CANCER IN THE TIME OF CORONAVIRUS COVID-19 VACCINE

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COVID-19 RE-CAP

• First cases seen in Wuhan, China in December 2019
• Common symptoms:
  • Fever
  • Cough
  • Shortness of Breath
  • New loss of taste or smell
• Caused by viral infection
• >350,000 deaths in the USA due to COVID-19 in 2020
• Potential for asymptomatic spread
• Please see our prior Webinar and Slides for additional background: https://cancer.ufl.edu/2020/04/07/cancer-in-the-time-of-coronavirus/
HOW DO VACCINES WORK?

- **Introduce** infectious particles into the body
- **Stimulate** immune response to vaccine
- “Memory” immune cells **recognize** a prior exposure
- Immune response to true infection **prevents** severe disease
1. Classical platforms
   - Whole-inactivated virus
     Example: Polio vaccine COVID-19
     PICoVacc in phase 1 clinical trials
   - Live-attenuated virus
     Example: MMF vaccine COVID-19
     in preclinical stage
   - Protein subunit
     Example: Seasonal influenza vaccine COVID-19
     NVX-CoV2373 in phase 1/2 clinical trials
   - Virus-like particle
     Example: Human papillomavirus vaccine COVID-19
     in preclinical stage

2. Next-generation platforms
   - Viral vector
     Example: VSV-Ebola vaccine COVID-19
     AZD1222, Ad5-nCoV
     in phase 1/2/3 clinical trials
   - DNA
     Example: Not currently licensed COVID-19
     INO-4800 in phase 1 clinical trials
   - RNA
     Example: Not currently licensed COVID-19
     mRNA-1273, BNT162
     in phase 1/2 clinical trials
   - Antigen-presenting cells
     Example: Not currently licensed COVID-19
     LV-SMENP-DC, COVID-19aAPC
     in phase 1/2 clinical trials
mRNA vaccines give the immune system genetic instructions to recognise the virus

Scientists focus on the genetic sequence for the virus’s ‘spike’ protein. This is used to synthesise an mRNA sequence – instructions that cells can use to make the ‘spike’ protein.

The synthetic mRNA is packaged in a lipid nanoparticle that delivers the instructions to a cell.

Once inside the cell, its cellular machinery follows the mRNA instructions to produce the viral protein. This is displayed on the surface of the cell and stimulates an immune system response.
HOW DO WE KNOW VACCINES ARE SAFE AND EFFECTIVE?

Phase 1
20-100 healthy volunteers
Researchers try to answer these questions:
• Is this vaccine safe?
• Are there any serious side effects?
• How does the vaccine dose relate to any side effects?
• Is the vaccine causing an immune response?

Phase 2
Several hundred volunteers
Researchers try to answer these questions:
• What are the most common short-term side effects of the vaccine?
• What is the body’s immune response?
• Are there signs that the vaccine is protective?

Phase 3
One thousand or more volunteers
Researchers try to answer these questions:
• How do disease rates compare between people who get the vaccine and those who do not?
• How well can the vaccine protect people from disease?

FDA approves a vaccine only if:
• It is safe and effective
• Its benefits outweigh the risks

Phase 4
Treatment is approved by the FDA and made available to the general public.
FDA closely monitors the safety of the vaccine after the public begins using it. Researchers continue to collect data on the vaccine’s long-term benefits and side effects.
**CORONAVIRUS VACCINES**

- In US, two vaccines received Emergency Use Authorization in December 2020.
  - Pfizer-bioNTech
  - Moderna
- Additional clinical trials ongoing.

*World Health Organization: Landscape of COVID-19 candidate vaccines*

*NYTimes: Coronavirus Vaccine Tracker*
Two shots, 3 weeks apart

4% of participants had history of cancer

Vaccine doesn’t affect our DNA.

Vaccine doesn’t give us COVID-19.

