

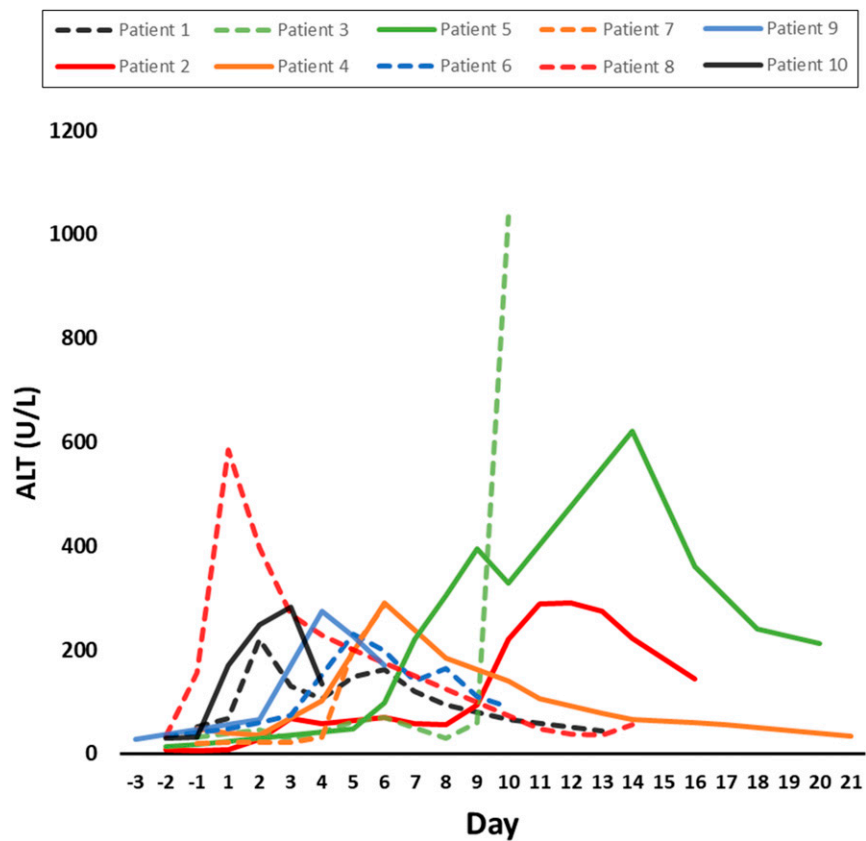
Supplemental Information

RESEARCH AND SUPPORT STAFF

The study authors and Gilead Sciences express our enormous gratitude to the staff at each hospital who risked their lives to care for patients with COVID-19. This study would not have been possible without their heroic efforts. We regret that we are unable to list the support staff at every hospital that took part in this study.

REMDESIVIR COMPASSIONATE-USE ELIGIBILITY REVIEW TEAM

The review team comprised Claudio Avila, Paul Brennan-Benson, Mark Bresnik, Sofia Caetano, Christoph Carter, Adam DeZure, Gabriele Forcina, Armando Gonzalez-Ruiz, Candido Hernandez, Jason Hindman, Kavita Juneja, Ioannis Katsarolis, Neal Marshall, Hal Martin, Christopher Ng, Sabrinel Sahali, Alan Smith, Susanna Tan, and Harout Tossonian.



SUPPLEMENTAL FIGURE 4

ALT levels in patients with grade 3 or 4 elevations ($>5 \times$ upper limit of normal). Patients 1, 2, 4, and 6 completed 10 days of remdesivir, patient 3 completed 9 days, patient 5 completed 8 days, patient 9 completed 7 days, patient 7 completed 5 days, and patients 8 and 10 received a single dose. We show all available data for each patient through 21 days.

