

October 16, 2020

Safety Innovation and the Future of EMS



EMS LEADERSHIP
SUMMIT
EMSLeadershipSummit.com

 @911Leadership

Nadine Levick, MD MPH
Research Director, EMS Safety Foundation
CEO, Objective Safety
Director of Research and Innovation, Emergency Health Services



EMSSafety
FOUNDATION
Innovation, Collaboration & Knowledge Transfer

www.EMSSafetyFoundation.org

Much of what you shall hear today is thanks to the work of all of those in the:



**and the National Academies of Science,
Medicine and Engineering
Transportation Research Board's
ANB10(5) EMS Safety Subcommittee**

Today's Outline

- Future is now!
- New World Order
- Cross skilling Industry and providers
- Innovation dimensions
- Cheaper Better Safer
- Open source
- Challenges

The Future is NOW!

Space based solar power, million mile battery, eVTOL & XR

Morning Brief: Secret Air Force space plane to beam solar power to Earth, Tesla's 'million-mile' battery

Also in the brief: DOE kicks off \$230 million advanced reactor demonstration program, and the global coal industry will never recover from the Covid-19 pandemic.

MAY 18, 2020 **ERIC WESOFF**

The U.S. Air Force launched its [secret X-37B space plane](#) on Sunday for a long-duration mission in low Earth orbit. Ahead of its sixth launch, the Air Force gave some rare details about its cargo: a solar panel developed by the Naval Research Lab will be used to conduct the first orbital experiment with space-based solar power. The premise is to convert the sun's energy into microwaves and beam it down, an idea from science fiction writer Isaac Asimov in the 1940s.

This experiment is likely related to the Air Force Research Lab's Space SSPIDI effort to collect solar energy with high-efficiency solar cells, convert it to RF, and beam it to earth — providing an energy source to forward operating bases with limited traditional power sources. AFRL awarded Northrop Grumman a \$100M contract for space-based experiments supporting this program. *Sources: U.S. Space Force, WireImage*

Tesla CEO Elon Musk has been teasing investors and rivals with promises to reveal significant advances in battery technology at a "Battery Day" this month — now postponed. The new "million mile" battery at the center of Tesla's strategy was developed with China's Contemporary Amperex Technology Ltd (CATL) and a team of battery experts recruited by Musk. Tesla's new batteries rely on low-cobalt and cobalt-free battery chemistries, and the use of additives, materials and coatings that will reduce internal stress and enable longer duration. The cost of CATL's cobalt-free lithium iron phosphate battery packs has fallen below \$80/kWh. CATL's low-cobalt NMC battery packs are close to \$100/kWh. *Source: Reuters*

eVTOL and XR

electric Vertical Take Off & Landing and mixed reality



Next is now!

- Fleet mix
 - Vertical take off vehicles
 - Drones
 - Unmanned Drones
- Smart Technologies
 - AI dispatch
 - Voice activated commands
 - Advanced Smart phone technology
- XR - Mixed reality
- Covid PPE and innovation
- Connected health
- Wireless patient monitoring
- Health Information Exchange (HIE) Applications

**Be ready to deploy new and
effective tools for both
training and operations**

Chris Cebollero, 2020

- "Leadership is not about position, it's about professional development."
- Leadership as a verb, it's an action not a position and everyone will influence someone else... for the good or the bad.

New Solutions

- Training and education
- Operational tools
- Transport Vehicles
- PPE innovation
- Support tools and adjuncts

Leadership and Innovation

- “Being responsible sometimes means pissing people off... By procrastinating on the difficult choices, by trying not to get anyone mad, and by treating everyone equally "nicely" regardless of their contributions, you'll simply ensure that the only people you'll wind up angering are the most creative and productive people in the organization.”



A Leadership Primer from General (Ret.) Colin Powell,
Former Secretary of State, USA

So what is safety?

- condition of being protected against undergoing or causing harm, injury or loss

And.. what is innovation?

- Something new,
original and more
effective

Joe Bourgraf, President, Ferno Group

- “To create an innovative and model EMS system..., we must engage in a collaborative and cross-functional conversation among the many contributing partners in the EMS industry. EMS suppliers should embrace and drive new innovation.. to improve the process and efficiency of delivering service, while advancing the level and outcome of emergency care”

From low tech to high tech

- System of Safety
- Think of the overall impact
- Small low cost changes in practice
- Policies that augment safety
- Innovation in design from micro to macro
- Preparedness and Training

Safety of the...

- Provider
- Public
- Patient

Safety is a tool to save

- Lives
- Time
- Money

must be evidenced based

Work Smarter NOT Harder

To Do...

- The right thing:
 - At the right place
 - At the right time
 - For the right person

- How best to achieve that goal now and for the future??

June 9, 2020

June 9, 2020 | [View as webpage](#)

EMS1
Newsletter



TOP STORIES



Patient dead, 2 EMS providers injured after rollover rig crash

The patient was receiving CPR en route to the hospital when the crash occurred

EMS Safety's frontier -

- the interface of disruptive new tech and operational practice at all levels of the EMS system and across disciplines

1980's Then....



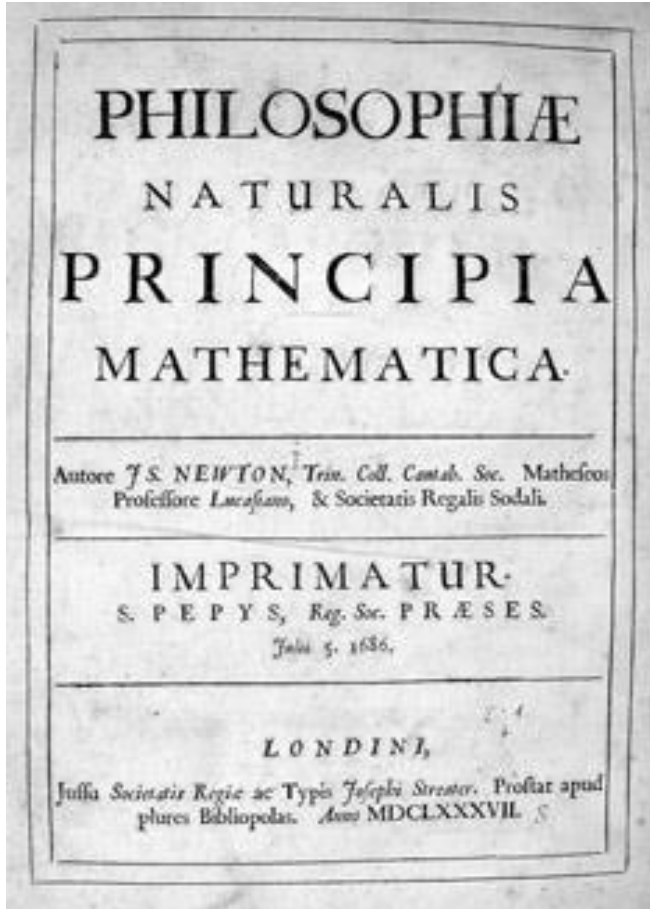
And NOW!...

USA 1980's Then....



And 2020...

The Laws of Physics Prevail..



*Philosophiæ Naturalis Principia
Mathematica, July 1687*



1864 Ambulance Design Patent

re: safety of ambulance design

> 150 years ago

UNITED STATES PATENT OFFICE.

G. W. ARNOLD, OF MORGANTOWN, WEST VIRGINIA.

IMPROVEMENT IN AMBULANCES.

Specification forming part of Letters Patent No. 42,152, dated April 5, 1864.

To all whom it may concern:

Be it known that I, G. W. ARNOLD, of Morgantown, in the county of Morgan and State of West Virginia, have invented a new and useful Improvement in Ambulances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

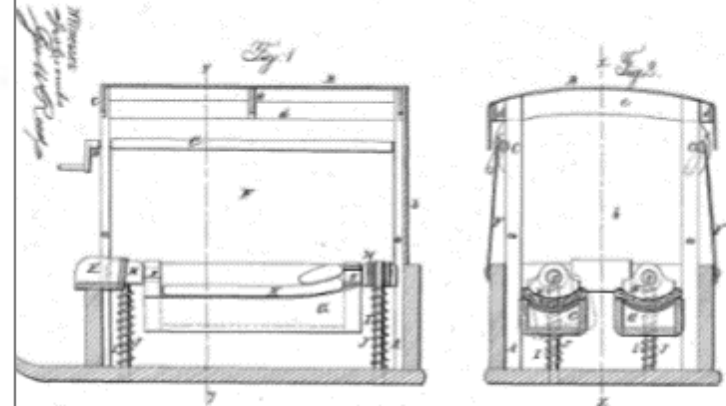
Figure 1 is a side sectional view of my invention, taken in the line *x x*, Fig. 2; Fig. 2, a transverse vertical section of the same, taken in the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention consists in a novel manner of arranging couches within the body of an ambulance, whereby the couches are retained in a proper position when the ambulance is passing over inclined ground, the couches be-

fore are attached bearings *f*, in which a roller, *C*, is fitted and allowed to turn freely. These rollers are near the upper ends of the uprights, and have each a crank, *D*, at their front ends within convenient distance of the driver's seat *E*. Each roller has a curtain, *F*, attached to it, and by turning the rollers the curtains may with the greatest facility be raised and lowered as occasions may require.

G G are two couches, which are placed within the body *A* and may be constructed in the form of rectangular boxes provided with suitable mattresses, *H*. These couches are each suspended by two pins, *y y*—one at the head, and the other at the foot—the pins passing into the upper parts of the head and foot boards in line with their centers. The pins are fitted loosely in the couches, so that the latter, by virtue of their own gravity, will always remain suspended in a vertical position, the inclining of the ambulance laterally in passing



No. 42,152.

G. W. ARNOLD
Ambulance

Patented Apr. 5, 1864.



AMBULANCE.

If you were to survey for what would enhance safety and efficiency then....

- Likely “more rest stations”
- Not likely – “the combustion engine”
- Let alone the Hydrogen powered eVTOL

EMS Safety timeline

- Didn't know it was an issue – 60's-70's
- Knew it was an issue – but didn't really know what to do – 80's-90's
- Safety technical data rolls out – past 10 years
- **Change and adoption challenges – *we are here now***

Safety Dimensions we know


- Safe systems – CRM / transport system safety
- Risk perception
- Fleet and operations management
- Vehicle design safety
- Scene safety
- Patient Handling: physical & biological hazards
- Health and wellness
- Hours of service

TRB EMS Safety Summit


<http://www.EMSSafetyFoundation.org/2012TRBSummitMultimediawithLinks.pdf>



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 **TRANSPORTATION RESEARCH BOARD**
OF THE NATIONAL ACADEMIES

Emergency Medical Services Safety Subcommittee ANB 10(S)




2012 EMS Safety Systems, Strategies and Solutions Summit

Kook Center, Washington DC, February 29th, 2012

The National Academies Transportation Research Board ANB10(S) EMS Safety Subcommittee held its third EMS Safety Summit February 29th, 2012, in collaboration with the EMS Safety Foundation. This EMS Safety Systems, Strategies and Solutions Summit was a comprehensive one day interdisciplinary, interactive on-site and broadcast event held in Washington DC at the Kook Center simulcast to EMS Today Conference and Exposition – where there was a satellite site for the Summit during EMS Today pre-con. A.J. Heighman, Editor of JEMS and EMS Icon, gave the opening address beamed from the satellite site at EMS Today. This one day EMS Safety Systems, Strategies and Solutions Summit comprehensively covered the spectrum of cutting edge approaches to optimizing the systems safety of EMS and Medical Transport operations.

