

# Health Service Circular



**Series number:** HSC 1999/178  
**Issue date:** 13th August 1999  
**Review date:** 13th August 2002  
**Category:** Public Health  
**Status:** Action

*sets out a specific action on the part of the recipient with a deadline where appropriate*

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## VARIANT CREUTZFELDT-JAKOB DISEASE (vCJD) : MINIMISING THE RISK OF TRANSMISSION

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## VARIANT CREUTZFELDT-JAKOB DISEASE (vCJD) : MINIMISING THE RISK OF TRANSMISSION

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### Summary

This circular describes the present state of knowledge of the risks of transmission of variant Creutzfeldt-Jakob Disease (vCJD) from one patient to another. It details the action that health organisations and clinicians should already be taking to reduce the risk of transmission and recommends some further precautionary measures. It should be read in conjunction with HSC1999/179 *Controls assurance in infection control: Decontamination of medical devices* and HSC 1999/123 *Governance in the new NHS: Controls assurance statements 1999/2000 : Risk management and organisational control*.

### Action

Chief Executives of NHS Trusts and Health Authorities (in respect of general practice) should take action to ensure that there are proper arrangements in place to comply with the existing and new guidance set out in this circular. The key messages in this circular are:

#### *Reinforcing existing safeguards:*

- (i) All cases where CJD of any type is a possible diagnosis should be reported to the National CJD Surveillance Unit (CJDSU) so that any necessary action can be taken;
- (ii) Effective and thorough cleaning of surgical instruments to remove as much organic debris as possible before sterilization makes the major contribution to risk reduction. It is therefore essential that all existing cleaning and sterilization procedures operate to the highest standards in line with extant guidance. Instruments designated for a single episode of use should be discarded after use and never reprocessed.
- (iii) The guidance produced jointly in April 1998 by the Advisory Committee on Dangerous Pathogens (ACDP) and the Spongiform Encephalopathy Advisory Committee (SEAC) on safe working and the prevention of infection must be followed to ensure optimum clinical care and management of patients with CJD of any type.

#### *New advice*

- (iv) Single-use kits should always be used for all lumbar-punctures.
- (v) Where practical options for using single-use instruments are available which do not compromise clinical outcome, consideration should be given to using these for surgical procedures.

Chief Executives of NHS Trusts should ensure that all relevant staff are fully conversant with the procedures set out in this Circular. In particular they should draw it to the attention of Medical Microbiologists, Infection Control Doctors, Infection Control Nurses and Operating Theatre Managers, Estates Managers and Sterile Service Managers.

Chief Executives of Health Authorities should ensure that this Circular is drawn to the attention of Estates Managers and that copies are forwarded to all registered private, and voluntary, hospitals and clinics. They should also assure themselves that general practitioners who undertake surgical procedures and dental practitioners are fully aware of the contents of this Circular.

*This circular has been issued by:*

**Professor Liam Donaldson, Chief Medical Officer**

### THE EMERGENCE OF vCJD

Creutzfeldt-Jakob disease (CJD) in its classical form was first described in the 1920s. It is one of a group of diseases called transmissible spongiform encephalopathies (TSEs) which can occur in people or animals. The diseases are characterised by degeneration of the nervous system and are invariably fatal.

CJD in its classical form is the commonest of the human TSEs but it is still rare with an annual incidence across the world of 0.5 to 1.0 cases per million population. In Britain, there have been about 35 cases per year. The average age of onset of classical CJD is between 55 and 75 years. Classical CJD has no known cause in the majority of cases. However, about 15% of cases are inherited and are caused by gene mutations. About 1% in the past have been transmitted as a result of medical treatments such as human pituitary derived growth hormone injections, corneal transplants and brain surgery involving contaminated instruments.

Early in 1996, the National CJD Surveillance Unit, which is based in Edinburgh, identified a form of CJD that differed from previously recognised types of the disease. The patients affected were usually younger, their symptoms were different and the appearance of their brain tissue after death was not the same as in the classical form of CJD. The disease was initially labelled new variant CJD (nvCJD), and is now known as variant CJD (vCJD).

