

Narrative Review

History Taking, Assessment, and Diagnosis of Patients with Cardiovascular Diseases- Re-defining the Clinical Skills.

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Abstract

Cardiovascular diseases are among the top leading causes of death worldwide. Most of the time, the patients present with no symptoms, or some symptoms resemble other diseases. This makes most cases challenging for physicians and health care workers to diagnose. Besides this, most of the time, not diagnosing the patient on time or delay in the start of intervention is the main cause of death in cardiovascular diseases. Proper history and examination can play a crucial role in this part. History taken in properly can help in reaching the diagnosis. Apart from this, it also helps in the start of empirical therapy. This is where most clinicians are lacking. Waiting for the labs is still time-wasting in other health issues, but it can be killing in cardiac patients. Thus the cardiologist needs to start with a good history and then go on with examinations. Then confirm their findings with the proper labs. This narrows down the diagnosis and saves a lot of time. History taking is the most important clinical step in the management of patients. But most of the time, it is underrated, and most clinicians rely on labs rather than these basic skills. This article thus reviews the importance of history taking in diagnosing patients with cardiovascular diseases. Besides this, it also addresses how a good history should be taken to narrow down the diagnosis and reach the proper diagnosis within time to save a patient's life.

Keywords

History Taking, Diagnosis, Examination, Cardiovascular, Clinical Skills.



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Introduction

Concerns and the quest to know about cardiovascular diseases (CVDs), which have been the prominent cause of death in industrialized nations, and the spread of the epidemic to emerging countries have been seen from different perspectives by different researchers. The pathophysiology common to all is the atheromatous vascular disease, which leads to coronary artery disease (CAD), peripheral vascular disease, cerebrovascular disease, heart failure, and cardiac arrhythmias. Long-term studies have identified several major risk factors for these disorders, including lack of physical exercise, regular tobacco consumption, metabolic disorders like diabetes mellitus, high blood pressure, central abdominal obesity, psychosocial factors, irregular timings of unhealthy meals, excessive alcohol consumption, and high levels of low-density lipoprotein (LDL) or even hypercholesterolemia¹. A patient's overall health, venous distention or pulsation, the quality and rate of their arterial pulses, the look of their mucous membranes, and the auscultation of their heart rate and rhythm are all used to evaluate their cardiovascular system².

Unmodifiable risk factors are not changeable and include heredity or genetic makeup, diabetes insipidus, and age. The deterioration of the body with age becomes a predisposing factor for most chronic illnesses. The body is subjected to various stresses as we age, including free radicals produced by the body, which promote the degeneration of organs and cell functioning. According to epidemiological studies, the risk of CVD is increased in people with a family history. Additionally, a person with type 1 (juvenile) diabetes experiences impairments in several bodily processes, most notably tolerance to glucose and metabolism of fats. The person is more prone to acquire CVDs due to such metabolic disorders. The increased prevalence of cardiovascular disease and stroke has also been attributed to risk factors such as severe migraines, abrupt anxiety, and hormonal contraceptive usage³⁻⁵.

Compared to inactivity, increased physical activity lowers the chance of cardiovascular disease.

Abrupt, vigorous-intensity physical exercise increases the risk of cardiovascular events in inactive people. However, there may be a threshold at which activity levels transmit higher risk. These dangers might be reduced by introducing the new activity and having a doctor check out before starting an exercise program. Therefore, a personal history of physical fitness, duration, and intensity of exercise is as important as a history of a stationary lifestyle. It may also be influenced by the person's occupation type, i.e., desk-bound jobs or manually stressful jobs⁶.

Diabetes mellitus has many complications in the heart. Increased oxidative stress leads to impairment in Protein kinase C signaling, and this results in a rise in the level of glycation end products. This causes inflammation and constriction of blood vessels, thrombus formation, and vascular dysfunction. These conditions are brought on by increased blood glucose levels, resistance to insulin, and an excess of fatty acids⁷. An increase in cholesterol causes atherosclerosis of blood vessels, and hypertension causes the tearing of blood vessels due to excessive force of circulation and heart pumping triggered by different external and internal factors. Therefore, detailed history in consideration of all these will help reach the proper diagnosis and treatment of the patient^{8,9}.

