GIG CYMRU NHS WALES
Cyd-bwyllgor Comisiynu
Joint Commissioning Committee

Hyperbaric Oxygen Therapy (all ages)

Commissioning Policy: CP07

Document Information	
Document Name	Hyperbaric Oxygen Therapy
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Target Audience	Chief Executives, Medical Directors, Directors of Finance, Chief Pharmacists and Directors of Nursing, NHSE National Clinical Lead HBOT CRG, Medical Director of DDRC, Plymouth, Chair of British Hyperbaric Association, NHSE Head of Trauma Programme of Care (POC), Medical Director of Wirral Hyperbaric Chamber, British Safety Group (BDSG), British Sub Aqua Club (BSAC), HM Coastguard.
Description	NHS Wales will routinely commission this specialised service in accordance with the criteria described in this policy
Document Update Information	Target Audience – added BDSG, BSAC ICD -10 codes – reflect the inclusion criteria Patient Pathway - aligns with NHSE Service Specification Glossary - added decompression illness and gas embolism Designated centres - Include all HBOT centres

Contents

Abbreviations

DAN	Divers Alert Network
HBOT	Hyperbaric Oxygen Therapy
IPFR	Individual Patient Funding Request
NWJCC	NHS Wales Joint Commissioning Committee

Policy Statement

NHS Wales Joint Commissioning Committee (NWJCC) will commission Hyperbaric Oxygen Therapy for decompression illness/ gas embolism (all ages) with in accordance with the criteria outlined in this document.

In creating this document NWJCC has reviewed this clinical condition and the options for its treatment. It has considered the place of this treatment in current clinical practice, whether scientific research has shown the treatment to be of benefit to patients, (including how any benefit is balanced against possible risks) and whether its use represents the best use of NHS resources.

Welsh Language

NWJCC is committed to treating the English and Welsh languages on the basis of equality, and endeavour to ensure commissioned services meet the requirements of the legislative framework for Welsh Language, including the Welsh Language (Wales) Measure 2011 and the Welsh Language Standards (No.7) Regulations 2018.

Where a service is provided in a private facility or in a hospital outside of Wales, the provisions of the Welsh language standards do not directly apply but in recognition of its importance to the patient experience, the referring health board should ensure that wherever possible patients have access to their preferred language.

In order to facilitate this, NWJCC is committed to working closely with providers to ensure that in the absence of a Welsh speaker, written information will be offered. Where possible, links to local teams should be maintained during the period of care.

Decarbonisation

NWJCC is committed to taking assertive action to reducing the carbon footprint through mindful commissioning activities. Where possible and taking into account each individual patient's needs, services are provided closer to home, including via digital and virtual access, with a delivery chain for service provision and associated capital that reflects the NWJCC commitment.

Disclaimer

NWJCC assumes that healthcare professionals will use their clinical judgement, knowledge and expertise when deciding whether it is appropriate to apply this policy.

This policy may not be clinically appropriate for use in all situations and does not override the responsibility of healthcare professionals to make decisions appropriate to the

circumstances of the individual patient, in consultation with the patient and/or their carer or guardian, or Local Authority.

NWJCC disclaims any responsibility for damages arising out of the use or non-use of this policy.

1. Introduction

This policy has been developed for the planning and delivery of hyperbaric oxygen therapy (HBOT) for people registered with a general practice in Wales. This service will only be commissioned by the NHS Wales Joint Commissioning Committee (NWJCC) and applies to all seven Health Boards in Wales and external providers within NHS England.

1.1 Plain Language Summary

Hyperbaric oxygen therapy (HBOT) is breathing 100% oxygen while under increased atmospheric pressure. When a patient is given 100% oxygen under pressure, haemoglobin is saturated, but the blood can be hyper-oxygenated by dissolving oxygen within the plasma. This takes place within a treatment chamber at a pressure typically of at least 2.0 ATA (atmosphere absolute) with 2.8 ATA commonly used in most recompression protocols for DCI and iatrogenic gas embolism.