For further info and ALL downloads: go to <http://www.objectivesafety.net/TRBSummit2012.htm> or scan this QR code




access the presentation slides here: Click on the Speakers name links below
for the audio track either:

- click on the 'Audio' links below with your mouse, or
- capture the QR codes below with your smart phone of any type (after downloading any free QR reader)

Agenda

[Biographies of Presenters and Moderators](#)

[Audio 1](#)
[Opening Address:](#)

	<u>A.J. Heighman</u>	8:00-8:15
	Introductions and Safety Developments Update <u>Nancy Lewis, MD, MPH</u> , Rick Paine, PhD, <u>Research needs assessment form</u> explained – E. Frazer	8:15-8:30

Session 1:

• Data and Recent Initiatives – moderator – C. Cobb	8:30 – 9:15
• Safety data update – <u>N. Lewis</u>	8:30 – 8:45
• Bureau of Labor Statistics data – <u>J. Windsor</u>	8:45 – 8:55
• NIOSH /NEMSWAC/NIST/IOSH Update – <u>E. Frazer</u>	8:55 – 9:10
• NAEEM Safety Course – <u>G. Luedtke</u>	9:10 – 9:15

[Audio 2](#)
Session 2:

• Transport, Human Factors and Bridging Diverse Disciplines - C. Cunningham	9:25 – 10:05
• Safety Culture/ Culture of Change – <u>E. Frazer</u>	9:25 – 9:35
• Bridging Ergonomics Operational Task Analysis and automotive safety – <u>G. Luedtke</u> / <u>C. Pittsford</u>	9:35-9:55
• Information and technology transfer – <u>N. Lewis</u>	9:55 – 10:05

THE NATIONAL ACADEMIES
Adviser to the Nation on Science, Engineering, and Medicine

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The 2012 TRB EMS Safety Summit

print this page & your smart phone will play the 8 sessions from the QR codes



1: Intro & Data and Recent Initiatives



2: Transport, Human Factors - Bridging Diverse Disciplines



3: Testing and Standards



4: New systems safety technology solutions & telematics



5: Fleet management strategies



6: Innovative Vehicle Design



7: Operationalizing Safety



8: Panel: How to optimize the safety of your existing fleet

Wrap up – from Prof. Art Cooper

Now we have many new technologies

- Fleet management tools
- Diverse vehicle types and design
- Drones
- Robotic tools
- XR – AR, VR, AI
- Connected Digital Health
- The Cloud
- The Crowd

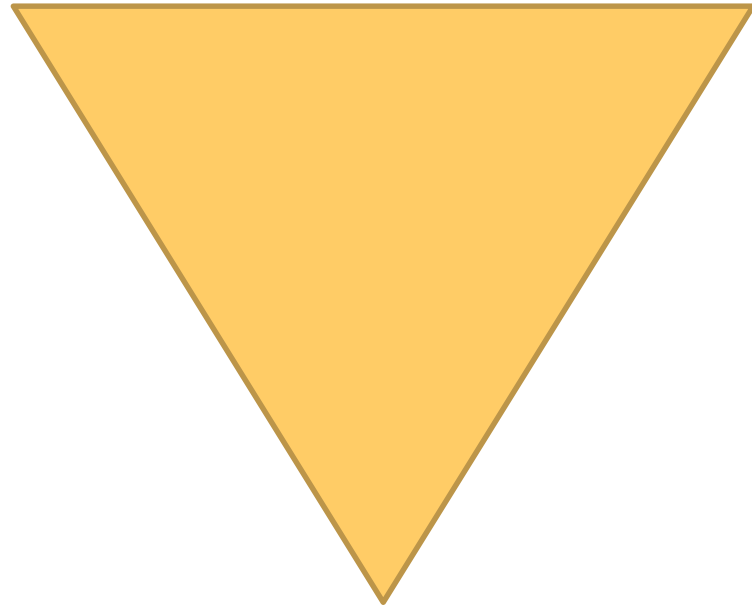
..... that we need to harness

Very Important Principle

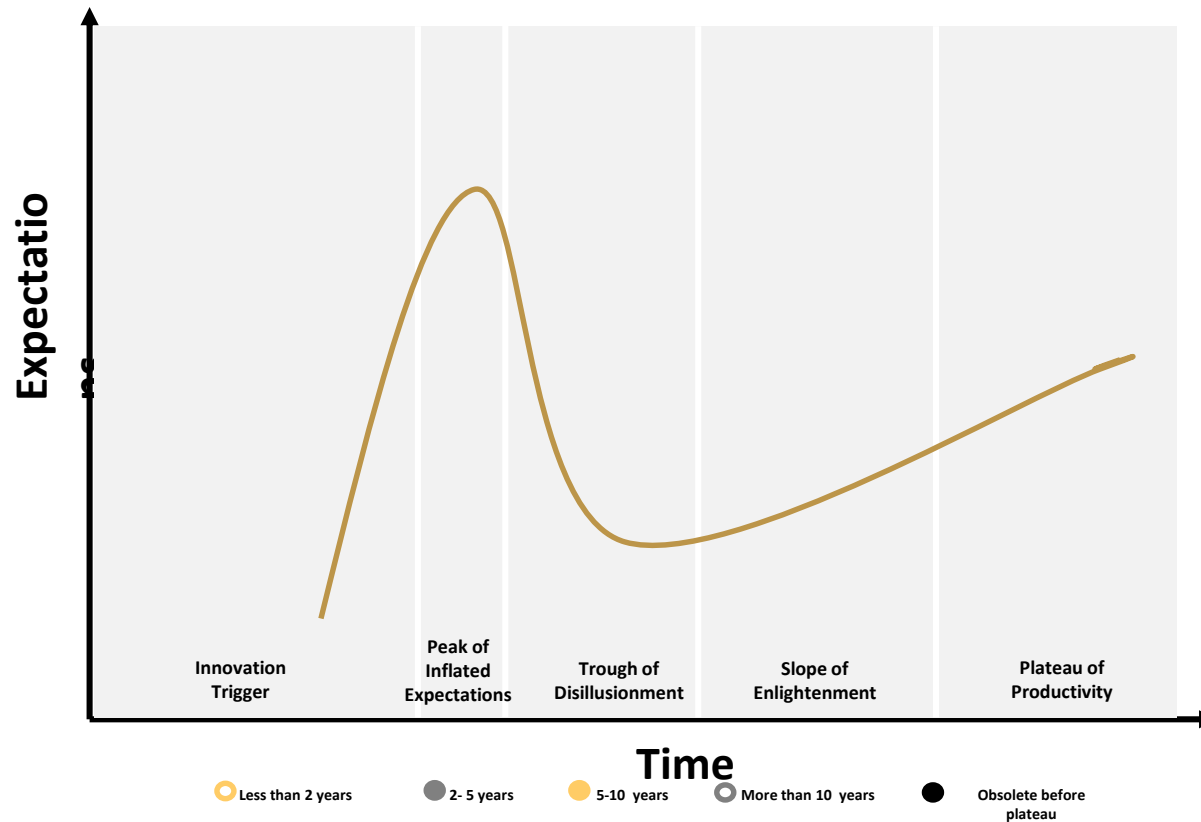
Ambulance transport safety is part of a **SYSTEM**, the overall balance of risk involves the safety of all occupants and the public

How does design happen in EMS

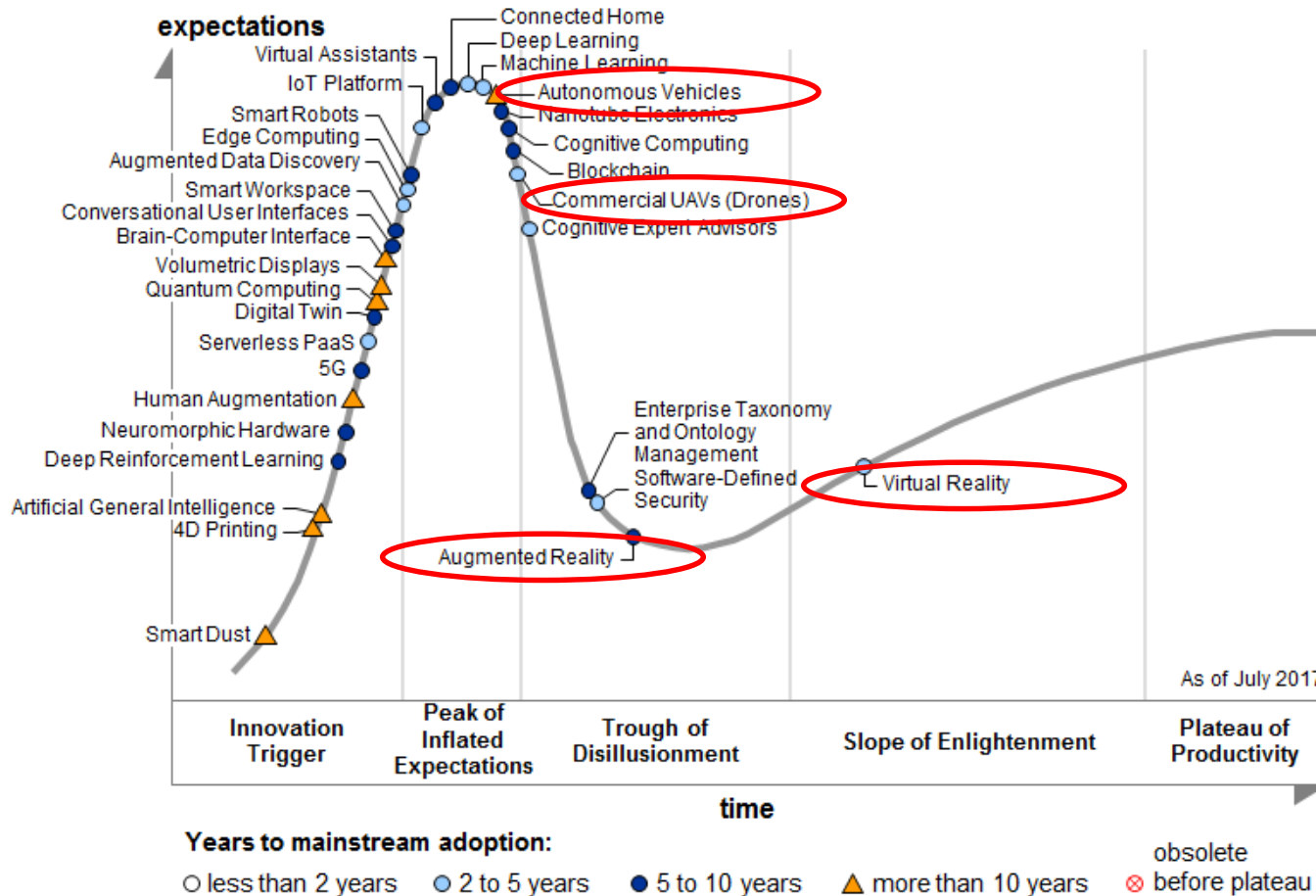
- Tradition
- Experience
- Vision
- Interdisciplinary



