ISRCTN52590306 https://doi.org/10.1186/ISRCTN52590306

Rapid genomic sequencing for the diagnosis of critically ill children in the NHS Genomic Medicine Service: Ensuring an equitable and effective parent and patient-centred service

Submission date 15/09/2021	**Recruitment status** No longer recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 20/09/2021	**Overall study status** Completed	
Last Edited 30/10/2026	**Condition category** Other	

Plain English summary of protocol

Background and study aims

Rapid genomic sequencing is a relatively new technology that allows scientists to look in much greater detail at a person's genes than ever before. Rapid genomic sequencing can be used to look for changes in genes that may cause a genetic disorder. The NHS has recently started offering rapid genomic sequencing to babies and children who are critically ill to try and rapidly find the underlying genetic cause of their condition. The child and the parents are offered the test as it is useful to compare a child's DNA with DNA from both parents and identify the harmless gene changes which can run in families.

This is the first time that rapid genomic sequencing for critically ill children has been offered nationally in a public health service. This research will make sure that this new service is useful for patients, parents and the NHS. The aim of this study is to examine the delivery of rapid genomic sequencing in the NHS from the perspective of parents and professionals and consider and the impact of the test on patient care.

Who can participate?

1. Parents and carers of a child with a rare or undiagnosed condition
2. Parents who have been offered rapid genomic sequencing in the NHS
3. Professionals involved in delivering the rapid genomic sequencing service
4. Over 18 years of age

What does the study involve?

The researchers will;

1. Conduct a survey with parents and carers of children with rare and undiagnosed conditions that will help them focus their research on the issues that are most important for parents and carers.
2. Interview parents whose children had rapid genomic sequencing when they were seriously ill to ask what they think of the test and how support and information could be improved.
3. Interview and survey professionals to look at how rapid genomic sequencing is delivered

across England and ask what training and education they need.
4. Look at all of the tests done in a 12-month period (about 700) to see if families from all over England have access to the test and whether the test changed the care children received.
5. Gather all their findings together and make recommendations for best practice.

What are the possible benefits and risks of participating?
There is no immediate and direct benefit to taking part in the study. However, participants will be helping to improve the information and support given to families when they are offered rapid genomic sequencing.

Where is the study run from?
Great Ormond Street Hospital for Children NHS Foundation Trust (UK)

When is the study starting and how long is it expected to run for?
September 2021 to October 2023

Who is funding the study?
The National Institute for Health Research (NIHR) (UK)

Who is the main contact?
Dr Melissa Hill, melissa.hill@ucl.ac.uk

Contact information

Type(s)
Public

Contact name
Dr Melissa Hill

ORCID ID
https://orcid.org/0000-0003-3900-1425

Contact details
NHS North Thames Genomic Laboratory Hub
Great Ormond Street Hospital for Children NHS Foundation Trust
Level 5, Barclay House
37 Queen Square
London
United Kingdom
WC1N 3BH
+44 (0)20 7405 9200/8225
melissa.hill@ucl.ac.uk

Type(s)
Scientific

Contact name
Dr Melissa Hill

Contact details

NHS North Thames Genomic Laboratory Hub
Great Ormond Street Hospital for Children NHS Foundation Trust
Level 5, Barclay House
37 Queen Square
London
United Kingdom
WC1N 3BH
+44 (0) 207405 9200/8225
melissa.hill@ucl.ac.uk

Additional identifiers

Integrated Research Application System (IRAS)
304769

National Institute for Health and Care Research (NIHR)
202725

Study information

Scientific Title
Rapid genomic sequencing for the diagnosis of critically ill children in the NHS Genomic Medicine Service: A mixed-methods evaluation to ensure an equitable and effective parent and patient-centred service

Study objectives
Rapid genomic sequencing approaches, including whole and targeted genome and exome sequencing, are increasingly being used for the diagnosis of critically ill babies and children. These tests can be invaluable for directing patient management, identifying treatment options, or guiding decisions around palliative care, whilst avoiding invasive or painful diagnostic interventions. Rapid genomic sequencing for the diagnosis of critically ill children is now being offered routinely in the NHS Genomic Medicine Service. This is the first time that rapid genomic sequencing has been offered nationally in a public health service in mainstream clinical care. This mixed-methods evaluation will examine the delivery of this service from the perspective of parents, patients and professionals.

