

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use VITRAKVI safely and effectively. See full prescribing information for VITRAKVI.

VITRAKVI® (larotrectinib) capsules, for oral use

VITRAKVI® (larotrectinib) oral solution

Initial U.S. Approval: 2018

RECENT MAJOR CHANGES

Dosage and Administration (2.3,2.4)	11/2023
Dosage and Administration (2.6)	11/2022
Dosage and Administration (2.8)	12/2022
Warnings and Precautions (5.3)	11/2023

INDICATIONS AND USAGE

VITRAKVI is a kinase inhibitor indicated for the treatment of adult and pediatric patients with solid tumors that:

- have a neurotrophic receptor tyrosine kinase (NTRK) gene fusion without a known acquired resistance mutation,
- are metastatic or where surgical resection is likely to result in severe morbidity, and
- have no satisfactory alternative treatments or that have progressed following treatment.

Select patients for therapy based on an FDA-approved test. (1, 2.1)

This indication is approved under accelerated approval based on overall response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials (1,14).

DOSAGE AND ADMINISTRATION

- Select patients for treatment with VITRAKVI based on the presence of a *NTRK* gene fusion (2.1, 14).
- Recommended Dosage in Adult and Pediatric Patients with Body Surface Area of 1 Meter-Squared or greater: 100 mg orally twice daily (2.2)
- Recommended Dosage in Pediatric Patients with Body Surface Area of Less Than 1 Meter-Squared: 100 mg/m² orally twice daily (2.2)

DOSAGE FORMS AND STRENGTHS

- Capsules: 25 mg, 100 mg (3)
- Oral Solution: 20 mg/mL (3)

CONTRAINDICATIONS

None. (4)

WARNINGS AND PRECAUTIONS

- Central Nervous System (CNS) Effects: Advise patients and caretakers of the risk of CNS adverse reactions including dizziness, cognitive

impairment, mood disorders, and sleep disturbances. Advise patients not to drive or operate hazardous machinery if experiencing neurotoxicity. Withhold and modify dosage, or permanently discontinue VITRAKVI based on severity. (2.3, 5.1)

- Skeletal Fractures: Promptly evaluate patients with signs or symptoms of fractures. (5.2)
- Hepatotoxicity: Obtain liver function tests (ALT, AST, ALP and bilirubin) before initiation of VITRAKVI and every 2 weeks during the first 2 months of treatment, then monthly thereafter or as clinically indicated. Temporarily withhold, reduce dose, or permanently discontinue VITRAKVI based on severity. (2.4, 5. 3)
- Embryo-Fetal Toxicity: Can cause fetal harm. Advise females with reproductive potential of potential risk to the fetus and to use effective contraception. (5.4, 8.3)

ADVERSE REACTIONS

The most common (≥ 20%) adverse reactions, including laboratory abnormalities, with VITRAKVI were increased AST, increased ALT, anemia musculoskeletal pain, fatigue, hypoalbuminemia, neutropenia, increased alkaline phosphatase, cough, leukopenia, constipation, diarrhea, dizziness, hypocalcemia, nausea, vomiting, pyrexia, lymphopenia, and abdominal pain (6).

To report SUSPECTED ADVERSE REACTIONS, contact Bayer HealthCare Pharmaceuticals Inc. at 1-888-842-2937 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS

- Strong CYP3A4 Inhibitors: Avoid coadministration of strong CYP3A4 inhibitors with VITRAKVI. If coadministration cannot be avoided, reduce the VITRAKVI dose. (2.5, 7.1)
- Moderate CYP3A4 Inhibitors: Monitor for adverse reactions more frequently in patients coadministered a moderate CYP3A4 inhibitor with VITRAKVI and reduce the VITRAKVI dosage based on severity of adverse reactions. (7.1)
- Strong CYP3A4 Inducers: Avoid coadministration of strong CYP3A4 inducers with VITRAKVI. If coadministration cannot be avoided, increase the VITRAKVI dose. (2.6, 7.1)
- Moderate CYP3A4 Inducers: Increase the VITRAKVI dose. (2.6, 7.1)
- Sensitive CYP3A4 Substrates: Avoid coadministration of sensitive CYP3A4 substrates with VITRAKVI. (7.2)

USE IN SPECIFIC POPULATIONS

- Lactation: Advise not to breastfeed. (8.2)
- Hepatic Impairment: Reduce the starting dose of VITRAKVI in patients with moderate (Child-Pugh B) to severe (Child-Pugh C) hepatic impairment. (2.7, 8.7)

See 17 for PATIENT COUNSELING INFORMATION and FDA-approved patient labeling

Revised: 11/2023

FULL PRESCRIBING INFORMATION: CONTENTS*

- | | |
|--|--|
| <p>1 INDICATIONS AND USAGE</p> <p>2 DOSAGE AND ADMINISTRATION</p> <p>2.1 Patient Selection</p> <p>2.2 Recommended Dosage</p> <p>2.3 Dosage Modifications for Adverse Reactions</p> <p>2.4 Dosage Modifications for Hepatotoxicity</p> <p>2.5 Dosage Modifications for Coadministration with Strong CYP3A4 Inhibitors</p> <p>2.6 Dosage Modifications for Coadministration with Strong or Moderate CYP3A4 Inducers</p> <p>2.7 Dosage Modifications for Patients with Hepatic Impairment</p> <p>2.8 Administration</p> <p>3 DOSAGE FORMS AND STRENGTHS</p> <p>4 CONTRAINDICATIONS</p> <p>5 WARNINGS AND PRECAUTIONS</p> <p>5.1 Central Nervous System Effects</p> <p>5.2 Skeletal Fractures</p> <p>5.3 Hepatotoxicity</p> <p>5.4 Embryo-Fetal Toxicity</p> <p>6 ADVERSE REACTIONS</p> <p>6.1 Clinical Trial Experience</p> <p>7 DRUG INTERACTIONS</p> <p>7.1 Effects of Other Drugs on VITRAKVI</p> <p>7.2 Effects of VITRAKVI on Other Drugs</p> | <p>8 USE IN SPECIFIC POPULATIONS</p> <p>8.1 Pregnancy</p> <p>8.2 Lactation</p> <p>8.3 Females and Males of Reproductive Potential</p> <p>8.4 Pediatric Use</p> <p>8.5 Geriatric Use</p> <p>8.6 Hepatic Impairment</p> <p>8.7 Renal Impairment</p> <p>11 DESCRIPTION</p> <p>12 CLINICAL PHARMACOLOGY</p> <p>12.1 Mechanism of Action</p> <p>12.2 Pharmacodynamics</p> <p>12.3 Pharmacokinetics</p> <p>13 NONCLINICAL TOXICOLOGY</p> <p>13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility</p> <p>13.2 Animal Toxicology and/or Pharmacology</p> <p>14 CLINICAL STUDIES</p> <p>16 HOW SUPPLIED/STORAGE AND HANDLING</p> <p>17 PATIENT COUNSELING INFORMATION</p> <p>*Sections or subsections omitted from the full prescribing information are not listed.</p> |
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FULL PRESCRIBING INFORMATION

1 INDICATIONS AND USAGE

VITRAKVI is indicated for the treatment of adult and pediatric patients with solid tumors that:

- have a neurotrophic receptor tyrosine kinase (*NTRK*) gene fusion without a known acquired resistance mutation,
- are metastatic or where surgical resection is likely to result in severe morbidity, and
- have no satisfactory alternative treatments or that have progressed following treatment.

Select patients for therapy based on an FDA-approved test [see *Dosage and Administration (2.1)*].

This indication is approved under accelerated approval based on overall response rate and duration of response [see *Clinical Studies (14)*]. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials.

2 DOSAGE AND ADMINISTRATION

2.1 Patient Selection

Select patients for treatment with VITRAKVI based on the presence of a *NTRK* gene fusion in tumor specimens [see *Clinical Studies (14)*]. Information on FDA-approved tests is available at <http://www.fda.gov/companiondiagnostics>.

2.2 Recommended Dosage

Recommended Dosage in Adult and Pediatric Patients with Body Surface Area of at Least 1 Meter-Squared

The recommended dosage of VITRAKVI is 100 mg orally twice daily, with or without food, until disease progression or until unacceptable toxicity.

Recommended Dosage in Pediatric Patients with Body Surface Area Less Than 1 Meter-Squared

The recommended dosage of VITRAKVI is 100 mg/m² orally twice daily, with or without food, until disease progression or until unacceptable toxicity.

2.3 Dosage Modifications for Adverse Reactions

For Grade 2 and higher liver function test abnormalities, refer to Section 2.4, Table 2, Dosage Modifications for Hepatotoxicity.

For all other Grade 3 or 4 adverse reactions:

- Withhold VITRAKVI until adverse reaction resolves or improves to baseline or Grade 1. Resume at the next dosage modification if resolution occurs within 4 weeks.
- Permanently discontinue VITRAKVI if an adverse reaction does not resolve within 4 weeks.

The recommended dosage reductions for VITRAKVI for adverse reactions are provided in Table 1.

Table 1 Recommended Dosage Reductions for VITRAKVI for Adverse Reactions

Dosage Reduction	Adult and Pediatric Patients with Body Surface Area of 1 m ² or Greater	Pediatric Patients with Body Surface Area Less Than 1 m ²
First	75 mg orally twice daily	75 mg/m ² orally twice daily
Second	50 mg orally twice daily	50 mg/m ² orally twice daily
Third	100 mg orally once daily	25 mg/m ² orally twice daily ^a

^a Pediatric patients on 25 mg/m² orally twice daily should remain on this dosage even if body surface area becomes greater than 1 m² during the treatment. Maximum dose should be 25 mg/m² orally twice daily at the third dosage modification.

Permanently discontinue VITRAKVI in patients who are unable to tolerate VITRAKVI after three dose modifications.

2.4 Dosage Modifications for Hepatotoxicity

The recommended dosage modifications for VITRAKVI liver function test abnormalities are provided in Table 2.

For CTCAE Grade 2 ALT and/or AST elevation, monitor liver function frequently as clinically indicated, to establish whether a dose interruption or reduction is required [*see Warnings and Precautions (5.3)*].

Table 2 Recommended Dosage Modifications for VITRAKVI for Hepatotoxicity

Severity ^a	Dosage Modification
AST or ALT $\geq 5 \times$ ULN with bilirubin $\leq 2 \times$ ULN [<i>see Warnings and Precautions (5.3)</i>]	<ul style="list-style-type: none"> Withhold VITRAKVI until recovery to \leq Grade 1 or return to baseline. Resume VITRAKVI at the next lower dose level. Permanently discontinue if a Grade 4 AST and/or ALT elevation occurs after resuming VITRAKVI.
AST or ALT $> 3 \times$ ULN with total bilirubin $> 2 \times$ ULN in the absence of alternative causes	<ul style="list-style-type: none"> Permanently discontinue VITRAKVI.

