Abstract: Physicians are uniquely positioned to stem the tide of the world’s top lifestyle-related diseases; however, most are not trained to provide effective patient care. The Lifestyle Medicine Education Collaborative (LMEd) has a plan that is a comprehensive and sustainable approach to policies, programs, and initiatives to increase graduating US medical students’ knowledge and application of lifestyle medicine. LMed’s strategic plan is to (1) provide high-quality curricular material; (2) solicit support of medical school deans, critical administration, and faculty; (3) influence federal and state policy; (4) develop and conduct assessment; and (5) support medical students as lifestyle medicine champions. Accomplishments to date include (1) collaboration with Association of American Medical Colleges’ MedEdPORTAL for the curation of a LM Collection; (2) creation of a network of >350 members, 80 medical schools including 33 hospitals/clinics; 1:1 mentoring sessions >70 medical school faculty/administration; and (4) establishment of a relationship with the National Board of Medical Examiner’s Customized Assessment Services to create a subject test in lifestyle medicine. National awareness is being increased through webinars and hosting the first-annual LMed Summit in October 2016. LMed strives to alter the health care landscape by enhancing physician competency in lifestyle-related disease and value-based care and affecting the health of populations.

Keywords: undergraduate medical education; mentoring; chronic disease; lifestyle medicine

Why lifestyle medicine (LM)? The World Health Organization states that chronic diseases, such as heart disease, stroke, cancer, chronic respiratory diseases, and diabetes, are the leading causes of mortality in the world, representing 60%
of all deaths, conditions in which promotion of healthy behaviors, including good nutrition and a physically active lifestyle, play a key role. Health care professionals are uniquely positioned to stem the tide of chronic disease through patient education on proper nutrition, increased physical activity, and overall patient self-care. However, our nation’s physicians must first be trained to have the competencies to provide effective patient counseling for preventing, treating, and managing chronic disease. This can be a challenge as today’s medical school curriculum rarely includes lifestyle medicine education.45

In September 2013, the University of South Carolina School of Medicine Greenville and the Institute of Lifestyle Medicine at Harvard Medical School hosted the first national invitational Lifestyle Medicine in U.S. Medical Education Think Tank supported by the Josiah Macy Jr Foundation. Thought leaders and experts in medical education and lifestyle medicine gathered in Greenville, South Carolina, and explored the idea of making lifestyle medicine a formal part of medical school curricula. Content areas were discussed, and it was collectively decided that “nutrition, exercise, behavior change and student self-care” are the most influential content areas that are still underrepresented (or not represented at all) in medical education. Furthermore, a vision, mission, goal, and objectives were discussed and agreed by content experts from each representing organization/institution:

**Vision**

One day, Lifestyle Medicine will become an integral component of medical school curricula.

**Mission**

Lifestyle factors including nutrition, physical activity, and stress are critical determinants of health, causing a pandemic of chronic disease and unsustainable health care costs. The LMed Collaborative will provide an array of evidence-based curricular resources for prevention and treatment of lifestyle-related diseases throughout medical education. Medical schools will utilize this array of resources to provide core curricula, lifestyle medicine competencies integrated into existing curricula, additional electives, rotations, and scholarly concentrations.

**Goal**

To expand access of lifestyle medicine curricula and resources to U.S. medical schools, with a concentration on subjects in the Basic Sciences, Clinical Knowledge, and Clinical Skills.

**Objectives**

1. Provide high-quality curricular material on an easily navigable website.
2. Provide support for medical school deans, critical administration, and faculty in order for them to, in turn, advocate for and implement lifestyle medicine curricula into their own institutions.
3. Impact federal and state policy through increased awareness and legislative initiatives that encourage adoption of lifestyle medicine into medical school education.
4. Develop and conduct assessment in the following areas: Student Health, Student Knowledge, and Program Effectiveness.
5. Train and support medical students as effective champions of lifestyle medicine whose engagement with the curriculum lead to increased adoption within medical schools and enhanced collaboration nationally.

