scene. So, they called the ring-down, and then began to send the patients to the hospitals. Now, the ring down, when it came, what, 2:52, immediately gives the commander on the scene the capability of the hospital. So, let's say we had capacity for 10. So, they say to the first ambulance, "Take two to Mass General." They now have a capacity of eight. "Take two to the Brigham. Take two to the Boston Medical Center." So, they're just running through and they're allocating the severely injured not to one hospital, but equally amongst the five adult trauma centers within Boston, all of which are within about two or three miles of the finish line.

So, the patients all got to the trauma centers very quickly, and that contributed to the incredible survival of the patients. Another thing, the explosion was a low-power. Now, I'm not a bomb explosion expert. My understanding is they basically used fireworks. If they'd used something like C4, which is an extremely powerful explosive, it would have been a much more damaging

explosion. Many more people would have been injured, and many more people would have been killed. The rapid evacuation to the trauma centers, and they began to arrive just after 3:00, the nurses from the 7:00 to 3:00 shift were just completing their shift. The nurses from the 3:00 to 11:00 shift were already in house. Same in the operating room, same for many of the physicians. Physicians in the emergency department, in the OR, and in the intensive care, they worked shifts. So, as you can imagine, we were immediately double-staffed. Nobody's going to go home.

HARRISON: (overlapping dialogue; inaudible) left, yeah.

CONN: So, it wasn't until we stood down for the disaster, which was about 7:00 or 8:00 that evening, that the day shift was able to leave and go home. But we had immediate double coverage. The operating rooms, it was a holiday for Boston, so although they had full staff, it was a relatively light day in the operating room. And again, that's one reason why we were able to accommodate so many patients so quickly in the ORs. And it's the same story across all the other hospitals. Were there things we learned? Oh, yes.

HARRISON: That question is coming up, yeah. (laughter)

CONN: Yeah. So, the first one was that in actual fact, [00:40:00] we learned -- the hospital learned of the marathon before we even had radio contact. Somebody Tweeted that there had been an explosion at the finish line, and that was picked up by one of the anesthesiologists in our operating rooms. He was following one of his relatives who was running the marathon, and they Tweeted something like, "Explosion at the marathon. Multiple casualties." And so, he went to his supervisor in the OR and says, "What do we do with this information? Has there been an explosion?" I believe they called down to the emergency department and said, "Do you know anything about an explosion?" And we said, "No, we haven't had any verification." And of course, two or three minutes after that, we have. So, one of the things we need to learn is how do we incorporate social media into our disaster planning? And what I think we're going to alert and maybe even activate our disaster plan, but not the whole response. You're not going to bring in 1,000 people on the basis of one unsubordinated Tweet. But we are going to say, "Something's going on and we need to at least begin to alert people and set up the contingency plans."
We had a -- We had a misidentification, and it's -- that's -- that's really tragic. It's really tragic. It's very

easy to find out, to determine what happened. What happened was that one of the people in actual fact passed away at the scene had handed her bag with her ID, her wallet, her driving license, etc., to a friend of hers. And we got the friend, and of course, when we looked, we just went through, "Yes, oh, this -- I found a driving license, it's in her bag, this must be this person." "They look about the same. We've got a positive ID, send her to the OR." Of course, when the relative turned up and went up to the recovery room and said, "This is not my daughter," and that's when everybody realized his daughter in actual fact had died at the scene, and that's a tragedy. We are -- It's easy to know how we made that mistake, but we shouldn't make it. And so, we need to be more vigilant in the way we identify people. It's -- It's -- It's a conundrum. One other hospital never gives out any identification until they've been positively identified by a member of kin, which may be several hours afterwards. That's hard because initially, we had hundreds of people going to different hospitals. And if you were a relative, you'd start calling. You want a central number to say, "Where is my daughter, where's my husband, my brother, my sister? Which hospital? How do I get more information?"

So, there's an enormous push to get that medical information out and to the public.

Having said that, there's also a lot of -- there's HIPAA laws, in terms of medical confidentiality, and we need to think our way through that in terms of how are we going to work that a little bit better next time? The other thing I would say, while looking at a better way, a different way of identifying sort of patients. If somebody gets shot, or like the Marathon bombings, when we don't have any identification, it's basically trauma patient 1, trauma patient 2, trauma patient 3. And then, we rely on the medical record number.

