Guidelines for the Management of Acute COVID-19 in Children

This guideline was developed by the following multidisciplinary group:
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I. Basic Principles

a. This guideline predominantly applies to children with an acute infection with SARS-CoV-2, and therefore patients should have at least one symptom associated with their viral infection.

b. Pediatric comprehensive studies evaluating therapies for COVID-19 are lacking.

c. Most children with SARS-CoV-2 infection have mild or moderate disease and recover with supportive care alone. Therefore, the risks of therapies must be carefully weighed against unclear benefit.

d. Whether or not to initiate therapy is at prescriber's discretion. Prior to treatment, the risks, benefits, and alternatives should be discussed with the patient and documented in the medical record.

e. Some therapeutics are available via Emergency Use Authorization (EUA) and therefore criteria for use must be met and the appropriate Fact Sheet should be provided to our patients, families, and caregivers.

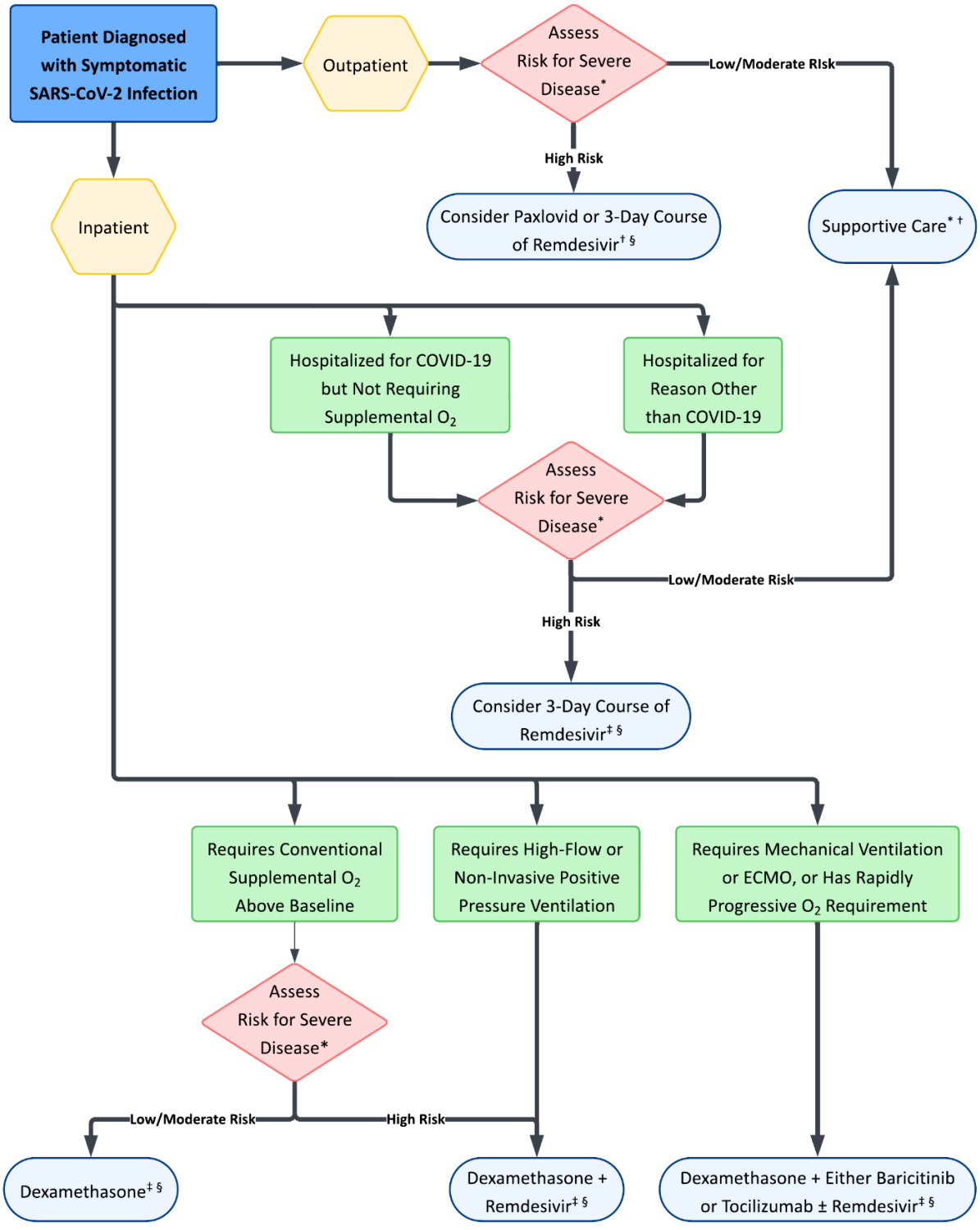
f. Infectious Diseases (ID) consultation is recommended for children with severe COVID-19 rapidly progressing despite first-line therapies (e.g., if considering use of immunomodulators such as baricitinib or tocilizumab).

