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
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 Scinent
    • 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
How we approached the board review course

• What we knew
  – Curriculum outlined based on paper from Gardner (2009) – reproduced in ABPM course study guide
  – 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
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
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
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
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
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.
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
Current OHSU informatics physician enrollment by age

![Bar chart showing enrollment by age](image-url)
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
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
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.
The AMIA 10x10 Program: An International Approach to Building Informatics Capacity

The 10x10 in Spanish in Uruguay and Puerto Rico

Alvaro Margolis, MD MS
Biomedical informatics training

• University centered

• Project centered
Conceptual model for training (*Project-centric approach*)

- **Resources**
- **Implementation project**
- **Outcomes**
- **Skills**
- **Skills sources**
  - Center of excellence
  - **GPP**
    - Selection
    - Match-making
    - Accreditation
    - Contents development
    - Advocacy
    - Learn from success/failure

Source: Global Partnership Program, AMIA.
Example 1: Project in 23 health care institutions in Uruguay
• Target population: the Medical Director, the Heads of Information Systems, Medical Records, Administration and Nursing of each Institution.

• Combination of on-site learning activities, site visits and online courses, both supported by local or regional academic institutions.

• Integrated into the project needs and stages.
Online course on HL7 Argentina

Diagrama de temas

HL7 para la Comunidad Iberoamericana

Modalidad Virtual - Cuarta edición

Bienvenidos! Este es el espacio de enseñanza-aprendizaje que compartiremos a partir de hoy y por próximos 3 meses.

- Programa del curso
- Guía de estudio
- Cronograma de actividades
- Foro de presentaciones
- Pruebas Técnicas
- Materiales de Ayuda
- Foro de consultas e intercambio
10 x 10 course
Results

• More than 100 professionals trained across the country
  – 10 x 10 course, 150 hours: 100 professionals, editions 2008, 2009 and 2010.
  – HL7 online: 40 information system professionals.
  – Informatics and nursing: 67 participants.
Train-the-Trainers Session:
Introduction to the EHR
Weekly remote seminars

Padrón Federal de Afiliados
## Application of the project-centric approach in Uruguay

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Source of contents</th>
<th>Target audience</th>
<th>Adaptations that were necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face introductory health</td>
<td>Uruguayan Health Informatics Society, School of Engineering, School of Medicine,</td>
<td>The Medical Director, the Heads of Information Systems, Medical Records,</td>
<td>It was customly designed.</td>
</tr>
<tr>
<td>informatics course</td>
<td>Universidad de la República, Uruguay</td>
<td>Administration and Nursing of each FEMI Institution.</td>
<td></td>
</tr>
<tr>
<td>Online introductory health</td>
<td>AMIA; University of Oregon, USA; Hospital Italiano de Buenos Aires, Argentina.</td>
<td>Particularly focused on the Medical Director as a liaison to the health care</td>
<td>The course was adapted to a Latin American audience, and the specifics of Uruguay were</td>
</tr>
<tr>
<td>informatics course (10 x 10)</td>
<td></td>
<td>team, but also including the Heads of Information Systems, Medical Records,</td>
<td>addressed by online groups and during the onsite concurrent sessions with the Central</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administration and Nursing of each FEMI Institution.</td>
<td>Coordinating Unit at FEMI.</td>
</tr>
<tr>
<td>Online HL7 course</td>
<td>HL7 Argentina</td>
<td>Informatics professionals</td>
<td>No adaptation undertaken.</td>
</tr>
<tr>
<td>Train-the-trainer course for end</td>
<td>FEMI</td>
<td>Local coordinating units from 5 pilot institutions</td>
<td>It was customly designed.</td>
</tr>
<tr>
<td>users</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly remote seminar on</td>
<td>FEMI</td>
<td>Informatics professionals from 5 pilot institutions and a selection of the rest.</td>
<td>It was customly designed.</td>
</tr>
<tr>
<td>informatics topics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly remote seminar on health</td>
<td>FEMI</td>
<td>Medical leaders from 5 pilot institutions and a selection of the rest.</td>
<td>It was customly designed based on the informatics experience, and intended to integrate both</td>
</tr>
<tr>
<td>informatics topics</td>
<td></td>
<td></td>
<td>groups as seen convenient.</td>
</tr>
<tr>
<td>Balanced scorecard training</td>
<td>Information system provider of the Balanced Scorecard. FEMI.</td>
<td>Medical directors, administrators and medical statistics professionals.</td>
<td>Adapted to fit FEMI’s needs.</td>
</tr>
</tbody>
</table>
References:


Example 2: Certificate program in Health Informatics for Puerto Rico

August - December 2012
Launching live session
Remote phase
Saludos Edriel,

También podemos tener de base el incentivo que el gobierno federal está dando por la adquisición de EHR para los hospitales, es aproximadamente de unos dos millones de dólares. Esto depende de varios factores, las camas que tiene el hospital, los encuentros, etc., es una fórmula bastante compleja para llegar a ese número, pero en PR los hospitales promedio 1-5 millones reciben de incentivo.
Results

<table>
<thead>
<tr>
<th>Area</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Computer sciences</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>Health sciences</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Communication and education</td>
<td>3</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Passed: 28 (70%)
Assessment by attendees

• 71%: first distance education experience.
• 82% considered the platform to be easy to use.
• 65% considered that the overall course experience was excellent.
• Time devoted to course per week:
  – 4 to 6 hours: 65%.
  – More than 6 hours: 35%.
Qualitative assessment

• **Positive aspects**
  – The structure of the course.
  – The organization and contents.
  – The tutoring by the course Faculty.
  – That the language was Spanish.
  – The flexibility (each attendee does the course at his/her own pace).
  – Teamwork.
  – The insight about different experiences in Latin America, USA and Europe.

• **Suggestions**
  – To have two versions of the course: introductory and advanced.
  – To offer CME credits.
  – To have more synchronous remote sessions, and/or more scheduling options.
  – More team interaction in the remote workshops.
  – More adaptation to the local health care system.
Comments or questions?

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