

CURRICULUM VITAE

NAME: Vreeman Daniel Jay

EDUCATION:

POSTDOCTORAL

Regenstrief Institute, Inc. NLM Medical Informatics Research Fellow 2003-2005

GRADUATE

Duke University School of Medicine Doctor of Physical Therapy (DPT) 2000-2003

UNDERGRADUATE

Cornell University,
College of Arts and Sciences Bachelor of Arts in Biological Sciences,
Program of Study in General Biology 1996-2000

FURTHER EDUCATION:

Indiana University Master of Science in Clinical Research 2003-2005

APPOINTMENTS:

ACADEMIC

Indiana University School of Health and Rehabilitation Sciences Visiting Assistant Research Professor of Physical Therapy 2005-2007

Indiana University School of Health and Rehabilitation Sciences Assistant Research Professor of Physical Therapy 2007

Indiana University School of Health and Rehabilitation Sciences Adjunct Assistant Professor 2008-2009

Indiana University School of Medicine, Division of General Internal Medicine and Geriatrics Assistant Research Professor 2008-2014

Regenstrief Institute, Inc. Research Scientist 2005-present

Regenstrief Institute, Inc. Associate Director of Terminology Services 2009-2016

Indiana University School of Medicine, Division of General Internal Medicine and Geriatrics Associate Research Professor 2014-present

Regenstrief Institute, Inc., Center for Biomedical Informatics Director, LOINC and Health Data Standards 2016-present

Indiana University School of Medicine, Division of General Internal Medicine and Geriatrics Regenstrief-McDonald Scholar in Data Standards 2016-present

NON-ACADEMIC

Clarian Health Partners	Staff Physical Therapist	2003-2005
Wishard Health Services	Staff Physical Therapist	2003-2005

LICENSURE AND CERTIFICATION, SPECIALTY BOARD STATUS:

Indiana, Physical Therapist License	#05008112A	2003-present
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PROFESSIONAL ORGANIZATIONS MEMBERSHIPS:

American Physical Therapy Association (APTA)		2000-present
Health Policy and Administration Section		2000-present
Education Section		2000-present
Research Section		2000-present
Private Practice Section		2000-2002
North Carolina State Chapter, Central District		2000-2003
Acute Care Section		2003-2005
Indiana State Chapter, Central District		2003-present
American Medical Informatics Association (AMIA)		2002-present
Health Level Seven (HL7)		2009-present
American College of Medical Informatics (ACMI)		2017-present

PROFESSIONAL HONORS AND AWARDS:

RESEARCH

Distinguished Paper Award – Finalist	AMIA Annual Symposium	2006
Distinguished Paper Award	AMIA Annual Symposium	2007
Distinguished Paper Award – Finalist	AMIA Annual Symposium	2008
Stanford Award	American Physical Therapy Association, Education Section	2010
Best of AMIA 2012	AMIA Annual Symposium	2012
Distinguished Paper Reviewer	AMIA Annual Symposium	2013
Distinguished Paper Reviewer	AMIA Annual Symposium	2014

OVERALL/OTHER

Dean's List	Cornell University	1997-2000
Community Spirit "Innovation in Service" Award	Cornell University	2000
Faculty Recognition Award	Duke University Doctor of Physical Therapy Program	2003
Forty Under 40	Indianapolis Business Journal	2015
Center for Biomedical Informatics Outstanding Investigator Award	Regenstrief Institute	2016
Duke Doctor of Physical Therapy Distinguished Alumni Award	Duke University Doctor of Physical Therapy Program	2017
Fellow, American College of Medical Informatics (ACMI)	American Medical Informatics Association	2017
Technology and Innovation Award	American Physical Therapy Association, Health Policy and Administration Section	2018

PROFESSIONAL DEVELOPMENT:

Clinical Logical Observation Identifiers Names and Codes (LOINC) Meeting	Intermountain Healthcare, Salt Lake City, UT	June 2-4, 2005
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Sept. 26-27, 2005
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Oct. 23-26, 2005
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 21, 2006
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Nov. 11-15, 2006
LOINC and International Classification of Functioning, Disability, and Health Meeting	National Center for Health Statistics (NCHS) and Centers for Disease Control (CDC), Washington, DC	Dec. 11-12, 2006
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Jan. 4-6, 2007
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	May 13-14, 2007
Indiana University Federal Relations Meeting	Department of Defense, Washington, DC	July 26, 2007

LOINC Meeting	National Library of Medicine (NLM), Atlanta, GA	Sept. 19-20, 2007
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Oct. 10-12, 2007
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Chicago, IL	Nov. 11-14, 2007
National Library of Medicine (NLM) and Health Level Seven (HL7) Lab Orders Project Meeting	National Library of Medicine (NLM) and Health Level Seven (HL7), Washington, DC	Dec. 13, 2007
Health Level Seven Meeting	Health Level Seven (HL7), San Antonio, TX	Jan. 14-16, 2008
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Jan. 31-Feb. 1, 2008
Health Level Seven Meeting	Health Level Seven (HL7), Phoenix, AZ	May 8-9, 2008
Standards Development Organization (SDO) Summit	SDO Charter Organization (SCO), Washington, DC	June 18-19, 2008
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	July 10-11, 2008
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Nov. 9-12, 2008
Health Level Seven Meeting	Health Level Seven (HL7), Orlando, FL	Jan. 13-15, 2009
Clinical LOINC Meeting	Intermountain Healthcare, Big Sky, MT	Jan. 29-31, 2009
American Physical Therapy Association Combined Sections Meeting	American Physical Therapy Association (APTA), Las Vegas, NV	Feb. 9-12, 2009
Physical Therapy and Society Summit (PASS)	American Physical Therapy Association (APTA), Washington, DC	Feb. 26-28, 2009
American Telemedicine Association Annual Conference	American Telemedicine Association (ATA), Las Vegas, NV	Apr. 27-29, 2009
Health Level Seven Meeting	Health Level Seven (HL7), Kyoto, Japan	May 11-17, 2009
American Physical Therapy Association Annual Conference	American Physical Therapy Association (APTA), Baltimore, MD	June 10-13, 2009
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 12-14, 2009
Health Level Seven Meeting	Health Level Seven (HL7), Atlanta, GA	Sept. 20-22, 2009

2009 Regenstrief Institute Open Health Methodologies Conference	Regenstrief Institute, French Lick, IN	Sept. 22-25, 2009
AMIA Annual Symposium	American Medical Informatics Association (AMIA), San Francisco, CA	Nov. 15-19, 2009
Health Level Seven Meeting	Health Level Seven (HL7), Atlanta, GA	Jan. 19-22, 2010
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Feb. 4-5, 2010
Collaborative Laboratory Conference	American Society for Clinical Laboratory Science, Clinical Laboratory Management Association, and American Association of Clinical Chemistry, Strongsville, OH	Apr. 28-30, 2010
PhenX Toolkit and LOINC Meeting	RTI International, Raleigh, NC	June 1-2, 2010
North American Collaborating Center (NACC) International Classification of Functioning (ICF) Conference	National Institutes of Health (NIH), Bethesda, MD	June 23-24, 2010
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	July 14-16, 2010
Health Level Seven Meeting	Health Level Seven (HL7), Cambridge, MA	Oct. 4-7, 2010
IHTSDO Conference	International Health Terminology Standards Development Organization (IHTSDO), Toronto, Canada	Oct. 16-20, 2010
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, Dc	Nov. 14-17, 2010
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Jan. 26-28, 2012
Health Level Seven Meeting	Health Level Seven (HL7), Buena Vista, FL	May 16-19, 2011
American Physical Therapy Association Annual Conference	American Physical Therapy Association (APTA), National Harbor, MD	June 9-10, 2011
Radlex and LOINC Meeting	Radiologic Society of North America (RSNA), Oakbrook, IL	Aug. 1-2, 2011
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 15-16, 2011
Public Health Informatics 2011 Annual Conference	Centers for Disease Control and Prevention (CDC) and the National Association of County and City Health Officials (NACCHO), Atlanta, GA	Aug. 20-24, 2011

Exploring the Future of Physical Therapy Symposium	American Physical Therapy Association (APTA), Philadelphia, PA	Sept. 9-11, 2011
Health Level Seven Meeting	Health Level Seven (HL7), San Diego, CA	Sept. 11-15, 2011
IHTSDO Conference	International Health Terminology Standards Development Organization (IHTSDO), Sydney, Australia	Oct. 9-15, 2011
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Oct. 23-26, 2011
NINDS Common Data Elements (CDE) Workshop	National Institutes of Health, Bethesda, MD	Nov. 29-30, 2011
APTA Combined Sections Meeting	American Physical Therapy Association (APTA), Chicago, IL	Feb. 8-12, 2012
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Feb. 15-17, 2012
RadLex and LOINC Meeting	Radiologic Society of North America (RSNA) Oakbrook, IL	May 9-10, 2012
Health Level Seven Meeting	Health Level Seven (HL7), Vancouver, British Columbia, Canada	May 14-17, 2012
Strategic Health IT Advanced Research Projects (SHARP) Summit on "Secondary Use"	Mayo Clinic, Rochester, MN	June 10-12, 2012
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 29-31, 2012
Health Level Seven Meeting	Health Level Seven (HL7), Baltimore, MD	Sept. 10-13, 2012
Innovation, Discovery, and Translation in Service to Health Development: Indiana Global Health Research Working Conference	Regenstrief Institute, Indiana Clinical and Translational Sciences Institute, University of Notre Dame's Eck Institute for Global Health, Indiana University Center for Global Health, Marshall, IN	Oct. 3-5, 2012
IHTSDO Conference	International Health Terminology Standards Development Organization (IHTSDO), Stockholm, Sweden	Oct. 22-28, 2012
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Chicago, IL	Nov. 4-7, 2012
Health Level Seven Meeting	Health Level Seven (HL7), Phoenix, AZ	Jan. 14-17, 2013
APTA Combined Sections Meeting	American Physical Therapy Association (APTA), San Diego, CA	Jan. 21-24, 2013

Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Feb. 13-15, 2013
IHTSDO Conference	International Health Terminology Standards Development Organization (IHTSDO), Copenhagen, Denmark	Apr. 7-10, 2013
Health Level Seven Meeting	Health Level Seven (HL7), Atlanta, GA	May 7-9, 2013
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 29-30, 2013
IHTSDO Conference	International Health Terminology Standards Development Organization (IHTSDO), Washington, DC	Oct. 7-11, 2013
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Nov. 16-20, 2013
Health Level Seven Meeting	Health Level Seven (HL7), San Antonio, TX	Jan. 20-23, 2014
WHO Forum on Health Data Standardization and Interoperability	World Health Organization, Geneva, Switzerland	Feb. 10-11, 2014
IHTSDO Conference	International Health Terminology Standards Development Organization (IHTSDO), Copenhagen, Denmark	Apr. 28-30, 2014
Health Level Seven Meeting	Health Level Seven (HL7), Phoenix, AZ	May 5-8, 2014
Health Level Seven Meeting	Health Level Seven (HL7), Chicago, IL	Sept. 16-18, 2014
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Nov. 9-12, 2014
Health Level Seven Meeting	Health Level Seven (HL7), San Antonio, TX	Jan. 19-22, 2015
APTA Combined Sections Meeting	American Physical Therapy Association (APTA), Indianapolis, IN	Feb. 4-7, 2015
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Feb. 12-13, 2015
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Washington, DC	Mar. 19-20, 2015
SNOMED International Business Meeting	SNOMED International, Copenhagen, Denmark	Apr. 26-30, 2015
Health Level Seven Meeting	Health Level Seven (HL7), Paris, France	May 11-15, 2015

Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 11-14, 2015
Medinfo 2015	15 th World Congress on Health and Biomedical Informatics, Sao Paulo, Brazil	Aug. 19-23, 2015
Health Level Seven Meeting	Health Level Seven (HL7), Atlanta, GA	Oct. 5-8, 2015
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Washington, DC	Oct. 13, 2015
SNOMED International Business Meeting and Expo	SNOMED International, Montevideo, Uruguay	Oct. 26-30, 2015
AMIA Annual Symposium	American Medical Informatics Association (AMIA), San Francisco, CA	Nov. 15-18, 2015
Health Level Seven Meeting	Health Level Seven (HL7), Orlando, FL	Jan. 11-14, 2016
APTA Combined Sections Meeting	American Physical Therapy Association (APTA), Anaheim, CA	Feb. 17-20, 2016
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Feb. 23-26, 2016
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Washington, DC	April 8, 2016
SNOMED International Business Meeting	SNOMED International, London, UK	Apr. 18-21, 2016
Health Level Seven Meeting	Health Level Seven (HL7), Montreal, Canada	May 9-12, 2016
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Aug. 24-26, 2016
Health Level Seven Meeting	Health Level Seven (HL7), Baltimore, MD	Sept. 19-22, 2016
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Arlington, VA	Oct. 13, 2016
SNOMED International Business Meeting and Expo	SNOMED International, Wellington, New Zealand	Oct. 24-28, 2016
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Chicago, IL	Nov. 12 -16, 2016
Health Level Seven Meeting	Health Level Seven (HL7), San Antonio, TX	Jan. 16 – 19, 2017

APTA Combined Sections Meeting	American Physical Therapy Association (APTA), San Antonio, TX	Feb. 15 – 19, 2017
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Arlington, VA	Mar. 6-7, 2017
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Mar. 8-10, 2017
SNOMED International Business Meeting	SNOMED International, London, UK	April 24 – 27, 2017
Clinical Information Interoperability Council Joint Meeting	Clinical Information Interoperability Council (CIIC), Washington DC	July 13, 2017
Health Level Seven Meeting	Health Level Seven (HL7), Madrid, Spain	May 8 – 12, 2017
Regenstrief/Duke-Margolis Center for Health Policy Collaborations	Duke-Margolis Center for Health Policy, Duke University, Chapel Hill, North Carolina	Aug. 8, 2017
Medinfo 2017	16 th World Congress on Health and Biomedical Informatics, Hangzhou, China	Aug. 21-25, 2017
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Sept. 26-28, 2017
Health Level Seven Meeting	Health Level Seven (HL7), San Diego, CA	Sept. 11-15, 2017
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Washington, DC	Oct. 4, 2017
SNOMED International Business Meeting	SNOMED International, Bratislava, Slovak Republic	Oct. 15-20, 2017
AMIA Annual Symposium	American Medical Informatics Association (AMIA), Washington, DC	Nov. 9-12, 2017
Health Level Seven Meeting	Health Level Seven (HL7), New Orleans, LA	Jan. 30-Feb. 2, 2018
ACMI Winter Symposium	American College of Medical Informatics(ACMI), Scottsdale, AZ	Feb. 1-4, 2018
APTA Combined Sections Meeting	American Physical Therapy Association (APTA), New Orleans, LA	Feb. 21-24, 2018
Health Standards Collaborative (HSC) Meeting	Health Standards Collaborative (HSC) Washington, DC	Mar. 15, 2018
Clinical LOINC Meeting	Intermountain Healthcare, Salt Lake City, UT	Mar. 21-22, 2018

Health Level Seven Meeting	Health Level Seven (HL7), Cologne, Germany	May 14-18, 2018
American College of Cardiology Annual Scientific Session and Expo	American College of Cardiology, Washington, DC	May 4, 2018
Data Translator Meeting	Monarch, Bethesda, MD	May 25, 2018

TEACHING:

TEACHING ASSIGNMENTS:

GRADUATE

P513	Functional Anatomy and Clinical Biomechanics	Lecture & Lab	Co-Instructor	Fall 2005-2006	38
P660	Selected Topics in Physical Therapy Practice (<i>Medical Informatics</i>)	Lecture	Guest Lecturer	Fall 2005-2008	38
P645	Evidence Based Critical Inquiry II	Lecture	Primary Instructor	Fall 2007-2008	38
T558	OT Management in Today's Health & Community Systems (<i>Electronic Health Records</i>)	Lecture	Guest Lecturer	Spring 2007-present	32
93ZM720	Medical Informatics Elective	Lecture	Co-Instructor	Fall & Spring 2008-2016 30 hrs/semester	1-6 per month
INFO 581	Health Informatics Standards and Terminologies (<i>LOINC</i>)	Lecture	Guest Lecturer	Spring 2011-2016	30 + 25 distance
INFO 667	Seminar in Health Informatics I (<i>Introduction to Terminology</i>)	Lecture	Guest Lecturer	Fall 2011-2016	20
INFO 584	Practicum in Health Information Technology	Lecture & Lab	Preceptor for Terminology Module	Summer 2013 – 2016	3
SHRS-P664	Administration and Management of Physical Therapy Services	Lecture	Guest Lecturer	Fall 2015 - present	38
INFO B582	Health Information Exchange	Lecture	Guest Lecturer	Spring 2017	Distance
PBHL E-635	Foundations of Public Health Informatics	Lecture	Guest Lecturer	Spring 2018	

POSTGRADUATE

N/A	NLM Medical Informatics Training Program	Lecture	Faculty	Fall & Spring 2005-2012 30 hrs/semester	6-8 per year
N/A	Clinical Informatics Training Program	Lecture	Faculty	2017-present	6-8 per year

MENTORING:

Mark (Ming-Chin) Lin, MD, MS	Program: Role: Project: and	PhD Candidate, University of Utah Mentor Profiling of LOINC usage across institutions enterprises to determine whether LOINC is meeting its goals	2009-2012
Maria Teresa Chiaravalloti	Program: Role: Project:	PhD Candidate, University of Calabria, Italy Mentor Effective and efficient approaches to foreign language translation of LOINC	2010-2011
Mustafa Fidahusseini, MD	Program: Role: Project:	Regenstrief Medical Informatics Fellowship Mentor A corpus-based approach for automated LOINC mapping	2011-2012
Judy Gichoya	Program: Role: Project: Notifiable	Regenstrief Medical Informatics Fellowship Mentor An Evaluation of the Rates of Repeat Disease Reporting and Patient Crossover Using a Health Information Exchange-based Automated Electronic Laboratory Reporting System	2011-2012
Jianmin Wu, PhD	Program: Role: Project:	Regenstrief Medical Informatics Fellowship Mentor Impact of frequency-based LOINC mapping on electronic quality measure reporting	2012-2013
Masoud Hosseini	Program: Role: Project:	PhD Candidate, IU School of Informatics Research Committee Advisor Consolidation of CDA based Documents from Multiple Sources: A modular Approach	2013-2017
Melissa Mary	Program: Role: Project:	PhD Candidate, Université de Rouen (France) External Advisor Semantic interoperability for in vitro diagnostic: Knowledge representation and biomedical terminologies mapping	2014-2017

RESEARCH/CREATIVE ACTIVITY:

GRANTS/FELLOWSHIPS IN RESEARCH:

ACTIVE RESEARCH GRANTS/FELLOWSHIPS

Linking Complex Disease and Exposure Data to Established Data Standards

Research Triangle Institute (RTI) International	Site-Principal Investigator	5%	\$149,624	10/1/2017-9/30/2020
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The goal of this project is to use the community-based data standard consensus measures for Phenotypes and Exposures (PhenX) to link existing studies and to use the linked studies to assess environmental contributions to complex diseases and conditions.

Creation, Maintenance and Distribution of Logical Observation Identifiers Names Codes (LOINC®)

National Library of Medicine (NLM)	Principal Investigator	80%	\$8,078,520	7/1/2014-6/30/2019
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The major goals of this project are to maintain and enhance the LOINC database as an openly developed standard for clinical observations and claims attachments, as needed for standard administrative health transactions, and for government and private sector computer-based patient records, as well as to develop software tools to facilitate the development and public use of this database, and to continue to distribute the database and supporting tools on a no cost basis for public use.

Collaboration on Codification of IVD Tests with LOINC

bioMérieux	Principal Investigator		\$91,050	12/14/2014-12/19/2019
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The overall goal of this project is to support the LOINC® codification of bioMérieux in vitro diagnostics (IVD) tests.

Health Care Systems Research Collaborator - Administrative Supplement: ADAPTABLE

Duke University <small>Subcontract on Assistant Secretary for Planning and Evaluation (ASPE) award</small>	Co-Investigator	10%	\$38,613	9/30/2016-8/31/2018
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The purpose of this project is to use the ADAPTABLE Trial to Strengthen Methods to Collect, Validate, and Integrate Patient-reported Information with Electronic Health Record Data.

Post-Acute Care (PAC)

Centers for Medicare & Medicaid Service (CMS)	Principal Investigator	5%	\$731,595	8/15/2016-8/14/2021
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The scope of this work is to allow the creation and update of Logical Observation Identifiers Names and Codes (LOINC) for assessment data elements that will be included in the CMS Data Element Library.

COMPLETED RESEARCH GRANTS/FELLOWSHIPS

Creation, Maintenance and Distribution of Logical Observation Identifiers Names Codes (LOINC®)

National Library of Medicine (NLM)	Co-Director	45%	\$2,630,455	2/1/2003-6/30-2008
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The major goals of this project are to maintain and enhance the LOINC database as an openly developed standard for clinical observations and claims attachments, as needed for standard administrative health transactions, and for government and private sector computer-based patient records, as well as to develop software tools to facilitate the development and public use of this database, and to continue to distribute the database and supporting tools on a no cost basis for public use.

Creating an Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research

United States Department of	Principal	30%	\$800,000	1/1/2006-4/30/2008
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This project proposes to establish an Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research (Indiana-Ohio Center) to promote outcomes research on a population with potentially unique rehabilitation needs for long-term health and welfare. Phase I will create the Indiana-Ohio Center and will establish a nation-wide database of Vietnam veterans with traumatic amputation as phase 1 of a multiple year, three phase approach to fully testing the overarching hypothesis. Phases 2 and 3 will focus on collecting data pertaining to key outcomes indicators.

