Competency-Based Medical Education

A Practical Guide for Medical School Deans

{ medtrics }
Practice Medicine, Not Software

Table of Contents

Introduction

Medical education is shifting from traditional, time-based curricula to Competency-Based Medical Education (CBME), a model that prioritizes demonstrated proficiency over the completion of predefined hours or courses. As more institutions adopt this approach, medical school deans must navigate the complexities of curriculum design, faculty engagement, and assessment strategies to ensure a smooth transition.

This guide provides a strategic framework for implementing CBME in Undergraduate Medical Education (UME). It outlines the rationale behind this shift, anticipates common challenges and delivers actionable steps for curriculum development, assessment, and faculty training. Drawing on best practices from early adopters, it also highlights how Medtrics streamlines competency tracking and evaluation, supporting institutions in delivering a more effective, outcomes-driven medical education.

Key objectives of this guide:

- Examine the driving forces behind CBME in UME, including foundational competencies and Entrustable Professional Activities (EPAs).
- Identify challenges deans may face when transitioning to CBME.
- Provide a structured approach to designing and implementing a competency-based curriculum, including assessment methodologies and faculty development.
- Share best practices from institutions that have successfully adopted CBME.
- Demonstrate how Medtrics facilitates competency tracking and assessment to support medical education programs.

Why the Shift to Competency-Based Medical Education in UME?

Medical schools are under increasing pressure to produce graduates fully prepared for residency demands. Traditional, time-based curricula assume that completing a fixed number of hours and clerkships equates to readiness, but real-world outcomes suggest otherwise. Variability in clinical preparedness has prompted institutions to adopt Competency-Based Medical Education (CBME), a model designed to ensure that all students meet clearly defined proficiency standards before advancing.

CBME provides a structured approach that ensures clinical readiness, meets accreditation standards, improves transparency, and fosters a culture of lifelong learning.

Addressing Gaps in Clinical Readiness

Traditional programs measure progress by time spent in training rather than demonstrated proficiency. This approach assumes that four years of education and clinical rotations prepare students for residency, yet data shows significant differences in readiness among graduates.

CBME addresses this gap by establishing explicit medical knowledge, clinical reasoning, professionalism, and communication competencies. Instead of assuming preparedness based on exposure, CBME ensures that every graduate meets defined performance standards before advancing to the next stage of training.

Meeting Accreditation and National Frameworks

Competency frameworks provide clear guidelines for medical education, ensuring alignment with national accreditation bodies:

- **Foundational Competencies:** Many medical schools integrate competency models from organizations such as the AAMC, AACOM, or ACGME, focusing on core areas like patient care, medical knowledge, and professionalism.
- **Entrustable Professional Activities (EPAs):** The AAMC's 13 core EPAs define critical tasks students must be able to perform upon entering residency, such as conducting patient histories, performing physical exams, and formulating differential diagnoses. These structured, observable expectations provide consistency across institutions.

Enhancing Transparency and Accountability

As patient safety becomes a greater priority, educators, healthcare institutions, and the public demand greater accountability in medical training. CBME strengthens transparency and accountability by:

- **Clear Expectations for Students:** Students understand the competencies they must master from the start of their training, enabling them to take ownership of their learning.
- **Stronger Public and Institutional Trust:** CBME reinforces the confidence that graduating students possess the necessary skills, improving accountability across the medical education system.

Fostering Lifelong Learning

Medical practice requires continuous self-assessment and adaptation. CBME nurtures a culture of lifelong learning by emphasizing the following:

- **Self-Directed Learning:** Students develop the ability to evaluate their competencies and identify areas for improvement, a skill essential for residency and beyond.
- **Ongoing Professional Development:** With an emphasis on skill mastery rather than time spent in training, CBME prepares graduates to adapt to evolving medical knowledge and patient care challenges throughout their careers.

By adopting CBME, medical schools ensure that graduates enter residency with the skills, confidence, and mindset necessary for long-term success. The shift from time-based to competency-based education represents a fundamental evolution in medical training that directly enhances patient care and professional readiness.

Implementing CBME: Key Structural Adjustments

Implementing CBME requires updating grading models, assessment methods, and curriculum structure to align with accreditation standards and ensure student readiness.

Shifting from Norm-Referenced Grading

Traditional grading models compare students to their peers, often creating a competitive ranking system. CBME replaces this with a performance-based model, where students are assessed against defined milestones. This shift:

- Establishes **clear expectations** for students from the start.
- Ensures evaluations are based on **demonstrated proficiency** rather than relative ranking.
- Enables faculty to **prioritize mastery over competition**, supporting more effective student learning.