g. For guidelines on thromboprophylaxis in children hospitalized with COVID-19, see Appendix I.

h. See Figure 1 below for the suggested general approach to therapeutic management in children with COVID-19. As referenced, tables and figures that follow provide additional information regarding risk stratification, inpatient/outpatient therapeutic options, and dosing of listed agents.

Last updated on 11/26/2025.

Figure 1. Flowchart Suggesting Therapy for Patients with Acute COVID-19



Footnotes

* See Table 1 and Figure 2 for information regarding risk stratification.
† See Table 2 for additional information about outpatient therapeutics.
‡ See Table 3 for additional information about inpatient therapeutics.
§ See Table 4 for dosing.

II. Risk Stratification

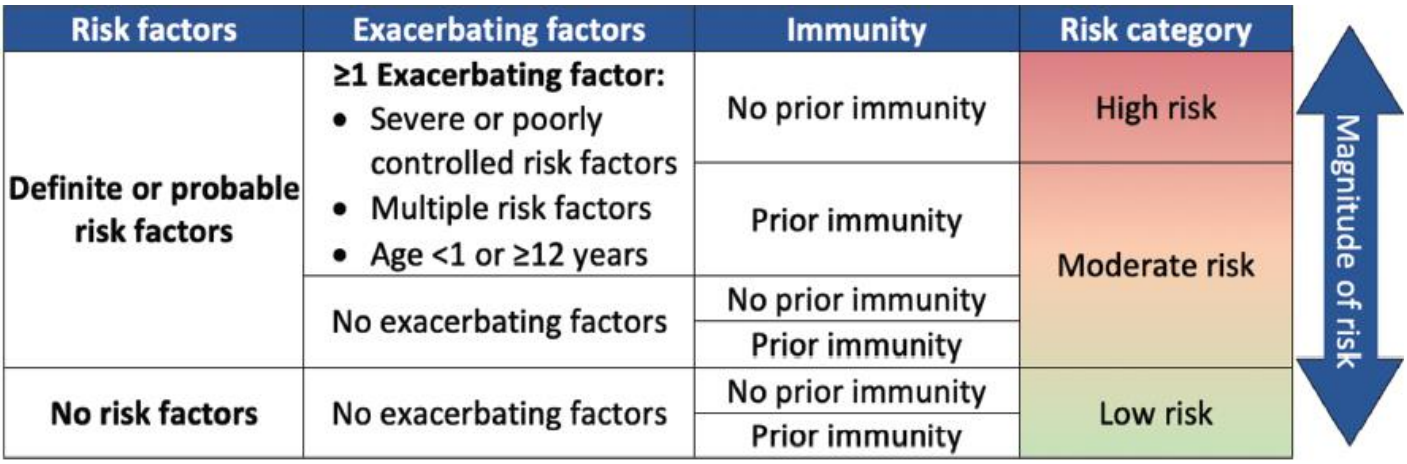
a. A risk assessment should be performed when determining if a patient should receive treatment for COVID-19, considering pre-existing conditions, exacerbating factors, and prior vaccination/immunity. Those at highest risk for progression to severe infection are likely to benefit most from treatment for mild to moderate disease.

b. Risk factors for severe disease in adults likely do not extrapolate perfectly to the pediatric population, and patients must be assessed on an individual basis. In **Table 1** below, definite and probable risk factors for progression to severe COVID-19 in children are provided based on available evidence and expert opinion.[1,2]

