

## PARAINFLUENZA BACKGROUND

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### BIOLOGY AND EPIDEMIOLOGY

- Single-stranded, enveloped, RNA viruses (Paramyxoviridae family).<sup>1</sup>
- Virus is divided into 4 serotypes “with HPIV4 subdivided into two genera (HPIV4a and HPIV4b).”<sup>1</sup>
- Pathogenesis: human parainfluenza viruses (HPIVs) target and infect ciliated epithelial cells of the upper and lower respiratory tracts.<sup>1</sup>
- “Severe disease and fatal pneumonia may occur in elderly and immunocompromised adults.”<sup>1</sup>
- It is estimated that only 1% of respiratory illnesses in adults are caused by human parainfluenza viruses resulting from waning immunity and reinfection after childhood.<sup>1</sup>
- The CDC reports that transmission occurs through direct person-to-person contact or respiratory droplets.<sup>2</sup>
- Infections typically occur:<sup>1</sup>
  - HPIV1 – biennial outbreaks during the fall of odd-numbered years
  - HPIV2 –annually in the fall
  - HPIV3 – seasonal outbreaks in the spring
  - HPIV4 infections have not been well studied.
    - Commonalty of serotypes
      - HPIV3 (52%)
      - HPIV1 (26%)
      - HPIV2 (12%)
      - HPIV4 (2%)
- Reports list human parainfluenza viruses as the “second most common cause of acute respiratory tract infections” in children under the age of 5, accounting for “up to 17% of [child] hospitalizations.”<sup>3</sup>
- Serological studies suggest that by the age of 6, the vast majority of children will have been infected by HPIV3.<sup>3</sup>
- By the age of 10, 70% to 80% of children will have developed antibodies against the remaining human parainfluenza viruses serotypes.<sup>3</sup>



## COMMON SYMPTOMS

- Fever, runny nose, cough, croup, pneumonia, sore throat, wheezing, ear pain.<sup>4</sup>

## DIAGNOSIS

- Detection of virus by culture, fluorescent antibody assays, or some other molecular assays using PCR.<sup>5</sup>

## TREATMENT

- Currently no antivirals available.
- Corticosteroids are primarily used to treat croup symptoms, while the use of nebulized epinephrine is associated with short-term relief of symptoms after 30 minutes. However, the benefit of nebulized epinephrine generally disappears after 2 hours.<sup>1</sup>
- Treatment regimens “utilize aerosolized or systemic ribavirin in combination with intravenous immunoglobulins and/or corticosteroids.”<sup>1</sup>
  - Ribavirin is a synthetic nucleoside analog normally used to treat RSV.
    - Despite its use, there does not seem to be much in the scientific literature on its actual effectiveness in treating human parainfluenza viruses.
  - The drug DAS181 appears promising in efforts to treat severe disease in immunocompromised patients.
    - “DAS181 is an inhaled recombinant sialidase fusion protein that interferes with the initial binding of HN with the host cell sialic acid containing receptor.”<sup>1</sup>
    - Currently in Phase 2 clinical trials as a treatment option for infected individuals who are immunocompromised.<sup>1</sup>

## REFERENCES

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