Defining and Mapping Competencies

A well-structured competency framework ensures students progress with purpose. Schools must:

- **Avoid excessive granularity**, which can overwhelm students and faculty.
- **Ensure clarity**, avoiding overly broad competencies that leave expectations unclear.
- **Use established frameworks**, such as the AAMC's EPAs and ACGME competencies, while allowing flexibility for institutional priorities.

Expanding Assessment Methods and Faculty Training

CBME requires assessments that reflect competency development in real-world scenarios. Effective evaluation includes:

- **OSCEs** to assess structured clinical skills.
- **Direct Observations** of real-world performance.
- **Multi-Source Feedback** incorporating perspectives from faculty, peers, and patients.
- **Portfolios** to track long-term competency progression.

Faculty training is critical to ensuring evaluations align with CBME principles. Institutions must provide structured development programs to maintain assessment consistency and reliability.

Integrating CBME Within Existing Institutional Frameworks

CBME allows students to progress based on demonstrated competence rather than fixed timelines. However, most medical schools operate within established accreditation and financial aid requirements. To balance flexibility with regulatory considerations, institutions often:

- **Use competency checkpoints** within the standard four-year model to maintain structure while embedding CBME principles.
- **Develop flexible pathways** that allow for individualized progression without disrupting institutional operations.

By making these adjustments, schools ensure CBME is seamlessly integrated, maintaining educational continuity while enhancing student readiness.

Summarizing the Shift to CBME

Category	Traditional Model	CBME Model
Grading	Students ranked against peers	Students assessed against performance milestones
Competency Definition	Often broad or implied	Clearly defined using EPAs and core competencies
Assessment Methods	Exams and clerkship evaluations	OSCEs, direct observations, multi-source feedback, portfolios
Progression	Fixed time-based curriculum	Competency-based advancement with checkpoints
Faculty Role	Lecturing, grading exams	Coaching, evaluating performance, structured feedback
Student Focus	Meeting course requirements	Developing proficiency in defined skills

Practical Steps for Implementing CBME in UME

A structured, phased approach ensures a smooth transition to CBME. Schools should focus on adopting a competency framework, aligning curriculum design with learning outcomes, implementing robust assessment strategies, and supporting faculty through ongoing training. The following steps outline a clear implementation path.

1. Adopt or Adapt a Competency Framework

A well-defined competency framework provides the foundation for CBME. Schools should:

- **Select a Recognized Model** – Use nationally established frameworks such as:
  - AAMC's **Entrustable Professional Activities (EPAs).**
  - ACGME's **six core competencies** (adapted for UME).
  - The **Physician Competency Reference Set.**

- **Customize for Institutional Needs** – Ensure the framework reflects the school's educational values, specialty strengths, and local healthcare priorities.

2. Curriculum Mapping and Backward Design

CBME requires intentional curriculum alignment to competency outcomes. Schools should:

- **Map the Existing Curriculum** – Identify where competencies are already integrated and gaps exist.

- **Address Gaps** - Add or modify learning activities to strengthen underrepresented areas, such as interprofessional collaboration or patient safety.

- **Apply Backward Design** – Start with the desired graduate competencies, then:
  - Define assessments that accurately measure them.
  - Structure learning experiences to help students reach competency.

3. Implement Programmatic Assessment

CBME relies on **longitudinal, data-driven assessment** rather than isolated exams. Schools should:

- **Use Multiple Data Sources** – Combine:
  - **Direct Observations** (clinical and simulated settings).
  - **OSCEs** (Objective Structured Clinical Examinations).
  - **Multi-Source Feedback** (faculty, peers, and patients).
  - **Portfolios** (tracking long-term competency progression).

- **Prioritize Continuous and Formative Feedback** – Frequent, low-stakes evaluations help students refine skills before high-stakes assessments.

- **Leverage Technology** – Platforms like **Medtrics** enable real-time competency tracking, benefiting both students and faculty.

4. Faculty Development and Buy-In

Faculty play a central role in CBME's success. Institutions must:

- **Provide Faculty Training and Support –** Offer structured workshops covering:
  - CBME principles and assessment strategies.
  - Effective feedback techniques.
  - Coaching-based teaching approaches.

- **Establish Faculty Champions –** Assign leaders to competency domains to promote engagement and guide colleagues.

- **Ensure Ongoing Support –** Provide faculty with:
  - Dedicated time for curriculum adjustments.
  - Recognition for contributions to CBME implementation.

5. Pilot Programs and Phased Rollouts

A phased rollout ensures a smooth transition while allowing for continuous improvement. Schools should:

- **Start Small –** Introduce CBME in one clerkship or specialty track before scaling up.
- **Evaluate and Adjust –** Use data-driven insights to refine the approach before scaling up.
- **Run Parallel Systems –** Track competency progress alongside traditional grading before shifting to CBME-based evaluation.