The number of definite and probable vCJD cases in the UK at the end of July 1999 is 43, all of whom have died. In 1998 16 people died of vCJD, compared to 10 in each of the previous two years. It is too soon to tell whether this increase in incidence will be sustained, or what the eventual number of vCJD cases will be.

The precise nature of the agent which causes vCJD is not known, but the most likely theory implicates an abnormal form of a protein which is called a "prion". Normal prion proteins are distributed throughout nature and are found in the tissues of healthy people and animals. It is believed that prions can cause disease when they become altered in shape, by folding in an abnormal way. The abnormally shaped prion protein then influences the normal protein to alter its shape. This leads to destruction of nervous tissue, particularly in the brain, giving it a spongy appearance under the microscope.

The Government's Spongiform Encephalopathy Advisory Committee (SEAC) concluded that the most likely explanation for the emergence of vCJD was that it had been transmitted to people through exposure to Bovine Spongiform Encephalopathy (BSE).

### THE POSSIBILITY OF PERSON-TO-PERSON SPREAD

Available epidemiological evidence suggests that normal social or routine clinical contact with a patient suffering from any type of CJD, including vCJD, does not present a risk to healthcare workers, relatives and the community.

The possibility that vCJD might be spread from person-to-person in health care situations arises for a number of reasons:

- classical CJD has been transmitted from person to person by medical procedures,
- abnormal prion protein has been demonstrated in the lymphatic tissue (including tonsils) of patients with established vCJD,
- abnormal prion protein has been demonstrated in the appendix of a patient who subsequently developed vCJD,
- abnormal prion protein may not be inactivated by normal sterilization procedures.

The recent research and clinical observation which gave rise to these concerns includes the identification of the abnormal form of prion protein reported in the appendix removed from a man some months before he went on to develop clinical signs of vCJD<sup>1</sup>. This was the first time that the presence of abnormal prion protein had been detected in peripheral tissues before the onset of clinical disease. Furthermore, in a study<sup>2</sup> lymphoreticular tissues (tonsils, spleen and lymph nodes) from patients with neuropathologically confirmed vCJD were found to be positive for the abnormal protein associated with prion diseases. Tissues from patients with other types of CJD, and from control patients, did not test positive in this way. In addition strain typing of abnormal prion protein showed a consistent pattern in the tissues of patients with neuropathologically confirmed vCJD, which was of a type different from the strain found in brain tissue from patients with other types of CJD.

These research findings raise two main issues in relation to vCJD. Firstly the theoretical possibility of transmission of the abnormal prion protein from lymphoreticular tissues of a pre-symptomatic patient undergoing certain surgical procedures to another patient, and the implications of even the theoretical possibility of transmission for clinical policy. Secondly, the possible use of tonsil biopsy both as a diagnostic test and as a way of establishing the prevalence of vCJD through population studies, once the relevance of positive results to clinical disease is elucidated.

#### 1. ACTION: REINFORCE EXISTING SAFEGUARDS AGAINST TRANSMISSION

The following section of the Circular sets out the measures already covered in extant guidance. Health organisations should ensure that these are being rigorously adhered to.

##### a. Notification of new cases of CJD to the CJD Surveillance Unit in Edinburgh.

Any patient suspected on clinical grounds of having CJD (either vCJD or any other type of CJD) should be referred to the CJD Surveillance Unit in Edinburgh. Not only is this required for epidemiological and surveillance purposes, but it is necessary as a control measure to guard against the theoretical risk of transmission of vCJD. Failure to notify promptly would prevent early action to trace and withdraw any blood donations which the sufferer of vCJD may have made. Similarly, such failure to notify could also prevent the institution of other control measures. Contact details for the CJD Surveillance Unit are:-

Professor R G Will  
Director, National CJD Surveillance Unit  
Western General Hospital  
Crewe Road  
Edinburgh EH4 2XUT

Tel:  Fax:

##### b. Properly clean and sterilize surgical instruments before re-use.

The abnormal protein associated with TSEs, including vCJD, is very resistant to all common methods of inactivation. Expert advice is that effective cleaning of surgical instruments prior to sterilization is of the utmost importance in reducing the risk of transmission of vCJD via surgical procedures. It is therefore essential that all existing cleaning and sterilization procedures operate to the highest standards.

