

# CHRISP

Queensland Health Centre for Healthcare  
Related Infection Surveillance and Prevention

2009

## Management of Classical Creutzfeldt-Jakob Disease



Queensland  
Government

**DOCUMENT HISTORY**

Version 1.0	August 2007
Reviewed with no content changes	February 2009

# Management of Classical Creutzfeldt - Jakob disease (cCJD)

## Key Points

- Currently, variant CJD (vCJD); (the human form of bovine spongiform encephalopathy, or 'mad cow disease') has not been reported in Australia and is therefore excluded from the scope of this guideline.
- There is no test presently available to detect infection before the onset of symptoms.
- There is no epidemiological evidence that cCJD can be transmitted through normal social or sexual contact.
- Although transmission of classical Creutzfeldt–Jakob disease (cCJD) in the healthcare setting is very rare, health care workers should be aware of the potential for transmission by contaminated instruments or via high infectivity tissues.
- The infective agent of cCJD (the prion) is resistant to routine reprocessing, making the additional precautions outlined in this chapter essential for the treatment of patients with an identified risk of cCJD infection.
- The decision to implement additional precautions for equipment reprocessing is based on the currently known infectivity of the tissue to which the instrument has been exposed (see Table1) and patient risk categories.
- Some instruments cannot be cleaned and reprocessed adequately because of their design or the limitations of current reprocessing technology. Diagnostic or therapeutic procedures using these instruments on patients in both cCJD risk categories should be avoided when possible.

## Introduction

The infection control recommendations provided in this document specifically address Classical Creutzfeldt–Jakob disease (cCJD) in health care settings and should not be used to manage a case of vCJD. If you suspect a case of vCJD, contact your local Public Health Medical Officer for advice.

The infective agent of cCJD (the prion) is resistant to routine reprocessing (as per AS/NZ 4187-2003). This makes the additional precautions outlined in this guideline essential for treatment of patients with an identified risk of cCJD infection.

## Disease description and clinical manifestations

For simplicity, the term 'classical CJD' (cCJD) is used to describe all forms of human transmissible spongiform encephalopathies (TSE) affecting humans except vCJD, including:

1. Sporadic CJD
2. Inherited CJD
  - a. Familial CJD
  - b. Gerstmann -Sträussler-Scheinker disease (GSS)
  - c. Fatal familial insomnia (FFI)
3. Acquired CJD
  - a. Health Care associated (iatrogenic) CJD
  - b. Kuru

## Diagnosis

For cCJD, whether acquired naturally or iatrogenically, there is a pre-symptomatic period during which, disease transmission is presumed to be possible. There is no minimally invasive test presently available to detect infection before the onset of symptoms.

Definitive diagnosis of cCJD is by clinical and neuropathological examination. Currently, the only method for obtaining a definitive diagnosis is by neuropathological examination of brain tissue following biopsy or autopsy. However, brain biopsy is not recommended as a routine procedure to confirm the clinical suspicion of cCJD.

Other methods which may assist in the diagnosis of cCJD and in excluding other causes of subacute dementia in symptomatic patients are:

- electroencephalograph (EEG)
- presence of protein 14-3-3 in cerebrospinal fluid
- imaging techniques such as computerised tomography and magnetic resonance imaging (MRI)

## Transmission

### Modes of transmission

Most cases of cCJD are sporadic. However, there is evidence of iatrogenic transmission through neurosurgical instruments contaminated with central nervous system (CNS) tissue, and through contaminated tissue implants or products (dura mater grafts, corneal grafts and pituitary products). There is no epidemiological evidence to indicate that health care workers (HCW) are at increased occupational risk for cCJD. There is no epidemiological evidence that cCJD can be transmitted through normal social or sexual contact, mother-to-child transmission or via blood or blood products.

### Infectivity of human tissues

Table 1 is a guide to the known or predicted infectivity of body tissues and fluids of symptomatic and asymptomatic patients with cCJD. This information is based largely on studies of experimentally transmitted cCJD in non-human primates and other animals. Whilst there is likely a spectrum of infectivity from very low to high infectivity, the classifications in Table 1 group the tissues and fluids according to the reprocessing that will be required after contact with these tissues.

**Table 1** Guide to Known or Predicted Infectivity of Body Tissues and Fluids for cCJD

INFECTIVITY CATEGORY	TISSUES	SECRETIONS
HIGH <sup>(1)</sup>	Brain	
	Dura mater	
	Pituitary gland	
	Spinal cord	
	Retina	
	Optic Nerve	
	Cranial & dorsal root ganglia	
	Olfactory epithelium §	
LOW <sup>(2)</sup> or NO DETECTABLE INFECTIVITY	Cornea <sup>(3)</sup>	CSF <sup>(3)</sup>
	Anterior chamber of eye <sup>(3)</sup>	Amniotic fluid
	Kidney	Faeces
	Liver	Breast milk
	Lung	Nasal mucus
	Lymph nodes/spleen	Saliva
	Placenta	Semen
	Uterus	Serous exudate
	Adipose tissue	Sweat
	Adrenal gland	Tears
	Blood & blood products	Urine
	Bone marrow	
	Gingival tissue	
	Heart muscle	
	Intestine	
	Peripheral nerve	
	Prostate	
	Skeletal muscle	
Testes		
Thyroid gland		

Adapted from: WHO Guidelines on Tissue Infectivity Distribution in Transmissible Spongiform Encephalopathies (2006) accessed at <http://www.who.int/bloodproducts/tse/WHO%20TSE%20Guidelines%20FINAL-22%20JuneupdatedNL.pdf>

UK Department of Health. Transmissible Spongiform Encephalopathy Agents: Safe Working and the Prevention of Infection (2003) accessed at <http://www.advisorybodies.doh.gov.uk/acdp/tseguidance/>

(1) Considerable Risk of Transmission – instruments having contact with these tissues may require additional reprocessing precautions

(2) Low Risk of Transmission – instruments having contact with these tissues and fluids only, do not require additional precautions

(3) It is recommended that single use instruments be used in known high risk patients

§ Normal nasal endoscope procedures do not reach the olfactory epithelium.