SUPPLEMENTAL TABLE 3 Clinicians Who Treated Children in the Remdesivir Compassionate-Use Program

| Provider | Country | Institution |
|-----------------------------|----------------|---|
| Margaret Aldrich | United States | The Children's Hospital at Montefiore |
| David Goldman | United States | The Children's Hospital at Montefiore |
| Andres Camacho-Gonzalez | United States | Children's Healthcare of Atlanta, Egleston Hospital |
| Stefan Hagmann | United States | Cohen Children's Medical Center of New York |
| Ana Mendez | Spain | Hospital Universitario La Paz |
| Massimo Puoti | Italy | Ospedale Niguarda |
| Alasdair Bamford | United Kingdom | Great Ormond Street Hospital |
| Sejal Bhavsar | United States | Hackensack University Medical Center |
| Steven Coleman | United States | Maimonides Medical Center |
| Daniel Conway | United States | St Christopher's Hospital for Children |
| Saul Hymes | United States | Stony Brook University Hospital |
| Milunka Kojic | United States | Mount Sinai Hospital |
| Mari Nakamura | United States | Boston Children's Hospital |
| Gholamabbas Ostovar | United States | Cohen Children's Medical Center |
| Sujatha Rajan | United States | Cohen Children's Medical Center of New York |
| Karen Acker | United States | New York-Presbyterian Hospital |
| Rabia Agha | United States | Maimonides Medical Center |
| Mehreen Arshad | United States | Ann and Robert H. Lurie Children's Hospital of Chicago |
| Aryeh Baer | United States | Hackensack University Medical Center |
| Joseph Barney | United States | University of Alabama at Birmingham |
| Christy Beneri | United States | Stony Brook University Hospital |
| Joe Brierley | United Kingdom | Great Ormond Street Hospital |
| Dana Byrne | United States | Cooper University Hospital |
| Mara Chavolla | United States | Maimonides Medical Center |
| John Christenson | United States | Riley Hospital for Children |
| Blanca Rosich del Cacho | Spain | Hospital Universitari Joan XXIII |
| Cecilia Maria Di Pentima | United States | Morristown Medical Center |
| Jonathan Fish | United States | Cohen Children's Medical Center of New York |
| Hayley Gans | United States | Stanford University |
| Sunanda Gaur | United States | Robert Wood Johnson University Hospital |
| Ghostine Ghida | France | CHU Amiens-Picardie |
| Louis Grandjean | United Kingdom | Great Ormond Street Hospital |
| Pilar Guerra | Spain | Hospital Universitario La Paz |
| Uzma Hasan | United States | Saint Barnabas Medical Center |
| Rosa Maria Hernandez Palomo | Spain | Hospital Quiron Madrid |
| Alicia Herrera | United States | Rocky Mountain Hospital for Children |
| Garrett Hunt | United States | Nationwide Children's Hospital |
| Jason Kessler | United States | Morristown Medical Center |
| Graham Krasan | United States | Beaumont Hospital |
| Gabriella Lamb | United States | Boston Children's Hospital |
| Giuseppe Lapadula | Italy | Ospedale San Gerardo di Monza |
| Beatriz Larru | United Kingdom | Alder Hey Children's Hospital |
| Sidharth Mahapatra | United States | Children's Hospital and Medical Center |
| David Moreno Perez | Spain | Hospital Regional Universitario de Malaga |
| Karyn Moshal | United States | Great Ormond Street Hospital |
| Sarah Parker | United States | Children's Hospital Colorado |
| Rebecca Pellett Madan | United States | NYU Langone |
| Vanessa Raabe | United States | Bellevue Hospital Center |
| Linette Sande-Lopez | United States | Loma Linda University Children's Hospital |
| Alpana Waghmare | United States | Seattle Children's Hospital |
| Patricia Whitley-Williams | United States | Robert Wood Johnson University Hospital |
| James Wood | United States | Riley Hospital for Children |
| Dominik Wulf | Germany | University Hospital Duesseldorf, Children's Hospital |
| Philip Zachariah | United States | Morgan Stanley Children's Hospital of New York-Presbyterian |

NYU, New York University.

