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Twenty years ago, pioneers and leaders in the Emergency Medical Services (EMS) industry described a vision of data-driven and evidence-based systems in the EMS Agenda for the Future. Since then, the profession has worked tirelessly to fulfill the vision set out in that landmark document.

Throughout 2017 and 2018, the EMS community is coming together to build on this foundational work and advance the vision for the future of EMS. EMS Agenda 2050 is a collaborative and inclusive, two-year project, to create a bold plan for the next several decades. EMS community members, stakeholder organizations, and the public, are all encouraged to get involved in writing a new Agenda for the Future that will set forth a vision for the next thirty years of EMS system advancement.

A note on terminology:

There is ongoing discussion in the profession about how well the term “emergency medical services” describes the full scope of the services provided by EMS organizations and personnel. The EMS Agenda 2050 Technical Expert Panel considered this debate and chose to use “EMS” in this Straw Man document, as the profession has not yet agreed upon another way to refer to the many important services it provides to communities, or the individuals who deliver those services.
ABOUT THE STRAW MAN

A straw man is a proposal put forth to generate discussion.
• It is not as detailed as the final document
• Ideas are included to provoke a reaction, so they can be debated, improved and refined
• It is not all-inclusive—we are counting on everyone to get involved and add more bold ideas

This second version of the EMS Agenda 2050 “Straw Man” was developed based on the input received from the community thus far during the regional public meetings in Silver Spring, Maryland, and Minneapolis, Minnesota; via the EMS Agenda 2050 website; at conference sessions and other opportunities—including a formal request for information, which received responses from many individuals and major EMS organizations. The concept of a Straw Man is to hold ideas and concepts up and allow you to absorb, discuss, and expand them. Hopefully there will be ideas that seem impossible, or others that appear extreme. The goal of the Straw Man is to stretch your thinking and to solicit thoughtful—even passionate—responses. In the spring of 2018, we will release EMS Agenda 2050, and we want you to recognize it as your own.

In other words, this Straw Man is not the end of the process, but simply the end of the beginning. Over the next few months, we hope you poke holes in it, build on to it, or rearrange it. We hope it inspires you to think boldly and give us your thoughts on what EMS should look like three decades from now.
It’s Sunday, January 23, 2050, and in a small community in eastern Nebraska, nine-year-old Carla Hernandez walks into the backyard, taking care not to step on the tomato plants just beginning to grow. Although fresh produce is available by instant drone delivery, she enjoys spending time in her grandmother’s garden. As she kneels next to the kale and begins pulling weeds, she feels a sharp pain in her leg and reflexively swings for the bug that might be biting her. She continues working, but suddenly feels lightheaded and sick to her stomach. She calls to her grandmother for help.

Michelle Hernandez hurries outside, throwing her gardening gloves on the ground. Her granddaughter is lying on the grass, looking pale and gasping for air. Michelle hears a beeping coming from Carla’s earring—wearable devices come in almost any shape nowadays—and then a recorded voice. “Carla, we have detected some abnormalities in your health monitoring. We are notifying the Telemedic Center. Please stand-by.” Michelle kneels next to Carla and takes her hand.

Another voice comes through the earring. “Carla, Hi, it’s Abdi, a Telemedic with emergency services. We received an alert that there was an abnormality and have dispatched paramedics to help. Are you feeling okay?”

“Hi, this is Carla’s grandmother. Something’s wrong with her. Please help!”
“Our monitors received a notification that Carla’s heart rate had accelerated and her blood pressure decreased,” Abdi says. “Activate the emergency app on your mobile and I’ll connect to you.”

Abdi’s face appears on her screen. “Michelle, is Carla responding to you?” he asks.

“Her eyes are open but she’s not answering me and she seems out of it. Her breathing doesn’t sound good either.”

Abdi continues to speak to Michelle, confirming that an emergency medical kit (EMK) drone has already been launched and is on its way to her home.

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Jefferson Bishop is watching a baseball game at home—he loved sitting in the bleacher seats as a kid and had chosen that view for today’s game—when an alert pops up in his 3-D virtual reality display. Someone is having a serious medical event nearby.

“You are a registered volunteer for medical emergencies. Are you able to respond?” read the words across the screen.

“I am on my way,” Jefferson says, and the address appears on his watch. He hops on his bike and rides down his long driveway and turns left just in time to see the emergency services drone pass overhead, headed toward the yellow farmhouse just down the street. “That’s Michelle’s house,” he says to himself.
Jefferson knocks on the front door and someone yells, “In the backyard.” There, he finds Michelle and her young granddaughter, who looks pale and is gasping for breath. “Jefferson, I’m so glad you’re here,” Michelle says.

An experienced respiratory therapist, Jefferson can tell when a patient is sick. He leans down: Carla’s face is swollen and she has hives around her neck and upper chest. He tells Abdi that he thinks she is having an allergic reaction, and he grabs the medication administrator from the EMK. He programs the device to epinephrine and sticks it on Carla’s arm. It quickly reassesses her vital signs, weight and other parameters and administers the calculated appropriate dose.