Table 1: Risk Factors for Severe Disease in Children[1,2]

Definite Risk Factors	Probable Risk Factors
• Severe immunocompromise: Recent chemotherapy, myeloablative conditioning regimens, graft-versus-host disease, and recent hematopoietic cell transplant • Obesity (defined as BMI or weight > 95th % for age and sex) • Diabetes (Type I or II) • Prematurity • Chronic cardiac disease: Congenital heart disease and hypertension • Chronic pulmonary disease (excluding mild to moderate asthma): Pulmonary hypertension, anatomical abnormality, bronchopulmonary dysplasia, obstructive sleep apnea and oxygen/ventilatory dependence • Chronic neurological disease: Down syndrome, cerebral palsy, and metabolic syndrome	• Sickle cell disease • Mild-moderate Immunocompromise • Neuro-disabilities • Chronic kidney disease • Chronic liver disease (especially end-stage) • Chronic gastrointestinal disease: short bowel syndrome and requirement of parenteral/enteral tube feeding

Figure 2: Risk Stratification Framework from PIDS Pediatric COVID-19 Therapies Taskforce[1,2]



- High risk = Patients **with uncontrolled risk factors** (e.g., uncontrolled diabetes), or **multiple risk factors**, or in **children <1 year** of age, AND **no prior immunity.**
- Example: Children with medical complexity and reliance on medical technology with multiple risk factors listed above who are not vaccinated or who have not had COVID-19 infection in the preceding few months are at high-risk for progression to severe COVID-19, especially if any risk factors is currently uncontrolled from baseline.
- Prior immunity = up to date with current COVID-19 vaccine recommendations (assuming an immune response can be mounted to the vaccine) or documented SARS-CoV-2 infection in the past 4 months.

III. Management

Table 2. Therapeutic Management of Nonhospitalized Children with Mild to Moderate COVID-19 Not Requiring Increased Supplemental Oxygen Requirements from Baseline

Patient Population	Suggestions	Clinical Considerations
All Patients	Supportive care alone is appropriate for most	Systemic steroids are NOT recommended in the absence of another indication
Patients at High-Risk for Progressing to Severe COVID-19 **High-risk as defined in Figure 1 and Table 1** Consider listed therapeutics without strong recommendation for use.	**Nirmatrelvir/ritonavir (Paxlovid)** PO initiated within 5 days of symptom onset – preferred regimen for children ≥12 years & ≥40 kg For children 12 to <18 who qualify, Paxlovid is only available through an EUA. Paxlovid Fact Sheet for Healthcare Providers Provide and review with patient/caregiver the Paxlovid Fact Sheet for Patients	Paxlovid is contraindicated with strong CYP3A4 inducers or CYP3A substrates for which elevated drug concentrations are associated with serious and/or life-threatening reactions. Many drug-drug interactions can be safely managed: BJC Paxlovid Drug Interactions and Management; Liverpool COVID-19 Drug Interaction Checker
	Remdesivir IV 3-day regimen initiated within 7 days of symptom onset who meet **all** of the following criteria. • Unable to take nirmatrelvir/ritonavir. Drug interactions that can be safely managed should not preclude use of nirmatrelvir/ritonavir. • Positive SARS-CoV-2 test (rapid antigen or PCR) • Room air or baseline oxygen • **High-risk** of progressing to severe illness	Remdesivir is an intravenous infusion that requires an infusion clinic visit on 3 consecutive days. See Appendix II or talking points when discussing with patient and family. For logistical information on ordering outpatient remdesivir, see Tip Sheet: Pediatric Remdesivir Ordering.
	Molnupiravir PO initiated within 5 days of symptom onset for patients who are ≥18 years old in whom other options are unavailable Molnupiravir is available through an EUA. Molnupiravir Fact Sheet for Healthcare Providers Provide and review with the patient/caregiver the Molnupiravir Fact Sheet for Patients	Molnupiravir is NOT recommended in pregnancy. **Contraception required for females** of childbearing age during therapy and 4 days following last dose. **Contraception required for males** with partners of childbearing age during therapy and 3 months following last dose.

