USF HEALTH

UNIVERSITY OF SOUTH FLORIDA

GERIATRIC WORKFORCE ENHANCEMENT PROGRAM (GWEP)

FACULTY DEVELOPMENT MASTERWORKS SERIES

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To Shoot or Not to Shoot: Immunization Rates & Disparities in the Elderly

Given by Dr. Asa Oxner

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Disclosures

- I have no financial, personal, or familial associations to disclose

Vaccine History

First, a little background…

What is a Vaccine?

- **Agent stimulates the body's immune system to recognize the agent as foreign, destroy it, and "recognize" it, so that the immune system can more easily recognize and destroy at a later time.**

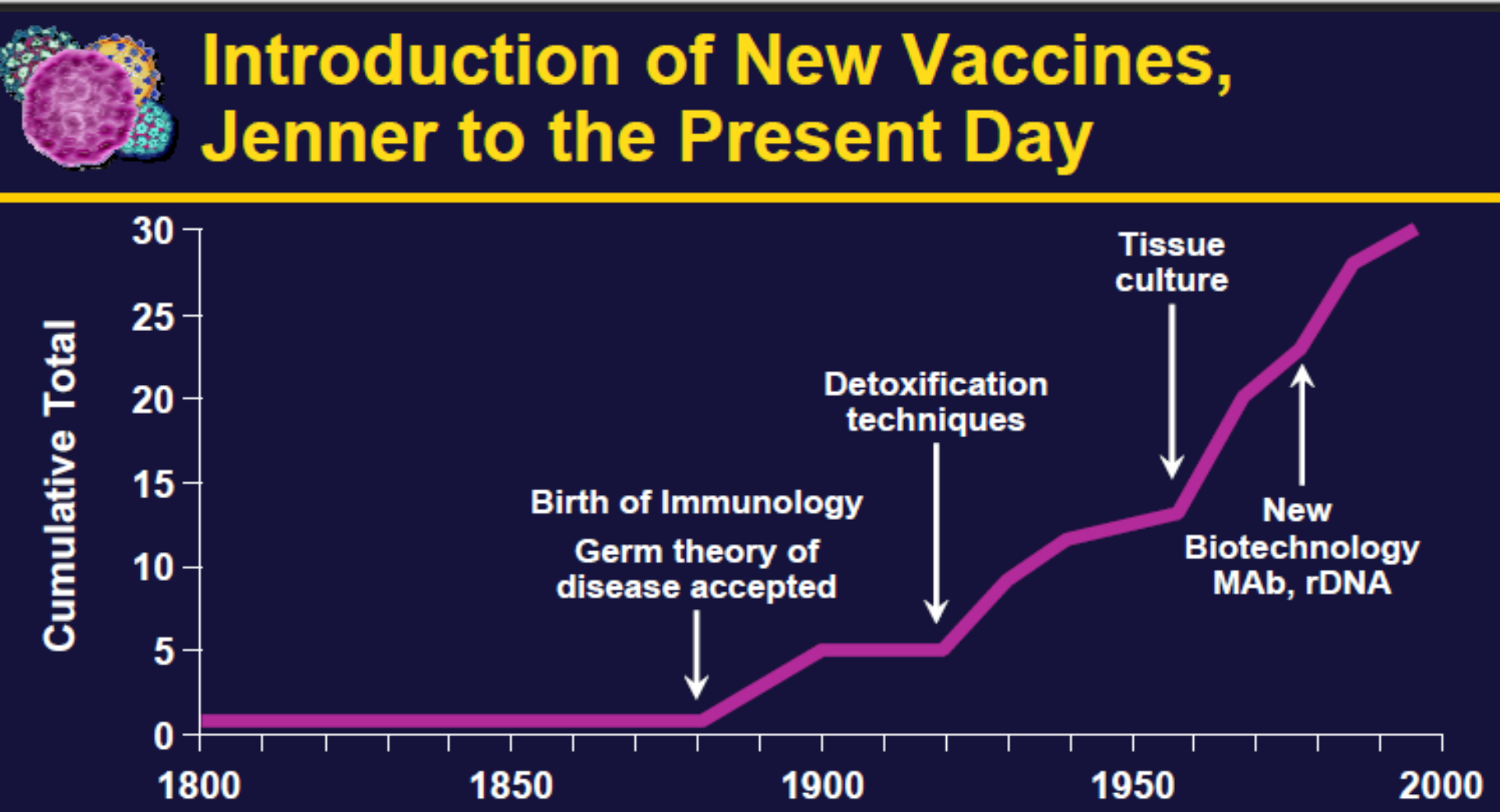
-UpToDate, 2014

History of Vaccinations: Jenner & Smallpox

1796- The term vaccine was derived from Edward Jenner's use of cow pox.

