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Review Article

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A Comparative Analysis of Financial Tariff Coding Accuracy Between Non-Clinical Coders and Orthopaedic Surgeons in A Large District Hospital–A Prospective Controlled Study

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ABSTRACT

Accurate coding for trauma and orthopaedic surgical patients is crucial for reliable data collection, influencing income generation, national statistical analysis, and clinical performance benchmarks. Inaccurate coding can lead to misrepresentation of patient care, impacting the generated financial tariff. This study compares the accuracy of financial tariff coding between non-clinical coders and orthopaedic surgeons.

In a prospective controlled study, 20 patients undergoing elective orthopaedic procedures were randomly selected from 219 consecutive admissions. Their procedures were independently coded by non-clinical coders (control group) and the surgeons (study group).

Tariffs generated by both groups were then compared. Results showed that non-clinical coders produced identical tariff codes in 60% of cases, higher tariffs in 30%, and lower tariffs in 10%. On average, non-clinical coders generated £114.7 more per patient than the surgeons.

These findings suggest that non-clinical coders can efficiently generate accurate financial tariffs, potentially reducing the need for direct input from busy orthopaedic surgeons

Keywords: Coding, Clinical Coding, Healthcare Resource Groups, Financial Tariff, Coding Accuracy, Orthopaedics

Introduction

Since 2004, the NHS in the United Kingdom has been funded via a 'payments by results' system whereby hospitals are paid for the work they do instead of being allocated a certain amount to spend each year [1]. Every patient treated in hospital is coded into a Healthcare Resource Group (HRG) which represents a group of diagnoses and interventions that use a similar amount of NHS resources. Each HRG is associated with a national tariff. Thus, the hospital receives a certain sum of money, which reflects the level of resources used in treating a particular patient. For example, more money would be received performing a total knee replacement on a patient with multiple co-morbidities than performing the same procedure on an otherwise fit and well patient. It was thought that such a system would encourage a more efficient health service, given there is a monetary incentive attached to performed activity.

There is a complex system of clinical coding to produce a HRG for a patient's interaction with the health service. Primary diagnoses and co-morbidities are coded using the International Classification of Disease (ICD-10), and any procedures performed are coded using the Office of Population Census and Surveys (OPCS) classification system. Therefore, for each

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patient a variety of diagnostic and procedural codes are entered and processed by a computer system to give a corresponding HRG which is used as the unit of payment.

Coding is mostly done by 'clinical coders' who are professional coders but not clinical staff nor involved in the patient's care. Therefore, they rely on evaluation of clinical records following a patient's discharge to produce codes that reflect clinical activity. Numerous studies have demonstrated drawbacks in this coding system [2,3]. The expanding co-morbidities of our patient populaton can lead to more complex coding. Without sufficient clinical knowledge, professional coders may make errors generating HRG codes which do not accurately reflect the level of activity taken.

This study seeks to compare the accuracy of financial tariff coding performed by non-clinical coders versus clinicians in the field of orthopaedic surgery, with the aim to address whether non-clinical coders can achieve similar or superior accuracy in tariff generation.

Methods

This prospective controlled study involved the random selection of 20 patients from 219 consecutive admissions to the orthopaedic department at Royal Wolverhampton NHS Trust, in West Midlands of England over one week in 2022. The procedures performed were independently coded by two groups: non-clinical coders (blinded control group) and three orthopaedic surgeons (study group). The data for each patient was systematically reviewed, including clinical notes, test results, surgical reports and family doctor letters, with each case being verified by the authors three times to ensure accuracy.

HRG tariff codes generated by each group were then compared. The procedures covered in this study included a variety of elective orthopaedic surgeries, such as joint arthroplasty, knee arthroscopy, and carpal tunnel decompression. [Table 1] Statistical analysis was performed using Microsoft® Excel® with randomisation through an online random number generator [4]. The agreement analysis between the study and control groups was carried out using the Shapiro-Wilk test [5].

