High Yield Applications of Point-of-Care Ultrasound in Primary Care

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Paul H. Bornemann, MD

Assistant Professor of Clinical Family and Preventive Medicine, University of South Carolina School of Medicine, Columbia; Director of Primary Care Ultrasound, Ultrasound Institute, University of South Carolina School of Medicine, Columbia; Associate Program Director, Palmetto Health Family Medicine Residency Program, Columbia, South Carolina

Dr. Bornemann is board certified in family medicine. He is a military veteran who has eight years of experience working as a family physician in the U.S. Army, including a combat deployment in support of Operation Enduring Freedom. His military awards include the Combat Medical Badge for providing medical care under direct fire. He has experience introducing point-of-care ultrasound curriculum in military and civilian family medicine residency programs, has multiple publications on the topic, and often teaches about it at national conferences. His other interests include teaching medical decision making and behavioral health strategies for primary care.
Mark Deutchman, MD, FAAFP

Professor, Department of Family Medicine, University of Colorado School of Medicine, Aurora; Executive Director, Colorado Area Health Education Center Program Office, Aurora

For more than 35 years, Dr. Deutchman has been involved in rural medical practice or teaching. In 2000, he received the American Academy of Family Physicians’ (AAFP’s) Exemplary Teaching Award for Full-Time Faculty. He has experience performing and teaching maternity care, ultrasonography, and other clinical procedures in ambulatory and hospital settings. He is founding director of the University of Colorado School of Medicine’s rural track for students who are planning a career in rural medical practice. In addition to his focus on rural physician workforce development, Dr. Deutchman is engaged in interdisciplinary training and is a co-author of Smiles for Life: A National Oral Health Curriculum.
Jacqueline Gerhart, MD, FAAFP

Associate Professor, University of Wisconsin-Madison Family Medicine Residency; Associate Director of Family Medicine Student Mentorship, University of Wisconsin School of Medicine and Public Health, Madison

Dr. Gerhart earned her medical degree from the Mayo Medical School in Rochester, Minnesota, where she received the AOA Service Leadership Award. She completed her family medicine residency at the University of Wisconsin-Madison. She also completed undergraduate degrees in biomedical engineering and neuroscience, and worked on the design of medical devices and industrial engineering projects to improve the delivery of health care. She currently practices full-spectrum family medicine at the University of Wisconsin Health DeForest-Windsor Family Medicine Clinic. Dr. Gerhart practices maternity and inpatient care, and writes a medical column for the newspaper Wisconsin State Journal. Her clinical interests include obstetrics, women’s health, point-of-care ultrasound, and minor surgical procedures.
Joy Shen-Wagner, MD

Assistant Professor, Department of Family and Preventive Medicine, University of South Carolina (USC) School of Medicine, Columbia

Dr. Shen-Wagner earned her medical degree from the Eastern Virginia Medical School in Norfolk, and completed her family medicine residency with Sutter Health in Sacramento, California. She is a primary care physician at USC Family Medicine in Columbia, a Palmetto Heath-USC clinic, and is attending for residents at the Palmetto Health Family Medicine Residency Program. Her medical interests include optimizing the physician-patient experience in primary care. Currently, she serves as a department wellness champion for efforts aimed at redesigning the clinical practice to improve physician wellness. She recently finished a focused fellowship in point-of-care ultrasound at the USC School of Medicine’s Ultrasound Institute, and conducted a study on pelvic simulation and medical student education.
Vu Kiet Tran, MD, MBA, FCFP

Assistant Professor, Department of Family and Community Medicine, University of Toronto, Ontario, Canada.

Dr. Tran practices family medicine and emergency medicine in a group practice in suburban Toronto, Ontario, Canada. His practice encompasses the full spectrum of family medicine, from pediatric patients to the elderly. Dr. Tran has taught for 15 years in an academic emergency medicine center affiliated with the University of Toronto. His specialty topics include emergency medicine, cardiovascular medicine, dermatology, and procedures in the emergency department. Dr. Tran believes in lifelong learning.
Learning Objectives

1. Recognize the value of point-of-care ultrasound in family medicine.
2. Understand how to perform the eFAST scan and how to incorporate into management of a trauma patient.
3. Understand and practice the performance of a limited echocardiographic evaluation of the heart to assess left ventricular systolic function.
4. Determine how to incorporate echocardiographic evaluation of the heart into patient management.
5. Understand and practice how to perform a transvaginal ultrasound examination in the evaluation of first trimester bleeding.
6. Identify procedures to incorporate transvaginal ultrasound examination information into patient management.
7. Review indications for AAA screening. Understand and practice the performance of ultrasound screening for AAA.
8. Identify recommendations for treatment of AAA and/or follow-up based on findings.
9. Identify appropriate credentialing and billing for ultrasound applications in family medicine.
Pre-course Material – please view prior to workshop

