Department of Health Working Party, Code of Practice: Cadveric Organs for Transplantation, including the diagnosis of brain death

wellcome collection

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

CADAVERIC ORGANS FOR TRANSPLANTATION

A CODE OF PRACTICE INCLUDING THE DIAGNOSIS OF BRAIN DEATH

Drawn up and revised by a Working Party on behalf of the Health Departments of Great Britain and Northern Ireland.

PREFACE

This Code has been prepared by a Working Party set up by the United Kingdom Health Departments under the Chairmanship of Lord Smith of Marlow. It is a model set of basic guidelines which could be amplified to suit local circumstances. It is intended not only for the staff of hospitals which carry out organ transplantation, but particularly for the staff of hospitals which may have potential donors but little experience of the procedures leading to organ removal.

This Code has been revised, by the available members of the Working Party, in the light of the further views expressed by the Conference of Medical Royal Colleges and Faculties of the United Kingdom on the diagnosis of brain death and of other published evidence.*

February 1983

---

*Brain Death in three neurosurgical units, Jennett B, Gleave J and Wilson P; Br Med J 1981, 282, 533.
Brain Death in Britain as reflected in renal donors, Jennett B and Hessett C; Br Med J 1981, 283, 359.

CONTENTS

MEMBERS OF THE WORKING PARTY

Lord Smith of Marlow KBE PPRCS (Chairman)

Mr A D Barnes BSc ChM FRCS
Mr G S Bessey CBE †
Dr J Burton MB BS FFARCS Barrister
Miss D Caulfeild-Stoker SRN
Professor H M Dick MB ChB MRCPath MD FRCP(Glas)
Dr P Emerson MA MD FRCP*
Miss J Flindall SRN SCM DipN
Professor G A Gresham TD MD ScD FRCPath ††
Dr E Hayward FFARCS
Professor W B Jennett MD FRCS LRCP
Mr W Lewin CBE MS FRCS
Dr M McGeown MD PhD FRCP
Dr W P Povey MRCS LRCP FFCM DPH D, Obst RCOG
Professor J G Robson CBE FRCS FFARCS FFARACS (Hon)
Professor J R Salaman MChir FRCS
Mr R A Sells MB BS FRCS
Mr P D G Skegg MA LLB D Phil Barrister
Dr G H Tovey CBE FRCP FRCPath

*Until October 1978
†From October 1978
††From January 1979

Observers

Mrs J Evans SRN SCM *Department of Health and Social Security*
Dr R M Melville OBE MB ChB DPH MFCM *Scottish Home and Health Department*

Secretariat

Dr G Pincherle MA MB B Chir MRCP *Department of Health and Social Security*
Mrs E V Lancaster (to May 1979) *Department of Health and Social Security*
Miss M Heath (from June 1979) *Department of Health and Social Security*
Mr N J Boyd *Department of Health and Social Security*

The Working Party would like to thank the following for their help in drafting the passages in the Code of Practice on corneal grafting:

Mr T A Casey MCh FRCS
Professor A L Crombie MB FRCS
Mr D L Easty MD FRCS
Mr J R Hudson MB BS FRCS DOMS
Mr N S C Rice MD FRCS
Mr A D McG Steele FRCS
Mr P D Trevor-Roper MA MD FRCS DOMS

INTRODUCTION

The present supply of cadaveric kidneys for transplantation is only about half that necessary to meet the demand. One of the reasons for this shortage is the lack of awareness - on the part of both the public and the medical and nursing professions - of the extent of the shortage, of the high degree of success which now results from renal transplantation and of the benefits it brings to patients. This partly accounts for the hesitancy on the part of hospital staff to identify, among their dying patients, those who might be potential donors, and to initiate the procedures leading to transplantation. There is often uncertainty, too, about what those procedures are. These factors affecting the kidney supply are also partly responsible for the continuing shortage of eyes for corneal grafting.

Early in 1978 the Transplant Advisory Panel advised the Departments to consider producing a code of practice for procedures relating to the removal of organs for transplantation. A Working Party under the chairmanship of Lord Smith of Marlow was set up to draft such a code for use by medical, nursing and administrative staff concerned.

It is hoped that this code will assist in clarifying the procedures pertaining to organ transplantation and in ensuring that the legal requirements are met. As kidney transplantation is the most common form of organ transplant the code refers primarily to this but it is also applicable to other organs such as the heart and liver. The procedures for the removal of eyes are different in some respects and these are dealt with in paragraph 38 of the code. It is hoped that those using the code will bear in mind the continuing need for donor eyes. The code refers throughout to the removal of organs from bodies in hospital because that is where kidney removal and transplantation takes place.

Good liaison between a hospital and its local transplant team is essential to ensure that procedures leading to transplantation are smoothly and correctly carried out. The practice of the transplant teams may vary from place to place and although this code gives a broad indication of the procedures to be followed hospital staff should read it in conjunction with the advice given by the local transplant team. A list of the UK centres (with telephone numbers) where renal transplantation is carried out at present is at Appendix 1 and a list of those doing corneal grafting is at Appendix 2. Clearly, these lists will need amending from time to time.

The code is aimed at all relevant professional groups. In particular it is hoped that doctors, nurses and administrators - who all have an important part to play in transplantation procedures - will find it valuable.

The code presents the present consensus of professional opinion but as this is a rapidly developing field the Working Party recommends that the Departments of Health keep it under regular review.

A CODE OF PRACTICE

I Person lawfully in possession of the body in hospital 1-3

1 Under the Human Tissue Act 1961[1] and the Human Tissue Act (Northern Ireland) 1962 only the person lawfully in possession of the body or his designate can authorise the removal of organs from a body. This authorisation may be given orally.

2 The Departments are advised that the relevant health authority is normally the person lawfully in possession of a dead body in an NHS hospital until such time as it is claimed by the person with the right to possession of it (usually the Coroner/Procurator Fiscal, Executor, or next of kin). The Working Party agrees with this view and it is assumed in the following guidance.

3 The person lawfully in possession of the body has powers and duties in connection with the removal of organs. But the Acts empower a health authority to designate any officer or person to act on its behalf, and this code of practice will assume that the health authority has delegated its power in this way to an appropriate person (or persons) who will be readily available, and who will hereafter be referred to as 'the designated person'.

II Records 4

4 The steps taken to fulfil the procedures described in this code for removing organs for transplantation should be recorded in a separately identifiable part of the patient's case notes. This could easily be done in the form of a checklist, and we recommend the model attached at Appendix 3 for general use. The Working Party regard it as particularly important that Part C of the checklist, which has been prepared by the Conference of Royal Colleges, should be used in all cases where death is being determined on the basis of ' brain death '. They recommend that the Departments make this generally available to all hospitals.

III Choice of donors for kidney transplantation 5-7

5 Patients who may become suitable donors after death are those who have suffered severe and irreversible brain damage. Such patients will be dependent on artificial ventilation or expected shortly to become so.

[1] The Human Tissue Act is reproduced at Appendix 4.

6 Those who would be unsuitable as donors are:

i Patients with malignant disease (except primary brain tumours)

ii Patients with systemic infection

iii Patients with renal disease, including chronic hypertension and recent urinary infection or those who have suffered renal anoxic damage

iv Patients with severe athero-sclerosis. It follows from this that many elderly patients would not be suitable as donors.

7 It is not always easy to recognise whether a patient would be considered a suitable donor should he die. For example, patients who have had a sudden irreversible cardiorespiratory arrest (for example, myocardial infarction) or those in the so-called 'brought in dead' category are unlikely to be suitable as organ donors. If there are any doubts about suitability hospital staff should contact the local transplant team.

IV Approach to relatives 8-16

8 If a patient carries a signed donor card or has otherwise recorded his wishes[1] there is no legal requirement to establish lack of objection on the part of relatives, although it is good practice to take account of the views of close relatives. If a relative objects despite the known request by the patient, staff will need to judge according to the circumstances of the case whether it is wise to proceed with organ removal. Relatives may be under great stress, and staff have a duty to consider their feelings.

9 If a patient who has died is not known to have requested (in the required manner) that his organs be removed for transplantation after his death, the designated person may only authorise the removal if, having made such reasonable enquiry as may be practicable, he has no reason to believe:

a that the deceased had expressed an objection to his body being so dealt with after his death, and had not withdrawn it; or

b that the surviving spouse or any surviving relative of the deceased objects to the body being so dealt with.

The designated person need not enquire of the relatives himself but need only satisfy himself that such enquiries have been properly carried out.

