Disclosures

• Advisory Board:
  • DiaSorin Molecular
  • Mammoth Biosciences
Upper Respiratory Tract Infections

- One of the leading causes of morbidity and mortality worldwide
- Cause a range of symptoms, from mild to life-threatening
- Extremely common (17.2 B cases in 2015)\(^1\):
  - <5 years old: mean 6.1 episodes/year\(^2\)
  - >40 years old: mean 4.1 episodes/year

Upper Respiratory Tract Infections

- Caused by a variety of infectious pathogens, including:
  - Viruses
    - Coronavirus, rhinovirus, influenza, parainfluenza
  - Bacteria
    - *Streptococcus pyogenes*, *S pneumoniae*, *Haemophilus influenzae*, *Bordetella pertussis*
Laboratory Diagnosis

- Historically, performed using a “mixed bag” approach:
  - Culture
    - Bacterial, viral tube/shell vial
  - Antigen testing
    - Influenza, RSV, group A strep
  - Individual or duplex molecular tests
    - Influenza A/B and RSV PCR

Laboratory Diagnosis

- Syndromic testing: The next frontier of diagnosing respiratory infections?
  - Rapid (some <60 minutes)
  - Sample-to-answer
  - Broad coverage
    - Viral
    - Bacterial

[Links to products and systems]
Syndromic Panels: Broad Coverage

**Viral**
- Adenovirus
- Coronavirus
  - HKU1, NL63, 229E, OC43, COVID-19
- Metapneumovirus (hMPV)
- Rhinovirus/Enterovirus
- Influenza A/B
  - H1, H1-2009, H3
- Parainfluenza (1-4)
- RSV

**Bacterial**
- *Bordetella pertussis*
- *Chlamydophila pneumoniae*
- *Mycoplasma pneumoniae*
Case #1

• A 7-year-old male presents in November to his primary care provider with a 3-day history of fever, cough, headache and myalgia.

Should a syndromic panel be considered in this case?

Case #1, continued:

• In an otherwise healthy individual without severe disease, targeted testing would be most appropriate

• Consider:
  • Influenza A/B PCR
  • COVID-19
  • S pyogenes (Group A Strep) PCR
Case #2

- A 35-year-old female undergoes an allogeneic stem cell transplant, and 3 weeks later, develops a cough and fever. She is admitted to the intensive care unit due to respiratory distress.

Should a syndromic panel be considered in this case?

Case #2, continued:

- Yes – a syndromic panel could be considered in this case.
- Rapid and broad testing may inform management decisions, including:
  - Infection Prevention and Control (eg, isolation)
  - Antibiotic/antiviral use
**Syndromic Panels: Advantages**

- Rapid results (some in <60 minutes)
- Allow for detection/identification of viruses (i.e., hMPV, coronaviruses) not routinely detected by conventional methods
- Syndromic panels should be considered in:
  - Immunosuppressed population (i.e., transplant recipients)
  - Critically ill

**Syndromic Panels: Limitations**

- Higher cost than conventional laboratory methods
  - However, may be cost effective if multiple routine methods would have been ordered
  - May reduce downstream costs (i.e., hospital stay)
- More information does not always equate to improved patient management/outcomes
  - Example: How should a positive result for rhinovirus be interpreted in an immunosuppressed host?
Summary

- Respiratory infections are common and associated with high morbidity and mortality worldwide
- Syndromic panels offer a rapid (some <60 min) and broad (some ~20 targets) approach to testing for causes of respiratory infection
- The cost of syndromic panels (both to the lab and patient) is typically higher than conventional methods (e.g., culture, antigen testing)

Summary

- Issues to consider prior to ordering a syndromic respiratory panel:
  - Is the patient otherwise healthy or immunosuppressed/critically ill?
  - Will I manage my patient differently based on the results of this test (e.g., what if I get a positive)?
  - Is targeted testing (e.g., influenza, COVID-19) prudent due to the clinical presentation and/or seasonality?
References


Thank you!