



# VIVEKANANDHA MEDICAL CARE HOSPITAL ALLIED HEALTH SCIENCES

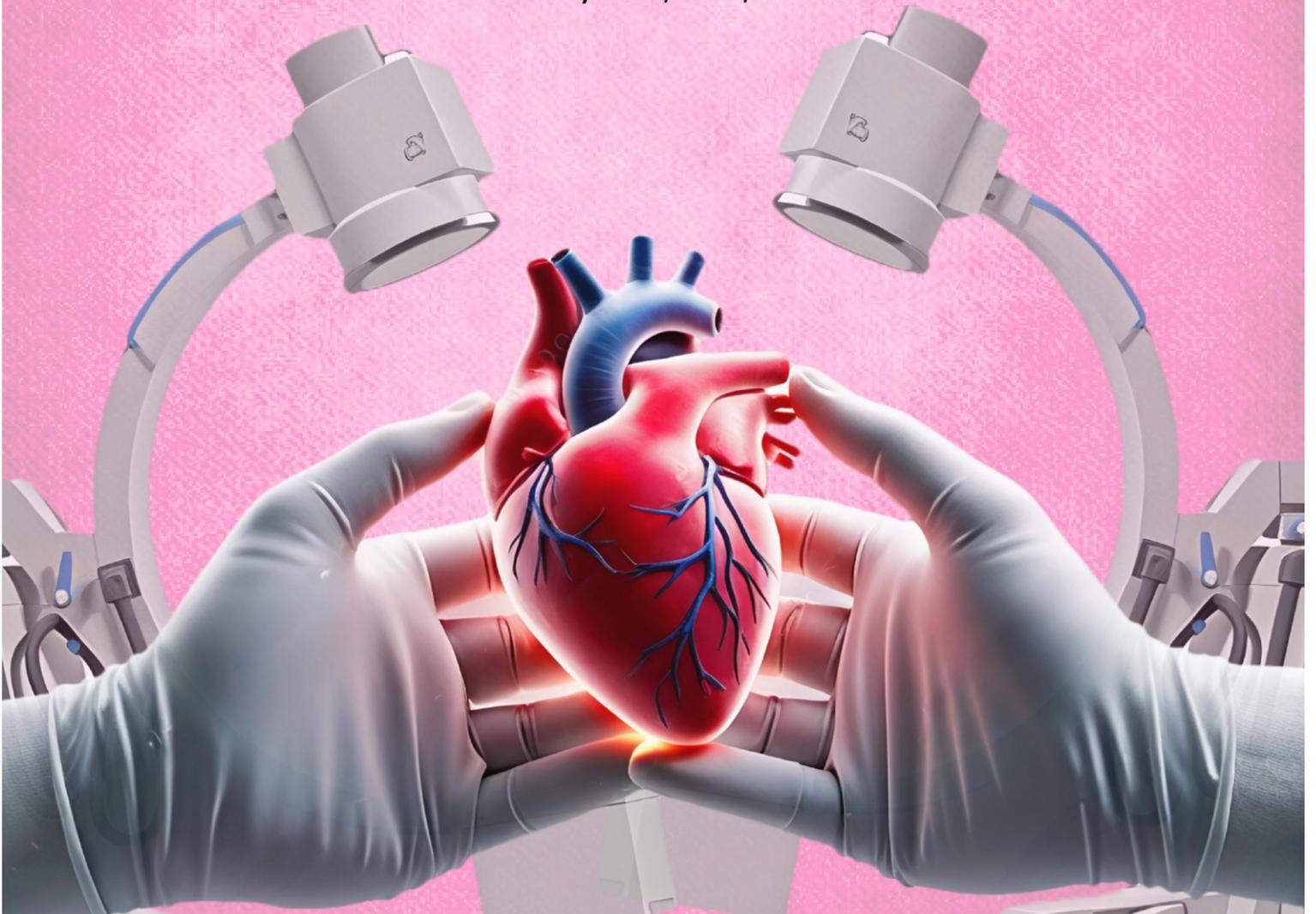
( Affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai )  
Elayampalayam - 637 205, Tiruchengode (Tk)., Namakkal (Dt)., Tamil Nadu.



