

## Standard Terminology for Capsule Endoscopy

### Introduction

As computer technology developed over the last two decades, endoscopy integrated electronic technology for the processing of endoscopic images with the use of electronic endoscopes, the magnification of the image by electronic zooms and more recently, the electronic enhancement of the colours of the endoscopic image. Beside these technical advances, computers have also been progressively used for the post-procedure processing of endoscopic data, including the generation of the report and the storage of endoscopic images (1). More recent reports have also shown that computer technology can be used in training programs (2).

Capsule endoscopy constitutes in some way an ultimate step in this direction, as the role of the physician can be limited to the discussion of the indication, the analysis of the data and the processing of the report by using a computer, while the acquisition of the data can be performed by a medical assistant, technician or nurse without any specific skills during the procedure itself. The dissociation of the acquisition and analysis processes of the data during capsule endoscopy changes on the other hand the approach to data management. All data of the procedures are permanently available for multiple reading by the same physician or by another one. Clinical significance of the data may thus change over time when new data become available from other sources to explain the patient condition.

The extensive use of computers in medicine also changes the flow of data within the hospitals as well as the exchange of data between specialized units and the referring physician in charge of the patient. These processes are made possible by the integration of data between the computer systems supporting the patient file (Hospital Information System) and the endoscopic report of a classical or capsule endoscopy (3). To achieve the exchange of data between systems, standard formats need to be used for the images, the encoding of the data but also for the text data, including patient's administrative data, procedure data and medical data. Standardization of endoscopic data has been up to now progressing slowly and has not entered the daily practice in most units. Capsule endoscopy is thus regarded as a chance to promote standardization of the endoscopic report because the whole procedure is computer-based and that might help to overcome the usually low acceptance of computer-assisted data input in endoscopy.

## Principles of standardization of the endoscopic report

The initial attempt to systematize endoscopic nomenclature was the work done by Z. Maratka and published as the "OMED" Terminology (4). Despite the clever design of it, acceptance was very low in the endoscopic community and it was never implemented in practical reporting systems. Therefore, following an initiative of the European Society of Gastroenterology, a project started in cooperation with the American and Japanese Societies for Gastrointestinal Endoscopy. The major aim of the project was to devise a "minimal" list of terms that could be included within any computer system used to record the results of a gastrointestinal endoscopic examination. It was decided that the terms selected must have wide acceptability and provide a means for recording the findings in the majority of examinations performed. Excessive detail was to be avoided and rare findings were to be recorded using "free text" fields.

To facilitate implementation and allow a more complete description of observations, when necessary, qualifying attributes which provide additional detail were attached to terms. The attributes are a list of descriptive concepts such as size, number, extent, etc... for which there are a series of values appropriate to that term. Every described lesion is placed in its location by the use of a list of sites relevant to the organ being examined. By this construction, the lists of terms with the specifications given by the attributes translate the concepts evoked by the users into a structured language. The *Minimal Standard Terminology for Digestive Endoscopy* is structured in lists of terms that cover the main types of endoscopic examinations, e.g. upper GI endoscopy, colonoscopy and ERCP, with an additional complementary list of Therapeutic Procedures (5) that might be performed (*Figure 1*).

The *Minimal Standard Terminology for Digestive Endoscopy* (MST) must be regarded as a structured language that analyzes the descriptions made in natural language and transforms them into concepts linked at different levels in order to enable the handling of the data by the computer and at the end to restore the data in a format understandable by the referring physician, who is the final user of the endoscopic report. The accuracy of the MST has been tested in prospective trials in Europe (6) and the USA (7) and shown to cover about 95% of terms used in daily routine to describe endoscopic findings.

► TABLES

**Table 1: Report structure.**

Data fields
Patient Name
Date of Birth
Sex
Patient ID
Study Date (Date of Procedure)
Study Type (Capsule Type)
Capsule ID
Physician/Provider
Patient History
Clinical Indication
ICD Indication*
Extent of Examination
Characteristics of Examination
Complication
Findings
Diagnostic Impression
Diagnosis ICD*
Recommendation

\* ICD codes recommended for use in this place are relevant only if ICD codes are in use in the country and depend on the version in use in each country. They may however be useful to homogenate data in international multicenter trials.

**Table 2: Major headings for grouping of terms in the structure of the MST.**

<b>1. Normal</b>	Should be used if the organ has been entirely examined and everything is normal in it
<b>2. Lumen</b>	Contains all terms regarding an abnormality of the size of the organ, any deformity, compression and the evidence of previous surgery.
<b>3. Contents</b>	Terms describing the presence of various materials within the organ
<b>4. Mucosa</b>	Terms describing patterns of the mucosa that are mainly diffuse and may involve all the mucosa of one limited area. These terms are not applicable to individual lesions.
<b>5. Flat lesions</b>	Terms to be used for individual lesions which remain in the plane of the mucosa.
<b>6. Protruding lesions</b>	Terms to be applied to lesions growing above the plane of the mucosa
<b>7. Excavated lesions</b>	Terms to be applied to lesions the surface of which is beneath the plane of mucosa.