



Sustaining Emergency Medical Services during COVID-19

March 26, 2020

This presentation is a product of the National Occupational Research Agenda (NORA) Public Safety Council. The findings and conclusions in these reports are those of the author(s) and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.

Today's Agenda

- | | |
|--------------------|--|
| 2:00 -2:05 | Welcome - <i>Jeff Burgess, MD, MS, MPH</i> |
| 2:05 – 2:15 | COVID-19 Disease - <i>CDR Marie A. de Perio, MD</i> |
| 2:15 – 2:30 | Partnering and Leveraging Displaced Workers - <i>Brian Maguire, Dr.PH, MSA, EMT-P</i> |
| 2:30 – 2:38 | Leveraging Computer Aided Dispatch to Inform Strategy and Needs - <i>Lori Moore-Merrell, Dr.PH, MPH</i> |
| 2:38 – 2:45 | Video to Guide EMS Exposure Reduction - <i>Kelly Reynolds, PhD</i> |
| 2:45 – 2:53 | Reducing Risks Associated with Long Work Hours - <i>Claire C. Caruso, PhD, RN, FAAN</i> |
| 2:53 – 3:00 | Open Forum for EMS Information Exchange - <i>Carol Brown, PhD</i> |
| 3:00 – 3:10 | Facilitated Discussion (Burgess) |
| 3:10 – 3:15 | Interest and Mechanism(s) for Future Engagement |

Welcome

Jeff Burgess, MD, MS, MPH

Associate Dean for Research - University of Arizona

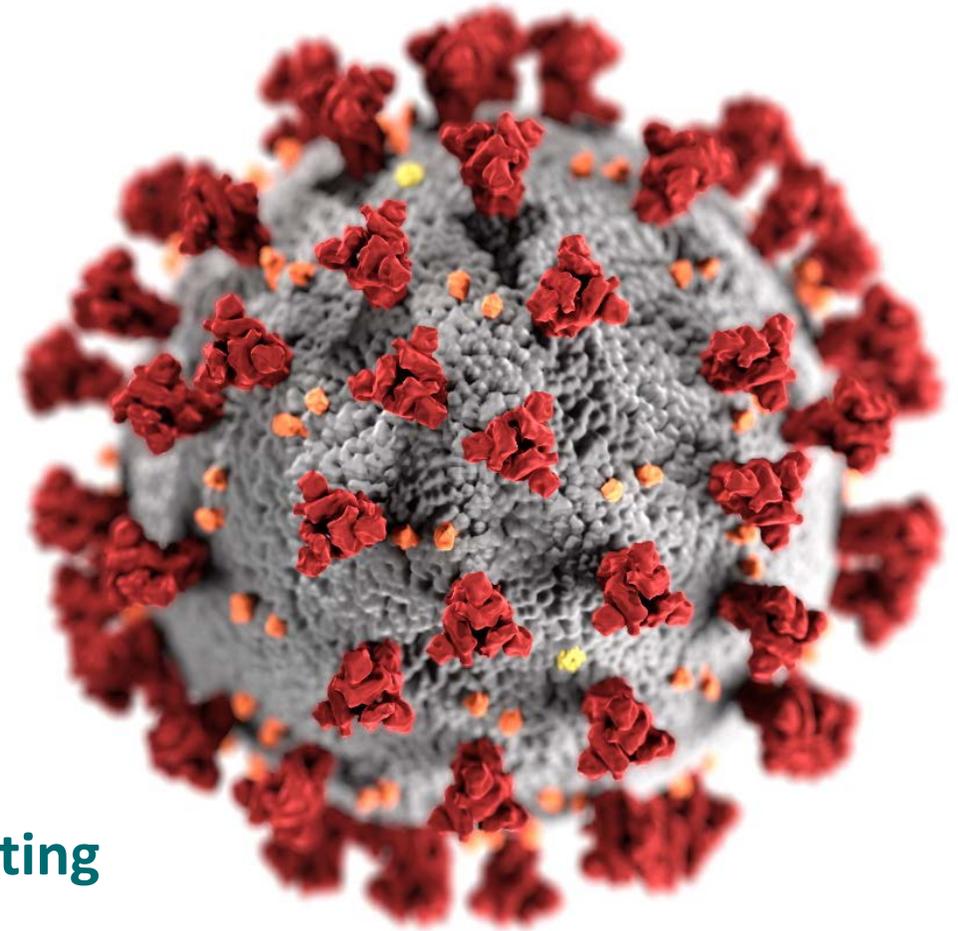
Co-Chair - NORA PS Council

Coronavirus Disease 2019 (COVID-19)