SUPPLEMENTAL TABLE 4 Comorbid Medical Conditions

| Condition ^a | n (%) | | |
|--------------------------------------|----------------------------|-------------------------------|----------------|
| | Baseline Invasive (n = 39) | Baseline Noninvasive (n = 38) | Total (N = 77) |
| Obesity | 5 (12.8) | 5 (13.2) | 10 (13) |
| Asthma | 1 (2.6) | 6 (15.8) | 7 (9.1) |
| Seizure | 5 (12.8) | 2 (5.3) | 7 (9.1) |
| Autism spectrum disorder | 4 (10.3) | 1 (2.6) | 5 (6.5) |
| Premature infant | 5 (12.8) | — | 5 (6.5) |
| Cerebral palsy | 3 (7.7) | 1 (2.6) | 4 (5.2) |
| Developmental delay | 2 (5.1) | 1 (2.6) | 3 (3.9) |
| Sleep apnea syndrome | 1 (2.6) | 2 (5.3) | 3 (3.9) |
| Acute lymphocytic leukemia | — | 2 (5.3) | 2 (2.6) |
| Acute respiratory failure | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| B-cell-type acute leukemia | — | 2 (5.3) | 2 (2.6) |
| Bone marrow transplant | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Bronchiectasis | 2 (5.1) | — | 2 (2.6) |
| Eczema | — | 2 (5.3) | 2 (2.6) |
| Epilepsy | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Failure to thrive | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Hypothyroidism | 2 (5.1) | — | 2 (2.6) |
| Lennox-Gastaut syndrome | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Pneumonia | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Primary immunodeficiency syndrome | 2 (5.1) | — | 2 (2.6) |
| Sickle cell disease | — | 2 (5.3) | 2 (2.6) |
| Trisomy 21 | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Vitamin D deficiency | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Acute lymphocytic leukemia recurrent | — | 1 (2.6) | 1 (1.3) |
| Acute myeloid leukemia | — | 1 (2.6) | 1 (1.3) |
| Alveolar rhabdomyosarcoma | — | 1 (2.6) | 1 (1.3) |
| Aortic dilatation | 1 (2.6) | — | 1 (1.3) |
| Aortic valve incompetence | 1 (2.6) | — | 1 (1.3) |
| Aortic valve stenosis | 1 (2.6) | — | 1 (1.3) |
| <i>Aspergillus</i> infection | — | 1 (2.6) | 1 (1.3) |
| Atrial septal defect | — | 1 (2.6) | 1 (1.3) |
| Atrioventricular block | 1 (2.6) | — | 1 (1.3) |
| Atrioventricular block second degree | 1 (2.6) | — | 1 (1.3) |
| Atrioventricular septal defect | — | 1 (2.6) | 1 (1.3) |
| ADHD | — | 1 (2.6) | 1 (1.3) |
| B precursor type acute leukemia | — | 1 (2.6) | 1 (1.3) |
| Bacterial tracheitis | 1 (2.6) | — | 1 (1.3) |
| Bronchiolitis | 1 (2.6) | — | 1 (1.3) |
| Bronchomalacia | — | 1 (2.6) | 1 (1.3) |
| Cardiac arrest | 1 (2.6) | — | 1 (1.3) |
| Cardiac failure | 1 (2.6) | — | 1 (1.3) |
| Cardiac failure acute | 1 (2.6) | — | 1 (1.3) |
| Cerebral disorder | 1 (2.6) | — | 1 (1.3) |
| Chronic respiratory disease | — | 1 (2.6) | 1 (1.3) |
| Chronic respiratory failure | 1 (2.6) | — | 1 (1.3) |

