

▼ This medicinal product is subject to additional monitoring in Australia. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse events at [www.tga.gov.au/reporting-problems](http://www.tga.gov.au/reporting-problems).

## **WARNINGS**

**XELJANZ and XELJANZ XR should only be used if no suitable treatment alternatives are available in patients:**

- **with history of atherosclerotic cardiovascular disease or other cardiovascular risk factors (such as current or past, long-time smokers)**
- **with malignancy risk factors (e.g., current malignancy or history of malignancy)**
- **who are 65 years of age and older.**

**See Section 4.4 Special Warnings and Precautions for Use: Mortality; Major Adverse Cardiovascular Events (including Myocardial Infarction); Thrombosis; Malignancy and Lymphoproliferative Disorder (excluding Nonmelanoma Skin Cancer [NMSC]); Skin Cancer and Use in the Elderly.**

# **AUSTRALIAN PRODUCT INFORMATION**

## **XELJANZ<sup>®</sup>, XELJANZ XR tofacitinib (as citrate)**

### **1 NAME OF THE MEDICINE**

tofacitinib (as citrate)

### **2 QUALITATIVE AND QUANTITATIVE COMPOSITION**

#### XELJANZ 5 mg film-coated tablet

Each 5 mg tablet contains 8.078 mg of tofacitinib citrate equivalent to 5 mg of tofacitinib free base active pharmaceutical ingredient.

*Excipients with known effect*

Contains sugars (lactose monohydrate).

#### XELJANZ 10 mg film-coated tablet

Each 10 mg tablet contains 16.155 mg of tofacitinib citrate equivalent to 10 mg of tofacitinib free base active pharmaceutical ingredient.

*Excipients with known effect*

Contains sugars (lactose monohydrate).

#### XELJANZ XR 11 mg extended release film-coated tablet

Each 11 mg tablet contains 17.771 mg of tofacitinib citrate equivalent to 11 mg of tofacitinib free base active pharmaceutical ingredient.

#### XELJANZ 1 mg/mL oral solution

Each 1 mL of oral solution contains 1.62 mg of tofacitinib citrate equivalent to 1 mg of tofacitinib free base active pharmaceutical ingredient.

#### *Excipients with known effect*

Contains sucralose and benzoates.

For the full list of excipients, see Section 6.1 List of excipients.

### **3 PHARMACEUTICAL FORM**

#### XELJANZ 5 mg film-coated tablet

White, round, immediate release, tablet debossed with “Pfizer” on one side, and “JKI 5” on the other side.

#### XELJANZ 10 mg film-coated tablet

Blue, round, immediate release, tablet debossed with “Pfizer” on one side, and “JKI 10” on the other side.

#### XELJANZ XR 11 mg extended release film-coated tablet

Pink, oval tablet with a drilled hole at one end of the tablet band and “JKI 11” printed on one side of the tablet.

#### XELJANZ 1 mg/mL oral solution

Clear, colourless solution

### **4 CLINICAL PARTICULARS**

Information in this section for the rheumatoid arthritis and psoriatic arthritis indications is applicable to XELJANZ 5 mg twice daily and XELJANZ XR 11 mg once daily as they contain the same active ingredient (tofacitinib).

#### **4.1 Therapeutic Indications**

##### ***Rheumatoid Arthritis (RA)***

XELJANZ and XELJANZ XR are indicated for the treatment of moderate to severe active rheumatoid arthritis in adults who have had an inadequate response or are intolerant to methotrexate. XELJANZ and XELJANZ XR can be used alone or in combination with conventional synthetic disease-modifying antirheumatic drugs (DMARDs), including methotrexate.

### ***Psoriatic Arthritis (PsA)***

XELJANZ and XELJANZ XR in combination with conventional synthetic DMARDs are indicated for the treatment of active psoriatic arthritis in adult patients who have had an inadequate response to a prior DMARD therapy.

### ***Ulcerative Colitis (UC)***

XELJANZ is indicated for the treatment of adult patients with moderately to severely active ulcerative colitis who have had an inadequate response, lost response, or were intolerant to either conventional therapy or a biological therapy.

### ***Ankylosing Spondylitis (AS)***

XELJANZ is indicated for the treatment of adult patients with active ankylosing spondylitis who have responded inadequately to conventional therapy.

### ***Juvenile Idiopathic Arthritis (JIA)***

XELJANZ is indicated for the treatment of active polyarticular course juvenile idiopathic arthritis (rheumatoid factor positive [RF+] or negative [RF-] polyarthritis, extended oligoarthritis and systemic juvenile arthritis without systemic features for six months) and juvenile psoriatic arthritis in patients 2 years of age and older, who have responded inadequately to previous therapy with DMARDs.

## **4.2 Dose and Method of Administration**

Therapy with XELJANZ or XELJANZ XR should be initiated and monitored by a specialist physician with expertise in the management of conditions for which XELJANZ or XELJANZ XR are indicated (e.g., rheumatologist or gastroenterologist).

### ***Important Administration Instructions***

- Do not initiate XELJANZ or XELJANZ XR in patients with an absolute lymphocyte count (ALC) less than  $0.75 \times 10^9$  cells/L, an absolute neutrophil count (ANC) less than  $1 \times 10^9$  cells/L or who have haemoglobin levels less than 90 g/L.
- Dose adjustment or interruption is recommended for management of lymphopenia, neutropenia, and anaemia (see Section 4.4 Special Warnings and Precautions for Use).
- Interrupt use of XELJANZ or XELJANZ XR if a patient develops a serious infection until the infection is controlled.
- Promptly evaluate patients with signs and symptoms of venous thromboembolism (VTE) and discontinue tofacitinib in patients with suspected VTE, regardless of dose or indication. Avoid XELJANZ or XELJANZ XR in patients at risk (see Section 4.4 Special Warnings and Precautions for Use).

### ***Method of Administration***

XELJANZ and XELJANZ XR are given orally with or without food.

Swallow XELJANZ XR tablets whole and intact. Do not crush, split or chew.

## ***Dosage***

### ***Recommended Dosage in Rheumatoid Arthritis, Psoriatic Arthritis and Ankylosing Spondylitis***

The recommended adult daily dosage of XELJANZ for rheumatoid arthritis, psoriatic arthritis and ankylosing spondylitis is 5 mg twice daily.

A dosage of XELJANZ 10 mg twice daily is not recommended for the treatment of rheumatoid arthritis, psoriatic arthritis or ankylosing spondylitis (see Section 4.4 Special Warnings and Precautions for Use).

The recommended adult daily dosage of XELJANZ XR for rheumatoid arthritis and psoriatic arthritis is 11 mg once daily.

XELJANZ and XELJANZ XR may be used as monotherapy or in combination with methotrexate (MTX) or other conventional synthetic DMARDs (csDMARDs) in rheumatoid arthritis.

XELJANZ and XELJANZ XR are used in combination with csDMARDs in psoriatic arthritis. The efficacy of XELJANZ as monotherapy has not been studied in patients with psoriatic arthritis.

### ***Switching between XELJANZ Tablets and XELJANZ XR Extended Release Tablets***

XELJANZ XR 11 mg once daily has demonstrated pharmacokinetic equivalence (AUC and C<sub>max</sub>) to XELJANZ 5 mg twice daily.

Treatment with XELJANZ 5 mg tablets twice daily and XELJANZ XR once daily may be switched between each other on the day following the last dose of either tablet.

### ***Dose Discontinuation in AS***

Available data suggest that clinical improvement in AS is observed within 16 weeks of initiation of treatment with tofacitinib. Continued therapy should be carefully reconsidered in a patient exhibiting no clinical improvement within this timeframe.

### ***Recommended Dosage in Ulcerative Colitis***

The recommended adult daily dosage of XELJANZ for ulcerative colitis is 10 mg twice daily for induction for 8 weeks and 5 mg twice daily for maintenance.

Two XELJANZ 5 mg tablets are bioequivalent to one XELJANZ 10 mg tablet and may be used as an alternative to one XELJANZ 10 mg tablet.

For patients who do not achieve adequate therapeutic benefit by week 8 (e.g., those with the greatest disease activity or those refractory to tumour necrosis factor (TNF)-inhibitors), the induction dose of 10 mg twice daily can be extended for an additional 8 weeks (16 weeks total), followed by 5 mg twice daily for maintenance. Continued treatment is not recommended for patients who have not shown a clinical response by Week 16 (see Section 5.1 Pharmacodynamic Properties, Clinical Trials, Ulcerative Colitis).

XELJANZ 10 mg twice daily for maintenance treatment is not recommended in patients with UC who have major adverse cardiovascular events (MACE) and malignancy risk factors, unless there is no suitable alternative treatment available (see Boxed Warning, Section 4.4

Special Warnings and Precautions for Use and Section 4.8 Adverse Effects (Undesirable Effects)).

Following end of induction therapy, the choice of maintenance therapy should be based on individual consideration of the patient's clinical response and treatment history. For refractory patients who are not at increased risk for VTE, MACE and malignancy (see Section 4.4 Special Warnings and Precautions for Use), such as those who have failed prior TNF inhibitor therapy, consideration may be given to continuation of the 10 mg twice daily dose for maintenance in order to maintain therapeutic benefit.

Patients who are not at increased risk for VTE, MACE and malignancy (see Section 4.4 Special Warnings and Precautions for Use), and who fail to maintain therapeutic benefit on XELJANZ 5 mg twice daily may benefit from an increase to XELJANZ 10 mg administered twice daily for maintenance.

XELJANZ 10 mg twice daily for maintenance treatment should be used for the shortest duration possible. The lowest effective dose needed to maintain response should be used.

In patients who have responded to treatment with XELJANZ, corticosteroids may be reduced and/or discontinued in accordance with standard of care.

#### *Retreatment in UC*

If therapy is interrupted, restarting treatment with XELJANZ can be considered. If there has been a loss of response, reinduction with XELJANZ 10 mg twice daily may be considered. The treatment interruption period in clinical studies extended up to 1 year. Efficacy may be regained by 8 weeks of 10 mg twice daily therapy (see Section 5.1 Pharmacodynamic Properties, Clinical Trials).

#### *Recommended Dosage in Polyarticular Course Juvenile Idiopathic Arthritis (pcJIA) and Juvenile Psoriatic Arthritis (jPsA)*

XELJANZ may be used as monotherapy or in combination with MTX.

The recommended dose in patients 2 years of age and older is based upon the following weight categories as indicated in Table 1:

<b>Table 1: Tofacitinib dose for patients with polyarticular juvenile idiopathic arthritis and juvenile PsA two years of age and older</b>	
<b>Body weight (kg)</b>	<b>Dose regimen</b>
10 - <20	3.2 mg (3.2 mL of oral solution) twice daily
20 - <40	4 mg (4 mL of oral solution) twice daily
≥40	5 mg (5 mL of oral solution or one 5 mg film-coated tablet) twice daily

Patients ≥40 kg treated with 5 mL of XELJANZ oral solution twice daily may be switched to XELJANZ 5 mg film-coated tablets twice daily. Patients <40 kg cannot be switched from XELJANZ oral solution.

Available data suggest that clinical improvement is observed within 18 weeks of initiation of treatment with tofacitinib. Continued therapy should be carefully reconsidered in a patient exhibiting no improvement within this timeframe.

### *How to Use XELJANZ Oral Solution*

XELJANZ Oral Solution is presented in a carton with a press-in bottle adaptor (PIBA), an oral dosing syringe and an “Instructions for use” leaflet, which contains diagrams.

#### Instructions for Use

1. Wash hands with soap and water and place the items from the carton on a clean flat surface.
2. Open the bottle. Remove the seal off the top of the bottle (first time only).  
**Do not throw away the child-resistant cap. Note:** The bottle does **not** need to be shaken before use.
3. Remove the press-in bottle adaptor and oral dosing syringe from the plastic overwrap. With the bottle on a flat surface, push the ribbed end of the press-in bottle adaptor all the way into the neck of the bottle pressing down with thumbs while holding the bottle firmly.  
**Do not remove the press-in bottle adaptor from the bottle after it is inserted.**
4. Remove air from oral dosing syringe by pushing the oral dosing syringe plunger all the way to the tip of the syringe barrel.
5. Insert the oral dosing syringe into the upright bottle through the opening of the press-in bottle adaptor until it is firmly in place.
6. With the oral dosing syringe in place, turn the bottle upside down. Pull back the plunger. If there are air bubbles in the oral dosing syringe, fully push the plunger in to empty the solution back into the bottle. Then withdraw the prescribed dose of solution.
7. Turn the bottle upright and place the bottle on a flat surface. Remove the oral dosing syringe from the bottle adaptor and bottle by pulling straight up on the oral dosing syringe barrel.
8. Check the correct dose was drawn up into the oral dosing syringe. If the dose is not correct, insert the oral dosing syringe tip firmly into the bottle adaptor. Fully push in the plunger so that the solution flows back into the bottle. Repeat Steps 6 and 7.
9. Place the tip of the oral dosing syringe into the inside of the patient’s cheek. Slowly push the plunger all the way down to give all the medicine in the oral dosing syringe. Make sure the patient has time to swallow the medicine.
10. Close the bottle tightly by turning the child-resistant cap clockwise, leaving the press-in bottle adaptor in place. Place the bottle back into the carton and close the carton to protect the solution from light.
11. Remove the plunger from the barrel by pulling the plunger and the barrel away from each other. Rinse both with water after each use. Allow to air dry, then put the oral dosing syringe back together. Store the oral dosing syringe in the carton with the XELJANZ Oral Solution.  
**Do not throw away the oral dosing syringe until the medicine is finished.**

Discard any remaining XELJANZ Oral Solution 60 days after opening the bottle for the first time.

#### ***Dosage Adjustments - Interactions with Other Medicines, Renal Impairment, Hepatic Impairment, Lymphopenia, Neutropenia or Anaemia***

Dosage adjustments for patients receiving CYP2C19 and/or CYP3A4 inhibitors and patients with renal or hepatic impairment, lymphopenia, neutropenia or anaemia are provided in Table 2.

<b>Table 2: Recommended Dosage Adjustments</b>	
<b><i>Interactions with Other Medicines<sup>1</sup></i></b>	
Patients receiving: <ul style="list-style-type: none"> <li>• Potent CYP3A4 inhibitors (e.g., ketoconazole) or</li> <li>• a moderate CYP3A4 inhibitor(s) with a potent CYP2C19 inhibitor(s) (e.g., fluconazole) (see Section 4.5 Interactions with Other Medicines and Other Forms of Interactions).</li> </ul>	If taking 10 mg twice daily, reduce to 5 mg twice daily  If taking 5 mg twice daily, reduce to 5 mg once daily  If taking 11 mg once daily, reduce to 5 mg once daily  For XELJANZ Oral Solution, if taking 3.2 mg, 4 mg or 5 mg twice daily, reduce to 3.2 mg, 4 mg or 5 mg once daily, respectively
<b><i>Renal Impairment<sup>2</sup></i></b>	
Patients with estimated GFR less than or equal to 50 mL/min (including but not limited to those with severe renal impairment who are undergoing haemodialysis), the recommended dose is half the total daily dose indicated for patients with normal renal function (see Section 4.4 Special Warnings and Precautions for Use and Section 5.2 Pharmacokinetic Properties).	If taking 10 mg twice daily, reduce to 5 mg twice daily  If taking 5 mg twice daily, reduce to 5 mg once daily  If taking 11 mg once daily, reduce to 5 mg once daily  For XELJANZ Oral Solution, if taking 3.2 mg, 4 mg or 5 mg twice daily, reduce to 3.2 mg, 4 mg or 5 mg once daily, respectively
<b><i>Hepatic Impairment<sup>3</sup></i></b>	
Patients with moderate hepatic impairment, the recommended dose is half the total daily dose indicated for patients with normal hepatic function (see Section 4.4 Special Warnings and Precautions for Use and Section 5.2 Pharmacokinetic Properties).	If taking 10 mg twice daily, reduce to 5 mg twice daily  If taking 5 mg twice daily, reduce to 5 mg once daily  If taking 11 mg once daily, reduce to 5 mg once daily  For XELJANZ Oral Solution, if taking 3.2 mg, 4 mg or 5 mg twice daily, reduce to 3.2 mg, 4 mg or 5 mg once daily, respectively
<b><i>Lymphopenia</i></b>	
Patients with ALC $\geq 0.75 \times 10^9$ cells/L.	Maintain dose
Patients with persistent decrease (2 sequential values on routine testing) in ALC in the range of $0.5 - <0.75 \times 10^9$ cells/L.	Reduce or interrupt dosing.  If taking 10 mg twice daily, reduce to 5 mg twice daily.

	<p>If taking 5 mg twice daily, interrupt dosing.</p> <p>If taking 11 mg once daily, interrupt dosing.</p> <p>When ALC is <math>\geq 0.75 \times 10^9</math> cells/L, resume treatment as clinically appropriate.</p>
Patients with ALC $< 0.5 \times 10^9$ cells/L (lab value confirmed by repeat testing within 7 days).	Discontinue dosing
<b>Neutropenia</b>	
Patients with ANC $> 1.0 \times 10^9$ cells/L.	Maintain dose
Patients with persistent decrease (2 sequential values on routine testing) in ANC in the range of $0.5 - 1.0 \times 10^9$ cells/L.	<p>Reduce or interrupt dosing until ANC <math>&gt; 1.0 \times 10^9</math> cells/L.</p> <p>If taking 10 mg twice daily, reduce to 5 mg twice daily.</p> <p>If taking 5 mg twice daily, interrupt dosing.</p> <p>If taking 11 mg once daily, interrupt dosing.</p> <p>When ANC is <math>&gt; 1.0 \times 10^9</math> cells/L, resume treatment as clinically appropriate.</p>
Patients with ANC $< 0.5 \times 10^9$ cells/L (confirmed by repeat testing).	Discontinue dosing
<b>Anaemia</b>	
Patients with haemoglobin $\leq 20$ g/L decrease and $\geq 90$ g/L.	Maintain dose
Patients with haemoglobin $> 20$ g/L decrease or $< 80$ g/L (confirmed by repeat testing).	Interrupt dosing until haemoglobin values have normalised.

<sup>1</sup> Co-administration of XELJANZ or XELJANZ XR with potent CYP inducers (e.g., rifampicin) may result in loss of or reduced clinical response (see Section 4.5 Interactions with Other Medicines and Other Forms of Interactions). Co-administration of potent inducers of CYP3A4 with XELJANZ or XELJANZ XR is not recommended.

<sup>2</sup> No dose adjustment is required in patients with estimated GFR more than 50 mL/min.

<sup>3</sup> No dose adjustment is required in patients with mild hepatic impairment. XELJANZ and XELJANZ XR should not be used in patients with severe hepatic impairment (see Section 4.3 Contraindications and Section 5.2 Pharmacokinetic Properties).

### ***Dosage Adjustment in the Elderly***

No dosage adjustment is required in patients 65 years of age and older. For use in patients 65 years of age and older, see Boxed Warning and Section 4.4 Special Warnings and Precautions for Use, Use in the Elderly.



### *Children and Adolescents*

Refer to 'Recommended Dosage in polyarticular course Juvenile Idiopathic Arthritis (pcJIA) and Juvenile Psoriatic Arthritis (jPsA)' for indication-specific dosing instructions and to Table 2 for dosage adjustments.

## **4.3 Contraindications**

Hypersensitivity to tofacitinib citrate or to any of the excipients.

XELJANZ or XELJANZ XR must not be used in combination with biological agents or other potent immunosuppressive agents (see Section 4.5 Interactions with Other Medicines and Other Forms of Interactions).

XELJANZ or XELJANZ XR should not be used in patients with severe hepatic impairment.

## **4.4 Special Warnings and Precautions for Use**

**Therapy with XELJANZ or XELJANZ XR should be initiated and monitored by a specialist physician with expertise in the management of conditions for which XELJANZ and XELJANZ XR are indicated (e.g., rheumatologist or gastroenterologist).**

The efficacy of XELJANZ or XELJANZ XR as monotherapy has not been studied in patients with psoriatic arthritis (PsA).

**Dose-dependent adverse reactions seen in patients treated with XELJANZ 10 mg twice daily, in comparison to 5 mg twice daily include the following: herpes zoster infections, serious infections, non-melanoma skin cancer (NMSC), higher rate of all-cause mortality and thrombosis.**

Information in this section is applicable to XELJANZ oral solution and XELJANZ tablets.

### ***Mortality***

In a large randomised post-marketing safety study in RA patients 50 years of age and older with at least one additional cardiovascular risk factor comparing tofacitinib to TNF inhibitors, a higher rate of all-cause mortality, including sudden cardiovascular death, was observed with tofacitinib. Mortality was mainly due to cardiovascular events, infections and malignancies. Consider the benefits and risks for the individual patient prior to initiating or continuing therapy with XELJANZ or XELJANZ XR (see the Boxed Warning, Section 4.4 Special Warnings and Precautions for Use: *Major Adverse Cardiovascular Events (including Myocardial Infarction), Thrombosis, Malignancy and Lymphoproliferative Disorder (excluding Nonmelanoma Skin Cancer [NMSC])*, *Serious Infections* and Section 4.8 Adverse Effects (Undesirable Effects)).

A dosage of XELJANZ 10 mg twice daily is not recommended for the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis or juvenile idiopathic arthritis (see Section 4.2 Dose and Method of Administration).

For the treatment of UC, use XELJANZ at the lowest effective dose and for the shortest duration needed to achieve/maintain therapeutic response.

### ***Major Adverse Cardiovascular Events (including Myocardial Infarction)***

In a large randomised post-marketing safety study in RA patients 50 years or older with at least one additional cardiovascular risk factor, patients treated with tofacitinib 5 mg twice daily or tofacitinib 10 mg twice daily had a higher rate of major adverse cardiovascular events (MACE), defined as cardiovascular death, non-fatal myocardial infarction (MI) and non-fatal stroke, compared to TNF inhibitors (see Section 4.8 Adverse Effects (Undesirable Effects)). MACE, including events of myocardial infarction, were more common in patients 65 years of age and older, in patients who were current or past, long-time smokers, and in patients with a history of atherosclerotic cardiovascular disease (ASCVD). In patients 65 years of age and older, patients who are current or past, long-time smokers, and patients with history of ASCVD or other cardiovascular risk factors, tofacitinib should only be used if no suitable treatment alternatives are available (see Boxed Warning). In these patients, an individualised benefit-risk assessment should be completed prior to a decision on treatment initiation or continuation (see Section 5.1 Pharmacodynamic properties).

### ***Thrombosis***

Serious and sometimes fatal events of thrombosis, including deep vein thrombosis (DVT), arterial thrombosis and pulmonary embolism (PE), have occurred in patients treated with JAK inhibitors, including tofacitinib. In a randomised post-marketing safety study in patients with rheumatoid arthritis who were 50 years of age or older with at least one additional cardiovascular risk factor, a dose-dependent increased risk for these thrombotic events was observed with tofacitinib compared to TNF inhibitors (see Section 4.8 Adverse Effects (Undesirable Effects)).

In patients with cardiovascular or malignancy risk factors (see also Section 4.4 Special Warnings and Precautions for Use, *Major Adverse Cardiovascular Events (including Myocardial Infarction)* and *Malignancy and Lymphoproliferative Disorder (excluding Nonmelanoma Skin Cancer [NMSC])*) tofacitinib should only be used if no suitable treatment alternatives are available (see Boxed Warning).

Avoid XELJANZ and XELJANZ XR in patients with an increased risk of thrombosis or in whom risk factors are identified. VTE risk factors other than MACE or malignancy risk factors include history of thrombosis, patients undergoing major surgery, immobilisation, use of combined hormonal contraceptives or hormone replacement therapy, inherited coagulation disorder. Patients should be re-evaluated periodically during tofacitinib treatment to assess for changes in VTE risk.

Promptly evaluate patients with signs and symptoms of VTE and discontinue tofacitinib in patients with suspected VTE, regardless of dose or indication.

A dosage of XELJANZ 10 mg twice daily is not recommended for the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis or juvenile idiopathic arthritis (see Section 4.2 Dose and Method of Administration).

In a long-term extension study in patients with UC, four cases of pulmonary embolism (PE) were reported in patients taking XELJANZ 10 mg twice daily, including one death in a patient with advanced cancer.

XELJANZ 10 mg twice daily for maintenance treatment is not recommended in patients with UC who have MACE and malignancy risk factors, unless there is no suitable alternative treatment available (see Boxed Warning and Section 4.2 Dose and Method of Administration).

For the treatment of UC, use XELJANZ at the lowest effective dose and for the shortest duration needed to achieve/maintain therapeutic response (see Section 4.2 Dose and Method of Administration).

***Malignancy and Lymphoproliferative Disorder (excluding Nonmelanoma Skin Cancer [NMSC] – see also Skin Cancer below)***

The possibility exists for XELJANZ or XELJANZ XR to affect host defences against malignancies.

Lymphomas have been observed in patients treated with XELJANZ/XELJANZ XR. In patients treated with XELJANZ in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, an increased incidence of lymphoma was observed with tofacitinib compared with TNF inhibitors (see Section 4.8 Adverse Effects (Undesirable Effects)). Patients with RA, particularly those with highly active disease, are at a higher risk (up to several-fold) than the general population for the development of lymphoma. The role of XELJANZ/XELJANZ XR, a Janus kinase (JAK) inhibitor, in the development of lymphoma is uncertain.

Lung cancers have been observed in patients treated with XELJANZ/XELJANZ XR. Lung cancers were also observed in patients treated with XELJANZ in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor; an increase was observed in patients treated with XELJANZ 5 mg twice daily or XELJANZ 10 mg twice daily compared with TNF inhibitor (see Section 4.8 Adverse Effects (Undesirable Effects)). Of the 30 lung cancers reported in the study in patients taking tofacitinib, all but 2 were in patients who were current or past smokers. Patients with rheumatoid arthritis may be at higher risk than the general population for the development of lung cancer. The role of XELJANZ/XELJANZ XR in the development of lung cancer is uncertain.

Other malignancies were observed in clinical studies and the post-marketing setting, including, but not limited to, breast cancer, melanoma, prostate cancer and pancreatic cancer.

The role of treatment with XELJANZ or XELJANZ XR on the development and course of malignancies is not known.

An increase in malignancies was observed in patients treated with tofacitinib compared to TNF inhibitor in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor (see Section 5.1 Pharmacodynamic Properties). Malignancies excluding NMSC were more common in patients 65 years of age and older, and in patients who were current or past, long-time smokers. In patients 65 years of age and older, patients who are current or past, long-time smokers, and patients with other malignancy risk factors (e.g., current malignancy or history of malignancy other than a successfully treated non-melanoma skin cancer) tofacitinib should only be used if no suitable treatment alternatives are available (see Boxed Warning). In these patients, an individualised benefit-risk assessment should be completed prior to a decision on treatment initiation or continuation (see Section 5.1 Pharmacodynamic Properties).

Epstein Barr Virus-associated post-transplant lymphoproliferative disorder has been observed at an increased rate in renal transplant patients treated with XELJANZ and concomitant immunosuppressive medications (see Section 4.4 Special Warnings and Precautions for Use, Renal Transplant).

### Rheumatoid Arthritis

In the controlled Phase 3 clinical studies in RA patients, 26 malignancies (excluding NMSC) including 5 lymphomas, were diagnosed in 26 patients receiving XELJANZ/XELJANZ plus DMARD, compared to 0 malignancies (excluding NMSC) in patients in the placebo/placebo plus DMARD group, 2 malignancies in 2 patients in the adalimumab group and 1 in the MTX group. Three thousand eight hundred (3800) patients (3942 patient-years of observation) were treated with XELJANZ for durations up to 2 years while 681 patients (203 patient-years of observation) were treated with placebo for a maximum of 6 months and 204 patients (179 patient-years of observation) were treated with adalimumab for 12 months. The exposure-adjusted incidence rate for malignancies and lymphoma was 0.66 and 0.13 events per 100 patient-years, respectively, in the XELJANZ groups.

