Is There a PA Onboard?
In-flight Medical Emergencies

Fred Wu, MHS, PA-C
Residency Program Director
Emergency Medicine PA Residency
University of California San Francisco - Fresno

UCSF Fresno Medical Education Program
School of Medicine

UCSF FRESNO
DEPARTMENT OF EMERGENCY MEDICINE

Disclosures

Society of Emergency Medicine® Physician Assistants

EM:RAP
Emergency Medicine:
Reviews and Perspectives

Objectives

- Describe the epidemiology of in-flight emergencies
- List common conditions encountered during in-flight emergencies and when to consider diversion
- Describe health challenges associated with flying
- Review typical medical equipment found on domestic planes


TICKETING
&CHECK-IN
A
B
C
5-10

Epidemiology

- More than 4 billion passengers flew on commercial airlines in 2017
- Estimated prevalence of in-flight emergency: 1 in 604 flights
- 24 to130 in-flight emergencies per 1 million passengers
- 260 to 1420 in-flight emergencies daily
- Diversion in 4.4% of cases


DREAMLINER
DREAMLINER
DREAMLINER

Plane Environment

- Cruising altitude usually 30,000 – 40,000 feet
- Expansion of closed gas-containing spaces
- Healthy passengers may have mild hypoxia
- Prolonged sitting and hypoxia → ? Venous thromboembolism

Cabin Air

- Little clinical evidence to show that cabin air is harmful
- Risk of infection due to close proximity, NOT cabin air
- Source of air
  - Recirculated
  - “bleed air”

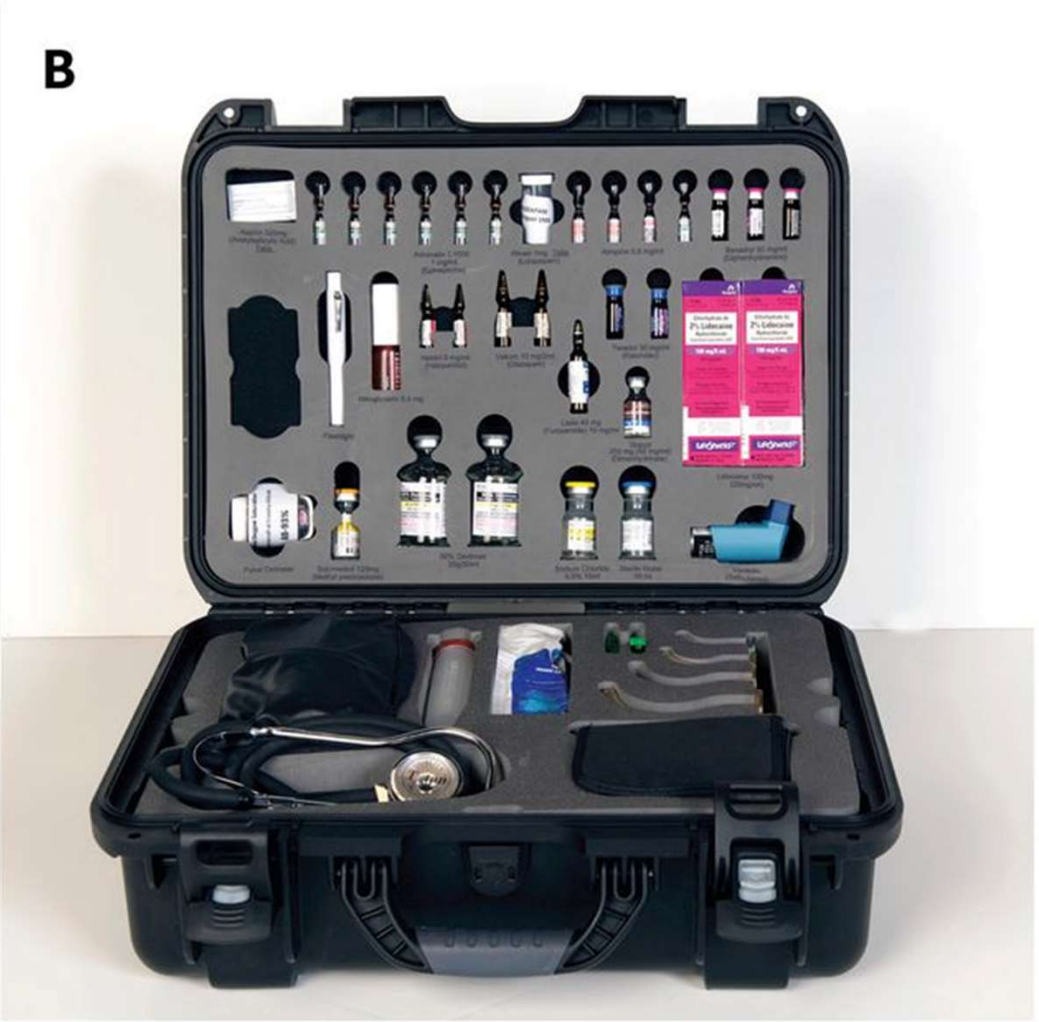
Aviation Medical Assistance Act

- Protects passengers who provide medical assistance from liability except when gross negligence or willful misconduct
- Must not seek compensation
- Duty to respond varies between countries

Emergency Medical Kit

- Federal Aviation Administration (FAA) required
- US vs. non-US airlines
- Automated external defibrillator (AED)
- Can usually treat:
  - Basic injuries
  - Mild pain
  - Allergic reactions
  - Hypoglycemia
  - Dehydration
  - Bronchospasm
  - Cardiac