THEME

DIGITAL HEART SYMPHONY

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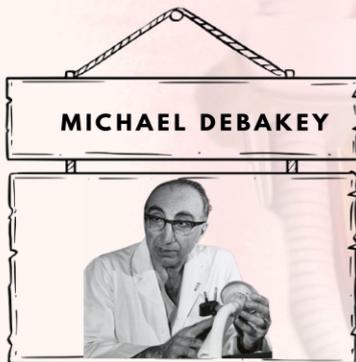
## INTRODUCTION

VAD is a mechanical pump that helps a weak heart pump blood. A Ventricular Assist Device (VAD) is a mechanical pump used to support or replace the pumping function of one or both ventricles in patients with severe heart failure, improving blood circulation.

## HISTORY



*Domingo Liotta (1924–2022), Argentine cardiac surgeon; developed total artificial heart.*



*Michael DeBakey (1908–2008), cardiovascular surgery pioneer; invented advanced bypass, VAD and vascular graft surgery,*

## NEED FOR VAD

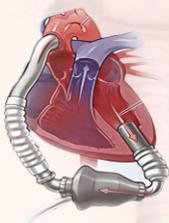
- ♥ Bridge to transplant (waiting for a donor heart )
- ♥ Bridge to recovery (allowing the heart to rest )
- ♥ Destination therapy (longterm support for those ineligible for transplant)

# History OF LVAD



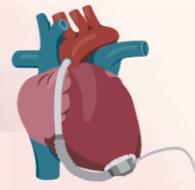
## ORIGIN (1962)

*Dr. Domingo Liotta at Baylor College of Medicine created the first Left Ventricular Assist Device (LVAD)*



## FIRST SUCCESSFUL SUPPORT (1966)

*A LVAD was used for 10 days to help a patient recover from shock after open-heart surgery*



## FIRST IMPLANT (1963)

*Liotta implanted a pneumatically-driven tube pump to connect the left atrium to the descending aorta, used for 4 days*