In the long-term safety population (4867 patients), in RA studies, the rates of malignancies (excluding NMSC) and lymphoma were 0.97 and 0.09 events per 100 patient-years, respectively, consistent with the rate observed in the controlled period.

In a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, an increased incidence in malignancies (excluding NMSC) was observed in patients treated with XELJANZ compared with TNF inhibitor (see Section 4.8 Adverse Effects (Undesirable Effects)). Malignancies (excluding NMSC) were more common in patients 65 years of age and older and in patients who were current or past, long-time smokers.

### Psoriatic Arthritis

In 2 controlled Phase 3 clinical trials in patients with active PsA, there were 3 malignancies (excluding NMSC) in 474 patients (298 patient-years of observation) receiving XELJANZ plus csDMARD (6 to 12 months exposure) compared with 0 malignancies in 236 patients (52.3 patient-years) in the placebo plus csDMARD group (3 months exposure) and 0 malignancies in 106 patients (91 patient-years) in the adalimumab plus csDMARD group (12 months exposure). No lymphomas were reported. The exposure-adjusted incidence rate for malignancies (excluding NMSC) was 1.95 patients with events and 0 patients with events per 100 patient-years in the XELJANZ groups that received 5 mg twice daily and 10 mg twice daily, respectively.

In the safety population comprised of the 2 controlled Phase 3 clinical trials and the long-term extension trial (783 patients) the rate of malignancies (excluding NMSC) was 0.72 patients with events per 100 patient-years.

### Ankylosing Spondylitis

In the combined safety population comprised of 1 placebo-controlled Phase 2 clinical trial and 1 placebo-controlled Phase 3 clinical trial in patients with active ankylosing spondylitis, there were no malignancies (excluding NMSC) in 420 patients receiving XELJANZ up to 48 weeks (233 patient-years of observation).

### Ulcerative Colitis

No malignancies other than NMSC were reported in the 8-week induction and 52-week maintenance study. In the long-term extension study, malignancies (including solid cancers and lymphomas) were observed more often in patients treated with XELJANZ 10 mg twice daily compared with patients treated with XELJANZ 5 mg twice daily.

### ***Serious Infections***

Patients treated with XELJANZ or XELJANZ XR are at increased risk for developing serious infections that may lead to hospitalisation or death, especially in those taking concomitant immunosuppressants.

Serious and sometimes fatal infections due to bacterial, mycobacterial, invasive fungal, viral or other opportunistic pathogens have been reported in rheumatoid arthritis (RA) patients receiving immunomodulatory agents (these include biological DMARDs as well as XELJANZ). The most common serious infections reported with XELJANZ included pneumonia, urinary tract infection, cellulitis, herpes zoster, bronchitis, septic shock, diverticulitis, gastroenteritis, appendicitis and sepsis. Among opportunistic infections, tuberculosis and other mycobacterial infections, cryptococcus, histoplasmosis, oesophageal candidiasis, pneumocystosis, multidermatomal herpes zoster, cytomegalovirus infection, BK virus infections and listeriosis were reported with XELJANZ. Some patients have presented with disseminated rather than localised disease, and were often taking concomitant immunomodulating agents such as methotrexate (MTX) or corticosteroids which, in addition to RA may predispose them to infections. Other serious infections, that were not reported in clinical studies, may also occur (e.g., coccidioidomycosis).

In one large randomised post-authorisation safety study (PASS) in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, a dose-dependent increase in serious infections was observed in patients treated with tofacitinib compared to TNF inhibitor (see Section 4.8 Adverse Effects (Undesirable Effects)). Some of these serious infections resulted in death. Opportunistic infections were also reported in the study.

In patients with ulcerative colitis, XELJANZ treatment with 10 mg twice daily was associated with greater risk of serious infections compared to 5 mg twice daily. Additionally, opportunistic herpes zoster infections (including meningoencephalitis, ophthalmologic, and disseminated cutaneous) were seen in patients who were treated with XELJANZ 10 mg twice daily.

XELJANZ or XELJANZ XR should not be administered to patients with an active infection, including localised infections. The risks and benefits of treatment should be considered prior to initiating XELJANZ or XELJANZ XR in patients with chronic or recurrent infections, or those who have been exposed to tuberculosis, or with a history of a serious or an opportunistic infection, or have resided or travelled in areas of endemic tuberculosis or endemic mycoses; or have underlying conditions that may predispose them to infection.

Patients should be closely monitored for the development of signs and symptoms of infection during and after treatment with XELJANZ or XELJANZ XR. XELJANZ and XELJANZ XR should be interrupted if a patient develops a serious infection, an opportunistic infection, or sepsis (see Section 4.2 Dose and Method of Administration). A patient who develops a new infection during treatment with XELJANZ or XELJANZ XR should undergo prompt and complete diagnostic testing appropriate for an immunocompromised patient, appropriate antimicrobial therapy should be initiated, and the patient should be closely monitored.

As there is a higher incidence of infections in the elderly and in the diabetic populations in general, caution should be used when treating the elderly and patients with diabetes (see Section 4.8 Adverse Effects (Undesirable Effects)). In patients 65 years of age and older, tofacitinib should only be used if no suitable treatment alternatives are available (see Boxed Warning and Section 4.8 Adverse Effects (Undesirable Effects)).

Caution is also recommended in patients with a history of chronic lung disease as they may be more prone to infections (see Section 4.4 Special Warnings and Precautions for Use, Interstitial Lung Disease).

Risk of infection may be higher with increasing degrees of lymphopenia and consideration should be given to lymphocyte counts when assessing individual patient risk of infection. Discontinuation and monitoring criteria for lymphopenia are discussed in Section 4.2 Dose and Method of Administration.

### ***Tuberculosis***

Patients should be evaluated and tested for latent or active infection prior to administration of XELJANZ or XELJANZ XR and continue to be evaluated while on treatment.

Patients with latent tuberculosis should be treated with standard antimycobacterial therapy before administering XELJANZ or XELJANZ XR.

Antituberculosis therapy should be considered prior to administration of XELJANZ or XELJANZ XR in patients with a past history of latent or active tuberculosis in whom an adequate course of treatment cannot be confirmed, and for patients with a negative test for latent tuberculosis but who have risk factors for tuberculosis infection. Consultation with a health care professional with expertise in the treatment of tuberculosis is recommended to aid in the decision about whether initiating antituberculosis therapy is appropriate for an individual patient.

Patients should be closely monitored for the development of signs and symptoms of tuberculosis, including patients who tested negative for latent tuberculosis infection prior to initiating therapy. The need for repeat testing should be considered during therapy if symptoms develop or if re-exposure occurs.

### ***Viral Reactivation***

Viral reactivation, including cases of herpes virus reactivation (e.g., herpes zoster) were observed in clinical studies with XELJANZ and XELJANZ XR. In one large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, an increase in herpes zoster events was observed in patients treated with tofacitinib compared to TNF inhibitor (see Section 4.8 Adverse Effects (Undesirable Effects)). Post-marketing cases of hepatitis B reactivation have been reported in patients treated with XELJANZ. In patients treated with XELJANZ, the incidence of herpes zoster appears to be increased in:

- Japanese or Korean patients.
- Patients with an ALC less than  $1.0 \times 10^9$  cells/L (see Section 4.2 Dose and Method of Administration).
- Patients with long standing RA who have previously received two or more biological DMARDs.

- Patients treated with 10 mg twice daily.

The impact of XELJANZ or XELJANZ XR on chronic viral hepatitis reactivation is unknown. Patients who screened positive for hepatitis B or C were excluded from clinical trials. Screening for viral hepatitis should be performed in accordance with clinical guidelines before starting therapy with XELJANZ or XELJANZ XR.

At least one confirmed case of progressive multifocal leukoencephalopathy (PML) has been reported in RA patients receiving tofacitinib in the post marketing setting. PML can be fatal and should be considered in the differential diagnosis in immunosuppressed patients with new onset or worsening neurological symptoms.

### ***Skin Cancer***

Melanoma and NMSCs have been reported in patients treated with XELJANZ and XELJANZ XR. NMSCs were also reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. In this study, an increase in overall NMSCs, including cutaneous squamous cell carcinomas was observed in patients treated with tofacitinib compared to TNF inhibitor (see Section 4.8 Adverse Effects (Undesirable Effects)). In patients 65 years of age and older, patients who are current or past, long-time smokers, and patients with other malignancy risk factors (e.g., current malignancy or history of malignancy other than a successfully treated non-melanoma skin cancer) tofacitinib should only be used if no suitable treatment alternatives are available (see Boxed Warning). Regular skin examinations are recommended for all patients, particularly those with an increased risk for, or a prior history of, skin cancer.

### ***Renal Transplant***

In studies in renal transplant patients treated with XELJANZ (15 mg twice daily for 3 to 6 months then reduced) and concomitant immunosuppressive agents (induction therapy with basiliximab, high dose corticosteroids, mycophenolic acid products) for prophylaxis of organ rejection, serious infections and Epstein Barr Virus-associated post-transplant lymphoproliferative disorder were observed at an increased rate compared to patients treated with ciclosporin and concomitant immunosuppressive agents.

XELJANZ or XELJANZ XR should not be used in combination with potent immunosuppressants because of the possibility of an increased risk of serious infection and post-transplant lymphoproliferative disorder.

### ***Cardiovascular***

XELJANZ causes a decrease in heart rate and a prolongation of the PR interval. Caution should be observed in patients with a low heart rate at baseline (<60 beats per minute), a history of syncope or arrhythmia, sick sinus syndrome, sinoatrial block, atrioventricular (AV) block, ischaemic heart disease, or congestive heart failure. Concomitant medications that result in a decrease in heart rate and/or PR interval prolongation should be avoided to the extent possible during treatment with XELJANZ or XELJANZ XR (see Section 4.5 Interactions with Other Medicines and Other Forms of Interactions).

### ***Gastrointestinal Perforations***

Events of gastrointestinal perforation have been reported in clinical trials including a large randomised PASS in RA patients who were 50 years or older with at least one additional

cardiovascular risk factor (see Section 4.8 Adverse Effects (Undesirable Effects)). The role of JAK inhibition in these events is not known. Events were primarily reported as diverticular perforation, peritonitis, abdominal abscess and appendicitis. In the RA clinical trials, the incidence rate of gastrointestinal perforation across all studies (Phase 1, Phase 2, Phase 3 and long-term extension) for all treatment groups all doses was 0.11 events per 100 patient-years with XELJANZ therapy. RA patients who developed gastrointestinal perforations were taking concomitant nonsteroidal anti-inflammatory drugs (NSAIDs) and/or corticosteroids. The relative contribution of these concomitant medications vs. XELJANZ to the development of gastrointestinal perforations is not known. The incidence rate in the PsA clinical trials (Phase 3 and long-term extension) was 0.08 patients with events per 100 patient-years with XELJANZ therapy. In the ankylosing spondylitis clinical trials, no gastrointestinal perforation events occurred in 420 patients receiving XELJANZ up to 48 weeks (233 patient-years of observation).

In placebo-controlled induction studies for UC, gastrointestinal perforation occurred in 2 (0.2%) patients treated with XELJANZ 10 mg twice daily and in 2 (0.9%) patients receiving placebo. In the Phase 3 maintenance study for UC, gastrointestinal perforation was not reported in patients treated with XELJANZ and was reported in 1 patient treated with placebo.

XELJANZ and XELJANZ XR should be used with caution in patients who may be at increased risk for gastrointestinal perforation (e.g., patients with a history of diverticulitis). Patients presenting with new onset abdominal symptoms should be evaluated promptly for early identification of gastrointestinal perforation.

### ***Fractures***

Fractures have been observed in patients treated with XELJANZ in clinical studies and the post-marketing setting.

In controlled Phase 3 clinical studies in RA patients, during the 0 to 3 months exposure, the incidence rates for fractures for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and placebo were 2.11, 2.56 and 4.43 patients with events per 100 PYs, respectively.

In a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, fractures were observed across XELJANZ and TNF inhibitor treatment groups (see Section 4.8 Adverse Effects (Undesirable Effects)).

Caution should be used in patients with known risk factors for fractures such as elderly patients, female patients and patients with corticosteroid use.

### ***Hypersensitivity***

Reactions such as angioedema and urticaria that may reflect drug hypersensitivity have been observed in patients receiving XELJANZ or XELJANZ XR. Some events were serious. Many of these events occurred in patients that have a history of multiple allergies. If a serious hypersensitivity reaction occurs, promptly discontinue tofacitinib while evaluating the potential cause or causes of the reaction.

### ***Vaccinations***

No data are available on the secondary transmission of infection by live vaccines to patients receiving XELJANZ or XELJANZ XR. Live vaccines should not be given concurrently with XELJANZ or XELJANZ XR. It is recommended that all patients be brought up to date with



all immunisations in agreement with current immunisation guidelines prior to initiating XELJANZ or XELJANZ XR therapy. The decision to use live vaccines prior to XELJANZ or XELJANZ XR treatment should take into account the pre-existing immunosuppression in a given patient.

Prophylactic zoster vaccination should be considered in accordance with vaccination guidelines. Particular consideration should be given to patients with longstanding RA who have previously received two or more biological DMARDs. The interval between live vaccinations and initiation of XELJANZ or XELJANZ XR therapy should be in accordance with current vaccination guidelines regarding immunomodulatory agents.

In a controlled clinical trial, the humoral response to concurrent vaccination with influenza and pneumococcal polysaccharide vaccines in patients with RA initiating tofacitinib 10 mg twice daily or placebo was evaluated. A similar percentage of patients achieved a satisfactory humoral response to influenza vaccine ( $\geq 4$ -fold increase in  $\geq 2$  of 3 antigens) in the tofacitinib (57%) and placebo (62%) treatment groups. A modest reduction in the percentage of patients who achieved a satisfactory humoral response to pneumococcal polysaccharide vaccine ( $\geq 2$ -fold increase in  $\geq 6$  of 12 serotypes) was observed in patients treated with tofacitinib monotherapy (62%) and MTX monotherapy (62%) as compared with placebo (77%), with a greater reduction in the response rate of patients receiving both tofacitinib and MTX (32%). The clinical significance of this is unknown.

A separate vaccine study evaluated the humoral response to concurrent vaccination with influenza and pneumococcal polysaccharide vaccines in patients receiving tofacitinib 10 mg twice daily for a median of approximately 22 months. Greater than 60% of patients treated with tofacitinib (with or without MTX) had satisfactory responses to influenza and pneumococcal vaccines. Consistent with the controlled trial, patients receiving both tofacitinib and MTX had a lower response rate to pneumococcal polysaccharide vaccine as compared with tofacitinib monotherapy (66% vs. 89%).

A controlled study in patients with RA on background MTX evaluated the humoral and cell mediated responses to immunisation with a live attenuated virus vaccine indicated for prevention of herpes zoster. The immunisation occurred 2 to 3 weeks before initiating a 12-week treatment with tofacitinib 5 mg twice daily or placebo. Six weeks after immunisation with the zoster vaccine, tofacitinib and placebo recipients exhibited similar humoral and cell mediated responses (mean fold change of varicella zoster virus [VZV] Immunoglobulin G [IgG] antibodies 2.11 in tofacitinib 5 mg twice daily and 1.74 in placebo twice daily; VZV IgG fold-rise  $\geq 1.5$  in 57% of tofacitinib recipients and in 43% of placebo recipients; mean fold change of VZV T-cell ELISPOT Spot Forming Cells 1.5 in tofacitinib 5 mg twice daily and 1.29 in placebo twice daily). These responses were similar to those observed in healthy volunteers aged 50 years and older.

In this study, one patient experienced dissemination of the vaccine strain of VZV, 16 days after vaccination and 2 days after initiation of tofacitinib. The patient was varicella virus naïve, as evidenced by no previous history of varicella infection and no anti-varicella antibodies at baseline. Tofacitinib was discontinued and the subject recovered after treatment with standard doses of antiviral medication. Subsequent testing showed that this patient made robust anti-varicella T-cell and antibody responses to the vaccine approximately 6 weeks post-vaccination, but not at 2 weeks post-vaccination, as expected for a primary infection.

Retention of immunisation protection with tofacitinib has not been evaluated.

### ***Interstitial Lung Disease***

Events of interstitial lung disease (ILD), some of which had a fatal outcome, have been reported in clinical trials with XELJANZ in RA patients, and in the post-marketing setting, although the role of JAK inhibition in these events is not known. All patients who developed ILD in clinical trials were taking concomitant MTX, corticosteroids and/or sulfasalazine, which have been associated with ILD. Asian patients had an increased risk of ILD (see Section 4.4 Special Warnings and Precautions for Use, Asian Patients).

XELJANZ and XELJANZ XR should be used with caution in patients with a risk or history of ILD.

### ***Lymphocytes***

Treatment with XELJANZ was associated with initial lymphocytosis at one month of exposure followed by a gradual decrease in mean lymphocyte counts below the baseline of approximately 10% during 12 months of therapy (see Section 5.1 Pharmacodynamic Properties).

Lymphocyte counts less than  $0.75 \times 10^9$  cells/L were associated with an increased incidence of serious infections. It is not recommended to initiate or continue XELJANZ or XELJANZ XR treatment in patients with a confirmed lymphocyte count less than  $0.75 \times 10^9$  cells/L. Lymphocytes should be monitored at baseline and every 3 months thereafter. For recommended modifications based on lymphocyte counts, see Section 4.2 Dose and Method of Administration.

### ***Neutrophils***

Treatment with XELJANZ was associated with an increased incidence of neutropenia ( $<2.0 \times 10^9$  cells/L) compared to placebo.

Avoid initiation of XELJANZ or XELJANZ XR treatment in patients with a low neutrophil count (i.e.,  $<1.0 \times 10^9$  cells/L). For patients who develop a persistent absolute neutrophil count (ANC) of  $0.5$ - $1.0 \times 10^9$  cells/L, reduce XELJANZ or XELJANZ XR dose or interrupt XELJANZ dosing until ANC is  $>1.0 \times 10^9$  cells/L. In patients who develop a confirmed ANC  $<0.5 \times 10^9$  cells/L treatment with XELJANZ or XELJANZ XR is not recommended. Neutrophils should be monitored at baseline and after 4 to 8 weeks of treatment and every 3 months thereafter (see Section 4.2 Dose and Method of Administration and Section 4.8 Adverse Effects (Undesirable Effects)).

### ***Haemoglobin***

Avoid initiation of XELJANZ or XELJANZ XR treatment in patients with low haemoglobin values (i.e.,  $<90$  g/L). Treatment with XELJANZ or XELJANZ XR should be interrupted in patients who develop haemoglobin levels  $<80$  g/L or whose haemoglobin level drops  $>20$  g/L on treatment. Haemoglobin should be monitored at baseline and after 4 to 8 weeks of treatment and every 3 months thereafter (see Section 4.2 Dose and Method of Administration).

### ***Lipids***

Treatment with XELJANZ was associated with dose-dependent increases in lipid parameters such as total cholesterol, low-density lipoprotein (LDL) cholesterol, and high-density lipoprotein (HDL) cholesterol (see Section 4.8 Adverse Effects (Undesirable Effects)). Maximum effects were generally observed within 6 weeks. There were no clinically relevant

changes in LDL/HDL cholesterol ratios. The effect of these lipid parameter elevations on cardiovascular morbidity and mortality has not been established.

Increases of total cholesterol, LDL cholesterol and HDL cholesterol were also reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor (see Section 4.8 Adverse Effects (Undesirable Effects)).

Assessment of lipid parameters should be performed approximately 4 to 8 weeks following initiation of XELJANZ or XELJANZ XR therapy. Patients should be managed according to clinical guidelines for the management of hyperlipidaemia. Increases in total and LDL cholesterol associated with XELJANZ or XELJANZ XR may be decreased to pre-treatment levels with statin therapy.

### ***Liver Enzyme Elevations***

Treatment with XELJANZ was associated with an increased incidence of liver enzyme elevation compared to placebo (see Section 4.8 Adverse Effects (Undesirable Effects)). Most of these abnormalities occurred in studies with background DMARD (primarily MTX) therapy.

Routine monitoring of liver tests and prompt investigation of the causes of liver enzyme elevations is recommended to identify potential cases of drug-induced liver injury. If drug-induced liver injury is suspected, XELJANZ or XELJANZ XR administration should be interrupted until this diagnosis has been excluded.

Elevations of ALT and AST were reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor (see Section 4.8 Adverse Effects (Undesirable Effects)).

### ***Hypoglycaemia in patients treated for diabetes***

There have been reports of hypoglycaemia following initiation of JAK inhibitors, including tofacitinib, in patients receiving treatment for diabetes. Dose adjustment of anti-diabetic medicinal products may be necessary in the event that hypoglycaemia occurs.

### ***Asian Patients***

Asian patients had higher rates of herpes zoster, opportunistic infections, interstitial lung disease, elevated transaminases (alanine aminotransferase (ALT), aspartate aminotransferase (AST)) and decreased white blood cell counts (WBCs). Therefore, XELJANZ and XELJANZ XR should be used with caution in Asian patients.

### ***Use in Hepatic Impairment***

Subjects with moderate hepatic impairment had 65% higher AUC compared with healthy subjects (see Section 5.2 Pharmacokinetic Properties). XELJANZ has not been studied in patients with severe hepatic impairment, or in patients with positive hepatitis B virus or hepatitis C virus serology. No dose adjustment is required in patients with mild hepatic impairment. In patients with moderate hepatic impairment, the recommended dose is half the total daily dose indicated for patients with normal hepatic function (see Section 4.2 Dose and Method of Administration). XELJANZ and XELJANZ XR should not be used in patients with severe hepatic impairment (see Section 4.3 Contraindications).

### ***Use in Renal Impairment***

No dose adjustment is required in patients with estimated GFR more than 50 mL/min. In patients with estimated GFR less than or equal to 50 mL/min (including but not limited to those with severe renal impairment who are undergoing haemodialysis), the recommended dose is half the total daily dose indicated for patients with normal renal function (see Section 4.2 Dose and Method of Administration and Section 5.2 Pharmacokinetic Properties).

In clinical trials, XELJANZ and XELJANZ XR were not evaluated in patients with baseline creatinine clearance values (estimated by Cockcroft-Gault equation) <40 mL/min.

### ***Use in the Elderly***

Considering the increased risk of serious infections, MACE, malignancies and all cause mortality with tofacitinib in patients 65 years of age and older, tofacitinib should only be used in these patients if no suitable treatment alternatives are available (see Boxed Warning and further details in Section 4.4 Special Warnings and Precautions for Use and Section 4.8 Adverse Effects (Undesirable Effects)).

### ***Paediatric Use***

The safety and efficacy of XELJANZ have been evaluated in pcJIA and juvenile PsA patients 2 years to <18 years of age.

The safety and efficacy of XELJANZ in children less than 2 years of age with pcJIA and juvenile PsA have not been established. No data are available.

The safety and efficacy of XELJANZ in children less than 18 years of age with other indications (e.g., ulcerative colitis) have not been established. No data are available.

In studies conducted in juvenile rats and monkeys tofacitinib-related effects on the immune system were similar to those in adult animals. There were no tofacitinib-related effects on the reproductive system or bone development in males or females.

### ***General (Specific to XELJANZ XR)***

The XELJANZ XR tablet shell remains undissolved during passage through the gastrointestinal tract and is eliminated in the faeces.

As with any other non-deformable material, caution should be used when administering XELJANZ XR to patients with pre-existing severe gastrointestinal narrowing (pathologic or iatrogenic). There have been rare reports of obstructive symptoms in patients with known strictures in association with the ingestion of other drugs utilising a non-deformable modified release formulation.

### ***Effects on Laboratory Tests***

No information available.

## **4.5 Interactions with Other Medicines and Other Forms of Interactions**

The metabolism of tofacitinib is primarily mediated by CYP3A4 with minor contribution from CYP2C19.

### ***Potential for Other Medicines to Influence the Pharmacokinetics of Tofacitinib***

Since tofacitinib is metabolised by CYP3A4, interaction with medicinal products that inhibit or induce CYP3A4 is likely. Tofacitinib exposure is increased when co-administered with potent inhibitors of CYP3A4 (e.g., ketoconazole) or when administration of one or more concomitant medications results in both moderate inhibition of CYP3A4 and potent inhibition of CYP2C19 (e.g., fluconazole). Tofacitinib exposure is decreased when co-administered with potent CYP3A4 inducers (e.g., rifampicin). Inhibitors of CYP2C19 alone or P-glycoprotein are unlikely to significantly alter the pharmacokinetics (PK) of tofacitinib.

#### ***Methotrexate***

Concomitant administration with MTX (15-25 mg MTX once weekly) had no effect on the PK of tofacitinib.

#### ***Ketoconazole***

Co-administration of ketoconazole, a strong CYP3A4 inhibitor, with a single dose of tofacitinib increased the AUC and  $C_{max}$  of tofacitinib by 103% and 16%, respectively (see Section 4.2 Dose and Method of Administration).

#### ***Fluconazole***

Co-administration of fluconazole, a moderate inhibitor of CYP3A4 and a strong inhibitor of CYP2C19, increased the AUC and  $C_{max}$  of tofacitinib by 79% and 27%, respectively (see Section 4.2 Dose and Method of Administration).

#### ***Ciclosporin***

Co-administration of ciclosporin, a moderate inhibitor of CYP3A4, increased the AUC of tofacitinib by 73% and decreased  $C_{max}$  of tofacitinib by 17%. The combined use of multiple-dose tofacitinib with this potent immunosuppressive has not been studied in patients with RA, PsA, AS, UC or JIA and is contraindicated.

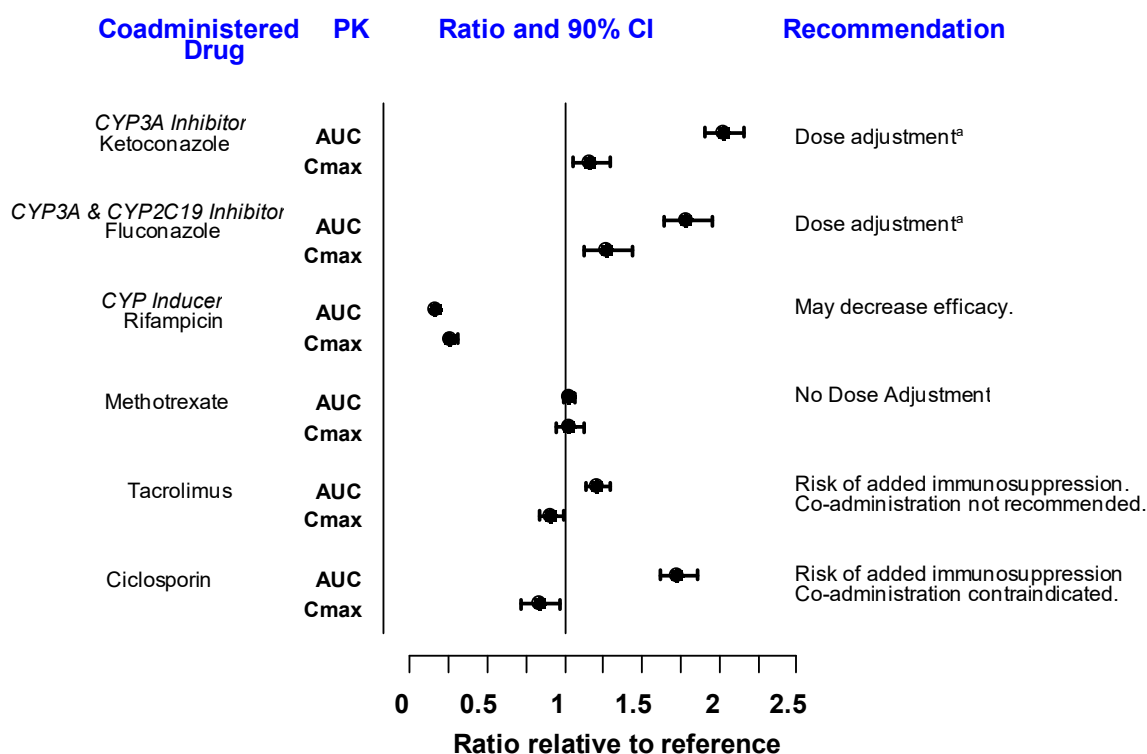
#### ***Tacrolimus***

Co-administration of tacrolimus, a mild inhibitor of CYP3A4, increased the AUC of tofacitinib by 21% and decreased the  $C_{max}$  of tofacitinib by 9%. The combined use of multiple-dose tofacitinib with this potent immunosuppressive has not been studied in patients with RA, PsA, AS, UC or JIA and is not recommended.