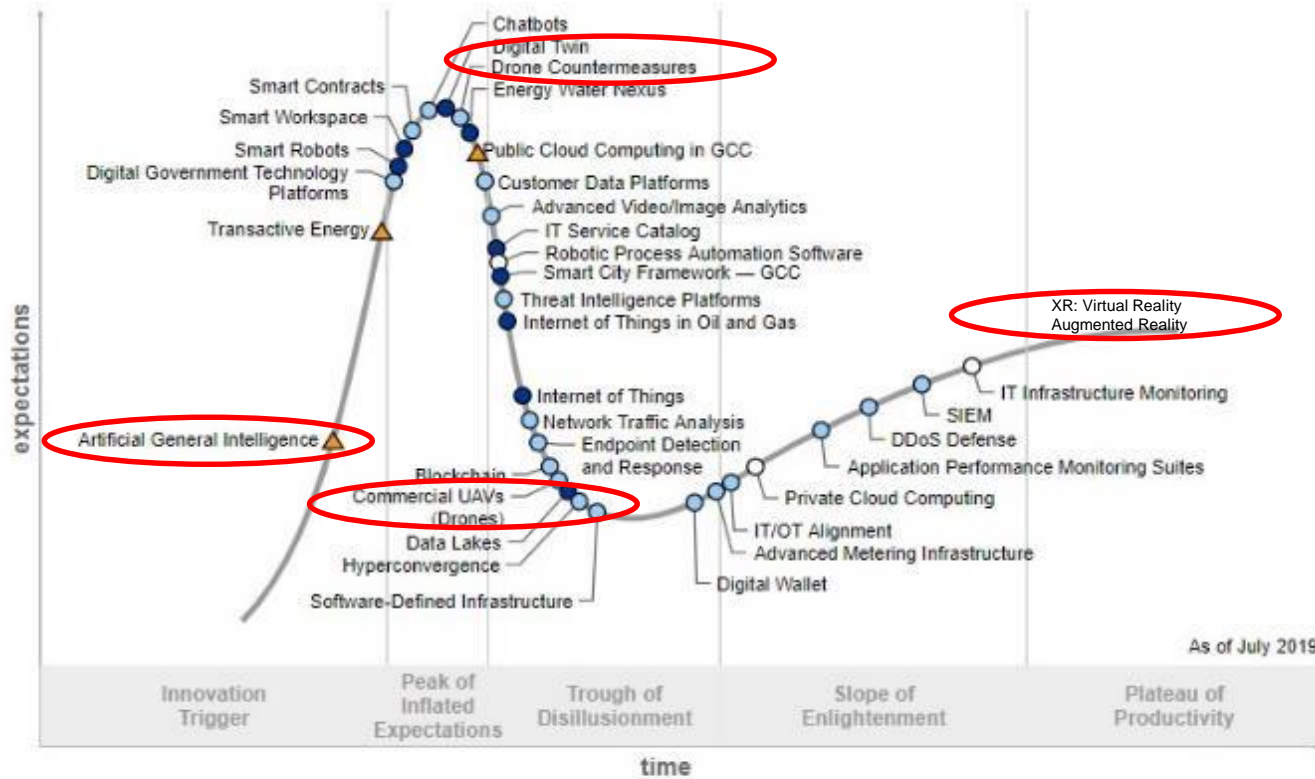
Change, Adoption and Sustainability



Gartners Hype Cycle 2017



Gartners Hype Cycle 2019



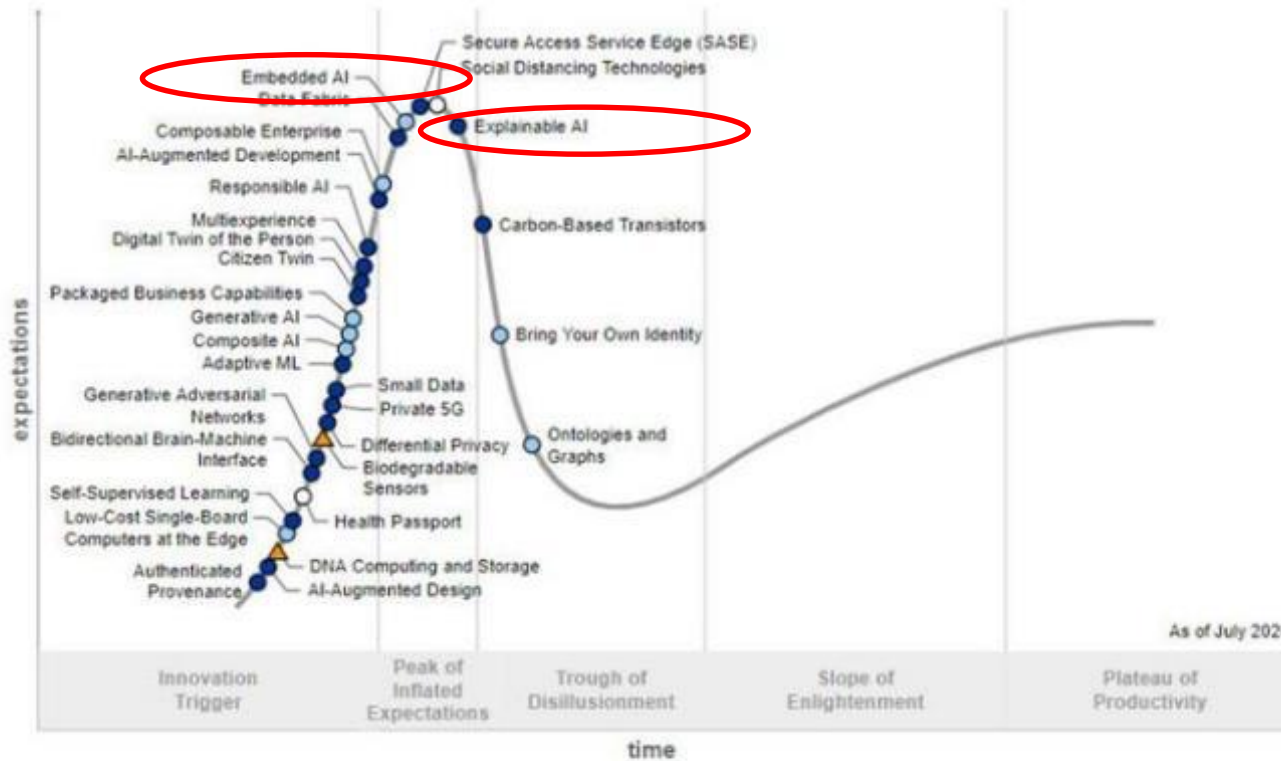
Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

© 2019 Gartner, Inc.

Gartners Hype Cycle 2020

Hype Cycle for Emerging Technologies, 2020




Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

New World Order

Covid19, the 2020 Pandemic



 Bronx-Lebanon Hospital Center medical staff stand outside of the emergency room bay, April 9, 2020 in New York City.

David Dee Delgado/Getty Images

June 2020

New patterns of morbidity and mortality

- *a 10 fold increase in Out of Hospital Cardiac Arrest Deaths*

Research

JAMA Cardiology | **Original Investigation**

Characteristics Associated With Out-of-Hospital Cardiac Arrests and Resuscitations During the Novel Coronavirus Disease 2019 Pandemic in New York City

Pamela H. Lai, MD, PhD, MSc; Elizabeth A. Lancet, DrPH, MPH; Michael D. Weiden, MS, MD; Mayris P. Webber, DrPH, MPH; Rachel Zeig-Owens, DrPH, MPH; Charles B. Hall, PhD; David J. Prezant, MD

IMPORTANCE Risk factors for out-of-hospital death due to novel coronavirus disease 2019 (COVID-19) are poorly defined. From March 1 to April 25, 2020, New York City, New York (NYC), reported 17 118 COVID-19-related deaths. On April 6, 2020, out-of-hospital cardiac arrests peaked at 305 cases, nearly a 10-fold increase from the prior year.

 Editor's Note

October 14, 2020

NEWS • INTERVENTIONAL | TCT 2020

Delays, Deaths, and More Cardiogenic Shock Among ACS Patients With COVID-19

Public health messaging should reassure patients they needn't be scared to go to the hospital, a COVID-ACS researcher says.



By [Todd Neale](#) | October 14, 2020




Patients with ACS and COVID-19 took longer to get to the hospital, had a much higher rate of cardiogenic shock, and were more likely to die in the hospital compared with ACS patients treated in the prepandemic era, findings from a global COVID-ACS registry show.

New Tragic Hazards for EMS

April 21, 2020

Coronavirus News: FDNY mourns death of EMT from COVID-19

 By Eyewitness News

Tuesday, April 21, 2020



NEW YORK CITY (WABC) -- The Fire Department of New York is mourning the loss of Emergency Medical Technician John Redd, 63, from COVID-19.

April 22, 2020

NYC EMT Idris Bey dies of coronavirus, becoming 8th active FDNY member killed by pandemic



By THOMAS TRACY

NEW YORK DAILY NEWS | APR 22, 2020 | 1:29 PM



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**Emergency
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Emergency Medicine
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Charts & More.

April 28, 2020

> 24 Covid19 USA EMS Provider deaths



NEWS PRODUCTS VIDEOS TOPICS TRAINING JOBS GRANTS COVID-19

Topics > Coronavirus (COVID-19)

Email Print Comment

CORONAVIRUS (COVID-19) >

COVID-19: EMS deaths

Tracking the coronavirus-related deaths of EMTs and paramedics

Apr 28, 2020



- COVID-19: How public safety companies are assisting the frontline pandemic response
- NY ambulance volunteer dies from COVID-19
- FF-medic repurposes infant mask to help COVID-19 patients breathe

MORE CORONAVIRUS (COVID-19) NEWS >



May 1, 2020

Topics > Coronavirus (COVID-19)

Email Print Comment

NY ambulance volunteer dies from COVID-19

Sal Mancuso, 66, who volunteered driving ambulances for Blooming Grove Volunteer Ambulance Corps, died Thursday

Yesterday at 8:43 PM



By Laura French

BLOOMING GROVE, N.Y. — A New York ambulance service volunteer died due to COVID-19 on Thursday night.

Sal Mancuso, 66, who volunteered for Blooming Grove Volunteer Ambulance Corps driving ambulances, was on a ventilator for almost two weeks before his death, according to the Times Herald-Record. He first became ill on

August 6, 2020

Entire Mo. FD quarantined after FF tests positive for COVID-19

All 27 firefighters of the Lemay Fire Protection District, including the fire chief and deputy chiefs, are quarantined pending further test results

Kim Bell
St. Louis Post-Dispatch

LEMAY, Mo. — Every firefighter in the Lemay Fire Protection District was under quarantine at home Thursday after a colleague tested positive for the coronavirus, a district official said.

The 911 calls that Lemay normally would handle were being rerouted to fire houses in Valley Park, Fenton, Affton and elsewhere. Crews are rotating the responsibility of filling in for Lemay, according to Jerry Schloss, chairman of

October 14, 2020

FDNY monitoring new COVID-19 outbreak at Queens EMS station

Five EMS providers at the Astoria station have tested positive; union officials warned that the department may not be prepared for a second wave

Oct 14, 2020

By Laura French

NEW YORK — Five FDNY EMS providers at a station in Queens have tested positive for COVID-19, renewing warnings from union leaders regarding a potential second wave of the pandemic.

The department is closely monitoring the outbreak at the Astoria EMS station with contact tracing and additional

USA: 36 Covid19 EMS Provider Deaths

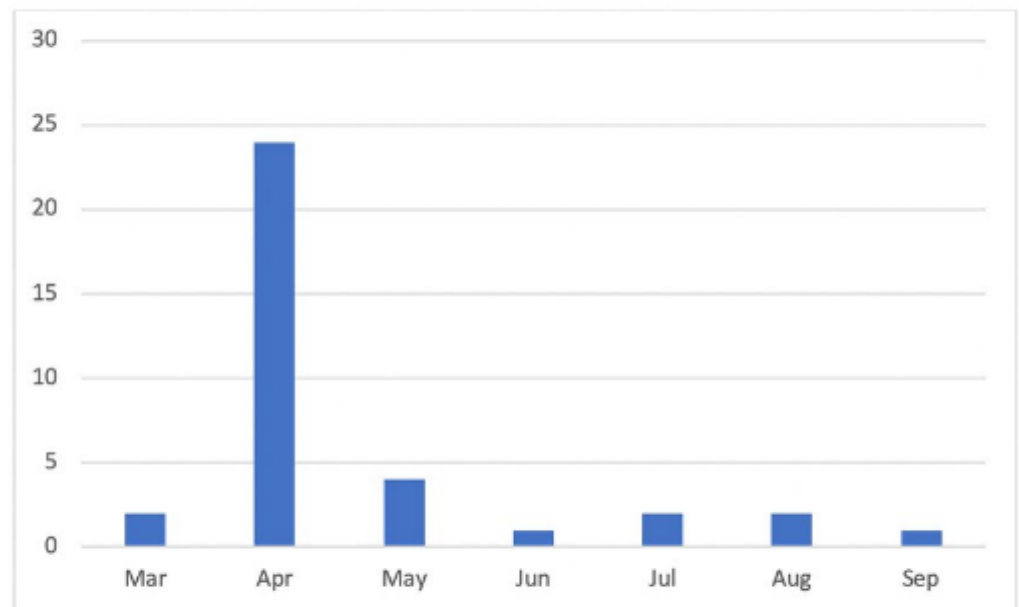
AND 3 + suicide... in NYC alone

March 2020 to September 2020



NEWS PRODUCTS TOPICS VIDEOS CAREERS TRAINING GRANTS COVID-19

Chart 2. EMS clinicians COVID-19 fatalities by month of death in 2020. (N = 36)



The 36 victims came from 11 states. Figure 1 shows the distribution of states. Thirty-six percent of the EMS clinicians were from New Jersey and 22% from New York. It should be noted that although we expect that most of these victims died in their home states, at least one Colorado EMS clinician died while on the FEMA national ambulance contract (NAC) deployment to New York City under the National Response Framework Emergency Support Function #8 Public Health and Medical Services [23].

Solutions out there

- PPE
- Handwashing
- Patient Barriers
 - Spectrum – high and low tech
- Air filtration systems - ?





