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| **1. JOB IDENTIFICATION** |
|  **Job Title:**  | Clinical Scientist (Medical Physicist / Clinical Engineer / Clinical Scientist (Audiology))   |
|  **Responsible to:**  | Head of Service  |
|  **Department (s):**  | Scottish Cochlear Implant Programme    |
|  **Directorate:**  | Head & Neck Directorate  |
|  **Operating Division:**  | NHS Ayrshire & Arran, Acute Hospitals Division  |
|  **CAJE No:**  | 800-3153 |
|  **No. of Job Holders:**  | 8.1 WTE  |
|  **Latest Update:**  | December 2023  |

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| **2. JOB PURPOSE**  |
| The Clinical Scientist provides highly specialist scientific and technical input to the Scottish Cochlear Implant Programme. S/he is involved in all four phases of patient management (1. pre-implant assessment, 2. cochlear implant surgery, 3. psychophysics process of stimulating the electrodes and 4. monitoring outcomes & habilitation support) and is involved with both client groups (infants/children and adults).  |

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| **3. DIMENSIONS**  |
| Cochlear implantation is a highly specialised scientific and surgical procedure. Surgery is required to embed a receiver/stimulator package into a cavity drilled in the mastoid bone and to insert an electrode array into the cochlea. Whilst the surgical procedure is a single event, the procedure for activating and programming the device is an ongoing scientific process which requires lifelong aftercare for the patient. Clinical Scientists are responsible for activating the device by applying electrical stimuli to the implanted electrodes within the cochlea (psychophysics). Each electrode is tested individually with appropriate stimulation parameters. Parameters are custom set and optimised for each individual patient. This information is programmed into the patient’s speech processor. This work is highly specialist and requires expert scientific input.  Responsibilities in this area include:  * evaluating device function and hearing responses in the operating theatre during cochlear implant surgery. Approximately 100 cochlear implant operations are carried out per annum.

 activating and programming cochlear implant systems on an outpatient basis following surgery. In the first year following cochlear implant surgery, patients require ~ 8 appointment sessions. Each appointment session lasts for one to two hours. Thereafter, patients require lifelong follow-up support which usually entails one or two appointment sessions per annum. The service is currently supporting ~1600 cochlear implant patients (infants, children and adults) from throughout Scotland. Appointments are usually provided in the main Cochlear Implant Department and via remote care / eHealth solutions. Some patients (~ 20 elderly/infirm patients) are seen by staff at home and others are seen at Satellite Clinics in Hospitals and Health Centres in Lothian, Tayside, Grampian and Highland. This entails staff working away from base, occasional long distance driving over a wide geographic area and can involve being away from home overnight. The annual mileage for one WTE post is ~1000 miles per annum.  Clinical Scientists are also responsible for equipment management. They are responsible for:-  * ensuring that there is an adequate supply of cochlear implant systems and spare parts held within the department by placing orders and securing authorisation for orders from the Head of Service.

 * ensuring that all repairs are logged and checked and securing funding approval from the Head of Service.

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| Clinical Scientists are actively involved in research. They keep abreast of new scientific and technical developments in the field in order to provide up-to-date scientific and technical support. They participate in research projects to validate new implants, speech processors, coding strategies and explore new physiological measurement techniques. They record outcome data, carry out statistical analysis and write/ orally present peer reviewed scientific papers.  |

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| **4. ORGANISATION CHART**  |
| The attached chart demonstrates the relationship of this post within the Service.   |

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| **5. ROLE OF DEPARTMENT**  |
| The Scottish Cochlear Implant Programme is one of the largest in the United Kingdom. Since its inception in 1988, over 4000 referrals have been received and almost 2000 patients (adults & children) have undergone cochlear implant surgery.  NHS Ayrshire & Arran is commissioned to provide this service by NHS National Services Division (NSD). The programme, based at University Hospital Crosshouse, provides a national cochlear implant service for profoundly deaf adults and children from across Scotland.  This specialist service is delivered by a dedicated multidisciplinary team of 19 staff, including 1.0 Head of Service, 8.1 WTE Clinical Scientists (including the Deputy Head of Service), 0.7 WTE Clinical Physiologist, 3.0 WTE Rehabilitation Advisors, 6.0 WTE support staff (3.2 WTE Assistant Technical Officers (including 0.8 WTE for this post) and 2 WTE Administration and Clerical staff) and input on a sessional basis from three ENT Consultants from the ENT Department.   |