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Jana Nguyen and Chip Costello sit in the back of their ambulance outside the stroke care clinic, watching live video of the stroke specialists treating the patient they brought in just 15 minutes earlier. Chip is an experienced paramedic clinician while Jana only recently completed her degree in mobile paramedicine with a concentration in community health. She is going over the details of the case with Chip—although she is fully certified, she knows her learning has just begun.
A voice interrupts Jana and Chip; it’s the computer-generated dispatch, notifying them that they are responding to a call for a sick child. Another voice requests that they secure themselves in their seats. They hear the quiet hum as the engine starts. They click into their restraint systems and the screen on the wall flips from the stroke patient’s scans to a map and information about their new patient. Chip swipes the screen and he and Jana begin reading about Carla’s medical history—other than being born 6 weeks premature, she’s been healthy—and see her current vital signs. They agreed that it sounded like an allergic reaction, which was surprising since most allergies were discovered by testing at birth these days and treated prophylactically. Jana knew from her training, though, that occasionally the assays were inaccurate or new allergens emerged that couldn’t be detected by current technology.

Meanwhile, the ambulance accelerates onto the interstate and a few miles later they exit onto Highway 133. Traffic is light in this semi-rural community, but a few self-driving vehicles, receiving automated signals that the ambulance is approaching, stop and wait for it to pass. An alert notifies Jana and Chip that they will be arriving in one minute. Chip picks up his tablet and switches it on—Carla’s record appears on the screen. The ambulance stops and the restraint systems unlock. The paramedics quickly get out, grab their equipment and head to the backyard.

“Hi, I’m Jana and this is Chip. What’s going on?” Jana says to Jefferson, who explains that he just administered the epinephrine.
The paramedics attach Carla to their monitor, running a quick respiratory and cardiac scan. They read the results, confirming that Carla has some constriction in her airways. Her perfusion levels have improved, though, and she’s beginning to regain color in her skin. “How are you feeling?” Jana asks her. Carla, still groggy, says she’s feeling better. Jana explains what is happening and continues with her assessment.

After a few minutes, Carla is feeling much better. Jana and Chip re-contact Abdi, and ask him for a connection to the pediatric emergency specialist on call. A few seconds later, Dr. Nora Henry appears on the screen. She talks to Carla and Michelle for a few minutes, reviews the assessment findings, and asks the paramedics what they think. “It appears as if she had an anaphylactic reaction, possibly to some sort of bite or sting,” Chip says. “Right now, she’s doing much better—I think she can remain home on observation for a few hours.”

Dr. Henry nods. “Sounds good. Carla, I want you to get some rest for a bit to make sure you’re okay. Mrs. Hernandez, we’ll be monitoring your granddaughter and will call to check in shortly. If the next hour goes fine, then I think she can go back to being a 9-year-old. You should get a notification later today about scheduling a visit with an allergist, and the complete report will be available in just a few minutes in Carla’s health portal.”
Jana and Chip help Carla inside and make sure she and Michelle are comfortable with the plan. They quickly do a home health assessment before heading outside to the ambulance. Heading back to the station, Chip and Jana review the information in their report, which was collected based on voice recordings and data transmitted from the Telemedic Center and the medics’ diagnostic equipment.

Meanwhile, Carla rests at home but soon feels better. Michelle is too nervous to let her play outside, but they find an old movie to watch—an old 2D classic that Michelle remembers from her childhood in the 1990s, back when kids had to use their imaginations. The next day, Carla follows up with an allergy specialist who is able to identify what she reacted to and prescribe a vaccine to prevent future reactions.

To be continued…
THE VISION FOR 2050

In 2050, EMS systems are **people-centered**.

In people-centered EMS systems, processes, protocols, technology, policies and practices, are designed to provide the best possible outcome for individuals and communities, day-to-day and during disasters. EMS is a versatile, mobile, community healthcare resource. It serves as the front line of the healthcare system and plays a core role in supporting the well-being of members of the community through data-driven, population-oriented, evidence-based, and safe approaches to prevention, response and clinical care. EMS organizations collaborate with their community partners and have access to the resources they need, including up-to-date technology and a highly trained, healthy workforce.
THE VISION FOR 2050

To achieve this vision, EMS systems in 2050 will be based on six guiding principles, in no particular order:

1. Inherently safe and effective
2. Integrated and seamless
3. Sustainable and efficient
4. Reliable and prepared
5. Socially equitable
6. Adaptable and innovative
The over-arching vision presented here is a **people-centered** EMS system.

**Why people-centered?**

- People-centered because while while caring for patients is our top priority, we must strive to meet the needs of patients’ loved ones and communities, as well as the practitioners who provide care.

- People-centered because for too long, decisions have been made based on tradition, or assumptions, or what’s best for the organization providing care. Effecting this change will require *deliberateness*; a conscious effort to design EMS systems focused on the person, not the system itself.
For example, in a people-centered EMS system:

- People will receive comprehensive care in the place that is most convenient and comfortable for them, rather than be transported someplace else.

- If people do need to be relocated for complex interventions, they will be moved to ambulances using technology to lift and transfer them that dramatically decreases the chance that their care providers will be injured from lifting. The ambulance will not require lights and sirens but take advantage of other advances that prevent collisions.

- People will not only receive lifesaving and disease-treating care, they will also receive care that reduces physical, emotional and psychological suffering; care providers will be given the education and training that adequately prepares them to meet the needs of the people they are called to help.

- EMS providers will have access to, and contribute to, a person’s comprehensive medical record, the same one that is used by all other aspects of the healthcare system.

- Diagnosis and treatment will be supported by comprehensive expert systems that are continuously updated in real-time as new scientific advancements emerge.
The six guiding principles provide a framework for addressing the most critical aspects of developing a people-centered EMS system. By considering the future of EMS through the lens of these principles, the EMS profession can imagine how the individual attributes of an EMS system, from education to clinical care, to quality improvement and much more, fit together to create a people-centered system.