CDR Marie A. de Perio, MD

March 26, 2020

NORA Public Safety Sector (PSS) Council &
Healthcare and Social Assistance (HCSA) Council Meeting



For more information: www.cdc.gov/COVID19

Overview of Presentation

- Background on coronavirus disease 2019 (COVID-19)
 - Transmission
 - Symptoms and disease
 - Epidemiology
- COVID-19 in the United States
- Web resources for emergency responders



Coronavirus Disease 2019 (COVID-19)



Coronavirus Disease 2019 Abbreviation

'CO' stands for 'corona'

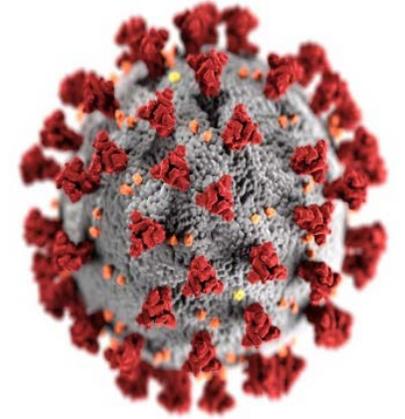
'VI' stands for 'virus'

'D' stands for 'disease'

'19' refers to 2019

COVID-19

COVID-19: Emergence



- Identified in Wuhan, China
- Caused by the virus SARS-CoV-2
- Early on, many patients were reported to have a link to a large seafood and live animal market
- Now person-to-person spread
- Imported cases in travelers and community spread reported in U.S.
 - First US case: January 21, 2020
- CDC is reporting confirmed COVID-19 cases in the U.S. online at www.cdc.gov/coronavirus/2019-ncov/cases-in-us.html

How It Spreads



- Investigations are ongoing to better understand spread
- Largely based on what is known from other coronaviruses
- Person-to-person spread
 - Between people in close contact with each other (about 6 feet)
 - Through respiratory droplets produced when infected person coughs or sneezes
- Possible spread from contact with infected surfaces or objects and then touching the mouth, nose, or eyes

COVID-19: Symptoms & Complications

Wide range of illness severity has been reported

- Mild to severe illness
- Can result in death

Estimated incubation period: 2 to 14 days

Complications may include:

- Pneumonia
- Respiratory failure
- Most common in older patients, those with underlying medical conditions



