

**NATIONAL PROTOCOL FOR ASSESSMENT OF
CARDIOTHORACIC TRANSPLANT PATIENTS**

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1 INTRODUCTION

Following the recommendations of the Commission for Health Improvement (CHI) Investigation into Heart and Lung Transplantation at St George's Healthcare NHS Trust, the former UK Transplant Cardiothoracic Advisory Group (UKT CTAG) was given the remit to:

“Develop a national protocol for the assessment of patients for heart and lung transplantation, which highlights the need for multidisciplinary involvement in assessment and adequate recording of the process in patients' records.”

This protocol has been produced to reflect and amalgamate existing policies produced by the six cardiothoracic transplant centres and two paediatric transplant centres in the UK.

2 REVIEW

This document will be reviewed every two years, or more frequently as need occurs.

3 INDICATIONS FOR HEART TRANSPLANTATION

3.1 **Heart transplantation should be considered when the following criteria apply**

- q End stage heart disease with a life expectancy of between 12 to 18 months
- q New York Heart Association Classification (NYHA) III or IV Heart Failure
- q Refractory to medical therapy, including if necessary cardiac resynchronisation therapy. This assessment should be made by a cardiologist with a special interest in heart failure.

- q Usually less than 60 years of age as there is an increase in co-morbidity with the ageing process. Outcome is less satisfactory. However, consider biologically fit older patients.

3.2 **Contraindications to Heart Transplantation**

3.2.1 Absolute Contraindications

- q Chronic current systemic infection, including endocarditis
- q Chronic extracardiac infection
- q Active peptic ulcer
- q Continued abuse of alcohol or other drugs
- q Irreversible secondary organ failure unless considering for combined transplant
- q Psychiatric history likely to result in non-compliance and/or persistent non-compliance with medical therapy
- q Severe peripheral or cerebrovascular disease
- q Malignancy
- q Other life threatening medical condition, likely to cause death within five years.

3.2.2 Relative contraindications

- q HIV (subject to discussion with Associate Medical Director at ODT)
- q Hepatitis B/C
- q Acute pulmonary embolus (within 3 months)
- q Obesity BMI >30
- q COPD with FEV1 < 50% predicted
- q Pulmonary vascular resistance greater than 4 Wood units
- q Transpulmonary gradient greater than 12 mmHg
- q Chronic renal impairment with GFR <50ml/min, unless candidate for combined renal transplant
- q Diabetes with target organ damage
- q Hypercholesterolaemia or other lipid diseases refractory to diet or drug therapy
- q Severe osteoporosis (bone mineral density > 2 sd's less than predicted for age)
- q Amyloidosis
- q Continued smoking
- q Giant cell myocarditis.

4 LUNG AND HEART-LUNG TRANSPLANTATION

4.1 Criteria

- q Usually less than 60 years of age for a bilateral lung and heart-lung transplant, less than 65 for single lung transplant, as there is increase in co-morbidity illness with the ageing process. Outcome is less satisfactory. However consider biologically fit older patients.
- q The following conditions will be considered:
 - Diffuse Parenchymal Lung Disease including:
 - Idiopathic pulmonary fibrosis
 - Lung fibrosis in association with connective tissue disease
 - Occupational lung fibrosis
 - Drug /toxic lung fibrosis
 - Chronic allergic alveolitis
 - Sarcoidosis
 - Obstructive lung disease including COPD, Emphysema, alpha 1 antitrypsin deficiency and obliterative bronchiolitis
 - Pulmonary vascular disease including idiopathic pulmonary hypertension, complex congenital heart disease and Eisenmenger's syndrome
 - Suppurative lung disease including Cystic Fibrosis and bronchiectasis

