Avoiding the Storm: Recommended Practices for Building Cross-Institutional Teams and Collaboration in Graduate Medical Education

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Introduction

Undergraduate medical education (UME) programs regularly innovate together,[1,2] yet there are few examples of cross–graduate medical education (GME) collaborations with the potential to examine outcomes across multiple settings and directly improve patient care. This Perspective discusses lessons learned from 5 varied GME projects that required multi-institutional teamwork. All 5 were supported by American Medical Association (AMA) Reimagining Residency grants and represent more than 60 GME programs across 18 institutions (TABLE). The projects use a modified Tuckman model[7] of group development—forming, storming, norming, and performing—to describe our experiences and recommendations for successful cross-institutional collaboration. The project names, institutions, and descriptions are outlined in the TABLE.

Level-Setting

Before engaging in the first step of the Tuckman model—forming—our projects found it helpful to engage in level-setting with each participating group. Although our projects varied in focus, collaborators, time zones, assets, and obstacles, we shared a common goal of innovating in GME. Early and candid discussions of local milieu, resource allocation, and logistics can set the stage for collaboration and a productive formation.

Local Milieu

Differences in the local milieu will influence project scope and timeline. For example, COMPADRE obtained affiliation agreements, volunteer faculty appointments, and necessary authorizations early in the collaboration with all potential clinical sites to prevent future delays. Timelines and processes for the institutional review board at each institution must also be considered. It is also important to understand how each institution's leaders prioritize the project work, as differential readiness for change can delay widespread project implementation.

Resource Allocation

We recommend team leaders take early inventory of resources, such as budget, in-kind support, existing teams and expertise, and the extent that resources can be shared across programs. Frequently, there will be differences between resources available and resources required across institutions. Acknowledging that complex projects will likely require more intensive resource investment from different institutions at various times throughout the project can help mitigate future conflicts. Unanticipated turnover may also affect institutions' bandwidth to contribute resources. We learned that mutual agreement on equitable resource allocation is crucial to define the investment needed from participating members in the collaboration.

Logistics

Many of our collaborators were in different time zones, limiting the degree of flexibility for meetings. It was important to set expectations for meeting cadence, block calendars in advance, and decide early whether long-distance teams would meet in person to allocate resources accordingly.

Team Development

In the FIGURE, we describe the Tuckman model for collaboration with recommendations for best practices. Over time with intentional level setting, storming decreases in duration and intensity to allow for increased norming, resulting in a high-performing team.

Forming

As multi-institutional teams form, collaborators need to determine in advance if there is a lead institution

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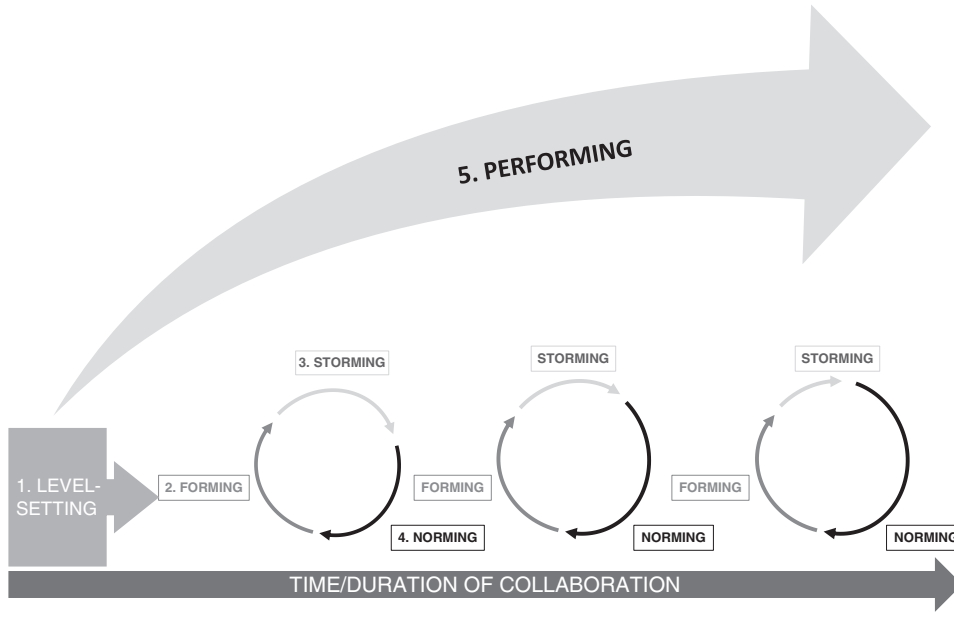
TABLE
Brief Descriptions of AMA Reimagining Residency Projects Leveraging Cross-Institutional Collaborations

