

# Medical Assessment of Fitness to Dive Professional Diving Aspects

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# Professional Diving

- Definition
  - UK = "diving for monetary gain"
- Statutory framework
  - Health and Safety Legislation
- Employment legislation
  - e.g. disability discrimination
- Civil litigation

# Professional Diving

- Objectives of medical assessment
  - Safety of diving operations
    - For diver and other members of dive team
  - Health surveillance
    - Identification of diving related ill health

# Importance of medical assessment

- Safety
  - Diving remains a hazardous occupation
  - Most diving accidents affect healthy divers
  - Few accidents relate to health issues
  - Health issues are potentially identifiable in few of these divers
  - Legal challenge to fitness assessment is rare
- ? Evidence of its benefit

# Development of a Medical Standard

- First concepts established by military
  - Fitness criteria within military situation
- Civilian organisations have used pre-existing standards as template
- Recent attempts to provide an evidence base for standards
- E.g. BTS Guideline of Respiratory Aspects
  - no randomised trial evidence available (Thorax 2003;58:3-13) - most evidence remains at level of expert committee report.

# EDTC Fitness for Professional Diving

- Guidelines are result of consensus discussions over several years = expert committee report.
- Not possible to be totally compliant with all national guidelines.
- Document provides a sound basis for doctor to conduct an examination.

# Issues in assessment of fitness

- "Certification" requires yes/no answer
  - Medical examination is an assessment of risk
  - Very limited knowledge of risk
  - ? Acceptable risk for certification
- Application of guidelines
  - Knowledge of diving operations conducted
  - Knowledge / skills in diving medicine

# UK current issues

- EC directive on use of ionising radiation in medicine - now translated into UK law
  - Chest radiography only if clinically indicated.
  - Long bone radiology no longer justifiable.
- Assessment of physical fitness
  - Consensus that physical fitness is important
  - All fitness tests carry morbidity/mortality
  - No good information concerning required level of fitness or how fitness test on office relates to performance as diver
  - ? Justification ? Grounds for defending an appeal

# Reassessment

- Consensus
  - Initial medical assessment is most critical
  - Reassessment required after illness
  - Health status changes little to age 40
- Poor agreement about re-assessment
  - Mainly logistical/bureaucratic

# Lessons from Aviation - 1

- Zero risk = unattainable utopia
- Acceptable fatal accident rate 1 in  $10^7$  hours flying
- Crew failure should not represent more than 10% i.e. 1 in  $10^8$  hours
- Incapacitation = 10% of crew failure
- Fatal accident due to incapacitation might occur 1 in  $10^9$  hours

# Lessons from Aviation - 2

- In males aged 65 annual cardiovascular mortality is 1%
  - i.e. 1 in  $10^6$  hours
- Only 10% of flight time is critical
  - (take off / landing)
- 99% of time other crew will take over.
- Hence acute cardiac events don't increase the 1 in  $10^9$  hours rate

(Johnston, R.V. Scot. Med. J 1999; 44: 174-175)

# In Practice

- Most diver medical assessments are straightforward
  - most divers are fit
- Where there is a medical fitness issue it is often complex
  - obviously unfit divers don't pay for an examination when the outcome is obvious

# Conclusion

- EDTC Medical standard = expert consensus document
- Training /skill of doctors is equally important
- Requirement for evidence to support medical decisions on fitness
- Important to understand to role of fitness assessment in relation to safety