FLIGHT ATTENDANT PERSPECTIVE

Deanne DeWitt Freise

A presentation to GCAQE
Aircraft Cabin Air Quality Conference

London  England
September 19-20, 2017

INTRODUCTION

- Thankyou GCAQE Global Cabin Air Quality Executive
- Flight Attendant serving 27 years with a major US carrier
- Experienced a toxic inhalation injury on September 22, 1992
- Aircraft Health and Safety advocate for 25 years
- Researching and collaborating with others to help solve aviation illness
- President and Director of “Clean Up Cabin Air”

FACT NOT FICTION FILMS

ASHRAE

SAE

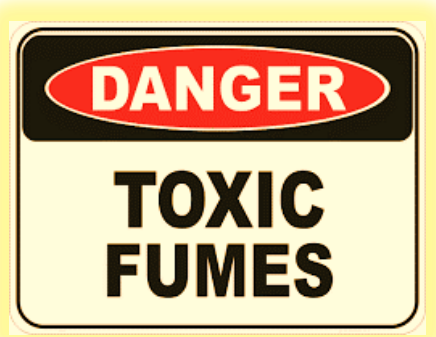
AEROTOX RESEARCH GROUP

CLEAN UP CABIN AIR

TOXIC INCIDENT

SEPTEMBER 22, 1992

- Flight attendants reported to flight in excellent health
- Oil dripping from an engine onto tarmac was observed on our inbound aircraft
- Mechanics performed a pack burnout on the oil contaminated engine – with APU on
- The pilots departed the aircraft leaving the flight attendants onboard during burn off
- The aircraft was returned to service and flown 1 hour to the next destination
- 10 minutes into flight the cabin crew experienced debilitating symptoms while an iridescent haze was observed
- Symptoms inflight
- Symptoms on ground
- Medical diagnosis: "Probable Inhalation Injury"



The condition of the flight attendants was so compromised they would have been incapable of appropriately responding to any emergency.

EMERGENCY RECORD

MEMORIAL HOSPITAL

OUTPATIENT & EMERGENCY RECORD

CATEGORY
ROOM #
CHART COPY

PATIENT NAME (LAST) (FIRST): CLARKE, DEANNE C

12:2

ALLERGIES: PCN

PRESENT MEDICATIONS: 0

CHRONIC PROBLEMS: 0

TIME	T	R	P	BP	P	BP	P	BP
1310	98	16	72	130/70	72	130/70	80	122/82

HPI 41 y.o. Flight attendant ... felt wave of pressure ... head mainly frontal part of head. Eye pressure. Ⓘ nausea. Felt wave then removed from plane ~30 min. Now has "seasick" feeling. Forward - worked aft. stan Has improved from initial feel. Very graphic - "was about to go into limbo" lost of contact ē reality. Hot flashes, shaky, chills, eyelids vibrating - Similar to anesthesia experience.
ROS - Neg. FH - Neg.
PMH - NC. Ø smoking / substance
PE: Very pleasant ♀ NAD
Skin clammy, normal. Ø JVD Ø bruit
Neuro - ... cerebellar ... gait ...
Sx improved ... continued mild dizziness ē some HA.
Carbox Neg. glu-WNL

1310 Pt c/o acute onset head pressure ~11A today ē shakiness, feeling that she was anesthetized. Only c/o upon ER arrival was faintness, HA. Relates to flight from ANC → FAI.
Also c/o feeling her heart thumping hard "about every 3rd beat" lasting ~1" - resolved PTA. PW

LAB: CBC, UA C/S, AMYLASE, BL. GLUC, LYTES, CARD ENZ, ABG, BUN, CR, ETOH, GRAVIDEX, BIOCERT-G, ERTT, T & S, T & C, LFT, PT/PTT, TOX SCREEN, Carbox

MONITOR, O_2, EKG, CATH, NG, X RAYS

CODES: 9804, 7870

NURSE'S INITIALS: PW. SIGNATURE: P. Williams RN

IV's, MEDS, AND MISC. ORDERS — TIME / INIT / RT. / SITE / RESPONSE

Industrial Insurance Board of Appeals
In re: Deanne C. Clarke
Exh
ADM. 6-29-94 Date REJ.

CONDITION ON RELEASE: Stable

REFERRED M.D.: GMD

TIME & DISPOSITION: DISC

Plan: ① Regular Activity ② Avoid tobacco smoke / chemical inhalation or enclosed areas ③ Please Return to ER if Sx ↑ or persist at 2 days.