Comprehensive guidance on decontamination is available on the CD ROM titled *Decontamination Guidance* that accompanied HSC1999/179.

<sup>1</sup> Hilton et al., (1998) *Lancet*, 352: 703-704

<sup>2</sup> Hill et al., (1999) *Lancet*, 353: 183-189

Decontamination equipment will work less efficiently on instruments which are difficult to clean and/or in poor condition. Consideration should therefore also be given to the condition of surgical instruments in use. Devices that cannot easily be cleaned should be identified and, where practicable and in a planned programme, replaced with versions that are easier to clean.

**c. Handling instruments used on known or suspected CJD patients.**

Policy on the use and disposal of surgical, diagnostic or other instruments involved in the care of patients who have or are suspected of having any type of CJD is set out in the guidance produced jointly by the Advisory Committee on Dangerous Pathogens (ACDP) and the Spongiform Encephalopathy Advisory Committee (SEAC)<sup>3</sup>. Chief Executives and others leading health organisations should ensure that all relevant staff are fully conversant with the procedures set out in this guidance.

The ACDP/SEAC guidance makes it clear that:

- Instruments and equipment used in the care of patients with confirmed CJD of any type should not be re-used and should be disposed of by incineration;
- Instruments used on patients suspected of having CJD of any type should be quarantined pending confirmation of a diagnosis (and should be then destroyed by incineration unless a definitive alternative diagnosis is confirmed). Supplementary advice for those limited circumstances where quarantining of instruments may be appropriate is set out in Annex A to this circular;
- Certain categories of patient should be regarded as presenting a potential risk (defined in the guidance as recipients of hormones derived from human pituitary glands, recipients of human dura mater grafts, and people with a family history of CJD);
- Single-use instruments and equipment should be used wherever possible in cases involving patients in a risk category as defined in the guidance;
- Instruments and equipment used in procedures involving brain, spinal cord or eyes carried out on a patient in a risk category as defined in the guidance should be destroyed by incineration.

**d. Exposure of a health worker or research worker to a case of CJD**

Action must be taken when clinical, laboratory or research workers are exposed to the infective agent associated with CJD of any type. One aspect of this is the requirement under the Control of Substances Hazardous to Health Regulations 1999 (COSHH) to keep a list of employees exposed to Hazard Group 3 or 4 biological agents. Annex B to this circular sets out how this should be interpreted in respect of possible exposure to the agent of CJD (which is classified as a Group 3 biological agent), in the healthcare setting.

**e. Advice on the care of patients**

The following resources are available to health professionals dealing with cases of CJD:

- The National CJD Surveillance Unit in Edinburgh can provide advice on all clinical and neuropathological aspects of CJD. It can be contacted at:

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<sup>3</sup> "Transmissible Spongiform Encephalopathy Agents: Safe Working and the Prevention of Infection", April 1998. Full text available on:  
<http://www.official-documents.co.uk/document/doh/spongiform/report.htm>



Professor R G Will  
Director, National CJD Surveillance Unit  
Western General Hospital  
Crewe Road  
Edinburgh EH4 2XUT

TEL:  Fax:

- The Prion Unit at St Mary's Hospital, London specialises in the care of patients suffering from CJD. It can be contacted at:

Kathryn Prout  
Clinical Nurse Specialist  
Prion Unit  
Department of Neurology  
St Mary's Hospital  
Praed Street  
London W2 1NY

TEL:

- The CJD Support Network is a voluntary organisation set up to provide help and support for patients of all types of CJD and their families. The Network has undertaken a case co-ordination initiative aimed at facilitating the co-ordination of care for patients affected by all types of CJD, and gives advice on case co-ordination enabling cost effective care and ensuring appropriate responses to carers' needs. It can be contacted at:

Gillian Turner  
National CJD Co-ordinator  
CJD Support Network  
Birchwood  
Heath Top  
Ashley Heath  
Market Drayton, Shropshire TF9 4QR

TEL:

- The Human BSE Foundation is a voluntary organisation run by families of vCJD patients aimed at helping relatives, friends and carers of vCJD patients by providing support, information and practical advice. It can be contacted at:

The Human BSE Foundation  
Greenfields, Bath Road  
Devizes  
Wiltshire SN10 1QG

TEL (Helpline): 01380 720 033

## **2. ACTION : EXTENSION OF SAFEGUARDS AGAINST TRANSMISSION IN TO THEORETICAL RISK FROM vCJD**

## **RESPONSE**

This section of the Circular sets out the new measures being implemented and recommended by the Department of Health. Health organisations need to ensure that measures for which they are responsible are fully implemented.

**a. Use of leucodepleted blood in transfusions.**

The Government's main advisory committee on TSEs, SEAC, gave advice in June 1998 that as a precautionary measure the use of leucodepletion (removal of white cells) should be extended as soon as possible to all blood destined for transfusion, whilst ensuring there was no adverse effect on the donation and supply of blood. Action has been taken by the UK blood services to achieve this. As a result, all blood donated after 31 October 1999 and issued as red cells or platelets will have been leucodepleted.

**b. Use of non-UK sourced plasma and blood products**

The Government's main advisory body on the safety of medicinal products, the Committee on Safety of Medicines (CSM), advised in May 1998 that manufactured blood products should not be sourced from UK plasma for the time being. This advice has been implemented and all major blood products (eg Factor VIII, immunoglobulins and anti-D for Rhesus negative pregnant women) are now made from non-UK plasma.

**c. Transplants**

There is a theoretical but unquantifiable risk of transmission of vCJD by organs or tissues transplanted from those incubating vCJD. Current procedures to minimise that risk should be in line with the Microbiological Safety of Blood and Tissues for Transplantation (MSBT) guidance<sup>4</sup> issued in 1996 and the guidance contained in this circular. The MSBT guidance is under review and revised guidance is expected later this year. Procedures should be reviewed again as soon as the revised guidance is available.

In the interim, potential donations should be rejected in the following circumstances:

- Recipients of pituitary derived hormones such as human growth hormone or gonadotrophins,
- People known or assumed to have had human dura mater implanted including:
  - People who have had brain surgery before August 1992,
  - People who have had an operation for a tumour or a cyst of the spine before August 1992,
- People diagnosed or suspected of suffering from CJD of any type, or with a family history of CJD,
- People with degenerative neurological diseases of unknown causation,
- Recipients of corneal transplants.

Human dura mater should not be used in surgical procedures because of the high risk of transmission of CJD. The licence for products derived from human dura mater was withdrawn in 1992.

Until there is an effective screening test for vCJD, the decision on whether to use an organ from a particular donor, particularly in the case of life-preserving organ transplants, will depend on clinical need.

**d. Single-use instruments**

Single-use kits must always be used for all lumbar-puncture procedures.

The ACDP/SEAC guidance (see 1c above) states instruments should not be re-used once they have been used on patients with known or suspected CJD of any type. Even if single-use disposable items are not available, the instruments should under no circumstances be re-used. The same precautions are recommended for patients in a risk category for CJD as defined in the guidance where the clinical intervention involves brain, spinal cord or eye. For these patients, where other tissues are involved, the use of single-use instruments is encouraged.

<sup>4</sup>"Guidance on the microbiological safety of human tissues and organs used in transplantation", MSBT, March 1996.

In the light of uncertainty about the tissue-distribution of infectivity in vCJD, where practical options for using single-use instruments are available which do not compromise clinical outcome, consideration should be given to using these for surgical procedures.

Devices designated for single episodes of use must not be re-used under any circumstances whatsoever. As they are not intended to be reprocessed, it will be impossible to ensure they are decontaminated effectively.

