**CHILDREN'S CANCER AND LEUKAEMIA GROUP (CCLG)**

# Guidelines for biopsy sampling of solid tumours

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On behalf of the CCLG Tissue Bank and the CCLG Paediatric Surgery Group

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# Introduction

These guidelines set out recommendations for biopsy sampling of solid tumours for the purposes of diagnosis including current standard of care genetic testing, including from Q3 2020 NHS whole genome sequencing (at diagnosis), Stratified Medicine Programme in Paediatrics (SMPaeds) (at relapse )and samples destined for tissue banking with the CCLG Tissue Bank.

In 2018 a national survey was undertaken to capture data about the current biopsy methods used, including size and number of biopsy cores taken by paediatric surgeons across the UK (CCLG Surgeons Group) and internationally. A local audit of previously biopsied samples was also undertaken at the Royal Victoria Infirmary, Newcastle UK and these guidelines are based on the results of this survey and audit.

Patient biopsy samples are increasingly being used for a wider range of diagnostic investigations including detailed genetic testing of DNA via single nucleotide polymorphism (SNP) arrays, panel sequencing, exome and whole genome sequencing in order to accurately assign risk groups and detect molecular abnormalities which may lead to treatment with a targeted agent. It is important that an appropriate number of samples are taken at the time of biopsy to allow for contemporary genetic testing to be undertaken and for the storage of samples in the CCLG tissue bank for further research or diagnostics to be performed.

Tissue banking is especially important with regard to SMPaeds, as material from the original tumour at diagnosis may be required at a later stage for comparison with the relapsed tumour.

## Hazards and precautions

Staff should be appropriately qualified and trained in retrieving tissue core biopsy samples.

Risks posed to patients' health and wellbeing should be addressed prior to carrying out an invasive procedure and patients' safety should be prioritised at all times. The method used for biopsy sampling of solid tumours and the number and size of cores should only be taken if safe to do so.

Local standard operating procedures should be adhered to at all times when handling human tissue.

**Handling of fresh tissue** - risk of infection – ensure appropriate infection control is maintained.
**Use and handling of sharps** – caution should be taken when handling sharp implements. Blades and needles should be disposed of in an appropriate sharps bin.
**Use and handling of Liquid nitrogen ($LN_2$)** - risk of serious burns and asphyxiation. Gloves and appropriate protective equipment should be worn. Local standard laboratory practices should be followed and users be trained appropriately for the handling and use of asphyxiating gases/$LN_2$.

# Consent

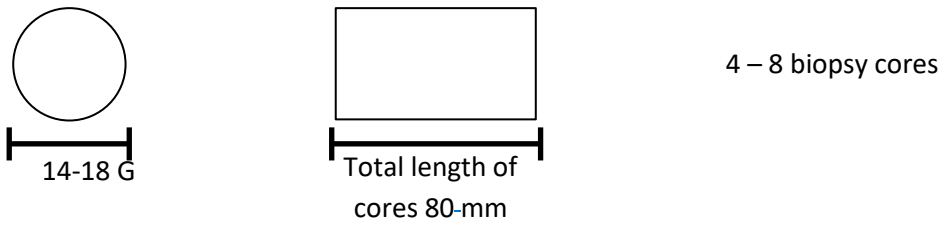
Ensure that the appropriate consent has been obtained to allow the collection of biopsy samples for NHS whole genome sequencing, SMPaeds and inclusion in the CCLG Tissue Bank. If consent has not been obtained prior to procedure, biopsy samples may still be taken and stored appropriately within Histopathology Departments prior to consent being obtained within a time limited period determined by the downstream application.

# Procedure

## Biopsy sampling

Core biopsy samples for research should be collected after samples have been obtained for diagnostic tests.

- A 14-18 G biopsy needle should be used to collect tumour samples which should be done ideally under image guidance (USS/CT)
- A total length of 80 mm per core biopsy sample should be taken.
- This could be achieved by 4 x 20mm samples or 8 x 10 mm samples (depending on the length of the retrieved sample).
- Optimum number of 4-8 biopsy cores should be taken per patient (provided there is no risk to patient safety).
- General Safety rules should be followed including that the biopsy should be representative of the tumour, avoidance of tumour spillage or rupture and consideration for future surgical incision should be taken into account in suspected sarcoma cases.
- Other means of tumour sampling can be considered e.g. surgical biopsies such as incision and excision biopsies via open or laparoscopic methods, which should be discussed at the relevant MDT before the procedure.




Samples should be collected at diagnosis, progression or relapse, however biopsy samples may be collected at other stages depending if sampling procedures are being undertaken

These are recommendations based on a previous audit of adequacy of tissue for cytogenetic studies in neuroblastoma undertaken by Mr Hany Gabra, consultant paediatric surgeon, with colleagues from Cytogenetics and Cellular Pathology, Great North Children's Hospital/Royal Victoria Infirmary, Newcastle. The amount of tissue that can be safely collected remains at the discretion of the operator (usually an interventional radiologist or paediatric surgeon).

## Sample collection and storage

Excised fresh tumour tissue received in the pathology laboratory should be frozen for subsequent downstream applications including storage within the CCLG Tissue Bank. For the tissue bank multiple aliquots of the same sample can be banked.

**For the CCLG tissue bank**

- Information about the size of the tumour sample (dimensions), percentage tumour cell content and cold ischemia time should be recorded on the specimen registration form.
- Fresh tissue samples should be kept on ice or cold in the short term until they can be frozen
- Tissue samples should be placed in 2D sterile barcoded tubes or cryovials provided by the CCLG Tissue Bank central bank team, and snap frozen (where possible), then stored in $LN_2$ or in an -80 °C freezer.
- If excess biopsy cores surplus to routine diagnostics are to be fixed in formalin and embedded in paraffin blocks, these should be numbered appropriately and labelled with the pathology number and CCLG Tissue Bank Number in accordance with the appropriate CCLG Tissue Bank SOP.
- All cryovials should be pre-labelled with at least two identifiers – pathology number and CCLG Tissue Bank number. Where handwritten, labelling should be legible and in permanent ink.

## Sample registration and transfer

- Samples should be registered with the CCLG Tissue Bank using the appropriate sample registration form.
- All registered samples should be transferred to the Central Bank on a 6-monthly basis, based on the list provided to the centre by the Tissue Bank team.

# Contacts

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