It is most commonly known for treatment of dive injuries when divers have come to the surface of the water too quickly.

1.2 Aims and Objectives

This policy aims to define the commissioning position of NWJCC on HBOT as part of the treatment pathway for people of all ages undergoing treatment for decompression illness and gas embolism.

The objectives of this policy are to:

- ensure commissioning for the use of HBOT is evidence based
- ensure equitable access to HBOT
- define criteria for people with decompression illness and gas embolism
- improve outcomes for people with decompression illness and gas embolism

1.3 Epidemiology

Decompression illness

Decompression illness (DCI) results from exposure to a changing pressure environment, most commonly during or after diving. The geographic distribution of DCI reflects local diving activity and is therefore concentrated in coastal regions, around inland dive sites, and near divers' home locations. Airports account for a significant minority of presentations, typically in divers returning from overseas trips. In England, approximately 250 cases are reported each year, with around 2–3 cases per year in Wales. Service demand also shows clear seasonal variation in line with diving activity[1].

[1] Hyperbaric-oxygen-therapy-services-all-ages-Service-specification-January-2025.pdf

Gas embolism
Iatrogenic gas embolism occurs when gas is inadvertently introduced into a patient's circulation during medical care. It is most commonly associated with invasive procedures (for example vascular access, surgery, haemodialysis, or positive-pressure ventilation). Gas embolism may also occur in divers as a consequence of pulmonary barotrauma. In England, around 10 cases are treated each year with hyperbaric oxygen therapy (HBOT), although the true incidence is likely to be higher due to under-recognition and under-reporting[2].

1.4 Current Treatment

Management of DCI and Gas Embolism (including Iatrogenic Gas Embolism)
If a patient develops decompression illness (DCI) or gas embolism—including iatrogenic gas embolism (inadvertent intravascular gas during medical care)—definitive treatment is urgent assessment for recompression with hyperbaric oxygen therapy (HBOT) in a hyperbaric chamber. HBOT increases ambient pressure and oxygen partial pressure, reduces bubble volume, improves tissue oxygenation, and promotes safe inert-gas elimination.

- **Time to treatment:** treatment should begin as soon as possible; once HBOT is indicated, it should be initiated urgently after specialist assessment.
- **Treatment duration:** the initial HBOT session is commonly around 5 hours, but longer and/or repeat treatments may be required depending on severity and clinical response.

HBOT is generally well tolerated. Most adverse effects are mild and reversible (for example ear/sinus barotrauma or transient visual change), but serious complications can occur, including oxygen-toxicity seizures and pulmonary complications.

- Table 1 provides a summary of risks.

Table 1: Summary of risks	
General	Claustrophobia, Reversible myopia, Fatigue, Headache, Vomiting
Oxygen Toxicity	Convulsions, Psychological, Lung, Pulmonary oedema, haemorrhage, pulmonary toxicity, Respiratory failure
Barotrauma	Ear damage, Sinus damage, Ruptured middle ear, Lung damage

1.5 What NHS Wales has decided

NWJCC has carefully reviewed the evidence of Hyperbaric Oxygen Therapy for decompression illness/gas embolism to access treatment. We have concluded that there is enough evidence to fund the use of treatment, within the criteria set out in section 2.1.

[2] Hyperbaric-oxygen-therapy-services-all-ages-Service-specification-January-2025.pdf

1.6 Relationship with other documents

This document should be read in conjunction with the following documents:

- **NHS Wales**
  - All Wales Policy: Making Decisions in Individual Patient Funding requests (IPFR).