Instructions: FEVER, VOMITING DIARRHEA, CLEAR LIQUIDS, WOUND CARE, URINARY TRACT INFEC., EYE INJURIES, HEAD INJURY, SPRAINS, STRAINS, FRACTURES, BRUISES

Tentative Diagnosis: Dizziness / Nausea s/p suspect Inhalation Injury

Physician Signature

MEMORIAL HOSPITAL

PATIENT INSTRUCTIONS FOR FOLLOW-UP CARE

CATEGORY
ROOM #
CHART COPY 8

9/22/92 12:1

PATIENT NAME (LAST) (FIRST) (MIDDLE): CLARKE, DEANNE C

FOLLOW ALL INSTRUCTIONS THAT ARE CHECKED.

EMERGENCY ROOM 451-3565

The examination and treatment you have received has been on an emergency basis only. It is not designed to be a substitute for continuing medical care. We strongly recommend that you seek follow-up care as suggested in these instructions.

Diagnosis: Probable Inhalation Injury

- ☑ Follow up with Dr. ER
- ☐ Doctor's Phone #
- ☐ As Soon as possible or ☐ In ___ days.
- ☑ If not improved in 2 days or if symptoms get worse. Return to Emergency Department if not better in 24 hrs.
- ☐ Employment Activity - As follows:

Additional Instructions: ① Regular Activity ② Avoid Smoke or Chemical Inhalation or enclosed spaces

- ☐ The medicine prescribed may make you nauseated ☐ Take with food or milk ☐ Take on an empty stomach
- ☐ The medication prescribed can cause drowsiness. You should not drink or drive, or operate machinery.
- ☐ The medication prescribed is an antibiotic, be sure to take all of the medicine as directed, since cure of the illness is dependent upon complete dosage.
- ☐ Please pickup x-rays at hospital on way to follow-up physician's appointment.
- ☐ A culture was done to determine the exact organism causing your infection. The results will be sent to your private doctor.

Any x-ray report you received is not final until read by the Radiologist. If any additional abnormalities are found, we will notify you as soon as possible.

MEDICAL CASE STUDY

In Flight

- All four flight attendants reported illness
- Passengers reported nausea and headaches
- Symptoms: CNS-anesthesia, acute respiratory, acute neuromuscular, acute confusion

5 Hours

- ER: Probable Inhalation Injury Diagnosis Notes: Nausea, headaches, tunnel vision, legs weak and heavy, fasciculations, back and neck pain, shakes, spasms, abdominal cramping, needles and tingles, skin burning hot, burning chest, hot flashes, ears, ringing, joint pain

16 Hours

- ER Record: cognitive problems, disoriented, memory and concentration disoriented, slurred speech and stammering, headache, nausea, dizziness, blurred vision, sweating
- Carbon Monoxide Level 2.5

20 Hours

- Internist Doctor: ataxia, inability to coordinate thumb and finger, inability to subtract 7 serially from 100, inability to remember 3 digits,
- Diagnosis: organic brain syndrome beyond acute anxiety - Toxic Encephalopathy

Day 2

- Lost sense of humor
- Personality gone
- Couldn't match socks
- Retarded
- Muscle spasms
- Wandering, agitated, angry at forgetfulness
- Falling up and down stairs
- Balance gone
- Black chemical diarrhea

Day 3

- Son found mother could not turn on washing machine- EMTs were called
- Neurologist documents toxic encephalopathy with significant cognitive dysfunction
- Organic brain syndrome, small white rash on face and neck
- Weak right lower extremity
- Memory loss
- Speech disorder

Day 5

- Reads paper but does not retain anything
- Increasing weakness and involvement of neck muscles and eye muscles
- Head falls to the right

Day *8 and 9*

- Increased weakness of arms and legs
- Stumbling when walking
- Muscle twitches
- Neck pain
- Manual dexterity decreased
- Fuzzy vision
- Hair loss
- Cognitive disorientation

Day 10

- Neuropsychologist indicated cognitive problems consistent with Toxic Encephalopathy and recommends specific cognitive remediation

Day 14

- Unstable, Drift of right arm and leg
- Confusion
- Visual problems
- Headaches
- Joint pain
- Using words wrong
- Generalized weakness
- Difficulty reading because words tend to jump on the page

1 Month

- Pain in back and neck
- Visual floaters
- Cognitive problems
- Internist documents unable to remember 3 digits
- Unable to subtract serial 7s
- Wobbly and ataxia
- The MRI of the brain finds white matter high signal, intensity spots on the frontal lobe of the brain

