

Evaluation Plan for the Undergraduate Medical Education Curriculum

University of Arizona

College of Medicine Tucson



College of Medicine
Tucson

Office of Medical Student Education

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1. Introduction

Description of the program

The undergraduate medical degree program at the University of Arizona, Tucson is a four year program intended to develop the six educational competencies central to the practice of medicine. These competencies, as listed below, are based on the Accreditation Council for Graduate Medical Education (ACGME) competencies for residency programs.

Patient Care	Graduates obtain appropriate histories and perform skillful, comprehensive and accurate patient examinations. They develop appropriate differential diagnoses and patient care management plans. They recognize and understand the principles for managing life-threatening situations. They select, perform and accurately interpret the results of laboratory tests and clinical procedures in making patient care decisions, and use appropriate diagnostic and treatment technologies in providing patient care.
Medical Knowledge	Graduates apply problem solving and critical thinking skills to problems in basic science and clinical medicine. They demonstrate knowledge about (1) established and evolving core of basic sciences, (2) application of sciences to patient care, and (3) investigatory and analytical thinking approaches.
Practice Based Learning and Improvement	Graduates are prepared to practice medicine within the context of society and its expectations. They use evidence-based approaches, demonstrating proficiency with information retrieval and critical appraisal of the medical literature to interpret and evaluate experimental and patient care information. They understand the limits of their own personal knowledge, remediate inadequacies to remain current, and integrate increased self-knowledge into their daily activities.
Interpersonal and Communication Skills	Graduates must demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates. They promote health behaviors through counseling of individual patients and their families, and through public education and action.
Professionalism	Graduates are committed to carrying out professional responsibilities, adhering to ethical principles, and demonstrating sensitivity to diverse patient populations. They are altruistic and compassionate in caring for patients and at all times act with integrity, honesty, and respect for patients' privacy and for the dignity of patients as persons. Graduates are advocates for improving access to care for everyone. They are committed to working collaboratively with the health care team, and acknowledge and respect the roles of other health professionals. Graduates recognize their limitations and seek improvements in their knowledge and skills.
Systems-Based Practice and Population Health	Graduates demonstrate awareness of and responsiveness to the large context and system of health care. They are able to effectively call on system resources to provide optimal care. Graduates are able to work with patients both as individuals and as members of communities and take this into account when performing risk assessments, diagnosing illnesses, making treatment plans and considering the public health implications of their work.

Structure of the program

Currently the curriculum is implemented in three phases comprising four years. The first phase lasts two years and includes the pre-clinical basic science foundational curriculum components. Phase 1 is organized by an organ-system approach. The end of the first phase is typically marked by the USMLE Step 1 exam. The second phase is the start of clerkship clinical experience and includes student rotations on the seven core clerkships. The

Pre-Clinical Blocks

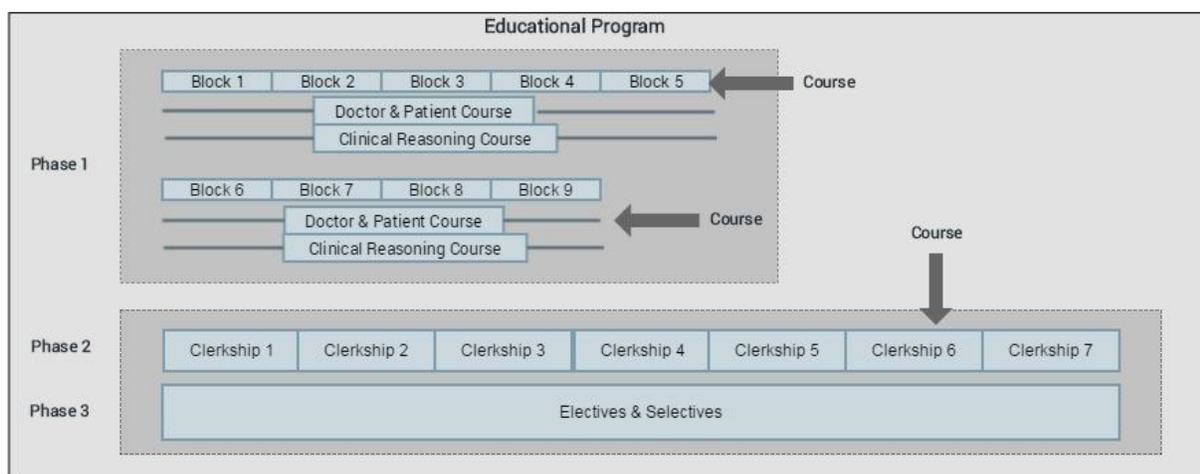
Foundations
Nervous System
Musculoskeletal
Cardiovascular, Pulmonary & Renal
Digestion, Metabolism & Hormones
Immunology & Infection
Life Cycle
Advanced Topics

