

Midlands Diving Chamber Quality Report

St Cross Hospital Barby Road Rugby CV22 5PX Tel: 01788 579555 Website: www.midlandsdivingchamber.co.uk

Date of inspection visit: 13 to 14 December 2017 Date of publication: 14/02/2018

This report describes our judgement of the quality of care at this location. It is based on a combination of what we found when we inspected and a review of all information available to CQC including information given to us from patients, the public and other organisations

Ratings

Overall rating for this location	
Are services safe?	
Are services effective?	
Are services caring?	
Are services responsive?	
Are services well-led?	

Mental Health Act responsibilities and Mental Capacity Act and Deprivation of Liberty Safeguards

We include our assessment of the provider's compliance with the Mental Capacity Act and, where relevant, Mental Health Act in our overall inspection of the service.

We do not give a rating for Mental Capacity Act or Mental Health Act, however we do use our findings to determine the overall rating for the service.

Further information about findings in relation to the Mental Capacity Act and Mental Health Act can be found later in this report.

Overall summary

Midlands Diving Chamber (MDC) is operated by Midlands Diving Chamber Ltd. It is located in an independent unit within the grounds of St Cross Hospital, Rugby. The service does not have any beds. Facilities include a ten seat hyperbaric chamber, a reception area and offices. Emergency hyperbaric oxygen therapy was available 24 hours a day, 7 days a week, 365 days each year. MDC has a sister unit based in London, the London Diving Chamber. MDC is one of ten hyperbaric chambers across England.

The service provides a hyperbaric decompression chamber offering NHS funded recompression to divers with decompression sickness (DCS) together with other Hyperbaric Oxygen Therapy (HBOT) treatments.

Hyperbaric oxygen treatment involves breathing 100% oxygen at higher than atmospheric pressures in an enclosed chamber. At the time of our inspection, the service had a category two, ten-person, 'walk-in' hyperbaric chamber which was installed in 2009. There are four categories of hyperbaric oxygen chambers, a category two chamber is capable of receiving elective or emergency referrals for any accepted application of hyperbaric oxygen therapy but excluding patients who are critically ill at the time of referral or are considered likely to become so. Patients can spend between two to eight hours in the oxygen chamber depending on the treatment pathway.

The service treats mainly adults but can treat children in certain specific emergency situations and only if accompanied by a paediatric qualified clinician. The minimum age for scuba diving is ten years old.

The Midlands Diving Chamber is a recompression chamber offering consultation and hyperbaric oxygen therapy treatment for:

- Air or Gas Embolism
- Carbon Monoxide Poisoning
- Carbon Monoxide Poisoning Complicated By Cyanide Poisoning
- Clostridial Myositis and Myonecrosis (Gas Gangrene)

- Crush Injury, Compartment Syndrome and Other Acute Traumatic Ischemias
- Decompression Sickness
- Arterial Insufficiencies
- Enhancement of Healing In Selected Problem Wounds
- Severe Anaemia
- Intracranial Abscess
- Necrotizing Soft Tissue Infections
- Osteomyelitis (Refractory)
- Delayed Radiation Injury (Soft Tissue and Bony Necrosis)
- Compromised Grafts and Flaps
- Acute Thermal Burn Injury
- Idiopathic Sudden SensorineuralHearing Loss

We inspected this service using our comprehensive inspection methodology. We carried out the inspection on 13 and 14 December 2017.

To get to the heart of patients' experiences of care and treatment, we ask the same five questions of all services: are they safe, effective, caring, responsive to people's needs, and well-led? Where we have a legal duty to do so we rate services' performance against each key question as outstanding, good, requires improvement or inadequate.

Throughout the inspection, we took account of what people told us and how the provider understood and complied with the Mental Capacity Act 2005.

Services we do not rate

We regulate hyperbaric oxygen therapy services but we do not currently have a legal duty to **rate** them when they are provided as a single specialty service. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary.

We found the following areas of good practice:

- Policies and procedures were in place which kept staff and patients safe and free from harm.
- Staff followed recommended infection prevention and control procedures, patients were provided with appropriate clothing to wear whilst in the chamber.
- A thorough and detailed planned maintenance system was in place for the hyperbaric chamber, staff had specialist training in order to maintain the equipment was safe to use. All equipment used was checked and serviced regularly.
- Procedures were in place to follow in the event of an emergency. Staff read and signed to say they understood the procedures once every three months.
- Patient records we reviewed were accurate, complete, up to date and stored securely. Details of each therapy session were recorded in the patient record including improvements in condition or any adverse effects.
- Thorough risk assessments were carried out for each patient prior to treatment, staff worked to a set of exclusion criteria. Patients were constantly monitored throughout the therapy session.
- Each therapy was supported by a full hyperbaric team of four staff as recommended by the British Hyperbaric Association.
- Emergency scenarios were tested regularly so staff understood their roles in the event of an emergency.
- Treatments were based on evidence based care and policies based on best practice guidance.
- The service submitted information to the NHS England specialised services quality dashboard to enable benchmarking with other hyperbaric oxygen services.
- Staff were highly competent in the specialist service they delivered.
- Patients spoke very highly about the care and treatment they received at Midlands Diving Chamber and the thoughtful and considerate way they were treated by staff.

- Midlands diving chamber tailored services to meet the needs of individuals, appointments were flexible and emergency care could be delivered throughout the 24hour period.
- The buildings and oxygen chamber were wheelchair friendly and staff could cater for patients with communication difficulties.
- Leaders were competent to carry out their duties, staff respected and valued one another, strategic objectives were realistic and included improving care for patients and developing staff.
- Quality and performance was monitored and analysed for areas for improvement, changes were made as a result.
- Expertise in the specialist field of hyperbaric oxygen therapy was maintained by investing in staff training and development and being members of specialist societies and associations.

However, we also found the following issues that the service provider needs to improve:

- Include reference to female genital mutilation in safeguarding policies and raise staff awareness.
 Following our inspection an updated policy was submitted which included information about female genital mutilation.
- Review the storage of oxygen cylinders and safety signage. Following our inspection we received evidence that safety signage had been obtained and was clearly displayed.
- Develop a checklist for the resuscitation trolley based on the resuscitation council guidance.
 Following our inspection the provider submitted an updated checklist based on resuscitation council guidance.
- Implement cleaning schedule checklists for the chamber and chamber room. Following our inspection we saw evidence of an updated cleaning schedule checklist.
- Consider centralising information technology systems.
- Ensure HR policy reflects relevant employment regulations for future recruitment processes.