#### ***Rifampicin***

Co-administration of rifampicin, a strong CYP3A4 inducer, decreased the AUC and  $C_{max}$  of tofacitinib by 84% and 74%, respectively (see Section 4.2 Dose and Method of Administration).

**Figure 1: Impact of Other Medicines on the Pharmacokinetics of Tofacitinib**



Abbreviations: AUC=total area under the concentration time curve; C<sub>max</sub>=maximum plasma concentration; CYP=cytochrome P450; PK=pharmacokinetics; CI=confidence interval

Note: Reference group is administration of tofacitinib alone

<sup>a</sup> In rheumatoid arthritis and psoriatic arthritis patients the recommended dose is XELJANZ 5 mg once daily. In ulcerative colitis patients the recommended dose is half the total daily dose indicated for patients not receiving these CYP inhibitors; in patients already taking XELJANZ 10 mg twice daily, reduce the dose to XELJANZ 5 mg twice daily, and in patients already taking XELJANZ 5 mg twice daily, reduce the dose to XELJANZ 5 mg once daily.

### ***Potential for Tofacitinib to Influence the Pharmacokinetics of Other Medicines***

*In vitro* studies indicate that tofacitinib does not significantly inhibit or induce the activity of the major human drug-metabolising CYPs (CYP1A2, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, and CYP3A4) at concentrations exceeding 80 times the steady state C<sub>max</sub> of a 10 mg twice daily dose. These *in vitro* results were confirmed by a human drug interaction study showing no changes in the PK of midazolam, a highly sensitive CYP3A4 substrate, when co-administered with tofacitinib.

In RA, UC and JIA patients, the oral clearance of tofacitinib does not vary with time, indicating that tofacitinib does not normalise CYP enzyme activity in these patients. Therefore, co-administration with tofacitinib is not expected to result in clinically relevant increases in the metabolism of CYP substrates in RA, UC and JIA patients.

*In vitro* studies indicate that tofacitinib does not significantly inhibit the activity of the major human drug-metabolising uridine 5'-diphospho-glucuronosyltransferases (UGTs), [UGT1A1, UGT1A4, UGT1A6, UGT1A9, and UGT2B7] at concentrations exceeding 250 times the steady state C<sub>max</sub> of a 10 mg twice daily dose.

*In vitro* data indicate that the potential for tofacitinib to inhibit transporters such as P-glycoprotein, organic anion transporting polypeptide, organic anionic or cationic transporters at therapeutic concentrations is also low.

### Oral Contraceptives

Co-administration of tofacitinib did not have an effect on the PK of oral contraceptives, levonorgestrel and ethinyloestradiol, in healthy female volunteers.

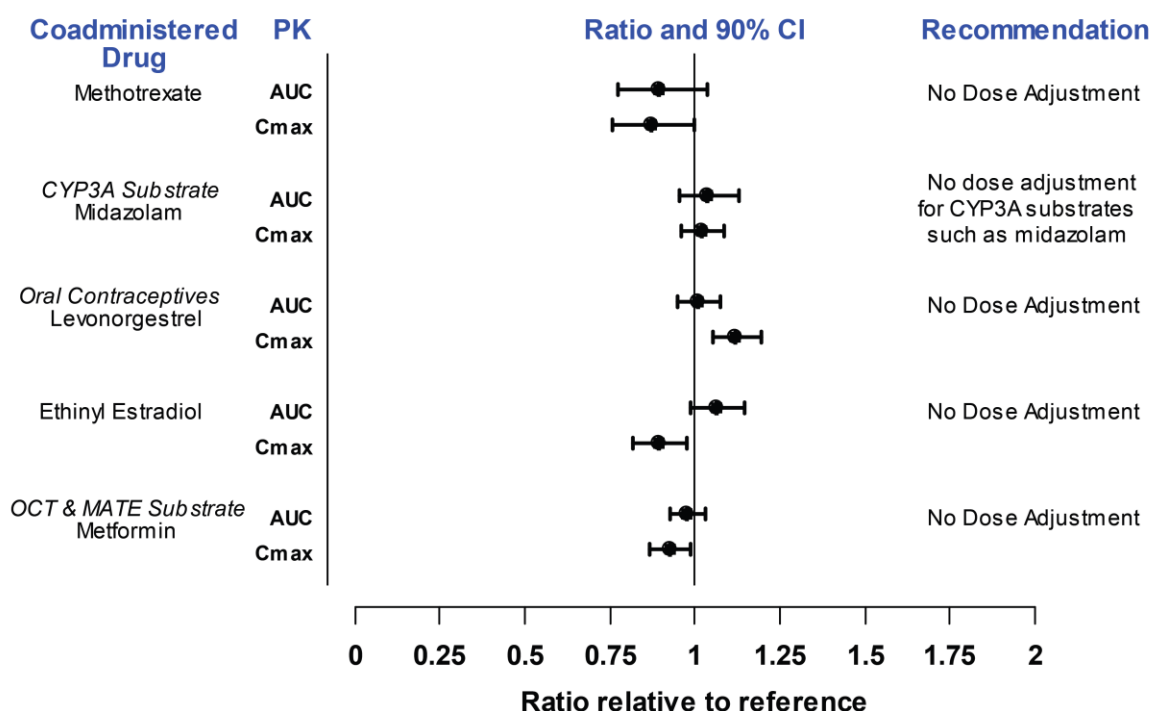
### Methotrexate

Co-administration of tofacitinib with MTX 15-25 mg once weekly decreased the AUC and  $C_{max}$  of MTX by 10% and 13% respectively. The extent of decrease in MTX exposure does not warrant modifications to the individualised dosing of MTX.

### Metformin

Co-administration of tofacitinib did not have an effect on the PK of metformin, indicating that tofacitinib does not interfere with the organic cationic transporter (OCT2) in healthy volunteers.

**Figure 2: Impact of Tofacitinib on the Pharmacokinetics of Other Medicines**



Note: Reference group is administration of concomitant medication alone.

Abbreviations: OCT=organic cationic transporter; MATE=multidrug and toxic compound extrusion; AUC=total area under the concentration time curve;  $C_{max}$ =maximum plasma concentration; CYP=cytochrome P450; PK=pharmacokinetics; CI=confidence interval

### **Medicines that Decrease Heart Rate (HR) and/or Prolong the PR Interval**

Tofacitinib results in a decrease in heart rate and an increase in the PR interval (see Section 4.4 Special Warnings and Precautions for Use, Cardiovascular). Caution should be observed if XELJANZ or XELJANZ XR are used concomitantly with medicines that lower heart rate

and/or prolong the PR interval, such as antiarrhythmics, beta blockers, alpha2 adrenoceptor agonists, non-dihydropyridine calcium channel blockers, digitalis glycosides, cholinesterase inhibitors, sphingosine-1 phosphate receptor modulators, and some HIV protease inhibitors.

### ***Combination with Other Therapies***

XELJANZ and XELJANZ XR have not been studied and should not be used in combination with biological agents such as TNF antagonists, interleukin (IL)-1R antagonists, IL-6R antagonists, anti-CD20 monoclonal antibodies, IL-17 antagonists, IL-12/IL-23 antagonists, anti-integrins, selective co-stimulation modulators, and/or potent immunosuppressants such as azathioprine, 6-mercaptopurine, tacrolimus and ciclosporin because of the possibility of increased immunosuppression and increased risk of infection (see Section 4.3 Contraindications).

There was a higher incidence of adverse events for the combination of XELJANZ with MTX versus XELJANZ as monotherapy in RA clinical studies.

The use of XELJANZ or XELJANZ XR in combination with phosphodiesterase 4 inhibitors has not been studied in XELJANZ clinical trials.

### ***Paediatric Population***

Drug-drug interaction studies have only been performed in adults.

## **4.6 Fertility, Pregnancy and Lactation**

### ***Effects on Fertility***

In rats, tofacitinib had no effects on male fertility, sperm motility, or sperm concentration at doses up to 100 mg/kg/day (55 times the human unbound drug AUC at 10 mg twice daily; extrapolated from values from other rat studies). Treatment-related effects on female fertility were noted at  $\geq 10$  mg/kg/day in rats (9 times the human unbound AUC at 10 mg twice daily; based on extrapolation from values from other rat studies).

### ***Use in Pregnancy - Category D***

There are no adequate and well-controlled studies on the use of XELJANZ or XELJANZ XR in pregnant women. Tofacitinib has been shown to be teratogenic in rats and rabbits, and to have effects in rats on parturition, and peri/postnatal development.

In an embryo-fetal development (EFD) study in rats given 30, 100, or 300 mg/kg/day, maternal toxicity was observed at doses  $\geq 100$  mg/kg/day. Observations included post-implantation loss, consisting of early and late resorptions and consequently a reduced number of viable fetuses, and decreased uterine weight. Fetal developmental effects were observed at 100 mg/kg/day ( $\geq 101$  times the unbound drug human AUC at 10 mg twice daily). Teratogenic effects consisted of external and soft tissue malformations of anasarca and membranous ventricular septal defects, respectively, and skeletal malformations or variations (absent cervical arch; bent femur, fibula, humerus, radius, scapula, tibia, and ulna; sternoschisis; absent rib; misshapen femur; branched rib; fused rib; fused sternebra; and hemicentric thoracic centrum). The no observed adverse effect level (NOAEL) for maternal and developmental toxicity in this study was 30 mg/kg/day, a dose at which the unbound drug AUC was  $\sim 40$  times the human AUC at 10 mg twice daily.



In an EFD study in rabbits given 10, 30, or 100 mg/kg/day, maternal toxicity was not observed. Fetal developmental effects were observed at  $\geq 30$  mg/kg/day. Teratogenic effects included thoracogastroschisis, omphalocele, membranous ventricular septal defects, and cranial/skeletal malformations (microstomia, microphthalmia), mid-line and tail defects. The NOAELs for maternal and developmental toxicity in this study were 100 and 10 mg/kg/day, doses at which the total drug AUCs were ~32- and 1.5 times, respectively, the human AUC at 10 mg twice daily.

In a perinatal/postnatal rat study, there were reductions in live litter size, postnatal survival, and pup body weights at 50 mg/kg/day (~51 times the unbound exposure in humans at 5 mg twice daily, based on extrapolation from values from other rat studies). At 10 mg/kg/day (~12 times the unbound exposure in humans at 10 mg twice daily, based on extrapolation from values from other rat studies), no effect occurred on sexual maturation or the ability of the F1 generation rats to learn, mate, and produce viable F2 generation fetuses.

In the Phase 2, Phase 3 and long-term extension studies in RA patients, 14 maternal pregnancies were reported in patients treated with tofacitinib. Pregnancy outcomes comprised full-term normal newborn (6 cases), spontaneous abortion (3), elective termination (2), lost to follow-up (2) and low birth weight (1). A spontaneous abortion occurred in the only maternal pregnancy in patients treated with placebo.

XELJANZ or XELJANZ XR should not be used during pregnancy or by women attempting to become pregnant. Women of reproductive potential should be advised to use effective contraception both during treatment with XELJANZ or XELJANZ XR and after discontinuing therapy. The extended pharmacodynamic effects of XELJANZ or XELJANZ XR should be considered when determining how long to continue effective contraception after discontinuing XELJANZ or XELJANZ XR therapy.

### ***Use in Lactation***

Tofacitinib was secreted in the milk of lactating rats. It is not known whether tofacitinib is secreted in human milk. Women should not breastfeed while being treated with XELJANZ or XELJANZ XR.

## **4.7 Effects on Ability to Drive and Use Machines**

No formal studies have been conducted on effects on the ability to drive and use machines.

## **4.8 Adverse Effects (Undesirable Effects)**

### ***Rheumatoid Arthritis***

The following data include 6 double-blind, controlled, multicentre studies of varying durations from 6 to 24 months (Studies I to VI, see Section 5.1 Pharmacodynamic Properties, Clinical Trials). In these studies, 3200 patients were randomised and treated with doses of XELJANZ 5 mg twice daily (616 patients) or 10 mg twice daily (642 patients) monotherapy and XELJANZ 5 mg twice daily (973 patients) or 10 mg twice daily (969 patients) in combination with DMARDs (including MTX).

All patients in these studies had moderate to severe active RA. The XELJANZ study population had a mean age of 52 years and 83% were female. The highest proportions of patients in the clinical studies were either White (62%) or Asian (24%).

The long-term safety population includes all patients who participated in a double-blind, controlled study (including earlier development phase studies) and then participated in one of two long-term safety studies.

A total of 6194 patients (Phase 1, 2, 3, and long-term extension studies) were treated with any dose of XELJANZ with a mean duration of 3 years, with 19,405.8 patient-years of accumulated total drug exposure based on up to 8 years of continuous exposure to XELJANZ.

Safety information is also included for one large (N=4362), randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor (CV risk factors defined as: current cigarette smoker, diagnosis of hypertension, diabetes mellitus, family history of premature coronary heart disease, history of coronary artery disease including a history of revascularisation procedure, coronary artery bypass grafting, myocardial infarction, cardiac arrest, unstable angina, acute coronary syndrome, and presence of extra-articular disease associated with RA, e.g., nodules, Sjögren's syndrome, anaemia of chronic disease, pulmonary manifestations), and were on a stable background dose of methotrexate. The majority (more than 90%) of tofacitinib patients who were current or past smokers had a smoking duration of more than 10 years and a median of 35.0 and 39.0 smoking years, respectively.

Patients were randomised to open-label tofacitinib 10 mg twice daily, tofacitinib 5 mg twice daily, or a TNF inhibitor (TNF inhibitor was either etanercept 50 mg once weekly or adalimumab 40 mg every other week) in a 1:1:1 ratio. The co-primary endpoints are adjudicated malignancy (excluding NMSC) and adjudicated major adverse cardiovascular events (MACE); cumulative incidence and statistical assessment of endpoints are blinded. The study is an event-powered study that also requires at least 1500 patients to be followed for 3 years. The study treatment of tofacitinib 10 mg twice daily has been stopped and the patients were switched to 5 mg twice daily because of a dose-dependent signal of PE.

### Psoriatic Arthritis

XELJANZ 5 mg twice daily and 10 mg twice daily were studied in 2 double-blind Phase 3 clinical trials in patients with active PsA.

Study PsA-I had a duration of 12 months and included 422 patients who had an inadequate response to a csDMARD and who were naïve to treatment with a TNF-inhibitor (TNFi) biologic DMARD. Study PsA-I included a 3-month placebo-controlled period and also included adalimumab 40 mg subcutaneously once every 2 weeks for 12 months. Study PsA-II had a duration of 6 months and included 394 patients who had an inadequate response to at least one approved TNFi. Study PsA-II included a 3-month placebo-controlled period. All patients in the clinical trials were required to receive treatment with a stable dose of a csDMARD [the majority received methotrexate (78.2%)]. In the Phase 3 clinical trials, patients were randomised and treated with XELJANZ 5 mg twice daily (238 patients) or XELJANZ 10 mg twice daily (236 patients). The study population randomised and treated with XELJANZ (474 patients) included 45 (9.5%) patients aged 65 years or older and 66 (13.9%) patients with diabetes at baseline.

An additional long-term, open-label clinical trial was conducted which included 686 patients with PsA who originally participated in either of the 2 double-blind, controlled clinical trials. Patients who participated in this open-label clinical trial were initially treated with XELJANZ 5 mg twice daily. Starting at Month 1, escalation to XELJANZ 10 mg twice daily was permitted

at investigator discretion; subsequent dose reduction to 5 mg twice daily was also permitted. This limits the interpretation of the long-term safety data with respect to dose.

Of the 783 patients who received XELJANZ doses of 5 mg twice daily or 10 mg twice daily in PsA clinical trials, 713 received treatment for 6 months or longer, of whom 635 received treatment for one year or longer, of whom 335 received treatment for greater than or equal to 24 months.

### Ankylosing Spondylitis

XELJANZ 5 mg twice daily was studied in patients with active AS in a randomised double-blind placebo-controlled Phase 3 clinical trial (Study AS-I) and included in a randomised dose-ranging double-blind placebo-controlled Phase 2 clinical trial (Study AS-II).

Study AS-I enrolled patients who had an inadequate response to at least 2 NSAIDs. Study AS-I included a 16-week double-blind treatment period in which patients received XELJANZ 5 mg or placebo twice daily and a 32-week open-label treatment period in which all patients received XELJANZ 5 mg twice daily.

Study AS-II enrolled patients who had an inadequate response to at least 2 NSAIDs. This clinical trial included a 12-week double-blind treatment period in which patients received either XELJANZ 2 mg, 5 mg, 10 mg or placebo twice daily. This trial also included a 4-week follow-up period.

In the safety population of the combined Phase 2 and the Phase 3 clinical trials, a total of 420 patients were treated with either XELJANZ 2 mg, 5 mg or 10 mg twice daily. Of these, 316 patients were treated with XELJANZ 5 mg twice daily for up to 48 weeks. Among these 316 patients, 253 received treatment for 6 months or longer, and among these 253 patients, 108 received treatment for 12 months or longer. In the combined double-blind placebo-controlled period, 185 patients were randomised to and treated with XELJANZ 5 mg twice daily and 187 were randomised to and treated with placebo for up to 16 weeks. Concomitant treatment with stable doses of csDMARDs, NSAIDs or corticosteroids ( $\leq 10$  mg/day) was permitted. The study population of 420 patients randomised and treated with XELJANZ included 13 (3.1%) patients aged 65 years or older and 18 (4.3%) patients with diabetes at baseline.

### Ulcerative Colitis

The following safety data were based on 4 randomised, double-blind, placebo-controlled studies: 2 Phase 3 induction studies of identical design (UC-I and UC-II), a Phase 3 maintenance study (UC-III), and 1 dose-ranging Phase 2 induction study (UC-V). Patients with moderately to severely active UC were enrolled in the Phase 2 and Phase 3 induction studies. In the induction studies, randomised patients received treatment with XELJANZ 10 mg twice daily (938 patients combined) or placebo (282 patients combined) for up to 8 weeks. Patients who completed either Study UC-I or Study UC-II and achieved clinical response entered Study UC-III. In Study UC-III, patients were re-randomised, such that 198 patients received XELJANZ 5 mg twice daily, 196 patients received XELJANZ 10 mg twice daily, and 198 patients received placebo for up to 52 weeks. Concomitant use of immunosuppressants or biologics was prohibited during these studies. Concomitant stable doses of oral corticosteroids were allowed in the induction studies, with taper of corticosteroids to discontinuation mandated within 15 weeks of entering the maintenance study. In addition to the induction and maintenance studies, long-term safety was evaluated in an open-label long-term extension study (Study UC-IV).

### Juvenile Idiopathic Arthritis

The following safety data were based on the double-blind, placebo-controlled Phase 3 clinical trial (Study pcJIA-I) in a total of 225 JIA patients (56 male and 169 female) 2 to <18 years of age, treated with XELJANZ dosed at 5 mg twice daily or weight based equivalent twice daily with or without concomitant MTX.

### ***Clinical Trial Experience***

The most common category of serious adverse reactions in RA, PsA and JIA were serious infections (see Section 4.4 Special Warnings and Precautions for Use) and the most common categories of serious adverse reactions in UC were gastrointestinal disorders and infections.

### Rheumatoid Arthritis

The most commonly reported adverse reactions during the first 3 months in controlled clinical trials (occurring in  $\geq 2\%$  of patients treated with XELJANZ monotherapy or in combination with DMARDs) were headache, upper respiratory tract infections, nasopharyngitis, diarrhoea, nausea and hypertension.

The proportion of patients who discontinued treatment due to any adverse reactions during first 3 months of the double-blind, placebo- or MTX-controlled studies was 3.8% for patients taking XELJANZ and 3.2% for placebo-treated patients. The most common adverse reactions that resulted in discontinuation of XELJANZ were infections. The most common infections resulting in discontinuation of therapy were herpes zoster and pneumonia.

Table 3 below lists the adverse events (regardless of causality) occurring in  $\geq 1\%$  of patients treated with XELJANZ during the double-blind, placebo-controlled portion of the RA studies.

**Table 3: Summary of Adverse Events reported by  $\geq 1\%$  of patients treated with XELJANZ (All Causalities) - double-blind, placebo-controlled portion of Phase 3 Studies (up to 3 months)**

Body System/ Adverse Event	XELJANZ 5 mg BD (N=1216)	XELJANZ 10 mg BD (N=1214)	Placebo (N=681)	Adalimumab 40 mg SC q2w (N=204)
<b>Infections and Infestations</b>				
Upper respiratory tract infection	53 (4.4)	47 (3.9)	23 (3.4)	7 (3.4)
Nasopharyngitis	48 (3.9)	35 (2.9)	19 (2.8)	7 (3.4)
Urinary tract infection	25 (2.1)	24 (2.0)	12 (1.8)	7 (3.4)
Bronchitis	14 (1.2)	13 (1.1)	10 (1.5)	4 (2.0)
Influenza	9 (0.7)	14 (1.2)	5 (0.7)	2 (1.0)
Herpes zoster	5 (0.4)	16 (1.3)	2 (0.3)	0
<b>Blood and Lymphatic System Disorders</b>				
Anaemia	15 (1.2)	13 (1.1)	8 (1.2)	0
<b>Metabolism and Nutrition Disorders</b>				
Hypercholesterolaemia	12 (1.0)	13 (1.1)	3 (0.4)	1 (0.5)
<b>Nervous System Disorders</b>				
Headache	54 (4.4)	39 (3.2)	15 (2.2)	5 (2.5)
Dizziness	13 (1.1)	12 (1.0)	8 (1.2)	3 (1.5)
<b>Vascular Disorders</b>				

Body System/ Adverse Event	XELJANZ 5 mg BD (N=1216)	XELJANZ 10 mg BD (N=1214)	Placebo (N=681)	Adalimumab 40 mg SC q2w (N=204)
Hypertension	20 (1.6)	27 (2.2)	7 (1.0)	0
<b>Respiratory, Thoracic and Mediastinal Disorders</b>				
Cough	11 (0.9)	16 (1.3)	11 (1.6)	4 (2.0)
<b>Gastrointestinal Disorders</b>				
Diarrhoea	45 (3.7)	34 (2.8)	16 (2.3)	2 (1.0)
Nausea	32 (2.6)	25 (2.1)	18 (2.6)	3 (1.5)
Dyspepsia	19 (1.6)	25 (2.1)	11 (1.6)	3 (1.5)
Abdominal pain upper	23 (1.9)	13 (1.1)	5 (0.7)	3 (1.5)
Vomiting	21 (1.7)	9 (0.7)	10 (1.5)	0
Constipation	16 (1.3)	17 (1.4)	6 (0.9)	2 (1.0)
Gastritis	12 (1.0)	16 (1.3)	7 (1.0)	0
Abdominal pain	10 (0.8)	13 (1.1)	7 (1.0)	2 (1.0)
Gastroenteritis	12 (1.0)	13 (1.1)	5 (0.7)	0
<b>Musculoskeletal and Connective Tissue Disorders</b>				
Rheumatoid arthritis	17 (1.4)	5 (0.4)	17 (2.5)	1 (0.5)
Back pain	18 (1.5)	20 (1.6)	5 (0.7)	1 (0.5)
Arthralgia	13 (1.1)	9 (0.7)	16 (2.3)	4 (2.0)
<b>General Disorders and Administration Site Conditions</b>				
Oedema peripheral	17 (1.4)	21 (1.7)	16 (2.3)	3 (1.5)
Pyrexia	13 (1.1)	7 (0.6)	5 (0.7)	1 (0.5)
<b>Investigations</b>				
Blood creatine phosphokinase increased	9 (0.7)	26 (2.1)	3 (0.4)	1 (0.5)
Alanine aminotransferase increased	14 (1.2)	15 (1.2)	7 (1.0)	1 (0.5)
Weight increased	11 (0.9)	13 (1.1)	4 (0.6)	2 (1.0)
<b>Injury, Poisoning and Procedural Complications</b>				
Fall	7 (0.6)	13 (1.1)	4 (0.6)	1 (0.5)

Abbreviations: BD=twice daily; SC q2w=subcutaneously once every 2 weeks.

### Psoriatic Arthritis

In active PsA, the most commonly reported adverse reactions during the first 12 weeks in placebo-controlled clinical trials (occurring in  $\geq 2\%$  of patients treated with XELJANZ and at least 1% greater than the rate observed in patients on placebo) were bronchitis, diarrhoea, dyspepsia, fatigue, headache, nasopharyngitis, pharyngitis.

The proportion of patients who discontinued treatment due to any adverse reactions during the first 12 weeks of the double-blind placebo-controlled studies was 3.2% for XELJANZ treated patients and 2.5% for placebo-treated patients. The most common infection resulting in discontinuation of therapy was sinusitis.

Overall, the safety profile observed in patients with active PsA treated with XELJANZ was consistent with the safety profile in patients with RA.

### Ankylosing Spondylitis

In active AS, the most commonly reported adverse reactions during the first 16 weeks in the controlled clinical trials (occurring in  $\geq 2\%$  of patients treated with XELJANZ and at least 1% greater than the rate observed in patients on placebo) were upper respiratory tract infection, influenza and fatigue.

### Ulcerative Colitis

The adverse reactions that occurred in at least 2% of patients receiving XELJANZ 10 mg twice daily and at least 1% greater than that observed in patients receiving placebo in the induction studies (Study UC-I, Study UC-II, and Study UC-V) were increased blood creatine phosphokinase, nasopharyngitis, pyrexia, and headache.

In induction and maintenance studies, across all treatment groups, the most common categories of serious adverse reactions were gastrointestinal disorders and infections, and the most common serious adverse reaction was worsening of UC.

In the controlled clinical studies for UC, 1 case of breast cancer was reported in a placebo-treated patient and no cases of solid cancers or lymphoma were observed in XELJANZ-treated patients. Malignancies have also been observed in the long-term extension study in patients with UC treated with XELJANZ, including solid cancers and lymphoma.

In induction and maintenance studies, the most frequent reason for study discontinuation was worsening of UC. Excluding discontinuations due to worsening of UC, the proportion of patients who discontinued due to adverse reactions was less than 5% in any of the XELJANZ or placebo treatment groups in these studies.

Overall, the safety profile observed in patients with UC treated with XELJANZ was consistent with the safety profile of XELJANZ in the RA indication.

Table 4 below lists the treatment-emergent adverse events (all causality) occurring in  $\geq 2\%$  of patients in any treatment group, during the Phase 2 and Phase 3 induction studies in the UC clinical program.