10 Where a donor has lived closely with someone to whom he was not related it is advisable to try to seek the views of the cohabitee as well as those of the relatives.

11 There is no need for relatives to confirm their lack of objection in writing, but it is essential to keep a written record of the enquiries made and their outcome. This should be entered in the transplantation checklist. If relatives are asked to sign any form this should be worded in terms of lack of objection rather than consent - following the wording of the Human Tissue Act. A form used for giving consent to a post-mortem examination of the body is not suitable for this purpose.

12 Staff will need to decide in the light of individual circumstances who is best qualified to approach the relatives. This should be someone with appropriate experience who is aware how much the relatives already know about the patient's condition. It would normally be a hospital doctor with some seniority and experience in carrying out personal interviews of a sensitive nature and this may be a member of the transplant team.

[1] Under the Human Tissue Act, a request may be made by a person "in writing at any time or orally in the presence of two or more witnesses during his last illness".

There may be occasions, though, when the person best qualified to be given this responsibility is a senior nurse (for example, a ward sister), a chaplain or the family doctor. Any approaches should be made with proper sensitivity and a feeling for the relatives' distress. Their views should be sought whenever possible in a personal interview, only in quite exceptional circumstances should interviews be conducted by telephone.

13 Relatives should not normally be approached before death has occurred, but sometimes a relative approaches the hospital staff and suggests some time in advance that the patient's kidneys might be used for transplantation after his death. If the patient dies some appreciable time after this approach has been made, it may be appropriate to confirm with the relatives their lack of objection in case they have changed their minds. It sometimes happens, too, that relatives offer to consent to the removal of kidneys from a patient who has died but whose kidneys would not be suitable for transplantation. Such offers should be gratefully acknowledged and the opportunity can often be sensitively used to point out to relatives other tissues (such as corneas) from the donor which might be more suitable for transplantation.

14 The designated person's duty is only to make "such reasonable enquiry as may be practicable". The Working Party concurs with the view expressed in paragraph 11 of the Departments' Guidance Circulars on the Human Tissue Act (DHSS Circular HSC(IS)156, N Ireland Circular HSS(OS3)7/75, SHHD Circular NHS 1975(GEN)34, and Welsh Office Circular WHSC(IS)155) that "in most instances it will be sufficient to discuss the matter with any one relative who had been in close contact with the deceased, asking him his own views, the views of the deceased and also if he has any reason to believe that any other relative would be likely to object". There is no need actually to establish a lack of objection from all relatives before authorising the removal of organs, or to make enquiries which are unreasonable or impracticable. If a donor's relatives are found to be inaccessible it would be impracticable to ask them; and if they were, for example, young children or very seriously ill it would generally be unreasonable to do so. In such circumstances the designated person can proceed to give authorisation if he has no reason to believe that there is a relevant objection but a note of the enquiries made should be entered on the transplantation checklist.

15 The number of cases when a potential donor's views about organ removal cannot be established and his relatives cannot be contacted are very few, but in such cases it is generally reasonable to assume that if the donor has belonged to a religious group which objected to the removal of organs from a body he himself would have objected.[1]

16 Approaches to the parents of a dead child need a particularly high standard of sensitivity and tact; while the law does not demand parental consent, it should always be obtained in the case of a child.

---

[1] As far as is known no major religious grouping in the UK objects outright to the principles of organ donation and transplantation, although there are some who feel it is only permissible if the donor himself requested it before he died. These include in particular, Orthodox Jews, Muslims, Hindus and Christian Scientists. The Jehovah's Witnesses have religious objections to blood transfusion, but feel that donating or receiving organs is a matter for each Jehovah's Witness to decide for himself. It must therefore be assumed that people known to be of these faiths who die without leaving evidence of their wishes would have objected to the removal of their organs for transplantation.

V Confidentiality 17

17 The staff of hospitals and organ exchange organisations must respect the wishes of the donor, the recipient and their families with respect to anonymity. Organ transplants may arouse great public or personal interest, but the involvement of the media or of the donor's or recipient's families with each other could have a distressing effect for both the patient and his relatives. Payments to the donor's relatives in connection with kidney transplants are ethically unacceptable except for any out-of-pocket expenses for which they would be eligible in other circumstances.

VI Approach to Coroner or Procurator Fiscal 18-21

18 The Coroner or, in Scotland, the Procurator Fiscal need only be approached in connection with organ transplantation in cases which would ordinarily need to be reported to him because of the circumstances leading to the patient's death.

19 If the body is in England, Wales or Northern Ireland, and the designated person has reason to believe that an inquest may be required to be held on the body or that a post-mortem examination of the body may be required by the Coroner, the designated person may not authorise the removal of any organs unless the Coroner has given his consent. The arrangements for obtaining this consent vary from area to area, and it is necessary to ascertain in advance and follow the procedures set out by the local Coroner.

20 If the body is in Scotland, the designated person may not authorise the removal of any organs if the Procurator Fiscal has objected to such removal. If there is a reason to believe that the Procurator Fiscal may require a fatal accident inquiry or a post-mortem examination the consent of the Procurator Fiscal should be obtained before any organs are removed.

21 Initial contact for permission to remove the organs should be made by those who are most familiar with the local Coroner's or Procurator Fiscal's practice. This may be the hospital with the potential donor, or the transplant team. The Coroner or Procurator Fiscal should be told exactly which organs are to be removed (for example, kidneys, heart, liver). Hospital pathologists need to be involved only when they have been asked by a Coroner or Procurator Fiscal to act on his behalf. After removal of organs the donor's doctor should report the case in the usual way.

VII Pre-mortem treatment, tests and tissue-typing 22-27

22 Any tests or treatment carried out on a patient before he dies must be for his benefit and not solely to preserve his organs. Relatives who enquire should be left in no doubt about this. Nevertheless, it is appropriate to take extra blood for tests such as tissue-typing when blood is being taken for tests directly concerned with the patient's own care.[1]

[1]Tests to exclude the presence of antigens of viral hepatitis should also be included in the procedures, using an appropriate sample of blood. Such tests should be carried out by laboratories which are suitably designated to carry out this investigation (see The Howie Report: 'Code of Practice for the Prevention of Infection in Clinical Laboratories and Post-Mortem Rooms'. P4 - HMSO 1978. Issued with DHSS Circular HC(79)3, SHHD Circular NHS 1979(GEN)35, Welsh Office Circular WHC(79)5 and Northern Ireland Circular HSS(OS3)5/81).

23 The maintenance of normal homeostasis, by ensuring adequate fluid intake, normal blood pressure and the monitoring of urine output by catheter collection, is part of the standard medical care of the patient where brain death has not been conclusively established. It is also important to maintain the function of organs for transplantation.

24 After a patient is dead there is no legal objection to administering any drugs necessary to maintain the condition of the organs or to conducting the necessary diagnostic tests.[1]

25 Sometimes a patient thought to have irreversible brain damage, and who would be a suitable donor, stops breathing before it has been possible to make the necessary enquiries. In most cases of this kind brain death will not yet have been diagnosed and it will not be possible to say with certainty that it will inevitably occur. In such cases initiation of artificial ventilation as part of resuscitation is justified because it is of potential benefit for the patient.

26 Very occasionally it will be considered certain that death will inevitably occur shortly (in the case, for example, of gross trauma and progressive cerebral tumour). Despite what has been said in paragraph 13, in these cases doctors should seek the agreement of relatives for the initiation of artificial ventilation to preserve organ function before death has been diagnosed. If it is not possible to obtain the relatives' views before the situation arises, doctors should exercise their judgement in the light of the circumstances of the individual case whether or not to initiate artificial ventilation, so as to enable enquiries to be made about the views of the deceased and the relatives about the removal of organs after death has been diagnosed.

27 When a hospital has in its care a potential kidney donor (see section III) the sooner the local transplant team is approached the better. If contact is made before the patient is dead or authorisation for the removal of the organs has been given this should always be made clear. The transplant team should decide when to contact UK Transplant, which will usually be when tissue-typing is undertaken.

VIII Diagnosis of death 28-30

28 There is no legal definition of death. Death has traditionally been diagnosed by the irreversible cessation of respiration and heart-beat. This Working Party accepts the view held by the Conference of Royal Colleges[2] that death can also be diagnosed by the irreversible cessation of brain-stem function - 'brain death'. In diagnosing brain death the criteria laid down by the Colleges[3] should be followed.

[1] In Coroners' cases in Northern Ireland the provisions of section 9 of the Coroners' Act (Northern Ireland) 1959 must be complied with.

