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THE NATIONAL BOARD OF HEALTH AND WELFARE

Representing and recording reasons for prescription using SNOMED CT

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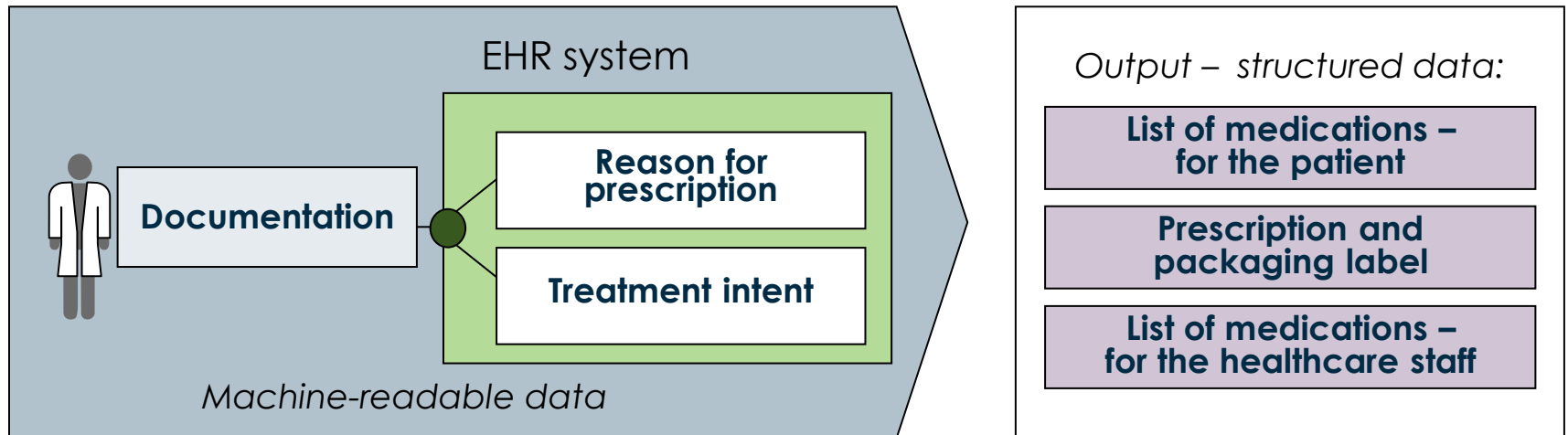**The National Board of Health and Welfare, Sweden**

Introduction

A new, national knowledge base for reasons for prescription will facilitate the documentation of the reasons for prescription in day-to-day health care.
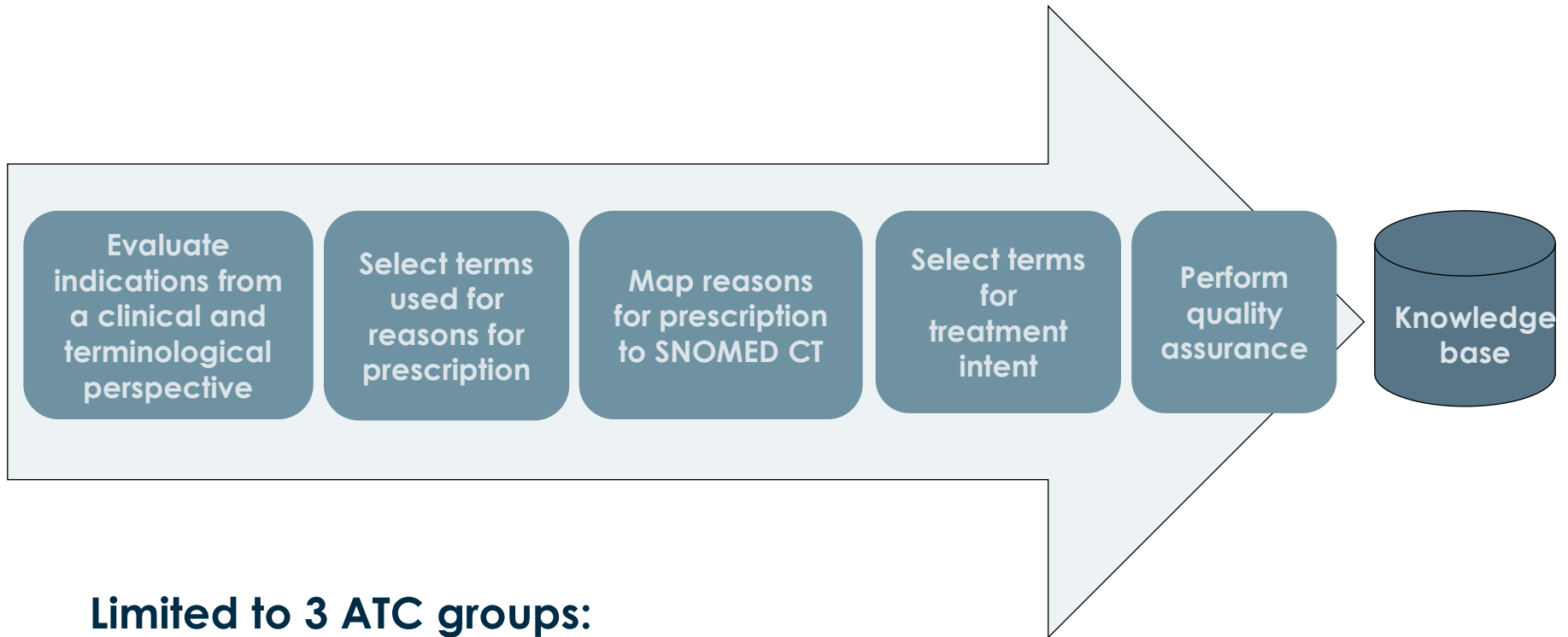
The project aims to reduce drug-related health morbidity and reduce the physicians' administrative workload.

