



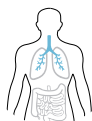
# Integrate Ultrasound into Undergraduate Medical Education with SonoSim



## What Medical Students Think About Ultrasound

- 95%** Agree that U/S should be added into UME curriculum<sup>1</sup>
- 96%** Reported improved anatomy knowledge<sup>2</sup>
- 95%** Reported improved physiology knowledge<sup>3</sup>
- 92%** Reported improved physical examination skills<sup>4</sup>

### Integration of ultrasound is a proven method of improving...<sup>5,6,7,8</sup>



**Anatomy & Physiology Understanding**



**Clinical Diagnostic Ability**



**Patient Management Techniques**

### Benefits of Blended Learning

Blended learning, also termed asynchronous or flipped classroom instruction, helps medical schools satisfy the Liaison Committee on Medical Education (LCME) self-directed learning mandates. This self-directed learning allows students to do the majority of didactic learning and initial scanning practice outside the classroom, **leaving valuable instructor time open for more advanced hands-on scanning instruction and teaching how to integrate ultrasound findings into medical decision making.**



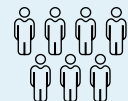
### Research shows that SonoSim is...



**Equally effective** as live instruction in ultrasound image acquisition training<sup>9</sup>



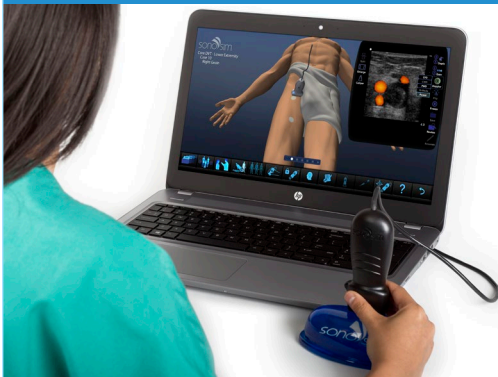
**More effective** than live instruction in ultrasound image interpretation training<sup>10</sup>



Able to **uniformly train & assess** any number of learners<sup>11,12</sup>

# A Full Ecosystem of Products to Complement UME Training

## Standardize Didactic Instruction & Image Acquisition/Interpretation Training



### The SonoSim® Ultrasound Training Solution

Access 60+ Cloud-Based Courses  
With Built-In Knowledge Assessments

Learn Image Acquisition & Interpretation  
With Virtual Tutor Assistance

Scan Hundreds of Real-Patient Pathologies  
In the Patented SonoSimulator®

## Assess Ultrasound Knowledge & Medical Decision Making



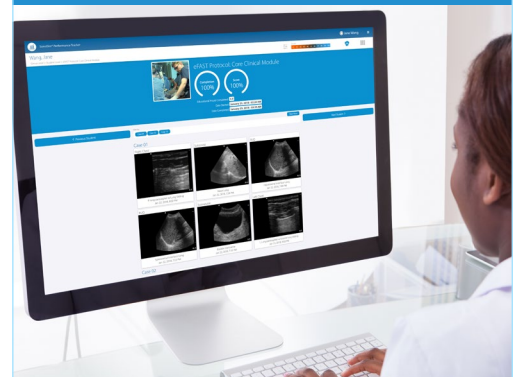
### SonoSim LiveScan® with CaseBuilder

Simulate Ultrasound Findings & Pathologies  
On Manikins & Live Volunteers

Teach Integration of Ultrasound Findings  
Into Clinical Decision Making

Create Over One Million Assessment Cases  
To Enhance Bedside Training

## Monitor & Evaluate Student Progress



### SonoSim® Performance Tracker

Track Performance Metrics & Provide Feedback  
On Saved Ultrasound Images

Access Course Outlines & Module Assignments  
For Standardized Ultrasound Training

Create e-Portfolios of Students' Scans  
From the SonoSimulator

## Improve Training Efficiency & Reduce Costs with Blended Learning

Traditional apprenticeship models for UME ultrasound education are **very labor intensive, logistically difficult, and costly**. One study described needing 24 instructors to implement a curriculum for a first-year medical school class size of 184 students, which required a total of 484 hours of instructor time. Each student only received 14-18 hours of individual hands-on scanning practice over the course of the entire two-year preclinical curriculum.<sup>13</sup>