Project Name	Collaborators	Number of GME Programs and Specialties	Description
Fully Integrated Readiness for Service Training (FIRST)	University of North Carolina–affiliated residency programs	20 GME programs in family medicine, pediatrics, general surgery, psychiatry, medicine-pediatrics, internal medicine	FIRST supports a 3-year UME curriculum with direct progression to more than 20 GME programs across 6 hospital systems.[3,4] Students are selected in their first year of medical school and receive additional instruction in their specialty of choice and in their selected program.
Developing Residents as Systems Citizens: The Systems-Based Practice Competency for the 21st Century Healthcare System	Kaiser Permanente, Virginia Tech Carilion School of Medicine, Penn State College of Medicine, Allegheny Health Network, Geisinger Health	All GME programs at the institutions	The program seeks to improve the implementation and adoption of the systems-based practice core competency in GME programs by defining the conceptual framework for systems-based practice and building novel systems-based practice assessment tools and indices.[5]
California Oregon Medical Partnership to Address Disparities in Rural Education and Health (COMPADRE)	University of California, Davis; Oregon Health & Science University	31 GME programs in family medicine, internal medicine, pediatrics, general surgery, obstetrics and gynecology, and psychiatry	COMPADRE aims to address regional physician workforce shortages in rural, tribal, and underserved communities through embedding UME learners in GME settings, tailored curricular and educator development, strengthening well-being practices, and innovative holistic admissions.
The Graduate Medical Education Laboratory (GEL)	The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center, Stanford University, and The University of Alabama at Birmingham	4 GME internal medicine residency programs	The goal of GEL is to link modifiable aspects of the training environment to metrics of clinical skill and professional fulfillment in order to design testable strategies to improve the GME experience.[6] Much of the GEL project has focused on understanding factors that impact clinical skills development and professional fulfilment using novel in-person clinical skills assessments and real-time location systems to understand physician behavior in the hospital.
The Goals of Life and Learning Delineated Project (GOL^2D)	Vanderbilt University and University of Mississippi Medical Center	All GME programs at the 2 institutions	The project promotes collaboration across academic health systems to better align GME with learner, patient, and societal needs. The project trains residents in different physician tracks—structural competency, health systems science, and leadership and advocacy—and uses them to support career development.

Abbreviations: AMA, American Medical Association; GME, graduate medical education; UME, undergraduate medical education.
Note: Each row depicts a single AMA Reimaging Residency grant-funded project that utilized multi-institution/organization collaborations.

that is primarily responsible for the logistics of the project, reporting to the funder (if applicable), and project implementation. For example, in the FIRST Program, the University of North Carolina School of Medicine was responsible for all logistics of the program and reported to funders while collaborating with more than 20 GME programs across the state. A horizontal/equal approach is also possible, as evidenced by the University of California, Davis and Oregon Health & Science University, where the institutions shared responsibility throughout. However, it is essential in both cases that each participating institution knows if it will contribute to the project's study design, implementation, assessment, and dissemination. This specificity will prevent competitiveness or resentment from arising between institutions.

Building in opportunities to develop relationships is critical to foster the trust and psychological safety needed for teammates to share their experiences at their own institution. All of our teams employed a strategy of a brief check-in at the beginning of meetings to learn about each other outside of the project. Trying to develop these relationships during or after a crisis makes the crisis that much harder to



Best Practice Recommendations for Each Stage	
1. Level-setting	• Advanced preparation regarding logistics, milieu, resource allocation.
2. Forming	• Invest in relationships as people—get to know the team beyond profession/role. • Establish working relationships and roles for all institutions—decision hierarchy vs equal. • Anticipate high team member turnover by building standardized onboarding processes.
3. Storming	• Try to resolve conflicts quickly to not hamper project. • Develop a system to ensure even small concerns can be escalated to project leadership quickly.
4. Norming	• Establish working commitments. • Develop a community of practice. • Consider "leapfrogging" implementation.
5. Performing	• Cycles of forming, storming, and norming will occur throughout the project and with team turnover. Repeated attention to level-setting will decrease storming over time and yield higher performance.