**Table 4: Treatment-Emergent Adverse Events (All Causality) Occurring in  $\geq 2\%$  of Patients in Any Treatment Group during the Phase 2 and Phase 3 Induction Studies in the UC Clinical Program**

SOC PT	Placebo (N=282)	XELJANZ 10 mg BD (N=938)
	n (%)	n (%)
<b>Blood and lymphatic system disorders</b>	<b>9 (3.19)</b>	<b>22 (2.35)</b>
Anaemia	9 (3.19)	22 (2.35)
<b>Gastrointestinal disorders</b>	<b>40 (14.18)</b>	<b>72 (7.68)</b>
Abdominal pain	11 (3.90)	25 (2.67)
Colitis ulcerative	20 (7.09)	26 (2.77)
Nausea	11 (3.90)	28 (2.99)
<b>General disorders and administrative site conditions</b>	<b>4 (1.42)</b>	<b>24 (2.56)</b>
Pyrexia	4 (1.42)	24 (2.56)
<b>Infections and infestations</b>	<b>20 (7.09)</b>	<b>82 (8.74)</b>
Nasopharyngitis	14 (4.96)	56 (5.97)

**Table 4: Treatment-Emergent Adverse Events (All Causality) Occurring in  $\geq 2\%$  of Patients in Any Treatment Group during the Phase 2 and Phase 3 Induction Studies in the UC Clinical Program**

<b>SOC PT</b>	<b>Placebo (N=282)</b>	<b>XELJANZ 10 mg BD (N=938)</b>
Upper respiratory tract infection	6 (2.13)	26 (2.77)
<b>Investigations</b>	<b>3 (1.06)</b>	<b>25 (2.67)</b>
Blood creatine phosphokinase increased	3 (1.06)	25 (2.67)
Elevated cholesterol levels*	0 (0.0)	31 (3.3)
<b>Musculoskeletal and connective tissue disorders</b>	<b>12 (4.26)</b>	<b>27 (2.88)</b>
Arthralgia	12 (4.26)	27 (2.88)
<b>Nervous system disorders</b>	<b>19 (6.74)</b>	<b>73 (7.78)</b>
Headache	19 (6.74)	73 (7.78)
<b>Respiratory, thoracic and mediastinal disorders</b>	<b>7 (2.48)</b>	<b>13 (1.39)</b>
Cough	7 (2.48)	13 (1.39)
<b>Skin and subcutaneous tissue disorders</b>	<b>1 (0.35)</b>	<b>25 (2.67)</b>
Acne	1 (0.35)	25 (2.67)
Abbreviations: BD=twice daily; PT=preferred term; SOC=system organ class; UC=ulcerative colitis. Subjects are only counted once per treatment for each row. * Includes hypercholesterolaemia, hyperlipidaemia, blood cholesterol increased, dyslipidaemia, blood triglycerides increased, low density lipoprotein increased, low density lipoprotein abnormal, or lipids increased.		

#### *Maintenance Trial (Study UC-III)*

Common adverse reactions reported in  $\geq 4\%$  of patients treated with either dose of XELJANZ and  $\geq 1\%$  greater than reported in patients receiving placebo are shown in Table 5.

**Table 5: Common Adverse Reactions\* in UC Patients during the Maintenance Trial (Study UC-III)**

<b>Preferred Term</b>	<b>XELJANZ 5 mg Twice Daily N=198 (%)</b>	<b>XELJANZ 10 mg Twice Daily N=196 (%)</b>	<b>Placebo N=198 (%)</b>
Nasopharyngitis	10	14	6
Elevated cholesterol levels**	5	9	1
Headache	9	3	6
Upper respiratory tract infection	7	6	4
Increased blood creatine phosphokinase	3	7	2
Rash	3	6	4
Diarrhoea	2	5	3
Herpes zoster	1	5	1
Gastroenteritis	3	4	3
Anaemia	4	2	2
Nausea	1	4	3

\* Reported in  $\geq 4\%$  of patients treated with either dose of XELJANZ and  $\geq 1\%$  greater than reported for placebo.

\*\* Includes hypercholesterolaemia, hyperlipidaemia, blood cholesterol increased, dyslipidaemia, blood triglycerides increased, low density lipoprotein increased, low density lipoprotein abnormal, or lipids increased.

In the 52-week maintenance study, no malignancies were reported in patients treated with XELJANZ 10 mg twice daily or 5 mg twice daily. In the long-term extension study, malignancies (including solid cancers, lymphomas and NMSC) were observed more often in patients treated with XELJANZ 10 mg twice daily (see Section 4.4 Special Warnings and Precautions for Use). Four cases of pulmonary embolism were reported in patients taking XELJANZ 10 mg twice daily, including one fatality in a patient with advanced cancer (see Section 4.4 Special Warnings and Precautions for Use).

Dose-dependent adverse reactions seen across indications in patients treated with XELJANZ 10 mg twice daily, in comparison to 5 mg twice daily, include the following: herpes zoster infections (incidence rates in UC patients for 10 mg twice daily and 5 mg twice daily were 6.64 events per 100 patient-years and 2.05 events per 100 patient-years, respectively), serious infections (incidence rates in UC patients for 10 mg twice daily and 5 mg twice daily were 0.64 events per 100 patient-years and 1.35 events per 100 patient-years, respectively), and NMSC (incidence rates in UC patients for 10 mg twice daily and 5 mg twice daily were 1.91 events per 100 patient-years and 0 events per 100 patient-years, respectively) (see Section 4.4 Special Warnings and Precautions for Use).

### Juvenile Idiopathic Arthritis

The adverse reactions in JIA patients in the clinical development program were consistent in type and frequency with those seen in adult RA patients, with the exception of some infections (influenza, pharyngitis, sinusitis, viral infection) and gastrointestinal or general disorders (abdominal pain, nausea, vomiting, pyrexia, headache, cough), which were more common in the JIA paediatric population. MTX was the most frequent concomitant csDMARD used (on Day 1, 156 of 157 patients on csDMARDs took MTX). There are insufficient data regarding the safety profile of tofacitinib used concomitantly with any other csDMARDs.

In the pivotal Phase 3 (Study pcJIA-I [A3921104]), in patients with juvenile idiopathic arthritis aged 2 to <18 years of age, the most commonly reported adverse reactions occurring in  $\geq 5\%$  of patients treated with tofacitinib dosed at 5 mg twice daily or weight-based equivalent twice daily were upper respiratory tract infections, headache, nasopharyngitis, pyrexia, nausea and vomiting.

### ***Adverse Drug Reactions for XELJANZ***

The Adverse Drug Reactions (ADRs) listed below are from randomised Phase 3 clinical studies for rheumatoid arthritis, plaque psoriasis, psoriatic arthritis, ankylosing spondylitis, ulcerative colitis and juvenile idiopathic arthritis, and are presented by System Organ Class (SOC) and frequency categories, defined using the following convention: very common ( $\geq 10\%$ ); common ( $\geq 1\%$  to  $<10\%$ ), uncommon ( $\geq 0.1\%$  to  $<1\%$ ) or rare ( $\geq 0.01\%$  to  $<0.1\%$ ).

### ***Blood and Lymphatic System Disorders***

*Common:* Anaemia.

*Uncommon:* Leucopenia, lymphopenia, neutropenia.



### ***Gastrointestinal Disorders***

*Common:* Abdominal pain, vomiting, diarrhoea, nausea, gastritis, dyspepsia.

### ***General Disorders and Administration Site Conditions***

*Common:* Pyrexia, oedema peripheral, fatigue.

### ***Hepatobiliary Disorders***

*Uncommon:* Hepatic steatosis.

### ***Infections and Infestations***

*Common:* Pneumonia, influenza, herpes zoster, urinary tract infection, sinusitis, bronchitis, nasopharyngitis, pharyngitis.

*Uncommon:* Tuberculosis, diverticulitis, pyelonephritis, cellulitis, herpes simplex, gastroenteritis viral, viral infection.

*Rare:* Sepsis, tuberculosis of central nervous system<sup>^</sup>, encephalitis<sup>^</sup>, necrotising fasciitis<sup>^</sup>, meningitis cryptococcal<sup>^</sup>, disseminated tuberculosis, urosepsis<sup>^</sup>, *Pneumocystis jirovecii* pneumonia, pneumococcal pneumonia<sup>^</sup>, staphylococcal bacteraemia<sup>^</sup>, atypical mycobacterial infection<sup>^</sup>, *Mycobacterium avium* complex infection<sup>^</sup>, cytomegalovirus infection, bacteraemia<sup>^</sup>, bacterial pneumonia, bacterial arthritis.

### ***Injury, Poisoning and Procedural Complications***

*Uncommon:* Ligament sprain, muscle strain

### ***Investigations***

*Common:* Gamma glutamyltransferase increased, blood cholesterol increased, weight increased, blood creatine phosphokinase increased.

*Uncommon:* Hepatic enzyme increased, transaminases increased, blood creatinine increased, liver function test abnormal, low density lipoprotein increased.

### ***Metabolism and Nutrition Disorders***

*Common:* Hyperlipidaemia.

*Uncommon:* Dyslipidaemia, dehydration.

### ***Musculoskeletal and Connective Tissue Disorders***

*Common:* Arthralgia.

*Uncommon:* Musculoskeletal pain, tendonitis, joint swelling.

### ***Neoplasm Benign, Malignant and Unspecified (Including Cysts and Polyps)***

*Uncommon:* Nonmelanoma skin cancers.<sup>§</sup>

### ***Nervous System Disorders***

*Common:* Headache.

*Uncommon:* Paraesthesia.

### ***Psychiatric Disorders***

*Uncommon:* Insomnia.

### ***Respiratory, Thoracic and Mediastinal Disorders***

*Common:* Cough.

*Uncommon:* Dyspnoea, sinus congestion.

### ***Skin and Subcutaneous Tissue Disorders***

*Common:* Rash.

*Uncommon:* Erythema, pruritus.

### ***Vascular Disorders***

*Common:* Hypertension.

*Uncommon:* Venous thromboembolism<sup>#</sup>.

<sup>^</sup> These ADRs have only been reported in open-label long-term extension studies; therefore, the frequency of these ADRs in Phase 3 randomised trials was estimated.

<sup>§</sup> Nonmelanoma skin cancer is not a preferred term. The frequency is determined by combining frequencies for the PT's of basal cell carcinoma and squamous cell carcinoma.

<sup>#</sup> Venous thromboembolism (e.g., pulmonary embolism, deep vein thrombosis, retinal venous thrombosis).

### ***Overall Infections***

#### ***Rheumatoid Arthritis***

In the controlled portion (0-3 months) of the Phase 3 monotherapy studies (I and VI), the rate of infections in the 5 mg twice daily and 10 mg twice daily XELJANZ monotherapy groups were 16.1% and 17.8%, respectively, compared to 18.9% in the placebo group. In the controlled portion (0-3 months) of the Phase 3 studies II to V with background DMARDs, the rates of infections in the 5 mg twice daily and 10 mg twice daily XELJANZ plus DMARD groups were 21.3% and 21.8%, respectively, compared to 18.4% in the placebo plus DMARD group. In the controlled portion (0-6 months) of the Phase 3 studies II to IV with background DMARDs, the rates of infections in the 5 mg twice daily and 10 mg twice daily XELJANZ plus DMARD groups were 34.6% and 32.8%, respectively, compared to 21.3% in the placebo plus DMARD group.

The most commonly reported infections were upper respiratory tract infections and nasopharyngitis (3.7% and 3.2%, respectively).

The overall rate of infections with XELJANZ in the long-term safety all exposure population (total 4867 patients) was 72.1 events per 100 patient-years (71.8 and 72.2 events for 5 mg and 10 mg twice daily, respectively). For patients on monotherapy (total 1750), the rates were 75.3 and 64.2 events per 100 patient-years for 5 mg and 10 mg twice daily, respectively. For patients on background DMARDs (total 3117), the rates were 69.7 and 76.5 events per 100 patient-years for 5 mg and 10 mg twice daily, respectively.

Infections were also reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. The incidence rates (IRs) (95% CI) and hazard ratios (HRs) (95% CI) are presented as follows:

- The IRs (95% CI) for all infections for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 41.74 (39.21, 44.39), 48.73 (45.82, 51.77), 45.02 (43.10, 47.01), and 34.24 (32.07, 36.53) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.20 (1.10, 1.31), 1.36 (1.24, 1.49), and 1.28 (1.18, 1.38), respectively.

### Psoriatic Arthritis

In the controlled Phase 3 studies of up to 6-month and up to 12-month, the frequency of infections in the XELJANZ 5 mg twice daily (238 patients) and XELJANZ 10 mg twice daily (236 patients) groups were 37.8% and 44.5%, respectively. The frequency of infections in the 3-month placebo-controlled period was 23.5% for XELJANZ 5 mg twice daily (238 patients), 28.8% for XELJANZ 10 mg twice daily (236 patients) and 15.7% in the placebo group (236 patients).

The most commonly reported infections in the 3-month placebo-controlled period were nasopharyngitis (5.9% and 5.5% in the 5 mg twice daily and 10 mg twice daily dose groups, respectively) and upper respiratory tract infections (5.0% and 4.7% in the 5 mg twice daily and 10 mg twice daily dose groups, respectively).

The overall rate of infections with XELJANZ in the long-term safety population for combined doses was 52.3 patients with events per 100 patient-years.

### Ankylosing Spondylitis

In the combined Phase 2 and Phase 3 clinical trials, during the placebo-controlled period of up to 16 weeks, the frequency of infections in the XELJANZ 5 mg twice daily group (185 patients) was 27.6% and the frequency in the placebo group (187 patients) was 23.0%. In the combined Phase 2 and Phase 3 clinical trials, among the 316 patients treated with XELJANZ 5 mg twice daily for up to 48 weeks, the frequency of infections was 35.1%.

### Ulcerative Colitis

In the randomised 8-week Phase 2/3 induction studies, the proportions of patients with infections were 21.1% (198 patients) in the XELJANZ 10 mg twice daily group compared to 15.2% (43 patients) in the placebo group. In the randomised 52-week Phase 3 maintenance study, the proportion of patients with infections were 35.9% (71 patients) in the 5 mg twice daily and 39.8% (78 patients) in the 10 mg twice daily XELJANZ groups, compared to 24.2% (48 patients) in the placebo group.

In the entire treatment experience with XELJANZ, the most commonly reported infection was nasopharyngitis, occurring in 18.2% of patients (211 patients). In the entire treatment experience with XELJANZ, the overall incidence rate of infections was 60.3 events per 100 patient-years (involving 49.4% of patients; total 572 patients).

### Juvenile Idiopathic Arthritis

In the double-blind portion of the pivotal Phase 3 Study pcJIA-I, infection was the most commonly reported adverse reaction with 44.3% of patients treated with tofacitinib as compared with 30.6% of patients on placebo. The infections were generally mild to moderate in severity.

## ***Serious Infections***

### ***Rheumatoid Arthritis***

In the controlled portion (0-3 months) of the Phase 3 monotherapy studies (I and VI), the rate of serious infections in the 5 mg twice daily XELJANZ monotherapy group was 0.2% (0.7 events per 100 patient-years). In the 10 mg twice daily XELJANZ monotherapy group, the rate was 0.3% (1.3 events per 100 patient-years), and the rate was 0 for the placebo group.

In the controlled portion (0-3 months) of the Phase 3 studies II to V with background DMARDs, the rates of serious infections in the 5 mg twice daily and 10 mg twice daily XELJANZ plus DMARD groups were 0.8% and 0.8% (4.4 and 3.9 events per 100 patient-years), respectively, compared to 0.4% (1.5 events per 100 patient-years) in the placebo plus DMARD group. In the controlled portion (0-6 months) of the Phase 3 studies II to IV with background DMARDs, the rates of serious infections in the 5 mg twice daily and 10 mg twice daily XELJANZ plus DMARD groups were 1.8% and 1.4% (4.7 and 3.4 events per 100 patient-years), respectively, compared to 0.5% (2.1 events per 100 patient-years) in the placebo plus DMARD group.

In the long-term safety all exposure population comprised of Phase 2 and Phase 3 clinical trials and long-term extension studies, the overall rates of serious infections were 2.7 and 3.4 events per 100 patient-years in the 5 mg and 10 mg twice daily XELJANZ groups, respectively. The most common serious infections reported with XELJANZ included pneumonia, herpes zoster, urinary tract infection, cellulitis, gastroenteritis and diverticulitis. Cases of opportunistic infections have been reported (see Section 4.4 Special Warnings and Precautions for Use).

Serious infections were also reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. The IRs (95% CI) and HRs (95% CI) are presented as follows:

- The IRs (95% CI) for serious infections for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 2.86 (2.41, 3.37), 3.64 (3.11, 4.23), 3.24 (2.89, 3.62), and 2.44 (2.02, 2.92) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.17 (0.92, 1.50), 1.48 (1.17, 1.87), and 1.32 (1.07, 1.63), respectively.
- The IRs (95% CI) for opportunistic infections for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.76 (0.54, 1.04), 0.91 (0.66, 1.22), 0.84 (0.67, 1.04), and 0.42 (0.26, 0.64) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.82 (1.07, 3.09), 2.17 (1.29, 3.66), and 1.99 (1.23, 3.22), respectively. The majority of the opportunistic infections in the XELJANZ treatment arms were opportunistic herpes zoster infections; a limited number of events with tuberculosis were also reported. Excluding opportunistic herpes zoster infections and tuberculosis, the IRs (95% CI) for all other opportunistic infections for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.08 (0.02, 0.20), 0.14 (0.06, 0.30), 0.11 (0.05, 0.20), and 0.06 (0.01, 0.17) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR)

(95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.30 (0.29, 5.82), 2.40 (0.62, 9.29), and 1.84 (0.51, 6.59), respectively.

#### *Serious Infections from Non-interventional Post-approval Safety Study*

Data from a non-interventional post-approval safety study that evaluated XELJANZ and XELJANZ XR in RA patients from a registry (US Corrona) showed that a numerically higher incidence rate of serious infection was observed for XELJANZ XR administered once daily than XELJANZ 5 mg administered twice daily. Crude incidence rates (95% CI) (i.e., not adjusted for age or sex) from availability of each formulation at 12 months following initiation of treatment were 3.45 (1.93, 5.69) and 2.78 (1.74, 4.21) and at 36 months were 4.71 (3.08, 6.91) and 2.79 (2.01, 3.77) patients with events per 100 patient-years in the XELJANZ XR once daily and XELJANZ 5 mg twice daily groups, respectively. The unadjusted hazard ratio was 1.30 (95% CI: 0.67, 2.50) at 12 months and 1.93 (95% CI: 1.15, 3.24) at 36 months for XELJANZ XR once daily dose compared to XELJANZ 5 mg twice daily dose. Data are based on a small number of patients with events observed with relatively large confidence intervals and limited follow up time available in the XELJANZ XR once daily dose group after 24 months.

#### *Serious Infections in the Elderly*

Of the 4271 patients who enrolled in Studies I to VI, a total of 608 RA patients were 65 years of age and older, including 85 patients 75 years and older. The frequency of serious infection among XELJANZ-treated patients 65 years of age and older was higher than those under the age of 65. As there is a higher incidence of infections in the elderly population in general, caution should be used when treating the elderly (see Section 4.4 Special Warnings and Precautions for Use).

#### Psoriatic Arthritis

In the 6-month and 12-month Phase 3 studies, the rate of serious infections in the XELJANZ 5 mg twice daily group was 1.30 patients with events per 100 patient-years. In the XELJANZ 10 mg twice daily group, the rate was 2.0 patients with events per 100 patient-years.

In the long-term safety population, the overall rate of serious infections was 1.4 patients with events per 100 patient-years for XELJANZ treated patients. The most common serious infection reported with XELJANZ was pneumonia.

#### Ankylosing Spondylitis

In the combined Phase 2 and Phase 3 clinical trials, among the 316 patients treated with XELJANZ 5 mg twice daily for up to 48 weeks, there was one serious infection (aseptic meningitis) yielding a rate of 0.43 patients with events per 100 patient-years.

#### Ulcerative Colitis

In the randomised 8-week Phase 2/3 induction studies, the proportion of patients with serious infections in patients treated with XELJANZ 10 mg twice daily was 0.9% (8 patients) compared with 0.0% in patients treated with placebo. In the randomised 52-week Phase 3 maintenance study, the incidence rates of serious infections in patients treated with XELJANZ 5 mg twice daily (1.35 events per 100 patient-years) and in patients treated with XELJANZ 10 mg twice daily (0.64 events per 100 patient-years) were not higher than that for placebo (1.94 events per 100 patient-years). The incidence rate of serious infections in the entire

treatment experience with XELJANZ in patients with UC was 1.99 events per 100 patient-years. There was no apparent clustering into specific types of serious infections.

### Juvenile Idiopathic Arthritis

In the pivotal Phase 3 Study pcJIA-I, four patients had serious infections during treatment with tofacitinib, representing an incidence rate of 3.25 events per 100 patient-years: pneumonia, epidural empyema (with sinusitis and subperiosteal abscess), pilonidal cyst and appendicitis.

In the integrated safety program, additional serious infections reported by patients treated with tofacitinib included one report each of pyelonephritis, limb abscess and urinary tract infection. Three patients had non-serious events of herpes zoster within the reporting window representing an incidence rate of 0.82 patients with events per 100 patient-years. One additional patient had an event of serious herpes zoster outside the reporting window.

### **Mortality**

#### *Rheumatoid Arthritis*

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- The IRs (95% CI) for all-cause mortality for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.50 (0.33, 0.74), 0.80 (0.57, 1.09), 0.65 (0.50, 0.82), and 0.34 (0.20, 0.54) events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.49 (0.81, 2.74), 2.37 (1.34, 4.18), and 1.91 (1.12, 3.27), respectively.
- The IRs (95% CI) for deaths associated with infection for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.08 (0.02, 0.20), 0.18 (0.08, 0.35), 0.13 (0.07, 0.22), and 0.06 (0.01, 0.17) events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.30 (0.29, 5.79), 3.10 (0.84, 11.45), and 2.17 (0.62, 7.62), respectively.
- The IRs (95% CI) for deaths associated with cardiovascular events for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.25 (0.13, 0.43), 0.41 (0.25, 0.63), 0.33 (0.23, 0.46), and 0.20 (0.10, 0.36) events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.26 (0.55, 2.88), 2.05 (0.96, 4.39), and 1.65 (0.81, 3.34), respectively.
- The IRs (95% CI) for deaths associated with malignancies for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.10 (0.03, 0.23), 0.00 (0.00, 0.08), 0.05 (0.02, 0.12), and 0.02 (0.00, 0.11) events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 4.88 (0.57, 41.74), 0 (0.00, Inf), and 2.53 (0.30, 21.64), respectively.

- The IRs (95% CI) for deaths associated with other causes (excluding infections, cardiovascular events, malignancies) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.08 (0.02, 0.20), 0.21 (0.10, 0.38), 0.14 (0.08, 0.23), and 0.06 (0.01, 0.17) events per 100 patient-years, respectively. Compared with TNF inhibitor, the hazard ratio (HR) (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.30 (0.29, 5.81), 3.45 (0.95, 12.54), and 2.34 (0.67, 8.16), respectively.

### ***Viral Reactivation***

Patients treated with XELJANZ who are Japanese or Korean, or patients with long standing RA who have previously received two or more biological DMARDs, or patients with an ALC less than  $1.0 \times 10^9$  cells/L, or patients treated with 10 mg twice daily may have an increased risk of herpes zoster (see Section 4.4 Special Warnings and Precautions for Use). Events of herpes zoster were reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. The IRs (95% CI) and HRs (95% CI) are presented as follows:

- The IRs (95% CI) for herpes zoster (includes all herpes zoster events) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms) and TNF inhibitor were 3.75 (3.22, 4.34), 3.94 (3.38, 4.57), 3.84 (3.45, 4.26), and 1.18 (0.90, 1.52) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HR (95% CI) for herpes zoster with XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 3.17 (2.36, 4.27), 3.33 (2.48, 4.48), and 3.25 (2.46, 4.29), respectively.

### ***Venous Thromboembolism***

#### **Rheumatoid Arthritis**

In the 4 to 12 week placebo period of randomised controlled studies of 4 weeks to 24 months duration, the IRs (95% CI) for tofacitinib 5 mg twice daily, tofacitinib 10 mg twice daily, and placebo for PE were 0.00 (0.00, 0.57), 0.00 (0.00, 0.77), and 0.40 (0.01, 2.22) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.00 (0.00, 0.57), 0.21 (0.01, 1.16), and 0.40 (0.01, 2.22) patients with events per 100 patient-years respectively.

In the full randomised period of controlled studies of 4 weeks to 24 months duration, the IRs (95% CI) for tofacitinib 5 mg twice daily and tofacitinib 10 mg twice daily for PE were 0.12 (0.02, 0.34) and 0.15 (0.03, 0.44) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.15 (0.04, 0.40) and 0.10 (0.01, 0.36) patients with events per 100 patient-years respectively.

In the long-term safety population that includes exposure during completed randomised controlled studies and open label long-term extension studies, the IRs (95% CI) for tofacitinib 5 mg twice daily and tofacitinib 10 mg twice daily for PE were 0.12 (0.06, 0.22) and 0.13 (0.08, 0.21) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.17 (0.09, 0.27) and 0.15 (0.09, 0.22) patients with events per 100 patient-years respectively.

Events of PE and DVT were reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. The IRs (95% CI) and HRs (95% CI) are presented as follows:

- The IRs (95% CI) for VTE for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms) and TNF inhibitor were 0.33 (0.19, 0.53), 0.70 (0.49, 0.99), 0.51 (0.38, 0.67), and 0.20 (0.10, 0.37) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HR (95% CI) for VTE with XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.66 (0.76, 3.63), 3.52 (1.74, 7.12), and 2.56 (1.30, 5.05), respectively.
- The IRs (95% CI) for PE for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms) and TNF inhibitor were 0.17 (0.08, 0.33), 0.50 (0.32, 0.74), 0.33 (0.23, 0.46), and 0.06 (0.01, 0.17) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HR (95% CI) for PE with XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 2.93 (0.79, 10.83), 8.26 (2.49, 27.43), and 5.53 (1.70, 18.02), respectively. In tofacitinib-treated patients where PE was observed, the majority (97%) had VTE risk factors.
- The IRs (95% CI) for DVT for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms) and TNF inhibitor were 0.21 (0.11, 0.38), 0.31 (0.17, 0.51), 0.26 (0.17, 0.38), and 0.14 (0.06, 0.29) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HR (95% CI) for DVT with XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.54 (0.60, 3.97), 2.21 (0.90, 5.43), and 1.87 (0.81, 4.30), respectively.

In a post hoc exploratory biomarker analysis within a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, occurrences of subsequent VTEs were observed more frequently in tofacitinib-treated patients who, at 12 months treatment, had D-dimer level  $\geq 2x$  ULN versus those with D-dimer level  $< 2x$  ULN. This observation was not evident in TNFi-treated patients. Interpretation is limited by the low number of VTE events and restricted D-dimer test availability (only assessed at Baseline, Month 12, and at the end of the study). In patients who did not have a VTE during the study, mean D-dimer levels were significantly reduced at Month 12 relative to Baseline across all treatment arms. However, D-dimer levels  $\geq 2x$  ULN at Month 12 were observed in approximately 30% of patients without subsequent VTE events, indicating limited specificity of D-dimer testing in this study.

For patients with RA with known risk factors for VTE, consider testing D-dimer levels after approximately 12 months of treatment. If D-dimer test result is  $\geq 2x$  ULN, confirm that clinical benefits outweigh risks prior to a decision on treatment continuation with tofacitinib.

### Psoriatic Arthritis

In the 3 month placebo period of completed randomised controlled studies of 6 to 12 months duration, the IRs (95% CI) for tofacitinib 5 mg twice daily, tofacitinib 10 mg twice daily, and placebo for PE were 0.00 (0.00, 6.75), 0.00 (0.00, 6.78), and 0.00 (0.00, 6.87) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.00 (0.00, 6.75), 0.00 (0.00, 6.78), and 0.00 (0.00, 6.87) patients with events per 100 patient-years respectively.