Enhancing the Interoperability of the Post Acute Care Patient Assessment Instrument with LOINC

RTI International Sub-award on Centers for Medicaid and Medicare Services Contract	Principal Investigator	5%	\$91,650	8/1/2007-9/29/2012
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In the Deficit Reduction Act of 2005, the Secretary of Health and Human Services was directed to use a standardized patient assessment instrument across all post-acute care (PAC) sites, and has now begun developing this instrument called CARE. LOINC® is a coding system developed by the Regenstrief Institute that provides universal identifies and names for laboratory tests, clinical observations, and clinical reports used in electronic transactions between independent computer systems. LOINC® has been adopted by the National Committee on Vital and Health Statistics and Consolidated Health Informatics initiative as the standard for representing federally required patient assessment instruments. The purpose of this work is to create a LOINC representation of the PAC/CARE tool and to provide CMS and associated contractors with key informatics expertise to inform the development of interoperable assessment systems, including PAC/CARE.

Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research: Phase II

Ohio State University Research Foundation Subcontract on US Department of Defense award	Principal Investigator	25%	\$474,731	9/1/2007-2/29/2009
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Phase II of the Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research will (1) continue initiatives in Phase I to nationally recruit Vietnam veterans with traumatic amputations to the registry, (2) design appropriate survey instruments to gather data on continuity of care across the life span including comorbidities, health treatment and rehabilitation issues, psycho-social factors, prosthetic issues, and educational and occupational information, (3) conduct content validity, item reduction, reliability and validity analysis of the instrument, (4) pilot test and collect preliminary data for analysis to assure the viability of the data collection instruments (5) initiate strategies to inform veterans, care-givers, providers, researchers, and policy makers on amputation issues of veterans and (6) initiate strategic, collaborative relationships that maximize the evidence-based research opportunities of the database and lead to best practice guidelines for care of veterans with traumatic amputations.

Standardizing Assessments and Supporting Health Information Exchange

Foundation of Research and Education (FORE) Subcontract on Assistant Secretary for Planning and Evaluation (ASPE) award	Principal Investigator	15%	\$70,985	9/3/2007-7/31/2010
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Currently, the HIT standards efforts have been primarily focused on ambulatory and acute care; however, there is a unique opportunity to increase the use of standards in the post-acute and long-term care community and promote interoperability. The federal government currently requires assessment instruments to be completed and electronically transmitted by specific care settings (nursing home, home care, and inpatient rehab). These assessment instruments, if fitted with interoperability standards, would identify and make available to providers and vendors the infrastructure needed to support interoperable health information exchange. The application and dissemination of accepted standards to federally-required assessment instruments will enable post-acute and long-term care vendors and providers to develop and use HIT products that will be functional in the emerging interoperable nationwide health information network standardized. In addition, this project creates a repeatable framework for making future assessment requirements interoperable.

Nationwide Health Information Network Trial Implementation (NHIN)

DHHS/Office of the National Coordinator for Health Information Technology (ONC)	Co-Investigator	10%	\$3,699,142	10/1/2007-1/23/2010
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The purpose of this contract is for state, regional and non-geographic health information exchange consortia to become components of the "network of networks" that is the Nationwide Health Information Network (NHIN). Contractors will cooperatively develop specifications for, and trial implementations of, the NHIN and test these trail implementations with each other to ensure that they can all work together to implement an interoperable "network of networks" built on top of the Internet.

Accelerating Public Health Situational Awareness Through Health Information Exchanges

Centers for Disease Control and Prevention (CDC)	Co-Investigator	5%	\$2,587,529	2/6/2008-12/31/2009
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The purpose of the contract is for state, regional and non-geographic health information exchanges to enable access to clinical care information at all levels of public health for the purposes of improved public health situational awareness and case reporting in the context of the emerging Nationwide Health Information Network (NHIN).

Indiana Clinical and Translational Sciences Institute

National Center for Research Resources (NCRR)	Co- Investigator	15%	\$21,168,775	5/1/2008-4/30/2013
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To establish a new institute that facilitates clinical and translational biomedical research across the state of Indiana. This is an institute established by the CTSA to Indiana and Purdue Universities.

Creation, Maintenance and Distribution of Logical Observation Identifiers Names Codes (LOINC®): Interim Support

National Library of Medicine (NLM)	Principal Investigator	65%	\$77,750	7/1/2008-7/31/2008
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The purpose of this support is to provide bridge funding for LOINC development. The major goals of this project are to maintain and enhance the LOINC database as an openly developed standard for clinical observations, to develop software tools to facilitate the development and public use of this database, and to continue to distribute the database and supporting tools on a no cost basis for public use.

Creation, Maintenance, and Distribution of the Logical Observation Identifiers Names Codes (LOINC®)

National Library of Medicine (NLM)	Principal Investigator	65%	\$4,867,679	8/1/2008-1/31/2014
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The purpose of this project is to ensure the continued maintenance of LOINC as a freely available and openly developed source of standard identifiers, names, and codes for clinical observations, clinical document types and claims attachments sets, and individual questions being asked as part of claims attachments for use in standard administrative health transactions and government and private sector computer-based patient records.

NCRR ARRA Supplement - Translational

National Center for Research Resources (NCRR)	Co-Investigator	10%	\$247,498	4/22/2010-4/21/2012
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A fundamental challenge to interoperable health information exchange between clinical and research systems is the lack of a standardized representation of the data elements so that the systems understand their meaning and can store them appropriately. By representing the widely applicable variables of PhenX and PROMIS in LOINC, we will enable a shared "master catalog" among clinical and research systems.

Indiana Prospective Outcome Systems Using Patient-Specific Electronic Data to Compare Tests and Therapies (PROSPECT)

Agency for Healthcare Research and Quality (AHRQ)	Co-Investigator	10%	\$8,422,410	9/30/2010-9/29/2013
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The PROSPECT grant is focused on building a sustainable and flexible electronic infrastructure to drive decades of future comparative effectiveness research (CER) within busy clinical environments, supporting a wide array of study designs and priority conditions. The pilot CER study is centered on Alzheimer's disease.

Southeastern Minnesota Community Healthcare Information Technology Collaboration

Mayo Clinic Subcontract on Department of Health and Human Services award	Co-Investigator	3%	\$649,000	4/1/2011-9/15/2013
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The goal of the Southeastern Minnesota Beacon Community is to expand availability of electronic health records and health information exchange to a) enhance patient involvement in the management of chronic illness; b) improve disease metrics and quality of life for patients diagnosed with diabetes or childhood asthma; c) reduce costs associated with hospitalization and emergency services for patients with diabetes or childhood asthma; and d) address health disparities for underserved populations and rural communities.

Buttressing LOINC for Coming Growth

Regenstrief Foundation	Principal Investigator	1%*	\$1,005,000	7/1/2011-6/30/2014
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LOINC has been widely adopted in both the public and private sectors, within the United States, and internationally. It has tangible and practical effects on the care system by facilitating the information flow needed to deliver and manage healthcare in real-world systems, with payoffs that will increase with growing adoption. As the winds are gathering for rapid growth in LOINC adoption, including new federal initiatives, this proposal seeks to buttress the LOINC project by supporting software, infrastructure, and clinical content development.

*No PI salary support

Interoperable Data Exchange with LOINC®: Learning from the Crowd

Indiana Clinical and Translational Sciences Institute	Co-Principal Investigator	1%*	\$80,000	3/1/2012-2/28/2014
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This project will enhance the RELMA mapping program with features that will tap into the “wisdom of the crowd” of the LOINC community and also provide a peer-review feedback mechanism.

*No PI salary support

SHARP Area 4: Secondary Use of EHR Data

Mayo Clinic <small>Subcontract on Office of the National Coordinator for Health Information Technology award</small>	Principal Investigator	10%	\$250,019	4/1/2012-9/30/2013
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Mayo Clinic's SHARP project will enhance patient safety and improve patient medical outcomes through the use of an electronic health record (EHR). Traditionally, a patient's medical information, such as medical history, exam data, hospital visits and physician notes, are inconsistently stored in multiple locations, both electronically and non-electronically. With a vision of solving this issue, the project aims to efficiently leverage EHR data to improve care, generate new knowledge, and address population needs.

Analysis of Enhanced Automated Mapping of Local® Clinical Codes and Terms

Siemens Medical Solutions USA, Inc	Principal Investigator	10%	\$64,000	8/30/2013-9/15/2013
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The purpose of this study is to develop and evaluate automated methods of identifying likely “best matches” between terms in local clinical systems and terms in standardized vocabularies in order to improve the efficiency and consistency of the mapping process. These automated methods will employ approximate string comparators, parsing algorithms, statistical methods, machine learning techniques, and an enhanced scoring system. The substrate for these automated methods will be de-identified data extracted from clinical result messages from INPC institutions.

Unification of LOINC® Radiology and the RadLex Playbook: Phase I

Radiologic Society of North America (RSNA) <small>Subcontract on National Heart, Lung, and Blood Institute award</small>	Principal Investigator	10%	\$128,759	09/30/2013-9/29/2015
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The goal of this project is to undertake an initial effort to unify LOINC Radiology and RadLex Playbook into a single integrated terminology. These two terminologies share in common a standardized nomenclature for naming radiology procedures. LOINC is a broader standardization that encompasses laboratory and other medical procedures, while Playbook focuses on the domain of radiology. A harmonization effort will provide a common information model and a single governance process for terms that describe radiology orders and results.

Building an Empiric Common LOINC® Laboratory Orders Set for Ambulatory Care

California Healthcare Foundation	Principal Investigator	5%	\$31,044	11/25/2013-5/23/2014
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The overall objective of this project is to provide critical data and analytics that enables creation of a timely, empirically derived, and consensus-vetted revision of the LOINC Top Orders list. To accomplish this aim, we will mine data from the Indiana Network for Patient Care (INPC), the nation's longest tenured and most comprehensive health information exchange. These data will provide the substrate for developing a list of the most commonly ordered laboratory tests. The INPC data will be added to 3-8 other sources (not funded by this

proposal) and then fed into a consensus-based review by laboratory and clinical data standards experts to be coordinated by the Standards and Interoperability (S&I) Framework of the Office of the National Coordinator for Health Information Technology (ONC). By defining such a list in a standard nomenclature, LOINC, electronic health record (EHR) systems can vastly reduce the complexity and cost of electronically ordering tests from clinical laboratories.

**Creation, Maintenance and Distribution of Logical Observation Identifiers Names Codes (LOINC®):
LOINC Bridge II**

National Library of Medicine (NLM)	Principal Investigator	65%	\$385,143.75	02/14/2014- 07/31/2014
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The purpose of this support is to provide bridge funding for LOINC development. The major goals of this project are to maintain and enhance the LOINC database as an openly developed standard for clinical observations, to develop software tools to facilitate the development and public use of this database, and to continue to distribute the database and supporting tools on a no cost basis for public use.

Preparing the APTA Physical Therapy Outcomes Registry for Interoperable Data Exchange with LOINC®

American Physical Therapy Association (APTA)	Principal Investigator	5%	\$50,412.37	11/1/2014- 4/30/2015
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The overall objective of this project is to prepare the APTA Physical Therapy Outcome Registry for effective and efficient data exchange from many independent clinical systems using widely adopted data standards.