April 2020 - PPE Shortages

Calif. EMS Agencies Manufacture PPE Amid Shortage During COVID-19

04/29/2020

PRESS RELEASE

April 28th marks National Superhero Day and some California Ambulance services are leveraging their individual super powers to manufacture their own capes and masks. With continuing shortages of personal protective equipment (PPE) and lengthy delivery schedules, California Ambulance Association members have taken matters into their own hands and are locally manufacturing PPE. Members of the CAA's Inter Facility Transfer (IFT) Committee identified the ways they were individually creating PPE and





2020 - Cross skill development with Lowes Home Improvement



 BUY PHOTO

 HIDE CAPTION

Onslow County EMS crew members Susan Kellough (left) and Nicole Johnson (right) unload the ambulance stretcher fitted with the new isolation tent. [Trevor Dunnell / The Daily News]





emergency preparedness team, Beth-El also
patients who must be kept quarantined for long

Dynamics of isolation chamber transports

Medics

6 May 2020

Sean Bryan

Share



tion

ant Director of Medical
ulance, shares the

EMS Patient Isolation

Design requirement/constraints

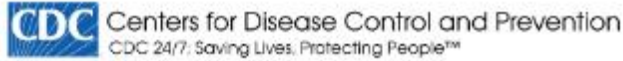
- Easy to get the patient in and out
- Contain aerosol pathogens
- Tolerable for the patient
- Cleanable or disposable
- Cost effective
- Time effective
- Does the WHOLE patient need to be contained

Whole Vehicle Air Filtration Systems

- Is this a realistic tool in the time and physical constraints of an EMS system
- ? Practical
- ? Effective
- ? Cost effective
- ? System of solutions

CDC EMS Guidelines – July 2020

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-for-ems.html>



A-Z Index
Search COVID-19
[Advanced Search](#)

Coronavirus Disease 2019 (COVID-19)



- Your Health ▾
- Community, Work & School ▾
- Healthcare Workers & Labs ▾
- Health Depts ▾
- Cases & Data ▾
- More ▾

🏠 Healthcare Workers

Testing +

Vaccination

Clinical Care +

Infection Control +

Optimizing PPE Supplies +

Potential Exposure at Work +

First Responder Guidance

Healthcare Facility Tools +

Veterinary Clinics

Pandemic Planning Scenarios

HEALTHCARE WORKERS

Interim Recommendations for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points/Emergency Communication Centers (PSAP/ECCs) in the United States During the Coronavirus Disease (COVID-19) Pandemic

Updated July 15, 2020

Print



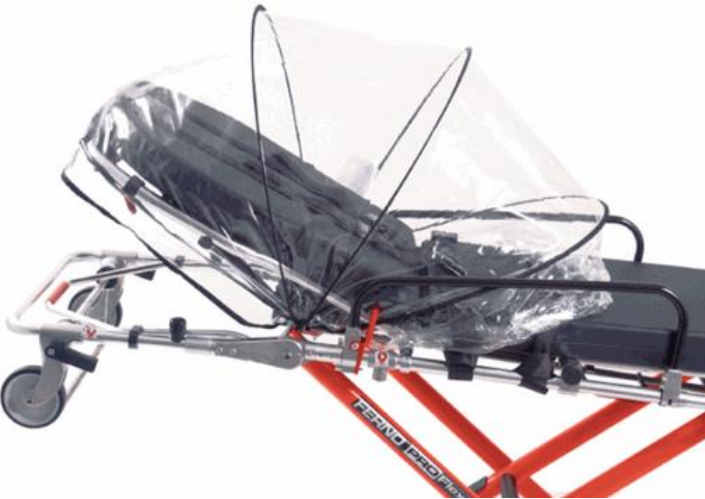
This guidance applies to all medical first responders, including fire services, emergency medical services, and emergency management officials, who anticipate close contact with persons with suspected or confirmed Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection in the course of their work.

Updated July 15, 2020

**New Tools, New Vehicles
new industry relationships**

Innovation!!

A Simple Practical Solution compact patient barrier – Ferno Covid Shield



2020 Pandemic Innovation

PPE to contain the patients aerosol

Experium Protect™ 

- Add-on patient scavenger mask
- Actively minimizes escape of patient aerosolized air

www.experium.co.il

October 2020 AWARDS



1st prize
Hardware Finals competition



1st prize
Impact Award

EMSSafety
FOUNDATION



eVTOL, October, 2020




The Vertical Flight Society's 76th Annual Forum & Technology Display is the world's leading international technical event on vertical flight technology. The virtual conference will span 4 days and include 230+ technical papers on every discipline from Acoustics to Unmanned Systems, as well as invited presentations and discussions by leaders in the military, government agencies and industry.

The Technology Display, running concurrent with the Forum, is the most extensive exposition of cutting-edge vertical flight technologies in the world, and also includes other technologies more broadly applicable to aerospace in general. Leading manufacturers, service providers, defense agencies, universities, and research and development organizations will showcase the very latest in vertical flight technology in our virtual exhibit hall.

Take a look at our [Forum 76 Program Overview](#) to see what we have planned!

Unmanned Ambulance drones



 **FlyPulse**
AIRBORNE AID

FlyPulse
@FlyPulseAB

Develops dronesystems for
rescue missions

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Manned Drones



argodesign's drone ambulance quickens emergency responses

designboom 

car, so that a patient could be loaded up and then flown back to hospital for further treatment.



its small footprint enables it to land anywhere in the emergency area

eHang passenger drone



? The ambulance of the future

First passenger drone makes its debut at CES

Chinese entrepreneurs bring their one-person craft, which is controlled by tablet and capable of flying 60mph, to the annual technology convention



Passenger drone powered by batteries unveiled at CES

A Chinese company claimed a world first on Wednesday by unveiling a drone capable of carrying a human passenger.

August 24, 2020



Urban Aeronautics To Develop Emergency Response Flying Vehicle With Hatzolah Air

By [Simona Shemer](#), NoCarnels August 24, 2020

An illustration of the CityHawk eVTOL flying vehicle in New York City. Courtesy.

[Design News](#) [Technology News](#)

Flying vehicles have been called [the future of urban transportation](#) in the smart mobility sector, with companies like Amazon, Tesla, and Boeing creating some of the most cutting-edge flying car technologies — from [delivery drones](#) to [all-electric passenger aircraft](#).

Thought leaders – Urban Aeronautics Ambulance Transport Safety 2002

*X-Hawk:
The Revolutionary, Modular, Aerial Vehicle*



Whereas most designs for new, aerial vehicles offer incremental improvements in the state of the art, the X-Hawk flying platform presents a revolutionary advance in both the mobility and utility of aerial vehicles. Simply put, nothing like it has ever hit the market before.

September 2020

Jerusalem Post > Innovation Technology

Urban Aeronautics CEO has designed a made-in-Israel flying car

The car is able to take off the ground with two compressors located at its base.

By HAGAY HACOHEN SEPTEMBER 6, 2020 15:06



The City Hawk model presented in this computer graphic (photo credit: URBAN AERONAUTICS)

Unmanned operational Prototype



Urban Aeronautics CityHawk for Rescue & EMS

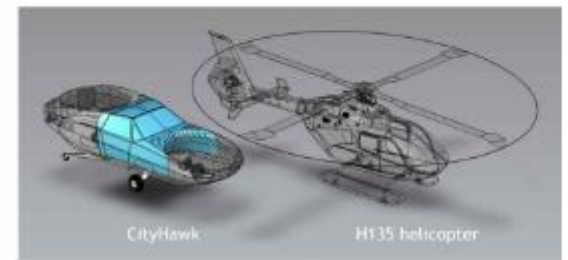
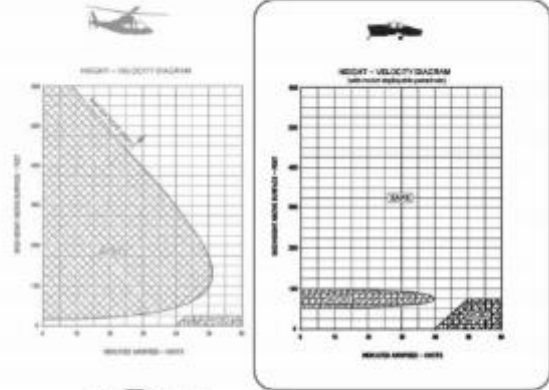


Unprecedented Safety

"fly anywhere, land anywhere"



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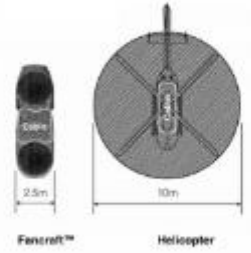


Ask any helicopter pilot ...

- No exposed rotors
- Emergency parachute
- Flight in icing conditions
- Spacious cabin
- Quiet cabin
- Unparalleled safety



↑
Emergency, rocket deployed and fully steerable parachute eliminates need for autorotation



September 29, 2020

Jet suit paramedic takes Lake District test flight

Inventor Richard Browning puts potentially life-saving suit through its paces in 'groundbreaking exercise'



▲ Rapid response 'jet suit paramedic' trialled in Lake District - video

Defying gravity as they hover over water before zipping across mountainous landscapes and landing with pinpoint accuracy, the jet suit paramedic could soon form part of what could become an extraordinary new service being trialled in the [Lake District](#).

If given the green light by ambulance service chiefs, the paramedic powered by lightweight jet-packs would flit across treacherous terrain within minutes to reach stranded casualties.

In an awe-inspiring test flight, the inventor Richard Browning, looking distinctly like Marvel's Iron Man, put the suit through its paces on the Langdale Pikes.

Ambulance Safety Innovation

Design Module 1.0

www.INDEMO.info

**the future concepts you can
have right now!!!**

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Configurable!



LED lights on the stretcher

Simple equation

- Strip of LED lights + small battery + switch = \$20
- Can see where the stretcher is going at night
- Fewer tripping injuries, fewer dropped patients

Voice Activated

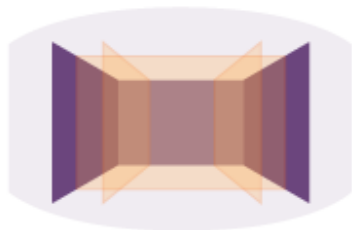


The Virtual World

XR (VR, AR, MR) – and EMS

VIRTUAL REALITY (VR)

Fully artificial environment



Full immersion in virtual environment



AUGMENTED REALITY (AR)

Virtual objects overlaid on real-world environment



The real world enhanced with digital objects



MIXED REALITY (MR)

Virtual environment combined with real world



Interact with both the real world and the virtual environment



Virtual Reality First Aid/EMS

- Just released - Virtual Reality Scenarios that you can build, April 2020 – and with gratis Covid19
 - <https://www.VRpatients.com>
- Real First Aid, First Aid and MCI VR both physical simulation scenarios Jan 2018
 - <https://www.realfirstaid.com.au/>
- Haseeb Iqbal, Published on Jan 27, 2018
 - Virtual Reality CPR created for the Oculus Rift using Unreal Engine 4. Integrated with Leap Motion technology
 - <https://www.youtube.com/watch?v=Vq7k-Kg7ulo>
- IRC ircouncil, Published on Oct 10, 2017
 - Project by Italian Resuscitation Council
 - Scientific Supervision: Federico Semeraro, Andrea Scapigliati & Giuseppe Ristagno
 - VR development: Studio Evil s.r.l.
 - <https://www.youtube.com/watch?v=reSpd1hrVXQ>
- ResusCouncilUK, Published on Sep 8, 2017
 - A virtual reality game-in-a-film that teaches you to save a life. Step inside, save a life.
 - Play now - <http://lifesavervr.org.uk/> <https://www.trustedtraining4u.co.uk/vr-training> <http://dualgoodhealth.com/info/>
 - <https://www.youtube.com/watch?v=QuUavS3WSAI>
- Virtual Education Systems, Published on May 16, 2017
 - This video is showcasing the abilities of VRPatients.
 - https://www.youtube.com/watch?v=K_hFS7Cocfg
 - <https://virtualeducationsystems.com/>
- Marco Vettorello, Published on Sep 3, 2017
 - First test of teaching defibrillation (AED) with the HTC Vive in a homemade Unity scenario
 - <https://www.youtube.com/watch?v=pMPtIzzd9xw>

VR Training for ACLS



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**The NEXT LEVEL VR
Scenario Training
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Virtual Reality Patients – EMS



[Home](#) [Educators / Trainers](#) [First Responders](#) [Request a Demo](#)

A photograph of an emergency scene. In the background, a white ambulance with 'AMBULANCE' written on its side is parked. To the left, a red car is involved in a crash, with smoke rising from the hood. In the foreground, three emergency responders in high-visibility orange and grey uniforms are kneeling on the ground, attending to a patient lying on a stretcher. The scene is set outdoors on a paved area with greenery in the background.

VRpatients for First Responders

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But there are obstacles.

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DIY VR Training and evaluation tools

just like making a Power Point



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Online VR EMS Training you can build yourself

Real life training *without* real life consequences

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www.VRpatients.com



VR Training that you can create

The screenshot displays the EMS Safety VR training software interface. At the top left is the VR logo. The top right shows the user account 'ACCOUNT (NADINE)' and a 'LOGOUT' button. Below this is a header bar with 'ACCOUNT', 'NAME' (NL- Neuro male 38), a search bar, and 'SCENARIO'. A sidebar on the left lists various training modules: SCENARIO, DISPATCH REPORT, PATIENT CONDITIONS, QUESTIONS, VITALS, MEDICATIONS, OXYGEN, PROCEDURES, MONITORS, VITAL MEDIA, GRADING, and CASE LOGIC. The main area is titled 'Scenario' and shows a patient profile for 'NL- Neuro male 38' with a 3D avatar of a man named 'Ben'. Below the avatar are 'Previous' and 'Next' buttons. To the right of the avatar are two scene thumbnails: 'Starting Scene' (City Park Day) and 'Ending Scene' (Emergency Room). A right-hand panel provides details for the scenario, including symptoms (stroke, weakness, slurred speech, confusion, Covid19), a learning objective (to evaluate a patient with neurological deficit to identify stroke and understand its presentation as Covid19), and dispatch information (sudden onset slurred speech, confusion, drooping on one side of the face, and a dead feeling in one arm). At the bottom of this panel are buttons for 'Grades', 'Sharing', 'Delete', 'Duplicate', 'Run', and 'Edit'. A bottom navigation bar includes a 'Help' button and a 'CREATE NEW' button.