- **Relevant NHS England policies**
  - NHS England Specialised Services clinical commissioning policy: HBOT for Decompression Sickness and Gas Embolism
  - NHS England Commissioning Specialised commissioning Updated Service Specification Hyperbaric oxygen therapy services all ages Service specification January 2025
  - NHS England Specialised Service clinical commissioning policy:
  - HBOT for Necrotising Soft Tissue Infections
  - NHS England Specialised Service clinical commissioning policy:
  - HBOT for Carbon Monoxide Poisoning
  - NHS England Specialised Services clinical commissioning policy: HBOT for Soft Tissue Radiation Damage in patients with a history of Pelvic Irradiation

2. Criteria for Commissioning

The NHS Wales Joint Commissioning Committee approve funding of HBOT for all ages for the emergency indications as set out in section 2.1.1 and the elective indications as set out in section 2.1.2 in line with the criteria identified in this policy.

2.1 Inclusion Criteria

2.1.1 Decompression Illness

Patients satisfying all of the following criteria are eligible for hyperbaric oxygen therapy:

- a history of decompression, with or without an inert gas burden, within the 72 hours prior to onset of symptoms or signs
- all reasonable efforts commensurate with the urgency of the situation have been taken to exclude causes other than bubble-mediated disease.

and

A history of one or more of the following persisting at the time of assessment:

- limb pain
- pain presenting in a thoracolumbar dermatomal distribution (girdle pain)
- subjective or objective neurological deficit
- audiovestibular symptoms or signs
- cardio-pulmonary symptoms or signs
- cutaneous symptoms or signs (pruritis, rash, discoloration)
- lymphatic symptoms or signs (painful or swollen lymph nodes, regional oedema)
- constitutional symptoms or signs (such as headache, fatigue, malaise, nausea, vomiting and anorexia) severe enough to affect quality of life or function

or

- omitted more than 20 minutes of planned decompression (not including safety stops) and remain asymptomatic and can present at a hyperbaric facility within 60 minutes of the decompression insult.

or

- a history clearly consistent with arterial gas embolism, are now asymptomatic with no abnormal neurological signs, and for whom there is no other obvious cause, if they can present at a hyperbaric facility within 6 hours of the decompression insult.

2.1.2 Gas embolism

Patients satisfying all of the following criteria are eligible for hyperbaric oxygen therapy:

- a history of an event which could plausibly have introduced gas into a blood vessel

- all reasonable efforts commensurate with the urgency of the situation have been taken to exclude causes other than bubble-mediated disease.

A history of one or more of the following persisting at the time of assessment:

- Subjective or objective Neurological deficit
- Cardio-pulmonary symptoms or signs

or

A history clearly consistent with arterial gas embolism, are now asymptomatic with no abnormal neurological signs, and for whom there is no other obvious cause, if they can present at a hyperbaric facility within 6 hours of the decompression insult.

2.2 Exclusion Criteria

2.2.1 Emergency Indications

A patient is not eligible for hyperbaric oxygen therapy if:

- a reason other than bubble-mediated disease for the signs or symptoms is identified
- Untreated pneumothorax poses a high risk of sudden, life-threatening deterioration during HBOT, so it must be treated before HBO therapy is commenced.

and

In line with the NHS England, HBOT is **Not routinely commissioned for other indications including (but not limited to)**:

- Hyperbaric oxygen therapy for malignant otitis externa (all ages)
- Hyperbaric oxygen therapy for necrotising soft tissue infections (adults)
- Hyperbaric oxygen therapy for soft tissue radiation damage in patients with a history of pelvic irradiation for malignant disease (all ages)
- Hyperbaric oxygen therapy for carbon monoxide poisoning (all ages)
- Hyperbaric oxygen therapy for diabetic lower limb ulceration (diabetic foot ulcer) (all ages)

2.3 Continuation of Treatment

Healthcare professionals are expected to review a patient's health at regular intervals to ensure they are demonstrating an improvement to their health due to the treatment being given.

If no improvement to a patient's health has been recorded then clinical judgement on the continuation of treatment must be made by the treating healthcare professional.

2.4 Acceptance Criteria

The service outlined in this policy is for patients ordinarily resident in Wales, or otherwise the commissioning responsibility of the NHS in Wales. This excludes patients who whilst resident in Wales, are registered with a GP Practice in England, but includes patients resident in England who are registered with a GP Practice in Wales.