LMEd has since then continued planning and implementation work with publications and meetings at Washington, DC (Bipartisan Policy Center; January 12-13, 2015) and Boston, Massachusetts (August 24-25, 2015), with represented medical schools: University of South Carolina School of Medicine Greenville, Harvard Medical School, and Western University of Health Sciences–College of Osteopathic Medicine of the Pacific, as well as representation from the organizations below:

- Association of American Medical Colleges
- American College of Lifestyle Medicine
- American College of Sports Medicine/Exercise is Medicine
- American College of Preventive Medicine
- American Medical Student Association
- Bipartisan Policy Center
- Liaison Committee on Medical Education
- National Board of Medical Examiners
- National Coalition for Promoting Physical Activity
- National Institutes of Health (NIH)
- NextGenU

The purpose of this report is to summarize the 2015 and 2016 accomplishments of LMed, including the creation of the LMed website, the unveiling of LMed at professional conferences, providing detailed accomplishments listed by Objective, and providing a summary and reflections from the 2016 Inaugural LMed Summit. We also give a brief overview of the next steps for 2017.

**LMEd Website and Launch**

First, the LMed website was launched in July, 2015, aimed at (1) connecting and communicating champions and adopters of lifestyle medicine in medical education who want guidance, leadership, and mentoring through dissemination of materials and (2) networking for educators to share resources.

Next, the concept, Vision and Mission of LMed were introduced at several major annual conferences throughout the 2015 year: American Society of Sports Medicine in February, Association for American Colleges of Osteopathic Medicine (AACOM), the Society for Teachers of Family Medicine in April, and the American College of Sports Medicine in May. The official LMed
Collaborative launch venues were the American College of Lifestyle Medicine (ACLM) (October), the American Heart Association (November), and most significantly, at the 2015 Association for American Medical Colleges (November) through the 2-hour working symposium at the 2015 AAMC Emerging Solutions working symposium, “Lifestyle factors, disease burden, and medical school education . . . let’s connect the dots.” The objective of the working symposium was to assist professionals involved in undergraduate medical education in understanding the importance, identifying, and overcoming barriers, and investigating ways for medical schools to incorporate a lifestyle medicine curriculum into their programs. A white paper summarizing the results of the interactive session is currently in review.

**Accomplishments by Objective**

1. Provide high-quality curricular material on an easily navigable website

   To encourage future submission of quality curricular materials related to lifestyle medicine, LMed partnered with the Association of American Medical Colleges’ (AAMC) publishing suite, MedEdPORTAL Publications. MedEdPORTAL maintains a rigorous peer review process based on standards used in the scholarly publishing community. As stated in the MedEdPORTAL submission criteria, each submission is scrutinized by editorial staff and independent reviewers using a standardized review instrument grounded in the tenets of scholarship. Published authors receive a formal citation for their accepted publication. MedEdPORTAL publications are considered by many to be scholarly works that may support faculty advancement decisions. The AAMC manages a database of trained, content expert reviewers, puts forth a call for submissions to all medical schools, tracks submissions through the publication process, and supports an Associate Editor for the collection. As such, the Lifestyle Medicine Collection curated and housed at MedEdPORTAL will include material vetted by lifestyle medicine content-expert reviewers and an Associate Editor that will guarantee the collection to be of the utmost quality of material educators can use in teaching. Finally, as all content housed in MedEdPORTAL is both considered a peer-reviewed publication and also is indexed with PubMed, authors who develop evidence-based, lifestyle medicine material will be incentivized to submit to the collection. In summary, by distributing high-quality curriculum, and incentivizing faculty, this collaboration will “raise the bar” of making available evidence-based lifestyle medicine education for medical schools to utilize.

