**Carl J. Shapiro Institute for Education and Research**
**Millennium Conference Impact 2001-2025**

The purpose of the Millennium Conference series is to assemble educational stakeholders and thought leaders to discuss a topic of pressing importance in medical education, with the aim to advance a national agenda for that area. Institutional teams, rather than individuals, are chosen to participate through a selective application process.

In all, 49 medical schools from the US and Canada have participated in the thirteen conferences convened since 2001.

## Millennium Conference 2001 and 2002: The Clinical Education of Medical Students

The proceedings were disseminated as a special report released by the Association of American Medical Colleges (1).

## Millennium Conference 2003: The Continuum of Clinical Training in Undergraduate and Graduate Medical Education

## Millennium Conference 2005: Medical Simulation - Theory and Practice

The proceedings were published in Simulation in Healthcare (2).

An accompanying editorial (3) stated, "[They] are to be congratulated for providing such a clear concise account of a meeting that has helped both to give us a snapshot of where medical simulation thinks it is in the early years of the 21st century and also to set and clarify an agenda not only for the medical simulation community, but for the whole healthcare simulation community. The success of simulation in healthcare will be determined by how successfully we respond to those challenges."

## Millennium Conference 2007: A Collaborative Approach to Educational Research

The proceedings were published in *Teaching and Learning in Medicine* (4).

The keynote, given by Larry Gruppen, was published in *Teaching and Learning in Medicine* (5).

The work of a task force on longitudinal databases for medical education research was published in *Academic Medicine* (6).

The work of a task force on research priorities was published in *Academic Medicine* (7).

The work of a task force on the IRB process in medical education research was published in *Academic Medicine* (8).

## Millennium Conference 2009: Patient Safety – Implications for Teaching in the 21st Century

The proceedings were published in Teaching and Learning in Medicine (9).

## Millennium Conference 2011: Critical Thinking

The proceedings were published in *Teaching and Learning in Medicine* (10).

- The work of a task force on developing milestones in critical thinking was published in *Academic Medicine* (11). A letter of intent submitted to the Stemmler Fund was selected to go on to full proposal for the second time. Meanwhile, the task force has been invited to collaborate with the National Board of Medical Examiners to create a critical thinking assessment for the health professions. The task force submitted two

grant proposals to the NBME for the Stemmler Fund; both were asked to submit full proposals but, unfortunately, proposals were not funded.

- The work of a task force on strategies to teach critical thinking was published in *Medical Education*. This study represented the characterization of 44 interviews of faculty at 9 institutions (12). This paper was identified at the Clerkship Directors of Internal Medicine as one of the top medical education articles of 2016 and was one of the top 5 downloaded articles in *Medical Education* in 2016.

- A second paper on how the learning environment is shaped to support critical thinking was published in *Perspectives in Medical Education* (13).

**Millennium Conference 2013: Teaching Value-Added Care**

The proceedings were published in *Teaching and Learning in Medicine* (14).

One task force tackled the issue of the bedside teaching of high value care principles, using SOAP-V, a framework to include "Value" as part of SOAP presentations on inpatient rounds. This work resulted in a multi-institutional randomized controlled trial to teach medical students about high value care. The study took place at Penn State, Case Western Reserve University, and Harvard Medical School and concluded in June 2015.

- It won the 2015 Teaching Value and Choosing Wisely Challenge sponsored by the ABIM Foundation and Costs of Care (15). As part of the award, Eileen Moser presented the project at the ACP 2015 conference.
- An abstract submitted to the NEGEA 2015 conference was accepted for oral presentation. The presentation went on to win an award for Best Short Communication, UME Clerkship.
- The task force published an article describing this work for the Journal of Hospital Medicine for their Choosing Wisely series (16). The group gave a webinar for the Teaching Value in Health Care Learning Network supported by the ABIM Foundation and Costs of Care in 2015.
- In 2016, the task force received an ABIM Foundation grant to translate SOAP-V to the outpatient setting for internal medicine residents.
- SOAP-V was presented as a workshop at the AAIM Skills conference in October 2016 and at an AAIM HVC pre-course in March 2017 as well.
- A paper describing the quantitative and qualitative results of the multi-institutional study was published in *American Journal of Medicine* (17).
- SOAP-V has been incorporated into the curriculum at 11 medical schools.

The work of a task force to propose a framework for communication skills completed 5 case scenarios to exemplify value conversations, using the input of patient advocates. Daisy Smith from the ACP developed a communication guide based on this work and piloted it at the Waxman Center at the ACP 2015 conference in three HVC cases, as part of a randomized controlled trial of physicians, supported in part by the ABIM Foundation.

