Editorial

Should doctors still examine patients?

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ABSTRACT

The physical examination skills of young physicians in training need careful examination as advancing technology seems to have replaced those skills compared to prior generations of physicians. A question to ponder is how should medical education address the convincing evidence that physician trainees of today are less astute at the physical examination than those that came before them? This inquiry must address whether the decline in physical examination skills hinders accurate, cost effective, and timely diagnoses. Additionally, it must consider whether the absence of a comprehensive physical examination impairs the patient–physician relationship.

This type of inquiry leads to the conclusion that the physical examination and technology must be merged as the clinical situation dictates to provide accurate, cost effective and timely diagnoses. The carefully performed physical examination in conjunction with a detailed history should dictate the use of our ever-advancing technology advances in medicine.

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“Learn to see, learn to hear, learn to feel, learn to smell and know by practice alone you can become an expert”
Sir William Osler

1. Introduction

Physicians once relied on seeing, hearing and touching a patient to make a diagnosis. Technology has enhanced and sometimes replaced those skills, but many doctors lament their decline. A question to ponder is how should medical education address the convincing evidence that physician trainees of today are less astute at the physical examination than those that came before them? [1].

2. Technology

Technology is constantly redefining the practice of medicine. New devices and laboratory tests from sophisticated testing in tertiary care centers to advanced technology available in outpatient settings have changed how we practice medicine. The question we posed is whether the advanced technology of echocardiography replaces the stethoscope in disease diagnosis.

3. Diagnostic acumen

Physicians still diagnose as well as generations of physicians did before them. Few physicians, however, would trade a certain echocardiographic diagnosis of a mitral diastolic murmur, complete with color flow, Doppler velocities, leaflet visualization and ejection fraction, for a probable diagnosis by physical examination. Clearly advanced technology aids diagnosis, but determining what must be confirmed or ruled out depends on a comprehensive history and physical examination.

4. Ethical considerations

Is it ethical for advanced technology to be the sole actor in disease diagnosis? An emphatic “yes” may be challenged by an environment of soaring health care costs, unaffordability, and the consideration that most information gleaned from technology can be ascertained from an astute physical examination. The time spent listening, examining, and physically touching the patient builds a robust patient–doctor relationship. Physical diagnosis must be fused with technology when necessary to diagnose and treat patients.

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5. Legal considerations

Current billing regulations by Medicare and Medicaid mandate that physicians perform key components of the physical examination [2]. Physicians who want to be paid must confirm that they performed these components. Failure to perform the physical examination is unethical and unlawful. Furthermore, studies have shown that the best approach to avoiding legal proceedings is to have a strong, trusting, and caring relationship with one’s patients [3].

6. Is echocardiography making the stethoscope a relic?

Echocardiography should be an extension of a comprehensive history and physical examination, including auscultation, and should never be a replacement for a comprehensive history and physical examination including auscultation. Echocardiography should be a confirmatory test that increases the understanding of the degree of valvular abnormality detected on physical examination.

The cardiac sounds appreciated with the stethoscope can only be adequately evaluated if the clinician knows the patient’s symptoms and all aspects of the cardiovascular examination. A comprehensive assessment of the blood pressure, arterial pulses, venous system, heart sounds, and lung sounds permits the clinician to determine the patient’s cardiovascular status.

7. Cardiovascular performance

Cardiovascular performance is dependent upon the patient’s autonomic tone, preload, afterload, and left and right ventricular contractility. Knowledge of these variables allows the clinician to understand where the patient lies on the Frank Starling curve and the Force Tension curve.

A careful, critically performed physical examination allows a detailed understanding of the individual patient’s autonomic tone, preload, afterload, and cardiac contractility.

- The patient’s jugular venous pressure is a surrogate measure of preload and is dependent upon total blood volume, venous tone, supine/standing position, atrial function, skeletal muscle contraction, and pericardial pressure.
- The patient’s systolic blood pressure is a surrogate measure of afterload. Afterload represents the work load the contracting myocardium faces on each cardiac cycle. The afterload is dependent upon the left ventricular geometry, left ventricular (LV) pressure, and systemic vascular resistance.
- The carotid upstroke is a surrogate measure of the LV performance (contractility). It is a rough measure of the LV ejection fraction.

The LV contractility is dependent upon the preload and afterload. Contractility is influenced by many parameters including circulating catecholamines, the autonomic nervous system function, extrinsic abnormalities, metabolic factors, and degree of functioning myocardium [4,5].

A synthesis of the information ascertained from the clinical history and physical examination allows the clinician to determine the patient’s cardiovascular status and performance. That understanding in conjunction with the auscultator’s finding with the stethoscope allows for a determination of whether the echocardiogram is needed as an extension of the stethoscope.

