

# **BENDS**

**IS NOT A DIRTY WORD**

**A Practical Look at  
Decompression Illness**

**Extended Range Diving Organization Inc.  
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# What is The Bends?

- It is the syndrome of joint pain, numbness, paralysis and other symptoms caused by the release of gas dissolved in tissues, which forms bubbles in the blood upon surfacing after a scuba or compressed gas dive.
- Bubbles forming in tissues near joints cause the pain of classical “bends.” When high levels of bubble formation occur, complex reactions take place, which can cause other symptoms.

# When does it show up?

- Symptoms and signs can appear within 20 minutes to 48 hours after surfacing from any dive.
- Severe cases can show symptoms “in-water” or immediately upon surfacing.

# Who is thought to be a “Bent Diver?”

- Divers who exceed no-deco limits
- Deep divers
- Cold water divers
- Inexperienced divers
- Divers with “risky” profiles
- “Stupid” divers
- “Bad” divers

# CITY ISLAND CHAMBER

## 1994-1995 STATISTICS

0 % Technical Diver

17% Deeper than 130 fsw

17% No Timing Device

41% Multi-day Trips

48% Caribbean/Mexico

52% Fly < 24 hrs. after diving

42% No Safety Stops

52% Computer Users

55% < 100 fsw

79% Repetitive Diving

79% No-Deco Dives

Population n = 45 divers

# What the Statistics Mean

- Of divers who required treatment, most of the profiles would on the surface not warranted treatment.
- However, neurological examinations showed significant deficits which required treatment.
- Most divers who required treatment believed that they were “within tables” but were really way outside no-stop time limits.
- Divers who dive often and have additional training are better prepared to prevent DCI.

# Sources of Myths

- Instructors
- Retailers
- Resort Operators
- Medical Personnel
- Training Agencies
- Poor Press Coverage
- Uninformed Divers
- Divers in Denial
- Effects of Alcohol
- “Party” Mentality
- Peer Pressure

# Emotional Issues Divers Face

- Anxiety
- Shame
- Humiliation
- Guilt
- Incompetence
- Exaggerated fears of treatment
- Fear of inability to dive again
- Real concern for physical well-being

# Diver Denial

*“The diver may mobilize defenses and engage in behaviors that temporarily ease the psychological burden.”*

*Jennifer C. Hunt, Ph.D. aquaCorps, N5*

# Injured Diver's First Reactions

- “Not me, I’m a good diver.”
- “Only bad divers get bent.”
- “It’s only a sprain.”
- “I probably have the flu.”
- “I’m just tired.”
- “I’m within the tables.”
- “My computer says I’m O.K.”
- “I don’t want to ruin the trip.”

# Secondary Reactions

- “Maybe I am hurt.”
- “It will probably go away.”
- “I don’t want to go to a chamber.”
- “Can I afford treatment?”
- “Am I insured?”
- “If I am bent can I ever dive again?”
- “I’m probably not bent.”

