

FACT SHEET FOR HEALTHCARE PROVIDERS: EMERGENCY USE AUTHORIZATION FOR ACTEMRA®

HIGHLIGHTS OF EMERGENCY USE AUTHORIZATION (EUA)

These highlights of the EUA do not include all the information needed to use ACTEMRA under the EUA. See the FULL FACT SHEET FOR HEALTHCARE PROVIDERS for ACTEMRA.

ACTEMRA® (tocilizumab) injection, for intravenous use
Original EUA Authorized Date: 06/2021

EUA FOR ACTEMRA (tocilizumab)
The U.S. Food and Drug Administration (FDA) has issued an EUA for the emergency use of ACTEMRA for the treatment of coronavirus disease 2019 (COVID-19) in hospitalized pediatric patients (2 years of age and older) who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or extracorporeal membrane oxygenation (ECMO). However, ACTEMRA is not FDA-approved for this use.

See Full Fact Sheet for Healthcare Providers for the justification for emergency use of drugs during the COVID-19 pandemic, information on available alternatives, and additional information on COVID-19.

DOSAGE AND ADMINISTRATION
The recommended dosage of ACTEMRA is a single 60-minute intravenous infusion as follows:

Patients less than 30 kg weight	12 mg/kg
Patients at or above 30 kg weight	8 mg/kg

If clinical signs or symptoms worsen or do not improve after the first dose, one additional infusion of ACTEMRA may be administered at least 8 hours after the initial infusion.

Maximum dosage in COVID-19 patients is 800 mg per infusion.

Preparation and Administration

- For patients less than 30 kg, dilute to 50 mL in 0.9% or 0.45% Sodium Chloride Injection, USP for intravenous infusion using aseptic technique.
- For patients at or above 30 kg, dilute to 100 mL in 0.9% or 0.45% Sodium Chloride Injection, USP for intravenous infusion using aseptic technique.
- Administer as a single intravenous drip infusion over 1 hour; do not administer as bolus or push.

DOSAGE FORMS AND STRENGTHS
Injection: 80 mg/4 mL (20 mg/mL), 200 mg/10 mL (20 mg/mL), 400 mg/20 mL (20 mg/mL) in single-dose vials for further dilution prior to intravenous infusion (3)

CONTRAINDICATIONS

ACTEMRA is contraindicated in patients with known hypersensitivity to ACTEMRA (4)

WARNINGS AND PRECAUTIONS

- Serious Infections – do not administer ACTEMRA during any other concurrent active infection (5.1)
- Gastrointestinal (GI) perforation – use with caution in patients who may be at increased risk. (5.2)
- Hepatotoxicity – ACTEMRA treatment is not recommended in patients with elevated ALT or AST above 10 times the upper limit of the reference range. (5.3)
- Laboratory monitoring – recommended due to potential consequences of treatment-related changes in neutrophils, platelets, and liver function tests. (5.4)
- Hypersensitivity reactions, including anaphylaxis and death have occurred. (5.5)
- Live vaccines – avoid use with ACTEMRA. (5.8)

ADVERSE REACTIONS

Most common adverse reactions (incidence $\geq 3\%$) are constipation, anxiety, diarrhea, insomnia, hypertension and nausea (6.1)

You or your designee must report all SERIOUS ADVERSE EVENTS or MEDICATION ERRORS potentially related to ACTEMRA (1) by submitting FDA Form 3500 [online](#), (2) by [downloading](#) this form and then submitting by mail or fax, or (3) contacting the FDA at 1-800-FDA-1088 to request this form. Please also provide a copy of this form to Genentech at us_drug.safety@gene.com or call 1-888-835-2555 (6.2).

DRUG INTERACTIONS

Interactions with CYP450 Substrates: Caution should be exercised when co-administering ACTEMRA with CYP3A4 substrate drugs where decrease in effectiveness is undesirable. (7)

USE IN SPECIFIC POPULATIONS

- Pregnancy:** ACTEMRA should be used during pregnancy only if the potential benefit justifies the potential risk for the mother and the fetus. (8.1)
- Lactation:** Breastfeeding individuals with COVID-19 should follow practices according to clinical guidelines to avoid exposing the infant to COVID-19. (8.2)
- Pediatric Use:** ACTEMRA is not authorized or approved for emergency use for the treatment of coronavirus disease 2019 (COVID-19) in pediatric patients less than 2 years of age. (8.4)

See PATIENT AND PARENTS/CAREGIVER FACT SHEET.

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FULL FACT SHEET FOR HEALTHCARE PROVIDERS

1 EMERGENCY USE AUTHORIZATION

The U.S. Food and Drug Administration (FDA) has issued an Emergency Use Authorization (EUA) for the emergency use of ACTEMRA® (tocilizumab) for the treatment of coronavirus disease 2019 (COVID-19) in hospitalized pediatric patients (2 years of age and older) who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or extracorporeal membrane oxygenation (ECMO). However, ACTEMRA is not FDA-approved for use in pediatric patients with COVID-19.