When administered it provided protection against smallpox..

Introduction of New Vaccines, Jenner to the Present Day



1796	1880-1920	1920-1960	1960-1990	1990-2000
Smallpox	• Rabies • Typhoid • Cholera • Plague • Diphtheria toxin	• Diphtheria toxoid • BCG (Tuberculosis) • Pertussis • Tetanus toxoid • Yellow fever • Influenza • Polio	• Measles • Mumps • Rubella • Adenovirus • Pneumococcal • Meningococcal C, A • Hepatitis B • Rabies, HDCV • Hib • Typhoid, oral	• Hepatitis A • Acellular pertussis • Varicella • DTaP/Hib • Japanese encephalitis • Vi typhoid • Lyme disease • Pneumococcal conjugate

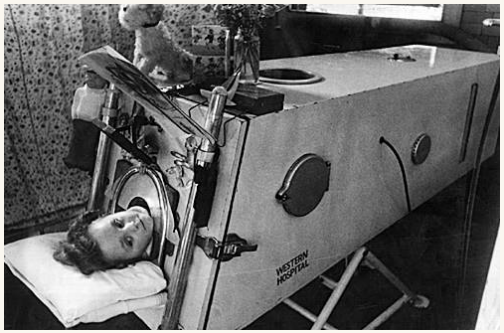
Presentation Objectives

- **Address why vaccines are an important public health measure**
- **Briefly review guidelines for flu and pneumonia vaccines in older adults**
- **Examine disparities in vaccination rates in the geriatric population**
- **Understand vaccine myths**
- **Identify barriers to vaccinations in geriatric patients**

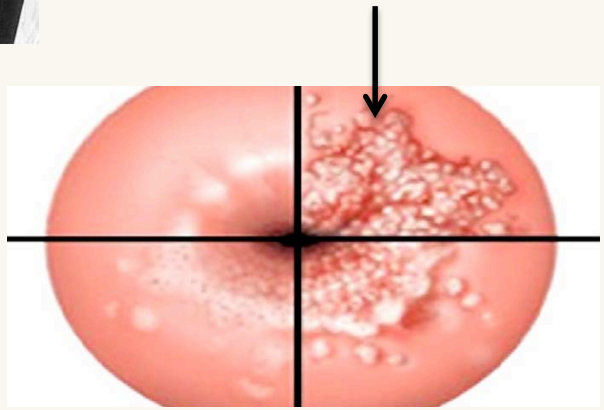
Important Public Health Measure: Vaccines Prevent Disease

