Clinical coders - the challenges, opportunities and the role technology can play in their future

Having carried out an online survey of clinical coding professionals, Nuance Communications convened a roundtable to discuss the challenges the profession faces, the way it is likely to change and the part that technology could play in their future.

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About this report

This report was written following the roundtable event held in London and chaired by Michael Jones, Associate Director of Education (Clinical Coding) Institute of Health Records & Information Management. Nuance would like to thank the following for their contribution to the roundtable and the report:

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1.0 Executive summary

The role of clinical coders is pivotal to the NHS. They use health records to translate clinical terms into a sequence of codes which describe the diagnoses and procedures.

For the NHS in England this activity ensures accurate payment for providers of care through the National Tariff Payments System (NTPS). In England, the data derived from the codes is used in Hospital Episode Statistics (HES) and Secondary Usage Services (SUS). This means it becomes the basis for performance measurement and benchmarking, but also for planning future health services and improvements in patient care.

However, clinical coders face many challenges. The move towards a digital NHS which is supposed to support better use of data has inherent challenges for coders. There is significant variation in the implementation of record keeping standards and record keeping systems. Electronic patient records (EPRs) create a further challenge as they are cumulative and designed to allow clinicians a longitudinal view of care - particularly relevant for patients who have many comorbidities or chronic illnesses. However, from a clinical coding perspective, codes are based on episodes of care and the standards need to change to reflect the new way of working with EPRs.

The role itself is often misunderstood. There needs to be a culture shift which helps to elevate what clinical coders do, highlighting the benefit of accurate coding to clinical colleagues which in turn will encourage them not to think about 'wrong codes', but how they can play a part in improving coding. Clinical coders need to have a greater understanding of how the data is used, so they can reinforce the importance of accurate and consistent recording.

Documenting relevant co-morbidities is also an area of concern. In order to claim correct payments for care and treatment, clinical coders must include all relevant comorbidities. Clinicians may not amend or include them if they have been previously documented. As coders can only code episodically, they may fail to include relevant conditions.

These challenges could be overcome by encouraging better communication between clinical coders and clinicians, yet a further challenge for many coders in the NHS is that they are often in different locations and away from front line care.

Coders often feel the main emphasis on their job is one of financial accuracy rather than data analysis and service improvement and the NTPS doesn't help in this respect. The NTPS can create perverse incentives and consistency of data quality can be affected by this.

Despite these challenges, there are opportunities for clinical coders, and it is likely that new technology will have a direct impact on their role. Rather than build walls and defend what they see as the typical coding role, coders are being encouraged to embrace what the future could hold and evolve so the role becomes more about developing insights from the data. SNOMED CT is one example of an NHS-wide change, which although not universally acknowledged, could be a catalyst for elevating the role of the coder.

This report makes a series of recommendations which should help to improve the day-to-day lives of clinical coders and ensure that what is sometimes seen as backroom function is given the daylight it deserves.

We are advocating more detailed guidance and support from NHS Digital around standards and policies, and a mandate to enforce better coding standards is needed in order to reduce variation in the way information is collated, so that it is not up to the coder to wade through notes and interpret these. A clear vision for SNOMED CT implementation and use is needed, too, so this can be consistent across the country. EPRs should enable coders to begin working in real time, which will in turn enable timely validation of information with cases fresh in the minds of the clinician. Improving coders' knowledge of medical conditions and increasing communication with clinicians will lead to a greater understanding of the patient diagnosis and treatment and therefore better data and insights.

We also recommend a nationally standardised job specification and pay band for coders to raise their profile and value perception amongst other clinical staff. Trust boards must work to increase their understanding of the importance of good quality data and the value this brings to service planning rather than focusing on the number of records processed. Finally, as clinical coders will play a vital role in the data-driven NHS of the future, they should be given more training and support so they can be maximally effective and can help drive improvements.

2.0 Introduction

The World Health Organisation (WHO) has declared 2020 as the International Year of the Nurse and Midwife in honour of the bicentenary of the birth of Florence Nightingale. Nightingale is popularly remembered as the founder of modern nursing, but her pioneering contributions to the field of statistics are less widely acknowledged.

Nightingale recognised the importance of collecting and arranging data and their power to inform and transform; the observations she recorded in Istanbul hospitals during the Crimean War are testament to that[1]. In 1860 she wrote a paper that advocated for the systematic collection of hospital data using a uniform classification of diseases and operations. This went on to form the basis International Classification of Disease (ICD)[2].

So, it is not unreasonable to argue that 'The Mother of Nursing' also has a claim to the title 'Mother of Clinical Coding'. Much has happened since her time but the principles for the routine collection and analysis of hospital statistics remain the same and are as important as ever.

The NHS has long recognised the benefits of good quality coded clinical data and the important contribution it can make to the safer care of patients and effective management of hospitals[3 & 4]. Since 2004, when the NHS in England introduced Payment by Results (PbR) – now known as the NTPS – clinical coding has underpinned payment of providers for their activities.

The same coded data is used to produce standardised hospital mortality indices and contributes to the Getting it Right First Time (GIRFT) programme and Model Hospital project, which use the data for performance monitoring and benchmarking.

It is therefore easy to see why clinical coding is fundamental to the NHS and why it will be increasingly useful. However, the methods used for collecting this data have not significantly changed in the past 25 years. The coding process is a manual task that requires a specialist trained member of staff, the clinical coder, to transact episodes of care in hospital administration systems.