end of the second phase is typically marked by the USMLE Step 2 exam and the Year Three OSCE. The third phase of the curriculum consists of elective courses and completion of courses in each following categories; Core Subinternship (Sub-Is); Selective in Emergency Medicine and/or Critical Care; and Surgical Subspecialty. Students must take one course in each category and complete an additional 24 units of elective course credit. There is a total of 42 weeks instructional time in Year 4. The end of the third phase is marked by the residency match process and convocation.

Core Clerkships

Family & Community Medicine
Medicine
Neurology
Obstetrics & Gynecology
Pediatrics
Psychiatry
Surgery

Curriculum Governance



The Tucson Educational Policy Committee (TEPC) maintains oversight of the curriculum. The TEPC is a standing committee of the General Faculty and members are elected by the General Faculty. Student members are elected by their classes. The role of the TEPC committee is to effect the expression and delivery of the ArizonaMed Program at all sites where that program is delivered.

The TEPC is responsible for the regular evaluation of the curriculum, as conducted by three subcommittees. The Tucson Evaluation Subcommittee (TEVS) reviews phase 1 and the Clerkship review Subcommittee (CRS) reviews phase 2. These subcommittees then present their findings to the committee at large for a discussion and vote. The Electives Subcommittee is responsible for the evaluation of the electives courses.

2. Evaluation Approach

Standards

The curriculum evaluation is guided by the standards developed by the Joint Committee on Standards for Educational Evaluation and Program Evaluation.

Utility	The evaluation will serve the information needs of the intended users
Feasibility	The evaluation will be realistic, prudent, diplomatic, and frugal
Propriety	The evaluation will be conducted legally, ethically and with due regard to those involved in the evaluation as well as those affected by its results
Accuracy	The evaluation will convey technically adequate information about the features that determine worth or merit

Rationale

The evaluation of the educational program meets the Liaison Committee on Medical Education (LCME) accreditation Standard 8 Curriculum Management, Evaluation, and Enhancement which states that “The faculty of a medical school engage in curriculum revision and program evaluation activities to ensure that the medical education program quality is maintained and enhanced and that medical students achieve all medical education program objectives and participate in required clinical experiences and settings.”¹

The supporting standards detail requirements regarding the use of outcome data including nationally normed data throughout the program and program completion as well as the use of student evaluations of their courses and instructors.

Evaluation Model

The evaluation model for the curriculum evaluation uses a blended approach, integrating aspects of different evaluation theory. The two primary approaches are a Utilization model developed by Michael Quinn Patton (1997) and the Context, Input, Process and Product (CIPP) model developed by Daniel Stufflebeam (1971). The Office of Medical Student Education, Evaluation and Assessment unit is responsible for the implementation of the curriculum evaluation.

