DEPARTMENT OF CLINICAL BIOCHEMISTRY
Neurochemistry Laboratory

the children's hospital at Westmead

Corner Hawkesbury Road and Hainsworth Street
Locked Bag 4001, Westmead NSW 2145
Sydney Australia
Dr Sushil Bandodkar Ph 61 2 9845 3289
Fax 61 2 9845 3332
E-mail sushil.bandodkar@health.nsw.gov.au

CEREBROSPINAL FLUID NEUROCHEMISTRY COLLECTION PROTOCOL

Collect the following set of micro-tubes first.

Collect onto "wet" ice and send within 5 minutes to the Biochemistry Laboratory. If the sample is contaminated with blood, the sample must be immediately centrifuged in the Biochemistry Laboratory, and the supernatant transferred to a fresh tube.

Micro-tube 1	0.5 mL CSF for Lactate, Glucose and Pyruvate [1]
Micro-tube 2	0.5 mL CSF for Amino Acids [2]
Micro-tube 3	0.5 mL CSF for HVA, 5-HIAA and other metabolites [3]
Micro-tube 4	0.5 mL CSF for Pteridines [4]
Micro-tube 5	0.5 mL CSF for MHPG, 3-MDOPA and storage for future studies
Micro-tube 6	0.5 mL CSF for Immunology (Collected for CHW patients only)

Ideally CSF should be collected at a time when symptoms are most severe, especially for DRD with diurnal variation. Collect all tubes to ensure consistency in sampling volume. For example if lactate, pyruvate, amino acids are not required, it is still essential to collect 0.5ml into microtubes 1 and 2 and store or redirect for other analyses. A paired blood sample for glucose, lactate, pyruvate and amino acids should be collected onto ice and sent immediately to the Biochemistry Laboratory.

Collect the remainder in standard tubes.

Collect at room temperature and send immediately to the Microbiology Laboratory.

Tube 1	1.0 mL CSF for Bacteriology, Glucose & Protein [5]
Tube 2	1.0 mL CSF for Virology or Cytospin
Tube 3	Further CSF as required for DNA studies or TB screening [6]

Notes:

1. Micro-tube 1 is most likely to be blood-contaminated. The laboratory can centrifuge this sample, but this must take place immediately, with the clear CSF supernatant being transferred to a fresh tube.
2. Sample will be passed on to the NSW Biochemical Genetics Service for amino acid analysis. A paired blood sample is also required for glycine analysis.
3. This sample must be free of preservative to facilitate metabolite analyses
4. This tube contains a special preservative consisting of diethylenetriaminepentaacetic acid and dithioerythritol to minimise breakdown of tetra-hydrobiopterin.
5. Sample will be processed rapidly by Bacteriology and supernatant passed on to Biochemistry for analysis of glucose and protein.
6. Virology Department at The Children's Hospital at Westmead requires 10mL of CSF for TB screening.

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CEREBROSPINAL FLUID NEUROCHEMISTRY - MEDICATION EFFECTS

A list of all drugs being taken by the patient should be provided to the laboratory including any medication/anaesthesia for performing a lumbar puncture. The presence of certain drugs may be important in assessing CSF abnormalities, or it may be necessary to modify analysis conditions to avoid interference from various drugs and their metabolites.

The following drugs should be avoided for ten days prior to CSF collection.

Metabolic Intermediates

(Produce high levels of CSF amines and metabolites)

L-DOPA	3,4-DIHYDROXYPHENYLALANINE, MALDOPAR, SINEMET
5-HTP	5-HYDROXYTRYPTOPHAN

Mono-amine Oxidase Inhibitors

(Prevent formation of metabolites)

Selegiline	ELDEPRYL, SELGENE
Moclobemide	ARIMA, AURORIX
Tranylcypromine	PARNATE
Phenelzine	NARDIL

Catechol-O-Methytransferase Inhibitors

(Prevent formation of metabolites)