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| **6. KEY RESULTS AREAS**  |
| To use a wide range of physiological measurement techniques in the assessment of patients pre-, peri- and post-implant including neural response telemetry, electrocochleography, auditory brainstem responses, mismatch negativity tasks, cortical evoked potentials and steady-state evoked potentials and to use expert knowledge to interpret the data & analyse the test results and provide an accurate diagnosis of the patient’s hearing status.  To advise and counsel patients and parents on cochlear implantation and to make them aware of the commitment and factors that influence outcome, ensuring that the patient’s/family’s expectations are realistic.  To use expert knowledge to custom programme cochlear implant systems for infants, children and adults by electrical stimulation, psychophysics and electrophysiology. To use specialist skills to interpret behavioural observations during paediatric programming sessions to facilitate optimal programming of the cochlear implant speech processor.  To carry out screening tests during programming sessions to monitor patient’s responses to sound and to evaluate listening skills. To share and discuss the results of these tests with the patient, parents and local professionals and offer highly specialist advice.  To monitor progress of adult patients after cochlear implantation and advise on strategies that could help them achieve their potential including onward referral for auditory rehabilitation training where appropriate.  To advise and teach patients,parents and local professionals about cochlear implant equipment, safety issues, assistive listening devices, accessories, daily checks and basic troubleshooting. Enabling them to manage the device on a day-to-day basis.  To carry out compliance & impedence telemetry, integrity checks and a thorough case history to investigate device failures. To share and discuss the results with the patient and family and to alert the Head of Service at the earliest opportunity.  To write reports, summarise assessment results and chart progress, addressing any concerns regarding lack of progress and where possible identifying contributory factors; making recommendations to parents and local professionals.  To participate in monthly Cochlear Implant Team meetings, sharing information, contributing to multidisciplinary discussions regarding case management and offering specialist scientific advice.  To ensure that there is an adequate supply of cochlear implant systems and spare parts held within the department by following departmental procedures and protocols for monitoring and ordering stock. To ensure that the external components of patient equipment is in good working order by replacing broken equipment and sending broken equipment away for repair. Ensuring that all repairs are logged and checked following departmental procedures.  To use reasoning and problem solving skills to conduct fundamental research and to keep abreast of scientific and technical developments in the field in order to provide up-to-date scientific and technical support.  |

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| **7a. EQUIPMENT AND MACHINERY**  |
| General office equipment for administration and clerical duties (Personal Computer, Printer, Scanner, Fax Machine, Photocopier, Laminator, Telephone, Answering Machine etc.).  A wide range of Cochlear Implant Programming Systems and systems for carrying out Intraoperative Measurements (e.g. Neural Response Telemetry) from a variety of cochlear implant manufacturers (Advanced Bionics, Cochlear and Medel. Interactive PC based systems (Crescent of Sound) to carry out speech perception testing and record responses to standard questionnaires. Data entry is by touch-screen and keyboard.  Manchester Picture/McCormick Toy Test (Parrot System) and ASSE for assessing speech & sound perception.  Audiological assessment equipment (Audiometer, Visual Reinforcement Audiometry System, Tympanometer, Otoacoustic Emissions System, Evoked Response Audiometry System).  |

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| **7b. SYSTEMS**  |
| In-depth knowledge of national policies and international trends relevant to cochlear implants and hearing impairment.  To conform with NHS Ayrshire & Arran policies for mandatory and statutory training by participating in induction training, e-learning (e.g. through LearnPro) and attending training sessions.  For Health & Safety, this includes Child Protection, Fire Training and Manual Handling.  For Infection Control, this includes adhering to advice/guidelines in order to deal with specific issues relating to patient contact.  In general, compliance with NHS Ayrshire & Arran guidelines for personal safety is required including participation in mandatory training.  Contributing to the formulation and implementation of departmental policies ensuring that a high standard of service is delivered.  To ensure that there is an adequate stock of spare parts held within the department by following departmental protocols for monitoring and ordering stock. To prepare orders and request authorisation from the Head of Service.   |

To ensure that broken equipment is sent and returned from repair timeously by following departmental protocols for completing fault reports and requesting authorisation for payment from the Head of Service.

To manage confidential information, keeping records and sharing data to ensure collaborative working within a multidisciplinary team and external agencies.

To maintain up-to-date and accurate records on both paper and electronic systems and write reports reflecting expert knowledge, ensuring that they meet departmental protocols and are in line with NHS Scotland policy and professional standards (e.g. British Cochlear Implant Group (BCIG) and the British Society of Audiology (BSA).

To contribute to data collection and participate in departmental audit.

