Is There a Doctor on the Plane?

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Chief Gynecology Texas Children’s Hospital Pavilion for Women
Baylor College of Medicine
I have no disclosures.
Inflight Medical Emergencies

- Incidence and Predisposing Factors
- Most common etiologies
- Challenges
- FAA regulations
- EMK and AED

- Physician Obligations and Protection
- Outcomes
- OB emergencies
- Preflight screening
- Recommendations for air travel
August 2012

- Atlanta to Houston
- 30-40 minutes outside Houston
- United Airlines
- Canada Air Regional 700
Leave me alone.
Incidence IME

• Not tracked
  • Non uniform reporting
  • Non standardized documentation
  • Data request 1300 airlines: 10 participated
    • Sand M, Critical Care 2012

• USNTSB required reporting:
  • Hospitalization 48 hours
  • Bone fracture (X finger/toe/nose)
  • Injury to internal organ
    • Ruskin Anesthesiology 2008
Incidence

- Flight Safety Foundation 1996-97
  - 1132 incidents in the US
- Estimate severe emergencies: 1/10,000-1/40,000 passengers
- 1/604 flights in 2013 (NEJM)
- 44,000 flights/day US
- 2.7 million passengers/day
Incidence IME increasing

• Increasing age average passenger
• Increased disease as age increases
  • Impair adaptation to inflight environment
• ADA
• Increased number passengers/plane
  • Boeing 787: 960 passengers
• Few seek pre-flight medical advice
• Less than 15% use airline prescreening
  • Riou Anesthesiology 2008
Inflight Environment: Predisposing Factors

- Barometric pressure cabin = 8,000 feet
  - Hypoxia
    - SaO2 decreases to as low as 89%
    - PaO2 decrease to 55-70 mm Hg
  - Gas Expansion by 30%
- Humidity 10%
  - Dreamliner 787 30%
- Air recirculation 50% vs. 80% commercial buildings
Gas Expansion

• Wound dehiscence
• Bronchogenic cyst rupture
• Expansion of:
  • Pneumatic splints
  • ET tubes
  • Feeding tubes
• Ear and sinus pain
Co-morbidity
Relative hypoxemia
Dehydration
Stress
Alcohol
Drug use or Withdrawal

Most common causes of medical incidents. Percentages are based on 910 incidents on British Airways; January-September 2000
IME review US 2013

- 2008-2010
- N=11,920 1/604 flights
  - Syncope 37%, respiratory 12%, GI 9%
  - 7.3% Diverted
  - AED applied 1.3% (n=137, 5 shocked)
  - 26% transported by EMS
  - 7% admitted
  - 0.3% died

Peterson DC NEJM 2013
Most Common Medical Issues IME’s

- Fainting/lightheaded/dizzy -37%
- Respiratory-12%
- Nausea/vomiting 10%
- Allergies 2.2%
- MI 0.3%, accounts for 86% in flight death
- near-syncope (32.7%) and gastrointestinal (14.8%), respiratory (10.1%), and cardiovascular (7.0%) symptoms. (JAMA. 2018 Dec 25;320(24):2580-2590. doi: 10.1001/jama.2018.19842)
Air Rage?

• Psychiatric emergencies: 3.5% IME’s in 2015
  • Isolation, Fear and stress
  • Syncope MC sign
  • MC closer to arrival than takeoff
• 73% female, mean age 39
  • Anxiety 90%
  • Psychosis 4%
  • Conversion reaction 2%
• Diversion: 6%, 2 admissions
  • Matsumoto K. Aviation, Space and Environ Med 2001
Incidence: In-flight Death

• Laws regarding death certification: port of landing
• IATA data 1977-84
  • 42 airlines surveyed
  • 72 deaths/year
  • =0.31/million passengers
  • Cardiac in greater than 50%
• FAA 1988 n=33
• Cathay Pacific 0.58/million
  • Cocks R E Med Australia 2007
Paging Dr. Anyone Else
Facts:

• Health care provider present up to 90% IME’s in 2014*
  • Majority not within specialty
  • In 2013
    • 48% attended by physicians
    • 20% by RN’s

• Most unaware of resources

* Delta Airlines Data
I’m an OBGYN!

• 10 year old AA male
• Unaccompanied minor
• Leaning forward
• Not speaking/no noise
IME outside of Expertise

• Inflight OB/GYN issues rare
• Does condition require treatment emergently?
• Is the provider training and experience adequate?