Clinical coders work from the health records of patients, whether paper, electronic or both, analysing the text written by clinicians and translating their clinical terms into a sequence of alphanumeric codes which describe the diagnoses and procedures.

There is nationally mandated training for clinical coders that effectively instructs on the common toolbox of methods which all coders rely on, but much of what makes a good coder is experiential. Therefore, results can vary due to differences in judgement when analysing and abstracting the relevant diagnoses and procedures from documents, or as a consequence of varying quality and reliability of the source document. This has been referred to as the "qualculative practices of data workers"[5].

In its report, *Artificial Intelligence: How to get it right*, NHSX declared clinical coders as being under significant pressure and is keen to explore the opportunities of using innovative technologies, such as natural language processing (NLP), to accelerate efficiency.

In August 2019 the prime minister pledged an investment of £250m into artificial intelligence (AI) to support the NHS, including a £140m award to fast-track AI innovations and realise the potential of AI to meet the aspirations of the *NHS Long Term Plan*.

Yet, despite the apparent advantages, there is reticence amongst coders who have concerns that AI is after their jobs. However, AI should be perceived as an opportunity rather than a threat. The future requirements of the workforce will change and the profession must be forward thinking and focus on identifying the knowledge that will be needed liaising with clinicians using new technologies, such as SNOMED CT, and upgrading skills in line with changing roles.

In turn, this will create a framework for the upcoming generation of informatics professionals which aligns with the objectives of Health Education England's Building a Digital Ready Workforce programme[6].

It is clear that the clinical coding profession is well served by its passion and expertise.

– Michael Jones ACC
Associate Director of Education (Clinical Coding)
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1 "Florence Nightingale – recognising the nurse statistician." *More or Less*, BBC, 27 May 2019 https://www.bbc.co.uk/programmes/w3csz3qx

2 The ABCs of ICD, Salcido MD, EdD, R.,2015. Available at: https://www.nursingcenter.com/journalarticle?Article_ID=2713783&Journal_ID=54015&Issue_ID=27137822

3 The report of the Public Inquiry into children's heart surgery at the Bristol Royal Infirmary, 1984-85 Available at: https://webarchive.nationalarchives.gov.uk/20090811143822/http://www.bristol-inquiry.org.uk/final_report/the_report.pdf

4 Report of the Mid Staffordshire NHS Trust Public Inquiry, 2013

5 The qualculative dimension of healthcare data interoperability, Pine, K, 2019, *Health Informatics Journal*

6 Building a digital ready workforce, Health Education England, 2020. Available at: https://www.hee.nhs.uk/our-work/building-digital-ready-workforce

3.0 What are the challenges faced by clinical coders?

Digitisation of patient records across the NHS has been slow and not all NHS trusts or even all departments within trusts are working consistently with EPR – in some cases they can be working with both while the transition happens, which adds an extra layer of information, making the job even more complex. According to NHSX[7], around a quarter of hospitals have yet to implement any EPR systems. Of the systems that are in place, they are all designed and work differently.

3.1 The challenges of paper notes:
– can often be in poor condition and not necessarily in any order
– coders often resort to using discharge summaries, but the quality of such sources can often be inconsistent and incomplete
– can go missing
– could be in use by someone else at the point that the coder needs to use them
– can sometimes be difficult to read the handwriting

The challenges of EPRs:
– lack of structure to how notes are recorded – leading to coders needing to trawl many different systems to ensure they have the accurate information
– coding standards dictate that coders can only code from the current patient spell in hospital, yet EPR is accumulative which avoids clinicians having to update information that may not have changed such as comorbidities

The majority of our coding roundtable attendees felt the move to a digital NHS is, on its own, not the solution. At those trusts where EPRs have already been introduced, the systems are often developed solely from the point of view of the clinician. With little or no input from clinical coding departments, the quality of the data itself can be compromised or harder to access.

Gillian Cartledge is Head of Clinically Coded Data and Standards Assurance Informatics at the Northern Care Alliance NHS Group, a group formed by bringing together two NHS Trusts, Salford Royal NHS Foundation Trust and The Pennine Acute Hospitals NHS Trust. She says: "The EPR gives us new challenges. People think it's the answer to all the problems, but that is not always the case. While we no longer have to deal with illegible handwritten notes, we are working with unstructured records and lots of free text."

3.2 Variation in the implementation of coding standards and record keeping systems
Clinical coders must operate to rigid, nationally set standards and guidelines – but this works on the assumption that anyone filling in the health records complies with these guidelines. The Royal College of Physicians[8] says the purpose of the guidelines, which set the general record keeping standards for physicians, is to maximise patient safety and quality of care. Its recommendations include:

– the contents of the record should have a standardised structure and layout
– the patient's complete medical records should be available at all times during their stay
– data recorded or communicated on admission, handover and discharge should be recorded using a standardised proforma
– every entry to the record should be dated, timed (24hr clock), legible and signed by the person making the entry. The name and designation of the person making the entry should be legibly printed against their signature. Deletions and amendments should be countersigned, dated and time

7. NHS Tech Plan for Health and Care, Feb 2020 https://jointheconversation.scwcsu.nhs.uk/tech-plan
8. Royal College of Physicians: General Medical Record Keeping Standards https://www.rcplondon.ac.uk/projects/outputs/generic-medical-record-keeping-standards

With little regulation and no mandate or guidance on how records should look and what should be recorded in them it means there is a lack of clarity when it comes to best practice.