TM

VRpatients

REQUEST A DEMO



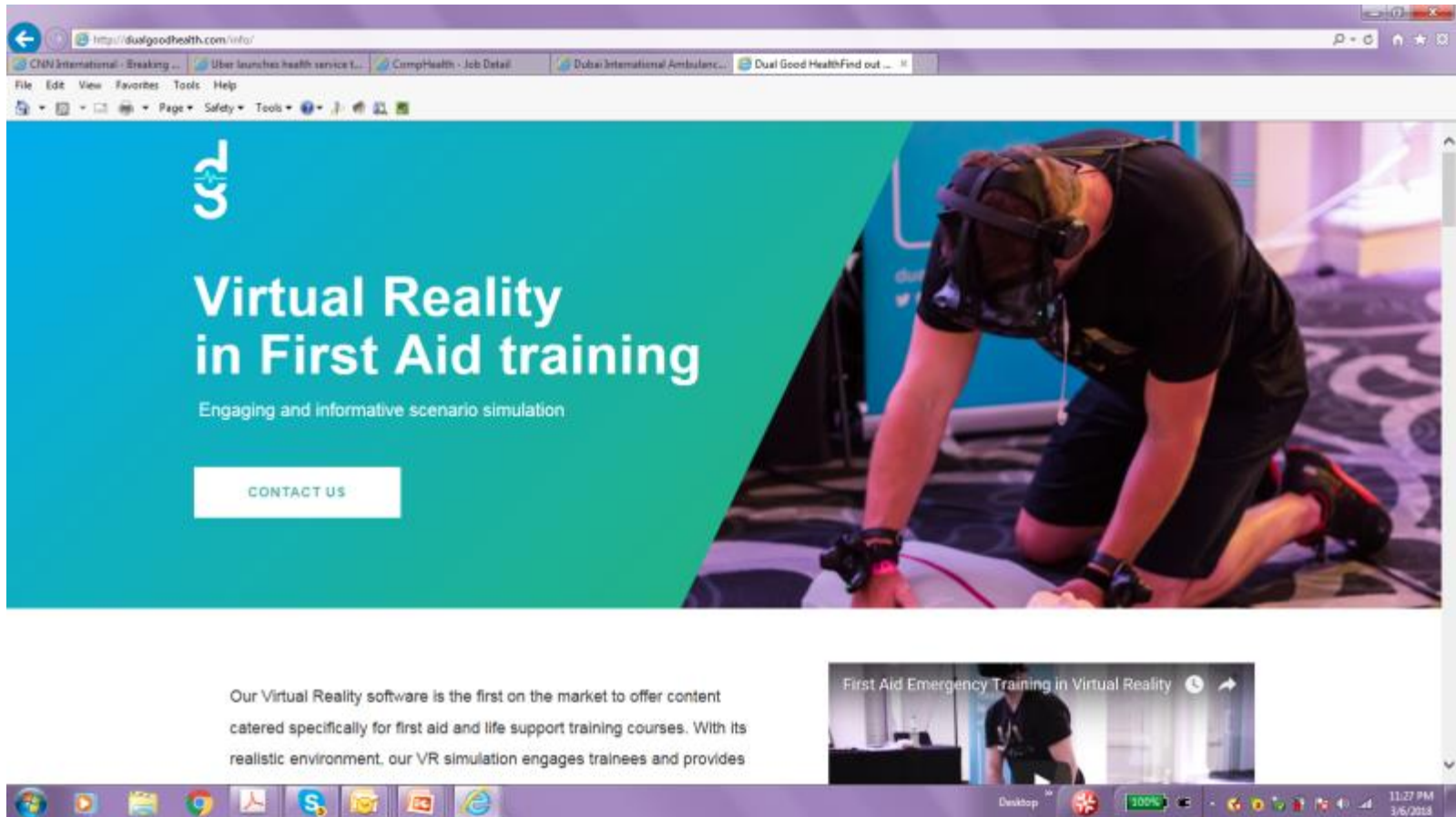
ASSESS
MONITOR
TREAT

SELECTED ROUTE:	SET FLOW:
BVM	0
NASAL CANNULA	
NEBULIZER	1 2 3
NON-REBREATHER	4 5 6
CPAP	7 8 9
SIMPLE FACE MASK	0 . CE
CANCEL	ADMINISTER

REAL LIFE TRAINING *without* REAL LIFE CONSEQUENCES

VR – CPR training

<http://dualgoodhealth.com/info/>



The screenshot shows a web browser window displaying the website <http://dualgoodhealth.com/info/>. The page features a large teal and white graphic on the left with the logo 'dgd' and the text 'Virtual Reality in First Aid training' and 'Engaging and informative scenario simulation'. A white button labeled 'CONTACT US' is positioned below the text. On the right, a photograph shows a person wearing a VR headset and kneeling on a patterned carpet, performing a CPR simulation. Below the main graphic, a paragraph of text reads: 'Our Virtual Reality software is the first on the market to offer content catered specifically for first aid and life support training courses. With its realistic environment, our VR simulation engages trainees and provides'. To the right of this text is a video player with the title 'First Aid Emergency Training in Virtual Reality'. The Windows taskbar at the bottom shows various application icons, a system tray with a 100% battery indicator, and the date and time '11:27 PM 3/6/2018'.

VR EMS violence training

- AmbulanceVic,
 - Feb 2017, Virtual Reality training for all Ambulance Victoria paramedics to better protect them from violence as they respond to medical emergencies.
 - Ambulance Victoria is using Virtual Reality to help paramedics manage violence and aggression in the workplace.

www.globalfrontline.com.au

<https://www.youtube.com/watch?v=IQhxrF5tvFA>

INTL NEWS

Ambulance Victoria Offers Virtual Reality Training on Violence Prevention

Video Mar 01, 2017

[Print Version](#)





REAL RESPONSE

First Aid
Virtual Reality
Security
Medical
e
s

REAL RESPONSE



VR MCI – www.RealResponse.com.au



Performance score card



Virtual Reality

A new design tool too

Exploring the inside of a virtual ambulance



EMSSafety
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www.emssafetyfoundation.org

AI and EMS

TECHNOLOGY NEWS | JUNE 28, 2018 / 9:13 AM / 10 MONTHS AGO

AI ambulances and robot doctors: China seeks digital salve to ease hospital strain

Adam Jourdan

5 MIN READ



HANGZHOU, China/SHANGHAI (Reuters) - In the eastern Chinese city of Hangzhou, an ambulance speeds through traffic on a wave of green lights, helped along by an artificial intelligence (AI) system and big data.



Revealed: how AI will transform Dubai ambulance services

Immediate Response project aims to transform every Dubai resident into a potential lifesaver



Dubai Corporation for Ambulance Services (DCAS) has developed the Immediate Response project under the umbrella of the Dubai 10X initiative.

The project features an application that uses artificial intelligence (AI) to help volunteers identify patients' emergency cases and guide them through the necessary procedures to help save their lives while waiting for the ambulance.

Business

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Home > Industries > Healthcare

By Sam Bridge

Business

Fri 15 Jun 2018 12:52 AM

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Related Articles



Abu Dhabi eyes ambulance drones, 3D printed police stations

7/20/2017

Sheikh Hamdan launches next phase of 'Dubai 10X' initiative

AI and EMS Dispatch



Posted on January 15, 2018

AI detects cardiac arrest



Emergency services in Denmark are enlisting the help of artificial intelligence to analyse emergency calls along with a human operator.

Developed by start-up Corti, the system listens in for signs of a possible cardiac arrest when a call is made to 112 in Copenhagen. The AI system uses speech-recognition software to transcribe what is being said, confirms a diagnosis and then flashes an alert on the screen for the operator to see.



Becoming The Best In The World At Detecting Cardiac Arrest

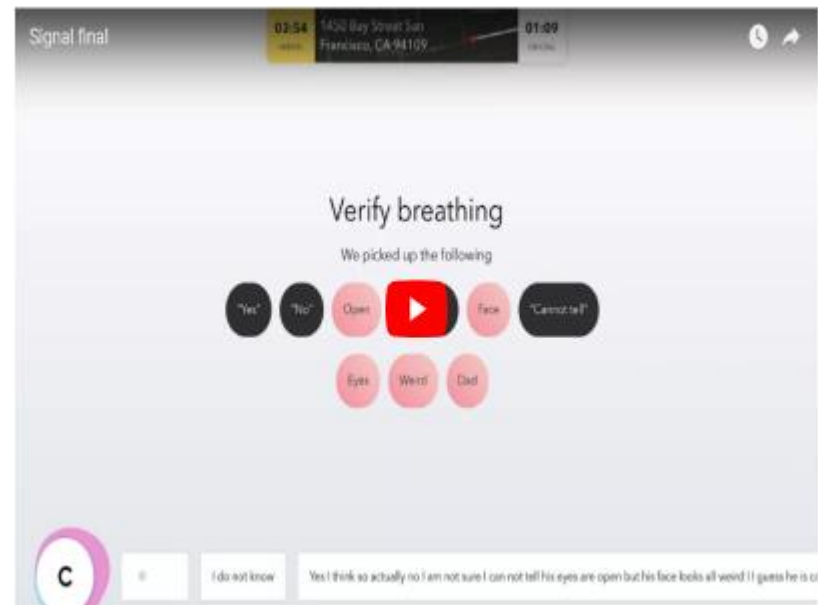
In 2016, Corti and Copenhagen EMS started a partnership to merge human expertise with AI to improve performance on emergency calls.

When an emergency call is made, the dispatcher at the other end of the line must triage the patient on their own. With Corti implemented, the dispatcher now gets a digital assistant that listens in on the conversation and helps to look for important signals in both verbal communication as well as the tone of voice and breathing patterns.

All the data provided during the emergency call is automatically analysed by Corti and then compared to the millions of emergency calls, which Corti has already analysed, to find important patterns.

As Corti's understanding of the incident increases, Corti will try to predict the criticality of the patient's situation based on symptom descriptions and the signals gathered from voice and audio. These insights are delivered to the dispatcher as alerts and recommendations.

Freddy Lippert, MD CEO of Copenhagen EMS said, "This is an innovation with the potential to change the way Emergency Medical Services handle emergency calls."



AI and Dispatch

AI that detects cardiac arrests during emergency calls will be tested across Europe this summer

The software listens in to calls and helps emergency dispatchers make judgements

By James Vincent | Apr 25, 2018, 10:06am EDT

f t SHARE



Illustration by James Bareham / The Verge

A startup that uses artificial intelligence to help emergency dispatchers identify signs of cardiac arrest over the phone will begin testing its software across Europe this summer.

Revealed: how AI will transform Dubai ambulance services

Immediate Response project aims to transform every Dubai resident into a potential lifesaver



Dubai Corporation for Ambulance Services (DCAS) has developed the Immediate Response project under the umbrella of the Dubai 10X initiative.

The project features an application that uses artificial intelligence (AI) to help volunteers identify patients' emergency cases and guide them through the necessary procedures to help save their lives while waiting for the ambulance.

Fleet telematics tools

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Home > 1. Transportation > Beyond Compliance: Driving Fleet Safety and Operational Performance with Trusted Telematics

Beyond Compliance: Driving Fleet Safety and Operational Performance with Trusted Telematics

Posted on June 21, 2018 by Daniel Garstang – No Comments ↓



There's been a lot of coverage in the media recently about commercial vehicle telematics thanks to the new ELD (Electronic Logging Device) mandate that came into effect last December by FMCSA, the US Federal Motor Carrier Safety Administration. The new rule, fully enforced from April 1, affects all professional drivers and motor carriers who are required to prepare hours-of-service (HOS) records of duty status (RODS), although fleets with existing automated on-board recording devices (AOBRDs) have until December 2019 to upgrade.

But regulatory compliance is only a part of the telematics story. Fleets of all shapes and sizes – from light vehicles up to the most heavy-duty haulage – can benefit from significant increases in driver performance, safety and operational effectiveness by correctly selecting and implementing a telematics solution, regardless of whether they are affected by the ELD rule or not. That's especially the case for anyone working in and with the high risk- and safety-conscious hydrocarbon and mineral extraction industries, where compliance is simply a given and a "license to operate."

So, should you be investing in telematics, what should you expect and demand from your solution and how can you ensure maximum return on investment?



Telematics

- How much technology and data and of what type do you need to improve fleet safety performance

CAD - Crowd and the Cloud



- Simplify dispatching.
- Validate decisions.
- See everything.