   Additional opportunities for sharing lifestyle medicine curricular content are in partnership with the online university, NextGenU, with the American College of Sports Medicine’s Mosaic learning platform via a link on the LMed website. These materials must meet 1 of the 3 following LMed criteria: (1) be a peer review publication, (2) currently in use by an LCME-accredited medical school, or (3) provided by a professional medical organization. Several layers of curricula related to the LMed topics are being sought (ie, full-length course, section or module, individual lecture, individual supporting material) and outcomes are being utilized to define targeted goals for processing subsequent materials.

2. Provide support for medical school deans, critical administration, and faculty for them to, in turn, advocate for and implement lifestyle medicine curricula in their own institutions

   LMed has reached several milestones related to this goal thus far. As LMed publicized the vision, mission, goals, and objectives through the key presentations, booth presence, and receptions held at the conferences, adopters of the collaborative were given the opportunity to join at 1 of 2 levels. (1) **Members**—individuals who would like to receive updates on the collaborative’s successes and potentially be consumers of the shared curriculum. (2) **Champions**—individuals who are committed to bringing awareness of lifestyle medicine education to their medical school. Champions as such have provided their professional contact information and affiliations that are publicized on the LMed global networking map as presented in Figure 1. This mechanism also allows colleagues who work in the same institution/geographical area to find each other and to collaborate.

   Outcomes of this registration includes 350 members, 120 champions located across 71 US, 9 worldwide medical schools, 1 US nursing school, 25 and 8 worldwide hospitals and clinics.

   After building a network of lifestyle medicine educator members and champions, LMed hosted four webinars to provide resources to deans, administration, and faculty to increase national awareness of the Collaborative:

   a. May 2016: Teaching Doctors to Practice Value-Based Health Care and Population Health Management: The Lifestyle Medicine Education Collaborative

   b. June 2016: Medical Students as a Key Partner in the Co-creation of Evidence-Based Lifestyle Medicine Medical School Education

   c. August 2016: Lifestyle Medicine Education Collaborative Mentoring—Assisting Medical Schools in Lifestyle Medicine Student Education

   d. September 2016: The Lifestyle Medicine Education Collaborative Partners with AAMC’s MedEdPORTAL to Provide Evidence-Based Lifestyle Medicine Curricular Resources

   LMed found that hosting webinars tailored to the needs of our medical school audience was very cost-effective in sharing curriculum and expertise from around the country.
**Figure 1.**
Global and US distribution of Lifestyle Medicine Education Collaborative (LMEd) champions.

**LMEd Mentoring**
In addition to the national reach of the webinars, one-on-one mentoring (in-person, video conferencing, phone, email) was created and is being performed to educate key stakeholders how to overcome the barriers of starting a lifestyle medicine education program with limited resources, time, and understanding. It follows Kotter’s 8-step model of change from Harvard Business School, includes steps to
implementation through individual school leadership and project management to create a lifestyle medicine culture and sustainable educational change. These steps include building a lifestyle medicine team with a co-created mission, vision, roles, budget, plan, program areas, and so on. Lifestyle medicine program areas include student interest groups, community service, curricular electives, research, overview courses, public health, medical challenges/trends, and integration of lifestyle medicine into systems courses. A mentees toolkit was also created. It showcases (1) the connection of national programs to local school education (eg, CHIP community health program13 and Tulane Culinary Medicine Education13); (2) thought leaders in the lifestyle medicine movement (eg, Dean Ornish, MD,14 and Michael Greger, MD, founder of NutritionFacts.org and contributor to LifestyleFacts.org); (3) published articles that define the broad perspective of lifestyle medicine in medical education; (4) the return on investment for lifestyle medicine; and (5) presentations to schools that want to incorporate lifestyle medicine from a value and trends perspective nationally. This mentoring process, which project to last throughout the entire implementation process (a few months to 1-2 years), has received excellent feedback from one-on-one conversations with administration, faculty, and students.

