

AIIC2023

FORTEZZA DA BASSO

Firenze 10-13 maggio 2023



Convegno Nazionale
Associazione Italiana Ingegneri Clinici

Innovazione e accessibilità:
il governo delle tecnologie sanitarie come sfida sociale



IC



Approaches to Benchmarking The UK Perspective

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...a *fixed* point from which other measurements can be reliably made...

- **best** - to which we should all strive
- **average** - standard achieved by our peers
- **worst** - lowest we can get away with



Business models across UK

- 1 NHS but 4 nations
 - England
 - Scotland
 - Northern Ireland
 - Wales
- **Financial models** – similar, but sufficiently different



Clinical Engineering Services across the NHS



- Two broad types of Clinical Engineering service
- Medical Physics & Clinical Engineering
- Estates

Challenges



- Apples and oranges – are we comparing the same things
- **Scope of services** – just basic equipment or everything, imaging, renal, Radiotherapy...proportion of contract vs in-house
- **Data gathering** – do we understand our own data (and speak the same language)
- **Interpretation**- who uses this and for what?

Sources of national data

IPEM

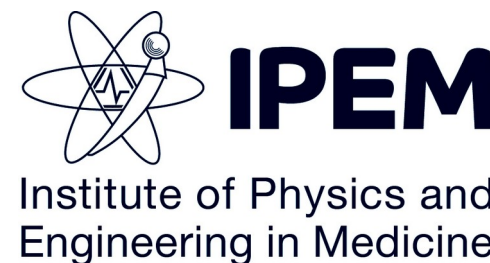
- National professional body, analogous to AIIC (but also represents Medical Physics)
- Workforce data surveys

NHS England

- National Clinical Engineering Network
- Network of regional lead clinical engineers
- Responds directly to CSO and Department of Health

NPAG – National Performance Advisory Group

- Now called Best Value Groups (were benchmarking groups)
- Genuine benchmarking activities