ALT = alanine aminotransferase; AST = aspartate aminotransferase; ULN = upper limit of normal

^aGrading defined by National Cancer Institute Common Terminology Criteria for Adverse Events (NCI CTCAE) version 4.03

2.5 Dosage Modifications for Coadministration with Strong CYP3A4 Inhibitors

Avoid coadministration of strong CYP3A4 inhibitors with VITRAKVI. If coadministration of a strong CYP3A4 inhibitor cannot be avoided, reduce the VITRAKVI dose by 50%. After the inhibitor has been discontinued for 3 to 5 elimination half-lives, resume the VITRAKVI dose that was used prior to initiating the CYP3A4 inhibitor [see *Drug Interactions (7.1)*, *Clinical Pharmacology (12.3)*].

2.6 Dosage Modifications for Coadministration with Strong or Moderate CYP3A4 Inducers

Avoid coadministration of strong CYP3A4 inducers with VITRAKVI. If coadministration of a strong CYP3A4 inducer cannot be avoided, double the VITRAKVI dose. Additionally, for coadministration with a moderate CYP3A4 inducer, double the VITRAKVI dose. After the inducer has been discontinued for 3 to 5 elimination half-lives, resume the VITRAKVI dose that was used prior to initiating the CYP3A4 inducer [see *Drug Interactions (7.1)*, *Clinical Pharmacology (12.3)*].

2.7 Dosage Modifications for Patients with Hepatic Impairment

Reduce the starting dose of VITRAKVI by 50% in patients with moderate (Child-Pugh B) to severe (Child-Pugh C) hepatic impairment [see *Use in Specific Populations (8.6)*, *Clinical Pharmacology (12.3)*].

2.8 Administration

VITRAKVI capsule or oral solution may be used interchangeably.

Do not make up a missed dose within 6 hours of the next scheduled dose.

If vomiting occurs after taking a dose of VITRAKVI, take the next dose at the scheduled time.

Capsules

Swallow capsules whole with water. Do not chew or crush the capsules.

Oral Solution packaged in one bottle containing 100 mL

- Store the glass bottle of VITRAKVI oral solution in the refrigerator. Discard any unused VITRAKVI oral solution remaining after 90 days of first opening the bottle.
- Prior to preparing an oral dose for administration, refer to the Instructions for Use.

Oral Solution packaged in two bottles each containing 50 mL

- Store the glass bottles of VITRAKVI oral solution in the refrigerator. Discard any unused VITRAKVI oral solution remaining after 31 days of first opening the bottle.
- Prior to preparing an oral dose for administration, refer to the Instructions for Use.

3 DOSAGE FORMS AND STRENGTHS

Capsules

- 25 mg: white opaque hard gelatin capsule, size 2, with blue printing of “BAYER” cross and “25 mg” on body of capsules. 25 mg larotrectinib is equivalent to 30.7 mg larotrectinib sulfate.

- 100 mg: white opaque hard gelatin capsule, size 0, with blue printing of “BAYER” cross and “100 mg” on body of capsule. 100 mg larotrectinib is equivalent to 123 mg larotrectinib sulfate.

Oral Solution packaged in one bottle containing 100 mL

- 20 mg/mL: clear yellow to orange solution. 20 mg/mL larotrectinib is equivalent to 24.6 mg/mL larotrectinib sulfate.

Oral Solution packaged in two bottles each containing 50 mL

- 20 mg/mL: colorless to yellow or orange or red or brownish solution. 20 mg/mL larotrectinib is equivalent to 24.6 mg/mL larotrectinib sulfate.

4 CONTRAINDICATIONS

None.

5 WARNINGS AND PRECAUTIONS

5.1 Central Nervous System Effects

Central nervous system (CNS) adverse reactions occurred in patients receiving VITRAKVI, including dizziness, cognitive impairment, mood disorders, and sleep disturbances.

In patients who received VITRAKVI, all grades CNS effects including cognitive impairment, mood disorders, dizziness and sleep disorders were observed in 42% with Grades 3-4 in 3.9% of patients.

Cognitive impairment occurred in 11% of patients. The median time to onset of cognitive impairment was 5.6 months (range: 2 days to 41 months). Cognitive impairment occurring in $\geq 1\%$ of patients included memory impairment (3.6%), confusional state (2.9%), disturbance in attention (2.9%), delirium (2.2%), cognitive disorders (1.4%), and Grade 3 cognitive adverse reactions occurred in 2.5% of patients. Among the 30 patients with cognitive impairment, 7% required a dose modification, and 20% required dose interruption.

Mood disorders occurred in 14% of patients. The median time to onset of mood disorders was 3.9 months (range: 1 day to 40.5 months). Mood disorders occurring in $\geq 1\%$ of patients included anxiety (5%), depression (3.9%), agitation (2.9%), and irritability (2.9%). Grade 3 mood disorders occurred in 0.4% of patients. Dizziness occurred in 27% of patients, and Grade 3 dizziness occurred in 1.1% of patients. Among the 74 patients who experienced dizziness, 5% of patients required a dose modification, and 5% required dose interruption.

Sleep disturbances occurred in 10% of patients. Sleep disturbances included insomnia (7%), somnolence (2.5%), and sleep disorder (0.4%). There were no Grade 3-4 sleep disturbances. Among the 28 patients who experienced sleep disturbances, 1 patient each (3.6%) required a dose modification or dose interruption.

Advise patients and caretakers of these risks with VITRAKVI. Advise patients not to drive or operate hazardous machinery if they are experiencing neurologic adverse reactions. Withhold or permanently discontinue VITRAKVI based on the severity. If withheld, modify the VITRAKVI dosage when resumed [*see Dosage and Administration (2.3)*].

5.2 Skeletal Fractures

Among 187 adult patients who received VITRAKVI across clinical trials, fractures were reported in 7% and among 92 pediatric patients, fractures were reported in 9% (N=279; 8%). Median time to fracture was 11.6 months (range 0.9 to 45.8 months) in patients followed per fracture. Fractures of the femur, hip or acetabulum were reported in 4 patients (3 adult, 1 pediatric). Most fractures were associated with minimal or moderate trauma. Some fractures were associated with radiologic abnormalities suggestive of local tumor involvement. VITRAKVI treatment was interrupted due to fracture in 1.4% patients.

Promptly evaluate patients with signs or symptoms of potential fracture (e.g., pain, changes in mobility, deformity). There are no data on the effects of VITRAKVI on healing of known fractures or risk of future fractures.

5.3 Hepatotoxicity

Hepatotoxicity including drug-induced liver injury (DILI) has been reported in patients taking VITRAKVI.

In patients who received VITRAKVI, increased AST of any grade occurred in 52% of patients and increased ALT of any grade occurred in 45%. Grade 3-4 increased AST or ALT occurred in 3.1% and 2.5% of patients, respectively [see *Adverse Reactions (6.1)*]. The median time to onset of increased AST was 2.1 months (range: 1 day to 4.3 years). The median time to onset of increased ALT was 2.3 months (range: 1 day to 4.2 years). Increased AST and ALT leading to dose modifications occurred in 1.4% and 2.2% of patients, respectively. Increased AST or ALT led to permanent discontinuation in 3 (1.1%) of patients.

There have been reports in adult patients from clinical studies and postmarketing cases of Grade ≥ 2 increases in ALT and/or AST with increases in bilirubin $\geq 2 \times$ ULN.

Obtain liver function tests (ALT, AST, ALP and bilirubin) before initiation of VITRAKVI and monitor every 2 weeks during the first 2 months of treatment, then monthly thereafter, or more frequently following the occurrence of Grade 2 or greater AST or ALT elevation. Temporarily withhold, reduce the dose, or permanently discontinue VITRAKVI based on severity [see *Dosage and Administration (2.4)*].

5.4 Embryo-Fetal Toxicity

Based on literature reports in human subjects with congenital mutations leading to changes in TRK signaling, findings from animal studies, and its mechanism of action, VITRAKVI can cause fetal harm when administered to a pregnant woman. Larotrectinib resulted in malformations in rats and rabbits at maternal exposures that were approximately 11- and 0.7-times, respectively, those observed at the clinical dose of 100 mg twice daily. Advise women of the potential risk to a fetus. Advise females of reproductive potential to use an effective method of contraception during treatment and for 1 week after the last dose of VITRAKVI [see *Use in Specific Populations (8.1, 8.3)*].

6 ADVERSE REACTIONS

The following clinically significant adverse reactions are described elsewhere in the labeling:

- Central Nervous System Effects [see *Warnings and Precautions (5.1)*]

- Skeletal Fractures [see *Warnings and Precautions* (5.2)]
- Hepatotoxicity [see *Warnings and Precautions* (5.3)]

6.1 Clinical Trial Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

Unless noted, data in WARNINGS AND PRECAUTIONS and below reflects exposure to VITRAKVI in 279 patients, including 54% patients exposed for greater than 6 months and 30% patients exposed for greater than 1 year. VITRAKVI was studied in one adult dose-finding trial [LOXO-TRK-14001 (n = 75)], one pediatric dose-finding trial [SCOUT (n = 88)], and one single arm trial [NAVIGATE (n = 116)]. All patients had an unresectable or metastatic solid tumor and no satisfactory alternative treatment options or disease progression following treatment.

Across these 279 patients, the median age was 46 years (range: 0.1 days to 84 years); 33% were younger than 18 years; 48% were male; and 74% were White, 9% were Hispanic/Latino, 7% were Asian and, 6% were Black. The most common tumors ($\geq 3\%$) in order of decreasing frequency were soft tissue sarcoma (17%), thyroid (13%), infantile fibrosarcoma (12%), primary central nervous system (CNS) (11%), salivary gland (9%), lung (9%), colon (6%), breast (4%), or melanoma (3%). *NTRK* gene fusions were confirmed or inferred in 75% of VITRAKVI-treated patients. Most adults (86%) received VITRAKVI 100 mg orally twice daily and 85% of pediatrics (< 18 years) received VITRAKVI 100 mg/m² twice daily up to a maximum dose of 100 mg twice daily. The dose ranged from 50 mg daily to 200 mg twice daily in adults and 9.6 mg/m² twice daily to 120 mg/m² twice daily in pediatrics [see *Use in Specific Populations* (8.4)].

The most common adverse reactions ($\geq 20\%$), including laboratory abnormalities, in order of decreasing frequency were increased AST, increased ALT, anemia, musculoskeletal pain, fatigue, hypoalbuminemia, neutropenia, increased alkaline phosphatase, cough, leukopenia, constipation, diarrhea, dizziness, hypocalcemia, nausea, vomiting, pyrexia, lymphopenia, and abdominal pain.