- Inherently safe and effective
- Integrated and seamless
- Sustainable and efficient
- Socially equitable
- Reliable and prepared
- Adaptable and innovative

EXPLAINING THE VISION AND GUIDING PRINCIPLES
Inherently safe and effective

The entire EMS system, from how care is accessed, to how it is delivered, will be designed to be inherently safe and minimize exposure of people to injury, infections, illness, and stress. Decisions will be made with the safety of patients, bystanders, the public, and practitioners as a priority, from how people are moved to hygiene practices in the field and in the ambulance, with a priority on error mitigation. Decisions about clinical care, operations and other aspects of the system will be made based on the best evidence in order to deliver effective service.

Integrated and seamless

Healthcare systems, including EMS, will be fully integrated with each other and with the communities in which they operate. From the patient’s and community’s perspectives, care will be seamless, with communication and coordination between different pieces of the continuum making it difficult for someone to ascertain where EMS “ends” and primary care, in-patient care, specialists, public health, and social services begin.
Sustainable and efficient

EMS systems across the country will have the resources they require to provide care in a fiscally-responsible, sustainable, framework that compensates caregivers with a living wage and allows them to find joy in their work. Efficient service will minimize waste and organizations will operate with efficiency, transparency, and accountability.

Reliable and prepared

No matter when or where someone needs help, or who the practitioner is, patients will receive reliable EMS service that is consistent, evidence-based and compassionate. EMS systems will be prepared for anything by being scalable, able to respond to fluctuations in day-to-day demand, as well as major events, both planned and unplanned, that increase demand for service.
EXPLAINING THE VISION AND GUIDING PRINCIPLES

Socially equitable

In a socially equitable system, access to care, quality of care, and outcomes will not be determined by age, socioeconomic status, gender, ethnicity, or other social determinants. In every community in the nation, EMS systems will be able to provide any resident or visitor to the United States the best possible care and services, in order to maintain the health of individuals and populations. Caregivers will feel confident and prepared when caring for children, people who speak different languages, persons with disabilities, or other populations that they may not interact with frequently.

Adaptable and innovative

An adaptable healthcare system, including EMS, will quickly and effectively meet the evolving needs of the population. EMS will continuously and methodically evaluate new technologies, system designs, educational programs, and other aspects of the system in order to best meet the needs and desires of the people and communities it serves. Innovative individuals and organizations will be able to test new ideas and implement effective new programs.
HOW WE GET THERE

A note about this section:

These are ideas generated by the Technical Expert Panel (TEP) and the broader EMS and healthcare communities, including providers of all levels who have attended EMS Agenda 2050 public meetings and submitted input online. How they will ultimately be organized, articulated and prioritized in the final EMS Agenda 2050 will be part of the feedback process. For now, for the straw man process, we want to know:

What ideas resonate?

What has been left out?

What needs to be combined or eliminated?
INHERENTLY SAFE AND EFFECTIVE

The entire EMS system, from how care is accessed, to how it is delivered, will be designed to be inherently safe and minimize exposure of people to injury, infections, illness, and stress. Decisions will be made with the safety of patients, bystanders, the public, and practitioners as a priority, from how people are moved to hygiene practices in the field and in the ambulance, with a priority on error mitigation. Decisions about clinical care, operations and other aspects of the system will be made based on the best evidence in order to deliver effective service.

LOOKING INTO THE FUTURE • PART II

After lunch, Jana heads to the station training room, where she quickly completes the afternoon fatigue assessment so she can go back in service—she passes. Taking advantage of a few minutes of down time, she initiates an adult cardiac arrest training scenario. The walls of the completely empty room suddenly change, now appearing like a restaurant. She puts on her safety goggles, which automatically activates a heads-up display and the 3D virtual scenario. She sees a woman frantically waving her toward what appears to be a middle-aged man—he can’t be over 70—lying on the ground near the salad bar.

But before she can take another step, the walls turn white and she’s back in the training room as she’s alerted by her watch that there’s a call. Stepping into the ambulance, Jana has a seat. Her partner, Chip, sits across from her—he has 24 years of experience and she’s already heard some of his stories more than once. A millennial, he’s always kidding her about “kids these days” who don’t even remember what it was like when paramedics actually had to drive ambulances and they ran calls for car crashes every day. Now, it’s rare—but as a voice tells them the ambulance will begin moving, they view the screen and see that that’s exactly what they’re responding to now. A car traveling on Route 75 a few miles north of Omaha was apparently struck by a deer. It’s an antique vehicle—a 2018 electric—so while it’s been retrofitted with the required passenger safety system and automatic crash notification, it hasn’t been equipped with video or other sensors.
INHERENTLY SAFE AND EFFECTIVE

However, while they are en route, a response drone reaches the scene and soon live video pops up on their monitor. It doesn’t look like there’s too much damage to the car, which is pulled over on the side of the road. It looks like another vehicle has stopped in front of the Tesla and a police officer is pulling up behind it.

“Remember, these old vehicles can be dangerous,” Chip says. “They don’t always automatically shut off, and they can leak fluids or have broken glass.”

No vehicles are in front of them, having all automatically pulled over or rerouted. Chip laments the lack of flashing lights and sirens—Jana reminds him that his mentors had all been deaf by the end of their careers, and he should be grateful. He rolls his eyes as the ambulance slows down and stops. The ambulance lowers to the ground and Jana steps out and walks toward the driver of the vehicle who’s holding his arm and wincing in pain…
EMS system organizations at all levels will adopt a culture of safety.

