



FOR  
**Health Professionals**

# Immunization in Cancer Patients: An Often Forgotten or Ignored Responsibility

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# Disclosures

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Pfizer/Teva/GlyPharma/Cidara

**Scientific advisory board:** Amgen/Merck Frosst/Pfizer

Teva/GlyPharma/Cidara

# Objectives

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1. To understand the principles of immunization in cancer and blood disorder patients
2. To be aware of the live and attenuated vaccines that are available in Canada
3. To understand the timing of immunization for bacterial and viral diseases
4. To review recommendations for asplenia, family/household members and international travel

## Question:

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**A 66-year old man has T2N1M0 Stage III adenocarcinoma of the sigmoid colon based upon a complete resection September 15<sup>th</sup> . His medical oncologist recommends adjuvant FOLFOX every 2 weeks over 8 cycles beginning mid-October. His family physician reminds him about his annual influenza vaccination and advises him to consider the pneumococcal conjugate and polysaccharide vaccines.**

***When should the vaccines be administered?***

## Select the best response...

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- A. Administer the influenza (TIV) and pneumococcal polysaccharide (PPV-23) vaccines on day 1 of FOLFOX?
- B. Administer TIV and pneumococcal conjugate (PCV-13) vaccine now and PPV-23 in 9 months?
- C. Administer TIV and PPV-23 at the beginning of Flu season in December?
- D. Administer Oseltamivir and phenoxymethyl penicillin throughout Flu season?



# Immunizations in Cancer Patients

## *Principles*

### 1. Why . . .

- I. Children: to prevent illness
- II. Adults: to prevent severe illness and death

### 2. Responsibility . . .

- I. Shared between specialist and primary care provider
- II. Patients and family / household contacts  
*“Circle of Protection”*

