

The economic implications of using a Pocket-Sized Ultrasound Device in routine cardiology practice



Executive summary

The use of pocket-sized ultrasound in cardiology clinics has demonstrated clinical and economic value by contributing to prompt clinical decisions, reducing the number of unnecessary diagnostic tests, reducing patient wait times and follow-up consultations, and increasing the productivity and workflow of physicians as well as echocardiography labs leading to overall cost savings.

Clinical use and challenges of standard echocardiography

Increasing evidence from cardiology clinics has demonstrated the challenges cardiologists face in making accurate patient diagnoses based on medical history, physical examination, and laboratory tests alone, which may result in missed or inaccurate diagnoses of unexpected cardiac abnormalities.⁴ These challenges can also lead to delayed diagnosis, potentially avoidable complications, and costly economic consequences that ultimately could have been avoided.

Standard Echocardiography (SE) is a well-established diagnostic imaging tool, and is used whenever a physical examination is inconclusive or for further evaluation of a known disease's severity.⁴ While Standard Echocardiography helps enable more accurate diagnosis, such testing requires highly skilled personnel, and may not be performed until days after the initial cardiology evaluation; thus resulting in further delays in diagnosis and increased economic costs due to the need for additional patient–doctor encounters to discuss results and possible revisions to treatment.

Pocket-Sized Ultrasound

Current ultrasound technologies can help address these hurdles in clinical practice. Over the past few years, Pocket-sized Ultrasound Devices (PSUDs) have proven to be reliable tools for physicians to rapidly assess the presence of cardiac and

non-cardiac abnormalities.⁴ GE Healthcare offers one such tool called Vscan.* This device is a pocket-sized visualization tool that uses ultrasound technology to provide real-time black and white anatomic and color-coded blood flow images. Vscan can help enhance the physical exam by allowing the physician to noninvasively inspect cardiac function and collect additional information to assist them in making informed, rapid, and potentially cost-effective diagnoses.

Economic impact

The impact to healthcare by cardiologists using Vscan was assessed in a study by Cardim et.al, where the additional clinical information provided through the use of Vscan during a physical exam was shown to increase the physician's diagnostic yield regarding cardiac abnormalities. This improvement in clinical assessment resulted in 16% fewer unnecessary echocardiography lab referrals and changes to patient management in 19% of patients evaluated with PSUD after a traditional physical examination.

Also the use of Vscan in addition to the physical exam, resulted in nearly 20% more discharges from the outpatient clinic.

These outcomes directly impacted patient treatment costs by reducing the number of diagnostic tests in both the unnecessary lab group and the early discharged group. In addition, the early discharged group realized additional cost savings because they no longer required further consult or treatment.

In addition to these direct cost savings, the potential indirect and downstream cost impacts of using pocket-sized ultrasound can also be identified. For example, the downstream impact of increasing discharge rates improves physician productivity because physicians are not spending time conducting or reading tests from patients who should have been discharged. Additional physician time savings are realized because follow-up visits may no longer need to be scheduled or conducted for patients who no longer need to be seen.² Cardim and his colleagues also hypothesized that these downstream time savings should offset the average 3-7 minute use of Vscan during the initial cardiology consultation. In essence, they concluded that the downstream time savings recognized through the clinical benefits and efficiencies of using PSUD offsets the initial time spent using Vscan during the physical exam workup.

In addition to physician time savings, evidence supports that implementing bedside echocardiograms into cardiology units improves workflow.^{1,3} Performing echocardiograms in the admission department of an inpatient clinic improved sonographer productivity by 34%[†] and echocardiography lab productivity by 41%.¹

These improvements in productivity coupled with reductions in porter and staff time, hospital costs, and scanning and reporting times, decreased the average cost of each echocardiography exam by approximately 29%. Similar findings from another study confirm that the use of hand-carried ultrasound reduced both the number of echocardiography exams and follow-up visits which led to overall cost savings of € 2,142 per 100 patients referred for SE in Italy.⁴

The use of Pocket-Sized Ultrasound Devices may also help improve the clinical experience for patients. The efficiencies of Vscan use reported above were shown to lead to reductions in waiting times and follow-up visits among patients who do not require further evaluation.^{2,3} These savings imply potential additional indirect cost savings for patients by reducing travel time and time missed from work due to unwarranted doctor appointments.

[†]p<0.001

Discussion

It is important to emphasize that Pocket-Sized Ultrasound Devices cannot replace SE examinations. PSUDs should be an adjunct to the standard physical examination. The primary value is in the information obtained through the use of PSUDs by physicians to help them improve diagnostic accuracy leading to efficiencies in triaging patients to the next step in their care and increasing the quality of referrals. The use of Pocket-Sized Ultrasound Devices in cardiology clinics has demonstrated clinical and economic value by reducing the number of unnecessary diagnostic tests, contributed to prompt clinical decisions with reduced patient wait times and follow-up consultations, and enabled productivity and workflow improvements of physicians as well as echocardiography labs leading to overall cost savings for the department.

As the use of PSUD expands into other clinical settings, future strategies should focus on routine implementation of pocket-sized devices into additional areas such as emergency room care for the diagnosis of highly variable symptoms. As clinical support and workflow efficiencies are demonstrated in these areas, GE hopes that the economic benefits will be identified, captured, and communicated.

References

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