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LITERATURE REVIEW ARTICLES

The Role of Online Education in Physician Leadership Development: Opportunities & Challenges

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Medical providers' leadership has become essential in today's complex healthcare environment; however, traditional medical training rarely prepares physicians for management, strategic, and system-level roles. This gap is not unique to medicine: many professions emphasize technical content and practice while providing limited formal preparation for leadership. This narrative review examines the core competencies required for effective physician leadership and the main professional pathways available, with particular attention to the growing role of online and hybrid education. Online formats offered by organizations such as the American Association for Physician Leadership (AAPL), academic partners, and health-system academies provide accessible, flexible options that address time and geographic barriers while supporting competency development in business acumen, emotional intelligence, and change management.

Although certain interpersonal skills appear to benefit from hybrid or in-person elements, the available literature suggests that well-designed online programs can contribute meaningfully to physician leadership development. Evidence regarding comparative long-term outcomes of fully online versus hybrid or in-person formats remains limited, and claims of organizational benefit associated with physician leadership should be interpreted with appropriate caution. Healthcare organizations and individual physicians are encouraged to leverage high-quality online and hybrid opportunities as one practical component of broader leadership capacity building.

Keywords: Physician leadership, online education, and leadership development

Medical providers' leadership has become essential in today's complex health industry. Physicians increasingly transition from clinical roles into positions involving team management, strategic decision-making, operational oversight, and system-level change. Traditional medical training emphasizes clinical expertise but rarely prepares physicians for these expanded responsibilities (Dai et al., 2025; Stoller, 2008). This pattern is not confined to medicine. Across many professions, including nursing, engineering, law, accounting, and other practice-oriented fields, formal education prioritizes technical knowledge and clinical or professional skills while providing comparatively limited structured preparation for leadership, management, and systems thinking (Day et al., 2014; Frich et al., 2015; Snook et al.,

2012). Structured leadership development, including general skill-building and professional certification, is widely regarded as a means of bridging this gap and has been associated in observational studies with improved organizational performance, quality of care, and team effectiveness (Dai et al., 2025; Stoller, 2008).

This article is structured as a narrative review, as online and hybrid formats have emerged as practical solutions that increase access for busy practicing professionals, including physicians. Its purpose is to synthesize existing competency frameworks, describe major professional development pathways, and examine the opportunities and limitations of online and hybrid education for physician leadership. The review does not claim to be systematic; rather, it draws on published frameworks, program documentation, and selected empirical and conceptual literature to provide a practical overview for clinicians and organizational leaders.

Review Approach

Because this is a narrative rather than a systematic review, formal database search protocols, PRISMA flow diagrams, and predefined risk-of-bias assessments were not applied. Sources were identified through targeted searches of PubMed, Google Scholar, and organizational websites (AAPL, AAMC, ACHE, major academic health centers) using combinations of terms such as physician leadership, online leadership education, hybrid medical leadership, CPE, and leadership competencies for physicians. Priority was given to peer-reviewed reviews and empirical studies published from approximately 2008 onward, official program descriptions from recognized professional bodies, and widely cited competency frameworks. Inclusion was guided by relevance to core physician-leadership competencies, formal credentialing pathways, and the delivery or evaluation of online or hybrid formats. Program-specific details (eligibility, curriculum hours, format) were cross-checked against the most recent publicly available organizational documentation at the time of edition. Where evidence was limited or largely descriptive, statements are qualified accordingly. This approach prioritizes practical utility and transparency over exhaustive systematic coverage.

General Requirements

No single licensing board mandates leadership training for all physicians, but healthcare organizations and professional bodies recognize a core set of competencies that distinguish effective physician leaders. These fall into two broad categories: threshold or technical/business skills that are not typically taught in medical school, and interpersonal or people skills (Dai et al., 2025). Key threshold competencies include operations, finances, policy, quality improvement, and negotiation. Once these foundations are in place, leaders are expected to develop emotional intelligence, change management, team building, and conflict resolution skills (Stoller, 2008).

A widely cited framework, often referred to as Stoller's physician-leader competency model, identifies six core domains: (a) technical skills and knowledge (operational, financial, information systems, human resources, and strategic planning); (b) industry knowledge (clinical processes, regulation, and healthcare trends); (c) problem-solving skills; (d) emotional intelligence; (e) communication; and (f) commitment to lifelong learning (Stoller, 2008). Recent systematic scoping reviews confirm a shift toward collective, team-based, patient-centered, and culturally sensitive competencies, with growing emphasis on business acumen, digital literacy, and crisis management (Dai et al., 2025). Professional organizations continue to highlight both hard skills (strategic vision, operational proficiency, financial acumen, specialty-specific clinical expertise) and soft skills, including empathy, active listening, respect, authenticity, and humility (Ibrahim, 2025).