We, in actual fact, use barcodes, the one at the supermarket. But one of the other hospitals, that's confu-- this is medical patient -- sorry, trauma patient 1 and medical record number 12345678. This is medical or trauma patient 2, medical record number 12345679. That's confusing, and so some hospitals have gone to patient Alpha, patient Bravo, patient Charlie, Delta, Echo, Foxtrot, like the military do, and A, B, C, D, E. And we think we're probably going to move to a system like that, yeah. It was the drills that paid off in dividends that day because when they alert went out, everybody knew what to do. Yeah.

HARRISON: Were there any deviations from the training that you noticed on that particular day? Innovations that needed to happen because of --

CONN: [00:45:00] No, not really. One of the things that we -- We did have an issue with sort of crowd control, in that we had a tremendous response from the staff. Nobody got in the way. What we think we're going to do is have a separate area other than in the emergency department, so that if we need an orthopedic surgeon, we sort of go to the bullpen and we say, "We need an orthopedic surgeon to come to the emergency department," they'll go up to OR 5 or 17 or wherever the patient is. Because every -- every incident is unique, and this time, we needed a lot of orthopedic surgeons, a lot of vascular surgeons, and a lot of plastic surgeons. We didn't need neurosurgeons, for example, but obviously they responded. So, we're thinking of revising that particular component of the plan.

HARRISON: OK. You've talked about how there's been -- there's a really strong network in the Boston -- among the Boston hospitals. Can you talk about communication that was happening among the hospitals on that particular day? You -- You've talked about the central coordinating triage unit, but then among other physicians, what type of communication was happening?

CONN: So, most of the communications that I was aware of were done through the Web EOC. We certainly knew sort of online, how many patients were going to which hospitals, and how hospitals were managing. And again, because of the planning and the dispersal of the critical patients amongst the different hospitals, there was no hospital that was overwhelmed. And so, with that, we sort of left them to their own devices. Now, my understanding is that later in the evening, there was a lot of communication particularly amongst the news and public affairs offices, in terms of how do we get this information? We have these patients, we have positive IDs, how do we then work amongst each other so that if you get a call at Mass General, we can say, "That patient isn't here, it's at Boston Medical Center," or the Brigham, or some other hospital. And -- And I know that communication occurred later on that day and into the next day.

HARRISON: And to put sort of a bracket of time around this, you said the stand-down was at 7:00 or 8:00 that night.

CONN: Correct.

HARRISON: And then, how -- how -- what other sorts of time brackets would you set on the important change points, phase points, in that respects?

CONN: So, there's three or four, in actual fact. The first one is that although we stood down because the -- by 7:00 in the evening, all of the acute -- well, we knew before then -- all of the acute patients had been in transfer to the hospitals and were being managed. Now, they might have been in the OR, and so, hospitals didn't want to settle down until the OR is completed and the ICU, etc. So, we stood down 'round about 7:00 that evening, I think, if I remember. Now, we were still receiving patients until the next day, and they would come in and say, "I was at the marathon and I have pain in my leg," and we'll do an x-ray, and they had some shrapnel in their leg, for example. And we managed them as a matter of routine, but -- and they did not -- they obviously had injuries, but we -- it didn't sort of interrupt our normal operations.

And that were not -- And then, the other thing I would say, obviously, is that when in actual fact there was the unfortunate shooting of the MIT security guard, and that's when we ramped up again, and then the governor, as you may know, basically put Boston into lockdown and stopped all public transportation, that's another way we activated our disaster plan because now, nurses can't go home because their replacements can't come in. Doctors can't change of shift, they can't go home. Patients can't be discharged

from hospital or be transferred to rehabilitation or a home. So, we were completely locked, and that created, until it was lifted later that day, created another sort of activation of our disaster plan. A different sort --

HARRISON: A different plan. (laughter)

CONN: -- a different plan, if you like, but we met and we had our incident command structure up. But -- And again, that's -- the disaster plan needs to be flexible because that's a different scenario, and I -- again, I thought that the hospital managed it very well, but it was a different type of challenge.

HARRISON: So, in -- I see we have about 10 minutes, and I would -- I'd love to talk about what happened [00:50:00] sort of the week after then, the week after the marathon, then the year after the marathon. Can you talk a bit about what the week after the marathon looked like for you, in particular?