	Apprenticeship Model for Ultrasound Instruction <sup>13</sup>	SonoSim Ultrasound Training Solution
Instructor Time Required	484 hours/year	<b>No additional faculty time needed</b>
Total Individual Student Scan Time within Curriculum	14-18 hours over two years	<b>Unlimited scan time and refresher training</b>
Monitoring & Evaluation	No competency assessment performed in study	<b>SonoSim Performance Tracker</b>
Teaching Cost	\$34.11/student/hour <sup>14</sup>	<b>\$4.21/student/hour<sup>15</sup></b>

1. Florescu CC, Mullen JA, Nguyen VM, et al. Evaluating didactic methods for training medical students in the use of bedside ultrasound for clinical practice at a faculty of medicine in Romania. *J Ultrasound Med.* 2015 Oct;34(10):1873-82. Epub 2015 Sep 11. 2. Brown B, Adhikari S, Marx J, et al. Introduction of ultrasound into gross anatomy curriculum: perceptions of medical students. *J Emerg Med.* 2012 Dec;43(6):1098-1102. Epub 2012 Mar 28. 3. Bell FE, Wilson LB, Hoppmann RA. Using ultrasound to teach medical students cardiac physiology. *Adv Physiol Educ.* 2015 Dec;39(4):392-396. 4. Hoppmann RA, Rao VV, Poston MB, et al. An integrated ultrasound curriculum (iUSC) for medical students: 4-year experience. *Crit Ultrasound J.* 2011 Apr;3(1):1-12. Epub 2011 Feb 1. 5. Butter J, Grant TH, Egan M, et al. Does ultrasound training boost year 1 medical student competence and confidence when learning abdominal examination? *Med Educ.* 2007;5(9):843-848. 6. Decara JM, Kirkpatrick JN, Spencer KT, et al. Use of hand-carried ultrasound devices to augment the accuracy of medical student bedside cardiac diagnoses. *J Am Soc Echocardiogr.* 2005;5(3):257-263. 7. Tshibwabwa ET, Groves HM, Levine MA. Teaching musculoskeletal ultrasound in the undergraduate medical curriculum. *Med Educ.* 2007;5(5):517-518. 8. Wittich CM, Montgomery SC, Neben MA, et al. Teaching cardiovascular anatomy to medical students by using a handheld ultrasound device. *JAMA.* 2002;5(9):1062-1063. 9. Paddock MT, Bailitz J, Horowitz R, et al. Disaster response team FAST skills training with a portable ultrasound simulator compared to traditional training: pilot study. *West J Emerg Med.* 2015 Mar;16(2):325-330. 10. Chung GKWK, Gyllenhammer RG, Baker EL, et al. Effects of simulation-based practice on focused assessment with sonography for trauma (FAST) window identification, acquisition, and diagnosis. *Mil Med.* 2013 Oct;178(10 Suppl):87-97. 11. Adhikari SR, Samsel K, Irving S, et al. Can ultrasound naive first-year medical students develop hands-on skills in image acquisition after reviewing online ultrasound modules? Paper presented at: AIUM 2018. Proceedings of The American Institute of Ultrasound in Medicine Annual Convention; 2018 Mar 24-28; New York, New York. 12. Lewis RE, Hayden GE, Murray A, et al. SonoGames: an innovative approach to emergency medicine resident ultrasound education. *J Ultrasound Med.* 2014 Oct;33(10):1843-1849. 13. Siegel-Richman Y, Kendall J. Establishing an ultrasound curriculum in undergraduate medical education: how much time does it take? *J Ultrasound Med.* 2018 Mar;37(3):569-576. Epub 2017 Sep 6. 14. Based on representative human capital cost for a preclinical curriculum divided by total students divided by individual scanning hours; Numbers found in: Siegel-Richman Y, Kendall J. 15. Based on SonoSim® UME Package cost per student divided by total accredited hours of corresponding case study preclinical content