• Implement a risk register for the service.

Following this inspection, we told the provider of some improvements it should make, even though a regulation had not been breached, to help the service improve, Details are at the end of the report.

Name of signatory

Heidi Smoult

Deputy Chief Inspector of Hospitals (Central)

Our judgements about each of the main services

Service	Rating	Summary of each main service
Hyperbaric Therapy Services		We regulate this service but we do not currently have a legal duty to rate it. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary

Contents

Summary of this inspection	Page
Background to Midlands Diving Chamber	8
Our inspection team	8
Why we carried out this inspection	8
How we carried out this inspection	8
Information about Midlands Diving Chamber	8
What people who use the service say	9
The five questions we ask about services and what we found	10
Detailed findings from this inspection	
Mental Health Act responsibilities	13
Mental Capacity Act and Deprivation of Liberty Safeguards	13
Overview of ratings	13
Outstanding practice	26
Areas for improvement	26
Action we have told the provider to take	27



Location name here

Services we looked at Hyperbaric Therapy Services;

Background to Midlands Diving Chamber

Midlands Diving Chamber (MDC) is operated by Midlands Diving Chamber Ltd. The service opened in 2009. It is a privately owned service in Rugby. The service accepts NHS patients and self-funded patients from anywhere in the country. The service has had a registered manager in post since 2009.

Our inspection team

The team that inspected the service comprised a CQC inspection manager, a CQC inspector, a specialist advisor and was overseen by Carolyn Jenkinson, Head of Hospital Inspection.

Why we carried out this inspection

Start here...

How we carried out this inspection

Start here...

Information about Midlands Diving Chamber

The service is registered to provide the following regulated activities:

- Diagnostic and screening procedures
- Treatment of disease, disorder or injury
- Transport services, triage and medical advice provided remotely

During the inspection, we visited the service and inspected all clinical areas. We spoke with five staff including, medical staff, supervising chamber operator, chamber attendant and managers. We spoke with five patients, we also received ten 'tell us about your care' comment cards which patients had completed prior to our inspection. During our inspection, we reviewed four sets of patient records and four staff files.

There were no special reviews or investigations of the service ongoing by the CQC at any time during the 12

months before this inspection. The service has been inspected, and the most recent inspection took place in November 2012 under previous methodology, we found that the service was meeting all standards of quality and safety it was inspected against.

Activity (October 2016 to September 2017)

• In the reporting period October 2016 to September 2017 there were 62 patients treated at the Midlands Diving Chamber, 41 were unplanned/emergency patients and 21 elective (planned). Of the 62 patients, 41 patients were NHS patients and the rest self-funded. No children were treated during this period.

Staffing

• Staff employed by MDC comprised: one full time hyperbaric doctor, one full time supervising chamber

operator, one full time chamber attendant (also known as a tender), and one full time technical support staff. The service also employed a small team of bank staff comprised of two part time hyperbaric doctors, two part time supervising chamber operators and three part time chamber attendants.

Track record on safety (October 2016 to September 2017)

- No Never events
- No clinical incidents
- No serious injuries
- No incidences of healthcare acquired Meticillin-resistant Staphylococcus aureus (MRSA)
- No incidences of healthcare acquired Meticillin-sensitive staphylococcus aureus (MSSA)

- No incidences of healthcare acquired Clostridium difficile (c.diff)
- No incidences of hospital acquired E-Coli
- No complaints

Services accredited by a national body:

• The service was accredited by the British Hyperbaric Association

Services provided to Midlands Diving Chamber under service level agreement:

- Rental of the building
- General maintenance
- Fire Safety Equipment
- Infection prevention and control services
- Interpreting service
- Waste removal

What people who use the service say

Start here...

The five questions we ask about services and what we found

We always ask the following five questions of services.

Are services safe?

Services we do not rate

We do not currently have a legal duty to rate hyperbaric oxygen therapy services where these services are provided as an independent healthcare single speciality service.

Are services safe?

We found the following areas of good practice:

- Systems and processes were in place to keep patients and staff safe from avoidable harm.
- All areas and equipment were cleaned appropriately and good infection prevention measures were followed.
- The environment was suitable for the delivery of services provided and well equipped.
- Medicines were stored and managed safely.
- Staff had attended all mandatory training required for their role.
- Patients were risk assessed prior and during treatments and procedures were in place to deal with emergencies.
- Numbers of staff on duty during treatments followed recommended guidelines.

However, we also found the following issues that the service provider needs to improve:

- Safeguarding policies did not include reference to female genital mutilation.
- Oxygen hazard signs were not displayed in some areas where oxygen cylinders were stored.
- Daily, weekly and monthly cleaning logs were not completed.
- The resuscitation trolley did not have a checklist of equipment.

Are services effective?

We found the following areas of good practice:

- Care and treatment was based on evidence based best practice guidance.
- Patients told us pain relief was available and administered quickly if required.
- There was a good range of food and drinks available throughout treatments and for waiting relatives and carers.
- The service submitted information to the NHS specialised services quality dashboard including data on patient outcomes.

- Staff were expert in the field of hyperbaric medicine.
- Multidisciplinary working was evident both within the service and with other healthcare professionals.
- Staff had access to the information they needed to work effectively.
- Consent was obtained prior to any care and treatments carried out and staff were aware of the Mental Capacity Act.

However, we also found the following issues that the service provider needs to improve:

• Information technology systems were not centralised which meant in the event of a technology failure staff may not be able to access some information.

Are services caring?

We found the following areas of good practice:

- Care was delivered in a compassionate way; patient privacy and dignity were respected at all times.
- Patients spoke very highly of the care and attention they received at the centre.
- Adequate information was given to patients to allow them to make informed choices about their care and this included carers and relatives when appropriate.
- Patients were given time to understand the information and opportunity to ask questions for clarification.
- Patients were unanimous in their praise for the service.

Are services responsive?

