ACGME International

Advanced Specialty Program Requirements for Graduate Medical Education in Clinical Informatics

**ACGME International Specialty Program Requirements for
Graduate Medical Education
in Clinical Informatics**

Int.   Introduction

Background and Intent: Programs must achieve and maintain Foundational Accreditation according to the ACGME-I Foundational Requirements prior to receiving Advanced Specialty Accreditation. The Advanced Specialty Requirements noted below complement the ACGME-I Foundational Requirements. For each section, the Advanced Specialty Requirements should be considered together with the Foundational Requirements.

Int. I.   Definition and Scope of the Specialty

Clinical informatics is the subspecialty of all medical specialties that transforms health care by analyzing, designing, implementing, and evaluating information and communication systems to improve patient care, enhance access to care, advance individual and population health outcomes, and strengthen the clinician-patient relationship.

Physicians who practice clinical informatics draw from the broader field of biomedical and health information technology (IT) as they apply informatics methods, concepts, and tools to the practice of medicine. Thus, they must understand the culture, boundaries, and complexities of the field. Further, the stakeholders, structures, and processes that constitute the health system affect the information and knowledge needs of health care professionals and influence the selection and implementation of clinical information processes and systems.

Physicians who practice clinical informatics collaborate with other health care and IT professionals and provide consultative services that use their knowledge of patient care combined with their understanding of informatics concepts, methods, and health IT tools to improve clinical practice by:

> leading initiatives designed to enhance health care quality and access by supporting and facilitating care coordination and transitions of care through the procurement, customization, development, implementation, management, evaluation, and continuous improvement of clinical information systems;

> securing the legal and ethical use of clinical information;

> assessing information and knowledge needs of health care professionals and patients;

> characterizing, evaluating, and refining clinical processes;

> analyzing, developing, implementing, and refining clinical decision support systems; and,

participating in projects designed to use technology to promote patient care that is safe, efficient, effective, timely, patient-centered, and equitable.

Int. II. Duration of Education

Int. II.A. The educational program in clinical informatics must be 24 or 36 months in length.

Int. II.A.1. Fellows must complete the program within 48 months of matriculation.

I. Institution

I.A. Sponsoring Institution

I.A.1. A fellowship in clinical informatics must function as an integral part of an ACGME-I-accredited residency.

I.A.2. There must be an institutional policy governing the educational resources committed to the fellowship that ensures collaboration among the multiple disciplines and professions involved in educating fellows.

I.A.3. There may be only one ACGME-I-accredited clinical informatics program within a Sponsoring Institution.

I.B. Participating Sites

See International Foundational Requirements, Section I.B.

II. Program Personnel and Resources

II.A. Program Director

II.A.1. The program director must have at least three years of experience in the practice of clinical informatics.

II.A.1.a) The program director should have experience in clinical informatics education.

II.A.2. The program director must ensure that each fellow's individualized learning plan includes documentation of Milestones evaluation.

II.A.3. The program director must ensure that each resident's semiannual evaluation include review of an individualized learning e-portfolio, which may include IT applications used, projects participated in, presentations given, team/committee work, courses taken, externships, or other educational products.

II.B. Faculty

II.B.1.	In addition to the program director, there must be at least two faculty members.

II.B.1.a)	The faculty members and program director should equal at least two full time equivalents (FTE).

II.B.2.	Physician faculty members should have at least two years of experience in the practice of clinical informatics.

II.C.   Other Program Personnel

See International Foundational Requirements, Section II.C.

II.D.   Resources

II.D.1.	There must be space and equipment for the educational program, including meeting rooms, classrooms, computers, internet access, visual and other educational aids, and work/study space.

II.D.2.	The primary clinical site must operate a clinical information system that is able to:

II.D.2.a)	collect, store, retrieve, and manage health and wellness data and information;

II.D.2.b)	provide clinical decision support; and,

II.D.2.c)	support ambulatory, inpatient, and remote care settings, as needed.

III.   Fellow Appointment

III.A.   Eligibility Criteria

III.A.1.	Prior to appointment in the program, fellows should have completed an ACGME-I-accredited residency program, or a residency program acceptable to the Sponsoring Institution's Graduate Medical Education Committee.

