A Fast and Simple CCU Complication Risk Registration Module for the Local Cardiology Information System (LCIS)

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Abstract

We have decided to implement the CCU complication & risk registration in our Local Cardiology Information System (LCIS). Relevant items for complication & risk registration have to be entered from different locations and units such as the Clinical Chest Pain Unit, the catheterization lab and CCU. For the parameters included in the complication & risk registration module we fully adopted to the (European) Cardiology Audit and Registration Standard CARDS (see: www.escardio.org), however we did not include the complete set of CARDS parameters since it would be to time consumable to enter all the information. To facilitate data entry we customized the existing module CCU and 7 types of information are identified and can be stored. This set-up is implemented in the Apollo system in a short period. In future we will monitor the percentage of entered parameters, evaluate whether it is feasible to increase the parameters to the full CARDS set.

1. Introduction

In the Academic Medical Center we identified the need for a Cardiology/Coronary Care Unit (CCU) complication & risk registration module. The relevant items for complication & risk registration have to be entered from different locations and units such as the Clinical Chest Pain Unit, the catheterization lab and CCU. Since our Local Cardiology Information System (LCIS) "Apollo Advance" (LUMEDX-Seattle http://www.lumedx.com) is already widely used everywhere in the Cardiology department from 65 Apollo workstations, we have decided to implement the CCU complication & risk registration in the Apollo system. Implementation of Apollo started in 2000 and the system currently contains: Demographics (38700 patients), Catheterization (22000 events), Stress ECG (7900 events), Pediatric Echo (14500 events), Echo (26800 events total of the Resting, Stress and Transesophageal echo), EP-Electrophysiology (1000 events) and ICD and Pacemakers (300 events). Further the clinic Cardiology started 2006 (combination of the CCU and the Chest Pain Clinic "EHH" 10000 events).

In order to create a Cardiology/Coronary Care (CCU) complication & risk registration, it is necessary to integrate information from different sources and locations. At the department of Cardiology, AMC we have decided to implement a CCU complication & risk registration module within our Local Cardiology Information System "Apollo Advance 4.1" (fig.1).

Fig.1 LCIS (LUMEDX Apollo Advance 4.1.)

2. Methods

We adopted the Cardiology Audit and Registration Data Standards (CARDS) standard. CARDS is developed in 2004 by the Irish Department of Health and Children in partnership with the European Commission and the ESC (European Society of Cardiology).

The aim of CARDS is to achieve consensus on data standards (variables, definitions and coding) in Europe for 3 addressed subspecialties: PCI (Percutaneous Coronary Intervention), Clinical Electrophysiology (pacemakers, ICD's and ablation), and acute coronary syndromes. Three expert committees, one for each priority topics, have selected and described approximately 100 variables per module. In our CCU complication & risk registration module we have chosen only to implement the most significant parameters since implementing the full set would have been too time consuming at the data-entry level.

A nationwide initiative has been started to evaluate the feasibility of implementing the CARDS-PCI standards. Currently three University hospitals have started to implement these standards in their Cardiologic Information Systems (EPD-Vision - Leiden and Apollo Advance and Thor2006 - Rotterdam).

Our Cardiology department has chosen to start with the CARDS CCU/ACS Standards.

We are implementing the registration of most significant parameters within our Cardiology Local Information System (LIS) "Apollo Advance 4.1" in the department of Cardiology.

The complication & risk module gathers information from the Cardiology emergency unit (EHH), the CCU, the Heartcatheterization unit and from external and internal investigators.

Seven categories of information were identified:

1.) First indication Risk: No or not known
2.) GTT, Glucose Tolerance Test (diabetic)
3.) Groin complications post-PCI
4.) Risk stratification factors (Hypertension, etc) (Acute coronaries syndromes)
5.) Clinical parameters at admission
6.) Biochemical markers (CRP, NT-Pro-BNP etc.)
7.) ST segment analyses based of the admission ECG

Examples of the views (data entry windows) from a "dummy-patient" are shown in figure 2 to 4.

