

**[EQUIPMENT REVIEW]****AR Terial Stiffness Evaluation Using Non-Invasive Screening (ARTSENS)- A non-invasive vascular imaging device with emerging applications in Physiotherapy****Gaikwad Pranali<sup>1</sup>, Diwate Abhijit<sup>2</sup>**Assistant Professor<sup>1</sup>, Prof. & HOD<sup>2</sup>, Dept. of Cardiovascular and Respiratory Physiotherapy, DVVPF's College of Physiotherapy, Ahilyanagar**Introduction**

The major cause of fatal events accounting for 31% of deaths world wide is Cardiovascular diseases (CVD).<sup>[1]</sup> According to World Health Organization (WHO), around 80% of deaths due to CVD occurs in low and middle income countries due to less access to effective and equitable health care services responding to their need which also includes early detection service. Easy and approachable diagnostic and screening tool in such scenarios is a very important. There are numerous studies which correlate cardiovascular diseases with carotid artery stiffness.<sup>[2]</sup> Also, Vascular health, particularly arterial stiffness is a growing concern in conditions such as diabetes, hypertension, stroke and post- COVID rehabilitation.<sup>[3]</sup>

For the same, ARTSENS (ARterial Stiffness Evaluation using Non-invasive Screening), developed by the Healthcare Technology Innovation Centre (HTIC), IIT Madras, offers a easy to use handheld and portable solution to screen the vascular health of the individual. This device will enhance the physiotherapy practice by integrating diagnostic technologies to enhance patient assessment and therapeutic outcomes.<sup>[3]</sup>

**Equipment Overview**

ARTSENS is a tablet integrated device using ultrasound technology to assess both local and arterial stiffness along with central blood pressure, all in a single test making it extremely useful in estimating vascular health status as an early marker in multiple conditions. The device comprises pressure cuffs for the upper arm and thighs and a probe applied to the surface of the neck to detect the carotid artery. It measures the carotid artery stiffness,

aortic pulse wave velocity and central blood pressure, all three being important markers of cardiovascular health.<sup>[4]</sup>

**Clinical Relevance in Physiotherapy**

The interventions in physiotherapy include aerobic training, resistance exercises, and neuromuscular stimulation which impact vascular function.

**The ARTSENS allows objective measurement of these effects:**

- To monitor the improvement in the arterial stiffness after structured exercise programs.<sup>[3]</sup>
- Evaluating vascular age in aging populations or cardiac rehab patients.
- Detecting asymptomatic vascular dysfunction in diabetic or obese individuals undergoing physiotherapy.<sup>[5]</sup>

The main usability pf the device is that it's protabiliy makes it useful for home based rehabilitation programs and rural outreach camps.

**Conclusion**

ARTSENS is a novel addition to the physiotherapy toolkit, particularly for vascular and geriatric rehabilitation. It's non invasive, realtime feedback on vascular health offers scope for integrating vascular diagnostics into everyday physiotherapy practice.

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