



# Importance of Orthotopic Heart Transplantation in Heart failure patients enhancing its Non pharmacological treatment, Risk factors and Cost of transplantation in India.

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## Abstract

**Aim:** The purpose of this study is to assess the impact of orthotopic heart transplantation on heart failure patients' non-pharmacological treatment outcomes, identify risk factors, and analyze transplantation costs in India.

**Objectives:** 1. To evaluate if patient outcomes have improved following orthotopic heart transplantation  
2. To determine the main risk factors connected to OTH  
3. To assess the price of cardiac care

**Methodology:** To give a thorough grasp of the effects of orthotopic heart transplantation, this study will use a mixed-methods approach, integrating quantitative data analysis and qualitative interviews.

**Data collected prior to transplantation:** Patient characteristics, medical background, heart failure, severity (e.g., NHYA class), and pre-transplant therapies

**Result:** This review study discusses the importance of OTH therapy for heart failure patients, highlighting its potential to improve quality of life and reduce the risk of life-extending complications after transplants, with costs varying in India.

**Keywords:** Orthotopic, Heart failure, Pharmacological treatment, Severity

## Introduction

Orthotopic heart transplantation involves removing the recipient's heart from their chest and implanting the donor heart there instead. Only individuals with end-stage heart failure who are receiving transplantation are eligible for this procedure. Many assays are used to evaluate transplantation. As soon as the transplant is approved, the hospital team needs them. This group ensures the opportunities for Doing better after transplant or surviving? then using continuous medication treatment. The amount that the heart can pump in a minute can be estimated with the use of blood tests for exercise capacity, such as the NT-pro BNP test, which measures cardiac output in liters of blood. Probability of survival with tablet treatment The team must be informed during the assessment. If the individual suffering from any severe ailments. It probably has an impact on the patient's outcomes. Patients undergoing transplantation may be exposed to risk factors, which will lower their survival chances.

⌘ Rejection: Rejection can occur when the immune system attacks the donor heart because it perceives it as alien.

⌘ Graft Failure: Following transplantation, the donor heart may develop primary graft failure, a potentially lethal condition.

⌘ Cardiac Allograft Vasculopathy (CAV): This type of chronic rejection causes the transplanted heart's blood arteries to gradually narrow, which eventually results in heart disease.

⌘ Cancers: Immunosuppressive medication use over an extended period of time raises the risk of cancer, especially skin cancer and lymphomas.

**Potential risks include:** An increased risk of infection as a result of immunosuppressant therapy;

- The possibility of organ rejection following transplant

- Most people who receive heart transplants live long and fulfilling lives, with the exception of the need for constant medicine to prevent the body from rejecting the new heart.

### Waiting list of the patient.

Patients with kidney failure, liver failure, or high blood pressure in the lungs are placed on a waiting list for heart transplantation or LVAD surgery. Doctors support patients' medical needs and provide relief from symptoms. If a patient is not suitable, they are informed. Once deemed suitable, the patient is transferred to the intensive care unit for breathing assistance and nutrition

### Important Criteria:

1. Blood type
2. Body size
3. Cross matching test

**Blood type:** The blood types of the patient (A, B, AB, and O) and the recipient and donor hearts must match. Individuals with AB can receive a heart transplant from a donor of any blood type since they are universal recipients

**Body size:** Heart transplant clinics screen underweight and overweight donors using a cross-match test, ensuring no transplant-relevant antibodies in the recipient. The International Society of Heart & Lung Transplantation recommends a donor's weight be no more than 30%

### Cross matching test:

Regarding heart transplantation, there is a scientific question on whether it is appropriate to replace a male heart with a woman's heart during the transplant procedure. Although the likelihood of successfully transplanting a woman's heart is reduced, only men's hearts can be replaced. When we go to the UK, the woman's heart is not accepted for transplantation into patients. However, there are fewer options in the USA and India for a female heart transplant.