We found the following areas of good practice:

- Services were planned to meet the individual needs of the patients and the diving community.
- Care was individualised as much as possible; patients gave us examples of where staff had addressed their individual requirements.
- The service was easy to access, patients told us that response to queries and referrals were timely.
- Emergency out of hours teams could be mobilised quickly.
- Appointments were easy to make, easy to change and flexible to suit the needs and lifestyle of patients.
- Care could be individualised to meet patients' needs, there was wheelchair access to all areas.
- Comprehensive complaints procedures were in place and staff understood how to manage patient complaints.

Are services well-led?

Are services well-led?

We found the following areas of good practice:

- Leaders were visible and good management processes were in place to support and develop staff.
- Staff achieved good job satisfaction, told us they could raise issues or concerns without hesitation and felt valued and respected.
- Strategic objectives were realistic and in line with the vision statement of the service.
- Satisfactory governance processes were in place, there was a good understanding of sharing best practice and monitoring for quality. Staff attended national and international events for hyperbaric services.
- Risk management and awareness was evident and managers were aware of the risks relevant to the service.
- Processes were in place for staff and patients to contribute to the development of the service and we saw evidence of where this feedback had resulted in changes.
- The service was accredited by the British Hyperbaric Association.

However, we also found the following issues that the service provider needs to improve:

- Some HR policies needed updating to include the most recent employment regulations for future staff recruitment.
- Improve the recording and monitoring of risks.

Detailed findings from this inspection

Mental Health Act responsibilities

Start here...

Mental Capacity Act and Deprivation of Liberty Safeguards

Start here...

Overview of ratings

Our ratings for this location are:

	Safe	Effective	Caring	Responsive	Well-led	Overall
Hyperbaric Therapy Services	N/A	N/A	N/A	N/A	N/A	N/A
Overall	N/A	N/A	N/A	N/A	N/A	N/A

Notes

Safe	
Effective	
Caring	
Responsive	
Well-led	

Are hyperbaric therapy services safe?

We regulate this service but we do not currently have a legal duty to rate it. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary.

Incidents

- Systems were in place to report incidents and staff were aware of the process and the duty of candour. Safety alerts were received from other organisations and action taken if relevant.
- The service had a policy in place which described the actions staff should take following identification of an incident and included reporting processes to the Care Quality Commission. The policy was dated October 2016 and due for review October 2019.
- Duty of candour and whistle blowing policies were also in place and in date. The duty of candour is a regulatory duty that relates to openness and transparency and requires providers of health and social care services to notify patients (or other relevant persons) of certain notifiable safety incidents and provide reasonable support to that person.
- Staff we spoke with described the process they would follow to report an incident with reference to the incident notification policy and gave a good description of the duty of candour. Staff said they felt able to raise concerns with other members of the team and would escalate the concerns to senior managers if necessary.
- There were no serious or other incidents in the reporting period so we were unable to comment on actions following investigation and shared learning.

• Medicines and Healthcare products Regulatory Agency (MHRA) safety alerts were received by the service and shared with staff although staff told us they were rarely relevant to the equipment used and treatments delivered.

Cleanliness, infection control and hygiene

- All areas we inspected were visibly clean. There was a lead for infection prevention and control (IPC) and staff practised good hygiene procedures.
- Cleaning services for the premises was provided through a service level agreement from the local hospital cleaning team, however due to the specialist equipment the chamber and chamber room were cleaned by Midlands Diving Chamber (MDC) staff. Although cleaning regimes were part of the overall chamber checklists, daily, weekly and monthly log sheets were not used to confirm that cleaning had taken place.
- After each use the chamber and equipment used within it was cleaned with recommended antibacterial, antiseptic wipes.
- Colour coded mops were used for designated areas which reduced the risk of cross contamination from one area to another.
- There was a designated Infection Prevention and Control (IPC) lead supported by the local hospital IPC lead who visited annually and carried out an IPC audit.
- We saw the latest IPC audit report dated October 2017. The report gave a compliance score of 92% and identified some dusty areas at high levels and dusty hand gel dispensers in the toilet, kitchen, changing room and chamber room. At our inspection we found all these areas to be clean and dust free.
- Patients were screened for infectious diseases as part of the pre-treatment assessment. Patients who were

tested positive for Meticillin-resistant Staphylococcus aureus (MRSA) were treated separately from other patients. There were no incidences of healthcare acquired infection in the reporting period.

- Water systems were drained and refilled every six months and samples taken for legionella testing including the sprinkler system in the chamber. We saw the report and certificate for legionella testing dated October 2017 which assured us there was no risk of legionella to patients or staff. Legionella is a waterborne bacterium, which causes legionnaires disease.
- The service followed the five steps to effective hand hygiene, hand hygiene practises of all staff had been audited within the past six months all resulting in 100% compliance. Posters were displayed to remind staff and patients about correct hand washing technique.
- Staff followed National Institute for Health and Care Excellence (NICE) guidance and adhered to the practice of bare below the elbows at all times whilst carrying out clinical duties.
- Patients were provided with scrubs to wear whilst in the chamber, these were sent for laundering at the end of each day. Scrubs are protective garments designed to be worn by doctors and nurses usually comprising of a shirt and trousers.
- Clinical and domestic waste was segregated; clinical waste was tagged and recorded before being disposed of in the external locked disposal bin. There was one sharps bin which was assembled correctly and dated at the time of assembly.

Environment and equipment

- The environment and equipment were suitable for the delivery of hyperbaric oxygen therapy. The building and chamber were accessible to wheelchair users. All safety checks were carried out according to manufacturer's recommendations and British standard safety checks.
- The chamber, machinery components and gas storage were located in an area which was firewalled form the rest of the building. A firewall is a wall or partition designed to inhibit or prevent the spread of fire.
- A planned maintenance system was in place with a calibration register and written scheme of examination. The maintenance schedule was also displayed in the chamber room giving details of all routine checks, when they were last carried out and when they were next due. Staff also had access to a folder containing detailed

instructions for each safety check according to manufacturer's guidance. This ensured that the specialist equipment including the compressor was tested regularly and adjustments made if necessary to maintain optimum performance and was in line with BS EN 14931:2006 (Pressure vessels for human occupancy performance safety requirements and testing).