In addition to the mentoring, LMEd also performs a daily, national scan of evidence-based lifestyle medicine for repurposing of material that can be used in the mentoring toolkit, as well as to utilize these data to map locations and reach out to of lifestyle medicine champions in medical schools and educators in practice. Stakeholder mapping links key partners who work with medical schools, such as the ACLM Professionals in Training Committee,16 to enhance existing efforts and reduce duplications. In addition to undergraduate medical education, LMEd works closely with the ACLM Residency Curriculum Committee and the ACLM Continuing Medical Education lifestyle medicine curriculum working group. LMEd is interprofessional in nature, the trend of the medical profession, which enhances LMEd's value to medical schools.

Finally, LMEd documents all contact and reporting processes in order to track current status and opportunities to enhance outreach and mentoring. For example, in a medical school mentoring session, LMEd identifies and charts the individual medical school in the change continuum of leadership over the course of the mentoring. More than 140 contact reports have occurred at the time of writing.

3. Impact federal and state policy through increased awareness and legislative initiatives that encourage adoption of lifestyle medicine into medical school education.

In 2015, LMEd established collaborative relationships with groups supporting lifestyle medicine education through policy and legislative initiatives. These include the Bipartisan Policy Center, American College of Sports Medicine, American Council on Exercise, American College of Preventive Medicine, American College of Lifestyle Medicine, American Medical Student Association, and the National Coalition for Promoting Physical Activity. In addition, we aligned LMEd's efforts with the Physicians’ Committee for Responsible Medicine (PCRM is forwarding the ENRICH Act now before Congress which seeks dedicated funding for nutrition and exercise taught in US medical schools). A number of these organizations also are providing resources and support for the LMEd Summit that was held in Greenville, South Carolina, in October 2016.

4. Develop and conduct assessment in the following areas: Student Health, Student Knowledge, and Program Effectiveness

It is likely that the gap in assessment of lifestyle medicine for licensing and credentialing of medical professionals through the National Board of Medical Examiners (NBME) has created a gap in medical schools' teaching of knowledge and skills related to prevention and treatment of chronic disease. We must examine internal, external, and longitudinal student learning outcomes and behaviors for NBME to understand the importance of lifestyle medicine assessment. LMEd has successfully built a strong relationship with representatives at the NBME, who, through their Customized Assessment Services (CAS) are working with LMEd to allow our content experts to examine more than 11,000 test items in the Customized Assessment Bank for identification of lifestyle medicine–related questions.

In forming this relationship and examining the test items, this will allow us to (1) use items from the NBME CAS bank to build a NBME-based Customized Assessment Test (CAT) to be piloted in select medical schools to measure knowledge related to lifestyle medicine in the curriculum; (2) implement a pilot study to internally assess progression in levels of medical student “knowledge” (through the NBME CAT) associated with lifestyle medicine goals and compare this progression data with schools that self-report no lifestyle medicine curricular content; and (3) develop a tool to assess student self-care (including stress resiliency) to be used in medical schools, in which LMEd will assess and publish the findings.

5. Train and support medical students to be effective champions of lifestyle medicine whose engagement with the curriculum lead to increased adoption within medical schools and enhanced collaboration nationally.

This initiative continues to be a cornerstone of LMEd by fostering engagement and energy of US medical students in advancing the vision and mission of LMEd. Current funding has allowed LMEd to cultivate and/or continue work on the following:

a. Conduct outreach to all US medical students through relationships with medical student organizations, (eg, American Medical Student Association)
and social media to identify interested students and champions at each medical school.

b. Work in close cooperation with the American College of Lifestyle Medicine (ACLM) Professionals-in-Training group to support development of LMEd-approved Lifestyle Medicine Interest Groups.

c. Provide telephonic mentoring to advance student knowledge and interest in lifestyle medicine and to connect to other students in their school, regionally and nationally through the LMEd website.

d. Foster medical student participation in LMEd Summit, including review of curricula, policy initiatives, and assessment and representation of medical student interests on the LMEd core team.

e. Expand medical students’ lifestyle medicine scholarship by creating and awarding poster prizes to attend and present at relevant national meetings, for example, American College of Lifestyle Medicine, Institute of Lifestyle Medicine, and LMEd Summits.

f. Support highly motivated students to participate in all aspects of LMEd, including review of curricula, policy initiatives, and assessment and representation of medical student interests on the LMEd core team.

g. Promote medical student self-care through interest groups and individual efforts to improve health behaviors.

h. Encourage self-monitoring and reporting to achieve recognition as “healthiest medical students.”