- [https://www.youtube.com/watch?v=4vcaFKcV3kw](https://www.youtube.com/watch?v=4vcaFKcV3kw) (RUQ)
- [https://www.youtube.com/watch?v=gG191GI_4ME](https://www.youtube.com/watch?v=gG191GI_4ME) (Spleen)
- [https://www.youtube.com/watch?v=lN12Gz8CClQ](https://www.youtube.com/watch?v=lN12Gz8CClQ) (Bladder)
- [https://www.youtube.com/watch?v=WOlz8-km6hE&t=21s](https://www.youtube.com/watch?v=WOlz8-km6hE&t=21s) (lung)
- [https://www.youtube.com/watch?v=zcFFTKteaUQ](https://www.youtube.com/watch?v=zcFFTKteaUQ) (subcostal cardiac)
- [https://www.youtube.com/watch?v=mZtK4PMdacE](https://www.youtube.com/watch?v=mZtK4PMdacE) (PLAX)
- [https://www.youtube.com/watch?v=Q6VIg3kv28Y&t=24s](https://www.youtube.com/watch?v=Q6VIg3kv28Y&t=24s) (IVC)
- [https://www.youtube.com/watch?v=2tHrgkrmnQ4](https://www.youtube.com/watch?v=2tHrgkrmnQ4) (Cardiogenic shock)
- [https://www.youtube.com/watch?v=yG4GapymYUo](https://www.youtube.com/watch?v=yG4GapymYUo) (Intro Pelvic)
- [https://www.youtube.com/watch?v=8EB0Au3l4AM&t=28s](https://www.youtube.com/watch?v=8EB0Au3l4AM&t=28s) (AAA)
Why Ultrasound?

• Healthcare in the US is expensive and with suboptimal outcomes.

• High utilization of expensive diagnostic testing along with disparities in access.

Henry J Kaiser Fam Found. 2015.
Why Ultrasound?

POCUS can decrease use of costly diagnostic studies and improve outcomes.

- Nephrolithiasis, Musculoskeletal...
- Central lines, thoracentesis, arthrocentesis...


Why Ultrasound?

POCUS applications can be performed effectively by non-specialist physicians

– AAA screening, DVT, Cardiac…

– Evidence of Feasibility in Family Medicine setting

Needs Assessment

- Few Family Medicine residencies have POCUS training, although there is a large degree of interest.
- Over twenty medical schools have POCUS curricula.
- Ultrasound devices are rapidly becoming smaller and less expensive.

Primary Care Applications

- Limited Echocardiography
- Limited Biliary Ultrasound
- Limited Urologic Ultrasound
- Abdominal Aortic Aneurysm Screening
- Focused DVT Evaluation
- Peripheral Arterial Disease
- Carotid Artery Stenosis
- Ophthalmologic Ultrasound
- Pulmonary Ultrasound
- OBGYN Ultrasound
- Limited Thyroid Evaluation
- Musculoskeletal Ultrasound
- Soft Tissue Ultrasound
- Bowel Assessment
- Much More!
Goals for Today

– Introduce basic ultrasound concepts and techniques
– Practice with the ultrasounds
– Discuss administrative issues
Physics
Transducers

Low Frequencies – 3 – 5 MHz

High Frequencies – 8 to 12 MHz
Ultrasound Image Terminology

- Anechoic
- Hypoechoic
- Hyperechoic
- Isoechoic
Settings
Depth
Gain
Anatomical Planes

Probe marker should point to the patient’s right or patient’s head.
Transverse View
Sagittal View

Cephalic end

Caudal end
Cardiac Views
Cardiac Views

Right side of patient

Left side of patient

Left side of patient

Right side of patient
Scanning Terminology
Sliding
Turning
Fanning
Heel-Toe
Rotate Through Stations
Ultrasound Billing and Credentialing
Credentialing

- Accreditation
  - External, Practice or institution level
- Certification
  - External, Practitioner level
- Credentialing/Privileging
  - Local, Practitioner level
  - Hospital Committee, Professional Guidelines
Credentialing

I. Residency Track

II. Practice Track

   1. CME Course
   2. Document Supervised Scans
      A. 25 per exam (10 for guided procedure) or 150 for global point-of-care ultrasound
      B. Directly supervised, Images reviewed, or compared to formal exams
   3. Approval by credentialed provider

American College of Emergency Physicians 2008 Emergency Ultrasound Guidelines
SCCM. Critical Care Ultrasound Credentialing Guidelines.
Billing

Requirements for accreditation, certification or credentialing

– Medicare and Medicaid
  • No specific requirements
  • A licensed physician must perform or supervise

– Private Insurances
  • May have additional requirements

Report Requirements for CPT Codes

1. Indication (Medically Necessary)
2. Description of the exam (Limited?)
3. Findings (Including measurements)
4. Impression
5. Permanent image storage

Diagnostic CPT Code Reimbursement

**GLOBAL FEE**

**Professional Component**
- Interpretation
- Report

**Technical Component**
- Equipment
- Sonographer
  - Image acquisition and storage
  - Preliminary report
- Overhead
## Medicare National Average 2016

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<th>EXAM</th>
<th>CPT</th>
<th>Global</th>
<th>Prof Comp*</th>
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<td>Limited transthoracic echo</td>
<td>93308</td>
<td>$126.19</td>
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<td>Limited chest ultrasound</td>
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<td>Vascular access</td>
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* Modifier-26, professional (interpretation) component only (reimburses about 1/3 of total fee)
Equipment Costs

• Basic Laptop with 4 probes
  – $40 – 75 K to purchase
  – $600 - $1,250 per month for 5-year lease

• Pocket Ultrasound
  – $5 – 10 K to purchase
  – $150 - 200 per month for 5-year lease

• Section 197 Tax Deduction

Start Up Model

- Lease least expensive machine
- Start with ultrasound billing to supplement something you are already doing
- Practice other applications
- Expand what you bill for as you develop comfort or credentialing necessary
- Upgrade equipment later
Thank you!

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