- Air quality testing within the chamber was conducted every three months. We saw the written procedure and the log of tests which showed that tests had taken place within the last three months including replacement of the air filter.
- The chamber technician had the competencies to carry out repairs as soon as faults in equipment were recognised. A range of spare parts for the chamber were kept in stock. In the event that the fault was complicated, advice was available by phone from the equipment manufacturers or site visits arranged to review the fault, these usually took place within 48 hours.
- We examined the insurance documents and chamber certificates and found them to be in date and appropriate to the service provided.
- Gas cylinders were supplied as required and by British oxygen cylinders we saw the gas cylinder log. The receipt of new cylinders and return of empty cylinders were recorded in the log.
- Only equipment that was suitable for use under pressure was taken into the chamber.
- We inspected the resuscitation trolley and found that equipment was appropriate for staff to be able to provide basic life support and urgent response to anaphylactic shock. Anaphylactic shock is a severe and life threatening allergic reaction. All the equipment was within its expiry date however the trolley was not a standard resuscitation trolley as recommended by the resuscitation council and did not have the recommended checklists.
- Other clinical equipment was available such as a spirometer (apparatus for measuring the volume of air inspired and expired by the lungs), capnography equipment (Capnography is the monitoring of the concentration or partial pressure of carbon dioxide in the respiratory gases), urinary catheters and intra venous infusion sets.
- Fire safety equipment was checked and maintained under a service level agreement with the local hospital. All fire extinguishers had been checked within the last 12

months. Fire extinguishing systems in the chamber were in line with BS EN 16081:2011- specific requirements for fire extinguishing systems in hyperbaric chambers. The sprinkler system in the hyperbaric chamber was included in the planned maintenance schedule.

- A comprehensive set of emergency operating procedures were in place which staff signed every three months to confirm they had read, understood and would put into practice when required.
- We observed two patients receiving treatment in the chamber, the chamber operator and chamber attendant monitored constantly conditions in the chamber and the condition of the patients. This was done by technical monitoring devices, CCTV, intercom and observation.
- All control of substances hazardous to health (COSHH) products were kept in a locked cupboard in a locked room not accessible to patients. We saw completed risk assessment for all COSHH products which meant that products were handled safely. COSHH Regulations 2002, state general requirements on employers to protect employees and other persons from hazardous substances used at work by risk assessment, control of exposure, health surveillance and incident planning.
- We reviewed the log for equipment testing and saw that all appliances had been tested within the past 12 months which meant all equipment had been checked for safe use. This included medical equipment such as the defibrillator and the spirometer.
- Due to the increased risk of ignition in the chamber certain items were prohibited from being taken in during treatments, there was a list of prohibited items clearly displayed in the changing room and patients were also given instructions about what could, and could not be taken into the chamber. For example sanitising hand gel containing alcohol was prohibited. Patients were provided with scrubs to wear whilst in the chamber. This meant that the risk of any items being taken in to the chamber that were prohibited was reduced. Scrubs are protective garments designed to be worn by doctors and nurses usually comprising of a shirt and trousers.
- There was a designated area located in a nearby field which could be used as a helicopter landing pad, ambulance transport was still required to transfer the patient from the helicopter to the diving chamber.

Medicines

- A management and administration of medicines policy was in place which was due for review November 2019. The policy was comprehensive and covered the safe management of medicines including audit and the management of medicines errors.
- A designated member of staff was responsible for the safe and secure handling of medicines and a service level agreement was in place with the onsite hospital pharmacy department for the provision of medicines and pharmacy advice.
- There were no controlled drugs stored or administered on the premises.
- The hyperbaric doctor was the only person who administered medicines.
- An additional policy covered patient self-administration of medicines which meant that only patients who were fit and able took responsibility for their own medication throughout treatment. Patients were asked if they were taking any regular medication as part of their pre-treatment assessment.
- Medicines were stored in a locked cabinet; the key to the cabinet was kept in a key safe, only staff with permission to handle medicines had access to the medicines cabinet key. We checked all the medicines in the cabinet and all were within their expiry date.
- The resuscitation trolley had appropriate emergency medicines including medicine for anaphylactic shock.
- All medical gases were within their expiry date and had the relevant certificates of conformity – a certificate stating the specified quality of the gas. Some areas where gas cylinders were stored did not have oxygen hazard signs.
- Of the five patients we spoke with all said they had been asked if they were allergic to anything and we saw allergies recorded in patients' notes.

Records

- We reviewed four sets of patient records during our inspection and found that they were all accurate, complete, legible, up to date and stored securely.
- Patient records included a detailed treatment plan which took account of the relevant Royal Navy table. These tables describe a planned sequence of events in chronological order for hyperbaric pressure exposures specifying the pressure profile over time and the breathing gas to be used during specified periods for medical treatment.

• A discharge summary letter was provided to the patient's GP, with the patient's consent, which included history, clinical measurements, diagnosis, treatment and outcomes. Information was not routinely shared with the hospital unless the patient was transferred to the hospital.

Safeguarding

- The manager was the designated lead for children and adults safeguarding. Three members of staff had been trained to adult and children safeguarding level three and one member of staff had been trained to level two. Level four safeguarding advice was available from the local authority safeguarding team. A paediatric qualified clinician accompanied all children during their treatment.
- We reviewed the safeguarding policies which contained contact numbers for local authority safeguarding teams, staff were aware of the policy and described the process they would follow if they had a safeguarding concern. The policy did not contain any information about female genital mutilation (FGM), we raised this with the managers and they planned to revise the policy to include FGM and also arrange staff awareness training.
- All staff had up to date disclosure and barring service checks in place. The Disclosure and Barring Service (DBS) helps employers make safer recruitment decisions and prevent unsuitable people from working with vulnerable groups, including children.

Mandatory training

- We reviewed staff training records and staff personal files and saw that all staff had received training in safety systems, processes and practice.
- A comprehensive mandatory training programme was in place. Staff attended annual refresher sessions apart from first aid (every three years) and DMT Diver Medic Course (every two years). We saw from the information provided that all staff were up to date with the MDC, 19 mandatory training topics, these included; basic life support, infection control, mental capacity act and safeguarding.

Assessing and responding to patient risk

• Systems were in place to assess patients as suitable for category two hyperbaric oxygen therapies and to monitor their condition during treatment.