**2016 Inaugural LMEd Summit**

The LMEd Inaugural Summit was held October 7 to 9, 2016 in Greenville, South Carolina. The Summit included experts in the field of lifestyle medicine curriculum development for medical education, as well as faculty and administration who were looking to succeed in implementing lifestyle medicine at their schools. Representatives from 16 US medical schools, as well as 1 school from Italy and 1 school from India, were represented. Three stratifications of schools were seen at the Summit: (1) schools having difficulty finding support to start a lifestyle medicine program, (2) schools in development stage, and (3) schools in the process of building their lifestyle medicine program. We incorporated that pre-collected information into our delivery format (presentations, curricular material educations, and small/large group discussions) to meet the needs of the 3 groups (see full agenda). Content areas included showcasing LM curricula by medical schools’ representative, plenary talks discussing various facilitators to influence curricular changes such as the power of students, and curricular resources, and small groups practice which include identifying barriers and facilitators for a change in their medical school and how to set achievable action items.

It was a hands-on Summit, providing participants with tangible insights and plans for improving and expanding their lifestyle medicine education program through creating a “Road Map to Success” for their school. LMEd provided opportunities to explore best practices in lifestyle medicine education with LMEd’s national and international partners. Additionally, participants learned about the curricular resources by AAMC’s MedEdPORTAL and NextGenU content expert staff. Participants also learned more detail of LMEd’s mentoring program for medical school leadership and gained access to the resources schools’ have found most helpful in integrating and furthering their programs. Results from the post-LMEd Summit participant survey feedback demonstrated that the Summit was highly successful and valuable to the participants.

While the Summit was an overall success (in spite of some last-minute cancellations due to Hurricane Matthew), a number medical schools were not able to receive representatives due to financial constraints. Therefore, LMEd is in discussions to incorporate the subsequent Summit into the ACLM National Conference, which would allow more participation and bring awareness of ACLM to medical educators interested in lifestyle medicine.

**Future Directions**

In reference to the 5 objectives; first, we will continue working with AAMC’s MedEdPORTAL and NextGenU to provide lifestyle medicine curriculum across the country. Second, we will continue to provide support for deans, administration, and faculty that join the LMEd site through outreach/mentoring and presentations/webinars/workshops and connecting members and champions through the LMEd Interactive Map. Third, we will continue impacting federal and state policy through aligning with organizations, serve on committees of the aligned organizations, and produce legislative briefs. Fourth, we will create a NBME Customized Assessment Test, or CAT, to examine students’ competencies related to lifestyle medicine and noncommunicable diseases content-related basic science. Finally, we will continue to work with students who chose to engage in lifestyle medicine learning through research or community projects, completing online lifestyle medicine education modules, and/or applying for research grants and poster presentations.

In summary, the LMEd Collaborative provides a comprehensive, sustainable approach to policies, programs, and initiatives to increase graduating US medical students’ knowledge and application of lifestyle medicine (nutrition, exercise/physical activity, behavior change, and student self-care), who are the nation’s future physicians. Our intent is that the results of this work ultimately increase the impact of patient/doctor interactions and contribute to altering the healthcare landscape by enhancing the patient experience of care, improving population health, and reducing per capita costs while preventing disease and disability.

**Authors’ Note**

The LMEd Collaborative has previously been presented at the American Society of Sports Medicine in February, April 2015; Association for American Colleges of Osteopathic Medicine (AACOM), April 2015; The Society for Teachers of Family Medicine, April 2015; American College of Sports Medicine, May 2015; American College of Lifestyle
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