Gillian says: "You might find a therapist note under a therapy document, but then you might also find it under a clinical note. There is no guidance or structure that says if you are recording this it must be kept in a specific document."

This view was reflected widely at the roundtable. For Denise Blackman, Head of Coding at East Kent University Hospitals NHS Trust, the reality is that clinical coders at the trust, which still has paper-based patient records, can find themselves working with a temporary folder created from one spell in hospital if the original record is unavailable. Clinical coders then must try to match up the information they need.

Roundtable attendees confirmed that, across the UK, a significant part of a clinical coder's time is spent searching through notes or a number of different systems for specific information that they may find scrawled somewhere in the corner of a page.

While digitisation will help to address the time-consuming issue of searching through paper notes, unless there is greater guidance and structure, there will continue to be an impact on the consistency of record keeping. Where there are inconsistencies clinical coders must refer to their clinical colleagues to ensure accurate coding. Meeting tight deadlines for national tariffs becomes a priority, rather than using their skills to be able to create the data needed for service improvement.

Without guidance on how systems should be implemented, some services within trusts are creating their own systems that make accessibility for coders even more difficult, meaning they must find workaround solutions which adds more time to their task.

3.3 Coding standards and episodic versus longitudinal working

While technology in healthcare is moving on at pace and coding standards are updated annually, they are still written around a traditional view of the hospital patient record and not the health and care records which we see in integrated care organisations. A single EPR may combine records from primary, secondary and community care.

EPRs are cumulative and designed to allow clinicians a longitudinal view of care, which is particularly relevant for patients who have many comorbidities or chronic illnesses, with each new spell of care feeding into the overall record.

Michael Jones says: "Strictly speaking, coders should only be coding what is documented in the current episode, but the EPR is designed in a way that clinicians should not have to record something more than once. The idea is that the clinician should be able to look and see that the patient has diabetes and not have to record all that history each time.

"Coding standards need to address this pragmatically, recognising that some conditions are being recorded and are persisting but coders are unable to use the information. Standards are not supporting the technology."

For staff at Salford Hospital, being able to access as much clinical information as possible in one place puts the coders in a privileged position and can enhance the quality of the data produced while also augmenting the evolving skills of the coders. Gillian says: "We have written a lengthy document which supports coders and informs them what they should be using and what they can access. The EPR even provides access to PACS, whilst coders would not use it to code directly, it is used to enhance the coding processes. Being able to see the images can provide greater clarity."

3.4 Cultural challenges around the importance of coding

The view from the roundtable was that coding should not be considered a back office function; it is no longer the data inputting role it once was, so there needs to be a greater focus on training and investment in people who have the skills to take the role forward. There was a consensus that there is currently less of a focus on training and personal development than ever before, at a time when the clinical coder role should be advancing with new skill sets.

Using available technology, the role can evolve to become a key part of the drive for improving patient care, helping to identify areas where change is needed as well as providing the depth of data needed to develop predictive healthcare tools.

But for this to happen, a greater understanding of the value of the coding role from clinicians to board members is vital, along with national guidelines on the structure and paygrade of the role and the skills needed to fulfil it.

Clinical coders themselves need to have a greater understanding as to the value of the data and how it is used, so that they can continue to educate clinicians on the importance of accurate and consistent recording.

Michael Jones says: "National policies for the coding role (for instance the national occupational standard approved in 2013) have not changed much and trusts tend to do their own thing. It seems to vary from trust to trust, with many different job titles from coding analysts to income assurance leads.

"It is hard to build a national profile when there is so much variation in the job roles and titles. People often think they are talking to a finance professional when speaking with a coder, but this isn't always the case as not all coders are knowledgeable in Health Resource Groups (HRGs) and the payment system."

Gareth Jones is Clinical Coding Improvement Manager at Manchester University NHS Foundation Trust. He recognises the difficulty in building profile, but adds that more needs to be done to demonstrate what insights coded data can provide. He says: "Coders need to rebrand themselves as clinical data people.

"We have years and years' worth of data we can track using the coding standards that were in place at that time to gain insight into long-term health conditions."

At Guy's and St Thomas's Hospital, Carolyn Cooper, Head of Clinical Analytics and Clinical Coding, has developed a new clinical strategy based around producing more structure, educating clinicians about how, why and what to record and giving them record keeping guidance. This means clinicians can record information themselves in a structured way that can then flow through the system (see case study on page 18).

3.5 Helping clinicians understand the importance of coding

Producing high-quality data relies on good record keeping by clinicians, with clear, complete and concise information about conditions, diagnosis and comorbidities. Yet this is not always what is provided and there is room for greater education and communication for clinicians and healthcare staff about how the data is used and the consequences of inaccurate recording of information.

Some of the inconsistencies in record keeping may seem minor, but the consequences can be far reaching. For example, the standards stipulate that clinical records must be updated when the consultant responsible for the patient care changes. However, Denise Blackman says: "When the patient is moved, the name of the consultant responsible for the bay they are in is sometimes recorded instead of the consultant who

will be responsible for their care. If that patient dies and the name of the consultant is incorrect on the patient administration system (PAS) and we code that, the death is attributed to the wrong consultant." In addition, it is not always possible for a clinical coder to validate (from the clinical record) who was responsible for the care of the patient because clinical documentation is not in line with RCP guidelines on record keeping. The issue of incorrect recording generally comes to light when mortality statistics are published and are challenged by consultants when they have a higher death rate attributed to them in HES and SUS data tables.