# Immunizations in Cancer Patients

## *Principles*

### 3. What . . .

- I. Inactivated vaccines
- II. Live vaccines

# Immunizations in Cancer Patients

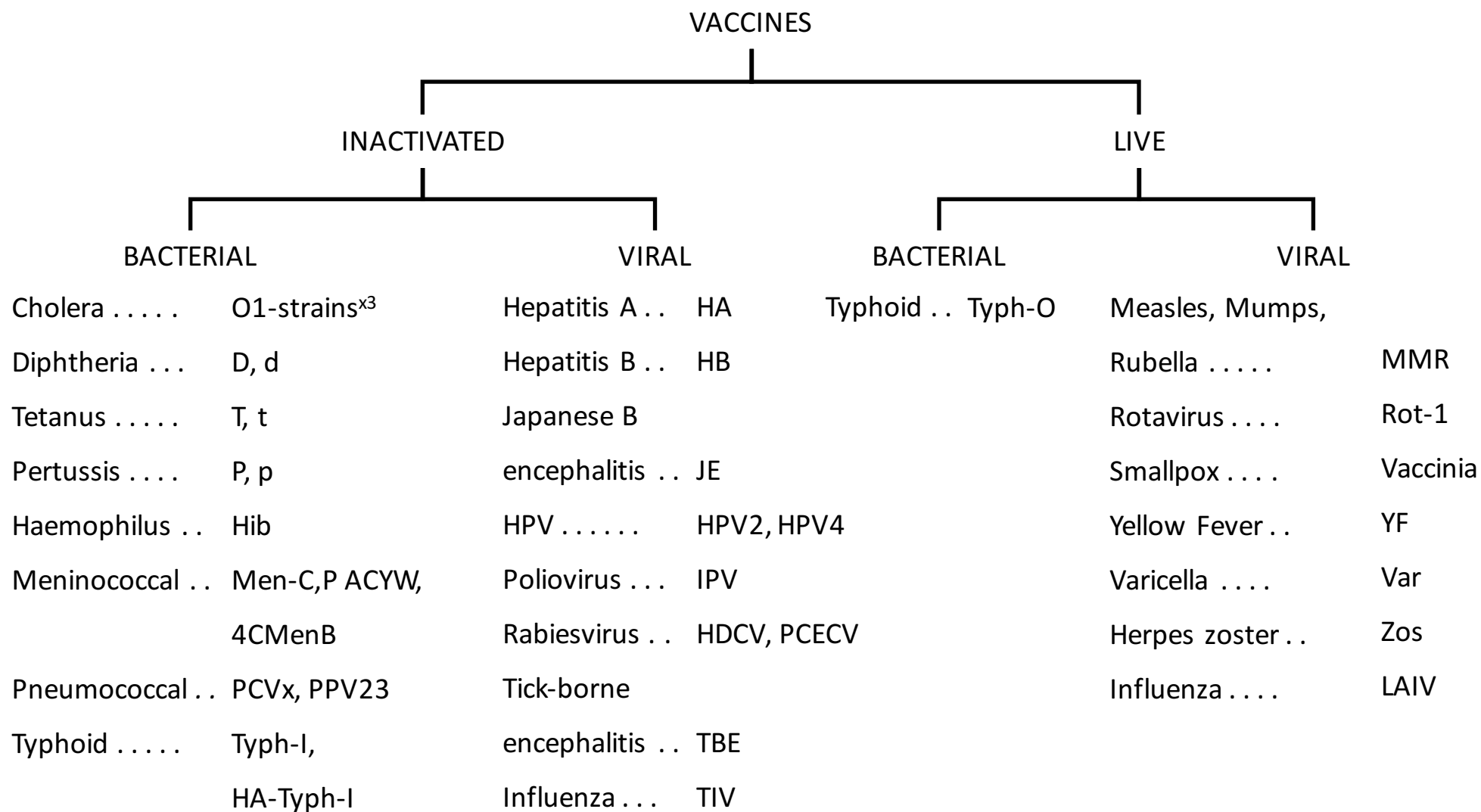
## *Principles*

### 4. Timing . . .

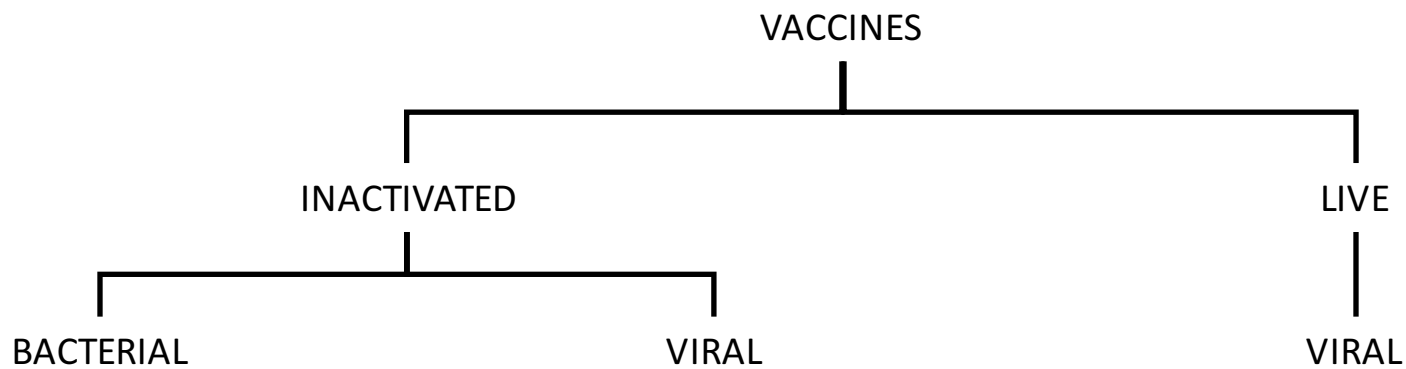
- i. **Prior** to planned chemo/radio/immuno-suppressive therapy
  - a) Live vaccines:  $\geq 4$  weeks prior
  - b) Inactivated vaccines:  $\geq 2$  weeks prior
- ii. **During** chemo/radio/immuno-suppressive therapy
  - a) Inactivated vaccines:  
Considered incomplete . . . re-dosing is controversial
  - a) Live vaccines: **Contraindicated**, *except . . .*
- iii. **After** chemo/radio/immuno-suppressive therapy
  - a)  $\geq 3$  months after completion of treatments
  - b)  $\geq 6$  months after anti-B-cell antibodies
  - c) HSCT: Inactivated = 6-12 months post-SCT
  - d) HSCT: Live = 24 months post-SCT, free of GvHD & treatment