ACTEMRA is authorized only for the duration of the declaration that circumstances exist justifying the authorization of the emergency use of ACTEMRA under section 564(b)(1) of the Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.

Justification for Emergency Use of Drugs During the COVID-19 Pandemic

There is currently an outbreak of Coronavirus Disease 2019 (COVID-19) caused by SARS-CoV-2, a novel coronavirus. The Secretary of Health and Human Services (HHS) has declared that:

- A public health emergency related to COVID-19 has existed since January 27, 2020.
- Circumstances exist justifying the authorization of emergency use of drugs and biological products during the COVID-19 pandemic (March 27, 2020 declaration).

An EUA is an FDA authorization for the emergency use of an unapproved product or unapproved use of an approved product (i.e., drug, biological product, or device) in the United States under certain circumstances including, but not limited to, when the Secretary of HHS declares that there is a public health emergency that affects the national security or the health and security of United States citizens living abroad, and that involves biological agent(s) or a disease or condition that may be attributable to such agent(s). Criteria for issuing an EUA include:

- The biological agent(s) can cause a serious or life-threatening disease or condition;
- Based on the totality of the available scientific evidence (including data from adequate and well-controlled clinical trials, if available), it is reasonable to believe that the product may be effective in diagnosing, treating, or preventing the serious or life-threatening disease or condition;
- The known and potential benefits of the product - when used to diagnose, prevent, or treat such disease or condition - outweigh the known and potential risks of the product, taking into consideration the material threat posed by the biological agent(s); and
- There is no adequate, approved, and available alternative to the product for diagnosing, preventing, or treating the serious or life-threatening disease or condition.

Information Regarding Available Alternatives for the EUA Authorized Use

There is no adequate, approved and available alternative to ACTEMRA for treatment of pediatric patients (2 years of age and older) hospitalized with COVID-19 who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or ECMO. For information on clinical studies of ACTEMRA and other therapies for the treatment of COVID-19, see www.clinicaltrials.gov.

2 DOSAGE AND ADMINISTRATION

2.1 Recommended Dosage for Pediatric Patients with COVID-19

The recommended dosage for emergency use of ACTEMRA authorized under this EUA given as a single 60-minute intravenous infusion is:

Recommended Intravenous Dosage for COVID-19	
Patients less than 30 kg weight	12 mg/kg
Patients at or above 30 kg weight	8 mg/kg

If clinical signs or symptoms worsen or do not improve after the first dose, one additional infusion of ACTEMRA may be administered at least 8 hours after the initial infusion.

Maximum Dosage in COVID-19 patients is 800 mg per infusion.

ACTEMRA subcutaneous administration is not authorized for the treatment of COVID-19 patients.

No dose adjustment is required in patients with mild or moderate renal impairment.

2.2 Preparation and Administration Instructions for Intravenous Infusion

ACTEMRA for intravenous infusion should be diluted by a healthcare professional using aseptic technique as follows:

- Use a sterile needle and syringe to prepare ACTEMRA.
- Patients **less than 30 kg**: use a **50 mL** infusion bag or bottle of 0.9% or 0.45% Sodium Chloride Injection, USP, and then follow steps 1 and 2 below.
- Patients **at or above 30 kg weight**: use a **100 mL** infusion bag or bottle of 0.9% or 0.45% Sodium Chloride Injection, USP, and then follow steps 1 and 2 below.
- Step 1. Withdraw a volume of 0.9% or 0.45% Sodium Chloride Injection, USP, equal to the volume of the ACTEMRA injection required for the patient's dose from the infusion bag or bottle (0.4 mL/kg and 0.6 mL/kg for 8 mg/kg and 12 mg/kg dosages, respectively)
- Step 2. Withdraw the amount of ACTEMRA for intravenous infusion from the vial(s) and add slowly into the 0.9% or 0.45% Sodium Chloride Injection, USP infusion bag or bottle. To mix the solution, gently invert the bag to avoid foaming.
 - The fully diluted ACTEMRA solutions for infusion using 0.9% Sodium Chloride Injection, USP may be stored at 36°F to 46°F (2°C to 8°C) or room temperature for up to 24 hours and should be protected from light.
 - The fully diluted ACTEMRA solutions for infusion using 0.45% Sodium Chloride Injection, USP may be stored at 36°F to 46°F (2°C to 8°C) for up to 24 hours or room temperature for up to 4 hours and should be protected from light.
 - ACTEMRA solutions do not contain preservatives; therefore, unused product remaining in the vials should not be used.
 - Allow the fully diluted ACTEMRA solution to reach room temperature prior to infusion.
 - The infusion should be administered over 60 minutes, and must be administered with an infusion set. Do not administer as an intravenous push or bolus.
 - ACTEMRA should not be infused concomitantly in the same intravenous line with other drugs. No physical or biochemical compatibility studies have been conducted to evaluate the co-administration of ACTEMRA with other drugs.

- Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit. If particulates or discolorations are noted, the product should not be used.
- Fully diluted ACTEMRA solutions are compatible with polypropylene, polyethylene and polyvinyl chloride infusion bags and polypropylene, polyethylene and glass infusion bottles.