A
001
AIR CANADA
AIRCRAFT MEDICAL KIT
TROUSSE MÉDICALE DE BORD
NANUK 925


B


A
B


Lufthansa
Doctor's Kit
HEARTSTREAM
FORERUNNER
semi-automatic defibrillator

Table 3. Contents of Emergency Medical Kits

	FAA-Mandated Emergency Medical Kit[a]	Additional Contents[b]
Equipment	Airways, oropharyngeal Adhesive tape, 1-in Alcohol sponges Cardiopulmonary resuscitation mask Intravenous administration set Needles Protective gloves Sphygmomanometer Stethoscope Syringes Tape scissors Tourniquet (for intravenous catheter placement) Manual resuscitation device, 3 masks Instructions on kit use	Burn dressings Cord clamps Disposable scalpel Endotracheal tubes Emergency tracheal catheter Glucometer Insulin syringe Laryngoscope blade Pulse oximeter Skin closure strips Thermometer Tourniquet (for hemorrhage control) Umbilical cord clamp Urinary catheter

Martin-Gill C, Doyle TJ, Yealy DM. In-Flight Medical Emergencies: A Review. *JAMA.* 2018;320(24):2580–2590.

Medications	Analgesic, nonnarcotic Antihistamine, 50 mg, injectable Antihistamine tablets, 25 mg Aspirin tablets, 325 mg Atropine, 0.5 mg, 5 mL Bronchodilator, inhaled Dextrose, 50%/50 mL, injectable Epinephrine, 1:1000, 1 mL, injectable Epinephrine, 1:10 000, 2 mL, injectable Lidocaine, 5 mL, 20 mg/mL, injectable Nitroglycerin tablets Saline solution, 500 mL	Antacid tablets (eg, calcium carbonate) Calcium chloride Chlorphenamine Cinnarizine Decongestant spray Dexamethasone Diazepam Diclofenac sodium, injectable Diclofenac sodium tablets Digoxin Dimenhydrinate Epinephrine autoinjector Fexofenadine Furosemide Glucose gel Glucagon Haloperidol Hydrocortisone Hyoscine Ibuprofen Ketorolac injectable Lorazepam Meclizine Methylprednisolone Metoprolol Morphine Nalbuphine Naloxone Ondansetron Oxytocin Promethazine

Martin-Gill C, Doyle TJ, Yealy DM. In-Flight Medical Emergencies: A Review. *JAMA.* 2018;320(24):2580–2590.

Ground-Based Medical Support

- Third-party organizations that provide recommendations for in-flight emergencies and pre-flight screening
- Radio or satellite phone communication to medical support center and airline operations
- Relay of information via pilot or direct communication

Aircraft Diversion

- Multiple factors involved
  - Fuel
  - Weather
  - Appropriate medical facilities
  - Appropriate landing facilities
  - At least 30 minutes to land
  - Patients may not want to be diverted
  - Cost of diversion $20,000 to $725,000
  - Who ultimately decides to divert?

Did The Delta Airlines Fuel Dump Possibly Prevent A Larger Disaster?

Michael Goldstein Contributor ⓘ
Travel

In this image from video, Delta Air Lines Flight 89 to Shanghai, China dumps fuel over Los Angeles ... [+] ASSOCIATED PRESS

Recommended for Diversion

- Unremitting chest pain
- Shortness of breath
- Severe abdominal pain
- Stroke
- Persistent unresponsiveness
- Refractory seizures
- Severe agitation

Common Conditions

- Syncope / near syncope (32.7%)
- Gastrointestinal (14.8%)
- Respiratory (10.1%)
- Cardiovascular (7.0%)
- Cardiac Arrest (0.2%)

PEDIATRICS/ORIGINAL RESEARCH

Characterization of In-Flight Medical Events Involving Children on Commercial Airline Flights

Alexandre T. Rotta, MD*; Paulo M. Alves, MD; Neil Nerwich, MD; Steven L. Shein, MD

*Corresponding Author. E-mail: alex.rotta@duke.edu, Twitter: @AlexRotta.

- 15.5% involved children
- 25 days – 18 y.o., median age 7 y.o.
- Nausea/vomiting (33.9%), fever/chills (22.2%), allergic reaction (5.5%), abdominal pain (4.7%), gastroenteritis (4.5%)