The aim is also to give the patients better information about the treatment intent of their different drug therapies.

EHR system

Documentation

Reason for prescription

Treatment intent

Machine-readable data

Output – structured data:

List of medications – for the patient

Prescription and packaging label

List of medications – for the healthcare staff

Documentation in the future: one single entry of the information

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The Process

Evaluate indications from a clinical and terminological perspective

Select terms used for reasons for prescription

Map reasons for prescription to SNOMED CT

Select terms for treatment intent

Perform quality assurance

Knowledge base

Limited to 3 ATC groups:

- C, Cardiovascular system
- J, Antiinfectives for systemic use
- N, Nervous system

Why not record the indications?

Examples of indications:

Product X is especially useful for patients with manifest cramps, such as febrile convulsion, tetanus and eclampsia, patients with status epilepticus and for premedication and sedation. Product X is also useful in other acute situations when fast, tranquilizing or sedating effect is aimed for.

Active immunization for prevention of invasive disease caused by Streptococcus pneumoniae in adults at the age of 50 or older.

- The indications are only available in free text.

- The indication for a certain product often includes several separate conditions.

- The indications are developed by the pharmaceutical companies, and therefore not expressed with a consistent terminology – contain synonyms and near-synonyms

- The indications contain recommendations that are important to have when selecting which product to prescribe (decision support), but which don't have to be stored in the EHR of a specific patient.

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Terms used for reasons for prescription

- **Indications were evaluated from a clinical and terminological perspective, to form the basis of the terms.**

  – Approx. 9.900 indications were analysed by a clinician from a terminological perspective. All synonyms were removed.

  – Approx. 500 reasons for prescription were extracted from the indications.

- **The terms were**

  – based on medical reference material and linguistic guidelines (same guidelines as were used in the process of translating SNOMED CT to Swedish)

  – expressed using medical terminology, to match the language of clinicians. Based on the Swedish preferred terms in SNOMED CT.

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Examples of reasons for prescription

Indications:
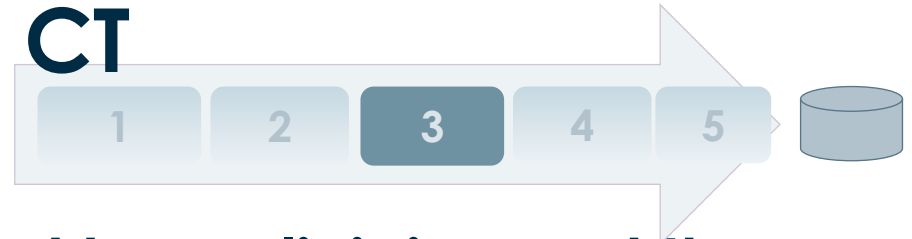
Product X is especially useful for patients with manifest cramps, such as febrile convulsion, tetanus and eclampsia, patients with status epilepticus and for premedication and sedation. *Product X* is also useful in other acute situations when fast, tranquilizing or sedating effect is aimed for.

Active immunization for prevention of invasive disease caused by Streptococcus pneumoniae in adults at the age of 50 or older.

Reasons for prescription:

- febrile convulsion

- tetanus

- eclamptic seizure

- status epilepticus

- sedation for diagnostic and surgigal procedures

- anxiety attack

- active immunization to prevent pneumococcal infectious disease

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Mapping to SNOMED CT

- The mapping was performed by a clinician and the results were reviewed by two terminologists.

- Two hierarchies were used to represent the information: Clinical findings and Procedures.

- 60 % of the terms were coded with pre-coordinated SNOMED CT concepts from the International Edition and will form the basis of a reference set.

- All missing concepts will be added to the Swedish extension and will also be included in the reference set.