- Education and training for the EMS workforce will include curricula that cover all aspects of provider and patient safety, including the recognition, assessment and de-escalation of potentially violent or dangerous situations.

- EMS systems across the country will use a standardized method of collecting and reporting data on provider injuries and illnesses, medical errors, injuries to patients and near-hits in order to evaluate improvement efforts, facilitate research and develop evidence-based safety training and procedures.

- Funding and regulatory mechanisms will incentivize safe and evidence-based practices.
INHERENTLY SAFE AND EFFECTIVE

Integrated technology and artificial intelligence will provide situational awareness and decision support.

• Real-time information will be delivered to EMS personnel while responding to calls, including video and sensor data from the scene.

• Wearable devices will be able to alert providers on a scene to any potential safety hazard, from CBRNE threats to personal health issues.

• Real-time, automated decision-making support will be provided to ensure evidence-based care is delivered to all patients based on all information available on the scene, in patient records and in published research and guidelines.
EMS systems will prioritize technology and equipment that limit the safety risk to providers and patients.

- EMS professionals will not have to lift or move patients, taking advantage of technologies that safely move patients.

- Out-of-hospital medical care will allow for delivery of time-sensitive interventions on the scene, eliminating the need for rapid transport.

- EMS data systems will be safe and secure to protect patient health information and patient privacy.

- Medication delivery systems will use real-time and historical data from health records to deliver appropriate and correctly-dosed medications specific to each patient.
Evidence-based methods will prevent EMS personnel fatigue from impacting the safety of the workforce, their patients or the public.

- Regulations to limit the number of consecutive hours worked by EMS personnel.
- Adequate breaks and rest during shifts.
- Sufficient pay and staffing to avoid the need for extensive overtime and working multiple jobs.
- Physiological or other methods will be used to objectively test an EMS worker’s level of fatigue before, during and after shifts.
Jana introduces herself to the driver of the car, who is holding his left arm. He says his name is Liam, and says he was driving around 50 miles per hour when a deer ran right in front of the car. He says he tried to swerve but ended up hitting the deer and sliding to a stop, which bumped his arm against the door. Liam, who is 57 years old, thinks it’s just bruised. He denies any other injuries. Jana puts a small sticker on his wrist to check his vital signs. The sticker turns green, indicating no immediate life threats were detected.

“May I access your health information and your car’s records?” Jana asks, and Liam says yes. His response activates the transmission, and Jana’s watch beeps. She taps a few buttons and sees she has the sensor and video information from the Tesla as well as Jaoquin’s medical records. She reads the summary, which provides the critical info that she needs—Liam received one nanotreatment for hypertension four years ago, he has no allergies, and his last health screening was three years ago. She pulls up the data from the car accident—the video shows exactly what Liam described, and the report indicates only a moderate deceleration with minimal damage.

While Chip continues to chat with Liam and examines his arm, Jana hears a beep and looks at her watch, which alerts her that Liam’s blood sugar is not normal for him. She’s surprised—her teachers had taught her that these alerts happened so rarely now that most people monitored their own vitals regularly at home and received immediate treatments.
“I’m a little old school,” Liam says when she asks him, explaining that he never puts the monitor sticker on at home. “I’ve never been a big fan of all this fancy technology.”

“Well, this technology could save your life,” Jana says. She tells him what she found, and says that while it’s urgent, it doesn’t need immediate treatment—they’ll make sure his doctor receives the information and gets in touch with him soon to take care of it.

Liam’s arm is extremely tender and starting to bruise, so Chip puts on the imaging gloves and holds them over the spot of the injury. The display on the glove indicates a fracture was not found and there is less than 0.5% chance of any vascular injury. Chip explains what the numbers mean to Liam and they briefly discuss what the risks are; he decides he’d rather just head home. With his arm clearly still causing some pain, they put a non-addictive pain patch on the site of the injury to provide some localized relief tailored to him specifically. The self-driving transit vehicle, automatically sent by the medical command center, arrives and Liam gets in, headed home.

Jana and Chip return to the ambulance. A voice reads the automated report, compiled by the computer through data transmission and voice recognition.

“Confirm desire to notify patient’s physician and transmit report to patient record and EMS database,” it concludes.

“Yes please,” Jana says, finally taking a sip of her coffee as the ambulance heads back toward its station.
EMS personnel will have immediate access to any resources needed, including healthcare providers, social services and other community resources.

• EMS must have knowledge of the available resources and be able to link patients with the appropriate organization or entity that will provide the care and service that they need.

• Information and communication systems will be connected and continuously updated and improved to ensure immediate access to the right resource for the right patient.

• Medical communication centers, integrated with public safety answering points, will serve as hubs for unscheduled, non-acute healthcare, using evidence-based methods to triage potential patients and provide the appropriate resource or referral, including telemedicine care.
INTEGRATED AND SEAMLESS

Design a fully integrated, patient-centered medical record that EMS personnel can access and contribute to.

- A real-time, national healthcare data system, that can be accessed remotely through a safe and secure authentication process of both the patient and the provider will provide patient health information to EMS personnel in the field.

- Information will be provided to EMS personnel in the field in a way that is easily digestible and gives them the information they need to support decision making at that time.

- Ensure that paramedics have access to patients’ care plans and are included as part of the patient’s medical team.

- Provide rapid feedback to EMS providers of outcomes and other data from hospitals and other EMS partners in order to improve performance measurement, quality improvement and education.
INTEGRATED AND SEAMLESS

Move EMS from a rapid treatment and transport paradigm to a system where EMS can more accurately assess patients and ensure they receive the right care and access the necessary resources.