TRAINING CPR-D•padz
PUSH HARDER

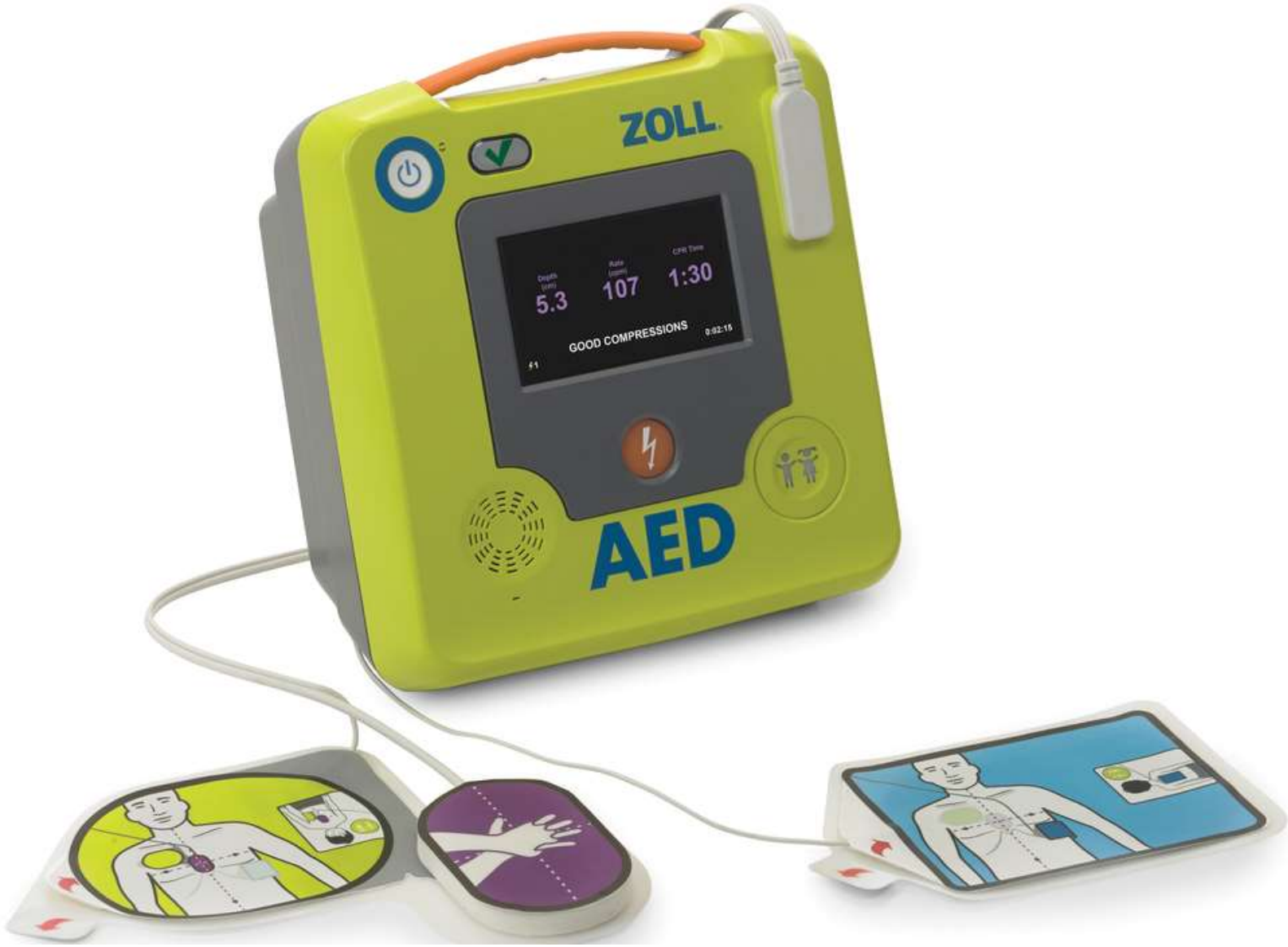
Cardiac Arrest at 35,000 Feet

- Standard basic life support
- AED
- Phone a friend (i.e. ground-based medical support)
- Consider epinephrine / lidocaine
- Consider termination of efforts after 20-30 minutes

When to Stop CPR

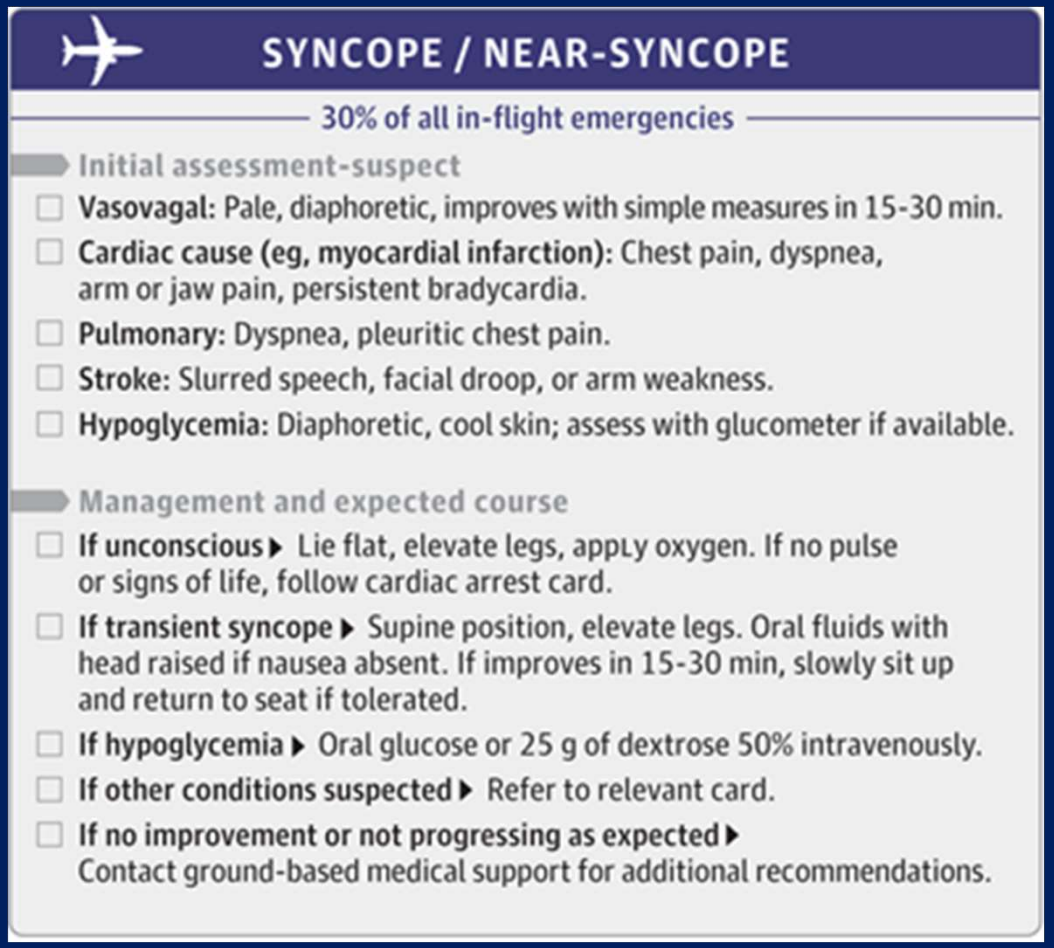
- Spontaneous breathing and circulation resume; or
- Unsafe to continue CPR; or
- Too exhausted to continue; or
- Care transferred to EMS; or
- Presumed dead (CPR > 30 min, no shock advised)

Phone a friend!