**Millennium Conference 2015: Transforming the Post-Clerkship Curriculum**

Two task forces were formed. The first focused on determining the essential elements of situational awareness in medicine. A national Delphi study was performed and the manuscript has been submitted. The second task force focused on investigating the views of students, faculty, and residents on the drivers of student choices in the post-clerkship curriculum. A mixed methods study was preformed and the manuscript has been accepted for publication.

**Millennium Conference 2017: From Student to Doctor: Aligning UME and GME Teaching to Ensure Success**

This conference resulted in the creation of two task forces focused on the UME to GME transition. One completed a national study using a modified Delphi to determine which aspects of Social Determinants of Health should be taught in UME (medical school) and which should be taught in GME (Residency and fellowship) (18).

The other task force has completed a multi-institutional randomized trial of explicit verses implicit clinical modeling to determine what learners "actually learn" from each type of modelling. Faculty modeling of desired behaviors has historically been a part of the apprenticeship model of clinical teaching, yet little is known about best practices for modeling. This study compared the educational impact of implicitly versus explicitly modeled communication skills among U.S. medical students (19).

**Millennium Conference 2019: Self-Directed Learning: Training Doctors for a Lifetime of Discovery**

The conference proceedings were published in Teaching and Learning in Medicine (20).

Two task forces built upon the foundation of the 2019 conference. The first, comprising representatives from Colorado, Dell, Sidney Kimmel, George Washington, Sherbrooke, and Vanderbilt medical schools, developed a framework that describes the elements necessary for the progression of SDL-HP from the novice to advanced learner. A manuscript describing this framework has been published by *Academic Medicine* (21).

The second taskforce, comprising faculty from Harvard, Dell, George Washington, Sidney Kimmel, Sherbrooke, and Colorado medical schools, is pursuing a study, utilizing a modified Delphi process, to determine the essential elements of a learning environment needed to support SDL-HP. The manuscript from this study is in preparation.

**Millennium Conference 2021**: The conference was cancelled due to the Covid pandemic

**Millennium Conference 2023: Professional Identity Formation: Evolving concepts of professionalism for physicians in a world with pandemics and social and political upheaval**

This conference resulted in the creation of a task force to pursue a study on generational views of professional values around professional identity formation (manuscript submitted for publication). A modified Delphi study from this conference was published in Frontiers in Medicine, where the findings offer a contemporary framework for teaching and assessing professionalism that emphasizes reflection, positive role modeling, and sensitivity to evolving societal expectations and the needs of today's learners (22). In addition, some of the outcomes of the conference served as the basis for a session at the 2024 annual meeting of the Association of American Medical Colleges (AAMC).

**Millennium Conference 2025: Artificial Intelligence: Prompts, Hallucinations and the Future of Medical Education**

A multi-institutional task force has created a modular curriculum for teaching medical students and residents core principles about the use of artificial intelligence in the clinical setting. A summary of the development of the curriculum and its core elements was presented at 2026 annual meeting of the Association of American Medical Colleges. This curriculum is available on the Shapiro Institute web-site free of charge (https://www.shapiroinstitute.org/aicurriculum). In a viewpoint published in JMIR, the conference writing group argues that the prime question facing the field of medical education is

not primarily technical but rather a deeper philosophical question about how to cultivate the core responsibilities of physicians in a world shaped by powerful "thinking" technologies (23).