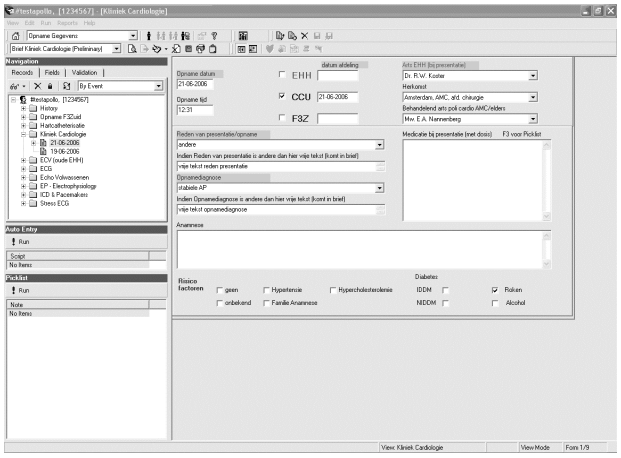

Fig. 2 Clinic Cardiology (Form 1/9)

Fig. 2a First indication Risk: No or not known

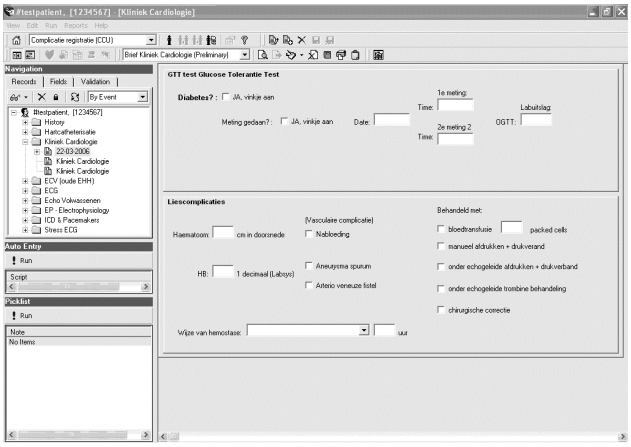

Fig. 3 Clinic Cardiology (Form 3/9)

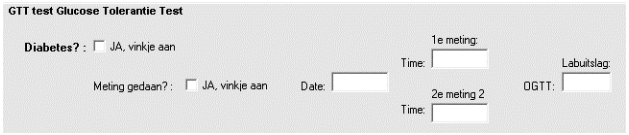

Fig. 3a GTT, Glucose Tolerance Test (diabetic)

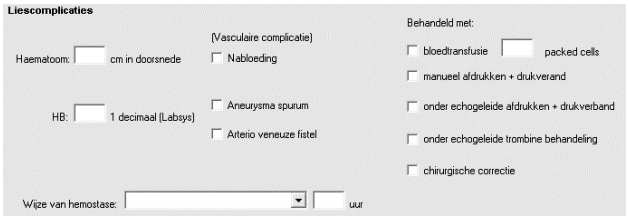

Fig. 3b Groin complications post-PCI

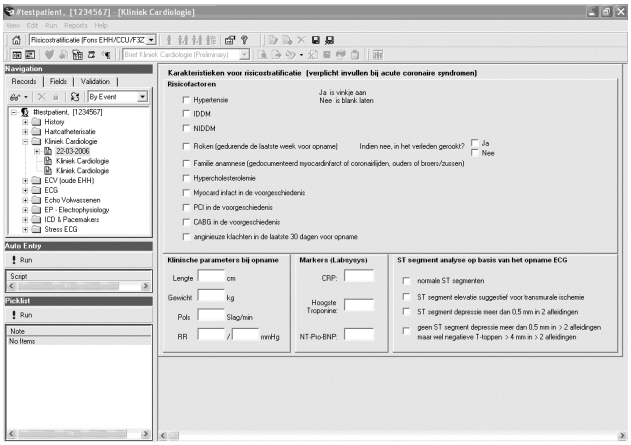

Fig. 4 Clinic Cardiology (Form 4/9)

