TITLE: Developing an autonomous coding solution: Canada, UK and Australia – results across three ICD versions

Introduction

In recent years efforts have been made to automate clinical coding to ease the burden of clinical and administrative tasks and improve documentation and collection standardisation. In 2024, Beamtree (an Australian provider of coding quality and AI solutions) presented its work in partnership with healthcare services in Australia, New Zealand and the UK to deliver a Proof of Concept for transparent and auditable autonomous coding, retrospectively coding records.

In 2025, Beamtree has worked with providers in three countries to jointly develop and implement a Minimum Viable Product (MVP) autonomous coding (no-touch) solution, localised for classification systems and coding rules, with results presented here:

- Barwon Health, Australia, ICD-10-AM/ACHI/ACS
- Milton Keynes University Hospital Foundation Trust (MKUH), UK, ICD-10/OPCS-4
- Kingston Health Sciences Centre (KHSC), Canada, ICD-10-CA/CCS

Methods

The MVP will be built on an AI 'expert learning system', RippleDown. RippleDown is a curated AI expert system (a multi-pass interference engine) which supports subject matter experts (clinical coders) to safely apply expertise at scale to deliver operational, workforce, financial and reporting efficiencies while improving data quality. The coding rules will be built by local experts in partnership with the hospital Coding Managers.

The MVP will read patient records from the Electronic Medical Record (EMR) and other systems as required, including scanned records within the EMR using machine learning to automatically extract text and data for further processing. Autonomously coded episodes will then be sent to the local Patient Administration System or reporting system. Coding decisions and outputs will be fully auditable by the hospital Coding Manager.

Results

At all three sites, the aim is to run a live, near-real-time MVP to demonstrate autonomous coding can be implemented without impacting the manual coding workflow and process. Each site will measure general and localised return on investment, including relating to cash-releasing, qualitative, patient safety, sustainability and societal measures.

At MKUH, the project will refine the rules built in 2024 to achieve 95% accuracy (or at least as good as manual coding); expand the ruleset to automate up to 25% of volume; and innovate with machine learning based rule-writing to industrialise rule building and correction. At Barwon Health, the trial will be applied to all oncology admissions, coding as many as possible within six months. At KHSC, 10% of inpatient episodes are expected to be automated in the first few months, with at least 20% within 12 months.

This paper will report on the outcomes of all three projects including the above criteria and feedback from the site Coding Manager.

Discussion/Conclusions
The advancement in autonomous coding is crucial in enhancing the efficiency and accuracy of healthcare data management globally. As healthcare systems increasingly rely on digital solutions, autonomous coding systems can significantly reduce the burden on human coders by automating routine coding tasks, thus minimising errors and improving data quality. This needs to be achieved in a transparent, localised way, trusted and adaptable by local coding teams to realise benefits globally.

497/500 words

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Topics
- Innovations in case-mix, data and technology.
- Advancements in coding, classification systems and data quality.
- Artificial intelligence & case-mix: in services

Keywords
- Autocoding
- Clinical coding
- Automation
- AI
- Machine Learning