## Patient risk categories

The recommended approach for minimising the risk of cCJD transmission in health care settings is firstly to identify individuals who may pose a risk. These individuals are then further categorised as to their level of risk. Other individuals provide no or minimal epidemiological risk and are not further discussed in this document.

It is international convention to define three (3) risk categories that reflect the theoretical and demonstrable risks of transmitting cCJD:

- **high-risk** — people who represent a *definite* risk of cCJD transmission (Appendix1) These patients are generally showing neurological symptoms;
- **low-risk** — people who represent a *potential* risk of cCJD transmission (Appendix2) These patients may be showing neurological symptoms or may have an identified risk factor (NOTE: Individuals who have been contacted by a health authority as part of a look-back procedure from exposure to surgical instruments that had previously been used on patients later found to have contracted cCJD are likely to have a very low, but unquantifiable risk for cCJD. Until further information on the likely risk of these individuals is available, they are conservatively placed in a low risk category.);
- **background-risk** – the general population who represent *no* identified increased risk of cCJD transmission.

## Assessment of the Risk

### Assessing the Risk

Diagnostic and therapeutic procedures are divided into those where high infectivity tissue is exposed and those where only low-infectivity or no infectivity tissue is exposed (see Table1)

Additional precautions for equipment reprocessing are implemented when the patient is identified as being in the high- or low-risk category and when the diagnostic or therapeutic procedure used involves the exposure of high-infectivity tissues.

It is recommended that all patients undergoing surgical or diagnostic procedures in which high infectivity tissue will be exposed (e.g. neurosurgery, spinal cord surgery, ophthalmic surgery, pituitary surgery) should have their cCJD risk status (higher-risk, lower-risk, background risk) determined.

PATIENT RISK CATEGORIES	High Infectivity Tissue Exposed	Low Infectivity Tissue Exposed
<b>HIGH RISK</b> People who represent a <b>definite</b> risk of cCJD transmission. These patients are generally showing neurological symptoms.	Additional Precautions Required	STANDARD PRECAUTIONS
<b>LOW RISK</b> People who represent a <b>potential</b> risk of cCJD transmission. These patients may have an identified risk factor.	Additional Precautions Required	STANDARD PRECAUTIONS
<b>BACKGROUND RISK</b> The general population who represent no identified increased risk of cCJD transmission	STANDARD PRECAUTIONS	STANDARD PRECAUTIONS

A template for a questionnaire to determine cCJD risk status is included in (Appendix 3).

Questionnaires should be administered to patients by the health care practitioner conducting the procedure and the completed questionnaire included in the patient medical record prior to consent for the planned procedure.

Opportunities for completing the questionnaire include:

- Outpatient Clinic or Consulting Rooms prior to booking the patient for surgery;
- Emergency Department when reviewing trauma patients in the high-risk category

A final check to ensure that the questionnaire is completed prior to surgery can be conducted by the person responsible for maintaining the theatre bookings. This person should establish the risk of the patient undergoing surgery before entering them onto the list.

If, on the basis of responses to the questionnaire, the patient is determined to be in the higher- or lower-cCJD risk category, the planned procedure may be modified or a process initiated for the implementation of additional precautions for equipment reprocessing/disposal. Health care institutions should establish systems that ensure risk assessment, where recommended, is undertaken, documented and linked to the hospital booking process.

Each health care facility should have an action plan in place, so that if the questionnaire identifies a patient with the risk of CJD, patient admission and treatment is not delayed. There is a need to ensure that patient care is not compromised and that any reasons for variations or delays in treatment are explained to the patient in order to encourage patients with identified risk factors to disclose their risk status to health care facilities.

A flow chart 'Summary of Actions for a Surgical Procedure- CJD Risk Assessment' is included in Appendix 4.

As most cases of cCJD are identified as sporadic, patients of background risk may still have asymptomatic cCJD. In order to minimise the risk of transmitting cCJD from an asymptomatic patient without identified risk factors, all procedures involving high infectivity tissues should be subject to best practice for instrument reprocessing.

## **Additional Precautions**

### **Reasons for additional precautions**

The prion protein which is the infectious agent of cCJD is resistant to routine reprocessing. The chemicals known to have some activity against prions include hypochlorites and harsh acids and alkalis. However, their practical effectiveness and use in reprocessing is uncertain because of the impact of prior cleaning. Occupational health issues surrounding the use of these agents mean they are not recommended.

### **Additional precautions**

**Additional precautions are implemented when the patient is identified as being in a high- or low-risk category AND when the diagnostic or therapeutic procedure used involves the exposure of high-infectivity tissues.**

Relevant additional precautions that apply to the handling and reprocessing of surgical instruments and diagnostic equipment are shown in Table 2. For routine hospital, long-term residential or community care not involving exposure to high-infectivity tissues, routine reprocessing precautions and Standard Precautions are all that are required for the management of cCJD patients.