Table 1: Showing the generated tariffs for each of the 20 randomly selected patients as calculated by the non-clinical coders and the orthopaedic surgeons in the control and study groups, respectively

		Tariff in British Pounds		
Patients	**Procedure**	**Control group**	**Study group**	**Difference**
1	Shoulder injection	480	480	0
2	Trapeziectomy	3209	3209	0
3	Total Hip Replacement	6913	6267	646
4	Hip injection	563	480	83
5	Shoulder injection	536	1797	-1261
6	Caudal Injection	480	595	-115
7	Hip injection	501	480	21
8	Carpal Tunnel Decompression	1091	1091	0
9	Total Hip Replacement	6267	6267	0
10	Total Knee Replacement	6342	6342	0
11	Shoulder injection	480	480	0
12	Knee arthroscopy	9060	6740	2320
13	Knee arthroscopy	1793	1793	0
14	Total Knee Replacement	6342	6342	0
15	Knee arthroscopy	3965	3965	0
16	Trigger finger release	2171	2171	0
17	Hip injection	880	480	400
18	Total Hip Replacement	6267	6068	199
19	Fingernail ablation	409	409	0
20	Hip spica application	480	480	0
	Mean SD	2911.5 2876.3	2796.8 2565.6	114.7 621.8

Results

In our analysis, non-clinical coders and orthopaedic surgeons generated identical HRG tariff codes in 60% of cases. In 30% of cases, non-clinical coders assigned higher tariffs with a mean difference in tariff of £611.5 (SD±867), while in 10% they assigned lower tariffs with a mean difference in tariff of £688 (SD±810). The mean tariff generated by non-clinical coders was £114.7 higher per patient compared to the surgeons. The Shapiro-Wilk test revealed excellent agreement between the two groups, with an intraclass correlation coefficient of 0.987 (95% CI 0.968-0.995). It is important to note that values exceeding 0.9 are considered excellent for absolute-agreement statistical analysis purposes [6].

Discussion

In this study, we found that non-clinical coders performed comparably to clinicians in most cases and, in some instances, generated higher tariffs—particularly for common procedures such as total hip replacement and knee arthroscopy, resulting in additional earnings of £199 and £2,320 per case, respectively. Non- clinical coders also undervalued the tariff in only two cases, achieving a 90% accuracy rate. This positions their performance near the top of the reported accuracy range for non-clinical coders of 52-98% [2].

This strong performance may be attributed to the clinical coding practices within our institute, where coders analyse a comprehensive set of clinical documentation, including notes, test results, operation notes, and GP letters. In contrast, hospitals that rely solely on discharge summaries for coding have reported significantly lower accuracy, with nearly half of cases miscoded and an average underpayment of £290 per patient [7].

In two procedures – shoulder injections and cauda epidural injections – clinical coding by orthopaedic surgeons outperformed that of non-clinical coders. Given the broad range of indications for injections, clinical expertise can allow more accurate interpretation and coding of the primary diagnosis, a key factor in determining the HRG for a patient and associated tariff.

Although non-clinical coders have shown good results in financial tariff generation, the significance of clinician input cannot be understated in precisely documenting fundamental clinical details such as baseline clerking, the specific procedure performed, equipment utilised and encountered complications. Clinical coders heavily depend on these essential clinical data to generate the appropriate tariff.

The potential benefits of non-clinical coders include freeing up surgeons to focus on patient care, which could improve overall operational efficiency and patient outcomes. Additionally, our findings support the idea that non-clinical coders can optimise financial tariff generation without the direct involvement of surgeons, making the coding process more efficient.

Limitations: Only non-clinical coders were blinded, whilst the surgeons in the study group were deliberately not blinded to actively seek the best possible tariff, potentially introducing bias favouring the surgeons; but despite this the non-clinical coders performed equally if not better at times than the surgeons notwithstanding.

Conclusion

Our study suggests that non-clinical coders can generate accurate financial tariffs comparable to those produced by clinicians, without requiring direct involvement in the coding process by clinical staff, provided documentation is comprehensive. This finding has important implications for the efficiency of coding processes in orthopaedic departments, potentially reducing the burden on surgeons and improving overall workflow. Further research with larger sample sizes could further validate these findings and contribute to the optimisation of clinical coding practices in healthcare.

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