The Association of American Medical Colleges (AAMC) Group on Resident Affairs offers the Institutional Graduate Medical Education (GME) Leadership Competencies framework (commonly abbreviated GMELCs, 2023), tailored for GME leaders. It organizes competencies into four domains: (a) foundational attributes (emotional intelligence, compelling communication, agility); (b) leadership capabilities (building teams, driving improvement, strategic planning); (c) knowledge and skills (accreditation, human resources, business acumen); and (d) essential functions, such as delivering education, innovating, and ensuring safe learning environments (Association of American Medical Colleges, 2023; Broquet et al., 2025). This framework supports self-assessment and professional development for institutional GME roles.

Development typically begins with self-assessment, followed by targeted training. Many organizations use coaching, mentoring, workshops, and action-learning projects. Early investments, such as emerging-leader programs for physicians without formal titles, are intended to identify and cultivate talent before formal promotion (Ibrahim, 2025). Online platforms now make many of these elements more widely available, although the strength of evidence linking specific formats to long-term competency attainment varies. Similar patterns of strong technical preparation paired with thinner formal leadership curricula have been documented in other practice-oriented professions, reinforcing that the challenge of integrating leadership development into professional education is broadly shared (Day et al., 2014; Frich et al., 2015).

Professional Requirements and Pathways

While general competencies can be developed informally or through short courses, professional leadership roles often require formal credentials, experience, and organizational recognition. There is no universal "Physician Leader License," but employers and certifying bodies set clear benchmarks. The most common pathways can be grouped into three categories. The

descriptions that follow summarize publicly available program information and should be distinguished from independent empirical evaluations of outcomes.

Certified Physician Executive (CPE) – American Association for Physician Leadership (AAPL)

The CPE is a widely recognized professional credential for physician executives, endorsed by the Certifying Commission in Medical Management. It is designed to signal competence in business acumen, team leadership, quality, and strategic insight (American Association for Physician Leadership, 2025; Angood, 2024). According to current AAPL documentation, eligibility for the CPE Capstone typically requires: (a) a licensed M.D. or D.O.; (b) active AAPL membership for at least one year; (c) at least two cumulative years of healthcare leadership experience with significant managerial oversight; (d) board certification or board eligibility in a clinical specialty recognized by ABMS, AOA, or equivalent; and (e) three years of clinical practice beyond residency or fellowship.

The educational pathway includes completion of AAPL's Certified Physician Executive curriculum (commonly described as 125 core hours plus 30 elective hours), or a qualifying graduate management degree (e.g., MBA, MMM, MHA, MPH), together with specified core courses. Many components are available in self-paced online and facilitated online formats. The Capstone is described as a multi-day intensive that includes group exercises and a leadership presentation. Maintenance requires ongoing AAPL membership (American Association for Physician Leadership, 2025). These details reflect program documentation at the time of writing and should be verified directly with AAPL, as requirements can evolve.

Advanced Degrees and Blended Programs

Many physicians pursue master's degrees (MBA, MHA, MPH, MMM) either independently or through partnerships (for example, AAPL collaborations with university business schools). These programs aim to provide deeper business and policy knowledge. Blended and fully online options from AAPL, the American College of Physicians, and university partners combine coursework with graduate degrees, offering flexibility for practicing physicians (Bhanot, 2025). Empirical evaluations of the relative effectiveness of these degree pathways specifically for subsequent leadership performance remain limited.

Institutional and Specialty-Specific Programs

Large health systems frequently create internal leadership academies or multi-year programs, such as offerings associated with Mayo Clinic, Cleveland Clinic, Mass General Brigham, and The Permanente Medical Group (Mayo Clinic Executive Education, 2026; Tangalos et al., 1998). Harvard T.H. Chan School of Public Health offers a Leadership Development for Physicians in Academic Health Centers program that has been delivered in on-site

or hybrid formats for administrative roles in academic settings (Harvard T.H. Chan School of Public Health, 2026). The AAMC GME Leadership Development Certificate Program targets new institutional GME leaders and is aligned with the GME Leadership Competencies (GMELCs) framework (Association of American Medical Colleges, 2023).