<table>
<thead>
<tr>
<th></th>
<th>After 1st</th>
<th>After 2nd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm pain</td>
<td>71%</td>
<td>66%</td>
</tr>
<tr>
<td>Tired</td>
<td>34%</td>
<td>51%</td>
</tr>
<tr>
<td>Headache</td>
<td>25%</td>
<td>39%</td>
</tr>
<tr>
<td>Muscle ache</td>
<td>14%</td>
<td>29%</td>
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<tr>
<td>Joint ache</td>
<td>9%</td>
<td>19%</td>
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<tr>
<td>Chills</td>
<td>6%</td>
<td>23%</td>
</tr>
<tr>
<td>Use of Tylenol or Ibuprofen</td>
<td>20%</td>
<td>38%</td>
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</tbody>
</table>

COVID-19 Infections After Vaccine or Placebo

- Early protection 12 days after first vaccine dose.
- After first vaccine dose, 52% less COVID-19.
- Seven days after second vaccine dose, 95% less COVID-19.
- Curve plateau suggests extended protection.

COVID-19 Infections After Vaccine or Placebo

**COVID-19 VACCINE EFFICACY**

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- **After first vaccine dose, 52% less COVID-19.**
- **Seven days after second vaccine dose, 95% less COVID-19.**
- **Curve plateau suggests extended protection.**

**VACCINE DISTRIBUTION**

- **Limited Doses Available**
  - Constrained supply
  - Highly targeted administration required to achieve coverage in priority populations

- **Large Number of Doses Available**
  - Likely sufficient supply to meet demand
  - Supply increases access
  - Broad administration network required, including surge capacity

- **Continued Vaccination, Shift to Routine Strategy**
  - Likely excess supply
  - Broad administration network for increased access

**Example populations**
- **HCPs** First responders
- **People with high-risk conditions**
- **Non-healthcare critical workers**
- **Young adults**
- **All others in the US who did not have access in previous phases**
SHOULD CANCER PATIENTS GET VACCINATED?

• YES … MAYBE!
Personal History of Cancer

Off Active Treatment
- Chemotherapy finished
- Autologous transplant > 3 months
- Allogeneic transplant off immune suppression and > 6 months after

On Active Treatment
- Hormone therapy
- Chemotherapy

Maintenance Treatment
- Chemotherapy
- Immune therapy

Ask your oncologist now.
WHERE CAN I GET VACCINATED?

<table>
<thead>
<tr>
<th>Population</th>
<th>Place</th>
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</thead>
<tbody>
<tr>
<td>Health Care Personnel</td>
<td>✔ Health System</td>
</tr>
<tr>
<td>Long-Term Care Resident</td>
<td>✔ Facility</td>
</tr>
<tr>
<td>65 year olds and older</td>
<td>✔ Health System</td>
</tr>
<tr>
<td></td>
<td>✔ County Health Department</td>
</tr>
<tr>
<td>High Risk Patients</td>
<td>✔ Health System</td>
</tr>
<tr>
<td></td>
<td>✔ County Health Department</td>
</tr>
</tbody>
</table>

Vaccine Updates from State of Florida: Text FLCOVID19 to 888777
WHAT DO I DO AFTER GETTING THE VACCINE?

• Tylenol or Ibuprofen?
• Continue prevention:
  • Masking
  • Social distancing
  • Hand-washing frequently
COMMON QUESTIONS

• Should I get a vaccine if I had COVID-19 in the past?
• Should I get a vaccine if I have an autoimmune condition?
• Should I get a vaccine if I have HIV?
• If I get a COVID-19 vaccine will I test positive on a coronavirus swab test?
• Will the vaccine prevent infection from the new, highly transmissible variants?
• North Central Florida Regional Cancer Control Collaborative

• UF Health Cancer Center

• Florida Cancer Control and Research Advisory Council (CCRAB)
AFTER WEBINAR SURVEY

http://bit.ly/3q1uUbQ