ZOLL
5.3
107
1:30
GOOD COMPRESSIONS
AED

Automatic External Defibrillators

- Before 1990, cardiac arrest diverts aircraft to the nearest major airport
- Since 2001, FAA mandate to carry AED
- Some have monitoring capabilities
- Limitations
  - Operator error
  - Aircraft vibrations
  - Crew operation only



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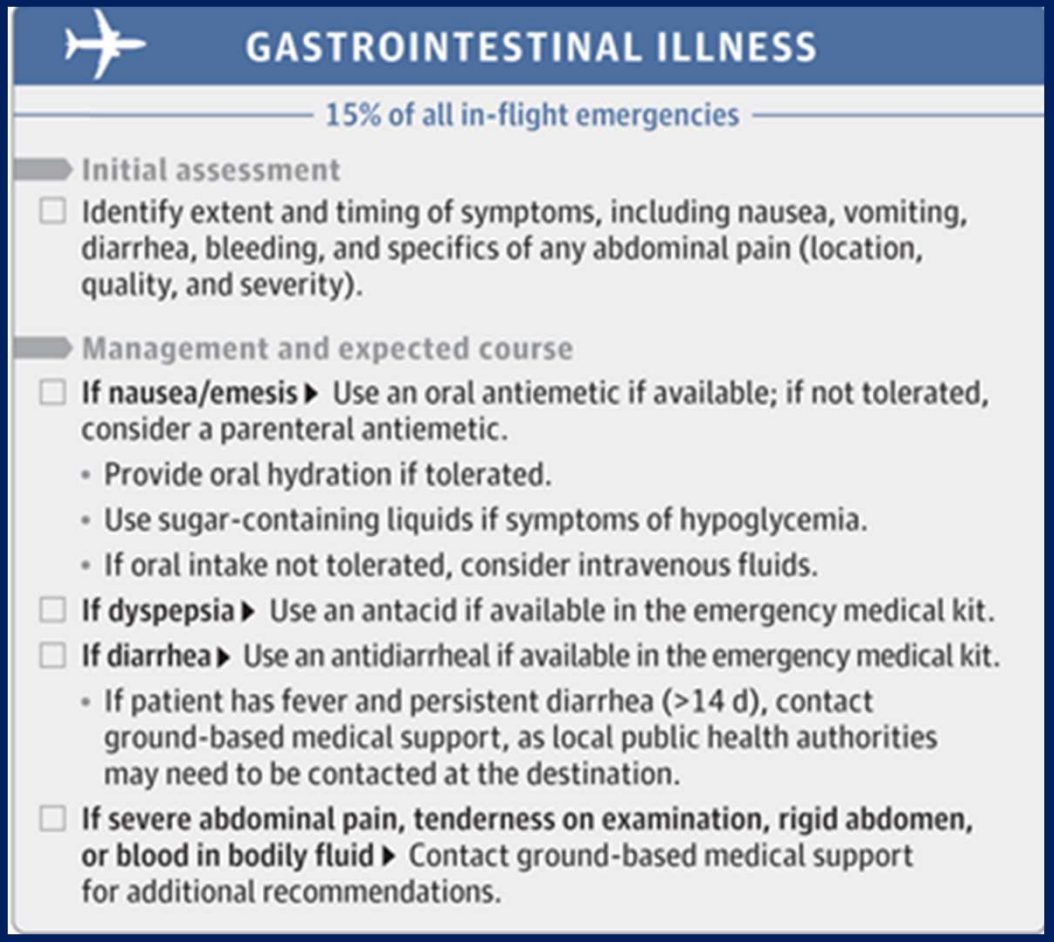