4.2 Contraindications to Lung and Heart-Lung Transplantation

4.2.1 Absolute Contraindications

- q Related co-morbidity with advanced ageing
- q Severe right heart failure. Consider heart/lung transplantation
- q Septicaemia
- q Malignancy - non curable
- q Active peptic ulcer or diverticulitis
- q Continued abuse of alcohol or other drugs
- q Irreversible secondary organ failure unless considered for a combined transplant
- q Psychiatric history likely to result in non-compliance and or persistent non-compliance with medical therapy.
- q Active smoking

4.2.2 Relative Contraindications

- q HIV (subject to discussion with the Associate Medical Director at ODT)
- q Hepatitis B/C
- q Coronary artery disease, if for lung transplant only
- q Intubated and ventilator dependent
- q Obesity BMI >30
- q Chronic renal impairment with GFR <50ml/min, unless candidate for combined renal transplant
- q Diabetes with target organ damage
- q Severe osteoporosis (bone mineral density > 2 sd's less than predicted for age)

5 THE HEART AND LUNG TRANSPLANT ASSESSMENT

5.1 Stages of assessment

- 1 Referral letter and proforma with details
- 2 Pre-assessment outpatient clinic when appropriate
- 3 In patient assessment
- 4 Decision
- 5 Waiting List

5.2 Pre-assessment Outpatient Clinic

Initial pre-assessment outpatient clinic appointment for selected new patients to assess suitability for transplantation. The pre-assessment outpatient clinic appointment must be conducted within three months of referral unless the patient is clearly unsuitable and a consultant physician or surgeon has made this decision. The general principle of this assessment is attention to detail and the avoidance of assessment and blood tests if the patient is clearly unsuitable for transplantation at initial clinic appointment.

5.3 In Patient Assessment

Usually patients will be assessed by the hospital from home or referring hospital over a 2 - 4 day period. The results of investigations are requested from the referring hospital but during their admissions patients will undergo other and repeated investigations depending on their primary disease and individual need. At all stages of the assessment the patient and family are involved in any discussions and encouraged to ask any questions.

5.4 **Objectives of Assessment Procedures**

- q To assess the patient's clinical, social and psychological suitability as a transplant recipient
- q To impart factual information to the patient and his/her family concerning all aspects of transplantation
- q To meet hospital staff and transplant patients
- q To provide an opportunity for the patient, and his or her family, to begin to come to terms with the prospect of transplantation, and to be informed about the procedure and its aftermath
- q The general condition of the patient is such that transplantation of the heart/lungs or lungs alone allows the patient a realistic chance of prolonging a good quality of life.

5.5 **Investigations Conducted**

The importance of the multi-disciplinary involvement in the assessment of the patient and care received is paramount. The assessment should involve a whole spectrum of healthcare professionals, including physicians, surgeons, radiologists, nurses, transplant co-ordinators, pharmacists, occupational therapists, dieticians, physiotherapists, social workers, psychologists (if indicated psychiatrists) - everyone has a key role to play.

5.6 **Clinical Assessment**

A full history and examination including:

- 5.6.1 **Cardiac Condition**
 - Cause
 - Previous cardiac surgery
 - Current therapy.

- 5.6.2 **Social History**
 - Marital status
 - Housing
 - Employment
 - Smoking
 - Drugs/alcohol abuse.

- 5.6.3 **Past/Concurrent History**
Unresolved pulmonary infarction or consolidation
Malignancy
Diabetes
Hypertension
Renal disease
Liver disease
Peripheral or cerebrovascular disease
Peptic ulceration, GI bleeding
Diverticular disease, GI sepsis
Unresolved sepsis in any site
Herpes virus infection
Previous blood transfusion
- 5.6.4 **Routine Observations**
Temperature
Blood pressure
Heart rate
Height
Weight
- 5.6.5 **Radiology**
Chest x-ray
Further assessment may be needed with ultrasound or CT scanning.
- 5.6.6 **Cardiac Assessment**
ECG
Echo (echo for dyssynchrony if indicated).
6 minute exercise walk and/or metabolic exercise test (if capable of doing)
Ejection fraction assessment (by locally validated nuclear cardiology technique)
Cardiac catheterisation & coronary angiogram.
- 5.6.7 **Pulmonary Assessment**
Lung function assessments.
- Additional Tests for Lung Transplants
6 minute walk test with oximetry
Arterial blood gases
Sputum culture.