# DCI Signs and Symptoms

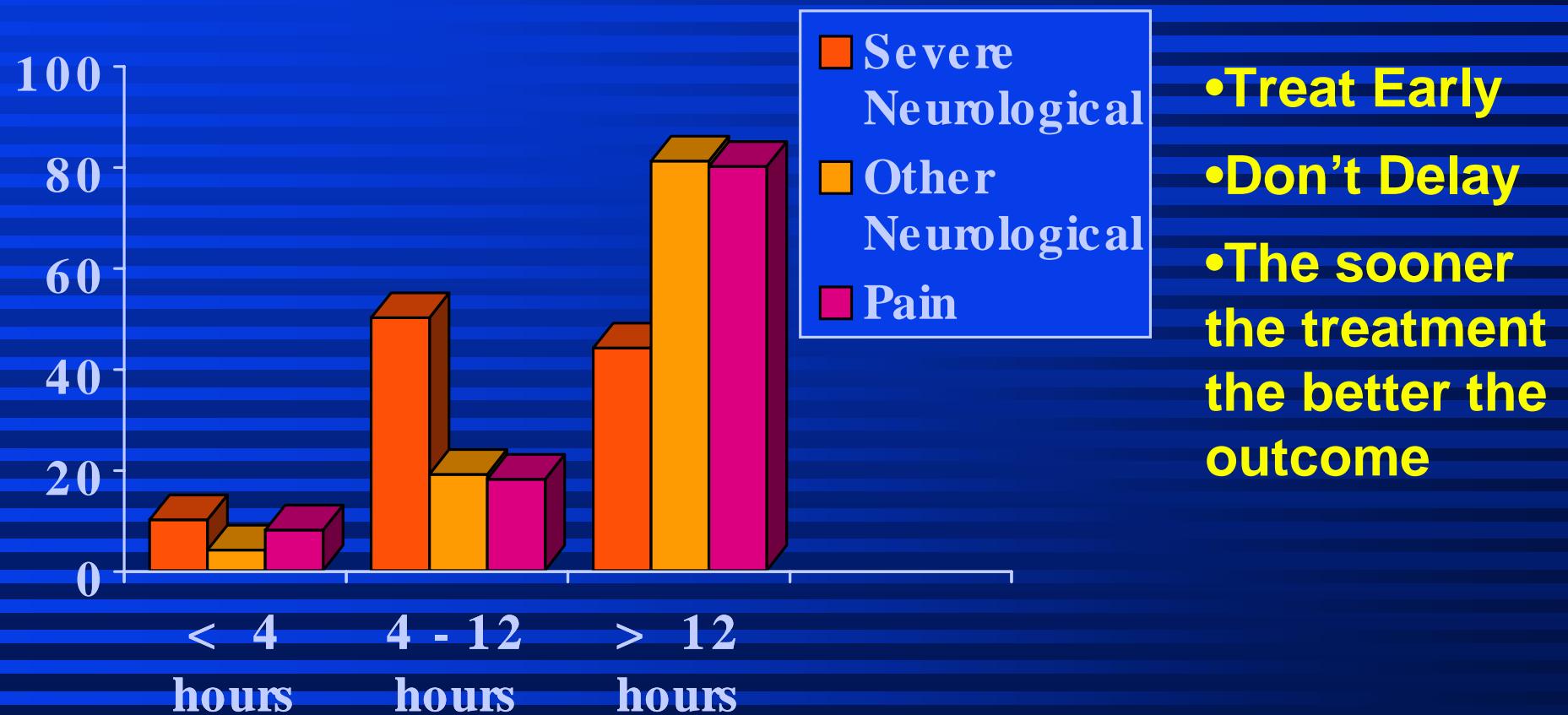
- Disorientation
- Dizziness
- Fatigue
- Hearing Difficulties
- Muscle Pain
- Numbness
- Joint Pain
- Paralysis
- Skin Rash
- Slurred Speech
- Agitation
- Tingling
- Vision Problems
- Weakness

# Treatment Delays

- 55 % of divers delayed treatment for 48 hours or longer.
- 38 % had signs and symptoms that forced them to seek treatment in under 24 hours.
- 14 % had significant delays due to seeking help from non-diving medical personnel.

# DELAYING TREATMENT

## % of Divers with Post-Treatment Residuals as a Function of Treatment Delay



- Treat Early
- Don't Delay
- The sooner  
the treatment  
the better the  
outcome