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Terms used for treatment intent

The terms should always:

- **have the patients as their target audience, and be expressed using natural language (not mapped to SNOMED CT)**

- **be short, but clear enough to distinguish the drug from similar drugs**

- **have the patient integrity perspective.**

Reason for prescription	Treatment intent
Personality disorder with psychotic symptom present	Tranquilizing
Angina	Against chest pain
Genitourinary chlamydia trachomatis infection	Against infection

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Quality Assurance

1 **2** **3** **4** **5**

- **Clinical experts from professional organisations within the domains neurology, psychiatry, cardiology and general practice were engaged to review the information.**

- **A more extensive quality assurance process will be needed before implementation in ICT systems.**

  - Broader range of clinical specialties.

  - Review by patient organisations.

  - Review in the context of implementation within certain domains/tools.

Information in the knowledge base

NPL – ID*	Label name	Substance	Form	Dosage	ATC	Indication	Reason for prescription	SNOMED CT**	Treatment intent
199706 190000 99	Aciklovir Stada	Aciklovir	Tablet	200 mg	J05AB01	Genital herpes in adults with normal immune system	**Genital herpes simplex**	**33839006 | genital herpes simplex (disorder) |**	**Against infection**
196105 260000 19	Salures	Bendroflu-metiazid	Tablet	2.5 mg	C03AA01	Prophylactic treatment of patients with recurrent idiopatic urolithiasis	**Preventive procedure of recurrent kidney stone**	**169443000 | preventive procedure (procedure) |: (363702006 | has focus (attribute) | (= 95566004 urolithiasis (disorder) |:2635020 05 | clinical course (attribute) |=255318 003 | relapsing course (qualifier value) |)**	**Prevents kidney stone**
195906 020000 75	Nozinan	Levome-promazin	Tablet	100 mg	N05AA02	Short-term treatment of prominent psychotic symptoms as part of a personality disorder	**Personality disorder with psychotic symptom present**	**33449004 | personality disorder | : 47429007 | associated with | = 280427006 | psychotic symptom present |**	**Tranquilizing**

Information stored in the knowledge base. Label namn, substance etc. are derived from other databases through the NPL-ID.

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* NPL is a Swedish national register of medical products.
** All post-coordinated expressions will be replaced by pre-coordinated concepts.

The interface prototype in the Swedish prescribing tool Pascal

1. Choose product/drug

2. Choose reason(s) for prescrition

Based on the chosen drug + dosage and form, the SNOMED CT coded reasons for prescriptions will be displayed. For Inderal tabl 10 mg there are 11 reasons for prescription extracted from the indiciation texts. It´s also possible for the prescriber to choose a reason for prescription from the whole database, or to write in free text.

3. Specify the dosage

Dosering*

◉ Kortnotation och doseringstider ⭘ Doseringsangivelse i text ⭘ Schema för flera dagar

1x2

❌ ❌

08 ⌄   20 ⌄

1   1

Lägg till

Regelbundenhet

Varje dag ⌄

Expediering

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4. Choose treatment intent(s).

Based on chosen reasons for prescription, suggested phrases for treatment intent will be displayed. The grey box at the right is the label as it will be shown for the patient on the package: "1 tablet twice a day with water. Against chest pain. Against hypertension". It´s also possible for the prescriber to write in free text.

Maintenance

- **Updates of the knowledge base when new medications are introduced or if the indications change. Probably more frequently releases of the National extension.**

- **Ongoing collaboration between terminologists and clinicians.**

- **Development of tools to maintain and distribute the knowledge base.**

Implementation

- The knowledge base is built to be used in health care and pharmacies.

- The ICT systems used in the health care sector today will need to be adapted to the knowledge base.

- Recorded reasons for prescription will be stored in the National Prescription Database (NOD).

- The existing national prescribing tool Pascal can be used to record reasons for prescription.

- It is expected that any prescribing tool will be able to store information in NOD in the future.

Achievements

Using SNOMED CT will achieve:

- Technical and semantic interoperability between the ICT systems used in the prescribing process.

- Consistent interpretation of the terms used for reasons for prescription regardless of the context in which they are used.

- A good basis for research and monitoring.

Achievements

The system will enable clinicians to:

- Get easier access to clear and structured information about why another prescriber has chosen to initiate, change, continue or discontinue a drug treatment previously in the prescribing process.

- Get support for and be able to document the *reasons for prescription* and *treatment intents* more easily.

Achievements

The system will enable patients (e.g also parents, relatives, school staff etc) to:

- **Get better knowledge about the intent of the drug treatment.**

- **More easily separate their different drugs/medications from each other.**

Long-term goal

Establish a source of information that can be used for all drug prescriptions and also to document other types of prescriptions within health care, e.g. physiotherapy, occupational therapy, physical activity etc.

Now and the future

First version	Complete version
3 ATC groups	All ATC groups
Approved indications	Other indications, off-label prescription
Drug treatment	Other treatments
Selected product → suggestion of reasons for prescription	Specified reasons for prescription → suggestions of treatment/drug

Thank you

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