8. The stethoscope and auscultation

The invention of the stethoscope in 1816, by French physician René Théophile Hyacinthe Laennec, was the most revolutionary step in the clinical auscultation of humans [6]. With this invention, many new heart sounds could be heard. Physicians and health care providers often feel obligated to evaluate these extra sounds for organic heart disease. In most cases, the distinction between an innocent/benign and pathological/malignant murmur can be made at bedside.

Murmurs are characterized as systolic, diastolic, or continuous, based on the portion of the cardiac cycle the murmur occupies in relation to the first (S1) and second (S2) heart sounds. Differentiating S1 and S2 is accomplished by palpating the carotid artery during auscultation. Palpation of the carotid upstroke occurs simultaneously with S1. Systolic murmurs occur between the S1 and S2 heart sounds, while diastolic sounds occur after S2 and before S1 [4,7]. Diastolic murmurs often require further assessment with an echocardiogram. The same is true for continuous murmurs, which are heard throughout the cardiac cycle, unless the auscultator is confident the continuous murmur is due to venous hum or mammary souffle of pregnancy, which are benign conditions [8].

One should be able to determine the etiology of the murmur based upon comprehensive physical examination. Clues are the area on the chest wall where a murmur is best heard, the timing of the murmur in the cardiac cycle, the location to which it radiates, and changes in the characteristics of the murmur in response to maneuvers that alter cardiac hemodynamics by alteration in preload and afterload (dynamic auscultation) [4,8].

Benign murmurs are typically related to turbulent blood flow during systole. These turbulent sounds may relate to high flow states secondary to medical conditions such as anemia and hyperthyroidism. These flow murmurs are typically related to aortic and pulmonary flow. The velocity of blood flow in healthy individuals is highest during early systole so these benign murmurs are best heard at this stage, but not beyond mid-systole. Bedside maneuver such as Valsalva decreases preload with reduced velocity of blood flow, resulting in decreased murmur intensity. These short, crescendo–decrescendo, grade 1–2 sounds with no associated diastolic component. These flow murmurs are generally common in young individuals but can be heard in all age groups [8]. Accordingly, medical education must not de-emphasize the importance of the physical examination in disease diagnosis.

9. Echocardiography

Pathologic systolic murmurs include aortic (AS) and pulmonic stenosis (PS), mitral (MR) and tricuspid (TR) regurgitation, and the murmurs of hypertrophic obstructive cardiomyopathy (HOCM), mitral valve prolapse (MVP), and ventricular septal defect (VSD). Their verification and quantitation often requires the use of echocardiography. Dynamic auscultation, with alteration in loading conditions, is used to differentiate these various murmurs. Inspiration, which increases venous return, increases the intensity of right-sided murmurs. Standing and Valsalva decrease preload and decrease the intensity of these murmurs; the exceptions being HOCM and MVP which will have increased intensity [8].

The intensity and timing of a murmur may determine whether it requires further evaluation. Murmur intensity is gauged with a system originally proposed by Samuel Levine in 1934, grading the murmur on a 1–6 scale based on its noise intensity. A grade 1 murmur is very faint, and can only be heard with special effort. Grade 4–6 murmurs are loud, are associated with a palpable thrill, and can be distinguished based upon whether the stethoscope needs to be on the chest to hear the murmur. A grade 4 murmur is loud, but requires the stethoscope to be on the chest for auscultation. A grade 5 murmur can be heard with the stethoscope partially off the chest wall, and a grade 6 with the stethoscope completely removed from contact with the chest wall [9]. Most murmurs grades 3–6 require further evaluation with an echocardiogram [8].

Clinical evaluation of murmurs includes obtaining a comprehensive clinical history to determine whether patients have symptoms. Any cardiac symptoms associated with grade 3–6 systolic murmurs and diastolic murmurs warrant an echocardiogram. A history of cardiovascular
issues, such as prior myocardial infarction or symptoms of exercise-induced rhythm abnormalities, may indicate a need for an echocardiogram. Examples of significant exercised-induced findings include shortness of breath, syncope, and angina [8]. Additionally, on rare occasions the echocardiogram may be necessary because the patient’s body habitus precludes an accurate physical examination.

10. Conclusion

An echocardiogram is an extension of a comprehensive history and physical examination. It is not needed for benign flow murmurs, but is indicated for cardiac murmur associated with cardiac symptoms, diastolic murmurs, and systolic murmurs with grade ≥ 3 intensity, and systolic murmurs associated with other abnormal physical exam findings [8]. Ultimately, the echocardiogram should confirm the physical examination findings and determine the hemodynamic significance of the abnormal turbulent blood flow. The echocardiogram should only serve as an extension of a comprehensive history and physical examination and not to eliminate the stethoscope. Physical examination and technology must be merged as the clinical situation dictates.

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

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