3.6 **Communications between clinicians and clinical coders**
Unstructured and unclear recording can lead to the clinical coder needing to question or interpret clinicians' notes. The coder often feels the need to take responsibility for those notes and does not want to code something for fear of being incorrect. Ideally there would be good communication between clinician and clinical coder, so the coder can clarify the information, but the pressures on both roles leave limited time to do this effectively. In some trusts the coding teams are not even on the same site as clinicians.

The roundtable consensus is that it is time to move away from the attitude that notes are "coded wrong" and get to a point where the documentation is accurate and good enough to code from, with both sides understanding how the information is recorded and what it will eventually be used for.

Documenting relevant comorbidities is also an area of concern. In order to claim correct payments for care and treatment through the NTPS, clinical coders must include all relevant comorbidities, yet clinicians will not always amend or include them if they have been previously documented and there is no change. As coders can only code episodically, they may fail to include relevant conditions.

While national guidance states that non-mandatory comorbidities should only be coded where identified as clinically relevant, there can also be variation between clinicians as to what they feel is relevant and should be included, which leads to a risk of important or valuable data being omitted.

⚠ **Lack of specificity about diagnosis is a challenge to coders** as different codes are available as subcategories of the same condition. For example, pneumonia can be bacterial or viral but, unless prompted, some clinicians will only document pneumonia. Sepsis, too, can be a particular difficulty for coders as a final diagnosis may not always be included.

Improving sepsis coding through clinician review

At East Kent Hospitals University NHS Foundation Trust, Denise Blackman arranged an external audit to look at all the cases of sepsis that had been recorded. Recording of sepsis can be particularly difficult for coders as a clinician may initially record suspected sepsis, but the end result and initial diagnosis may differ if it is deemed a patient has an infection that is not septic.

Coders are expected to use the information they have available to them, yet previous knowledge and experience will often lead them to investigate further with clinicians if they have time to do so. The East Kent

audit revealed that there was no problem with coding and all cases had been coded accurately on the basis of the recorded information.

However, when Denise brought in a lead clinician to check the cases, it was found that a number of the cases had not been septic. Denise says: "I used the report to improve education in this area, so that coders can feel confident when using sepsis codes. Our clinician provided guidance on the use of the Early Warning Score (EWS) as a means of assisting the coding team to accurately determine true cases of sepsis."

3.7 Correct use of language and terms

Without guidance on what should be recorded in notes by the clinician and how it should be recorded, there will always be a risk of misinterpretation of the information by the coder.

To avoid this, it is vital that clinical terms are used in the correct context and that a final diagnosis is recorded where available.

3.8 The contracting process in the NHS

In England, linking coding to the NTPS has changed the focus of the job for clinical coders. Accurate coding underpins the payment system – overcharging or undercharging commissioners can have a detrimental impact, so the coding must accurately reflect the procedures and treatment carried out during a spell in hospital.

The challenge is that with an increase in patient admissions year on year, there has been no commensurate increase in coding staff, which has led to extra pressures on coders to code each patient spell to tight deadlines. This limits their ability to validate the data and make the necessary checks to ensure the data is accurate.

It is no surprise, then, that coders feel the main emphasis on their job is financial accuracy rather than data analysis and service improvement. Yet the pressures are similar for coders working in systems with block contracts. With many trusts using both systems depending on the service, accuracy of coding is just as important. HRGs must still be generated to illustrate to commissioners how the trust is performing on that block contract.

3.9 Financial pressure and recording of comorbidities

Financial pressures inevitably lead to a greater emphasis on payments and, in some trusts, there has been a drive over the years to increase the number of comorbidities. Increasing the number of comorbidities coded will help to increase the Complications and Comorbidities (CC) score attribute of the HRG. HRG4+ introduced interactive complication and comorbidity splits, which put an even greater emphasis on coding of secondary diagnoses in a spell. In some ways this is fairer because it allows for a more granular assessment of a patient's relative complexity and means reimbursement can be adjusted for that. However, the CC score is influenced by number rather than accuracy of codes. This changes the focus of why the information is being gathered, with some mistaking large quantities of codes for depth of coding.

But Michael Jones warns: "The NTPS can create perverse incentives and consistency of data quality can be affected by this. The number of codes used is not an indicator of quality or accuracy. Coders shouldn't just put in a lot of redundant codes. The point is they are meaningful.

"It's important to avoid the temptation to artificially 'up-code' activity since this means that you are attributing it to a more complex HRG than it actually belongs to. When the activity data is married with the costing data this causes a dilution since coders will be submitting average lower costs against higher payment HRGs. The danger in doing this is when the tariff is rebased, those higher payment HRGs may be reduced because the data was not providing an accurate picture. There should be greater scrutiny of this."

4.0 SNOMED – an opportunity for joined up healthcare

SNOMED CT is a way of providing a single terminology across all trusts, ensuring EPRs can be shared across primary and secondary care and paving the way to improved patient care. SNOMED CT is the world's most comprehensive medical terminology, and is used to standardise the storage, retrieval, exchange and analysis of electronic health data. Representing more than 350,000 clinical concepts, it should allow the transmission of data in a uniform and standard way

SNOMED allows clinicians to enter detailed data in language they are familiar with and which is more appropriate for recording the detail of a patients record; whereas Classifications such as ICD-10 aggregate that data together into codes more suitable for population level statistical use.