- 5.6. 8 **Microbiology Assessment**
MSU and urine test
Nose swab
MRSA screen.
- 5.6.9 **Dental Assessment**
Full dental examination
Advice on dental hygiene
Restorative work and extractions as necessary.
- 5.6.10 **Haematology Blood Tests**
Blood group
Antibody screen
Full blood count
ESR
Plasma viscosity
Reticulocytes
APTT
PT, INR
Fibrinogen.
- Biochemistry Test**
Urea & electrolytes
Creatinine
Uric acid
Calcium phosphate
Liver function tests
Alkaline phosphatase
Cardiac enzymes
Amylase
Thyroid function tests
Fasting blood glucose
Fasting blood lipids.
- 5.6.11 **Serology Blood Sample**
Hepatitis B/C
HIV
Syphilis
Rubella
Epstein Barr Virus
Toxoplasma
Varicella-Zoster
Herpes simplex
Cytomegalovirus.

- 5.6.12 **Immunology Blood Tests**
Auto-immune (including ANF, DNA, SCAT/LATEX)
HLA typing
Lymphocytotoxic antibody screen.
- 5.6.13 **Psychosocial Assessment**
Letter from GP confirming compliance with past therapy
Interview with Social Worker.
- 5.6.14 **Other**
Creatinine clearance or GFR
Dietician (after discussion with transplant team)
Physiotherapy assessment.

6 FINAL DECISION

The decision to place a patient on the waiting list is a multi-disciplinary one. If the decision for transplantation is straightforward, the patient may be informed of the decision before discharge. This decision will subsequently be confirmed at the next multi-disciplinary team meeting (MDT). Routinely, however the decision will not be made before the next MDT meeting. The patient and relatives will be informed of the outcome and given the opportunity to discuss it with a representative of the transplant team. Such discussions should always be undertaken in a private area.

The multi-disciplinary transplant meeting is made up of a wide selection of healthcare professionals. These may include

- Anaesthetist
- Cardiologist
- Cardiothoracic surgeons
- Transplant co-ordinators
- Transplant nurses
- Radiologist
- Lung physicians
- Dieticians
- Physiotherapists
- Social worker
- Microbiologist (lung).

If the patient decides to go forward for transplantation, he or she is then registered with NHS Blood & Transplant and placed on the waiting list. If the patient is not deemed suitable and/or declines the option of transplantation the clinician explains to the patient and their family the options available to

them. The GP and referring clinicians are informed of the outcome of the assessment.

7 THE WAITING LIST

The patient receives detailed explanations, which are consistent, and key information pertaining to the waiting period for transplantation is recorded appropriately in accordance with the National Standards on Documentation for Cardiothoracic Patients (UK CTAG 2002).

At all stages the patient is encouraged to ask questions and an information booklet should be provided. The following key areas must be discussed with the patient as appropriate:

- Provision of a pager and explanation of its use
- The patient's responsibility to make him/herself available to be contacted by the transplant centre at anytime. This is discussed with the transplant co-ordinator
- Patients are requested to inform the transplant centre of any changes in their circumstances i.e.
 - If they become unwell
 - If they are admitted to hospital
 - Any changes in medication
 - Holidays.

An information booklet will be given to the patient. This will explain:

- Preparation for admission for surgery
- Maintenance of regular contact
- Reporting changes in circumstances
- What to do when called for surgery
- The operation
- Accommodation for partners
- Publicity and the media
- Wards and departments after the operation.

During the waiting period the transplant centre will maintain contact with the patient and his/her family to offer support, information and guidance according to their needs. Clinical review of patients on the waiting list will be as clinically indicated.

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