# TYPES OF VAD

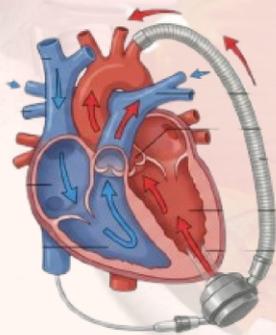
**LEFT  
VENTRICULAR  
ASSIST DEVICE**

**RIGHT  
VENTRICULAR  
ASSIST DEVICE**

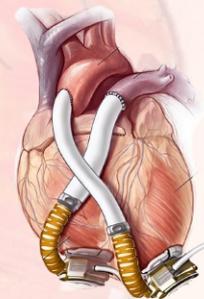
**BIVENTRICULAR  
ASSIST  
DEVICE**

**TOTAL  
ARTIFICIAL  
HEART**

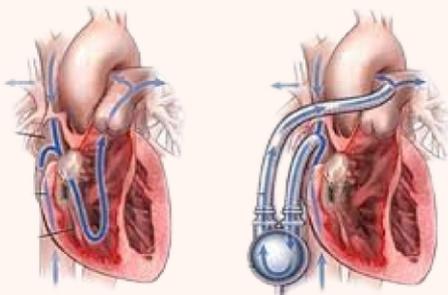
➔ **LVAD - SUPPORTS LEFT VENTRICLE → PUMPS OXYGENATED BLOOD TO BODY.**



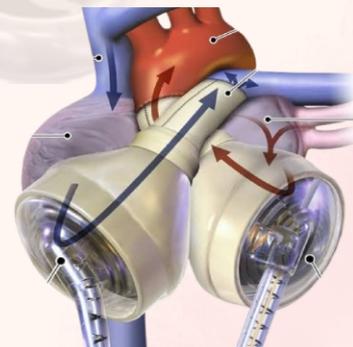
➔ **BIVAD - SUPPORTS BOTH VENTRICLES → USED IN SEVERE TOTAL HEART FAILURE.**



➔ **RVAD - SUPPORTS RIGHT VENTRICLE → PUMPS BLOOD TO LUNGS**



➔ **TOTAL ARTIFICIAL HEART**



**TYPES OF DEVICES!**

**SHORT TERM**

**LONG TERM**

**TANDEM HEART**

**ABIOMED IMPELLA**

**HEARTMATE PHP**

**ABIOMED B6VS500  
AB50000**

**CENTRIMAG**

**PULSATILE FLOW**

**AXIAL CONTINUOUS**

**3RD GENERATION**

**TOTAL ARTIFICIAL  
HEART**



**Tandem  
Heart**

**Total Artificial  
Heart**

## COMPONENTS OF VENTRICULAR ASSIST DEVICE (VAD)

- ♥ **Pump** - Moves blood from ventricle to artery
- ♥ **Cannulae (Inflow & Outflow tubes)** - carry blood into and out of the pump
- ♥ **Driveline** - Cable that connects internal pump to external controller.
- ♥ **Controller** - External computer that controls pump speed and function.
- ♥ **Power Source (Batteries /AC power)** provides energy to run the pump.

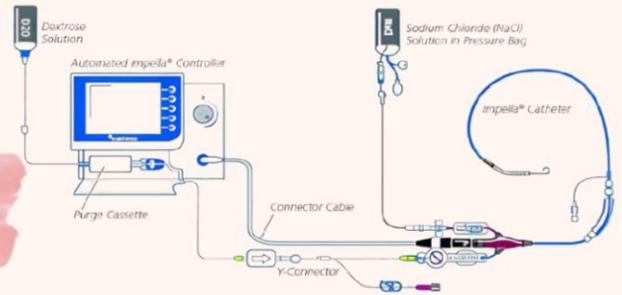
## COMPONENTS OF VENTRICULAR ASSIST DEVICE (VAD)

INDICATIONS	CONTRAINDICATIONS
♥ Acute MI with shock	♥ Recent stroke
♥ High risk ventricular arrhythmia	♥ End stage kidney disease (liver/lung )
♥ High risk catheter valve procedure	♥ Severe Right heart failure
♥ Post heart transplant graft dysfunction	♥ Severe neurological damage

# IMPELLA: Powering the Failing Heart

## Access

*Femoral artery punctured; 14 Fr introducer sheath inserted after dilation. Systemic heparin given.*



## LV Entry

*Diagnostic catheter with 0.018" guidewire advanced across aortic valve into LV.*

## Device Advancement

*Impella catheter guided over wire across aortic valve under fluoroscopy*

## Positioning

*Inlet ~3.5 cm below aortic valve; outlet positioned in ascending aorta.*

## Activation & Securing

*Position confirmed → wire removed  
→ pump started (low P-level). Peel-away sheath removed & repositioning sheath secured.*

## Monitoring & Weaning

*Continuous purge infusion. Pulsatile waveform = correct position. Reduce P-level gradually before removal.*

# HIDDEN PUMP, POWERFUL IMPACT - INTRACORPOREAL LVAD

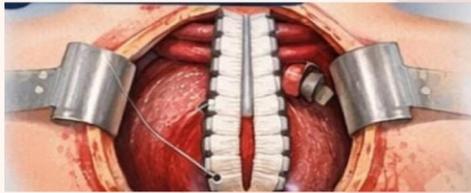
1

General anesthesia is administered



2

Median sternotomy (chest opened through sternum)



3

Patient connected to heart-lung machine during pump placement



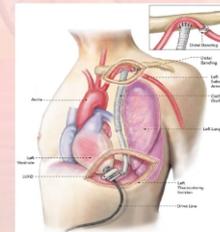
4

Creation of pump pocket, either in pericardial space or pre peritoneal space ( HEART MATE III ) device is used to place in pericardial space



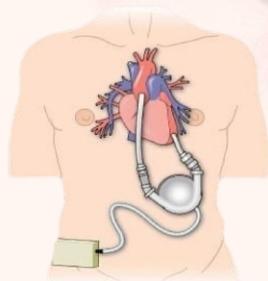
5

The inflow cannula is inserted into the apex of the left ventricle



6

Pump body connected to inflow cannula.