FHIRing up LOINC Subsets

Regenstrief Foundation	Principal Investigator	5%	\$32,000	2/1/15-12/31/15
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In this project, we are going to leverage the emerging open source HL7 FHIR standard to deliver key LOINC subsets as FHIR value sets. The value sets will be available in both JSON and XML formats through a restful interface that complies with the FHIR standard.

Unification of the Radlex Playbook and LOINC into a Single Unified LOINC/Radlex Model: Phase II

Radiologic Society of North America (RSNA)	Principal Investigator	5%	\$117,566	9/30/2015- 9/30/2017
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Subcontract on National Heart, Lung, and Blood Institute award

The goal of this project is to undertake an initial effort to unify LOINC Radiology and RadLex Playbook into a single integrated terminology. These two terminologies share in common a standardized nomenclature for naming radiology procedures. LOINC is a broader standardization that encompasses laboratory and other medical procedures, while Playbook focuses on the domain of radiology. A harmonization effort will provide a common information model and a single governance process for terms that describe radiology orders and results.

IVD Device Infectious Disease LOINC Mapping Manual

Food and Drug Administration (FDA)	Principal Investigator	4.81%	\$130,000	8/10/2017- 7/30/2018
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The goal of this project is to develop and publish an *in vitro* diagnostic (IVD) Device Infectious Disease LOINC Mapping Manual in order to provide definitive guidance on linking the test result output from infectious disease IVD tests to the appropriate LOINC codes.

NKDEP Chronic Kidney Disease (CKD) Care Plan

National Institutes of Health – National Institute of Diabetes and Digestive and Kidney Diseases	Principal Investigator		\$20,875	8/15/2017- 8/14/2018
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Support for development of a CKD care plan template, including identifying data standards & messages & technical guidance for use of a template selection model.

Indiana Clinical and Translational Sciences Institute: Administrative Supplement to Create LOINC Equivalence Groups

National Center for Advancing Translational Sciences	Co-Investigator	10%	\$930,344	9/23/2016- 6/30/2018
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The goal of this proposal is to create a flexible, extensible, and computable mechanism for rolling up LOINC codes into clinically relevant equivalence groups that enable more efficient processing and aggregation of laboratory and other data from diverse health IT systems.

PENDING

Standardizing and Evaluating the Representation of Social Determinants of Health-Related Data in the EHR

DHHS, Office of the National Coordinator (ONC)	Principal Investigator	\$65,942	04/01/2018- 03/31/2020
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Create new codes in LOINC, where necessary, that correspond to the set of social determinants proposed in this project; Gather these codes into a group that is easily identifiable and accessible in the overall terminology; and Contribute to and validate the implementation specification related to the overall set of codes.

SUBMITTED BUT NOT FUNDED RESEARCH GRANTS/FELLOWSHIPS

Standardizing the representation of social determinants of Health-related data in the EHR

Office of the National Coordinator (ONC)	Principal Investigator	\$66,353	09/05/2016- 09/04/2017
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Create new codes in LOINC, where necessary, that correspond to the set of social determinants proposed in this project. Gather these codes into a group that is easily identifiable and accessible in the overall terminology. Contribute to and validate the implementation specification related to the overall set of codes.

Precision Medicine Translator Biomedical Data Translator: Technical Feasibility Assessment and Architecture Design Projects

National Center for Advancing Translational Sciences (NCATS)	Co-Principal Investigator	\$2,807,177	09/1/2016- 08/31/2018
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In this grant, we will identify and assess three key informatics gaps in connecting the knowledge: disease symptoms and drug side effects; drugs, drug targets and lab tests; and drug interactions, drug indications and side effects, and molecular mechanisms.

Informatics Collaboratory for Health (IC4H)

National Institutes of Health (NCATS)	Co-Investigator	\$1,785,565	11/01/2017- 10/31/2022
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Regenstrief Institute will support the project management, data management, and stakeholder communication aspects of the proposed work under Aim 2.

Big Data to Knowledge (BD2K) Community-Based Data and Metadata Standards Efforts (R24)

National Institute of Health (NIH)	Principal Investigator	\$1,077,185	07/01/2017- 06/30/2022
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The goal of this proposal is to catalyze the representation of key social determinants of health (SDH) variables in LOINC. We will create an advisory group to help identify, prioritize, and propose relevant SDH measures, and will substantially enrich the content in LOINC. Representing SDH content in LOINC will enable more efficient sharing and use of this data across diverse clinical, population, and research IT systems.

INVITED PRESENTATIONS - RESEARCH

LOCAL

Where Angels Fear to Tread: Developing an Automated Method of Mapping Legacy Radiology System Codes to LOINC	Regenstrief Institute, Work in Progress, Indianapolis, IN	June 2004
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Reducing Barriers to Data Aggregation with Automated Tools for Term Mapping: Challenges, Successes, and Future Directions	Regenstrief Institute, Work in Progress, Indianapolis, IN	May 2005
The Indiana-Ohio Center for Traumatic Amputee Rehabilitation Research	VA HSR&D Center on Implementing Evidence-based Practice, Work in Progress, Indianapolis, IN	June 2006
The Indiana-Ohio Center for Traumatic Amputee Rehabilitation Research	Regenstrief Institute, Work in Progress, Indianapolis, IN	Nov. 2006
Reducing Barriers to Health Information Exchange: Challenges and Successes with Automated Term Mapping	Regenstrief Institute, Work in Progress, Indianapolis, IN	Jan. 2007
LOINC: The Master Catalog of Clinical Observations	Regenstrief Institute, Work in Progress, Indianapolis, IN	Jan. 2008
LOINC: Grown locally. Consumed worldwide.	Regenstrief Institute, Work in Progress, Indianapolis, IN	Mar. 2011
LOINC: Grown locally. Consumed worldwide.	Regenstrief Global Health Informatics, Quarterly Meeting, Indianapolis, IN	Mar. 2012
Strategies for Mapping Local Lab Tests to LOINC That Aren't a Pig in a Poke	Regenstrief Institute, Work in Progress, Indianapolis, IN	Apr. 2013
Learning with LOINC: A 20-year project looks ahead	Regenstrief Institute, Work in Progress, Indianapolis, IN	June 2014
How to Make your Project an Overnight Success (in Twenty Years)	Regenstrief Institute, Work in Progress, Indianapolis, IN	Apr. 2015
Taming the Wicked Problem of Health Data Interoperability	Regenstrief Institute, Work in Progress, Indianapolis, IN	June 2017

REGIONAL

Evidence-based Practice: Resources for the Busy Clinician	Indiana Chapter, American Physical Therapy Association, Central District Meeting, Indianapolis, IN	Nov. 2005
Evidence-based Practice: Resources for the Busy Clinician	Indiana Chapter, American Physical Therapy Association, Central District Meeting, Indianapolis, IN	Nov. 2006
The Indiana Network for Patient Care: a central Indiana health information network with a national impact	Indiana Chapter, American Physical Therapy Association, Central District Meeting, Indianapolis, IN	Jan. 2008
An Overview and Introduction to LOINC: the universal catalog of laboratory observations	American Society for Clinical Laboratory Science, Clinical Laboratory Management Association, and American Association of Clinical Chemistry, Ohio 2010 Collaborative Laboratory Conference, Cleveland, OH	Apr. 2010
LOINC: Introduction and Mapping Boot Camp	Chicago Health Information Technology Regional Extension Center, Laboratory LOINC Workshop, Chicago, IL	May 2011
LOINC: an Introduction to the Universal Catalog of Laboratory and Clinical Observations	BloodCenter of Wisconsin, Milwaukee, WI	Sep. 2011

Electronic Health Records: chicken soup or rotten egg?	Gentiva Home Health, Indianapolis, IN	Mar. 2012
Maybe is Not a Wary Word	Arcadia University, Graduate Colloquium Keynote, Glenside, PA	May 2012
Why Using EHRs Might Save Lives but Steal your Sunshine	West Virginia University, Fall 2012 Visiting Scholar Lecture, Morgantown, WV	Sep. 2012
Electronic Health Records: chicken soup or rotten egg?	Gentiva Home Health, Indianapolis, IN	Sep. 2012
A Reflection on a Profession of Conviction, A Discipline You've Barely Heard of, and How The World is Changed	Indiana Chapter, American Physical Therapy Association, Central District Meeting, Indianapolis, IN	Oct. 2012
Data Standards at the Regenstrief Institute, Inc.	Regenstrief Institute Open House, Indianapolis, IN	May 2015

NATIONAL

Developing an Automated Method of Mapping Legacy Radiology System Codes to LOINC	National Library of Medicine, Training Directors Meeting, Indianapolis, IN	June 2004
Reducing Barriers to Health Information Exchange: challenges and successes with managing terminology	Agency for Healthcare Research and Quality (AHRQ), State and Regional Demonstration Project Meeting Pre-conference Session, Indianapolis, IN	May 2007
LOINC: the Master Catalog of Clinical Observations	Interagency Committee on Disability Research (ICDR), ICDR State-of-the-Art Conference 2007: New Federal Applications of ICF, Arlington, VA	June 2007
Essential Informatics for Private Practice Physical Therapists	American Physical Therapy Association Private Practice Section, Annual Conference and Exposition 2007, San Diego, CA	Nov. 2007
Developing Information Systems to Inform Change	Duke University Doctor of Physical Therapy Program, Research Symposium 2008, Durham, NC	Oct. 2008
LOINC and RELMA: Introduction and Tutorial	Centers for Disease Control and Prevention (CDC), Public Health Information Network Vocabulary and Messaging Community of Practice Meeting	Dec. 2009
Terminology Mapping in the INPC: overview and lessons learned	HHS Office of the National Coordinator for Health IT (ONC), Beacon Community Meeting, Indianapolis, IN	Feb. 2011
LOINC: Introduction and Mapping Boot Camp	Centers for Disease Control and Prevention (CDC), Public Health Informatics 2011 Conference, Atlanta, GA	Aug. 2011
Maybe is Not a Wary Word	American Physical Therapy Association, Exploring the Future of Physical Therapy Symposium, King of Prussia, PA	Sep. 2011
Challenges and Successes with Community-wide Laboratory Data Exchange: corralling creativity with	International Quality and Productivity Center, 9th Forum on Laboratory Informatics, San Diego, CA	Nov. 2011

standards.