Utilization

The structure and content of the Educational Program is governed by a faculty committee. This committee has the authority to make recommendations and changes to the curriculum within the limitations of the Faculty Bylaws. In addition, course, thread and discipline directors use the evaluation data to make decisions about process and implementation within their courses or areas of expertise. Lastly, administrative units may use evaluation data to guide decision making regarding educational priorities. These three groups represent the intended users of the evaluation. A Utilization Focused Evaluation model provides the guidance to establish an evaluation process that focuses on the end-use of the data being collected, analyzed and presented. A Utilization focus also helps prioritize what data is collected for accountability or accreditation purposes and what data is seen as useful and meaningful to the intended users. These types of data may or may not be similar.

¹ <http://www.lcme.org/2015-reformat-project.htm>

CIPP

The evaluation data is intended to inform different types of decision-making. The types of decision-making can be described by the Context, Input, Process and Product (CIPP) model developed by Daniel Stufflebeam (1971). The formal definition of evaluation in the CIPP model is “Evaluation is the process of delineating, obtaining, providing, and applying descriptive and judgmental information about the merit and worth of some object’s goals, design, implementation, and outcomes to guide improvement decisions, provide accountability reports, inform institutionalization/dissemination decisions, and improve understanding of the involved phenomena.”

Goal of the Curriculum Evaluation

The goal of the curriculum evaluation is to gather information to provide timely and accurate feedback on the performance of the curriculum to support decision-making at the course (block, clerkship, elective), phase (pre-clinical and clinical years), and program level (the program as a four-year unit). In addition the curriculum evaluation meets a key accountability requirement of accreditation. “The faculty of a medical school engage in curriculum revision and program evaluation activities to ensure that the medical education program quality is maintained and enhanced and that medical students achieve all medical education program objectives and participate in required clinical experiences and settings.”²

3. Methodology and Data

Process and Outcome Variables

Process evaluation categories focus on the delivery of the education curriculum. These characteristics help to answer the question, “Was the curriculum delivered in the right way, to the right audience, at the right level, at the right time?” Outcome evaluation categories help answer the question, Did the participants in the curriculum achieve the intended changes in knowledge, skills, attitudes or behaviors?”

Table 1 on the following page provides an overview of the process categories included in the curriculum evaluation. These are the areas that characterize the delivery of the educational program.

² <http://www.lcme.org/2015-reformat-project.htm>

Table 1 Process Categories

Categories	Description	Measure	Method
Organization and Management	All courses and phases should be organized in a coherent structure that supports student learning in a developmental fashion. Central oversight should ensure that learning is consistent at different sites and that the educational experience is comparable. Policies and procedures that impact learning should be clearly delineated in communication with students (e.g., via orientation, syllabi, etc.). Expectations, performance standards and assessment criteria should be clearly detailed. Learning objectives should be present for all levels of the curriculum and explicitly tied to content and performance assessment.	<ul style="list-style-type: none"> • Self-report Likert-type items • Open-ended items 	<ul style="list-style-type: none"> • Student Feedback survey
Objectives	Learning objectives should be present at all levels of the curriculum (instructional activity, course, phase, and program). Learning objectives should be aligned with the program competencies. Learning objectives should be clearly communicated to students. Learning objectives should guide the development of content and be explicitly linked to performance assessment. Learning objectives should be developmental throughout the curriculum.	<ul style="list-style-type: none"> • Self-report Likert-type items • Open-ended items • Learning Objective Analysis 	<ul style="list-style-type: none"> • Student Feedback survey • Course director self-study • Document review
Content Integration and Distribution	The inclusion of content in the curriculum should be purposeful and guided by the competencies, educational program objectives, and course objectives. Inclusion and pairing of content should be intentionally designed to support a developmental approach to learning. Given the depth, breadth and rapid changes in medical knowledge, core topics must be sufficiently covered and distributed in the curriculum. Essential topics should be covered, reviewed, and revisited at regular intervals. Difficulty of concepts should increase as the curriculum progresses to meet a developmental approach. Redundant content should be avoided.	<ul style="list-style-type: none"> • Self-report Likert-type items • Open-ended items • Content Maps • Taxonomy maps 	<ul style="list-style-type: none"> • Student Feedback survey • Analysis using content tags
Instructional Methods	Instructional methods should be selected and implemented in the curriculum based on their effectiveness and appropriateness for the learning material. A variety of instructional methods should be used. Instructional methods should favor interaction over passivity and questions over answers. Methods should include opportunities to practice the concepts taught.	<ul style="list-style-type: none"> • Self-report Likert-type items • Open-ended items • Hour x method analysis 	<ul style="list-style-type: none"> • Student Feedback survey • Analysis using content tags
Instructional Quality	The overall instructional quality is the measure of how well the selected instruction is implemented. Instruction should: <ul style="list-style-type: none"> • Be based on pre-determined standards • Include clearly stated purpose and outcome of the instruction • Be organized with reference to course materials, syllabi etc. 	<ul style="list-style-type: none"> • Self-report Likert-type items • Open-ended items 	<ul style="list-style-type: none"> • Student Feedback survey

