



# HEPATITIS C GENOTYPES

## **WHAT ARE HEPATITIS C GENOTYPES?**

There are different strain, or genotypes of hepatitis C virus (HCV). Each genotypes' genes differ somewhat from one another and can be distinguished by laboratory tests. Different HCV genotypes are more common in some parts of the world. The HCV genotypes share some common gene sequences with other genotypes, but differ in others. These variations are adaptations by the virus to different environments and challenges.

HCV multiplies very quickly, making more than 1 trillion copies each day. Many of these new copies are different from the original virus. Many of these mutant versions cannot survive. However, some do survive, even when anti-HCV drugs are used. These mutant versions involve just a few points of the HCV genetic code. They are not genotypes.

Globally, there are 11 HCV genotypes. They are identified by a number, for example genotype 1. There are also subtypes, identified by a letter (for example, genotype 1a.)

## **WHY DO HCV GENOTYPES MATTER?**

The different HCV genotypes generally act the same in how they infect people and cause disease. But HCV genotypes respond differently to treatment with HCV medications, like interferon and ribavirin (see fact sheet 680.) Treatment with interferon and ribavirin is successful in 70% to 90% of patients with genotypes 2 and 3, but only 40% to 60% of patients with genotype 1. Newer HCV drugs are more effective against a range of genotypes; sometimes, different treatments are given to people with specific genotypes.

The variety of HCV genotypes is also important for vaccine development. An effective vaccine will have to produce an immune response to more than one genotype.

## **WHERE ARE THE HCV GENOTYPES FOUND?**

Genotypes 1, 2, and 3 occur throughout the world. Subtypes 1a and 1b are the most common. They account for about 60%-70% of global infections. Type 1a is found mainly in North and South America, Europe and Australia. Type 1b is found in North America, Europe, and in parts of Asia.

Genotype 2 occurs in most developed countries, but it is much less common than genotype 1. Genotype 3 is common in Southeast Asia but is also found in other countries.

Genotype 4 is mainly found in the Middle East, Egypt, and central Africa. Type 5 is found in local clusters around the world resulting in a low number of infected individuals overall, and genotypes 6 through 11 occur in Asia.

Genetic analysis shows that most HCV belongs to genotypes 1 through 6. In the United States, the most common genotypes are 1a and 1b, followed by genotypes 2 and 3. Genotypes 4 through 11 make up less than 5% of HCV cases globally.

## **HOW IS THE GENOTYPE DETERMINED?**

A blood sample is tested to determine the HCV genetic sequence. HCV genotype testing is only done once since the genotype does not change.

However, if someone infected with HCV is exposed again, they could be infected with a different genotype.

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