4.1 Ensuring a positive impact on clinical coders
SNOMED CT has been designed with clinicians in mind, allowing them to update records in a narrative style while different codes are assigned to the text behind it. It is also powerful when underpinning specific data items in a structured clinical record. To the uninitiated it may seem that clinicians are taking over coding, but this is not so.

It is not a coding tool, but a way to update patient records, attaching codes to both structured and free text written by clinicians. Our survey found that 74 per cent of people felt that SNOMED CT would have an impact on the day-to-day activity of clinical coders and 57.5 per cent felt that its implementation would improve data quality.

Coders, with their extensive knowledge of classification and terminology, will still be needed to validate the information and ensure the right codes have been used. However, this should be less time-consuming, giving them more time for validation and data quality checks and perhaps even looking for trends in the data. It will also allow coders to allocate episodes to the correct HRG faster. The roundtable was supportive of SNOMED CT. However, most attendees agreed that, although clinicians may not necessarily know that their narrative is being SNOMED coded, SNOMED should still be mandated by the Medical Director and enforced by the clinical leads to ensure accurate terminology and classification.

4.2 Addressing the vacuum of SNOMED leadership
While primary care has been using SNOMED codes for some time, the April 2020 deadline for secondary care looks unlikely to be reached. The roundtable sensed an unwillingness to take ownership combined with a lack of national standards on implementation. While some clinicians are interested in it, they don't have the time to get involved, and while coders are closer to it and have a greater understanding of it, it is not a coding tool for them so they should not necessarily be leading its implementation.

Adam Theobald, Head of Clinical Coding and PbR Assurance, King's College Hospital NHS Foundation Trust, says: "Trusts have been told that they need to adopt SNOMED, but there needs to be greater emphasis on everyone using it the same way – that's how you get joined-up healthcare."

He says: "Every trust needs a team of clinicians and tech experts to ensure implementation. Where we have different systems, we could have better joined-up healthcare. SNOMED could be the thing that brings it together."

But for Michael Jones, implementation is the biggest problem as he feels the expertise is not there to do it successfully. More input is needed from NHS Digital to enable coders to map SNOMED codes to current classification codes.

He says that although NHS Digital provides the maps, they are complex and it is not possible to fully automate coding since a single map may contain many target codes. "Without mapping you don't have the terms and so it is difficult to see how that will work. The technical aspects of SNOMED implementation, such as the messaging and expression constraint, relies on expertise which is often missing."

Of greater importance is the need to get SNOMED right at the development phase. The roundtable felt that, without the onus being on developers to ensure the system is fit for purpose, there is a danger of the responsibility of SNOMED falling to clinical coding teams. A lack of a mandate means no clear initiative for system developers so it will continue to be implemented in an ad hoc way, which will reduce its impact.

5.0 Clinical coding in Wales

Welsh coders face many of the same challenges as their English counterparts, but the healthcare system is set up in such a way that coders have more of an opportunity to get involved in public health initiatives. There is also greater consistency when it comes to coding practice. In Wales, the NHS Wales Informatics Services oversees the standards, collection and analysis of the data and has responsibility for data quality.

With no NPTS, there is the freedom to optimise the coding to achieve the most accurate and relevant data. But the challenges, such as access to information and the difficulties of clinicians' notes, are the same across the board. However, it appears there has been more focus on developing the coding role and building skills beyond simply using and interpreting the standards. The Informatics Service has responsibility for training clinical coders and has taken the training beyond the mandatory training surrounding standards that is offered in England.

5.1 E-learning and clinical training
With no NPTS, there is the freedom to optimise the coding to achieve the most accurate and relevant data. By introducing e-learning, the training has become accessible and flexible. NHS Wales is setting up programmes to enhance the skills of the clinical coders, providing relevant clinical knowledge alongside standards training. This will not only help them make coding decisions, but aims to increased their confidence in discussing these issues with clinical staff. The available elearning modules are now: Chronic Obstructive Pulmonary Disease; Urinary Endoscopy; Vaginal Mesh; Fractures and fixations and Heart Failure. These programmes currently include fractures and fixations and bone anatomy.

Richard Burdon is Classification and Terminology standards manager. He says: "This knowledge helps them make decisions. It also helps them to see where the information goes and why it is important to get it right. We have had a general push for being better."

Accuracy targets have also been introduced alongside the traditional completeness targets. This has achieved a steady increase, and a recent audit revealed health boards achieving 90 per cent for the first time.

A dashboard has also been devised to look at clinical accuracy. After calls by clinical coders for more training around COPD, the dashboard revealed the extent of the help needed as some places had more than 400 errors.

5.2 Mandatory SNOMED coding

Welsh Government policy has mandated the use of SNOMED CT as the chosen terminology to be used across Wales and a large amount of work has been done around the implementation of it to make the process as easy as possible. However, this mandate relies on SNOMED being present and usable in any clinical application/digital record. These systems need to have been been designed using SNOMED CT to underpin its structured data.

A type ahead search has been developed to enable the clinician to type in a clinical term and for the user to see the results and select the correct term. Richard says: "Adverse reactions has identified a number of substances and allergies that could be recorded for patients. The Adverse reactions application allows the clinician to type in Penicillin or Aspirin, the results are displayed and the clinician selects the correct term. This allows for information to be available instantly and accessed across Wales using the Welsh Clinical Portal". There are plans to begin piloting this year at hospital sites.

