Flu & Respiratory Syncytial Virus (RSV) in Illinois
Agenda

- RSV Overview – Dr. Tina Tan
- Respiratory Virus Update – Dr. Arti Barnes
- Question & Answer (please only use Q & A feature)

Recording & slides will be posted to illinoisaap.org
Email info@illinoisaap.com
Speakers

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Conflict of Interest Disclosures

- Advisor/Consultant: Merck, Sanofi Pasteur, GSK, Pfizer, Moderna, Novavax
- Research Funding: GSK, AstraZeneca
RSV Epidemiology

- RSV is one of the most common causes of acute respiratory tract infection in people of all ages
- RSV typically circulates in fall, winter, and spring
- Each year in the United States, RSV leads to approximately:
  - 2.1 million outpatient (non-hospitalization) visits among children younger than 5 years of age
  - 58,000-80,000 hospitalizations among children younger than 5 years of age
  - 60,000-120,000 hospitalizations among adults 65 years and older
  - 6,000-10,000 deaths among adults 65 years and older
  - 100–300 deaths in children younger than 5 years of age
RSV Cases in US 10/31/20-10/15/22

cdc.gov
RSV Symptoms

- Early symptoms of the infection may include:
  - Rhinorrhea
  - Decreased appetite
  - Cough develops a few days later, often followed by sneezing, wheezing, and fever
  - In infants <6 months of age, the only symptoms may be:
    - Irritability
    - Decreased activity
    - Decreased appetite
    - Apnea
RSV in Infants and Children

- Most children have RSV infection by age 2 years.
- Most cases are a mild, cold-like illness, but severe illness can occur requiring hospitalization, such as:
  - Bronchiolitis
  - Pneumonia
- Most children improve with supportive care and are discharged home after a few days.
RSV in Infants and Children: Risk Factors for Severe Illness

- Premature birth
- Very young infants, especially those ≤6 months of age
- ≤2 years with chronic lung disease or congenital heart disease
- Weakened immune system
- Neuromuscular disorders, including those who have difficulty swallowing or clearing mucus secretions

Most infants with RSV infection are otherwise healthy term infants in the first 2-3 months of life

Severe RSV Disease

- Data from 74 prospective, epidemiologic studies, conducted during the time period from 1995-2015.

- Infants and children who had RSV lower respiratory tract infection (LRTI) during the 1st 3 years of life.

- Studies demonstrated that RSV LRTI is a significant risk factor for on-going respiratory morbidity within the first decade of life and possibly into adolescence and adulthood characterized by:
  - transient early wheezing and recurrent wheezing
  - asthma
  - impaired lung function

Severe RSV Disease

• This results in reduced quality of life and increased healthcare resource use.

• The mechanisms through which RSV contributes to wheezing/asthma development appear to be related to: viral injury, preexisting abnormal lung function, other factors that predispose to wheezing/asthma, including genetic susceptibility, altered immunology, eosinophilia, and associated risk factors such as exposure to tobacco smoke.
Laboratory Tests for Diagnosing RSV Infection

- The most commonly used RSV clinical laboratory tests are:
  - Real-time reverse transcriptase-polymerase chain reaction (rRT-PCR), which is more sensitive than culture. In many cases this is a multiplex test that is combined with influenza and COVID-19.
  - Antigen testing which is highly sensitive in children but not sensitive in older children and adults because there may be lower respiratory viral loads in the specimens.
- These tests may be performed on both upper and lower respiratory tracts specimens.
- Both rRT-PCR and antigen detection tests are effective methods for diagnosing RSV infection in infants and young children. The RSV sensitivity of antigen detection tests generally ranges from 80% to 90% in this age group.
Treatment and Prophylaxis

- Treatment is supportive care – there are no available therapies that will shorten the course of bronchiolitis.

- Palivizumab is a monoclonal antibody recommended by the American Academy of Pediatrics to be administered to high-risk infants and young children likely to benefit from immunoprophylaxis based on gestational age and certain underlying medical conditions. It is given in monthly intramuscular injections during the RSV season.

