

# The New Clinical Informatics Medical Subspecialty in the United States

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## Outline

- Preparation for certification exam
- Challenges for building capacity in the new subspecialty



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## Preparation for certification exam

- AMIA Clinical Informatics Board Review Course
  - Planning process started in 2012
  - William Hersh appointed Course Director, with three co-faculty
    - Thomas Payne, University of Washington
    - Bimal Desai, Children's Hospital of Philadelphia
    - Diane Montella, Veteran's Administration
  - Four offerings of course between April-September, 2013
  - Online version also available in AMIA partnership with Scitent
    - <http://learn.amia.org>
  - Additional AMIA product is practice question bank
- Should be adaptable to other (non-physician) clinical informatics certification
  - Core content not very physician-specific



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## How we approached the board review course

- What we knew
  - Curriculum outlined based on paper from Gardner (2009) – reproduced in ABPM course study guide
    - [http://www.theabpm.org/application/ci\\_studyguide.pdf](http://www.theabpm.org/application/ci_studyguide.pdf)
  - Percentage of distribution of test items
    - Fundamentals – 10%
    - Clinical Decision Making and Care Process Improvement – 30%
    - Health Information Systems – 40%
    - Leading and Managing Change – 20%
  - Examination being produced by 15-member group under ABPM auspices

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## How we organized the course

- Adhered to core content distributed proportionally based on ABPM study guide
  - Organized into lectures
  - Aimed for broad overview and coverage of major themes
  - Provided more references for further study
- Additional sessions
  - Approaching exam
  - Reviewing sample questions
  - General discussion
  - Social hour

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## Challenges for the faculty

- Experienced educators but not experienced “teaching to the test”
- Minimal details from ABPM on exam content
  - I will know more after I take the exam in October!
- Core content is typically covered in master’s degree program – how to cover essentials in a three-day course
- Varied knowledge of many current informatics practitioners – from none to degrees and fellowships

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## Core Content Outline

### 1. Fundamentals

- 1.1. Clinical Informatics
  - 1.1.1. The discipline of informatics
  - 1.1.2. Key informatics concepts, models, and theories
  - 1.1.3. Clinical informatics literature
  - 1.1.4. International clinical informatics practices
  - 1.1.5. Ethics and professionalism
  - 1.1.6. Legal and regulatory issues
- 1.2. The Health System
  - 1.2.1. Determinants of individual and population health
  - 1.2.2. Primary domains, organizational structures, cultures, and processes
  - 1.2.3. The flow of data, information, and knowledge within the health system
  - 1.2.4. Policy & regulatory framework
  - 1.2.5. Health economics and financing
  - 1.2.6. Forces shaping health care delivery
  - 1.2.7. Institute of Medicine quality components

### 2. Clinical Decision Making and Care Process Improvement

- 2.1. Clinical Decision Support
  - 2.1.1. The nature and cognitive aspects of human decision making
  - 2.1.2. Decision science
  - 2.1.3. Application of clinical decision support
  - 2.1.4. Transformation of knowledge into clinical decision support tools
  - 2.1.5. Legal, ethical, and regulatory issues
  - 2.1.6. Quality and safety issues
  - 2.1.7. Supporting decisions for populations of patients
- 2.2. Evidence-based Patient Care
  - 2.2.1. Evidence sources
  - 2.2.2. Evidence grading
  - 2.2.3. Clinical guidelines
  - 2.2.4. Implementation of guidelines as clinical algorithms
  - 2.2.5. Information retrieval and analysis
- 2.3. Clinical Workflow Analysis, Process Redesign, and Quality Improvement
  - 2.3.1. Methods of workflow analysis
  - 2.3.2. Principles of workflow re-engineering
  - 2.3.3. Quality improvement principles and practices

### 3. Health Information Systems

- 3.1. Information Technology Systems
  - 3.1.1. Computer Systems
  - 3.1.2. Architecture
  - 3.1.3. Networks
  - 3.1.4. Security
  - 3.1.5. Data
  - 3.1.6. Technical approaches that enable sharing data
- 3.2. Human Factors Engineering
  - 3.2.1. Models, theories, and practices of human-computer (machine) interaction (HCI)
  - 3.2.2. HCI Evaluation, usability testing, study design and methods
  - 3.2.3. Interface design standards and design principles
  - 3.2.4. Usability engineering
- 3.3. Health Information Systems and Applications
  - 3.3.1. Types of functions offered by systems
  - 3.3.2. Types of settings where systems are used
  - 3.3.3. Electronic health/medical records systems as the foundational tool
  - 3.3.4. Telemedicine
- 3.4. Clinical Data Standards
  - 3.4.1. Standards development history and current process
  - 3.4.2. Data standards and data sharing
  - 3.4.3. Transaction standards
  - 3.4.4. Messaging standards
  - 3.4.5. Nomenclatures, vocabularies, and terminologies
  - 3.4.6. Ontologies and taxonomies
  - 3.4.7. Interoperability standards
- 3.5. Information System Lifecycle
  - 3.5.1. Institutional governance of clinical information systems
  - 3.5.2. Clinical information needs analysis and system selection
  - 3.5.3. Clinical information system implementation
  - 3.5.4. Clinical information system testing, before, during and after implementation
  - 3.5.5. Clinical information system maintenance
  - 3.5.6. Clinical information system evaluation