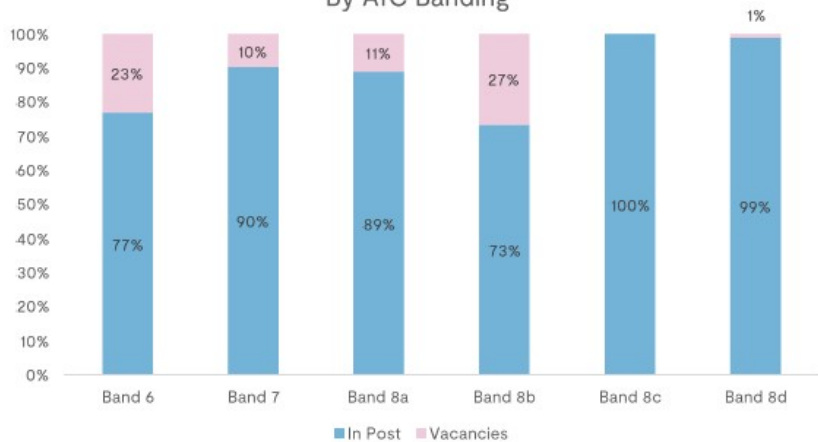


National Performance
Advisory Group

IPEM Workforce Survey

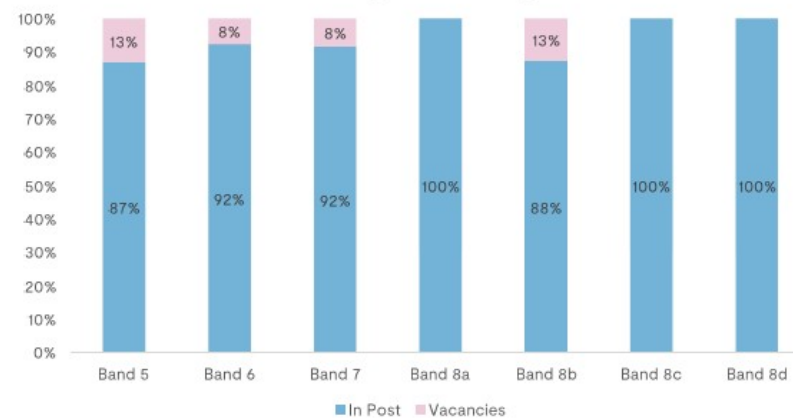
NHS Agenda for Change Banding

Clinical Scientists in Clinical Engineering Vacancy Rate By AfC Banding



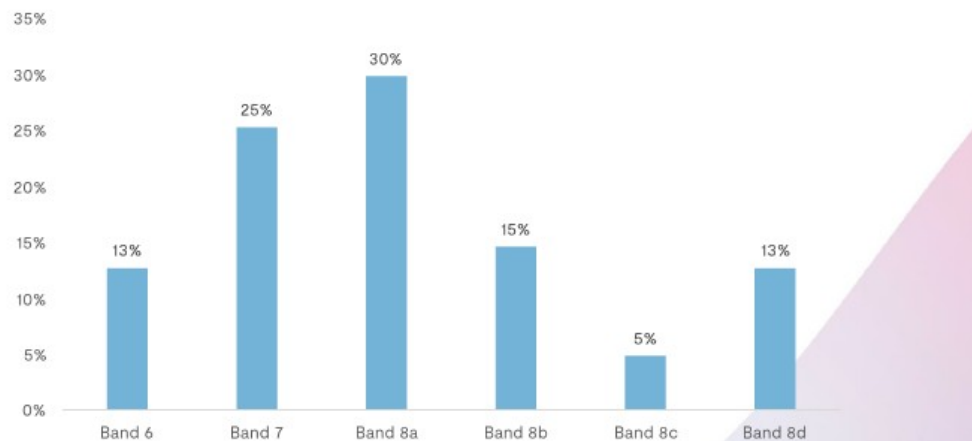
Agenda for Change Banding

Clinical Technologists in Clinical Engineering Vacancy Rate by AfC Banding

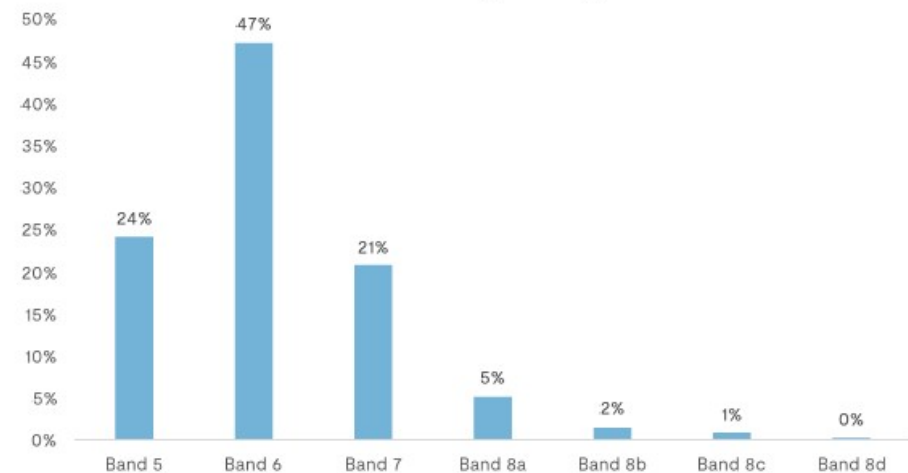


IPEM Workforce Survey

AfC Banding Distribution of Clinical Scientists in Clinical Engineering



AfC Banding Distribution of Clinical Technologists in Clinical Engineering



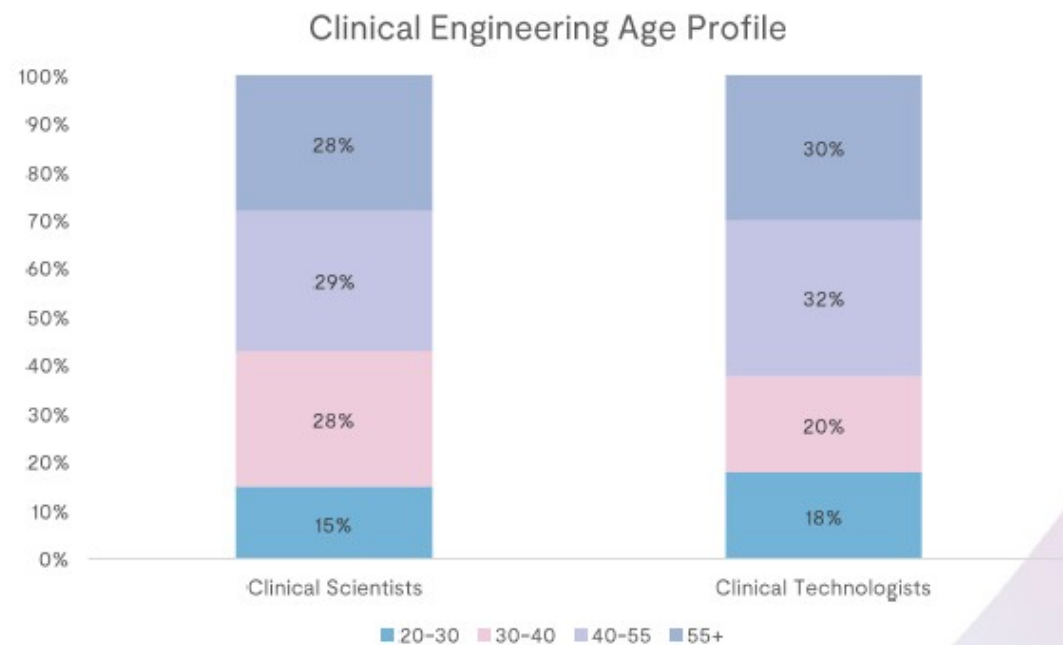
Age Profile

Workforce Data Summary No:
006

Report published on
Friday, 26 November 2021

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IPEM Workforce Survey



NHS England CE Network – National equipment survey

Definitions

National Critical Equipment Survey

The following definitions may be helpful when completing this survey:

Equipment Category Definitions

- Mechanical Ventilator - ICU**
An automatic cycling device intended to provide time-cycled, volume-assisted ventilation support for the full range of patients, from neonatal, paediatric to adult, in a critical care setting. It typically uses positive pressure to deliver gas at a normal breathing rate and tidal volume through an endotracheal (ET) tube or tracheostomy, and consists of a breathing circuit, a control system, manometer, and alarm. The inhalation limb includes a valve where inspired gas may be heated/humidified, and the exhalation limb includes an exhaust valve to release gas to the ambient air. It can be operated in several modes (e.g., assist/control, synchronized, patient triggered).
- Mechanical Ventilator - Transport**
An electrically-powered device designed to provide automatic, volume ventilatory support for patients during inter-hospital or intra-hospital transport, and in emergency situations. It is typically a compact, lightweight, rugged device with internal battery to power it during patient transport. It typically provides mandatory breaths at preset intervals (control mode), not allowing the patient to breathe spontaneously in assist/control and/or synchronized intermittent mandatory ventilation (SIMV) modes in volume-type. It usually includes an airway pressure monitor and low or high pressure alarms; it may be used in ambulance, and in field hospital.
- Mechanical Ventilator - Anaesthetic**
A major electricity (AC-powered), automatic cycling device used to assist and control alveolar ventilation during general anaesthesia, and in conjunction with inhalation anaesthetic agents. This is often a mechanical ventilator integrated into an anaesthetic machine, but can also be a stand-alone device. It has four functions and is far simpler to operate than an intensive care ventilator, but also quietly meets the patient's ventilation needs for oxygen (O2) and carbon dioxide (CO2) exchange to maintain normal blood gas concentrations. The device provides a mechanical means to deliver the breathing gas to the patient in a controlled pattern, and is equipped with alarms to users of changes in respiration or the onset of any operating conditions.
- Mechanical Ventilator - Emergency**
Emergency ventilator only appropriate for use during the COVID-19 pandemic in the event of a ventilator shortage. This is a classification of device that has been used to describe a small range of ventilators specifically modified in response to the pandemic.
- Non Invasive Ventilator - BIPAP and CPAP**
Ventilator intended for non-invasive ventilation of patients who are not critically ill. May be suitable for use on patients off invasive ventilation. Some models may be capable of providing invasive ventilation in the event of a ventilator shortage. Requires no pressurized gas supply. Typical capability options are also available for selection for this equipment category.
- Non Invasive Ventilator - CPAP Only**
Applies a continuous positive pressure to the mouth and nose. This prevents closure of airways and improves oxygenation in patients with mild disease.
- Enteral Feed Pumps**
Device designed to pump liquid feed into a patient's stomach via a percutaneous endoscopic gastrostomy (PEG) either by compressing syringe or by controlling flow through a line by other means (e.g. peristaltic action).
- Patient Monitors**
Continuously monitor a patient's vital signs. Some models may monitor additional parameters such as end-tidal CO2 and invasive blood pressure.
- Suction Pumps**
Battery-powered suction unit. Typically used to clear secretions from a patient's airway.
- Volumetric Pumps**
Administer fluids at a pre-programmed rate by controlling flow rate through an intravenous line.
- Oxygen Concentrators**
Produce oxygen-enriched gas from room air - models will have different maximum flow rates often ranging from 5-10L per minute.
- Syringe drivers**
Small, portable, battery-operated device that administers medication subcutaneously over a selected time period.
- Humidifiers**
Allow an increase in the relative humidity in the oxygen supplied to the patient.
- ECMO machines**
Machine that facilitates extracorporeal membrane oxygenation (ECMO), where blood is pumped outside the body to remove carbon dioxide and add oxygen.
- Haemofiltration**
A form of renal dialysis, which removes waste products from the blood by passing it out of the body through a set of tubing and returning it, cleaned, to the body.

Equipment Category Detail Form

1. Mechanical Ventilator ICU

Please complete both tables below with the total quantity of this equipment category that is held by the trust

The quantity provided should be the total held by the trust across all sites and settings and also include equipment that may be held in permanent or temporary storage.