[2] 'Diagnosis of Death'. Br Med J 1979, i, 332; Lancet 1979, i, 261.

[3] 'Diagnosis of Brain Death'. A paper endorsed by the Conference of Royal Colleges and Faculties of the United Kingdom. Lancet 1976, ii, 1069-70; Br Med J 1976 ii, 1187-8. Copies of both the Royal Colleges' documents are at Appendix 5 to the Code.

29 When death is determined on the basis of brain death, or where it is proposed to remove organs within an hour after respiration and circulation have ceased, death should be diagnosed by the combination of doctors recommended by the Conference of Royal Colleges: a consultant, preferably the one in charge of the patient, and another consultant or senior registrar, clinically independent of the first, who shall assure themselves that the preconditions have been met before testing is carried out. Both shall have expertise in this field.[1] Neither doctor should be a member of the transplant team, and the results of the examination and the diagnosis should be recorded in the case notes. The transplantation checklist attached to this code includes a model checklist of criteria for diagnosing brain death. This should be completed, signed by both doctors and permanently retained in the patient's case notes.

30 The two doctors may carry out the tests separately or together. Even if the tests confirm brain death they should nevertheless be repeated. The interval between tests should be a matter for decision by the two doctors but should be adequate for reassurance of all those directly concerned. Death is only conclusively established when the criteria have been satisfied on two successive occasions. As a patient must be presumed to be alive until it is clearly established that he is dead, the time of death should be recorded as the time when death was conclusively established, not some earlier time or a later time when artificial ventilation is withdrawn, or the heart-beat ceases. Diagnosis of brain death should not normally be considered until at least six hours after the onset of coma or, if cardiac arrest was the cause of the coma, until 24 hours after the circulation has been restored.

IX Removal of organs 31-35

31 Before removal of the organs all practicable measures should be taken to ensure that their condition is optimal, otherwise they may prove to be unusable, or the patient who receives them may undergo a fruitless transplantation, or a period of unnecessary hazard and discomfort before the organs begin to function.

32 Drugs to maintain renal function should be given. Antibiotics may be required and fluid intake should be maintained. In respect of other drugs advice should be sought from the local transplant team whose responsibility it is to see that hospitals likely to have donors know what the requirements are and have supplies of the necessary drugs. Hypothermia occurring after death has been diagnosed need not be corrected because it may favour organ survival. Adequate ventilation must be maintained during this period.

33 Relatives who enquire should be told that some post-mortem treatment of the donor's body will be necessary if the organs are to be removed in good condition. Relatives sometimes wish to remain near the body of the deceased until the organs are actually removed and doctors should explain that this is impracticable.

34 It is ethical to maintain artificial ventilation and heart beat until the removal of organs has been completed. This is essential in the case of heart and liver transplants and many doctors think it desirable when removing kidneys. The removal should always be carried out under normal operating theatre

1 "Brain Death" letter from Professor J G Robson, Br Med J 1981, 283, 505, and Lancet 1981, ii, 365 - see Appendix 5.

conditions and may proceed at any convenient time after the diagnosis of death. The maintenance of artificial ventilation after this time should only exceptionally be continued beyond 12 hours. Kidneys must be removed within 60 minutes of cessation of circulation and it is desirable that this time is kept as short as practicable - less than 30 minutes if possible.

35 Removal must be effected by a fully registered medical practitioner[1] who should be an appropriately trained surgeon. He must have satisfied himself by personal examination of the body, that the patient is dead. He may not remove any organs unless he is satisfied that, where necessary, the Coroner has given his consent (or, if the body is in Scotland, that the Procurator Fiscal has not objected to the removal).

X Post-mortem treatment, distribution and transport 36-37

36 As techniques are constantly changing and being improved, advice should be sought from the local transplant team who should be responsible for bringing the necessary materials for preserving the organs in good condition. Each individual kidney should be accompanied by a sample of blood, a 2cm cube of spleen and a lymph node for further tissue-typing. Technical advances have made it unnecessary to move a donor to the place where the organ transplant is to take place (irrespective of which organ is to be transplanted).

37 The team which removes the kidneys should seek information from UK Transplant about the availability of recipients with close tissue matching but the final choice about recipients remains with the team.

XI Corneas 38

38 The Code is broadly applicable to the removal of eyes or corneas although the following additional points need to be made:

Paragraph 2: Sometimes a patient who has expressed a wish to donate his eyes dies at home, and the householder is normally the person lawfully in possession of the body.

Paragraphs 5 and 6: All adult patients are suitable as donors provided they have no known history of eye disease and have not undergone intraocular surgery. Those suffering from syphilis or infective hepatitis would also be unsuitable, and it would be prudent to exclude as donors those patients with post-infectious polyneuritis. Corneas from patients with neurologic disease suspected of having either a viral or 'immune' pathogenesis should not be used for transplantation. Children, too, are generally less suitable as donors because their corneal thickness is inadequate.

Paragraph 7: This does not apply to corneal donation. All patients (except as above) are suitable as donors irrespective of the cause of death. Thus the question of the diagnosis of death, by other than the traditional criteria, seldom arises.

[1] According to the Medical Acts the term 'fully registered medical practitioner' includes doctors with limited and provisional registration where the activity they are carrying out is part of the duties of the employment for which they hold such registration.

Paragraph 22: Tissue matched corneas are important in some complicated cases, and close co-operation between renal transplant surgeons and corneal surgeons should be encouraged here.

Paragraph 33: It is important to avoid visible signs of disfigurement after the eyes have been removed.

Paragraph 34: Eyes should be removed within an hour of the cessation of respiration and circulation if possible. However, useful eyes can be obtained up to 12 hours later. If the body has been kept in a refrigerated mortuary, this period can be extended to 24 hours. Operating theatre conditions are not required; eyes can be removed in the patient's home if necessary.

Paragraph 35: It is necessary for eyes to be removed by an appropriately trained person, though this need not necessarily be a fully trained surgeon.

RENAL TRANSPLANT UNITS

Appendix I

Northern
Royal Victoria Infirmary
Queen Victoria Road
Newcastle-upon-Tyne
NE1 4LP
Tel: 0632 325131

Yorkshire
St James Hospital
Leeds LS9 7TF
Tel: 0532 33144

Trent
Leicester General Hospital
Gwendolen Road
Leicester LE5 4PW
Tel: 0533 730222

Hallamshire Hospital
Glossop Road
Sheffield S10 2JF
Tel: 0742 20063

Nottingham City Hospital
Hucknall Road
Nottingham NG5 1PM
Tel: 0602 608111

East Anglia
Addenbrookes Hospital
Douglas House
Cambridge CB2 2QQ
Tel: 0223 245151

North-West Thames
Hammersmith Hospital
Du Cane Road
London W12 0HS
Tel: 01-743 2030

St Mary's Hospital
Praed Street
London W2 1NY
Tel: 01-262 1280

Charing Cross Hospital
Fulham Palace Road
London W6 8RF
Tel: 01-748 2050

North-East Thames
St Paul's Hospital
Endell Street
London WC2H 8AE
Tel: 01-836 9611

St Bartholomew's Hospital
West Smithfield
London EC1A 7BE
Tel: 01-739 3911

The Royal Free Hospital
Lawn Road
London NW3
Tel: 01-794 0500

The London Hospital
Whitechapel
London E1 1BB
Tel: 01-247 5454

South-East Thames
Guy's Hospital
St Thomas Street
London SE1 9RT
Tel: 01-407 7600

St Thomas' Hospital
Lambeth Palace Road
London SE1 7EH
Tel: 01-928 9292

King's College Hospital
Denmark Hill
London SE5 9RS
Tel: 01-693 3377

Wessex
St Mary's General Hospital
Milton Road
Portsmouth
Hants PO3 6AD
Tel: 0705 22331

Oxford
Churchill Hospital
Headington
Oxford OX3 7LJ
Tel: 0865 64841

South Western
Southmead Hospital
Westbury-on-Trym
Bristol BS10 5NB
Tel: 0272 505050

Whipton Hospital
Hospital Lane
Exeter
Devon EX1 3RB
Tel: 0392 68497

Freedom Fields Hospital
Plymouth PL4 7JJ
Tel: 0752 68080

From April 1983
Royal Devon and
Exeter Hospital
Barrack Road
Exeter EX2 5DW
Tel: 0392 77833

West Midlands
The Queen Elizabeth
Hospital
Edgbaston
Birmingham B15 2TH
Tel: 021-472 1311

