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Increasing Cervical Lesion Identification in Junior Practitioners after Abnormal Cervical Cytology ; A Computer-Based Colposcopy Tutorial.

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Background. Work-up for abnormal cervical cytology is time consuming for patients and expensive for the medical system. Yearly, 3.5 million women have abnormalities detected on pap smears that require further work-up and most often colposcopic examination is the primary starting point for such work-up. Although most family practice trained physicians have some experience with colposcopy, little formal training exists prior to residency.

With these needs in mind we set out to develop a computer based, colposcopy tutorial that could be used prior to the residents' hands on training in colposcopy.

Methods: Faculty colposcopists at Hahneman Family Health Center in Worcester were informally polled to investigate what knowledge areas in women's health needed teaching or reinforcement prior to resident training in colposcopy. Six subject domains were identified and are listed: 1.) Female Genital Tract Anatomy and Physiology 2.) Cervical Dysplasia Diagnosis 3.) Cervical Dysplasia Management 4.) Colposcopic Lesion Characteristics 5.) Developing a Colposcopic Impression 6.) Colposcopic Techniques and Practice 7.) HPV 8.) Natural History of Cervical Dysplasia

A computer based tutorial was designed that is approximately 30 minutes in length, based in Power Point with voice overlay. The Tutorial was designed to expose junior practitioner to the above mentioned teaching points. A paper-based test was developed in which there were 17 questions related to these subject areas and this was used as both a pre-test and post-test to evaluate the efficacy of the tutorial.

Participants were contacted through the Hahneman Family Health Center Residency Program, Family Medicine Clerkship for Medical Students and Obstetrics and Gynecology Clerkship for students. Each participant completed the pre-test and viewed the colposcopy tutorial either individually or in a classroom setting. Immediately following the tutorial participants were asked to complete the post-test.

The mean pre-test and post-test scores were compared using two-tailed, paired t-tests. Change in performance in specific subject areas was analyzed qualitatively as well.

Results: The subject areas most likely to be new information to junior practitioners were colposcopic techniques and practices, lesion characteristics, and developing a colposcopic impression.

As expected, the mean score increased between pre-test and post-test (Figure 3) by an average of 27.34% ($p=2.3E-13$) after viewing the colposcopy tutorial. The mean pre-test score was 61.65% as compared to the post-test score 88.99% (Table 1). In all cases except one, the post-test score was higher than the pre-test scores. This is depicted in the line graph (Figure 4). Further, the variability decreased between pre-test and post-test scores as can be seen in the error bars depicted in Figure 3. Feedback from participants was not quantified but was primarily positive.

Particular areas of knowledge strength on the pre-test included HPV, cervical dysplasia management and techniques and practices. Areas of knowledge deficit on the pre-test included lesion characteristics and developing a colposcopic impression as well as the natural history of dysplasia and female reproductive anatomy and physiology. There was an increase in correctly answered questions on the post-test in these domains.

Conclusion: It is not surprising that students and interns had high error rates in the subject areas pertaining to lesion identification, colposcopic technique and practice and development of a colposcopic impression as these subject areas are traditionally taught in the residency period.

Because of the concern that junior practitioners are unfamiliar with colposcopic lesion identification and grading it has been suggested that the number of biopsies be increased to ensure adequate diagnosis (Gage). However, increased tissue sampling is painful for the patient and time consuming to the practitioner. It is perhaps a better investment of time and resources to increase the education around lesion identification. This computer-based colposcopy tutorial reliably introduces important concepts to junior practitioners developed by faculty colposcopists in an time- and financially-economic way.