III.B.   Number of Fellows

See International Foundational Requirements, Section III.B.

IV.   Specialty-Specific Educational Program

IV.A.   ACGME-I Competencies

IV.A.1.	The program must integrate the following ACGME-I Competencies into the curriculum.

IV.A.1.a)	Professionalism

IV.A.1.a).(1)	Fellows must demonstrate a commitment to professionalism and an adherence to ethical principles. Fellows must demonstrate:
IV.A.1.a).(1).(a)	the ability to recognize the causes and prevention of security breaches and their consequences to the individual, the system, the organization, and society at-large; and,
IV.A.1.a).(1).(b)	sensitivity to the impact information system changes have on practice patterns, and on physician-patient relations and physician work-life balance.
IV.A.1.b)	Patient Care and Procedural Skills
IV.A.1.b).(1)	Fellows must provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows must demonstrate competence in:
IV.A.1.b).(1).(a)	the practice of health promotion, disease prevention, diagnosis, care, and treatment of patients of each gender, from adolescence to old age, during health and all stages of illness;
IV.A.1.b).(1).(b)	leveraging information and communication technology to:
IV.A.1.b).(1).(b).(i)	incorporate informatics principles across the dimensions of health care including, health promotion, disease prevention, diagnosis, and treatment of individuals and their families across the lifespan;
IV.A.1.b).(1).(b).(ii)	use informatics tools to improve assessment, interdisciplinary care planning, management, coordination, and follow-up of patients;
IV.A.1.b).(1).(b).(iii)	use informatics tools, such as electronic health records or personal health records, to facilitate the coordination and documentation of key events in patient care, such as family communication, consultation around goals of care, immunizations, advance directive completion, and involvement of multiple team members as appropriate; and,

IV.A.1.b).(1).(b).(iv)	use informatics tools to promote confidentiality and security of patient data.
IV.A.1.b).(1).(c)	fundamental programming, database design, and user interface design;
IV.A.1.b).(1).(d)	project management and software engineering related to the development and management of IT projects pertinent to patient care;
IV.A.1.b).(1).(e)	identification of changes needed in organizational processes and clinician practices to optimize health system operational effectiveness;
IV.A.1.b).(1).(f)	analysis of patient care workflow and processes to identify information system features that will support improved quality, efficiency, effectiveness, and safety of clinical services;
IV.A.1.b).(1).(g)	assessment of user needs for a clinical information or telecommunication system or application;
IV.A.1.b).(1).(h)	combining an understanding of informatics concepts, methods, and health IT to develop, implement, and refine clinical decision support systems; and,
IV.A.1.b).(1).(i)	evaluating the impact of information system implementation and use on patient care and users.
IV.A.1.c)	Medical Knowledge
IV.A.1.c).(1)	Fellows must demonstrate knowledge of established and evolving biomedical clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows must demonstrate knowledge of:
IV.A.1.c).(1).(a)	fundamental informatics vocabulary, concepts, models, and theories;
IV.A.1.c).(1).(b)	the health care environment, to include how business processes and financial considerations, including resourcing information technology, influence health care delivery and the flow of data among the major domains of the health system;
IV.A.1.c).(1).(c)	how information systems and processes enhance or compromise the decision-making and actions of health care team members;

IV.A.1.c).(1).(d)	process improvement or change management for health care processes;
IV.A.1.c).(1).(e)	information system management skills, to include project management, the life cycle of information systems, the constantly evolving capabilities of IT and health care, and the technical and non-technical issues surrounding system implementation;
IV.A.1.c).(1).(f)	the impact of clinical information systems on users and patients;
IV.A.1.c).(1).(g)	strategies to support clinician users and promote clinician adoption of systems;
IV.A.1.c).(1).(h)	clinical decision design, support, use, and implementation;
IV.A.1.c).(1).(i)	evaluation of information systems to provide feedback for system improvement;
IV.A.1.c).(1).(j)	leadership in organizational change, fostering collaboration, communicating effectively, and managing large-scale projects related to clinical information systems;
IV.A.1.c).(1).(k)	risk management and mitigation related to patient safety and privacy; and,
IV.A.1.c).(1).(l)	the various settings and related structures for organizing, regulating, and financing care for patients.
IV.A.1.d)	Practice-based Learning and Improvement
IV.A.1.d).(1)	Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and lifelong learning.
IV.A.1.e)	Interpersonal and Communication Skills
IV.A.1.e).(1)	Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Fellows must:
IV.A.1.e).(1).(a)	demonstrate the ability to serve as a liaison among IT professionals, administrators, and clinicians.