**Table 2: Additional precautions required for diagnostic or therapeutic procedures involving high infectivity tissues for patients in the high- and low-risk categories for cJD**

Procedure	Action
<b>Instrument reuse</b>	Use single-use instruments <b>OR</b> Incinerate* instruments immediately after use <b>OR</b> Reprocess separately and quarantine instruments pending determination of risk status of patient (then incinerate*, <b>or</b> reprocess and put back into circulation if risk is found to be background) <b>OR</b> Reprocess separately and keep for the exclusive use of an individual patient involved in a course of therapy (then incinerate*)
<b>Intra-operative handling of instruments</b>	Where possible, instruments used on high infectivity tissues should be separated from general instruments and equipment to reduce the possibility of cross contamination. Instruments used on high infectivity tissue should also be quarantined from other instruments in the reprocessing area.
<b>Operating room set up</b>	Cameras and other equipment not in contact with the high infectivity tissues should be covered in plastic to protect from splashing; these covers should be incinerated after use.
<b>Scheduling of patients</b>	Operations or procedures should be scheduled to allow for appropriate cleaning of facilities.
<b>Personal protective equipment (PPE)</b>	HCWs should wear liquid repellent single-use PPE including gloves, gowns and full face shields if high infectivity tissue is exposed.
<b>Surgical drapes gowns &amp; other PPE</b>	If high-risk tissue is exposed, use single use surgical drapes dispose by incineration (or appropriate alternate approved method)
<b>Collection of specimens</b>	Specimens should be collected into a secure-closing container and enclosed in a plastic bag for transportation. The container should be clearly labelled with patient identification details, including a CJD risk alert to laboratory workers and other HCWs. Hospital lamson transport should not be used for transporting these specimens.
<b>Other articles used in procedures</b>	All articles that contact high-infectivity tissue during a procedure should be disposed of by incineration (or appropriate alternate approved method). Standard infection control procedures and environmental landfill recommendations should be followed for disposal of other waste materials.
<b>Anaesthetic equipment</b>	Routine reprocessing

\* or appropriate alternative method of medical waste destruction

## **Destruction of equipment by incineration**

Single use instruments should be used where possible. Contaminated articles (exposure to high-infectivity tissue in high and low risk patients) should be placed immediately into the correct clinical waste container for disposal by incineration or alternate approved method of medical waste destruction. Needles, blades and other sharp articles should be placed in non-reusable sharps containers (in accordance with AS 4031) and disposed of by incineration.

## **Tracking of reusable equipment**

All health care facilities that perform procedures exposing high infectivity sites, and companies that provide instrument “loan sets”, demonstration or trial equipment for use in these procedures, must have systems in place to track individual reusable items of equipment used on high-infectivity sites (Table1), to the level of the individual patient to minimise the number of patients implicated in a look-back. Instruments that have been in contact with high infectivity sites (regardless of the risk-status of the patient) should also be separated from other instruments to avoid cross-contamination.

## **Reprocessing procedures**

Instruments and equipment exposed to high infectivity tissues should be reprocessed according to AS-NZ 4187 with the following additional recommendations. Reprocessing of instruments exposed to high-infectivity tissue in high and low risk patients would only occur prior to quarantine, or between uses on the same patient.

Wherever possible, instruments that have been in contact with high infectivity tissues in high- or low-risk patients should be separated from other instruments in the operating room to avoid cross-contamination.

Infectivity of cCJD may be stabilised by drying on metal surfaces, thereby becoming more difficult to inactivate. Wherever possible, instruments, from high- or low-risk patients, potentially contaminated with high infectivity tissue should be kept immersed in a dedicated container in sterile water, until they are either reprocessed (for subsequent quarantine or exclusive use in that patient) or destroyed.

Wherever possible, contaminated instruments from each patient should be cleaned (with an anionic detergent and water using a soft brush) and reprocessed in a separate batch, and not mixed with other surgical instruments at any stage of the reprocessing cycle. Ultrasonic cleaners and automatic washing appliances should not be used in the preparatory cleaning process. Instruments should not be exposed to chemical disinfectants prior to the above cleaning procedures.

Pre-cleaning to remove visible particles, particularly from intricate surfaces, will reduce potential infectivity.

Items that have been identified as difficult to clean should be disposed of.

While alternative methods of reprocessing (proteases, enzymatic or alkaline detergents) are being actively researched, they are not yet being recommended as alternatives to destruction for instruments used on high- or low-risk patients in high infectivity tissues. In the future, it is likely that if a cleaning method is found to be effective in removing prions, it may be incorporated into routine reprocessing for all surgical instruments. Healthcare facilities should consider this when purchasing new instrument cleaning systems.

**Steam sterilisation at 134°C for 3 minutes is currently recommended for all instruments in contact with high infectivity tissues unless otherwise directed.**

Equipment reprocessing staff should wear gloves, liquid-repellent gowns, masks and eye protection at all times when handling high infectivity tissues and instruments exposed to high infectivity tissues.

**Endoscopes used in procedures that involve exposure to high infectivity tissues in high or low risk patients.**

Thorough washing and cleaning with anionic detergents will reduce the level of instrument contamination by all micro-organisms and therefore would be expected also to decrease the risk of transmission of prions if any were present. High-level disinfectants such as glutaraldehyde, however, enhance the adherence of prions to surfaces, and thus are contraindicated for use on instruments that may potentially be contaminated by prions.

