



Topic Exploration Report

Topic explorations are designed to provide a high-level briefing on new topics submitted for consideration by Health Technology Wales. The main objectives of this report are to:

1. Inform discussions on new topics received by HTW.
2. Determine the quantity and type of evidence available on a topic.
3. Assess the topic against HTW selection criteria.

Topic:	Hand-held ultrasound devices (HUDs) in the community or primary care setting
Topic exploration report number:	TER014
Referrer:	Abbas Zaidi
Topic exploration undertaken by:	Cedar and Health Technology Wales

Aim of Search

Cedar and Health Technology Wales researchers searched for evidence on the use of hand-held ultrasound devices (HUDs) for cardiac assessment and diagnosis of heart failure in the community or primary care setting.

Summary of Findings

No relevant systematic reviews were identified on this topic. A small number of primary studies were identified which compared the use of hand-held ultrasound devices (HUDs) with standard echocardiography in different patient groups. These provided mixed outcomes with some finding that the HUD had lower diagnostic capabilities than conventional echocardiography, while other studies reported that the use of HUDs was feasible and missed no relevant findings. A full review and assessment of the literature is required to assess the quality and study population of the evidence available.

A position statement published by the European Association of Echocardiography is available which suggests that HUD devices should be used only as a screening tool to complement physical examination and triage patients who require standard echocardiography.

Conclusions

A range of evidence is available on the comparative accuracy of HUDs although this appears to be limited in terms of level and the quality of the available studies is unclear.

There appears to be a lack of studies providing cost effectiveness evidence, however some available studies looked at waiting time before receiving an echo examination, and the duration of examination as outcome measures, with these being shortened for those undergoing HUD.

Areas of Uncertainty

The Topic Referrer confirmed there are a number of different HUDs available from different manufacturers, but that Vscan™ (GE Healthcare) appears to be the market leader. There is not currently provision of HUDs in the community/primary care setting.

Feasibility of Technology Assessment

There is uncertainty around the clinical and cost-effectiveness evidence surrounding HUDs in a primary care or community setting. It is feasible that they may be used as an effective patient screening or triage tool, and potentially for diagnosis purposes. A full review of the evidence is required to fully assess the potential health benefits of HUDs in this setting.

HTW's Assessment Group concluded to progress this topic to Evidence Appraisal. This will be published as EAR009.

Brief literature search results

Resource	Results
UK guidelines and guidance	
SIGN	No results.
NICE	No results.
Guidelines International Network (GIN)	No results.
Secondary literature and economic evaluations	
Cochrane library	No results.
Medline	No results.
Primary studies	
Medline	<ol style="list-style-type: none"> Olesen LL, Andersen A, Thaulow S. Hand-held echocardiography is useful for diagnosis of left systolic dysfunction in an elderly population. <i>Dan Med J.</i> 2015Jul;62(7). Panoulas VF, Daigeler AL, Malaweera AS, Lota AS, Baskaran D, Rahman S, Nihoyannopoulos P. Pocket-size hand-held cardiac ultrasound as an adjunct to clinical examination in the hands of medical students and junior doctors. <i>Eur Heart J Cardiovasc Imaging.</i> 2013 Apr;14(4):323-30. Giannotti G, Mondillo S, Galderisi M, Barbati R, Zacà V, Ballo P, Agricola E, Guerrini F. Hand-held echocardiography: added value in clinical cardiological assessment. <i>Cardiovasc Ultrasound.</i> 2005 Mar 24;3:7. DeCara JM, Lang RM, Koch R, Bala R, Penzotti J, Spencer KT. The use of small personal ultrasound devices by internists without formal training in echocardiography. <i>Eur J Echocardiogr.</i> 2003 Jun;4(2):141-7. Vourvouri EC, Poldermans D, Schinkel AF, Koroleva LY, Sozzi FB, Parharidis GE, Bax JJ, Roelandt JR. Left ventricular hypertrophy screening using a hand-held ultrasound device. <i>Eur Heart J.</i> 2002 Oct;23(19):1516-21. Melamed R, Sprenkle MD, Ulstad VK, Herzog CA, Leatherman JW. Assessment of left ventricular function by intensivists using hand-held echocardiography. <i>Chest.</i> 2009 Jun;135(6):1416-1420. Quiles J, García-Fernández MA, Almeida PB, Pérez-David E, Bermejo J, Moreno M, Avanzas P. Portable spectral Doppler echocardiographic device: overcoming limitations. <i>Heart.</i> 2003 Sep;89(9):1014-8. Coletta C, De Marchis E, Lenoli M, Rosato S, Renzi M, Sestili A, Romano P, Infusino T, Ricci R, Ceci V. Reliability of cardiac dimensions and valvular regurgitation assessment by sonographers using hand-carried ultrasound devices. <i>Eur J Echocardiogr.</i> 2006 Aug;7(4):275-83. Epub 2005 Jul 6. Vignon P, Chastagner C, François B, Martailié JF, Normand S, Bonnivard M, Gastinne H. Diagnostic ability of hand-held echocardiography in ventilated critically ill patients. <i>Crit Care.</i> 2003 Oct;7(5):R84-91. Scholten C, Rosenhek R, Binder T, Zehetgruber M, Maurer G, Baumgartner H. Hand-held miniaturized cardiac ultrasound instruments for rapid and effective bedside diagnosis and patient screening. <i>J Eval Clin Pract.</i> 2005 Feb;11(1):67-72. Vignon P, Frank MB, Lesage J, Mücke F, François B, Normand S, Bonnivard M, Clavel M, Gastinne H.

	<p>Hand-held echocardiography with Doppler capability for the assessment of critically-ill patients: is it reliable? Intensive Care Med. 2004 Apr;30(4):718-23.</p> <p>12. Weston P, Alexander JH, Patel MR, Maynard C, Crawford L, Wagner GS. Hand-held echocardiographic examination of patients with symptoms of acute coronary syndromes in the emergency department: the 30-day outcome associated with normal left ventricular wall motion. Am Heart J. 2004 Dec;148(6):1096-101.</p> <p>13. Sicari R, Galderisi M, Voigt JU, Habib G, Zamorano JL, Lancellotti P, Badano LP. The use of pocket-size imaging devices: a position statement of the European Association of Echocardiography. Eur J Echocardiogr. 2011 Feb;12(2):85-7.</p>
Cochrane library	<p>Hand-held echocardiography in the setting of pre-operative cardiac evaluation of patients undergoing non-cardiac surgery: results from a randomized pilot study</p> <p>Cavallari I, Mega S, Goffredo C, Patti G, Chello M and DiSciascio G. International journal of cardiovascular imaging, 2015, 31(5), 995</p>
Other	
Ongoing studies	No relevant studies identified.
Scopus	Prinz, C., Voigt, J.-U. Diagnostic accuracy of a hand-held ultrasound scanner in routine patients referred for echocardiography. (2011) Journal of the American Society of Echocardiography, 24 (2), pp. 111- 116.

Date of search:	26 April 2018
Concepts used:	Hand held echocardiograph, portable echocardiograph