A Clinician's Approach to History Taking and Management

Rapport Building with the Patients: A Perspective

The main aim of the medical professional is to make the patient comfortable by creating the best environment possible to build trust between them. Communication is the new age key to success and a significant part of the doctor-patient relationship. A good history comes with excellent communicative skills, established with empathy, sympathy, and understanding the clinician builds with the patient. The most effective way to extract complete and relevant information regarding the problems and the history is by communication in the vernacular language. It makes the patient feel the interest of the doctor, an association of being connected by the mother tongue, which makes the

patient talk about his/her problems transparently. Some researchers also proved effective when asking about the type of profession^{10,11}.

ABCDE Approach to Emergency Management

ABCDE approach, without the usage of any equipment, for immediate yet effective patient management, is shown in Figure 1. This approach to Airway, Breathing, Circulation, Disability and

Exposure is crucial, along with the efficient assessment of the patient's heart and history, this provision of a life-saving intervention, and the division of challenging clinical problems into simpler parts. It creates a shared situational awareness among all healthcare professionals and allows time to determine a definitive diagnosis and course of action^{12,13}.

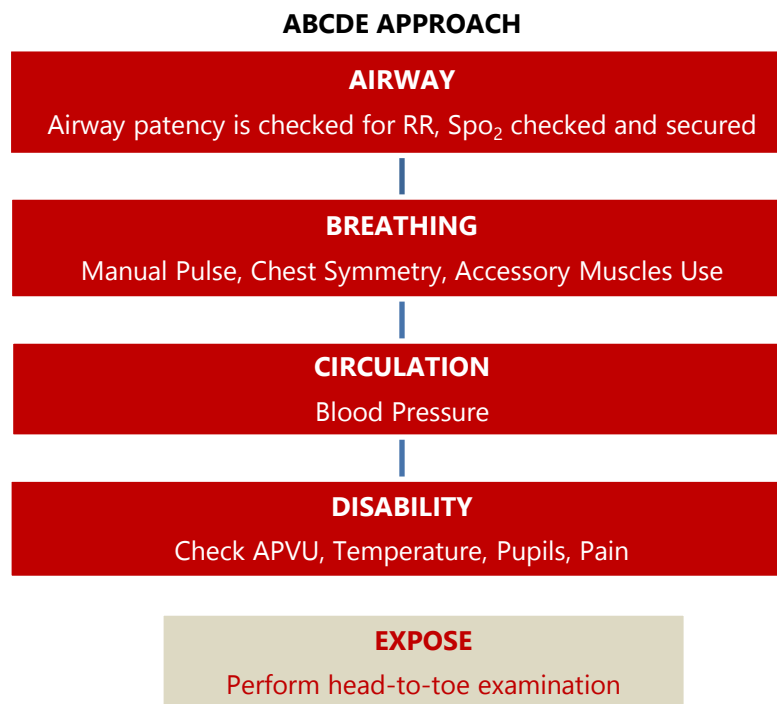


Figure 1: ABCDE approach for stabilizing the patient in an emergency.

The approach to recalling the eight elements of medical problems by asking the patient to obtain a history of the presenting illness is shown in Table 1. This approach may provide a structured way of asking for important information about the clinical condition shown by the patient.

The widely used chronological order of patient-doctor interactions while taking a history is shown in Table 2. This table covers all the aspects of the history and personal information of the patient-relevant for diagnosis by the doctor.

Table 1: Mnemonics are widely followed in asking patients about their symptoms¹⁴.

"PQRSTU" MNEMONIC	"OLD CART" MNEMONIC
P- Palliative means when the symptoms get better or worse.	O- Onset of the symptoms gradually or suddenly.
Q- Quantity/quality of the type of symptoms that the patient feels and if it affects the patient's day-to-day activities.	L- Location on the body.
R- Radiating/region means which region of the body is affected and whether it radiates to other body parts.	D- Duration of the persistence of the symptoms.
S- Severity on a scale of 1 to 10, with ten being the most severe.	C- Characteristics of severity, quantity, and quality of the symptoms.
T- Timing or onset of the problems.	A- Aggravating factors are due to enhanced symptoms and associated factors.
U- Understanding what the patient understands by the problem.	R- Relieving factors are the things that cause the relaxation of symptoms.
	T- Treatment has been taken by the patient previously, or any remedy tried.