- Hospitals, skilled care facilities, medical offices and EMS must work together as a team to ensure smooth transitions of care for patients.

- Partners throughout the healthcare system, including hospitals, mental health facilities and medical clinics, should work to better understand EMS and create partnerships that improve population health and care delivery.

- Incorporate EMS and inter-facility/critical care transport, including air medical resources, into regional systems of care.
Use EMS data to its fullest extent in order to improve population health, preparedness, research and more

- Implement data systems that produce real-time knowledge about patterns of disease and injury, based on populations, geography, demographics, or other criteria.

- Integrate EMS and public health data to help identify emerging outbreaks or demographic trends in injury and illness patterns.

Education of EMS professionals must promote integration of care.

- Education of paramedics needs to include a comprehensive orientation to public health, social services, mental health and social determinants of health in a way that truly empowers them to provide integrated care.

- Create inter-professional education systems that prepare EMS personnel and healthcare colleagues to work with each other collaboratively.
EMS oversight should come from experts with specialty training that includes health integration, patient navigation, public health, managing population health and social determinants.

- In addition to EMS physicians and paramedics, other specialists should be consulted and included in the medical oversight of the EMS system, including but not limited to, pediatricians, psychiatrists and other behavioral health experts, pain specialists, cardiologists, neurologists, pharmacists and others.

- EMS medical oversight for specific patients and/or populations will include close collaboration with the physician(s) who make up the patients' medical home.

- EMS should take advantage of technology to connect with EMS physicians, the patient’s physician or specialists during patient care when direct consultation adds value and improves outcomes.
LOOKING INTO THE FUTURE • PART IV

When they arrive at the station, Jana and Chip grab a quick snack. Jana makes sure to print a pain patch and vitals sticker from the 3D printer in the supply room. The monitor on the wall is displaying the public measures that are constantly available for viewing; Jana learned about the importance of data and measurement in her paramedic education. The screen is currently displaying a chart that shows years-of-life saved per dollar spent on the community’s emergency care system in the last month. She doesn’t know the specifics of these calculations, but she does know how critical it is to provide effective and cost-efficient care in order to demonstrate to taxpayers the value of paramedics.

Just last week, she read a series of articles on the efficiency and effectiveness of the essential services provided by the county. While she usually focused on patient care, she found it fascinating to learn about the history of funding for EMS—not that long ago, it turns out, many ambulance services took every patient to the hospital because payment policy incentivized it. Now she knew, thanks to the public measures her agency reported, that only 12 percent of people who contacted medical command were taken by an ambulance to the hospital. Most were assessed and treated at home and given follow-up instructions or referrals.
Jana hears a beep, letting her know the ambulance is fully recharged and the station’s charging system is powering down. She knows that the command center will also receive an alert and might notify her shortly of a new assignment—possibly home health inspections or even follow-up visits. Jana particularly loves following up with people who’ve been seen recently by her colleagues or local physicians. It was a chance to really talk to them in a calmer setting and hopefully prevent any need for them to require acute medical care any time soon.

As Jana predicted, the station screens light up a minute later. Chip looks up from his coffee and a smile brightens his face. “Sophia! Long time no talk,” he says to the woman whose face has just appeared. “Chip—how you been?” she replies. Chip turns to Jana. “Jana, do you know Sophia? She’s my favorite MedComm Tech.”

“Oh, okay, enough chit-chat. I have an assignment for you. You’re headed to the east side. We have six visits for you. I’ve already talked to each of them—just thought they needed that in-person empathy that only you can provide, Chip. Seriously, though, I sent all the information to you already, most of them would greatly benefit if you can check a lab value or do a safety check. Have fun.” She signs off, and Chip and Jana head toward the ambulance.
SUSTAINABLE AND EFFICIENT

System design, equipment needs and treatment protocols should be based on patient outcomes and cost.

- Design funding schemes to incentivize the most appropriate care for the patient.
- Ensure full transparency with individuals and communities so they know the cost of the service they are receiving and can make informed decisions.
- Invest in technologies that will improve care and save money in the long-term.
Support EMS as an essential service in all communities.

• Invest in ways to explain the EMS mission and educate the public about the important role it plays in preparedness and the population's health at the local, state, and national levels.

• Develop cost-controls for critical live-saving equipment and medications, increasing accessibility and consistent availability throughout the country.

• Ensure funding that allows for a professional, highly-capable workforce.

Create Medical Command Centers, incorporated with public safety answering points, that serve as integrated assessment and resource centers, allowing them to make decisions about resources needed for patients.
While en route to their first scheduled follow-up visit, Chip and Jana review the patient’s record. Suddenly they are interrupted by an announcement that they have been rerouted to an emergency. An explosion has occurred across the river just outside of Council Bluffs, Iowa. Jana knows the area—she received her paramedic education and was initially licensed in Iowa. To pay for her paramedic bachelor’s degree, she signed up for the U.S. Public Health Service, which deployed her for two years to her current area outside of Omaha. Her next assignment could be anywhere, although she would request a remote location out west; then her four-year commitment would be up. She loved the chance to see new places, expand her skills and help ensure paramedic coverage for communities that needed it.