Mersey
Royal Liverpool Hospital
Prescot Street
Liverpool L7 8XP
Tel: 051-708 0163
051-709 0141

North Western
Royal Infirmary
Oxford Road
Manchester M13 9WL
Tel: 061-273 3300

SCOTLAND

Western Infirmary
Glasgow G11 6NT
Tel: 041-339 8822

Western General Hospital
Crewe Road
Edinburgh EH4 2XU
Tel: 031-332 2525

Aberdeen Royal Infirmary
Foresterhill
Aberdeen AB9 2ZB
Tel: 0224 681818

WALES

Royal Infirmary
Newport Road
Cardiff CF2 1SZ
Tel: 0222 492233

NORTHERN IRELAND

Belfast City Hospital
Lisburn Road
Belfast BT9 7AB
Tel: 0232 229241

CENTRES CARRYING OUT CORNEAL GRAFTING

Appendix 2

Northern

Sunderland Eye Infirmary
Queen Alexandra Road
Sunderland SR2 9HP
Tel: 0783 283616

Darlington Memorial Hospital
Hundens Lane
Darlington DL3 6HX
Tel: 0325 60100

North Riding Infirmary
Middlesbrough TS1 5JE
Tel: 0642 46002

Cumberland Infirmary
Carlisle CA2 7HY
Tel: 0228 23444

North Lonsdale Hospital
Barrow-in-Furness
Cumbria
Tel: 0229 24201

Newcastle General Hospital
Westgate Road
Newcastle-upon-Tyne
NE4 6BE
Tel: 0632 38811

Royal Victoria Infirmary
Queen Victoria Road
Newcastle-upon-Tyne
NE1 4LP
Tel: 0632 325131

Yorkshire

Hull Royal Infirmary
Anlaby Road
Hull HU3 2JZ
Tel: 0482 28541

Grimsby General Hospital
South Parade
Grimsby DN31 1TZ
Tel: 0472 59901

Scunthorpe General Hospital
Cliff Gardens
Scunthorpe DN15 7BH
Tel: 0724 843481

York District Hospital
Wigginton Road
York YO3 7HE
Tel: 0904 31313

Scarborough Hospital
Scalby Road
Scarborough YO12 6QL
Tel: 0723 2121

Harrogate District Hospital
Lancaster Park Road
Harrogate HG2 7SL
Tel: 0423 885959

Bradford Royal Infirmary
Duckworth Lane
Bradford BD9 6RL
Tel: 0274 42200

Royal Halifax Infirmary
Free School Lane
Halifax HX1 2YP
Tel: 0422 57222

Huddersfield Royal Infirmary
Lindley
Huddersfield HD3 3EA
Tel: 0484 22191

Dewsbury General Hospital
Moorlands Road
Dewsbury WF13 2LE
Tel: 0924 465111

Leeds General Infirmary
Great George Street
Leeds LS1 3EX
Tel: 0532 32799

St James's University Hospital
Beckett Street
Leeds LS9 7TF
Tel: 0532 33144

Pinderfields General Hospital
Aberford Road
Wakefield WF1 4DG
Tel: 0924 375217

Trent

Barnsley District General Hospital
Barnsley
Tel: 0226 86122

Pilgrim Hospital
Sibsey Road
Boston
Tel: 0205 64801

The Royal Hospital
Holywell Street
Chesterfield
Tel: 246 77271

Derbyshire Royal Infirmary
London Road
Derby DE1 2QY
Tel: 0332 47141

Doncaster Royal Infirmary
Doncaster
Tel: 0302 66666

Leicester Royal Infirmary
Infirmary Square
Leicester LE1 5WW
Tel: 0533 541414

Lincoln County Hospital
Sewell Road
Lincoln
Tel: 0522 29921

Nottingham Eye Hospital
The Ropewalk
Nottingham
Tel: 0602 46161

Hallamshire Hospital
Glossop Road
Sheffield S10 2JF
Tel: 0742 26484

East Anglia
West Suffolk Hospital
Hardwick Lane
Bury St Edmunds
Suffolk IP33 2QZ
Tel: 0294 63131

Ipswich Hospital
Anglesea Road Wing
Anglesea Road
Ipswich IP1 3P7
Tel: 0473 51021

West Norwich Hospital
Bowthorpe Road
Norwich
Norfolk NR2 3TU
Tel: 0603 28377

West Norfolk & Kings Lynn
General Hospital
London Road
Kings Lynn
Tel: 0553 66111

Addenbrookes Hospital
Hills Road
Cambridge CB2 2QQ
Tel: 0223 64341

Peterborough District
Hospital
Thorpe Road
Peterborough PE3 6DA
Tel: 0733 67451

North-West Thames
Luton and Dunstable
Hospital
Lewsey Road
Luton LU4 0DZ
Tel: 0582 53211

St Albans City Hospital
Normandy Road
St Albans
Herts AL3 5PN
Tel: 56 66122

Edgware General Hospital
Edgware
Middlesex HA8 0AD
Tel: 01-952 2381

Charing Cross Hospital
Fulham Palace Road
London W6 8RF
Tel: 01-748 2040

West Middlesex Hospital
Twickenham Road
Isleworth
Middlesex
Tel: 01-560 2121

Western Ophthalmic
Hospital
Marylebone Road
London NW1 5YE
Tel: 01-402 4211

Westminster Hospital
Dean Ryle Street
London SW1 2AP
Tel: 01-828 9811

St Stephen's Hospital
Fulham Road
London SW10 9TH
Tel: 01-352 8161

Ashford Hospital
London Road
Ashford
Middlesex TW15 3AA
Tel: 69 51188

North-East Thames
Chelmsford & Essex
Hospital
London Road
Chelmsford
Essex
Tel: 0245 83331

Myland Hospital
Mill Road
Colchester
Tel: 0206 69244

Southend General Hospital
Prittlewell Chase
Westcliff-on-Sea
Tel: 0702 48911

Oldchurch Hospital
Oldchurch Road
Romford
Essex RM7 0BE
Tel: 70 46090

University College Hospital
Gower Street
London WC1E 6JD
Tel: 01-387 9300

Middlesex Hospital
Mortimer Street
London W1N 8AA
Tel: 01-636 8333

North Middlesex Hospital
Silver Street
London N18 1QX
Tel: 01-807 3071

Whipps Cross Hospital
Whipps Cross Road
Leytonstone
London E11 1NR
Tel: 01-539 5522

Moorfields Eye Hospital
City Road
London EC1V 2PD
Tel: 01-253 3411
(Eye bank for region)

South-East Thames
Greenwich District Hospital
Vanburgh Hill
London SE10 9HE
Tel: 01-858 8141

Eastbourne District
General Hospital
Kings Drive
Eastbourne
Tel: 0323 21351

Kent and Canterbury
Hospital
Ethelbert Road
Canterbury
Kent CT1 3NG
Tel: 0227 66877

Kent County Ophthalmic
and Aural Hospital
Church Street
Maidstone Kent
Tel: 0622 673444

Royal East Sussex Hospital
Cambridge Road
Hastings
Sussex TN34 1ER
Tel: 0424 434513

Kent & Sussex Hospital
Mount Ephraim
Tunbridge Wells
Tel: 0892 26111

Queen Victoria Hospital
(designated unit)
Holtye Road
East Grinstead
Sussex RH19 3DZ
Tel: 0342 24111

Sussex Eye Hospital
Eastern Road
Brighton BN2 5BF
Tel: 0273 66126

St Thomas' Hospital
Lambeth Palace Road
London SE1 7EH
Tel: 01-928 9292

Guy's Hospital
St Thomas Street
London SE1 9RT
Tel: 01-407 7600

South-West Thames
Farnham Road Hospital
Farnham Road
Guildford
Surrey GU2 5LX
Tel: 0483 71122

East Surrey Hospital
Shrewsbury Road
Redhill
Surrey RH1 6BQ
Tel: 91 65081

Worthing Hospital
Lyndhurst Road
Worthing
Tel: 0903 205111

Waddon Hospital
Purley Way
Croydon
Surrey CR9 4PL
Tel: 01-684 6999

Kingston General Hospital
Galsworthy Road
Kingston-on-Thames
Surrey KT2 7QB
Tel: 01-546 7711

St George's Hospital
Blackshaw Road
London SW17 0QT
Tel: 01-672 1255

Sutton Hospital
Cotswold Road
Sutton
Surrey SM2 5NF
Tel: 01-642 6090

Wessex
Weymouth & Dorset
Royal Eye Infirmary
9 Greenhill
Weymouth Dorset
Tel: 03057 72211