LOINC: An Introduction to the Universal Catalog of Laboratory and Clinical Observations	Sysmex America	Feb. 2012
LOINC: An Introduction to the Universal Catalog of Laboratory and Clinical Observations	American Medical Informatics Association Knowledge Representation and Semantics Working Group, Webinar Series on Standard Biomedical Terminologies, online webinar	Mar. 2012
Challenges and Successes in Building a Community-wide EHR	Mayo Clinic, 2012 SHARPn Summit “Secondary Use”, Rochester, MN	June 2012
Use of LOINC in Electronic Quality Measures	National Quality Forum, Health Information Technology Advisory Committee Meeting, Washington DC	July 2012
Vocabulary Standards for Electronic Claims Attachments	National Committee on Vital and Health Statistics, Standards Subcommittee Meeting, Washington, DC	Feb. 2013
LOINC: Introduction and Overview	dbMotion Clinical Vocabulary Forum, online webinar	Aug. 2013
LOINC and SNOMED CT	National Library of Medicine, National Institutes of Health, VA-NLM Interagency Agreement Face to Face Kick-off, Bethesda, MD	Nov. 2013
EHRs – Can they save lives without stealing your sunshine?	American Physical Therapy Association, Combined Sections Meeting, Las Vegas, NV	Feb. 2014
Regenstrief Institute Overview Presentation	American Physical Therapy Association Combined Sections Meeting, Indianapolis, IN	Feb. 2015
Challenges and Successes in Managing Local Healthcare Terminologies in a Community-Wide HIE	Icahn School of Medicine at Mount Sinai, New York	Oct. 2015
Update on LOINC and Radlex Unification	Icahn School of Medicine at Mount Sinai, New York	Oct. 2015
Technopalooza “Practicality of Wearable Technology in Physical Therapy”	American Physical Therapy Association APTA Combined Sections Meeting (APTA), Indianapolis, IN	Feb. 2016
PCORnet Best Practices Sharing Session: Best Practices for Using LOINC.	PCORnet Online Webinar	Jan 2016
Context Is Important but Consistency and Quality is Critical - Creating Standards Around SDoH Data Collection	Health Insights, Arlington, Virginia	July 2017
Advancing Lab Data Interoperability with LOINC: An update on current standardization initiatives	Clinical Laboratory Improvement Advisory Committee (CLIAC), Silver Spring, MD	April 2018

INTERNATIONAL

Using RELMA for Mapping Local Laboratory Tests to LOINC	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2007
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2008
LOINC: Overview and Introduction	Regenstrief Institute, site visit from National Health Information Standards Committee of the Korean Ministry of Health and Welfare Indianapolis, IN	Mar. 2009
LOINC Representation of Diagnostic Genetics, Molecular Biology, and Surgical Pathology Testing	National Health Information Standards Committee of the Korean Ministry of Health and Welfare and HL7 Korea, Seoul, Korea	May 2009
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2009
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2009
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2009
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2009
Challenges and Successes with Community-wide Health Information Exchange: corralling the creativity with standards	BC Children's Hospital and BC Women's Hospital and Health Centre Department of Pathology and Laboratory Medicine Distinguished Lecturer Series, Vancouver, BC Canada	Mar. 2010
A Proposal for Interoperable Health Information Exchange with Two Esperantos: ICF and LOINC	WHO North American Collaborating Center, 2010 Conference on ICF: Enhancing our Understanding of the ICF Bethesda, MD	June 2010
LOINC Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2010
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	July 2010
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	July 2010
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2010
LOINC: Documents	Indian Health Service, Public Clinical LOINC Tutorial and Committee Meeting Tucson, AZ	Jan. 2011
LOINC: Panels, Forms, and Patient Assessment Instruments	Indian Health Service, Public Clinical LOINC Tutorial and Committee Meeting Tucson, AZ	Jan. 2011

LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2011
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2011
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2011
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2011
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2012
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2012
LOINC: Overview and Introduction	Hong Kong eHealth Record Office, Seminar on Standardization of Laboratory data with LOINC, Hong Kong, SAR	Feb. 2012
RELMA: the Regenstrief LOINC Mapping Assistant	Hong Kong eHealth Record Office, Seminar on Standardization of Laboratory data with LOINC, Hong Kong, SAR	Feb. 2012
RELMA: Advanced Topics and Practicum	Hong Kong eHealth Record Office, Seminar on Standardization of Laboratory data with LOINC, Hong Kong, SAR	Feb. 2012
Health Information Interoperability and LOINC	Thai Health Information Network (THINK) Consortium Meeting, Bangkok, Thailand	Mar. 2012
LOINC: An Introduction to LOINC	Health Systems Research Institute, International (HSRI) Workshop on Logical Observation Identifiers Names and Codes (LOINC), Bangkok, Thailand	Mar. 2012
Mapping Local Laboratory Codes to LOINC with RELMA – Practicum	Health Systems Research Institute (HSRI), International Workshop on Logical Observation Identifiers Names and Codes (LOINC), Bangkok, Thailand	Mar. 2012
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2012
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2012
LOINC: Panels, Forms, and Patient Assessment Instruments.	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2012
Proposed Collaboration of IHTSDO with Regenstrief on SNOMED CT & LOINC	Health Level 7 (HL7) International, HL7 Board of Directors Meeting, Baltimore, MD	Sep. 2012
Meeting Terminology Requirements for	International Health Terminology Standards	Oct. 2012

Order Entry and Result Reporting	Development Organisation, SNOMED CT Implementation Showcase, Stockholm, Sweden	
Essentials of Health Data Standards for Health Care Delivery	World Health Organization, Forum on Health Data Standardization and Interoperability, Geneva, Switzerland	Dec. 2012
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2012
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2013
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2013
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2013
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2013
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2013
Cooperation Agreement between IHTSDO and Regenstrief Institute on SNOMED CT & LOINC	Health Level 7 (HL7) International, HL7 Board of Directors Meeting, Cambridge, MA	Sep. 2013
LOINC: Introduction and Mapping Best Practices	Regenstrief Institute, Site Visit from Malaysian Ministry of Health, Indianapolis, IN	Oct. 2013
Using RELMA and Advanced Mapping Topics	Regenstrief Institute, Site Visit from Malaysian Ministry of Health, Indianapolis, IN	Oct. 2013
LOINC: A Universal Catalog of Clinical and Laboratory Observations	Consiglio Nazionale Delle Ricerche, Evoluzione e interoperabilità tecnologica del Fascicolo Sanitario Elettronico, Sorrento, Italy	Oct. 2013
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2013
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2014
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2014
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2014
LOINC: Overview and Introduction	Malaysia Ministry of Health, LOINC Workshop, Kuala Lumpur, Malaysia	Aug. 2014

Introduction to RELMA for Mapping to LOINC	Malaysia Ministry of Health, LOINC Workshop, Kuala Lumpur, Malaysia	Aug. 2014
LOINC Panels and Answers	Malaysia Ministry of Health, LOINC Workshop, Kuala Lumpur, Malaysia	Aug. 2014
Special Topics in LOINC Mapping and Submissions	Malaysia Ministry of Health, LOINC Workshop, Kuala Lumpur, Malaysia	Aug. 2014
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Sep. 2014
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Sep. 2014
LOINC and RELMA for Diagnostic Imaging	Canada Health Infoway, Standards Collaborative Working Group 10 for Diagnostic Imaging, Toronto, Ont, Canada	Sep. 2014
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2014
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2015
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2015
Why Use Standards for Semantic Interoperability	Standards for Semantic Interoperability in Health Informatics for bioMerieux, La Balme, France	May 2015
An Introduction to LOINC	Standards for Semantic Interoperability in Health Informatics for bioMerieux, La Balme, France	May 2015
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2015
LOINC: Radiology Studies	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2015
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2015
LOINC: Panels, Forms, and Patient Assessment Instruments	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2015
LOINC: An Introduction to LOINC	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2015
LOINC Introduction and Use for Interoperability	FDA/CDC/NLM Workshop on Promoting Semantic Interoperability of Laboratory Data	Sep. 2015

LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec. 2015
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2016
LOINC: Panels, Forms, and Patient Assessment Instrument	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2016
LOINC: Radiology Studies	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2016
LOINC: An Introduction to LOINC	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Feb. 2016
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2016
LOINC: Tutorial LOINC Essentials: A Step by Step Workshop on Getting your Local Codes Mapped to LOINC	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2016
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2016
LOINC: Panels, Forms, and Patient Assessment Instrument	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2016
LOINC: Radiology Studies	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Aug. 2016
LOINC: More Data, More Problems	Regenstrief Institute Conference Precision Medicine: Putting the Pieces Together, Turkey Run, IN	Oct. 2016
LOINC: Addressing LOINC Code Challenges	FDA/CDC/NLM Workshop on Promoting Semantic Interoperability of Laboratory Data	Nov. 2016
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	Dec 2016
LOINC: Documents	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Mar. 2017
LOINC: Panels, Forms, and Patient Assessment Instrument	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Mar. 2017
LOINC: Radiology Studies	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Mar. 2017

LOINC: Overview and Introduction	Intermountain Healthcare, Public Clinical LOINC Tutorial and Committee Meeting, Salt Lake City, UT	Mar. 2017
LOINC: Overview and Introduction	Regenstrief Institute, Public Laboratory LOINC Committee Meeting and Workshop, Indianapolis, IN	June 2017
LOINC: Addressing LOINC Code Challenges	FDA/NIH/CDISC Workshop on Promoting Semantic Interoperability of Laboratory Data	June 2017
Clinical Terminology Standards required for US Health Data Exchange: SNOMED CT, LOINC, RxNorm	National Committee on Vital and Health Statistics (NCVHS), Washington, DC	June 2017
Making Data Elements Interoperable with LOINC.	Long Term Post-Acute Care and HIT Summit (LTPAC), Baltimore, MD	June 2017
An Introduction to LOINC	Standards for Semantic Interoperability in Health Informatics for bioMerieux Lyon, France	Oct. 2017
FHIR AND LOINC	FHIR DevDays2017, Amsterdam, Netherlands	Nov. 2017
An Introduction to LOINC	RSNA Annual Meeting, Chicago, ILL	Nov. 2017
LOINC: Welcome and Introduction	Regenstrief Institute, Public Laboratory LOINC Conference, Indianapolis, IN	Dec. 2017
LOINC: LOINC for Beginners	Regenstrief Institute, Public Laboratory LOINC Conference, Indianapolis, IN	Dec. 2017
LOINC: RELMA Part 1	Regenstrief Institute, Public Laboratory LOINC Conference, Indianapolis, IN	Dec. 2017
LOINC: RELMA Part 2	Regenstrief Institute, Public Laboratory LOINC Conference, Indianapolis, IN	Dec. 2017
LOINC: LOINC on FHIR	Regenstrief Institute, Public Laboratory LOINC Conference, Indianapolis, IN	Dec. 2017
Advancing Lab Data Interoperability with LOINC: An update on current standardization initiatives	Clinical Laboratory Improvement Advisory Committee (CLIAC), Silver Spring, MD	April 2018
LOINC and FHIR	FHIR DevDays USA 2018, Boston, MA	June 2018
Health Terminologies and Vocabularies Environmental Scan	National Committee on Vital and Health Statistics (NCVHS), Washington, DC	July 2018

SERVICE:

UNIVERSITY SERVICE:

DEPARTMENT

Department of Physical Therapy Curriculum Committee	Member	2005-2007
Department of Physical Therapy Student Affairs Committee	Member	2005-2007
SCHOOL		
Search and Screen Committee, Health Services Researcher, School of Health and Rehabilitation Sciences	Member	2005-2006
Academic Studies and Research Development Committee	Member	2006-2007
CAMPUS		
None		
UNIVERSITY		
Indiana CTSI Sustainable and Collaborative Informatics Projects (SCIP) Program	Grant Reviewer	2012
PROFESSIONAL SERVICE:		
LOCAL		
None		
REGIONAL		
Indiana American Physical Therapy Association	Reviewer, Annual Fall Conference	2006
NATIONAL		
American Physical Therapy Association	Reviewer, Hooked on Evidence Online Research Database	2004
American Physical Therapy Association	Delegate, Indiana Chapter of APTA	2006-2007
American Physical Therapy Association	Vice President, Technology in Physical Therapy Special Interest Group, Section on Health Policy and Administration	2006-2007
American Physical Therapy Association	Alternate delegate, Indiana Chapter of APTA	2007-2008
American Physical Therapy Association	Participant, Physical Therapy and Society Summit	2009

Healthcare Information Technology Standards Panel (HITSP)	Member, HITSP Foundations Committee	2007-2010
American Physical Therapy Association	President, Technology in Physical Therapy Special Interest Group, Health Policy and Administration Section	2007-2013
Health Information Technology Standards Committee (HITSC)	Member, HITSC Task Force on Vocabulary	2009-2012
American Physical Therapy Association	Member, Advisory Committee on Health Information Technology	2009-present
American Physical Therapy Association	Member, National Outcomes Database Workgroup	2010-present
Health Standards Collaboration	Executive Representative for LOINC	2010-present
American Physical Therapy Association	Advisor, PTNow Editorial Board and Staff	2012-present
Health Information Technology Standards Committee (HITSC)	Member, HITSC Clinical Operations Workgroup	2012-2014
National Institutes of Health (NIH)	NIH Early Career Reviewer Program	2012-present
Agency for Healthcare Research and Quality	Member, Technical Expert Panel for Health Information Exchange	2014-2015
Health Information Technology Standards Committee (HITSC)	Member, 2017 Interoperability Standards Advisory Task Force	2016-present
Health Information Technology Standards Committee (HITSC)	Chair, 2017 Interoperability Standards Advisory Task Force Structure Subcommittee	2016-present
Health Standards Collaboration	Chair-elect	2016-present
FDA/CDISC/NIH/LOINC Workgroup	Executive Representative for LOINC	2017-present
INTERNATIONAL		
Timmy Foundation and Indiana University	Faculty Leader, IU Doctor of Physical Therapy Service Trip, Quito, Ecuador	June 2007
Medinfo	Reviewer, 12 th World Congress on Health Informatics	2007
LOINC Committee	Member, Laboratory LOINC Committee	2003-present
LOINC Committee	Member, Clinical LOINC Committee	2003-present
American Medical Informatics Association	Reviewer, AMIA Fall Symposium	2005-present
<i>Physical Therapy</i>	Reviewer	2006-present
<i>Journal of Medical Internet Research</i>	Reviewer	2008-present
American Medical Informatics Association	Editorial Board Member, AMIA's	2009-2014

Standards Standard

HL7 International	Member, Vocabulary Work Group, Structured Documents Work Group, and Attachments Work Group	2009-present
Regenstrief Institute	Liaison to HL7 International	2011-present
<i>Journal of Biomedical Informatics</i>	Reviewer	2011-present
The Unified Code for Units of Measure (UCUM)	Board of Advisors Member	2012-present
Regenstrief Institute	Liaison to International Health Terminology Standards Organisation	2013-present
<i>Journal of the American Medical Informatics Association</i>	Reviewer	2014-present
Regenstrief Institute	Chair, Executive Policy Group Regenstrief Institute and International Health Terminology Standards Organisation	2015-2017
<i>Western Journal of Nursing</i>	Reviewer	2016-present
<i>Health Policy and Technology</i>	Reviewer	2016-present
<i>International Journal of Medical Informatics</i>	Reviewer	2016-present
<i>Archives of Physiotherapy</i>	Reviewer	2016-present

PATIENT CARE/CLINICAL SERVICE:

Wishard Health Services	Staff Physical Therapist	2003-2005
Clarian Health Partners	Staff Physical Therapist	2003-2005
Regenstrief Institute, Inc.	Website Redesign Team	2006
Regenstrief Institute, Inc.	Co-Supervisor, Terminology and Mapping Team	2005-2007
Regenstrief Institute, Inc. and Indiana Health Information Exchange	Member, Interface X-Team	2008-2009
Regenstrief Institute, Inc.	Co-Chair, Optimizing the Research Environment Workgroup	2009-2010
Regenstrief Institute, Inc.	Supervisor, Terminology and Mapping Team	2008-2011
Regenstrief Institute, Inc. and Indiana Health Information Exchange	Faculty Advisor, Interface and Mapping Team	2011-present
Regenstrief Institute, Inc.	Member, Biomedical Informatics Executive Leadership Council	2012-present
Regenstrief Institute, Inc.	Chair, Biomedical Informatics Social Media Task Force	2013-2015

GRANTS/FELLOWSHIPS IN SERVICE:

COMPLETED SERVICE GRANTS/FELLOWSHIPS

Regenstrief System Support Agreement for INPC development

Indiana Health Information Exchange)	Co-Investigator	6%	N/A	7/1/2011-6/31/2013
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Regenstrief provides to IHIE, as requested by IHIE, the services of a dedicated team of Regenstrief personnel to (i) build, support and maintain interfaces with healthcare data providers' systems (inbound and outbound) located within Dartmouth Atlas Hospital Referral Region 183 and (ii) map healthcare data providers' data from within Dartmouth Atlas Hospital Referral Region 183 into a mutually agreed upon standardized language and format for use in the Indiana Network for Patient Care and IHIE's clinical messaging system.

INVITED PRESENTATIONS - SERVICE

LOCAL

Optimizing the Research Environment at the Regenstrief Institute	Regenstrief Institute, Work in Progress, Indianapolis, IN	Apr. 2010
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PUBLICATIONS:

TEACHING

Refereed

None

Refereed Presentations and Abstracts

1. †Ippensen-Vreeman LB, Beck EM, Beheme JK, DeWolf ME, Hagemeyer MA, Lecher PS, Morgan PA, Robertson NT, Townsend SE, **Vreeman DJ**. Conceptual Framework for Clinical Decision Making: Individual-Centered Approach. APTA Combined Sections Meeting 2007, Boston, MA, February 2007.
2. Wilkinson SG, **Vreeman DJ**. Informatics Competencies in Physical Therapy Education: A Proposed Framework, APTA Combined Sections Meeting 2012, Chicago, IL, February 2012.
3. Finnell JT and **Vreeman DJ**. The Evolution of Medical Informatics Education: Training the Next Generation of Informaticians. AMIA Annu Symp Proc. 2010;1038.

Non-refereed

None

RESEARCH/CREATIVE ACTIVITY

Refereed

1. **Vreeman DJ** and McDonald CJ. Automated mapping of local radiology terms to LOINC. *AMIA Annu Symp Proc.* 2005;769-773. PMID: [16779144](#).
2. **Vreeman DJ**, Taggard SL, Rhine MD, and Worrell TW. Evidence for electronic health record systems in physical therapy. *Phys Ther.* 2006;86(3):434-449. PMID: [16506879](#).
3. Vreeman RC, Madsen, KA, **Vreeman DJ**, Carroll AE, and Downs SM. Compliance with guidelines for ADHD: a pilot study of an evaluation tool. *J Pediatr.* 2006;149(4):568-571. PMID: [17011336](#).
4. **Vreeman DJ**, McDonald CJ. A comparison of Intelligent Mapper and document similarity scores for mapping local radiology terms to LOINC. *AMIA Annu Symp Proc.* 2006;809-813. PMID: [17238453](#).
5. **Vreeman DJ**. Keeping up with source system changes in a local health information infrastructure: running to stand still. *Stud Health Technol Inform.* 2007;129:775-779. PMID: [17911822](#).
6. **Vreeman DJ**, Finnell JT, Overhage JM. A rationale for parsimonious laboratory term mapping by frequency. *AMIA Annu Symp Proc.* 2007;771-775. PMID: [18693941](#).
7. **Vreeman DJ**, Stark M, Tomashefski GT, Phillips DR, Dexter PR. Embracing change in a health information exchange. *AMIA Annu Symp Proc.* 2008;768-772. PMID: [18999242](#).
8. Robbins C, **Vreeman DJ**, Sothmann MS, Wilson SL, Oldridge N. A review of the long-term health outcomes associated with war-related amputation. *Mil Med.* 2009;174(6):588-592. PMID: [19585770](#).
9. Wilkinson SG, Chevan J, **Vreeman DJ**. Establishing the centrality of health informatics in physical therapist education: if not now, when? *J Phys Ther Educ.* 2010;24(3):10-15. CINAHL AN: 2010781382.
10. †Lin MC, **Vreeman DJ**, Huff SM. Correctness of voluntary mapping for laboratory tests in three large institutions. *AMIA Annu Symp Proc.* 2010;447-451. PMID: [21347018](#).
11. Grannis SJ, **Vreeman DJ**. A vision of the journey before us: using public health notifiable condition mapping to illustrate the need for maintaining value sets. *AMIA Annu Symp Proc.* 2010;261-265. PMID: [21346981](#).
12. **Vreeman DJ**, McDonald CJ, Huff SM. Representing patient assessments in LOINC®. *AMIA Annu Symp Proc.* 2010;832-836. PMID: [21347095](#).
13. Wilson SL, Sothmann MS, **Vreeman DJ**. Forming partnerships: Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research. *J Allied Health.* 2010;39(4):301-305. PMID: [21184027](#).
14. **Vreeman DJ**, McDonald CJ, Huff SM. LOINC® - a universal catalog of individual clinical observations and uniform representation of enumerated collections. *Int J Funct Inform Personal Med.* 2010;3(4):273-291.
15. †Lin MC, **Vreeman DJ**, McDonald CJ, Huff SM. A characterization of local LOINC mapping for laboratory tests in three large institutions. *Methods Inf Med.* 2011; 50(2): 105–114. PMID: [20725694](#).
16. Rajda J, **Vreeman DJ**, Wei HG. Semantic interoperability of health risk assessments. *AMIA Annu Symp Proc.* 2011;1134-1143. PMID: [22195174](#).
17. †Lin MC, **Vreeman DJ**, Huff SM. Investigating the semantic interoperability of laboratory data exchanged using LOINC codes in three large institutions. *AMIA Annu Symp Proc.* 2011;805-814. PMID: [22195138](#).
18. Kroth DJ, Daneshvari S, Harris EF, **Vreeman DJ**, Edgar HJ. Using LOINC to link ten terminology standards to one unified standard in a specialized domain. *J Biomed Inform.* 2012;45(4):674-682. Epub 2011 Oct 19. PMID: [22036696](#).
19. †**Vreeman DJ**, Chiaravalloti MT, Hook J, McDonald CJ. Enabling international adoption of LOINC through translation. *J Biomed Inform.* 2012;45(4):667-673. Epub 2012 Jan 21. PMID: [22285984](#).
20. †Lin MC, **Vreeman DJ**, McDonald CJ, Huff SM. Auditing consistency and usefulness of LOINC among three large institutions – using version spaces for grouping LOINC codes. *J Biomed Inform.* 2012;45(4):658-666. Epub 2012 Jan 28. PMID: [22306382](#).
21. Pan H, Tryka KA, **Vreeman DJ**, Huggins W, Phillips MJ, Phillips JH, McDonald CJ, Junkins HA, Ramos EM, Hamilton CM. Using PhenX measures to identify opportunities for cross-study analysis. *Hum Mutat.* 2012;33(5):849-57. doi: 10.1002/humu.22074. Epub 2012 Apr 3. PMID: [22415805](#).
22. †Gichoya J, Gamache RE, **Vreeman DJ**, Dixon BE, Finnell JT, Grannis SJ. An Evaluation of the Rates of Repeat Notifiable Disease Reporting and Patient Crossover Using a Health Information Exchange-based Automated Electronic Laboratory Reporting System. *AMIA Annu Symp Proc.* 2012; 1229-1236. PMID: [23304400](#).
23. Gamache RE, Dixon BE, Grannis SJ, **Vreeman DJ**. Impact of Selective Mapping Strategies on Automated Laboratory Result Notification to Public Health Authorities. *AMIA Annu Symp Proc.* 2012; 228-236. PMID: [23304292](#).
24. ***Vreeman DJ**, Richoz C. Possibilities and implications of using the ICF and other vocabulary standards in electronic health records. *Physiother Res Int.* 2013 Jul 30. doi: 10.1002/pri.1559. [Epub ahead of print] PMID: [23897840](#).
25. *†Wu J, Finnell JT, **Vreeman DJ**. Evaluating Congruence Between Laboratory LOINC Value Sets for Quality Measures, Public Health Reporting, and Mapping Common Tests. *AMIA Annu Symp Proc.* 2013 Nov 16;2013:1525-32. eCollection 2013. PMID: [24551424](#); PMCID: PMC3900163.