### 4. Leading and Managing Change

- 4.1. Leadership Models, Processes, and Practices
  - 4.1.1. Dimensions of effective leadership
  - 4.1.2. Governance
  - 4.1.3. Negotiation
  - 4.1.4. Conflict management
  - 4.1.5. Collaboration
  - 4.1.6. Motivation
  - 4.1.7. Decision making
- 4.2. Effective Interdisciplinary Teams
  - 4.2.1. Human resources management
  - 4.2.2. Team productivity and effectiveness
  - 4.2.3. Group management processes
  - 4.2.4. Managing meetings
  - 4.2.5. Managing group deliberations
- 4.3. Effective Communications
  - 4.3.1. Effective presentations to groups
  - 4.3.2. Effective one-on-one communication
  - 4.3.3. Writing effectively for various audiences and goals
- 4.3.4. Developing effective communications program to support system implementation
- 4.4. Project Management
  - 4.4.1. Basic principles
  - 4.4.2. Identifying resources
  - 4.4.3. Resource allocation
  - 4.4.4. Project management tools (non-software specific)
  - 4.4.5. Informatics project challenges
- 4.5. Strategic and Financial Planning for Clinical Information Systems
  - 4.5.1. Establishing mission and objectives
  - 4.5.2. Environmental scanning
  - 4.5.3. Strategy formulation
  - 4.5.4. Action planning and strategy implementation
  - 4.5.5. Capital and operating budgeting
  - 4.5.6. Principles of managerial accounting
  - 4.5.7. Evaluation of planning process
- 4.6. Change Management
  - 4.6.1. Assessment of organizational culture and behavior
  - 4.6.2. Change theories
  - 4.6.3. Change management strategies
  - 4.6.4. Strategies for promoting adoption and effective use of clinical information systems

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## Challenges for building capacity

- Attributes of physicians entering field
- OHSU experience in informatics education of physicians
- Challenges
  - In the “grandfathering” era
  - In the move to clinical informatics fellowships
- For more details
  - <http://informaticsprofessor.blogspot.com/2012/09/challenges-for-building-capacity-of.html>

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## Attributes of physicians entering clinical informatics professionally

- Many enter informatics mid-career
- Clinical informatics not a refinement of medical training like most specialties, e.g., compare
  - Comparison with critical care medicine
  - Clinical informatics adds topics such as standards and interoperability, privacy and security, clinical decision support, project management, etc.

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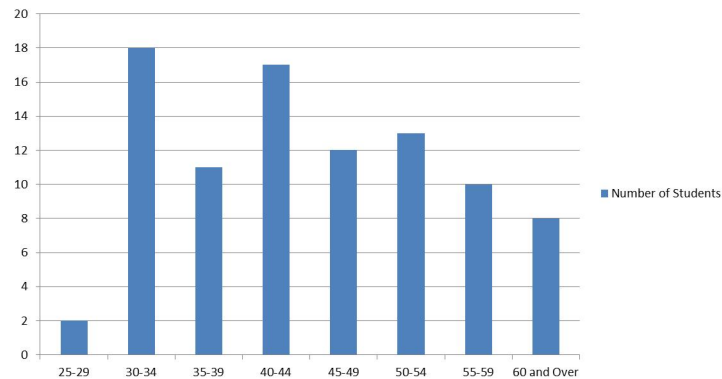
## OHSU informatics education experience

- Wealth of experience offered both on-campus and on-line, with students able to learn, interact, and gain practical experience
  - Program expanded with funding under ONC UBT program
- A total of 1558 individuals have enrolled in the OHSU informatics program since its inception in 1996
  - During that time, 509 people have received a total of 14 PhD degrees, 193 master's degrees, and 330 graduate certificates
- Currently 291 students actively enrolled in the OHSU informatics program, 95 (32%) of whom are physicians
  - Median age of matriculation = 41.5 years
- Clinical informatics core content covered by 23 courses
  - <http://informaticsprofessor.blogspot.com/2012/07/mapping-amia-clinical-informatics-core.html>

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## Current OHSU informatics physician enrollment by age



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## Challenges in the “grandfathering” era

- Training requirements met by
  - Practice pathway – many physicians not formally trained
  - Non-traditional fellowship – existing educational mostly at graduate level, e.g., Graduate Certificate or Master’s; where to draw the line?
- Sources of disappointment
  - Those who practice but cannot pass the exam
  - Those who can pass the exam but do not meet the training requirements

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## Challenges in the fellowship era

- How will trainees learn the core content?
- How will mid-career physicians be able to enter?
- How will organizations be able to stand up training programs that provide education as well as clinical environments?
- Who will pay the cost of fellowship training?
- How flexible will the Accreditation Council for Graduate Medical Education (ACGME) be?
  - Draft program requirements released in late July; comment period closes 11 September
    - Summary at <http://informaticsprofessor.blogspot.com/2013/08/acgme-releases-draft-clinical.html>

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## Possible solutions

- Partnering between those who can offer clinical sites and those who provide education
- Distributed sites allowing for wide range of experiences
- ACGME allowing flexibility in terms of sites, timing, educational experiences, etc.

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