Obstetrics & Gynecology:
April 2006 - Volume 107 - Issue 4 - pp 922-926
doi: 10.1097/01.AOG.0000202007.36641.d5
In the Trenches

House Calls at 30,000 Feet
Williams, Richard D. MD; Strunk, Albert L. JD, MD; Buckwalter,
Stork in the Sky

• “Several” babies born annually in the air
  • “Doctors seldom have an important role, except to reassure and administer contractant.”

• Air-born study:
  • 5/17 airlines surveyed: precip kit
  • 17/17 restrict employee flights
  • 10 third trimester patients, no change FHR

• Skyborn study:
  • 1929-2018 74 infants on 73 flights, 72 survived
  • 77% international, 26% diverted
  • GA 25-38 weeks
Provider Obligation

- Must comply with laws of Physician country of origin
- US, UK, Canada:
  - No duty to provide care
- Australia, parts of Asia and Europe:
  - Duty is imposed
    - In part from: Hedouin V. Med Law 1998
IME Pearls

• MI:
  • Do CPR, AED and if survives divert and land.
  • If not revived stop efforts after 20-30 minutes

• Acute Coronary Symptoms:
  • ASA
  • NTG can worsen shock with STEMI
  • IVF, O₂, lower altitude (but this will use more fuel).
  • Divert if you think MI

• Stroke: abrupt neuro sx.
  • Give O₂. (limited supply so use low flow).
  • no ASA, check glucose.
  • Divert
CPR at 35,000 ft.

- European Resuscitation Guidelines:
  - Continue if Ventricular rhythm persists
  - Cease if asystole > 20 minutes without reversible cause
  - Cease if PEA > 25 minutes

- Air Transport Association:
  - Cease: no shocks recommended and no signs of life after 30 minutes
More Pearls

• Syncope:
  • lay on floor
  • hydration
  • check glucose.
  • Risk stratify based on hx

• Psych:
  • check glucose
  • Restrain
  • Watch for injury secondary to restraints
    • Nable JV et al NEJM 2015 Sep 3.
Challenges:
Space
Vibration
Noise
Lighting

Where do Unaccompanied minors sit?
Differential Diagnosis
Flight Medicine

• AsMA: Aerospace Medical Association
• IATA: International Air Transport Association
• ICAO: International Civil Aviation Organization
Flight Crew FAA Mandate

- Coordination communication
- Location, function, operation of medical equipment
- Crew training q 1-2 years
  - CPR
  - AED
  - Not uniform
- Not required to provide care
  - Ruskin K. Anesthesiology 2008
What about Kids?

- 222 pediatric consults Mayo air support (9% total)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Percent Calls</th>
<th>Percent Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Neurologic</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>Respiratory</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>GI</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Allergic</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>
Pediatric IME

- All IME 22 monts 2015-16
- 15% (11,719) pediatric
- 14% of these lap infants
- 83% resolved in flight, 1/6 require more med care on groud
- 0.5% diversion
- 34% GI, 22% fever, 6% allergy
- Lap infants: trauma, burns, lacs
Back to Basics

• History
• ABC’s
• Luck:
  • “He’s Having an Asthma Attack. It happens all the time.”
Request O2

- 7 year old hands me inhaler:
  - “He uses this, and I just made him use it again.”
  - “He’s supposed to take pills but our Dad doesn’t believe in them.”
- O2 arrives
History of IME Medkit

• 1998: Air Transport Medicine recommendations
• 2002 updated
• ICAO 2007:
  • Plane = air taxi
  • Basic first aid only
  • Limited medications available onboard
  • Small kit size
Medkit (EMK) Required

• 1 or more flight attendants
• 30 or greater seats
• Many airlines exceed minimal requirements
• Enough O2 for 2% of passengers
EMK

• Basic carried all airlines US: most non US
• Sealed: not locked
• Expire annually
• Some enhanced
  • Quantas ET tubes and 1L IVF
• Care with sedatives: handcuffs instead
## Basic EMK 1996

