

	No. of high confidence predictions (% of total)	Sensitivity, % (min-max)	Specificity, % (min-max)	Positive predictive value, % (min-max)	Negative predictive value, % (min-max)
Fellow (n=14)		59 (26.3-89.5)	93.4 (84.6-100)	86.7 (66.7-100)	75.7 (64.1-92.6)
-1th year training (n=2)		36.8	94.2	82.4	67.1
-2th year training (n=3)		57.9	91	82.5	74.7
-3th year training (n=3)		59.6	92.3	85.0	75.8
-4th year training (n=6)		66.7	94.9	90.5	79.6
High confidence only					
All endoscopists (n=28)	673 (53.4)	64.8 (0-100)	98 (83.3-100)	95.5 (0-100)	81.2 (50-100)
Experts (n=7)	240 (76.2)	66 (37.5-92.3)	97.9 (94.1-100)	95.5 (90-100)	80.9 (69.7-95.2)
General gastroenterologist (n=7)	150 (47.6)	57.6 (37.5-100)	98.9 (94.4-100)	97.1 (85.7-100)	78.3 (66.7-100)
Fellow (n=14)	283 (44.9)	67.6 (0-100)	97.7 (83.3-100)	94.8 (0-100)	83 (50-100)
-1th year training (n=2)	20 (22.2)	40	100	100	62.5
-2th year training (n=3)	34 (25.2)	92.3	100	100	95.5
-3th year training (n=3)	79 (58.2)	63	98.1	94.4	83.6
-4th year training (n=6)	150 (55.5)	69	96.7	93.0	93.0

Min = minimum score observers; Max = maximum score observers

Su1557

Development of an E-Learning System for the Endoscopic Diagnosis of Early Gastric Cancer: an International Multicenter Randomized Controlled Trial

Kenshi Yao¹, Noriya Uedo², Manabu Muto³, Hideki Ishikawa⁴, Hector J. Cardona⁵, Elio C. Castro Filho⁶, Rapat Pittayanon⁷, Carolina Olanos⁸, Fang Yao⁹, Adolfo Parra-Blanco¹⁰, Shiao-Hooi Ho¹¹, Gerardo Avendano Alvarado¹², Alejandro Piscoya¹³, Evgeny Fedorov¹⁴, Andrzej P. Bialek¹⁵, Alexandr Mitrov¹⁶, Luis E. Caro¹⁷, Can Gonen¹⁸, Sunil Dolwani¹⁹, Alberto Farca²⁰, Liz F. Cuaresma²¹, Juan J. Bonilla²², Wisit Kasetsermwiya²³, Krish Raganath²⁴, Sung Eun Kim²⁵, Mario Marini²⁶, Hanhua Li²⁷, Daniel G. Cimmino²⁸, Maria M. Piskorz²⁹, Federico Iacopini³⁰, Jimmy B. So³¹, Kendi Yamazaki³², Gwang H. A. Kim³³, Tiing Leong Ang³⁴, Daniela M. Milhomem-Cardoso³⁵

¹Fukuoka University Chikusbi Hospital, Chikusbino, Japan; ²Osaka Medical Center for Cancer and Cardiovascular Diseases, Osaka, Japan; ³Kyoto University, Kyoto, Japan; ⁴Kyoto Prefectural University of Medicine, Kyoto, Japan; ⁵Simon Bolivar Hospital, Bogota, Colombia; ⁶Rio de Janeiro State University, Rio de Janeiro, Brazil; ⁷King Chulalongkorn Memorial Hospital, Bangkok, Thailand; ⁸Universidad de la Republica, Montevideo, Uruguay; ⁹Peking Union Medical College Hospital, Beijing, China; ¹⁰School of Medicine, Pontificia Universidad Catolica De Chile, Santiago, Chile; ¹¹University of Malaya, Kuala Lumpur, Malaysia; ¹²Hospital Dr. R. A. Calderon Guardia, CGSS, San Jose, Costa Rica; ¹³Universidad Peruana de Ciencias Aplicadas, Lima, Peru; ¹⁴Russia National Medical University, Moscow University Hospital N31, Moscow, Russian Federation; ¹⁵Pomeranian Medical University, Szczecin, Poland; ¹⁶Nizhny Novgorod Cancer Hospital, Nizhny Novgorod, Russian Federation; ¹⁷Gastroenterologia diagnosticoy terapeutica, Buenos Aires, Argentina; ¹⁸Haydarpasa Numune Training and Research Hospital, Istanbul, Turkey; ¹⁹Institute of Cancer & Genetics, Cardiff University School of Medicine, Cardiff, United Kingdom; ²⁰Centro Medico ABC, Mexico City, Mexico; ²¹Hospital Nacional Adolfo Guenvara Velasco, Cusco, Peru; ²²i-gastro/Hospital de Fuerza Aerea del Peru, Lima, Peru; ²³Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand; ²⁴Nottingham University Hospital, Nottingham, United Kingdom; ²⁵Kosin University College of Medicine, Busan, Korea (the Republic of); ²⁶Gastroenterology and Operative Endoscopy Unit, Siena, Italy; ²⁷Sichuan Provincial People's Hospital Sichuan Academy of Medical Sciences, Chengdu, China; ²⁸Hospital Aleman, Buenos Aires, Argentina; ²⁹Hospital de Clinicas Jose de San Martin, Buenos Aires, Argentina; ³⁰Ospedale S. Giuseppe, ASL Rome H, Albano L, Italy; ³¹National University of Singapore, Singapore, Singapore; ³²University of Sao Paulo, Sao Paulo, Brazil; ³³Pusan National University School of Medicine, Busan, Korea (the Republic of); ³⁴Changi General Hospital, Singapore, Singapore; ³⁵General Hospital or Goiania, Goiania, Brazil