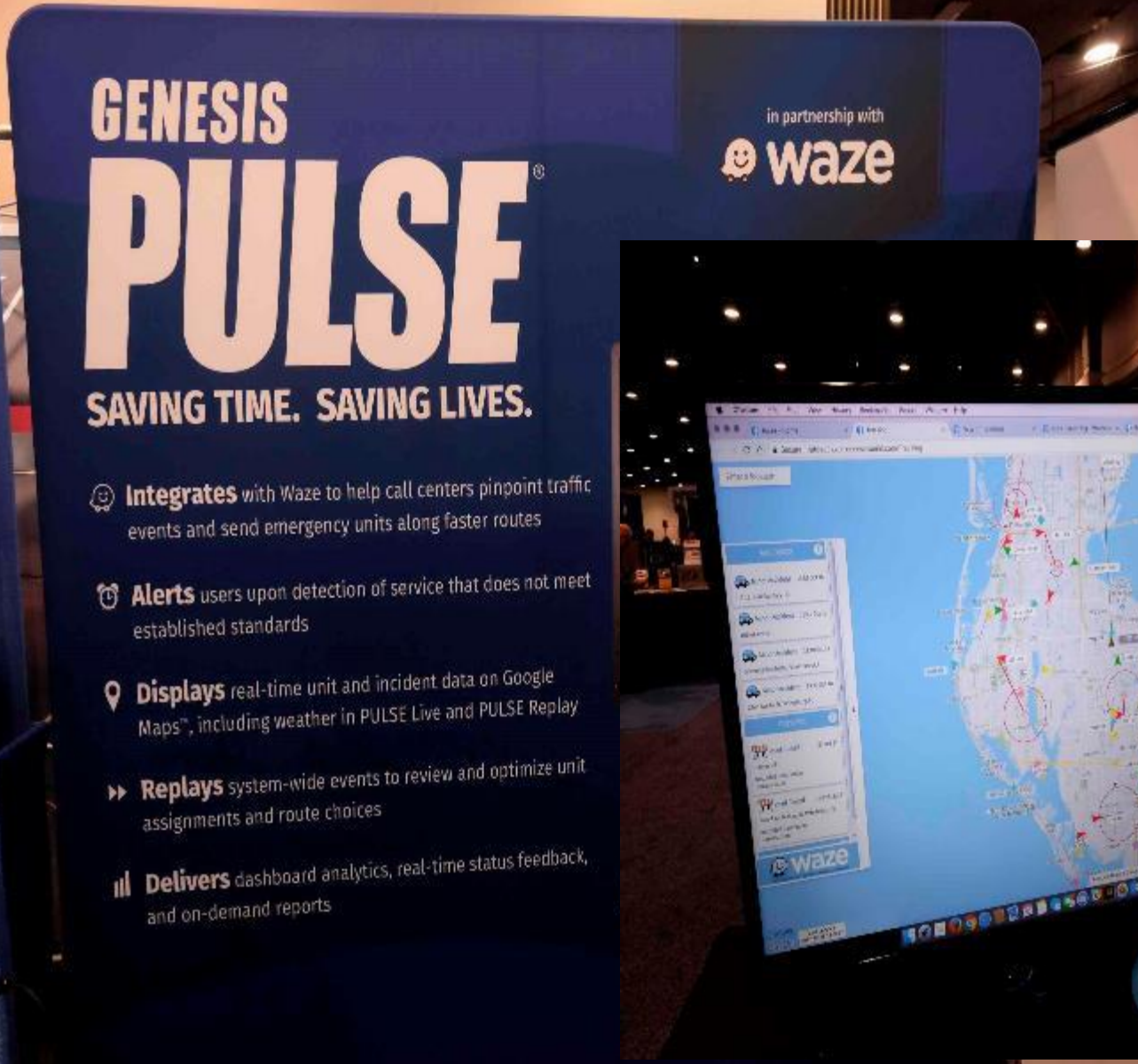
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
Integrated crowd sourcing

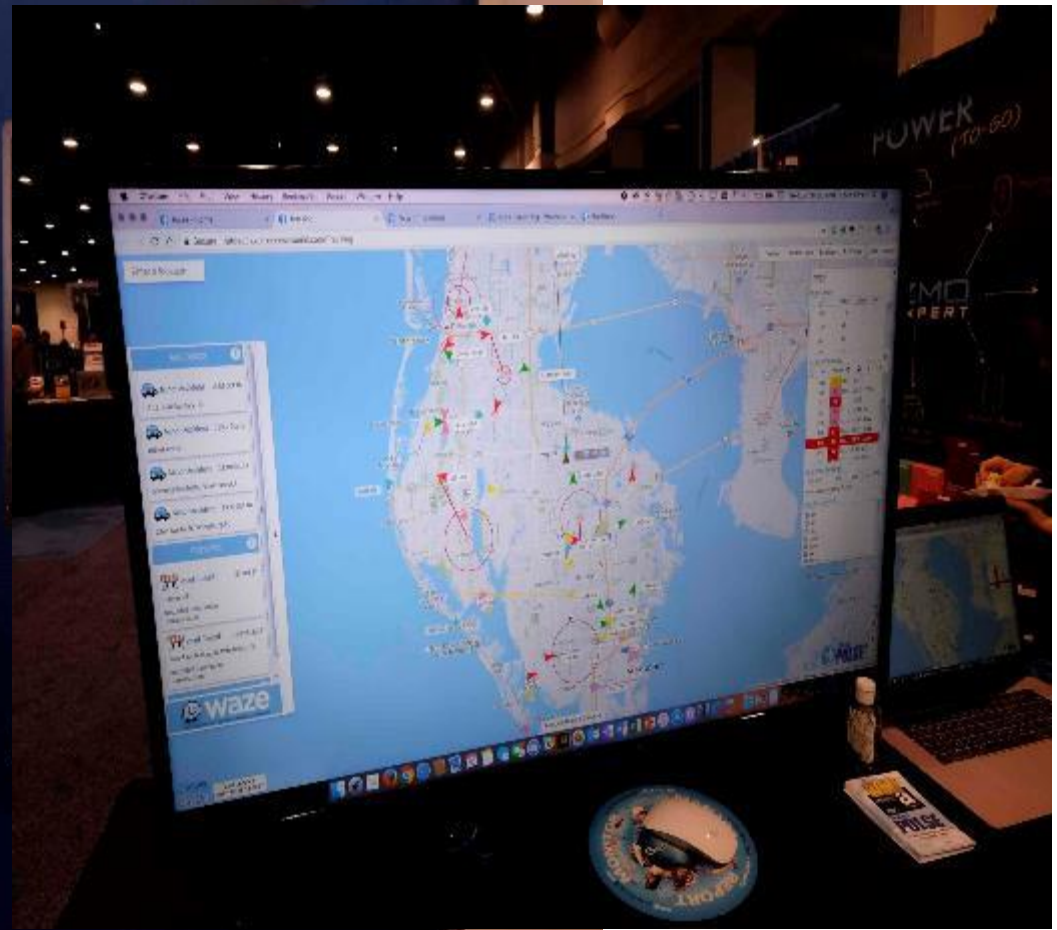


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-  **Delivers** dashboard analytics, real-time status feedback, and on-demand reports



Cardiac Arrest.... Engage bystanders!

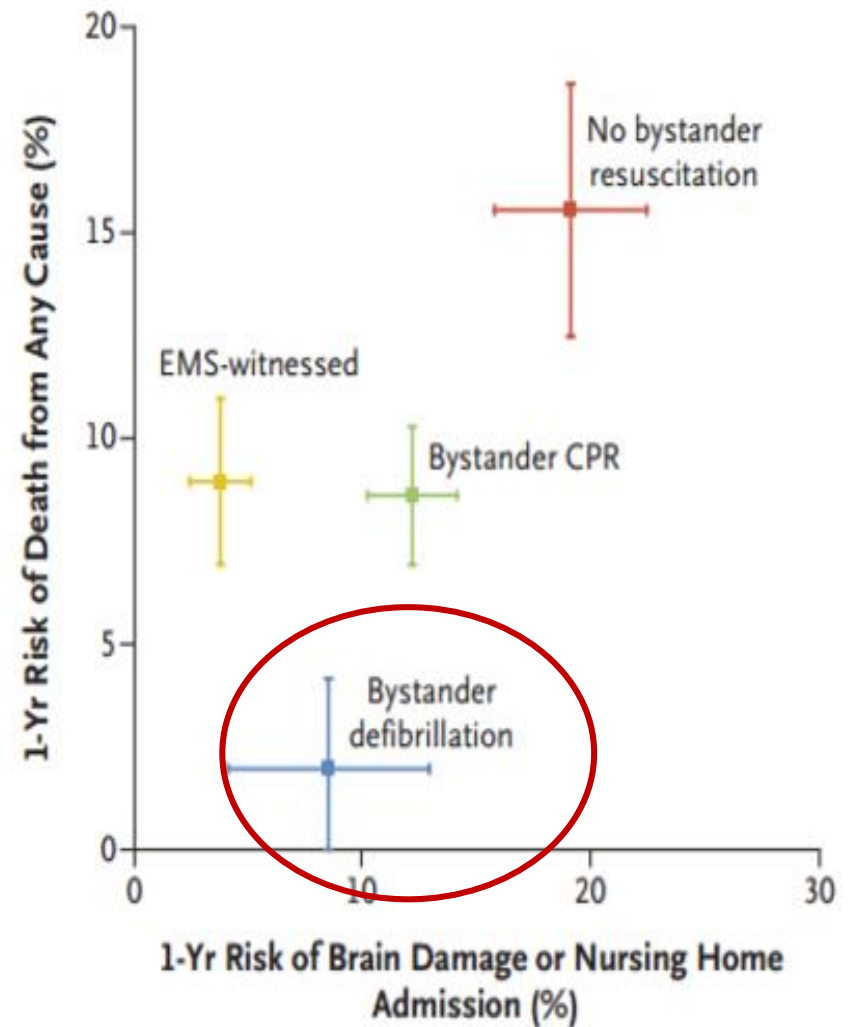


Figure 4. Absolute Risk of Anoxic Brain Damage or Nursing Home Admission and Death from Any Cause at 1 Year of Follow-up According to EMS-Witnessed and Bystander-Intervention Status.

Wearable tech..



<http://www.visimobile.com/visi-product-info/>



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PRODUCT INFORMATION



Sotera Wireless introduces the VISI Mobile System, a comprehensive vital sign monitoring platform designed to keep clinicians connected to their patients, whether the patient is in or out of bed or in transport. The VISI Mobile System is the only monitor that allows clinicians to continuously monitor all core vital signs with ICU-level accuracy, in a wearable and non-invasive package. Now, even a patient's blood pressure can be measured and displayed continuously along with Pulse oximetry, Heart Rate and ECG, Respiration Rate, and Skin Temperature all the while preserving patient mobility and without disturbing the patient for frequent vital sign checks. In the future, the VISI Mobile System will also include Sotera's patient Posture / Motion as a "new vital sign."

VISI Mobile is a "first of its kind" system, designed to enhance patient safety through early detection of signs of patient deterioration and connect clinicians with their patients anywhere, any time.

[Clinical >>](#)

[Technical >>](#)

[Economic >>](#)

EU funded COVID-19 Acute Mx Support Tool

- The European Open Science Cloud (EOSC)
- To be deployed globally
- <https://www.eoscsecretariat.eu/sites/default/files/eucovid19acutemx1-0.pdf>

Spun out of the Covid-19 Sprint Program

@ Assuta Ashdod University Hospital, Israel

COVID-19 SPRINT
Powered by Assuta Ashdod Hospital

The Team

Ori Avihail - Project Manager, Tech, IAI

Nadine Levick - MD, MPH, FACEM Emergency Physician, and Interdisciplinary Researcher, Assuta Ashdod, and CEO, Founder EMS Safety Foundation

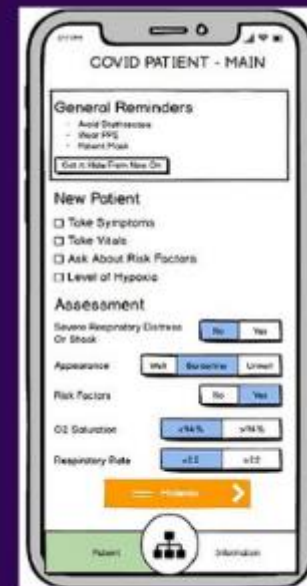
Professor (Rachel) Yaffa Zisk Rony - PhD, RN, MPH, Professor Hebrew University School of Nursing

Amit Boukai - MPH, Tel-Aviv University and MD Candidate, Technion American Medical School

Sarit Shahroor-Kami - MD Director Pediatric ICU Shaarei Tzedek Hospital

Jeffrey Green - MD, Emergency Physician, Assuta Hospital, Ashdod, Milwaukee VA Medical Center

Jack Kustanowitz - BS, MS CEO, Peak 360 Ltd Israel, Mountain Pass Technologies, USA



Covid19AcuteMx Support Tool

So what is this?

A Frontline Healthcare Provider:

- Decision support tool
- Acute care clinical Management (Mx) guide
- Disease and treatment alerts
- Educational resource
- Reference information



Some examples of Global Innovation

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Fleet Mix ?