### **Predicted Heart mass calculation:**

Estimated left ventricular mass:  $a = 6.82$  for women and  $8.25$  for males;  $a = \text{height} \times 0.54 \times \text{weight} \times 0.61$ . Estimated right ventricular mass:  $a = 10.59$  for women and  $11.25$  for males;  $a = \text{age} - 0.32 \times \text{height} \times 1.135 \times \text{weigh}$

Orthotopic can be used for adults and children up to the age of 70, and in certain cases, up to the age of 75. The initial hours to weeks following a heart transplant are crucial while the patient's body adjusts to their new, healthy heart.

### **Management for OHT :**

⌚ Avoid consuming too much salt, sugar, and saturated fats. In particular, a low-sugar diet is essential for managing diabetes.

⌚ Keeping your diet low in saturated fat can help you manage your cholesterol.

⌚ Try to sleep on your back as the sternum, or breastbone, heals. Try to walk every day in accordance with your cardiac rehab routine.

⌚ Grapefruit and grapefruit juice should be avoided because of potential interactions with some immunosuppressive medications.

### **Cost of OHT :**

⌚ An orthotopic heart transplant's cost Orthotopic heart transplantation is much less common than heterotopic heart transplantation. In India, this type of transplant ranges in price from \$45,500 to \$48,500. Donor Availability Restrictions: There is still a limited supply of donor hearts despite the rising demand.

⌚ Effects of Immunosuppressive Therapy Sides: Although lifelong immunosuppressive medication is required to prevent rejection, it can have unfavorable effects such as increased vulnerability to infections, metabolic problems, and organ malfunction. The risk of rejection persists after transplantation, even with improvements in immunosuppressive treatments.

### **Inclusion and Exclusion criteria:**

#### **Inclusion criteria:**

⌚ Diagnosis: individuals with end-stage heart failure who need more advanced care.

⌚ Individuals who have had an orthotopic heart transplant are listed as transplant status patients.

⌚ Patients must be at least 18 years old.

⌚ Follow-Up: Individuals who receive follow-up care for at least a year after transplantation.

⌚ Patients who have given their informed consent form

#### **Exclusion criteria:**

⌚ Individuals who have not had an orthotopic heart transplant are known as non-transplant patients.

⌚ Age: Patients that are younger than eighteen.

⌚ Patients with inadequate follow-up data or incomplete medical records are considered to have incomplete data.

⌚ Patients who refuse to give informed consent in order to take part in the study are considered non-consent.

#### **Limitations :**

⌚ Donor Availability: There aren't enough donor hearts available, which causes lengthy wait times.

⌚ Infrastructure: Not all Indian hospitals possess the requisite facilities and knowledge to carry out heart transplants.

⌚ Cost and Accessibility: Many patients cannot afford the treatment because of the high cost of the related care.

## Result

### 1. After OTH transplantation the survival rates

1-year: 90%  
5-year: 75%  
10-year: 60%

Direct Costs in India :

Pre-operative: ₹200,000 (\$2,500)

Surgery: ₹1,200,000 (\$15,000)

ICU/hospital stay: ₹500,000 (\$6,250)

Annual post-op: ₹300,000 (\$3,750)

### 2. Following an OTH transplantation :

The following are the main risk factors:

☞ Patient-Associated: older (60 years or older)

☞ Co-morbidities: renal failure and diabetes

☞ Procedure-Specific: prolonged periods of ischemia Heart condition of donor (healthier, younger donors produce higher results)

☞ Following Transplantation: Failure to adhere to immunosuppressive treatment Early infection control is essential.

## Discussion

☞ Addressing the organ scarcity may involve streamlining the procedures for discovering and assigning donor organs.

☞ Advances in immunosuppressive drug formulations can reduce the risks associated with long-term therapy.

☞ Technological developments in surgical procedures and perioperative care can improve patient outcomes.

☞ Economical actions such as expanding insurance coverage and streamlining transplant procedures might improve accessibility

## Conclusion

While OHT offers a promising non-pharmacological therapy option for heart failure patients in India, there are significant issues to consider in relation to risk factors and transplantation costs. However, with further developments and timely interventions, OHT can dramatically improve the prognosis and quality of life for individuals with severe heart failure in India.

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