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Optimal Coding for Pharmaceutical Products

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Webster's dictionary defines a code as a "system of symbols, as letters or numbers, used to represent assigned or often secret meanings".

Medications are often coded whether on the active ingredient level or brand level in order to uniquely identify, monitor or inspect the quality of the medication in the market. The selection of the appropriate coding method is essential to facilitate tracing drug utilization and billing.

This paper presents the different types of pharmaceutical coding systems used around the world.

Long since its invention some 120 years ago, Aspirin was considered a miraculous medication. Today, the amount of medications invented and used to treat various diseases has surged immensely. The number of variations in medications, same active ingredient(s), forms, dose(s) and presentations has reached an excess of 45,000 combinations according to National Drug Directory. With these huge variations, a coding structure became indispensable in order to properly reflect these combinations.

The selection of the appropriate coding structure depends on a variety of objectives:

a. Identify: Search for and locate a specific medication

b. Track: Monitor the medication status (grace, deleted and active)

c. Financial: The ability to reimburse the patient or health care provider and to collect rebate from drug manufacturers

d. Statistics: The ability to generate drug utilization statistics and hence enhance drug usage

e. Regulate: The ability of the regulator to identify and monitor all the medications present in the market

National Drug Code (NDC)

At the start of 1972, coding of pharmaceutical products became necessary and essential to uniquely identify, monitor, recall and inspect the quality of medications present in the market. In the United States, the National Drug Code (NDC), a three-segment number, functions as a universal product identifier for all drugs. The three segments of the NDC identify the labeler (manufacturer, repackager or distributor), the product (strength, dosage form and formulation) and the commercial package size (size and type). The Food and Drug Administration (FDA) publishes a list of NDC numbers in the NDC directory that is updated daily.[i]

For example:
Prozac 20mg 100 capsules

In the example shown to the left, the first segment of the code identifies the labeler. In this case, the labeler code "0777" is for Dista Products Company, the labeler of Prozac. The second segment, the product code, identifies the specific strength, dosage form (i.e; capsule, tablet, liquid) and formulation of a drug for a specific manufacturer. In the demonstrated case, "3105" identifies that this dosage form is a capsule. The third segment is the package code and it identifies package size and type. This example shows that the package code "02" for this bottle of Prozac identifies that 100 capsules are in the bottle.[ii]

Anatomical Therapeutic Category (ATC)

In 1976, the World Health Organization introduced the Anatomical Therapeutic Category (ATC) classification system. In the ATC system, the active ingredients are split into various groups depending on the organ or the system which they act on or influence and "their therapeutic, pharmacological and chemical properties". Drugs are categorized into groups based on five different levels namely anatomical, therapeutic, pharmacological, chemical subgroup and substance. The Defined Daily Dose (DDD) is the assumed "average maintenance dose per day for a drug used for its main indication in adults." The main purpose of the ATC/DDD system, which undergoes annual updates, is to present a tool for drug utilization statistics with the aim of improving drug use.[iii]

Acetylsalicylic acid (aspirin), for example, has A01AD05 as a drug for local oral treatment, B01AC06 as a platelet inhibitor, and N02BA01 as an analgesic and antipyretic.[iv]

Drug Identification Number

The Drug Identification Number (DIN) is a computer generated eight digit number assigned by Health Canada to a drug product before it is marketed in Canada. A DIN uniquely identifies the following product characteristics: manufacturer, product name, active ingredient(s), strength(s) of active ingredient(s), pharmaceutical form and route of administration. In order to have a drug sold in the Canadian market it should have a DIN otherwise it is not compliant with the Canadian law. The DIN, similar to the NDC code used in the US, is unique and serves as a tool to help in the follow up of products in the market, recall of products, inspections and quality control.[v]

For example:
02155907 is the DIN for **ADALAT XL - SRT 30MG**

Green Rain Code and Dubai Drug Code

With the emergence of more medications into the market, introduction of regulators and the movement toward electronic dispensing and prescribing; the significance of using proper pharmaceutical coding has grown even more critical. Therefore, the United Arab Emirates introduced the Green Rain Codes for medications sold in Abu Dhabi and Dubai Drug Codes (DDC) for medications sold in Dubai. However, both Green Rain Code and DDC are localized codes that do not comply with international coding rules.[vi]

For example:
TARKA 180MG/2MG: Green Rain Code: 1240-4142-001
Dubai Drug Code: 0652-274001-2001[vii]

Hong Kong Registration Number

In several countries around the world, such as Hong Kong (HK), the registration number is commonly used as a reference number to identify, trace and monitor drugs. However, registration numbers have several limitations, namely it doesn't comply with international coding conventions.[vii]

For example:
Lipitor 10mg tablets: HK-42328

GlobeMed Group Pharmaceutical Coding

Since the early 1990s, GlobeMed Group's experience with coding of pharmaceutical items commenced and today is seated at the vanguard of TPA business in the MENA region. During 2013, GlobeMed Group integrated the First Data Bank (FDB) database into its pharmaceutical system which rendered all GlobeMed alphanumeric codes/sequences to become NDC/Canadian DIN/HK and ATC coded at the level of international brands and active ingredient level.

For example:
TARKA 180MG/2MG
TARKA1 (GCNSEQNO. 29251)

Comparison of Various Codes and their Specification

	Identify	Track	Billing	Statistics	Regulate
NDC	●	●	●		●
ATC	●			●	
DIN	●	●	●		●
Green rain	●	●			●
DDC	●	●			●
HK ID	●	●			●
GlobeMed	●	●	●	●	●

Summary

The use of a drug coding system is no doubt becoming essential if not unavoidable. In addressing the question of why to use coding and what system to use the answer is related very much to the purpose the organization is seeking to use it for. For any health care organization or any entity involved in the health services sector, public or private, coding of the medication in use is critical to facilitate and maintain control of the way the drugs are used in addition to the tracking, monitoring, and capturing the health impact of drug utilization and the financial implications. On local level of a country a local coding system may be sufficient to accomplish the goal of monitoring however it deprives us from the ability to compare to global benchmarks necessary to identify problem and improve performance. Therefore it is critical to augment any local coding system with an international reference such the NDC/DIN rendering any coding system useable not only locally but internationally with all the benefits and flexibilities it brings with. From the perspective of a TPA, the linking of local coding systems to the NDC/DIN and ATC/DDD makes it possible to work without borders and have a system that is compatible with any coding convention around the world in addition to the ability to integrate any utilization data with and to international statistics.

References

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