2.5 Transition Arrangements

Transition arrangements should be in line with Transition from children's to adults' services for young people using health or social care services, NICE guidance NG43 and the Welsh Government Transition and Handover Guidance

Transition involves a process of preparation for young people and their families for their transition to adulthood and their transition to adult services. This preparation should start from early adolescence 12-13 year olds. The exact timing of this will ideally be dependent on the wishes of the young person but will need to comply with local resources and arrangements.

The transition process should be a flexible and collaborative process involving the young person and their family as appropriate and the service.

The manner in which this process is managed will vary on an individual case basis with multidisciplinary input often required and patient and family choice taken into account together with individual health board and environmental circumstances factored in.

For the specialised paediatric services it commissions, the NWJCC will routinely commission treatment up until a patient is 16 years old. The NWJCC does not commission specialised paediatric services for patients aged 18 years and older. For patients aged 16 or 17 years of age, the NWJCC will continue to commission ongoing specialised treatment initiated before the patient's 16th birthday and under the ongoing care of a specialised paediatric team.

2.6 Patient Pathway (Annex i)

See Annex i for patient pathway details.

2.7 Designated Centre

The primary providers of emergency HBOT commissioned for NHS Wales patients are DDRC Healthcare, Plymouth and North West Emergency Recompression Unit, Birkenhead.

If a patient presents with symptoms outside the geographical area of these two centres, they should be transferred to the nearest appropriate facility based on the location of the incident or their point of presentation.[3]

DDRC Healthcare, The Hyperbaric Medical Centre
Plymouth Science Park
Research Way
Plymouth Science Park
Plymouth
Devon
PL6 8BU
01752 209999
0783 115 1523 (emergencies)
info@ddrc.org
Visit website

Wirral
Hyperbaric Treatment & Training
2 East Street
Birkenhead
CH41 1BY
0151 648 8000
0151 648 8000 (emergencies)
Visit website

2.8 Exceptions

If the patient does not meet the criteria for treatment as outlined in this policy, an Individual Patient Funding Request (IPFR) can be submitted for consideration in line with the All Wales Policy: Making Decisions on Individual Patient Funding Requests. The request will then be considered by the All Wales IPFR Panel.

If the patient wishes to be referred to a provider outside of the agreed pathway, an IPFR should be submitted.

Further information on making IPFR requests can be found at: Individual Patient Funding Requests

[3] Facilities - British Hyperbaric Association

2.9 Clinical Outcome and Quality Measures

The Provider must work to written quality standards and provide monitoring information to the lead commissioner.

The centre must enable the patient's, carer's and advocate's informed participation and to be able to demonstrate this. Provision should be made for patients with communication difficulties and for children, teenagers and young adults.

Good practice guidelines set out optimal time to treatment from symptom onset as within 6 hours. Timely access to appropriate treatment is particularly important for patients with gas embolism, most of whom will be acutely unwell and require access to ICU care.[4]

Services providing HBOT must comply with the following:

- Registered with the Care Quality Commission (CQC),
- Appraised by the British Hyperbaric Association (BHA) every 5 years or appraised to these standards by an appropriate alternative organisation as agreed by the commissioner.
- Commissioned providers are required to participate in annual quality assurance, collect and submit data to support the assessment of compliance with the NHS England Service Specification (Schedule 4A-C)[5]

The HBOT providers must take account of the following professional guidance and technical standards where applicable:[6]

Technical guidance and facilities standards:

- Fire safety guidelines for multiplace hyperbaric treatment facilities. The British Hyperbaric Association. 2018
- Guide to electrical safety standards for hyperbaric treatment centres. The British Hyperbaric Association. 1996
- Health and safety for therapeutic hyperbaric facilities: a code of practice. The British Hyperbaric Association. 2000
- BS EN 14931. Pressure vessels for human occupancy (PVHO). Multi-place pressure chambers for hyperbaric therapy. Performance, safety requirements and testing. 2008
- BS EN 16081. Hyperbaric chambers. Specific requirements for fire extinguishing systems. Performance, installation, and testing. 2013
- A code of good working practice for the operation and staffing of hyperbaric chambers for therapeutic purposes. The Faculty of Occupational Medicine. (The Cox Report) 1994

[4] NHS England » Reviewing Hyperbaric Oxygen Services: Consultation Guide
[5] Hyperbaric-oxygen-therapy-services-all-ages-Service-specification-January-2025.pdf
[6] Hyperbaric-oxygen-therapy-services-all-ages-Service-specification-January-2025.pdf

- Recommendations for standards of monitoring during anaesthesia and recovery 2021. Association of Anaesthetists. 2021

Workforce and training standards:

- Educational and training standards for physicians in diving and hyperbaric medicine. Joint Educational Subcommittee of the European Committee for Hyperbaric Medicine (ECHM) and the European Diving Technical Committee (EDTC). 2011
- The training and education of hyperbaric unit personnel. The British Hyperbaric Association. 1999
- Education of nurses, operators, and technicians in hyperbaric facilities in Europe: EBAss/ECHM resources manual. European Baromedical Association for Nurses, Operators and Technicians (EBAss) and European Committee for Hyperbaric Medicine (ECHM). 2008
- A European code of good practice for hyperbaric oxygen therapy: Review 2022. European Cooperation in Science and Technology Working (COST) Group B14 (Hyperbaric Oxygen Therapy). 2022

Service standards:

- Essential standards of quality and safety, Care Quality Commission.
- Adult critical care service specification (when applicable)

2.10 Responsibilities

Referrers should:

- inform the patient and/or their parent or guardian that this treatment is not routinely funded outside the criteria in this policy, and
- refer via the agreed pathway.

Clinicians considering treatment should:

- discuss all alternative treatments with the patient and/or their parent or guardian;
- advise the patient and/or their parent or guardian of any side effects and risks of the potential treatment
- inform the patient and/or their parent or guardian that treatment is not routinely funded outside of the criteria in the policy, and
- confirm that there is contractual agreement with NWJCC for the treatment.

In all other circumstances an IPFR must be submitted.

3. Evidence

NWJCC is committed to regularly reviewing and updating all of its commissioning policies based upon the best available evidence of both clinical and cost effectiveness.

3.1 References

- 'Recommendations for standards of monitoring during anaesthesia and recovery 2021'.
- Fire safety guidelines for multiplace hyperbaric treatment facilities. The British Hyperbaric Association. 2018
- Guide to electrical safety standards for hyperbaric treatment centres. The British Hyperbaric Association. 1996
- Health and safety for therapeutic hyperbaric facilities: a code of practice. The British Hyperbaric Association. 2000
- BS EN 14931. Pressure vessels for human occupancy (PVHO). Multi-place pressure chambers for hyperbaric therapy. Performance, safety requirements and testing. 2008
- BS EN 16081. Hyperbaric chambers. Specific requirements for fire extinguishing systems. Performance, installation, and testing. 2013
- A code of good working practice for the operation and staffing of hyperbaric chambers for therapeutic purposes. The Faculty of Occupational Medicine. (The Cox Report) 1994
- Recommendations for standards of monitoring during anaesthesia and recovery 2021. Association of Anaesthetists. 2021
- Educational and training standards for physicians in diving and hyperbaric medicine. Joint Educational Subcommittee of the European Committee for Hyperbaric Medicine (ECHM) and the European Diving Technical Committee (EDTC). 2011
- The training and education of hyperbaric unit personnel. The British Hyperbaric Association. 1999
- Education of nurses, operators, and technicians in hyperbaric facilities in Europe: EBAss/ECHM resources manual. European Baromedical Association for Nurses, Operators and Technicians (EBAss) and European Committee for Hyperbaric Medicine (ECHM). 2008
- A European code of good practice for hyperbaric oxygen therapy: Review 2022. European Cooperation in Science and Technology Working (COST) Group B14 (Hyperbaric Oxygen Therapy). 2022
- Essential standards of quality and safety, Care Quality Commission.
- Adult critical care service specification (when applicable)
- Diving - HSE
- Home - Undersea & Hyperbaric Medical Society
- http://www.echm.org/

