JOB DESCRIPTION

1. JOB IDENTIFICATION

Job Title: Clinical Perfusionist

Responsible to: Clinical Perfusion Manager and Deputy Clinical Perfusion Manager

Department(s): Clinical Perfusion

Directorate: Cardiothoracic Surgery

Operating Division:

Job Reference: 099808 R1

No of Job Holders:

Last Update: August 2010

2. JOB PURPOSE

Highly specialised autonomous Clinical Perfusion Scientist within the Cardiac surgery team, who assembles, prepares and manages adult cardiopulmonary bypass (CPB), long term heart/respiratory assist (ECMO & VAD), Intra aortic Balloon Pump (IABP), and blood conservation/cell salvage techniques/therapies in both elective and emergency settings to the Clinical Perfusion Service in the Royal Infirmary of Edinburgh. This 24/7 service covers both the National Waiting Times & South East and Tayside.

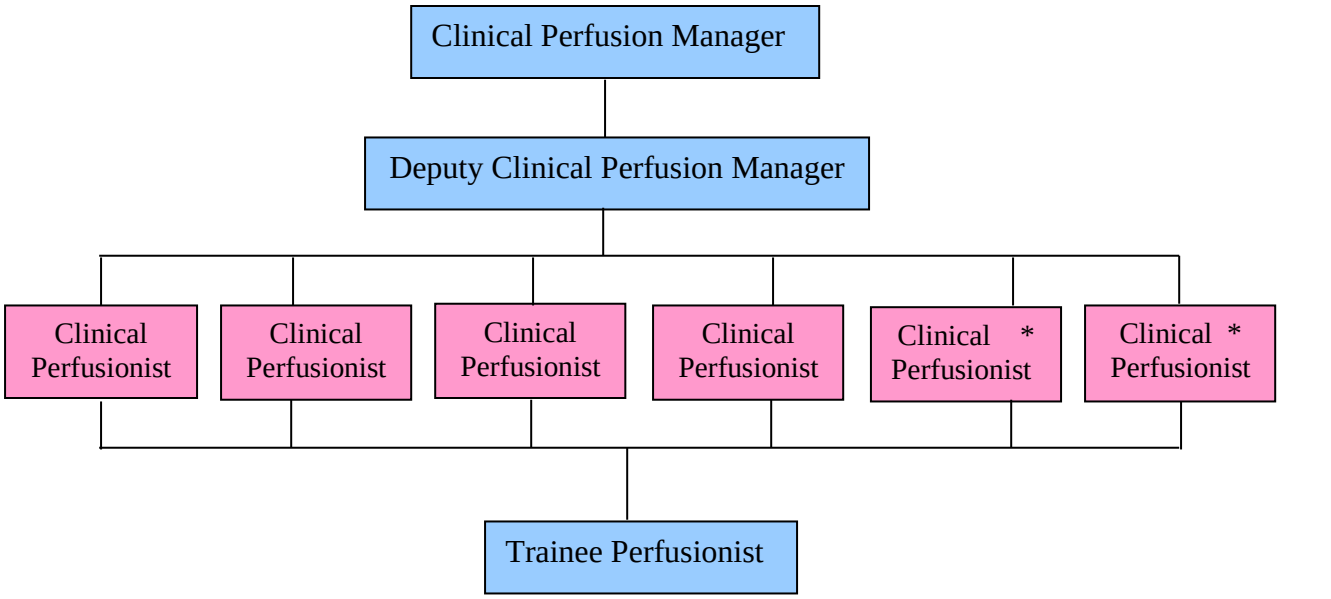
3. DIMENSIONS

The post holder's primary duties will be within the Cardio-Thoracic Theatres and ITU, but with an additional commitment to provide perfusion support for the Regional Vascular Unit and Regional Liver Transplant Unit.

1. Clinical Perfusion Scientist is a highly specialised autonomous practitioner who interprets broad occupational policies and guidelines to provide best patient care on an individual basis.
2. The out of hours on call service, requires this role to act as the lead specialist.