Therefore, it is advised, any endoscope<sup>§</sup> used in a procedure in a high- or low- risk patient during which high infectivity tissue has been exposed (e.g. ventriculoscope) must be destroyed by incineration or kept for exclusive use in that patient. In all other situations, endoscopes may be reprocessed using routine reprocessing.

§ A normal nasal endoscope procedure does not reach the olfactory epithelium.

### **Quarantining of equipment**

Quarantining of equipment is the process by which instruments are separated, reprocessed, labelled and held aside for either of two courses of action; destruction or return to circulation. Quarantine of equipment should be used if the patient's cCJD risk status is not known, including during an investigation by the CJD Incident Panel. The equipment should be quarantined until the risk status is clarified.

Once the risk status of the patient is determined, equipment should be either returned to circulation after thorough cleaning and reprocessing or destroyed by incineration or alternate approved method of medical waste destruction. In some instances, the CJD Incident Panel may require additional reprocessing before instruments or equipment are returned to circulation. If a patient is categorised either low-risk or high-risk for cCJD, the equipment may be quarantined for future exclusive use with that patient, and then disposed of by incineration or alternate approved method of medical waste destruction.

Any tracking and quarantine system must minimise the risk of accidental re-introduction of potentially infected equipment into the reprocessing area.

### **Environmental cleaning of the operative or procedure area**

Routine containment and cleaning procedures should be used for the whole operative area, including surfaces, unless a major 'spill' of high infectivity tissues has occurred. Any contamination by high infectivity tissues from patients in either the low-or-high risk cCJD categories should be cleaned using anionic detergent and water#.

This recommendation differs to Chapter 31 in the *DoHA Infection control in the health setting* which recommends the cleaning by first exposing the area to freshly prepared sodium hydroxide or sodium hypochlorite for 1 hour.

Consider the use of disposable covers for floors and horizontal surfaces where contact with high infectivity tissue is possible.

## Health care worker responsibilities

### Occupational exposure to high risk tissue

There are no special requirements following a needlestick or other body fluid exposure. (Refer to Queensland Health Infection Control Guidelines – [Guidelines for management of Occupational & Non-Occupational Exposures to Blood and Body Fluids](#)).

### Management of spills

All spills from patients in either the lower- or higher-risk CJD categories should be cleaned using standard spills management procedures.

### Cleaning equipment (spills kit)

A spills kit (that includes occupational health and safety recommendations) should be available in areas of increased risk, such as neurosurgery operating rooms, mortuaries and laboratories. Appropriate training should be provided to waste handlers through to the point of destruction.

### Organs and tissues for transplantation

In all situations, the following people should be excluded from the routine donation of organs and tissues:

- people in the high-risk group;
- people in the low-risk group (tissues are excluded from donation, but organs may be allowed to be donated, if informed consent is given by the recipient);
- people who die in psychiatric hospitals, with the exception of those in whom cCJD has been specifically excluded; and
- people who die with any obscure undiagnosed neurological disorder, including dementia.

Agencies that are responsible for recruiting organ/tissue donors and for the banking of tissues (eg corneas, heart valves, skin) should be aware of the public health implications of cCJD and should have donor exclusion criteria and screening procedures in place.

When tissues are collected at autopsy for tissue donation, the brain of the donor should be assessed by a pathologist and the paraffin blocks archived for future reference. The stored tissue should not be transplanted until examination of the autopsy material has been completed.

Material from patient groups at risk of transmitting cCJD should not be used for the preparation of any therapeutic products or laboratory reagents (eg thromboplastin or Kveim test material).

### Post Mortem Examinations

No additional precautions are required for transport of bodies although bodies should be secured in an approved body bag to avoid fluid leakage. Embalming of bodies should be avoided. There is currently no requirement for cremation so relatives of the deceased are free to choose the method of interment.

Additional precautions should be used for post mortem examinations involving exposure to high infectivity sites in patients of high- or low risk. At the time of this guideline there is a requirement for all post mortem examinations to be performed at the John Tonge Centre. A set of instruments dedicated to suspect CJD patients should be used and kept separate to instruments used to harvest organs and tissues for donation.

Removal of the brain with the electric bone saw should be performed with sufficient containment to avoid aerosol production, or a hand saw may be used.

All tissue samples from high infectivity site should be treated as potentially infectious for cCJD until proved otherwise. Tissue or fluid samples should be collected into sealed containers with the cCJD risk status of the patient clearly labelled. High infectivity tissues should be handled under PC2 containment. Due to the resistance to inactivation by aldehydes and alcohols, brain specimens should be fixed in 4% formaldehyde solution (10% formal saline), followed by immersion in formic acid (>96%) for one hour. For machine processing, tissues should be washed in formalin to prevent damage to containers by formic acid. For hand processing, tissues can be transferred directly from formic acid to ascending alcohol solutions. Cryostat microtomes should be cleaned after preparation of frozen sections.

Cadavers from high- or low- risk patients should not be used for teaching purposes.

## Surveillance

cCJD is a notifiable disease in Queensland. Doctors and hospitals are required to notify on provisional clinical diagnosis to their local population health unit (PHU). Contact details for PHUs are provided in Appendix 6.

### **Australian National CJD Registry (ANCJDR)**

The Australian Department of Health and Ageing established the ANCJDR in 1993, which is based in the Department of Pathology at the University of Melbourne. The registry assists the department with the ongoing surveillance of CJD cases in Australia, identifies CJD risk factors for population health and should be notified of CJD cases at the same time as public health authorities. The contact details of the registry are provided in Appendix 6.