- Patients were admitted to the service according to a set of referral exclusion criteria. Patients who were likely to require advanced life support systems were not accepted for treatment. Some other groups of patients were not accepted for treatment such as those with a head injury, recent coronary failure and patients suffering from mental ill health or learning disabilities. This meant that only patients who could be safely treated in the hyperbaric oxygen chamber were admitted for treatment.
- Patients had a full medical assessment and examination prior to treatment this included assessment of social history, mental health, anxiety and claustrophobia. In the four sets of patient records we reviewed we saw that vital signs, allergies and consent had been recorded. Details of the treatment plan and advice had been given about possible complications and after care and the hyperbaric doctor had signed the notes.
- Patients' vital signs were taken and recorded prior to each treatment. Due to the pressure in the chamber the usual equipment for taking vital signs was ineffective. The chamber attendant and the hyperbaric doctor constantly monitored patients during treatment by visual observation and asking the patient how they felt. If there were any concerns about the patient the hyperbaric doctor would quickly enter the chamber through the pressurised access hatch.
- We observed a treatment taking place. Constant visual and verbal communication was possible via internal CCTV, observation windows and intercom.
- The hyperbaric doctor told us that if they had any concerns about the condition of a patient treatment would be delayed if possible until the concerns were resolved. However this situation rarely occurred.
- Emergency operating procedures were in place for the management of oxygen toxicity which can occur if oxygen is breathed at a high pressure for long periods.
- Referral back to emergency departments was unusual but on the rare occasion this had taken place the hyperbaric doctor accompanied the patient in the ambulance. In the reporting period there were no unplanned transfers of patients to another health care provider.
- There was no formal agreement in place for how patient care would be managed between two organisations,

however due to the low patient numbers personalised care included direct consultation between the hospital and hyperbaric doctor and attending the patient to hospital for a handover with hospital staff.

- Following treatment in the chamber patients were assessed again by the hyperbaric doctor who noted changes and improvements in the patient record.
- Patient ability to drive was assessed on an individual basis. Some patients did not feel well enough to drive but others on a therapeutic course of treatment were well enough to drive. All patients had their visual acuity checked after each treatment and we observed this taking place during our inspection.
- MDC had procedures in place for emergency operating procedures the document was dated March 2016 with a review date of March 2019. These included clinical patient related emergencies and emergencies due to the loss of vital services such as power, communications and pressure.

Staffing

- Staffing and skill mix was planned to ensure patients received safe care and treatment at all times, the rota was planned to enable staff to have a good work life balance and staff were able to request time off for holidays and social events.
- The provider did not employ nursing staff. Staff employed by MDC comprised: one full time hyperbaric doctor, one full time supervising chamber operator, one full time chamber attendant (also known as a tender), and one full time technical support staff. The service also employed a small team of bank staff comprised of two part time hyperbaric doctors, two part time supervising chamber operators and three part time chamber attendants. All staff were experienced divers.
- At the time of the inspection there was a vacancy for a full time chamber attendant however the vacancy was being covered by bank staff. In the 12 month period before the inspection no staff had left the service.
- The bank staff regularly worked at the chamber to cover training, holidays and sickness absence. In the 12 months prior to the inspection the service had used bank staff to cover the following shifts: hyperbaric doctor 17 shifts, supervising chamber operator 6 shifts and chamber attendant 14 shifts. The service did not use agency staff.
- There was no sickness absence reported in the 12 month period before the inspection.

- Sickness absence, staff turnover, use of bank staff and vacancy rates for this service indicate a stable workforce with good employment practices in place.
- Staffing levels were planned according to European Baromedical Association and British Hyperbaric Association recommendations which are four staff on duty for each hyperbaric session. We reviewed the decompression illness (DCI) log between October 2017 and December 2017 and saw that for each hyperbaric oxygen therapy session there was one hyperbaric doctor, two supervising chamber operators and one chamber attendant.
- Staff told us that a short briefing meeting took place at the beginning of each day this included details of patients undergoing treatment, allocation of roles on the day and any other information of note such as changes to equipment or processes.
- As there was only one shift staff handovers were rarely necessary. However staff told us that in the event of extended operating hours to cover unprecedented demand briefing and debriefing would take place at shift handover if necessary.
- Staff were on call unless they indicated they were unable to be on call due to holidays, planned absence or social functions. As most referrals to the service were classed as unplanned or emergency and occurred outside the normal working period of 9am – 5pm staff were used to working flexible hours, lived locally and a team could be gathered to great the patient on their arrival at the centre.
- The service employed one full time hyperbaric doctor and two part time hyperbaric doctors. A hyperbaric doctor was present at all times during hyperbaric treatments as recommended by the European Baromedical Association and the British Hyperbaric Association (BHA).
- The hyperbaric doctor was an expert in hyperbaric oxygen therapy but if they required support and advice had access to their peer group at the BHA and a specialist in the Royal Navy.

Emergency awareness and training

- The service had plans and procedures in place to keep people safe in the event of an emergency or major incident.
- We saw evidence that staff had attended practice exercises for emergency scenarios. In May 2017 staff

practised the evacuation of an unconscious patient from the hyperbaric oxygen chamber. Learning was identified from the exercise and staff told us they had revised the manual handling procedure following the exercise.

- Staff at MDC were aware of and had access to a copy of the local health service providers' major incident plan; however managers told us they were not included in the communication chain. MDC also had a business continuity and major incident plan of their own dated November 2017 which clearly outlined the roles of each member of staff and included the process for evacuating the oxygen chamber in the event of an emergency. The plan also described what action was to be taken in the event of adverse weather conditions preventing staff from being able to get to work to operate the oxygen chamber.
- Emergency procedures were in place to ensure treatments could be completed in the event of a power failure. Back-up generators automatically engaged instantly, the back-up battery supplying the chamber would last approximately 12 hours.
- There were no special arrangements in place to deal with seasonal fluctuations as these did not occur in relation to this service.

Are hyperbaric therapy services effective? (for example, treatment is effective)

We regulate this service but we do not currently have a legal duty to rate it. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary.

Evidence-based care and treatment

• Decompression treatments and hyperbaric oxygen therapy were delivered according to a set of well-established protocols: the Royal Navy tables and the United States tables. These tables describe a planned sequence of events in chronological order for hyperbaric pressure exposures specifying the pressure profile over time and the breathing gas to be used during specified periods for medical treatment.