A pilot scheme using this type of pre-coding for multiple myeloma patients is also underway. As part of HaemBase Cymru, the outpatient continuation sheet has been designed to record presenting complaint and past medical history using SNOMED CT. This approach has been live since December 2019 in Cardiff and the Vale University Health Board. The information collected during the outpatient consultation has become part of the single digital patient record, electronically accessible via the Welsh Clinical Portal making the haematological care record available across Wales to all the clinical professionals who need access to continue the care of the patient. Any amount of information from confirmed diagnosis to comorbidities can continue to be added and will be available in their outpatient record.

Richard says: "Clinicians like it because it's quick and easy to use and for us it is better than free text." It also enables the coding team to deliver the analysed data back to clinicians, showing how the data can be used.

While some clinicians enjoy the ease of using SNOMED, it has brought with it the need for a change in culture as it requires them to be using the computer while the patient is still with them, rather than writing out paper notes at a later date.

6.0 What impact will technology and AI have on clinical coding?

Technology is rapidly evolving and in its tech vision of the future the NHS wants to become a truly data-driven system which can constantly optimise the care it gives through data, analysis and research. But in order to do this major change needs to take place.

In our pre-roundtable survey, 90 per cent of respondents felt that a greater role for technology would help to improve data quality.

Organisations and even departments within organisations have been operating as silos with, until recently, little or no national guidance about how technology such as EPRs should be put in place and what needs to be considered or included. As a result, each trust is working differently.

To ensure optimal data collection EPRs need to conform to a national structure with guidelines as to what and how information should be recorded, enabling clinical coders to quickly validate codes, freeing up time to analyse the data and create insights to enhance patient care.

AI is a hot topic, yet opinion currently seems divided around whether it is likely to have any impact on clinical coding in the near future. While some think that the use of some types of AI like NLP are a long way from being of use, others are of the belief that technology is rapidly progressing and will soon be playing a part in enhancing the work of the clinical coder.

Roundtable attendees felt that NLP is currently not yet advanced enough to truly augment the role of the coder. Michael Jones says: "I have seen systems that can handle negation but, in reality, clinicians don't document in this way. Clinicians all use acronyms and so many of them are the same, how will AI know which one is appropriate to use?"

To be fit for use in a service which by its very nature must have a very high threshold for failure, NLP must evolve beyond its current state and have the ability to understand context and idiosyncrasies such as clinician shorthand.

Michael says: "We have to ensure that what we are doing is not going to fail in areas that could put a patient at risk. It's why the NHS is so far behind other industries."

Richard Burdon believes there will always be a place for people as creating records that are too rigidly structured can result in a loss of information. Coders need to be able to create that connection between the narrative and the code.

He says: "Structured records will help to carry out tasks more quickly, but this runs the risk of losing some valuable data. When people think of SNOMED and NLP, they think they will have a system that will do it all, but clinicians need to be able to write a narrative rather than having structured data. They would lose a lot of data if they could only use a code. Text is the one way they can get that across and trying to translate text into code will mean some of these connections are lost."

However, technology is moving on at pace and the use of NLP is already being used in clinical contexts at the frontline of the NHS. Adam Theobald says: "In the next few years we would expect that text would be given structure by an NLP which could read the context of clinical notes and suggest codes based on that."

The approach is something that is already being explored at King's College Hospital, in the form of Cogstack, a database of electronic information all in one place, which is currently being piloted.

Adam says: "It you want to know how many patients had flu last year, it can read all those records and come back with an answer. That can be adapted to the needs of a clinical coder. We want to be able to look at a patient record and have a decision support tool which can suggest a primary diagnosis."

While some coders fear that the introduction of AI will put their jobs under threat, the intention is to make it easier and quicker to do their jobs and ensure more accuracy.

Adam says the use of AI will free up coders to talk to clinicians, helping to build a picture of the need for accurate and consistent information. He says: "We would expect it to save time but also AI will miss less. In a process where humans play a part there will always be a margin for error, but AI will always be able to look something up. The output can only be as good as the input and if the information isn't consistent the output won't be consistent either."

Pre-coding in real time during an admission
Well-structured EPRs can have multiple benefits for the clinical coder, particularly the ability to begin automated pre-coding of some conditions, where SNOMED codes have been used. This does not mean the coder role becomes redundant, but it does save coders time.

Michael Jones says: "The coder will still need to look into the detail and make sure everything is coded appropriately, but it gives them a starter for ten. Reading through the records takes so much time. So many documents get generated and it is very easy to miss things."

Richard Burdon believes there will come a time where everything will be pre-coded: "In an ideal world we would want a discharge summary where a clinical record contained coded content and for the system to be able to automate that."

Such technology would ensure the ability to be able to code in real time, or as close to real time as possible. Real-time coding has distinct benefits in terms of decision making and also accuracy of information.

By being able to start coding on admission rather than discharge, the patient journey is still fresh in the mind of the clinician, not several weeks down the line. It also opens up the possibility of getting ahead of the game by creating predicted pathways, for example ensuring that social services teams are in place before a patient leaves.

7.0 Solutions to challenges

Developing a clear mandate for the digitisation of NHS records
Putting in place a clear mandate for developers and trusts as to what must be included in EPRs as well as including insight from coding teams will help to ensure improved data quality.

Instead of having to search through pages of information, or work from several different systems with several different passwords, coders would ideally be able to access all relevant information through one system.