6 Months

- Neuropsychologist notes moderate improvement in complex attention, short term memory, speed and accuracy of information processing
- Variability's were noted in immediate attention, distractibility, verbal inefficiencies
- Weakness in arithmetic reasoning
- No menses for 6 months

25 Years

- Variabilities in complex immediate attention, short term memory
- Distractibility
- Verbal learning inefficiencies
- Enduring weakness in arithmetic and handwriting, despite the fact that my college major was architectural design/drafting

DIAGNOSIS:
Toxic Encephalopathy

INVESTIGATION

- Consulted Doctors of Neurology and other specialists
- Participated in cabin air quality groups of flight attendants; AFA union and company
- Began initial research at “The University of Washington Health Sciences Library”
- OSHA reform “coverage and enforcement hearing” testimony on Oct 19, 1993
- Aviation Subcommittee Hearing testimony on May 18, 1994: “Aircraft Air Quality”
- Letter writing campaign to US politicians, aviation medical specialists, scientists , manufacturers and researchers
- Collaborated with the first international group specific to researching cabin air quality: “AEROTOX”
- Joined the engineering societies: SAE and ASHRAE Aviation Medical Society: ASMA
- Became a voting member of ASHRAE to create the standard: “Air Quality within Commercial Aircraft”

CABIN AIR QUALITY COMMITEE

Air Quality meeting
August 11, 1993
Gateway Hotel

Dr. presented a composite case of a flight attendant [illegible]. Presenting symptoms included multiple chemical sensitivities, vision problems, memory deficit, joint stiffness and abnormal neuropsychological testing. He then described ear, back and toxic injuries as a whole, being much more common at Airlines than at any other AFA carrier.

Dr. Suggested these simple tests to determine quickly if a flying partner is impaired (suffering from hypoxia, or toxic exposure causing mental and physical injury).

To Assess mental status: Orientation to person, place and time.
Ask the person their name, the day, and the time, year.
Of course if your flying partner is unable to answer these questions, they are definitely impaired, they need oxygen and to be taken off the plane immediately.

To assess memory and concentration: Serial sevens
Ask person to subtract 7 from 100, then 7 from 93 etc...
until you reach the 50's or so.

Give them three numbers to remember, ie. apple, pencil, book, ask them to recall 5 minutes later.

Give them a phone number and ask them to repeat it back to you

Give them a zip code and ask them to repeat it to you backwards.

Ask them to read to you from a book or magazine.

BLOOD TESTS

Impaired individuals must be evaluated by a medical professional.

Arterial blood gases are appropriate for hypoxia however they apparently are not as useful if the individual has been on oxygen.

What Medical Tests should be performed aftera Cabin Air Quality Incident?

[illegible]y
[illegible]abin Air Quality Committee

There have been numerous questions our committee has received regarding what type of medical testings we should have done immediately after a Cabin Air Quality Incident.

In order to answer some of these questions I interviewed Dr. Richard R. MD (Internal Medicine, Hematology, Oncology) at the is the physician many of our the flight attendants have seen after being involved in an Air Quality incidents.

, since you are familiar with the symptoms our flight attendants have been reporting after Air Quality incident,I'd like to ask you what would be the routine laboratory tests you would recommend a flight attendant have done, as soon after an incident has taken place?

Well, first a **CBC**, which is a Completed Blood Count?

What is a CBC, and what would be the reason for he/she to have this done?

A CBC is the basis of all medical test. The important thing would be to ascertain if a toxic exposure resulted in a depression of the white cells, platelets or the red count.
Just as the other tests, the Chemical Screen, including liver

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S. HRG. 103-466

OSHA REFORM: COVERAGE AND ENFORCEMENT

Y4.L11/4:
S.HRG. 103-466

TESTIMONY

HEARING

BEFORE THE

SUBCOMMITTEE ON LABOR

OF THE

COMMITTEE ON

LABOR AND HUMAN RESOURCES

UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

EXAMINING THE SCOPE OF COVERAGE AND ENFORCEMENT OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION OF THE DEPARTMENT OF LABOR

OCTOBER 19, 1993

Printed for the use of the Committee on Labor and Human Resources

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AIRLINER CABIN AIR QUALITY

HEARING

BEFORE THE

SUBCOMMITTEE ON AVIATION

OF THE

COMMITTEE ON

PUBLIC WORKS AND TRANSPORTATION

HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

MAY 18, 1994

A Breath Of Fresh Air

AFA DEMANDS FEDERAL ACTION ON CABIN AIR QUALITY

Flight Log
Magazine
Spring 1994

By Molly Charboneau

on Capitol Hill, AFA is sounding the alarm and fighting for improvements in the quality of cabin air."