Table 2: A sequential and comprehensive format of history taking in cardiovascular diseases¹⁴.

Format of taking a detailed history of a patient
Demographic information and reference number: Name, age, gender, address, occupation, socioeconomic status, religion, and caste (to rule out specific diseases), unique hospital reference no. for identification, and contact details. Exceptions: In mentally compromised, unconscious, sometimes children, elders, and speech deficient patients, the nearest relative is asked for the patient's history.
Chief complaints: In cardiac tissues, a patient usually complains of chest pain, breathlessness, light-headedness/dizziness, cold sweat, heart palpitations, swollen feet, cyanosis, overall body weakness, and fatigue.
History of presenting illness: This is a detailed explanation of the chief complaints to find the pattern of the presentations and to know the precise cause of these symptoms.
Past History: This includes past hospital admissions and major or minor surgeries undergone by the patient. Vaccination and physical fitness regimes may also be a part of this. History of infection with COVID-19 is also included in the sight of the pandemic.
Family history: History of heart diseases, any other congenital anomalies, or the presence of genetically transmitted diseases for making a pedigree chart. Also, the life expectancy of relatives and family members gives an idea about the patient's livelihood.
Personal history: Educational, employment status, bowel habits, dietary habits, and any interests that may be medically relevant.
Social history: Addictions like alcohol consumption, smoking, mental status of happiness, or depression due to the influence of socializing factors.

General examination: Assess temperature, pulse, respiratory rate, blood pressure (PICCLEE), pallor, icterus, cyanosis, clubbing, lymphadenopathy, and edema.

Differential diagnosis and management: Some heart diseases can be concluded with this detailed history taking which has been discussed in the following sections.

The relevance of the conversation-making skills of the clinician for good rapport building with the patient is shown in Table 3. It is also vital for ethical decisions that the doctor needs to take after the diagnosis or while diagnosing the condition regarding the course of the treatment that needs to be taken while easing the patient throughout the process.

Table 3: Evaluating questions and statements in a doctor-patient relationship^{15,16}.

Part of Consultation	Style- DIRECT	Style- SHARING
Judgment	"This is a serious issue" or "I do not think this is serious."	"What is your opinion about why this happened?" "Why do you think this has happened " now?"
Diagnosis	"You are suffering from."	"What do you think is wrong?"
Treatment	"You must take this medicine. "	"What have you tried to do to help so far?" "What were you hoping that I would be able to do?" "Would you like a prescription?" "I think this medicine would be helpful; would you be willing to take it?"
Prognosis	"You should be better in ... days."	"What do these symptoms or health issues signify to you?"
Follow Up	"Come and meet me in... days" "I do not need to see you again for this. "	Are there any other problems?" "When would you like to come and see me again?"

History taking and differential diagnosis in a cardiac patient: an outlook

Acute coronary syndrome is identified in 10% of individuals with acute chest discomfort (ACS). Many hospitals stay among low-risk patients might be avoided by using clinical skills to predict the probability of ACS in these individuals. In contrast, high-risk patients could be treated immediately¹⁷⁻¹⁹.

Dyspnoea is the awareness of shortness of breath, possibly due to several respiratory and cardiac reasons. Orthopnoea and paroxysmal nocturnal dyspnoea are indications of left ventricular failure, which occurs as breathlessness during the night while lying flat on the back^{20,21}.

Another important symptom is palpitations, which could be rapid or stationary. Dyspnoea and palpitations are associated with anxiety, physical exertion, and emotions^{22,23}.

Understanding the myocardial compromise brought on by myocardial necrosis, myocardial stunning, and mechanical consequences such as heart muscle bursting, ventricular septal defect, and ventricular free wall fissures are among the factors that cause heart failure development at the time of sudden myocardial infarction and admission to the hospital^{24,25}.

One percent of newborns are born with congenital heart disease (CHD), a birth abnormality. Although

environmental exposures can induce CHD to teratogenic effects, the finding of a high-frequency risk, genetic variants of the illness, and even the well-described link of CHD with chromosomal aberrations strongly imply a genomic substrate for the condition. Some of these include patent ductus arteriosus, coarctation of the aorta, tetralogy of Fallot, septal defects, etc^{26,27}.