The information coming in indicates that the explosion has just occurred three minutes ago and they were on the initial response. The first responders are arriving on scene, as are additional driverless vehicles to help transport seriously injured patients. The video feeds Jana and Chip are watching showed a tremendous fire and large amounts of smoke—it’s hard to see how many people are hurt or what else is happening on the scene. They receive notifications that several patients are being taken to the burn center in Omaha. At the same time, a mobile burn unit is en route to one of the local trauma centers to augment its capabilities and other patients are being transported there.
An alert sounded, indicating the next message is directly for them. “Rerouting to Council Bluffs Hospital for triage and decon assignment.” Jana knows that probably means most of the patients have already been transported. Chip has special training in hazardous materials medicine; he will be assisting the emergency team at the hospital, while Jana will be assigned to help triage the patients arriving.

They arrive and immediately go to work, their assignments provided in advance. Although she’s never been to this particular hospital before, she easily follows the directions of her heads-up display and reports to her post, near the entrance. Vehicles are arriving—some ambulances, some smaller cars with just a patient, others with a patient and a paramedic or a trained civilian responder. With the hospital staff now overwhelmed treating patients, paramedics like Jana take over initial triage and intake. She also records a brief audio message about the patient for the hospital staff to listen to and then ensures their automated transport beds take them to the right place.

After about 30 minutes, the last patient has been triaged—with minor injuries, he is rerouted to a community health center nearby. She finds Chip, and they head inside the hospital to find water and attend an initial debriefing. Members of the Provider Mental Health Response Team speak with the EMS and hospital staff as soon as possible. Chip and Jana are given the okay to return back to the station, where they will get a chance for a short rest before finishing their shift.
Ensure consistent, reliable EMS service across the country.

- Implement evidence-based statewide or national programs, such as a public health service model, that place paramedics in areas of need and avoid oversaturation of paramedics in areas with adequate coverage.

- Use trained civilian responders of all levels to assist with response when necessary, from initiating CPR to bleeding control and other evidence-based methods.

- Create pathways for transitioning system models that rely on volunteers who may or may not be available to models that can ensure adequate staffing at all times.

- Make EMS a more attractive career option through better pay, benefits, and career paths that encourage experienced clinicians to remain in the field.

- Incentivize states to adopt a national scope of practice and certify providers for all levels, including those not based on ambulances such as emergency medical responders and emergency medical dispatchers.
Reliable and Prepared

Improve paramedic education to reflect EMS practices in the field and prepare them to practice in any environment.

• Expand bridge programs to take advantage of veterans' military medical training and experience, ensuring that veterans are adequately prepared to work in non-military EMS environments.

• Expand options for paramedics to receive degrees in EMS Associates, Bachelors, masters, etc.

• Create more education programs for EMS educators to ensure the people teaching at all levels, from initial certification through advanced degree programs, are qualified.

• Provide opportunities for providers to receive specialty training and certifications and maintain a database of those certifications in order to get the right provider to the right scene and patient.
Use data and monitoring to predict and/or immediately respond to emergencies from cardiac arrest to mass casualty incidents.

- Use healthcare and other information systems to identify members of the community in need of special assistance prior to and during disasters.

Plan for and allow for more flexibility in the practice location and setting of all healthcare professionals.

- Allow hospital-based employees to practice in the field and for EMS personnel to practice in the hospital and other settings, when emergency situations create demands.

- Train practitioners and prepare EMS systems to treat, evacuate, and care for "hospital at home" patients and other residents of the community with needs during a disaster.
Create educational and training opportunities for all providers to prepare for low-frequency events, including mass casualty situations.

- Use technology to provide lifelike simulations and make this training available to all EMS providers and agencies.
- Use “just in time” training to allow EMS providers to get training they need en route to an emergency.

Prioritize succession planning and leadership education for a new set of leaders in every EMS system.
LOOKING INTO THE FUTURE • PART VI

Jana and Chip head back out in the ambulance for a non-emergent follow-up visit with a patient whose physician requested an in-person assessment. While most follow-ups are performed virtually, in this case the patient felt more comfortable having someone come see her. Chip isn’t surprised. “She’s 96 years old,” he says. “When she was your age, computers were new and no one even had mobile devices yet. Every visit with a health-care provider was in-person.”

Jana sometimes had trouble visualizing what it must have been like working as a paramedic then, when medications were administered using a needle and imaging wasn’t available in the field. Jana tells Chip she would look through the patient’s record, so he reclines his seat and closes his eyes.

When she taps the screen, an image of Dr. Kelly Vorski appears. While Jana has never met Dr. Vorski before, she recognizes her from previous patient’s charts. Jana taps her earpiece so the sound will come through it, rather than the main speakers. Dr. Vorski begins speaking, explaining that the patient, Abigail Maina, is scheduled to receive an artificial heart any day now. She’s been a little short of breath the last few days, and her monitors indicated she has some fluid overload.

“Does she live alone?” Jana asks. As Dr. Vorski responds—the answer is yes—Jana has to remind herself that the doctor is an avatar, not a live video, programmed to respond as Dr. Vorski would.

In a socially equitable system, access to care, quality of care, and outcomes will not be determined by age, socioeconomic status, gender, ethnicity, or other social determinants. In every community in the nation, EMS systems will be able to provide any resident or visitor to the United States the best possible care and services, in order to maintain the health of individuals and populations. Caregivers will feel confident and prepared when caring for children, people who speak different languages, persons with disabilities, or other populations that they may not interact with frequently.
Jana continues asking questions and learning more about Ms. Maina until the ambulance arrives in front of a small home with a yard in need of a mow.

Ms. Maina opens the door. Jana knows from Dr. Vorski that she does not speak English very well, but wears a hearing aid that translates into her native Swahili. Jana’s earpiece will translate into English so she can understand what Ms. Maina says.