3 DOSAGE FORMS AND STRENGTHS

Injection: 80 mg/4 mL, 200 mg/10 mL, 400 mg/20 mL as a clear, colorless to pale yellow solution in 20 mg/mL single-dose vials for further dilution prior to intravenous infusion.

4 CONTRAINDICATIONS

ACTEMRA is contraindicated in patients with known hypersensitivity to ACTEMRA.

5 WARNINGS AND PRECAUTIONS

5.1 Serious Infections

In COVID-19 patients, ACTEMRA should not be administered if patients have any other concurrent active infection, including localized infection.

Serious and sometimes fatal infections due to bacterial, mycobacterial, invasive fungal, viral, protozoal, or other opportunistic pathogens have been reported in patients receiving immunosuppressive agents including ACTEMRA. The most common serious infections included pneumonia, urinary tract infection, cellulitis, herpes zoster, gastroenteritis, diverticulitis, sepsis and bacterial arthritis. Among opportunistic infections, tuberculosis, cryptococcus, aspergillosis, candidiasis, and pneumocystosis were reported with ACTEMRA. Other serious infections, not reported in clinical studies, may also occur (e.g., histoplasmosis, coccidioidomycosis, listeriosis).

The risks and benefits of treatment should be considered prior to initiating ACTEMRA in patients with chronic or recurrent infection, or who have a history of a serious or an opportunistic infection.

Closely monitor patients for the development of signs and symptoms of infection during and after treatment with ACTEMRA, as signs and symptoms of acute inflammation may be lessened due to suppression of the acute phase reactants.

A patient who develops a new infection during treatment with ACTEMRA should undergo a prompt and complete diagnostic workup appropriate for an immunocompromised patient; initiate appropriate antimicrobial therapy, and closely monitor the patient.

5.2 Gastrointestinal Perforations

Events of gastrointestinal perforation have been reported in clinical trials for chronic indications, primarily as complications of diverticulitis, in patients treated with ACTEMRA. Use ACTEMRA with caution in patients who may be at increased risk for gastrointestinal perforation. Promptly evaluate patients presenting with new onset abdominal symptoms for early identification of gastrointestinal perforation.

5.3 Hepatotoxicity

Patients hospitalized with COVID-19 may have elevated alanine aminotransferase (ALT) or aspartate aminotransferase (AST) levels. Multi-organ failure with involvement of the liver is recognized as a complication of severe COVID-19.

During randomized, controlled studies, treatment with ACTEMRA was associated with a higher incidence of transaminase elevations. Serious cases of hepatic injury have been observed in patients taking intravenous or subcutaneous ACTEMRA chronically. In this setting, the time to onset for cases ranged from months to years after treatment initiation with ACTEMRA.

The decision to administer ACTEMRA should balance the potential benefit against the risks of acute treatment with ACTEMRA. ACTEMRA is not recommended in COVID-19 patients with elevated ALT or AST above 10 times the upper limit of the reference range. When ACTEMRA is used for treatment of COVID-19, ALT and AST should be monitored according to current standard clinical practice.

5.4 Laboratory Parameters

In randomized, controlled trials, patients receiving ACTEMRA had higher rates of neutropenia, thrombocytopenia, and elevations of ALT or AST.

ACTEMRA is not recommended in COVID-19 patients with an absolute neutrophil count (ANC) less than 1000 per mm³, platelet count below 50,000 per mm³, or ALT or AST above 10 times the upper limit of the reference range [see *Warnings and Precautions* (5.3)]. Monitor ALT, AST, neutrophils and platelet counts according to current standard clinical practice.

5.5 Hypersensitivity Reactions, Including Anaphylaxis

Hypersensitivity reactions, including anaphylaxis, have been reported in association with ACTEMRA and anaphylactic events with a fatal outcome have been reported with intravenous infusion of ACTEMRA. These events have occurred both with and without previous hypersensitivity reactions and as early as the first infusion of ACTEMRA. ACTEMRA for intravenous use should only be infused by a healthcare professional with appropriate medical support to manage anaphylaxis. If anaphylaxis or other hypersensitivity reaction occurs, stop administration of ACTEMRA immediately and discontinue ACTEMRA permanently. Do not administer ACTEMRA to patients with known hypersensitivity to ACTEMRA.

5.6 Demyelinating Disorders

The impact of treatment with ACTEMRA on demyelinating disorders is not known, but multiple sclerosis and chronic inflammatory demyelinating polyneuropathy were reported rarely in rheumatoid arthritis clinical studies. Monitor patients for signs and symptoms potentially indicative of demyelinating disorders. Prescribers should exercise caution in considering the use of ACTEMRA in patients with preexisting or recent onset demyelinating disorders.

5.7 Active Hepatic Disease and Hepatic Impairment

ACTEMRA is not recommended in patients with active hepatic disease or hepatic impairment.

5.8 Vaccinations

Avoid use of live vaccines concurrently with ACTEMRA as clinical safety has not been established. The interval between live vaccinations and initiation of ACTEMRA therapy should be in accordance with current vaccination guidelines regarding immunosuppressive agents.