3. The Royal Infirmary of Edinburgh is the regional Heart & Lung Centre, providing in excess of 900 cardiac surgical procedures per year. The post-holder sets-up and manages CPB procedures required during cardiac surgical procedures. In addition, the post holder provides Intra-Aortic Balloon Pump therapy (IABP), ECMO/VADs and cell salvage services not only to cardiothoracic surgery but also to other specialties and areas such as, Coronary Care, Cath labs, ICU and non cardiac theatres.

4. ORGANISATIONAL POSITION



5. ROLE OF DEPARTMENT

The essential core services provided by the Perfusion department include the set-up, priming, de-airing and management of extracorporeal devices and circuitry for cardiac surgical procedures, thus maintaining vital life support, according to broad occupational and clinical policies.

A wide range of highly complex and routinely conflicting clinical information is assessed, interpreted and managed on a continual basis and appropriate autonomous action is taken. For example, blood pressure and flow, blood gases, gas exchange, anticoagulation status, ECG, acid base balance, fluid balance including blood transfusion and patient/blood temperatures.

The department provides a highly skilled service for complex procedures and specialised perfusion techniques deemed necessary for the individual patient requirement i.e. heart port, left heart bypass, vacuum assisted drainage, deep circulatory arrest, antegrade and retrograde cerebral perfusion, complex long-term extra-corporeal techniques i.e. extracorporeal membrane oxygenation (ECMO) and ventricular assist devices (VAD's).

6. KEY RESULT AREAS

1. Responsible for the safe and effective provision of highly specialised adult cardiopulmonary bypass an related procedures to the clinical area as assigned by the clinical perfusion manager,
2. Interprets broad occupational policies and guidelines to provide best patient care on, an individual basis, within a highly specialised clinical perfusion technical service.
3. Effectively plans and prepares the equipment to be used on an individual patient according to patient demographic data, clinical condition and the planned operation/procedure.
4. Controls, manages and is responsible for the single most invasive tool used today in routine surgery.- Heart-Lung bypass machine.
5. The safe use and care of various expensive specialised equipment e.g., Heart-lung machine & ECMO consoles , VAD systems & IABP devices.
6. Performs and advises on all Perfusion related tasks, adult CPB, ECMO, Ventricular Assist Devices (VAD), Intra-aortic balloon Pumping (IABP), autologous cell salvage, on bypass Haemofiltration, blood gas management., activated clotting time.
7. Makes on the spot clinical decisions based on interpretation of results of various complex tests and patient observations and alters management of patient treatment during CPB, ECMO & VAD procedures to optimise outcome and reduce patient risks.
8. Diagnoses and solves problems during heart surgery, ECMO/VAD runs by utilisation of highly specialised equipment skills and experience.
9. Contributes to the design of custom made circuits for use during clinical perfusion procedures.
10. Assists with monitoring of clinical Perfusion related disposable equipment, and ensuring there are adequate levels of stock on a routine basis.
11. Collation and provision of clinical data for audit and research purposes as required.
12. Provides input on routine clinical interventions which have a direct impact on patient mortality and morbidity.
13. Act as a mentor, on a daily basis, to trainee clinical perfusion scientists, producing reports to their training log and identifying development needs through the use of feedback and discussion via the service tutor/trainer.
14. Provide training, as required, to other staff groups and students on specialisation.
15. Actively participates in the development, regular review and the implementation of Protocols, policies and procedures for the Service and monitor that these are in place.
16. Fully contributes to evidence based clinical practice to maximise clinical effectiveness and provides evidence at monthly service meetings as required.

7a. EQUIPMENT AND MACHINERY

1. Heart Lung Machines (£100K) – Routine daily maintenance, calibration, set up, operation and trouble shooting of. (disposable circuit costs £400 per case)
2. ECMO systems (£30K)- routine daily maintenance, calibration, set up, operation and trouble-shooting of. (disposable circuit cost £1500 per case).
3. VAD systems (£25k)- used during complex clinical situations- set up, calibration, management and trouble shooting of (disposable circuit costs of £3300-£6600 per case).
4. Blood Gas Machines- daily maintenance, operation, interpretation and recording of results.
5. ACT Machines -Daily maintenance, QC, operation , interpretation and recording of results.
6. Intra Aortic Balloon Pump (£30K0 - daily maintenance, set up and operation, trouble shootir
7. CDI inline monitors- daily maintenance, calibration, set up, operation, trouble Shooting, interpretation and recording of results.
8. Cell saver units- set up, calibration and operation as required.