6. Build a Culture of Growth

CBME fosters a mindset of **continuous learning and self-improvement**, allowing schools to:

- **Encourage Growth Over Punishment –** Formative assessments and remediation pathways should focus on skill improvement rather than penalization.
- **Engage Students in the Process –** Involve student representatives in planning to promote acceptance and co-ownership.

Schools that embrace these strategies enhance student readiness and improve institutional outcomes. Many have already successfully made this transition—here's how leading institutions have implemented CBME and what they've learned.

Best Practices and Success Stories

Institutions implementing CBME have tested various approaches to improve competency assessment, faculty engagement, and student readiness. These success stories highlight best practices that can guide medical schools through their own transitions.

EPAC (Education in Pediatrics Across the Continuum)

- **What It Is:** EPAC is a pilot program that allows medical students to advance to residency as soon as they demonstrate proficiency in required pediatric competencies, rather than following a fixed timeline.EPAC demonstrated that moving beyond strict time-based models is feasible when institutional structures support competency-based transitions.

- **Key Lesson Learned:** Successful advancement in time variables requires **tight coordination between UME and GME** and regulatory flexibility to accommodate individualized progression.

Coaching Models: Vanderbilt, UCSF, and Others

- **What They Did:** Schools such as Vanderbilt and UCSF assign **faculty coaches** to each student, ensuring regular competency reviews and continuous feedback.

- **Key Outcomes:**

  - Improved **student awareness** of their performance, enabling more targeted skill development.

  - Allowed for **earlier interventions** for students struggling to meet competencies, reducing the likelihood of late-stage remediation.

  - Strengthened faculty-student relationships, reinforcing a **coaching culture** rather than a traditional grading model.

AMA Accelerating Change in Medical Education Initiative

- **What It Is:** A grant-funded initiative supporting medical schools in developing **innovative CBME approaches,** including team-based learning, competency-driven assessments, and integrated coaching models.

- **Key Lesson Learned:** Schools that collaborate **accelerate their learning curve and share resources** more effectively, reducing the burden of developing CBME structures independently. This initiative underscores the value of cross-institutional partnerships in refining competency-based models.

These success stories highlight proven strategies, but practical implementation requires the ability to track and analyze competency progress in real time.

This is where Medtrics comes in. Medtrics is a **comprehensive competency-tracking platform** designed to support CBME implementation at scale. By integrating real-time assessment tools, competency dashboards, and faculty-student engagement features, Medtrics helps institutions seamlessly manage CBME frameworks while improving transparency and efficiency.

How Medtrics Supports Competency Tracking

Implementing CBME requires **precise tracking, real-time insights, and seamless faculty-student engagement**. Medtrics provides an **integrated competency-tracking platform** to simplify the transition, ensuring institutions can effectively manage competency assessments while reducing administrative burden.

Curriculum Mapping and Alignment

- **Feature:** Aligns institutional objectives with AAMC/ACGME competencies, ensuring each course and rotation is mapped to relevant competencies.
- **Benefit:** Provides a real-time overview of where competencies are taught and assessed, helping institutions identify gaps and redundancies in the curriculum.

Customizable Evaluations and Automated Distribution

- This feature **enables schools to create and link custom evaluation forms** to specific competencies or Entrustable Professional Activities (EPAs).
- **Benefit:** Automated reminders streamline faculty participation, improving data reliability and reducing administrative workload.

Real-Time Dashboards

- **Feature:** Displays each student's competency progress in a clear, interactive dashboard.
- **Benefit:** Students and faculty can instantly identify strengths, weaknesses, and next steps, facilitating targeted interventions.

Data Analytics and Reporting

- **Feature:** Aligns institutional objectives with AAMC/ACGME competencies, ensuring each course and rotation is mapped to relevant competencies.
- **Benefit:** Provides a real-time overview of where competencies are taught and assessed, helping institutions identify gaps and redundancies in the curriculum.

Feedback and Coaching Features

- **Feature:** Automated notifications when evaluations are completed, plus integrated student portfolios for tracking competency development.
- **Benefit:** Strengthens timely, targeted feedback loops between faculty and students, reinforcing a coaching-based learning culture.