7

The outflow graft is sewn to the ascending aorta, Allows oxygenated blood to pumped into systemic circulation.



8

A driveline cable exits the abdomen to connect the pump to the external controller and battery.

9

Air removed from system, Pump gradually started, Heart lung machine gradually disconnected,

8

## RISKS & COMPLICATIONS

Bleeding

Infection

Blood clots

Stroke

Device failure

Right heart failure

## REHABILITATION AND LIFESTYLE MODIFICATION

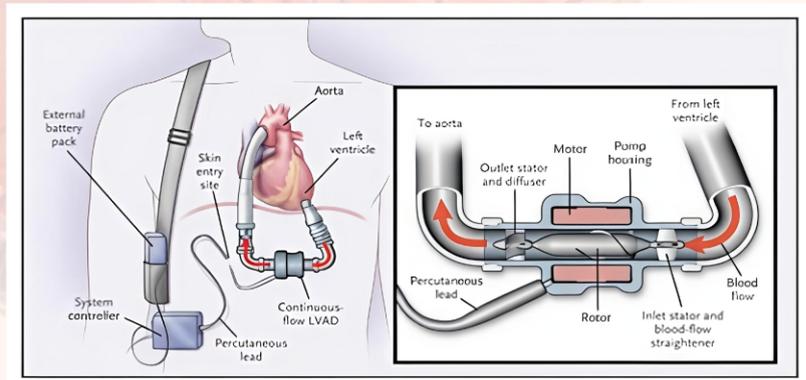
- 1 **Cardiac Rehabilitation:** Improves functional capacity, reduces mortality and hospitalizations. CPET helps in prognosis and LVAD management decisions.
- 2 **Exercise Prescription:** HIIT improves cardiorespiratory fitness and exercise tolerance.
- 3 **Lifestyle Modifications:** Aerobic exercise and limb strengthening improves overall health and recovery.

## FUTURE SCOPE OF VAD

- 1 Smaller and lighter devices improve comfort
- 2 Machine learning improves device performance and decision-making.
- 3 Wireless power reduces driveline complications
- 4 Advanced sensors improve monitoring and safety
- 5 Cost-effective designs increase accessibility and improve outcomes

*\*“END NOTE: A NEW ERA OF CARDIAC SUPPORT”\**

In the silent rhythm of mechanical precision, the Ventricular Assist Device stands as more than a machine. It is a lifeline, a bridge between weakness and strength, and a symbol of medical innovation. Where failing hearts once marked the limits of survival, VADs now offer hope, resilience, and a second chance at life. As technology continues to evolve, these remarkable devices remind us that the future of cardiac care is not just about sustaining life but restoring its quality, dignity, and promise. The heartbeat of tomorrow is no longer bound by biology alone; it is powered by science, compassion, and human ingenuity.



# Petales OF POETRY

## Artificial Dawn

*"When the left ventricle dimmed its flame;  
And circulation forgot its Name  
In the hush of End-stage despair,  
"A Rotor Whispered through the air",  
"No pulse to boast. No rhythm load",  
Yet perfusion flowed beneath the shroud",  
"Titanium Will in a fragile chest;  
"Guarding life that Would Not rest",  
"Not destiny changed. Not death denied"  
"But time Extended, side by side".*



