



## RUXOLITINIB

Ruxolitinib is a medication used to treat myeloproliferative neoplasms (MPNs). In Australia its trade name is Jakavi® and it is licensed for the treatment of patients with primary myelofibrosis (MF) or myelofibrosis occurring as a complication of polycythaemia vera (post-PV myelofibrosis) or essential thrombocythaemia (post-ET myelofibrosis). It is under investigation in clinical trials for patients with PV and ET. It is an oral medication which is available in 5 mg, 10 mg, 15 mg and 20 mg tablets.

### HOW DOES IT WORK?

Ruxolitinib works by interfering with the function of the JAK2 enzyme and its relation JAK1. This slows down blood cell production and also the production of signalling chemicals involved in inflammation, known as cytokines.

Ruxolitinib's most important actions in patients with MPNs are to reduce spleen size, improve symptoms and to decrease blood cell production. Most patients with an enlarged spleen will notice a rapid improvement in the size of the spleen and its associated symptoms. Many of the symptoms patients experience with MF (e.g. sweating, itching, fatigue and abdominal discomfort after meals) also improve with ruxolitinib therapy. Blood cell production is reduced on ruxolitinib and hence it can improve high blood counts but it may also exacerbate (make worse) pre-existing anaemia (low red cells) or thrombocytopenia (low platelets).

You will need frequent blood tests and monitoring whilst taking ruxolitinib to ensure that the dose you are taking is correct for you.

A small number of people develop resistance to ruxolitinib, (so that it no longer works) over a period of years, requiring a switch to another treatment.

### ARE THERE ANY SIDE EFFECTS?

Most people taking this drug tolerate it well and have few side effects. However, it is important that you inform your doctor if you are experiencing any of the side effects listed below or develop any new symptoms, even if mild.

#### Common side effects

Approximately 1- 20% of people taking ruxolitinib will experience some of these common side effects:

- Reduced red blood cells (anaemia). If your red blood cells drop too low you may notice that you are becoming breathless and tire easily.
- Reduced platelets (thrombocytopenia). If your platelet count drops too low you may experience nose bleeds, bleeding gums when you clean your teeth, a rash of tiny red spots or increased bruising.
- Reduced white blood cells (neutropenia). If your white blood cells drop too low you may have an increased risk of developing infections. You may experience a high temperature, fever, shivers or chills.

If you experience any of the symptoms above you must contact your haematologist immediately. Sudden and unexpected changes in blood cell levels may occur, although this is uncommon, therefore it is important to attend appointments to have your blood counts checked and to discuss any symptoms with your haematologist.

#### Other common side effects

- Painful skin rash with blisters (possible symptoms of shingles (herpes zoster))
- Increased cholesterol
- Abnormal liver function test results
- Dizziness
- Headache
- Weight gain
- Frequently passing wind (flatulence)



If you get any side effects, talk to your doctor. This includes any possible side effects not listed here.

### **Ruxolitinib and infections**

Ruxolitinib treatment has been shown to be associated with increased risk of infections varying from simple chest and urine infections to reactivation or occurrence of more serious infections such as shingles, hepatitis, TB and certain rare infections (including a disease called Progressive Multifocal Leucoencephalopathy). It is therefore important that other doctors involved in your care, as well as your haematologist are aware of your medical history.

### **Increased risk of non-melanoma skin cancer**

It is possible that ruxolitinib may increase the risk of non-melanoma skin cancer. It is sensible to avoid sun exposure, wear SPF >15 sunblock and protective clothing.

## **TAKING RUXOLITINIB**

### **How to take ruxolitinib**

- It is usually taken twice a day, with or without food
- Swallow ruxolitinib tablets whole with plenty of water. Do not chew, crush or break.
- If a dose is missed do not take an additional dose.

### **Dosage**

Your doctor will determine the dose of ruxolitinib you are to take, predominantly based on your platelet count but also on your general health and other health problems. Depending upon your response and the presence of side effects your doctor may alter the dose of ruxolitinib.

### **Keeping track**

Some patients find it helpful to keep a record to remember when to take your tablets (e.g. medication reminder app on a smart phone) and record any side effects.

### **Storage and disposal of ruxolitinib**

- Store in a dry place at room temperature.
- As with all medications ruxolitinib can be harmful to others. Keep all medications in a secure location well out of reach of children and pets.
- Return any unused tablets to your local pharmacy or hospital. Do not dispose of them in the bin or flush them down the toilet.
- Do not use tablets after the expiry date stated on the packaging.

### **Other medications and supplements to avoid whilst taking ruxolitinib.**

- Avoid grapefruit, grapefruit juice and supplements that contain grapefruit extract while taking ruxolitinib as grapefruit products may increase the amount of ruxolitinib in your blood.
- Ruxolitinib is metabolized through a pathway known as CYP3A4 and many drugs can increase or reduce its activity. A list of such medications (e.g. clarithromycin, fluconazole and St Johns Wort) will be in the package insert or ask a pharmacist before taking any new medicine.

