



HANDS-ON ULTRASOUND EDUCATION (HOUSE) PROGRAM

Pre-Course Learning Materials Package

Supplementary Textbooks

1) EDE book

Title: *Point of Care Ultrasound for Emergency Physicians “The EDE Book”* by Steve Socransky and Ray Wiss

We think the EDE textbook is fabulous and we highly recommend it. It is available in print form or digitally, but only as an **iBooks (Apple) eBook**. (This means you must have an iPad, iPhone or Mac Computer to use this.)

Print version: cost is \$135 including shipping, which takes about 2 weeks. Order it at: www.ede2course.com/index.php?fuseaction=ede2.publichome.

eBook version: cost is \$19.99. Download it at: <https://itunes.apple.com/us/book/essentials-point-care-ultrasound/id841572764?mt=11>

2) Mike and Matt Book

Title: *Introduction to Bedside Ultrasound: Volume 1 & Volume 2* by Mike Mallin and Matthew Dawson

Mike and Matt’s book is also good. This book has embedded videos, which is very helpful for folks with poor access to internet. **It is only available in digital format for Apple devices.**

Download on iTunes by following the links below or by searching “Introduction to Bedside Ultrasound” by Dawson & Mallin in the iTunes store (note: there are two volumes):

Volume 1: <https://itunes.apple.com/us/book/introduction-to-bedside-ultrasound/id554196012?mt=11>

Volume 2: <https://itunes.apple.com/us/book/introduction-to-bedside-ultrasound/id647356692?mt=11>

The eBooks are FREE for a limited time only on iTunes.



HOUSE PROGRAM: PRE-COURSE LEARNING MODULES

To get the most out of your hands on point-of-care ultrasound (POCUS) course, preparation is required. You need to understand the theory of each application prior to the course. This understanding can most rapidly be obtained by watching videos, all of which are freely available online. The course developers dedicated many hours combing through available online videos to curate this list of exceptional resources. This list is meant to not only enhance your experience taking the course, but also may be used for your future reference.

We suggest at a minimum you watch the primary video for each application. The blue hyperlinked text will open the videos directly from this document when you press the control key and click your mouse on the text. If you need more than just the primary video, check out some of the other recommended videos and look at the suggested reading in the textbook (***for further information about how to access the textbooks, refer to the textbook information at the beginning of this packet***).

Ultrasound Physics and Knobology

Those of you with no prior POCUS education need to spend a significant amount of time on this section. A little basic knowledge and understanding will go a long way to improve your scanning technique. This is essential knowledge, so get very comfortable with all of this information. Spend some time with longitudinal and transverse images, knowing where on these images you will find the patient's right and left side, and in which direction are the head and feet. It seems confusing at first but when you are at the bedside it will become clear.

For most of our scanning purposes, consider the phased array and the low frequency probes to be interchangeable. Many centres do not have the phased array probe – but you can use your low frequency probe quite easily for everything except the cardiac exam. Even there you might be surprised by the good images you can get with your low frequency probe.

Primary videos: (watch all of these)

Physics & Knobology: vimeo.com/53793842 (43:03)

Probe Movements: vimeo.com/77104010 (6:51)

Supplementary text and videos (arranged in no particular order):

EDE text: pages 1–16 (Print); pages 14–34 (eBook).

Mike & Matt text: Vol. 1 Chapter 8



Introduction to Ultrasound <http://uscm.med.sc.edu/mods/1B/player.html> (17:17)

Image Orientation and Resolution

<http://uscm.med.sc.edu/mods/1E/player.html> (9:02)

Ultrasound artifacts video: www.ultrasoundpodcast.com/2014/01/google-glass-ultrasound-education-physics-artifacts-bedsidesono-foamed/ (18:24) [Note: this video above will only play on Chrome and Firefox browsers, not Internet Explorer.]

Extended Fast (eFAST)

The eFAST is the application upon which many other applications build upon. Make sure you understand this section well. Don't spend time learning how to measure things or archive – every ultrasound is different, so just learn how to do this on your own unit. The initial video shows the basic FAST. The eFAST is simply the addition of looking above the diaphragm for pleural fluid (as in hemothorax) when you are searching for free fluid in the RUQ and LUQ.

Primary videos:

Basic FAST part 1: youtu.be/zXFIEfYcqfw (12:17)

Basic FAST part 2: youtu.be/71ea-GUTFCY (20:13)

eFAST: <https://youtu.be/Yg78aU93SZE> (from minutes 1:48 to 3:33)

Want more?