Additional options include the American College of Healthcare Executives (ACHE) Physician Executives Community and board certification pathways in Administrative Medicine through the American Board of Physician Specialties (American Board of Physician Specialties, 2026; American College of Healthcare Executives, 2026). A growing number of these programs incorporate substantial online or hybrid components. Published outcome data that rigorously compare these institutional programs with external credentials or purely online alternatives are relatively sparse.

Benefits and Challenges of Online, Hybrid, and In-Person Approaches

Observational studies and organizational reports have associated physician leadership with favorable quality, efficiency, financial, and patient-experience metrics relative to non-physician-led counterparts in some settings (Angood, 2024; Kaiser et al., 2020; Mohmad et al., 2024). Formal development programs have also been linked to improved physician engagement and retention in selected evaluations (Angood, 2024; Prenestini et al., 2023). These associations should be interpreted cautiously: many studies are observational, subject to selection bias, and do not establish causality. Parallel findings in other professions suggest that intentional leadership development can improve engagement and organizational outcomes beyond healthcare alone (Day et al., 2014).

Online education offers several practical advantages for physician leadership development, including accessibility for practicing clinicians, reduced travel burden, potentially lower direct costs, scalability, and flexible scheduling. Reputable providers (including AAPL self-paced and facilitated online courses and various university hybrid offerings) report measurable gains in knowledge and self-assessed competence in domains such as change management, finance, and team leadership. However, independent, comparative evidence on long-term behavioral change, promotion rates, or organizational impact specifically attributable to fully online formats remains limited (Angood, 2024; Prenestini et al., 2023).

A more critical comparison of delivery modes highlights important distinctions. Fully online, self-paced formats excel in transmitting technical and cognitive content (finance, operations, policy, quality improvement methods) and can reach geographically dispersed learners. Facilitated online or hybrid models that incorporate live discussion, cohort interaction, and structured feedback appear better suited to developing interpersonal competencies, such as emotional intelligence, negotiation, conflict resolution, and nuanced communication, where practice, observation, and real-time

coaching matter. In-person intensives may still offer advantages for high-stakes relationship building, complex simulation, and network formation, although they impose greater time and travel costs (Dai et al., 2025).

Learner engagement and accountability can be lower in purely asynchronous formats without facilitation or cohort structure. Assessment of interpersonal and leadership behaviors is also more challenging online; many programs rely on self-report, peer feedback, or knowledge tests rather than observed performance in authentic settings. Longitudinal outcome data tracking graduates of fully online, hybrid, and in-person programs on metrics such as sustained leadership effectiveness, team climate, and patient outcomes are scarce. Consequently, claims that online programs are uniformly as effective as traditional formats should be qualified: effectiveness appears domain-dependent and design-dependent. Persistent barriers across formats include time away from clinical practice, program cost, and variable organizational sponsorship (Chubaci, 2024; Nash, 2021). Hybrid models that combine high-quality online content with limited synchronous or in-person elements currently appear to offer a pragmatic balance for many practicing physicians, though rigorous comparative trials are still needed.

Conclusion

Physician leadership development is increasingly recognized as important for navigating the complexity of contemporary healthcare. The underlying challenge, including strong technical preparation paired with thinner formal leadership curricula, is shared by many professions. Core requirements for physicians center on a balanced set of technical, industry, problem-solving, emotional intelligence, communication, and lifelong-learning competencies, as articulated in frameworks such as Stoller's (2008) physician-leader competency model and the AAMC GME Leadership Competencies (GMELCs). Professional pathways, most notably the AAPL CPE, advanced degrees, and institutional programs, provide structured routes to demonstrate mastery, although requirements and formats continue to evolve and should be verified with the issuing organizations.

Online and hybrid education has expanded access and can effectively support many cognitive and technical leadership competencies. Evidence is more limited, however, regarding the comparative effectiveness of fully online formats for interpersonal skill development, sustained behavioral change, and long-term organizational outcomes. Hybrid designs that integrate online learning with facilitated interaction currently appear especially promising, yet the overall evidence base remains largely observational and descriptive.

Healthcare organizations that invest in leadership development across career stages, and that thoughtfully incorporate high-quality online and hybrid options, are better positioned to cultivate leaders who can address system challenges while keeping patient care central. Individual physicians seeking advancement are advised to begin with structured self-assessment against established competency frameworks, explore credible programs (including those with substantial online components), and seek

organizational sponsorship where possible. Future research that employs more rigorous comparative designs and longer-term outcome measures will be essential to refine recommendations about optimal delivery formats, both within medicine and across other professions facing similar developmental gaps.

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