Innovations in Family Medicine Education

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Editor's Note: Send submissions to jfreeman3@kumc.edu. Articles should be between 500–1,000 words and clearly and concisely present the goal of the program, the design of the intervention and evaluation plan, the description of the program as implemented, results of evaluation, and conclusion. Each submission should be accompanied by a 100-word abstract. Please limit tables or figures to one each. You can also contact me at Department of Family Medicine, KUMC, Room 1130A Delp, Mail Code 4010, 3901 Rainbow Boulevard, Kansas City, KS 66160. 913-588-1944. Fax: 913-588-2496.

Papaya: A Simulation Model for Training in Uterine Aspiration

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Family medicine physicians from several residency programs received training in manual vacuum aspiration (MVA) using papayas as low-cost simulation models. Ninety-two percent of trainees (n=26) rated the value of the simulation practice as "high," and 73% of trainees from a separate session (n=11) reported that it would change the way they managed patients. Trainees asked to rate their perceptions before and after simulated practice (n=16) indicated a 55% decrease in perceived difficulty of uterine evacuation and a 275% increase in procedural confidence. These preliminary measures suggest that simulation is an effective first step in teaching uterine aspiration procedures.

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Described as an "ethical imperative" in the interest of reducing patient risk,[1] practice with simulation models has been shown to improve physicians' skill,[2] efficiency,[3] and confidence.[4] Simulation models are particularly useful in teaching uterine procedures, since they enable physicians to learn how to maneuver within the organ's invisible cavity. A study of midwives demonstrated that those trained to insert intrauterine devices on anatomical models achieved competence significantly more quickly than those who practiced only with patients.[5]

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However, the cost of three-dimensional pelvic models can be prohibitive in low-resource settings or for programs that train a large group in a single session.

The availability of mifepristone and manual vacuum aspiration (MVA) has expanded the options for early pregnancy management in primary care settings. A growing number of family medicine residency programs are incorporating MVA into their curricula for induced abortion and treatment of incomplete spontaneous abortion. We have found that papayas make an excellent simulation model for MVA training. Papayas resemble the early pregnant uterus in size, shape, and consistency, and their softness makes them somewhat more realistic models than durable plastic devices. This article describes the methods and evaluation results from a series of MVA training sessions using this low-cost simulation model.

Curriculum and Methods

The Training in Early Abortion for Comprehensive Healthcare (TEACH) Project is an academic-community partnership designed to integrate early abortion training into primary care. From June 2003 to June 2004, TEACH faculty trained 63 physicians from three California-based family medicine programs in early MVA procedures using papaya simulation prior to hands-on clinical experience. In December 2004, we provided an additional training at the University of Puerto Rico (Table 1). Most resi-

Table 1

Session Characteristics

Group	*Date*	*Residency Location*	*# of Attendees*	*# of RESPONDENTS BY TYPE*						
				Medical Student	*PGY-1*	*PGY-2*	*PGY-3*	*Faculty*	*Other*	*Total*
1	June 2003	Northern California Peri Urban	33	0	10	8	6	1	2	27
2	December 2003	Central California Rural	18	. . . . . *Information not available*				0	0	11
3	March 2004	Northern California Urban	3	0	0	0	0	3	0	3
4	June 2004	Northern California Urban	9	0	0	7	0	0	0	7
5	December 2004	Puerto Rico Urban	16	5	3	3	2	3	0	16

dents did not have prior experience with MVA.

The MVA training was integrated into a 3-hour didactic session designed to (1) place abortion services in the context of public health and primary care and (2) introduce physicians to MVA through simulation. The first hour was devoted to lecture, and the remaining time to MVA practice.

Trainees worked in pairs so they could take turns handling instruments and stabilizing the papaya for their training partner (Figure 1). Each training pair shared a papaya and an instrument pack consisting of a tenaculum, Pratt dilators, an Ipas® manual vacuum aspirator with flexible cannulas, and materials for local anesthesia (10 cc syringe, needle, and small bowl filled with water to mimic lidocaine). Faculty toured the room to provide hands-on assistance.

