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Building point of care ultrasound experience in a rural primary care network

Jamie Cyr

Family Medicine Rotation, March 2023

Northern Counties Health Care

Project Mentors: John Raser, MD & Dana Kraus, MD

Problem identification and description of need

- Point-of-care ultrasonography (POCUS) is a safe, noninvasive and rapidly developing diagnostic technique.
- The increasing portability of POCUS equipment has enabled practitioners to perform bedside exams. In the outpatient setting this enables improve access to timely care, raises patient satisfaction, and reduces the need for costly tests¹⁻³.
- While application of POCUS is well established in the emergency department and intensive care unit, its use in ambulatory medicine is still emerging⁴.
- Prior literature has shown that while many rural care offices have access to POCUS units^{5,6}, the technology is not being used to its full potential^{5,7}.
- Prior family medicine projects have identified barriers to the use of ultrasound in rural Vermont outpatient clinics⁸⁻¹⁰.
 - **A lack of training was identified as the largest barrier to POCUS use in both 2019 and 2022**^{8,9}

Public health cost

- Given the relatively low cost of these systems, their mobility, and minimal maintenance requirements, they are among the most economical and practical imaging tools¹¹.
- Implementation of POCUS in general practice has led to a measurable reduction in planned referrals¹².
- Health care costs were lower with the use of ultrasound¹³.
 - One study found that the use of POCUS resulted in significant cost savings, even when management was not directly impacted¹⁴.

"POCUS, when incorporated earlier and more frequently into community hospital emergency medicine diagnostic protocols, can lower direct and indirect costs associated with diagnostic workups.*"

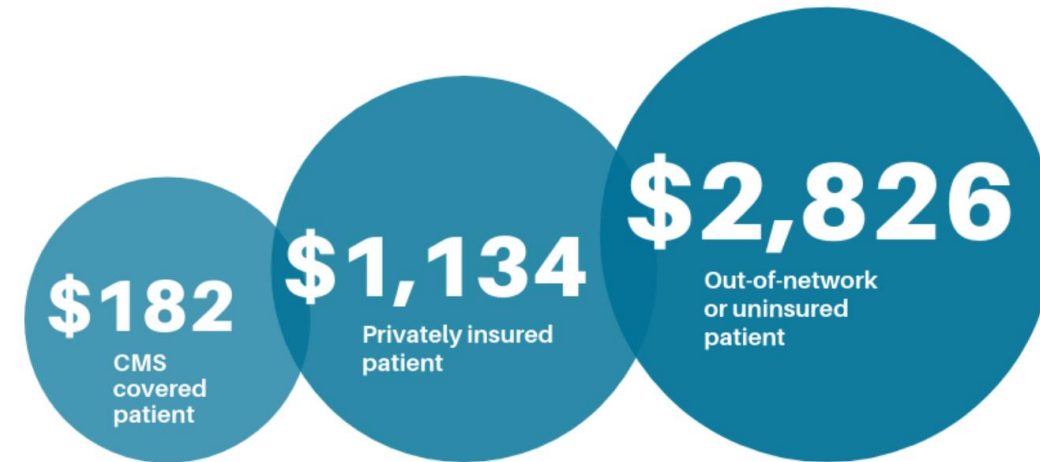


Fig 1. Average savings due to POCUS use for patients with different insurance coverage¹⁴.

Community perspective

“yes, ultrasound is useful in my practice”

- Utilizes POCUS frequently in primary care practice
 - Most commonly with obstetrics exams
 - Soft tissue exams and bladder scans
- Committed to teaching POCUS to 3rd year medical students at Dartmouth College during their family medicine rotation
- Hopes to continue to teach POCUS exam skills to practitioners across Vermont

Stephen H. Genereaux, MD
General Family Medicine
Cottage Hospital
Wells River, VT



“I found the process so much less stressful than waiting for and then going to a second appointment”

- Reassured by getting quick in the office results
 - Appreciated getting answers faster and avoiding the anxiety and suspense of awaiting a separate appointment.
 - Appreciated being with the primary provider during the exam
 - More comfortable with them than a technician
 - Felt able to ask questions during the exam
- Pleased with cost and time savings
 - Didn't need to take off work a second time

Elizabeth Ferraro
Patient
Northern Counties Health Care



Intervention and methodology

Organized and hosted two POCUS training sessions

Instructor Stephen H. Genereaux MD

Target audience Nurses + providers associated with Northern Counties Health Care network

Duration 1.5 hours each

- E-mailed training dates to nurses and providers at associated practices:

- Caledonia Home Health Care & Hospice
- Concord Health Center
- Danville Health Center
- Hardwick Area Health Center
- Island Pond Health & Dental Center
- Northern Express Care – Newport
- Northern Express Care – St. Johnsbury
- St. Johnsbury Community Health Center