COVID-19: Treatment

Treatment

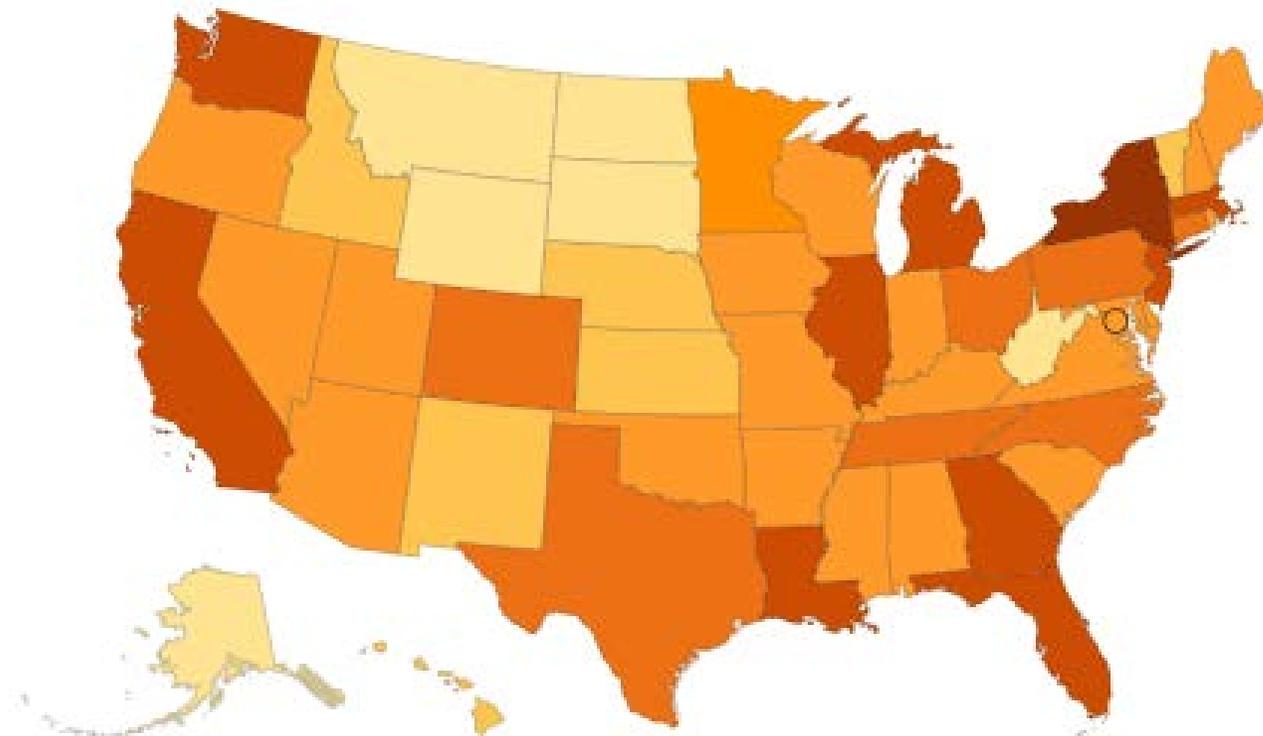
- No specific antiviral treatment licensed for COVID-19
- Supportive care to
 - Relieve symptoms
 - Manage pneumonia and respiratory failure



COVID-19 in the United States



COVID-19 in the United States



Reported Cases

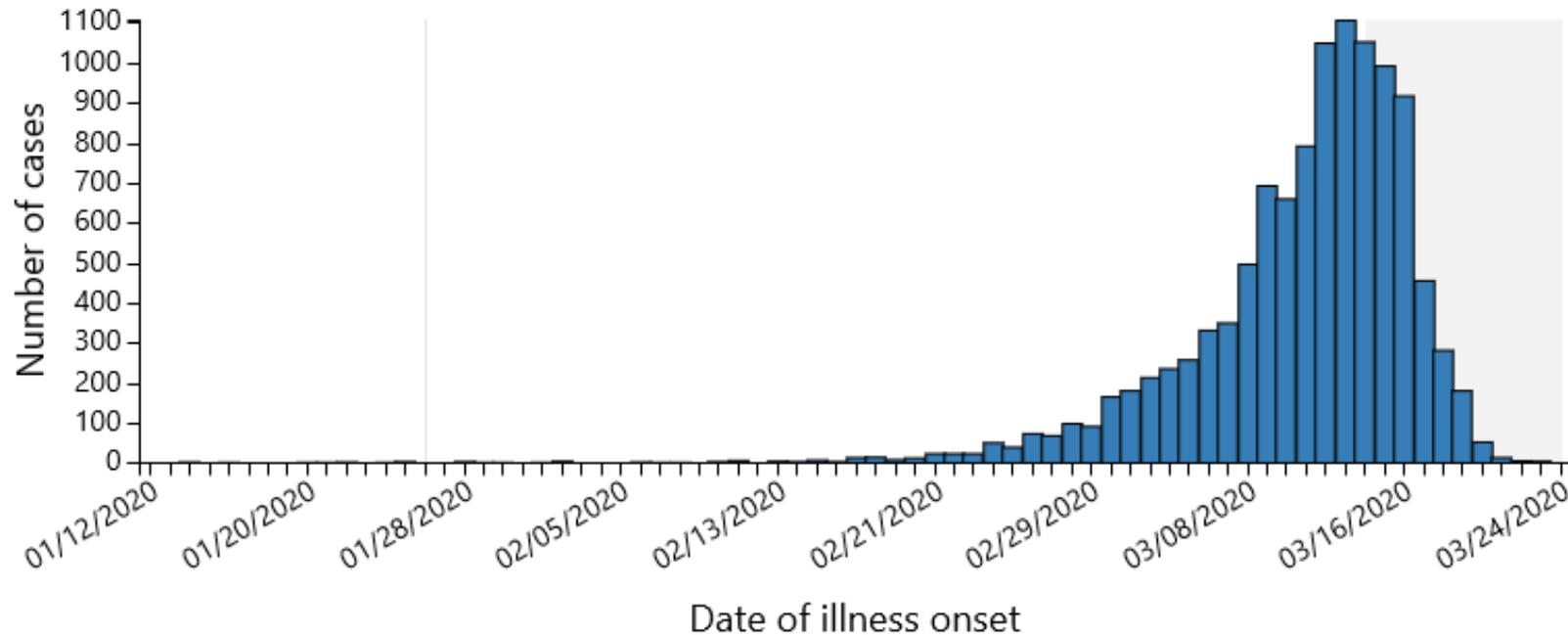
(last updated March 25, 2020)