3.2 Date of Review

This document is scheduled for review every three years, unless information is received which indicates that the policy requires revision.

If an update is carried out the policy will remain extant until the revised policy is published.

4. Equality Impact and Assessment

The Equality and Welsh Language Impact Assessment (EWLIA) process has been developed to help promote fair and equal treatment in the delivery of health services. It aims to enable NHS Wales Joint Commissioning Committee to identify and eliminate detrimental treatment caused by the adverse impact of health service policies upon groups and individuals for reasons of race, gender re-assignment, disability, sex, sexual orientation, age, religion and belief, marriage and civil partnership, pregnancy and maternity, socio-economic duty and language (Welsh).

This policy has been subjected to an EWLIA.

The assessment demonstrates the policy is robust and there is no potential for discrimination or adverse impact. All opportunities to promote equality have been taken.

5. Listening to People:

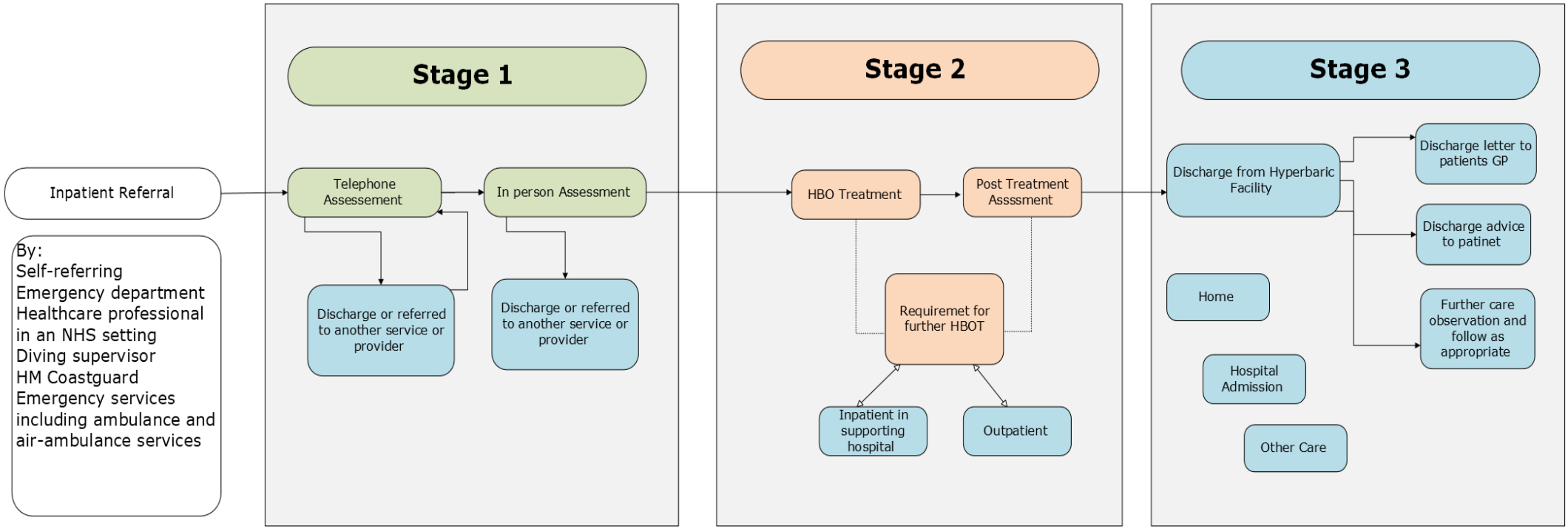
5.1 Complaints, Incidents and Redress Process

Whilst every effort has been made to ensure that decisions made under this policy are robust and appropriate for the patient group, it is acknowledged that there may be occasions when the patient or their representative are not happy with decisions made or the treatment provided.