Royal Isle of Wight
County Hospital
Swanmore Road
Ryde Isle of Wight
Tel: 0983 63311

Basingstoke District
Hospital
Aldermaston Road
Basingstoke RG24 9NA
Tel: 0256 3202

Royal Victoria Hospital
Poole Road
Westbourne
Bournemouth
Tel: 0202 61332

Queen Alexandra Hospital
Cosham
Portsmouth
Hants PO6 3LY
Tel: 07018 79451

Southampton Eye Hospital
Wilton Avenue
Southampton
Hants SO9 4XW
Tel: 0703 22208

Royal Hampshire
County Hospital
Romsey Road
Winchester Hants
Tel: 0962 63555

Salisbury General Hospital
General Infirmary Branch
Fisherton Street
Salisbury
Wilts SP2 7SX
Tel: 0722 6212

Princess Margaret Hospital
Okus Road
Swindon
Wilts SN1 4JU
Tel: 0793 62131

Royal United Hospital
Combe Park
Bath BA1 3NG
Tel: 0225 28331

Oxford
Oxford Eye Hospital
Woodstock Road
Oxford OX2 6HE
Tel: 0865 49891

Northampton General
Hospital
Billing Road
Northampton NN1 5BD
Tel: 0604 34700

Stoke Mandeville Hospital
Mandeville Road
Aylesbury
Bucks HP21 8AL
Tel: 0296 84111

Royal Berkshire Hospital
London Road
Reading
Berks RG1 5AN
Tel: 0734 85111

South Western
Bristol Eye Hospital
Lower Maudlin Street
Bristol BS1 2LX
Tel: 0272 25535

Falmouth & District
Hospital
(Ophthalmology Unit)
Trescobeas Road
Falmouth
Cornwall TR11 2JA
Tel: 0326 311841

West of England
Eye Infirmary
Magdalen Street
Exeter
Devon EX2 4HT
Tel: 0392 73183

Royal Eye Infirmary
Apsley Road
Plymouth PL4 6PL
Tel: 0752 62078

Torbay Hospital
Lawe's Bridge
Newton Road
Torquay
Devon TA2 7AA
Tel: 0803 64567

Gloucestershire Royal
Hospital
Great Western Road
Gloucester GL1 3NN
Tel: 0452 28555

West Midlands
Birmingham and Midland
Eye Hospital
Church Street
Birmingham B3 2NS
Tel: 021-236 4911

Paybody Hospital
Birmingham Road
Allesley
Coventry CV5 9AA
Tel: 0203 24055

Warneford Hospital
Radford Road
Leamington Spa
Warwickshire
Tel: 0926 27121

Wolverhampton and
Midland Counties Eye
Infirmary
Compton Road
Wolverhampton WV3 9QR
Tel: 0902 26731

North Staffordshire Royal Infirmary
Princes Road
Hartshill
Stoke-on-Trent
Staffs ST4 7LN
Tel: 0782 49144

Burton General Hospital
New Street
Burton on Trent
Staffs
Tel: 0283 63334

Ear, Eye and Throat Hospital
Murivance
Shrewsbury
Salop SY1 1JS
Tel: 0743 55771

Queen Elizabeth Hospital
Queen Elizabeth Medical Centre
Edgbaston
Birmingham B15 2TH
Tel: 021-472 1311

Selly Oak Hospital
Raddle Barn Road
Selly Oak
Birmingham B29 6JB
Tel: 021-472 5313

Kidderminster General Hospital
Bewdley Road
Kidderminster
Worcs
Tel: 0562 3424

Worcester Eye Hospital
Barbourne Road
Worcester WR1 1RY
Tel: 0905 24017

Bromsgrove General Hospital
Bromsgrove
Worcs B61 0BB
Tel: 0527 73321

Smallwood Hospital
Redditch
Worcs B97 4BD
Tel: 0527 62312

Mersey
St Paul's Eye Hospital
Old Hall Street
Liverpool L3 9PF
Tel: 051-236 6766

St Helens Hospital
Marshalls Cross Road
St Helens WA9 3EA
Tel: 0744 26633

Chester Royal Infirmary
St Martins Way
Chester CH1 2AZ
Tel: 0244 28261

Whiston Hospital
Warrington Road
Whiston
Prescot L35 5DR
Tel: 051-426 1600

North Western
Royal Albert Edward Infirmary
Wigan Lane
Wigan
Lancs
Tel: 0942 44000

Birch Hill Hospital
Rochdale
Lancs OL1 9QB
Tel: 0706 77777

Royal Eye Hospital
Oxford Road
Manchester M13 0JH
Tel: 061-273 3300

Oldham Royal Infirmary
Union Street West
Oldham OL8 1DJ
Tel: 061-624 0420

Stepping Hill Hospital
Poplar Grove
Stockport
Cheshire SK2 7JE
Tel: 061-483 1010

Lancaster Moor Hospital
Quernmore Road
Lancaster LA1 3JR
Tel: 0524 65241

Victoria Hospital
Thursby Road
Burnley
BB10 3HP
Tel: 0282 25071

Victoria Hospital
Whinney Heys Road
Blackpool
FY3 8NR
Tel: 0253 34111

Preston Royal Infirmary
Deepdale Road
Preston
PR1 6PS
Tel: 0772 54747

SCOTLAND

Argyll & Clyde
Royal Victoria
Eye Infirmary
Mansion House Road
Paisley PA1 3RQ
Tel: 041-887 9111

Fife
Victoria Hospital
Hayfield Road
Kirkcaldy
Fife KY2 5AH
Tel: 0592 61155

Greater Glasgow
Western Infirmary
Dumbarton Road
Glasgow G11 6NT
Tel: 041-339 8822

Canniesburn Hospital
Switchback Road
Bearsden
Glasgow G61 1QN
Tel: 041-942 2255

Southern General Hospital
1345 Govan Road
Glasgow G51 4TF
Tel: 041-445 2466

Gartnavel General Hospital
1055 Great Western Road
Glasgow G12 0YN
Tel: 041-334 8122

Stobhill Hospital
133 Balornock Road
Glasgow G21 3UW
Tel: 041 5580111

Lothian
Princess Alexandra
Eye Pavilion
Royal Infirmary
of Edinburgh
Lauriston Place
Edinburgh EH3 9YW
Tel: 031-229 2477

Ayrshire and Arran
Heathfield Hospital
Ayr KA8 9DZ
Tel: 0292 68621

Grampian
Woodend General Hospital
Aberdeen AB9 2YS
Tel: 0224 681818

Aberdeen Royal Infirmary
Foresterhill
Aberdeen AB9 2ZB
Tel: 0224 681818

Tayside
Ninewells Hospital and
Medical School
Dundee DD1 9SY
Tel: 0382 60111

Highland
Royal Northern Infirmary
Ness Walk
Inverness IV3 5SF
Tel: 0462 34411

WALES

Maelor General Hospital
Croesnewydd Road
Wrexham Clwyd
Tel: 0978 53153

West Wales
General Hospital
Glangwili
Carmarthen
Tel: 0267 5151

HM Stanley Hospital
St Asaph
Clwyd
Tel: 0745 583275

Bridgend General Hospital
Quarella Road
Bridgend
Mid Glamorgan
CF31 1JS
Tel: 0656 3341

East Glamorgan General
Hospital
Church Village
Nr Pontypridd
Mid Glamorgan CF38 1AA
Tel: 044362 4242/3331

University Hospital of Wales
Heath Park
Cardiff CF4 7XY
Tel: 0222 755944

Prince Charles Hospital
Gurnos
Merthyr Tydfil
Mid Glamorgan
Tel: 0685 71111

Caernarvon Eye and
Cottage Hospital
Caernarvon
Gwynedd LL55 1ES
Tel: 0286 2286

St Woolos Hospital
131 Stow Hill
Newport
Gwent NPT 4SZ
Tel: 0633 52244

NORTHERN IRELAND

Royal Victoria Hospital
Grosvenor Road
Belfast BT12 6BA
Tel: 0232 240503

Name of patient . . . . . Age . . . . .

Home address . . . . . .

Hospital number . . . . . .

Name and address of next of kin . . . . . .

. . . . . .

Address of local transplant team . . . . . .

. . . . . Tel: . . . . . .

Part A Administrative and legal measures

Code of Practice Paragraph

---

29 I **Diagnosis of Death** *(see Part C for checklist of criteria for diagnosis of brain death)*

Date and time diagnosis made . . . . . .