### **Adverse Event Management**

Since there is no test to reliably detect cCJD prior to the onset of symptoms, it is possible that surgical instruments used on a patient with asymptomatic cCJD might subsequently be used unknowingly on other patients after routine reprocessing, with a potential risk of transmission. In the event of patients being exposed to instruments that have previously been exposed to high infectivity tissues in a patient that is subsequently found to have cCJD, the following should be immediately notified:

- the executive of the health care establishment; and
- the local population health unit.

In September 2004, the Australian Government established a National CJD Incident Panel. This panel provides expert advice in the event of an adverse event involving cCJD. The relevant State or Territory Health Department assumes responsibility and is accountable for determining action to be taken, the investigation, equipment management,

patient risk assessment and the scope of a look-back investigation if it is required. The National CJD Incident Panel advises the Health Department on specific look-back and infection control issues.

If equipment having direct contact with high- or medium- infectivity tissue (Table 31.1) has been used in the past on a patient subsequently found to have cCJD, the equipment should be identified and withdrawn pending a decision from the State or Territory Health Department who will obtain advice from the National CJD Incident Panel. Upon this decision, the instruments will either be destroyed or returned to use following reprocessing. Other equipment that has not been in contact with a high- or medium-infectivity tissue should not be withdrawn and should continue to be reprocessed using routine methods.

### **Look-back**

The need for a look-back is determined by a risk assessment process undertaken by the Queensland Health. A flow chart summarising the essential steps in a look-back procedure is provided in Appendix 5. Queensland Health in consultation with the health care establishment is responsible for tracing individuals suspected of exposure to cCJD. The National CJD Incident Panel provides expert advice to inform decisions on the need for a look-back and infection control measures.

A plan for the look-back should be developed that allows for tracing of potentially exposed individuals and assessment of their potential exposure to risk. Consideration should be given to maintenance of confidentiality of patient details and the way in which information is provided (personal phone communication, face-face, written information), standardised or individualised information and involvement of the media.

## Appendix 1: Individuals in the high-risk category for cCJD

(Kovacs *et al* 2002, Kovacs *et al* 2005).

<p><b>1 Sporadic TSE</b></p> <p><b>1.1 Definite</b> Neuropathologically/ immunocytochemically confirmed</p> <p><b>1.2 Probable</b> 1.2.1 I and 2/4 of II and III 1.2.2 Possible and positive 14-3-3 CSF assay</p> <p><b>1.3 Possible</b> I and 2/4 of II and duration □2 years</p>	<p><b>Clinical signs</b></p> <p>I Rapidly progressive dementia</p> <p>II A Myoclonus B Visual or cerebellar problems C Pyramidal or extrapyramidal features D Akinetic mutism</p> <p>III Typical EEG</p>
<p><b>2 Accidentally transmitted TSE</b></p> <p><b>2.1 Definite</b> Definite TSE with a recognised health care acquired risk factor</p> <p><b>2.2 Probable</b> 2.2.1 Progressive predominant cerebellar syndrome in human pituitary hormone recipients 2.2.2 Probable TSE with recognised health care acquired risk factor</p>	<p><b>Recognised health care acquired risk factors</b></p> <ul style="list-style-type: none"> <li>• Treatment with human pituitary growth hormone, human pituitary gonadotrophin or human dura mater graft.</li> <li>• Corneal graft in which the corneal donor has been classified as definitely or probably having a human prion disease.</li> <li>• Exposure to surgical instruments that have come into contact with high- or medium- infectivity tissues previously used in a case of definite or probable human prion disease.</li> </ul> <p>The relevance of any exposure to disease causation must take into account the timing of exposure in relation to disease onset. This list is provisional, as previously unrecognised mechanisms of human prion disease may occur.</p>
<p><b>3 Genetic TSE</b></p> <p><b>3.1 Definite</b> 3.1.1 Definite TSE and definite or probable TSE in first- degree relative 3.1.2 Definite TSE with a pathogenic PRNP mutation</p> <p><b>3.2 Probable</b> 3.2.1 Progressive neuropsychiatric disorder and definite or probable TSE in first-degree relative 3.2.2 Progressive neuropsychiatric disorder and pathogenic PRNP mutation</p>	<p><b>PRNP mutations</b></p> <ul style="list-style-type: none"> <li>• PRNP mutations associated with GSS neuropathological phenotype: P102L, P105L, A117V, G131V, F198S, D202N, Q212P, Q217R, M232T, 192 bpi</li> <li>• PRNP mutations associated with CJD neuropathological phenotype: D178N-129V, V180I, V180IM232R, T183A, T188A, E196K, E200K, V203I, R208H, V210I, E211Q, M232R, 96 bpi, 120 bpi, 144 bpi, 168 bpi, 48 bp deletion</li> <li>• PRNP mutations associated with FFI neuropathological phenotype: D178N-129M</li> <li>• PRNP mutation associated with vascular PRP amyloid: Y145S</li> <li>• PRNP mutations associated with proven but unclassified prion disease: H187R, 216 bpi</li> <li>• Mutations associated with neuropsychiatric disorder but not proven prion disease: I138M, G142S, Q160S, T188K, M232R, 24 bpi, 48 bpi, 48 bpi nucleotide substitution in other octapeptides</li> <li>• PRNP mutations without clinical and neuropathological data: T188R, P238S</li> <li>• PRNP polymorphisms with established influence on phenotype: M129V</li> <li>• PRNP polymorphisms with suggested influence on phenotype: N171S, E219K, 24 bp deletion</li> <li>• PRNP polymorphisms without established influence on phenotype: P68P, A117A, G124G, V161V, N173N, H177H, T188T, D202D, Q212Q, R228R, S230S</li> </ul>
<p><b>Other</b> The following people are also classified as being at high risk: carriers of disease-linked mutations of the PrP gene; and persons in whom the PrP gene has not been sequenced but who have two or more first degree relatives with cCJD (including GSS or FFI). <b>Note:</b> People who have had the PrP gene sequenced and are shown not to carry the disease-linked mutation can be classified as 'background' risk, unless they have other demonstrated risk factors.</p>	