26. *Fidahusseini M, **Vreeman DJ**. A corpus-based approach for automated LOINC mapping. *J Am Med Inform Assoc*. 2014 Jan 1;21(1):64-72. PMID: [23676247](#).
27. *Dixon BE, **Vreeman DJ**, Grannis SJ. The long road to semantic interoperability in support of public health: Experiences from two states. *J Biomed Inform*. 2014 Jun;49C:3-8. doi: 10.1016/j.jbi.2014.03.011. Epub 2014 Mar 25. PMID: [24680985](#).
28. *Deckard J, McDonald CJ, **Vreeman DJ**. Supporting Interoperability of Genetic Data with LOINC. *J AM Med Inform Assoc*. 2015 May;22(3):621-7. PMID: [25656513](#).
29. *Dixon BE, Hook J, **Vreeman DJ**. Learning From the Crowd in Terminology Mapping: The LOINC Experience. *Lab Med*. 2015 Spring; 46(2):168-74. PMID: [25918199](#).
30. ***Vreeman DJ**, Hook J, Dixon BE. Learning from the crowd while mapping to LOINC. *J Am Med Inform Assoc* 2015 Nov;22(6):1205-11. PMID: [26224334](#). PMCID: PMC479557.
31. *Wang KC, Patel JB, Vyas B, Toland M, Collins B, **Vreeman DJ**, Abhyankar S, Siegel EL, Rubin DL, Langlotz CP. Use of Radiology Procedure Codes in Health Care: The Need for Standardization and Structure. *Radiographics*. 2017 Jul-Aug;37(4):1099-1110. PMID: [28696857](#); PMCID: PMC5548452.
32. *Hosseini M, Jones J, Faiola A, **Vreeman DJ**, Wu H, Dixon BE. Reconciling disparate information in continuity of care documents: Piloting a system to consolidate structured clinical documents. *J Biomed Inform*. 2017 Oct;74:123-129. PMID: [28903073](#).
33. *Campbell WS, Karlsson D, **Vreeman DJ**, Lazenby AJ, Talmon GA, Campbell JR. A computable pathology report for precision medicine: extending an observables ontology unifying SNOMED CT and LOINC. *J Am Med Inform Assoc*. 2017 Sep 13. PMID: [29024958](#).
34. *Beitia AO, Lowry T, **Vreeman DJ**, Loo GT, Delman BN, Thum FL, Slovis BH, Shapiro JS. Standard Anatomic Terminologies: Comparison for Use in a Health Information Exchange-Based Prior Computed Tomography (CT) Alerting System. *JMIR Med Inform*. 2017 Dec 14;5(4):e49. PMID: [29242174](#); PubMed Central PMCID: [PMC5746622](#).
35. ***Vreeman DJ**, Abhyankar S, Wang KC, Carr C, Collins B, Rubin DL, Langlotz CP. The LOINC RSNA radiology playbook - a unified terminology for radiology procedures. *J Am Med Inform Assoc*. 2018 Jul 1;25(7):885-893. doi: 10.1093/jamia/ocy053. PubMed PMID: [29850823](#); PubMed Central PMCID: [PMC6016707](#).
36. Bodenreider O, Cornet R, **Vreeman DJ**. Recent Developments in Clinical Terminologies - SNOMED CT, LOINC, and RxNorm. *Yearb Med Inform*. 2018 Aug;27(1):129–39. PMID: [30157516](#).

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1. **Vreeman DJ**. Medical Informatics – an important field you’ve probably never heard of. *HPA Resource*. 2004;4(3)1,3-5. CINAHL AN: 2009082750.
2. **Vreeman DJ**. Why life is hard—challenges is research on information technology. *HPA Resource*. 2004;4(4):11-13. CINAHL AN: 2009082784.
3. **Vreeman DJ**. A physical therapist’s guide to the National Health Information Network. 2006. *PT Magazine*. 16(4):28-33. CINAHL AN: 2009160269.
4. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2007;7(4):20. CINAHL AN: 2009749201.
5. **Vreeman DJ**. New technology initiatives adopted in 2008 by APTA’s House of Delegates. *HPA Resource*. 2008;8(3):9-10. CINAHL AN: 2010132080.
6. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2009;9(2):22. CINAHL AN: 2010380321.
7. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2009;9(4):14. CINAHL AN: 2010507887.
8. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2010;10(1):14. CINAHL AN: 2010632268.
9. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2010;10(2):14. CINAHL AN: 2010765020.
10. **Vreeman DJ**. LOINC Update. *AMIA Standard’s Standard*. 2010;1(1).
11. **Vreeman DJ**. LOINC Update. *AMIA Standard’s Standard*. 2010;1(2).
12. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2011;11(1):13. CINAHL AN: 2010929880.
13. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2011;11(2):13. CINAHL AN: 2011256010.
14. **Vreeman DJ**. LOINC Update. *AMIA Standard’s Standard*. 2011;2(1).
15. **Vreeman DJ**. Technology in Physical Therapy SIG Update. *HPA Resource*. 2011;11(3):13. CINAHL AN: 2011256010.

16. **Vreeman DJ.** Technology in Physical Therapy SIG Update. *HPA Resource*. 2011;11(4):8. CINAHL AN: 2011341708.
17. **Vreeman DJ.** LOINC Update. *AMIA Standard's Standard*. 2011;2(2).
18. **Vreeman DJ.** Technology in Physical Therapy SIG Update. *HPA Resource*. 2012;12(1):25-26. CINAHL AN: 2011433561.
19. **Vreeman DJ.** Technology in Physical Therapy SIG Update. *HPA Resource*. 2012;12(3):17. CINAHL AN: 2011650322.
20. **Vreeman DJ.** LOINC Update. *AMIA Standard's Standard*. 2012;3(1).
21. **Vreeman DJ.** Technology in Physical Therapy SIG Update. *HPA Resource*. 2013;13(1):12. CINAHL AN: 2011650322.
22. **Vreeman DJ.** For Interoperability, Not all Juice is Worth the Squeeze. *HIMSS News*. October 18, 2017. Available at: <http://www.himss.org/news/interoperability-not-all-juice-worth-squeeze-0>.

Letters to the Editor

1. **Vreeman DJ.** Clinical prediction rules. 2006. *Phys Ther*. 86(5):761-762. PMID: [16649900](#).
2. McDonald CJ, **Vreeman DJ**, Abhyankar S. Comment on "time to integrate clinical and research informatics". *Sci Transl Med*. 2013 Apr 3;5(179):179le1. doi: 10.1126/scitranslmed.3005700. PMID: [23552367](#).
3. *Abhyankar S, **Vreeman DJ**, Westra BL, Delaney CW. Letter to the Editor-Comments on the Use of LOINC and SNOMED CT for Representing Nursing Data. *Int J Nurs Knowl*. 2017 Aug 30. PMID: [28856826](#).
4. ***Vreeman DJ**, Abhyankar S, McDonald CJ. Re: Unit conversions between LOINC codes. *J Am Med Inform Assoc*. 2017 Aug 23. 10.1093. PMID: [29025119](#).

Refereed Presentations and Abstracts

1. Vreeman RC, Madsen, KA, **Vreeman DJ**, and Downs SM. Evaluating Compliance with Guidelines for ADHD Diagnosis and Treatment. Pediatric Academic Societies' Meeting, San Francisco, CA, May 2004.
2. **Vreeman DJ**, Taggard SL, Rhine MD, Worrell TW. Implementation of Electronic Health Record Systems in Physical Therapy – A Systematic Review. APTA Annual Conference 2005, Boston, MA, June 2005.
3. **Vreeman DJ**, Taggard SL. On the Road to a National Health Information Network: Implications for Physical Therapy. APTA Combined Sections Meeting 2006, San Diego, CA, February 2006.
4. **Vreeman DJ.** Maintaining mappings from source systems in a local health information infrastructure. AMIA Annu Symp Proc. 2006:1131. PubMed PMID: [17238750](#).
5. **Vreeman DJ**, Eng J, Herbold J. Using Information Technology to Develop and Implement Evidence-based Practice. APTA Combined Sections Meeting 2007, Boston, MA, February 2007.
6. Robbins CB, Oldridge NB, Sothmann MS, **Vreeman DJ**, Wilson S. Creating the Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research. 12th World Congress of the International Society for Prosthetics and Orthotics 2007, Vancouver, BC Canada, July 2007.
7. Robbins CB, Morley S, Oldridge NB, Sothmann MS, **Vreeman DJ**, Wilson S. Creating the Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research – Findings from an Initial Survey. 10th Annual Force Health Protection Conference, Louisville, KY, August 2007.
8. **Vreeman DJ**, Herbold J, Hall M, Brooks G. Information Technology in Physical Therapy – A Journey, Not a Destination. APTA Combined Sections Meeting 2008, Nashville, TN, February 2008.
9. Robbins C, Sothmann M, Wilson S, **Vreeman DJ**. Examining the Long-Term Health Outcomes of Traumatic Amputation to Better Educate Young War Veterans. Eighth Annual American Academy of Health Behavior Conference, Oxnard, California, March 2008.
10. **Vreeman DJ**, Robbins CB, Oldridge NB, Wilson S, and Sothmann MS. Creating an Informatics Infrastructure to Support a Participant Registry and Outcomes Research in the Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research. APTA Annual Conference 2008, San Antonio, TX, June 2008.
11. Robbins C, MacKinnon J, Oldridge N, Sothmann M, Wilson, S, **Vreeman DJ**. Indiana-Ohio Center: Long-terms outcomes of war-related traumatic amputations. AcademyHealth 2008 Annual Research Meeting, Washington, DC, June 2008.
12. **Vreeman DJ.** An informatics infrastructure supporting outcomes research in the Indiana-Ohio Center for Traumatic Amputation Rehabilitation Research. ATA Annual Conference 2009, Las Vegas NV, April 2009.

