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### Portable Ultrasound for Heart Failure

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#### Ultrasound Exam Changed Treatment in 30 of 119 Cases

Cardiac nurses in Norway trained in the use of handheld pocket ultrasound devices have improved diuretic dosing in patients by calculating fluid retention both in the pleural cavities (between the two membranes surrounding the lungs) and the inferior vena cava of heart failure patients.

By detecting harmful fluid retention in patients early, this could prevent their heart failure from getting worse, according to a study conducted by researchers at Levanger Hospital and the Norwegian University of Science and Technology (NTNU).

Guri Holmen Gundersen, an academic and research nurse and the first author of the study, said that a relatively high proportion of patients who came in for monitoring at the heart failure clinic had pleural effusion, also known as “water in the lungs.”

The study also found that the ultrasound examination significantly predicted diuretic dosing compared to other routine examinations and blood tests.

Based on the surveys of 62 patients who visited the heart failure outpatient clinic at Levanger Hospital on a total of 119 occasions, two specialised nurses examined them each time, one using a pocket ultrasound and one not using the device at all.

When each nurse and cardiologist team discussed adjustments to the patient's treatment plan following the exam, in the case of 89 of the paired consultations, the two teams (with and without ultrasound) agreed regarding diuretic dosing and changed the treatment in 30 of 119 cases.

Gundersen said that using a pocket ultrasound device enabled early detection of signs of dehydration or worsening heart failure, before the patient experiences symptoms of breathlessness, weight gain and oedema.

The study found pleural effusion in 42 percent of the patients, suggesting this was common in heart failure.

Researchers see promise in these study findings, but stress that it remains to be seen whether the effects of adjusting the medication dosage will have clinical significance for patient progress over the longer term.

Using the handheld ultrasounds to measure the volume of fluid retention was the single factor with the greatest impact on the dosage amounts prescribed for patients and on any dosage changes in follow-up visits.

More aggressive treatment of new fluid retention occurrences can restore fluid balance and potentially improve the prognosis of patients.

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