Vaccine Preventable Diseases in the Elderly

Paul Van Buynder, Professor
Griffith University
Simon Fraser University

Staff Specialist
Gold Coast Health

We were young and beautiful
Now we are just beautiful
Overview

- Who is most at risk and why .. Burden of disease
  - Impact of immune-senescence and frailty
  - Focus on influenza, pneumonia and shingles

- Country variations
  - UK, Canada, US and Australia

- Maximising coverage

Disclosures:

I have received study/trials and/or travel support relating to existing and novel influenza vaccines from Novartis, NVS, GSK, Sanofi, and CSL.

I am 60ish, take 4 medications, am overweight and unfit and my orthopod wants me to have a hip replacement

I AM TARGET GROUP
Seniors’ Health: Adding Life To Years

1980’s
1990’s
2000’s

Age
60 70 80 90
Immuno-senescence: Aging of Immune System

Immuno-senescence

Dysregulation in immune function

Increased incidence and severity of infections\(^1\)

Reduced response to immunization\(^2\)

Influenza and Pneumonia
Impact of Influenza

- 300,000 GP consultations per year
- 18,000 hospitalisations per year
  - Over 2/3 in elderly
  - Hospitalized older adults suffer rapid decline in health, quality of life
- 1500 - 3000 deaths
  - Over 90% in elderly
- Severe impact mainly in elderly
Effect of Immunosenescence

- Effect of serious outcomes increases
  - 90% of deaths in elderly
  - 3-4 hospitalisations per death

- Response to vaccinations decreases
  - Efficacy about 60% in healthy adults
  - Efficacy 27-40% in elderly
    - ..but are still cost saving so a margin for improvement
Chronic diseases that increase risk for influenza and complications of infection are very common in older adults.
Vaccine Preventable Disability

Catastrophic disability

- Defined as a loss of independence in ≥ 3 ADL
- 72% who experience catastrophic disability have been hospitalized
- Leading causes of catastrophic disability
  1. Stroke
  2. CHF
  3. Pneumonia and influenza
  4. Ischemic heart disease
  5. Cancer
  6. Hip fracture

Ferrucci et al. JAMA 277:728, 1997
Clinical Frailty Scale:

1. **Very fit** – robust, active, energetic, well motivated and fit; exercise regularly, are in the most fit group for their age

2. **Well** – without active disease, less fit than people in category 1

3. **Well, with treated chronic disease** – symptoms are well controlled compared to those in category 4

4. **Apparently vulnerable** – not frankly dependent, but commonly complain of being “slowed up” or have disease symptoms

5. **Mildly frail** – limited dependence on others for instrumental activities of daily living

6. **Moderately frail** – help is needed with both instrumental and basic activities of daily living (e.g. climbing stairs and bathing)

7. **Severely frail** – mostly dependent on others for the activities of daily living

8. **Very severely frail** – completely dependent on others for the activities of daily living

9. **Terminally ill**
Shingles
Herpes Zoster or “Shingles”

- Localised rash, acute pain
- Systemic symptoms
- Complications
  - Site specific
  - Post Herpetic Neuralgia (PHN)
  - Pain persisting > 90 days
- Risk of PHN increases with advanced age,
- PHN outcomes
  - substantial impact on quality of life
  - can be refractory to treatment
  - Complex management
  - antivirals, simple and complex analgesics
Impact on quality of life

- major impact across all four health domains
  - physical, psychological, functional and social.

- correlation between increasing severity of pain and greater interference with daily activities

- some experience permanent loss of independence
If you’ve had chickenpox, you’re at risk of zoster

(VZV seroprevalence: >97% in >35 years)

- Cumulative lifetime risk of HZ ~20%
- 70% of all HZ cases in those ≥50 yrs of age
- Over 150,000 new cases annually in Australia

PHN

- ~ 15% of all HZ patients > 50 years of age develop PHN.
- > 80 years of age about ¼ of HZ patients develop PHN
- ~35% of HZ-related hospitalisations coded as having PHN
Vaccines
So…. as we age

- Substantial impact of immune-senescence and frailty on impact of disease and ongoing disability.

- For influenza, pneumonia and shingles vaccines exist but not perfect and differential access and differential uptake across countries.

- In Australia
  - 75-80% of elderly regularly get influenza vaccine
  - Half this have had pneumococcal vaccines
  - 4% have had shingles vaccine
Zostavax  (Merck/Seqirus)

- Licensed for use in adults ≥ 50 years of age
- Single dose, no recommendations for a booster…yet

- Efficacy against HZ decreases with age (data for first 3 years)
  - 50-59 years: 69.8%
  - 60-69 years: ~63.9%
  - ≥70 years: 37.6%

- Waning of protection occurs within 5-7 years…
Australian Program

- Funded program coming later this year
- Free for those after 70 years with time limited update for those up to 79 years
- No booster recommendation
- Licensed from 50 years up
- Coverage poor but unfunded (and expensive)
What’s happening elsewhere?

USA
- Available since 2007
- Available after 50 years, funded from 60 years (= Canada in access)
- Uptake slow – 13-20% coverage

United Kingdom
- Program for 70 and 79 year olds, began in September 2013
- Uptake – 53% (3 cohorts)
- No impact assessment yet....
Influenza vaccines

- Largely available for all elderly
- Coverage reasonable most countries
- Challenge is effectiveness as we age
- ? and the mandating of cocooning
Better vaccines

- Two main ones
  - High Dose
    - in great use in the US particularly
  - Adjuvanted vaccines
    - Mainly Europe but also widely in Canada
  - Both give 25% on average enhanced protection which is massive in this group

- Have to fund them and make them available to improve uptake

- Primary care provider support for them critical
IIV3-HD US Vaccine Licensure

- IIV3-High-Dose vaccine was licensed by the FDA in December, 2009

- Approximate dosage distribution data in US:
  - 8 million doses 2013-2014 season.
  - 12 million doses 2014-2015 season (40%)
  - 17 million doses 2015-2016 season (50%).
And force uptake of vaccine in carers in Residential Care Facilities
Questions?

Acknowledgements:
Kristine Macartney, NCIRS