30 Names and status of doctors carrying out diagnosis

1 . . . . . .

2 . . . . . .

---

8 II **If a request had been made for removal of organs after death for transplantation specify nature of request, and which organs**

Has patient requested removal of organs? If so, how . . . . . .

Organs specified . . . . . .

Views of relatives, if known . . . . . .
(Provided this is not a Coroner's or Procurator Fiscal's case authorisation may now be given)

---

9 **III If there is no evidence that a patient had requested the removal of his organs specify enquiries made**

12 Name and status of person(s) making enquiries . . . . . .

9, 10 Name and relationship of person(s) approached (for example, parent, spouse, friend, co-habitee) . . . . . .

. . . . . .

12 Date and nature (that is, personal/telephone) and outcome of interview(s)

. . . . . .

If such reasonable enquiry as may be practicable was made, but views could not be obtained, state reasons . . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

(Provided this is not a Coroner's/Procurator Fiscal's case authorisation may now be given if there is no reason to believe that there is a relevant objection)

18-20 **IV If case is one normally to be reported to Coroner/Procurator Fiscal his consent to removal of organs must be obtained**

21 Name and status of person approaching Coroner/Procurator Fiscal . . . . . .

. . . . . .

21 Organs specified for removal . . . . . .

Date and time consent given . . . . . .

If consent withheld, state reasons . . . . . .

(Individual hospitals are advised to add a passage here setting out local Coroner's/Procurator Fiscal's practice)

Authorisation

Date and time authorisation given . . . . . .

How given (telephone, orally, etc) . . . . . .

Signature of person to whom authorisation communicated . . . . . .

Name of designated person . . . . . .

---

35 **V Removal of organs**

Name of doctor carrying out removal . . . . . .

35 Is doctor removing organs satisfied

a by personal examination of the body that the patient is dead

b where necessary, Coroner has given consent/ Procurator Fiscal has not objected

34 Time organs removed . . . . . .

Any relevant pathology . . . . . .

Part B Clinical Checklist for Renal Transplantation

Code of Practice Paragraph		Yes	No
22	Tissue typing samples sent		
	Hepatitis antigen negative		
6	Previous cancer (excl. primary brain tumours		
6	Previous renal disease		
6	Pre-existing hypertension		
6	Any systemic infection		
6	Any urinary infection		
23	Is patient adequately hydrated?		
23	Is patient adequately ventilated?		
23	Is patient adequately perfused?		
23	Is renal function being monitored?		

Part C Criteria for Diagnosis of Brain Death

Diagnosis to be made by two independent doctors, one a consultant and the other a consultant or senior registrar. Diagnosis should not normally be considered until at least 6 hours after the onset of coma or, if cardiac arrest was the cause of the coma, until 24 hours after the circulation has been restored.

Name . . . . Unit No . . . . . .

PRE-CONDITIONS

Are you satisfied that the patient suffers from a condition that has led to irremediable brain damage? Specify the condition:

Time of onset of unresponsive coma:

Dr A . . . .

Dr B . . . .

Are you satisfied that potentially reversible causes for the patient's condition have been adequately excluded, in particular:

	Dr A	*Dr B*
Depressant drugs		
Neuromuscular blocking (relaxant) drugs		
Hypothermia		
Metabolic or endocrine disturbances		

TESTS FOR ABSENCE OF BRAIN-STEM FUNCTION

	Dr A		*Dr B*	
	1st testing	2nd testing	1st testing	2nd testing
Do the pupils react to light?				
Are there corneal reflexes?				
Is there eye movement on caloric testing?				
Are there motor responses in the cranial nerve distribution, in response to stimulation of face, limbs or trunk?				

	Dr A		*Dr B*	
	1st testing	2nd testing	1st testing	2nd testing
Is there a gag reflex? (If the test is practicable)				
Is there a cough reflex?				
Have the recommendations concerning testing for apnoea been followed?*				
Were any respiratory movements seen?				

	Dr A	*Dr B*
Date and time of first testing	. . . . .	
Date and time of second testing	. . . . .	

(As stated in paragraph 30 of the "Code of Practice" the two doctors may carry out the tests separately or together.)

Dr A Signature . . . . . Dr B Signature . . . . . .

Status . . . . . Status . . . . . .

---

*Diagnosis of Brain Death. Br Med J 1976, ii, 1187-8.
See note (b) on page 35 of the Code of Practice.

†The relevant Act in Northern Ireland is the Human Tissue Act (Northern Ireland) 1962

CHAPTER 54

An Act to make provision with respect to the use of parts of bodies of deceased persons for therapeutic purposes and purposes of medical education and research and with respect to the circumstances in which post-mortem examinations may be carried out; and to permit the cremation of bodies removed for anatomical examination.

[27th July, 1961]

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

Removal of parts of bodies for medical purposes.

1.—(1) If any person, either in writing at any time or orally in the presence of two or more witnesses during his last illness, has expressed a request that his body or any specified part of his body be used after his death for therapeutic purposes or for purposes of medical education or research, the person lawfully in possession of his body after his death may, unless he has reason to believe that the request was subsequently withdrawn, authorise the removal from the body of any part or, as the case may be, the specified part, for use in accordance with the request.

(2) Without prejudice to the foregoing subsection, the person lawfully in possession of the body of a deceased person may authorise the removal of any part from the body for use for the said purposes if, having made such reasonable enquiry as may be practicable, he has no reason to believe—

(*a*) that the deceased had expressed an objection to his body being so dealt with after his death, and had not withdrawn it; or

(*b*) that the surviving spouse or any surviving relative of the deceased objects to the body being so dealt with.

Post-m
exami
2 & 3
c. 75.

(3) Subject to subsections (4) and (5) of this section, the removal and use of any part of a body in accordance with an authority given in pursuance of this section shall be lawful.

(4) No such removal shall be effected except by a fully registered medical practitioner, who must have satisfied himself by personal examination of the body that life is extinct.

(5) Where a person has reason to believe that an inquest may be required to be held on any body or that a post-mortem examination of any body may be required by the coroner, he shall not, except with the consent of the coroner,—

(*a*) give an authority under this section in respect of the body; or

(*b*) act on such an authority given by any other person.

(6) No authority shall be given under this section in respect of any body by a person entrusted with the body for the purpose only of its interment or cremation.

(7) In the case of a body lying in a hospital, nursing home or other institution, any authority under this section may be given on behalf of the person having the control and management thereof by any officer or person designated for that purpose by the first-mentioned person.

(8) Nothing in this section shall be construed as rendering unlawful any dealing with, or with any part of, the body of a deceased person which is lawful apart from this Act.

(9) In the application of this section to Scotland, for subsection (5) there shall be substituted the following subsection:—

"(5) Nothing in this section shall authorise the removal of any part from a body in any case where the procurator fiscal has objected to such removal."

Post-mortem examinations.
2 & 3 Will. 4. c. 75.

2.—(1) Without prejudice to section fifteen of the Anatomy Act, 1832 (which prevents that Act from being construed as applying to post-mortem examinations directed to be made by a competent legal authority), that Act shall not be construed as applying to any post-mortem examination carried out for the purpose of establishing or confirming the causes of death or of investigating the existence or nature of abnormal conditions.

(2) No post-mortem examination shall be carried out otherwise than by or in accordance with the instructions of a fully registered medical practitioner, and no post-mortem examination which is not directed or requested by the coroner or any other competent legal authority shall be carried out without the authority of the person lawfully in possession of the body; and subsections (2), (5), (6) and (7) of section one of this Act shall, with the necessary modifications, apply with respect to the giving of that authority.

Cremation of bodies after anatomical examination.

3. The provision to be made and the certificate to be transmitted under section thirteen of the Anatomy Act, 1832, in respect of a body removed for anatomical examination may, instead of being provision for and a certificate of burial, as mentioned in that section, be provision for the cremation of the body in accordance with the Cremation Acts, 1902 and 1952, and a certificate of the cremation.

2 Edw. 7. c. 8.
15 & 16 Geo. 6. & 1 Eliz. 2. c. 31.

Short title, etc.

4.—(1) This Act may be cited as the Human Tissue Act, 1961.

15 & 16 Geo. 6. & 1 Eliz. 2. c. 28.

(2) The Corneal Grafting Act, 1952, is hereby repealed.

(3) This Act shall come into operation at the expiration of a period of two months beginning with the day on which it is passed.

(4) This Act does not extend to Northern Ireland.

