Submission for: Stanford Medicine Teaching and Mentoring Academy Educational Scholarship Grant Teaching Pediatric Residents a Communication Framework for Delivering Difficult News: A Randomized-Controlled Trial of Teaching Methods

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I. Specific Educational Aims: This is a two-segment project that will create and test a curricular intervention, the modified-SPIKES (m-SPIKES) criteria, and determine the optimal form of small group practice mastery with a randomized controlled trial (RCT) aimed to improve the mastery and self-efficacy of pediatric residents in leading difficult conversations with pediatric patients and their families using evidence-based techniques. This project is being **rigorously designed and tested** in **collaboration with** Palliative Care Medicine, Stanford Educational Technology and the Stanford Quantitative Sciences Unit to create an **impactful and sustainable** curriculum that can be adapted widely for use at other residency programs throughout the country. Our aims include:

(1) Educate pediatric residents regarding delivering difficult news during an academic half-day session using a communication framework with validity evidence, the m-SPIKES criteria, through a didactic session and small group practice in order to improve resident mastery and self-efficacy of delivery difficult news.

(2) Perform an intervention in which after the didactic session, learners are randomized into small groups for either discussion with peer role-play or Rapid Cycle Deliberate Practice (RCDP) simulations to evaluate which practice modality is most effective at improving learner performance of delivering difficult news, as determined by learner self-assessment of self-efficacy and faculty/SP assessment of the learner's mastery in a simulated scenario.

(3) Determine if prior experience has any effect on the starting self-efficacy or change in self-efficacy of delivering difficult news by comparing the responses of the varying levels of trainees.

(4) Pilot a series of academic half-day sessions to implement this new curriculum and demonstrate a model that can be replicated at other residencies nationwide.

II. Project Rationale: Pediatric residents are the frontline providers for pediatric patients and their families, and must be able to effectively communicate difficult news, which can be very stressful for physicians, particularly those with less clinical experience[1]. While the SPIKES protocol is a widely used communication framework for breaking bad news in adult medicine, we would address the gap of teaching this skill in pediatrics using the modified-SPIKES framework which is tailored toward pediatric patients and their families[2,3]. RCDP is a form of simulation that has been implemented in learning communication strategies and medical education[4]. We developed a novel framework conceptualizing the use of RCDP to build competency and support the four elements of self-efficacy for pediatric residents in learning to deliver difficult news. We hypothesize that by educating pediatric residents with the m-SPIKES framework including a didactic session and small group practice, learners will increase their mastery of delivering difficult news and self-efficacy by at least 20%, and that residents with less clinical experience will report a lower baseline self-efficacy and will experience a greater change in self-efficacy compared with residents with more clinical experience. We also hypothesize that RCDP will be superior to discussion groups with peer role-play at improving learner mastery and self-efficacy of delivering difficult news using the m-SPIKES framework.

III: Approach: The proposed project will be executed in two academic half-day (AHD) segments: a randomized controlled trial AHD to educate and evaluate learner master and self-efficacy of delivering difficult news, followed by a residency-wide AHD series implementing the superior practice strategy. During Segment 1, 30 residents will attend an experimental half-day academic session that will teach the modified-SPIKES criteria, a validated method for delivering difficult news in pediatrics. Learners will then be randomized into small group practice via either Rapid Cycle Deliberate Practice (RCDP, a simulation method that involves standardized patients and real-time feedback) or a small group discussion with peer role-play. During segment 2 of this project, an AHD series will be implemented for all other pediatric residents at a single center using the superior practice modality, and changes in self-efficacy will be assessed by pre- and post- surveys. All participants (in both segments) will also receive a pocket card that outlines m-SPIKES to utilize during the simulations and to take with them after the session as a clinical aid.

IV: Timeline and Plan for Implementation:
Spring/Summer 2021: Background research, QSU study design, apply for grant funding
Fall 2021: Design didactic session with Stanford Educational Technology, complete RCDP and simulation scripts, train SPs and faculty facilitators
Winter 2021: Segment 1: single experimental AHD session, data analysis
Spring 2022: Segment 2: residency-wide curricular intervention with superior practice modality, data analysis, presentation of results and creation of manuscript

V: Anticipated Work Product: The didactic curricula and simulation scenarios will be designed with Stanford Education Technology using advanced multimedia online technology intended to be sustainable for future years as well as accessible and adaptable for easy use by pediatric programs throughout the country. We plan to disseminate this curriculum and the study findings so that it can be utilized at other institutions and in other specialties.