Recently advice that contact lenses issued to patients for a trial wearing should not be re-used is confirmed. SEAC's view is being sought on the question of the possible risks posed by the re-use of special complex diagnostic lenses and other instruments used in ophthalmology departments and optical practices which come into contact with the eye. In the meantime such devices and instruments may continue to be used.

The implications of vCJD for procedures involving the brain and spinal cord are also under review. Meanwhile the ACDP/SEAC guidelines on brain, spinal cord and eye surgery should be followed.

Further advice will be issued as new information becomes available.

**e. Identification and tracing of flexible endoscopes**

Whilst systems for routine tracing of instruments in the event of a vCJD related incident are being developed, immediate action as set out below should be taken to enable rapid tracing of flexible endoscopes.

Flexible endoscopes are expensive pieces of equipment and if they have to be quarantined as a result of exposure to a possible case of vCJD and then subsequently destroyed there is a large cost attached. If it is not possible to identify the instrument with certainty, the relevant instrument cannot be distinguished from identical ones in a pool, which would result in the need to quarantine and possibly destroy all the endoscopes in the pool. All endoscopes should therefore have a unique identifier and this should be recorded in the endoscopy suite, theatre or outpatients on every patient usage.

**A REMINDER OF THE EXPERT ADVISORY COMMITTEE STRUCTURE:**

The main expert Committees which advise the Government and the NHS on these matters are:

- Spongiform Encephalopathy Advisory Committee (SEAC)
  - advises on the scientific aspects of Transmissible Spongiform Encephalopathies
- Advisory Committee on Dangerous Pathogens (ACDP)
  - advises on all aspects of hazards and risks to workers and others from exposure to pathogens
- Microbiology Advisory Committee (MAC)
  - advises on microbiological aspects of equipment used and intended to be used in the Health Service, including disinfection and sterilization practices.
- Microbiological Safety of Blood and Tissues for Transplantation (MSBT)
  - advises on measures to ensure the microbiological safety of blood and tissues for transplantation.
- Committee on Safety of Medicines (CSM)

advises on the safety of new medicines and the adverse reaction reports on medicines already on the market.

### **CONCLUSIONS**

Whilst no cases of vCJD to date have been attributed to transmission by medical interventions, the emerging findings on the distribution of abnormal prion protein in the organs and tissues of vCJD patients suggest a precautionary approach to minimising the risk of transmission.

Whilst we cannot rule out a theoretical risk of transmission, strict adherence to best practice guidance as set out in this circular is essential to reduce any risk as far as possible.

Further guidance will be issued as new information on vCJD emerges.

## Annex A

**QUARANTINING OF SURGICAL INSTRUMENTS**

Paragraph 4.28 of the ACDP/SEAC guidance on "Transmissible spongiform encephalopathy agents: Safe working and the prevention of infection" allows for instruments that have been used on a patient suspected of having CJD of any type to be quarantined pending a confirmation of diagnosis. Although it is not expected that this facility will need to be used widely, the following supplementary advice has been prepared for reference in those instances where such quarantining may be appropriate.

At the completion of a surgical procedure undertaken on a patient suspected of suffering from CJD of any type, single-use instruments should be separated and disposed of by incineration, re-usable instruments should be washed to remove gross soil. Care should be taken to avoid splashing and generating aerosols by holding instruments below the surface of the water in a sink into which water is running and draining out continuously. Instruments should not be held directly under a flowing tap as this is likely to generate splashes. Operatives should wear protective gloves and either a visor or goggles and care must be taken to avoid penetrating injuries.

Instruments should be placed in a disposable instrument tray and allowed to air dry. They should then be placed in an impervious rigid plastic container with a close fitting lid. The lid should be sealed with heavy-duty tape (e.g. autoclavable tape) and labelled with the patient's identification (i.e hospital number, name and date of birth), the surgical procedure in which the instruments were used and the name of the responsible person (e.g. the theatre superintendent). The sealed box should be stored indefinitely in a suitable designated place until the outcome of any further investigation is known. The instrument tray should be disposed of by incineration.