# Vaccines available in Canada



# Vaccines for asplenia or hyposplenia



Pneumococcal . . . PCV<sub>13</sub> → PPV<sub>23</sub>  
 Tetanus,  
 diphtheria,  
 acellular  
 pertussis . . . . . Tdap  
 Haemophilus . . . . Hib<sub>unimmunized</sub>  
 Meningococcal . . . . Men-C-ACYW  
 . . . . & 4CMenB<sub>Q5Yr</sub>

Influenza . . . TIV<sub>annually</sub>  
 HPV . . . . . HPV2, HPV4  
 Hepatitis A . . HA ± HB, IViG  
 Hepatitis B . . HB<sub>40ug @ 0,1,6 mo</sub>

Measles, Mumps,  
 Rubella . . . . . MMR ≥ 1957  
 Varicella . . . . . Var, ≥ 1980  
 Herpes zoster . . Zos, ≥ 60 yr

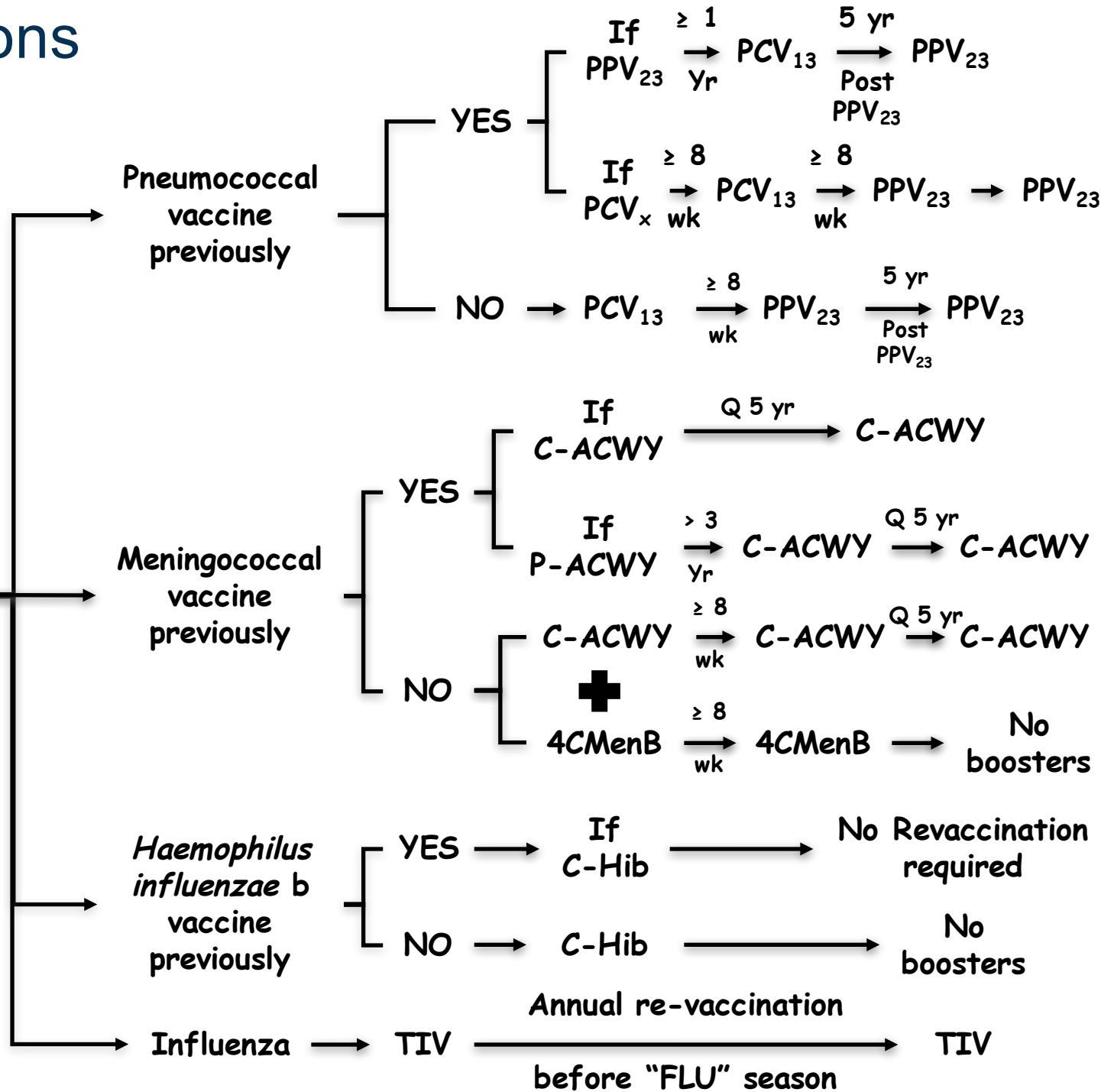
# Recommendations for Patients Undergoing Chemotherapy