- Tracked responses via survey

Plan Curriculum

- Provider oriented training curriculum
- Exam utility survey distributed to NCHC providers via e-mail
 - Exams described: listed →
- Responses tracked via survey

- Renal/Urinary
- Hepatobilliary
- Abdominal Free Fluid
- Abdominal Aorta
- Cardiac
- DVT
- Lung
- Pleural
- MSK/Soft Tissue
- Ocular
- OB/GYN

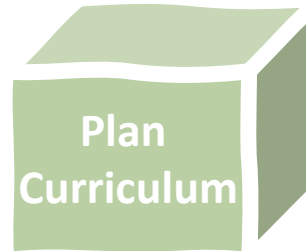
Host Training

- Two trainings hosted at SJCHC
- Directed by Dr. Genereaux
- Participants asked to fill out survey pre and post each training
- Exams taught with Butterfly handheld ultrasounds on standardized patients (SP)
 - 2:1 ration of trainees to SP

Provide Quick Guide

- Organize POCUS exam guide from FOAMed Ultrasound Curriculum: <https://www.sonomojo.org/us-cheat-sheets/>
- Quick guides paired with butterfly ultrasounds at respective practices

Results



• Attendance survey results

- 11 Responses endorsed attending one of the trainings

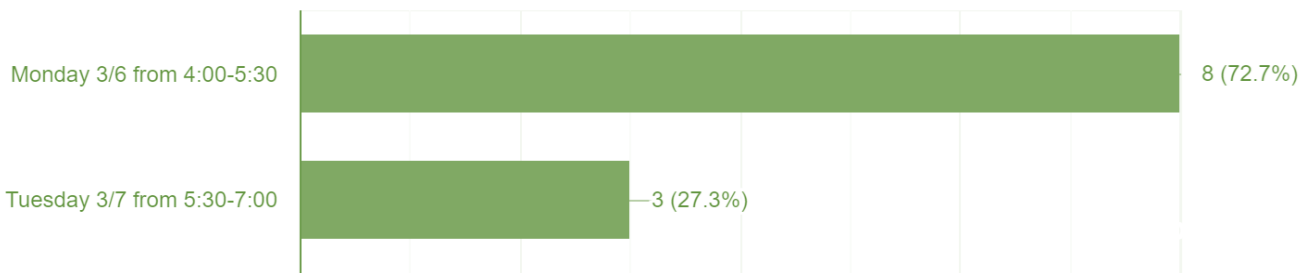


Fig 2. Respondents to training invitation.

• Exam utility survey results

- Highest rated utility (score out of 3)
 - Renal 1.8/3
 - MSK/Soft tissue 1.8/3
 - DVT 1.6/3
 - Abdominal Aorta 1.4/3

- Not useful (Blue)
- Sometimes useful (Red)
- Pretty useful (Yellow)
- Very useful (Green)

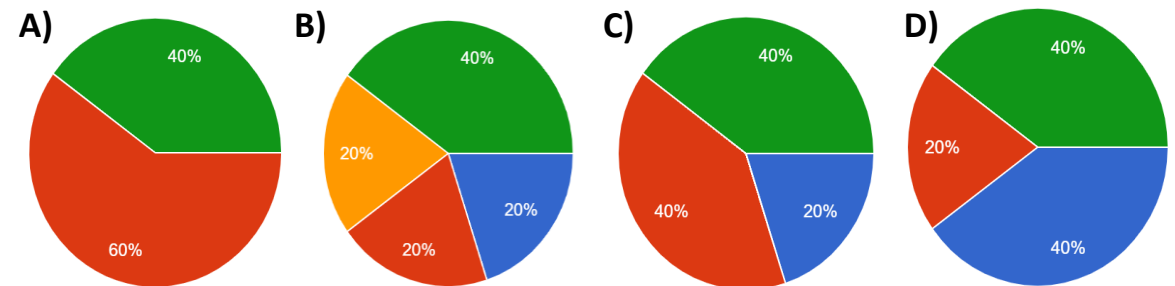


Fig 3. Pie charts for utility rating for POCUS exams A) Renal B) MSK/Soft tissue C) DVT D) Abdominal Aorta

Evaluation of efficacy

• Trainings

- 10 Participants attended
 - 5 per session
- Variety of clinical roles
 - MA, RN, NP, MD

• Post training

- Significantly increased confidence in performing POCUS exam
- Increased perceived clinical utility of POCUS exams
- Increased prediction of quick guide utilization
- Significantly increased prediction of positive patient perception of POCUS exam.