If the patient is confirmed as suffering from CJD of any type, the box and its contents should be incinerated without further examination. If an alternative, definitive diagnosis is confirmed, the instruments may be removed from the box by the responsible person (or a named deputy) and sent to the Sterile Service Department (SSD) for processing in the usual way.

Records must be kept of all decisions, and the SSD must be told of the decision before the instruments are sent for routine processing.

Prolonged autoclaving or supplemental disinfection is not necessary for instruments removed from quarantine, which had been used on a patient not suffering from CJD of any type.

**Annex B****RECORDING STAFF INVOLVED IN THE CLINICAL CARE OF CJD PATIENTS**

Part 2 of the ACDP/SEAC guidance on "Transmissible spongiform encephalopathy agents: Safe working and the prevention of infection" provides guidance on health and safety law in relation to workplace exposure to TSE agents, including the requirement under the Control of Substances Hazardous to Health Regulations 1999 (COSHH) to keep a list of employees exposed to hazard group 3 or 4 biological agents. This Annex sets out how this requirement should be interpreted with respect to exposure to CJD of any type in the healthcare setting.

Employers are required to keep a list of employees exposed to the agent of CJD of any type when there is a deliberate intention to work with the agent or, in cases of unintentional exposure, if a risk assessment shows there is a significant risk. The risk is deemed to be significant if more than basic hygiene measures are necessary to protect staff or if the control measures listed in COSHH are specifically applied.

The ACDP/SEAC guidance gives advice on when a list should be kept. It advises that in the majority of clinical situations there is no significant risk of exposure to CJD of any type. Staff working with such patients would not need to be listed as exposed to CJD (although their work with patients may be deemed to involve a "significant risk" from other Group 3 or 4 agents).

The decision to keep a list will depend on a local risk assessment. It is important to emphasise that the list is required where there is a likelihood of exposure, not simply when there has been a known incident or accident (although it should also include details of these). In this sense it is not the same as the requirement to report certain diseases and accidents to HSE under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR).

For other types of work, the guidance recommends additional control measures for staff undertaking certain procedures involving patients with clinical symptoms of CJD of any type or those defined as at risk of familial or iatrogenic CJD by virtue of their clinical history. Such staff may therefore need to be listed as being potentially exposed to CJD. Examples of when this may be required are:

- all those involved in laboratory research work with the agent of CJD of any type,
- any staff performing invasive clinical procedures on patients suspected to be suffering from CJD of any type, particularly where there is a risk of exposure to central nervous or eye tissue or other tissues known to contain CJD infectivity,
- laboratory staff handling tissue specimens from such patients, in either routine or specialist neuropathology laboratories,
- staff undertaking post-mortem examinations of patients who have died of CJD of any type or where CJD of any type is suspected.

**What to include in the list of employees**

The list must indicate the type of work done and, where known, record any specific exposure, accident or incident (some of which may be reportable under RIDDOR). This may include staff who have performed one of the above procedures on a patient subsequently shown to have CJD of any type, unless the procedure was conducted before the patient was likely to have been incubating the disease.

The list must be kept for at least 40 years after the last known exposure. The list is not the same as a health record required for the purposes of health surveillance under COSHH or the Management of Health and Safety at Work Regulations, however, it must be available to any doctor appointed for health surveillance (eg the local

occupational health physician). It must also be available to any employee specifically responsible for health and safety (such as a safety manager). Each employee must have access to the information which related to him or her personally. In practice the list might best be kept with other transferable confidential information (e.g. information open to access by authorised individuals) in the staff member's occupational health record. Guidance on record keeping can be found in the Health Services Advisory Committee guidance "The management of occupational health services for healthcare staff" (HMSO 1993, ISBN 0-11-882127-X).

The ACDP/SEAC guidance also recommends including certain other information about the member of staff (eg full name and maiden name for women; NI number; date of birth and dates of employment). Although this is not a legal requirement, it should improve the value for the list in any future epidemiological surveillance.