The most common serious adverse reactions ($\geq 2\%$) were pneumonia and pyrexia. Grade 3 or 4 adverse reactions occurred in 53% of patients; adverse reactions leading to dose interruption or modification occurred in 39% and 8% of patients, respectively, and 9% permanently discontinued VITRAKVI for adverse reactions.

The most common adverse reactions (1% each) that resulted in permanent discontinuation of VITRAKVI were increased ALT, increased AST, dehydration and fatigue.

The most common adverse reactions ($\geq 3\%$) resulting in dose interruption were increased ALT (4.7%), increased AST (4.3%), and neutrophil count decreased (4.3%). Most (70%) adverse reactions leading to dose interruption occurred during the first three months of exposure.

Adverse reactions of VITRAKVI occurring in $\geq 10\%$ of patients and laboratory abnormalities worsening from baseline in $\geq 20\%$ of patients are summarized in Table 3 and Table 4, respectively.

Table 3 Adverse Reactions Occurring in $\geq 10\%$ of Patients Treated with VITRAKVI

Adverse Reaction*	VITRAKVI N = 279	
	All Grades** (%)	Grade 3-4*** (%)
Musculoskeletal and Connective Tissue		
Musculoskeletal Pain ¹	42	3.9
Muscular weakness	10	0.7
General		
Fatigue ²	36	2.5
Pyrexia	24	1.8
Edema ³	19	0.7
Respiratory, Thoracic and Mediastinal		
Cough ⁴	32	0.4
Dyspnea ⁵	17	3
Upper respiratory tract infection	13	0
Nasal congestion	11	0
Nervous System		
Dizziness ⁶	27	1.1
Headache	15	0.4
Cognitive Impairment ⁷	11	2.5
Gastrointestinal		
Constipation	27	0.4
Diarrhea	27	1.4
Nausea	25	0.7
Vomiting	25	0.7
Abdominal pain ⁸	21	2.2
Skin and Subcutaneous Tissue Disorders		
Rash ⁹	19	0.4
Psychiatric		
Mood disorders ¹⁰	14	0.4
Sleep Disturbance ¹¹	10	0
Investigations		
Increased weight	14	3.6
Metabolism and Nutrition		
Decreased appetite	12	1.4
Infections and Infestations		
Urinary tract infection ¹²	12	1.4

* The adverse reaction identifies a composite term:

¹Includes: arthralgia, back pain, bone pain, musculoskeletal chest pain, musculoskeletal discomfort, musculoskeletal pain, musculoskeletal stiffness, myalgia, neck pain, non-cardiac chest pain, and pain in extremity

²Includes: fatigue, asthenia

³Includes: face edema, generalized edema, lip edema, localized edema, edema, edema genital, edema peripheral, periorbital edema, and swelling

⁴Includes: cough, productive cough, and upper-airway cough syndrome

⁵Includes: dyspnea, and dyspnea exertional

⁶Includes: dizziness, dizziness postural, and vertigo

⁷Includes: amnesia, aphasia, cognitive disorder, confusional state, delirium, disturbance in attention, hallucinations, memory impairment, mental impairment, mental status changes

⁸Includes: abdominal discomfort, abdominal pain, abdominal pain lower, abdominal pain upper, abdominal tenderness, epigastric discomfort, and gastrointestinal pain

⁹Includes: dermatitis, dermatitis acneiform, dermatitis bullous, dermatitis exfoliative generalized, eczema, eczema asteatotic, palmar-plantar erythrodysesthesia syndrome, rash, rash erythematous, rash macular, rash maculo-papular, rash papular, rash pruritic, and rash pustular

¹⁰Includes: agitation, anxiety, depression, depressed mood, euphoric mood, irritability

¹¹Includes: insomnia, sleep disorder, somnolence

¹²Includes: cystitis, escherichia urinary tract infection, pyelonephritis acute, and urinary tract infection

** National Cancer Institute-Common Terminology Criteria for Adverse Events (NCI-CTCAE) v 4.03.

*** One Grade 4 adverse reaction of pyrexia.

Clinically relevant adverse reactions occurring in $\leq 10\%$ of patients include fractures (8%).

Table 4 Laboratory Abnormalities Occurring in $\geq 20\%$ Patients Treated with VITRAKVI

Laboratory Abnormality	VITRAKVI*	
	All Grades (%)**	Grade 3-4 (%)**
Chemistry		
Increased AST	52	3.1
Increased ALT	45	2.5
Hypoalbuminemia	36	1.9
Increased alkaline phosphatase	34	1.9
Hypocalcemia	25	2.6
Hematology		
Anemia	42	10
Neutropenia	36	14
Leukopenia	28	1.9
Lymphopenia	22	6

* Based on NCI CTCAE v4.03

** Denominator for each laboratory parameter is based on the number of patients with a baseline and post-treatment laboratory value available which ranged from 272 to 277 patients.

7 DRUG INTERACTIONS

7.1 Effects of Other Drugs on VITRAKVI

Strong and Moderate CYP3A4 Inhibitors

Coadministration of VITRAKVI with a strong or moderate CYP3A4 inhibitor may increase larotrectinib plasma concentrations, which may result in a higher incidence of adverse reactions [see *Clinical Pharmacology (12.3)*]. Avoid coadministration of VITRAKVI with strong CYP3A4 inhibitors, including grapefruit or grapefruit juice. If coadministration of strong CYP3A4 inhibitors cannot be avoided, modify VITRAKVI dose as recommended [see *Dosage and Administration (2.5)*]. In patients coadministered a moderate CYP3A4 inhibitor with VITRAKVI, monitor for adverse reactions more frequently and reduce the VITRAKVI dosage based on the severity of emergent adverse reactions [see *Dosage and Administration (2.3)*].

Strong and Moderate CYP3A4 Inducers

Coadministration of VITRAKVI with a strong or moderate CYP3A4 inducer may decrease larotrectinib plasma concentrations, which may decrease the efficacy of VITRAKVI [see *Clinical Pharmacology (12.3)*]. Avoid coadministration of VITRAKVI with strong CYP3A4 inducers, including St. John's wort. If coadministration of strong CYP3A4 inducers cannot be avoided, modify VITRAKVI dose as recommended. For coadministration with moderate CYP3A4 inducers, modify VITRAKVI dose as recommended [see *Dosage and Administration (2.6)*].

7.2 Effects of VITRAKVI on Other Drugs

Sensitive CYP3A4 Substrates

Coadministration of VITRAKVI with sensitive CYP3A4 substrates may increase their plasma concentrations, which may increase the incidence or severity of adverse reactions [see *Clinical Pharmacology (12.3)*]. Avoid coadministration of VITRAKVI with sensitive CYP3A4 substrates. If coadministration of these sensitive CYP3A4 substrates cannot be avoided, monitor patients for increased adverse reactions of these drugs.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

Based on literature reports in human subjects with congenital mutations leading to changes in TRK signaling, findings from animal studies, and its mechanism of action [see *Clinical Pharmacology (12.1)*], VITRAKVI can cause embryo-fetal harm when administered to a pregnant woman. There are no available data on VITRAKVI use in pregnant women. Administration of larotrectinib to pregnant rats and rabbits during the period of organogenesis resulted in malformations at maternal exposures that were approximately 11- and 0.7-times, respectively, those observed at the clinical dose of 100 mg twice daily (*see Data*). Advise pregnant women of the potential risk to a fetus.

In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2% to 4% and 15% to 20%, respectively.

Data

Human Data

Published reports of individuals with congenital mutations in TRK pathway proteins suggest that decreases in TRK-mediated signaling are correlated with obesity, developmental delays, cognitive impairment, insensitivity to pain, and anhidrosis.

Animal Data

Larotrectinib crosses the placenta in animals. Larotrectinib did not result in embryoletality at maternally toxic doses [up to 40 times the human exposure based on area under the curve (AUC) at the clinical dose of 100 mg twice daily] in embryo-fetal development studies in pregnant rats dosed during the period of organogenesis; however, larotrectinib was associated with fetal anasarca in rats from dams treated at twice-daily doses of 40 mg/kg [11 times the human exposure (AUC) at the clinical dose of 100 mg twice daily]. In pregnant rabbits, larotrectinib administration was associated with omphalocele at twice-daily doses of 15 mg/kg (0.7 times the human exposure at the clinical dose of 100 mg twice daily).

8.2 Lactation

Risk Summary

There are no data on the presence of larotrectinib or its metabolites in human milk and no data on its effects on the breastfed child or on milk production. Because of the potential for serious adverse reactions in breastfed children, advise women not to breastfeed during treatment with larotrectinib and for 1 week after the last dose.

8.3 Females and Males of Reproductive Potential

Pregnancy Testing

Verify pregnancy status in females of reproductive potential prior to initiating VITRAKVI [see *Use in Specific Populations (8.1)*].

Contraception

VITRAKVI can cause embryo-fetal harm when administered to a pregnant woman [see *Use in Specific Populations (8.1)*].

Females

Advise female patients of reproductive potential to use effective contraception during treatment with VITRAKVI and for 1 week after the last dose.

Males

Advise males with female partners of reproductive potential to use effective contraception during treatment with VITRAKVI and for 1 week after the last dose.

Infertility

Females

Based on histopathological findings in the reproductive tracts of female rats in a 1-month repeated-dose study, VITRAKVI may reduce fertility [See *Nonclinical Toxicology (13.1)*].

8.4 Pediatric Use

The safety and effectiveness of VITRAKVI in pediatric patients was established based upon data from three multicenter, open-label, single-arm clinical trials in adult or pediatric patients 28 days and older [see *Adverse Reactions (6.1)*, *Clinical Studies (14)*].

The efficacy of VITRAKVI was evaluated in 12 pediatric patients and is described in the Clinical Studies section [see *Clinical Studies (14)*]. The safety of VITRAKVI was evaluated in 92 pediatric patients who received VITRAKVI. Of these 92 patients, 36% were <1 month to < 2 years (n = 33), 41% were 2 years to < 12 years (n = 38), and 23% were 12 years to < 18 years (n = 21); 29% had metastatic disease, 42% had locally advanced disease, and 27% had primary CNS; and 86% had received prior treatment for their cancer, including surgery, radiotherapy, or systemic therapy. The most common cancers were infantile fibrosarcoma (37%), primary CNS tumors (27%), soft tissue sarcoma (24%), and thyroid cancer (7%). The median duration of exposure was 7.4 months (range: 0.4 months to 39 months).

Due to the small number of pediatric and adult patients, the single arm design of clinical studies of VITRAKVI, and confounding factors such as differences in susceptibility to infections between pediatric and adult patients, it is not possible to determine whether differences in the incidence of adverse reactions to VITRAKVI are related to patient age or other factors. Adverse reactions occurring more frequently (at least a 10% increase in per-patient incidence) in pediatric patients compared to adult patients were pyrexia (45% versus 13%), vomiting (42% versus 17% in adults), diarrhea (35% versus 23% in adults), rash (28% versus 15% in adults), upper respiratory tract infection (23% versus 8% in adults), nasopharyngitis (16% versus 6% in adults), and otitis media and rhinitis (each 14% versus 0.5% in adults).