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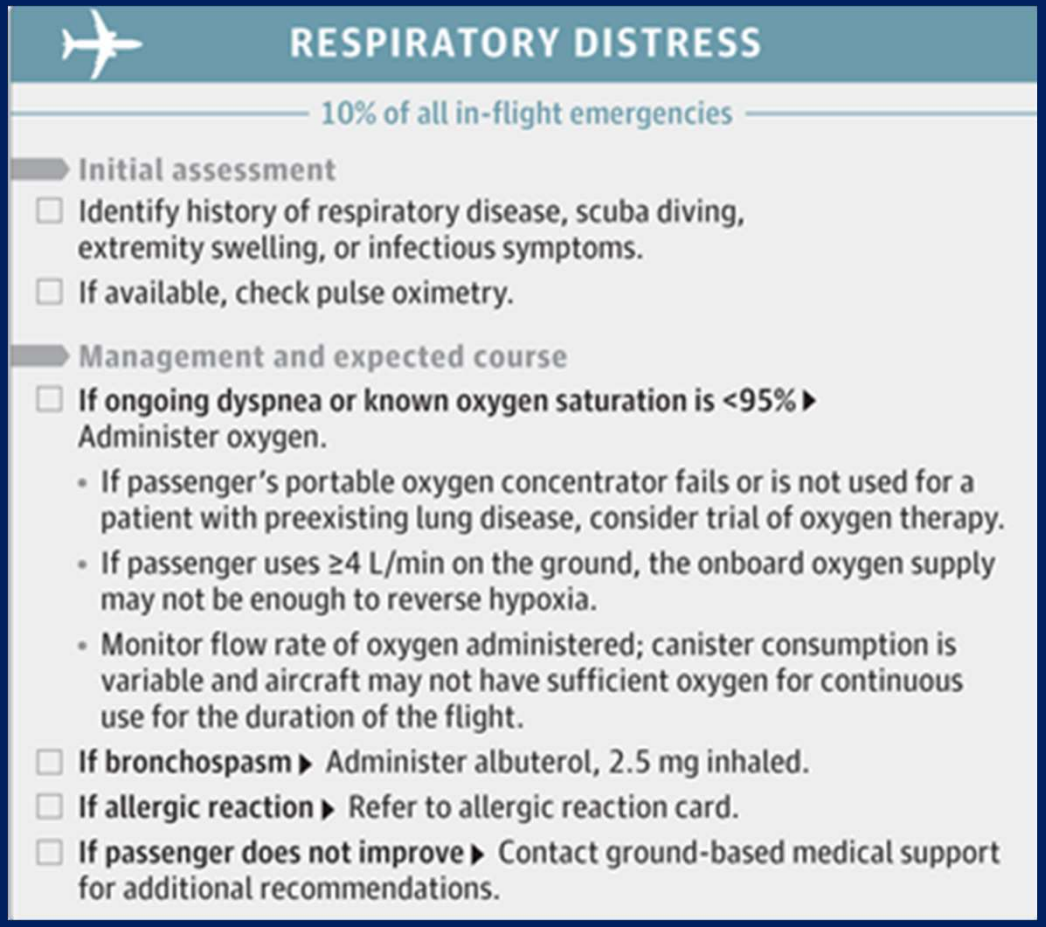

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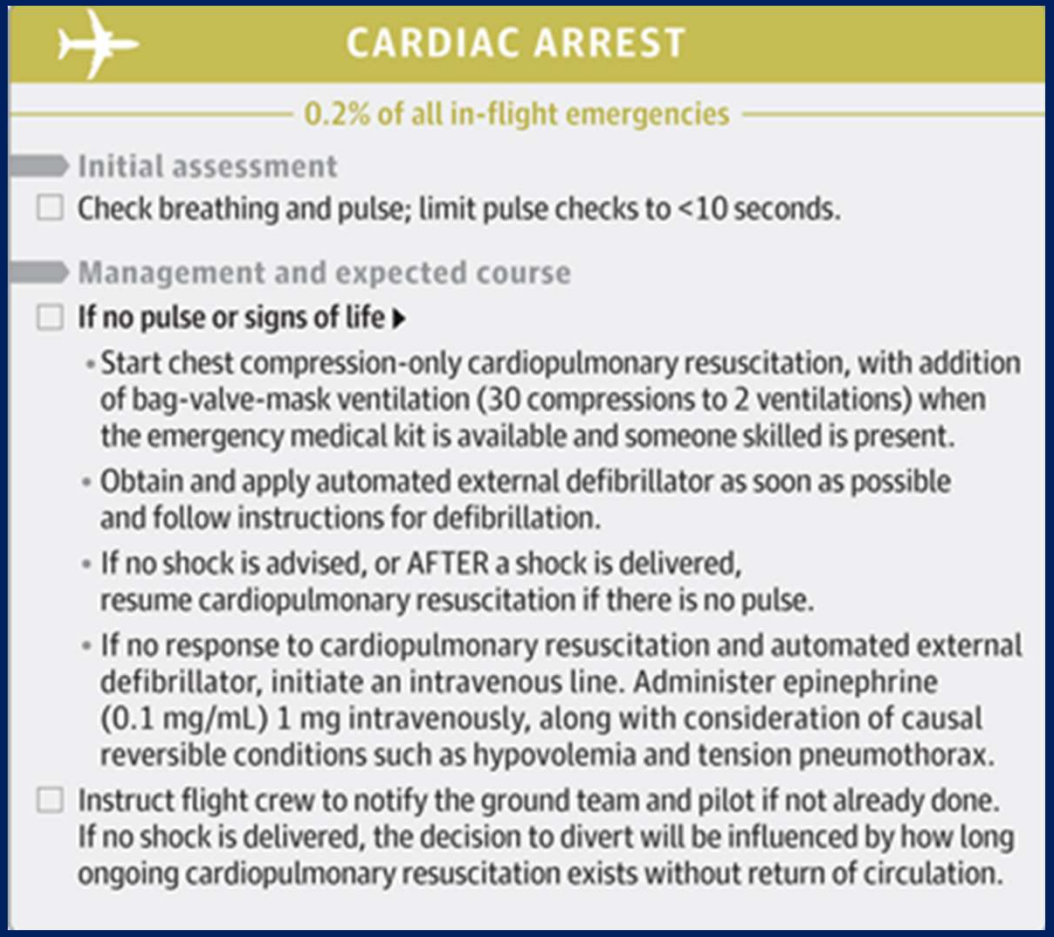
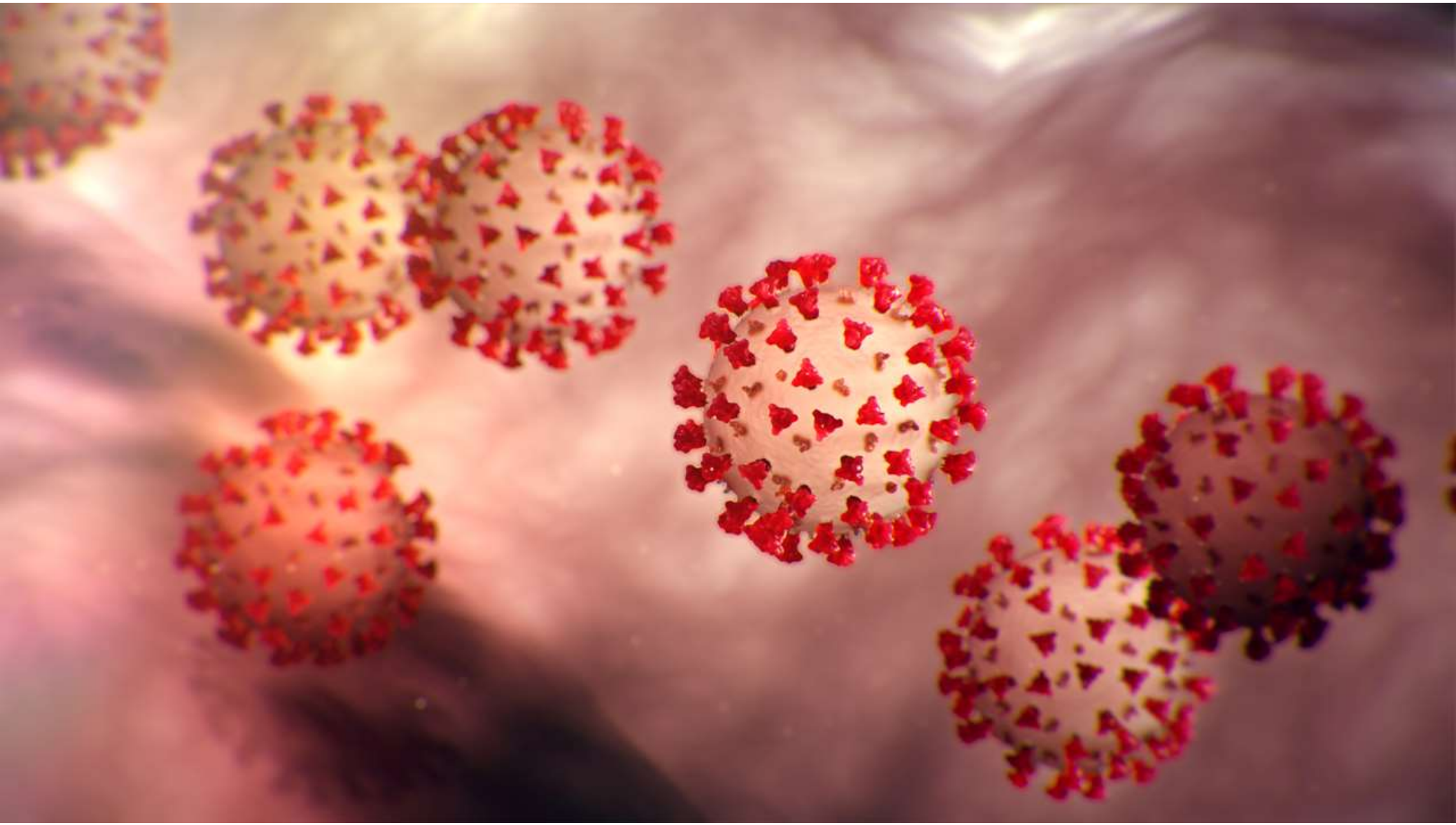