SUPPLEMENTAL TABLE 4 Continued

| Condition ^a | n (%) | | Total (N = 77) |
|---|----------------------------|-------------------------------|----------------|
| | Baseline Invasive (n = 39) | Baseline Noninvasive (n = 38) | |
| Congenital cardiovascular anomaly | 1 (2.6) | — | 1 (1.3) |
| Congenital central nervous system anomaly | 1 (2.6) | — | 1 (1.3) |
| Congestive cardiomyopathy | 1 (2.6) | — | 1 (1.3) |
| Coronavirus infection | 1 (2.6) | — | 1 (1.3) |
| Cortisol deficiency | 1 (2.6) | — | 1 (1.3) |
| CTLA4 deficiency | — | 1 (2.6) | 1 (1.3) |
| Deep vein thrombosis | — | 1 (2.6) | 1 (1.3) |
| Dermatomyositis | 1 (2.6) | — | 1 (1.3) |
| Diabetes insipidus | 1 (2.6) | — | 1 (1.3) |
| Double inlet left ventricle | 1 (2.6) | — | 1 (1.3) |
| Drug hypersensitivity | — | 1 (2.6) | 1 (1.3) |
| End stage renal disease | — | 1 (2.6) | 1 (1.3) |
| Epilepsy with myoclonic-atonic seizures | 1 (2.6) | — | 1 (1.3) |
| Essential hypertension | — | 1 (2.6) | 1 (1.3) |
| Face edema | 1 (2.6) | — | 1 (1.3) |
| Tetralogy of Fallot | — | 1 (2.6) | 1 (1.3) |
| Febrile convulsion | — | 1 (2.6) | 1 (1.3) |
| Febrile neutropenia | — | 1 (2.6) | 1 (1.3) |
| Fetal chromosome abnormality | 1 (2.6) | — | 1 (1.3) |
| Fragile X syndrome | — | 1 (2.6) | 1 (1.3) |
| Glucose tolerance impaired | — | 1 (2.6) | 1 (1.3) |
| Graft versus host disease | — | 1 (2.6) | 1 (1.3) |
| Hodgkin's disease | — | 1 (2.6) | 1 (1.3) |
| Hypertrophic cardiomyopathy | — | 1 (2.6) | 1 (1.3) |
| Hypogammaglobulinemia | — | 1 (2.6) | 1 (1.3) |
| Hypophagia | — | 1 (2.6) | 1 (1.3) |
| Hypopituitarism | 1 (2.6) | — | 1 (1.3) |
| Hypotension | 1 (2.6) | — | 1 (1.3) |
| Hypotonia | 1 (2.6) | — | 1 (1.3) |
| Hypoxic-ischemic encephalopathy | 1 (2.6) | — | 1 (1.3) |
| Immune thrombocytopenic purpura | 1 (2.6) | — | 1 (1.3) |
| Immunodeficiency | 1 (2.6) | — | 1 (1.3) |
| Immunodeficiency common variable | — | 1 (2.6) | 1 (1.3) |
| Immunosuppression | 1 (2.6) | — | 1 (1.3) |
| Intellectual disability | — | 1 (2.6) | 1 (1.3) |
| Interruption of aortic arch | 1 (2.6) | — | 1 (1.3) |
| Interstitial lung disease | 1 (2.6) | — | 1 (1.3) |
| Iron deficiency anemia | — | 1 (2.6) | 1 (1.3) |
| Ischemic cardiomyopathy | 1 (2.6) | — | 1 (1.3) |
| Kidney angiomyolipoma | 1 (2.6) | — | 1 (1.3) |
| Left ventricular dysfunction | 1 (2.6) | — | 1 (1.3) |

SUPPLEMENTAL TABLE 4 Continued

| Condition ^a | n (%) | | |
|---------------------------------------|----------------------------|-------------------------------|----------------|
| | Baseline Invasive (n = 39) | Baseline Noninvasive (n = 38) | Total (N = 77) |
| Leukopenia | — | 1 (2.6) | 1 (1.3) |
| Lymphopenia | — | 1 (2.6) | 1 (1.3) |
| Malnutrition | — | 1 (2.6) | 1 (1.3) |
| Microcytosis | — | 1 (2.6) | 1 (1.3) |
| Mitochondrial cytopathy | — | 1 (2.6) | 1 (1.3) |
| Movement disorder | 1 (2.6) | — | 1 (1.3) |
| Multiple sclerosis | — | 1 (2.6) | 1 (1.3) |
| Myelodysplastic syndrome | 1 (2.6) | — | 1 (1.3) |
| Myocarditis | — | 1 (2.6) | 1 (1.3) |
| Nephropathy | — | 1 (2.6) | 1 (1.3) |
| Nonalcoholic fatty liver disease | — | 1 (2.6) | 1 (1.3) |
| Nonalcoholic steatohepatitis | — | 1 (2.6) | 1 (1.3) |
| Optic nerve hypoplasia | 1 (2.6) | — | 1 (1.3) |
| Overweight | — | 1 (2.6) | 1 (1.3) |
| Pachygyria | 1 (2.6) | — | 1 (1.3) |
| Pancreatic failure | — | 1 (2.6) | 1 (1.3) |
| Pancreatitis necrotizing | — | 1 (2.6) | 1 (1.3) |
| Patent ductus arteriosus | — | 1 (2.6) | 1 (1.3) |
| Pneumonia adenoviral | — | 1 (2.6) | 1 (1.3) |
| Pneumonia respiratory syncytial viral | — | 1 (2.6) | 1 (1.3) |
| Pneumonia staphylococcal | 1 (2.6) | — | 1 (1.3) |
| Prader-Willi syndrome | 1 (2.6) | — | 1 (1.3) |
| Proteinuria | — | 1 (2.6) | 1 (1.3) |
| Pulmonary congestion | 1 (2.6) | — | 1 (1.3) |
| Pulmonary hypertension | — | 1 (2.6) | 1 (1.3) |
| Quadriplegia | 1 (2.6) | — | 1 (1.3) |
| Seborrheic dermatitis | — | 1 (2.6) | 1 (1.3) |
| Seizure-like phenomena | — | 1 (2.6) | 1 (1.3) |
| Separation anxiety disorder | — | 1 (2.6) | 1 (1.3) |
| Septo-optic dysplasia | 1 (2.6) | — | 1 (1.3) |
| Staphylococcal scalded skin syndrome | — | 1 (2.6) | 1 (1.3) |
| Stomatitis | 1 (2.6) | — | 1 (1.3) |
| Supraventricular tachycardia | — | 1 (2.6) | 1 (1.3) |
| Systemic lupus erythematosus | 1 (2.6) | — | 1 (1.3) |
| Temperature regulation disorder | 1 (2.6) | — | 1 (1.3) |
| Tethered cord syndrome | 1 (2.6) | — | 1 (1.3) |
| Tracheitis | 1 (2.6) | — | 1 (1.3) |
| Transposition of the great vessels | 1 (2.6) | — | 1 (1.3) |
| Tuberous sclerosis complex | 1 (2.6) | — | 1 (1.3) |
| Type 1 diabetes mellitus | — | 1 (2.6) | 1 (1.3) |
| Type 3 diabetes mellitus | — | 1 (2.6) | 1 (1.3) |