IV.A.1.f)	Systems-based Practice

IV.A.1.f).(1)　　　　　　　　Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, including the social determinates of health, as well as the ability to call effectively on other resources in the system to produce optimal care. Fellows must:

IV.A.1.f).(1).(a)　　　　　　　　demonstrate the ability to recognize one's own role and the role of systems in prevention and disclosure of medical error;

IV.A.1.f).(1).(b)　　　　　　　　identify, evaluate, and implement systems improvement based on clinical practice or patient and family satisfaction data in personal practice, in team practice, and within institutional settings;

IV.A.1.f).(1).(c)　　　　　　　　analyze the impact of business strategies on health information technology;

IV.A.1.f).(1).(d)　　　　　　　　analyze patient care workflow and processes;

IV.A.1.f).(1).(e)　　　　　　　　identify information system features that will support improved quality, efficiency, effectiveness, and safety of clinical services;

IV.A.1.f).(1).(f)　　　　　　　　identify potential unintended consequences of new system and process implementation, as well as changes to existing systems and processes;

IV.A.1.f).(1).(g)　　　　　　　　demonstrate awareness of issues related to patient privacy; and,

IV.A.1.f).(1).(h)　　　　　　　　query and analyze data repositories/warehouses.

IV.B.　　　　Regularly Scheduled Educational Activities

IV.B.1.　　　　Didactic sessions must be delivered at the primary clinical site or through distance education with partnered and approved educational institutions.

IV.B.2.　　　　Fellows must participate in planning and conducting conferences.

IV.C.　　　　Clinical Experiences

IV.C.1.　　　　Fellows must have clearly defined, written descriptions of responsibilities and a reporting structure for all educational assignments.

IV.C.2.　　　　Educational assignments must be designed to provide fellows with exposure to different types of clinical and health information systems.

IV.C.3.	Educational assignments should have a particular focus (or foci), such as:
IV.C.3.a)	algorithm development;
IV.C.3.b)	bioinformatics/computational biology;
IV.C.3.c)	clinical translational research;
IV.C.3.d)	data organization/user interface;
IV.C.3.e)	diagnostics;
IV.C.3.f)	health IT user interface design;
IV.C.3.g)	imaging informatics and radiology information systems;
IV.C.3.h)	information technology business strategy and management;
IV.C.3.i)	laboratory information systems/pathology informatics;
IV.C.3.j)	public health informatics;
IV.C.3.k)	regulatory informatics;
IV.C.3.l)	remote systems/telemedicine; and,
IV.C.3.m)	a specialty-specific focus.
IV.C.4.	Each fellow must have an individualized learning plan that allows the fellow to demonstrate competence in all required Competency areas within the specified length of the educational program, and that:
IV.C.4.a)	is specific to the fellow's primary specialty; or,
IV.C.4.b)	incorporates the area of focus in the fellow's educational assignment(s).
IV.C.5.	Fellows must have long-term assignments to integrate their knowledge and prior experience in a clinical setting that poses real-world clinical informatics challenges.
IV.C.6.	Each fellow must actively participate as a member of at least one interdisciplinary team that is addressing clinical informatics needs for the health system.
IV.C.6.a)	This must include analyzing issues, planning, and implementing recommendations from the team.
IV.C.6.b)	The interdisciplinary team should include physicians, nurses, other health care professionals, administrators, and information technology/system personnel.

IV.C.7.   Educational assignments should be conducted within at least three different settings.

IV.C.8.   Fellows should maintain current medical licensure and/or certification to practice in their primary specialty.

IV.D.   Scholarly Activity

See International Foundational Requirements, Section IV.D.

V.   Evaluation

See International Foundational Requirements, Section V.

VI.   The Learning and Working Environment

See International Foundational Requirements, Section VI.