**BY:**

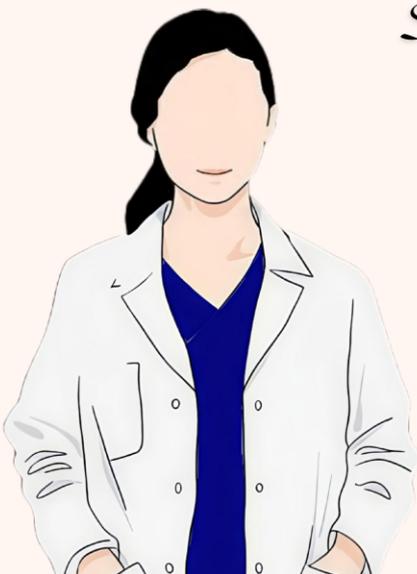
**KOWNISHA.B**  
III-Year CT-2023

# DIGITAL HEART SYMPHONY

*Guide wire glides through vascular shearms  
Threading path like silver dreams.  
coronary roads in contrast flow.  
Angiographic river glow.*

*Balloon inflates - a moment held,  
A stenosed artery gently compelled  
Stent deployed like a final note  
Restoring the heart's forgotten quate.*

*And in the room of screens and light  
where data sing in black and white  
"A digital heart symphony plays  
Saving lives in silent ways"*



**BY :**

**KAVIYA.V**  
III-Year CT-2023

# DIGITAL HEART SYMPHONY

*Balloon inflation controlled expansion  
plaque compression with precision action  
Drug eluting stent deployed with care,  
Metallic scaffold anchoring there*

*Antiplatelets guards the site  
Hemostasis achieved just right  
Sheath removed procedure complete  
Series Mytheon Steady and sweet*