Confidence

- Not confident at all
- Minimally confident
- Moderately Confident
- Very Confident

Utility

- Not useful
- Sometimes useful
- Pretty useful
- Very useful

Quick guide use

- Never
- Sometimes
- Pretty often
- Very often

Patient perception

- Not receptive and decline exam
- Reluctant to have the exam
- Neutral about the exam
- Reassured by additional in office assesment

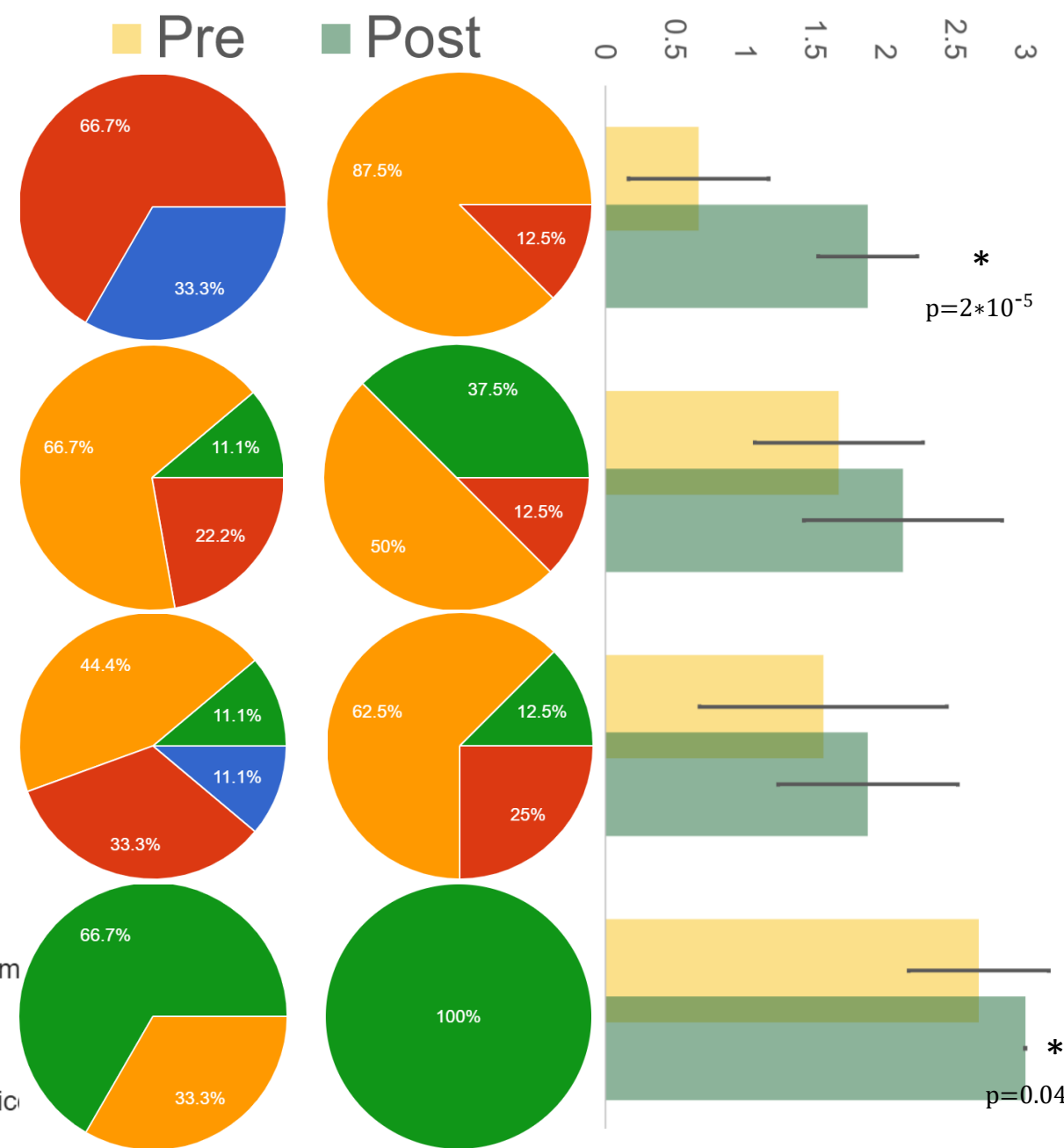


Fig 4. Responses to pre and post training survey to assess practitioner perception of confidence, utility of POCUS in clinic, utility of quick reference guides and patient perception of a POCUS exam; all ratings are out of 3. * indicates statistical significance

Further evaluation and intervention

- Temporal tracking of ultrasound use in NCHC clinics and comparing to prior data would indicate whether practitioners are implementing their training. This could be implemented similarly to the methodology described by Lo et al.¹
- Repeat fixed interval assessment of practitioner confidence, perceived ultrasound utility, quick guide utility and patient perception would indicate the longevity of the effect of intervention.
- Additional trainings, for both POCUS naive practitioners as well as brush up trainings to remind and advance existing skills, could also be implemented to reinforce the utilization of POCUS in the clinic.



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