- The service only accepted children for treatment in specific emergency situations and only if they were accompanied by a paediatric qualified clinician. There were no specific protocols for treating children, however children were rarely treated at the centre.
- The Snellon eye test had been replaced by the Logmar eye test in response to evidence based guidance from the British Hyperbaric Association. The Logmar eye test enables a more accurate estimate of visual acuity than other eye tests.
- Policies were based on best practice guidance for example the elective therapy treatment protocols was based on undersea and hyperbaric medical society recommendations.

Pain relief

- Effective systems were in place to assess and respond to patients expressing pain or discomfort.
- MDC stocked over the counter pain relieving medicines. Patients' pain was assessed before and after treatment. In most patients, particularly those with decompression illness, the oxygen therapy was the main pain relieving agent.
- Patients were given advice on what to do for earache associated with increased pressure. Some patients suffered from earache worse than others and for them the increase in pressure in the chamber was paused for a while until they felt able to carry on.
- Patients we spoke with told us that staff constantly asked how they were feeling and did everything they could to keep them comfortable including being able to put a mattress and pillows in the chamber for patients who needed to lie down.

Nutrition and hydration

• A pressurised access chute was built into the chamber to allow food and drinks to be passed to the occupants. Bottled water was readily available in the chamber. We saw hot drinks being made and passed through the chute.

Patient outcomes

• The service submitted information to the NHS England specialised services quality dashboard. This included the EQ-5D questionnaire which is a standardised

instrument for measuring general health status. On the whole the service performed better than the national average. Out of ten indicators the service performed better in the following:

- Percentage of divers returning to pre-morbid functionality.
- Mean time lag from referral date to hyperbaric oxygen therapy (HBOT) treatment.
- Mortality within 30 days of treatment.
- Percentage of patients who develop refractive changes as a result of treatment.
- Proportion of HBOT typical complications recorded.
- The service performed worse in one of the indicators percentage of patients who returned a completed patient feedback form – and about the same in the remaining four.
- Managers told us they reviewed the information and benchmarked against the other nine hyperbaric oxygen chambers. The dashboard was also reviewed at the national clinical advisory group attended by hyperbaric doctors where best practice was discussed and shared.

Competent staff

- Employment policies were in place to support the effective recruitment of staff with the right qualifications and expertise. Induction training and continuous professional development were easily accessible to staff.
- The hyperbaric doctor employed by Midlands Diving Chamber (MDC), was supervised by a responsible officer in line with General Medical Council guidance. This ensured that the doctor was suitably qualified, had appropriate expertise and attended suitable continuous professional development events and training. The responsible officer also undertook annual appraisal with the doctor. The bank doctors had supervision arrangements in place through their substantive NHS employment.
- Additional professional support for the hyperbaric doctors was available from their peer group at the BHA and a specialist in the Royal Navy.
- All staff attended specialist training and refreshers, for example the Health and Safety Executive (HSE), Approved Medical Examiner of Divers, HSE Fitness to

Dive medical and European hyperbaric chamber operator. All staff were experienced divers, managers told us that staff appointed with no diving experience were sent on a basic scuba diving training course.

- We saw in the chamber technician's personal file that they had attended equipment specific training provided by manufacturers and certified hyperbaric technologist, which meant they had the competencies to maintain the equipment to a safe standard.
- The manager had attended the Institute of Occupational Safety and Health training covering best practice in health and safety.
- The chamber CCTV recordings could be used for look back training purposes in the event of an incident occurring within the chamber.
- We saw in staff files and information provided that all staff had an annual appraisal. Staff told us the appraisals were meaningful and provided opportunity to discuss any concerns and training and development needs. Annual appraisals were undertaken by an independent appraiser.
- All staff attended annual basic life support training and we saw evidence of this in the training log.
- HR policies included the management of poor performance.

Multidisciplinary working

- We observed that care was being delivered in a co-ordinated way both within the service and when liaising with other health services.
- The team at MDC worked well together, everyone understood their role, some roles were interchangeable and we observed that interactions were professional and respectful.
- When patient care and treatment was being shared with other health care professionals the hyperbaric doctor made sure that information about treatment and progress was shared quickly by contacting the other professional directly.
- Discharge letters were sent to patient's GPs with the patient's consent. Patients we spoke with told us they were always asked for consent before any information was shared. A copy of the discharge letter was given to the patient.
- If necessary the hyperbaric doctor would travel to emergency departments to assess patients if other healthcare professionals were unsure if hyperbaric therapy was appropriate.

Access to information

- Staff had access to information required to deliver effective care. Policies, procedures and risk assessments were stored electronically and in folders containing paper copies which meant that key information was easily accessible.
- All information including administration systems were accessible via one main lap top which meant that it could be vulnerable to technology failure.
- Staff could access patient records and we saw staff reviewing patient records prior to their treatment.
- Detailed discharge information was shared with the referring consultant or patient's GP, with the patient's consent, in a timely way. Patients we spoke with said they were given a copy of discharge information at the discharge appointment.
- Patient records were predominantly paper. They were stored in a locked cabinet; the key to the cabinet was stored in a key safe, only appropriate staff had the access code for the key safe.
- Staff attended annual mandatory training on information governance; during our inspection we saw that all patient identifiable information was stored securely.

Consent, Mental Capacity Act and Deprivation of Liberty Safeguards

- Staff attend Mental Capacity Act training once a year as part of their mandatory training programme. Staff we spoke with understood that the act related to consent and decision making requirements. We observed staff checking with patients for consent before carrying out any treatments.
- The service had a consent policy which also included the consent process to follow for patients under the age of 18 years and made reference to Gillick competencies. Gillick competence is a term originating in England and is used in medical law to decide whether a child (under 16 years of age) is able to consent to his or her own medical treatment, without the need for parental permission or knowledge.
- Patient assessments did not directly assess mental capacity but did include questions about mental health and psychological disorders. The hyperbaric doctor told

us that if they were concerned about the mental capacity or mental health of a patient they would liaise with the patient's own GP for further information before continuing with treatment.

- Patients told us they were given enough information to make an informed consent decision and that this included the risks and possible side effects of hyperbaric therapy. Following the pre-treatment assessment elective patients could contact the hyperbaric doctor by e mail or telephone if they had any further queries or questions.
- MDC website also had a frequently asked questions section which patients told us they found very helpful.
- In the patient records we reviewed, we saw that consent forms had been completed appropriately including a record of the risks discussed. Patients were also informed about the CCTV and video recording and signed to give permission for this to take place. There was a section on the consent form to be completed by an interpreter, if used, to sign to state they had interpreted to the best of their ability.