Michael Jones says: "To assure data quality and improve confidence in the data our staff must have the correct tools to support them in their roles and minimise problematic information sources. Staff should be empowered to use these tools to their fullest potential to overcome the daily challenges facing clinical coding departments and those reliant upon that data to extract the most value for NHS organisations, patients, and the wider public."

At East Kent Hospitals University Foundation Trust, work is currently underway to move from paper notes to digital. Coding managers are working with the Trust's T3 development team and this has helped them to see how coders currently extract clinical information and the type of information coders focus on to generate coded data representative of the activity spell.

Denise Blackman says: "It's been really helpful for the person carrying out the work to see how we work, what information we need and how quickly we need to extract it."

The system is currently disjointed and designed by technology experts for use by clinicians, yet does not take into account a process that can standardise and regulate how such records should be kept.

Carolyn Cooper says: "We have cut corners and assumed a well-constructed computer system designed by technology experts in conjunction with brilliant clinical minds will automatically produce information gold.

"It's not going to be enough; we have laid the pipes but left them disconnected and we need a data production management system to join them up. We need a process that facilitates the extraction of clinical documentation and translates it into meaningful and useable information, the very definition of clinical coding. In short, our next step must be to transform the coding process to include influencing and facilitating record keeping behaviours as well as classification. We need a five-step coding process; structure, analyse, locate, assign and verify."

Updating and better regulation of national standards will also help to bring about change. A national mandate to set out what should be included in patient notes and where that information should be kept would help to create consistent and uniform data collection. Bringing standards in line with how EPRs work, rather than being based around paper notes, will enable coders to confidently validate the information they have through the resources available to them.

Addressing the cultural challenges around the importance of coding
Communicating the vital role of clinical coding teams in the collection of data that can help to transform patient care is crucial, not just to clinicians and other health care professionals but also to trust boards.

The NHSX tech vision of the future sees leaders and managers across the system being able to use data and innovation to keep improving outcomes and the experience of both staff and patients, leading a data-driven health and care system. It also sees insights from analytics driving continuous clinical and operational improvement as well as informing planning activity.

With well-structured records and regulation of national standards, clinical coding departments will play a vital role in providing the data and insight that will enable trusts to meet that challenge. However, to enable their role to be recognised, it is imperative that clinical coders can highlight their value, demonstrating the wide-ranging benefits that can be brought to each trust through the use of high-quality data, rebranding themselves as health informaticians or as clinical data experts.

Gareth Jones, Clinical Coding Improvement Manager, Manchester University NHS Trust, says: "The key thing we don't do well is demonstrate what insights coded data can provide – there are things we could show that would really make people sit up and take notice."

At the Manchester trust, coded data was used to reduce the amount of blood wastages, ensuring blood stocks were used more appropriately.

Gareth says: "Coded data was used to identify cohorts of patients and triangulate blood use data against those spells of care and we were therefore able to say that for a certain procedure we would expect to see a given volume of blood used."

The view of a coder as a back office data input clerk must be dispelled and replaced with one of a highly skilled data analyst or health informatician that has a pivotal role in providing the high-quality data needed to ensure good population health management or proactive or predictive health tools.

Clinical coders must be able to communicate effectively with clinicians, to reinforce the need for clear and concise information on patient records, educating them as to how that information could be used in the future, rather than just being viewed as a financial tool. Carolyn Cooper believes clinical coders should have a seat at the table to influence the discussion around data.

She says: "Clinical coders have a holistic knowledge of the hospital and they understand how information flows. They understand different data sets and many of them also have medical knowledge. We have coders who stand beside clinicians and also clinicians who come and talk to our coders about procedures."

Making the case for good record keeping by providing the tools for better patient care

At Guy's and St Thomas's Hospital, Carolyn Cooper has developed a new clinical strategy that is based around creating more structure, educating clinicians about how, why and what to record, and giving them record keeping guidance so that clinicians can record information themselves in a structured way that can then flow through the system. Providing evidence of how data can improve patient safety and day-to-day working lives is imperative to ensure good collaboration around record keeping behaviour and standards.

As part of this strategy, a number of tools have been developed by the coding department that illustrate to clinicians how well recorded data can lead to day to day improvements in patient care.

One such tool is a script using augmented clinical intelligence that tests kidney function. Test results are reviewed and an alert is sent to a clinician advising that the patient might have acute kidney injury (AKI) and asking for confirmation. If the clinician confirms

yes, that can be coded as such rather than the coder having to make an assumption from the information provided.

Using coded data, it has also been possible to extract all the BMI results for patients, highlighting where obesity can be a factor and where dietician involvement could be beneficial. Clinicians have also asked for undernourished patients to be identified in this way too.

The team also has data scientists looking at how they produce predictive models that can look for examples of efficiency, such as trying to reduce numbers of Do Not Attends (DNAs)

Using Python programming, a DNA predictor has been developed, looking for those patients who are less likely to turn up and putting in extra patient prompts or initiatives to remind them about their appointment.

8.0 Recommendations

8.1 End the variation in job descriptions
With no official guidelines as to the job description, along with a lack of structure around pay bands (they can be different across the country), the role of a coder can be vague and therefore not as high profile as it should be. Creating national guidelines around job specification and paygrade as well as ensuring extra training in areas such as medical knowledge (as in Wales) and softer skills such as communication can go some way to acknowledging the importance of well-trained and highly skilled clinical coding staff.