9. Microsoft Excel- Used daily for make up of Perfusion Records and departmental stats, Timesheets and research databases.
10. Microsoft Word- Used daily for company, departmental, institutional and other correspondence.
11. Microsoft Power-point- Used regularly for presentation of research, stats and teaching.
12. Email Systems- Used daily for internal and external communications
14. Jostra Database- Tailor made software program for recording and handling all perfusion related data.
13. DATIX- adverse incident reporting system
14. Provides data to Anaesthesia and Cardiac Surgery to facilitate audit and research.

7b. SYSTEMS

a) Maintain up to date and accurate individual patient case notes in line with the Society of Perfusion Scientists of Great Britain and Ireland and professional standards and local Trust policies. This report contains vital information about the procedure and the care the patient received. This should be used as part of their care pathway and is also a legal document that may be used in a coroner's court.
b) Create own clinical perfusion reports by utilising clinical perfusion data management software, and manage own database on a regular basis.
c) Providing perfusion data to the Unit Audit
d) Maintaining Blood Gas Machine Quality Control Records.
e) Maintaining records of Intra Aortic Balloon Pump and Autotransfusion usage.
f) Maintaining Emergency Duty and On Call records.

8. ASSIGNMENT AND REVIEW OF WORK

1. It is imperative and central to this post to create and maintain effective communication with Surgeons, Anaesthetists and all other surgical team members so as to effectively treat the patients undergoing surgery/therapy with a team approach.
2. This post relies heavily on two way communication whilst carrying out CPB which is often a highly emotive and challenging environment where highly complex information needs to be exchanged on an ongoing basis throughout the procedure as the surgeon and anaesthetist need to be aware of the Clinical Perfusion Scientists actions at all times and vice versa.
3. The confidence/skill to know when to interrupt the Surgeon whilst operating to give him/her information that may be necessary yet unwelcome.
4. It is also necessary to liase and communicate with external suppliers and other Institutions to discuss equipment requirements and supplies, trials of equipment, and sharing of experience and knowledge.
5. This role also requires the person to be able to integrate with the clinical perfusion staff and other members of the theatre team to maximise effectiveness and clinical excellence by encouraging and taking part in investigative research and creating an atmosphere of shared learning. This will also involve at times making presentations to other hospital staff members for training purposes or otherwise.
6. This role is emotionally extremely demanding by its very nature, as it is dealing on a daily basis with life and death situations and routine decisions made by the post holder have the potential to cause injury and or death to patients during CPB.

7. Part of this role also means that at times, communicating unpleasant news to other staff is inevitable, and that it is necessary at times to empathise and reassure other staff members whether it be about examination results personal problems or a patient death.
8. Required to advise the multidisciplinary team with regards to non routine specialist treatments such as ECMO/VADS & IABP therapy. Provides specific clinical/technical communication to the full range of clinical specialists involved in the care of such patients.