- None
- 6 to 50
- 51 to 100
- 101 to 500
- 501 to 1000
- 1001 to 5000
- 5001 or more

- As of March 25, 2020
- 50 states reporting cases + DC, PR, USVI, Guam
- <https://www.cdc.gov/coronavirus/2019-ncov/cases-in-us.html>



COVID-19 Cases in the United States by Date of Illness Onset



- As of March 25, 2020
 - 54,453 total cases*
 - 737 total deaths
 - 49 cases among repatriated U.S. citizens
- *Confirmed and presumptive cases detected, tested in United States

What law enforcement personnel need to know about coronavirus disease 2019 (COVID-19)

Coronavirus disease 2019 (COVID-19) is a respiratory illness that can spread from person to person. The outbreak first started in China, but cases have been identified in a growing number of other areas, including the United States.

Patients with COVID-19 have had mild to severe respiratory illness.

- Data suggests that symptoms may appear in as few as 2 days or as long as 14 days after exposure to the virus that causes COVID-19.
- Symptoms can include fever, cough, difficulty breathing, and shortness of breath.
- The virus causing COVID-19 is called SARS-CoV-2. It is thought to spread mainly from person-to-person via respiratory droplets among close contacts. Respiratory droplets are produced when an infected person coughs or sneezes and can land in the mouths or noses, or possibly be inhaled into the lungs, of people who are nearby.
 - Close contact increases your risk for COVID-19, including:
 - » Being within approximately 6 feet of an individual with COVID-19 for a prolonged period of time.
 - » Having direct contact with body fluids (such as blood, phlegm, and respiratory droplets) from an individual with COVID-19.

To protect yourself from exposure

- **If possible, maintain a distance of at least 6 feet.**
- **Practice proper hand hygiene.** Wash your hands with soap and water for at least 20 seconds. If soap and water are not readily available and illicit drugs are NOT suspected to be present, use an alcohol-based hand sanitizer with at least 60% alcohol.
- Do not touch your face with unwashed hands.
- Have a trained Emergency Medical Service/Emergency Medical Technician (EMS/EMT) assess and transport anyone you think might have COVID-19 to a healthcare facility.
- Ensure only trained personnel wearing appropriate personal protective equipment (PPE) have contact with individuals who have or may have COVID-19.
- Learn your employer's plan for exposure control and participate in all-hands training on the use of PPE for respiratory protection, if available.



COVID-19A 03/24/2020

Recommended Personal Protective Equipment (PPE)

Law enforcement who must make contact with individuals confirmed or suspected to have COVID-19 should follow CDC's Interim Guidance for EMS. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-for-ems.html>.

Different styles of PPE may be necessary to perform operational duties. These alternative styles (i.e., coveralls) must provide protection that is at least as great as that provided by the minimum amount of PPE recommended.

The minimum PPE recommended is:

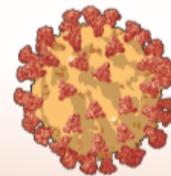
- A single pair of disposable examination gloves,
- Disposable isolation gown or single-use/disposable coveralls*,
- Any NIOSH-approved particulate respirator (i.e., N-95 or higher-level respirator); facemasks are an acceptable alternative until the supply chain is restored, and
- Eye protection (i.e., goggles or disposable face shield that fully covers the front and sides of the face).

*If unable to wear a disposable gown or coveralls because it limits access to duty belt and gear, ensure duty belt and gear are disinfected after contact with individual.