Background: Gastric cancer is the second highest cause of cancer deaths worldwide. Apart from Japan and Korea where screening programs are implemented, most gastric cancer patients worldwide are diagnosed at an advanced stage because of limited knowledge and experience of endoscopists. An internet-based e-learning

system to teach detection of early gastric cancer using standard endoscopy has been developed and this study evaluated its effectiveness. Methods: The study was designed as a randomized controlled trial. Participants worldwide signed a consent form before first undertaking a pre-test via the internet, after which they were randomly allocated to the e-learning and non-e-learning groups. Pre-adjustment strata were the pre-test score, experience of endoscopy, being a nurse endoscopist or a medical practitioner, and medical institution and country. Only the participants in the e-learning group were allowed to access the e-learning system, which consisted of video lectures on basic knowledge and self-exercise tests to accumulate experience. A post-test in both groups was conducted 2 months after the pre-test. The pre-determined primary endpoint was the difference in the rate of improvement of the test result (post-test score/pre-test score) between groups. After completion of the post-test, the e-learning system was opened for all participants. Results: Among the 515 endoscopists from 35 countries assessed for eligibility, 322 participants who met the study's inclusion criteria completed the pre-test and were enrolled: 166 were allocated to the e-learning group and 166 to the non-e-learning. Of these, 151 participants in the e-learning group and 144 in the non-e-learning group completed the post-test, and were included in the analysis. The mean rate of improvement (standard deviation) of the test result in the e-learning and non-e-learning groups was 1.24 (0.26) and 1.00 (0.16), respectively (P<0.001, Student's t-test). Conclusion: This global study clearly demonstrated the efficacy of an e-learning system to improve knowledge and experience on endoscopic detection of early gastric cancer. Its effectiveness will be further evaluated in a study of improvements in the rate of early gastric cancer detection by all participants in actual clinical practice (UMIN: R000012039).

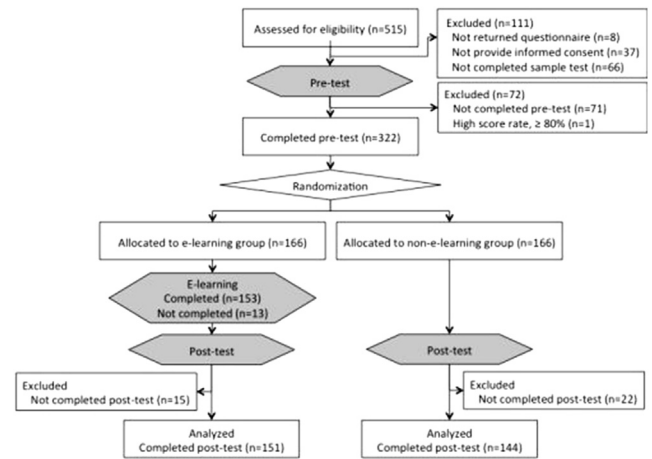


Figure 1. Participants enrollment, randomization and e-tests.

Su1558

Preclinical Endoscopic Training Using a Part-Task Simulator: Learning Curve Assessment and Determination of Threshold Score for Advancement to Clinical Endoscopy

Pichamol Jirapinyo¹, Hiroyuki Aihara¹, Wasif M. Abidi¹, Vicki Bing², Avlin B. Imaeda², Christopher C. Thompson¹

¹Division of Gastroenterology, Brigham & Women, Boston, MA; ²Yale University School of Medicine, New Haven, CT

Background: Endoscopic training is a multifaceted and complex process. It has been proposed that trainees should first learn endoscopy in a non-clinical environment. Once they reach a minimal level of familiarity with the device, they may advance to clinical endoscopic training. Aim: To characterize the endoscopic learning curve in novices using a part-task simulator and propose a threshold score for advancement to initial clinical cases. Methods: Fourteen residents with no prior endoscopic experience were enrolled. Participants underwent repeated endoscopic sessions using the part-task simulator. The simulator consists of 5 modules—polypectomy, retroflexion, torque, knob control and loop reduction/navigation. Simulator scores were collected. Mean total scores for each repetition were calculated. Change point analysis was used to determine when the subjects' simulator scores plateaued (the session after which the slope of the linear regression was not significantly different from zero). Additionally, all participants filled out a questionnaire regarding simulator experience after sessions 1, 5, 10, 15 and 20. A 100 mm visual analog scale (VAS) was used to assess the level of comfort and demand. Results: Fourteen novices underwent a total of 236 endoscopic simulator sessions with an average of 17 sessions per novice. Mean total simulator scores at sessions 1, 5, 10, 15 and 20 were