9. DECISIONS AND JUDGEMENTS

a) Review patient notes for relevant medical history, pathology and diagnosis making appropriate clinical decisions regarding the conduct of extracorporeal support i.e. perfusion technique, cannulation, type of equipment, intravenous fluid, blood products and drug additions to prime
b) Assemble, prime, de-air and manage extracorporeal devices and circuitry for cardiac surgical procedures, thus maintaining vital life support, according to broad occupational and clinical policies as well as recent scientific evidence seeking advice when necessary.
c) To assess, interpret and manage a wide range of highly complex and routinely conflicting clinical information on a continual basis and take appropriate autonomous action. For example, blood pressure and flow, anticoagulation status, ECG, fluid balance and patient/blood temperatures.
d) To assess, interpret and take appropriate autonomous action to provide adequate gas exchange and maintain homeostasis whilst on cardiopulmonary bypass. For example, arterial and venous blood gases, electrolytes, acid base balance, haemoglobin and derivatives and blood glucose levels.
e) Work as a self-directed, independent practitioner, taking responsibility for organising and delegating a number of specialised clinical techniques required during a single procedure, for example cardiopulmonary bypass, autologous cell salvage, haemofiltration, and intra-aortic counterpulsation.
f) Manage extremely complex procedures as an autonomous practitioner, making sound, informed decisions and advising others, often in the absence of a full clinical picture.
g) Be able to react to and deal with any critical incidents e.g., equipment failure, tubing ruptures and to rapidly assess and decide if and when an emergency change-out procedure is the appropriate response.
h) To integrate information from auditory, visual and perceptive senses on a constant basis and use this to manage the cardiopulmonary bypass procedure.
i) To use professional clinical judgement in liaison with the Cardiac Surgeon and Anaesthetist to optimise the performance and conduct of the bypass procedure for the patients benefit.
j) Discuss and evaluate options for best practice with colleagues as to individual patient management in order to optimise patient outcomes. Demonstrate reflection of perfusion practice with peers.

10. MOST CHALLENGING/DIFFICULT PARTS OF THE JOB

1. Emergency cases are highly complex and may be undertaken at any hour, most often in the early hours of the morning following a full day of duties, whilst being the sole Clinical Perfusion Scientist on duty. This provides a very high stress situation with increased physical and mental demands on the Clinical Perfusion Scientist who despite this is required to maintain intense concentration, be fully alert and possess sound analytical and judgemental skills to manage the patient.
2. Due to the very nature of this role, if a patient does not come through the surgery/ECMO/VAD successfully, the Clinical Perfusion Scientist is the person who effectively switches off the life support system to the patient, which can in itself be highly emotionally distressing.

3 Participation in the emergency out of hours service can be extremely demanding and have an effect on family and personal commitments.

11. COMMUNICATIONS AND RELATIONSHIPS

a) Communicate in an effective, clear, concise manner as a core member of the cardiothoracic surgical team, providing and receiving complex and/or contentious information to ensure a positive patient outcome.
b) Communicate in an environment that is often noisy, emotive and highly charged.
c) Communicate in a proactive manner, particularly in emergency and stressful situations.
d) Offer pre-operative advice to medical staff on the suitability of equipment and devices for specific procedures, taking into account changes/deterioration in patients condition, laboratory data, near patient test results and other technically limiting factors. Resistance to implementation of particular techniques due to differences in opinion, inexperienced surgeon/anaesthetist must be overcome by tactful, clear and concise explanation.
e) Relay sensitive information to members of the surgical team and other staff groups to ensure appropriate continuation of care for the patient.
f) Discuss with clinicians within and outside immediate surgical team an appropriate care pathway for patients. This is particularly important for patients whose underlying pathology is not conducive to cardiopulmonary bypass.
g) Convey complex information via various media to a broad range of audiences to promote understanding of a unique speciality.
h) Remain composed during emergency and high-pressure situations, being able to communicate effectively and clearly to colleagues in the multi disciplinary team.
i) To form productive relationships with others who may be under stress and/or have challenging communications difficulties.
j) To maintain close liaison within the multidisciplinary team and to foster good working relationships.
k) Provide clinical and professional advice to the multidisciplinary team.
l) Demonstrate good negotiation skills in the management of conflict across a range of clinical situations.

12. PHYSICAL, MENTAL, EMOTIONAL AND ENVIRONMENTAL DEMANDS OF THE JOB –

PHYSICAL SKILLS

1. For each CPB procedure, sitting at the Heart-Lung console in a restricted position with no relief available for long periods ranging from 2 to 8 hours or greater whilst concentrating on the many variable parameters for which the Clinical Perfusion Scientist is responsible.
2. Must possess excellent hand to eye co-ordination and manual dexterity to perform the tasks necessary safely, efficiently and accurately to deliver a high standard of perfusion i.e. termination of CPB requires a good sense of feel and a clinical eye combined with ambidextrous use of limbs to finely balance flow rates of blood, oxygen etc with the filling of the heart.
3. Set up equipment on a daily basis, which requires bending and lifting of sterile packs weighing 5-20 kilos and move the heart lung machine weighing 200 kilos, with no motorised assistance, between clinical areas which will involve manoeuvring this through doors, into sterile operating field and restricted spaces in the operating theatres and preparation areas.
4. In emergency situations, it is essential to be able to perform, set-up & priming tasks rapidly whilst maintaining accuracy of all calibrations and fluid/drug additions.

