Implementation and Evaluation of a Clinical Data Management Programme in a Primary Care Centre

Abstract:

Electronic health records (EHR) support clinical management, administration, quality assurance, research, and service planning. The aim of this study was to evaluate a clinical data management programme to improve consistency, completeness and accuracy of EHR information in a primary care centre with 10 General Practitioners (GPs). A Clinical Data Manager was appointed to implement a Data Management Strategy which involved coding consultations using ICPC-2 coding, tailored support and ongoing individualised feedback to clinicians. Over an eighteen month period there were improvements in engagement with and level of coding. Prior to implementation (August 2011) 4 of the 10 GPs engaged in regular coding and 69% of their consultation notes were coded. After 12 months, all 10 GPs and 6 nurses were ICPC-2 coding their consultations and monthly coding levels had increased to 98%. This structured Data Management Strategy provides a feasible sustainable way to improve information management in primary care.

Introduction

Managing clinical information effectively is an essential part of all medical care. Electronic health records (EHR) support clinical management, administration, quality assurance, research, and service planning. The Health Information and Quality Authority (HIQA) have emphasised the need for correct and up-to-date data for the provision of high quality clinical and social care. The development of robust electronic information systems and the increased use of EHRs has been a priority in national health policy for over a decade. Several strategy documents have highlighted the importance of developing an EHR that can be shared across health services, and the need for standardised methods for assessing data quality. For many people the majority of their interactions with health services occur in general practice, therefore high quality data at general practice level are essential for establishing a comprehensive national electronic patient record.

The number of computerised practices and the use of EHR by Irish GPs has grown substantially over the past fifteen years. Incentives to computerise practices include funding from Indicative Drug Budgeting, computerisation grants and training programmes run in conjunction with the Irish College of General Practitioners. Historically, data sources in primary care in Ireland have developed in an uncoordinated way and data are often fragmented, not easily accessible, and difficult to compare across providers. The absence of basic information on the pattern, intensity and cost of activity in primary care has been recognised as a major impediment to the proposed shifting of resources from secondary to primary care. The establishment of a sentinel practice network has been recommended to address this deficit of core activity data in primary care. According to primary care clinicians, missing clinical information is common, multifaceted, likely to impact on time and may adversely affect patients. Consequently, EHR data quality, uniformity and retrievability are key challenges in primary care. To date, Ireland has not adopted a national standard for coding primary care data and the use of coding by GPs is variable. Clinical coding is a way to record structured data which are then readily searchable by the computer system. However, a number of barriers to clinical coding have been highlighted including the limitations of current coding systems and the level of specificity of codes available, the skills required, and time and attention required to record structured data in the consultation, primary care professionals motivation, and priorities within the organisation.

Although there is overwhelming acceptance of the importance of coding as part of general practice data management, high quality coding of clinical data is not yet ubiquitous. To address the barriers to clinical coding and data quality, a Data Management Strategy (DMS) was developed and introduced in a large primary care centre. The aim of the strategy was to facilitate the recording of information in a unified, logical and secure manner and to improve levels of coding within the centre. This would allow for more accessible high quality information in the EHR to support clinical management, administration, quality assurance, service planning and research. The objective of this study was to evaluate the implementation of the DMS among GPs and nurses with reference to uptake of coding, impact on audit and pattern of activity recorded over an eighteen month period.

Methods

The DMS was implemented in Livinghealth Clinic as a joint collaboration between the Department of Epidemiology and Public Health University College Cork, College Clinical Centre, a Livinghealth Clinic (LHC) is an advanced primary care centre in Mitchelstown, Co Cork since November 2008 with 10 GPs, 6 nurses, a Clinical Data Manager (CDM) and a patient database of 22,000 patients. In July 2010 a Clinical Data Manager with a nursing background was appointed to oversee implementation of a DMS. This role involved providing information and training on data protection procedures, clinical disease coding and audit. The CDM monitored the consultation patterns, provided on-going support, tailored feedback to clinicians, and monthly practice management reports. A multidisciplinary coding team including GPs, nurses, the CDM and the practice manager was established. The clinical coding system ICPC-2 (International Classification of Primary Care) was adopted as the coding standard. ICPC-2 was introduced in 1987, and recognised by the World Health Organisation as a classification system for recording data in general practice.
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The primary outcome was the proportion of GP and nurse recorded notes that were ICPC-2 coded, as an indicator of levels of consultation coding. This measure captures patient-related activity beyond face-to-face contact, for example phone calls or writing reports. Furthermore coding of multiple issues within a consultation is represented in this measure. Secondary outcomes included the number of staff engaging in regular coding and changes in levels of coded consultation notes over time. Data on coding levels were extracted through the GP software system over 18 months at four time points to monitor progress - October 2011, April 2012, October 2012 and April 2013. Descriptive analysis was carried out to examine coding levels and changes over time.