## **WHAT SHOULD I EXPECT?**

### **How fast does it work?**

Ruxolitinib may take several weeks to begin having an effect on your blood cells, but often its effects on spleen and symptoms occur in 2-4 weeks. Your blood cell counts may not stabilise for up to 16 weeks.



### How will I feel?

You will hopefully notice a reduction in your MPN-related symptoms. It may help to keep track of these so you can monitor how you are feeling. Most people taking this drug tolerate it well and have relatively few side effects.

### Will I need follow up?

You will need more frequent blood tests during the first weeks of treatment to determine how your body is responding to the medication. Once your body has adjusted to the medication you will attend for checks less frequently, perhaps every two to three months. Your kidney and liver function may also be checked with blood tests.

### Important tips for taking ruxolitinib

Ruxolitinib works fast to reduce spleen size and symptoms but these benefits are rapidly lost when the medication is stopped. This relapse of symptoms and increase in spleen size can occur rapidly and can make patients ill. For this reason it is important not to stop this medication suddenly and generally your medical team will slowly reduce the dose before stopping this drug.

### CAN I TAKE OTHER MEDICINES?

Whenever you take ruxolitinib (or in fact any medication), it is important to inform your medical advisors about all other medications you are taking: this includes medicines prescribed for you as well as any vitamins, herbal supplements or remedies bought in chemists. Always provide the names of these medications and remedies to any specialist doctors, GPs and pharmacists who are treating you, prescribing additional medications or giving you advice. It can be very helpful to carry a list of the names and dosages of all your medicines to show to your doctor at appointments.

### WHAT IF I HAVE OTHER MEDICAL CONDITIONS?

Ruxolitinib should be used under supervision if you have now or have had any of the following conditions:

- Allergies to any of the ingredients in the medicine (these will be listed on the information leaflet that came with your tablets)
- HIV infection or AIDS
- Previous infections such as TB (tuberculosis) or hepatitis B
- Kidney problems
- If you are planning pregnancy
- If you have radiation therapy planned

If you think you may have or have had one of these conditions please discuss this with your doctor.

### FREQUENTLY ASKED QUESTIONS

#### Can I eat and drink normally?

Yes. We recommend that you eat a normal, healthy diet and drink plenty of water.

#### Can I drink alcohol?

While it is safe to drink alcohol in moderation whilst taking ruxolitinib, Australian NHMRC guidelines state that for healthy women and men drinking no more than two standard drinks on any day reduces your risk of harm from alcohol-related disease. Alcohol can cause dehydration, and it is important to avoid becoming dehydrated if you have an MPN. Please ask your doctor if you require more information regarding alcohol consumption.

**What if I want to have a child?**

We strongly recommend that you use contraception whilst taking ruxolitinib, because this medication can be harmful to a developing fetus. When planning to conceive or to father a child, you should stop taking ruxolitinib AFTER discussion with your doctor.

It is imperative to discuss your plans together with your haematologist prior to becoming pregnant or fathering a child. Your doctor can recommend treatment options for you that will not cause harm to your developing baby and will increase your chance of a successful pregnancy. If you or your partner becomes pregnant while taking this drug please contact your doctor immediately for further advice.

**Can I breastfeed while taking ruxolitinib?**

Breastfeeding while taking ruxolitinib is not recommended.

**Can I drive?**

There is no evidence that taking ruxolitinib would stop you from driving.

**Do I need to take any special precautions?**

It is important not to stop taking ruxolitinib suddenly as this can cause a withdrawal type syndrome which consists of a return of symptoms and growth of your spleen which may be sudden and has occasionally made patients very unwell.

**Can I have vaccinations such as the flu jab while taking ruxolitinib?**

Yes, you can have most vaccinations, including the flu vaccine, whilst taking ruxolitinib. Some vaccinations are live vaccines (e.g. measles, mumps and varicella virus vaccines) and these should not be taken with ruxolitinib. It is important you tell the person giving you the vaccine that you are taking ruxolitinib so he or she can verify it is safe for you to be vaccinated

**Interactions with other medicines and foods**

Ruxolitinib is metabolized through a pathway known as CYP3A4 and many drugs can increase or reduce its activity. A list of such drugs will be in the package insert or ask a pharmacist before taking any new medicine. This also extends to certain herbal remedies eg St John's Wort, and foodstuffs eg grapefruit and Seville oranges.

**WHAT CAN I DO TO HELP MYSELF IF I HAVE AN MPN?**

It's important to take good care of yourself. There are many things you can do to feel better.

- Good nutrition is important. Eat a balanced diet including lots of fresh fruit and vegetables, lean protein and whole grains.
- Drink plenty of water and prevent dehydration by avoiding excessive alcohol and caffeinated drinks.
- Maintain a normal weight and maintain your muscle mass to help keep your cholesterol and blood sugar within normal limits.
- Exercise is very beneficial for people with MPNs and helps to fight fatigue. Before starting on any new programme, check with your GP or haematologist and start slowly and gently.
- Stop smoking. Ask your GP if you need help.

More information on living well with an MPN is available at [www.mpnallianceaustralia.org.au](http://www.mpnallianceaustralia.org.au)