The simulation session opened with an explanation of the instruments and the "no touch technique" for maintaining sterility. This technique emphasizes not touching portions of the instruments (tips of dilators or cannulas) that will enter the sterile uterine cavity. Following the instructor, the trainees arranged their instruments and practiced handling them in an aseptic manner. They also practiced assembling, charging, and discharging the manual vacuum aspirator to gain familiarity with the device. To practice paracervical anesthesia technique, the trainees infiltrated the neck of the papaya with 4–5 cc of water at each of four sites (2, 4, 8, and 10 o'clock) using superficial and deep injections.[6] They then progressively dilated the papaya's small opening to a diameter of 25–27 mm using Pratt dilators and aspirated the interior seeds of the papaya with the manual vacuum aspirator attached to a 8 or 9 mm flexible cannula.

Training materials cost approximately $42 per pair of residents (manual vacuum aspirator $35, papaya $5, syringe and needle $2). Instrument kits were borrowed from a local women's health clinic. The total per-resident cost of the papayas ($2.50) is considerably less than plastic simulation models, such as an Ipas® Anatomical Pelvic Model ($295).

Evaluation

Trainees completed an evaluation form at the conclusion of each session. The type of survey questions changed over time to meet our program assessment needs. In the first four sessions, our main purpose

Figure 1

Papaya as a Simulation Model

was to assess the quality of the session and its reception by the trainees. At the fifth session, we piloted questions to evaluate changes in confidence and perceived difficulty of the procedure.

In general, trainees preferred simulation practice over the lecture portion of the session. Of trainees (group 1, n=26) asked to rate the value of the hands-on practice on an ordinal scale (low, medium, and high), 92% rated its value as "high," as compared to 60% for the lecture.

With groups 1, 2, and 4 (n=45), we assessed the impact of the sessions on their perceptions about abortion training. Eighty-seven percent reported that their enthusiasm toward clinical training had "increased," with the remaining 13% reporting "no change." In group 2 (n=11), trainees were asked if the session would affect the way they managed patients. Of nine who answered the question, eight (89%) replied "yes," and one was unsure.

Trainees in group 5 (n=16) were asked to compare the perceived difficulty of uterine evacuation before and after simulation training. The perceived difficulty of the procedure decreased by 55%, from 8.64 to 3.90 on a 10-point scale (1=very low, 10=very high). Confidence in performing MVA increased by 275%, from 1.36 to 5.10 on the same scale.

By December 2004, 27 of 33 trainees (82%) had completed a final evaluation of the clinical rotation (minimum 4 days) that followed this initial didactic session. Of these, 89% reported that they felt prepared to provide MVA procedures with confidence, and 78% intended to offer MVA in their future practice. The trainees' complication rate of 1% compares favorably with complication rates for MVA procedures in nontraining settings.

Discussion

Our preliminary results suggest that use of the papaya simulation model positively affects residents' perceptions about clinical abortion training and practice and increases procedural confidence. The limitations of the study include: (1) a limited sample size for several questions, (2) potential selection bias resulting from trainees not completing surveys or specific questions, and (3) reliance on measures of learner perception. We also could not separate the effects of simulated practice from other factors (eg, the initial lecture). A randomized study is needed to clarify these issues further and to assess the impact of simulated MVA training on clinical competency.

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References

1. Ziv A, Wolpe PR, Small SD, Glick S. Simulation-based medical education: an ethical imperative. Acad Med 2003;78(8):783-8.
2. Nyssen AS, Larbuisson R, Janssens M, Pendeville P, Mayne A. A comparison of the training value of two types of anesthesia simulators: computer screen-based and mannequin-based simulators. Anesth Analg 2002;94(6):1560-5.
3. Macedonia C, Kopelman J, Sarno A, Satin AJ. Development and validation of a model teaching operative vaginal delivery utilizing an anthropomorphic simulator. Am J Obstet Gynecol 2002;187:5106.
4. Adams DA, Dobbs J, Greene M, MacGillis PA, Stockhausen PA. A model to enhance staff response in cardiopulmonary arrest. J Nurs Care Qual 2002;17(1):43-50.
5. Ajello C, Limpaphayom K, Gaffikin L, Lumbiganon P, McGrath J. The effectiveness of model-based training in accelerating IUD skills acquisition: a study of midwives in Thailand. Baltimore: JPIEGO, 1994.
6. Wiebe ER. Comparison of the efficacy of different local anesthetics and techniques of local anesthesia in therapeutic abortions. Am J Obstet Gynecol 1992;50:41-6.