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## Asynchronous Learning: Newest Addition to Emergency Medicine Education

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With the advent and continuous improvement of smart phones and tablets, information is less than a fingertip away. One can determine the dose of any medication, translate questions into any language, research the most recent expert opinions on various topics, perform a quick PubMed search, and much more. As technology advances, medical education follows, shifting from lecture-based methodology to more student-centered learning.

Asynchronous learning is a student-centered method that focuses on providing access to information when convenient for the student without constraints of time or place. This approach has become more popular with the fast-paced life style of the twenty-first century and the advances in online sharing among groups of people confined to shift work schedules. This is in contrast to synchronous learning, a group-based method in which residents or students attend conferences on the same topics at the same time.

In 2008 a panel of Council of Emergency Medicine Residency Directors (CORD) members was created to examine the Emergency Medicine (EM) program requirements for educational conferences mandated by the Accreditation Council of Graduate Medical Education (ACGME). It was agreed that asynchronous learning requires considerable effort to develop and maintain, as well as a system to verify that the learner is meeting teaching objectives. The panel recommended that a mix of synchronous and asynchronous learning methods be incorporated into EM curriculum. Further research is required to differentiate areas where one method of learning may be superior to the other, as a sharp demarcation does not currently exist.

Asynchronous learning has been implemented in various ways. Students have access to the Internet on

various portable devices allowing them to watch lectures, read articles and chapters, listen to podcasts, look up radiographs and answer questions related to any field of medicine. Given the fast pace of EM, many find podcasts to be especially helpful. Examples of these include EMCrit, EM:RAP, SmartEM, and *Annals of Emergency Medicine*. These resources are inexpensive and easily accessible. Because simulation is both realistic and practical, it has become an increasingly popular teaching modality. There are numerous simulation resources online, including applications for smart phones and tablets simulating caring for patients in the emergency department, as well as the Digital Instruction in Emergency Medicine section devoted to simulation on the Clerkship Directors in Emergency Medicine (CDEM) curriculum website.

Many institutions have incorporated asynchronous learning into their residency curriculum. One such example is iTunesU. At the University of California, Irvine, a tertiary Level I trauma center, EM residents attend five hours of lectures every Wednesday afternoon, during which time residents are exempt from clinical duties. For residents who are unable to attend secondary to night shift schedules and work hour constraints, the lecture slides are video-recorded and linked to the speaker's associated audio. The audio and video files are linked to iTunesU. These files are then available for viewing on any iTunes-enabled device. This offers the attendees the chance to review lectures at a later time, and allows absentees to view the lectures as if attending these afternoon conferences. This model is being studied at the University of California, Irvine, using data retention and comparison between attendees and non-attendees to evaluate its effectiveness.

Residency programs recognize the potential

for asynchronous learning to improve educational opportunities. Asynchronous learning offers the ability to access the material at a convenient time and place. It also allows residents who missed lectures secondary to shift schedule to view these lectures without missing the learning opportunity.

Although asynchronous learning offers multiple advantages, there are limitations. The institution of such learning modalities requires a financial commitment for audio and visual equipment, servers, software, etc. Residents must be self-reliant enough to set aside time to

view the lectures. Currently it's not possible to monitor whether the viewer has listened to the lecture in its entirety or skipped through portions. And finally, there is the question of whether this learning method allows for better information retention.

While many EM residencies have incorporated this learning style into their curriculum. Synchronous learning remains the mainstream teaching method, More research is needed to determine if asynchronous learning, will be an effective supplement to traditional ways of teaching.