Fig. 4a Risk stratification factors (acute coronaries syndromes)

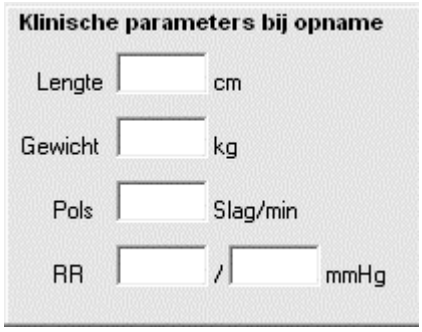

Fig. 4b Clinical parameters at admission

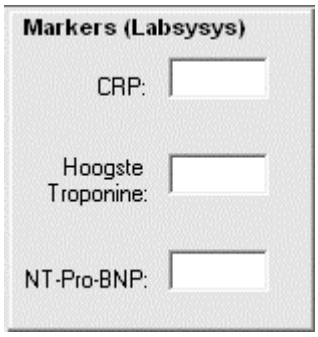

Fig. 4c Biochemical markers (CRP, NT-Pro-BNP etc.)

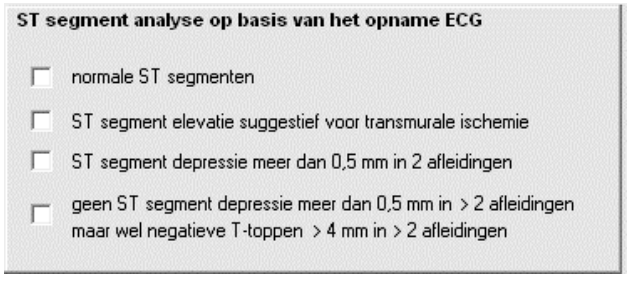

Fig. 4d ST segment analyses based of the admission ECG

3. Results

Since September 2005, our complication & risk registration module is running live. So far, the effective data entry is low, even though we have minimized the parameter set and the time and effort needed for data-entry by implementing it.
For an impression what has been registered we have made a selection of the data over the period 1-1-2006 to 31-8-2006.
2615 patients have been admitted to the Clinic Cardiology. Data entry from these patients is not complete filled in.
A number of 753 patients are marked with Hypertension, 144 IDDM, and 233 NIDDM.
A number of 573 patients smoked last week before start of the procedure and if not smoking in that time there where 134 patients who smoked earlier and 25 patients have never smoked.
A number of 553 patients have affected family members (documented myocardial or coronary disease by parents, brothers or sisters.
A number of 427 patients have Hypercholesterolemia, 61 a myocardial infarct, 50 a PCI and 31 a CABG history.

For special investigations, we have the possibility with the registered data to calculate the TIMI Risk score for UA/NSEMI *(www.timi.org)* and the GRACE ACS Risk score (www.outcomes.org) Ref: TIMI Risk Calculator Home Page

4. Discussion and conclusions

Overall the registered data gives a good impression but the discipline for filling in, the data entry, must be brought to a higher level.

We found web-based use of the TIMI and GRACE ACS Risk models to be very helpful in practice.

References

[1] LUMEDX - Seattle Apollo Advance 4.1 (http://www.lumedx.com)
[2] Cardiology Audit and Registration Standard CARDS (see: *www.escardio.org*)
[3] Score for UA/NSEMI (*www.timi.org*)
[4] Risk score using the GRACE ACS Risk Model (*www.outcomes-umassmed.org/grace*
[5] RIKS_HIA report 2002 Ulf Stenestrand and Lars Wallentin, UCR, University Hospital, 751 85 Uppsala, Sweden. (*http://www.riks-hia.se*)

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