Pictures Speak Louder than Words ---

Polio, Smallpox, Cervical Cancer



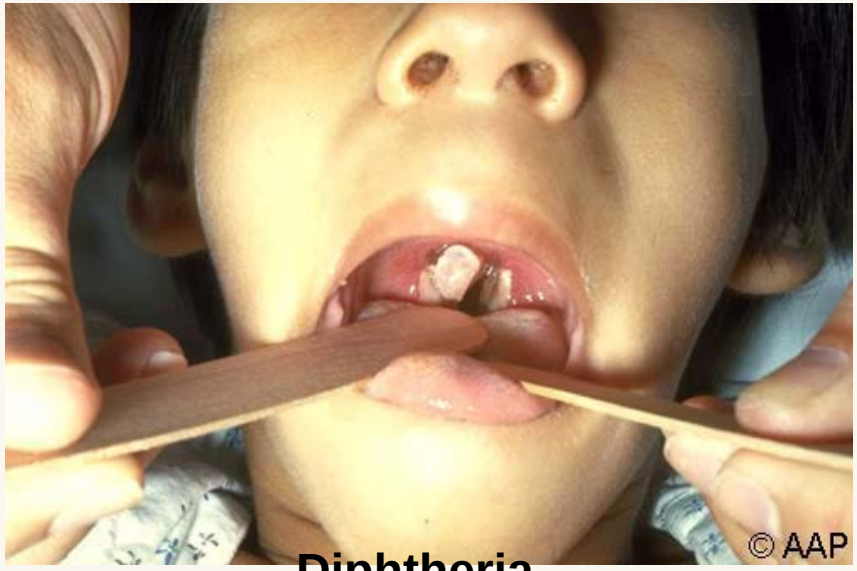
Polio



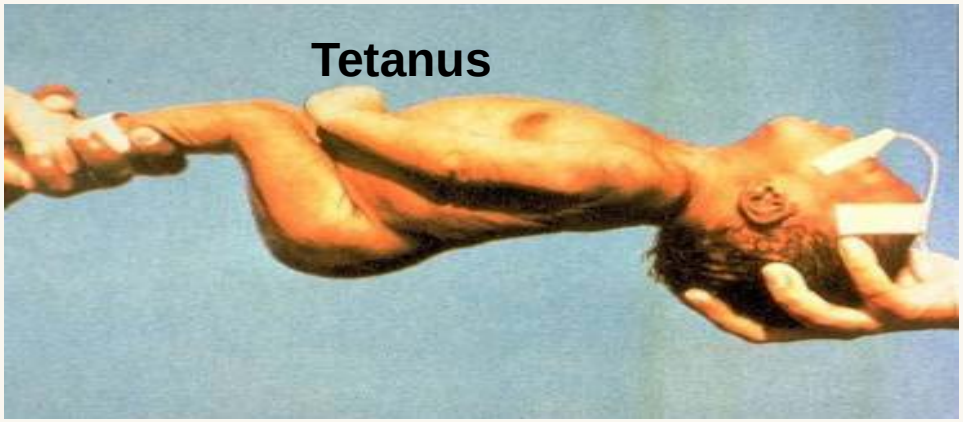
Cervical cancer

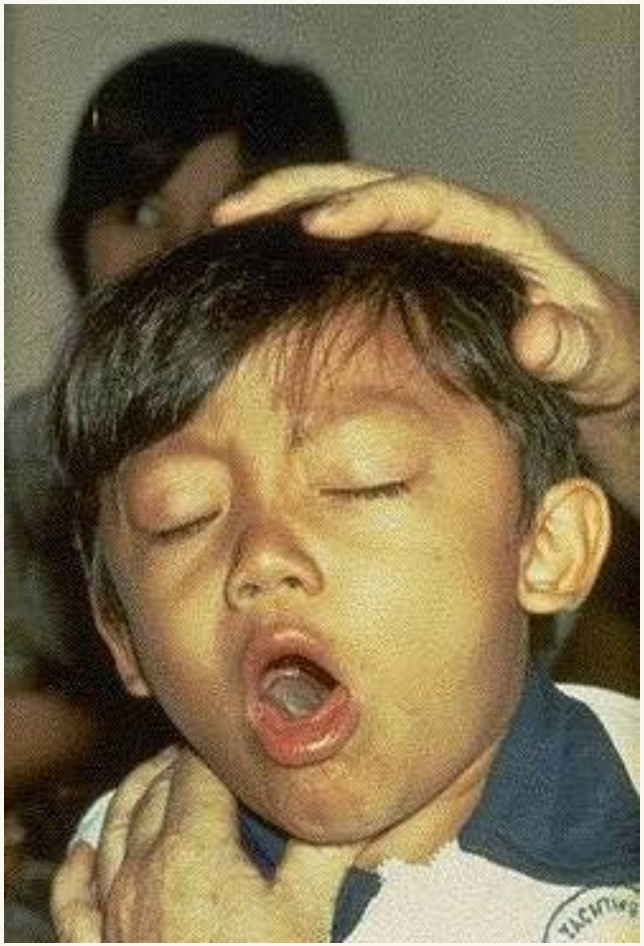
Smallpox

Diphtheria, Tetanus & Pertussis



Diphtheria





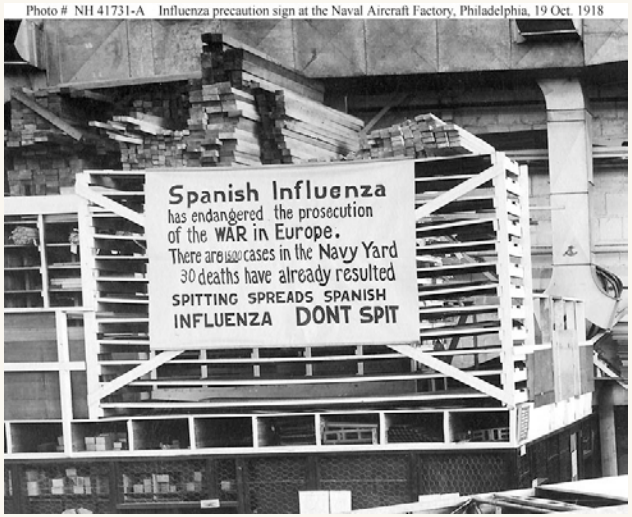
Pertussis = Whooping Cough

Influenza, Pneumonia & Meningitis

Pneumonia

Meningitis

Influenza Pandemic of 1918



Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases

Disease	20th Century Annual Morbidity†	2011 Reported Cases ††	Percent Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Measles	530,217	212	> 99%
Mumps	162,344	370	> 99%
Pertussis	200,752	15,216	92%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	4	> 99%
Congenital Rubella Syndrome	152	0	100%