Are hyperbaric therapy services caring?

We regulate this service but we do not currently have a legal duty to rate it. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary.

Compassionate care

- The interactions we observed on the day of inspection were courteous and respectful; staff introduced themselves and other members of the team.
- Patient privacy and dignity was maintained, private changing facilities were available and patients wore scrubs for the chamber session.
- Patients we spoke with said staff were wonderful, caring, put you at ease and made you feel relaxed. They said staff 'went the extra mile' to make you feel comfortable, this included pillows and mattress in the chamber for one patient who was quite unwell and responding quickly to pain and discomfort.
- One patient told us they only drank a particular type of tea and that MDC staff made sure there was some available for them at their follow up therapy sessions.

 Conversations with patients took place in the doctor's office which meant patient information remained confidential, patient consent was always sought before any information was shared.

Understanding and involvement of patients and those close to them

- Of the five patients we spoke with all stated they had been advised of possible side effects of hyperbaric oxygen therapy, we also saw that this was recorded in the patients' notes we reviewed. Patients had understood the information that was given to them and could ask questions for clarification if not.
- Three patients told us that staff had involved friends and relatives when appropriate. One patient told us that a friend had asked many questions about hyperbaric oxygen therapy and all had been answered to their satisfaction.
- Language interpreters were available and with notice other aids to communication could be arranged, however staff told us that there had not been any need for this during the reporting period.

Emotional support

- Patients we spoke with told us they were given ample opportunity to discuss any concerns they had with their care. They were able to contact the hyperbaric doctor by telephone or e mail and had access to the MDC intranet where a comprehensive list of frequently asked questions could be viewed.
- We observed care being given in a calm but professional way. One patient said, 'I have observed the care they have given to others with far more acute conditions than I and this clearly demonstrated how experience allows a calm atmosphere to prevail even when working in difficult conditions.'

Are syperbaric therapy services responsive to people's needs? (for example, to feedback?)

We regulate this service but we do not currently have a legal duty to rate it. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary.

Service planning and delivery to meet the needs of local people

- Midlands Diving Chamber (MDC) offers services to a defined group of patients, the service is planned to respond to elective referrals and emergencies. Patients are referred by NHS organisations or are self-funded. Patients can travel from anywhere in the UK for treatment.
- Services for NHS patients are commissioned through NHS England specialist commissioning group standard contract. The contract is detailed and specific about the services expected to be delivered.
- MDC also advertised services on its website and at a local diving centre.
- Elective patients attended a pre-treatment assessment during which information was given about oxygen therapy including risks and possible side effects, patients we spoke with all said they had ample information about the treatment to make an informed decision to proceed.
- Emergency patients were also given information on arrival at MDC; a written information sheet was given to all patients to back up verbal information.
- When we asked patients about the convenience and length of appointments and treatments we were told that MDC staff accommodated patient preferences, appointments were easy to make, easy to change and had very short waiting times.
- Chaperones could be arranged for patients during their consultation with the hyperbaric doctor or during their treatment in the chamber but staff said they could not remember anyone ever requesting a chaperone.
- Patients we spoke with also told us that clear directions were given on the location of MDC and usually there was free parking outside the building.

Access and flow

- Patients could be referred to the service by HM Coastguard, the British Hyperbaric Advice Line, ambulance services, emergency departments, registered medical practitioners or directly by the patient.
- The service monitored its response time to emergency decompression illness (DCI) referrals. The gold standard response time from dive to treatment is six hours. Between October 2016 and September 2017 there were 41 emergency DCI referrals to the service. Information

we reviewed showed that response time was delayed in 21 cases, however the standard does not allow for travel time and delays in referral which were out of the control of the MDC.

- MDC was commissioned to provide elective or emergency referrals for any accepted application of hyperbaric oxygen therapy but excluding patients who were critically ill at the time of referral or were considered likely to become so.
- Once an emergency referral was made to the service, a full team of staff could be at the centre within one hour to receive the patient. Once the patient arrived at the centre there was no delay in treatment.
- One elective hyperbaric oxygen session was cancelled in the 12 months prior to the inspection for non-clinical reasons.
- Patients we spoke with told us treatment was delivered quickly, follow up appointments were easy to make and change if necessary.

Meeting people's individual needs

- We found that individual needs were catered for appropriate to the patient group.
- There was wheelchair access into the building and all areas within the building including the diving chamber and the toilet.
- The waiting area had a television and reading materials, light refreshments were available.
- Translation services were available through an approved translation service; staff told us they had not needed to use the service in the past 12 months. An interpreter services policy was in place which supported staff in making a referral to the service if necessary.
- The service did not accept patients with dementia or who were psychologically vulnerable as the extended length of treatment in a confined, locked area could be detrimental to their mental health.
- Because of the personalised delivery of care the service could cater for patients with sight or hearing impairments. Specialist support such as braille information or British Sign Language could be arranged through hospital services but staff could not remember an occasion when this had been necessary.
- The hyperbaric doctor was occasionally approached by oncology specialists to treat patients with side effects from radiotherapy treatment. These types of patients

were not covered by the NHS contract, however MDC often gave treatments at no cost to patients in order to relieve their symptoms and promote the healing effect of oxygen therapy.

- Patients we spoke with who were in the chamber for extended periods of time (up to six hours) were able to choose what food they would like to eat this included pizza, Chinese and Thai food.
- Patients told us they had plenty of time at appointments to ask questions and could also contact the hyperbaric doctor with any queries following appointments.

Learning from complaints and concerns

- Feedback was actively sought from patients and information about how to make a complaint was given as part of the patient information leaflet, staff were familiar with the complaints process.
- Information on how to make a complaint was easily accessible and included on the patient information leaflet given to all patients and patients were encouraged to give feedback.
- In the 12 months prior to the inspection there were no complaints and 27 compliments had been received. During our inspection a satisfied patient called to deliver a thank you gift to the staff for their care and attention.
- All patients were provided with feedback forms at the end of treatment. Results were collated in the six monthly quality monitoring inspection; findings were distributed to staff and discussed at governance meetings. We saw examples of change in response to patient feedback, additional mirrors in the changing rooms and provision for extra toilet facilities in the diving chamber.
- Staff described to us the process they would follow if a patient wanted to make a complaint which was in line with the service's complaints policy.