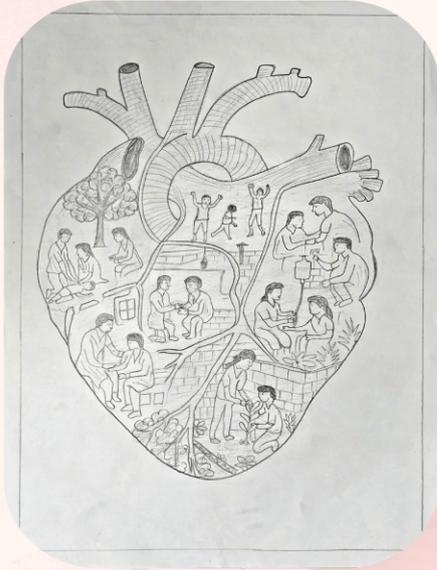


**BY:**

**YAMUNA DHEVE.J**

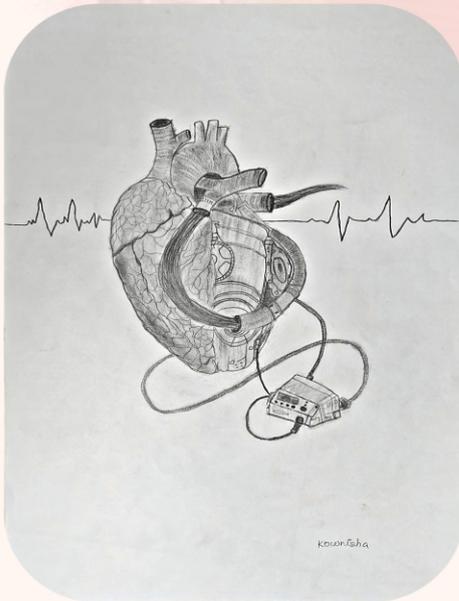
III-Year CT-2023

Creative  
**COLLECTIONS**

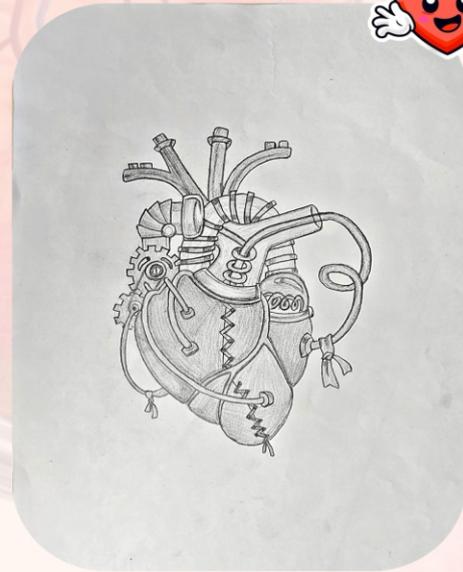


**GOKULPRIYAN.R**  
II-YEAR-CT-2024

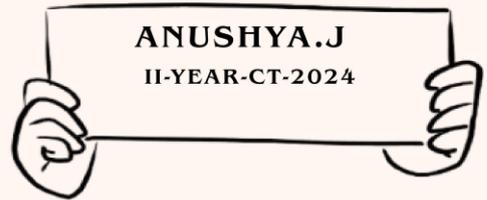
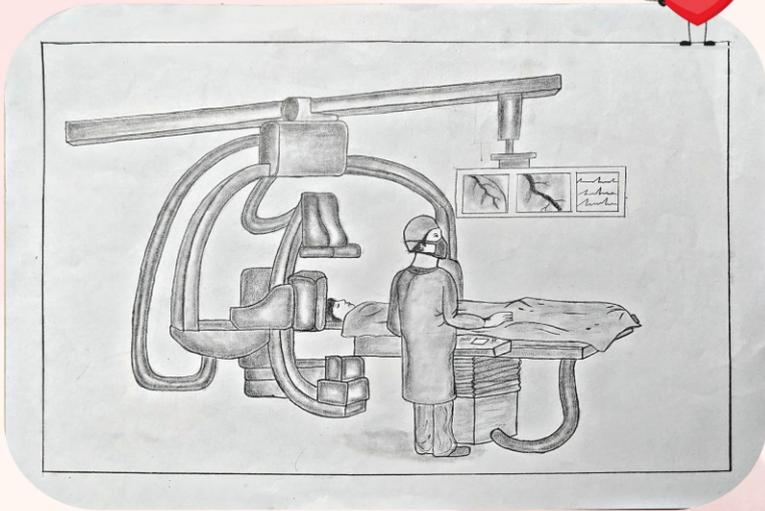
**MOSMI.A**  
III-YEAR-CT-2023



