

# Interferon Therapy

## What is interferon?

Interferon is a small protein messenger called cytokine produced by the immune system in response to viral infections. There are three types of interferon: alpha, beta and gamma. As far as treatment option, interferon alpha is the most effective one.

## How interferon works

The medication "Interferon Alpha" is a man made synthetic reproduction that mimics the activity of naturally occurring interferon alpha produced by the immune system. Interferon alpha work in three ways: it has an immune boosting effect to stimulate the immune system against viruses, it has a direct antiviral by stopping viruses from dividing, reproducing and protecting uninfected cells from becoming infected.

## Indications and regimen

Interferon alpha treatment has been used to treat several types of infections such as chronic hepatitis B, chronic hepatitis C, genital warts, leukemia, AIDS-related kaposi's sarcoma, and malignant melanoma

Since 1991, the FDA has approved several types of interferon for the treatment of chronic hepatitis B, chronic hepatitis C. These include 1) interferon alfa-2b (Intron A), (2) interferon alfa-2a (Roferon), (3) consensus interferon (Infergen), and more recently peginterferon. Currently, peginterferon in combination with ribavirin are the backbone of antiviral strategies used to treat chronic hepatitis C.

## Chronic hepatitis B

Intron A (Interferon alfa-2b) has been approved by Food and Drug Administration (FDA) for treating chronic hepatitis B and C. The recommended dose for adults is 5 million units (MU) daily or 10 million units (MU) three times a week for four to six months.

## Chronic hepatitis C

Roferon A (interferon alfa-2a), and Infergen ("consensus" interferon) are also FDA-approved for treatment of chronic hepatitis C but not for chronic hepatitis B but relapse occurs frequently and only 7 to 20 percent of people achieved a long-term sustained response once treatment is stopped.

Currently, the best treatment option to treat chronic hepatitis C is the combination of two medications: pegylated interferon and ribavirin. Two types of pegylated interferon are available: peginterferon alpha-2a (Pegasys) and peginterferon alpha-2b (Pegintron). Both pegylated interferons are taken by injection under the skin once a week. Ribavirin, an antiviral oral medication is given twice a day according to body weight. Ribavirin is also available in two types as Rebetol or Copegus.

## Pegylated interferon

Recently, the recombinant standard forms of interferon alpha 2a and 2b have been replaced by pegylated interferon (peginterferon). There are two types pegylated interferon used for the treatment of chronic hepatitis C; Peg-intron or Pegasys.

Pegylated interferon is made when a chemical called polyethylene glycol (PEG) is attached to interferon. PEG helps the interferon to remain in the body longer, work more efficiently against hepatitis C virus (HCV) and yields higher sustained response rate. Because of its ease of administration and better efficacy, peginterferon has been replacing standard interferon both as monotherapy and as combination therapy for hepatitis C

PEG Intron (pegylated alfa-2b) is given once a week under the skin at a dose of 0.5 or 1.0 micrograms according to body weight e weekly for at least six months. In patients showing significant loss of HCV RNA (HCV viral load) at six months, treatment is continues for an additional six months, i.e., for a total course of treatment of one year.

Pegasys (pegylated interferon alfa-2a) is also given once weekly under the skin.

### **Side effects**

The side effects for standard interferon and pegylated interferon are similar. Most side effects diminish in frequency and severity with continued administration.

The most common side effects are flu-like symptoms such as headaches, muscle aches, joint aches, fevers/chills and feeling sick vomiting, loss of appetite, feeling tired, and diarrhea, depression, mood swings, poor concentration, vagueness. The flu-like symptoms are likely to occur. They are most common at the start of therapy and may decrease with continued use. Over-the-counter fever reducers such as acetaminophen (Tylenol, others), ibuprofen (Motrin, Advil, others), and naproxen (Aleve), plenty of fluids, and taking the medication at bedtime may help to alleviate these symptoms.

Less common effects may include; metallic taste, dry skin dry mouth, loss or thinning of hair (temporary), pins and needles in the hands and toes, difficulty sleeping.

While on interferon treatment, temporary reduction in the production in white blood cells and platelets (clotting blood cells), and thyroid problems may occur. This makes you more vulnerable to infection, bleeding or bruising. It is important to report any signs of bleeding, bruising or infection to your doctor. The bone marrow returns to its normal state when the treatment is stopped.

### **Interferon treatment is not for everyone**

Interferon therapy is not for everyone. The presence of other medical conditions may affect the use of interferon alpha. Make sure you tell your doctor if you have any other medical problems, especially you have the one of the following conditions: bleeding problems, Convulsions (seizures), history of mental problems (depression), diabetes, heart disease, kidney disease, lack of blood supply to any part of the body, lung disease, thyroid disease, autoimmune disease (problems with overactive immune system). Your doctor will perform blood work al least once a month to monitor any abnormalities within the white blood cells, the platelets, and the red blood cells. Also, Interferon should not be use by pregnant women because it is not known whether interferon alpha will be harmful to an unborn baby. Do not use this medication if you are pregnant or could become pregnant during treatment. In addition, it is not known whether interferon passes into breast milk. Do not use this medication without first talking to your doctor if you are breast-feeding.

### **Drug interactions**

Tell your doctor of all over-the-counter and prescription medications you may use including: zidovudine (increases the risk of blood toxicity), barbiturates (e.g., phenobarbital), theophylline, vidarabine, other drugs which depress the immune system (e.g., anti-cancer type). Tell your doctor if you take any drugs that make you drowsy such as: sedatives, sleep medication, psychiatric drugs, drugs for anxiety (e.g., diazepam), anti-seizure drugs (e.g., phenytoin), narcotic pain relievers (e.g., codeine), certain antihistamines. Do not start or stop any medicine without doctor or pharmacist approval.

Talk to your doctor and pharmacist before taking any prescription or over-the-counter medicines, including herbal products.

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