Entacapone	COMTAN

Re-uptake inhibitors

(May raise or lower amines and metabolites)

Fluoxetine	ZACTIN, AUSCAP, EROCAP, FLUOHEXAL, LOVAN, PROZAC, ZACTIN
Citalopram	CIPRAMIL
Fluvoxamine	FAVERIN, LUVOX
Paroxetine	AROPAX
Sertraline	ZOLOFT
Venlafaxine	EFEXOR

For further information contact Dr Sushil Bandodkarl. Ph: 61-2- 9845-3289 Fax: 61-2-98453332

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Information for Referring Laboratories.

Storage & packaging:

CSF specimens should be stored below -20deg. C. prior to packaging and transport. Samples should be transported with sufficient dry ice to ensure samples remain frozen for the whole time the samples will be in transit. Dry ice must not be placed inside a sealed container and packaging must comply with IATA standards: International Air Transport Association, Dangerous Goods Regulations 1999, Section 3.6.2.4, p 80-81.

Request Form:

A request form must accompany each set of patient samples, setting out details of the patient, doctor, referring institution, billing information, clinical notes, details of the patient's medication, clinical details, brain imaging, and preliminary CSF chemistry.

Transport:

Address samples to: Dr Sushil Bandodkar, Clinical Biochemistry, The Children's Hospital at Westmead, Hawkesbury Road, Westmead, NSW. Australia. In practice it is best to send specimens from interstate or overseas early in the week so they will arrive between 9:00 am and 2:00 pm on Monday - Thursday. On several occasions, samples arriving in Sydney on a Friday afternoon have not been delivered until the following Monday morning, by which time the specimens had completely thawed.

Prepared by:
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References:

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Hyland K., Arnold L.A. Value of lumbar puncture in the diagnosis of genetic metabolic encephalopathies. J Child Neurol 1999: 14 (suppl. 1); S9 – S15.

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Request Form

MRN:_____Date of Birth: __/__/___ Female ☐ Male ☐
Name: (FAMILY)_____(GIVEN)_____
Address: _____

Billing Status:

☐ Hospital Patient in a recognised hospital
☐ Private Patient in a recognised hospital
☐ Private Patient in an approved day hospital facility
☐ Patient from outside Australia
☐ Compensable - Transcover Pre July 1989
☐ Compensable - Other
☐ Compensable - Motor Accident Authority, from July '89

CSF Collection: Date: _/__/___ Time: __:__
☐ Lumbar ☐ Ventricular ☐ Other (specify) _____
Requesting Institution: _____E-mail: _____
Institution Address: _____
Requesting Doctor: _____(Signed) _____Phone_____
AMO:_____Provider No._____

Tests Requested:

☐ HVA, 5-HIAA, Pterins ☐ Amino Acids ☐ L-DOPA ☐ 5-HTP ☐ Other _____
Indications/ Clinical Notes:_____
_____
_____
Medication: Anticonvulsants/Anaesthetic agents/other medication _____
_____
L-DOPA therapy: ☐ None ☐ Ceased for ___days prior to collection.

MRI: ☐ Normal
- ☐ Brain size/shape abnormalities: _____
- ☐ Ventricle/ fluid abnormalities: _____
- ☐ Demyelinating disease: _____
- ☐ Leukodystrophy: _____
- ☐ Neurodegenerative condition: _____
- ☐ Brainstem changes: _____
- ☐ Other conditions: _____

Laboratory Studies already performed:
CSF Appearance: ☐ Bloodstained ☐ Clear ☐ Turbid ☐ Coloured_____

CSF Cell Counts: RBC _____ Polymorphs _____ Mononuclear _____

CSF Glucose: _____ Protein: _____ Lactate: _____ Pyruvate: _____

CSF Phenylalanine: _____Tyrosine: _____Tryptophan: _____

Phenylalanine Load Test Result: ☐ Normal. ☐ Abnormal ☐ Not Performed