## Appendix 2: Individuals in the low-risk category for cCJD

1. People with a progressive neurological illness of less than one year's duration, with or without dementia for whom a determination to assign a high-risk status or background risk status cannot be made following competent professional review.
2. People with a progressive neurological illness of less than one year's duration, with or without dementia awaiting the outcome of a professional review to assign a high-risk status or background risk status.
3. Patients undergoing a diagnostic brain biopsy for progressive brain disease; and patients undergoing neurosurgical investigations (including brain biopsy) or therapeutic procedures for a progressive disorder that includes dementia.
4. All genetically related members of any family in which there is a strong family history (two or more first-degree relatives) of dementia or neurological illness, and in which affected individuals have not been competently and completely assessed neurologically, specifically for cCJD.
5. Recipients of cadaver-derived human pituitary hormones (growth hormone and gonadotrophins) before 1986.
6. Recipients of dura mater homografts or transdural neurosurgery before 1990, or neurosurgical patients for whom the use of dura mater homografts cannot be excluded by reference to patient records.
7. Individuals who have been contacted by a health authority as part of a look-back procedure from exposure to surgical instruments that had previously been used on patients later found to have contracted cCJD are likely to have a very low, but unquantifiable risk for cCJD that is thought to be above background risk. Until further information on the likely risk of these individuals is available, they are conservatively placed in a low risk category.

**Appendix 3 – CLASSICAL CREUTZFELDT-JAKOB DISEASE (CCJD) RISK ASSESSMENT TOOL**

(INSERT HOSPITAL LOGO HERE)	AFFIX PATIENT IDENTIFICATION LABEL HERE
-----------------------------	--

**INTRODUCTION**

The following questions are to be asked of a patient prior to their undergoing surgery, investigations or a procedure involving any of the following high infectivity tissues (including endoscopic procedures, eg. ventriculoscopes):

- (a) Brain, pituitary or dura mater
- (b) Cranial and dorsal root ganglia
- (c) Spinal cord
- (d) Eye (Retina/Optic Nerve)
- (e) Olfactory Epithelium

NB: if this is a repeat procedure and the following questions have already been answered, then they need not be completed again providing the patient’s neurological condition remains unchanged.

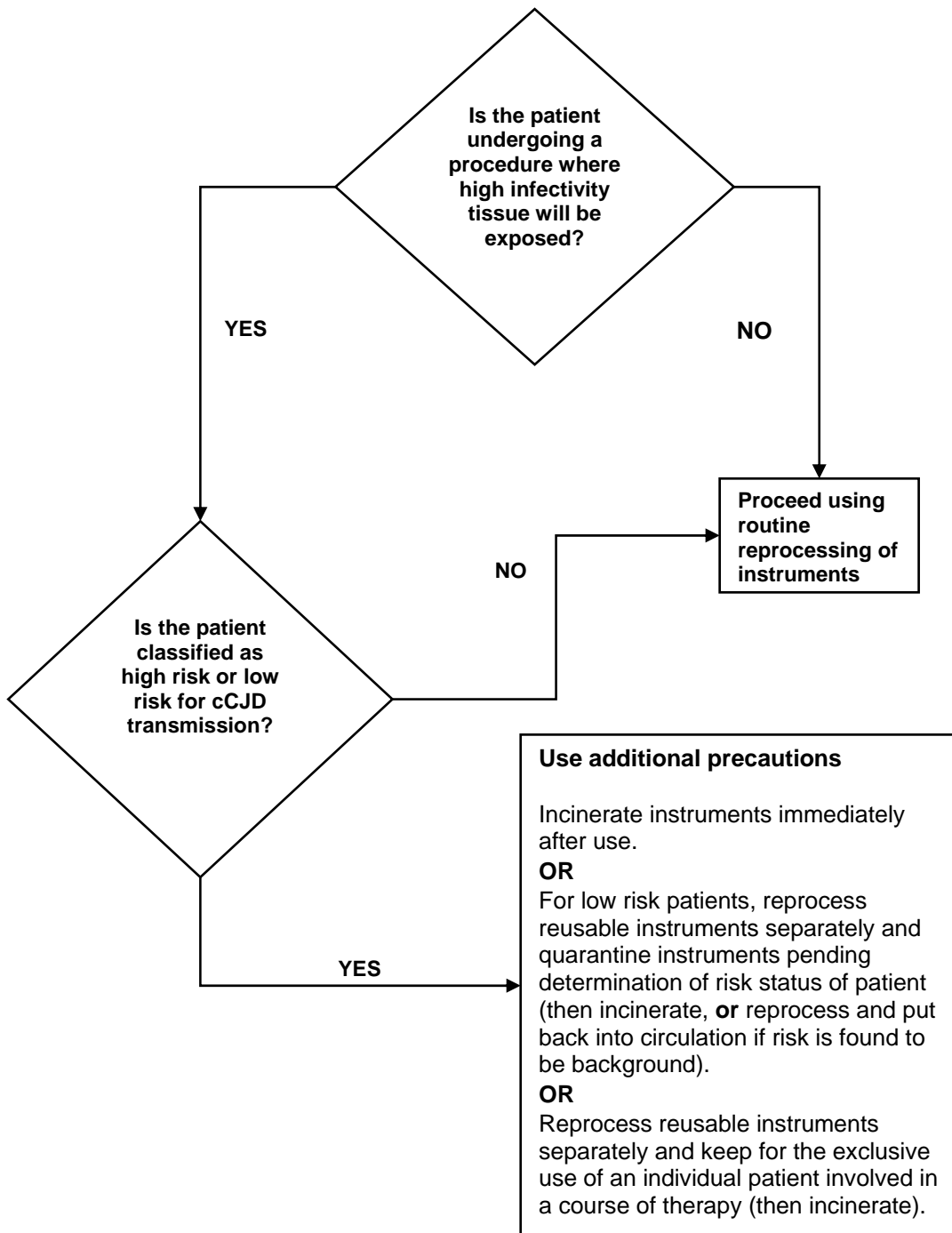
<b>Q1</b>	Do you think the patient may have cCJD?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Q2</b>	Does the patient have a family history of cCJD?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Q3</b>	Does the patient have a progressive neurological illness of less than 12 months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Q4</b>	Does the patient have a history of receiving human pituitary hormone for infertility or human growth hormone for short stature (prior to 1986)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Q5</b>	Has the patient previously had surgery on the brain or spinal cord that included a dura mater graft (prior to 1990)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Q6</b>	Has the patient been involved in a ‘look-back’ for cCJD or shown you a ‘medical in confidence letter’ regarding their risk for cCJD?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Action: If the patient answers yes to any of the above questionnaire, please contact infection control personnel in your health care facility. Put into place the facility action plan for potential cCJD patients.			