Table 1 Process Categories

Categories	Description	Measure	Method
	<ul style="list-style-type: none"> • Build on prior knowledge • Is developmentally appropriate • Use different questioning strategies • Engage and involves students in their own learning • Set high expectations • Define or describe expected behavior • Include clearly articulated assessment criteria • Ask students to demonstrate their competence in different modes • Include clear evidence of student learning 	<ul style="list-style-type: none"> • Learning Objective Analysis 	
Learning Environment	Learning occurs in a psycho-social context; the environment surrounding a student impacts learning. The learning environment should be characterized by respect between peers and between peers and instructors. Students should feel a sense of social support from their peers and instructor. Expectations for learning and criteria for success should be clearly defined.	<ul style="list-style-type: none"> • Self-report Likert-type items • Open-ended items 	<ul style="list-style-type: none"> • Student Feedback survey

Table 2 provides an overview of the outcome categories included in the program evaluation. Outcome categories are those that characterize the performance of the curriculum by measuring the changes in student's knowledge, skills, attitudes and behaviors. Outcome categories can be divided by time-frame into immediate, intermediate and long-term outcomes.

Table 2 Outcome Categories

Categories	Description	Measure	Method
Immediate			
Student Performance Assessment - MCQ			
<i>Course Exams</i>	Assesses mastery of basic science concepts	<ul style="list-style-type: none"> Institutionally developed exam 	<ul style="list-style-type: none"> Multiple choice questions
<i>Step 1</i>	Assesses ability to apply basic science concepts to the practice of medicine	<ul style="list-style-type: none"> Standardized nationally normed exam 	<ul style="list-style-type: none"> Multiple choice questions
<i>Subject (Shelf) Exams</i>	Assesses educational achievement in specific subject areas	<ul style="list-style-type: none"> Standardized nationally normed exam 	<ul style="list-style-type: none"> Multiple choice questions
<i>Step 2 CK</i>	Assesses principles of clinical science important for post-graduate training	<ul style="list-style-type: none"> Standardized nationally normed exam 	<ul style="list-style-type: none"> Multiple choice questions
Student Performance Assessment – Clinical Observation			
<i>Clinical Assessment</i>	Clerkship faculty assess clinical skills in the 6 core competencies	<ul style="list-style-type: none"> Likert-type performance rating scale 	<ul style="list-style-type: none"> Assessment form
<i>OSCE</i>	Assesses clinical competence when providing patient care	<ul style="list-style-type: none"> Checklist Global rating scale 	<ul style="list-style-type: none"> Standardized patients
<i>Step 2 CS</i>	Assesses the ability of to apply medical knowledge, skills and understanding of clinical science essential for the provision of patient care	<ul style="list-style-type: none"> Checklist Global rating scale 	<ul style="list-style-type: none"> Standardized patients
Intermediate			
<i>Retention</i>	Number of matriculated students who complete the UME program	N/A	<ul style="list-style-type: none"> Student records
<i>Residency Match Rates</i>	Percentage of students who match into residency programs; percentage of students who	N/A	<ul style="list-style-type: none"> NRMP/Student records
<i>Percent matching into Primary Care specialty</i>	Primary care specialties according to state statute include family medicine, general internal medicine, general pediatrics, & obstetrics and gynecology	N/A	<ul style="list-style-type: none"> State licensing database AAMC Mission Management Tool (MMT)
<i>Performance in residency</i>	The goal of the curriculum is to prepare students for residency	<ul style="list-style-type: none"> Self-report Likert-type item 	<ul style="list-style-type: none"> Survey to graduates and residency program dirs.
Long-term			
<i>Percent serving in a underserved area</i>	Post-residency clinical practice location.	N/A	<ul style="list-style-type: none"> AAMC MMT State licensing database
<i>Percent in Primary Care</i>	Post-residency practice specialty.	N/A	<ul style="list-style-type: none"> Specialty licensing data
<i>Percent in Arizona</i>	Remaining in Arizona post-residency.	N/A	<ul style="list-style-type: none"> State licensing database