- Use of β-adrenergic agents, albuterol, corticosteroids and antimicrobial therapy are NOT recommended in the management of RSV bronchiolitis.
Bivalent RSV PreF vaccine – combines two RSV prefusion proteins to provide protection against RSV A & B

Objective: To determine if vaccinating pregnant mothers would provide protection to their young infants after they were born

Phase 3 randomized, double blinded, placebo controlled, multi-center, international clinical trial in pregnant women

Single 120 µg dose given in late 2nd or 3rd trimester (between 24- and 36-weeks gestation)

7400 pregnant women ≤49 years of age randomized 1:1 to receive vaccine or placebo
MATISSE RSV Maternal Vaccine Trial (Pfizer)

Vaccine efficacy (VE):

- 81.8% against severe medically attended lower respiratory tract illness due to RSV in infants from birth through first 90 days of life.
- 57.1% against severe medically attended lower respiratory tract illness due to RSV in mothers from birth through first 90 days of life.
- 69.4% vaccine efficacy through first 6 months of life in infants.
- 51.3% vaccine efficacy through first 6 months of life in mothers.
Influenza-Like Illness (ILI):
Influenza, COVID-19, and RSV

CDC definition of influenza-like illness is used for flu surveillance

- Temperature ≥ 100 °F
- Cough
- Sore throat

CDC. https://www.cdc.gov/flu/about/glossary.htm
Importance of Influenza, COVID-19 & Routine Vaccines

The AAP and CDC recommend:

1) Annual influenza immunization of all children without medical contraindications, starting at 6 months of age

2) COVID-19 vaccination for everyone 6 months of age and older without medical contraindications. This includes the primary series and booster doses of vaccine for persons 5 years of age and older

The AAP and CDC support coadministration of routine childhood and adolescent immunizations with influenza and COVID-19 vaccines (or vaccination in the days before or after) for infants, children, and adolescents who are behind on or due for immunizations.
Respiratory Virus Update: Surveillance and Public Health Actions
Arti Barnes, MD, MPH
Conflict of Interest Disclosures

• None
Why Talk About RSV?

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<th>Age</th>
<th>Count</th>
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<tr>
<td>00-01</td>
<td>1088</td>
<td>69.5</td>
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<tr>
<td>02-04</td>
<td>398</td>
<td>25.4</td>
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<tr>
<td>05-17</td>
<td>79</td>
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Illinois Reportable Diseases

Mandated reporters, such as health care providers, hospitals and laboratories, must report suspected or confirmed cases of these diseases to the local health department. Diseases in **bold** are reportable within 24 hours. Diseases marked "immediate" (or in **red**) are reportable as soon as possible within 3 hours. All other conditions not in red or bold are reportable within 7 days.

- Anaplasmosis
- Any suspected bioterrorist threat (immediate)
- Any unusual case or cluster of cases that may indicate a public health hazard (immediate)
- Anthrax (immediate)
- Arboviruses (including WNV)
- Babesiosis
- Botulism, foodborne (immediate)
- Botulism, infant, wound, other
- Brucellosis*
- California Encephalitis virus
- Campylobacteriosis
- *Candida auris**
- Carbapenem-resistant Enterobacteriaceae (CRE)**
- Chancroid
- Chikungunya virus
- Chlamydial
- Cholera
- Cryptosporidiosis
- Cyclosporiasis
- Dengue viruses 1-4
- Diphtheria (immediate)
- Eastern Equine Encephalitis virus
- Ehrlichiosis
- *Escherichia coli* infections (*E. coli* O157:H7, and other Shiga toxin-producing *E. coli*)
- Foodborne or waterborne outbreaks
- Gonorrhea
- *Haemophilus influenzae*, invasive
- Hantavirus pneumonary syndrome
- Hemolytic uremic syndrome, post diarrheal
- Hepatitis A
- Hepatitis B, C, D
- Pregnant hepatitis B carrier
- Histoplasmosis
- HIV infection
- Influenza, deaths in <18 yr olds
- *Influenza A*, novel (immediate)
- Influenza, ICU admissions
- Influenza, Canyon virus
- Keystone virus
- La Crosse virus
- Legionellosis
- Leptospirosis
- Listeriosis
- Lyme disease
- Malaria
- Measles
- Mumps
- *Neisseria meningitidis*, invasive
- Outbreaks of public health significance
- Pertussis (whooping cough)
- Plague (immediate)
- Poliomyelitis (immediate)
- Powassan virus
- Psittacosis
- Q fever (*Coxiella burnetii)*
- Rabies, human and potential human exposure and animal
- Reye’s syndrome
- Rubella
- St. Louis Encephalitis virus
- Salmonellosis, other than typhoid
- *Severe Acute Respiratory Syndrome (SARS)* (immediate)
- Shigellosis
- Smallpox (immediate)
- Smallpox vaccination, complications of
- Snowshoe hare virus
- Spotted fever rickettsioses
- *S. aureus* infections with intermediate or high level resistance to vancomycin
- Streptococcal infections, Group A, invasive including STSS and necrotizing fasciitis
- *S. pneumoniae*, invasive in those <5 yrs
- Syphilis
- Tetanus
- Toxic shock syndrome due to *S. aureus*
- Trichinosis
- Trichinella virus
- Tuberculosis
- Tularemia*
- Typhoid fever
- Typhus
- Varicella (chickenpox)
- *Vibrio* (non-cholera)
- West Nile virus
- Western Equine Encephalitis virus
- Yellow Fever virus
- Zika virus

