Aeromedical COVID-19 Research Work and Support

“Maintaining Continued Operational Safety while Supporting Return to Flight During a Pandemic”

By: Stacey L. Zinke
Human Protection & Survival Research Laboratory Manager, AAM-630
Civil Aerospace Medical Institute
Date: February 2021
Aeromedical Laboratory Mission

- **Primary**
  - Aerospace Accident and Incident Prevention

- **Secondary**
  - Mitigating Hazards in Aerospace Accidents and Incidents

- **Protecting the Human involved in Aerospace Operations**
Aeromedical Laboratory Teams

- Bioaeronautical Sciences Branch, AAM-610
  - Forensic Sciences Section, AAM-611
    - Forensic Toxicology Team
    - Biochemistry Team
  - Biomedical Sciences Section, AAM-612
    - Functional Genomics Team
    - Knowledge Management Team
    - Autopsy Team
Aeromedical Laboratory Teams

• Protection and Survival Research Branch, AAM-630
  – Life Sciences Section, AAM-631
    • Medical Research Team
    • Aviation Physiology Research Team
    • Numerical Sciences Research Team
  – Engineering Sciences Section, AAM-632
    • Biodynamics Research Team
    • Cabin Safety Research Team
AAM-600 COVID-19 Work FAQs

• Circulated Cabin Air Question
  – Total air exchange rates within an airplane cabin can vary between 10 to 40 times per hour. Recirculated air flow varies from 30% to 60% of the total airflow in the cabin specific to airplane design & operating condition. Many large transport category airplanes use HEPA filters, for recirculating air. HEPA filter efficiency for capturing SARS-CoV-2 corona virus particles is ~ 99.97% to 99.99%.
AAM-600 COVID-19 Work FAQs

• Ventilation flow within airplane cabins to mitigate the potential of disease transmission (e.g., SARS-CoV-2).

• Health safety/health effects and efficacy of ultraviolet germicidal irradiation (UVGI) for airplane disinfection, specifically the efficacy of new technology -- Far Ultraviolet C (FUV) irradiation.

• Air ionization technology to mitigate potential disease transmission onboard airplanes and as a method for airplane disinfection.
AAM-600 COVID-19 Work FAQs

- On behalf of a flight school/pilot training, provided aeromedical/physiological subject matter expertise on face masks/coverings, carbon dioxide levels, and cognitive/flight performance.
- Use of anti-malarial medications as a prophylaxis treatment for COVID-19 to a supervisory pilot.
- Direction/guidance to locate and access publicly available FAA cabin air quality studies.
AAM-600 COVID-19 Work FAQs

• Guidance and recommendations for the safe transport of large amounts of dry ice on
  – Large commercial passenger aircraft
  – Small aircraft

• To allow the safe transport and handling of vaccines
AAM-600 Laboratory COVID-19 Plans

• **Website, including:**
  – Links to Relevant Guidance and Studies or Copies of Them
  – Risk calculator – In Draft, being refined
    • Collaborating and comparing with MIT/LL about assumptions and results
    • Will socialize across selected industry partners prior to release
  – FAQs
    • Publication of relevant facts associated with past inquiries
  – Quick-Turn Investigations
    • Collaborating with Oklahoma State University on Infectious Disease Study
AAM-600 Laboratory COVID-19 Plans

• **Website, including:**
  – Literature Reviews with Assessments
    • COVID-19 Testing and Aircraft Disinfection
    • Use of PPE/Masks/Physical Distancing
    • Infectivity/Transmission of COVID-19 in Air Travel, comparison to other previous infectious diseases
    • Airline Passenger Contact Tracing
    • Impact of COVID-19 on Psychological Factors In-flight/Air Rage
  – Assessments of Research Areas and Conclusions – Several Drafts
    • No evidence
    • Little evidence
    • Moderate evidence
    • Significant evidence
Collaboration

– Boeing’s “Return to Flight” Initiative
– ICAO Council Aviation Recovery Task Force (CART)
– IATA’s Cabin Safety and CART Interface Group
– NASA’s Group: Rebuilding Confidence in Air Travel Post Covid-19
– Cabin Air Quality Group, formed from past ACER CoE Members (cont.)
Collaboration (cont.)

– Military Laboratories through our AMRAC Group
  • NAMRU-D
  • USAF/SAM
  • USAARL

– Other Government Agencies
  • CDC
  • NIH
  • DHS, etc…

– University Partners
  • Oklahoma State University, etc…
Internal FAA Collaboration

- Aircraft Certification Services
  - Coordination and collaboration on research proposals
  - Created Guidance for safe transport of vaccines w/ large amounts of dry ice
- Flight Standards
  - Aviation Safety Inspector questions on mitigating the risks of inspections
- ATO
  - Consultation on best safety practices and research proposal
- ANG
  - Testing out dry ice sublimation rates in packaging
Supporting Others in the Fight Against COVID-19

• Loaned Genomics research equipment to OU Medicine to allow them to develop COVID-19 Tests

• Allowed our blood collection supplies to be used by Harvard’s Brigham & Women’s Hospital for COVID-19 Testing to Support the Fight Against COVID-19
Thank you for your time

• QUESTIONS?