If close contact occurred during apprehension

- Clean and disinfect duty belt and gear prior to reuse using a household cleaning spray or wipe, according to the product label.
- Follow standard operating procedures for the containment and disposal of used PPE.
- Follow standard operating procedures for containing and laundering clothes. Avoid shaking the clothes.

For law enforcement personnel performing daily routine activities, the immediate health risk is considered low. Law enforcement leadership and personnel should follow CDC's Interim General Business Guidance. Search "Interim Guidance for Businesses" on www.cdc.gov.



[cdc.gov/COVID-19](https://www.cdc.gov/COVID-19)

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/guidance-law-enforcement.pdf>



Web Resources

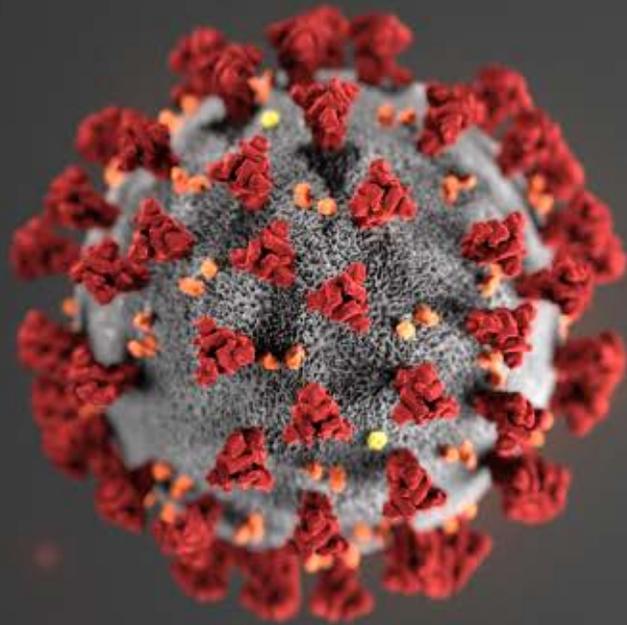
- [Coronavirus Disease 2019 \(COVID-19\) Situation Summary](#)
- [Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 \(COVID-19\), February 2020](#)
- [What Law Enforcement Personnel Need to Know about Coronavirus Disease 2019 \(COVID-19\)](#)
- [Interim Guidance for Emergency Medical Services \(EMS\) Systems and 911 Public Safety Answering Points \(PSAPs\) for COVID-19 in the United States](#)
- [COVID-19: Resources for Home](#)



Web Resources

- [Interim US Guidance for Risk Assessment and Public Health Management of Persons with Potential Coronavirus Disease 2019 \(COVID-19\) Exposures: Geographic Risk and Contacts of Laboratory-confirmed Cases](#)
- [Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease \(COVID-19\)](#)
- [Criteria for Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19 \(Interim Guidance\)](#)
- [Strategies for Optimizing the Supply of PPE](#)

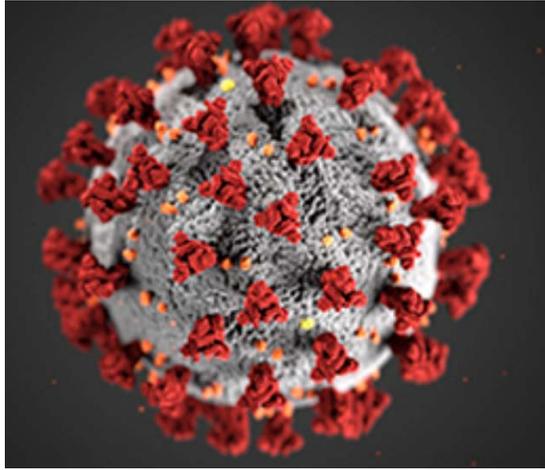




For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

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26 March 20

EMS response to COVID-19: Partnering and Leveraging Displaced Workers

Brian J. Maguire, Dr.PH, MSA, EMT-P

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2009 Senior Fulbright Scholar

Disclaimer and Acknowledgement

- *The views expressed in this presentation are those of the author and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.*
- *The presenter has no conflicts of interest.*
- *This project is unfunded.*

Status of the emergency medical services in the U.S.