EDE: pages 17–47 (Print); pages 35–88 (eBook)

Mike & Matt: Vol. 1 Chapter 1

Ultrasound in Trauma – The FAST Exam (watch video clips on this webpage)

<http://www.sonoguide.com/FAST.html>

Inferior Vena Cava (IVC)/Aorta

Primary Videos:

Aorta: youtu.be/B17eaSr1ZdM (12:29)

IVC: youtu.be/ndcJ4DjmWVY (4:23)

Want more?



EDE: pages 17-24 and pages 122-131 (Print); pages 35–50 and p 191–208 (eBook)

Mike & Matt: Vol. 1 Chapter 3, Chapter 5

Aorta: uscm.med.sc.edu/mods/7C/player.html (18:39)

IVC: youtu.be/ci9W4MvyMHI (1:15)

Hot Tips - IVC Volume Assessment with Ultrasound: youtu.be/92U-HtNSPeY (3:50)

Vascular Access

Primary Videos:

Ultrasound Guidance for Central Venous Access Part 1: youtu.be/_RHRy64jQ6s (8:04)

Ultrasound Guidance for Central Venous Access Part 2: youtu.be/zV3hw_QbgK4 (9:09)

Peripheral Vein: youtu.be/IREUPXCpK8Y (7:17)

Want more?

EDE: pages 226–252 (Print); pages 340–373 (eBook)

Mike & Matt: Vol. 1 Chapter 9; Vol. 2 Chapter 8

Vascular Access sonoguide.com/line_placement.html

Heart

Primary video:

Introduction to Cardiac Ultrasound: youtu.be/Q4umNZg_qms (22:01)

The first two minutes of this video are a review of ultrasound techniques. Note that fanning is called sweeping by EDE folks. The most important views for us on heart ultrasound are the parasternal long, the subxyphoid and then the apical four chamber view.

Not yet clear? Look at:

EDE: pages 25–33 and 132–149 (Print); pages 51–67 and 209–232 (eBook)

Mike & Matt: Vol. 1 Chapter 2; Vol. 2 Chapter 1-4



Pneumothorax

Primary Videos:

Ultrasound for pneumothorax – probe selection and placement. (*Don't worry if you find the lung images confusing – all will be clear in the next video*) youtu.be/D3mm9wwlw7g (4:54)

Ultrasound for pneumothorax – lung images. Start this one at the 3:30 mark.
youtu.be/Xxdedx1HtHo (9:29)

Want more?

EDE: pages 155–165 (Print); pages 233–259 (eBook)

Mike & Matt: Vol. 1 p.18–20; 71–74; Vol. 1 Chapter 4

First Trimester Pregnancy

Primary Videos:

Pelvis scanning techniques: youtu.be/6WAYnkJC964 (25:58 min)

The positive scan: youtu.be/Ap64FIijRUE (20:24)

Want more?

EDE: pages 48–70 (Print); pages 91–118 (eBook)

Mike & Matt: Vol. 1 Chapter 7

Normal Pregnancy Part 1: youtu.be/gv4q8ZB25JM (9:45)

Pregnancy Ultrasound Part 1 – start at the 2 minute mark:
ultrasoundpodcast.com/2014/10/pregnancy-ultrasound-part-1-foamed-back-back-basics-cabo-update/ (20:36)

Pregnancy Ultrasound Part 2: ultrasoundpodcast.com/2014/10/1st-trimester-pregnancy-ultrasound-part-2-ectopic-topics-foamed/ (30:06)

Renal

Primary Video:

Renal ultrasound – hydronephrosis: youtu.be/N750NAEmEso (8:22)



Want more?

Renal: www.ultrasoundpodcast.com/?s=renal (17:00) *[Note: this video will only play on Chrome and Firefox browsers, not Internet Explorer.]*

EDE: p.107–121 (Print); p.170–190 (eBook)

Mike & Matt: Vol. 1 Chapter 6

Right kidney: youtu.be/AH8RcdMQMHA (1:53)

Left kidney: youtu.be/zvOm9XDV02s (2:06)

Gallbladder

Primary Video:

Gallbladder: <http://uscm.med.sc.edu/mods/3B/player.html> (11:22) *[Note: this is a presentation with audio and slides]*

Want more?