Research questions:
1. What are parent's experiences of rapid genomic sequencing when it is offered routinely in the NHS and how are information and support best delivered to them?
2. What are the barriers to informed decision-making and how can these be minimised?
3. What factors act as facilitators or barriers to diversity and inclusivity in the service?
4. Are there any unexpected negative psychosocial impacts on parents?
5. What are the experiences of professionals (clinical scientists, genetics and non-genetics clinicians) of coordinating the clinical service and returning results in a rapid timeframe?
6. What are the outcomes (diagnostic yield, referral rates) of the service?
7. Is there regional variation in service delivery, what factors contribute to this, and how can they be addressed?
8. Is the service helping the overall management of patients?
9. Is collaborative working across multidisciplinary teams effectively supported?
10. Are the education and training needs of mainstream clinicians being met?

Ethics approval required
Old ethics approval format

Ethics approval(s)
Not provided at time of registration

Primary study design
Observational

Study design
Multi-centre mixed-methods design using qualitative and quantitative approaches

Study type(s)
Diagnostic

Health condition(s) or problem(s) studied
Evaluation of a clinical service offering rapid genomic sequencing for the diagnosis of critically ill babies and children

Interventions
This study is a mixed-methods evaluation of the rapid genomic sequencing service that is offered by the NHS Genomic Medicine Service. The evaluation consists of four sub-studies:
1. Survey with parents and carers of children affected with genetic, rare or undiagnosed conditions: Parents and carers will be recruited through patient organisations and asked to complete a brief online survey (15-20 minutes) that will gather their thoughts on the service and our research plan.
2. Qualitative interviews with parents and professionals: Parents who have been offered rapid genomic sequencing for their critically ill child will be recruited through clinical genetic services. Professionals involved in delivering the service will be recruited from clinical genetic services and specialist paediatric services. Potential participants will be invited to take part in a qualitative interview that will take 45-60 minutes and use a semi-structured interview guide, The interviews will explore clinical and personal utility, the information and support needs of parents and challenges for service delivery.
3. Cross-sectional descriptive survey with professionals: Professionals involved in delivering the rapid genomic sequencing services will be invited to complete a brief online survey (20 minutes) that will consider challenges for service delivery and training needs.
4. Clinical audit to assess outcomes, clinical utility and equity of access: The researchers will examine patient management and clinical outcomes following rapid exome sequencing for all patients referred through the rapid genomic sequencing service in England over a 12-month period (~700 cases) to determine test outcomes, clinical impact and equity of access.
They will integrate the findings from the four sub-studies using a triangulation protocol and develop parent and patient-centred recommendations for the service.

Intervention Type
Other

Primary outcome(s)
Parent attitudes towards rapid genomic sequencing, measured using qualitative interviews and thematic analysis at least 3 months after being offered testing

Key secondary outcome(s)

1. Challenges for delivering rapid genomic sequencing in the NHS, measured using qualitative interviews and surveys with professionals conducted within a 12-month period, which will be analysed with thematic analysis and descriptive statistics, respectively
2. Change in clinical management following rapid genomic sequencing, measured using a clinical audit for all patients tested in a 12-month period

Completion date
31/10/2023

Eligibility

Key inclusion criteria
1. Parents/carers of children with rare or undiagnosed conditions
2. Parents who have been offered rapid genomic sequencing because their baby or child was critically ill
3. Parents who have been offered rapid genomic sequencing to inform management of a current pregnancy because they had a previously affected undiagnosed fetus/child
4. Professionals from clinical genetics and paediatrics specialties
5. Over 18 years of age
6. Able to give consent for participation

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
100 Years

Sex
All

Total final enrolment
58

Key exclusion criteria
Under 18 years of age

Date of first enrolment
01/11/2021

Date of final enrolment
30/06/2023

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Great Ormond Street Hospital for Children
Great Ormond Street
London
England
WC1N 3JH

Study participating centre
Royal Devon and Exeter Hospital
Barrack Road
Exeter
England
EX2 5DW

Study participating centre
Birmingham Children's Hospital
Steelhouse Lane
Birmingham
England
B4 6NH

Study participating centre
The Royal London Hospital
80 Newark Street
London
England
E1 1BB

Study participating centre
St Mary’s Hospital
Oxford Road
Manchester
England
M13 9WL

Sponsor information

Organisation
Great Ormond Street Hospital for Children NHS Foundation Trust

ROR
https://ror.org/03zydm450

Funder(s)

Funder type
Government

Funder Name
Research for Patient Benefit Programme

Alternative Name(s)
NIHR Research for Patient Benefit Programme, Research for Patient Benefit (RfPB), The NIHR Research for Patient Benefit (RfPB), RfPB

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
All data generated or analysed during this study will be included in the subsequent results publication.

IPD sharing plan summary
Other

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
HRA research summary			30/10/2026	No	No