Table 3. Therapeutic Management of Hospitalized Children with COVID-19

Disease Severity	Patient Population	Suggestions	Clinical Considerations
I. **Hospitalized for Reasons Other Than COVID-19**	Patients with mild to moderate COVID-19 at high risk of progressing to severe disease	Monitor Consider remdesivir within 7 days of symptom onset	Dexamethasone or other systemic corticosteroids are **NOT** recommended in the absence of another indication.
II. **Hospitalized for COVID-19 but Does Not Require Supplemental Oxygen**	Most patients	Supportive care	Dexamethasone or other systemic corticosteroids are **NOT** recommended in the absence of another indication.
	Patients who are at high risk of progressing to severe disease	Consider remdesivir within 7 days of symptom onset	
III. **Hospitalized and Requires Conventional Oxygen** ***If having rapidly increasing oxygen needs, see category V.***	Most patients	Dexamethasone	Limited efficacy data exist evaluating remdesivir in children. Consider on a case-by-case basis.
	Patients who meet high risk criteria	Dexamethasone PLUS Remdesivir within 10 days of symptom onset	Available data best support the use of remdesivir in patients who meet high risk criteria
IV. **Hospitalized and Requires Oxygen via High-Flow Device or Non-invasive ventilation** ***If having rapidly increasing oxygen needs, see category V.***	Most patients, regardless of risk stratification	Dexamethasone PLUS Remdesivir within 10 days of symptom onset	
V. **Hospitalized and Requires Mechanical Ventilation and/or ECMO, or Has Rapidly Progressive Need for Supplemental Oxygen**	Most patients	Dexamethasone PLUS Baricitinib[#] OR Tocilizumab[%] if meet criteria below	A clear benefit of remdesivir has not been demonstrated in this group (adults nor children) as antiviral unlikely to be effective at this stage. Consider on a case-by-case basis. When used in conjunction with corticosteroids, non-steroid immunomodulators have been found to improve outcomes in some hospitalized adults with COVID-19, especially in the presence of significant inflammation.

[#] Criteria for Use and Considerations for Baricitinib (preferred over tocilizumab if meet use criteria):

- Able to tolerate enteral therapy
- >2 years of age
- Consider withholding or interruption of therapy for the following: 1) ALC<200 cell/µL; 2) ANC<500 cell/µL; or 3) suspected drug-induced liver injury

Baricitinib only available via EUA in children <18 years:
Baricitinib Fact Sheet for Healthcare Providers
Provide and review with patient/caregiver the Fact Sheet for Patients

[%] Use of Tocilizumab over Baricitinib if:

- Unable to obtain enteral access
- Evidence of thrombosis
- Pregnant
- GFR <15 mL/min or renal replacement therapy
- Within 24 hours of ICU admission and rapid progression of respiratory failure

Table 4. Dosing and Duration of COVID-19 Therapeutics

<table>
<tr><th>Therapeutic</th><th>Dosing and Duration</th></tr>
<tr><td>Nirmatrelvir/ritonavir (Paxlovid)</td><td>• eGFR ≥60 ml/min: 300mg nirmatrelvir + 100mg ritonavir (3 pills total: #2 150mg nirmatrelvir tabs + #1 100mg ritonavir tab) BID x5 days
• eGFR ≥30 to <60 ml/min: #1 150mg tab of nirmatrelvir + #1 100mg tab of ritonavir BID x5 days
• eGFR <30 ml/min: Use not recommended
• Avoid use in severe hepatic impairment (Child-Pugh Class C)</td></tr>
<tr><td>Molnupiravir</td><td>800mg every 12 hours (4 pills per dose) x5 days</td></tr>
<tr><td>Remdesivir</td><td>3-day IV regimen for non-severe COVID-19:
For patients at high risk for progression to severe disease not requiring supplemental oxygen (patients receiving outpatient therapy or inpatient therapy)

• ≥40 kg: 200 mg day 1, then 100 mg q24h × 2 days
• 3 - <40 kg: 5 mg/kg day 1, then 2.5 mg/kg q24 × 2 days
• 1.5 kg to <3 kg: 2.5 mg/kg day 1, then 1.25 mg/kg x 2 days

5-day IV regimen for severe COVID-19:
For patients hospitalized requiring supplemental oxygen