Results

Encourage engagement in coding & improve levels of coding in practice

Prior to implementation (August 2011), 4 of the 10 GPs engaged in coding and on average 63% of their consultation notes were coded. Within 2 months 9 GPs were engaged in ICPC-2 coding and 71% of consultation notes were being coded. Figure 1 illustrates the variation across GPs and the improvement in coding levels over eighteen months. The extent of improvement among GPs ranged from an 8% increase in coding levels to a 98% increase.

As Figure 2 illustrates, nurses were coding 91% of their notes at baseline (Oct 2011) compared to GPs who were coding 71% of consultation notes. After 12 months, monthly coding levels among GPs had increased to 91.5%. Figure 2 illustrates the marked improvements within the first six months of implementation and more modest changes in the last 12 months.

Adoption of ICPC-2 coding as a practice standard

Figure 3 illustrates the top ten codes used in October 2012 and April 2013. At both time points, blood tests were the most commonly applied code. There was no dramatic change in the types of activity captured as coding levels increased.

Discussion

The aim of this study was to examine the impact of a Data Management Strategy on engagement in and levels of coding in the primary care setting. The DMS was envisaged as a way to improve consistency, completeness and accuracy of EHR information. Over an eighteen month period there was an increase in the number of GPs and nurses engaging in coding. Furthermore, the overall level of coding increased from 71% to 98%. The results suggest that computerisation and coding can be incorporated into the patient consultation. The DMS was developed to address some of the barriers to implementing health information systems in general practice, these include lack of time, privacy concerns, previous experience and a lack of support. The DMS involved the introduction of a Clinical Data Manager to provide ongoing support and training to practice staff. The availability of individual support, assessment, feedback and tailored training appears to improve engagement in clinical coding. Hence, the development of Health IT infrastructure at a national level will require investment and targeted resources such as support, specific training, strong IT management and the standardisation of medical terminology.

The ICPC-2 coding framework was adopted in this initiative to improve the consistency of coding in the centre. This is a step forward as Ireland has not adopted a national standard for coding primary care data to date. However, there are challenges to the implementation of coding systems such as the absence of certain codes and the suitability of others. To address this shortcoming, multidisciplinary coding team meetings were held to discuss gaps in the coding system and to reach consensus on standard codes. The most commonly used consult codes were blood tests, blood pressure checks, Lund test results, administration procedures and cough. The CDM provided ongoing feedback at an individual practitioner level and monitored monthly progress using customised reports. The adoption of a DMS and standard coding practice has ongoing implications for clinical practice, quality assurance, clinical governance and research. As a result of the DMS a structured audit programme is in place, and all patients taking Warfarin now have the indication for therapy ICPC-2 coded into their EHR. All medical letters received by the clinic are examined for relevant information, for example procedures and results, this is then ICPC-2 coded by the CDM into the patients EHR, expanding the information in the past history and enabling classification of the episode from reason-for-encounter to outcome. Data from general practice in other countries are seen as an important and rich source of information about the health of their population, their behaviours and health service utilisation. Furthermore EHR notes are expected to have a central role in healthcare commissioning and this programme could be seen as a way to access the untapped potential of Irish primary care data.

The main limitation of this study is the lack of information on quality of coding before the intervention visit. While the use of coded consultation notes as an outcome measure allowed us to capture activity in general practice beyond the face-to-face patient consultation the quality and depth of coding was not assessed. Additionally, un-coded EHR notes such as out-of-hours GP entries need to be identified for each GP to accurately capture their level of coding activity. This study examined levels of coding before and after the implementation of the DMS. However, our
conclusions are tempered by the lack of a comparable control group. While the results are encouraging, this is only the first step in a continuous quality improvement process and more focus is needed on the quality and depth of coding. It will also be important to examine the impact of this organisational change on patient care and outcomes. A qualitative follow-up study is being planned with practice staff on the advantages and disadvantages of the initiative, as recording structured data during the consultation can be distracting and depends on the level of motivation among professionals and the priority within the organisation. The learning from this initiative could be applied to other general practices to allow data to be compared between practices, which ultimately could lead to improvements in routinely collected clinical data quality and support the creation of a national primary care database of international comparability.

In conclusion, this study found increases in engagement with and level of ICPC-2 coding following introduction of a structured supported DMS. Clinical coding at the levels achieved and sustained by GPs in this intervention is one way of successfully leveraging technology to potentially improve patient care and primary care information management. The results suggest that ongoing support, education and training, and incremental change can improve data quality. This strategy provides a feasible sustainable way to improve primary care information management in Ireland.

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References
1. Missing Clinical Information During Primary Care Visits. Smith et Al., JAMA. 2005; 293, No. 5
2. What you should know about Data Quality. A guide for health and social care staff, published by the Health Information and Quality Authority 2012
5. Primary Care: A New Direction. Action 8, Department of Health and Children
9. The Attitudes of GPs Towards Computerisation on the Island of Ireland, G Lordan, C Normand, Department of Health Policy and Management, Trinity College Dublin, Report for the National General Practice Information Technology Group (GPIT).


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