- There is no system for tracking personnel so we do not know the number of EMTs and paramedics, how many are ill or how many are available.
- There are no publicly available numbers but a recent post noted that one large EMS system was now handling daily call volumes that are 50% higher than historic highs.
- PPE supplies are critically low.

What can we expect

- Call volumes will rise dramatically.
- The number of EMS personnel will begin declining as people become ill and have to make difficult choices about caring for ill family members at home.
- Growing numbers of patients needing ventilators will require long-distance transports by ambulance.
- In addition to emergencies, EMS personnel may be asked to help ill patients at home when hospitalization is unwarranted or unavailable.

Funding is immediately needed

We need to be hiring people

- for logistic support including to clean and disinfect the ambulances and equipment
- for materials management teams to keep ambulances stocked
- to drive the ambulances to help take pressure off the EMS professionals.

EMS personnel should be focused on patient care.

Deliver National Online Training Program

- In conjunction with hiring these thousands of individuals, a national online training program is needed. The first priority for such a program is to provide critical training the new workers will need. The national program will need to hire local instructors to provide some hands-on training and those local instructors will need training on how to safely provide the training.

Training continued

- A training program is also needed to provide critical training updates to the EMS workforce on a timely and ongoing basis.
- Such a program could also provide training for the thousands of people who will be needed to support the health centers being planned for converted gymnasiums, cruise ships, hotels, and community buildings.

Activate A National EMS Communication Program

- Today, the 21,283 EMS agencies are each, individually trying to solve many, very similar problems. A national communication program is needed to facilitate interaction and provide a forum where agency leaders can share lessons learned, post resources and ask for advice.

Timing

- We are at the beginning of the tsunami. The beach is still mostly dry. However, by the time the cars start floating down the street it will be too late to plan
- We may have two weeks to prepare, we may have less
- We should plan for the emergency to last until August

Research perspectives

- We need a system for identifying personnel, monitoring their health status and reporting findings so that we can identify needs and deploy risk-reduction interventions.
- Once the immediate crisis is over we should evaluate lessons learned and begin planning both for the next crisis and for new ways that EMS can triage, provide community health needs and stay safe.

For more information contact:

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Dr. Brian Maguire is an epidemiologist and academic with a background in disaster preparedness and emergency medical services (EMS).

He is employed by Leidos in Connecticut where he conducts occupational health and safety research for the military. He is also an adjunct professor at both Central Queensland University in Australia and Mitchell College in Connecticut.

For three years he was a consultant on a Department of Homeland Security bioterrorism and pandemic preparedness program. He worked for two decades in the New York City EMS system as an administrator, operations supervisor and paramedic.

Publications

- Maguire BJ. COVID-19: Urgent EMS Issues. JEMS. March 23, 2020. Available at <https://www.jems.com/2020/03/23/covid-19-urgent-ems-issues/>
- Maguire BJ. Urgent EMS needs for COVID-19 response. EMS1. March 21, 2020. Available at: <https://www.ems1.com/coronavirus-covid-19/articles/urgent-ems-needs-for-covid-19-response-9v3lseTKtgByPYzb/>
- For additional publications click here: <https://sites.google.com/site/drbranjmaguire/publications>

Leveraging Computer Aided Dispatch to Inform Strategy and Needs

Lori Moore-Merrell, Dr.PH, MPH

President & CEO - International Public Safety Data Institute

EMS Exposure Reduction Training

Kelly A. Reynolds, PhD

Professor & Chair, Community Environment & Policy Department

National Occupational Research Agenda (NORA) Council's for
Public Safety (PS), Healthcare and Social Assistance (HCSA), and
Immune Infections, and Dermal Disease Prevention (IID)



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**Environment, Exposure Science
& Risk Assessment Center**

<https://ESRAC.Arizona.edu>

Previous research

- **Surface contamination** important in the spread of CoV
 - 13/17 surfaces from infected patient room positive, including HCW shoe
- Our studies showed **gaps** in EMS infection control protocols
 - Missed surfaces
 - Soft/porous surfaces
 - Cross-contamination between EMS hands, clothing, station surfaces- including living areas
 - Use of cleaning (not disinfecting) agents in station common areas
 - Minimum disinfectant contact times
- MRSA EMS **outbreak**
 - 17 cases of cellulitis
 - 4 required hospitalization
 - Spread to bunkmate of from different shift
 - Documented transmission to 14 month old child
 - **Targeted intervention and training**
 - Zero cases in three years
- Tracer studies showed **contamination** of both medical (60%) and non-medical surfaces (50%)



