

Regulatory Affairs

Ruxolitinib

Summary of the EU Safety Risk Management Plan

Active substance(s) (INN or common name):	Ruxolitinib
Product(s) concerned (brand name(s)):	Jakavi
Document status:	Final
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The Risk Management Plan (RMP) is a comprehensive document submitted as part of the application dossier for market approval of a medicine. The RMP summary contains information on the medicine's safety profile and explains the measures that are taken in order to further investigate and follow the risks as well as to prevent or minimise them.

The RMP summary of "Jakavi" is a concise document and does not claim to be exhaustive.

As the RMP is an international document, the summary might differ from the "Arzneimittelinformation / Information sur le médicament" approved and published in Switzerland, e.g. by mentioning risks occurring in populations or indications not included in the Swiss authorization.

Please note that the reference document which is valid and relevant for the effective and safe use of "Jakavi" in Switzerland is the "Arzneimittelinformation/ Information sur le médicament" (see www.swissmedic.ch) approved and authorized by Swissmedic. Novartis Pharma Schweiz AG is fully responsible for the accuracy and correctness of the content of the published summary RMP of "Jakavi".

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This is a summary of the RMP for Jakavi. The RMP details important risks of Jakavi, how these risks can be minimized and how more information will be obtained about Jakavi's risks and uncertainties (missing information).

Jakavi's NPI and its package leaflet give essential information to health care professionals (HCPs) and patients on how Jakavi should be used.

This summary of the RMP for Jakavi should be read in the context of all this information including the AR of the evaluation and its plain-language summary, all which is part of the European Public Assessment Report (EPAR).

Important new concerns or changes to the current ones will be included in updates of Jakavi's RMP.

I. The medicine and what it is used for

Jakavi is a selective inhibitor of the JAKs. Jakavi is authorized for the treatment of disease related splenomegaly or symptoms in adult patients with PMF (also known as chronic IMF), PPVMF or PETMF. Jakavi is indicated for the treatment of adult patients with PV who are resistant to or intolerant of HU. Currently, ruxolitinib is also indicated for the treatment of patients with GvHD aged 12 years and older who have inadequate response to corticosteroids or other systemic therapies. Jakavi is also indicated for the treatment of adults and pediatric patients aged 2 years and older with acute graft versus host disease who have inadequate response to corticosteroids or other systemic therapies. Jakavi contains "ruxolitinib" as the active ingredient and it is given by oral route.

The recommended starting dose of Jakavi in MF is 15 mg given orally b.i.d. for patients with a platelet count between 100000/mm³ and 200000/mm³ and 20 mg b.i.d. for patients with a platelet count of >200000/mm³. The recommended starting dose in patients with platelet counts between 75000/mm³ and <100000/mm³ and between 50000/mm³ and <75000/mm³ is 10 mg b.i.d. and 5 mg b.i.d., respectively. The patients should be titrated cautiously.

The recommended starting dose of Jakavi in PV is 10 mg given orally b.i.d.

The recommended starting dose of Jakavi in acute graft versus host disease (GvHD) is based on age groups (see Table below)

Age Group	Starting dose
6 years and older	5 mg orally twice daily
2 years to less than 6 years	4 mg/m ² oral zweimal täglich

These starting doses in GvHD can be administered using either the tablet for patients at or above 6 years old who can swallow tablets or the oral solution for patients under 12 years old.

Doses may be titrated based on safety and efficacy. Treatment should be discontinued for platelet counts less than 50000/mm³ or ANC less than 500/mm³. In PV, treatment should also be interrupted when hemoglobin is below 8 g/dl. After recovery of blood counts above these levels, dosing may be re-started at 5 mg b.i.d. and gradually increased based on careful monitoring of complete blood cell count, including a WBC count differential.

In MF, dose reductions should be considered if the platelet count decreases below 125000/mm³, with the goal of avoiding dose interruptions for thrombocytopenia. In PV, dose reductions should also be considered if hemoglobin decreases below 12 g/dl and is recommended if it decreases below 10 g/dl.

Dose reductions and temporary interruptions may be needed in GvHD patients with thrombocytopenia, neutropenia, and elevated total bilirubin after standard supportive therapy including growth-factors, anti-infective therapies and transfusions.

One dose level reduction step is recommended (10 mg b.i.d. to 5 mg b.i.d. or 5 mg b.i.d. to 5 mg once daily). In patients who are unable to tolerate ruxolitinib at a dose of 5 mg once daily, treatment should be interrupted.

In GvHD, tapering of ruxolitinib may be considered in patients with a response and after having discontinued corticosteroids. A 50% dose reduction every 2 months is recommended. If signs or symptoms of GvHD reoccur during or after the taper of ruxolitinib, re-escalation of treatment should be considered.

Further information about the evaluation of Jakavi's benefits can be found in Jakavi's EPAR, including in its plain-language summary, available on the European Medicines Agency (EMA) website, under the medicine's webpage link to product's EPAR summary landing page on the EMA webpage: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Summary_for_the_public/human/002464/WC500133225.pdf.

II. Risks associated with the medicine and activities to minimize or further characterize the risks

Important risks of Jakavi together with measures to minimize such risks and the proposed studies for learning more about Jakavi's risks, are outlined below.

Measures to minimize the risks identified for medicinal products can be:

- Specific information, such as warnings, precautions and advice on correct use, in the package leaflet and NPI addressed to patients and HCPs;
- Important advice on the medicine's packaging;
- The authorised pack size — the amount of medicine in a pack is chosen so to ensure that the medicine is used correctly;

- The medicine's legal status — the way a medicine is supplied to the patient (e.g. with or without prescription) can help to minimize its risks.

