

# Recommended HBO Facility Evaluation Criteria

ALL criteria should be addressed; those that are asterisked (\*) constitute **ESSENTIAL** criteria for acceptance as a recommended DoD referral facility for treatment of DoD personnel / beneficiaries.

- \* 24 hour “on-call” emergency treatment capability.
- \* Familiar with approved DCS and HBO treatment tables - ideally the USN standard oxygen treatment tables to include treatment tables 5, 6, 6A, and all required protocols for extensions thereof, as well as carbon monoxide profiles. Oxygen breathing periods for Inside Observer (multiplace) safety should be well delineated and cover table extensions and other mods.
- \* Physician credentialed in hyperbarics who remains on-site during all treatment protocols.
- \* Ability to pressurize to 60 FSW minimum (note: 66 FSW recommended for CO poisoning).
- \* Current inspection and certification by local fire department; meets all fire codes--specifically water deluge fire suppression system (multiplace) and minimized combustibles and spark sources in chamber.
- \* Built-in Breathing System for delivering air breaks in monoplace facilities.

Staff experienced in treating DCS cases (base flight surgeon may need to provide guidance if local experience is lacking).

Facility willingness to work harmoniously and expediently with referred cases.

Has real-time oxygen monitoring capability (multiplace) - operational guidelines have detailed plan if environmental O<sub>2</sub> concentration exceeds 23%.

System has sufficient air source (accumulator and/or compressor capacity using UPS) to complete acute/critical treatments if outside electrical power fails.

Has an experienced operations/safety director who is familiar with ASME/PVHO (American Society of Mechanical Engineers / Pressure Vessels for Human Occupancy) and NFPA (National Fire Protection Association) standards.

**NOTE:** Remember that contact with the USAF hyperbaricist on-call to review diagnosis and therapeutic options prior to treatment is still required (DSN 240-3281 day / -3278=24 hr).

## **Clarification of the above points in context of temporary chamber shut-down**

The real impact item is: if you lack the ability to treat the known possible adverse outcome of altitude chamber training (DCS), then you should NOT be conducting altitude chamber training. Since the patient may present at any hour of the day or night, a 24-hour treatment capability is essential if you are to run the altitude chamber. As a simple corollary: if you don't have anti-venin, then don't pet the rattlesnakes.

Taking the requirements found on our web site in order:

If a facility is otherwise acceptable, but lacks 24 hour coverage: I don't mind if that facility plays a role in your treatment coverage plan, but it cannot be the only facility you use. You may preferentially use a local civilian chamber which is closer and more convenient for patients who present during duty days, but if those facilities are not available evenings and weekends, then you must have another viable option for those off hours, even if farther away or less convenient. I think a combination of the civilian facility plus the small Navy chamber at Camp Schwampy (if they provide full coverage) may meet your needs. If you are unable to meet the 24 hour treatment coverage requirement, then it is my recommendation that altitude chamber training at your facility be suspended during the time your treatment chamber is off-line.

The treating physician must be at the facility during the treatment protocol. If he/she cannot be, then a USAF physician who is authorized to make treatment decisions and control the treatment protocol, must take over. If the physician is routinely not present during treatments, then another facility should be used.

You must have the ability to pressurize to 60 FSW. All USAF and USN treatment tables use this depth, as do Comex (French), Royal Navy, and Canadian tables. You can even treat Carbon Monoxide poisoning at 60 FSW in a monoplace chamber (Monoplace table 4). All monoplace chambers I am aware of can pressurize to 60 FSW, and most can go to 66 FSW. This should not be a problem for most modern facilities.

Fire department inspections and ASME PVHO certification only apply to facilities in the United States. Your country's facilities should be appropriately inspected and approved in whatever manner prescribed as acceptable to their authorities.

Air breaks are required on all DCS treatment tables I am aware of. If a monoplace facility does not have built-in breathing system to deliver air breaks, then it cannot be used to treat DCS.

The last people you want treating acute DCS are ones who have no familiarity with the protocol. If they only treat non-healing wounds and have no experience with DCS and the US Navy (or USAF) treatment tables, you would be better off finding another facility. If they have minimal experience BUT are amenable to letting your techs and physicians control the treatment dive (under their direct supervision) - - then that would be an acceptable hybrid solution.

I am uneasy about a host-nation medical facility that won't permit USAF physicians to observe or monitor the treatment of USAF personnel. If their physicians are not willing to explain their treatment protocols and work with our physicians, then I recommend you find other treatment facilities. I don't mind if a facility chooses to use a Comex or British Royal Navy treatment table to care for DCS, but we should all be aware ahead of time exactly what the treatment options are.

O2 sensors in multiplace chambers are a safety issue. Fatal fires have resulted in multiplace facilities when the oxygen concentration was inadequately controlled. Although this is a rare consequence, it should be considered when evaluating a host-nation civilian multiplace facility. I would not recommend a facility with inadequate O2 monitoring or an inadequate deluge / fire extinguishing system for routine use in your supplemental DCS treatment plan.

The backup capabilities of a selected facility should be understood. If they lose power, or lose a compressor - - how does that affect the patient being treated? The answers to these questions should be understood and not present an unacceptable risk.

The safety director is a good idea, but is only a US requirement.

Now - - as to what you actually do in an actual emergency situation?? The answer is - - "That Depends" on what the emergency is. Yes, it would be an emergency if you had a DCS patient and had no appropriate method of treating this expected patient. That would be bad on you. It's another thing altogether if you have a well prepared plan, and for some unforeseen reason, that plan becomes unworkable at the worst possible moment. What you do in this second case depends entirely on your medical staff and the risk/benefit tradeoffs of the treatment options at your disposal. In the end, you'll be judged on your preparations, the choices you made, and the final therapeutic outcome. As always, our consultant team expects to be a part of any real-time hyperbaric treatment decisions.

I expect you will notify your base population when your treatment chamber closes. The SCUBA divers will need to know that recompression therapy for DCS at your base is temporarily unavailable. Hopefully you will have an acceptable work-around by that time. While you can't control the divers, you can control the altitude chamber training risk. If you can't treat DCS appropriately and in a timely manner, you should not be conducting altitude chamber training. I realize that this is merely my opinion provided to the Line for their consideration and action - - however I think (and would recommend) that aircrew coming up on their 5-year refresher date simply be granted an extension for 6 - 8 months if your ability to treat DCS is compromised. If you are able to generate a workable DCS treatment plan, then altitude chamber training should continue.

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