Martin-Gill C, Doyle TJ, Yealy DM. In-Flight Medical Emergencies: A Review. *JAMA.* 2018;320(24):2580–2590.

Infectious Diseases

- Outbreaks
  - Influenza
  - Food poisoning
  - Measles
  - TB
  - Smallpox
- Risk of infection
  - Duration of flight
  - Proximity to source patient



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EID Journal > Volume 26 > Early Release > Main Article

Volume 26, Number 11—November 2020

Dispatch

Asymptomatic Transmission of SARS-CoV-2 on Evacuation Flight

Sung Hwan Bae, Heidi Shin, Ho-Young Koo, Seung Won Lee, Jee Myung Yang, and Dong Keon Yon

Author affiliations: Soonchunhyang University College of Medicine, Seoul, South Korea (S.H. Bae); Soonchunhyang University Seoul Hospital, Seoul (S.H. Bae); Harvard Business School, Boston, Massachusetts, USA (H. Shin); Korea University College of Medicine, Seoul (H.-Y. Koo); Sejong University College of Software Convergence, Seoul (S.W. Lee); University of Ulsan College of Medicine, Seoul (J.M. Yang); Asan Medical Center, Seoul (J.M. Yang); Armed Force Medical Command, Republic of Korea Armed Forces, Seongnam, South Korea (D.K. Yon); CHA University School of Medicine, Seongnam (D.K. Yon)

Suggested citation for this article

Abstract

We conducted a cohort study in a controlled environment to measure asymptomatic transmission of severe acute respiratory syndrome coronavirus 2 on a flight from Italy to South Korea. Our results suggest that stringent global regulations are necessary for the prevention of transmission of this virus on aircraft.

Undocumented cases of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection have been common during the coronavirus disease (COVID-19) global pandemic (*1*–*3*). Although inflight transmission of symptomatic COVID-19 has been well established (*1*,*2*), the evidence for transmission of asymptomatic COVID-19 on an aircraft is inconclusive. We conducted a cohort study evaluating asymptomatic passengers on a flight that carried 6 asymptomatic patients with confirmed SARS-CoV-2 infections. The Institutional Review Board of Armed Force Medical Command approved the study protocol. The ethics commission waived written informed consent because of the urgent need to collect data on COVID-19.

On This Page

The Study

Conclusions

Suggested Citation

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Downloads

RIS [TXT - 2 KB].

