

# "Measure What Matters: A Comparison Of Continuous Ankle Circumference Monitoring And Body Weight In The Management Of Worsening Heart Failure"

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## FLUID MANAGEMENT CASE STUDY

- The management and treatment of acute heart failure remains a difficult challenge hampered by the absence of timely and reliable methods for monitoring fluid retention in the patient setting. Peripheral edema associated with fluid overload is present in approximately 70% of patients hospitalized for acute decompensated heart failure. Ankle circumference has shown to be an accurate and reliable measure of peripheral edema.
- A case study is presented demonstrating the utility of continuous ankle circumference monitoring as a quantified measure of peripheral edema.

## HISTORY

- The patient is an 88-year-old woman with a history of advanced heart failure. The patient presented with substantial fluid loading and was diagnosed with a hypertrophic obstructive cardiomyopathy (HOCM) in Q1 2019 which was successfully resolved with alcohol septal ablation surgery.
- The patient has significant ascites, and her true dry weight is not known. Following an extended period of weight stability at 177 lbs., the patient experienced a weight gain of 6 lbs. over 6 weeks (Jan-Mar) which required medical intervention.

## PROCEDURE

- The patient continuously wears an ankle that collects circumference reading once every 10 minutes. She also weighs herself each morning wearing only her undergarments after voiding her bladder and takes her blood pressure, SPO2, and pulse.
- The circumference data is processed using an Exponential Weighted Moving Average (EWMA).
- A comparison of weight data and ankle circumference was presented to the patient's interventional cardiologist in Mar, Apr, and Aug of 2022 of the observation period. Based on the comparative data, the healthcare provider modified the dosage and types of medications used in treatment.

## RESULTS

- Peripheral edema was present and measurable for a patient who predominantly retained fluid in her abdomen, with circumference variations on the order of 4 mm and observed weight gain of 5+ pounds.
- Continuous ankle circumference measurements were determined to be as or more sensitive than daily weight.
- Selection and titration of patient-specific medication was accelerated based on the increased reliability of edema monitoring in the patient setting.

Continuous monitoring of leg edema yields reliable assessment of fluid retention and faster analysis of treatment efficacy.



## INTEGRATED MEASUREMENTS



## SUMMARY / CONCLUSION

- Continuous monitoring of ankle circumference is a useful measurement to evaluate the presence of fluid and response to treatment.
- A comfortable wearable device that is simple to use provides the feedback necessary to monitor the patient's condition and adjust medication as needed

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