**I have undertaken the appropriate action as required by the hospital’s infection control policies regarding cCJD.**

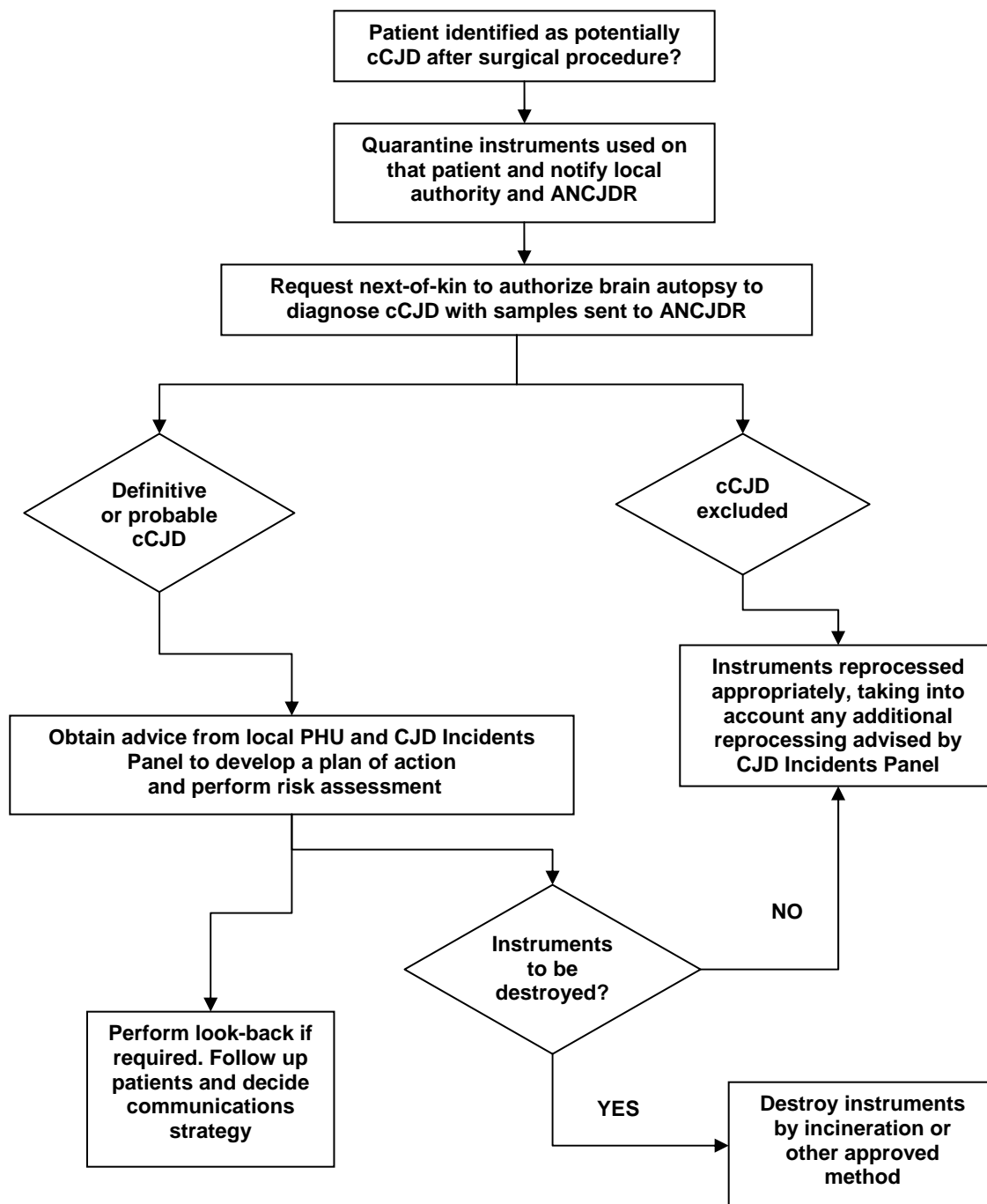
**Name of Medical Officer.....Date.....Time.....**