Laboratory abnormalities, surgical procedures, and nonspecific signs and symptoms (eg, nausea and vomiting) are not included. Because of the nature of provider reporting, in some cases, it is unknown whether conditions were antecedent or concurrent with COVID-19. ADHD, attention-deficit/hyperactivity disorder; —, not applicable.

^a Condition prevalence numbers are not additive because individual patients may have had multiple conditions.

SUPPLEMENTAL TABLE 5 Adverse Events

| Adverse Event | n (%) | | |
|--|----------------------------|-------------------------------|----------------|
| | Baseline Invasive (n = 39) | Baseline Noninvasive (n = 38) | Total (N = 77) |
| Any adverse event | 15 (38.5) | 10 (26.3) | 25 (32.5) |
| ALT level increased | 2 (5.1) | 3 (7.9) | 5 (6.5) |
| AST level increased | 3 (7.7) | 1 (2.6) | 4 (5.2) |
| Anemia | 2 (5.1) | — | 2 (2.6) |
| Acute lymphocytic leukemia recurrent | — | 1 (2.6) | 1 (1.3) |
| Acute respiratory failure | 1 (2.6) | — | 1 (1.3) |
| Atelectasis | 1 (2.6) | — | 1 (1.3) |
| Bacterial infection | 1 (2.6) | — | 1 (1.3) |
| Bacterial sepsis | 1 (2.6) | — | 1 (1.3) |
| Bacterial tracheitis | 1 (2.6) | — | 1 (1.3) |
| Bradycardia | 1 (2.6) | — | 1 (1.3) |
| Brain herniation | — | 1 (2.6) | 1 (1.3) |
| Cardiac disorder | 1 (2.6) | — | 1 (1.3) |
| Cardiac output decreased | 1 (2.6) | — | 1 (1.3) |
| Constipation | 1 (2.6) | — | 1 (1.3) |
| Death | 1 (2.6) | — | 1 (1.3) |
| Deep vein thrombosis | 1 (2.6) | — | 1 (1.3) |
| Device occlusion | 1 (2.6) | — | 1 (1.3) |
| Diabetes insipidus | 1 (2.6) | — | 1 (1.3) |
| Enterococcal bacteremia | 1 (2.6) | — | 1 (1.3) |
| Generalized edema | 1 (2.6) | — | 1 (1.3) |
| Hematuria | 1 (2.6) | — | 1 (1.3) |
| Hemophagocytic lymphohistiocytosis | 1 (2.6) | — | 1 (1.3) |
| Hypertension | — | 1 (2.6) | 1 (1.3) |
| Hypokalemia | 1 (2.6) | — | 1 (1.3) |
| Hyponatremia | 1 (2.6) | — | 1 (1.3) |
| Hypoxia | 1 (2.6) | — | 1 (1.3) |
| Insomnia | — | 1 (2.6) | 1 (1.3) |
| International normalized ratio increased | 1 (2.6) | — | 1 (1.3) |
| Intraabdominal hemorrhage | — | 1 (2.6) | 1 (1.3) |
| Lactic acidosis | 1 (2.6) | — | 1 (1.3) |
| Metabolic acidosis | 1 (2.6) | — | 1 (1.3) |
| Multiple organ dysfunction syndrome | 1 (2.6) | — | 1 (1.3) |
| Nephropathy toxic | 1 (2.6) | — | 1 (1.3) |
| Pneumomediastinum | 1 (2.6) | — | 1 (1.3) |
| Pneumothorax | 1 (2.6) | — | 1 (1.3) |
| Prothrombin time prolonged | 1 (2.6) | — | 1 (1.3) |
| Psychomotor hyperactivity | — | 1 (2.6) | 1 (1.3) |
| Pyrexia | — | 1 (2.6) | 1 (1.3) |
| Rash | — | 1 (2.6) | 1 (1.3) |
| Renal impairment | 1 (2.6) | — | 1 (1.3) |
| Respiratory distress | 1 (2.6) | — | 1 (1.3) |
| Rhabdomyolysis | 1 (2.6) | — | 1 (1.3) |
| Sepsis | 1 (2.6) | — | 1 (1.3) |
| Staphylococcal bacteremia | 1 (2.6) | — | 1 (1.3) |
| Transaminases increased | 1 (2.6) | — | 1 (1.3) |
| Venous thrombosis limb | 1 (2.6) | — | 1 (1.3) |