EDE: p.93-106 (Print); p.150–169 (eBook)

Mike & Matt: Vol. 2 Chapter 15

Procedures

Primary Videos:

Paracentesis youtu.be/bWxv_a9CkBs (10:09)

Thoracentesis youtu.be/6ThpUpgjSiM (10:33)

Pericardiocentesis youtu.be/M4vHEr25yFk (7:30)

Further Reading:

EDE: p.167–185 (Print); p.260–283 (eBook)

Mike & Matt: Vol. 2 Chapter 9



Deep Vein Thrombosis (DVT)

Primary Video:

DVT: youtu.be/Sh5cL72kgnU (13:44)

Want more?

EDE: p.187–200 (Print); p.284–303 (eBook)

Mike & Matt: Vol. 2 Chapter 12

Musculoskeletal (MSK) (Fractures, Joints, Foreign Bodies and Abscesses)

FRACTURES

Primary video:

Fractures and reduction: youtu.be/_imZr4EEOMY (4:03)

Want more?

Matt and Mike podcast on fracture/reduction:
ultrasoundpodcast.com/?powerpress_pinw=1735-podcast (16:24)

EDE text: p.216–225 (Print); p.325–339 (eBook)

Mike & Matt: Vol. 2 Chapter 11

JOINT EFFUSION AND INJECTION

Primary Video:

Ultrasound Guided Injection of the Lateral Knee: youtu.be/TLpNsmwBGS4 (1:22)

Want more?

EDE Reading: p.201–215 (Print); p.304–324 (eBook)

Mike & Matt: Vol. 2 Chapter 11

FOREIGN BODY LOCALIZATION AND REMOVAL

Primary Video:

Foreign body: youtu.be/GxifAE6Dm_o (:07)



Ultrasound guided foreign body removal: youtu.be/h1YQY7guUb0 (2:06)

Want more?

EDE text: p.271–274 (Print); p.400–405(eBook)

Mike & Matt: Vol. 2, Chapter 10, Section 3

ABSCESS VERSUS CELLULITIS

Primary Video:

Abscess: youtu.be/7M26wTrphmA (1:07)

Cellulitis: www.sonoguide.com/soft_tissue.html (read cellulitis section of text)

Want more?

EDE text: p.261–270 (Print); p.390–395 (eBook)

Mike & Matt: Vol. 2 Chapter 9, Section 5

OCULAR

Primary Video:

Ocular Ultrasound: youtu.be/weS0JvDRBG4 (1:39)

Want more?

EDE: p.278–285 (Print); pg 409–423 (eBook)

Mike & Matt: Vol. 2 Chapter 16

APPENDICITIS

Primary Video:

Diagnosis at the bedside: vimeo.com/93051990

Want more?

Mike & Matt: Vol. 2 Chapter 13

Matt and Mike Podcast Ultrasound of the Appendix: youtu.be/HX0Wn-1_p_o (32:23)

Matt and Mike podcast: Appendicitis Remix Part 1: youtu.be/qxavIQRBsdQ (20:26) (Start at 4:00)

Matt and Mike podcast: Appendicitis Remix Part 2: youtu.be/JWpnT9hjBow (26:45)



POCUS Quality Assurance: Putting Your Skills into Practice

Once you've completed this course and are ready to start scanning your patients, there are a few more things to keep in mind. Understand that taking a short course does not make you competent in the use of bedside ultrasound. This doesn't mean you should not be using this technology in your practice, but it is up to you to ensure that you use POCUS **safely**.

The obligation is upon you to use this skill carefully and safely. It is a simple enough skill to acquire. If you complete this course, understand the limits of POCUS and of your abilities, and continue to improve on your manual technique by frequent practice, you can be a safe and effective POCUS practitioner. You can improve the outcome and care of your patients. Do not tarnish the image of this course, your fellow POCUS practitioners or more importantly your patients care, by practicing POCUS erroneously - by performing scans with which you are not familiar, or by failing to recognize the limitations of the technique, and the ways in which you might generate a false positive or false negative finding, leading to adverse patient outcomes.

You must now practice POCUS at every opportunity. Try to scan every patient you can, (with the patient's consent), with the understanding that you are simply practicing your technique. (Of course, if your scanning reveals a concerning finding, you will need to act upon it.) As your technique improves, your rate of indeterminate scans (the ones that give you no information, because the quality of the generated images is poor) will diminish, as you improve upon your ability to generate quality images. When using POCUS in clinical situations, do not be lulled into a false sense of security with a negative scan. Instead, continue to **exercise your clinical judgment**, and provide patient care in the way that you did prior to using POCUS. If you think your patient has appendicitis and you can't see the appendix with POCUS, you will need to do more for your patient. If your FAST scan is negative but your patient is unstable, you need to care for your patient. At all costs you must avoid the FALSE NEGATIVE exam. If you have a positive finding, by all means act upon it.