CONN: So, the first thing I would say is that I was not present. We had a -- the first of a number of debriefings, in terms of the staff, about 80 of the staff met on Tuesday, late afternoon, and we invited anybody who'd been involved. So, it would be the doctors, the nurses, the administrative support personnel. The clerks who clocked people in. The people who cleaned the room between patients. The blood transfusion. Everybody. And one of

the attendings in the emergency department, [Vicky?], Vicky said, "You know, yesterday we came together as a team, and together as a team we saved lives." And I thought it was a wonderful quote because it expressed the sentiment, was that, "I'm just the doc, but without having somebody when I need a piece of equipment to be able to give me the piece of equipment, without being able to have the room cleaned and restocked, have the OR ready, have the blood ready, it wouldn't have worked."

And so, it was really, I thought, very eloquent in terms of this is a team sport. And in order to function, we need to really function together. It's a team. We did have a number of debriefings over the next weeks and months, first of all internally, what could we have improved? I mentioned the obvious one, which was where the misidentification, we've corrected there. And then we learnt from each other. We had a meeting with all of the hospitals in terms of how can we learn from each other. We learnt different practices, and we learned from that. As I mentioned, the alpha, bravo, Charlie, delta, echo, foxtrot, I think we're probably going to adopt that. And that was interesting as well. And then, you have the sort of specialty groups. We can all learn from this, so we have the orthopedic people looking at the types of injuries they

manage. The emergency physicians were getting together in terms of the pattern of injuries. A number of publications in terms of what went well that day and why the survival, which is unprecedented in a disaster, what went well and what can we learn. And hopefully, how we'll be able to manage disasters in the future.

The other thing I would mention is that there's a group called the Hartford Consensus. This is a group that met in actual fact after Sandy Hook, the tragedy in Connecticut where I think it was something like 24 young children and four adults were killed by a shooter --

HARRISON: Yes.

CONN: -- at the elementary school. And the -- Len Jacobs, he's a colleague, he's the chief of trauma at Hartford Hospital, has called together a group of experts to say, "How can we manage these things better?" And I've known Len for years. We're colleagues and buddies, and he asked me to join that group. And one of the reasons I know is because the survival of the Boston Marathon was unprecedented, so what is it that went well? And the answer is two or three-fold. I've mentioned some of them, why it went especially well, the change of shift. But one of the reasons is the victims were very quickly taken from the accident and taken to the trauma center. And the

second one was the application of tourniquets, particularly by Boston EMS, who had the military-type tourniquets.

HARRISON: Can you describe what those are?

CONN: So, a tourniquet is basically, it's a strap which you place round a bleeding extremity to basically stop the bleeding. Now, you think you'd be able to do that with a belt or a tie and just tie it very tight, and the answer's no, not really, it needs to be really tight. If you've ever had your blood pressure taken, the cuff is on your arm and it goes up above your blood pressure, and it stays there for a few minutes. It hurts, but it stops the blood from going to the extremity. In our conflicts in Iraq and Afghanistan, the application of military-type tourniquets to injured soldiers with arm and leg injuries has proven to be absolutely life saving. Together with the special bandages that basically have a special substance in them that, if it's bleeding, [00:55:00] you apply the bandage, the bleeding stops -- it just ceases, stops. It clots. Done.

The Hartford Consensus is trying -- successful -- to change the way we manage disasters. And one of the things I've said is, you know, one of the tragic lessons is that if you've got a school, like Sandy Hook, a movie theatre, Aurora, Colorado, a college, Virginia Tech, or a sporting

event, the Boston Marathon, if any of these occur in your community, you are no longer safe. So, you need to drill and you need to develop a capability of stopping a shooter, if that's what it is, applying the military tourniquets, these special bandages, and rapidly getting patients from the incident to the appropriate hospitals. The plan is to have every fire truck, every rescue vehicle, every police cruiser in the nation having these military-type tourniquets and these bandages on, and for the public to be familiar with what a trauma system is, and maybe even carry a military tourniquet in their first-aid kit in the car. I have one in my car, right? A few weeks afterwards, I went online and bought a military-type tourniquet. Bought two, one for me, it's in my car, one in my wife's car, so that if you come across an accident, or heaven forbid, an incident like this, you've got some of the tools.

The other one is that the Hartford Consensus is looking at the way we manage shooters. And it used to be you needed to wait for the SWAT team, which might take 20, 30 minutes to turn up, before you went in. Now, the police, the first police who are on the scene, they're all armed. They should be armed better, and I think that's another thing we can discuss, but they go after the shooter. But the incident commander says, "I'm going to send 10 people after

the shooter, but the next people that turn up, they're going to go after the victims, they're going to apply the tourniquets, they get them out of that zone." Even though the shooter may be walking around, they can protect them from the shooter but get them to the hospital. Because in that way, we can dramatically improve the survival of these victims, and that's what we showed in the Boston Marathon.