Pregnant females who have indications of heart disease from routine hospital visits are also susceptible to suffering, most commonly from cardiomyopathies and heart failures. The hormonal

imbalances lead to overcompensation by the circulatory system with the same amount of blood in the body. This overloads the functioning of the heart leading to its failure or hypertrophy as a defense mechanism^{28,29}.

Doctors should recommend psychiatric analysis and counseling for patients with terminal or severe heart conditions, especially older people, who need medical assistance to cope with grave situations like severe heart disease³⁰. Different ECG abnormalities and the diagnosis of heart diseases are shown in Table 4.

Table 4: Criteria for diagnoses of different cardiovascular conditions on reading the ECG³¹.

Diagnosis	Criteria
Rhythm Disturbances	
Sinus tachycardia	Sinus rhythm Heart rate >100 bpm
Sinus bradycardia	Sinus rhythm heart rate <50 bpm
Atrial extra systole: unifocal/multifocal	Ectopic complexes in atria give rise to premature complexes in atria. These are unifocal or can be multifocal. On ECG, p waves are abnormal during QRS morphology unaffected.
Ventricular extra systole: unifocal	Ventricular extrasystole arises in the same manner as atrial. They have abnormal QRS complexes on ECG. The QRS complexes are wide, and there are secondary ST T changes. These can be in various patterns, such as bigeminy (1:1) and trigeminy (2:1).
Ectopic atrial rhythm	Abnormal P waves Heart rate 50-100 bpm
Atrial fibrillation	No P waves. Irregularly irregular R-R interval.
AV blocks first degree.	PR interval >200 ms; a QRS complex after every P wave.
Incomplete right bundle branch block(IRBBB)	QRS duration <120 ms but > 110 ms. Secondary R' wave in the right precordial leads V1 or V2 (usually block (IRBBB) rsr', rsR, ' ISR').
Right bundle branch block(RBBB)	QRS >120 ms. Secondary R' wave in V1 or V2 Wide S wave in leads I, V5, and V6 (>40ms)
Left anterior ventricular block	Frontal plane QRS axis of -45 to -90. QRS duration < 120 ms.
Intraventricular conduction delay	QRS >110ms. LBBB or RBBB criteria not met.
Left atrial enlargement	lead II: wave >120ms in Lead V1: terminal negativity of P wave >0.04 mvs

Right atrial enlargement	Lead II: tall P wave amplitude >0.25 mV
Left ventricular hypertrophy(LVH)	ST segment depression with inverted T wave. V4 V6 shows asymmetric morphology. Voltage criteria to confirm LVH in patients above 40 is: S wave and R1 amplitude>3.5 mV in v5 or V6. The amplitude of the R wave in aVL >1.1mV. S wave amplitude in V3>2.8 mV
Right ventricular hypertrophy	V1: R:S ratio >1 R>0.5 mV or rsR' with Ri > 0.1 mV. Plus, the Right axis deviation, if present, confirms RVH.
Short PR interval	PR interval <120ms.
WPW syndrome	ST and T wave changes. PR interval < 120 ms. Wide QRS complex >120 ms. Delta wave present. (initial slurring of QRS)
Left axis deviation	-30° < QRS axis
Right axis deviation	+90° < QRS axis
Northwest axis	Axis between -90° & -180° or + 180° & + 270°
ST segment changes	
T wave abnormalities/Non-specific ST segment changes/ U wave abnormalities	Changes in T wave and U wave are highly suggestive of ischemia besides ST-segment elevation or depression. T waves inverted in more than 2 contiguous leads. U wave amplitude>25% and T wave amplitude in >2 leads. U wave -ve in >2 leads other than aVR and III.
Myocardial infarction(MI)	
Anterior MI	Pathological Q waves in lead V1, V2, V3, V4, V5, V6
Infero-lateral MI	Pathological Q waves on lead II, III, aVF, V5, V6, or I, aVL (pathological q wave > 40ms in duration and > 25% of the ensuing R wave in amplitude)
Miscellaneous	
Prolonged QT	QT > 430 ms (males) QT>450 ms (females)
Low voltage QRS complex	The amplitude of QRS < 5mm in limb leads < 10 mm in precordial leads

bpm- beats per minute; BBB- Bundle Branch Block; ms- milliseconds; PVC- Premature Ventricular Contractions; LBBB- Left Bundle Branch Block; ECG- Electrocardiogram; mm- millimeter

Cardiovascular sequel of COVID-19

Common symptoms and signs that a medical clinician should be keenly observant of in suspecting a cardiac condition are a tachycardia, palpitations, chest pain, dyspnoea on exertion, and intolerance to physical exercise. Studies, experiments, and case reports have led to a basic

understanding of the association between the virus and the cardiovascular system.