No data are available on the secondary transmission of infection from persons receiving live vaccines to patients receiving ACTEMRA.

No data are available on the effectiveness of vaccination in patients receiving ACTEMRA.

Refer to Section 5 **Warnings and Precautions** of the FDA-approved Prescribing Information for additional safety information on risks associated with chronic use of ACTEMRA.

6 ADVERSE REACTIONS

The following clinically significant adverse reaction is described elsewhere in the Fact Sheet:

- Serious Infections [see *Warnings and Precautions* (5.1)]

6.1 Adverse Reactions from Clinical Studies

The following adverse reactions have been observed in the clinical studies of ACTEMRA that supported EUA. The adverse reaction rates observed in the clinical studies of ACTEMRA used to support this EUA cannot be directly compared to rates in the clinical studies of ACTEMRA for rheumatoid arthritis, giant cell arteritis, systemic sclerosis-associated interstitial lung disease, polyarticular juvenile idiopathic arthritis, systemic juvenile idiopathic arthritis, and cytokine release syndrome and may not reflect the rates observed in clinical practice.

The safety of ACTEMRA in hospitalized COVID-19 adult patients was evaluated in a pooled safety population that includes patients enrolled in EMPACTA, COVACTA, AND REMDACTA. The analysis of adverse reactions included a total of 974 patients exposed to ACTEMRA. Patients received a single, 60-minute infusion of intravenous ACTEMRA 8 mg/kg (maximum dose of 800 mg). If clinical signs or symptoms worsened or did not improve, one additional dose of ACTEMRA 8 mg/kg could be administered between 8- 24 hours after the initial dose.

Adverse reactions summarized in **Table 1** occurred in at least 3% of ACTEMRA-treated patients and more commonly than in patients on placebo in the pooled safety population.

Table 1 Adverse Reactions¹ Identified From the Pooled COVID-19 Safety Population

Adverse Reaction	ACTEMRA 8 mg per kg N = 974 (%)	Placebo N = 483 (%)
Hepatic Transaminases increased	10%	8%
Constipation	9 %	8%
Urinary tract infection	5%	4%
Hypertension	4%	1%

Hypokalaemia	4%	3%
Anxiety	4%	2%
Diarrhea	4%	2%
Insomnia	4%	3%
Nausea	3%	2%

¹ Patients are counted once for each category regardless of the number of reactions

In the pooled safety population, the rates of infection/serious infection events were 30%/19% in patients receiving ACTEMRA versus 32%/23% receiving placebo.

Laboratory Abnormalities

In the pooled safety population of EMPACTA, COVACTA, and REMDACTA, neutrophil counts <1000 cells/mcl occurred in 3.4% of patients who received ACTEMRA and 0.5% of patients who received placebo. Platelet counts <50,000 cells/mcl occurred in 3.2% of patients who received ACTEMRA and 1.5% of patients who received placebo. ALT or AST at or above 5x ULN occurred in 11.7% of patients who received ACTEMRA and 9.9% of patients who received placebo.

Refer to Section 6 **Adverse Reactions** of the FDA-approved Prescribing Information for additional information on adverse reactions associated with chronic use of ACTEMRA.

6.2 Required Reporting for Serious Adverse Events and Medication Errors

The prescribing healthcare provider and/or the provider's designee is/are responsible for mandatory reporting of all serious adverse events* and medication errors potentially related to ACTEMRA within 7 calendar days from the healthcare provider's awareness of the event, using FDA Form 3500 (for information on how to access this form, see below). The FDA requires that such reports, using FDA Form 3500, include the following:

- Patient demographics and baseline characteristics (e.g., patient identifier, age or date of birth, gender, weight, ethnicity, and race)
- A statement "ACTEMRA use for COVID-19 under Emergency Use Authorization (EUA)" under the **"Describe Event, Problem, or Product Use/Medication Error"** heading
- Information about the serious adverse event or medication error (e.g., signs and symptoms, test/laboratory data, complications, timing of drug initiation in relation to the occurrence of the event, duration of the event, treatments required to mitigate the event, evidence of event improvement/disappearance after stopping or reducing the dosage, evidence of event reappearance after reintroduction, clinical outcomes).
- Patient's preexisting medical conditions and use of concomitant products
- Information about the product (e.g., dosage, route of administration, NDC #).

Submit adverse event and medication error reports, using Form 3500, to FDA MedWatch using one of the following methods:

- Complete and submit the report online: www.fda.gov/medwatch/report.htm
- Complete and submit a postage-paid FDA Form 3500 (<https://www.fda.gov/media/76299/download>) and return by:
 - Mail to MedWatch, 5600 Fishers Lane, Rockville, MD 20852-9787, or
 - Fax to 1-800-FDA-0178, or

- Call 1-800-FDA-1088 to request a reporting form

In addition, please provide a copy of all FDA MedWatch forms to:

Genentech US Drug Safety

Fax: 1-650-238-6067 or 1-650-225-4630

E-mail: us_drug.safety@gene.com or call Genentech at 1-[888-835-2555](tel:888-835-2555) to report adverse events.