HARRISON: Do you feel like the -- sort of in the past year since this incident, you've been participating in these sort of large think tanks in some way about how to respond. And you've also just changed your position entirely. Are there -- Can you talk a bit about sort of maybe any other changes that have happened over the past year for you that we should know as we're sort of listening to this reflection of what (overlapping dialogue; inaudible)?

CONN: Well, I think that certainly we've -- there have been a number of contributions to the literature. And that, in actual fact, is, you know, being disseminated in the normal way. A number of us have been asked to give (inaudible) at other hospitals, other cities. I know that -- and that's not just the medical profession. It's in EMS, you know, what went right.

HARRISON: Right.

CONN: So, I think that they're using the Boston Marathon to update and change the disaster plans for many major cities. And as I've intimated, any city or town that has a movie theatre or a college or a school now needs to realize that this could be them. And they need to prepare, as well. That, to me, is the big change.

HARRISON: You ment--

CONN: No longer is any community safe, and that's an enormous message. Which, I'll be honest, I thought that, you know, Ground Zero is going to happen in New York and maybe, you know, Chicago and Washington, DC. Potentially Boston, but no, it's every community. Every community needs to be prepared, and the public needs to be prepared as well. Yeah.

HARRISON: The -- You've talked a lot about exchange, from the beginning of our interview today, other doctors coming and helping develop disaster response plans, and now participating in -- with the Hartford Consensus group, and going and giving grand rounds at other hospitals. Can you think of any other types of groups that are coming to you or Boston hospitals to learn about this response? So, if someone, for example, were trying to follow ideas and practices and how they moved out from this to other places?

CONN: We've certainly had... So, one of the -- Hospitals have certainly realized that this is a major part and portion of their mission, that the hospitals can't be [01:00:00] in isolation with their, "Well, we'll wait until you get sick." So, many hospitals now have set up a section or a program in disaster preparedness. So, when you do that, what's the training of those people? What resources do they have? And we've certainly had a number of inquiries and a number of visitors, to "How do we set up a division of emergency preparedness in our hospital? And so, we can be as well equipped and as prepared as many of the hospitals were in Boston upon Marathon Monday." And I think that that's, again, going to roll out. Initially, now, it's a voluntary thing. I think ultimately, the Joint Commission, which inspects hospitals, will say, "Well, in addition to seeing your emergency department and your ICU, we want to see your plans for disaster preparedness, and we want to see specific drills that you've done. And, you know, how are you going to deal with a multiple shooting or an explosion, bomb explosion, in your downtown area? We want to see you drill this." So, I think that's going to be -- That's a change, this approach.

HARRISON: The Massachusetts Department of Public Health has had a disaster emergency preparedness, disaster response department for a while, right?

CONN: Correct.

HARRISON: So, how do the hospitals work with the Massachusetts Department of Public Health, or is that now dividing even further?

CONN: So, again, we've -- what -- we're fortunate in Boston, we've got a long tradition. So, there's both the Boston Emergency Management, and then there's the MEMA, the Massachusetts Emergency Management Agency. So, we work together very closely. We had a number of these drills. And as I say, they really ramped up after 9/11 because we realized that they weren't safe and this was a possible scenario in Boston.

End audio file 1 of 2

CONN: I think that the hospitals, until relatively recently, were sort of a little bit divorced from that.

HARRISON: Yeah.

CONN: Emergency was not something that affected them at all. And if there was a multiple casualty, then we could manage that when the time comes. But disasters are not just disasters like the Boston Marathon, but Hurricane Sandy. I

mean, you knock out a hospital, and it's beginning to make hospitals think how they operate, how they're even constructed. Let me give you an example from Hurricane Sandy.

HARRISON: Please.

CONN: In our new building here, all of the generators and the equipment, they're on the fifth floor. Why? Because in Hurricane Sandy, guess what's flooded first? The basement. All the generators go out, all of the electricity is separate. So, you've now got a non-functioning hospital. You have to close. So, in the design of hospitals, if you are in a flood zone, you better put those generators and things not on the ground floor, but halfway up the building. So, it's beginning to have an effect in terms of the design of hospitals, and that, again, is important. That's, again, it's important, yeah. You've had one of the scenarios we drilled, what happens if we need to evacuate this hospital? And I know that many hospitals in New Jersey had to be evacuated.