FIGURE
Visual Representation of Group Formation for Cross-Institutional Collaboration Modified From the Tuckman Model[7] With Recommend Best Practices for Each Stage

navigate. It was helpful for our project leaders to frequently role-model vulnerability, maintain transparency, and create a culture that welcomes diverse perspectives in meetings. In addition, we found meeting annually in person as multi-institutional teams, to discuss projects, roadblocks, solutions, and the AMA Reimagining Residency initiative, strengthened team dynamics.

Finally, forming and reforming the team should be anticipated with team member turnover. Many of our grant teams have turned over at least 50% of the original teammates, including site principal investigators. Standardized onboarding documents and processes can help lessen this challenge. These changes also lead to the need for repeated forming of the team with the addition of new members.

Storming

Vast differences between institutions and interpersonal styles can lead to conflicts that can delay progress and further decrease team engagement if not addressed promptly. We recommend extensive time investment in level-setting and forming to minimize the storming phase. If hierarchy, decision-making, and leadership roles have been well defined, project leaders are empowered to move quickly toward conflict resolution. In our complex multi-institutional projects, we experienced smaller storms within certain aspects of the project that did not always rise to the level of awareness of project leadership. Several of us established a system to capture and communicate conflicts as they arose, such as identifying a single point of contact or using an online submission form so that issues could be addressed in a timely manner.

Norming

As a greater sense of group cohesion emerges with shared ownership in the norming phase, establishing working commitments is imperative to maintain momentum. To enhance work commitments, one of our projects used a community of practice model where members who share a passion for a particular subject continue to improve their practice through regular interaction with one another.

Various factors can lead to differential institutional readiness to implement a project. For several of our projects, it was strategic to stagger implementation, "leapfrogging" the project to leverage the institution that was "ready." Lessons learned from supporting a pilot initiative can be shared in a community of practice, so that all participating institutions can learn and adopt similar initiatives when they are ready to do so. For FIRST, focusing on implementation with willing partners helped build early credibility and baseline outcomes, sparking interest from other institutions for eventual project expansion. For The Goals of Life and Learning Delineated Project (GOL^2D), asynchronous implementation of a health equity curriculum with leadership principles and a systems lens, first at Vanderbilt University's residency orientation, supported University of Mississippi Medical Center's later orientation. This staggered approach offered useful lessons when planning for subsequent iterations of this curriculum.

Performing

Over the course of a collaboration, there are inevitable turnovers in team members, policy changes, or unpredictable events (eg, COVID-19 pandemic) that affect the project. It is important to consider reviewing and reestablishing group dynamics and project objectives at each of these junctures. For example, COMPADRE anticipated embedding more trainees in community-based clinical experiences, but during the pandemic pivoted to emphasize curricular and educator development resource sharing in a community of practice, offering crucial support for GME programs. As we shifted back to focus on trainee clinical experiences, we needed to reintroduce the COMPADRE mission to programs with leadership turnover.

Leveraging a continuous quality improvement approach, including reflection and assessment of intervention, allows for rapid project adjustments. It is important to routinely reflect on the performance of the team and adjust elements that may threaten a successful collaboration. Sustainability planning must crucially be considered at all stages of collaboration, particularly those in which more than one institution is participating. Teams need to assess if all institutions and programs will commit to continuing, or only a small subset. As the AMA Reimagining Residency grant funding ends for our projects, many elements of the collaboration will continue forward with in-kind contributions from participating institutions as well as project support transitioning to annual budgetary support from the institutions.

Conclusion

The authors participated in these AMA Reimagining Residency collaborations. Thus, while the above assessments and recommendations are likely enhanced by our proximity to the process, they are also potentially biased by our participation. These projects, while varied in their goals, all derived similar lessons from cross-institutional GME collaboration. Key lessons included the importance of intentionally approaching group formation processes (forming, norming, storming) to accelerate high-performing cross-collaboration and successful innovation implementation.

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