To keep up to date with new techniques and developments through induction training, in-house training, attending relevant courses and through personal reading for the promotion of evidence based practice.

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| **8. ASSIGNMENT AND REVIEW OF WORK**  |
| Clinic appointments are assigned to the post-holder by the departmental diary system.  The post-holder works autonomously within the Clinical Scientist team of the Cochlear Implant Service.  Non-clinical tasks are assigned to the post-holder by the Head of Service. The work of the post-holder is reviewed on an ongoing basis by the Deputy Head of Service and the Head of Service.  |

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| **9. DECISIONS AND JUDGEMENTS**  |
| Exercise judgement to plan and prioritise day-to-day workload.  Be accountable for own professional actions and exercising judgements to maintain a consistently high standard of work.  To recognise own professional boundaries and seek advice and support when necessary.  To alert and seek advice from the Head of Service or Deputy Head of Service around case management in complex cases.  |

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| **10. MOST CHALLENGING / DIFFICULT PARTS OF THE JOB**  |
| Carrying out cochlear implant programming sessions with non-compliant patients e.g. children with behavioural problems or complex needs.  Carrying out intra-operative measurements, interpreting and advising Consultant ENT Surgeons of test results.  Counselling the patient and family when investigating the possibility of a cochlear implant device failure.  |

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| **11. COMMUNICATIONS AND RELATIONSHIPS** |
| To work in partnership with other members of the team in the audiological assessment of patients, communicating effectively, sharing information and providing consistent advice to patients, parents and local professionals.  To establish and maintain good and productive communications and working relationships with other team members.  To be able to impart complex and emotive information around issues about deafness and cochlear implants in a way that will be understood by the family and the child’s local professionals.  To be able to communicate effectively with individuals with communication impairments including those who use sign language as their primary means of communication. Making use of interpreter services as required to ensure accurate exchange of information.  To participate in workshops, courses and in-service training for patients, parents and local professionals.  To explain the role of the Clinical Scientist to students, visitors and voluntary organisations.  To participate in informal training during student placements (Audiology, Speech & Language Therapy, Teachers of the Deaf and Medical) within the department. |

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

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| **Physical Effort / Skills** * Combination of sitting, walking and standing.
* Occasional requirement for moderate physical effort for short periods (e.g. moving test equipment on trolleys) when taking equipment outwith the department to the operating theatre and satellite clinics.
* Medium levels of manual dexterity for preparing patients for hearing tests (e.g. skin preparation, electrode placement and wiring of amplifiers).

Frequent requirement for bending, kneeling and working at floor level when working with**Mental Effort** * Frequent requirement to be mentally alert for sustained periods whilst carrying out assessments, speech processor programming and intra-operative measurements.
* To participate in continuing professional development, ensuring that the objectives set reflect both personal and service needs.
* To keep abreast of new developments through attending specialist courses, Special Interest Group Meetings (e.g. Implant Centre Scientist Group Meetings) and BCIG Academic Meetings in order to maintain expert knowledge in the fields of hearing impairment and cochlear implantation.

 **Emotional Effort** * Dealing with anxious patients/parents and occasional aggression.

 **Working Conditions** * Frequent requirement for sitting in a restricted position when working with young children.
* Occasional requirement to work in isolation away from base.
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| **13. KNOWLEDGE, TRAINING AND EXPERIENCE REQUIRED TO DO THE JOB**  |
| **Qualifications**  Applicants must possess a 1st or 2:1 Honours Degree in a Physical Science, Bioengineering or Audiology together with an MSc in either* Medical Physics/ Clinical Engineering
* an IPEM accredited integrated master’s degree in Bioengineering
* Audiology
* STP Neurosciences.

 Completion of the NHS Clinical Scientist Training Programme or the Academy of Healthcare Science certificate of equivalence.  Registration with the Health & Care Professions Council.   Excellent standard of English Language.  **Knowledge and Skills** Well developed presentation skills (formal and informal). Proficient in using computer software packages.  Well developed report writing skills and ability to produce written materials for other professionals, patients and their families.  Ability to develop medical physics expert knowledge in cochlear implants and acquire specialist skills through working in the cochlear implant service, participating in in-house training and attending courses and conferences specific to cochlear implants and applying this knowledge to everyday practice.  **Pre-registration Experience** Broad based knowledge of Medical Physics and Clinical Engineering across all specialisms including clinical measurement and medical imaging. Experience in working directly with patients employing a range of electrophysiological and clinical measurement techniques.  **Other Requirements** Driving licence, car owner and ability to travel anywhere in Scotland independently. Good interpersonal skills and positive team player  |