The prescribing health care provider and/or the provider's designee is/are responsible for mandatory responses to requests from FDA for information about adverse events and medication errors following receipt of ACTEMRA.

*Serious adverse events are defined as:

- Death;
- A life-threatening adverse event;
- Inpatient hospitalization or prolongation of existing hospitalization;
- A persistent or significant incapacity or substantial disruption of the ability to conduct normal life functions;
- A congenital anomaly/birth defect;
- Other important medical event, which may require a medical or surgical intervention to prevent death, a life-threatening event, hospitalization, disability, or congenital anomaly.

7 DRUG INTERACTIONS

7.1 Interactions with CYP450 Substrates

Inhibition of IL-6 may lead to increased metabolism of drugs that are CYP450 substrates. Caution should be exercised when co-administering ACTEMRA with CYP3A4 substrate drugs where decrease in effectiveness is undesirable. The effect of ACTEMRA on CYP450 enzyme activity may persist for several weeks after stopping therapy.

Refer to Section 7.2 **Drug Interactions** of the FDA-approved Prescribing Information for ACTEMRA for further details.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Pregnancy Exposure Registry

There is a pregnancy exposure registry that monitors pregnancy outcomes in women exposed to ACTEMRA during pregnancy. Healthcare providers are encouraged to register patients and pregnant women are encouraged to register themselves by calling 1-877-311-8972.

Risk Summary

The limited available data with ACTEMRA in pregnant women are not sufficient to determine whether there is a drug-associated risk for major birth defects and miscarriage. ACTEMRA should be used during pregnancy only if the potential benefit justifies the potential risk for the mother and the fetus.

Refer to Section 8.1 **Pregnancy** of the FDA-approved Prescribing Information for additional information on risks and data associated with chronic use of ACTEMRA.

8.2 Lactation

Risk Summary

No information is available on the presence of tocilizumab in human milk, the effects of the drug on the breastfed infant, or the effects of the drug on milk production. Maternal immunoglobulin G (IgG) is present in human milk. If tocilizumab is transferred into human milk, the effects of local exposure in the gastrointestinal tract and potential limited systemic exposure in the infant to tocilizumab are unknown. The lack of clinical data during lactation precludes clear determination of the risk of ACTEMRA to an infant during lactation; therefore the developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for ACTEMRA and the potential adverse effects on the breastfed child from tocilizumab or from the underlying maternal condition. Breastfeeding individuals with COVID-19 should follow practices according to clinical guidelines to avoid exposing the infant to COVID-19.

8.4 Pediatric Use

The FDA has granted an EUA for the emergency use of ACTEMRA for the treatment of COVID-19 in hospitalized pediatric patients 2 years of age and older who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or ECMO. Pediatric use is supported by evidence justifying emergency use of ACTEMRA for the treatment of COVID-19 in hospitalized adults who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or ECMO, as well as safety and dosing information of ACTEMRA in pediatric patients for other uses. [see *Dosage and Administration* (2), *Clinical Studies* (14)].

ACTEMRA is not authorized or approved for the emergency use for pediatric patients younger than 2 years of age.

11 DESCRIPTION

Tocilizumab is a recombinant humanized anti-human interleukin 6 (IL-6) receptor monoclonal antibody of the immunoglobulin IgG1κ (gamma 1, kappa) subclass with a typical H₂L₂ polypeptide structure. Each light chain and heavy chain consists of 214 and 448 amino acids, respectively. The four polypeptide chains are linked intra- and inter-molecularly by disulfide bonds. ACTEMRA has a molecular weight of approximately 148 kDa. The antibody is produced in mammalian (Chinese hamster ovary) cells.

ACTEMRA (tocilizumab) injection is a sterile, clear, colorless to pale yellow, preservative-free solution for further dilution prior to intravenous infusion with a pH of approximately 6.5. Each single-dose vial, formulated with a disodium phosphate dodecahydrate/sodium dihydrogen phosphate dihydrate buffered solution, is available at a concentration of 20 mg/mL containing 80 mg/4 mL, 200 mg/10 mL, or 400 mg/20 mL of ACTEMRA. Each mL of solution contains polysorbate 80 (0.5 mg), sucrose (50 mg), and Water for Injection, USP.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

Tocilizumab binds specifically to both soluble and membrane-bound IL-6 receptors (sIL-6R and mIL-6R), and has been shown to inhibit IL-6-mediated signaling through these receptors. IL-6 is a pleiotropic pro-inflammatory cytokine produced by a variety of cell types including T- and B-cells, lymphocytes, monocytes and fibroblasts. IL-6 has been shown to be involved in diverse physiological processes such as T-cell activation, induction of immunoglobulin secretion, initiation of hepatic acute phase protein synthesis, and stimulation of hematopoietic precursor cell proliferation and differentiation.