Tetanus	580	9	98%
Haemophilus influenzae	20,000	8*	> 99%

† Source: JAMA. 2007;298(18):2155-2163

†† Source: CDC. MMWR January 6, 2012;60(51);1762-1775. (provisional 2011 data)

* *Haemophilus influenzae* type b (Hib) < 5 years of age. An additional 14 cases of Hib are estimated to have occurred among the 237 reports of Hi (< 5 years of age) with unknown serotype.

CDC Immunization

Vaccination is one of the greatest public health achievements in the United States in the 20th Century. Immunizations have eradicated smallpox, eliminated polio in the Americas, and controlled measles, rubella, tetanus, diphtheria and others.

Today, the greatest vaccine-preventable disease burden for the U.S. population is among older adults.

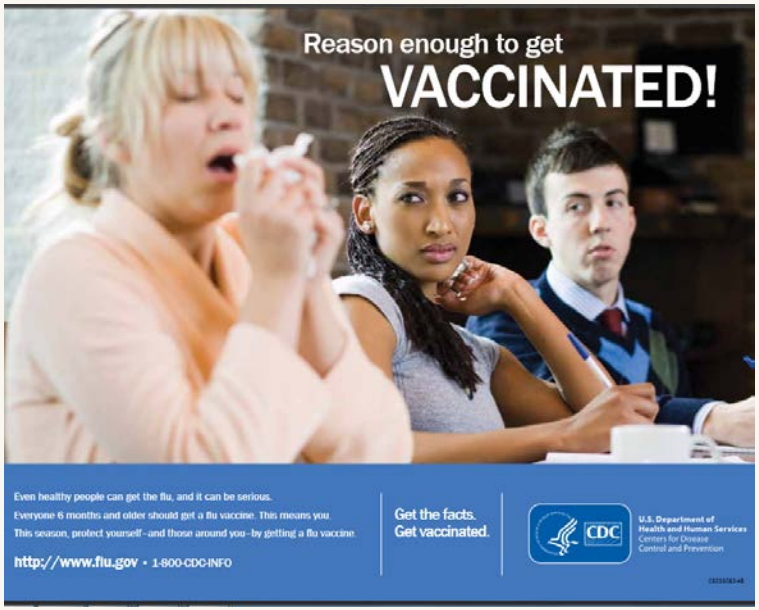
- Surgeon General David Satcher, MD, PhD