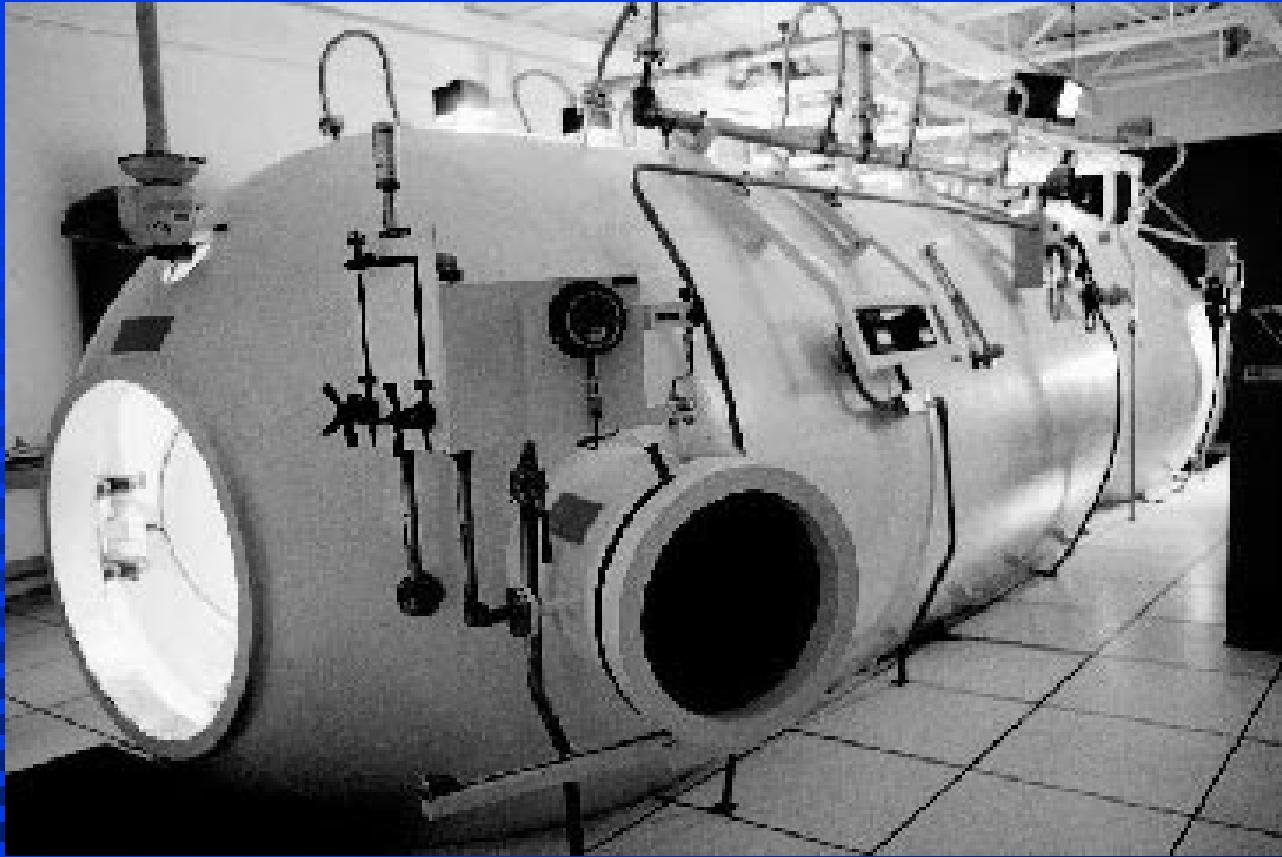
# Incident Management

- At first sign - 100 % Oxygen.
- Tell someone (buddy, boat captain, etc.)
- DO NOT let *anyone* minimize your urgency.
- Monitor your changes.
- Call for help - EMS - USCG - DAN.
- Drink plenty of non-alcoholic fluids.
- DO NOT take minor signs lightly.
- Never re-enter the water.
- Get to a recompression facility *fast*.

# How Recompression Works

- A room is pressurized with air while a diver and a medical tender relax inside.
- Most treatments are done at 60 feet - 2.8 atm.
- The diver breathes 100 % oxygen by a mask/hood, producing a surface equivalent of 280% oxygen.
- Oxygen eliminates nitrogen in the body and maximizes bubble resolution.
- Oxygenation of areas with compromised blood flow promotes healing.

# **Multiplace Hyperbaric Chamber**



- A multiplace chamber is the preferred choice.
- Mono-place chambers offer few treatment options.

# Treatment Schedules

- Average initial time at a hyperbaric facility 8 hours
- Repeat oxygen treatments last 2 hours each.
- Depending on DCI severity, treatments can be from 2 to 36 hours .

<b>US Navy Treatment Table 5</b>	<b>60 fsw</b>	<b>2 hours</b>
<b>US Navy Treatment Table 6</b>	<b>60 fsw</b>	<b>4 - 6 hours</b>
<b>COMEX 30 Treatment Table</b>	<b>100 fsw</b>	<b>7 - 9 hours</b>
<b>US Navy Treatment Table 6a</b>	<b>165 fsw</b>	<b>5 - 7 hours</b>

# Bends Prevention

- Dive within your training level.
- Always do a safety stop on no-stop dives.
- Limit decompression dives to one a day.
- Deepest dive first.
- Use conservative dive tables
- Take a day off every two on long trips.
- 24 hours minimum before flying.
- Stay well hydrated.
- NO ALCOHOL !

# What you can do now

- Training / Attitude
- Community Participation
- Peer Support
- Organization Support

# Training

- CPR / First Aid
- Oxygen Provider Certification
- Nitrox Certification
- Intro To Hyperbarics
- Advanced Diver Certification

# Community Participation

- Dive club meetings
- Tours of hyperbaric facilities
- Encourage oxygen availability
- Promote Responsible Diving
- Display safety signs and phone #'s

# Peer Support

- Learn signs of diver denial
- Encourage early treatment
- Don't promote myths
- Take “bends” out of the closet

*“ Decompression  
sickness is not an  
accident; a certain  
incidence of it is  
expected from practical  
diving”*

R.W. “Bill” Hamilton, Ph.D

***“The strong negative social reaction and stigma surrounding DCI increases the trauma, and jeopardizes the healing process.”***

Jennifer C. Hunt, Ph.D. aquaCorps , N5

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**This presentation is a public safety message of the  
Extended Range Diving Organization Inc.**

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