Laboratory abnormalities occurring more frequently (at least a 10% increase in per-patient incidence) in pediatric patients compared to adult patients were AST increased (63% versus 49% in adults), neutrophil count decrease (60% versus 16% in adults), leukocyte count decrease (39% versus 27% in adults), hyperkalemia (36% versus 15%), and lymphocyte increase (24% versus 0.5%). Two of the 92 pediatric patients discontinued VITRAKVI due to an adverse reaction (Grade 3 increased ALT and Grade 3 decreased neutrophil count).

The pharmacokinetics of VITRAKVI in the pediatric population were similar to those seen in adults [see *Clinical Pharmacology (12.3)*].

Juvenile Animal Toxicity Data

Larotrectinib was administered in a juvenile toxicity study in rats at twice daily doses of 0.2, 2 and 7.5 mg/kg from postnatal day (PND) 7 to 27 and at twice daily doses of 0.6, 6 and 22.5mg/kg between PND 28 and 70. The dosing period was equivalent to human pediatric populations from newborn to adulthood. The doses of 2/6 mg/kg twice daily [approximately 0.7 times the human exposure (AUC) at the clinical dose of 100 mg twice daily] and 7.5/22.5 mg/kg twice daily (approximately 4 times the human exposure at the clinical dose of 100 mg twice daily) resulted in mortality between PND 9 to 99; a definitive cause of death was not identified in the majority of cases.

The main findings were transient central nervous system-related signs including head flick, tremor, and circling in both sexes. An increase in the number of errors in a maze swim test occurred in females at exposures of approximately 4 times the human exposure (AUC) at the clinical dose of 100 mg twice daily. Decreased growth and delays in sexual development

occurred in the mid- and high-dose groups. Mating was normal in treated animals, but a reduction in pregnancy rate occurred at the high-dose of 7.5/22.5 mg/kg twice daily (approximately 4 times the human exposure at the clinical dose of 100 mg twice daily).

8.5 Geriatric Use

Of 279 patients in the overall safety population who received VITRAKVI, 19% of patients were ≥ 65 years of age and 5% of patients were ≥ 75 years of age. Clinical studies of VITRAKVI did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects.

8.6 Hepatic Impairment

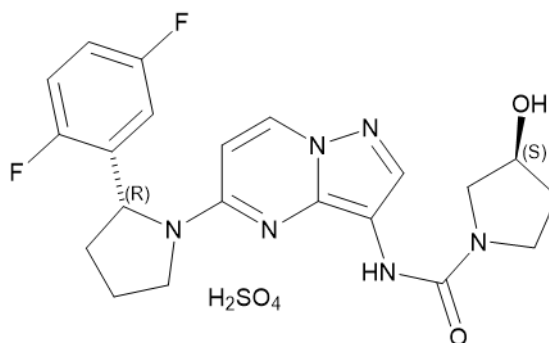
No dose adjustment is recommended for patients with mild hepatic impairment (Child-Pugh A). Larotrectinib clearance was reduced in subjects with moderate (Child-Pugh B) to severe (Child-Pugh C) hepatic impairment [see *Clinical Pharmacology (12.3)*]. Reduce VITRAKVI dose as recommended [see *Dosage and Administration (2.7)*].

8.7 Renal Impairment

No dose adjustment is recommended for patients with renal impairment of any severity [see *Clinical Pharmacology (12.3)*].

11 DESCRIPTION

Larotrectinib is a kinase inhibitor. VITRAKVI (larotrectinib) capsules and oral solution are formulated using larotrectinib sulfate. The molecular formula for larotrectinib sulfate is $C_{21}H_{24}F_2N_6O_6S$ and the molecular weight is 526.51 g/mol for the sulfate salt and 428.44 g/mol for the free base. The chemical name is (3*S*)-*N*-{5-[(2*R*)-2-(2,5-difluorophenyl)-1-pyrrolidinyl]pyrazolo[1,5-*a*]pyrimidin-3-yl}-3-hydroxy-1-pyrrolidinecarboxamide sulfate. Larotrectinib sulfate has the following chemical structure:



Larotrectinib sulfate is an off-white to pinkish yellow solid that is not hygroscopic. The aqueous solubility of larotrectinib at 37°C is pH dependent (very soluble at pH 1.0 and freely soluble at pH 6.8, according to USP descriptive terms of solubility).

VITRAKVI (larotrectinib) capsules and oral solution are for oral use. Each capsule contains 25 mg or 100 mg larotrectinib (30.7 mg and 123 mg larotrectinib sulfate, respectively) in a hard gelatin capsule. The capsule is composed of gelatin, titanium dioxide, and edible ink.

The oral solution packaged in one bottle containing 100 mL contains 20 mg/mL larotrectinib (24.6 mg/mL larotrectinib sulfate) and the following inactive ingredients: purified water, hydroxypropyl betadex, sucrose, glycerin, sorbitol, citric acid, sodium phosphate, sodium citrate dihydrate, propylene glycol and flavoring. Preserved with methylparaben and potassium sorbate.

The oral solution packaged in two bottles each containing 50 mL contains 20 mg/mL larotrectinib (24.6 mg/mL larotrectinib sulfate) and the following inactive ingredients: purified water, hydroxypropyl betadex, sucralose, sodium citrate, strawberry flavor, and citric acid. Preserved with sodium benzoate.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

Larotrectinib is an inhibitor of the tropomyosin receptor kinases (TRK), TRKA, TRKB, and TRKC. In a broad panel of purified enzyme assays, larotrectinib inhibited TRKA, TRKB, and TRKC with IC_{50} values between 5-11 nM. One other kinase TNK2 was inhibited at approximately 100-fold higher concentration. TRKA, B, and C are encoded by the genes *NTRK1*, *NTRK2*, and *NTRK3*. Chromosomal rearrangements involving in-frame fusions of these genes with various partners can result in constitutively-activated chimeric TRK fusion proteins that can act as an oncogenic driver, promoting cell proliferation and survival in tumor cell lines.

In in vitro and in vivo tumor models, larotrectinib demonstrated anti-tumor activity in cells with constitutive activation of TRK proteins resulting from gene fusions, deletion of a protein regulatory domain, or in cells with TRK protein overexpression. Larotrectinib had minimal activity in cell lines with point mutations in the TRKA kinase domain, including the clinically identified acquired resistance mutation, G595R. Point mutations in the TRKC kinase domain with clinically identified acquired resistance to larotrectinib include G623R, G696A, and F617L.

12.2 Pharmacodynamics

Cardiac Electrophysiology

At a dose 9-fold higher than the recommended adult dose, VITRAKVI does not prolong QTc intervals to any clinically relevant extent.

12.3 Pharmacokinetics

The pharmacokinetics of larotrectinib were studied in healthy subjects and adult and pediatric patients with locally advanced or metastatic solid tumors. In healthy subjects who received a single dose of VITRAKVI capsules, systemic exposure (C_{max} and AUC) of larotrectinib was dose proportional over the dose range of 100 mg to 400 mg (1 to 4 times the recommended adult dose) and slightly greater than proportional at doses of 600 mg to 900 mg (6 to 9 times the recommended adult dose). In adult patients who received VITRAKVI capsules 100 mg twice daily in Study LOXO-TRK-14001, peak plasma levels (C_{max}) of larotrectinib were achieved at approximately 1 hour after dosing and steady-state was reached within 3 days. Mean steady-state larotrectinib [coefficient of variation (CV%)] for C_{max} was 788 (81%) ng/mL and AUC_{0-24hr} was 4351 (97%) ng*h/mL.

Absorption

The mean absolute bioavailability of VITRAKVI capsules was 34% (range: 32% to 37%). In healthy subjects, the AUC of VITRAKVI oral solution was similar to that of the capsules and the C_{max} was 36% higher with the oral solution.

Effect of Food

The AUC of larotrectinib was similar and the C_{max} was reduced by 35% after oral administration of a single 100 mg capsule of VITRAKVI to healthy subjects taken with a high-fat meal (approximately 900 calories, 58 grams carbohydrate, 56 grams fat and 43 grams protein) compared to the C_{max} and AUC in the fasted state.

Distribution

The mean (CV%) volume of distribution (V_{ss}) of larotrectinib is 48 (38%) L following intravenous administration of larotrectinib in healthy subjects.

Larotrectinib is 70% bound to human plasma proteins in vitro and binding is independent of drug concentrations. The blood-to-plasma concentration ratio is 0.9.

Elimination

The mean (CV%) clearance (CL/F) of larotrectinib is 98 (44%) L/h and the half-life is 2.9 hours following oral administration of VITRAKVI in healthy subjects.

Metabolism

Larotrectinib is metabolized predominantly by CYP3A4. Following oral administration of a single [^{14}C] radiolabeled 100 mg dose of larotrectinib to healthy subjects, unchanged larotrectinib constituted 19% and an O-linked glucuronide constituted 26% of the major circulating radioactive drug components in plasma.

Excretion

Following oral administration of a single [^{14}C] radiolabeled 100 mg dose of larotrectinib to healthy subjects, 58% (5% unchanged) of the administered radioactivity was recovered in feces and 39% (20% unchanged) was recovered in urine.

Specific Populations

Age (range: 28 days to 82 years), sex, and body weight (range: 3.8 kg to 179 kg) had no clinically meaningful effect on the pharmacokinetics of larotrectinib.

Pediatric Patients

In pediatric patients, the larotrectinib geometric mean (%CV) AUC_{0-24hr} by age subgroup was: 3348 (66%) ng*h/mL in patients 1 month to < 2 years (n = 9), 4135 (36%) ng*h/mL in patients 2 to < 12 years (n = 15), and 3108 (69%) ng*h/mL and in patients 12 to < 18 years (n = 9).

Patients with Renal Impairment

Following oral administration of a single 100 mg dose of VITRAKVI capsules in subjects with end-stage renal disease (e.g., subjects who required dialysis), the AUC_{0-INF} of larotrectinib increased 1.5-fold and C_{max} increased 1.3-fold as compared to that in subjects with normal renal function (creatinine clearance ≥ 90 mL/min as estimated by Cockcroft-Gault). The

pharmacokinetics of VITRAKVI in patients with moderate to severe renal impairment (creatinine clearance ≤ 60 mL/min) have not been studied.

Patients with Hepatic Impairment

Following oral administration of a single 100 mg dose of VITRAKVI capsules, the AUC_{0-Inf} of larotrectinib increased 1.3-fold in subjects with mild hepatic impairment (Child-Pugh A), 2-fold in subjects with moderate hepatic impairment (Child-Pugh B) and 3.2-fold in subjects with severe hepatic impairment (Child-Pugh C) as compared to that in subjects with normal hepatic function. The C_{max} was similar in subjects with mild and moderate hepatic impairment and the C_{max} of larotrectinib increased 1.5-fold in subjects with severe hepatic impairment as compared to that in subjects with normal hepatic function [see *Dosage and Administration (2.7), Use in Specific Populations (8.6)*].