In the full randomised period of completed controlled studies of 6 to 12 months, the IRs (95% CI) for tofacitinib 5 mg twice daily and tofacitinib 10 mg twice daily for PE were 0.00 (0.00,



1.83) and 0.00 (0.00, 1.87) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.00 (0.00, 1.83) and 0.51 (0.01, 2.83) patients with events per 100 patient-years respectively.

In the long-term safety population that includes exposure during completed randomised controlled studies and ongoing open label long-term extension study, the IRs (95% CI) for tofacitinib 5 mg twice daily and tofacitinib 10 mg twice daily for PE were 0.11 (0.00, 0.60) and 0.00 (0.00, 0.58) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.00 (0.00, 0.40) and 0.16 (0.00, 0.87) patients with events per 100 patient-years respectively.

### Ankylosing Spondylitis

In the combined Phase 2 and Phase 3 randomised controlled clinical trials, there were no VTE events in 420 patients (233 patient-years of observation) receiving XELJANZ up to 48 weeks.

### Ulcerative Colitis

In the completed randomised placebo-controlled induction studies of 8 weeks duration, the IR (95% CI) for tofacitinib 10 mg twice daily and placebo for PE were 0.00 (0.00, 2.22) and 1.98 (0.05, 11.04) patients with events per 100 patient-years; the IR (95% CI) for DVT were 0.00 (0.00, 2.22) and 1.99 (0.05, 11.07) patients with events per 100 patient-years respectively.

In the completed randomised maintenance study of 52 weeks duration, the IRs (95% CI) for tofacitinib 5 mg twice daily and tofacitinib 10 mg twice daily for PE were 0.00 (0.00, 2.48) and 0.00 (0.00, 2.35) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.00 (0.00, 2.48) and 0.00 (0.00, 2.35) patients with events per 100 patient-years respectively.

In the long-term safety population that includes exposure during completed randomised controlled studies and ongoing open label long-term extension study, the IRs (95% CI) for tofacitinib 5 mg twice daily and tofacitinib 10 mg twice daily for PE were 0.00 (0.00, 0.54) and 0.20 (0.05, 0.52) patients with events per 100 patient-years respectively; the IRs (95% CI) for DVT were 0.00 (0.00, 0.54) and 0.05 (0.00, 0.28) patients with events per 100 patient-years respectively.

## **Arterial Thromboembolism**

### Rheumatoid Arthritis

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- The IRs (95% CI) for arterial thromboembolism (ATE) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms) and TNF inhibitor were 0.92 (0.68, 1.22), 0.94 (0.68, 1.25), 0.93 (0.75, 1.14), and 0.82 (0.59, 1.12) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HR (95% CI) for ATE with XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.12 (0.74, 1.70), 1.14 (0.75, 1.74), and 1.13 (0.78, 1.63), respectively.

## ***Major Adverse Cardiovascular Events (MACE), including Myocardial Infarction***

### ***Rheumatoid Arthritis***

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- MACE includes non-fatal myocardial infarction, non-fatal stroke, and cardiovascular deaths excluding fatal pulmonary embolism. The IRs (95% CI) for MACE for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.91 (0.67, 1.21), 1.05 (0.78, 1.38), 0.98 (0.79, 1.19), and 0.73 (0.52, 1.01) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.24 (0.81, 1.91), 1.43 (0.94, 2.18), and 1.33 (0.91, 1.94), respectively.
- In the XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ, and TNFi treatment arms, there were a total of 19, 19, 38, and 11 patients with MI events, respectively. Of these totals, the number of patients with fatal MI events was 0, 3, 3, and 3, respectively, whereas the number of patients with non-fatal MI events was 19, 16, 35, and 8, respectively. Therefore, the IRs that follow are for non-fatal MI. The IRs (95% CI) for non-fatal MI for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.37 (0.22, 0.57), 0.33 (0.19, 0.53), 0.35 (0.24, 0.48), and 0.16 (0.07, 0.31) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 2.32 (1.02, 5.30), 2.08 (0.89, 4.86), and 2.20 (1.02, 4.75), respectively.

## ***Malignancies excluding NMSC***

### ***Rheumatoid Arthritis***

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- The IRs (95% CI) for malignancies excluding NMSC for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 1.13 (0.87, 1.45), 1.13 (0.86, 1.45), 1.13 (0.94, 1.35), and 0.77 (0.55, 1.04) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.47 (1.00, 2.18), 1.48 (1.00, 2.19), and 1.48 (1.04, 2.09), respectively.
- The IRs (95% CI) for lymphoma for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.07 (0.02, 0.18), 0.11 (0.04, 0.24), 0.09 (0.04, 0.17), and 0.02 (0.00, 0.10) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 3.99 (0.45, 35.70), 6.24 (0.75, 51.86), and 5.09 (0.65, 39.78), respectively.
- The IRs (95% CI) for lung cancer for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms),

and TNF inhibitor were 0.23 (0.12, 0.40), 0.32 (0.18, 0.51), 0.28 (0.19, 0.39), and 0.13 (0.05, 0.26) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.84 (0.74, 4.62), 2.50 (1.04, 6.02), and 2.17 (0.95, 4.93), respectively.

## **NMSC**

### **Rheumatoid Arthritis**

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- The IRs (95% CI) for NMSC for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.61 (0.41, 0.86), 0.69 (0.47, 0.96), 0.64 (0.50, 0.82), and 0.32 (0.18, 0.52) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.90 (1.04, 3.47), 2.16 (1.19, 3.92), and 2.02 (1.17, 3.50), respectively.
- The IRs (95% CI) for basal cell carcinoma for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.37 (0.22, 0.58), 0.33 (0.19, 0.54), 0.35 (0.24, 0.49), and 0.26 (0.14, 0.44) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.43 (0.71, 2.90), 1.28 (0.61, 2.66), and 1.36 (0.72, 2.56), respectively.
- The IRs (95% CI) for cutaneous squamous cell carcinoma for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.29 (0.16, 0.48), 0.45 (0.29, 0.69), 0.37 (0.26, 0.51), and 0.16 (0.07, 0.31) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.82 (0.77, 4.30), 2.86 (1.27, 6.43), and 2.32 (1.08, 4.99), respectively.

## **Gastrointestinal Perforations**

### **Rheumatoid Arthritis**

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- The IRs (95% CI) for gastrointestinal perforations for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 0.17 (0.08, 0.33), 0.10 (0.03, 0.24), 0.14 (0.08, 0.23), and 0.08 (0.02, 0.20) patients with events per 100 patient-years, respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 2.20 (0.68, 7.15), 1.29 (0.35, 4.80), and 1.76 (0.58, 5.34), respectively.

## **Fractures**

### Rheumatoid Arthritis

Results from final safety data from a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor, are presented as follows:

- The IRs (95% CI) for fractures for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, all XELJANZ (combines 5 mg twice daily and 10 mg twice daily treatment arms), and TNF inhibitor were 2.79 (2.34, 3.30), 2.87 (2.40, 3.40), 2.83 (2.50, 3.19) and 2.27 (1.87, 2.74) patients with events per 100 PYs respectively. Compared with TNF inhibitor, the HRs (95% CI) for XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and all XELJANZ were 1.23 (0.96, 1.58) 1.26 (0.97, 1.62) and 1.24 (0.99, 1.55) respectively.

### **Laboratory Parameters**

In the clinical trials in PsA, AS, UC and JIA, changes in lymphocytes, neutrophils and lipids observed with XELJANZ treatment were similar to the changes observed in clinical trials in RA.

In the clinical trials in PsA, AS, UC and JIA, changes in liver enzyme tests observed with XELJANZ treatment were similar to the changes observed in clinical trials in RA where patients received background DMARDs.

### Rheumatoid Arthritis

#### *Lymphocytes*

In the controlled RA clinical studies, confirmed decreases in ALC below  $0.5 \times 10^9$  cells/L occurred in 0.3% of patients and for ALC between  $0.5$  and  $0.75 \times 10^9$  cells/L in 1.9% of patients for the 5 mg twice daily and 10 mg twice daily doses combined.

In the RA long-term safety population, confirmed decreases in ALC below  $0.5 \times 10^9$  cells/L occurred in 1.3% of patients and for ALC between  $0.5$  and  $0.75 \times 10^9$  cells/L in 8.4% of patients for the 5 mg twice daily and 10 mg twice daily doses combined.

Confirmed ALC less than  $0.75 \times 10^9$  cells/L were associated with an increased incidence of serious infections (see Section 4.4 Special Warnings and Precautions for Use and Section 4.2 Dose and Method of Administration).

#### *Neutrophils*

In the controlled clinical studies, confirmed decreases in ANC below  $1.0 \times 10^9$  cells/L occurred in 0.08% of patients for the 5 mg twice daily and 10 mg twice daily doses combined. There were no confirmed decreases in ANC below  $0.5 \times 10^9$  cells/L observed in any treatment group. There was no clear relationship between neutropenia and the occurrence of serious infections.

In the long-term safety population, the pattern and incidence of confirmed decreases in ANC remained consistent with what was seen in the controlled clinical studies (see Section 4.4 Special Warnings and Precautions for Use and Section 4.2 Dose and Method of Administration).

#### *Liver Enzyme Tests*

Confirmed increases in liver enzymes  $\geq 3$ x upper limit of normal (ULN) were uncommonly observed. In patients experiencing liver enzyme elevation, modification of treatment regimen,

such as reduction in the dose of concomitant DMARD, interruption of XELJANZ, or reduction in XELJANZ dose, resulted in decrease or normalisation of liver enzymes.

In the controlled portion of the Phase 3 placebo-controlled monotherapy study (0-3 months) (Study I, see Section 5.1 Pharmacodynamic Properties, Clinical Trials), ALT elevations  $\geq 3$ x ULN were observed in 1.65%, 0.41%, and 0% of patients receiving placebo, XELJANZ 5 mg and 10 mg twice daily, respectively. In this study, AST elevations  $\geq 3$ x ULN were observed in 1.65%, 0.41% and 0% of patients receiving placebo, XELJANZ 5 mg and 10 mg twice daily, respectively.

In the Phase 3 active-controlled monotherapy study (0-24 months) (Study VI, see Section 5.1 Pharmacodynamic Properties, Clinical Trials), ALT elevations  $\geq 3$ x ULN were observed in 7.1%, 3.0%, and 3.0% of patients receiving MTX, XELJANZ 5 mg and 10 mg twice daily, respectively. In this study, AST elevations  $\geq 3$ x ULN were observed in 3.3%, 1.6% and 1.5% of patients receiving MTX, XELJANZ 5 mg and 10 mg twice daily, respectively.

In the controlled portion of the Phase 3 studies on background DMARDs (0-3 months) (Studies II-V, see Section 5.1 Pharmacodynamic Properties, Clinical Trials), ALT elevations  $\geq 3$ x ULN were observed in 0.9%, 1.24% and 1.14% of patients receiving placebo, XELJANZ 5 mg, and 10 mg twice daily, respectively. In these studies, AST elevations  $\geq 3$ x ULN were observed in 0.72%, 0.52% and 0.31% of patients receiving placebo, XELJANZ 5 mg and 10 mg twice daily, respectively.

Elevations of ALT and AST were reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. The percentages of patients with at least one post-baseline ALT or AST elevation are presented as follows:

- The percentages of patients with at least one post-baseline ALT elevation  $>1$ x ULN, 3x ULN, and 5x ULN for the XELJANZ 5 mg twice daily treatment arm were 52.83, 6.01, and 1.68, respectively. The percentages for the XELJANZ 10 mg twice daily treatment arm were 54.46, 6.54, and 1.97, respectively. The percentages for all XELJANZ (combines XELJANZ 5 mg twice daily and XELJANZ 10 mg twice daily) were 53.64, 6.27, and 1.82, respectively. The percentages for the TNF inhibitor treatment arm were 43.33, 3.77, and 1.12, respectively.
- The percentages of patients with at least one post-baseline AST elevation  $>1$ x ULN, 3x ULN, and 5x ULN for the XELJANZ 5 mg twice daily treatment arm were 45.84, 3.21, and 0.98, respectively. The percentages for the XELJANZ 10 mg twice daily treatment arm were 51.58, 4.57, and 1.62, respectively. The percentages for all XELJANZ (combines XELJANZ 5 mg twice daily and XELJANZ 10 mg twice daily) were 48.70, 3.89, and 1.30, respectively. The percentages for the TNF inhibitor treatment arm were 37.18, 2.38, and 0.70, respectively.

One patient treated with tofacitinib 10 mg twice daily and MTX had possible drug-induced liver injury (DILI). Despite discontinuation of both drugs, 2-3 months later she developed further increases in transaminase levels. The elevated liver tests responded to prednisolone and azathioprine, possibly consistent with autoimmune hepatitis, but DILI cannot be ruled out.

### *Lipids*

Elevations in lipid parameters (total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides) were first assessed at one month following initiation of XELJANZ in the

controlled double-blind clinical trials. Increases were observed at this time point and remained stable thereafter. Changes in lipid parameters from baseline through the end of the study (6-24 months) in the controlled Phase 3 clinical studies are summarised below:

- Mean LDL cholesterol increased by 15% in the XELJANZ 5 mg twice daily arm and 20% in the XELJANZ 10 mg twice daily arm at month 12, and increased by 16% in the XELJANZ 5 mg twice daily arm and 19% in the XELJANZ 10 mg twice daily arm at month 24.
- Mean HDL cholesterol increased by 17% in the XELJANZ 5 mg twice daily arm and 18% in the XELJANZ 10 mg twice daily arm at month 12, and increased by 19% in the XELJANZ 5 mg twice daily arm and 20% in the XELJANZ 10 mg twice daily arm at month 24.
- Mean LDL cholesterol/HDL cholesterol ratios were essentially unchanged in XELJANZ-treated patients.
- Apolipoprotein B (ApoB)/ApoA1 ratios were essentially unchanged in XELJANZ-treated patients.

Elevations of LDL cholesterol, and HDL cholesterol, were reported in a large randomised PASS in RA patients who were 50 years or older with at least one additional cardiovascular risk factor. The percent change in LDL cholesterol and HDL cholesterol are presented as follows:

- At 12 months, in the XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and TNF inhibitor treatment arms, the mean percent increase in LDL cholesterol was 13.80, 17.04, and 5.50, respectively. At 24 months, the mean percent increase was 12.71, 18.14, and 3.64, respectively.
- At 12 months, in the XELJANZ 5 mg twice daily, XELJANZ 10 mg twice daily, and TNF inhibitor treatment arms, the mean percent increase in HDL cholesterol was 11.71, 13.63, and 2.82, respectively. At 24 months, the mean percent increase was 11.58, 13.54, and 1.42, respectively.

In a controlled clinical trial, elevations in LDL cholesterol and ApoB decreased to pre-treatment levels in response to statin therapy.

In the long-term safety populations, elevations in the lipid parameters remained consistent with what was seen in the controlled clinical studies.

### *Serum Creatinine*

In the controlled clinical trials, dose-related elevations in serum creatinine were observed with XELJANZ treatment. The mean increase in serum creatinine was  $<8.84 \mu\text{mol/L}$  in the 12-month pooled safety analysis; however, with increasing duration of exposure in the long-term extensions, up to 2.4% of patients were discontinued from XELJANZ treatment due to the protocol-specified discontinuation criterion of an increase in creatinine by more than 50% of baseline. The clinical significance of the observed serum creatinine elevations is unknown.

## ***Post-marketing Experience***

### ***Immune System Disorders***

*Uncommon:* Drug hypersensitivity (events such as angioedema and urticaria have been observed). Some events were also observed in clinical trials.

### ***Skin and Subcutaneous Tissue Disorders***

*Common:* Acne.

## ***Reporting Suspected Adverse Effects***

Reporting suspected adverse reactions after registration of the medicinal product is important. It allows continued monitoring of the benefit-risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions at [www.tga.gov.au/reporting-problems](http://www.tga.gov.au/reporting-problems).

## **4.9 Overdose**

There is no experience with overdose of XELJANZ or XELJANZ XR. There is no specific antidote for overdose with XELJANZ or XELJANZ XR. Treatment should be symptomatic and supportive. In case of an overdose, it is recommended that the patient be monitored for signs and symptoms of adverse reactions. Patients who develop adverse reactions should receive appropriate treatment.

Pharmacokinetic data up to and including a single dose of 100 mg in healthy volunteers indicates that more than 95% of the administered dose is expected to be eliminated within 24 hours.

For information on the management of overdose, contact the Poison Information Centre on 131126 (Australia).

## **5 PHARMACOLOGICAL PROPERTIES**

Information in this section is applicable to XELJANZ tablets and XELJANZ oral solution as they contain the same active ingredient (tofacitinib).

### **5.1 Pharmacodynamic Properties**

#### ***Mechanism of Action***

Tofacitinib is a selective inhibitor of the JAK family of kinases with a high degree of selectivity against other kinases in the human genome. In kinase assays, tofacitinib inhibits JAK1, JAK2, JAK3, and to a lesser extent tyrosine kinase 2 (TyK2). In cellular settings where JAK kinases signal in pairs, tofacitinib preferentially inhibits signalling by heterodimeric receptors associated with JAK3 and/or JAK1 with functional selectivity over receptors that signal via pairs of JAK2. Inhibition of JAK1 and JAK3 by tofacitinib blocks signalling through the common gamma chain-containing receptors for several cytokines, including IL-2, -4, -7, -9, -15, and -21. These cytokines are integral to lymphocyte activation, proliferation and function, and inhibition of their signalling may thus result in modulation of multiple aspects of the immune response. In addition, inhibition of JAK1 will result in attenuation of signalling by

additional pro-inflammatory cytokines, such as IL-6 and type I and II interferons. At higher exposures, inhibition of erythropoietin signalling could occur via inhibition of JAK2 signalling.

### ***Pharmacodynamics***

In patients with RA, treatment up to 6 months with tofacitinib was associated with dose-dependent reductions of circulating CD16/56+ natural killer (NK) cells, with estimated maximum reductions occurring at approximately 8-10 weeks after initiation of therapy. These changes generally resolved within 2-6 weeks after discontinuation of treatment. Treatment with tofacitinib was associated with dose-dependent increases in B cell counts. Changes in circulating T-lymphocyte counts and T-lymphocyte subsets (CD3+, CD4+ and CD8+) were small and inconsistent.

Following long-term treatment (median duration of tofacitinib treatment of approximately 5 years), CD4+ and CD8+ counts showed median reductions of 28% and 27%, respectively, from baseline. In contrast to the observed decrease after short-term dosing, CD16/56+ NK cell counts showed a median increase of 73% from baseline. CD19+ B cell counts showed no further increases after long-term tofacitinib treatment. These changes returned toward baseline after temporary discontinuation of treatment. There was no evidence of an increased risk of serious or opportunistic infections or herpes zoster at low values of CD4+, CD8+ or NK cell counts or high B cell counts.

Risk of infection may be higher with increasing degrees of lymphopenia and consideration should be given to lymphocyte counts when assessing individual patient risk of infection (see Section 4.4 Special Warnings and Precautions for Use, Serious Infections and Section 4.2 Dose and Method of Administration).

Changes in total serum IgG, IgM, and IgA levels over 6-month tofacitinib dosing in patients with RA were small, not dose-dependent and similar to those seen on placebo.

After treatment with tofacitinib in patients with RA, rapid decreases in serum C-reactive protein (CRP) were observed and maintained throughout dosing. Changes in CRP observed with tofacitinib treatment do not reverse fully within 2 weeks after discontinuation, indicating a longer duration of pharmacodynamic activity compared to the half-life.

Similar changes in T cells, B cells and serum CRP have been observed in patients with active PsA, although reversibility was not assessed. Total serum immunoglobulins were not assessed in patients with active PsA.

### ***Clinical Trials***

#### ***Rheumatoid Arthritis***

The efficacy and safety of XELJANZ were assessed in six randomised, double-blind, controlled, multicentre studies in patients  $\geq 18$  years with active RA diagnosed according to American College of Rheumatology (ACR) criteria. Patients had at least 6 tender and 6 swollen joints at randomisation (4 swollen and tender joints for Study II). XELJANZ, 5 mg or 10 mg twice daily, was given as monotherapy (Study I) and in combination with csDMARDs (Study II) in patients with an inadequate response to DMARDs. XELJANZ, 5 mg or 10 mg twice daily was given in combination with MTX in patients with either an inadequate response to MTX (Study III and Study IV) or inadequate response or intolerance to at least one approved TNF-inhibiting biological agent (Study V). XELJANZ, 5 mg or 10 mg twice daily was also given as monotherapy to MTX-naïve patients (Study VI). In a Phase 3b/4 randomised, open-



label safety endpoint study, XELJANZ, 5 mg or 10 mg twice daily was given to RA patients who were 50 years or older with at least one additional cardiovascular risk factor and on a stable dose of methotrexate (Study VII).

Study I (A3921045/ORAL Solo) was a 6-month monotherapy study in which 610 patients with moderate to severe active RA who had an inadequate response to a DMARD (csDMARD or biological) received XELJANZ 5 mg or 10 mg twice daily or placebo. At the Month 3 visit, all patients randomised to placebo treatment were advanced in a blinded fashion to a second predetermined treatment of XELJANZ 5 mg or 10 mg twice daily. The primary endpoints at Month 3 were the proportion of patients who achieved an ACR20 response, changes in Health Assessment Questionnaire – Disability Index (HAQ-DI), and rates of Disease Activity Score DAS28-4(ESR)<2.6.

Study II (A3921046/ORAL Sync) was a 12-month study in which 792 patients with moderate to severe active RA who had an inadequate response to a csDMARD received XELJANZ 5 mg or 10 mg twice daily or placebo added to background DMARD treatment (excluding potent immunosuppressive treatments such as azathioprine or ciclosporin). At the Month 3 visit, nonresponding patients randomised to placebo treatment were advanced in a blinded fashion to a second predetermined treatment of XELJANZ 5 mg or 10 mg twice daily. At the end of Month 6, all placebo patients were advanced to their second predetermined treatment in a blinded fashion. The primary endpoints were the proportion of patients who achieved an ACR20 response at Month 6, changes in HAQ-DI at Month 3 and rates of DAS28-4(ESR)<2.6 at Month 6.

Study III (A3921064/ORAL Standard) was a 12-month study in 717 patients with moderate to severe active RA who had an inadequate response to MTX. Patients received XELJANZ 5 mg or 10 mg twice daily, adalimumab 40 mg subcutaneously every other week, or placebo added to background MTX. Placebo patients were advanced as in Study II. The primary endpoints were the proportion of patients who achieved an ACR20 response at Month 6, HAQ-DI at Month 3, and DAS28-4(ESR)<2.6 at Month 6.

Study IV (A3921044/ORAL Scan) was a 2-year study with a planned analysis at 1 year in which 797 patients with moderate to severe active RA who had an inadequate response to MTX received XELJANZ 5 mg or 10 mg twice daily or placebo added to background MTX. Placebo patients were advanced as in Study II. The primary endpoints were the proportion of patients who achieved an ACR20 response at Month 6, mean change from baseline in van der Heijde-modified total Sharp Score (mTSS) at Month 6, HAQ-DI at Month 3, and DAS28-4(ESR)<2.6 at Month 6.

Study V (A3921032/ORAL Step) was a 6-month study in which 399 patients with moderate to severe active RA who had an inadequate response to at least one approved TNF-inhibiting biological agent received XELJANZ 5 mg or 10 mg twice daily or placebo added to background MTX. At the Month 3 visit, all patients randomised to placebo treatment were advanced in a blinded fashion to a second predetermined treatment of XELJANZ 5 mg or 10 mg twice daily. The primary endpoints at Month 3 were the proportion of patients who achieved an ACR20 response, HAQ-DI, and DAS28-4(ESR)<2.6.

Study VI (A3921069/ORAL Start) was a 2-year monotherapy study with a planned analysis at 1 year in which 956 MTX-naïve patients with moderate to severe active RA received XELJANZ 5 mg or 10 mg twice daily or MTX dose-titrated over 8 weeks from 10 mg to 20 mg

weekly. The primary endpoints were mean change from baseline in van der Heijde mTSS at Month 6 and the proportion of patients who achieved an ACR70 response at Month 6.

Study VII (A3921133/PASS) was a large randomised open-label study in RA patients who were 50 years or older with at least one additional cardiovascular risk factor and on a stable dose of methotrexate. Patients were treated with tofacitinib 5 mg twice daily, tofacitinib 10 mg twice daily or a TNF inhibitor. Notably, in February 2019, the dose of tofacitinib in the 10 mg twice daily arm of the study was reduced to 5 mg twice daily after it was determined that the frequency of pulmonary embolism was increased in the tofacitinib 10 mg twice daily treatment arm versus the TNF inhibitor. Additionally, all-cause mortality was increased in the tofacitinib 10 mg twice daily treatment arm versus the TNF inhibitor and tofacitinib 5 mg twice daily treatment arms. In the final study data, patients in the tofacitinib 10 mg twice daily treatment arm were analysed in their originally randomised treatment group. Results from final safety data from the study for selected events are presented in Section 4.8 Adverse Effects (Undesirable Effects).

### *Clinical Response*

#### ACR Response

The percentages of XELJANZ-treated patients achieving ACR20, ACR50 and ACR70 responses in Studies I, II, III, IV, and V are shown in Table 6. Results are provided for XELJANZ 5 mg twice daily.

In Studies I and V, patients treated with 5 mg twice daily XELJANZ had statistically superior ACR20, ACR50, and ACR70 response rates at Month 3 vs. placebo-treated patients. In Studies II, III and IV, patients treated with 5 mg twice daily XELJANZ had statistically superior ACR20, ACR50, and ACR70 response rates at Months 3 and 6 vs placebo-treated patients (Table 6).

In Study IV, ACR20/50/70 response rates at Month 12 were maintained through Month 24.

In Studies I, II and V, improvement in ACR20 response rate vs. placebo was observed within 2 weeks. In Study III the proportion achieving an ACR20 response at Month 6; change in HAQ-DI at Month 3, and DAS28-4(ESR) <2.6 at Month 6 were 51.5, 47.2 and 28.3%; -0.55, -0.49 and -0.24; and 6.2%, 6.7% and 1.1% for the 5 mg twice daily XELJANZ, adalimumab 40 mg subcutaneously every other week and placebo groups, respectively. For a pre-specified secondary endpoint, the ACR70 response rates at Month 6 for the 5 mg twice daily XELJANZ group was significantly greater than adalimumab (19.9% and 9.1%, respectively).

The treatment effect was similar in patients independent of rheumatoid factor status, age, gender, race or disease status. Time to onset was rapid (as early as Week 2 in Studies I, II and V) and the magnitude of response continued to improve with duration of treatment. As with the overall ACR response, each of the components of the ACR response was consistently improved from baseline, including: tender and swollen joint counts; patient and physician global assessment; disability index scores; pain assessment and CRP compared to patients receiving placebo plus MTX or other DMARDs in all studies.

#### DAS28-4(ESR) Response

Patients in the Phase 3 studies had a mean Disease Activity Score (DAS28-4(ESR)) of 6.1–6.7 at baseline. Significant reductions in DAS28-4(ESR) from baseline (mean improvement) of 1.8-2.0 were observed in 5 mg XELJANZ-treated patients compared to placebo-treated

patients (0.7-1.1) at 3 months. The proportion of patients achieving a DAS28 clinical remission (DAS28-4(ESR)<2.6) in Studies II, III and IV was significantly higher in patients receiving 5 mg XELJANZ (6–9%) compared to placebo (1–3%) patients at 6 months. In Study III, the percentages of patients achieving DAS28-4(ESR)<2.6 observed for XELJANZ 5 mg twice daily and adalimumab at Month 6 were 6.2% and 6.7%, respectively.