5. Move this equipment at speed from a standing start in cases of Trauma and pre/peri/ postoperative complications when CPB is required immediately to support the patient. This may involve pushing the whole CPB machine to other areas such as cath lab or the Cardiac ITU.
6. Responsible for the movement of ECMO consoles weighing in excess of 100kg, with patients attached to or on between theatre, ITU, Cath Lab, CT scanner; which involves manoeuvring through doors, sterile operating fields and restricted spaces in the operating theatre/ ITU cubicles, preparation areas and hospital elevators.
7. Responsible for safe transfer of patient receiving IABP therapy
8. Rapidly and effectively dealing with equipment malfunctions as any delay in this has serious effects and may require lateral thinking and utilisation of unusual resources. This may demand intense physical effort e.g. in cases of manually removing and replacing a pump or hand-cranking the tubing at a rate of approximately 100 revolutions a minute against sizable resistance.
10. On a daily basis, remove used disposables and safely disposal of this waste (20 - 30 kilograms) at the end of the case.
11. Position the ECMO patient on the ECMO bassinette on the ECMO console which involves bending and lifting or helping lift the ECMO patient onto the ITU bed.
12. Transfer stock weekly from the holding area to the Theatre Area which involves the transport of amounts ranging from 18-20 boxes weighing from 5-20Kg over a distance of 100 yards on a trolley with no motorised assistance.
13. When on-call out of hours being required to travel to hospital site quickly and safely to answer emergency callouts

MENTAL EFFORT

1. Cardiopulmonary bypass, which is performed autonomously at this grade, requires lengthy intense concentration from 2 hours to 8 hours for every procedure.
2. The Clinical Perfusion Scientist, as an integral part of the Cardiac Surgery team has to deal daily with other categories of staff in often stressful situations and to provide instant solutions to clinical and technical problems which may arise and be expert in troubleshooting these and/or providing alternative solutions.
3. Multitasking skills are essential for the job as the Clinical Perfusion Scientist may be subject to interruption from emergency demands for IABP, ECMO or cell saving procedures in areas out with the theatre area and for troubleshooting of equipment..
4. Cardiac emergencies, ECMO, Transplants and trauma cases are highly complex procedures and may be undertaken at any hour, these require the maintenance of high levels of concentration in all aspects of patient management most often in the early hours of the morning following on from a full days duties .

EMOTIONAL EFFORT

1. The management of Cardiopulmonary bypass holds with it a great responsibility and is recognised as a highly stressful undertaking that is emotionally extremely demanding by its very nature. It requires dealing on a daily basis with life and death situations where decisions made by the post-holder have the potential to cause injury and/or death to the patient during CPB i.e. any microscopic air left in the circuit by the Clinical Perfusion Scientist may lead to neurological deficits, ranging from confusion to CVA -with any gross air proving fatal to the patient.
2. Procedures which involve a high operative risk, post surgical mortality or morbidity will have a distressing effect on the post-holder who was involved and in the event of a death during a procedure, the Clinical Perfusion Scientist has the responsibility for cessation of the CPB and thus ending the patient's life support while maintaining the sensitivity and th dignity of the patient.

