



Liver disease is currently the 5th most common cause of death in the UK and the 10th Worldwide<sup>1</sup>. Death rates have doubled in the last 10 years with deaths due to cirrhotic liver disease at over 4000 per annum.

# Soft, firm or stiff

## Quantification of liver health

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It is estimated that in blood tests approximately 25% of the population show signs of liver disease and of these about a quarter will be due to the effects of alcohol.

It is also estimated that at any one time 15% of hospital beds are occupied by patients with liver disease.

There is a currently predicted rise in chronic liver disease in the UK due to a well documented increase in alcohol consumption, obesity and increasing rates of Hepatitis C infection.

The current method of investigating liver disease is a combination of physical examination, ultrasound and other imaging modalities such as MRI and CT plus blood tests and more invasively, direct puncture liver biopsy.

The use of biopsy carries with it risks associated with anaesthesia, bleeding post biopsy and the requirement for an overnight stay in hospital.

Ultrasound elastography (UE) provides an alternative to biopsy in many cases by being able to quantify the degree of fibrosis in the liver which can be followed up over a period of treatment to measure progression of disease and effectiveness of treatment. The scan takes a few minutes and is completely painless and non invasive.

The other use of UE currently under investigation is as part of an assessment of the apparently healthy individual with

life style predictors of liver disease such as excessive alcohol consumption.

According to the British Liver Trust<sup>2</sup> almost all excessive drinkers will develop a fatty liver, the first indicator of alcoholic liver disease and with continued excessive alcohol consumption, 20-30% of this group will go on to develop alcoholic hepatitis which in its severest form can lead to liver failure and death.

A smaller group of around 10% are likely to develop the irreversibly scarred, fibrotic liver of cirrhosis.

The technique of UE has the potential benefit of providing these individuals in the early stages with fatty changes in the liver, with an indicator of the condition of their liver and may provide a wake up call to make lifestyle changes and therefore remedy damage before fibrosis becomes irreparable liver cirrhosis.

### How does it work:

The use of UE is based on the clinical practice of palpating the liver to assess its' level of stiffness. A cirrhotic liver is firmer than a healthy one.

In practice the rating is on the lines of soft, firm or stiff.

Vibration causes an elastic wave to pass through the liver and it is the speed of propagation of this wave which is measured by the ultrasound and is directly related to the stiffness of the liver.

The faster the propagation wave, the

stiffer the liver.

Since the degree of stiffness of the liver is indicative of the level of fibrosis, it follows that the quantified speed of the wave is also an indicator of degree of fibrosis from whatever cause, be it alcoholic liver disease, fatty liver in obesity or complications associated with Hepatitis C.

**UE is of course not the ultimate diagnostic test for liver disease** but it is seen as a useful extra tool in the available methods of both diagnosing and following up liver disease.

There has been little peer review data published on the use of UE for screening in apparently healthy individuals, though it is an area being studied with a number of presentations being made at the Annual meeting of The American Association for the study of liver disease in October 2006.

The test is non invasive, however, and if used responsibly along with other liver tests such as traditional liver ultrasound and blood tests then we believe at London Bridge Hospital that the technique of UE has a significant role to play in the prevention of serious liver disease, especially in those individuals at risk from their lifestyle. It is this group who are the biggest potential beneficiaries from a liver screening programme.

#### References

<sup>1</sup> This information comes from an article by Prof Roger Williams in the Camden New Journal 21/08/03

<sup>2</sup> This information is taken from the British Liver Trust web site.