Drug Interaction Studies

Clinical Studies

Effect of CYP3A Inhibitors: Coadministration of a single 100 mg dose of VITRAKVI capsules with itraconazole (strong CYP3A inhibitor) increased the AUC_{0-Inf} of larotrectinib by 4.3-fold and the C_{max} by 2.8-fold as compared to VITRAKVI administered alone [see *Dosage and Administration (2.5), Drug Interactions (7.1)*].

Coadministration of VITRAKVI with fluconazole (moderate CYP3A4 inhibitor) is predicted to increase VITRAKVI steady state AUC by 2.7-fold and C_{max} by 1.9-fold.

Effect of CYP3A Inducers: Coadministration of a single 100 mg dose of VITRAKVI capsules with rifampin (strong CYP3A inducer) decreased the AUC_{0-Inf} of larotrectinib by 81% and the C_{max} by 71% as compared to VITRAKVI administered alone [see *Dosage and Administration (2.6), Drug Interactions (7.1)*].

Coadministration of VITRAKVI with efavirenz (moderate CYP3A4 inducer) is predicted to decrease steady state AUC of VITRAKVI by approximately 72% and C_{max} by 60% compared to VITRAKVI administered alone [see *Dosage and Administration (2.6), Drug Interactions (7.1)*].

Effect of Strong P-glycoprotein (P-gp) Inhibitors: Coadministration of a single 100 mg dose of VITRAKVI capsules with a P-gp inhibitor (rifampin) increased the AUC_{0-Inf} of larotrectinib by 1.7-fold and the C_{max} by 1.8-fold as compared to VITRAKVI administered alone.

Effect of Larotrectinib on CYP3A4 Substrates: Coadministration of VITRAKVI capsules 100 mg twice daily with a sensitive CYP3A4 substrate (midazolam) increased both the AUC_{0-Inf} and C_{max} of midazolam by 1.7-fold as compared to midazolam administered alone. The AUC_{0-Inf} and C_{max} of 1-hydroxymidazolam, the main metabolite of midazolam, were both increased 1.4-fold as compared to when midazolam was administered alone [see *Drug Interactions (7.2)*].

In Vitro Studies

Effect of Transporter on Larotrectinib: Larotrectinib is a substrate for P-gp and BCRP. Larotrectinib is not a substrate of OAT1, OAT3, OCT1, OCT2, OATP1B1, or OATP1B3.

Effect of Larotrectinib on Transporters: Larotrectinib is not an inhibitor of BCRP, P-gp, OAT1, OAT3, OCT1, OCT2, OATP1B1, OATP1B3, BSEP, MATE1 and MATE2-K at clinically relevant concentrations.

Effect of Larotrectinib on CYP Substrates: Larotrectinib is not an inhibitor or inducer of CYP1A2, CYP2B6, CYP2C8, CYP2C9, CYP2C19, or CYP2D6 at clinically relevant concentrations.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Carcinogenicity studies have not been conducted with larotrectinib. Larotrectinib was not mutagenic in the in vitro bacterial reverse mutation (Ames) assays, with or without metabolic activation, or in the in vitro mammalian mutagenesis assays, with or without metabolic activation. In vivo, larotrectinib was negative in the mouse micronucleus test.

Fertility studies with larotrectinib have not been conducted. In a 3-month repeat-dose toxicity study in the rat, larotrectinib had no effects on spermatogenesis at 75 mg/kg/day (approximately 7 times the human exposure at the 100 mg twice daily dose). Additionally, larotrectinib had no histological effects on the male reproductive tract in rats or monkeys at doses resulting in exposures up to 10 times the human exposure (AUC_{0-24hr}) at the 100 mg twice daily clinical dose.

In a 1-month repeat-dose study in the rat, decreased uterine weight and uterine atrophy were seen at 200 mg/kg/day [approximately 45 times the human exposure (AUC) at the 100 mg twice daily dose]. Fewer corpora lutea and increased incidence of anestrus were also noted at doses \geq 60 mg/kg/day (approximately 10 times the human exposure at the 100 mg twice daily dose). Decreased fertility occurred in a juvenile animal study [see *Use in Specific Populations (8.4)*]. There were no findings in female reproductive organs in repeat-dose studies in monkeys at exposures up to 22 times the human exposure at the 100 mg twice daily dose.

13.2 Animal Toxicology and/or Pharmacology

In general toxicology studies conducted in rats and monkeys and in reproductive toxicology studies conducted in rats and rabbits, administration of larotrectinib led to increased food consumption and increased body weight at doses resulting in exposures 0.6 times the human exposure at the 100 mg twice daily clinical dose. Obesity has also been one phenotypic outcome of some human syndromes resulting from congenital mutations in *NTRK2* resulting in altered TRK signaling.

14 CLINICAL STUDIES

The efficacy of VITRAKVI was evaluated in pediatric and adult patients with unresectable or metastatic solid tumors with a *NTRK* gene fusion enrolled in one of three multicenter, open-label, single-arm clinical trials: Study LOXO-TRK-14001 (NCT02122913), SCOUT (NCT02637687), and NAVIGATE (NCT02576431). All patients were required to have progressed following systemic therapy for their disease, if available, or would have required surgery with significant morbidity for locally advanced disease.

Adult patients received VITRAKVI 100 mg orally twice daily and pediatric patients (18 years or younger) received VITRAKVI 100 mg/m² up to a maximum dose of 100 mg orally twice daily until unacceptable toxicity or disease progression. Identification of positive *NTRK* gene fusion status was prospectively determined in local laboratories using next generation sequencing (NGS) or fluorescence in situ hybridization (FISH). *NTRK* gene fusions were inferred in three patients with infantile fibrosarcoma who had a documented *ETV6* translocation identified by FISH. The major efficacy outcome measures were overall response rate (ORR) and duration of

response (DOR), as determined by a blinded independent review committee (BIRC) according to RECIST v1.1.

The assessment of efficacy was based on the first 55 patients with solid tumors with an *NTRK* gene fusion enrolled across the three clinical trials. Baseline characteristics were: median age 45 years (range 4 months to 76 years); 22% <18 years of age, and 78% ≥18 years of age; 53% male; 67% White; 7% Hispanic/Latino, 4% Asian, 4% Black; and ECOG performance status (PS) 0-1 (93%) or 2 (7%). Eighty-two percent of patients had metastatic disease, including patients with brain metastases, and 18% had locally advanced, unresectable disease. Ninety-eight percent of patients had received prior treatment for their cancer, including surgery, radiotherapy, or systemic therapy. Of these, 82% (n = 45) received prior systemic therapy with a median of two prior systemic regimens and 35% (n = 19) received three or more prior systemic regimens. The most common cancers were salivary gland tumors (22%), soft tissue sarcoma (20%), infantile fibrosarcoma (13%), and thyroid cancer (9%). A total of 50 patients had *NTRK* gene fusions detected by NGS and 5 patients had *NTRK* gene fusions detected by FISH.

Efficacy results are summarized in Tables 5, 6, and 7.

Table 5 Efficacy Results for Patients with Solid Tumors Harboring *NTRK* Gene Fusions

Efficacy Parameter	VITRAKVI N = 55
Overall response rate (95% CI)	75% (61%, 85%)
Complete response rate	25%*
Partial response rate	49%
Duration of response (DOR)	N = 41
Median DOR	32.9** (14.8, NE***)
Range (months)	1.6+, 50.6+
% with Observed DOR > 12 months	63%
% with Observed DOR > 24 months	49%

+ Denotes ongoing response.

* 5% were pathological complete response. Patients undergoing a surgical resection whose post-operative pathologic assessment showed no viable tumor cells and negative margins were pathological complete responders provided that no other sites of disease were present.

**Kaplan-Meier estimates

***NE: Not evaluable

Table 6 Efficacy Results by Tumor Type

Tumor Type	Patients (N=55)	ORR		DOR Range (months)
		%	95% CI	
Salivary gland	12	83%	(52%, 98%)	7.7, 44.7+
Soft tissue sarcoma	11	91%	(59%, 100%)	3.6+, 50.6+
Infantile fibrosarcoma	7	100%	(59%, 100%)	1.6+, 28.6+
Thyroid	5	100%	(48%, 100%)	3.7, 32.9
Lung	4	75%	(19%, 99%)	8.2, 36.8+
Melanoma	4	50%	NA	1.9+, 23.2+*
Colon	4	25%	NA	5.6*
Gastrointestinal stromal tumor	3	100%	(29%, 100%)	9.5, 31.1+
Cholangiocarcinoma	2	SD, NE	NA	NA
Appendix	1	SD	NA	NA
Breast	1	PD	NA	NA
Pancreas	1	SD	NA	NA

NA = not applicable due to small numbers or lack of response; CR = complete response; PR = partial response; NE = not evaluable; SD = stable disease; PD = progressive disease; NR = not reached.

+ Denotes ongoing response.

* Observed values at data cutoff, not a range.

Table 7 Efficacy Results by NTRK Fusion Partner

<i>NTRK</i> Partner*	Patients (N=55)	ORR		DOR Range (months)
		%	95% CI	
ETV6-NTRK3	25	84%	(64%, 96%)	3.7, 44.7+
TPM3-NTRK1	9	56%	(21%, 86%)	3.7, 27.5+
LMNA-NTRK1	5	40%	(5%, 85%)	5.6, 50.6+
Inferred ETV6-NTRK3	3	100%	(29%, 100%)	1.6+, 28.6+**
IRF2BP2-NTRK1	2	CR, PR	NA	3.7, 36.8+
SQSTM1-NTRK1	2	pCR, PR	NA	9.9, 12.9+
PDE4DIP-NTRK1	1	PR	NA	3.6+ ***
PPL-NTRK1	1	CR	NA	28.2+ ***
STRN-NTRK2	1	PR	NA	5.6 ***
TPM4-NTRK3	1	pCR	NA	25.6+ ***
TPR-NTRK1	1	PR	NA	8.2 ***
TRIM63-NTRK1	1	PR	NA	1.9+ ***
CTRC-NTRK1	1	SD	NA	NA
GON4L-NTRK1	1	NE	NA	NA
PLEKHA6-NTRK1	1	SD	NA	NA

CR = complete response; PR = partial response; pCR = pathological complete response; NE = not evaluable; SD = stable disease; NA = not applicable; NR = Not reached.

+ Denotes ongoing response.

* Fusion partners identified in the primary analysis set (N=55) may not represent all potential fusion partners.

** Duration of response censored at the time of surgery for one pediatric patient with unresectable infantile fibrosarcoma who underwent resection following partial response and who remained disease-free at data cutoff.