12.2 Pharmacodynamics

Refer to Section 12.2 **Pharmacodynamics** of the FDA-approved Prescribing Information for additional information on pharmacodynamics data associated with chronic use of ACTEMRA.

12.3 Pharmacokinetics

The pharmacokinetics of tocilizumab in COVID-19 adult patients was estimated by a population pharmacokinetic analysis of a dataset composed of 380 adult patients treated with 8 mg/kg intravenously. For one dose of 8 mg/kg intravenous tocilizumab, the estimated median (range) C_{max} and C_{day28} of tocilizumab were 151 (77.5-319) mcg/mL and 0.229 (0.00119-19.4) mcg/mL, respectively. For two doses of 8 mg/kg intravenous tocilizumab separated by 8 hours, the estimated median (range) C_{max} of tocilizumab was 290 (152-604) mcg/mL.

Distribution

In COVID-19 adult patients treated with one or two infusions of 8 mg/kg intravenously separated by 8 hours, the estimated central volume of distribution was 4.52 L, and the estimated peripheral volume of distribution was 4.23 L, resulting in a volume of distribution of 8.75 L.

Elimination

In COVID-19 adult patients, serum concentrations were below the limit of quantification after 35 days on average following one infusion of intravenous 8 mg/kg. The average linear clearance in the population pharmacokinetic analysis was estimated to be 17.6 mL per hour in patients with baseline ordinal scale category 3 (OS 3, patients requiring supplemental oxygen), 22.5 mL per hour in patients with baseline OS 4 (patients requiring high-flow oxygen or non-invasive ventilation), 29 mL per hour in patients with baseline OS 5 (patients requiring mechanical ventilation), and 35.4 mL per hour in patients with baseline OS 6 (patients requiring extracorporeal membrane oxygenation (ECMO) or mechanical ventilation and additional organ support).

Specific Populations

In COVID-19 adult patients, exposure following body-weight-based intravenous dosing (8 mg/kg tocilizumab up to 100 kg body weight with a maximum dose of 800 mg tocilizumab) was dependent on body weight and disease severity. Within a specified OS category, compared to patients with a mean body weight of 80 kg, exposure was 20% lower in patients weighing less than 60 kg. Exposure in patients weighing more than 100 kg was in the same range as exposure in patients with a mean

body weight of 80 kg. For an 80 kg patient, exposure decreases as disease severity increases; for each category increase on the OS, exposure decreases consistently by 13%.

Refer to Section 12.3 **Pharmacokinetics** of the FDA-approved Prescribing Information for additional information on pharmacokinetics associated with chronic use of ACTEMRA.

14 CLINICAL STUDIES

14.1 Clinical Trials in Hospitalized Patients with COVID-19

The efficacy of ACTEMRA for the treatment of COVID-19 was based on RECOVERY (NCT04381936), a randomized, controlled, open-label, platform study, and supported by the results from EMPACTA (NCT04372186), a randomized, double-blind, placebo-controlled study. Results of two other randomized, double-blind, placebo-controlled studies, COVACTA (NCT04320615) and REMDACTA (NCT04409262), which evaluated the efficacy of ACTEMRA for the treatment of COVID-19 are also summarized.

RECOVERY (Randomised Evaluation of COVID-19 Therapy) Collaborative Group Study in Hospitalized Adults Diagnosed with COVID-19

RECOVERY was a randomized, controlled, open-label, multicenter platform study conducted in the United Kingdom to evaluate the efficacy and safety of potential treatments in hospitalized adult patients with severe COVID-19 pneumonia. Eligible patients for the ACTEMRA portion of the study had clinically suspected or laboratory-confirmed SARS-CoV-2 infection and no medical contraindications to any of the treatments and had clinical evidence of progressive COVID-19 (defined as oxygen saturation <92% on room air or receiving oxygen therapy, and CRP \geq 75 mg/L). Patients were then randomized to receive either standard of care (SoC) or intravenous ACTEMRA at a weight-tiered dosing comparable to the recommended dosage in addition to SoC.

Efficacy analyses were performed in the intent-to-treat (ITT) population comprising 4116 adult patients who were randomized to the ACTEMRA + SoC arm (n=2022) or to the SoC arm (n=2094). The mean age of participants was 64 years (range: 20 to 101), and patients were 67% male, 76% White, 11% Asian, 3% Black or African American, and 1% mixed race. At baseline, 0.2% of patients were not on supplemental oxygen, 45% of patients required low flow oxygen, 41% of patients required non-invasive ventilation or high-flow oxygen, and 14% of patients required invasive mechanical ventilation; 82% of patients were reported to be receiving systemic corticosteroids.

The primary efficacy endpoint was time to death through Day 28. The results for the overall population and the subgroups of patients who were or were not receiving systemic corticosteroids at time of randomization are summarized in Table 2.