JAMA Network | Open

Research Letter | Public Health

Assessment of SARS-CoV-2 Transmission on an International Flight and Among a Tourist Group

Sebastian Hoehl, MD; Onur Karaca; Niko Kohmer, MD; Sandra Westhaus, PhD; Jürgen Graf, MD; Udo Goetsch, MD; Sandra Ciesek, MD

Business

Virus Outbreak Tied to London-Hanoi Flight Rattles Vietnam

By John Boudreau and Xuan Quynh Nguyen

March 7, 2020, 9:18 PM PST *Updated on March 8, 2020, 6:08 PM PDT*

- Government minister on Vietnam Air plane under home quarantine
- Authorities isolate a neighborhood as residents hoard food

Most Read

BUSINESS

LETTERS

Lack of COVID-19 transmission on an international flight

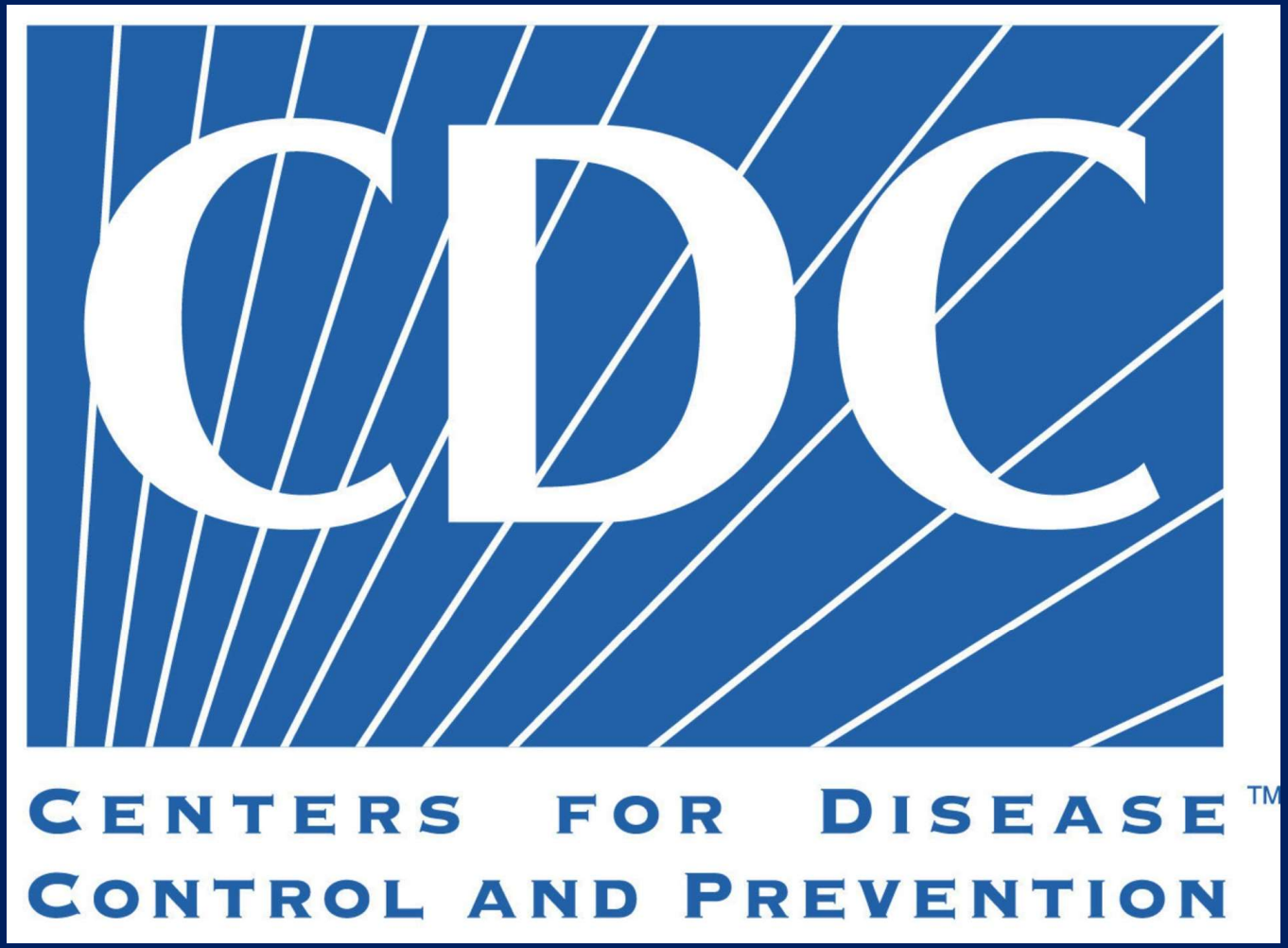
In response to the *CMAJ* news article, "Communication, transparency key as Canada faces new coronavirus threat,"[1] we would like to share the public health response to the first Canadian cases of coronavirus disease 2019 (COVID-19). Case details have been published.[2] The patients travelled from Wuhan to Guangzhou, then Guangzhou to Toronto, Canada, arriving on Jan. 22, 2020. The index patient was symptomatic with dry cough during the flight. His wife developed cough on Jan. 23. Both sets of throat and nasopharyngeal swabs collected were positive for COVID-19.

There were approximately 350 passengers on board the airplane. The public was notified through the media that the index case was symptomatic during the 15-hour flight. Close contacts included 25 individuals sitting within 2 m of the index case during the flight, flight crew members, and 1 close contact on arrival in Toronto. Close contacts received active daily contact monitoring by local public health officials for 14 days from the flight's arrival in Toronto. Passengers and crew members who were not from Ontario were referred to their home jurisdictions for follow-up. On Jan. 29, 1 close contact developed symptoms of cough; however, nasopharyngeal and throat swabs were negative for COVID-19. Non-close-contact passengers were advised to self-monitor and contact public health if they became symptomatic; 5 of these passengers became symptomatic, were tested and found by nasopharyngeal and throat swabs to be negative for COVID-19.

