

## Forensic investigations

Was it murder? Suicide? An accident?  
A natural death?

Which drugs can be detected in dried blood spots?

How much drugs was taken by/given to a victim?

Was the perpetrator under influence of drugs?

Is somebody driving under the influence of drugs?

Does somebody use drugs to perform better at  
sport competitions?

Is a child getting overdosed by  
medicines?

## Dried Blood Spot Tests

Dried Blood Spots (DBS) were used for the time first in 1963. Dr Guthrie used dried blood spots to detect disorders in neonates. Screening for inborn disorders in neonates is still the most widely used application of DBS, but DBS analysis is also being applied in a wide range of other applications more recently. The majority of these applications consist of other clinical applications such as epidemiological studies, optimising medication concentrations (therapeutic drug monitoring) and determining the fate of medication administered to patients (pharmacokinetic and toxicokinetic studies), but also testing animal blood for toxins or environmental contamination.

Of special interest for my project are forensic applications: testing blood spots from crime scenes to get clues about the state of mind of victims and/or perpetrators at the time of the incidence. Taking blood from persons who are suspected of offences after some time has elapsed is another possibility.

## Dried Blood Spot Method vs Other Forensic Tests

Various body tissues and fluids are used for the detection of drugs of abuse in forensic cases; hair, nails, urine, saliva and blood for example.

Sometimes only a small amount of blood is found on a crime scene and otherwise it is very easy and quick to obtain a sample. Obtaining small blood spots is less invasive than conventional blood pricking and it does not lead to privacy issues which can be encountered during urine sampling for example. Two other big advantages of dried blood spots are the versatile storage and shipping conditions. Blood spots can be preserved on paper cards which do not need much storage space and can be sent easily by post without the fear of breaking or other disruptions. These favourable conditions and the small amount of sample also lead to financial benefits. Stabilizing effects of many analytes and reduced risk of transmitting diseases have to be mentioned as a last but not least advantage of dried blood spots over liquid blood samples.

## My research

For blood spot experiments with drugs in the lab,  
the following steps are needed:

1. Pricking my fingers with an auto lancet.
2. Spotting small blood droplets on a paper card.
3. Adding medicines, drugs or alcohol to the blood spots.
4. Letting the spots dry before they are ready to be used.
5. Punching the spots out of the cards.
6. Developing a method to detect and quantify the drugs of abuse which are added before.