IDPH
Illinois Department of Public Health
RSV surveillance

- National Respiratory and Enteric Virus Surveillance System (NREVSS) - CDC
  - Data collected from participating labs

- Syndromic Surveillance
  - IL collects data from ED visits from 185 acute care hospitals
  - Admissions resulting from these ED visits are captured based on ICD codes

Illinois

- Illinois Department of Public Health, Springfield, IL
- Illinois Public Health Laboratory-Carbondale Division of Laboratories, Carbondale, IL
- Illinois Public Health Laboratory-Chicago Division of Laboratories, Chicago, IL
- Rush University Medical Center, Chicago, IL
- Scott AFB, Scott AFB, IL
- St Elizabeth Hospital, Belleville, IL
- University of Illinois at Chicago, Chicago, IL
What else is going on besides RSV?

Flu Vaccination coverage for all children as of week ending October 15, 2022 is similar to the same time October 2021 (22.1% compared to 21.7%) but lower compared with October 2020 (22.1% compared with 28.3%).
Figure 2B. Cumulative Influenza Vaccination Coverage*, by Week, Flu Season, and Race/Ethnicity, Children 6 Months–17 Years, United States
Data Source: NIS-Flu
Data are current through October 15, 2022

https://www.cdc.gov/vaccines/imz-managers/nis/about.html#current-surveys
Why is vaccination important this year? 

92% of Flu A- H1N1
95% of Flu A-H3N2
Were neutralized by current season vaccine derived ferret antisera

https://www.cdc.gov/vaccines/imz-managers/nis/about.html#current-surveys
What Happened to COVID?
35.7% of 12-17 y/o have received boosters
Do COVID-19 vaccines still matter?

In August 2022, compared to people who are up to date with COVID-19 vaccination, monthly rates of COVID-19-associated hospitalizations were **5.2x Higher in Unvaccinated Adults Ages 18 Years and Older.**

- **1.7x Higher** in Unvaccinated Children Ages 5-11 Years
- **3.4x Higher** in Unvaccinated Adolescents Ages 12-17 Years
- **3.5x Higher** in Unvaccinated Adults Ages 18-49 Years
- **7.4x Higher** in Unvaccinated Adults Ages 50-64 Years
- **5.4x Higher** in Unvaccinated Adults Ages 65 Years and Older

Source: CDC.gov
Laboratory-Confirmed COVID-19-Associated Hospitalizations

Selected Underlying Medical Conditions

- Asthma: 14.2%
- Autoimmune disease: 3.4%
- Cardiovascular disease: 9.7%
- Chronic lung disease: 4.9%
- Congestive heart failure: 2.2%
- Diabetes: 4.1%
- Hypertension: 55.5%
- Immune suppression: 6.0%
- Metabolic disease: 5.6%
- Neurologic disease: 6.4%
- Obesity: 60%
- Pregnancy: 32.2%
- Renal disease: 17.1%
- Other disease: 21.9%
- No known condition: 2.8%
To Complicate Things...Pediatric Bed Closures

• Between 2012 and 2017- number of licensed pediatric beds in IL declined by ~27% under the following circumstances:
  – Hospitals with low volumes
  – Hospitals with low market shares in metropolitan areas
  – Hospitals that sustained at least 50% of their pediatric volume after closure of licensed pediatric beds
• And yet...actual number of pediatric inpatient days stayed the same during that pre-pandemic period.
• And now...we have an even more challenging healthcare staffing environment post/intra pandemic
Impact of Hospital Strain on Excess Deaths During the COVID-19 Pandemic — United States, July 2020–July 2021

*Weekly* / November 19, 2021 / 70(46);1613–1616

Geoffrey French, MA¹; Mary Hulse, MPA¹; Debbie Nguyen²; Katharine Sobotka²; Kaitlyn Webster, PhD²; Josh Corman¹; Brago Aboagye-Nyame²; Marc Dion²; Moira Johnson²; Benjamin Zalinger, MA²; Maria Ewing² (VIEW AUTHOR AFFILIATIONS)