8.2 Ensure a UK-wide SNOMED roll-out
To ensure trusts can reap the benefits, SNOMED must be rolled out across the healthcare system and used in a consistent manner. NHS Digital could play a closer role in its implementation, issuing a clear mandate for system developers to follow to ensure all systems can incorporate its use and also working with trusts to set out its vision of what SNOMED should look like and how it should be used.

A multi-disciplinary team with skill sets from clinicians, IT, tech and coding must come together to ensure the implementation will be of benefit to all who use it, issuing clear guidelines to end users about the importance of its proper use.

8.3 Consider the future role of the coder and support with training
Clinical coding as a profession needs a new strategy to help it evolve through the use of technology over the next five to ten years. Its value must be recognised and it must start to play a bigger role in improving patient services.

Our survey found that 86.6 per cent of respondents felt that the role of a clinical coder will change in the next five years. Clinical coding must become a nationally structured role with specified skills that are recognised in terms of the pay band. In many trusts, the pay scale begins at Band 3, yet the skills needed are many and the end purpose of the work coders do can have a huge impact on improving patient care.

The NHS tech vision of the future highlights the vital role of analysts who need to be given support and training to ensure they are maximally effective and properly valued. As part of the plan the NHS will require every provider to be data driven, with insights from analysts driving continuous clinical and operational improvement as well as informing planning and activity. Clinical coders must be the cogs in the wheel of this vision and must be properly supported and trained over and above the current standards training, including in softer skills such as communication to enable a confident exchange with clinicians when necessary.

Boards and senior staff must be educated to realise the importance of clinical coders and their worth to the organisation, investing and supporting teams to move away from the traditional view of data inputters and helping to create successful teams of health informaticians.

8.4 Move towards real time coding
Using EPRs should enable coders to begin their work during the patient spell rather than after discharge. The patient will still be fresh in the mind of the clinician to enable timely validation about information. It will also enable predictive care pathways to be created to help improve patient care.

8.5 Better coding standards and a mandate to enforce better quality
Central to ensure the role of the clinical coder moves beyond simple data inputting is the need for a reform of standards and a mandate to enforce the use of them. Current standards must be updated with a major focus on

the change to EPRs and the resultant changes in work practices for clinical coders.

A clinical coder's time is better spent pulling quality data that can be used to drive patient improvement rather than wading through pages of patient notes and documents with scattered free text or scribbled notes in the corner of the page.

Currently the standards are putting the onus on the coder to interpret the notes and take a judgement, which can lead to inaccuracies within the data.

Our roundtable discussion revealed that clinicians often fail to meet all coding requirements when recording clinical events and a lack of training or robust educational programmes has meant many clinical staff members are uncertain as to what is required of them. Each trust working in a different way leads to information being collated differently with a risk of variation. A mandate to enforce quality must see clinicians and health workers adhering to guidance that dictates where, how and what information must be documented, making this consistent across all trusts.

8.6 Improve knowledge sharing and understanding from trust boards about the importance of good quality data

With an understandable focus on financial initiatives, it is vital that trust boards look beyond this to gain an understanding of the value of data. Rather than looking solely at how many records are being processed each day, the focus must be on the value gained in terms of service planning.

Creating a strong link between coding departments and the trust board, ensuring influence at board level, can increase that understanding of the need for good quality data and the impact that it can have.

It is widely acknowledged sharing best practice is not widely adopted within the NHS despite encouragement to do so. This has been reinforced by NHSX, which says that trusts must pursue their own innovations and share with other trusts rather than relying on third parties. However, trusts operating in silos with a variety of different systems can create too much variation in data.

To truly benefit from good quality data, creating joined-up care across the system, it is vital for trusts to be able to share that data around the country and establish a culture around the value of data information.

8.7 More guidance and expert support from NHS Digital

While the standards are set by NHS Digital, there is little guidance on how they are used by each trust. It is possible to interpret the standards in different ways and policies change not just from trust to trust, but sometimes from department to department or site to site. If every trust works differently it creates variation in data.

Roundtable attendees felt that a more detailed insight into NHS Digital's vision and understanding of the overall aim and need of the standards would help consistency and regulation.

Denise Blackman says: "It would be helpful to have someone from classification come along and say how they wrote the standards and what they wanted to achieve from them. If you speak to ten different people about the standards, they all have different ways of interpreting them."

When it comes to introducing technology, all trusts are operating to their own schedule, using different systems and different rules. More guidance and clarity from NHS Digital would be beneficial to support trusts. Our survey showed that 74 per cent of respondents felt that SNOMED CT would have an impact on the day-to-day activities of clinical coders, yet something of this magnitude has been left to trusts to implement themselves.

Clearer guidelines and expert support would be beneficial to help trusts put in place a system which could have a significant impact on the recording and documentation of notes for clinicians and the collection and validation of data for clinical coders.

8.8 **Improve communication with clinicians**
Improved communication with clinicians means that coders can validate the information and increase its depth by further understanding the specifics of the patient diagnosis and treatment, leading to better data, yielding a greater insight into areas where service improvement is needed. Improved training will ensure clinical coders have a greater understanding of medical conditions and the confidence to talk with clinicians, highlighting the importance of their role.

Job spec for clinical coder 2025

– Rounded, educated, articulate and confident
– Has the ability to talk about their profession and highlight the value and importance of clinical coding and how best to leverage the data

– Knowledge of anatomy and physiology
– Ability to analyse a source document and become a quality control auditor of information
– Task-focussed, resilient, with the ability to study

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