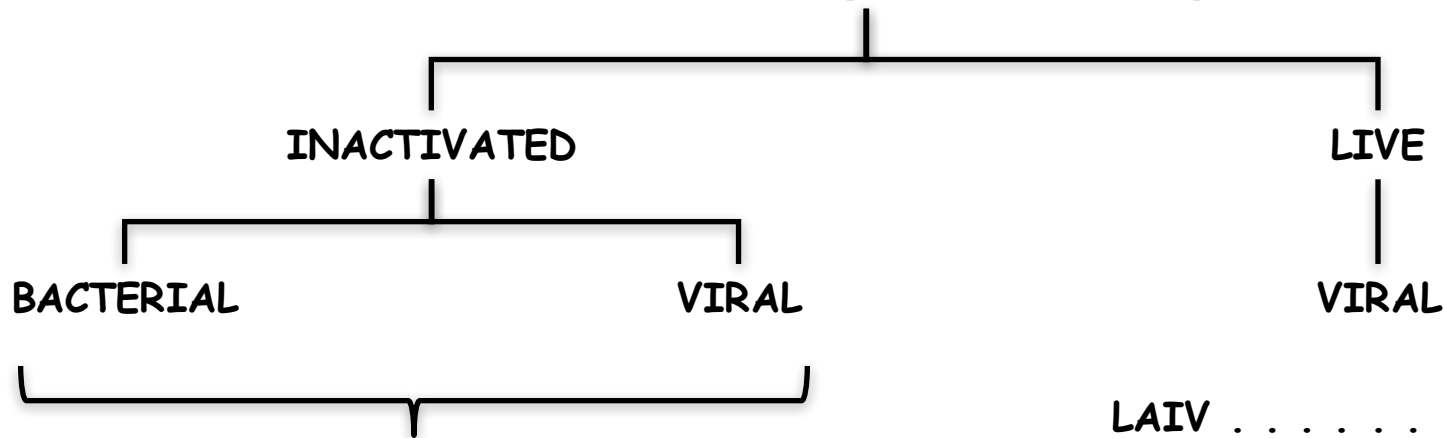
**Cancer or Blood Disorder**

**≥ 14 days before beginning chemotherapy**

**≥ 3 months after completing chemotherapy**



# Vaccines for household members of immunocompromised patients



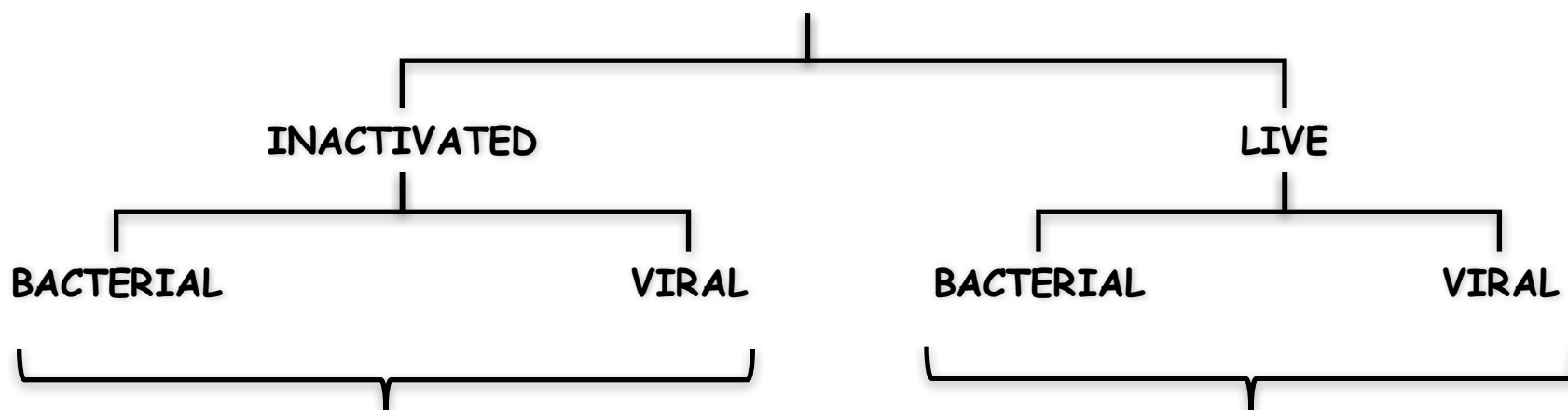
Household members of an immunocompromised patient may receive all inactivated vaccines as recommended by the CDC-ACIP

LAIV . . . . . Except HSCT  
< 2 mo post-SCT

Measles, Mumps, Rubella . . . . . MMR ≥ 1957  
Varicella\* . . . . . Var, ≥ 1980  
Herpes zoster\* . . . . . Zos, ≥ 60 yr

\*Avoid contact until skin lesions have resolved

## Vaccines for international travel for immunocompromised patients



Immunocompromised patients may receive all inactivated vaccines as recommended by the CDC-ACIP,  $\geq 3$  months after planned chemotherapy