It’s clear to Jana that Ms. Maina feels extremely anxious. She says her breathing has improved over the last few hours since her medication patch adjusted the dose in response to her fluid levels, but she’s nervous that it could still get worse again and she won’t be able to have her surgery. Jana talks to her for a few minutes and realizes her anxiety is worse than she initially thought. She offers reassurance that her medical condition is being controlled, but also sends a quick voice message to a counselor, who responds that she is available to help. Jana explains to Ms. Maina that it might be better for her to speak to a trained counselor, rather than Jana, and Ms. Maina agrees.
SOCIALY
EQUITABLE

Patients’ age should not impact the quality of care they receive.

• EMS initial and continuing education and simulation that assures providers are as comfortable treating infants and children as they are treating adults.

• Systems should develop evidence-based protocols and have equipment appropriate for every age range in the patient spectrum.

• Medical research should include safe ways of assessing the treatment of, and equipment used, for patients of all ages from neonates to the elderly.

• Industry should be incentivized to develop equipment that can be adjusted to the age and size of patients in order to safely assess, treat and transport patients of any age.
Geography should not impact the level of EMS service or quality of care provided to a community or individual.

- EMS systems across the nation should have equal access to technologies, devices, and other tools that are shown to improve patient care and/or patient and provider safety.

- Virtual models of care must be developed in order to efficiently provide specialty care and other resources in rural communities. Telepresence and virtual reality technologies should provide EMS the ability to consult with the patient's PCP in the community or a specialist hundreds of miles away, rather than transporting patients long distances to a specialty center far from home.

- EMS education should be subsidized if the practitioner commits to serving in underserved communities where they are needed.

- There should be national clinical guidelines with published levels of evidence. When 1A evidence exists, there should be no difference from one system to another.

- Scope of practice for EMS practitioners should be uniform across the country, but also must be adaptable for specialized needs like wilderness and tactical medicine and allow for flexibility to respond rapidly to changing practice standards and environments.
The most appropriate care should be available to a patient regardless of income or socioeconomic status.

- Ambulances and air transport should be used more judiciously and with more transparency regarding the benefits and risks, as well as costs, in order to avoid surprise medical bills.

- Treatment and, if necessary, transport decisions should be made based on clinical needs as well as the wishes of the patients and their families.
EMS care must be evidence-based but also tailored to individual patients’ needs and desires.

- Patients with behavioral emergencies and other mental health needs will receive care in the field from providers trained to address their concerns.

- EMS practitioners must be educated on how implicit bias impacts patient care. EMS practitioners must be educated on how implicit bias impacts patient care and how to overcome it.

- The EMS profession should strive to achieve diversity throughout all levels, including leadership, educators and field providers.

- Language should not inhibit delivery of the standard of care.

- EMS education must include more appropriate training on how to advocate for a patient in today's healthcare system.

- EMS must improve end-of-life care, including the use of technology to allow access by EMS to advanced directives and other methods to ensure the patient’s wishes are known and met.

- Compensation for the EMS workforce will enable EMS providers to live in the communities they serve.
LOOKING INTO THE FUTURE • PART VII

Jana’s shift is coming to an end, and she’s looking over some messages in her inbox before she heads home. The chief has passed along a message from the state EMS innovation officer. The memo describes the results of a recent test of a new patient movement device—according to the data, after only a month of use across the state, the number of injuries reported by paramedics has already declined.

The next message is from the agency director herself, asking Jana to stop by her office next week to discuss joining the Quality Improvement, Research and Innovation Committee—two spots on the committee are reserved for providers in their first three years, and Jana already told her supervisor that she’s interested. In school, she took elective courses in EMS Innovation Management and Clinical Research, so she’s excited to get involved. The idea of meeting with the director is intimidating. Twenty-seven years ago, as an economics graduate student, Director Rodgers developed a model for EMS systems that fundamentally changed how medical care was provided outside the hospital. Since then, she spent time in academia and also launched a start-up that revolutionized mental health care. Two years ago, the regional EMS system convinced her to lead the system.

Jana grabs her bag and heads for the door. On her way out, a voice reminds her that she hasn’t completed her post-shift survey and fatigue screening.

ADAPTABLE AND INNOVATIVE

An adaptable healthcare system, including EMS, will quickly and effectively meet the evolving needs of the population. EMS will continuously and methodically evaluate new technologies, system designs, educational programs, and other aspects of the system in order to best meet the needs and desires of the people and communities it serves. Innovative individuals and organizations will be able to test new ideas and implement effective new programs.
She quickly answers a few questions about some of the new equipment being used on the ambulance, including the new imaging sleeve she and Chip used on the guy who’d been in the car crash earlier in the day. Her department was one of seven in the country currently testing the device. Based on analysis of the patient care data and the provider satisfaction survey, they will probably know in a few months if the sleeve was an efficient and effective method of assessing patients.

Jana walks a few blocks, enjoying some time outside, and hops on a high-speed train. She lives just a few miles away, and in four minutes she’s outside again, walking toward her apartment. She can’t believe how lucky she is to be working as a paramedic, in a field that is constantly changing and improving.
Create an EMS education system that provides a strong foundation of knowledge but also recognizes the rapid pace of change in the field.

- Include more paramedic education on how research and the evidence base, change the standards of care, rather than teaching the current standards as if they are the only method of treatment.

- Teach innovation techniques to EMS professionals, including prototyping and rapid implementation, testing and evaluation.