**Table 6: Proportion of Patients with an ACR Response**

	Percent of Patients										
	Monotherapy in DMARD Inadequate Responders		DMARD Inadequate Responders		MTX Inadequate Responders			MTX Inadequate Responders		TNF Inhibitor Inadequate Responders	
	Study I (SOLO)		Study II (SYNC)		Study III (Standard)			Study IV (SCAN)		Study V (STEP)	
Response Rate	Placebo	XELJANZ 5 mg Twice Daily	Placebo + DMARD	XELJANZ 5 mg Twice Daily + DMARD	Placebo + MTX	XELJANZ 5 mg Twice Daily + MTX	Adalimumab 40 mg q2 Weeks + MTX	Placebo + MTX	XELJANZ 5 mg Twice Daily + MTX	Placebo + MTX	XELJANZ 5 mg Twice Daily + MTX
	N=120	N=241	N=157	N=311	N=106	N=196	N=199	N=154	N=309	N=131	N=132
<b>ACR20</b>											
Month 3	27%	60%***	27%	56%***	26%	61%***	56%***	27%	56%***	24%	42%*
Month 6	NA	69%	31%	53%***	28%	52%***	47%**	25%	51%***	NA	52%
Month 12	NA	NA	NA	51%	NA	49%	49%	NA	49%	NA	NA
Month 24	NA	NA	NA	NA	NA	NA	NA	NA	41%	NA	NA
<b>ACR50</b>											
Month 3	13%	31%***	10%	27%***	7%	34%***	24%***	8%	29%***	8%	27%***
Month 6	NA	42%	13%	34%***	12%	37%***	28%**	8%	32%***	NA	37%
Month 12	NA	NA	NA	33%	NA	37%	34%	NA	32%	NA	NA
Month 24	NA	NA	NA	NA	NA	NA	NA	NA	29%	NA	NA
<b>ACR70</b>											
Month 3	6%	15%*	2%	8%**	2%	12%**	9%*	3%	11%**	2%	14%**
Month 6	NA	22%	3%	13%***	2%	20%***	9%*	1%	15%***	NA	16%
Month 12	NA	NA	NA	19%	NA	23%	17%	NA	19%	NA	NA
Month 24	NA	NA	NA	NA	NA	NA	NA	NA	17%	NA	NA

\*  $p < 0.05$ , XELJANZ vs. placebo

\*\*  $p < 0.001$ , XELJANZ vs. placebo

\*\*\*  $p < 0.0001$ , XELJANZ vs. placebo

Abbreviations: ACR20/50/70=American College of Rheumatology  $\geq 20, 50, 70\%$  improvement; DMARD=disease-modifying antirheumatic drug; MTX=methotrexate; q2 Weeks=once every 2 weeks; NA=not applicable.

The results of the components of the ACR response criteria for Studies IV and V are shown in Table 7. Similar results were observed in Studies I, II and III.

**Table 7: Components of ACR Response at Month 3**

	<b>Study IV (SCAN)</b>				<b>Study V (STEP)</b>			
	<b>MTX Inadequate Responders</b>				<b>TNF Inhibitor Inadequate Responders</b>			
	<b>XELJANZ 5 mg Twice Daily + MTX N=316</b>		<b>Placebo + MTX N=156</b>		<b>XELJANZ 5 mg Twice Daily + MTX N=133</b>		<b>Placebo + MTX N=132</b>	
Component (mean)	Base-line	Month 3	Base-line	Month 3	Base-line	Month 3	Base-line	Month 3
Number of tender joints (0-68)	24	13	23	18	28	16	28	21
Number of swollen joints (0-66)	14	6	14	10	16	8	17	12
Pain <sup>a</sup>	58	35	55	47	66	39	61	53
Patient global assessment <sup>a</sup>	58	35	54	47	65	41.2	62	53
Disability index (HAQ-DI) <sup>b</sup>	1.41	1.00	1.31	1.19	1.60	1.20	1.63	1.44
Physician global assessment <sup>a</sup>	59	30	56	43	65	35	64	44
CRP (mg/L)	15.5	6.9	13.7	14.6	19.3	6.2	16.7	18.2

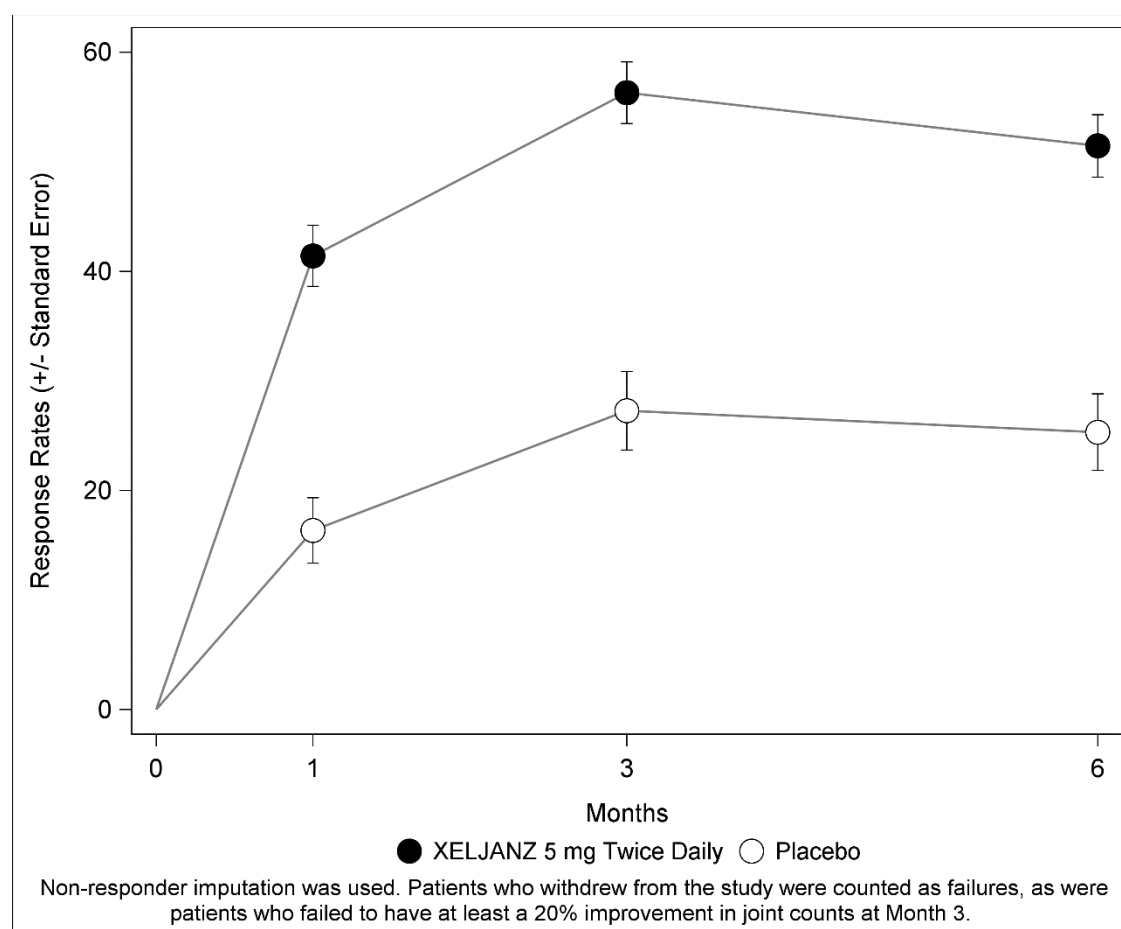
Abbreviations: MTX=methotrexate; TNF=tumour necrosis factor; CRP=C-reactive protein.

<sup>a</sup> Visual analogue scale: 0 = best, 100=worst.

<sup>b</sup> Health Assessment Questionnaire Disability Index: 0=best, 3=worst; 20 questions; categories: dressing and grooming, arising, eating, walking, hygiene, reach, grip, and activities.

The percent of ACR20 responders by visit for Study IV is shown in Figure 3. Similar responses were observed in Studies I, II, III and V.

**Figure 3: Percentage of ACR20 Responders by Visit for Study IV**



Abbreviations: ACR20=American College of Rheumatology  $\geq 20\%$  improvement

### *Radiographic Response*

In Study IV, progression of structural joint damage was assessed radiographically and expressed as change from baseline in mTSS and its components, the erosion score and joint space narrowing (JSN) score, at Months 6 and 12. The proportion of patients with no radiographic progression (mTSS change less than or equal to 0.5) was also assessed. XELJANZ 5 mg twice daily plus background MTX lead to a change of -0.3 in the progression of structural damage compared to placebo plus MTX at Month 6 but the result was not statistically significant. In the placebo plus MTX group, 78% of patients experienced no radiographic progression at Month 6 compared to 89% of patients treated with XELJANZ 5 mg twice daily plus MTX.

In Study VI, XELJANZ monotherapy inhibited the progression of structural damage compared to MTX at Months 6 and 12 in MTX-naïve patients (mean difference in mTSS from MTX was -0.7 and -0.9 respectively), which was maintained at Month 24. Analyses of erosion and JSN scores were consistent with overall results. Significantly more patients in the XELJANZ 5 mg twice daily group experienced no radiographic progression at Month 6 (84%) compared to patients in the MTX group (70%). XELJANZ is not approved for use in MTX-naïve patients.

### *Physical Function Response and Health Related Outcomes*

Improvements in physical function have been shown with and without MTX.

Improvement in physical functioning was measured by the HAQ-DI. Patients receiving XELJANZ 5 mg twice daily demonstrated significantly greater improvement from baseline in physical functioning compared to placebo at Month 3 (Studies I, II, III, and V) and Month 6 (Studies II and III). XELJANZ 5 mg twice daily treated patients exhibited significantly greater improved physical functioning compared to placebo as early as Week 2 in Studies I and II. Compared with adalimumab-treated patients, at Month 3, patients in the XELJANZ 5 mg twice daily group had similar decreases from baseline in HAQ-DI values. The mean change in HAQ-DI from baseline to Month 3 in Studies I to V are shown in Table 8.

**Table 8: Mean Change from Baseline in HAQ-DI**

Study I: DMARD Inadequate Responders			
Time	Placebo N=109	XELJANZ 5 mg monotherapy Twice Daily N=237	
LS Mean Change in HAQ-DI at Month 3 <sup>a</sup>	-0.19	-0.50**	
Study II: DMARD Inadequate Responders			
	Placebo + DMARD(s) N=147	XELJANZ 5 mg Twice Daily + DMARD(s) N=292	
LS Mean Change in HAQ-DI at Month 3 <sup>a</sup>	-0.21	-0.46**	
Study III: MTX Inadequate Responders			
	Placebo + MTX N=96	XELJANZ 5 mg BD + MTX N=185	Adalimumab 40 mg QOW + MTX N=188
LS Mean Change in HAQ-DI at Month 3 <sup>a</sup>	-0.24	-0.54**	-0.50**
Study IV: MTX Inadequate Responders			
	Placebo + MTX N=146	XELJANZ 5 mg Twice Daily + MTX N=294	
LS Mean Change in HAQ-DI at Month 3 <sup>a</sup>	-0.15	-0.40 <sup>b</sup>	
Study V: TNF Inhibitor Inadequate Responders			
	Placebo N=118	XELJANZ 5 mg Twice Daily + MTX N=117	
LS Mean Change in HAQ-DI at Month 3 <sup>a</sup>	-0.18	-0.43**	

<sup>a</sup> Primary efficacy time point.

<sup>b</sup> Statistical significance could not be declared in Study IV due to step-down procedure.

\*\* p<0.0001, XELJANZ (or adalimumab in Study III) vs. placebo + MTX/DMARD.

Results are obtained from a longitudinal linear model with change from baseline as a dependent variable and treatment, baseline, visit, region as fixed effects and patient as random effect.

Abbreviations: BD=twice daily; CI=confidence interval; FAS=full analysis set; LS=least squares; N=number of patients; MTX=methotrexate; QOW=every other week; HAQ-DI=Health Assessment Questionnaire Disability Index; DMARDs=disease-modifying anti-rheumatic drugs; TNF=tumour necrosis factor.

Health-related quality of life was assessed by the Short Form Health Survey (SF-36) in all 5 studies. XELJANZ-treated patients exhibited significantly greater improvement from baseline compared to placebo in all 8 domains of the SF-36 as well as the Physical Component Summary (PCS) and the Mental Component Summary (MCS) at Month 3 in

Studies I, IV, and V. In Studies III and IV, mean SF-36 improvements were maintained to 12 months in XELJANZ-treated patients.

Improvement in fatigue was evaluated by the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) scale at Month 3 in all studies. Patients receiving XELJANZ 5 mg twice daily demonstrated significantly greater improvement from baseline in fatigue compared to placebo in all 5 studies. In Studies III and IV, mean FACIT-F improvements were maintained to 12 months in XELJANZ-treated patients.

Improvement in sleep was assessed using the Sleep Problems Index I and II summary scales of the Medical Outcomes Study Sleep (MOS-Sleep) measure at Month 3 in all studies. Patients receiving XELJANZ 5 mg twice daily demonstrated significantly greater improvement from baseline in both scales compared to placebo in Studies II, III, and IV. In Studies III and IV, mean improvements in both scales were maintained to 12 months in XELJANZ-treated patients.

#### *Durability of Clinical Responses*

Durability of effect was assessed by ACR20, ACR50, ACR70 response rates, mean HAQ-DI, and mean DAS28-4(ESR) in the three Phase 3 DMARD IR studies with duration of at least one year (studies II, III and IV). Efficacy was maintained through to the end of the studies.

Evidence of persistence of efficacy with tofacitinib treatment for up to 7 years is also provided from data in the one ongoing and one completed open-label, long-term follow-up studies.

#### *Psoriatic Arthritis*

The efficacy and safety of XELJANZ were assessed in 2 randomised, double-blind, placebo-controlled Phase 3 studies in adult patients with active PsA ( $\geq 3$  swollen and  $\geq 3$  tender joints); patients received 1 csDMARD as concomitant therapy. Patients with each subtype of PsA were enrolled in these studies including: polyarticular arthritis,  $< 5$  joints or asymmetric involvement, distal interphalangeal (DIP) joint involvement, arthritis mutilans and spondylitis with peripheral arthritis. The median PsA disease duration was 5.5 years. Patients were required to have active plaque psoriasis at the screening visit. At baseline, 80% and 53% of patients had enthesitis and dactylitis, respectively. For both studies, the primary endpoints were ACR20 response rate and change from baseline in HAQ-DI at Month 3.

Study PsA-I (OPAL BROADEN) evaluated 422 patients who had a previous inadequate response (due to lack of efficacy or intolerance) to a csDMARD (MTX for 92.7% of patients); 32.7% of the patients in this study had a previous inadequate response to  $> 1$  csDMARD or 1 csDMARD and a targeted synthetic DMARD (tsDMARD). In OPAL BROADEN, previous treatment with TNF inhibitor was not allowed. All patients were required to have 1 concomitant csDMARD; 83.9% of patients received concomitant MTX. Patients randomised to XELJANZ received 5 mg twice daily or XELJANZ 10 mg twice daily for 12 months. Patients randomised to placebo were advanced in a blinded manner at Month 3 to either XELJANZ 5 mg twice daily or XELJANZ 10 mg twice daily and received treatment until Month 12. Patients randomised to adalimumab (active-control arm) received 40 mg subcutaneously every 2 weeks for 12 months.

Study PsA-II (OPAL BEYOND) evaluated 394 patients who had discontinued a TNF inhibitor due to lack of efficacy or intolerance; 36.0% had a previous inadequate response to  $> 1$  biological DMARD. All patients were required to have 1 concomitant csDMARD; 71.6% of



patients received concomitant MTX. Patients randomised to XELJANZ received 5 mg twice daily or XELJANZ 10 mg twice daily for 6 months. Patients randomised to placebo were advanced in a blinded manner at Month 3 to either XELJANZ 5 mg twice daily or XELJANZ 10 mg twice daily and received treatment until Month 6.

### Signs and Symptoms

Treatment with XELJANZ resulted in significant improvements in the signs and symptoms of PsA, as assessed by the ACR20 response criteria compared to placebo at Month 3. The efficacy results for other important endpoints assessed are shown in Table 9.

**Table 9: Proportion (%) of PsA Patients Who Achieved Clinical Response and Mean Change from Baseline in OPAL BROADEN and OPAL BEYOND Studies**

Treatment Group	csDMARD Inadequate Responders <sup>a</sup> (TNFi-Naïve)			TNFi Inadequate Responders <sup>b</sup>	
	OPAL BROADEN			OPAL BEYOND <sup>c</sup>	
	Placebo	XELJANZ 5 mg Twice Daily	Adalimumab 40 mg SC q2W	Placebo	XELJANZ 5 mg Twice Daily
N	105	107	106	131	131
ACR20					
Month 3	33%	50% <sup>d,*</sup>	52% <sup>*</sup>	24%	50% <sup>d,***</sup>
Month 6	NA	59%	64%	NA	60%
Month 12	NA	68%	60%	-	-
ACR50					
Month 3	10%	28% <sup>e,**</sup>	33% <sup>***</sup>	15%	30% <sup>e,*</sup>
Month 6	NA	38%	42%	NA	38%
Month 12	NA	45%	41%	-	-
ACR70					
Month 3	5%	17% <sup>e,*</sup>	19% <sup>*</sup>	10%	17%
Month 6	NA	18%	30%	NA	21%
Month 12	NA	23%	29%	-	-
ΔLEI <sup>f</sup>					
Month 3	-0.4	-0.8	-1.1 <sup>*</sup>	-0.5	-1.3 <sup>*</sup>
Month 6	NA	-1.3	-1.3	NA	-1.5
Month 12	NA	-1.7	-1.6	-	-
ΔDSS <sup>f</sup>					
Month 3	-2.0	-3.5	-4.0	-1.9	-5.2 <sup>*</sup>
Month 6	NA	-5.2	-5.4	NA	-6.0
Month 12	NA	-7.4	-6.1	-	-
PASI75 <sup>g</sup>					
Month 3	15%	43% <sup>d,***</sup>	39% <sup>**</sup>	14%	21%
Month 6	NA	46%	55%	NA	34%
Month 12	NA	56%	56%	-	-

\* Nominal p<0.05, \*\* Nominal p<0.001, \*\*\*Nominal p<0.0001 for active treatment versus placebo at Month 3.

Abbreviations: BSA=body surface area; ΔLEI=change from baseline in Leeds Enthesitis Index; ΔDSS=change from baseline in Dactylitis Severity Score; ACR20/50/70=American College of Rheumatology ≥20, 50, 70% improvement; csDMARD=conventional synthetic disease-modifying antirheumatic drug; N=number of randomised and treated patients; NA=not applicable, as data for placebo treatment is not available beyond Month 3 due to placebo advanced to XELJANZ 5 mg twice daily or XELJANZ 10 mg twice daily;

SC q2w=subcutaneously once every 2 weeks; TNFi=tumour necrosis factor inhibitor; PASI=psoriasis area and severity index; PASI75= $\geq 75\%$  improvement in PASI.

<sup>a</sup> Inadequate response to at least 1 csDMARD due to lack of efficacy and/or intolerability.

<sup>b</sup> Inadequate response to at least 1 TNFi due to lack of efficacy and/or intolerability.

<sup>c</sup> OPAL BEYOND had a duration of 6 months.

<sup>d</sup> Achieved statistical significance globally at  $p \leq 0.05$  per the pre-specified step-down testing procedure.

<sup>e</sup> Achieved statistical significance within the ACR family (ACR50 and ACR70) at  $p \leq 0.05$  per the pre-specified step-down testing procedure.

<sup>f</sup> For patients with Baseline score  $> 0$ .

<sup>g</sup> For patients with Baseline BSA  $\geq 3\%$  and PASI  $> 0$ .

Both TNF inhibitor naïve and TNF inhibitor inadequate responder XELJANZ-treated patients had significantly higher ACR20 response rates compared to placebo at Month 3. Examination of age, sex, race, baseline disease activity and PsA subtype did not identify differences in response to XELJANZ. The number of patients with arthritis mutilans was too small to allow meaningful assessment.

As with the ACR responses, in patients treated with XELJANZ 5 mg twice daily in OPAL BROADEN and OPAL BEYOND, each of the components of the ACR response was consistently improved from baseline at Month 3 including tender/painful and swollen joint counts, patient assessment of arthritis pain, patient and physician's global assessment of arthritis, HAQ-DI, and CRP compared to patients receiving placebo (Table 10).

**Table 10: Components of ACR Response at Baseline and Month 3 in OPAL BROADEN and OPAL BEYOND Studies**

Treatment Group	csDMARD Inadequate Responders <sup>d</sup> (TNFi-Naïve)			TNFi Inadequate Responders <sup>e</sup>	
	OPAL BROADEN			OPAL BEYOND	
	Placebo	XELJANZ 5 mg Twice Daily	Adalimumab 40 mg SC q2W	Placebo	XELJANZ 5 mg Twice Daily
N at Baseline	105	107	106	131	131
ACR Component <sup>a</sup>					
Number of tender/painful joints (0-68)					
Baseline	20.6	20.5	17.1	19.8	20.5
Month 3	14.6	12.2	10.8	15.1	11.5
Number of swollen joints (0-66)					
Baseline	11.5	12.9	9.8	10.5	12.1
Month 3	7.1	6.3	4.0	7.7	4.8
Patient assessment of arthritis pain <sup>b</sup>					
Baseline	53.2	55.7	50.7	54.9	56.4
Month 3	44.7	34.7	32.5	48.0	36.1
Patient global assessment of arthritis <sup>b</sup>					
Baseline	53.9	54.7	50.6	55.8	57.4
Month 3	44.4	35.5	32.9	49.2	36.9

	<b>csDMARD Inadequate Responders<sup>d</sup> (TNFi-Naïve)</b>			<b>TNFi Inadequate Responders<sup>e</sup></b>	
	<b>OPAL BROADEN</b>			<b>OPAL BEYOND</b>	
<b>Treatment Group</b>	<b>Placebo</b>	<b>XELJANZ 5 mg Twice Daily</b>	<b>Adalimumab 40 mg SC q2W</b>	<b>Placebo</b>	<b>XELJANZ 5 mg Twice Daily</b>
HAQ-DI <sup>c</sup>					
Baseline	1.11	1.16	1.10	1.25	1.26
Month 3	0.95	0.81	0.75	1.09	0.88
Physician's Global Assessment of Arthritis <sup>b</sup>					
Baseline	53.8	54.6	50.5	53.7	53.5
Month 3	35.4	29.5	26.3	36.4	27.0
CRP (mg/L)					
Baseline	10.4	10.5	14.3	12.1	13.8
Month 3	8.60	4.02	3.10	11.44	7.72

Abbreviations: ACR=American College of Rheumatology; csDMARD=conventional synthetic disease-modifying antirheumatic drug; N=number of randomised and treated patients; SC q2w=subcutaneously once every 2 weeks; TNFi=tumour necrosis factor inhibitor; CRP=C-reactive protein.

<sup>a</sup> Data shown are mean value at baseline and at Month 3.

<sup>b</sup> Visual analogue scale (VAS): 0=best, 100=worst.

<sup>c</sup> HAQ-DI=Health Assessment Questionnaire – Disability Index: 0=best, 3=worst; 20 questions; categories: dressing and grooming, arising, eating, walking, hygiene, reach, grip, and activities.

<sup>d</sup> Inadequate response to at least 1 csDMARD due to lack of efficacy and/or intolerability.

<sup>e</sup> Inadequate response to at least 1 TNFi due to lack of efficacy and/or intolerability.

ACR20 response rates for patients receiving tofacitinib 5 mg twice daily were statistically significantly higher than those receiving placebo as early as Week 2 (first post-baseline assessment).

ACR response rates, as well as effects on other endpoints (skin manifestations, enthesitis and dactylitis) continued to improve or were maintained through Month 6 (OPAL BROADEN and OPAL BEYOND) and Month 12 (OPAL BROADEN).

In OPAL BROADEN, resolution of enthesitis at Month 3 occurred in 33.3%, 47.4%, and 21.5% of patients on XELJANZ 5 mg twice daily, adalimumab 40 mg subcutaneously once every 2 weeks, and placebo, respectively. In OPAL BEYOND, resolution of enthesitis at Month 3 occurred in 39.8% and 21.6% of patients on XELJANZ 5 mg twice daily and placebo, respectively.

In Study OPAL BROADEN, resolution of dactylitis at Month 3 occurred in 34.4%, 46.6%, and 32.8% of patients on XELJANZ 5 mg twice daily, adalimumab 40 mg subcutaneously once every 2 weeks, and placebo, respectively. In OPAL BEYOND, resolution of dactylitis at Month 3 occurred in 51.5% and 28.6% of patients on XELJANZ 5 mg twice daily and placebo, respectively.

Improvements were observed after treatment with XELJANZ on the Minimum Disease Activity (MDA) response rate and the Psoriatic Arthritis Disease Activity Score (PASDAS).

## Radiographic Response

In Study OPAL BROADEN, the progression of structural joint damage was assessed radiographically utilising the van der Heijde modified Total Sharp Score (mTSS) and the proportion of patients with radiographic progression (mTSS increase from baseline greater than 0.5) was assessed at Month 12. At Month 12, 96% and 98% of patients receiving XELJANZ 5 mg twice daily and adalimumab 40 mg subcutaneously every 2 weeks, respectively, did not have radiographic progression (mTSS increase from baseline less than or equal to 0.5).

## Physical Function and Health-related Quality of Life

Improvement in physical functioning was measured by the HAQ-DI. Patients receiving XELJANZ 5 mg twice daily demonstrated greater improvement ( $p \leq 0.05$ ) from baseline in physical functioning compared to placebo at Month 3 (see Table 11). HAQ-DI improvement from baseline in XELJANZ-treated patients was maintained or improved through Month 6 (OPAL BROADEN and OPAL BEYOND) and Month 12 (OPAL BROADEN).

**Table 11: Change from Baseline in HAQ-DI in PsA Studies OPAL BROADEN and OPAL BEYOND**

Treatment Group	Least Squares Mean Change from Baseline in HAQ-DI				
	csDMARD			TNFi	
	Inadequate Responders <sup>a</sup> (TNFi-Naïve)			Inadequate Responders <sup>b</sup>	
	OPAL BROADEN			OPAL BEYOND	
	Placebo	XELJANZ 5 mg Twice Daily	Adalimumab 40 mg SC q2W	Placebo	XELJANZ 5 mg Twice Daily
N	104	107	106	131	129
Month 3	-0.18	-0.35 <sup>c,*</sup>	-0.38 <sup>*</sup>	-0.14	-0.39 <sup>c,***</sup>
Month 6	NA	-0.45	-0.43	NA	-0.44
Month 12	NA	-0.54	-0.45	NA	NA

\* Nominal  $p \leq 0.05$ ; \*\*\* Nominal  $p < 0.0001$  for active treatment versus placebo at Month 3.

Abbreviations: DMARD=disease-modifying antirheumatic drug; HAQ-DI=Health Assessment Questionnaire Disability Index; N=total number of patients in the statistical analysis; SC q2w=subcutaneously once every 2 weeks; TNFi=tumour necrosis factor inhibitor.

<sup>a</sup> Inadequate response to at least one conventional synthetic DMARD (csDMARD) due to lack of efficacy and/or intolerability.

<sup>b</sup> Inadequate response to a least one TNF inhibitor (TNFi) due to lack of efficacy and/or intolerability.

<sup>c</sup> Achieved statistical significance globally at  $p \leq 0.05$  per the pre-specified step-down testing procedure.

The HAQ-DI responder rate (response defined as having decrease from baseline of  $\geq 0.35$ ) at Month 3 in Studies OPAL BROADEN and OPAL BEYOND was 53% and 50%, respectively in patients receiving XELJANZ 5 mg twice daily, 31% and 28%, respectively in patients receiving placebo, and 53% in patients receiving adalimumab 40 mg subcutaneously once every 2 weeks (OPAL BROADEN only).