I don't know how many of them had drilled for it, but it's hard. You try getting a 500-pound patient down the elevator shaft, also down the stairwell because the elevators aren't working. What are you going to do with all of those patients who are on ventilators in an

intensive care unit? Are you going to take them to the rooftop and take them off by helicopter? Are you going to take them down to ground level? How do you get a person on a ventilator down the stairwell? It's hard. You have to drill it. You may need special equipment to be able to do that. So, all of those things go into the sort of disaster preparedness model. Nobody likes to think about it, but some day --

HARRISON: Yeah, the disaster within the hospital, not just --

CONN: But you need to -- If it's possible, it might happen.

HARRISON: Yeah.

CONN: That's, again, another lesson we learned.

HARRISON: Yeah. So, aside from watching the possible happen in other places and then reacting to it, are there other sort of exercises that are done, ways that the hospital has of sort of imagining and trying to expand its disaster preparedness outside?

CONN: Oh, yeah. Paul Biddinger, our director of disaster preparedness, dreams up the most unlikely and challenging scenarios. You know, what happens if you get a sarin gas attack in the Boston subway? How do we recognize it? How do we protect our staff? Have we got enough supplies?

HARRISON: Right. And there was a concern about that a few years ago, right?

CONN: Absolutely, absolutely. I think as a medical professional, we need to integrate ourselves in the -- let me give you another example. Hospitals are required to look at their local community and develop disaster plans with some of the local factories and manufacturing plants in the community. So, we're adjacent to MIT, across the river, so they probably have radioisotopes, so we need to know about those. There's a cement factory about a quarter of a mile from the hospital, so what chemicals do they have? What happens if they have an explosion? What are the workers going to be exposed to? What do we need to protect our workers from? Is it likely that the hospital will be a target for a terrorist bomb? We're getting to be drones -- you can get a drone and put a bomb on it and then fly it into a building. How's that going to work? How many casualties? So, all these things is -- we need to think about.

HARRISON: And when you says the -- you say the hospital needs to think about these things, the hospital needs to know these things, are there standard roles across hospitals or a particular role at this hospital that's a person or a group of people responsible for knowing those things or thinking about those things?

CONN: And the answer's yes. On disaster preparedness, one of the things that they are tasked to do is to look at the scenarios that the hospital will face, and is it, you know, is it high, medium, or low risk? Is it high probability, [00:05:00] medium, or low probability? And then to try and mitigate those and develop the appropriate plans, and if necessary, the appropriate training for staff or protective equipment. So, we have a small decontamination unit in our emergency department that's a fixture. If we need to decontaminate about 100 people an hour, we can do that. We need 20 minutes' warning, but we can do that. If you need to decontaminate more than that, we can do that, too. And it's not just the disasters -- what happens if we have a new outbreak of flu that is much more severe and overwhelms the hospital? So, you know, we suddenly require another 200 beds in a massive flu epidemic, which seems to be much more virulent? That's another possibility, so we have to be prepared for that, too.

HARRISON: OK. On that note, thinking about the future, is there anything that you want to talk about or put on the record from your experiences with the Marathon Bombing that we haven't talked about?

CONN: No, I'm -- I -- I've mentioned the Hartford Consensus. That, to me, is something that will change the way that

we... not only raise awareness in every community that these tragic events may occur, but how we can best prepare for them. I never thought, going to medical school, I would be dealing with how to manage a multiple casualty incident or a multiple shooting, but it's reality, now. And we have to be able to face that.

And I think that with the efforts of Len and all of those wonderful people who are on the Consensus taskforce, it will change the way we manage disasters of all sorts across the nation. And again, as hospitals develop their emergency preparedness programs, hospitals will allow their staff to obtain the appropriate resources, equipment, training, to be able to combat these tragic events, and ultimately to improve the survival of patients. Yeah, that's what all I'm here for, and it worked well for us on Marathon Monday, and we were wonderfully prepared. And I just want every other institution and hospital worldwide to learn from our experiences in any way they can, and modify their plans accordingly.

HARRISON: OK. Thank you very much.

CONN: Thank you.

HARRISON: That will conclude the recorded portion of your interview. Thank you.

CONN: Thank you.

END OF AUDIO FILE