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& Risk Assessment Center

Current EMS micro-training:

<https://www.youtube.com/watch?v=GlbGJtfzHdE&t=2s>

Coronavirus (COVID-19)

Infectious Agents Exposure Reduction Training for First Responders

ESRAC, in collaboration with the Tucson Fire Department (TFD) and the Western Regional Public Health Training Center (WRPHTC) at MEZCOPH, created a training video for firefighters and EMS responders about the best protocols to avoid infection. [Click here for more information](#)



Infectious Agents Exposure Reduction Training for First Responders

7,230 views · Mar 21, 2020

45 2 SHARE SAVE ...

Western Region Public Health Training Center
976 subscribers

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Exposure Mitigation Checklist

Completion status	Procedure Step	
<i>At Patient Home</i>		
<input type="checkbox"/>	<p style="text-align: center;">Don PPE</p> <p style="text-align: center;">Tier 1 for basic medical responses</p> <p style="text-align: center;">Tier 2 for suspected COVID-19 patient or if invasive procedure to be done</p>	<p>Tier 1:</p> <ul style="list-style-type: none"> • Gloves • Mask • Eye shield <p>Tier 2:</p> <ul style="list-style-type: none"> • Disposable gown • Boot covers • N95 respirator
<input type="checkbox"/>	Provide mask to patient	
<input type="checkbox"/>	Move patient to open-air area if ambulatory	<ul style="list-style-type: none"> • 6-12 foot distance • Bring in only necessary equipment • Minimize number of personnel for suspected COVID-19 cases
<i>Loading/Transporting Patient</i>		
<input type="checkbox"/>	Wrap patient, with one arm out for vitals	<ul style="list-style-type: none"> • Limit their contact with gurney
<input type="checkbox"/>	Driver: doff PPE before driving	
<i>After the Call</i>		
<input type="checkbox"/>	<p style="text-align: center;">Disinfect equipment</p> <p><u>Cabin:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Grab bars <input type="checkbox"/> Counter tops <input type="checkbox"/> Seatbelts <input type="checkbox"/> Gurney <input type="checkbox"/> Chords <input type="checkbox"/> Screens <input type="checkbox"/> Keyboards <input type="checkbox"/> Seats <input type="checkbox"/> Handles <p><u>Cab:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Radio <input type="checkbox"/> Steering wheel <input type="checkbox"/> Keys <input type="checkbox"/> Gear shift <input type="checkbox"/> Door handles <input type="checkbox"/> Seatbelts <p><u>Personal items:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Cell phone <input type="checkbox"/> Glasses/sunglasses 	<ul style="list-style-type: none"> • Use EPA-registered surface disinfectants • Observe proper contact time (time for surface to remain wet before drying) • Use disposable towels if using spray
<input type="checkbox"/>	Wash hands (at least 20 seconds)	
<input type="checkbox"/>	<u>Before entering the station:</u> Remove boots	
<input type="checkbox"/>	Use hand sanitizer (enough to cover front and back of hands)	
<input type="checkbox"/>	If patient was suspected to be highly infectious, document the call with department SOP	

- English and Spanish versions



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**Environment, Exposure Science
& Risk Assessment Center**

Future needs

- **Repeated training**
 - PPE and disinfection protocols essential- prioritization given **short supply**
 - Increased call volume can limit effectiveness- how to **optimize?**
- **Expanded training**
 - Additional topics
 - Broader reach
 - Engaging formats
 - Evidenced based targets
 - Model predictions
 - Field validation studies



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Environment, Exposure Science
& Risk Assessment Center

Infectious Agents Exposure Reduction Training for First Responders

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WESTERN REGION
Public Health
Training Center

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Infectious Agents Exposure Reduction Training for First Responders

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<https://www.youtube.com/watch?v=GlbGJtfzHdE&t=2s>

<https://ESRAC.Arizona.edu>

Resources for Long Work Hours, Shift Work & Related Workplace Fatigue Issues

Claire C Caruso, PhD, RN, FAAN
Research Health Scientist

March 26, 2020



National Institute for Occupational Safety & Health



The findings and conclusions in this presentation have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