The United States Centers for Disease Control and Prevention recommend contact tracing 2 rows in front and behind symptomatic cases with respiratory infections owing to an elevated risk within close contact.[3] However, for both severe acute respiratory syndrome–associated coronavirus (SARS-CoV) and influenza, approximately 50% of airplane transmission occurred beyond these rows.[4]

Studies of airplane transmission are commonly biased by contacts sharing exposure risks before boarding the aircraft.[5] In our investigation, transmission may have been mitigated by mild symptoms and masking during the flight. However, the lack of secondary cases after prolonged air travel exposure supports droplet transmission, not airborne, as the likely route of spread of the COVID-19.

Kevin L. Schwartz MD MSc
Infectious disease physician, Public Health Ontario, Toronto, Ont.
Michelle Murti MD MPH
Public health physician, Public Health Ontario, Toronto, Ont.
Michael Finkelstein MD MHSc
Associate medical officer of health, Toronto Public Health, Toronto, Ont.
Jerome A. Leis MD MSc
Infectious disease physician, Sunnybrook Hospital, Toronto, Ont.
Alanna Fitzgerald-Husek MD MPH
Associate medical officer of health, York Region Public Health, Newmarket, Ont.


CDC
CENTERS FOR DISEASE™
CONTROL AND PREVENTION

“CDC recommends that you do not travel at this time.”

“**Masks are required** on planes, buses, trains, and other forms of public transportation traveling into, within, or out of the United States and in U.S. transportation hubs such as airports and stations.”

- CDC

COVID-19: TESTING BEFORE TRAVEL

Get tested no more than 3 days before you travel.
Postpone travel if you are waiting for test results.
Watch for symptoms of COVID-19.

If you test NEGATIVE…

Keep a copy of your test results with you during travel

Take precautions to protect yourself and others from getting COVID-19

If you test POSITIVE or develop symptoms of COVID-19…

Do NOT travel

Immediately isolate yourself

Follow public health recommendations

If you fly to the US from a foreign country, you **must** provide a negative COVID-19 test result or documentation of recovery from COVID-19 before boarding your flight.

CDC

www.cdc.gov/covid19travel

CS321935-A 2/16/2021 2PM

COVID-19: TESTING AFTER TRAVEL

Get tested 3-5 days after you travel.

If you test NEGATIVE…

- Stay home for 7 days and self-quarantine
- Watch for symptoms of COVID-19
- Take precautions to protect others

If you test POSITIVE or develop symptoms of COVID-19…

- Do NOT travel
- Immediately isolate yourself
- Follow public health recommendations

If you don't get tested…

- Stay home for 10 days and self-quarantine
- Watch for symptoms of COVID-19
- Take precautions to protect others

If you fly to the US from a foreign country, you **must** provide a negative COVID-19 test result or documentation of recovery from COVID-19 before boarding your flight.

www.cdc.gov/covid19travel

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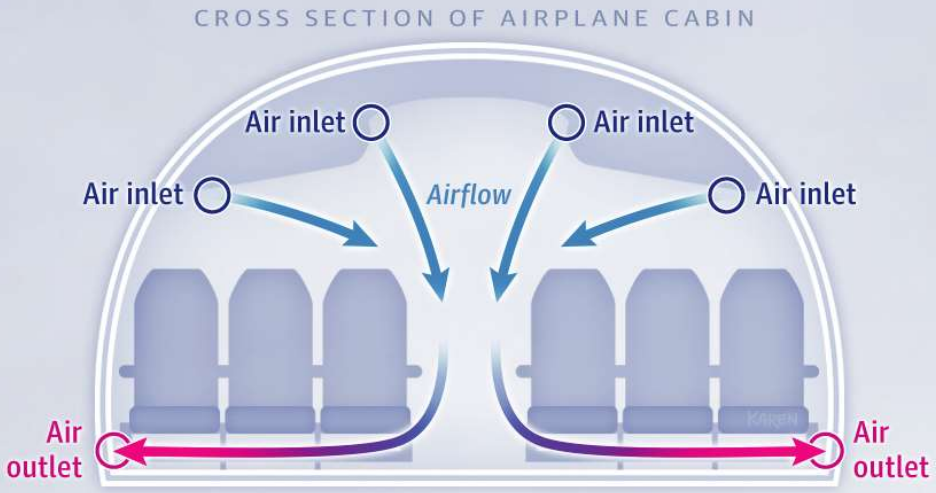
Air travel and COVID-19

The risk of contracting COVID-19 during air travel is low.
Modern airplanes maintain clean air by circulating a mix of fresh air and air recycled through HEPA filters, the same type of air filters used in hospital operating rooms.

Air enters the cabin from overhead air inlets and flows downward toward floor level outlets at the same seat row or nearby rows. There is little airflow forward and backward between rows.



Stay seated whenever possible, and follow crew instructions

Pombal R, Hosegood I, Powell D. Risk of COVID-19 During Air Travel. *JAMA.* 2020;324(17):1798.

General Approach – What Will YOU Do?

- Identify yourself
- Should you volunteer?
- What is your role?
- Obtain patient consent
- Perform a H&P
- Obtain Vitals
- Request specialized help
- Stay within your scope

Phone a friend!


CANADA DRY
CAFFEINE FREE
GINGER ALE

Prevention

- Hydration
- Medical clearance to fly
- Personal medications

Summary

- You are protected while providing care on flights
- All flights should have emergency medical equipment
- You are not alone – phone a friend

Thank You

frederick.wu@ucsf.edu

@FredWuPA