• ≥40 kg: 200 mg day 1, then 100 mg q24h × 4 days or until hospital discharge if shorter
• 3 - <40 kg: 5 mg/kg day 1, then 2.5 mg/kg q24 × 4 days or until hospital discharge if shorter
• 1.5 kg to <3 kg: 2.5 mg/kg day 1, then 1.25 mg/kg q24 x 4 days or until hospital discharge if shorter</td></tr>
<tr><td>Dexamethasone</td><td>0.15 mg/kg (max 6 mg) daily for up to 10 days or until hospital discharge, whichever comes first</td></tr>
<tr><td>Tocilizumab</td><td>• <30 kg: 12 mg/kg IV x1 dose
• ≥30 kg: 8 mg/kg (max dose 800 mg) IV x1 dose</td></tr>
<tr><td>Baricitinib</td><td>
<table>
<tr><th>Dosing:</th><th colspan="5">CrCl (mL/min)</th></tr>
<tr><th>Indication</th><th>≥ 60</th><th>30-59</th><th>15-29</th><th>< 15 or IHD</th><th>CRRT/SLED</th></tr>
<tr><td>Adult and pediatric patients 9 years of age and older</td><td>4 mg daily</td><td>2 mg daily</td><td>1 mg daily</td><td>Not recommended</td><td>Not recommended</td></tr>
<tr><td>Pediatric patients 2 years to less than 9 years of age</td><td>2 mg daily</td><td>1 mg daily</td><td>Not recommended</td><td>Not recommended</td><td>Not recommended</td></tr>
</table>
Duration: 14 days or until hospital discharge, whichever comes first</td></tr>
</table>

Appendix I. Pediatric Thromboprophylaxis Guidelines for Acute COVID-19

These are general guidelines on initiation of *prophylactic anticoagulation* in children admitted to St. Louis Children's Hospital with confirmed SARS-CoV-2 infection. This does not replace formal recommendations by the consulting hematology team who will formulate an individualized plan for each patient. *This guideline is not applicable to patients who develop thrombosis where standard treatment is recommended.*

Background:

- SARS-CoV-2 infection in adults is associated with an increased risk of coagulopathy.
- The *International Society on Thrombosis and Hemostasis* [ISTH] and *Anticoagulation Forum* have recommended prophylactic anticoagulation for all adult inpatients with SARS-CoV-2 infection.
- There is a paucity of pediatric studies investigating the impact of SARS-CoV-2 infection on both coagulopathy and thrombosis.
- Venous thrombo-embolism in rare in children (1:100,000/yr) compared to adults (1:1000/yr), though the incidence in hospitalized children in the US in increasing. Thrombosis in children tends to be multi-factorial; >85% of children with VTE have multiple risk factors for thrombosis.

Recommendations:

- We suggest obtaining the following labs for all patients admitted with confirmed SARS-CoV-2 infection (i) on admission and (ii) change in clinical status or level of care (i.e. transfer to ICU/ need for supplemental oxygen, etc.).
    - Platelet count
    - PT/aPTT
    - Fibrinogen
    - D-dimer
    - BUN/creatinine
- General recommendations for anticoagulation are in Table 1.
- Indications for thromboprophylaxis should be reviewed daily; thromboprophylaxis should be discontinued once criteria are not met, including change in the level of care

Table 5. Recommendations for Anticoagulation in Patients with Acute COVID-19.

<table>
<tr><th></th><th>Mild/Moderate</th><th>Severe</th><th>Critical</th></tr>
<tr><td rowspan="2">Anticoagulation</td><td><12 years: early ambulation and SCDs if tolerated</td><td><12 years: Consider prophylactic enoxaparin per VTE order set in patients with 2 or more additional VTE risk factors[1,2]</td><td rowspan="2">Prophylactic anticoagulation per VTE order set, in the absence of increased risk of bleeding[2]</td></tr>
<tr><td>≥12 years: Consider prophylactic enoxaparin per VTE order set for patients with 2 or more additional VTE risk factors[1,2]</td><td>≥12 years: Consider prophylactic enoxaparin per VTE orderset for patients with 1 or more additional VTE risk factors[1]</td></tr>
<tr><td colspan="4">[1] VTE risk factors: obesity, presence of central venous catheter, chronic inflammatory illness, use of estrogen-containing contraception, personal history of VTE or thrombophilia trait, family history of VTE in 1st-degree relative, altered mobility 30 days prior to admission (major surgery, significant trauma).
[2] Consider withholding VTE prophylaxis in the presence of bleeding risk factors: platelets <50 k/mm^3, fibrinogen <100 mg/dL, elevated PT/aPTT, hepatic or renal failure, recent or ongoing bleeding, recent surgery. Discuss net clinical benefit on a case-by-case basis. May consider low-dose unfractionated heparin (10 units/kg/hr) for high risk of bleeding and thrombosis. Anti-Xa goal 0.1-0.3 units/mL. PTT goal 60-75 sec.</td></tr>
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Appendix II. Talking Points Regarding Outpatient Remdesivir in Pediatric Patients