The Motorcycle Medics

THE JERUSALEM POST

THE JERUSALEM POST

ARAB ISRAELI CONFLICT ISRAELI NEWS OPINION WORLDWIDE

MAHAMEED BECOMES FIRST MUSLIM WOMAN TO RIDE A MEDICAL MOTORCYCLE

She told 'The Jerusalem Post' that despite the bike's speed, 'I am not worried about it being dangerous. I am strong.'

BY MARYAM ALFARUKHI | MARCH 9, 2019 07:48

1 minute read



MEET MAGEN DAVID ADOM'S FEMALE MOTORCYCLISTS

These six medically-trained female volunteers beat traffic to save lives.

BY MAGEN ADOMEN | JULY 18, 2018 10:11

1 minute read



ADOM: The female motorcyclists. (Photo credit: USA)



Jerusalem Post > Israel News >

MEET MAGEN DAVID ADOM'S FEMALE MOTORCYCLISTS

These six medically-trained female volunteers best traffic to save lives.

BY HAGAY HACHOEN / JULY 18, 2019 18:11

1 minute read



מדון אורטופדי בשליש המחר
פוסט בעלים המחר



MDA's first female motorcyclists. (photo credit: MDA)

MAHAMEED BECOMES FIRST MUSLIM WOMAN TO RIDE A MEDICAL MOTORCYCLE

She told 'The Jerusalem Post' that despite the bike's speed, "I am not worried about it being dangerous. I am strong."

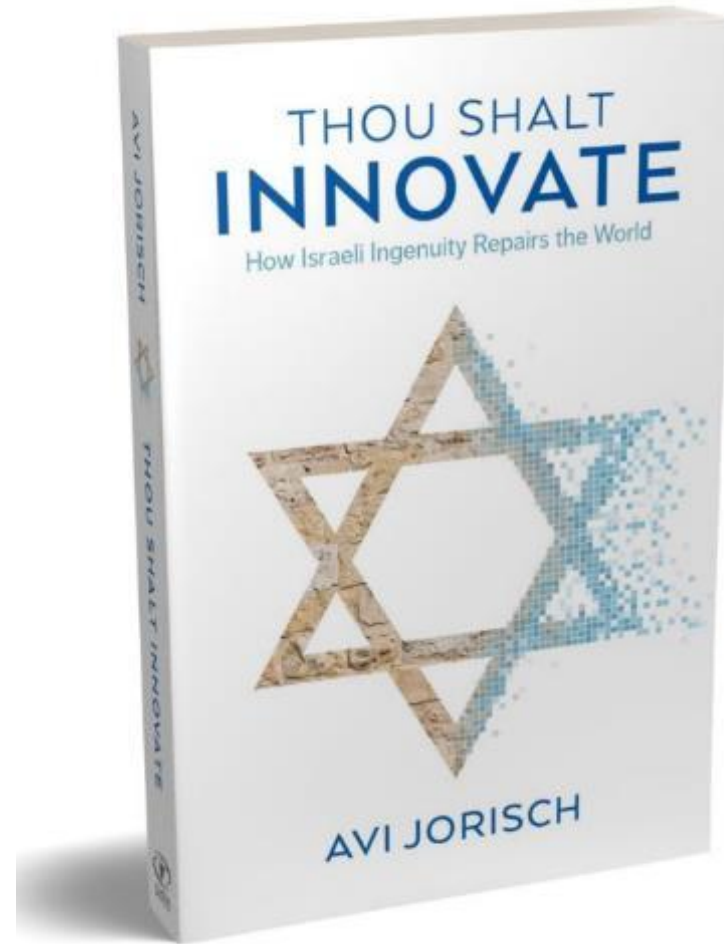
BY MAAYAN JAFFE-HOFFMAN / MARCH 5, 2019 07:49

4 minute read



Sanaa Mahameed, first Muslim woman to ride a medical motorcycle. (photo credit: MAAYAN JAFFE-HOFFMAN)

Israeli Innovation



Israeli EMS Innovations

By Dov Maisel, EMT-P

Mon, Jan 1, 2018 | P



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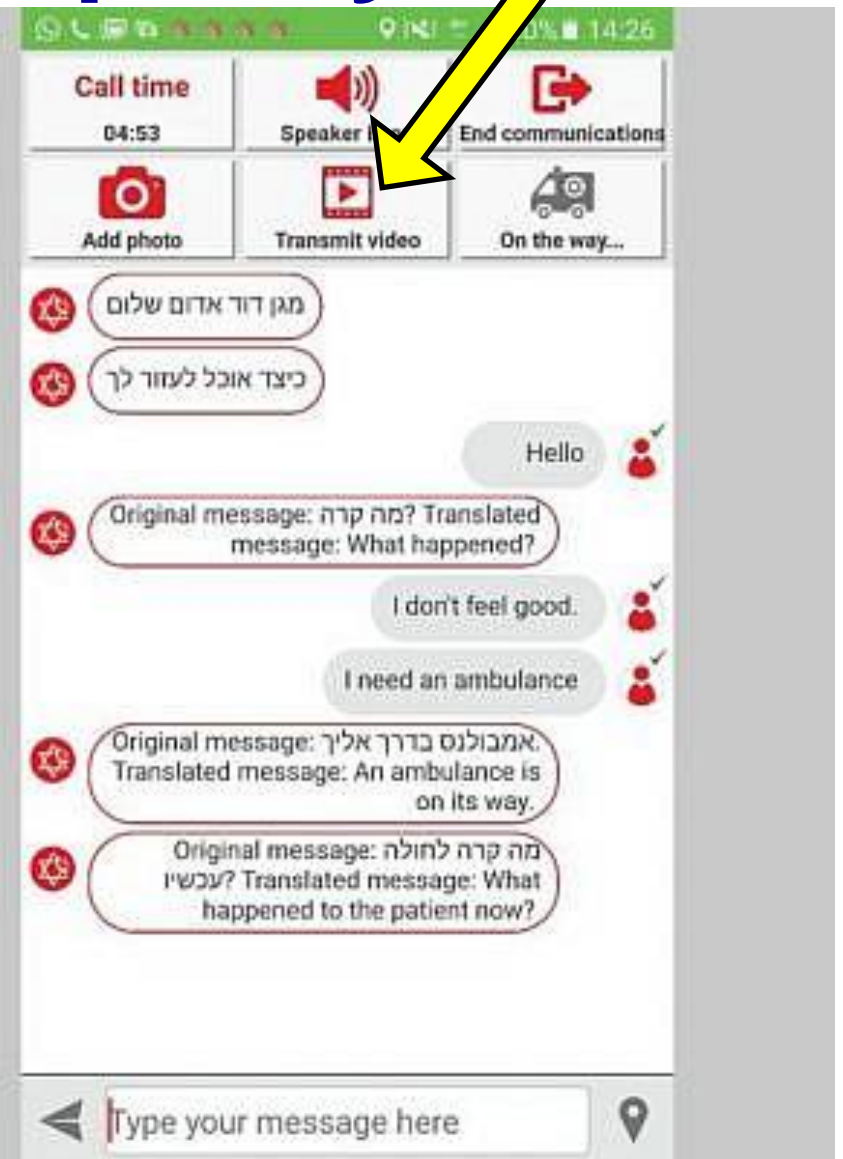
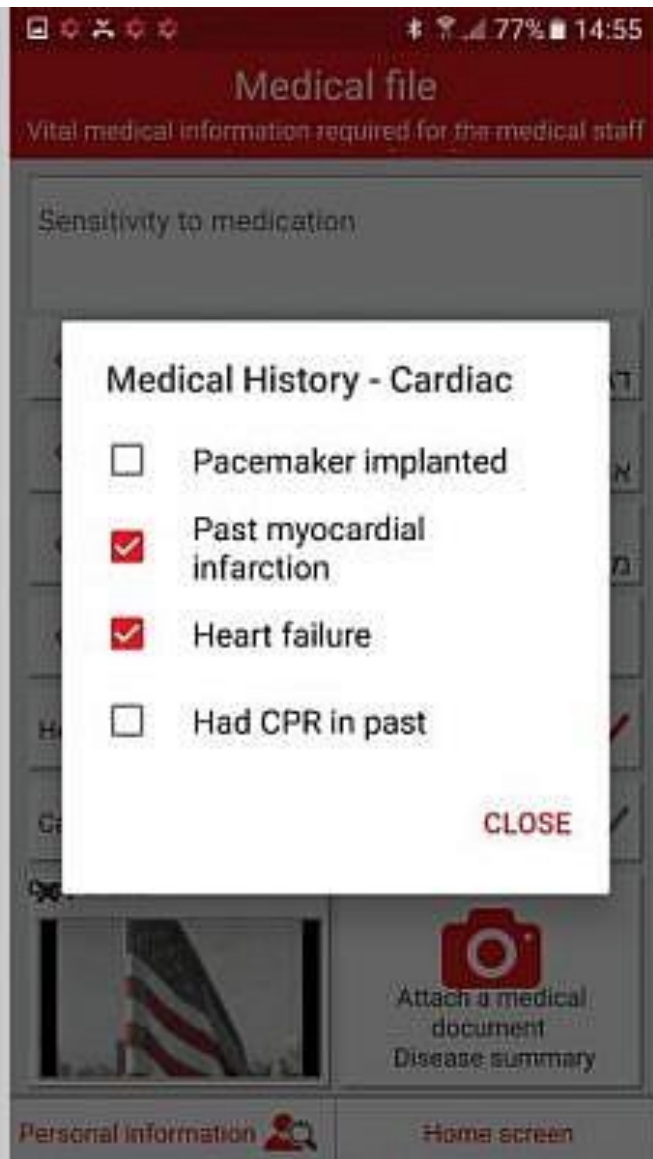
- Paramedic
Sunstar Paramedics - LOOKING...
- Paramedic
Divine Savior Healthcare - POSITION
SUMMARY: Provides...
- EMS Instructor
Mercy College of Health Sciences -...
- Program Coordinator - EMS
Vernon College - job description is...
- Specialty Programs Nurse
Coordinator
Santa Clara County EMS Agency -...

Israel

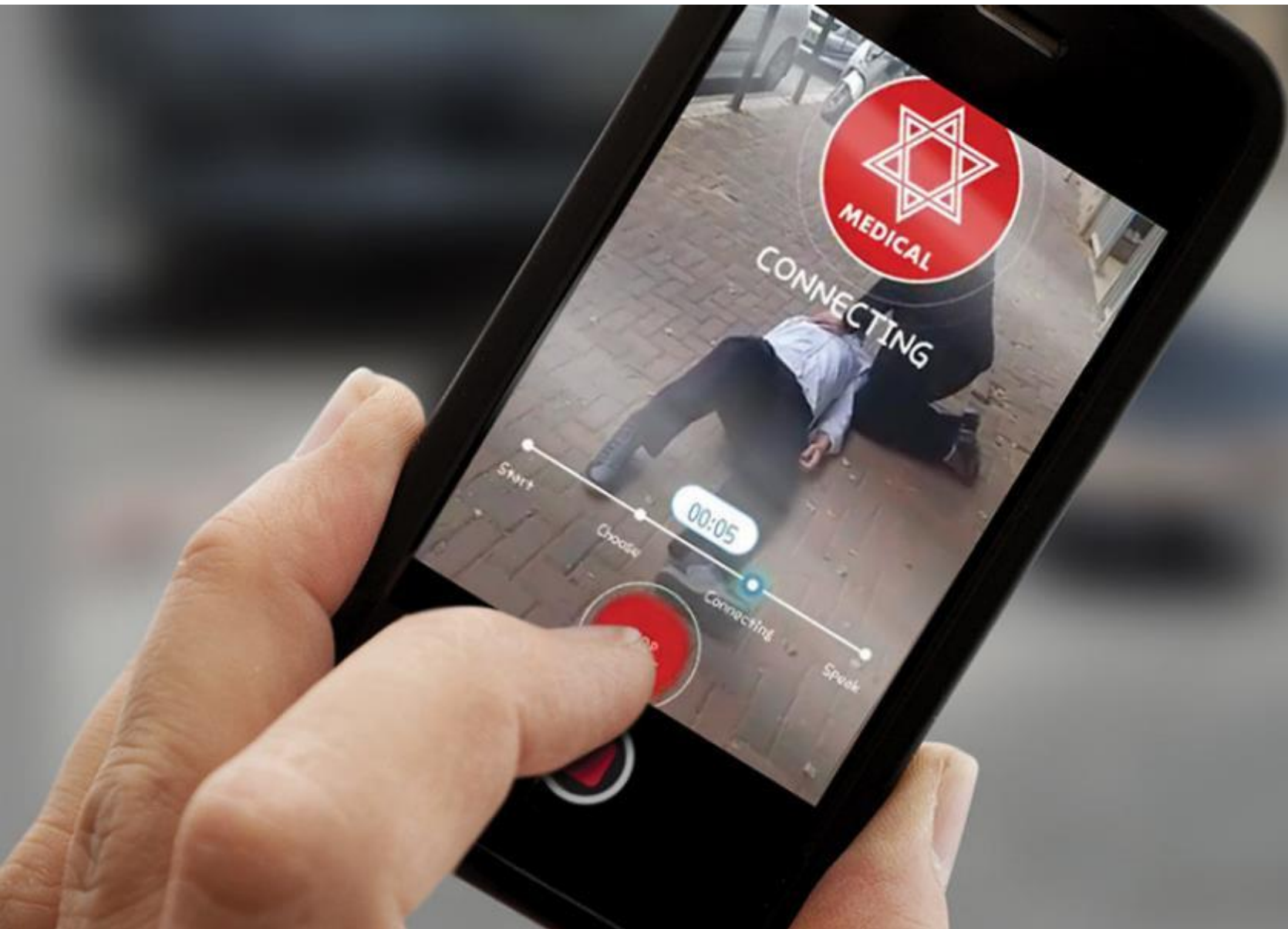
Magen David Adom - MDA

- The MDA fleet
 - Mobile Advanced Life Support Units (MALSU [Hebrew: "NATAN"])
 - Advanced Life Support Ambulances (ALSAs [Hebrew: "ATAN"])
 - Standard Ambulances
 - Mobile Mass Casualty Incident Units (MMCIUs [Hebrew: "TARAN"])
 - Command and Control Vehicle
 - Ambulances equipped with 4 X 4 wheel drive
 - All Terrain Vehicle – Ambulance (ATV - Ambulance)
 - MDA - Helicopter, Segway
 - Advanced Life Support Motorcycles
 - Supervisor Vehicle.