<table>
<thead>
<tr>
<th>Contents</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesive bandage compresses, 1-inch</td>
<td>16</td>
</tr>
<tr>
<td>Antiseptic swabs</td>
<td>20</td>
</tr>
<tr>
<td>Ammonia inhalants</td>
<td>10</td>
</tr>
<tr>
<td>Bandage compresses, 4-inch</td>
<td>8</td>
</tr>
<tr>
<td>Triangular bandage compresses, 40-inch</td>
<td>5</td>
</tr>
<tr>
<td>Arm splint, noninflatable</td>
<td>1</td>
</tr>
<tr>
<td>Leg splint, noninflatable</td>
<td>1</td>
</tr>
<tr>
<td>Roller bandage, 4-inch</td>
<td>4</td>
</tr>
<tr>
<td>Adhesive tape, 1-inch standard roll</td>
<td>2</td>
</tr>
<tr>
<td>Bandage scissors</td>
<td>1</td>
</tr>
</tbody>
</table>
**EMERGENCY MEDICAL KIT FOR COMMERCIAL AIRLINES: AN UPDATE**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without defibrillator/monitor or monitor</strong></td>
<td>Stethoscope</td>
</tr>
<tr>
<td>Epinephrine 1:1000</td>
<td>Sphygmomanometer (electronic preferred)</td>
</tr>
<tr>
<td>Dextrose 50% inj. 50m1</td>
<td>Airways, oropharyngeal (3 sizes)</td>
</tr>
<tr>
<td>Antihistamine injection</td>
<td>Syringes (appropriate range of sizes)</td>
</tr>
<tr>
<td>Nitroglycerin tab. or spray</td>
<td>Needles (appropriate range of sizes)</td>
</tr>
<tr>
<td>Major analgesic inj.</td>
<td>IV catheters (appropriate range of sizes)</td>
</tr>
<tr>
<td>Moderate analgesic P.O.</td>
<td>Antiseptic wipes</td>
</tr>
<tr>
<td>Sedative anticonvulsive inj.</td>
<td>Gloves (disposable) Needle disposal box</td>
</tr>
<tr>
<td>Anti-emetic inj.</td>
<td>Urinary catheter</td>
</tr>
<tr>
<td>Bronchial dilator inhaler</td>
<td>IV admin. set</td>
</tr>
<tr>
<td>Atropine inj.</td>
<td>Venous tourniquet</td>
</tr>
<tr>
<td>Adrenocortical steroid inj.</td>
<td>Sponge gauze (4 x 4)</td>
</tr>
<tr>
<td>Diuretic inj.</td>
<td>Tape adhesive</td>
</tr>
<tr>
<td>Oxytocin inj.</td>
<td>Surgical mask</td>
</tr>
<tr>
<td>Sodium chloride 0.9%</td>
<td>Flashlight and batteries</td>
</tr>
<tr>
<td>ASA p.o.</td>
<td>Blood glucose test strip</td>
</tr>
<tr>
<td><strong>With defibrillator/monitor or monitor alone</strong></td>
<td>Emergency tracheal catheter (or large gauge IV cannula)</td>
</tr>
<tr>
<td>Same list 1, adding:</td>
<td>Cord clamp</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>BLS cards</td>
</tr>
<tr>
<td>Epinephrine 1:1000</td>
<td>Bag-valve mask</td>
</tr>
<tr>
<td></td>
<td>A list of contents</td>
</tr>
<tr>
<td></td>
<td>ACLS cards</td>
</tr>
</tbody>
</table>
2007 Medkit

• Wording: “or equivalent” (dextrose, Pitocin)
• Oral analgesic added
• Minimum IVF added (500 cc)
• Oral beta blocker
• Lidocaine removed
• BG test strips removed
• Thermometer added
• Digital BP cuff

• Aviation Space Environ Med 2007
Can You Prove That You are a Doctor?
DELTA CHANGES POLICY AFTER BLACK DOCTOR'S HELP REFUSED

AP, Associated Press Dec. 21, 2016 5:37 PM ET
Diversion

- 4-13% of IME
  - Divert if:
    - Unremitting chest pain
    - SOB
    - Severe abdominal pain
    - Stroke
    - Unresponsive patient
    - Refractory Seizure
    - Persistent Agitation
Diversion

• Decision made by Captain
• Land “hot”
• On runway: full inspection
• Cost estimates: $3,000-725,000
  • Not including passenger costs for rerouting
• Equipment not positioned correctly
Triage for Diversion

- Physician present 50% admitted upon landing
- No physician present: 15% admitted after landing
  - Cocks R E Med Australasia 2007
- MC indications: (of 279)
  - 1. MI
  - 2. seizure
  - 3. CVA
- 80% international, 20% domestic
  - Sand M, Critical Care 2009
• O2 administered*
• Request ambulance on ground
EMK Arrives

- Size of the aisle
- Break seals
- List of contents
- No particular packing order (?)
- Albuterol MDI on top
Ground Based Support

