

## What Causes Pruritus (Itching)?

When those of us with liver disease notice a rise in our bilirubin levels we also experience pruritus (itching). The reason is jaundice. While we may

not be able to see the yellowing of jaundice on our skin or in the whites of our eyes, we still have enough elevation of jaundice to start the pruritus.

Normal bilirubin levels--

Total bilirubin 0.1 - 1mg/dl or 5.1 - 17 umol/L (SI units)

Indirect bilirubin 0.2 - 0.8 mg/dl or 3.4 - 12.0 umol/L (SI units)

Direct bilirubin 0.1 - 0.3 mg/dl or 1.7 - 5.1 umol/L (SI units)

Bilirubin metabolism begins with the breakdown of red blood cells (RBC).

Hemoglobin is released from the RBC and broken down to heme and globin molecules. Heme is then catabolized to form biliverdin, which is transformed

to bilirubin. This form of bilirubin is called unconjugated (indirect)

bilirubin. In the liver indirect bilirubin is conjugated with a glucuronide

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resulting in conjugated (direct)

bilirubin. The conjugated bilirubin is then excreted from the liver cells into the intrahepatic canaliculi, which eventually lead to the hepatic ducts,

the common bile duct, and the bowel.

Jaundice is the discoloration of body tissues caused by abnormally high blood levels of bilirubin. This yellow discoloration is recognized when the total serum bilirubin exceeds 2.5 mg/dl.

Once the jaundice is recognized either clinically {seen on the skin} or chemically

{with blood lab tests} it is important to differentiate whether it is predominantly caused by unconjugated or conjugated bilirubin. In general, jaundice caused by hepatocellular dysfunction, for example hepatitis, results

in elevated levels of unconjugated bilirubin. Jaundice resulting from extrahepatic obstruction of the bile ducts, for example like gallstones or a tumor blocking the bile ducts, results in elevated conjugated bilirubin levels (this type of jaundice can be resolved surgically or endoscopically).

The total serum bilirubin level is the sum of the conjugated (direct) and unconjugated (indirect) bilirubin. These are separated out when

"fractionation or

differentiation" of the total bilirubin to its direct and indirect parts is

requested from the lab.

Normally the unconjugated (indirect) bilirubin makes up 70% - 85% of the

total bilirubin. In patients with jaundice when more than 50% of the bilirubin is conjugated (direct) it is considered a conjugated hyperbilirubinemia from gallstones, tumor, inflammation, scarring, obstruction of the extrahepatic ducts, or extensive liver metastasis.

Unconjugated hyperbilirubinemia exists when less than 15% - 20% of the total bilirubin is conjugated. Diseases that typically cause this form of jaundice include accelerated erythrocyte (RBC) hemolysis, hepatitis, cirrhosis, or drugs.

**Source of information:**

Mosby's Diagnostic and Laboratory Test Reference, 4th Edition, 1999