Fostering innovation will be a priority of EMS leaders and leadership training and education

- EMS leaders will have same level of training and preparation as other high-performing industries.

- EMS should recruit innovative leaders from other fields who can bring new skills and ideas.

- EMS leaders should promote “psychological safety” for innovation teams, including conflict management, communication, blame, reaction, curiosity, feedback and measurement.
ADAPTABLE AND INNOVATIVE

Facilitate rapid and safe innovation, research and dissemination of results throughout the profession.

- Develop systems for testing and evaluating training and equipment, and disseminating information throughout the profession.

- Establish systems for regular exchange of practices between civilian and military EMS.

- Increase federal and state support for innovative pilot projects that have the potential to improve outcomes or reduce costs, and use rigorous measurement and evaluation protocols.

- Increase funding for EMS research tied to outcomes beyond mortality, extending to others such as morbidity, the patient experience, healthcare utilization, and cost of care.

- Reduce barriers to conducting clinical research and trials in EMS

- Encourage more QI-based research in order to accelerate the pace of research, and change through a plan-do-study-act cycle.

- Build collaborative forums for providers and organizations to share best practices and new ideas.
Two decades ago, the EMS Agenda for the Future described 14 attributes essential to an effective EMS system. Those attributes were:

1. Integration of Health Services
2. EMS Research
3. Legislation and Regulation
4. System Finance
5. Human Resources
6. Medical Direction
7. Education Systems
8. Public Education
9. Prevention
10. Public Access
11. Communication Systems
12. Clinical Care
13. Information Systems
14. Evaluation
The public conversation leading up to the development of the EMS Agenda 2050 Straw Man included a discussion about the 14 attributes—are any no longer relevant? Was anything not included that is necessary today?

Each of these 14 is still important, but members of the EMS profession have suggested several others that could be included today, such as:

- Preparedness and Surge Capacity
- Patient and Practitioner Safety
- Systems of Care
- Public Health and Planning
- Stakeholder Engagement and Customer Experience
Organizing the original EMS Agenda for the Future around the attributes paved the way for important developments in each of those areas. At the time, EMS systems were emerging from a period of rapid growth and improvement over the previous two decades. Characteristics of systems that are taken for granted today—a national data standard, local 911 access to emergency dispatchers, a national scope of practice for EMS practitioners—had not been achieved. Clearly, not every goal has been reached, but much progress has certainly been made toward ensuring those 14 attributes are part of every EMS system.

EMS Agenda 2050 will consider each of these attributes, and more, but the Straw Man proposes an approach that looks at them not as separate components; rather, they are interwoven together. For example, information systems and communication systems are more and more becoming one and the same, as digital technologies allow for rapid and easy sharing of health information.

The growth of mobile integrated healthcare programs, community paramedicine, and other innovations has blurred the lines between clinical care, prevention, and public education. EMS education and training systems are the backbone to just about everything we do. So while each of these attributes will not individually be addressed as its own section, none of them is any less critical to providing people-centered care than it was when visionary leaders came together to write the original EMS Agenda for the Future more than 20 years ago.
APPENDIX B: THE PROCESS

STRAW MAN DEVELOPMENT

This EMS Agenda 2050 Straw Man was developed based on the input received from the EMS community and public, through a formal request for information, informal conversations, the EMS Agenda 2050 website, conference sessions and other opportunities for feedback.

20TH Anniversary of the 1996 EMS Agenda for the Future
2016

RFI for the New Agenda for the Future Released to Gather Community Feedback
Spring 2016

Technical Expert Panel Convened
March 2017
The release of the Straw Man kicks off several more opportunities for the EMS community, our partners in healthcare and public safety, as well as members of the general public to provide input on the Straw Man. Those opportunities will include conference sessions, a webinar, and four public meetings.

**Public Meetings**

- **Silver Spring, MD**
  - September 25, 2017
- **Minneapolis, MN**
  - November 7, 2017
- **Los Angeles, CA**
  - January 17, 2018
- **Dallas, TX**
  - March 1, 2018

Find more information about the meetings and sign up to attend at [EMSAgenda2050.org](http://EMSAgenda2050.org).

You can also join a webinar on January 24 or provide feedback on the Straw Man online by visiting [EMSAgenda2050.org/share-comments](http://EMSAgenda2050.org/share-comments).
In the spring of 2018, a draft of EMS Agenda 2050 will be released for comment. After reviewing the feedback on the draft, the Technical Expert Panel will finalize EMS Agenda 2050.

**EMS Agenda 2050 Draft**
April 2018

**Public Comment Period**
May 2018

**Final EMS Agenda 2050**
August 2018
Following the release of EMS Agenda 2050, a National Implementation Forum will be held in September 2018 to discuss how to turn the vision for the future of EMS into a reality.
APPENDIX C: WHO’S INVOLVED

TECHNICAL EXPERT PANEL

The Technical Expert Panel (TEP) is tasked with listening to community input and gathering evidence to craft a vision for the future of EMS. Its members bring diverse competencies and backgrounds in public safety and healthcare and a history of innovative thinking and a passion for making a difference in the lives of patients and providers. Facilitating the work of this group is Mike Taigman, Improvement Guide for FirstWatch, performance improvement facilitator, and former paramedic. Meet the EMS Agenda 2050 TEP*:

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*The TEP would also like to acknowledge the contribution of Grace Mandel, MPH, EMT, who served as a member of the panel during the initial phase of EMS Agenda 2050 but resigned after accepting a new position within the Federal government, which made her ineligible to continue serving as a member of the panel.
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