

# Developing a new test for liver injury after taking too much paracetamol

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<b>Registration date</b> 15/09/2023	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 15/09/2023	<b>Condition category</b> Injury, Occupational Diseases, Poisoning	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Paracetamol overdose (POD) is common, with about 100,000 cases per year, and around 50,000 of these are treated and around 5,000 develop liver injury. The most common treatment used is called N-acetylcysteine (NAC). The sooner treatment with NAC is started after POD the greater the likelihood that drug-induced liver injury (DILI) will be prevented.

The current biomarker (a molecule in the blood) that shows us the extent of DILI is called ALT and it is a reliable gold standard for established liver injury. However, ALT increases too slowly after POD for the diagnosis of liver injury to occur so that treatment with NAC can have the best possible outcome. There is a need for an assay (a quick test) capable of telling us quicker that patients are likely to develop liver injury after POD to improve treatment knowledge and hopefully a better outcome.

K18 is another biomarker that is seen in liver injury earlier on than ALT. To try and improve patient care researchers have created a capillary blood (taken from a fingerpick), quantitative (can be measured), K18 Lateral Flow Assay/test (K18-LFA) that is low-cost, rapid and reliable. These look the same as the COVID-19 tests and can be read by the naked eye. The researchers also plan to test a device that uses a low-powered laser to read the strip and give a value (called a Raman Reader).

### Who can participate?

Patients aged 16 years or older who have presented to the emergency department with a suspected deliberate or accidental paracetamol overdose

### What does the study involve?

Participants will be asked to provide a tiny amount of blood with a blood sampling device which takes blood from the finger or thumb tip using a small lance. This will be carried out by a doctor or nurse. They will be asked for this soon after they have consented, 2 hours later and then on days 2-5 if they are in hospital. A small amount of any blood sample by the team looking after them whilst they are in hospital on days 1 and 2 will be requested - only if there is excess taken after the routine tests have been run.

### What are the possible benefits and risks of participating?

There are no expected benefits for the participant. This is a very low-risk study. The results of

the research tests will not be used to impact the clinical care of the participant. There is a small risk of bruising from the blood sampling device.

Where is the study run from?

1. Royal Infirmary of Edinburgh (UK)
2. St John's Hospital Livingston (UK)

When is the study starting and how long is it expected to run for?

July 2021 to May 2024

Who is funding the study?

The Medical Research Council (MRC)

Who is the main contact?

THT-clinical@ed.ac.uk

## Contact information

### Type(s)

Public

### Contact name

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## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### Integrated Research Application System (IRAS)

317414

### Protocol serial number

AC22112, IRAS 317414

## Study information

### Scientific Title

Point-of-care assessment of drug-induced liver injury (POC-DILI)

### Acronym

POC-DILI

### **Study objectives**

The novel medical devices will be able to identify liver injury post paracetamol overdose before the standard care test using a specific biomarker present in the blood.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Not provided at time of registration

### **Study design**

Single-site observational prospective cohort study.

### **Primary study design**

Observational

### **Study type(s)**

Diagnostic

### **Health condition(s) or problem(s) studied**

Diagnosis of liver injury in patients presenting with paracetamol overdose

### **Interventions**

Once consented:

1. Data will be collected on each patient including age, sex, gender, ethnicity, time of overdose, amount ingested, pattern of overdose, co-ingested medicines, blood results and treatment required.
2. At time 0, 2 hours (+/-1) and on days 2-5 (if admitted to hospital) approximately 25 µl of blood (could be a margin of 10-30 µl) will be taken using a standard finger prick lance will be mixed with 75 µl of buffer. The 100 µl of diluted blood will be added to the K18-LFA cassette at the bedside and a visual reading taken at between 10 and 30 minutes. An image of the cassette will be taken and uploaded to the database. The Handheld Raman Reader will then be used on the K18 LFA to quantify the assay in a separate area of the hospital and the results noted on the CRF /SDW. This will be performed in a timely manner (after 20 and before 120 minutes).
3. On days 1 and 2 (if the participant is admitted to the hospital) surplus blood (between 300 µl and 1 ml) (for serum) will be requested from the biochemistry labs at the recruiting hospital sites.
4. At Day 30 (+ 7 days) blood results and all clinical data required (treatment and health outcomes) will be recorded

### **Intervention Type**

Device

### **Phase**

Not Applicable

### **Drug/device/biological/vaccine name(s)**

Keratin 18 Lateral Flow Assay (K18-LFA), Raman Spectroscopy Reader (Raman Reader)

### **Primary outcome(s)**

1. ALT measured as part of routine clinical care and recorded on the patient's electronic medical record (daily blood results will be recorded up until day 30)
2. K18 in finger prick capillary blood measured using the Point of Care DILI Diagnostic (lateral flow assay combined with handheld Raman Spectrometer) at baseline, +2 hours then daily for up to 5 days whilst the participant is in hospital

### **Key secondary outcome(s)**

1. ALT, INR and bilirubin measured as part of routine clinical care and recorded on the patient's electronic medical record (daily blood results will be recorded up until day 30)
2. K18 from surplus blood serum measured by ELISA using the M65 Classic ELISA on days 1 and 2 if the participant is admitted and is in hospital on those days

### **Completion date**

31/05/2024

## **Eligibility**

### **Key inclusion criteria**

1. Presentation at hospital within 5 days after suspected or confirmed paracetamol overdose (all patterns of overdose are eligible – including single and staggered overdoses whether accidental or deliberate)
2. Aged 16 years or older
3. Capacity to provide informed consent
4. Deemed suitable for study procedures by attending/treating clinician

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Sex**

All

### **Key exclusion criteria**

1. Deemed unfit by the Investigator or treating clinician to participate
2. Detained under the Mental Health (Care and Treatment) (Scotland) Act 2003

### **Date of first enrolment**

01/05/2023

### **Date of final enrolment**

26/05/2024

## **Locations**

### **Countries of recruitment**

United Kingdom

Scotland

**Study participating centre**

**NHS Lothian**

Waverley Gate

2-4 Waterloo Place

Edinburgh

United Kingdom

EH1 3EG

## Sponsor information

**Organisation**

Accord (United Kingdom)

**ROR**

<https://ror.org/01x6s1m65>

## Funder(s)

**Funder type**

Research council

**Funder Name**

Medical Research Council

**Alternative Name(s)**

Medical Research Council (United Kingdom), UK Medical Research Council, Medical Research Committee and Advisory Council, MRC

**Funding Body Type**

Government organisation

**Funding Body Subtype**

National government

**Location**

United Kingdom

# Results and Publications

## **Individual participant data (IPD) sharing plan**

Consent will be sought from participants to permit sharing of anonymised data with funders, commercial and non-commercial collaborators or published on publicly available resources as appropriate. The data-sharing plans for the current study are unknown and will be made available at a later date.

## **IPD sharing plan summary**

Data sharing statement to be made available at a later date