The patient or their representative should be guided by the clinician, or the member of NHS staff with whom the concern is raised, to the appropriate arrangements for management of their concern.

If a patient or their representative is unhappy with the care provided during the treatment or the clinical decision to withdraw treatment provided under this policy, the patient and/or their representative should be guided to Listening to People, The NHS Wales Complaints, Incidents and Redress Process – People's Guidance 2026. For services provided outside NHS Wales the patient or their representative should be guided to the NHS Trust Concerns Procedure, with a copy of the concern being sent to NWJCC.

Annex i Patient Pathway



Annex ii Codes

The list of ICD codes is indicative and is not exhaustive. Additional codes may be used for contract monitoring purposes, furthermore some codes may cover indications not included within this policy.

Code Category	Code	Description
OPCS	X521	Hyperbaric therapy
ICD-10	T703	Caisson disease [decompression sickness]
ICD-10	T790	Air embolism (traumatic)
ICD-10	T800	Air embolism following infusion, transfusion and therapeutic injection

Annex iii Glossary

Individual Patient Funding Request (IPFR)
An IPFR is a request to NHS Wales Joint Commissioning Committee (NWJCC) to fund an intervention, device or treatment for patients that fall outside the range of services and treatments routinely provided across Wales.

Decompression Illness
Decompression illness (DCI) is the collective term for illness caused by a reduction in ambient pressure (usually after diving, compressed-air work, or altitude exposure), leading to gas bubbles in tissues and/or blood vessels. It includes decompression sickness (DCS) and arterial gas embolism (AGE), and can cause symptoms ranging from joint pain and rash to neurological deficits, breathing problems, shock, and death. (reference Mitchell SJ. Decompression illness: a comprehensive overview. Diving Hyperb Med. 2024;54(1Suppl):1-53. doi:10.28920/dhm54.1.suppl.1-53)

Iatrogenic Gas Embolism
Iatrogenic gas embolism is the unintended entry of gas into the venous or arterial circulation as a complication of medical care. It is most often associated with procedures such as haemodialysis, positive-pressure mechanical ventilation, vascular access, and certain surgical interventions. Intravascular gas can obstruct blood flow and cause tissue ischaemia, with clinical effects ranging from mild pain, dyspnoea, lethargy, or confusion to severe neurological injury, cardiovascular collapse, multi-organ failure, and death.

NHS Wales Joint Commissioning Committee (NWJCC)
NWJCC is a joint committee of the seven local health boards in Wales. The purpose of NWJCC is to ensure that the population of Wales has fair and equitable access to the full range of Tertiary Services. NWJCC ensures that services within our portfolio are commissioned from providers that have the appropriate experience and expertise. They ensure that these providers are able to provide a robust, high quality and sustainable services, which are safe for patients and are cost effective for NHS Wales.

Contact Us

If you have a question related to this document you can contact us using one of the methods outlined below.

If you would like this document in an alternative format and/or language, please contact us for assistance.

Email:

NWJCC consultation mailbox – NWJCC.Consultation@wales.nhs.uk

Telephone:

General Enquiries – 01443 433112

Website:

Contact us - NHS Wales Joint Commissioning Committee

Writing:

If you wish to contact the NHS Wales Joint Commissioning Committee, you can write to us at one of our locations below, we welcome correspondence in Welsh or English:

South Wales Office
Unit G1 The Willowford, Main Avenue, Treforest Industrial Estate, Pontypridd, CF37 5YL

North Wales Office
Unit 3, Media Point - Unit 3, Mold Business Park, Mold, CH7 1XY