13. McDonald CJ, Fung KW, Wang Y, Lynch P, Hook J, **Vreeman DJ**. Towards a standardized HL7 clinical data capture tool – a trial implementation in the US National Library of Medicine’s Personal Health Record. 10th International HL7 Interoperability Conference 2009, Kyoto, Japan, May 2009.
14. Bircher S, Latz R, Chong Lee A, Scoville C, Timmerberg J, **Vreeman DJ**. Expert panel: The Effect of Technology on Vision 2020 – The Train is Leaving the Station and We are Asking You to Please Get on Now. APTA Combined Sections Meeting 2010, San Diego, CA, February 2010.
15. Grannis SJ, **Vreeman DJ**. Notifiable case detection systems are dependent upon maintaining value sets. Indiana Center of Excellence in Public Health Informatics 2010 Symposium, Indianapolis, IN, September 2010.
16. **Vreeman DJ**. Are you ready for EHRs? Chicken soup or rotten egg? APTA Annual Conference 2011, National Harbor, MD, June 2011.
17. **Vreeman DJ**. LOINC: An Introduction to the Universal Catalog of Laboratory and Clinical Observations. Public Health Informatics 2011 Conference, Atlanta, GA, August 2011.
18. **Vreeman DJ**. Meaningful Use Messaging and Vocabulary Standards: Licensing and Redistribution Challenges – LOINC. Public Health Informatics 2011 Conference, Atlanta, GA, August 2011.
19. **Vreeman DJ**. Multi-Stakeholder Collaborative Development, Usage and Maintenance of ELR Reportable Condition Mapping Table (RCMT) – LOINC. Public Health Informatics 2011 Conference, Atlanta, GA, August 2011.
20. Hamilton CM, Pan H, Huggins W, Phillips MJ, Strader LC, Tryka KA, Phillips J, **Vreeman DJ**, Junkins H, Ramos E. The PhenX Toolkit: Enhancing Cross-study Analysis in Genomic Studies. The 12th International Meeting on Human Genome Variation and Complex Genome Analysis, Berkley, CA, September 2011.
21. †Chiaravallotti MT, **Vreeman DJ**. LOINC Learns to Speak Italian: Translation and Mapping of LOINC in Italy. AMIA Annual Symposium 2011, Washington, DC, October 2011.
22. **Vreeman DJ**, Elrod M, Latz R, Wilkinson SG. Electronic Health Records – health care system chicken soup or rotten egg? APTA Combined Sections Meeting 2012, Chicago, IL, February 2012.
23. Escorpizo R, Bemis-Dougherty A, Davenport T, Feliciano H, **Vreeman DJ**, and Riddle DL. The ICF and Physical Therapy: 10 years later, APTA Combined Sections Meeting 2012, Chicago, IL, February 2012.
24. **Vreeman DJ**. LOINC and SNOMED CT. SNOMED CT Implementation Showcase, Arlington, VA, October 2013.
25. *Latz R, **Vreeman DJ**. Integrating Technology into Specialty Practice, APTA Combined Sections Meeting 2015, Indianapolis, IN February 2015.
26. ***Vreeman DJ**. LOINC: International Perspectives and Strategies for LOINC Adoption. Medinfo 2015, 15th World Congress on Health and Biomedical Informatics, Brazil, August 2015.
27. ***Vreeman DJ**. LOINC: Approaches to LOINC Adoption around the globe. Medinfo 2015, 15th World Congress on Health and Biomedical Informatics, Brazil, August 2015.
28. ***Vreeman DJ**. Guidelines for Using LOINC and SNOMED CT Together. International Health Terminology Standards Development Organization (IHTSDO), Montevideo, Uruguay October 2015.
29. ***Vreeman DJ**. Squaring The Circle: Managing local healthcare terminologies in the age of standardization. AMIA Annu Symp Panel, San Francisco, CA Nov. 2015.
30. Abhyankar, S, Deckard, J, Armson S, **Vreeman DJ**. LOINCing for Precision Medicine, Regenstrief Institute Conference, Turkey Run, IN October 2016.
31. *Beitia A, Lowery T, **Vreeman DJ**, Delman B, Slovis B, Loo G, Thum F, Shapiro J. Constructing Diagnostic CT Exam Lists for Sites across an HIE. AMIA Annu Symp, Chicago, IL Nov. 2016
32. *McDonald CJ, Lynch P, Ludet C, Mericle L, Hook J, **Vreeman DJ**, Wang Y, NLM-Forms: a “well-connected” data capture widget and sister modules for capturing and tuning health data. AMIA Annu Symp, Chicago, IL Nov. 2016
33. ***Vreeman DJ**, Armson A. LOINC for assessment instruments. LTPAC HIT, Baltimore, MD June 2017
34. ***Vreeman DJ**, Armson SA, Abhyankar SA. Best practices for using LOINC in Commercial HIT Systems. LOINC in Commercial HIT Systems. LTPAC HIT, Baltimore, MD June 2017
35. ***Vreeman, DJ**. Introduction to LOINC, the global vocabulary for tests, measurements, and observations in healthcare. MedInfo 2017, Hangzhou, China August 2017
36. *Abhyankar, S, Schluter, P, Bennett, K, **Vreeman, DJ**, McDonald, CJ Enabling Interoperability between Healthcare Devices and EHR Systems AMIA Annu Symp, Washington, DC Nov. 2017
37. ***Vreeman, DJ**, Wang, K, Carr, C, Collins, B, Abhyankar, S, Deckard, J, McDonald, CJ, Rubin, D, Langlotz, CP, The LOINC/RSNA Radiology Playbook: A unified terminology for radiology procedures AMIA Annu Symp, Washington, DC Nov. 2017
38. ***Vreeman DJ**, Abhyankar SA. Tutorial: Introduction to LOINC. AMIA Annu Symp, Washington, DC Nov. 2017

39. *Allen K, Armson S, **Vreeman DJ**. Poster: SDOH in INPC. AMIA Annu Symp, Washington, DC Nov. 2017
40. *Beitia A, Lowry T, **Vreeman DJ**, Delman B, Loo G, Thum III F, Shapiro J. Poster: Mapping CT Codes from a Health Information Exchange to LOINC. AMIA Annu Symp, Washington, DC Nov. 2017
41. *Taylor A, **Vreeman DJ**, Puro J, Verzola M. Panel: Social and Behavioral Determinants of Health: Fundamental Informatics Challenges for Enriching Health IT Systems. AMIA Annu Symp, Washington, DC Nov. 2017
42. *Beitia A, Lowry T, **Vreeman DJ**, Delman B, Loo G, Thum F, Shapiro J, Poster: Mapping of HIE CT Codes to LOINC - Analysis of Inconclusive Codes and Quantification of Mapping Times. AMIA 2018 Informatics Summit, San Francisco, CA March 2018

Books, Chapters, and References

1. *Logical Observation Identifiers Names and Codes (LOINC®) Translation Users' Guide*. Regenstrief Institute, Inc. Indianapolis, IN USA. Latest revision: October 2009. Available at: <http://loinc.org> [also translated into Simplified Chinese and French]
2. Giannagelo K. Healthcare Code Sets, Clinical Terminologies, and Classification Systems. 3rd ed. Ed. Chicago: American Health Information Management Association; ©2015. Chapter 10, Logical Observation Identifiers, Names, and Codes (LOINC®); p.151-164.
3. *LOINC Mapper's Guide to the Top 2000+ Lab Observations*. Regenstrief Institute, Inc. Indianapolis, IN USA. Latest version: 1.1, June 2012. Available at: <http://loinc.org>.
4. Health Level 7 International. HL7 Attachment Specification: Supplement to Consolidated CDA Templated Guide, Release 1. June 2013. Available at: http://www.hl7.org/implement/standards/product_brief.cfm?product_id=305
5. *Imler TD, **Vreeman DJ**, Kannry, J. Healthcare Data Standards and Exchange In: Finnell JT, Dixon BE, editors, *Clinical Informatics Study Guide: Text and Review*. Switzerland: Springer International Publishing. 2016. 536 pages. ISBN: 978-3-319-22752-8
<http://www.springer.com/cn/book/9783319227528>
6. **Vreeman DJ**. *LOINC Essentials: a step by step guide to getting your local codes mapped to LOINC*. Blue Sky Premise, LLC. 2016. 259 pages. Available at: <https://danielvreeman.com/loinc-essentials/>.
7. McDonald CJ, Huff SM, Deckard J, Armson S, Abhyankar S, **Vreeman DJ**. *Logical Observation Identifiers, Names, and Codes (LOINC®) User's Guide*. Regenstrief Institute, Inc. Indianapolis, IN. Latest revision: June 2018. Available at: <http://loinc.org> [also translated into Simplified Chinese, Estonian, German, Spanish, and Turkish]
8. Abhyankar S, Zabriskie M, Baorto D, **Vreeman DJ**. *Guide for Using LOINC Microbiology Terms*. Regenstrief Institute, Inc. Indianapolis, IN. August 2018. Available at: <https://loinc.org/guides/micro/>.

Other Non-Refereed Electronic Publications and Media

Electronic Software and Products

1. Logical Observation Identifiers Names and Codes (LOINC). Regenstrief Institute, Inc. Indianapolis, IN USA. Latest version: 2.64, June 2018. Available at: <http://loinc.org>
2. The Regenstrief LOINC Mapping Assistant (RELMA). Regenstrief Institute, Inc. Indianapolis, IN USA. Latest version: 6.23, June 2018. Available at: <http://loinc.org>
3. Search LOINC. Regenstrief Institute, Inc. Indianapolis, IN USA. Latest version: 1.0, June 2018. Available at: <http://search.loinc.org>.

Podcasts

1. Escorpizo R, Davenport TE, **Vreeman DJ**. Moderator: Resnik L. ICF and Physical Therapist Practice Podcast. *Physical Therapy. Supplement DC2*. 2010;(90)7. Available at <http://ptjournal.apta.org/content/90/7/1053/suppl/DC2>
2. **Vreeman DJ**. The Evolution of Medical Informatics Education: Training the next generation of informaticians Podcast. *AMIA 2010 Annual Symposium*. Available at: <https://www.amia.org/content/podcasts>
3. **Vreeman DJ**. Electronic Health Records: Chicken soup or rotten egg. December 2011. APTA Section on Health Policy and Administration. Available at: <http://www.aptahpa.org>

Research Findings and Interviews Featured in Media and Other Popular Press

1. Aisen CF. The Dirty Work of Healthcare Information Technology: Developing a Lingua Franca or The Devil Is In the Details. December 2007. IU School of Medicine News Release. (Subsequently indexed by more than 40 online news aggregation sites).
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