The first table shows the details that were submitted against this equipment category the last time this survey was conducted in 2021

The second table contains makes and models of devices that have been provided by the DHSC O2 and Ventilator programme but this is only a starting point for providing details about any additional devices held by the trust

Please use the subsequent rows in the second table to provide further details of all the devices held by the trust, where possible using the list of manufacturers that has been provided.

	Quantity Reported 2021	Quantity Reported 2022
1. Mechanical Ventilator ICU - TOTAL	178	147

a) Please update or confirm the quantity held for this equipment category based on previous survey responses by completing the **Quantity Reported 2022** column

All cells highlighted red must be completed - if the quantity has not changed please provide the same value as last year. Please provide a brief comment to explain any differences.

Manufacturer	If Other please specify	Model	Quantity Reported 2021	Quantity Reported 2022	2022 Quantity over 10 years old	Comments
Dräger		Evita XL	50	8	8	All devices removed except PICU
Getinge/Maquet		Servo-U	125	136		
Dräger		Infinity V500	3	3		

NPAG Best Value Groups

- Established in the 1990s
- National networks
- Benchmarking
- Best practice
- Training events / conferences



- Arts, Heritage and Design in Healthcare
- Clinical Engineering North BVG
- Clinical Engineering South BVG
- Decontamination BVG
- EPRR Network
- Estates BVG
- Facilities North BVG
- Facilities South BVG
- Health Visiting & School Health Services Network
- IT & Connectivity Network
- National District Nurses Network
- NHS Car Parking and Sustainable Transport Network
- NHS Sustainability Leads Network
- NHS Transport & Logistics BPG
- Temporary Workforce Network
- Operating Theatres BVG
- Telecoms BVG
- Violence Reduction and Security Management Network
- Waste Management BVG

KPI 1 PPM Compliance

- The number of PPMs completed as a percentage of those planned.
- Include all equipment, maintained by in-house or external companies
- Categorise by Low, Medium and High equipment category, or optionally All if unable to split types.
- For 12 months ending 31st March

Optional

KPI 1a Percentage that were not available (looked for but either in use or missing) as a percentage of those planned.

Target Values

Low Risk Equipment PM \geq 70% Compliance
Medium Risk Equipment PM \geq 90% Compliance
High Equipment PM 95% \geq Compliance
All types Risk Equipment PM \geq 80% Compliance

KPI 2 Technical Resource Usage

- Time spent on direct technical work as a percentage of total available time for the whole department.
- For 12 months ending 31st March

Target Value \geq 75%

KPI 3 Repair Response Time

- The number of repair jobs started within the stated time frames of:
 - \leq 2 hours
 - \leq 2 days
 - \leq 7 days
- Expressed as a percentage of the total of all repair jobs.
- For 12 months ending 31st March

Target Value

95% responded to in \leq 2 hours
90% responded to in \leq 2 days
100% responded to in \leq 7 days

KPI 4 Repair Turnaround Time

- The number of repair jobs completed within the stated time frames of:
 - \leq 1 day
 - \leq 3 days
 - \leq 14 days
- Expressed as a percentage of the total of all repair jobs.
- For 12 months ending 31st March

Target Values

90% completed in \leq 1 day
90% completed in \leq 3 days
90% completed in \leq 14 days

KPI 5 PM to non-PM ratio

- The amount of time spent on planned PM as a percentage of all technical activity.
- For 12 months ending 31st March

Target Value

\geq 60% of time should be spent on PPM


KPI 6

Jobs in progress for longer than 30 days

- Those tasks that have been in progress for more than 30 days.
- Measured at 31st March

Target Value

\leq 0.5 % of total assets on the database.

 National Performance Advisory Group CEDRIC Analysis		Organisation Name
		B
BED RELATED		
Department total cost per bed		£2,300
Department pay cost per bed		£600
Department weekly hours spent per bed		0.41
Department weekly technical hours spent per bed		0.15
Average assets per bed		20
Average regularly maintained assets per bed		17
ASSET RELATED		
Average weekly hours per maintained asset		0.02
Average pay cost per maintained asset		£35
Average total cost per maintained asset		£135
Average value of spares/stock held per maintained asset		£3
Value of dept spares/stores as percentage of total value of assets maintained		0.13%
STAFF RELATED		
Average assets per staff member		1,818
Average regularly maintained assets per staff member		1,545

UK Benchmarking- Summary

1. NHS face same challenges with benchmarking data as anywhere else
2. Three broad categories of national data sets
3. Benchmarking use tool but need careful interpretation

Lessons learnt:

1. Decide how you want to use the data before trying to define/capture it
2. Seek agreement on KPIs before trying to gather data
3. Data is generally poorly used with little analytics