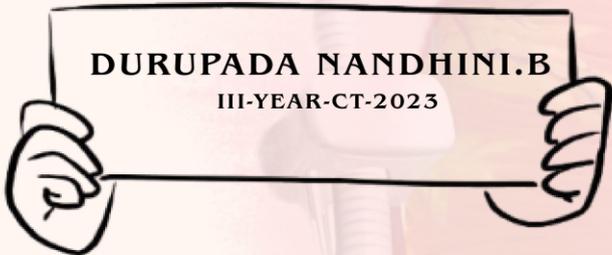
**KOWNISHA.B**  
III-YEAR-CT-2023



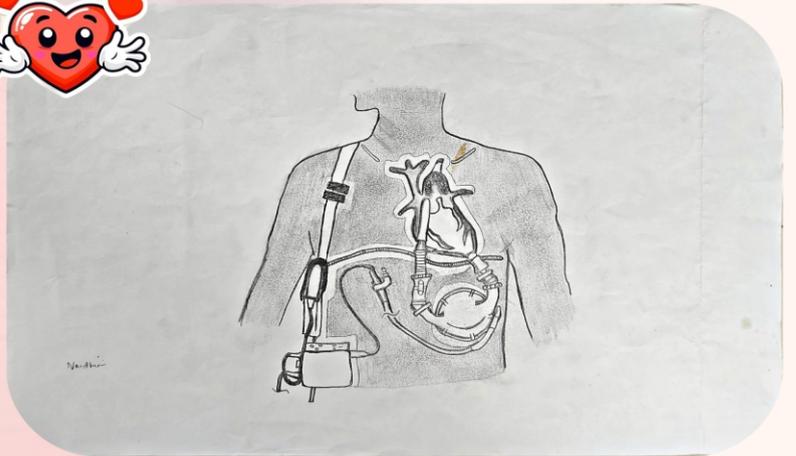
**SATHIYA.R**  
III-YEAR-CT-2023



**ANUSHYA.J**  
II-YEAR-CT-2024



**DURUPADA NANDHINI.B**  
III-YEAR-CT-2023



**GOKULNATH.S**  
III-YEAR-CT-2023

# PREVENT

## HEART DISEASE



### MORNING

#### DO THIS

-  20–30 mins walk / cycling
-  Eat a healthy breakfast

#### AVOID

-  Skipping breakfast
-  Smoking / tobacco early morning



### EVENING

#### DO THIS

-  Evening walk / light cardio
-  Meditation to reduce stress

#### AVOID

-  Excess tea/coffee
-  Continuous screen time



### NIGHT

#### DO THIS

-  Finish dinner 2-3 hrs before sleep
-  Sleep 7-8 hours

#### AVOID

-  Heavy oily dinner
-  Late-night stress or screen usage

# VIVEKANANDHA MEDICAL CARE HOSPITAL ALLIED HEALTH SCIENCES

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AFFILIATED TO THE TAMILNADU.DR.MGR MEDICAL UNIVERSITY

<b>S.NO</b>	<b>PROGRAM MES OFFERED UG</b>	<b>DURATION</b>
<b>01</b>	B.Sc.,ACCIDENT AND EMERGENCY CARE TECHNOLOGY	<b>4 YEARS</b>
<b>02</b>	B.Sc.,RADIOGRAPHY AND IMAGING TECHNOLOGY	<b>4 YEARS</b>
<b>03</b>	B.Sc.,OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY	<b>4 YEARS</b>
<b>04</b>	B.Sc.,CARDIAC TECHNOLOGY	<b>4 YEARS</b>
<b>05</b>	B.Sc.,PHYSICIAN ASSISTANT	<b>4 YEARS</b>
<b>06</b>	B.Sc.,MEDICAL LABORATORY TECHNOLOGY	<b>4 YEARS</b>
<b>07</b>	B.Sc.,DIALYSIS TECHNOLOGY	<b>4 YEARS</b>

## KRISHNA INSTITUTE OF OPTOMETRY AND RESEARCH

<b>01</b>	B.Sc.,OPTOMETRY	<b>4 YEARS</b>
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Vidhya Rathna,

**Prof. Dr. M. KARUNANITHI**, B.Pharm., M.S., Ph.D., D.Litt.,  
Chairman & Secretary.

## **VIVEKANANDHA EDUCATIONAL INSTITUTIONS**

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- ★ SWAMY VIVEKANANDHA MEDICAL COLLEGE HOSPITAL AND RESEARCH INSTITUTE
- ★ VIVEKANANDHA DENTAL COLLEGE FOR WOMEN
- ★ SWAMY VIVEKANANDHA COLLEGE OF PHARMACY
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- ★ SWAMY VIVEKANANDHA PHYSIOTHERAPY COLLEGE
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- ★ KRISHNA INSTITUTE OF HEALTH SCIENCE (Boys)
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- ★ VIVEKANANDHA COLLEGE OF TECHNOLOGY FOR WOMEN
- ★ VIVEKANANDHA INSTITUTE OF INFORMATION AND MANAGEMENT STUDIES
- ★ VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)
- ★ VIVEKANANDHA COLLEGE FOR WOMEN
- ★ VIVEKANANDHA COLLEGE OF EDUCATION FOR WOMEN
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- ★ VIVEKANANDHA MEDICAL CARE HOSPITAL (VMCH)

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- ★ VIVEKANANDHA NURSING COLLEGE FOR WOMEN
- ★ VIVEKANANDHA ARTS AND SCIENCE COLLEGE
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- ★ VISWABHARATHI COLLEGE OF EDUCATION FOR WOMEN

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