Immunocompromised patients should not receive live vaccines with some exceptions

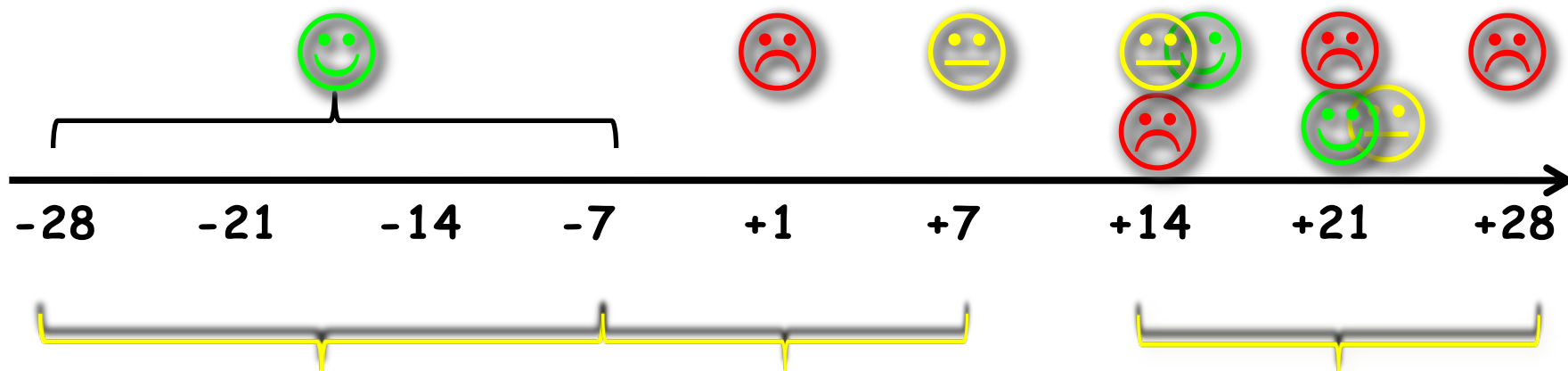
- *V. cholerae* O1
- Typh-I, HA-Typh-I
- Men-C-ACWY, 4CMenB
- Tdap
- HAHB
- JE
- IPV
- TBE
- HDCV, PCECV
- TIV

# INFLUENZA AND CANCER CARE

## When to administer the influenza vaccine to patients receiving on-going chemotherapy

Allen U, Doucette K, Bow EJ. PHAC Guideline January 26<sup>th</sup>, 2010

Regimens: 14-day, 21-day, 28-day



Immune response requires 7-14 days  
Best to immunize before planned CT/RT

Administration within 7 days of CT reduces vaccine responsiveness  
D+1 . . . No  
D+7 . . . Probably not

D+14 of 14-day regimen . . . No  
D+14 of 21-28 day regimen . Maybe  
D+21 of 21-day regimen . . . No  
D+21 of 28-day regimen . . . Maybe  
D+28 of 28-day regimen . . . No



# Take Home Messages

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1. Immunization = Standard supportive care
2. Safety: Inactivated  Live 
3. Timing: BEFORE ( $\geq 4$  weeks, live;  $\geq 2$  weeks, inactivated)  
AFTER ( $\geq 3$  months) end-of-treatment
4. Annual influenza immunization is a **MUST**
5. Family members  $\approx$  “herd immunity”
6. Cancer patients can travel safely, but it depends where you go!

# Questions?

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## Question:

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**Remember the 66-year old man with T2N1M0 Stage III adenocarcinoma of the sigmoid colon based upon a complete resection September 15<sup>th</sup> whose medical oncologist recommended adjuvant FOLFOX every 2 weeks over 8 cycles beginning mid-October and whose family physician advised him regarding his annual influenza vaccination and to consider pneumococcal conjugate and polysaccharide vaccines.**

***When should those vaccines be administered?***

## Select the best response...

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- A. Administer the influenza (TIV) and pneumococcal polysaccharide (PPV-23) vaccines on day 1 of FOLFOX?**
- B. Administer TIV and PCV-13 now and PPV-23 in 9 months?**
- C. Administer TIV and PPV-23 at the beginning of Flu season in December?**
- D. Administer oseltamivir and phenoxymethyl penicillin throughout Flu season?**

## Select the best response...

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- A. Administer the influenza (TIV) and pneumococcal polysaccharide (PPV-23) vaccines on day 1 of FOLFOX? *Nope! Poor response*
- B. Administer TIV and PCV-13 now and PPV-23 in 9 months?  
*Yup! Great for TIV, but incomplete for IPD . . .*
- C. Administer TIV and PPV-23 at the beginning of Flu season in December?  
*NOT ideal . . . Perhaps day +7 of a cycle*
- D. Administer oseltamivir and phenoxymethyl penicillin throughout Flu season?  
*Consider post-exposure oseltamivir . . . Otherwise NO*