3. Called upon to set up and perform CPB and associated procedures on an emergency basis, where time is of the essence yet there is no room for decreased accuracy of service and with any delay having serious if not fatal implications to the patient i.e. in trauma cases, the responsibility for ensuring that the patient is adequately supported while replacing potentially huge blood losses.
4. In the event of equipment failure, must be able to resolve problems quickly and efficiently with the prime objective of preserving the patient's circulation and limiting patient injury or death. This may require lateral thinking and utilisation of unusual resources or may demand tremendous physical effort depending on the particular failure or dysfunction i.e. hand cranking the arterial pump when it fails requires 100 revolutions/ minute to achieve an adequate flow an average sized adult. This results in the post-holder experiencing great stress and guilt, even when this has been speedily rectified and is not the direct fault of the Clinical Perfusion Scientist.
5. Occasionally in cases of high stress in the operating theatre, may be the subject of verbal abuse from other disciplines of staff and must deal with this calmly and responsibly.
6. ECMO/VAD is performed at the bedside in the presence of parents/relatives. This evokes intense emotions, as ECMO/VAD is usually a final procedure and not all survive.
7. In the event of the death of a patient on ECMO/VAD, the Clinical Perfusion Scientist is responsible for switching off the ECMO/VAD machine and ending that life.
8. Must be able to withstand erratic work patterns which can involve shifts in excess of 24 hours or longer at weekends. The working day is completely unpredictable, and dictated by the complexity and lengths of the procedures. Out of hours working is provided by on-call rather than by shifts, on a roster basis involving a great deal of commitment to the service by the staff, requiring last-minute changes to staff plans, necessitating re-planning or cancellation of family/personal commitments.

<u>WORKING CONDITIONS</u>

1. On a daily basis working in a space restricted environment in the Operating theatre and in other areas as required (e.g. ITU cubicles / Cath Lab)
2. On a daily basis sitting at the Heart-lung machine console in a restricted position with no relief available for long periods ranging from 2 to 8 hours or greater.
3. On a daily basis unable to have breaks e.g. comfort breaks, meal breaks, during procedures as no other member of cardiac surgical team is capable of managing the heart-lung machine and the patient's artificial support.
4. Standing in one position for long periods of time in each shift e.g. during an ECMO procedure.
5. Continuously monitor haemodynamics, pump parameters and blood gases on VDU equipment for the duration of each case.
6. On a daily basis working with exposure to high volumes of patient body fluids (circuit blood volumes range from 2 to 5 litres of blood) with inherent risks of infection e.g. in cases of HIV, CJD, Hepatitis A, B and C and MRSA
7. Daily exposure to volatile anaesthetic gases and the responsibility for the scavenging of these whilst on CPB.
8. Even adhering to local Health and Safety policies and exercising utmost care and attention, spills are often unavoidable due to the surgical techniques or the technical limitations of some equipment employed e.g. splashes from used cannulae as they are handed from the table.

13. KNOWLEDGE, TRAINING AND EXPERIENCE REQUIRED TO DO THE JOB

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1. Post Graduate Diploma in Clinical Perfusion Science or equivalent qualification, with accompanying practical clinical experience comprising of a mandatory minimum two years post graduate fully supervised Clinical Assignment plus a verified log book of 150 documented supervised cases.
2. Successful completion of practical & oral viva voce examinations.
3. Hold the accreditation certificate and current registration to practice with the College of Clinical Perfusion Scientists of Great Britain and Ireland,
3. Re-accreditation is mandatory by annual submission to the College of Clinical Perfusion Scientists, of on-going clinical and educational activity. (15 academic points every 3 years from presentations, lecture attendance, national & international conference attendance and 40 autonomous CPB procedures minimum per year.)
4. Must possess suitable experience to act as a consultant in clinical perfusion science.
5. Must operate autonomously and be fully conversant with specialised techniques and Perfusion procedures in order to undertake autonomous out of hours duty e.g. left heart bypass, cerebral Perfusion, vacuum assisted venous drainage, ventricular assist devices, modified ultrafiltration, antegrade & retrograde blood cardioplegia, cell salvage & autotransfusion, ECMO, VAD and complex paediatric & adult congenital work.
6. Abide by the codes of ethical conducts and practice as set out by both the Society of Clinical Perfusion Scientists and Clinical Perfusion Service.
7. Maintain Clinical Professional development programme in both a multidisciplinary and professional setting.

14. JOB DESCRIPTION AGREEMENT

A separate job description will need to be signed off by each jobholder to whom the job description applies.	
Job Holder's Signature:	Date:
Head of Department Signature:	Date: