

# A New Taxonomy for Telehealth Technologies

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## Abstract

Today, the field of telehealth lacks a comprehensive taxonomy that reflects the variety of remote interactions, technologies used, and personnel involved. The Center for Information Technology Leadership (CITL) has created a taxonomy that categorizes telehealth around four factors: type of telehealth interaction, location of the controlling medical authority, urgency of care, and timing of communication. This comprehensive taxonomy may help to define the field of telehealth and may help with adoption, research, and reimbursement.

## Overview

The field of telehealth is large with many types of telehealth services occurring world-wide, reflecting the variety of personnel who are involved and the technology that is used. In reviewing the telehealth literature, CITL found that there are four major factors that distinguish a telehealth encounter. First, the type of telehealth interaction indicates whether the patient is with a medical provider and how the communication is structured. Second, the location of the controlling medical authority indicates whether the provider in charge of the patient care is with the patient or away from the patient. Third, the urgency of care addresses whether the communication is for an emergent or non-emergent health issue. Finally, the timing of communication considers whether the communication is real-time (synchronous) or store-and-forward (asynchronous).

Prior efforts have not provided a comprehensive telehealth taxonomy. Although the Centers for Medicare and Medicaid Services (CMS)<sup>1</sup>, the Joint Commission (JC)<sup>2</sup>, and the American Telemedicine Association (ATA)<sup>3</sup>, have all categorized some aspects of telehealth technologies, no comprehensive taxonomy of the field exists. JC's taxonomy includes two categories, health care providers providing interpretive services and health care providers providing care, treatment, and services, but does not consider the timing of communication. CMS's taxonomy is more extensive: it includes specific telehealth encounters, but does not define comprehensive categories of telehealth, instead relying on additions through bureaucratic, and

sometimes legislative, actions. ATA's taxonomy is the most comprehensive, but does not consider the urgency of the care needed or the location of the controlling medical authority. CITL's taxonomy is the first to incorporate the type of interaction, location of the controlling medical authority, urgency of care and timing of communication (see Table 1).

Type of Interaction	Location of Controlling Medical Authority	Urgency of Care	
		Emergent (Real-Time Only)	Non-Emergent (Real-Time and Store-and-Forward)
Provider with Patient to Provider	Near Side	ED Consultation	Specialist Consultation
	Far Side	Provider Extension to ED	Provider Extension Consultation
Patient to Provider via Device (Remote Monitoring)	Far Side	Telemonitoring, etc.	Telemonitoring, etc.
Patient to Provider (Remote Care)	Far Side	Telecare, etc.	Telecare, etc.
Diagnostic Services	N/A	Teleradiology, Telepathology, etc.	Teleradiology, Telepathology, etc.
Provider to Provider without Patient (Education)	N/A	X	Continuing Medical Education

**Table 1.** All-inclusive taxonomy of telehealth.

## Conclusion

This taxonomy presents a distinct advantage over the previous taxonomies of telehealth as it considers each of the four major factors that determine a telehealth encounter. The categories represent unique areas of telehealth and allow for the inclusion of future telehealth endeavors.

## References

1. Department of Health & Human Services Centers for Medicare & Medicaid Services. CMS Manual System: Pub. 100-04 Medicare Claims Processing. December 23, 2005.
2. Joint Commission. Comprehensive Accreditation Manual for Hospitals: The Official Handbook, Update 2. September, 2006.
3. American Telemedicine Association. ATA Defining Telemedicine. <http://www.atmeda.org/news/definition.html>. Accessed March, 2007.