The Canadian Emergency Ultrasound Society, CEUS, recommends the following path for the non-certified IP user: "Non-IP's who are performing an exam without supervision can declare positives for the heart, aorta and abdomen. They can NOT declare positives for IUP. Positives declared by non-IP's in a STABLE patient must be confirmed by a formal imaging study as soon as possible. Positives declared in an UNSTABLE patient must be shown to the appropriate surgical consultant for consideration. Negative OR indeterminate scans declared by non-IP's must be documented as INDETERMINATE and the trainee must not draw any conclusions from said scan."

Once you have spent a bit of time refining your skills, consider becoming certified in POCUS. This process alone will lead to an improvement in your skills. In the emergency department world, where POCUS is well established, and rapidly becoming the standard of care, there are Canadian standards for certification, the Independent Practitioner (IP) status. After taking an introductory ultrasound course, and then practicing those skills, one can undergo a formal certification process through the Canadian Emergency Ultrasound Society (CEUS). (Please note that at this time the HOUSE Course does not qualify



as an introductory course for IP certification.) This involves having fifty scans supervised by a IP certified practitioner, as well a written exam, and covers the applications of FAST, AAA, and first trimester pregnancy. (There is currently no formal certification process for the other POCUS applications.) At this point one is then deemed competent to incorporate POCUS into practice, and to act upon any findings. There are several ways to achieve IP status. The fastest way to do so is to travel to a busy ER and work with an instructor for a few days. There will be vast numbers of patients to scan and you can quickly achieve your 50. You can also do this closer to home. Any IP certified physician can supervise your scans and administer the exam. Likely there are ER docs in your regional centers who might be willing to do this for you. You can also have a local IP certified colleague supervise your scans. This sometimes takes a bit longer, as getting the patients can be a limiting factor, however it can be done over any period of time. The other option would be to arrange a local certification course, where an instructor comes to your community, and you arrange for a number of models to scan ahead of time. If you have an interest in exploring these options, please contact us at rural.cpd@ubc.ca and we can connect you with people who might be able to help you.

In the early days of POCUS use in the ER in Canada, there was significant opposition from many parties to the introduction of this new technology. Although that battle is for the most part won, it is certainly possible that you will encounter resistance to your POCUS practice from others. Some of this resistance will be due to misunderstanding of POCUS and its clinical applications. It is thus extremely important to always communicate the intention and limitations of the scans you perform. We are in no way trying to duplicate or replace the formal ultrasound. We are merely using POCUS as an adjunct to our physical exam, where more information is required. It is a good idea to communicate with your local specialist colleagues and hospital administration about your new ultrasound skills and how you intend to use them. Communication can help prevent misunderstandings.

Although there is no current formal system of certification for many POCUS applications, it is up to you to undertake such a process informally. Use every opportunity available to you to gather more information about your scans. If the patient sees a specialist or has a formal scan, or other investigations, make sure you follow up on the outcome of these processes to ensure your findings are corroborated. As well, find a way to have your scanning assessed more directly, by another practitioner. Perhaps your friendly colleague, radiologist or ultrasound technician would be willing to review your scanning technique and images generated. If not, you can certainly arrange to spend further time working with someone, perhaps outside of your community, who can do this for you. Consider applying for REAP or reverted CME funds to support you in this process. As this course develops, it is our hope that we can provide more opportunities to support this process for you, so please keep in touch with us via our website at <http://www.ubccpd.ca/rural> or by email at rural.cpd@ubc.ca. We also suggest you keep a log of all the scans that you perform with both your interpretation and the final clinical outcome. This will again help build experience and skill.



CEUS Certification

For information about becoming CEUS certified, visit <http://pocutoronto.com/ip.html>.

Western representative: Dr. Ben Ho (Emergency Room Physician, British Columbia) hoben@shaw

UBC CPD Hands-On Ultrasound Education Program

If you have any questions, please contact the program assistant at the CPD office:

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Created by the UBC CPD Hands-On Ultrasound Education (HOUSE) Program (ubccpd.ca/rural/HOUSE)



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