**Bibliography**


1. The Clinical Education of Medical Students: Report on Millennium Conferences I & II, Association of American Medical Colleges. Special report 2002.
2. Huang G, Gordon J, Schwartzstein R. Millennium Conference 2005 on Medical Simulation: a summary report. Simul Healthc 2007 Summer;2(2):88-95.
3. Glavin RJ. Simulation: an agenda for the 21st century. Simul Healthc 2007 Summer;2(2):83-5.
4. Huang G, Newman L, Anderson M, Schwartzstein R. Conference proceedings and consensus statements of the Millennium Conference 2007: a collaborative approach to educational research. Teach Learn Med 2010;22:50-55.
5. Gruppen LD. Improving medical education research. Teach Learn Med. 2007 Fall;19(4):331-5.
6. Cook DA, Andriole DA, Durning SJ, Roberts NK, Triola MM. Longitudinal research databases in medical education: facilitating the study of educational outcomes over time and across institutions. Acad Med. 2010 Aug;85(8):1340-6.
7. Fincher RE, White CB, Huang G, Schwartzstein R. Toward hypothesis-driven medical education research: task force report from the 2007 Millennium Conference on educational research. Acad Med 2010;85:821–828.
8. Johansson AC, Durning SJ, Gruppen LD, Olson ME, Schwartzstein RM, Higgins PA. Medical education research and the institutional review board: Re-examining the process. Acad Med 2011 Jul;86(7):809-17.
9. Huang G, Newman L, Tess A, Schwartzstein R. Teaching patient safety: conference proceedings and consensus statements of the Millennium Conference 2009. Teach Learn Med 2011 Apr;23(2):172-8.
10. Huang G, Newman L, Schwartzstein R. Critical Thinking in Health Professions Education: Summary and Consensus Statements of the Millennium Conference 2011. Teach Learn Med 2014; 26(1), 95–102.
11. Papp K, Huang G, Lauzon Clabo L, Delva D, Fisher M, Konopasek L, Schwartzstein R, Gusic M. Milestones of critical thinking: a developmental model for medicine and nursing. Acad Med 2014 May; 89(5):715-720.
12. Huang GC, Lindell D, Jaffe LE, Sullivan AM. A multi-site study of strategies to teach critical thinking: 'why do you think that?'. Med Educ. 2016 Feb;50(2):236-49.
13. Jaffe L, Lindell D, Sullivan A, Huang GC. Clear skies ahead: optimizing the learning environment for critical thinking from a qualitative analysis of interviews with expert teachers. Persp Med Educ, 27 September 2019.
14. Huang GC, Tibbles CD, Newman LR, Schwartzstein RM. Consensus of the Millennium Conference on Teaching High Value Care. Teach Learn Med. 2016 Jan-Mar;28(1):97-104.
15. Winners Named in Teaching Value and Choosing Wisely Challenge. ABIM Foundation. Available at: http://www.abimfoundation.org/News/ABIM-Foundation-News/2015/Winners-of-Teaching-Value-Choosing-Wisely-Challenge.aspx
16. Moser E, Huang GC, Packer C, Glod S, Fazio S. SOAP-V: Introducing a method to empower medical students to be change agents in bending the cost curve. J Hosp Med. 2015 Sep 28.
17. Moser EM, Fazio SB, Packer CD, Glod SA, Smith CD, Alguire PC, Huang GC. SOAP to SOAP-V: A New Paradigm for Teaching Students High Value Care. Am J Med. 2017 Nov;130(11):1331-1336.
18. Ginzburg, SB, Hayes, MM, Ranchoff, BL, Aagaard E, Atkins KM, Barnes M, Soep JB, Yacht AC, Alexander EK, Schwartzstein RM. Optimizing allocation of curricular content across the Undergraduate & Graduate Medical Education Continuum. BMC Med Educ 22, 425 (2022).
19. Anderson ML, Beltran CP, Harnik V, Atkins M, Corral J, Farina G, Fornari A, Hamburger M, Holliday S, Manko J, Normand K, Ownby A, Pfeil S, Rankin D, Cohen A, Schwartzstein RM, Hayes MM; Role Modeling Faculty Working Group; Role Modeling Faculty Working Group*. A multisite randomized trial of implicit versus explicit modeling in clinical teaching. Med Teach. 2022 Oct 27:1-8.

20. Ricotta DN, Richards JB, Atkins KM, Hayes MM, McOwen K, Soffler MI, Tibbles CD, Whelan AJ, Schwartzstein RM; (on behalf of Millennium Conference 2019 writing group). Self-Directed Learning in Medical Education: Training for a Lifetime of Discovery. Teach Learn Med. 2022;34:530-540. *Co-First Authors
21. Papanagnou D, Corliss S, Richards JJ, Artino AR Jr, Schwartzstein R. Progression of Self-Directed Learning in Health Professions Education: Clarifying Terms and Processes. Acad Med. 2024;99:236.
22. Sullivan AM, Hsiao L, Schwartzstein RM, Hayes MMM, Jackson CD, Ölveczky DD, Ricotta DN, Tibbles C, Atkins KM. Re-defining professionalism in medicine in an era of rapid change: a modified Delphi study. Front Med (Lausanne). 2026 Jan 20;12:1686745. doi: 10.3389/fmed.2025.1686745. PMID: 41641257; PMCID: PMC12864426.
23. Rodman A, Sullivan A, Mitchell J, et al. Tool or teammate? Forming accountable physicians in the age of generative artificial intelligence. JMIR Preprints. Posted June 29, 2026. doi:10.2196/preprints.105819. https://preprints.jmir.org/preprint/105819