VI: Evaluation Plan: The Segment 1 experimental group will be evaluated pre and post intervention with self-efficacy evaluations and as well as simulations that will be evaluated by trained faculty and standardized patients to assess the mastery of fundamental communication skills, the m-SPIKES framework, and relevant ACGME milestones. The quantitative data from these pre- and post- self-efficacy surveys and mastery evaluations will be analyzed with the assistance of a biostatistician using Wilcoxon signed-rank tests. The Segment 2 groups will also complete pre and post intervention with self-efficacy evaluations, and the data will again be similarly analyzed. Data from both segments will also be controlled for post graduate year to determine if prior experience has any effect on baseline self-efficacy.

VII: Dissemination of Results: We plan to continue use of this curriculum at our institution for years to come, and will disseminate this curriculum broadly online and via MedEd Portal. We will also present our findings at conferences such as Pediatric Academic Societies, Academic Pediatrics Association, or APPD national conference. We will publish our findings a journal such as Academic Pediatrics.

VIII: Budget and Justification:

For this grant, we are requesting funding for the Learning & Instructional Design and Script Editing & Story Boarding for the educational technology that will be used as the core didactic material in the large group setting of the academic half-day curriculum. Please see budget breakdown and descriptions below. We will also be applying for other sources of funding to complete the funding of this project.

Total Budget:

Item	Justification	Funding Source	Amount
Standardized Patients	Payment of standardized patient actors	Covered by Pediatric Residency Education Grant	$2984
Pocket Card Materials	To be distributed to participants	Covered by Pediatric Research Grant	$250
Snacks/water for Participants	For half day sessions	Covered by Pediatric Research Grant	$500
Education Technology	**See descriptions below**	**Funding Requested by TMA Grant**	**$16,746**

Education Technology Budget:

Tasks by Type	Average cost/task	Average cost/hour	# hours/task	Projected cost	Hours Needed
Animation	$109	$51	8	$404	8.00
Assessments & Course Shell	$75	$72	0	$0	0.00
Audio Editing	$189	$56	16	$896	16.00
Illustration & Graphic Design	$129	$47	76	$3,572	76.00
Learning Design & Storyboarding*		$83	32	$2,656	32.00
Project Management		$83	0	$0	0.00
Script Editing & Instructional Design		$56	16	$896	16.00
Video Production	$327.95	$64	65	$4,138	65.00
Professional Voice Actor		$30	0	$500	
LMS Site setup & Management	$1500				
Projected Project Finish Out Cost	$14,562, with 15% variance added in: **$16,746**				

*Learning Design and Storyboarding: This item consists of the writing of an Instructional Design Document to organize the learning objectives and guide the scripting and storyboarding process, as well as the writing of an audio-visual script based on the Instructional Design documents, followed by the illustration of storyboards to guide the visual design for look, feel and shot composition.

Video Production: This item consists of the setup, recording and editing video footage for the purposes of creating clinical vignettes to be used in didactic and interactive learning materials.

LMS Site Setup and Site Management: This item consists of the setup and maintenance of a course site platform. The site management costs are accrued annually based on the number of seats used.

Additionally, because the Stanford Educational Technology team has deemed this a project of significance for our program and for national use, they are in the process of obtaining approval to supplement the potential funding from this grant with an additional contribution in order to further enhance the quality of the technology beyond base qualifications. Should we be awarded this grant, their team is committed to ensuring the funding is used to create the highest quality product possible within budgetary confinements.

Appendix: Works Cited:

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3. Wolfe AD, Frierdich SA, Wish J, Kilgore-Carlin J, Plotkin JA, Hoover-Regan M. Sharing Life-Altering Information: Development of Pediatric Hospital Guidelines and Team Training. *J Palliat Med*. 2014;17(9):1011-1018. doi:10.1089/jpm.2013.0620

4. Taras J, Everett T. Rapid Cycle Deliberate Practice in Medical Education - a Systematic Review. *Cureus*. 2017;9(4):e1180. doi:10.7759/cureus.1180

5. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev*. 19770101;84(2):191. doi:10.1037/0033-295X.84.2.191