*** Observed values at data cutoff, not a range.

16 HOW SUPPLIED/STORAGE AND HANDLING

Capsules

25 mg: Hard gelatin opaque white capsule size #2 with blue printing of “BAYER” cross and “25 mg” on the body of the capsule.

- 60 count bottle NDC# 50419-390-01

100 mg: Hard gelatin opaque white capsule size #0 with blue printing of “BAYER” cross and “100 mg” on the body of the capsule.

- 60 count bottle NDC# 50419-391-01

Store capsules at room temperature 20°C to 25°C (68°F to 77°F); temperature excursions between 15°C and 30°C (59°F to 86°F) are permitted [see USP Controlled Room Temperature].

Oral Solution Packaged in One Bottle Containing 100 mL

20 mg/mL: Clear yellow to orange solution.

- One bottle containing 100 mL NDC# 50419-392-01

Refrigerate oral solution at 2°C to 8°C (36°F to 46°F). Do not freeze.

Oral Solution Packaged in Two Bottles Each Containing 50 mL

20 mg/mL: Colorless to yellow or orange or red or brownish solution.

- Two bottles each containing 50 mL NDC# 50419-393-03

Refrigerate oral solution at 2°C to 8°C (36°F to 46°F). Do not freeze.

17 PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Patient Information and Instructions for Use).

Central Nervous System Effects

Advise patients to notify their healthcare provider if they experience new or worsening neurotoxicity. Advise patients not to drive or operate hazardous machinery if they are experiencing neurologic adverse reactions [*see Warnings and Precautions (5.1)*].

Skeletal Fractures

Inform patients that bone fractures have been reported in patients taking VITRAKVI. Advise patients to report symptoms such as pain, changes in mobility, or deformity to their healthcare provider [*see Warnings and Precautions (5.2)*].

Hepatotoxicity

Advise patients that they will need to undergo laboratory tests to monitor liver function [*see Warnings and Precautions (5.3)*].

Embryo-Fetal Toxicity

Advise males and females of reproductive potential of the potential risk to a fetus [*see Warnings and Precautions (5.4), Use in Specific Populations (8.1)*].

Advise females of reproductive potential to inform their healthcare provider of a known or suspected pregnancy and to use effective contraception during the treatment with VITRAKVI and for 1 week after the last dose [*see Use in Specific Populations (8.3)*].

Advise males with female partners of reproductive potential to use effective contraception during treatment with VITRAKVI and for 1 week after the last dose [*see Use in Specific Populations (8.3)*].

Lactation

Advise women not to breastfeed during treatment with VITRAKVI and for 1 week following the last dose [*see Use in Specific Populations (8.2)*].

Infertility

Advise females of reproductive potential that VITRAKVI may impair fertility [*See Nonclinical Toxicology (13.1)*].

Drug Interactions

Advise patients and caregivers to inform their healthcare provider of all concomitant medications, including prescription medicines, over-the-counter drugs, vitamins, and herbal products. Inform patients to avoid St. John's wort, grapefruit or grapefruit juice while taking VITRAKVI [see *Drug Interactions (7.1, 7.2)*].

Manufactured for Bayer HealthCare Pharmaceuticals Inc., Whippany, NJ 07981

PATIENT INFORMATION

VITRAKVI (vi trak vee)
(larotrectinib)
capsules

VITRAKVI (vi trak vee)
(larotrectinib)
oral solution

What is VITRAKVI?

VITRAKVI is a prescription medicine that is used to treat adults and children with solid tumors (cancer) that:

- are caused by certain abnormal NTRK genes **and**
- have spread or if surgery to remove their cancer is likely to cause severe complications, **and**
- there is no acceptable treatment option **or** the cancer grew or spread on other treatment.

Your healthcare provider will perform a test to make sure that VITRAKVI is right for you.

It is not known if VITRAKVI is safe and effective in children younger than 28 days of age.

Before taking VITRAKVI, tell your healthcare provider about all of your medical conditions, including if you:

- have liver problems
- have nervous system (neurological) problems
- are pregnant or plan to become pregnant. VITRAKVI can harm your unborn baby. Tell your healthcare provider right away if you become pregnant during treatment with VITRAKVI or think you may be pregnant.
 - If you are able to become pregnant, your healthcare provider may do a pregnancy test before you start treatment with VITRAKVI.
 - **Females who are able to become pregnant** should use effective birth control (contraception) during treatment and for **1 week** after the last dose of VITRAKVI. Talk to your healthcare provider about birth control methods that may be right for you.
 - **Males with female partners who are able to become pregnant** should use effective birth control during treatment with VITRAKVI and for **1 week** after the last dose of VITRAKVI.
- are breastfeeding or plan to breastfeed. It is not known if VITRAKVI passes into your breast milk. Do not breastfeed during treatment and for 1 week after the last dose of VITRAKVI.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Certain other medicines may affect how VITRAKVI works and VITRAKVI may affect how other medicines work. Know the medicines you take. Keep a list of them to show your healthcare provider and pharmacist when you get a new medicine.

How should I take VITRAKVI?

- Take VITRAKVI exactly as your healthcare provider tells you.
- Do not change your dose or stop taking VITRAKVI unless your healthcare provider tells you.
- VITRAKVI comes in capsules and as an oral solution.
- If your healthcare provider prescribes VITRAKVI oral solution:
 - Your healthcare provider will provide you with the VITRAKVI oral solution, oral syringes and bottle adaptors or send you to a pharmacy that can provide you with VITRAKVI oral solution, oral syringes and bottle adaptors.
 - Your healthcare provider should show you how to correctly measure and give a dose of VITRAKVI oral solution.
 - See the detailed Instructions for Use that comes with VITRAKVI oral solution for information about the correct way to measure and give a dose of VITRAKVI oral solution. If you have any questions, talk to your healthcare provider or pharmacist.
- VITRAKVI is usually taken by mouth 2 times a day.
- Swallow VITRAKVI capsules whole with water. Do not chew or crush the capsules.
- Take VITRAKVI with or without food.
- If you vomit after taking a dose of VITRAKVI, wait and take the next dose at your scheduled time.
- If you miss a dose of VITRAKVI, take it as soon as you remember. If your next scheduled dose is due within 6 hours, skip the missed dose and take your next dose at your regular time.
- If you take too much VITRAKVI, call your healthcare provider or go to the nearest hospital emergency room right away.

What should I avoid while taking VITRAKVI?

- VITRAKVI can make you feel dizzy. Do not drive or operate machinery until you know how VITRAKVI affects you.
- Avoid taking St. John's wort, eating grapefruit, or drinking grapefruit juice during treatment with VITRAKVI.

What are the possible side effects of VITRAKVI?

VITRAKVI may cause serious side effects, including:

- **Central nervous system (CNS) problems.** VITRAKVI may cause dizziness, confusion, problems with concentration, attention, and memory, changes in your mood, and sleep problems. Tell your healthcare provider if you develop any of these symptoms or they get worse.
- **Bone fractures.** Bone fractures can happen with VITRAKVI. Tell your healthcare provider if you develop pain, changes in your ability to move around, or bone abnormalities.
- **Liver problems.** Abnormal liver blood tests may occur with VITRAKVI and can sometimes become serious. Your healthcare provider will do blood tests to check your liver function before starting and during treatment with VITRAKVI as needed. Tell your healthcare provider right away if you develop new or worsening symptoms of liver problems including:
 - yellowing of your skin or the white part of your eyes (jaundice)
 - dark or brown urine
 - bruising or bleeding more easily than normal
 - tiredness

- pain in the upper right side of your stomach area (abdomen)
- nausea or vomiting
- loss of appetite

Your healthcare provider may decrease your dose, temporarily stop or permanently stop your treatment with VITRAKVI if you develop serious side effects.

The most common side effects of VITRAKVI include:

- low red blood cell and white blood cell counts
- muscle and bone pain
- tiredness
- low levels of protein called albumin in the blood
- increased levels of enzyme called alkaline phosphatase in the blood (test for liver or bone problems)
- increase in certain liver blood tests
- cough
- constipation
- diarrhea
- dizziness
- low levels of calcium in the blood
- nausea
- vomiting
- fever
- stomach (abdomen) pain

VITRAKVI may affect fertility in females and may affect your ability to become pregnant. Talk to your healthcare provider if this is a concern for you.

These are not all the possible side effects with VITRAKVI. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

How should I store VITRAKVI?

- Store VITRAKVI capsules at room temperature between 68°F to 77°F (20°C to 25°C).
- Store VITRAKVI oral solution in the refrigerator between 36° F to 46° F (2° C to 8° C). Do not freeze.
- Throw away (dispose of) any unused VITRAKVI oral solution:
 - Bottle of 100 mL: remaining 90 days after first opening the bottle
 - Bottle of 50 mL: remaining 31 days after first opening the bottle

Keep VITRAKVI and all medicines out of the reach of children.

General information about the safe and effective use of VITRAKVI.

Medicines are sometimes prescribed for purposes other than those listed in a Patient Information leaflet. Do not use VITRAKVI for a condition for which it was not prescribed. Do not give VITRAKVI to other people, even if they have the same symptoms you have. It may harm them. You can ask your healthcare provider or pharmacist for more information about VITRAKVI that is written for health professionals.

What are the ingredients in VITRAKVI?

Active ingredient: larotrectinib

Inactive ingredients:

Capsule: gelatin, titanium dioxide and edible ink

Oral Solution Packaged in One Bottle Containing 100 mL: purified water, hydroxypropyl betadex, sucrose, glycerin, sorbitol, citric acid, sodium phosphate, sodium citrate dihydrate, propylene glycol and flavoring. Preserved with methylparaben and potassium sorbate.

Oral Solution Packaged in Two Bottles Each Containing 50 mL: purified water, hydroxypropyl betadex, sucralose, sodium citrate, strawberry flavor, and citric acid. Preserved with sodium benzoate.

**This label may not be the latest approved by FDA.
For current labeling information, please visit <https://www.fda.gov/drugsatfda>**

Manufactured for Bayer HealthCare Pharmaceuticals Inc., Whippany, NJ 07981
For more information, go to www.VITRAKVI.com or call 1-888-842-2937

This Patient Information has been approved by the U.S. Food and Drug Administration.

Revised: 11/2023

INSTRUCTIONS FOR USE
VITRAKVI (vi trak vee)
(larotrectinib)
oral solution

Read this Instructions for Use before you take or give a dose of VITRAKVI oral solution for the first time and each time you get a refill. There may be new information. This information does not take the place of talking with your healthcare provider about your medical condition or your treatment.