Health-related quality of life was assessed by SF-36v2. Patients receiving XELJANZ 5 mg twice daily demonstrated greater improvement from baseline compared to placebo in the physical functioning domain and the physical component summary score at Month 3 in Studies OPAL BROADEN and OPAL BEYOND (nominal  $p \leq 0.05$ ). Improvements from baseline in SF-36v2 were maintained or improved through Month 6 (OPAL BROADEN and OPAL BEYOND) and Month 12 (OPAL BROADEN).

Improvement in fatigue was evaluated by the FACIT-F. Patients receiving XELJANZ 5 mg twice daily demonstrated greater improvements from baseline in FACIT-F scores compared to placebo at Month 3 in Studies OPAL BROADEN and OPAL BEYOND (nominal  $p \leq 0.05$ ). Improvements from baseline in FACIT-F scores were maintained or improved up to Month 6 (OPAL BROADEN and OPAL BEYOND) and Month 12 (OPAL BROADEN).

Improvement in pain was assessed by the Patient's Assessment of Arthritis Pain on a 0 to 100 Visual Analogue Scale (PAAP VAS). Patients receiving XELJANZ 5 mg twice daily demonstrated a greater reduction in pain from baseline in the PAAP VAS score compared to placebo at Month 3; this was seen as early as Week 2 in Studies OPAL BROADEN and OPAL BEYOND (nominal  $p \leq 0.05$ ). Improvement from baseline in PAAP VAS scores was maintained up to Month 6 (OPAL BROADEN and OPAL BEYOND) and Month 12 (OPAL BROADEN).

### Ankylosing Spondylitis

The XELJANZ clinical development program to assess the efficacy and safety included one placebo-controlled confirmatory trial (Study AS-I). Patients had active disease as defined by both Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and back pain score (BASDAI question 2) of greater or equal to 4 despite non-steroidal anti-inflammatory drug (NSAID), corticosteroid or DMARD therapy.

#### *Confirmatory Trial (Study AS-I)*

Study AS-I was a randomised, double-blind, placebo-controlled, 48-week treatment clinical trial in 269 adult patients who had an inadequate response (inadequate clinical response or intolerance) to at least 2 NSAIDs. Patients were randomised and treated with XELJANZ 5 mg twice daily or placebo for 16 weeks of blinded treatment and then all were advanced to XELJANZ 5 mg twice daily for an additional 32 weeks. The primary endpoint was to evaluate the proportion of patients who achieved an ASAS20 response at Week 16.

Approximately 7% and 21% of patients used concomitant methotrexate or sulfasalazine, respectively, from baseline to Week 16. Patients were allowed to receive a stable low dose of oral corticosteroids (8.6% received) and/or NSAIDs (81.8% received) from baseline to Week 48. Twenty-two percent of patients had an inadequate response to 1 or 2 TNF blockers.

#### *Clinical Response*

Patients treated with XELJANZ 5 mg twice daily achieved greater improvements in ASAS20 and ASAS40 responses compared to placebo at Week 16 (Table 12). The responses were maintained from Week 16 through Week 48 in patients receiving XELJANZ 5 mg twice daily.

Consistent results were observed in the subgroup of patients who had an inadequate response to TNF blockers for both the ASAS20 (primary endpoint) and ASAS40 (secondary endpoint) at Week 16 (Table 12).

**Table 12: ASAS20 and ASAS40 Responses at Week 16, Study AS-I**

	Placebo	XELJANZ 5 mg Twice Daily	Difference from Placebo (95% CI)
All patients (N)	N=136	N=133	
ASAS20 response*, %	29	56	27 (16, 38)**
ASAS40 response*, %	13	41	28 (18, 38)**
TNFi-IR patients (N)	N=30	N=29	
ASAS20 response, %	17	41	25 (2, 47)
ASAS40 response, %	7	28	21 (2, 39)

\* type I error-controlled.

\*\* p<0.0001.

TNFi-IR=tumour necrosis factor inhibitor inadequate response.

The improvements in the components of the ASAS response and other measures of disease activity were higher in XELJANZ 5 mg twice daily compared to placebo at Week 16 as shown in Table 13. The improvements were maintained from Week 16 through Week 48 in patients receiving XELJANZ 5 mg twice daily.

**Table 13: ASAS Components and Other Measures of Disease Activity at Week 16, Study AS-I**

	Placebo (N=136)		XELJANZ 5 mg Twice Daily (N=133)		
	Baseline (mean)	Week 16 (LSM change from Baseline)	Baseline (mean)	Week 16 (LSM change from Baseline)	Difference from Placebo (95% CI)
ASAS Components					
-Patient Global Assessment of Disease Activity (0-10) <sup>a,*</sup>	7.0	-0.9	6.9	-2.5	-1.6 (-2.07, -1.05)**
-Total spinal pain (0-10) <sup>a,*</sup>	6.9	-1.0	6.9	-2.6	-1.6 (-2.10, -1.14)**
-BASFI (0-10) <sup>b,*</sup>	5.9	-0.8	5.8	-2.0	-1.2 (-1.66, -0.80)**
-Inflammation (0-10) <sup>c,*</sup>	6.8	-1.0	6.6	-2.7	-1.7 (-2.18, -1.25)**
BASDAI Score <sup>d</sup>	6.5	-1.1	6.4	-2.6	-1.4 (-1.88, -1.00)**
BASMI <sup>e,*</sup>	4.4	-0.1	4.5	-0.6	-0.5 (-0.67, -0.37)**
hsCRP <sup>f,*</sup> (mg/dL)	1.8	-0.1	1.6	-1.1	-1.0 (-1.20, -0.72)**
ASDASCrp <sup>g,*</sup>	3.9	-0.4	3.8	-1.4	-1.0 (-1.16, -0.79)**

\* type I error-controlled.

\*\* p<0.0001.

<sup>a</sup> Measured on a numerical rating scale with 0=not active or no pain, 10=very active or most severe pain.

<sup>b</sup> Bath Ankylosing Spondylitis Functional Index measured on a numerical rating scale with 0=easy and 10=impossible.

<sup>c</sup> Inflammation is the mean of two patient-reported stiffness self-assessments in BASDAI.

<sup>d</sup> Bath Ankylosing Spondylitis Disease Activity Index total score.

<sup>e</sup> Bath Ankylosing Spondylitis Metrology Index.

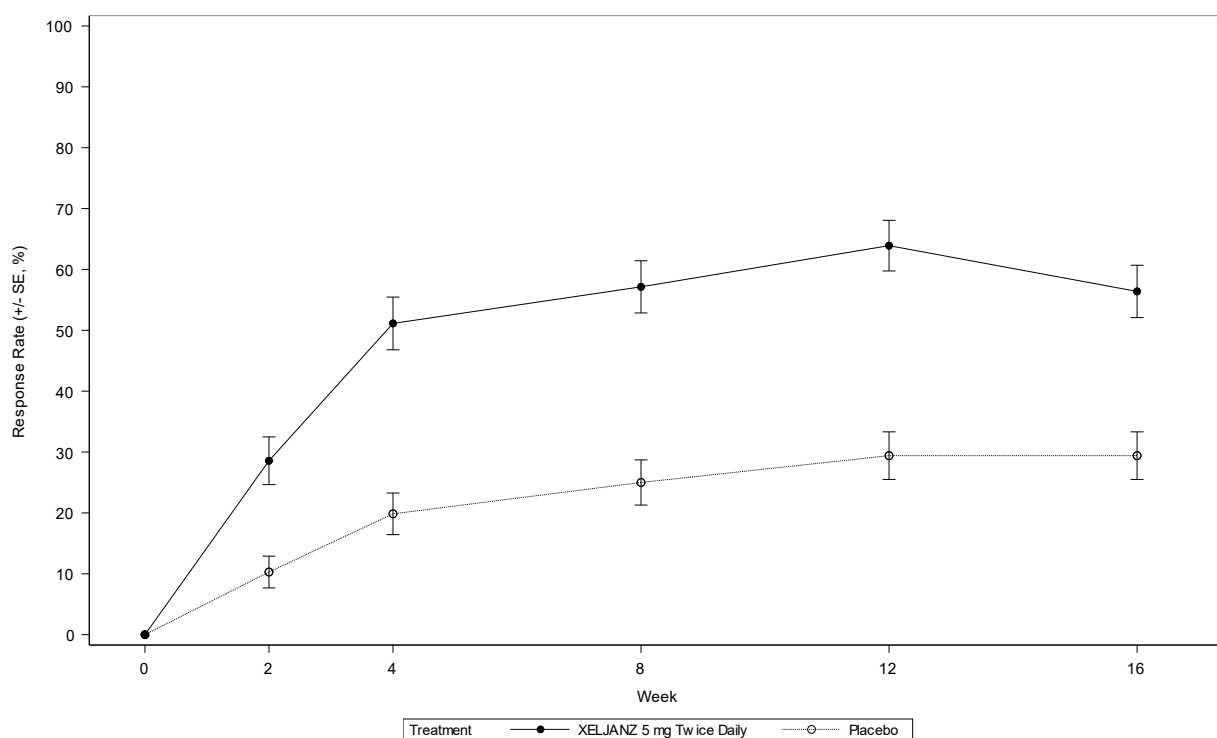
<sup>f</sup> High sensitivity C-reactive protein.

<sup>g</sup> Ankylosing Spondylitis Disease Activity Score with C-reactive protein.

LSM=least squares mean.

Improvement in ASAS20 response was first observed at Week 2. The percentage of patients achieving ASAS20 response by visit is shown in Figure 4.

**Figure 4: ASAS20 Response Over Time Up to Week 16, Study AS-I**



SE=standard error.

Patients with missing data were treated as non-responders.

### *Other Health-related Outcomes*

Patients treated with XELJANZ 5 mg twice daily achieved greater improvements from baseline in Ankylosing Spondylitis Quality of Life (ASQoL) (-4.0 vs -2.0) and Functional Assessment of Chronic Illness Therapy - Fatigue (FACIT-F) Total score (6.5 vs 3.1) compared to placebo-treated patients at Week 16 ( $p < 0.001$ ). Patients treated with XELJANZ 5 mg twice daily achieved consistently greater improvements from baseline in the Short Form health survey version 2 (SF-36v2), Physical Component Summary (PCS) domain compared to placebo-treated patients at Week 16.

### Ulcerative Colitis

#### *Induction Studies (OCTAVE Induction 1 and OCTAVE Induction 2)*

In two identical induction trials (OCTAVE Induction 1 / Study UC-I and OCTAVE Induction 2 / Study UC-II), 1139 patients were randomised (598 and 541 patients, respectively) to XELJANZ 10 mg twice daily or placebo with a 4:1 treatment allocation ratio. A total of 52%, 73% and 72% of patients had previously failed or were intolerant to TNF blockers, corticosteroids, and/or immunosuppressants, respectively. Oral corticosteroids were received as concomitant treatment for UC by 47% of patients and 71% were receiving concomitant aminosalicylates as treatment for UC. The baseline clinical characteristics were generally similar between the XELJANZ treated patients and patients receiving placebo.

The disease activity was assessed by Mayo scoring index (0 to 12) which consists of four subscores (0 to 3 for each subscore): stool frequency, rectal bleeding, findings on endoscopy, and physician global assessment. An endoscopy subscore of 2 was defined by marked

erythema, absent vascular pattern, any friability, and erosions; an endoscopy subscore of 3 was defined by spontaneous bleeding and ulceration.

The primary endpoint of OCTAVE Induction 1 and OCTAVE Induction 2 was the proportion of patients in remission at Week 8, and the key secondary endpoint was the proportion of patients with improvement of endoscopic appearance of the mucosa at Week 8. Remission was defined as clinical remission (a total Mayo score  $\leq 2$  with no individual subscore  $> 1$ ) and rectal bleeding subscore of 0. Improvement of endoscopic appearance of the mucosa was defined as endoscopy subscore of 0 or 1.

The other secondary efficacy endpoints were clinical response at Week 8 and normalisation of endoscopic appearance of the mucosa at Week 8. Clinical response was defined as a decrease from baseline in Mayo score of  $\geq 3$  points and  $\geq 30\%$ , with an accompanying decrease in the subscore for rectal bleeding of  $\geq 1$  point or absolute subscore for rectal bleeding of 0 or 1. Normalisation of endoscopic appearance of the mucosa was defined as a Mayo endoscopic subscore of 0.

A significantly greater proportion of patients treated with XELJANZ 10 mg twice daily achieved remission, improvement of endoscopic appearance of the mucosa, and clinical response at Week 8 compared to placebo in both studies, as shown in Table 14.

The efficacy results based on the endoscopic readings at the study sites were consistent with the results based on the central endoscopy readings.

**Table 14: Proportion of Patients Meeting Efficacy Endpoints at Week 8 (OCTAVE Induction Study 1 and OCTAVE Induction Study 2)**

	<b>OCTAVE Induction Study 1</b>			
	<b>Central Endoscopy Read</b>		<b>Local Endoscopy Read</b>	
<b>Endpoint</b>	<b>Placebo</b>	<b>XELJANZ 10 mg Twice Daily</b>	<b>Placebo</b>	<b>XELJANZ 10 mg Twice Daily</b>
	<b>N=122</b>	<b>N=476</b>	<b>N=122</b>	<b>N=476</b>
Remission <sup>a</sup>	8.2%	18.5% <sup>‡</sup>	11.5%	24.8% <sup>‡</sup>
Improvement of endoscopic appearance of the mucosa <sup>b</sup>	15.6%	31.3% <sup>†</sup>	23.0%	42.4% <sup>*</sup>
Normalisation of endoscopic appearance of the mucosa <sup>c</sup>	1.6%	6.7% <sup>‡</sup>	2.5%	10.9% <sup>‡</sup>
Clinical response <sup>d</sup>	32.8%	59.9% <sup>*</sup>	34.4%	60.7% <sup>*</sup>
	<b>OCTAVE Induction Study 2</b>			
	<b>Central Endoscopy Read</b>		<b>Local Endoscopy Read</b>	
<b>Endpoint</b>	<b>Placebo</b>	<b>XELJANZ 10 mg Twice Daily</b>	<b>Placebo</b>	<b>XELJANZ 10 mg Twice Daily</b>
	<b>N=112</b>	<b>N=429</b>	<b>N=112</b>	<b>N=429</b>
Remission <sup>a</sup>	3.6%	16.6% <sup>†</sup>	5.4%	20.7% <sup>†</sup>
Improvement of endoscopic appearance of the mucosa <sup>b</sup>	11.6%	28.4% <sup>†</sup>	15.2%	36.4% <sup>*</sup>



Normalisation of endoscopic appearance of the mucosa <sup>c</sup>	1.8%	7.0% <sup>‡</sup>	0.0%	9.1% <sup>‡</sup>
Clinical response <sup>d</sup>	28.6%	55.0%*	29.5%	58.0%*

\* p<0.0001; † p<0.001; ‡ p<0.05.

N=number of patients in the analysis set.

<sup>a</sup> Primary endpoint: Remission was defined as clinical remission (a Mayo score  $\leq 2$  with no individual subscore  $>1$ ) and rectal bleeding subscore of 0.

<sup>b</sup> Key secondary endpoint: Improvement of endoscopic appearance of the mucosa was defined as Mayo endoscopy subscore of 0 (normal or inactive disease) or 1 (erythema, decreased vascular pattern).

<sup>c</sup> Normalisation of endoscopic appearance of the mucosa was defined as a Mayo endoscopic subscore of 0.

<sup>d</sup> Clinical response was defined as a decrease from baseline in Mayo score of  $\geq 3$  points and  $\geq 30\%$ , with an accompanying decrease in the subscore for rectal bleeding of  $\geq 1$  point or absolute subscore for rectal bleeding of 0 or 1.

In both subgroups of patients with or without prior TNF inhibitor failure, a greater proportion of patients treated with XELJANZ 10 mg twice daily achieved remission and improvement of endoscopic appearance of the mucosa at Week 8 as compared to placebo. This treatment difference was consistent between the 2 subgroups (Table 15).

**Table 15: Proportion of Patients Meeting Primary and Key Secondary Efficacy Endpoints at Week 8 by TNF Inhibitor Therapy Subgroups (OCTAVE Induction Study 1 and OCTAVE Induction Study 2, Central Endoscopy Read)**

Endpoint	OCTAVE Induction Study 1		OCTAVE Induction Study 2	
	Placebo N=122	XELJANZ 10 mg Twice Daily N=476	Placebo N=112	XELJANZ 10 mg Twice Daily N=429
Remission <sup>a</sup>				
With prior TNF inhibitor failure	1.6% (1/64)	11.1% (27/243)	0.0% (0/60)	11.7% (26/222)
Without prior TNF inhibitor failure <sup>b</sup>	15.5% (9/58)	26.2% (61/233)	7.7% (4/52)	21.7% (45/207)
Improvement of endoscopic appearance of the mucosa <sup>c</sup>				
With prior TNF inhibitor failure	6.3% (4/64)	22.6% (55/243)	6.7% (4/60)	21.6% (48/222)
Without prior TNF inhibitor failure <sup>b</sup>	25.9% (15/58)	40.3% (94/233)	17.3% (9/52)	35.7% (74/207)

TNF=tumour necrosis factor; N=number of patients in the analysis set.

<sup>a</sup> Remission was defined as clinical remission (a Mayo score  $\leq 2$  with no individual subscore  $>1$ ) and rectal bleeding subscore of 0.

<sup>b</sup> Included TNF Inhibitor naïve patients.

<sup>c</sup> Improvement of endoscopic appearance of the mucosa was defined as Mayo endoscopy subscore of 0 (normal or inactive disease) or 1 (erythema, decreased vascular pattern).

Decreases in rectal bleeding and stool frequency subscores were observed by Week 2 in patients treated with XELJANZ.

### Maintenance (OCTAVE Sustain)

Patients who completed 8 weeks in 1 of the induction studies and achieved clinical response were re-randomised into OCTAVE Sustain (Study UC-III); 179 out of 593 (30.2%) patients were in remission at baseline of OCTAVE Sustain.

The primary endpoint in OCTAVE Sustain was the proportion of patients in remission at Week 52. The 2 key secondary endpoints were the proportion of patients with improvement of endoscopic appearance at Week 52, and the proportion of patients with sustained corticosteroid-free remission at both Week 24 and Week 52 among patients in remission at baseline of OCTAVE Sustain.

A significantly greater proportion of patients in both the XELJANZ 5 mg twice daily and XELJANZ 10 mg twice daily treatment groups achieved the following endpoints at Week 52 as compared to placebo: remission, improvement of endoscopic appearance of the mucosa, normalisation of endoscopic appearance of the mucosa, maintenance of clinical response, remission among patients in remission at baseline, and sustained corticosteroid-free remission at both Week 24 and Week 52 among patients in remission at baseline.

In both subgroups of patients with or without prior TNF inhibitor failure, a greater proportion of patients treated with either XELJANZ 5 mg twice daily or XELJANZ 10 mg twice daily achieved the following endpoints at Week 52 of OCTAVE Sustain as compared to placebo: remission, improvement of endoscopic appearance of the mucosa, or sustained corticosteroid-free remission at both Week 24 and Week 52 among patients in remission at baseline (Table 16). This treatment difference from placebo was similar between XELJANZ 5 mg twice daily and XELJANZ 10 mg twice daily in the subgroup of patients without prior TNF inhibitor failure. In the subgroup of patients with prior TNF inhibitor failure, the observed treatment difference from placebo was numerically greater for XELJANZ 10 mg twice daily than XELJANZ 5 mg twice daily by 9.7 to 16.7 percentage points across the primary and key secondary endpoints.

**Table 16. Proportion of Patients Meeting Primary and Key Secondary Efficacy Endpoints in Maintenance OCTAVE Sustain (Central Endoscopy Read)**

Endpoints in Maintenance OCTAVE Sustain (Central Endoscopy Read)				Treatment Difference versus Placebo (95% CI)	
Endpoint	Placebo	XELJANZ 5 mg Twice Daily	XELJANZ 10 mg Twice Daily	XELJANZ 5 mg Twice Daily	XELJANZ 10 mg Twice Daily
Remission at Week 52 <sup>a</sup>					
Total Population	N=198	N=198	N=197	23%* (15.3, 31.2)	30%* (21.4, 37.6)
	11%	34%	41%		
With Prior TNF Inhibitor Failure <sup>b</sup>	N=89	N=83	N=93		
	11%	24%	37%		
Without Prior TNF Inhibitor Failure <sup>c</sup>	N=109	N=115	N=104		
	11%	42%	44%		
Improvement of endoscopic appearance of the mucosa at Week 52 <sup>d</sup>					
Total Population	N=198	N=198	N=197	24%* (16.0, 32.5)	33%* (24.2, 41.0)

	13%	37%	46%		
With Prior TNF Inhibitor Failure <sup>b</sup>	N=89 12%	N=83 30%	N=93 40%		
Without Prior TNF Inhibitor Failure <sup>c</sup>	N=109 14%	N=115 43%	N=104 51%		
<b>Sustained corticosteroid-free remission at both Week 24 and Week 52 among patients in remission at baseline<sup>e</sup></b>					
Total Population	N=59 5%	N=65 35%	N=55 47%	30%* (17.4, 43.2)	42%* (27.9, 56.5)
With Prior TNF Inhibitor Failure <sup>b</sup>	N=21 5%	N=18 22%	N=18 39%		
Without Prior TNF Inhibitor Failure <sup>c</sup>	N=38 5%	N=47 40%	N=37 51%		

\* p-value <0.0001.

CI = Confidence interval; N=number of patients in the analysis set; TNF=tumour necrosis factor.

<sup>a</sup> Remission was defined as clinical remission (a Mayo score  $\leq 2$  with no individual subscore  $>1$ ) and rectal bleeding subscore of 0.

<sup>b</sup> Prior TNF inhibitor failure was defined in this program as inadequate response, loss of response, or intolerance to TNF inhibitor therapy.

<sup>c</sup> Patients in this group had failed one or more conventional therapies (corticosteroid, azathioprine, 6-mercaptopurine) but did not have history of prior failure of TNF inhibitor therapy.

<sup>d</sup> Improvement of endoscopic appearance of the mucosa was defined as Mayo endoscopy subscore of 0 (normal or inactive disease) or 1 (erythema, decreased vascular pattern).

<sup>e</sup> Sustained corticosteroid-free remission was defined as being in remission and not taking corticosteroids for at least 4 weeks prior to the visit at both Week 24 and Week 52.

The proportion of patients in both XELJANZ groups who had treatment failure was lower compared to placebo at each time point as early as Week 8, the first time point where treatment failure was assessed.

### *Other Health-related Outcomes*

XELJANZ 10 mg twice daily demonstrated greater improvement from baseline compared to placebo in physical component summary (PCS) and mental component summary (MCS) scores, and in all 8 domains of the SF-36 in the induction studies (OCTAVE Induction 1, OCTAVE Induction 2).

XELJANZ 10 mg twice daily demonstrated greater improvement from baseline compared to placebo in the total and all 4 domain scores of the Inflammatory Bowel Disease Questionnaire (IBDQ) at Week 8 in the induction studies (OCTAVE Induction 1, OCTAVE Induction 2).

Improvements were also observed in the EuroQoL 5-Dimension (EQ-5D) and various domains of the Work Productivity and Activity Impairment (WPAI-UC) questionnaire in the induction studies compared to placebo.

In general, improvements in quality of life measures were larger in patients given XELJANZ than in those given placebo in the maintenance study (OCTAVE Sustain).

### *Open-label Extension Study (OCTAVE Open)*

Patients who did not achieve clinical response in 1 of the induction studies (OCTAVE Induction 1 or OCTAVE Induction 2) after 8 weeks of XELJANZ 10 mg twice daily were allowed to enter an open-label extension study (OCTAVE Open). After an additional 8 weeks of XELJANZ 10 mg twice daily in OCTAVE Open, 53% (154/293) patients achieved clinical response and 14% (42/293) patients achieved remission.

Patients who achieved clinical response in either of the induction studies (OCTAVE Induction 1 or OCTAVE Induction 2) with XELJANZ 10 mg twice daily but subsequently experienced treatment failure after either their dose was reduced to XELJANZ 5 mg twice daily or following treatment interruption in OCTAVE Sustain (i.e., were randomised to placebo), had their dose increased back to XELJANZ 10 mg twice daily in OCTAVE Open. After 8 weeks on XELJANZ 10 mg twice daily in OCTAVE Open, 38% of those patients who had experienced treatment failure in OCTAVE Sustain achieved remission; 35% (20/58) previously on XELJANZ 5 mg twice daily, and 40% (40/99) patients with previous dose interruption. At Month 12 in OCTAVE Open, 52% (25/48) and 45% (37/83) of these patients achieved remission, respectively.

Furthermore, at Month 12 of Study OCTAVE Open, 74% (48/65) of patients who achieved remission at the end of Study OCTAVE Sustain on either XELJANZ 5 mg twice daily or XELJANZ 10 mg twice daily remained in remission while receiving XELJANZ 5 mg twice daily.

### *Juvenile Idiopathic Arthritis*

The efficacy of tofacitinib for pcJIA was assessed in Study pcJIA-I, a 44-week, two-part study (consisting of an 18-week, open-label, run-in phase, followed by a 26-week double-blind, placebo-controlled, randomised withdrawal phase) in patients 2 years to 17 years of age with active rheumatoid factor negative (RF-) polyarthritis, rheumatoid factor positive (RF+) polyarthritis, extended oligoarthritis, and systemic JIA without systemic manifestations who had an inadequate response or intolerance to at least one DMARD which could have included MTX or biological medicines; the study also included patients aged 2 years to 17 years of age with active juvenile psoriatic arthritis (jPsA) and enthesitis-related arthritis (ERA) who had an inadequate response to NSAIDs.

Patients received tofacitinib (dosed at 5 mg twice daily or body weight-based equivalent twice daily) for 18 weeks (run-in phase) followed by randomisation to either tofacitinib (dosed at 5 mg twice daily or body weight-based equivalent twice daily) or placebo for 26 weeks (double-blind phase). Only patients who achieved at least a JIA ACR30 response at the end of the run-in phase were randomised (1:1) to the double-blind phase. Treatment with a stable dose of MTX was permitted but was not required during the study. Concurrent use of biological medicines or DMARDs other than MTX was not permitted in the study.

A total of 225 JIA patients (56 male and 169 female) with active disease were enrolled in the run-in phase including RF- polyarthritis (104), RF+ polyarthritis (39), extended oligoarthritis (28), systemic JIA without systemic manifestations (13), jPsA (20) and ERA (21). Patients had a mean (SD) disease duration of 3.8±3.5 years and a mean (SD) number of active joints of 12.2±8.1.

Of the 225 patients, 173 (76.9%) patients achieved JIA ACR30 response at Week 18 and were randomised into the double-blind phase to either tofacitinib (n=88) or placebo (n=85). This

included 87 patients with RF- polyarthritis, 28 patients with RF+ polyarthritis, 18 patients with extended oligoarthritis, 9 patients with sJIA and no systemic manifestations, 15 patients with jPsA and 16 patients with ERA.

In both the run-in and double-blind phases, approximately one-third of the patients were taking concomitant oral corticosteroids and approximately two-thirds were taking concomitant MTX.

The primary outcome population included children with the pcJIA subtypes RF+ polyarthritis, RF- polyarthritis, extended oligoarthritis, and sJIA without active systemic features. The primary endpoint was the occurrence of disease flare at Week 44 relative to the double-blind phase baseline at Week 18. Disease flare was defined (according to Paediatric Rheumatology Collaborative Study Group (PRCSG)/Paediatric Rheumatology International Trials Organisation (PRINTO) Disease Flare criteria) as worsening of  $\geq 30\%$  in 3 or more of the 6 JIA core response variables with no more than 1 of the remaining JIA core response variables improving by  $\geq 30\%$ . The results for subjects with ERA and PsA were analysed separately.