Evaluation Schedule

The evaluation of the curriculum occurs at three levels that correspond with the units of the curriculum; the courses, phases, and the educational program. Courses are evaluated by the curriculum committee every two years. In off-cycle years course directors receive post-course data reports for the pre-clinical courses and every six months for the clinical courses. Phases are evaluated every three years, and the program as a whole is evaluated every four years. The evaluation is implemented by the sub-committees of the Educational Policy Committee, presented with recommendations for improvement, and voted on by the full committee.

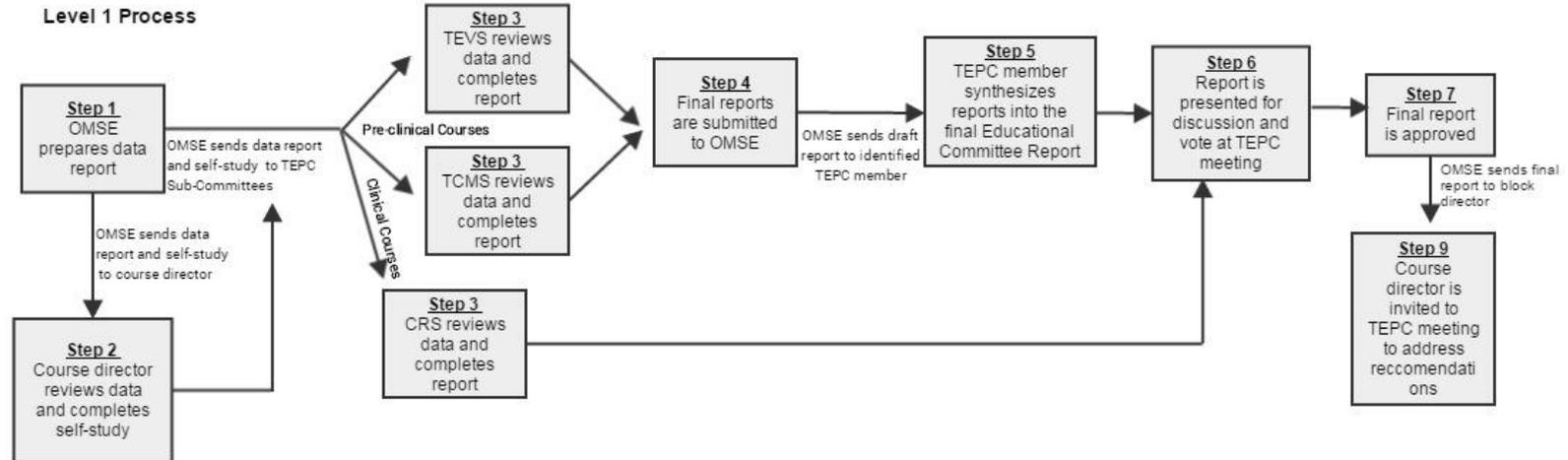
Evaluation Schedule
Level 1: biannual evaluation of courses
Level 2: triennial evaluation of phases
Level 3: quadrennial evaluation of the program

Table 3 on the following page provides a description of each level of the evaluation schedule. Chart 1 provides a procedural overview of the level 1 biannual evaluation of courses.