Summarizing the Shift to CBME

Feature	Functionality	Impact on CBME Implementation
Curriculum Mapping	Aligns courses with AAMC/ACGME competencies	Identifies gaps, prevents redundancy, and ensures complete competency coverage
Custom Evaluations	Automates competency-linked assessments	Increases faculty participation and ensures consistent evaluation standards
Real-Time Dashboards	Displays student competency progress at a glance	Provides immediate insights for targeted feedback and intervention
Data Analytics & Reporting	Generates reports at individual, cohort, and program levels	Supports curriculum adjustments, accreditation reporting, and evidence-based decision-making
Feedback & Coaching Tools	Automates notifications and integrates student portfolios	Strengthens coaching culture and facilitates timely, structured feedback

With Medtrics, institutions ensure seamless competency tracking, real-time insights, and enhanced student readiness, making CBME implementation more efficient and effective.

Recommendations for Deans: Leading a Successful Transition to CBME

Successfully implementing CBME requires **strategic leadership, ongoing engagement and clear communication across the institution**. Deans play a pivotal role in ensuring that faculty, students, and external partners understand the value of CBME and are equipped to support the transition. The following recommendations provide a structured approach to guiding this change effectively.

Communicate the Rationale

Gaining institutional support starts with clearly communicating why CBME improves student outcomes and patient care. Deans should share **compelling data** on how competency-based approaches improve **student success, clinical preparedness, and patient care outcomes**. Highlighting research, accreditation trends, and success stories from early adopters helps reinforce why this transition is necessary.

Engage Stakeholders Early

CBME impacts **every institutional level**, from **department chairs and faculty to students and external partners** like residency directors. Engaging these groups early fosters buy-in and collaboration, ensuring alignment on key goals. Town halls, faculty workshops, and structured discussions with clinical partners help address concerns and clarify how CBME will be implemented.

Appoint a Steering Committee

An effective CBME transition requires **dedicated leadership** beyond the dean's office. Establishing a **CBME Steering Committee** ensures **curriculum leads, assessment experts, faculty champions, and student representatives work** together to guide implementation. A steering committee is the central hub for decision-making, addressing challenges, and ensuring alignment with institutional goals.

Invest in Faculty Development

Faculty play a critical role in CBME, yet many will need training and support to transition from traditional assessment models to competency-based evaluation. **Dedicated resources, structured training sessions, and incentives** ensure faculty feel confident in delivering competency-based assessments, providing feedback, and embracing a coaching culture. Recognizing and rewarding faculty for their contributions reinforces long-term engagement.

Leverage Technology for Competency Tracking

CBME introduces a **more dynamic, data-driven approach to student assessment**, making technology essential for tracking progress. The **Medtrics** platform provides institutions with tools to:

- **Streamline evaluations** and ensure assessments are linked to competencies.
- **Generate real-time dashboards** that offer a clear view of student progression.
- **Identify learning gaps** through data analytics, improving decision-making. Investing in the right technology **reduces administrative burden**, ensures **consistency in competency assessment**, and provides **actionable insights** for continuous program refinement.

Phase the Implementation

CBME does not have to be an all-or-nothing transition. Schools that pilot key changes first—such as competency-based assessments in select clerkships—gain valuable insights before expanding the model institution-wide. A **measured, iterative approach** allows schools to **gather feedback, refine processes, and ensure a smooth transition** without overwhelming faculty or students.

Monitor Outcomes and Continuously Improve

Student outcomes measure the success of CBME. Schools should establish a **data-driven review** process using:

- **Competency tracking data** to assess progression trends.
- **Student surveys and feedback** to identify areas for improvement.
- **Residency placement results** to evaluate the long-term impact of CBME on postgraduate success.

Reviewing this data allows institutions to **fine-tune curriculum design, improve assessment strategies, and ensure that CBME achieves its intended goals.**

Guiding a Sustainable CBME Transition

With a structured approach, CBME enhances student competency, streamlines assessment, and strengthens institutional outcomes. Schools that lead this transition will shape the next generation of highly skilled physicians.

Transforming Medical Education: The Path to Competency-Based Learning

CBME strengthens clinical preparedness, improves student engagement, and increases institutional efficiency. Graduates enter residency equipped with the skills required for effective patient care and ongoing professional development.

Implementing CBME requires strong leadership, faculty engagement, and data-driven assessment strategies. Schools prioritizing structured frameworks, continuous feedback, and real-time competency tracking ensure that graduates are fully prepared while meeting accreditation standards and evolving healthcare demands.

Medical schools that lead this transition shape the future of medical education. Investing in faculty, leveraging technology, and fostering a culture of continuous improvement builds the foundation for highly skilled, patient-ready physicians who can adapt to the challenges of modern medicine.

References and Resources

AAMC Core EPAs for Entering Residency

ACGME Six Core Competencies (Adapted for UME)

AMA Accelerating Change in Medical Education

Medtrics Platform

This guide synthesizes current best practices and practical insights to help you lead your medical school through a successful transformation to Competency-Based Medical Education.