Together, these measures constitute routine risk minimization measures. There are no additional risk minimization measures.

In addition to these measures, information about adverse reactions is collected continuously and regularly analysed, including PSUR assessment so that immediate action can be taken as necessary. These measures constitute routine PhV activities.

If important information that may affect the safe use of Jakavi is not yet available, it is listed under 'missing information' below.

- Long-term safety in pediatric patients (GvHD only)

II.A: List of important risks and missing information

Important risks of Jakavi are risks that need special risk management activities to further investigate or minimize the risk, so that the medicinal product can be safely administered. Important risks can be regarded as identified or potential. Identified risks are concerns for which there is sufficient proof of a link with the use of Jakavi. Potential risks are concerns for which an association with the use of this medicine is possible based on available data, but this association has not been established yet and needs further evaluation. Missing information refers to information on the safety of the medicinal product that is currently missing and needs to be collected (e.g. on the long-term use of the medicine).

Table 13-1 **List of important risks and missing information**

Important identified risk	Serious infections
Important potential risk	Developmental toxicity
Missing information	Long-term safety in pediatric patients (GvHD on

II B: Summary of important risks

Table 13-2 **Important identified risk: Serious infections**

Evidence for linking the risk to the medicine	The frequently reported infections include: viral reactivation of HZ (shingles), UTI. Infections were frequently reported cause of death due to AEs in patients with MF. The frequency and severity of infections appear to be higher in MF patients than in PV patients. In GvHD indication, as expected in this patient population, infections were frequently reported AEs; most common infections reported in adult as well as pediatric patients included CMV infections including reactivation, sepsis, pneumonia and upper respiratory tract infections.
Risk factors and risk groups	Low neutrophil count, pre-existing comorbidities COPD, asthma, diabetes, co-medication (corticosteroids), higher dose, lack of dose adjustment if strong CYP3A4 inhibitors or fluconazole are used or the patient develops hepatic impairment, moderate or severe renal impairment (CrCl <30 mL/min) or has end stage renal failure requiring hemodialysis.
Risk minimization measures	Routine risk minimization measures: SmPC Section 4.4: Precaution for monitoring, treatment and description of risk factors and nature of risk. Section 4.8: Undesirable effects. Additional risk minimization measures None

Table 13-3 **Important potential risk: Developmental toxicity**

Evidence for linking the risk to the medicine	Myelofibrosis or PV is mainly a condition of the adult population; the median age of patients recruited in Phase III studies was about 66 years. Cases of childhood age are very rare. The number of female patients of child-bearing potential receiving Jakavi is therefore expected to be limited. In the pivotal studies, 6 female patients, ≤45 years representing 1.1% of the total population were enrolled. Due to the severity of the oncological condition the fertility rate of these elderly female patients is expected to be low. There are no data from the use
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	<p>of Jakavi in pregnant women with PV. Animal studies have shown that Jakavi is embryotoxic (causing harm to the embryo) and fetotoxic (causing harm to the fetus). Women of child-bearing potential should use effective contraception during the treatment with Jakavi. In case pregnancy should occur during treatment with Jakavi, a risk-benefit evaluation must be carried out on an individual basis with careful counseling regarding potential risks to the fetus.</p>
Risk factors and risk groups	<p>Women of child-bearing potential not using effective contraception, breast feeding women.</p>
Risk minimization measures	<p>Routine risk minimization measures</p> <p>SmPC Section 4.1 Section 4.2 Section 4.3 Section 4.6 Section 5.3</p> <p>Additional risk minimization measures</p> <p>None</p>

Table 13-4 Long-term safety in pediatric patients (GvHD only)

Risk minimization measures	Routine risk minimization measures SmPC Section 4.2 Additional risk minimization measures None
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Additional pharmacovigilance
Activities

Additional pharmacovigilance activities:

Study INC424G12201: This is a study of activity, safety and pharmacokinetics in pediatric subjects with moderate and severe cGvHD after allo-SCT.

See Section II.C of this summary for an overview of the post-authorization development plan.

II C: Post-authorization development plan

II.C.1 Studies which are conditions of the marketing authorization

There are no studies which are conditions of the marketing authorization or specific obligation of Jakavi.

II.C.2. Other studies in post-authorization development plan

Table 13-5 Other studies in the post-authorization development plan

Study short name	Rationale and study objectives
Study CINC424G12201 Open-label, single-arm, multi-center study of ruxolitinib added to corticosteroids in pediatric subjects with moderate and severe cGvHD after allo-SCT.	The rationale of the study is based on current knowledge of cGvHD pathophysiology and published studies showing that ruxolitinib impairs APC function, inhibits donor T cell proliferation, suppresses adverse cytokine production, and improves survival and disease manifestations in GvHD mouse models. This signaling cascade in cGvHD determined in the mouse model and adult subjects with cGvHD, is expected to be the same in pediatric subjects <12 years of age as compared to subjects ≥12 years of age. Further,

Study short name	Rationale and study objectives
	published data has shown that ruxolitinib has evidence of clinical efficacy when added to immunosuppressive therapy in subjects with SR-cGvHD. Clinical studies using ruxolitinib (10 mg b.i.d.) alone or in comparison to BAT are currently underway in the SR-cGvHD setting for adult patients and adolescents ≥ 12 years of age. Despite children being at a lower risk of developing cGvHD than adults, the incidence of cGvHD in the pediatric population is substantial and has increased recently in association with the expanded use of peripheral blood stem cells and unrelated donors.