Diving with Disability

Aspects of fitness to dive and rehabilitation

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Diving

means to be in another environment with a lot of changes for everybody
Aspects of fitness to dive
Medical assessment

Medical form

Health inventory

questions about all diseases
focus on medical problems which influence diving

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Aspects of fitness to dive
Medical assessment

Clinical examination

Sinuses
eardrums and equalizing
heart + blood pressure
lung
abdomen, skeleton
muscular function + joints
psychological aspects
neuro exam

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Aspects of fitness to dive with physical handicaps

Extended medical assessment

should be done by an experienced Diving Physician

- medical history of the handicap (stable / progressing)
- handicaps (influence on diving)
- special needs of assistance or equipment
- physical fitness concerning cardio-vascular function
- limitation because of medication
Aspects of fitness to dive with physical handicaps

Problems

• blind divers
  - communication
    under water
  - change of hearing

• deaf divers
  - equalizing the ears?

• physically disabled divers
  - how to swim?
  - how to handle diving equipment?
  - buoyancy problems?
  - protection of plegic limbs?
Aspects of fitness to dive
Diving with handicapped persons

Assessment

Level of handicap
• influence of handicap on diving
• basic skills possible
• self / buddy rescue possible

Assessment of level of handicap should be done by an experienced Diving Physician!!!
Aspects of fitness to dive
Diving with handicapped persons

Number of accompanying persons according to level of the handicap

• diving instructor
  - special qualification & experience
• diving assistant
  - experience with handicapped
• surface assistance
  - experience in handling handicapped (transfer in/out of pool)

Only special qualified and experienced persons should dive with persons with a handicap !!!
Aspects of fitness to dive

Diving with handicapped persons

Event „Dive Challenge“
in swimming pool conditions
• 2 diving instructors p.p.
• diving assistance at surface
• doctor at poolsite
• medic first aid stand-by

„Dive challenge“ offers the possibility
to feel comfortable in water:
• floating
• swimming
• snorkeling
• diving

But is NO scuba diving course !!!

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Aspects of fitness to dive
Medical Assessment

Beginning a diving course

further tests:
• ECG
• Chest x-ray
• Spirometry

certificate for fitness to dive
• limitations
  (children, disabled persons)
• interval to next examination
Aspects of fitness to dive
Medical Assessment

Additional tests

focus
on physical fitness
& performance exercise capacity
(e.g. stationary cycling)

measuring
exercise capacity for physical
& cardiovascular fitness
Diving means to be in another environment

Change of vision
Diving means to be in another environment

Change of vision

Water with mask
Diving means to be in another environment

Change of vision

Blind persons don´t see but feel their surrounding
Diving means to be in another environment

Change of hearing & communication
Diving means to be in another environment

Change of hearing & communication
Diving means to be in another environment

Change of hearing & communication

„normal“ divers‘ communication is sign language

Deaf persons can understand!
Diving means to be in another environment

Body temperature regulation

Loss of body temperature in water
Diving means to be in another environment

Body temperature regulation

Loss of body temperature
In water
Diving means to be in another environment

Body temperature regulation

Loss of body temperature in water more than on surface

- Persons with low motoric limb function should have enough protection
- Good wet suit
- Not stay too long in water

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Diving means to be in another environment

Change of environmental pressure of the surrounding water

Pressure changes
- in ears / sinuses
- lungs
- tissue
Diving means to be in another environment

Change of environmental pressure of the surrounding water

Pressure changes
- in ears / sinuses
- lungs
- tissue

Caution with disability concerning ear deformation

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Diving Medicine
Diving Medicine
Diving means to be in another environment

Change of environmental pressure of the surrounding water

Pressure changes
- ears / sinuses
- tissue
- lungs
  breathing against a higher surrounding pressure

Edema reduction by immersion
Diving means to be in another environment

Change of environmental pressure of the surrounding water

Pressure changes
- ears / sinuses
- tissue
- **lungs**
  - breathing against a higher surrounding pressure

Snorkeling
- higher breathing resistance
- training for muscles involved in breathing

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Diving Medicine

Barotrauma of the lung

Pneumothorax
Diving Medicine

Barotrauma of the lung

Mediastinal-Emphysema

Alveole
Barotrauma of the lung

Arterial Gasembolism

AGE / CAGE

Diving Medicine
Barotrauma of the lung

Arterial Gasembolism
AGE / CAGE

Intrapulmonal bulla
Diving means to be in another environment

Change of breathing
- breath hold diving
- breathing with a snorkel
- breathing with regulator

Breathing in a floating position changes lung position
Respiratory therapy!
Diving means to be in another environment

Floating with buoyancy with BCD (buoyancy control device)

Easy for disabled persons
They can float like everybody
Aspects of rehabilitation
Diving with disability

Dive Challenge Nizwa 2011

<table>
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<tr>
<th>In-water assistance</th>
<th>1 instructor</th>
<th>2 instructors</th>
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<tbody>
<tr>
<td>medically fit to snorkel</td>
<td>4 disabled</td>
<td>2 disabled</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1 attendant</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>medically fit to dive</td>
<td>2 disabled</td>
<td>13 disabled</td>
<td>10 disabled</td>
</tr>
<tr>
<td></td>
<td>6 attendants</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- nobody was totally unfit to dive or snorkel
- no medical problems
Aspects of rehabilitation
Diving with disability

• Better respiratory function
• Reduced edema
• Moving joints and limbs in weightlessness
• Reduced spasticity
• mastering the complex skill of diving similar to a not disabled person

• Better quality of life !!!
Thank you for attention!

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