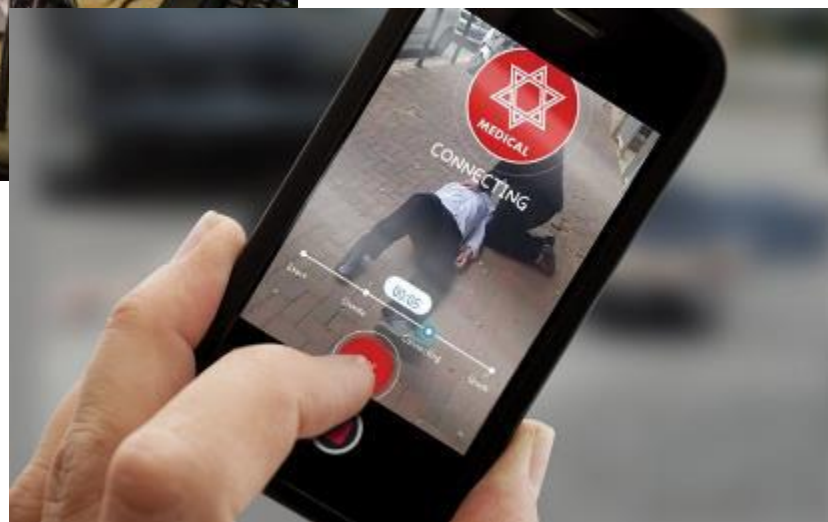
MDA App – Medical Hx & Video transmit capacity



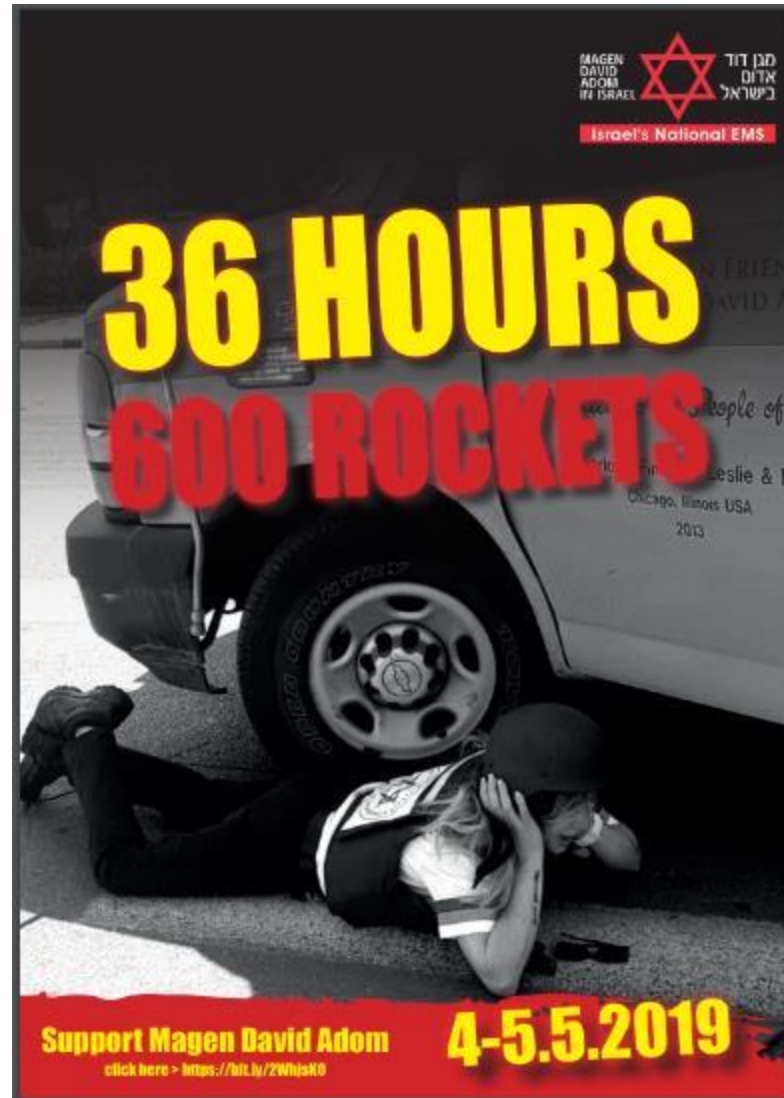
MDA App with scene video connect



MDA Dispatch



Constant preparedness a reality



MADA Innovation

Eli Jaffe EMT-P, PhD – MDA Deputy Director General-Community & International Relations

#First7Minutes

Israeli EMTs train Americans to deal with mass casualties

Magen David Adom paramedics provide Jewish, Muslim and Christian Americans with tools for dealing with emergencies.

By [Noama Barak](#) | AUGUST 6, 2019, 9:49 AM



Graduates of the 'First 7 Minutes' course given by Magen David Adom paramedics in Milwaukee. Photo courtesy of MDA

Mass casualty drills & Eli Jaffe EMT-P, PhD's moulage T-Shirts



New Models in the Corona Era

- 25- 30% EMS runs are non transport
- 30% of EMS transports to the ED are discharged home within 4 hours
- 24/7 national physician video interactive telemedicine support for these cohorts

EMS Triage... no.. Voting booth





WWW.NEWS.CN

Multicultural service



Magen David Adom 
@Mdais



A beautiful photo that shows how Israelis come together in a time of crisis.

MDA's staff and volunteers may come from different religions and backgrounds, but all of them are integral and committed to helping Israelis fight [#coronavirus](#) [#Israel](#) [#Covid_19](#)



346 12:02 AM - Mar 25, 2020



128 people are talking about this



October 2020 Developing world Innovation also



October 2020 Eric Kroner - Chad Team, a rear-motorcycle ambulance cart designed by Scott and a short-term visitor Patrick with local resources and labor

Clever innovation can be very simple, yet cost efficient



Today's Challenges

- Adopting new technologies and practices that augment EMS performance and safety
- Embracing decentralization of health care
- Doing more with less – money and workforce
- Cross skilling EMS, industry and the community
- Systems thinking and practice

Very Important Principle

Ambulance transport safety is part of a SYSTEM, the overall balance of risk involves the safety of all occupants and the public

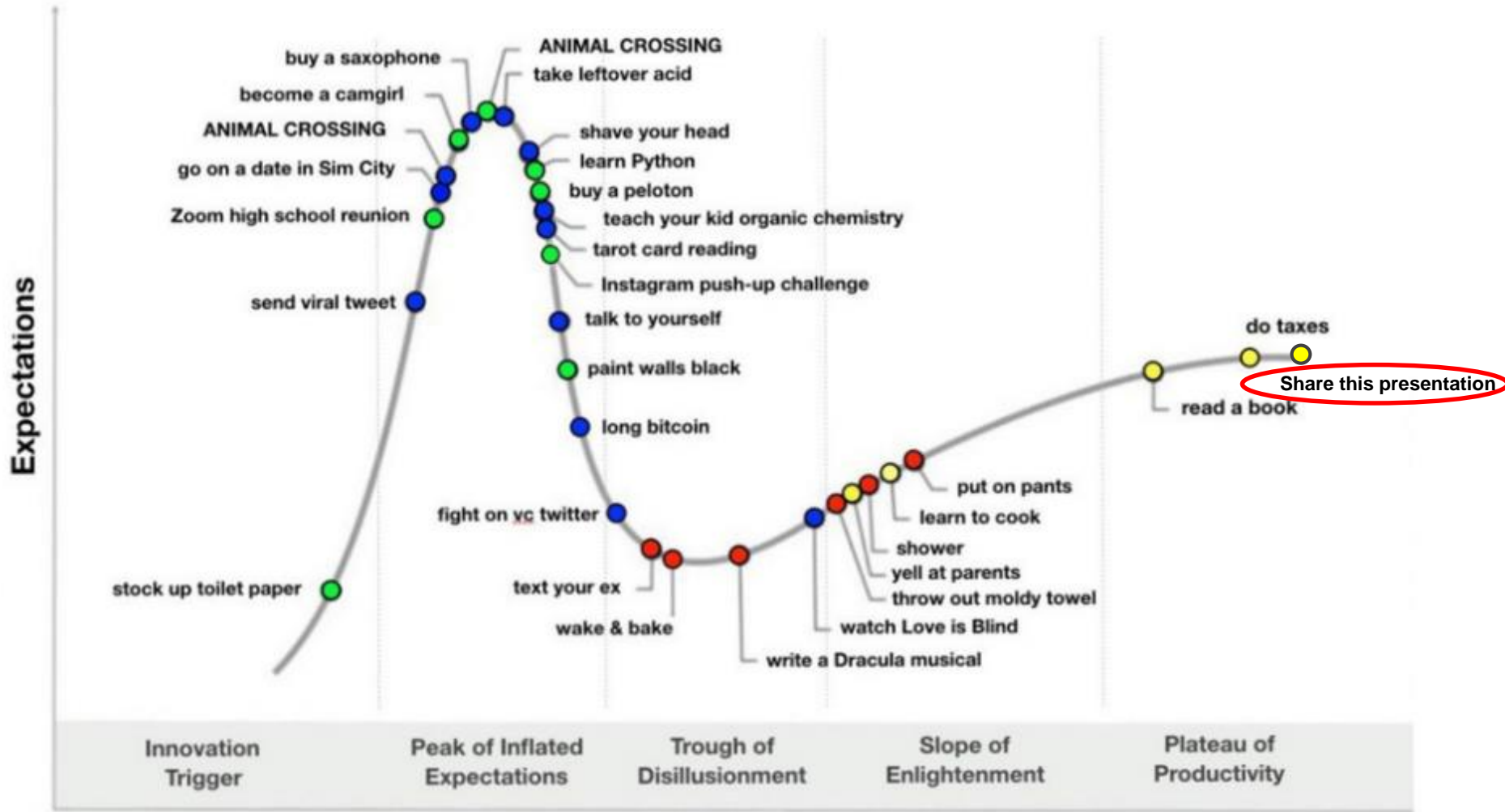
**Things can go wrong –
but when there are sound safety policies and
technologies in place, and the system is well
prepared, you can minimize harm**



EMS Systems Safety

- Technical Collaboration is key
- We cannot afford to play the silo game here, it is costing lives, time and money
- We MUST have a meaningful evidenced based approach to design, operations and policy
- We must be true outcomes driven

Gartner Hype Cycle for Emerging Quarantines, 2020



Share this presentation

Plateau will be reached:

- 2-5 days
- 6-10 days
- 10-15 days
- 15-21 days

Conclusion

- Future is now!
- Safety must be inherent to operational process, design and practice
- Adoption challenges of new disruptive technologies and applied innovation exist
- Cross skilling industry, providers and community
- Interplay between patient, provider and public safety from a systems perspective is key to effective and safe operational EMS performance

Your electronic handout/resource link with all text slides



Or if you are
> 45 years

www.objectivesafety.net/PDFHO.htm

<http://www.objectivesafety.net>

Your Handout and Additional Resources

Objective Safety - Windows Internet Explorer

http://www.objectivesafety.net/

Objective Safety

Thursday 13. December 2007

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Welcome...

Objective Safety

Objective Safety is dedicated to EMS safety awareness and enhancing injury prevention and control.