- **MedAire, Mayo Aerospace Medicine, Pitt: STAT-MD**
  - Preflight fitness questions
  - Assist on board providers
  - Guide diversion decisions
  - Consistent level of care
  - Data collection

- Onboard providers unaware availability

- MedAire: >23K incidents (60/day)
Effect of Ground Based Support

• 2004-2006 5386 Telmed contacts
  • 2.4 diversions/100 calls
• 2006-2007: rate Telmed calls decreased >50%
  • Rate diversions doubled

• Valani R. Aviation Space and Environmental Med 2010
• Albuterol 3 puffs
• Within 1-2 Minutes:
  • Airflow
  • Sits back in his chair
• Within 5 minutes:
  • fighting with little brother
• EMS on tarmac: EMT’s board plane
Job Not Done

- Paperwork
- Talk to parents
- Document in MR?
  - Where does responsibility end?
Obligation

- Obtain patient consent prior to treatment
- Do not have to accompany patient to hospital
- If patient refuses care post flight-not IME providers responsibility
Provider Liability

• No successful suits in US*
• Courts hold provider to lower standard
• Must provide care that competent physician would provide under similar circumstances
  • Williams R, Strunk A, Obstet Gynecol;107(4) 2006
• Liable if patient establishes that the provider was negligent or intentionally caused alleged harm.
Physician Protection: US

- Aviation Medical Assist Act 1998
- Airline indemnity policy
- Ground based indemnity policy
- Personal medical malpractice policy
- Lufthansa “Doctors on Board”

Declares that an individual shall not be liable for damages in any such action arising out of acts or omissions in providing or attempting to provide such assistance, except for gross negligence or willful misconduct.

http://www.govtrack.us/congress/bills/105/hr2843#summary/libraryofcongress
Who can fly?

- Babies 48 hours old, preferably 7 days
- Climb set of stairs without SOB or CP
- Walk 50 yards without SOB or CP
- Supplemental O2 if PO2 <70 or SaO2 < 92% RA
  - Aerospace Med Assn and British Thoracic Society
- No increased risk seizure
- Meds:
  - In carry on
  - Dose adjustment: hypoglycemic medications
Pre Flight Adult Assessment recommended:

- Prior air travel intolerance
- COPD FEV₁<30% predicted
- Asthma
- Bullous lung disease
- Severe restrictive disease VC< 1L
- Cystic Fibrosis
- Comorbidity worsened with hypoxemia
- Pulmonary TB
- Within 6 weeks DC for respiratory illness
- Recent Pneumothorax
- Prior VTE
- Pre-existing O₂ requirement

Medical Considerations for Airline travel:

• [http://www.asma.org/asma/media/asma/Travel-Publications/Medical%20Guidelines/BCS-FITNESS-TO-FLY-REPORT.pdf](http://www.asma.org/asma/media/asma/Travel-Publications/Medical%20Guidelines/BCS-FITNESS-TO-FLY-REPORT.pdf)
## Cardiovascular Disease History

<table>
<thead>
<tr>
<th>Condition</th>
<th>Functional status</th>
<th>Lay explanation</th>
<th>Restriction/guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PeriSTEMI and NSTEMI</td>
<td></td>
<td></td>
<td>Consider airport assistance and possible in-flight oxygen</td>
</tr>
<tr>
<td>Low risk, age &lt;= 55, first event, successful bypass, EF &gt; 40%, no complications, no planned investigations or interventions</td>
<td></td>
<td></td>
<td>Defer travel until steady or travel with medical escort and in-flight oxygen available</td>
</tr>
<tr>
<td>Medium risk, EF = 40%, no symptoms of heart failure, no evidence of unstable angina or symptoms, no planned investigations or interventions</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
</tr>
<tr>
<td>High risk, EF &lt; 40%, signs and symptoms of heart failure, those pending further investigation, revascularization or devices therapy</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
</tr>
<tr>
<td>Elective PCI uncomplicated</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
</tr>
<tr>
<td>Elective CABG uncomplicated</td>
<td></td>
<td>Allow for intravenous gas exemption. If complicated or symptomatic, see heart failure</td>
<td>Defer travel until condition stable</td>
</tr>
<tr>
<td>Acute heart failure</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
</tr>
<tr>
<td>Chronic heart failure</td>
<td>NYHA I and II</td>
<td></td>
<td>No restriction</td>
</tr>
<tr>
<td></td>
<td>NYHA III</td>
<td></td>
<td>May require in-flight oxygen</td>
</tr>
<tr>
<td></td>
<td>NYHA IV</td>
<td></td>
<td>Defer travel until condition stable</td>
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<tbody>
<tr>
<td>Congenital heart disease</td>
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<td></td>
<td>May require in-flight oxygen</td>
</tr>
<tr>
<td>NYHA I and II</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
</tr>
<tr>
<td>NYHA III</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
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<td>NYHA IV</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
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<th>Functional status</th>
<th>Lay explanation</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Stable</td>
<td></td>
<td></td>
<td>No restriction</td>
</tr>
</tbody>
</table>