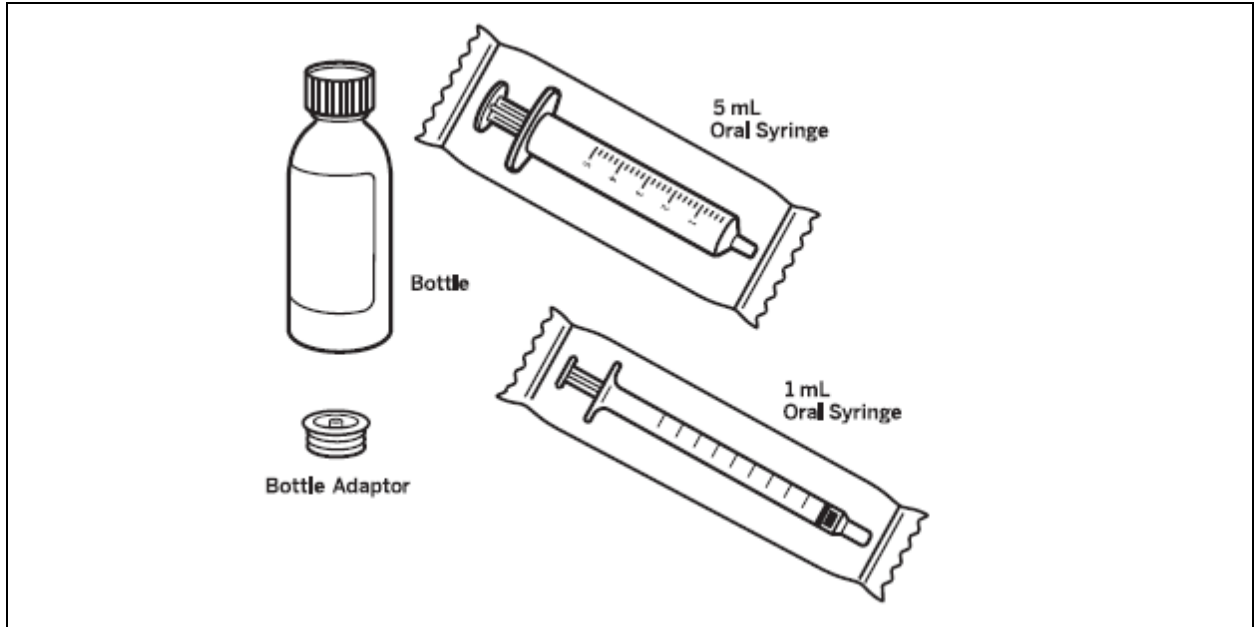
Your healthcare provider should show you how to correctly measure the prescribed dose of VITRAKVI oral solution before you take or give a dose for the first time.

Important information about measuring VITRAKVI oral solution:

- Always use the oral syringes provided with VITRAKVI to make sure that you correctly measure the prescribed dose.
- When you receive VITRAKVI oral solution from your healthcare provider or pharmacist, you will get a box that contains VITRAKVI oral solution. You may receive more than 1 box of VITRAKVI oral solution.
- Your healthcare provider or pharmacist will also provide you bottle adaptors and syringes. You will receive one bottle adaptor per bottle of VITRAKVI oral solution. After inserting the bottle adaptor into the bottle, **do not** remove the bottle adaptor.
- You will receive five 1 mL or 5 mL oral syringes that are marked to help you correctly measure the prescribed dose of VITRAKVI oral solution. Each oral syringe may be used over a 7-day period. **Do not** use a household teaspoon to measure the dose.

Supplies needed to take or give a dose of VITRAKVI oral solution

Figure A



How to prepare a dose of VITRAKVI oral solution:

Step 1: Remove the VITRAKVI oral solution bottle from the box. Place the bottle on a flat work surface. Open the bottle by pushing down firmly on the child-resistant cap and turning it in the direction of the arrow (counter-clockwise) **See Figure B.** **Do not** throw away the child-resistant cap.

Figure B



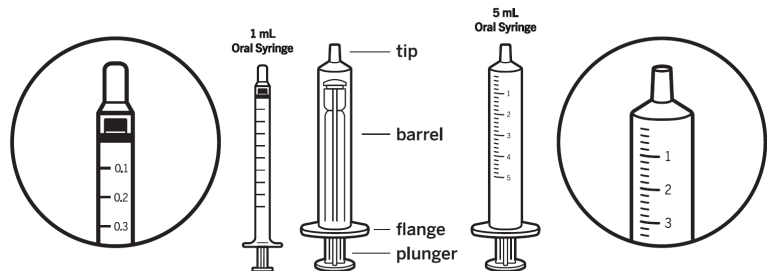
Step 2: Insert the bottle adaptor by pressing it into the bottle neck and make sure it is secure. **See Figure C.** **Do not** remove the bottle adaptor. If the bottle adaptor is missing, talk to your healthcare provider.

Figure C



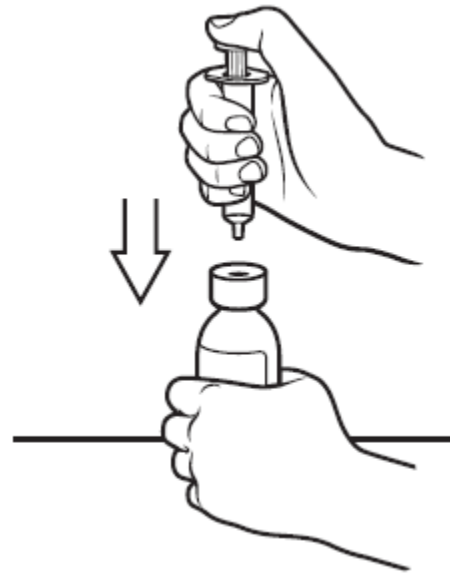
Step 3: Remove the oral syringe from the wrapper. Throw the wrapper away in your household trash. Look at the markings on the barrel of the oral syringe and find the marking that matches the VITRAKVI oral solution dose in mL prescribed by your healthcare provider. **See Figure D.**

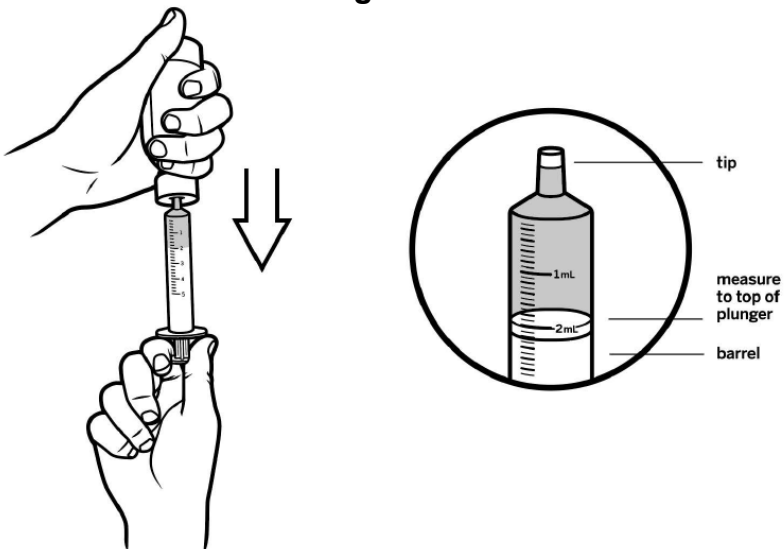
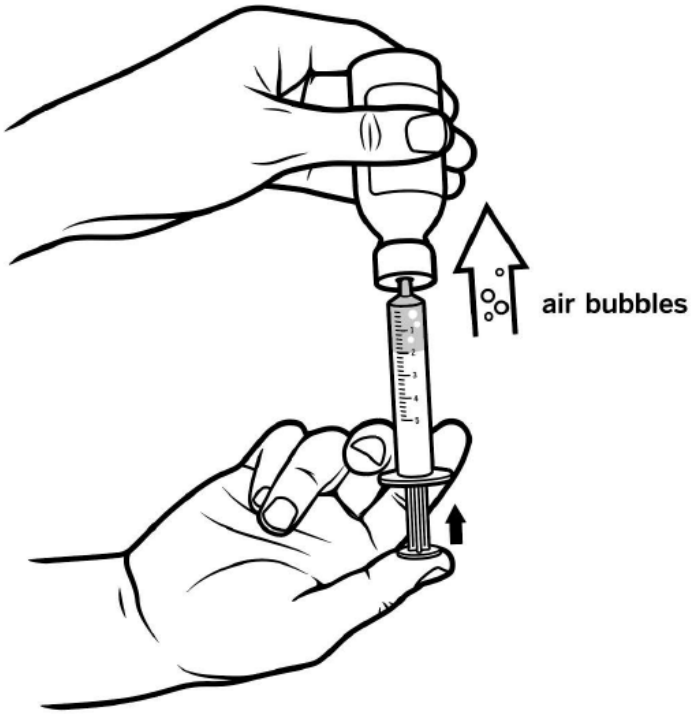
Figure D



Step 4: With the bottle on your flat work surface, use 1 hand to hold the bottle upright. Using your other hand, push the air out of the oral syringe by pushing the plunger down. Then, insert the tip of the oral syringe into the bottle adaptor at the top of the bottle. **See Figure E.** The tip of the oral syringe should fit snugly into the hole of the bottle adaptor.

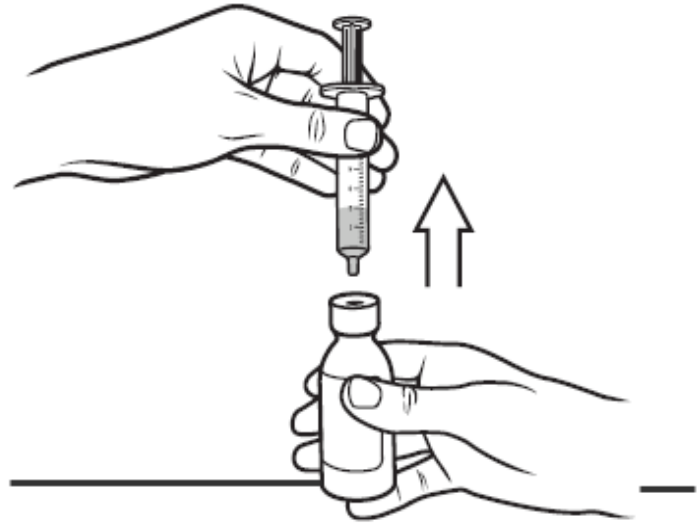
Figure E

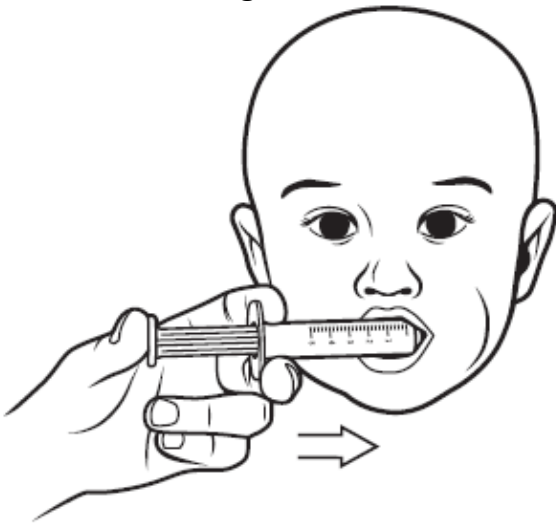
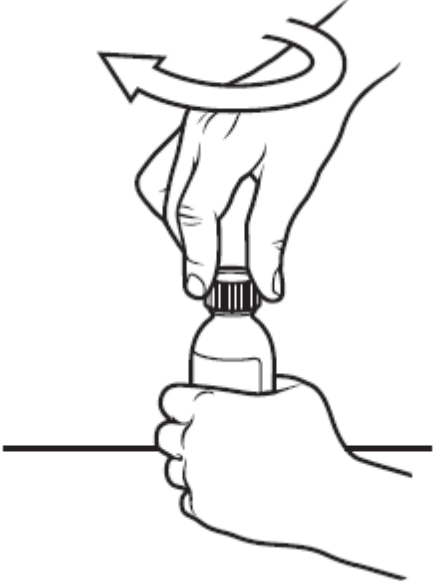