Table 3 Evaluation Schedule Description

	What gets evaluated?	When does it get evaluated?	Who does the evaluation?	Purpose
Level One	Courses	Biennial	<ul style="list-style-type: none"> • OMSE collects, synthesizes and reports data • Tucson Educational Policy Committee uses reports from the Tucson Evaluation Subcommittee, the Tucson Curriculum Management Subcommittee, and the Clerkship Review Subcommittee to create a final report 	<ul style="list-style-type: none"> • Provides process and outcome data to the course director • TEPC provides recommendations for improvement from the curriculum committee to the course directors
Level Two	Phases	Triennial	<ul style="list-style-type: none"> • OMSE collects, synthesizes and reports data • Tucson Educational Policy Committee using reports from the Tucson Evaluation Subcommittee, the Tucson Curriculum Management Subcommittee, and the Clerkship Review Subcommittee 	<ul style="list-style-type: none"> • Provides process and outcome data to the course director • TEPC provides recommendations for improvement from the curriculum committee to pre-clinical and clinical phase leadership and stakeholders
Level Three	The Educational Program	Quadrennial	<ul style="list-style-type: none"> • OMSE collects, synthesizes and reports data • Tucson Educational Policy Committee using reports from the Tucson Evaluation Subcommittee, the Tucson Curriculum Management Subcommittee, and the Clerkship Review Subcommittee 	<ul style="list-style-type: none"> • Provides process and outcome data to the course director • TEPC provides recommendations for improvement from the curriculum committee to the college leadership and stakeholders

Chart 1



Data Sources

Multiple data sources are used in the curriculum evaluation. The following provides a list of the internal and external data sources.

Internal

Pre-clinical Phase

- Student Feedback on Block (Self-Report Survey)
- Student Feedback on Individual Instructors in a Block (Self-Report Survey)
- Student Feedback on Facilitators (Self-Report Survey)
- Session Hours and Instruction Type (AZMED metadata)
- Content Integration Table (AZMED metadata)

Clinical Phase

- Student Feedback on Clerkship (Self-Report Survey)
- Student Feedback on Instructors in a Clerkship (Self-Report Survey)
- Duty Hours (AZMED data)
- History and Physical Documentation Data (AZMED data)
- Clinical Performance Assessment Ratings Analysis
- Clerkship Grade Analysis
- Clerkship Director Self-Study

Post-Graduation

- Resident and Residency Director Questionnaire (Self-Report Survey)

External

Pre-clinical Phase

- USMLE Step 1 Results (Nationally Standardized MCQ Exam)
- AAMC Graduate Questionnaire

Clinical Phase

- USMLE Step 2 (CK & CS) Results (Nationally Standardized Exam)
- NBME Shelf Exam Results
- AAMC Graduate Questionnaire

Post-Graduation

- AAMC Graduate Questionnaire
- AAMC Mission Management Tool
- Arizona State Medical Board Data

Analysis Methods

The quantitative data collected (e.g., Likert-type items on a student feedback survey) is typically presented with frequency and descriptive statistics (mean, median, mode, and standard deviation). The prior three years data from the same survey is also included for comparison. MCQ exam data is typically presented with the pass rate and score, standard deviation, as well as the test reliability statistics.

When appropriate inferential data analysis is used. For example, regression analysis is conducted to understand the relationship between GPA, MCAT, Medical Knowledge GPA, and student performance in the USMLE Step 1 exam.

Education Research

Outside of the recurring curriculum evaluation faculty and staff conduct education research projects based on their interests or areas of expertise. As appropriate this data is integrated into the curriculum evaluation and shared with the relevant committees. Examples of research include analysis of the impact of in-class attendance and Medical Knowledge scores.

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