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<tr>
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</thead>
<tbody>
<tr>
<td>Ablation therapy</td>
<td></td>
<td></td>
<td>Defer travel until condition stable</td>
</tr>
</tbody>
</table>

*Unless otherwise stated, patients should avoid flying within 2 weeks of the procedure.*
Pulmonary Disorders

Managing passengers with stable respiratory disease planning air travel: British Thoracic Society recommendations

British Thoracic Society
Air Travel Working Group
Preflight Assessment recommended: pediatric

- > 37 weeks at birth: Best if at least 7 DOL
- < 37 weeks if not reached EDD, O2 1-2L/min avail
- < 1 year old if SaO2 < 85% need inflight O2
  - Hypoxic challenge test if FEV1< 50%. Supplemental O2 if inflight SaO2< 90%
  - LT O2 requirement in last 6 months
- Double O2 flow rate from sea level when flying for O2 dependent kids
Pilot Fitness

• Physical q 6 months
• Annual EKG and DM screen after 40
  • Air France
Who Can’t Fly?

- Unstable or new onset angina
- Ventricular ectopy
- Poorly controlled hypertension or seizure disorder
- MI within 10 days 12 weeks
- TIA
- CVA within 2-4 weeks
- Hemoglobin < 8.5 g/dl (provide O2)
- Abdominal Surgery within 14 days
- Ileus
- Diverticulitis 10 days
- Scuba dive 12-24 hours
  - Silverman Lancet 2009
  - Rosenberg Eur J Med 1996

- Decompensated cardiac disease
- Decompensated respiratory disease
  - O2 requirement > 4L/min at sea level
- Hemoptyis (major)
- Infectious TB
- Intrathoracic air
- Acute psychosis
- Intracerebral air
- Retinal Detachment surgery within 2-6 weeks
- Pregnancy > 36 weeks (>32 weeks multiple)
Other considerations

- Casts applies within 24-48 hours should be bivalve
- Release air from pneumatic splints
VTE

- RR 3-4 flights > 4 hours
- No difference between classes

- 56 reports in 135 million passengers
- Flight length > 8 hours
- RR 16 if OCP use
- Controversial
  - Meta-analysis: no increased risk
    - Ruskin K Anesthesiology 2008

- TED Use
  - 2/1237 VTE with TED use
  - 46/1265 without
    - Silverman Lancet 2009
VTE prevention


Long-Distance Travel

For travellers who are taking flights > 8 hours, we recommend the following general measures:

- Avoidance of constrictive clothing around the lower extremities or waist;
- Maintenance of adequate hydration;
- Frequent calf muscle contraction (Grade 1C).

For long-distance travellers with additional risk factors for VTE, we recommend the general measures listed above. If active thromboprophylaxis is considered because of a perceived high risk of VTE, we suggest the use of properly fitted below-knee GCS, providing 15 to 30 mm Hg of pressure at the ankle (Grade 2C) or a single prophylactic dose of LWMH, injected prior to departure (Grade 2C).

For long-distance travellers, we recommend against the use of aspirin for VTE prevention (Grade 1B).

Fig. 1. Recommendations for DVT prevention (12).
Role of IME Responder

• Good communication with crew and passenger
• Assess: are you the most appropriate first responder?
• Obtain advice ground prn
• Determine if can temporize
• Recommend diversion if needed: Captain ultimate decision
• Maintain care throughout flight
Recognition

• None
• Thanks
• Champagne
• Putter
• Miles
• Gift Certificate to Airline
• Warm fuzzies
IATA recs

• Automatic ground consultation
  • Data collection
  • Consistent patient care
  • Decision making out of passenger hands
  • Fewer diversions