**Resources to Better Cope with Long Work Hours &
Improve Sleep during Disaster Responses**



**During sleep,
brain & body are
busy getting
us ready for
a new day**

(National Heart, Lung, and
Blood Institute., 2011)

View sleep as a critical logistical item, just like water, food, & supplies needed to carry out operations

THE PERFORMANCE TRIAD CHALLENGE



Sleep, Activity, and Nutrition



Professional
**SOLDIER
ATHLETE**
HERE IT'S NOT A GAME



Sleep, Activity, and Nutrition

Interim NIOSH Training for Emergency Responders: Reducing Risks Associated with Long Work Hours



Interim NIOSH Training for **Emergency Responders**:
Reducing Risks Associated with Long Work Hours



30 minute training program
for long day shifts by
emergency workers working
in disasters caused by
epidemics, & other
catastrophic events

<https://www.cdc.gov/niosh/emres/longhourstraining/>

NIOSH Training for Nurses on Shift Work and Long Work Hours

Module 9. Coping with the Night and Evening Shifts

Objectives

In this module you can learn ways of making night and evening shifts less difficult by taking an active coping approach. You can learn:

- Ways to improve the quantity and quality of sleep
- Ways of maintaining a healthy diet and avoiding gastrointestinal (GI) symptoms

Takes 12 minutes

<https://www.cdc.gov/niosh/docs/2015-115/default.html>

NIOSH Training for Nurses on Shift Work and Long Work Hours

DHHS (NIOSH) Publication Number 2015-115 (Revised October 2019)

On This Page

[Launch Desktop Course](#)

[Technical Requirements](#)

[Course Objectives](#)

[Target Audience](#)

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[Contact Information](#)

Training and Education

CDC Course Numbers: WB4217 and WB4218

Course Description

The purpose of this online training program is to educate nurses and their managers about the health and safety risks associated with shift work, long work hours, and related workplace fatigue issues and relay strategies in the workplace and in the nurse's personal life to reduce these risks. Part 1 (CDC Course No. WB4217) is designed to increase knowledge about the wide range of risks linked to these work schedules and related fatigue issues and promote understanding about why these risks occur. This knowledge provides background information for Part 2 of the training program. Part 2 (CDC Course No. WB4218) is designed to increase knowledge about personal behaviors and workplace systems to reduce these risks. Content for this training program is derived from scientific literature on shift work, long work hours, sleep, and circadian rhythms.

Launch Course

[NIOSH Training for Nurses on Shift Work and Long Work Hours](https://www.cdc.gov/niosh/docs/2015-115/default.html)

Takes about 3.5 hours

Continuing education
available: CNE, CEU, CPH

<https://www.cdc.gov/niosh/docs/2015-115/default.html>

IMPLEMENTATION GUIDEBOOK

2018 FATIGUE RISK MANAGEMENT
GUIDELINES FOR EMERGENCY
MEDICAL SERVICES

October 2018

By:

P. Daniel Patterson, PhD, NRP
University of Pittsburgh

Kathy Robinson, RN, EMT-P
National Association of State EMS Officials

With Support From:

National Highway Traffic Safety Administration
Contract Number: DTNH2215R00029



18 page guidebook for
EMS administrators with
Implementation of the
Evidence Based Guidelines for
Fatigue Risk Management in EMS

P. Daniel Patterson, PhD, NRP
Associate Professor
University of Pittsburgh
pdp3@pitt.edu

<https://nasemso.org/wp-content/uploads/Fatigue-Guidebook-FINAL-2018Oct.pdf>

Source material <https://www.tandfonline.com/doi/full/10.1080/10903127.2017.1376137>

**Thank You
For your interest
ccaruso@cdc.gov**

Open Forum for EMS Information Exchange

Carol Brown, PhD

Deputy Director – Center for Health, Work & Environment

University of Colorado at Denver

Facilitated Discussion

Jeff Burgess, MD, MS, MPH

Associate Dean for Research - University of Arizona

Co-Chair - NORA PS Council

Interest and Mechanism(s) for Future Engagement

Susan M. Moore, PhD

Senior Scientist – National Personal Protective Technology Laboratory, NIOSH

Coordinator – PS Portfolio, NIOSH

Co-chair - NORA PS Council