Designing Templates of Clinical Documents to be Suitable for Care, Reimbursement and Research

Vytenis PUNYSab, Elona JUOZAITYTEc, Laimas JONAITISd

a Department of Multimedia Engineering, Kaunas University of Technology, Lithuania
b IT Services Dept., Hospital of Lithuanian University of Health Sciences, Lithuania
c Oncology Clinic, Lithuanian University of Health Sciences, Lithuania
d Gastroenterology Clinic, Lithuanian University of Health Sciences, Lithuania

Abstract. Electronic clinical documents used within Hospital Information System should be designed in a particular way to facilitate efficient healthcare (enabling access to needed patient information in time), to provide seamless data aggregation for reimbursement and management, and also to support and to provide data for research purposes. In order to minimise human efforts to enter the clinical data the highly structured templates for clinical documents are suggested. Comprehensive templates contain multiple coded entries for procedures, diagnostic and clinical data. Most frequent clinical situations should be "described" by just marking the necessary coded entries from the template, and free-text is used in exceptional cases only. The information necessary for reimbursement or research is extracted automatically from collected clinical documents using the coded data inside them, and then the extracted data are routed to appropriate external medical insurance information system or internal research database.

Keywords. Clinical documents, templates, DRG, LOINC, HL7, SNOMED, DICOM.

Introduction

The decision of the Lithuanian Government to introduce the reimbursement system for healthcare services based on the DRGs (Diagnosis Related Groups), raised a particular objectives for the healthcare institutions. Their information systems that had been used for management and accounting of healthcare services being provided, are supposed to be improved to meet new reimbursement rules, and to introduce EHR elements as it was planned before.

The new reimbursement rules require considerably more coded information about provided healthcare services to be sent automatically to the State Patient Fund. Most of healthcare professionals have limited experience in coding of such information, and they want to minimise their efforts in this without sacrificing the reimbursements.

Therefore, following the advisable practices [1-2], the decision has been made to use clinical documents in a way, that eliminates multiple entries of the same data, and

1 Corresponding author: V.Punys, Department of Multimedia Engineering, Kaunas University of Technology. Address: Studentu str. 56-305, LT-51424 Kaunas, Lithuania. E-mail: Vytenis.Punys@KTU.LT
enables re-use of entered clinical data for both reimbursement and patient care. The structure of a clinical document could be designed in more advanced and structured way, if it is based on the data collection for research purposes in that particular medical area. Finally, such a document will be beneficial for all three objectives: patient care, reimbursement and research.

1. Coded data entries in document templates

According the defined national e-Heath framework [3], the clinical documents should meet the HL7 CDA requirements. Luckily, these allow the use of document templates, that should be carefully designed in order to avoid coding errors introduced by clinicians. The templates, jointly designed by leading professionals and medical statisticians (coding experts), contain the necessary data codes:

- Diagnostic (ICD-10-AM) and performed procedure (ACHI) codes necessary for the reimbursement.
- Hierarchical data structures based on SNOMED CT concepts and codes are prepared to describe clinical findings and status of a patient for most frequent clinical situations.

While providing care, a professional needs only to mark relevant coded entries in a selected template. The clinical document is then composed automatically, and only marked data elements remain in the document.

2. Introducing templates for clinical documents

The clinical documentation templates had been developed and introduced for diagnostic imaging procedures and oncological treatment first, as these areas were defined as most important and appropriate, and where most initiatives in creating structured documentation already took place. The lowest priorities were assigned to those areas, were subjective assessment of patient status is being collected and recorded.

The approved list of imaging procedures has been taken from the State Patient Fund. The appropriate codes for imaging procedures were easily matched using the DICOM-SNOMED microglossary, introduced to the DICOM standard rather long time ago [4] (in 1998). They had now been accompanied by the corresponding SNOMED CT concept identifiers.

![Radiotherapy (RT)](radiotherapy.png)

**Figure 1.** Structure of Radiotherapy report (personal data missing)
The oncology clinical application covered the following documents:

- Clinical and pathological assessment of a disease according to the TNM scheme and including some genetic data (if available);
- Surgery notes (RF destruction, etc.);
- Radiotherapy reports (see Figure 1);
- Chemotherapy reports (see Figure 2).

Chemotherapy
Sequential No. (e.g. from 1 to 6)
Begin (date)
End (date)
Scheme
#1-#4: selectable 4 pre-defined schemes (the list could be expanded)
#5: other
#6: not applied
#7: not known
Response to the chemotherapy
Full / Partial / Stable / Progressing / Not known

3. Conclusions

The suggested scheme of designing templates for clinical documents enables the re-use of clinical data for reimbursement, patient care and research.

Such scheme for clinical document design implies particular requirements for the EHR information system used in a healthcare institution. The system should have internal event-based data processing or business-process engine, which is able to analyse created clinical documents and to automatically extract from them the data for the reimbursement and for research.

References