<p>Step 5: Use 1 hand to hold the oral syringe in place. With the other hand, turn the bottle upside down. Pull back on the plunger until the top of the plunger lines up with the marking on the barrel of the oral syringe that matches the dose of VITRAKVI oral solution prescribed by your healthcare provider. See Figure F. Your dose may be different than the dose shown in Figure F.</p>	<p style="text-align: center;">Figure F</p>  <p>The illustration shows a hand holding a syringe vertically. The other hand is shown turning a bottle upside down. A downward-pointing arrow indicates the direction of the bottle. An inset circle provides a magnified view of the syringe barrel. The plunger is positioned at the 2 mL mark. Labels point to the 'tip' of the syringe, the 'barrel', and the 'measure to top of plunger'.</p>
<p>Step 6: Check for air bubbles in the oral syringe. If you see air bubbles, push up gently on the plunger to push any large air bubbles back into the bottle. Then, pull back on the plunger to the prescribed dose. See Figure G.</p>	<p style="text-align: center;">Figure G</p>  <p>The illustration shows a hand holding a syringe vertically. The other hand is shown turning a bottle upside down. An upward-pointing arrow from the plunger is labeled 'air bubbles', indicating the action of pushing air back into the bottle.</p>

Step 7: Turn the bottle upright again and place it on your work surface. Remove the oral syringe from the bottle adaptor by gently pulling up on the syringe barrel. **See Figure H.** Do not push on the plunger during this step. The bottle adaptor should stay attached to the bottle.

Figure H



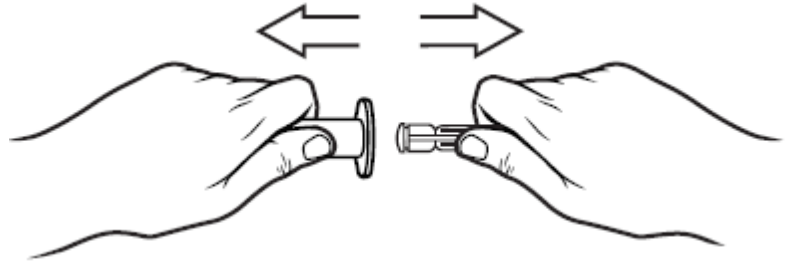
Giving a dose of VITRAKVI oral solution by mouth:	
<p>Step 8: Place the tip of the oral syringe into the child's mouth against the inside of the cheek. Slowly squirt VITRAKVI oral solution into the mouth by pressing down on the plunger and allow the child to swallow. See Figure I.</p> <ul style="list-style-type: none">• The child should be kept in an upright position for a few minutes right after giving a dose of VITRAKVI.• If the child spits up a dose or you are not sure the entire dose was given, do not give another dose. Wait until the next scheduled dose.	<p>Figure I</p>  <p>The illustration shows a hand holding an oral syringe horizontally, with the tip inserted into the child's mouth against the inner cheek. A white arrow points to the right, indicating the direction of the medication flow.</p>
<p>Step 9: Replace the child-resistant cap on the bottle of VITRAKVI oral solution. Do not remove the bottle adaptor. Close the bottle by turning the bottle cap in the direction of the arrow (clockwise). See Figure J.</p>	<p>Figure J</p>  <p>The illustration shows a hand holding a bottle cap over a bottle. A curved arrow above the hand indicates a clockwise rotation to secure the cap.</p>

Cleaning instructions for oral syringes

Follow the instructions below for cleaning the oral syringe (Step 10 through Step 16). After 7 days of use, throw away the oral syringe in your household trash. Use a new oral syringe for the next 7 days.

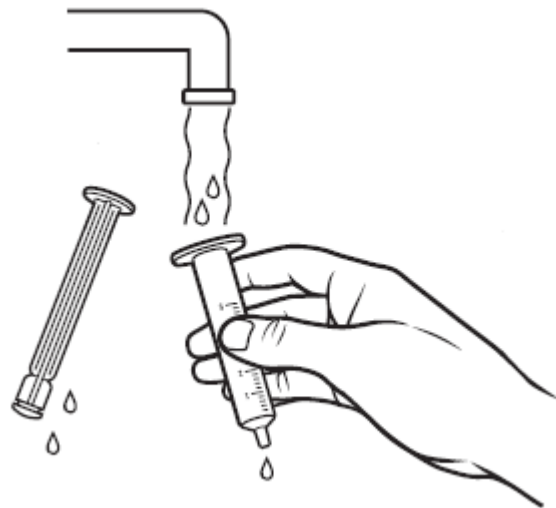
Step 10: Remove plunger from the barrel of the oral syringe. **See Figure K.**

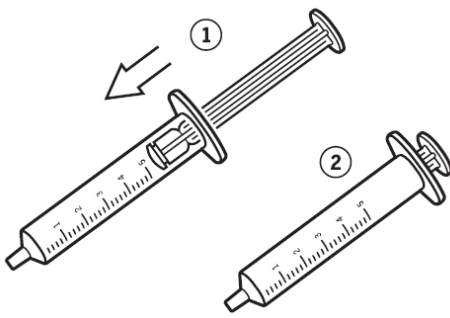
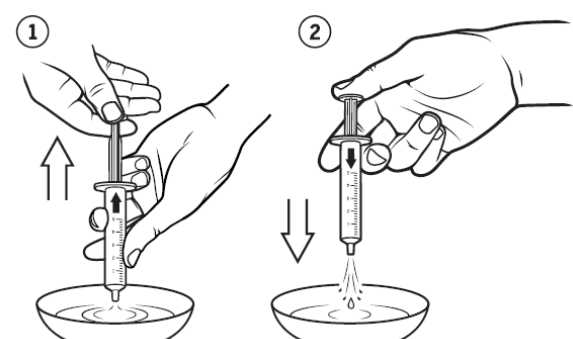
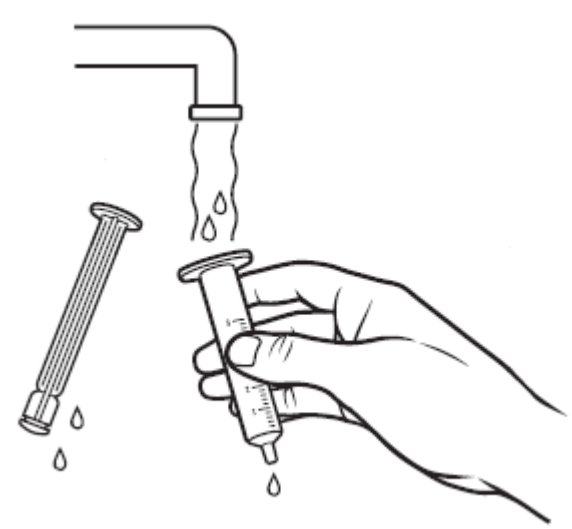
Figure K



Step 11: Rinse the barrel and plunger in warm running water to help make sure that all of the medicine has been removed from the oral syringe. **See Figure L.** **Do not** boil the oral syringe.

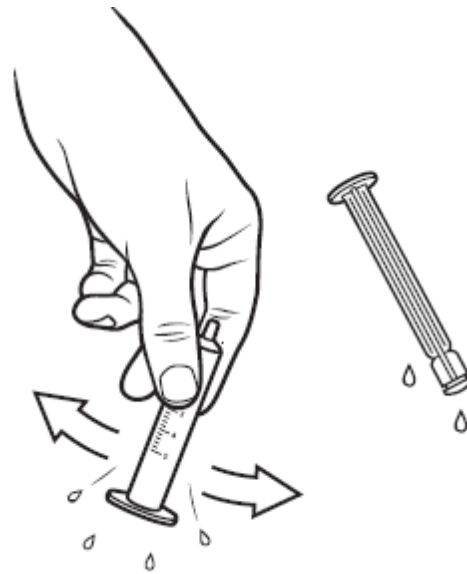
Figure L



<p>Step 12: Re-insert the plunger into the barrel of the oral syringe. See Figure M.</p>	<p>Figure M</p> 
<p>Step 13: Draw warm water several times into the oral syringe and squirt out again until all of the medicine has been removed from the oral syringe. See Figure N.</p>	<p>Figure N</p> 
<p>Step 14: Repeat steps 10 and 11 to rinse the barrel and plunger again with warm water. See Figure O.</p>	<p>Figure O</p> 

Step 15: Shake off excess water or wipe off the outside. **See Figure P.** Place the barrel and plunger on a clean, dry paper towel to dry.

Figure P



Step 16: Repeat step 12 to assemble the oral syringe and store in a clean place until the next use.

Replace the oral syringe after 7 days of use, **or** if:

- there is any damage to the barrel, plunger, or tip
- the dosage marking is no longer clearly recognizable or
- it becomes difficult to move the plunger

How should I store VITRAKVI oral solution?

- Store VITRAKVI oral solution in a refrigerator between 36° F to 46° F (2° C to 8° C). **Do not** freeze.
- Write the date that you opened the bottle of VITRAKVI oral solution on the bottle. **See Figure Q.**
- Throw away (dispose of) any unused VITRAKVI oral solution:
 - Bottle of 100 mL: remaining **90** days after first opening the bottle
 - Bottle of 50 mL: remaining **31** days after first opening the bottle

Keep VITRAKVI oral solution and all medicines out of the reach of children.

Figure Q



Talk to your healthcare provider if you have questions about how to use VITRAKVI oral solution.

For more information, go to www.VITRAKVI.com or call 1-888-842-2937.

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Manufactured for Bayer HealthCare Pharmaceuticals Inc., Whippany, NJ 07981

Revised: 12/2022