• Drawbacks:
  • Information transfer between many people
Take Home

- IME 1/10-40K passengers and increasing
- Data poor quality
- MC causes cardiac, respiratory, neurologic
- EMK, AED and Telemedicine available
- Role of communication and care
- Provider protected Aviation Med Assist Act
Best Line Ever

• “you're not a gynecologist are you?”
G&O Division Faculty
Flight Fitness

- Unstable medical condition
- Angina
- CHF
- MI
- VTE
- Asthma
- Emphysema
- Recent surgery
- Seizure disorder, stroke, mental illness
- DM
- Communicable diseases

- Consider:
  - Vaccination status
  - TB, measles, chicken pox
  - Contact airline for travel info re: med clearance, some require certificate of health
  - No flying within 24 hours scuba diving
Incidence IME Australia

- 27 million passengers/year
- 296 IME/month (n=3555)
- 26% graded as emergencies (37% syncope, 12%CV)
- 6 fatal
- <.016% diverted, ½ secondary to cardiac event
- Medical event rate: 1/40 flights
- Medical emergency rate: 1/150 flights

AED use

- FAA 2006 required if > 7500lb payload, 30 sets or 1 FA
- Quantus 1997:
  - Used 27 times over 64 months, 26% survival
- Air France
  - 12 AED/year, survival 25%
- Used for triage/monitoring EKG
Favorite Pearl

• Respiratory:
  • Those with resting PO2 < 92 are advised to bring their own O2.
  • If pneumothorax: needle Thoracotomy
  • Descend

Insertion Site

- **Triangle of Safety** (Mid Axillary line 4th or 5th Intercostal Space)
  - Anterior Border of Latissimus Dorsi
  - Lateral Border of Pectoralis Major muscle
  - Line superior to Horizontal Level of nipple
  - Apex below Axilla

- **Mid Clavicular Line** 2nd Intercostal Space
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<td>Syringes (1 ml, 3 rill, 10 ml)</td>
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<tr>
<td>Nitroglycerine tab. or spray</td>
<td>Needles (18, 20, 25)</td>
</tr>
<tr>
<td>Major analgesic inj.</td>
<td>IV Catheter (16, 18, 20)</td>
</tr>
<tr>
<td>Moderate analgesic p.o.</td>
<td>Antiseptic wipes</td>
</tr>
<tr>
<td>Sedative/anticonvulsivant inj.</td>
<td>Gloves (disposable)</td>
</tr>
<tr>
<td>Anti-emetic inj.</td>
<td>Needle disposal box</td>
</tr>
<tr>
<td>Bronchial dilator inhaler</td>
<td>Urinary catheter</td>
</tr>
<tr>
<td>Atropine inj.</td>
<td>IV admin. set</td>
</tr>
<tr>
<td>Adrenocortical steroid inj.</td>
<td>Tourniquet</td>
</tr>
<tr>
<td>Diuretic inj.</td>
<td>Sponge gauze (4 x 4)</td>
</tr>
<tr>
<td>Antispasmodic tab.</td>
<td>Tape adhesive</td>
</tr>
<tr>
<td>Ergotamine/oxytocin</td>
<td>Surgical mask</td>
</tr>
<tr>
<td>Sodium Chloride 0.9%</td>
<td>Flashlight and battery</td>
</tr>
<tr>
<td>ASA p.o.</td>
<td>Glucostix set</td>
</tr>
<tr>
<td><strong>With Defibrillator/Monitor</strong></td>
<td>Emergency tracheal catheter</td>
</tr>
<tr>
<td>Same as list 1, Adding:</td>
<td>(large gauge intracath)</td>
</tr>
<tr>
<td>Lidocaine inj.</td>
<td>Cord clamp</td>
</tr>
<tr>
<td>Bretylium inj. 10m1</td>
<td>ACLS cards</td>
</tr>
<tr>
<td>Sodium Bicarbonate inj.</td>
<td>Bag-Valve-mask</td>
</tr>
<tr>
<td>Diltiazem inj.</td>
<td>A list of contents</td>
</tr>
</tbody>
</table>
1977 ACLS meds European airlines
1982 Research Group Consumer Aviation Project
1986 EMK
1994 EMK amended
1996 1st aid kit/EMK 20-30 passengers
1998 Aviation Medical Assistance Act
2004 all airlines AED and EMK
Common Sense

• Do not volunteer if ETOH or sedative use
• Alcohol limit: same as country plane registered:
  • Australia impaired > .05 g/L
  • UK impaired = > .08 g/L
  • US impaired .08%
  • Equivalent to 300 cc wine with 12% ETOH