Are hyperbaric therapy services well-led?

We regulate this service but we do not currently have a legal duty to rate it. We highlight good practice and issues that service providers need to improve and take regulatory action as necessary.

Leadership and culture of service

- Managers were also experienced divers and during our inspection demonstrated that they had the skills and knowledge to effectively manage and develop staff. We observed person centred care being delivered and patients we spoke with described receiving personalised care.
- The small core team of four meant that all staff worked closely together and managers were always visible.
- Managers had an open door policy which meant staff could approach them at any time for advice and support. Staff told us that managers were approachable and supportive.
- Managers encouraged staff to develop; this was reflected in the vision and strategy which referenced personal development, training and expertise as key organisational objectives.
- Staff were aware of the whistle blowing policy and told us they felt able to raise concerns with managers. They also described the duty of candour requirements.
- The working environment was relaxed but professional, staff told us they enjoyed working for Midlands Diving Chamber (MDC) and felt respected and valued.
- HR policies were in place to address poor performance however managers told us the advantage of a small team meant poor performance or concerns about staff performance were addressed in real time. There had been no cause to implement disciplinary procedures. Similarly conflict within the team was resolved quickly, the manager told us they would find a private place to talk to the member of staff to explore the reason for the conflict, once again conflict rarely occurred within the team.
- MDC undertook responsibility for the safety and well-being of staff. In line with the Diving at Work Regulations 1997 and The Undersea and Hyperbaric Medical Society (UHMS) guidance, staff attended an annual occupational medical. Operating procedures for the chamber included the management and monitoring of the chamber attendant during treatments.

Vision and strategy for this core service

• MDC had a clear vision statement and set of strategic objectives. The vision was to provide up to date diagnostic services, treatment and medical advice whilst ensuring patient safety, wellbeing and clinical excellence. Strategic objectives were realistic, staff and patient centred and included business objectives. Staff were aware of the vision and strategy.

Governance, risk management and quality measurement

- The service had adequate and proportionate governance processes in place these were managed through a process of monthly internal meetings and external meetings with groups specialising in hyperbaric medicine such as the British Hyperbaric Association.
- The hyperbaric doctor attended the British Hyperbaric Association clinical advisory group which was made up of clinical representatives from each of the ten hyperbaric oxygen chambers in England. Best practice initiatives were shared at this national forum for implementation at local oxygen chambers. For example MDC had changed cleaning products used in the chamber in response to discussions held at the forum.
- The hyperbaric doctor was also the medical director and responsible for information and clinical governance.
- The two bank doctors employed by MDC were working under practising privileges and systems were in place to ensure HR checks were completed and indemnity insurance was adequate for the work undertaken at MDC. The medical director was responsible for ensuring revalidation processes were in place and that their employing trust and responsible officer were recorded in their personal files.
- The registered manager was responsible for ensuring the relevant employment checks were carried out for the medical director, we checked the medical director's personal file and saw that all documentation was in place and up to date. However human resource policies required updating to reflect the most recent employment regulations.
- Audits took place for example we saw the hand hygiene and records audits and results were shared with staff.
 We saw in one audit report where training had been identified for one member of staff and feedback given.
- There was no risk register in place to give an overview of the risks to the service, however the manager did complete risk assessments for all perceived risks which contained actions on how to mitigate these risks. The manager was clear about the main risk to the service which was the renewal of the NHS contract.
- Quality and performance were monitored by a variety of methods, the NHS England specialised services quality dashboard, patient feedback, treatment success rates

and staff appraisals. A six monthly quality monitoring visit was carried about by a senior manager, we saw the report of the last monitoring visit dated July 2017. Sixteen topics were reviewed such as incidents, staffing, medications, patient records and a summary of patient satisfaction surveys. Where improvements had been identified we saw that actions had been completed to implement them.

• A quality improvement and clinical governance monthly meeting took place which all staff attended. We saw the agenda and minutes of five meetings which covered appropriate topics and identified actions required.

Public and staff engagement

- At the end of the therapy session patients were given a questionnaire to complete with a pre-paid return envelope. We saw one of these returned on the day of our inspection. Feedback was positive with 100% satisfaction scores for 39 feedback forms received in the past twelve months.
- Staff we spoke with told us they felt empowered to make suggestions for improvements to the service and that managers gave serious consideration to requests.
- In the reporting period patients made few suggestions for improvement other than extra mirrors in the changing room which was acted on straight away.

Innovation, improvement and sustainability

- Midlands Diving Chamber (MDC) is accredited to the British Hyperbaric Association and was last inspected in August 2015. We reviewed the report and associated development plan and noted that all actions had been completed.
- Managers told us they valued the skill and expertise of the staff highly and supported specialist training and development opportunities in order to maintain staff expertise.
- In addition MDC were members of two specialist societies; The Undersea and Hyperbaric Medical Society, an international non-profit organization and primary source of scientific information for diving and hyperbaric medicine physiology worldwide and the European Underwater Baromedical Society, a European scientific society dedicated to the study and promotion of diving and hyperbaric medicine.
- Staff had recently attended a social event at which senior managers had applauded and thanked them for hard work and dedication. Managers also supported staff to attend motivational events as a team such as the great northern dive show and Dive 2018.

Outstanding practice and areas for improvement

Areas for improvement

Action the provider SHOULD take to improve Action the provider SHOULD take to improve

- The provider should include reference to female genital mutilation in safeguarding policies and raise staff awareness of the issues.
- The provider should review the storage of oxygen cylinders and safety signage.
- The provider should develop a checklist for the resuscitation trolley based on the resuscitation council guidance.
- The provider should implement cleaning schedule checklists for the chamber and chamber room.
- The provider should consider centralising information technology systems.
- The provider should ensure HR policy reflects relevant employment regulations for future recruitment processes.
- The provider should improve the recording and monitoring of risk.

Requirement notices

Action we have told the provider to take

The table below shows the legal requirements that were not being met. The provider must send CQC a report that says what action they are going to take to meet these requirements.

Enforcement actions

Action we have told the provider to take

The table below shows the legal requirements that were not being met. The provider must send CQC a report that says what action they are going to take to meet these requirements.