A significantly smaller proportion of patients with pcJIA in Study pcJIA-I treated with tofacitinib 5 mg film-coated tablets twice daily or tofacitinib oral solution weight-based equivalent twice daily flared by Week 44 compared with patients treated with placebo. A significantly greater proportion of patients treated with tofacitinib 5 mg film-coated tablets or tofacitinib oral solution achieved JIA ACR30, 50 and 70 responses at Week 44 compared to patients treated with placebo (Table 17).

**Table 17: Primary and secondary efficacy endpoints at Week 44\* in patients with pcJIA in Study pcJIA-I (Type I error-controlled)**

Primary endpoint	Treatment group	N	Occurrence rate	Difference (%) from placebo (95% CI)	p-value
Occurrence of disease flare	Tofacitinib 5 mg BD	72	29%	-23.7 (-39.4, -8.0)	0.0031
	Placebo	70	53%		
Secondary endpoints	Treatment group		Response rate	Difference (%) from placebo (95% CI)	p-value
JIA ACR30	Tofacitinib 5mg BD	72	71%	23.7 (8.0, 39.4)	0.0031
	Placebo	70	47%		
JIA ACR50	Tofacitinib 5mg BD	72	67%	19.5 (3.6, 35.5)	0.0166
	Placebo	70	47%		
JIA ACR70	Tofacitinib 5mg BD	72	54%	17.0 (0.9, 33.2)	0.0387
	Placebo	70	37%		
Secondary endpoint	Treatment group	N/n	LS mean (SEM)	Difference (%) from placebo (95% CI)	p-value
Change from Double-Blind Baseline in CHAQ Disability Index	Tofacitinib 5mg BD	72/49	-0.09 (0.04)	-0.12 (-0.22, -0.01)	0.0292
	Placebo	70/33	0.03 (0.04)		

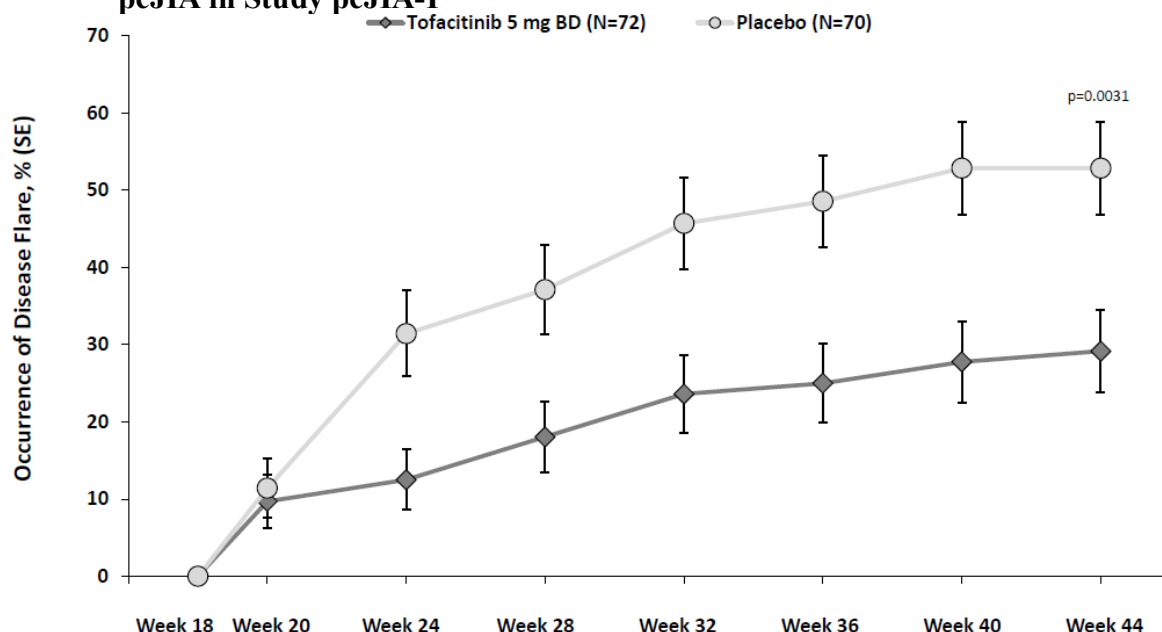
ACR=American College of Rheumatology; BD=twice daily; CHAQ=childhood health assessment questionnaire; CI=confidence interval; LS=least squares; n=number of patients with observations at the visit; N=total number of patients; SEM=standard error of the mean.

\* The 26-week double-blind phase is from Week 18 through Week 44 on and after randomisation day.

The Type-I error-controlled endpoints are tested in this order: Disease Flare, JIA ACR50, JIA ACR30, JIA ACR70, CHAQ Disability Index.

The occurrence of disease flare by visit for Study pcJIA-I is shown in Figure 5.

**Figure 5: Occurrence of disease flare by visit in the double-blind phase in patients with pcJIA in Study pcJIA-I**

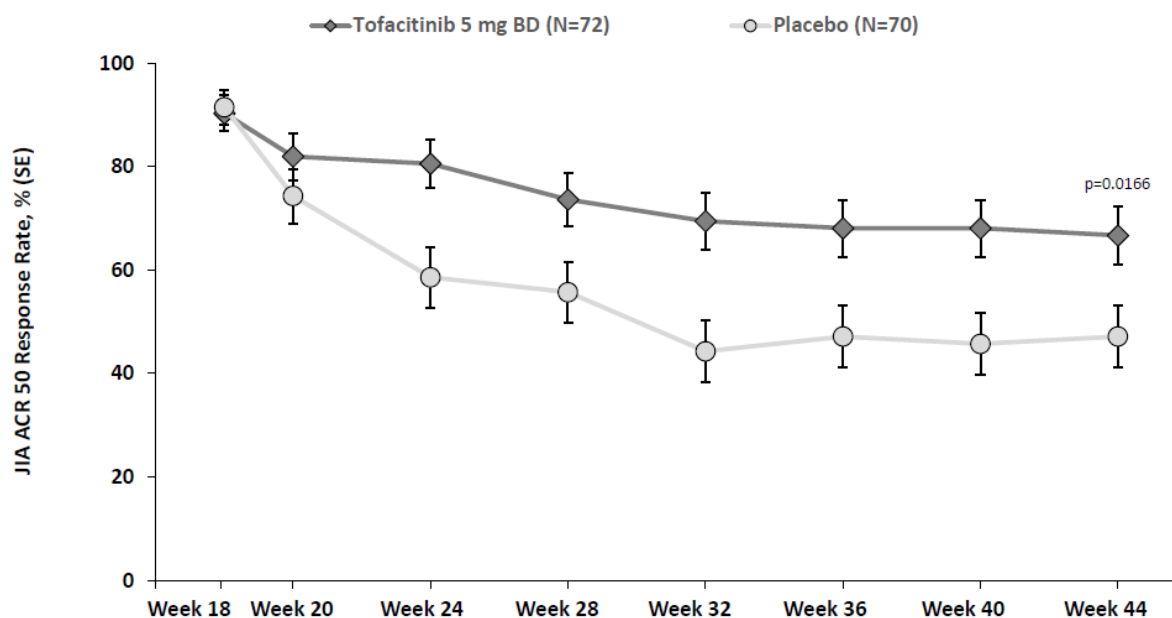


BD=twice daily; SE=standard error; N=total number of patients.

The 26-week double-blind phase is from Week 18 through Week 44 on and after randomisation day.

The ACR50 response rates by visit for Study pcJIA-I is shown in Figure 6.

**Figure 6: ACR50 response by visit in double-blind phase in patients with pcJIA in Study pcJIA-I**



ACR=American College of Rheumatology; BD=twice daily; SE=standard error; N=total number of patients.

The 26-week double-blind phase is from Week 18 through Week 44 on and after randomisation day.

Response is calculated relative to the open-label baseline.

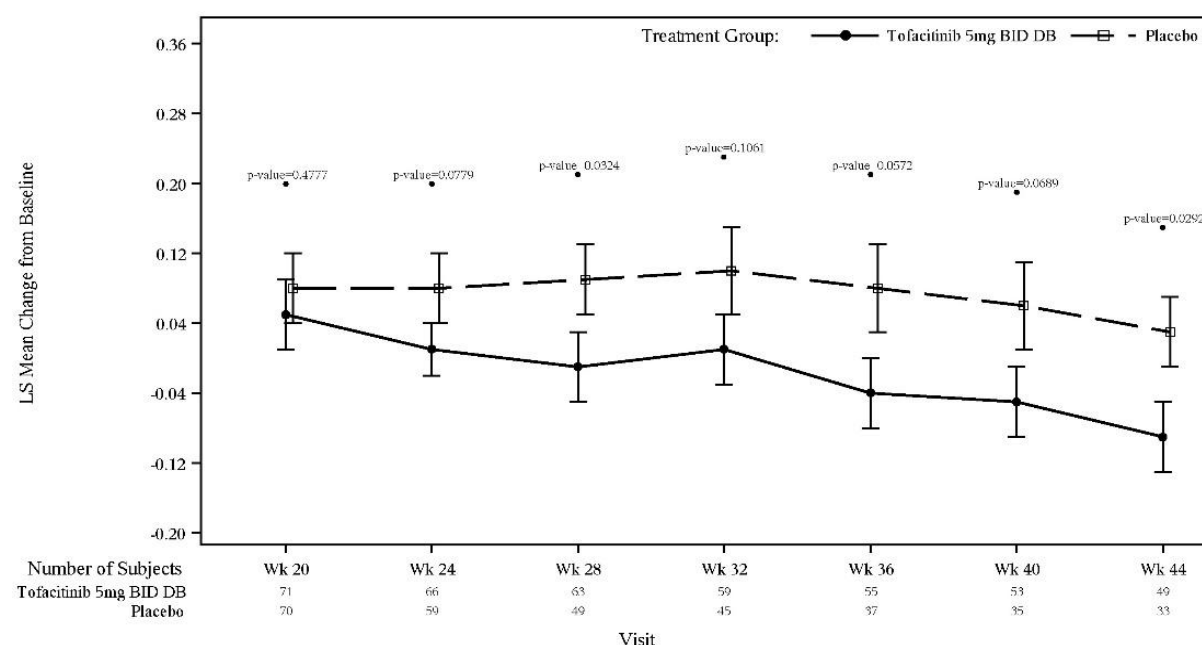
The results for occurrence of disease flare and JIA ACR30, 50 and 70 response rates for patients with juvenile PsA and ERA were consistent with those for subjects with pcJIA.

### Physical Function and Health-related Quality of Life

Changes in physical function in Study pcJIA-I were measured by the CHAQ Disability Index. The mean change from the double-blind baseline in CHAQ-Disability Index was significantly lower in the tofacitinib 5 mg film-coated tablets twice daily or tofacitinib oral solution weight-based equivalent twice daily compared to placebo at Week 44 (Table 17).

The LS mean change from double-blind baseline in CHAQ Disability Index for Study pcJIA-I is shown in Figure 7.

**Figure 7: LS mean change ( $\pm$ SE) from double-blind baseline in CHAQ Disability Index (MMRM) in double blind phase in Study pcJIA-I**



Abbreviations: CHAQ=Childhood Health Assessment Questionnaire; CRP=C-reactive protein; DB=double-blind; LS=Least squares; MMRM=mixed model for repeated measures; pcJIA=polyarticular course juvenile idiopathic arthritis.

Number of subjects=number of subjects with observations at visit.

The 26-week double-blind phase is from Week 18 through Week 44 on and after randomisation day.

The error bars are standard error of the mean.

## 5.2 Pharmacokinetic Properties

### XELJANZ Tablets

The PK profile of tofacitinib is characterised by rapid absorption (peak plasma concentrations are reached within 0.5-1 hour), rapid elimination (half-life of ~3 hours) and dose-proportional increases in systemic exposure. Steady state concentrations are achieved in 24-48 hours with negligible accumulation after twice daily administration.

### XELJANZ XR

Following oral administration of XELJANZ XR, peak plasma concentrations are reached at 4 hours and half-life is ~6 hours. Steady state concentrations are achieved within 48 hours with negligible accumulation after once daily administration. AUC and  $C_{max}$  of tofacitinib for XELJANZ XR 11 mg administered once daily are bioequivalent to those of XELJANZ 5 mg administered twice daily.

### *XELJANZ Oral Solution*

Tofacitinib in XELJANZ oral solution is absorbed rapidly with peak plasma concentrations reached within 0.5-1 hour and a mean elimination half-life of ~3 hours similar to the XELJANZ 5 mg tablet. XELJANZ 1 mg/mL oral solution when given as a 5 mg (5 mL) dose can be considered bioequivalent to the XELJANZ 5 mg tablet.

### ***Absorption***

#### *XELJANZ*

Tofacitinib is well-absorbed, with an oral bioavailability of 74% following administration of XELJANZ. Co-administration of tofacitinib with a high fat meal resulted in no changes in AUC while  $C_{\max}$  was reduced by 32%. In clinical trials, tofacitinib was administered without regard to meals.

#### *XELJANZ XR*

Coadministration of XELJANZ XR with a high fat meal resulted in no changes in AUC while  $C_{\max}$  was increased by 27% and  $T_{\max}$  was extended by approximately 1 hour.

### ***Distribution***

After intravenous administration, the volume of distribution is 87 L. Approximately 40% of circulating tofacitinib is bound to plasma proteins. Tofacitinib binds predominantly to albumin and does not appear to bind to  $\alpha$ 1-acid glycoprotein. Tofacitinib distributes equally between red blood cells and plasma.

### ***Metabolism and Excretion***

Clearance mechanisms for tofacitinib are approximately 70% hepatic metabolism and 30% renal excretion of the parent drug. The metabolism of tofacitinib is primarily mediated by CYP3A4 with minor contribution from CYP2C19. In a human radiolabeled study, more than 65% of the total circulating radioactivity was accounted for by unchanged drug, with the remaining 35% attributed to 8 metabolites, each accounting for less than 8% of total radioactivity. The pharmacologic activity of tofacitinib is attributed to the parent molecule. *In vitro*, tofacitinib is a substrate for multidrug resistance (MDR) 1, but not for breast cancer resistance protein (BCRP), organic anion transporting polypeptide (OATP) 1B1/1B3, or organic cationic transporter (OCT) 1/2, and is not an inhibitor of MDR1, OATP1B1/1B3, OCT2, organic anion transporter (OAT) 1/3, or multidrug resistance-associated protein (MRP) at clinically meaningful concentrations.

### ***Special Populations***

#### *Pharmacokinetics in Elderly (>65 years) Patients, Gender, Race*

Population PK analysis in RA patients indicated that systemic exposure (AUC) of tofacitinib in the extremes of body weight (40 kg, 140 kg) were similar to that of a 70 kg patient. Elderly patients 80 years of age were estimated to have <5% higher AUC relative to the mean age of 55 years. Women were estimated to have 7% lower AUC compared to men. The available data have also shown that there are no major differences in tofacitinib AUC between races. An approximate linear relationship between body weight and volume of distribution was observed, resulting in higher peak ( $C_{\max}$ ) and lower trough ( $C_{\min}$ ) concentrations in lighter patients. However, this difference is not considered to be clinically relevant. The between-subject



variability (percentage coefficient of variation) in AUC of tofacitinib is estimated to be approximately 27%.

#### *Pharmacokinetics in Patient Populations*

Results from population PK analysis in patients with active PsA, AS or moderate to severe UC were consistent with those in patients with RA.

#### *Pharmacokinetics in Children with JIA*

Population PK analysis based on results from both tofacitinib 5 mg film-coated tablets twice daily and tofacitinib oral solution weight-based equivalent twice daily indicated that tofacitinib clearance and volume of distribution both decreased with decreasing body weight in JIA patients. The available data indicated that there were no clinically relevant differences in tofacitinib exposure (AUC), based on age, race, gender, patient type or baseline disease severity. The between-subject variability (percentage coefficient of variation) in AUC was estimated to be approximately 24%.

#### *Renal Impairment*

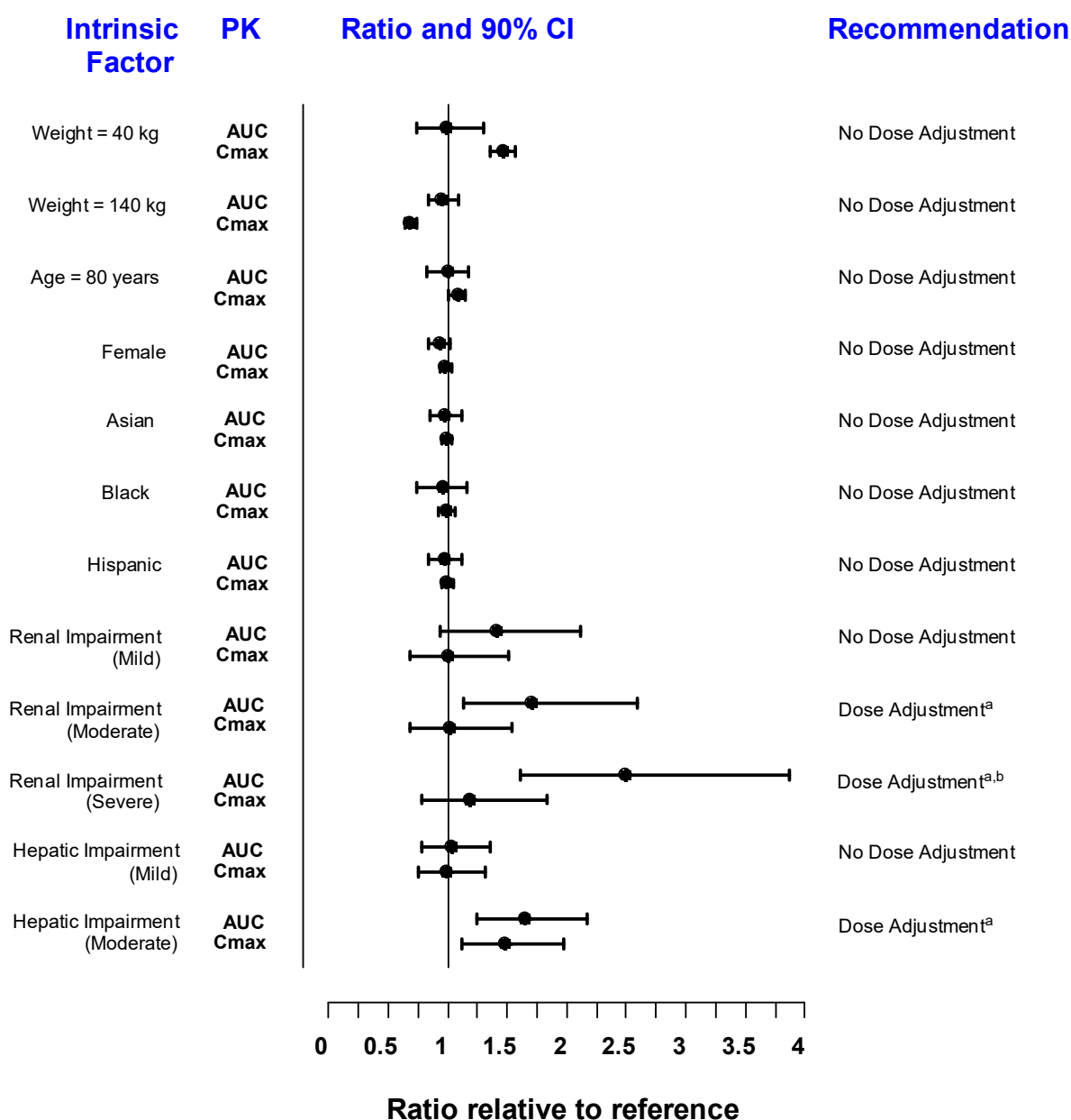
In a clinical study, subjects with renal impairment with a creatinine clearance of 51-80 mL/min, 30-50 mL/min and <30 mL/min (estimated GFR (Cockcroft–Gault formula)) had 37%, 43% and 123% higher AUC, respectively, compared with healthy subjects (see Section 4.2 Dose and Method of Administration). In subjects with end-stage renal disease, the contribution of dialysis to the total clearance of tofacitinib was relatively small.

#### *Hepatic Impairment*

Subjects with mild and moderate hepatic impairment had 3%, and 65% higher AUC, respectively, compared with healthy subjects (see Section 4.2 Dose and Method of Administration). Subjects with severe hepatic impairment were not studied. Therefore XELJANZ should not be used in patients with severe hepatic impairment (see Section 4.3 Contraindications).

The impact of intrinsic factors on tofacitinib pharmacokinetics is summarised in Figure 8 with dosage adjustment recommendations. Modifications required for special populations are described in Section 4.2 Dose and Method of Administration.

**Figure 8: Impact of Intrinsic Factors on Tofacitinib Pharmacokinetics**



Abbreviations: AUC=total area under the concentration time curve; C<sub>max</sub>=maximum plasma concentration; PK=pharmacokinetics; CI=confidence interval

Note: Reference values for weight, age, gender, and race comparisons are 70 kg, 55 years, male and white, respectively; reference groups for renal and hepatic impairment data are subjects with normal renal or hepatic function.

<sup>a</sup> In rheumatoid arthritis and psoriatic arthritis patients the recommended dose is XELJANZ 5 mg once daily. In ulcerative colitis patients the recommended dose is half the total daily dose indicated for patients with normal renal and hepatic function; when the indicated dose in the presence of normal renal and hepatic function is XELJANZ 10 mg twice daily the recommended dose is XELJANZ 5 mg twice daily, and when the indicated dose in the presence of normal renal and hepatic function is XELJANZ 5 mg twice daily the recommended dose is XELJANZ 5 mg once daily.

<sup>b</sup> Supplemental doses are not necessary in patients after dialysis.

## 5.3 Preclinical Safety Data

### ***Genotoxicity***

Tofacitinib is not mutagenic or genotoxic based on the weight of evidence from a series of *in vitro* and *in vivo* tests for gene mutations and chromosomal aberrations.

### ***Carcinogenicity***

The carcinogenic potential of tofacitinib was assessed in 6-month rasH2 transgenic mouse carcinogenicity and 2-year rat carcinogenicity studies. Tofacitinib was not carcinogenic in mice up to a high dose of 200 mg/kg/day (unbound drug AUC of ~38 times or ~19 times the human AUC at 5 mg or 10 mg twice daily). Benign Leydig cell tumours were observed in rats: benign Leydig cell tumours in rats are not associated with a risk of Leydig cell tumours in humans. Hibernomas (malignancy of brown adipose tissue) were observed in female rats at doses  $\geq 30$  mg/kg/day (unbound drug AUC of ~83 times or ~41 times the human AUC at 5 mg or 10 mg twice daily). Benign thymomas were observed in female rats dosed only at the 100 reduced to 75 mg/kg/day dose (unbound drug AUC of ~187 times or ~94 times the human AUC at 5 mg or 10 mg twice daily).

Lymphoma was observed in 3 of 8 adult and 0 of 14 juvenile monkeys dosed with tofacitinib at 5 mg/kg twice daily. The NOAEL for the lymphomas was 1 mg/kg twice daily. The unbound AUC at 1 mg/kg twice daily was 341 ng•h/mL, which is approximately half of the unbound AUC at 10 mg twice daily and similar to the unbound AUC at 5 mg twice daily in humans.

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of Excipients

#### **XELJANZ Tablets**

##### Tablet Core

Microcrystalline cellulose  
Lactose monohydrate  
Croscarmellose sodium  
Magnesium stearate

##### Film Coat

Hypromellose  
Titanium dioxide  
Lactose monohydrate  
Macrogol 3350  
Triacetin  
Indigo carmine aluminium lake (10 mg strength only)  
Brilliant blue FCF aluminium lake (10 mg strength only)

#### **XELJANZ XR Tablets**

##### Tablet Core

Sorbitol  
Hyetellose  
Copovidone

Magnesium stearate

#### Film Coat

Cellulose acetate

Hyprolose

OPADRY complete film-coating system 03K140024 PINK

OPACODE monogramming ink S-1-17823 BLACK

#### **XELJANZ Oral Solution**

Xylitol

Lactic acid

Sucralose

Sodium benzoate

Grape flavor 534732 T (Proprietary Ingredient ID: 142903)

Hydrochloric acid

Purified water

### **6.2 Incompatibilities**

Incompatibilities were either not assessed or not identified as part of the registration of this medicine.

### **6.3 Shelf Life**

In Australia, information on the shelf life can be found on the public summary of the Australian Register of Therapeutic Goods (ARTG). The expiry date can be found on the packaging.

### **6.4 Special Precautions for Storage**

Store below 30°C (Tablets)

Store below 25°C (Oral Solution)

XELJANZ Oral Solution should be stored in the original bottle and carton to protect from light. Discard any remaining solution 60 days after opening the bottle for the first time.

### **6.5 Nature and Contents of Container**

#### XELJANZ 5 mg

HDPE bottles with desiccant and child-resistant caps containing 60 or 180 film-coated tablets.

Aluminium/PVC-backed Aluminium blisters containing 14 or 56 film-coated tablets.

Not all pack sizes may be marketed.

#### XELJANZ 10 mg

Aluminium/PVC-backed Aluminium blisters containing 14 or 56 film-coated tablets.

Not all pack sizes may be marketed.

### XELJANZ XR 11 mg

HDPE bottles with desiccant and child-resistant caps containing 14 or 30 extended release film-coated tablets.

Aluminium/Aluminium-backed foil blisters containing 7 or 28 extended release film-coated tablets.

Not all pack sizes may be marketed.

### XELJANZ Oral Solution

250 mL HDPE bottle with a child-resistant polypropylene closure containing 240 mL of solution; closure containing PP liner sealed by aluminium-foil heat-induction seal. The pack also contains a LDPE press-in bottle adaptor (PIBA) and an oral dosing syringe.

## 6.6 Special Precautions for Disposal

In Australia, any unused medicine or waste material should be disposed of by taking to your local pharmacy.

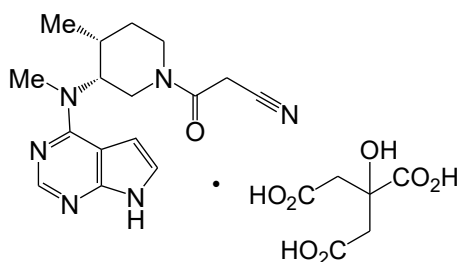
## 6.7 Physicochemical Properties

Chemical name: (3*R*,4*R*)-4-methyl-3-(methyl-7*H*-pyrrolo [2,3-*d*]pyrimidin-4-ylamino)-β-oxo-1-piperidinepropanenitrile, 2-hydroxy-1,2,3-propanetricarboxylate

Molecular weight: 504.5 (312.4 for tofacitinib free base)

Molecular formula: C<sub>16</sub>H<sub>20</sub>N<sub>6</sub>O•C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>

### **Chemical Structure**



### **CAS Number**

540737-29-9 (citrate salt); 477600-75-2 (free base)

Tofacitinib citrate is a white to off-white powder with a pKa of 5.07. Tofacitinib citrate is freely soluble in *N,N*-dimethylacetamide, slightly soluble in water, and very slightly soluble in ethanol (99.5% ethanol). The partition coefficient is 14.3 (Log P=1.15).

## 7 MEDICINE SCHEDULE (POISONS STANDARD)

S4 (Prescription Medicine)

## **8 SPONSOR**

Pfizer Australia Pty Ltd  
Level 17, 151 Clarence Street  
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[www.pfizermedicalinformation.com.au](http://www.pfizermedicalinformation.com.au)

## **9 DATE OF FIRST APPROVAL**

05 February 2015

## **10 DATE OF REVISION**

12 January 2026

® Registered trademark

### **Summary Table of Changes**

<b>Section changed</b>	<b>Summary of new information</b>
4.4	Addition of information regarding the potential risk of progressive multifocal leukoencephalopathy (PML).