COVID-19 diagnosis is not included as an adverse event. —, not applicable.

SUPPLEMENTAL TABLE 6 Serious Adverse Events

| Serious Adverse Event | <i>n</i> (%) | | |
|---------------------------------------|------------------------------------|---------------------------------------|------------------------|
| | Baseline Invasive (<i>n</i> = 39) | Baseline Noninvasive (<i>n</i> = 38) | Total (<i>N</i> = 77) |
| ALT level increased | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| AST level increased | 1 (2.6) | 1 (2.6) | 2 (2.6) |
| Acute lymphocytic leukemia, recurrent | — | 1 (2.6) | 1 (1.3) |
| Acute respiratory failure | 1 (2.6) | — | 1 (1.3) |
| Bacterial infection | 1 (2.6) | — | 1 (1.3) |
| Bacterial sepsis | 1 (2.6) | — | 1 (1.3) |
| Brain herniation | — | 1 (2.6) | 1 (1.3) |
| Cardiac disorder | 1 (2.6) | — | 1 (1.3) |
| Coronavirus infection | 1 (2.6) | — | 1 (1.3) |
| Coronavirus test result positive | — | 1 (2.6) | 1 (1.3) |
| Death | 1 (2.6) | — | 1 (1.3) |
| Diabetes insipidus | 1 (2.6) | — | 1 (1.3) |
| Enterococcal bacteremia | 1 (2.6) | — | 1 (1.3) |
| Hemophagocytic lymphohistiocytosis | 1 (2.6) | — | 1 (1.3) |
| Hypoxia | 1 (2.6) | — | 1 (1.3) |
| Intraabdominal hemorrhage | — | 1 (2.6) | 1 (1.3) |
| Lactic acidosis | 1 (2.6) | — | 1 (1.3) |
| Multiple organ dysfunction syndrome | 1 (2.6) | — | 1 (1.3) |
| Nephropathy toxic | 1 (2.6) | — | 1 (1.3) |
| Pneumomediastinum | 1 (2.6) | — | 1 (1.3) |
| Pneumothorax | 1 (2.6) | — | 1 (1.3) |
| Sepsis | 1 (2.6) | — | 1 (1.3) |
| Staphylococcal bacteremia | 1 (2.6) | — | 1 (1.3) |
| Venous thrombosis limb | 1 (2.6) | — | 1 (1.3) |

COVID-19 diagnosis is not included as an adverse event. —, not applicable.