Table 2 Mortality through Day 28 in RECOVERY

	ACTEMRA+ SoC N=2022 n (%)¹	SoC N=2094 n (%)¹	Hazard Ratio (95% CI)	Risk Difference (95% CI)
Mortality	621 (30.7%)	729 (34.9%)	0.85 (0.76, 0.94) p= 0.0028 ¹	-4.1% (-7.0, -1.3)
By baseline receipt of corticosteroid use				

Mortality for patients receiving systemic corticosteroids at randomization ²	482/1664 (29.0%)	600/1721 (34.9%)	0.79 (0.70, 0.89)	-5.9% (-9.1, -2.8)
Mortality for patients not receiving systemic corticosteroids at randomization ²	139/357 (39.0%)	127/367 (34.6%)	1.16 (0.91, 1.48)	4.4% (-2.6, 11.5)

¹ P-value reflects that the RECOVERY trial primary analysis results were statistically significant at the two-sided significance level of $\alpha = 0.05$.

² Probabilities of dying by Day 28 were estimated by the Kaplan-Meier method.

EMPACTA

EMPACTA was a randomized, double-blind, placebo-controlled, multicenter study to evaluate intravenous ACTEMRA 8mg/kg in combination with SoC in hospitalized, non-ventilated adult patients with COVID-19 pneumonia. Eligible patients were at least 18 years of age, had confirmed SARS-CoV-2 infection by a positive reverse-transcriptase polymerase chain reaction (RT-PCR) result, had pneumonia confirmed by radiography, and had SpO₂ < 94% on ambient air.

Of the 389 patients who were randomized, efficacy analyses were performed in the modified intent-to-treat (mITT) population comprising 377 patients who were randomized and received study medication (249 in the ACTEMRA arm; 128 in the placebo arm). The mean age of participants was 56 years (range 20-95); 59% of patients were male, 56% were of Hispanic or Latino ethnicity, 53% were White, 20% were American Indian/Alaska Native, 15% were Black/African American and 2% were Asian. At baseline, 9% patients were not on supplemental oxygen, 64% patients required low flow oxygen and 27% patients required high-flow oxygen and 73% were on corticosteroids.

The primary efficacy endpoint evaluated time to progression to mechanical ventilation or death through Day 28. The hazard ratio comparing ACTEMRA to placebo was 0.56 (95% CI, 0.33 to 0.97), a statistically significant result (log-rank, p-value = 0.036). The cumulative proportion of patients who required mechanical ventilation or died by Day 28 was 12.0% (95% CI, 8.5% to 16.9%) in the ACTEMRA arm and 19.3% (95% CI, 13.3% to 27.4%) in the placebo arm.

Mortality at Day 28 was 10.4% in the ACTEMRA arm versus 8.6% in the placebo arm (weighted difference (ACTEMRA arm - placebo arm): 2.0% [95% CI, -5.2% to 7.8%]).

COVACTA

COVACTA was a randomized, double-blind, placebo-controlled, multicenter study to evaluate intravenous ACTEMRA 8 mg/kg in combination with SoC for the treatment of adult patients hospitalized with severe COVID-19 pneumonia. The study randomized 452 patients who were at least 18 years of age with confirmed SARS-CoV-2 infection by a positive RT-PCR result, had pneumonia confirmed by radiography, and had oxygen saturation of 93% or lower on ambient air or a ratio of arterial oxygen partial pressure to fractional inspired oxygen of 300 mmHg or less. At baseline, 3% of patients were not on supplemental oxygen, 28% were on low flow oxygen, 30% were on non-invasive ventilation or high flow oxygen, 38% were on invasive mechanical ventilation, and 22% were on

corticosteroids. The primary efficacy endpoint was clinical status on Day 28 assessed on a 7-category ordinal scale that ranged from “discharged” to “death.” There were no statistically significant differences observed in the distributions of clinical status on the 7-category ordinal scale at Day 28 when comparing the ACTEMRA arm to the placebo arm.

Mortality at Day 28 was 19.7% in the ACTEMRA arm versus 19.4% in the placebo arm (weighted difference (ACTEMRA arm - placebo arm): 0.3% [95% CI, -7.6 to 8.2]).

REMDACTA

REMDACTA was a randomized, double-blind, placebo-controlled, multicenter study to evaluate intravenous ACTEMRA 8 mg/kg in combination with intravenous remdesivir (RDV) 200 mg on Day 1 followed by 100 mg once daily for a total of 10 days in hospitalized patients with severe COVID-19 pneumonia. The study randomized 649 adult patients with SARS-CoV-2 infection confirmed by a positive polymerase chain reaction (PCR) result, pneumonia confirmed by radiography, and who required supplemental oxygen > 6 L/min to maintain SpO₂ >93%. At baseline, 7% of patients were on low flow oxygen, 80% were on non-invasive ventilation or high flow oxygen, 14% were on invasive mechanical ventilation, and 84% were on corticosteroids.