**Signature.....**

**Appendix 4: Summary of Actions for a Surgical Procedure – CJD risk Assessment**



## Appendix 5: Summary of actions for a look-back



## Appendix 6 – Key Contacts

<b>Communicable Diseases Branch Queensland Health</b> Telephone: (07) 3234 0111	<b>Centre for Healthcare Related Infection Surveillance &amp; Prevention Queensland Health</b> Telephone: (07) 3895 3117
<b>Australian National CJD Registry (ANCJDR)</b> Department of Pathology The University of Melbourne Parkville, Victoria 3052 Telephone: 03 8344 5868 or 03 8344 1949 Fax: 03 8344 4004 Email: <a href="mailto:ANCJD-REG@unimelb.edu.au">ANCJD-REG@unimelb.edu.au</a>	<b>Australian Government Department of Health and Ageing</b> Office of Health Protection Telephone: +61 2 6289 8951 Fax: +61 2 6289 7100 Email: <a href="mailto:ICG@health.gov.au">ICG@health.gov.au</a> BSE hotline: 1800 200 701

### CJD Support Group Network

The CJD Support Group Network is funded by the Department of Health and Ageing and is contracted to assist and support all families affected by CJD and people who are 'at risk of CJD' in Australia. Visit their site at <http://www.cjdsupport.org.au/>

### Queensland Health Population Health Units

All cases of suspect cCJD should be reported immediately to your local Population Health Unit:

Central Population Health Unit Network	Brisbane Northside	Phone: 3624 1111 Fax: 3624 1199
	Sunshine Coast	Phone: 5409 6600 Fax: 5443 5488
	Wide Bay	Phone: 4120 6000 Fax: 4120 6009
	Bundaberg	Phone: 4150 2780 Fax: 4150 2729
	Rockhampton	Phone: 4920 6989 Fax: 4920 6865
Southern Population Health Unit Network	Brisbane Southside	Phone: 3000 9148 Fax: 3000 9130
	Darling Downs	Phone: 4631 9888 Fax: 4632 8563
	Gold Coast	Phone: 5509 7222 Fax: 5561 1851
Tropical Population Health Unit Network	Cairns	Phone: 4050 3600 Fax: 4031 1440
	Mackay	Phone: 4968 6611 Fax: 4968 6610
	Mt Isa	Phone: 4744 4846 Fax: 4745 4573
	Townsville	Phone: 4753 9000 Fax: 4753 9001

## References

1. J Bell and J Ironside. How to tackle a possible Creutzfeldt-Jakob disease necropsy. *J Clin Pathol* 1993; 46: 193-197,
2. Brown P, *et al* Chemical disinfection of Creutzfeldt-Jakob disease virus. *New Engl J Med* 1982; 306(21): 1279-1282
3. Brown P *et al* Human spongiform encephalopathy: the national Institutes of Health series of 300 cases of experimentally transmitted disease. *Annals of Neurology* 1994; 35 (5): 513-529.
4. Brown P, *et al* Iatrogenic Creutzfeldt-Jakob disease at the millennium. *Neurology* 2000; 55(8): 1075-1081.
5. Budka H *et al* Tissue handling in suspected Creutzfeldt-Jakob disease (CJD) and other human spongiform encephalopathies (prion diseases). *Brain Pathology* 1995; 5: 319-322.
6. Collins SJ, *et al* *Lancet* 1999; 353: 696-697.
7. Collins SJ, *et al* Gerstmann-Sträussler-Scheinker syndrome, fatal familial insomnia, and Kuru: a review of these less common human transmissible spongiform encephalopathies. *Journal of Clinical Neurosciences* 2001; 8: 387-397.
8. Collins SJ, *et al* *Lancet* 2004; 363: 51-61.
9. Fichet G, *et al* *Lancet* 2004; 364: 521-526.
10. Gajdusek DC. *Science* 1977; 197: 943-960.
11. Gibbs C, *et al* *Proc Natl Acad Sci* 1978; 75: 6268-6270.
12. Jackson G, *et al* *J Gen Virology* 2005; 86: 869-878.
13. Kovacs G, *et al* *J Neurol* 2002; 249: 1567-1582.
14. Kovacs G, *et al* *Hum Genet* 2005 DOI 10.1007/s00439-005-0020-1.
15. Shiga Y, *et al* *Neurology* 2004; 63: 443-449.
16. Tamai Y, *et al* *New Engl J Med* 1992; 327: 649.
17. Tateishi J, *et al* *Annals of Neurology* 1980; 7: 390-391.
18. Tateishi J, *et al* *Annals of Neurology* 1988; 24: 466.
19. Taylor DM. *Annals of Neurology* 1987; 22: 557-558.
20. Taylor DM., *The Veterinary Journal* 2000; 159: 10-17.
21. UK Transmissible Spongiform Encephalopathy Agents: Safe Working and the Prevention of Infection (2003)
22. WHO Guidelines on Tissue Infectivity Distribution in Transmissible Spongiform Encephalopathies (2006)
23. Wientjens DPWM, *et al* 1996; 46: 1287-91.
24. Will RG. *BMJ* 1993; 49: 960-70.
25. Zerr I, *et al* *Neurology* 2000; 55: 811-815.