The conditions of hospital strain during July 2020–July 2021, which included the presence of SARS-CoV-2 B.1.617.2 (Delta) variant, predicted that intensive care unit bed use at 75% capacity is associated with an estimated additional 12,000 excess deaths 2 weeks later. As hospitals exceed 100% ICU bed capacity, 80,000 excess deaths would be expected 2 weeks later.
What Can We Do? Health Care Strategies

- Expedite discharges when applicable, including considering the feasibility of home health care and home hospital care.
- Utilize contractual staffing.
- Cross-train other non-pediatric staff who may be able to provide patient care in non pediatric areas.
- Ensure timely and accurate reporting of available staffed pediatric and PICU beds.
- Increase the frequency of pediatric bed availability reporting in EmResource for a region or regions.
- Share information/education on wearing face masks, enhancing hand hygiene and physical distancing, particularly for those children with chronic medical conditions/weakened immune conditions.
- Utilize the IDPH RSV fact sheet for sharing education and information about RSV.
- Enhance communications with other hospitals that have pediatric units.
What Can We Do? Community Recommendations

• Mask indoors in crowded areas, especially at large gatherings during the upcoming holiday season, to prevent acquiring any infection, such as RSV, flu, or COVID-19.
• Wear a mask if you develop any symptoms, such as a runny nose, cough, or fever.
• Cover your cough and sneezes and stay home until you are feeling better or fever free for at least 24 hours without needing fever reducing medications.
• During holiday parties or communal dining, make sure to frequently wash one’s hands with soap and water or use alcohol-based hand sanitizer and avoid touching utensils that are frequently handled by others.
• Whenever possible, maximize indoor ventilation and air circulation.
• Get vaccinated for the flu and get up to date on the COVID-19 vaccine as soon as possible.
• If your child 6 months or older qualifies for Synagis for RSV prevention, talk to your provider at the earliest.
• Seek TIMELY TREATMENT for those at HIGH RISK for flu and COVID-19.
Home Ventilation Will Be Key!

HVAC Operation
- AUTO/Intermittent

Filter (Skip if no HVAC system)
- Regular (MERV 6)

Portable HEPA Air Cleaner
- Yes

Open Window
- No

Extra hour of ventilation
- Yes

Submit

Your Results

End of 4-hour visit
- 82% particle reduction achieved in your home by using ventilation.

1 Hour Later
- 98% particle reduction achieved in your home by using ventilation. You can decrease particles even more by continuing to ventilate for an extra hour.
Packaged Messaging? RSV, FLU, COVID-19

**COLD**
- **COMMON SYMPTOMS:**
  - Cough, running/stuffy nose, sneezing, sore throat
- **PEOPLE AT HIGHEST RISK:**
  - Immunocompromised

**RSV**
- **COMMON SYMPTOMS:**
  - Symptoms appear in stages, not all at once, and include running/stuffy nose, decreased appetite, coughing, sneezing, fever, wheezing
- **PEOPLE AT HIGHEST RISK:**
  - Infants under 6 months, children under 2 with weakened immune systems and underlying health conditions, adults 65+

Wash your hands often to prevent the spread of germs.

**COVID-19**
- **COMMON SYMPTOMS:**
  - Loss of taste/smell, shortness of breath, difficulty breathing, fever, fatigue, cough, muscle aches, running/stuffy nose, sore throat, diarrhea, headache
- **PEOPLE AT HIGHEST RISK:**
  - Unvaccinated individuals, adults over 50, underlying health issues, immunocompromised

**FLU**
- **COMMON SYMPTOMS:**
  - Fever, fatigue, muscle aches/pains, cough (usually coryza), headache, runny/stuffy nose, sore throat, upset stomach
- **PEOPLE AT HIGHEST RISK:**
  - Young kids, adults 65+, pregnant women, immunocompromised, those with underlying health conditions, unvaccinated individuals

IDPH - ILLINOIS DEPARTMENT OF PUBLIC HEALTH
## COVID vs Flu vs. Common Cold vs. RSV: What You Need to Know

