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Optimizing Patent Foramen Ovale Detection Through a Multimodal Approach

Abstract: The Patent Foramen Ovale (PFO) is a prevalent heart defect occurring in nearly a quarter of the human population. It is a small opening in the heart that exists during fetal development but closes shortly after birth. However, for some, this opening persists through adulthood. This condition can present as asymptomatic in some patients, but for others it can have serious implications, including stroke events and embolisms. Due to these potential serious consequences, it is essential for patients to have access to accurate PFO detection and diagnosis to prevent future events and complications. Standard detection methods are primarily imaging techniques such as transesophageal echocardiography (TEE), transthoracic echocardiography (TTE), and transcranial doppler (TCD). They are commonly used to detect PFOs but each present their limitations in sensitivity, specificity, and accessibility when used alone. This literature review critically evaluates recent studies investigating alternative methods and refining existing methods to improve the testing, diagnosis, and availability to patients. Combining existing imaging methods, refining contrast agents and maneuvers, and advancements in technology such as MRI and transmitral doppler ultrasound have all shown promise in providing more accurate and effective diagnoses. With these refinements, false positive and negative results are reduced, diagnoses are more reliable, and approaches can be patient oriented. By utilizing a multimodal approach, healthcare providers are provided with the tools to make improved informed decisions regarding their patients' health and prevent future complications.