In the COVID-19 era, acute myocarditis can show a wide range of clinical severity and provides considerable diagnostic difficulty. Chest discomfort, breathlessness, irregular heart rhythm,

and acute left ventricular failure can all occur in COVID-19 patients³²⁻³⁴. The ECG irregularities due to inflammation of the myocardium and findings of PR and ST segment depressions and elevations, non-specific ST and T wave abnormalities, inversion of T wave, and troponin level peaks are difficult to diagnose in the background of COVID-19 raised markers and often lead to bad prognosis and results.

Acute myocardial infarction is associated closely with Covid-19 diagnosed patients due to rupture of atheromatous plaques in the blood vessels surrounding the heart leading to severe myocardial infarction. Hospital-acquired pneumonia due to bacterial and viral causes like Influenza has been recorded to affect the Covid-19 deceased who are hospitalized very commonly. Thrombophilia and extreme inflammatory conditions increase susceptibility to myocardial infarctions^{35,36}.

The most apparent sign of COVID-19 infection might be an acute cardiac failure. According to one study, fewer individuals who initially appear with COVID-19 may have acute heart failure than cardiomyopathy. With or without a history of hypertension or any cardiological dysfunction, this condition is seen to precipitate³⁷.

Covid 19 patients have confirmed experiencing a wide variety of dysrhythmias. Such individuals typically have sinus tachycardia, which has several underlying factors, such as feverishness, decreased perfusion, low oxygen delivery to the heart, and anxiety. According to one research, 44 percent of COVID-19 ICU patients and 17 percent of

hospitalized patients both had dysrhythmias. Viral infection can lead to dysrhythmias because of hypoxia, inflammatory stress, and aberrant metabolism. In the differential diagnosis, the physician should take damage to the myocardium and acute myocarditis into account if dysrhythmias are linked to increased blood troponin. Over seven percent of individuals with COVID-19 may also present with palpitations in such conditions³⁸⁻⁴⁰.

Heart problems are the initial clinical sign of COVID-19 in some people who do not have typical symptoms like cough or fever. During COVID-19, myocardial damage is independently associated with an increased death rate. Furthermore, a condition resembling Kawasaki illness has been observed in children who may have COVID-19⁴¹⁻⁴³.

COVID-19 deceased with concomitant cardiovascular disorders are also at risk for significant drug-disease interactions. We can better understand the possible processes behind COVID-19 by fusing our understanding of the mutating biological and structural compositions and characteristics of the virus and the host-virus interactions along with clinical results, and we open the door to the accurate diagnosis and creation of prophylactic and therapeutic measures^{44,45}.

With such viral complications affecting the functioning of the heart, the symptomatology and the signs perceived by the clinician may or may not be valid, leading to misdiagnosis and mortality, especially in economically growing countries. Complications of covid 19 are highlighted in table 5.

Table 5: Complications of COVID-19⁴⁵.

Complications	%
Acute respiratory distress syndrome	33.15%
Arrhythmia	16.64%
Acute cardiac injury	15.68%
Heart failure	11.5%
Acute kidney injury	9.87%

Recommendations

It can be concluded from all the discussion above that History taking is one of the most important tools for a clinician to diagnose a patient. Thus, physicians should work on their history-taking skills and try to improve them. Besides this, more literature is needed to evaluate the importance of good history-taking skills and how it affects healthcare.

Conclusion

Thus good history and clinical skills are very important in diagnosing cardiovascular diseases. This is because most diseases related to cardiac issues are not diagnosed within the right time, leading to mortality. Thus, a proper history can narrow down the diagnosis and help save a patient's life. Besides this, most of the patient's symptoms are difficult to distinguish from other causes. This article highlights all the parameters essential for diagnosing and treating patients. The importance of history and clinical skills are mentioned to help physicians focus more on their skills rather than waiting for labs.

Conflicts of Interest

The author(s) declare that they have no competing interests.

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