'DIAGNOSIS OF BRAIN DEATH' AND 'DIAGNOSIS OF DEATH'

Appendix 5

Papers produced by the Conference of Medical Royal Colleges and Faculties of the United Kingdom.

I Diagnosis of Brain Death (October 1976)

With the development of intensive-care techniques and their wide availability in the United Kingdom it has become commonplace for hospitals to have deeply comatose and unresponsive patients with severe brain damage who are maintained on artificial respiration by means of mechanical ventilators. This state has been recognised for many years and it has been the concern of the medical profession to establish diagnostic criteria of such rigour that on their fulfilment the mechanical ventilator can be switched off, in the secure knowledge that there is no possible chance of recovery.

There has been much philosophical argument about the diagnosis of death which has throughout recorded history been accepted as having occurred when the vital functions of respiration and circulation have ceased. However, with the technical ability to maintain these functions artificially the dilemma of when to switch off the ventilator has been the subject of much public interest. It is agreed that permanent functional death of the brain-stem constitutes brain death and that once this has occurred further artificial support is fruitless and should be withdrawn. It is good medical practice to recognise when brain death has occurred and to act accordingly, sparing relatives from the further emotional trauma of sterile hope.

Codes of practice, such as the Harvard criteria (1968)[1], have been devised to guide medical practitioners in the diagnosis of brain death. These have provided considerable help with the problem and they have been refined as the knowledge gained from experience has been collated.

More recently Forrester[2] has written on established practice in Scotland and Jennett[3] has made useful observations. The diagnostic criteria presented for brain death here have been written with the advice of the sub-committee of the Transplant Advisory Panel, the working-party of the Royal College of Physicians, the working-party of the Faculty of Anaesthetists, and the Royal College of Surgeons and have been approved by the Conference of Medical Royal Colleges and their Faculties in the United Kingdom. They are accepted as being sufficient to distinguish between those patients who retain the functional capacity to have a chance of even partial recovery and those where no such possibility exists.

Conditions under which the Diagnosis of Brain Death should be considered

1. *The patient is deeply comatose.*

(a) There should be no suspicion that this state is due to depressant drugs. *Note 1*

(b) Primary hypothermia as a cause of coma should have been excluded.

(c) Metabolic and endocrine disturbances which can be responsible for or can contribute to coma should have been excluded. *Note 2*

2. *The patient is being maintained on a ventilator because spontaneous respiration had previously become inadequate or had ceased altogether.*

(a) Relaxants (neuromuscular blocking agents) and other drugs should have been excluded as a cause of respiratory inadequacy or failure. *Note 3*

3. *There should be no doubt that the patient's condition is due to irremediable structural brain damage. The diagnosis of a disorder which can lead to brain death should have been fully established. Note 4*

NOTES

Note 1

Narcotics, hypnotics, and tranquillisers may have prolonged duration of action particularly when some hypothermia exists. The benzodiazepines are markedly cumulative and persistent in their actions and are commonly used as anticonvulsants or to assist synchronisation with mechanical ventilators. It is therefore recommended that the drug history should be carefully reviewed and adequate intervals allowed for the persistence of drug effects to be excluded. This is of particular importance in patients where the primary cause of coma lies in the toxic effects of drugs followed by anoxic cerebral damage.

Note 2

Metabolic and endocrine factors contributing to the persistence of coma must be subject to careful assessment. There should be no profound abnormality of the serum-electrolytes, acid-base balance, or blood glucose.

Note 3

Immobility, unresponsiveness, and lack of spontaneous respiration may be due to the use of neuromuscular blocking drugs and the persistence of their effects should be excluded by elicitation of spinal reflexes (flexion or stretch) or by the demonstration of adequate neuromuscular condition with a conventional nerve stimulator. Equally, persistent effects of hypnotics and narcotics should be excluded as the cause of respiratory failure.

Note 4

It may be obvious within hours of a primary intra-cranial event such as severe head injury, spontaneous intra-cranial haemorrhage or following neurosurgery that the condition is irremediable. However, when a patient has suffered primarily from cardiac arrest, hypoxia or severe circulatory insufficiency with an indefinite period of cerebral anoxia, or is suspected of having cerebral air or fat embolism then it may take much longer to establish the diagnosis and to be confident of the prognosis. In some patients the primary pathology may be a matter of doubt and a confident diagnosis may only be reached by continuity of clinical observation and investigation.

Diagnostic tests for the confirmation of Brain Death

All brain-stem reflexes are absent:

(i) The pupils are fixed in diameter and do not respond to sharp changes in the intensity of incident light.

(ii) There is no corneal reflex.

(iii) The vestibulo-ocular reflexes are absent. *Note (a)*

(iv) No motor responses within the cranial nerve distribution can be elicited by adequate stimulation of any somatic area.

(v) There is no gag reflex or reflex response to bronchial stimulation by a suction catheter passed down the trachea.

(vi) No respiratory movements occur when the patient is disconnected from the mechanical ventilator for long enough to ensure that the arterial carbon dioxide tension rises above the threshold for stimulation of respiration. *Note (b)*

Note (a)
Vestibulo-ocular reflexes. These are absent when no eye movement occurs during or following the slow injection of 20 ml of ice-cold water into each external auditory meatus in turn, clear access to the tympanic membrane having been established by direct inspection. This test may be contra-indicated on one or other side by local trauma.

Note (b)
Disconnection from the ventilator. During this test it is necessary for the arterial carbon dioxide tension to exceed the threshold for respiratory stimulation - that is, the $PaCO_2$ should normally reach 6.65kPa (50 mmHg). This is best achieved by measurement of the blood gases; if this facility is available it is recommended that the patient should be disconnected when the $PaCO_2$ reaches 5.33-6.00kPa (40-45 mm Hg) following administration of 5% CO_2 in oxygen through the ventilator. This starting level has been chosen because patients may be moderately hypothermic (35^oC - 37^oC), flaccid, and with a depressed metabolic rate, so that the arterial carbon dioxide tension rises only slowly in apnoea (about 0.26kPa/min, or 2 mm Hg/min). (Hypoxia during disconnection should be prevented by delivering oxygen at 6 litres/min through a catheter into the trachea). If blood-gas analysis is not available to measure the $PaCO_2$ and PaO_2 the alternative procedures is to supply the ventilator with pure oxygen for 10 minutes (pre-oxygenation), then with 5% CO_2 in oxygen for 5 minutes and to disconnect the ventilator for 10 minutes, while delivering oxygen at 6 litres/min by catheter into the trachea. This establishes diffusion oxygenation and ensures that during apnoea hypoxia will not occur even in 10 or more minutes of respiratory arrest. Those patients with pre-existing chronic respiratory insufficiency, who may be unresponsive to raised levels of carbon dioxide and who normally exist on an hypoxic drive, are special cases and should be expertly investigated with careful blood-gas monitoring.

Other considerations

1. *Repetition of Testing*

It is customary to repeat the tests to ensure that there has been no observer error. The interval between tests must depend upon the primary pathology and the clinical course of the disease. Note 4 indicates some conditions where it would be unnecessary to repeat them since a prognosis of imminent brain death can be accepted as being obvious.

In some conditions the outcome is not so clear cut and in these it is recommended that the tests should be repeated. The interval between tests depends upon the progress of the patient and might be as long as 24 hours. This is a matter for medical judgement and repetition time must be related to the signs of improvement, stability, or deterioration which present themselves.

2. *Integrity of Spinal Reflexes*

It is well established that spinal-cord function can persist after insults which irretrievably destroy brain-stem function. Reflexes of spinal origin may persist or return after an initial absence in brain dead patients.[4]

3. *Confirmatory Investigations*

It is now widely accepted that electro-encephalography is not necessary for the diagnosis of brain death.[5-9] Indeed this

view was expressed from Harvard in 1969[10] only a year after the publication of their original criteria.

Electro-encephalography has its principal value at earlier stages in the care of patients, in whom the original diagnosis is in doubt. When electro-encephalography is used, the strict criteria recommended by the Federation of EEG Societies[11] must be followed.

Other investigations such as cerebral angiography or cerebral blood-flow measurements are not required for the diagnosis of brain death.

4. *Body Temperature*

The body temperature in these patients may be low because of depression of central temperature regulation by drugs or by brain-stem damage and it is recommended that it should not be less than 35°C before the diagnostic tests are carried out. A low-reading thermometer should be used.

5. *Specialist Opinion and the Status of the Doctors Concerned*

Experienced clinicians in intensive care units, acute medical wards, and accident and emergency departments should not normally require specialist advice. Only when the primary diagnosis is in doubt is it necessary to consult with a neurologist or neurosurgeon.