<table>
<thead>
<tr>
<th>VIRUS</th>
<th>LEVEL OF INFECTIVITY</th>
<th>TIME FROM EXPOSURE TO INFECTION</th>
<th>SYMPTOMS</th>
<th>PREVALENCE IN CHILDREN</th>
<th>VACCINE AVAILABILITY</th>
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</thead>
<tbody>
<tr>
<td><strong>COMMON COLD</strong></td>
<td>Less contagious</td>
<td>2 to 3 days</td>
<td>Cough</td>
<td>Common</td>
<td>None</td>
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<tr>
<td>Rhinovirus</td>
<td>Symptomatic individuals shed the virus during the first 2 to 3 days of infection.</td>
<td>Low-grade fever</td>
<td>Most children experience 2 to 4 colds per year; frequently associated with asthma exacerbations.</td>
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<td></td>
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<td></td>
<td>Sore throat</td>
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<td></td>
<td>Stuffy nose</td>
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<td><strong>SEASONAL INFLUENZA</strong></td>
<td>Contagious</td>
<td>1 to 4 days</td>
<td>Body aches</td>
<td>Common</td>
<td>Multiple approved</td>
</tr>
<tr>
<td>Influenza virus (A and B)</td>
<td>Viral shedding occurs 24 hours before symptoms appear, peaking around day 3 of illness.</td>
<td>Chills</td>
<td>Children younger than 2 are at highest risk for more severe disease.</td>
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<td></td>
<td></td>
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<td>Cough</td>
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<td>Fatigue</td>
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<td>Sore throat</td>
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<td>Stuffy nose</td>
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<tr>
<td><strong>COVID-19</strong></td>
<td>More contagious</td>
<td>2 to 14 days</td>
<td>Body aches</td>
<td>Becoming more common, and asymptomatic children are possible</td>
<td>Two- and three-dose vaccine approved for ages 6 months–4 years</td>
</tr>
<tr>
<td>Severe acute respiratory syndrome coronavirus 2 (SARS-CoV2)</td>
<td>Viral shedding occurs 2 to 3 days before symptoms appear, peaking around day 3 of illness. However, there can be viral shedding without ever developing symptoms.</td>
<td>Chills</td>
<td>Typically children have mild symptoms, and rarely they develop multisystem inflammatory syndrome in children (MIS-C) weeks after a SARS-CoV-2 infection.</td>
<td>Two-dose vaccine and booster approved for ages 5 and older</td>
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<td></td>
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<td></td>
<td>Cough</td>
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<td>Diarrhea</td>
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<td>Multiple vaccines and boosters approved for adults</td>
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<td>Fatigue</td>
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<td>Headache</td>
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<td></td>
<td>Loss of smell/taste</td>
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<td>Nausea/vomiting</td>
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<td>Shortness of breath</td>
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<td>Stuffy/runny nose</td>
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<tr>
<td><strong>RSV</strong></td>
<td>Very contagious</td>
<td>4 to 6 days</td>
<td>Cough</td>
<td>Common</td>
<td>None</td>
</tr>
<tr>
<td>Respiratory syncytial virus</td>
<td>Symptoms can last 7 to 10 days, but some kids can develop a cough that takes up to six weeks to clear.</td>
<td>Runny nose</td>
<td>Infants are at high risk for severe disease, including pneumonia or bronchiolitis, an inflammation of the small airways in the lungs.</td>
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<td>Sneezing</td>
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<td>Fever</td>
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<td>Wheezing</td>
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**Treatment:** Babies 2 weeks and up can get treatment

**Oral Treatment:** children 12 years and up
Resources

From the AAP
- News: Surge of respiratory viruses in children spurs CDC advisory
- Letter from AAP president: AAP Advocates for Changes to Improve Pediatric Health Care Capacity
- Video of baby with RSV breathing - highly popular content
- Healthy Children parent webinar
- Healthy Children article on FAQs about RSV
- Healthy Children article on RSV vs COVID
- Video featuring Dr. Parga-Belinkie where she reassures parents about the scary news headlines and encourages them to get their kids vaccinated and to call their pediatrician with concerns. Check out and share on Facebook, Twitter, Instagram and YouTube

From ICAAP
- Immunizations page – this is where today’s slides and recording will be posted
- Immunizations resources for providers
- Immunizations resources for families
Upcoming ICAAP Webinars/Events

- **November 15 at 12pm: I-CARE Tips** – CME available. Register [here](#).

- **December 16 at 8am: I-VAC Vaccine Bootcamp** – CME available. Register [here](#).

- **December 20 at 12pm: Vaccinations - Back to Basics** – CME available. Register [here](#).

- **Adolescent Health Training Series in ICAAP’s Learning Management System** – CME Available until December 31, 2022

  ICAAP has Adolescent Health continuing medical education on the following topics: Transitioning Youth to Adult Healthcare, Teen Brain Development: Effects in Health and Behavior, Counseling Teens on Sexual Health and Risk-Taking Behaviors, Bright Futures Guidelines: Implementation for Adolescents (11-21 years), Use of social media for Patient Outreach, Marijuana: Medical and Recreational Use, and Aiding Adolescents to Take Control of their Health. Visit [here](#) to enroll.
Thank you!

Any Questions?