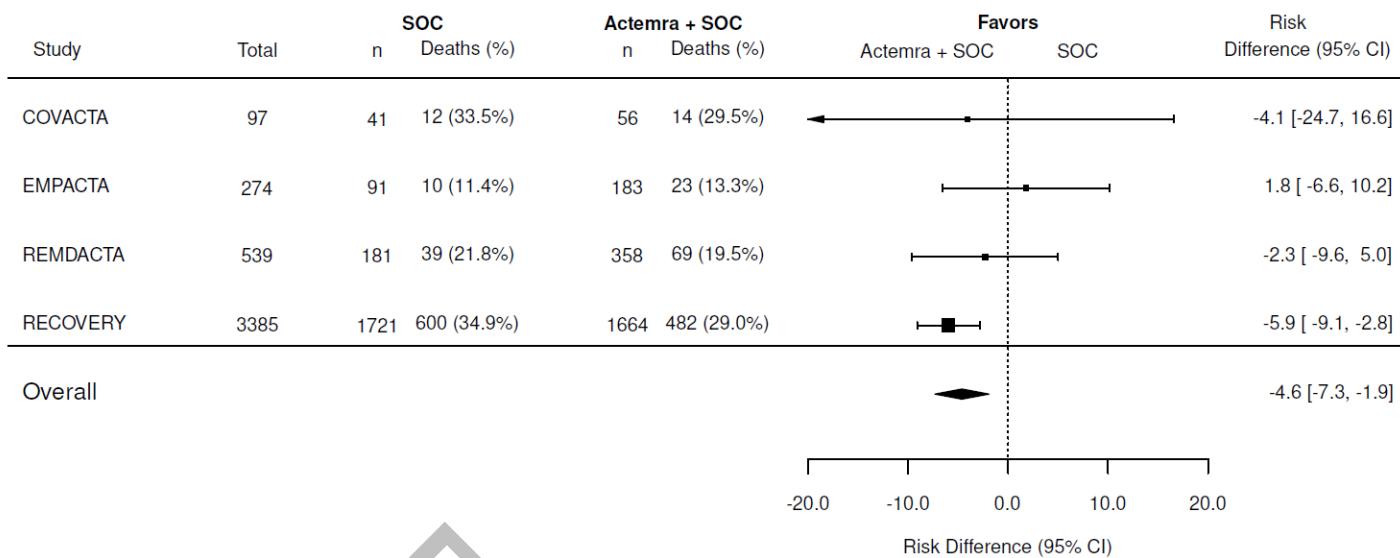
The primary efficacy endpoint was time from randomization to hospital discharge or “ready for discharge” up to Day 28. There were no statistically significant differences observed between treatment arms with respect to time to hospital discharge or “ready for discharge” through Day 28.

Mortality at Day 28 was 18.1% in the ACTEMRA + RDV arm versus 19.5% in the placebo + RDV arm (weighted difference [ACTEMRA arm - placebo arm]: -1.3% [95% CI, -7.8% to 5.2%]).

Mortality Across Trials in Patients Receiving Baseline Corticosteroids

A study-level meta-analysis was conducted on EMPACTA, COVACTA, REMDACTA and RECOVERY studies. For each of the four studies, the risk difference through Day 28 was estimated by the Kaplan-Meier method in the subgroup of patients receiving baseline corticosteroids, summarized in Figure 1. Patients from the RECOVERY trial represent 78.8% of the total sample size in this meta-analysis. The combined risk difference showed that ACTEMRA treatment (n=2261) resulted in a 4.6% absolute reduction in the risk of death at Day 28 (risk difference=-4.6%; 95% CI: -7.3% to -1.9%) compared to SoC (n=2034).

Figure 1. Risk Differences Through Day 28 Baseline Corticosteroid Use Subpopulation in RECOVERY, EMPACTA, COVACTA, REMDACTA studies



16 HOW SUPPLIED/STORAGE AND HANDLING

How Supplied

ACTEMRA (tocilizumab) injection is a preservative-free, sterile clear, colorless to pale yellow solution. Under this EUA, ACTEMRA is supplied as 80 mg/4 mL (NDC 50242-135-01), 200 mg/10 mL (NDC 50242-136-01), and 400 mg/20 mL (NDC 50242-137-01) individually packaged 20 mg/mL single-dose vials for further dilution prior to intravenous infusion.

Storage and Handling

Do not use beyond expiration date on the container or package. ACTEMRA must be refrigerated at 36°F to 46°F (2°C to 8°C). Do not freeze. Protect the vials from light by storage in the original package until time of use.

17 PATIENT COUNSELING INFORMATION

As a healthcare practitioner, you must communicate to the patient and/or caregiver information consistent with the “FACT SHEET FOR PATIENTS, PARENTS AND CAREGIVERS” (https://www.gene.com/download/pdf/actemra_eua_patient_fact_sheet.pdf) and provide them with a copy of this Fact Sheet prior to administration of ACTEMRA. However, if providing this information will delay the administration of ACTEMRA to a degree that would endanger the life of a patient, the information must be provided to the parent and/or caregiver as soon as feasible after ACTEMRA administration.

18 MANUFACTURER INFORMATION

Manufactured by Genentech, Inc., A Member of the Roche Group, 1 DNA Way, South San Francisco, CA 94080-4990

To access the most recent ACTEMRA COVID-19 Fact Sheets and authorization letter, visit <https://www.actemrahcp.com/covid-19>.