Decision to withdraw artificial support should be made after all the criteria presented above have been fulfilled and can be made by any one of the following combinations of doctors:

(a) a consultant who is in charge of the case and one other doctor.

(b) In the absence of a consultant, his deputy, who should have been registered for 5 years or more and who should have had adequate previous experience in the care of such cases and one other doctor.

References

[1] Report of the Ad Hoc Committee of Harvard Medical School to examine the definition of brain death. Definition of irreversible coma. *Journal of the American Medical Association, 1968, 205, 337.*

[2] Forrester, A C. Brain Death and the donation of cadaver kidneys. *Health Bulletin,* 1976, 34, 199.

[3] Jennett, B. The donor doctor's dilemma: observations on the recognition and management of brain death. *Journal of Medical Ethics,* 1975, 1, 63.

[4] Ivan, L P. Spinal reflexes in cerebral death. *Neurology,* 1973, 23, 650.

[5] Walker, A E. The neurosurgeon's responsibility for organ procurement. *Journal of Neurosurgery,* 1976, 44, 1.

[6] Mohandas, A. and Chou, S N. Brain death. A clinical and pathological study. *Journal of Neurosurgery,* 1971, 35, 211.

[7] Brain damage and brain death. *Lancet,* 1974, i, 341.

[8] Brain death. *British Medical Journal,* 1975, i, 356.

[9] MacGillivray, B. The diagnosis of cerebral death. In *Proceedings of the Tenth Congress of the European Dialysis and Transplant Association,* ed J F Moorhead, London, Pitman Medical, 1973.

[10] Beecher, H K. After the "definition of irreversible coma". *New England Journal of Medicine,* 1969, 281, 1070.

[11] The International Federation of EEG Societies. Report. *Electroencephalography and Clinical Neurophysiology,* 1970, 28, 536; 1974, 37, 530.

II Memorandum on the Diagnosis of Death (January 1979)

1 In October 1976 the Conference of Royal Colleges and their Faculties (UK) published a report* unanimously expressing the opinion that 'Brain Death', when it had occurred, could be diagnosed with certainty. The report has been widely accepted.

The Conference was not at that time asked whether or not it believed that death itself should be presumed to occur when brain death takes place or whether it would come to some other conclusion. The present report examines this point and should be considered as an addendum to the original report.

2 Exceptionally, as a result of massive trauma, death occurs instantaneously or near-instantaneously. Far more commonly, death is not an event, it is a process, the various organs and systems supporting the continuation of life failing and eventually ceasing altogether to function, successively and at different times.

3 Cessation of respiration and cessation of the heart beat are examples of organic failure occurring during the process of dying and since the moment that the heart beat ceases is usually detecable with simplicity by no more than clinical means, it has for centuries been accepted as the moment of death itself, without any serious attempt being made to assess the validity of this assumption.

*Br Med J, 1976, ii, 1187-1188
Lancet, 1976, ii, 1069-1070

4 It is now universally accepted, by the lay public as well as by the medical profession, that it is not possible to equate death itself with cessation of the heart beat. Quite apart from the elective cardiac arrest of open-heart surgery, spontaneous cardiac arrest followed by successful resuscitation is today a commonplace and although the more sensational accounts of occurrences of this kind still refer to the patient being 'dead' until restoration of the heart beat, the use of the quote marks usually demonstrate that this word is not to be taken literally, for to most people the one aspect of death that is beyond debate is its irreversibility.

5 In the majority of cases, in which a dying patient passes through the processes leading to the irreversible state we call death, successive organic failures eventually reach a point at which brain death occurs and this is the point of no return.

6 In a minority of cases, brain death does not occur as a result of the failure of other organs or systems but as a direct result of severe damage to the brain itself from, perhaps, a head injury or a spontaneous intracranial haemorrhage. Here the order of events is reversed; instead of the failure of such vital functions as heart beat and respiration eventually resulting in brain death, brain death results in the cessation of spontaneous respiration; this is normally followed within minutes by cardiac arrest due to hypoxia. If, however, oxygenation is maintained by artificial ventilation the heart beat can continue for some days, and haemoperfusion will for a time be adequate to maintain function in other organs, such as the liver and kidneys.

7 Whatever the mode of its production, brain death represents the stage at which a patient becomes truly dead, because by then all functions of the brain have permanently and irreversibly ceased. It is not difficult or illogical in any way to equate this with the concept in many religions of the departure of the spirit from the body.

8 In the majority of cases, since brain death is part of or the culmination of a failure of all vital functions, there is no necessity for a doctor specifically to identify brain death individually before concluding that the patient is dead. In a minority of cases in which it is brain death that causes failure of other organs and systems, the fact that these systems can be artificially maintained even after brain death has made it important to establish a diagnostic routine which will identify with certainty the existence of brain death.

Conclusion

9 It is the conclusion of the Conference that the identification of brain death means that the patient is dead, whether or not the function of some organs, such as heart beat, is still maintained by artificial means.

III Brain Death*

Sir, – In October 1976 the Conference of Medical Royal Colleges and their Faculties in the UK published the statement "Diagnosis of Brain Death"[1,2] following discussions by several committees, which included anaesthetists, neurologists, clinical neurophysiotherapists, neurosurgeons, and others. Over the next year this proved to be acceptable to the profession and a copy of the statement was sent by the health departments to every hospital doctor in January 1978 with a covering letter from the chief medical officers. In February 1979 the Conference published a memorandum, "Diagnosis of Death",[3,4] in which it was noted that "brain death represents the stage at which a patient becomes truly dead". These two conference statements were included in the code of practice "The Removal of Cadaveric Organs for Transplantation",[5] which was distributed to all hospital doctors in January 1980. This has been drawn up by a widely based working party of the health departments that included doctors, nurses, lawyers, Coroners, and administrators, and which took advice from health councils and major religious bodies.

The Conference considered the matter further at its quarterly meetings in April and July of 1981 and decided that there was no need to reconvene the expert working parties which had formerly advised it. It is of the opinon that the safeguards which are normally observed by doctors concerned with such patients should be emphasised and form part of the guidelines to the profession. It therefore makes the following recommendations.

(1) The diagnosis of brain death should be made by two medical practitioners, who have expertise in this field. One should be a consultant, the other being a consultant or senior registrar who should assure himself or herself that the pre-conditions have been met before testing is carried out. The length of time required before the pre-conditions can be satisfied varies according to circumstances, and although occasionally it might be less than 24 hours it may extend to several days.

(2) The two doctors may carry out the tests separately or together. If the tests confirm brain death they should nevertheless be repeated. It is for the two doctors to decide how long the interval

between tests should be but the time should be adequate for the reassurance of all those directly concerned.

(3) There may be circumstances in which it is impossible or inappropriate to carry out every one of the tests. The criteria published by the conference give recommended guidelines rather than rigid rules and it is for the doctors at the bedside to decide when the patient is dead.

The Royal Colleges and their Faculties recognise the need for continuing education in the topic of the diagnosis of brain death and about the procedures involved in donating organs for transplantation.

Individually they will continue to take this into account in their educational programmes.

It is suggested that new entrants to medical practice in the NHS be provided with a copy of the code of practice, which should also be readily available at all hospitals and in all units in which its implementation is likely to arise.

Finally, it is suggested that the profession, in association with the health departments, should design a checklist which would be completed in all cases and form part of the hospital case record.

J G Robson
Honorary Secretary
Conference of Medical Royal Colleges and their Faculties in the UK

Department of Anaesthetics
Royal Postgraduate Medical School
London W12 0HS

References

[1]Conference of Medical Royal Colleges and their Faculties in the United Kingdom. Br Med J, 1976, ii, 1187-8.

[2]Conference of Medical Royal Colleges and their Faculties in the United Kingdom. Lancet, 1976, ii, 1069-70.

[3]Conference of Medical Royal Colleges and their Faculties in the United Kingdom. Br Med J, 1979, i, 332.

[4]Conference of Medical Royal Colleges and their Faculties in the United Kingdom. Lancet, 1979, i, 261-2.

[5]Health Departments of Great Britain and Northern Ireland. The removal of cadaveric organs for transplantation: a code of practice. London, HMSO, 1979.

*Br Med J, 1981, 283, 505
Lancet, 1981, ii, 365

Printed for Her Majesty's Stationery Office by Hobbs the Printers of Southampton
(3304/86) Dd8995865 C80 12/86 G3371