AFA is also seeking Occupational Safety and Health Administration (OSHA) coverage for flight attendants to strengthen members' ability to monitor and report health problems with-

U.S. House of Representatives
Committee on Public Works and Transportation
Subcommittee on Aviation
Suite 2165 Rayburn House Office Building
Washington, DC 20515

The Honorable James L. Oberstar

The Honorable Peter A. DeFazio

The Honorable Jerrold Nadler

June 6, 1994

Dear Honorable Gentlemen,

Thank you for the opportunity to speak at the Aviation Subcommittee hearing on Airliner Cabin Air Quality. My testimony is only one example of countless Flight Attendant injuries at my carrier due to the inhalation of numerous toxins and high altitude flight. It is obvious from the conflicting testimony of the people involved, that controlling expenses and maintaining profit margins are higher priorities than ensuring a healthy environment for passengers and crew. It is imperative, that this hopefully unintentional experiment, in human survival, at high altitudes, with almost no effective ventilation, and the complicating presence of chemical toxins be stopped immediately. Congress is the only power to intervene and regulate the outlaw and dangerous manner in which the manufacturers and airlines seek to control costs.

Flight Attendants like "the canaries in the mines", are the indicators of life threatening exposures and provide a unique opportunity to study the toxic environment in aircraft. Although we are the experts to be consulted and studied, systematically we have been ignored and excluded from previous scientific inquiry. Now is the time for an honest and thorough survey, to find practical solutions and implement them. A collaborative effort must include flight attendants, aerospace medical experts, aerospace engineers, toxicologists, epidemiologists, NASA and NOAA ozone scientists, EPA ozone researchers, and military physicians who have studied tolerance for exercise and physiological changes at high altitudes. The end goal of panel

REQUEST for ACTION

9.) A standard in line with the enclosed Indoor Air Standards for Washington State, must be enacted for the airlines to ensure maintenance of all parts of a working system. This must include ducting inspection and replacement or cleaning. This ducting becomes contaminated with petrochemicals and hydraulic fluid from over maintenance, contaminating the cabin air with chronic low levels of these chemicals.

10.) Government subsidy to retrofit aircraft with catalytic converters.

11.) Design changes for new aircraft to ensure maximum ventilation.

12.) Ventilatory rates for aircraft must be standardized and developed by unbiased individuals, and not the same as at sealevel.

In the writing of this report I am again overwhelmed with the complexity of these problems. The lack of responsibility or even caring of those who should be accountable to provide a safe workplace is unacceptable. The economic climate is such that, in the desperate attempt to maintain profit in an unregulated industry, the expensive and expendable item has become healthful ventilation. Let's make air non-negotiable. People must come before profits. I am encouraged by the strong commitment and interest of the Aviation Subcommittee and on behalf of myself and my flying partners we will continue to be involved. We look forward to your response and the opportunity to discuss these ideas.

Respectfully submitted,

Deanne C. Clarke

Deanne C. Clarke

FOUNDING MEMBER

ASHRAE STANDARD

Air Quality within Commercial Aircraft

ANSI/ASHRAE Addenda a and b to
ANSI/ASHRAE Standard 161-2007

ASHRAE Presented January, 1999

CABIN CREW SYNDROME

A CASE STUDY - ACUTE AND CHRONIC SYMPTOMS

A Presentation to the
ASHRAE Aviation Subcommittee

Tuesday January 26, 1999

By J. Wright BSN/Cabin Crew and D. Clarke/Cabin Crew

CONCERN'S

- Epidemiological studies of pilots & flight attendants to asses occupational exposure and effects are long overdue
- Medical community must be provided with complete information of chemical exposure so effective treatment is provided to return health and prevent permanent impairment
- The effect of chronic, low level toxic exposure needs further study
- More research on long term exposure to engine oils
- The role of Cabin Air Pollution by organophosphates causing endocrine disruption and consequent infertility, premature birth, breast cancer and prostate cancer needs further study.
- Funding for Dr. Furlong's blood test is essential

CLEAN UP CABIN AIR

generosityby INDIEGOGO

“Clean Up Cabin Air” campaign to assist Dr. Clem Furlong’s research team in the development of a diagnostic blood test

CLEAN UP CABIN AIR -NON-PROFIT-

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https://www.generosity.com/medical-fundraising/air-crew-passenger-health-research-toxic-oil

www.afacwa.org

www.gcaqe.org

GCAQE