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Defining a Standardized Information Model for Multi-Source Representation of Breast Cancer Data

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Abstract. This work aims to define a standardized information model for representation of multiple data sources in breast cancer. A set of data elements has been identified using ICHOM Breast Cancer as the minimum data set and adapting it to the needs of Hospital Universitario 12 de Octubre. With this, an information model has been defined according to ISO 13606 and SNOMED CT standards.

Keywords, EHR, Information model, Standardization, Breast cancer, ISO 13606, SNOMED-CT, ICHOM.

1. Introduction

Advanced uses of health information require standard data that allows its representation without loss of meaning [1], essential in a multidisciplinary condition such as breast cancer. This work aims to define an information model for the standardized representation of data in breast cancer domain.

2. Methods

First, the set of data elements for breast cancer domain was identified using ICHOM Breast Cancer [2] as the minimum data set. Second, tis data set has been reviewed and adapted to the needs of Hospital Universitario 12 de Octubre [3]. Finally, based on this specification, an information model has been defined according to ISO 13606 [4] and SNOMED CT [5].

3. Results

Table 1 shows the number of data elements that have been identified, comparing them with the number of elements defined by ICHOM Breast Cancer.

Table 1. Data elements identified by categories and compared with ICHOM Breast Cancer

Data category	ICHOM BC	Data Element Set
Clinical	47	71
Pathological Anatomy	17	84
PROM	104	104
Total	168	259

Table 2 shows an example of standardized data element using the reference model of ISO 13606 and SNOMED CT.

Table 2. Data element standardized according to ISO 13606 and SNOMED CT standards

Component	Data-type	Cardinality	SCT Code	SCT Term
Element	Coded Value	1	371480007	Tumor site
Value	-	-	181134008	Entire upper outer quadrant of breast
Value	-	-	181136005	Entire lower outer quadrant of breast
Value	-	-	181132007	Entire upper inner quadrant of breast
Value	-	-	181135009	Entire lower inner quadrant of breast
Value	-	-	205042000	Entire central portion of breast
Value	-	-	265780004	Entire nipple

4. Conclusions

Data set proposed by ICHOM Breast Cancer has been used as the minimum data set. It has been necessary to increase the number of data elements from 168 to 259 to adapt it to the needs of the Hospital (see Table 1).

The combined use of ISO 13606 and SNOMED CT has allowed the standardized definition, structure and meaning, of previously identified data elements. This will allow advanced uses of these data with full meaning.

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