- It is used for the treatment of mild-to-moderate COVID-19 to reduce the risk of hospitalization in high-risk patients.
- It isn't a substitute for being vaccinated.

Requirements for pediatric patients

- It is approved for use in pediatric patients who weigh at least 1.5 kg.
- Patients must have a positive COVID-19 test with mild-to-moderate symptoms and be at a high risk for progression to severe COVID-19.
- The drug should be administered within 7 days of symptoms appearing.

How is remdesivir administered?

- This antiviral drug is administered through a vein with daily IV infusions for 3 consecutive days in an outpatient setting at Children's Hospital.
- On the day of the first infusion, lab tests will be sent before infusion is started. The infusion can be administered prior to those labs resulting.
- Patients are monitored during the infusion and observed for at least 1 hour after the infusion.
- The amount of the dose is adjusted for the child's body weight.

What is the cost?

- There are costs for the drug itself, for the infusion used to deliver the drug, and for lab tests.
- The cost of the antiviral drug will vary depending upon the child's weight and how much of the drug is used.

Weight	Total number of vials for 3 days of therapy based on PINETREE	Cost of Drug
20 kg (44 pounds) or less	3	Up to $7,020 Up to $4,212 with 40% self-pay discount
21 kg (46.2 pounds) or more	4	Up to $9,360 Up to $5,615 with 40% self-pay discount

- Costs will vary depending on whether the patient has insurance. We expect patients with insurance to have much less out-of-pocket costs.
- Most insurance plans will cover the cost of the infusion, so parents should check with their insurance provider to see if they are covered.
    - Medicare and MO Medicaid provide coverage for this service.
- Lab tests that are included with the infusion treatment will total $327 for four different tests. For those who are self-pay, the discounted cost will be $196.20.
- Some patients with commercial insurance plans may have out-of-pocket costs for the infusion or lab tests. Check with your insurance provider. Parents may call the BJC Price Estimate line for specific questions about their potential costs at 314-747-8845 or toll-free at 1-844-747-8845.

References:

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2. Camila Aparicio, Zachary I Willis, Mari M Nakamura, et al, on behalf of the PIDS Pediatric COVID-19 Therapies Task Force. Risk Factors for Pediatric Critical COVID-19: A Systematic Review and Meta-Analysis, *Journal of the Pediatric Infectious Diseases Society*, Volume 13, Issue 7, July 2024, Pages 352–362.
3. Gottlieb RL, Vaca CE, Paredes R, et al; GS-US-540-9012 (PINETREE) Investigators. Early Remdesivir to Prevent Progression to Severe Covid-19 in Outpatients. *N Engl J Med*. 2022 Jan 27;386(4):305-315.
4. Adarsh Bhimraj, Rebecca L Morgan, Amy Hirsch Shumaker, et al. Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients With COVID-19 (September 2022), *Clinical Infectious Diseases*, Volume 78, Issue 7, 15 June 2024, Pages e250–e349.
5. Bittle E, Arnold S, Hijano DR, et al. Safety Data for Baricitinib Use in Children With Severe SARS-CoV-2 Infection. *Hosp Pediatr*. 2025 May 1;15(5):e203-e208.
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7. Karampitsakos T, Papaioannou O, Tsiri P, et al. Tocilizumab versus baricitinib in hospitalized patients with severe COVID-19: an open label, randomized controlled trial. *Clin Microbiol Infect.* 2023 Mar;29(3):372-378.
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