Remarks to Congress, August 1999

Guidelines for Vaccinations in older adults

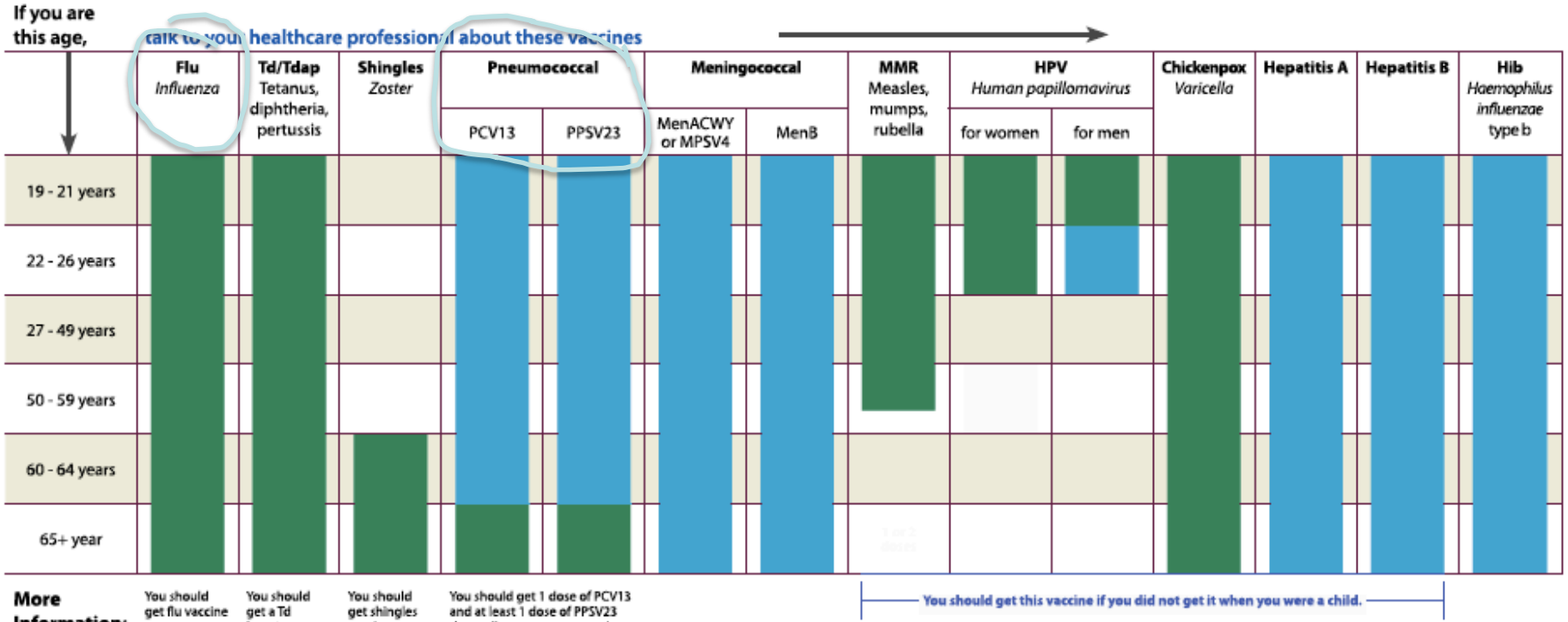
Guidelines for Vaccinations in older adults

- **Influenza, pneumococcal, tetanus/diphtheria, and herpes-zoster vaccinations are recommended by Advisory Committee on Immunization Practices (ACIP) for elders**



INFORMATION FOR ADULT PATIENTS

2016 Recommended Immunizations for Adults: By Age



More Information:

- **Flu:** You should get flu vaccine every year.
- **Td/Tdap:** You should get a Td booster every 10 years. You also need 1 dose of Tdap. Women should get a Tdap vaccine during every pregnancy to protect the baby.
- **Shingles:** You should get shingles vaccine even if you have had shingles before.
- **Pneumococcal:** You should get 1 dose of PCV13 and at least 1 dose of PPSV23 depending on your age and health condition.
- **MMR, Chickenpox, Hepatitis A, Hepatitis B, Hib:** You should get this vaccine if you did not get it when you were a child.
- **HPV:** You should get HPV vaccine if you are a woman through age 26 years or a man through age 21 years and did not already complete the series.

Recommended For You: This vaccine is recommended for you ***unless*** your healthcare professional tells you that you cannot safely receive it or that you do not need it.

May Be Recommended For You: This vaccine is recommended for you if you have certain risk factors due to your health, job, or lifestyle that are not listed here. Talk to your healthcare professional to see if you need this vaccine.

If you are traveling outside the United States, you may need additional vaccines.
Ask your healthcare professional about which vaccines you may need at least 6 weeks before you travel.

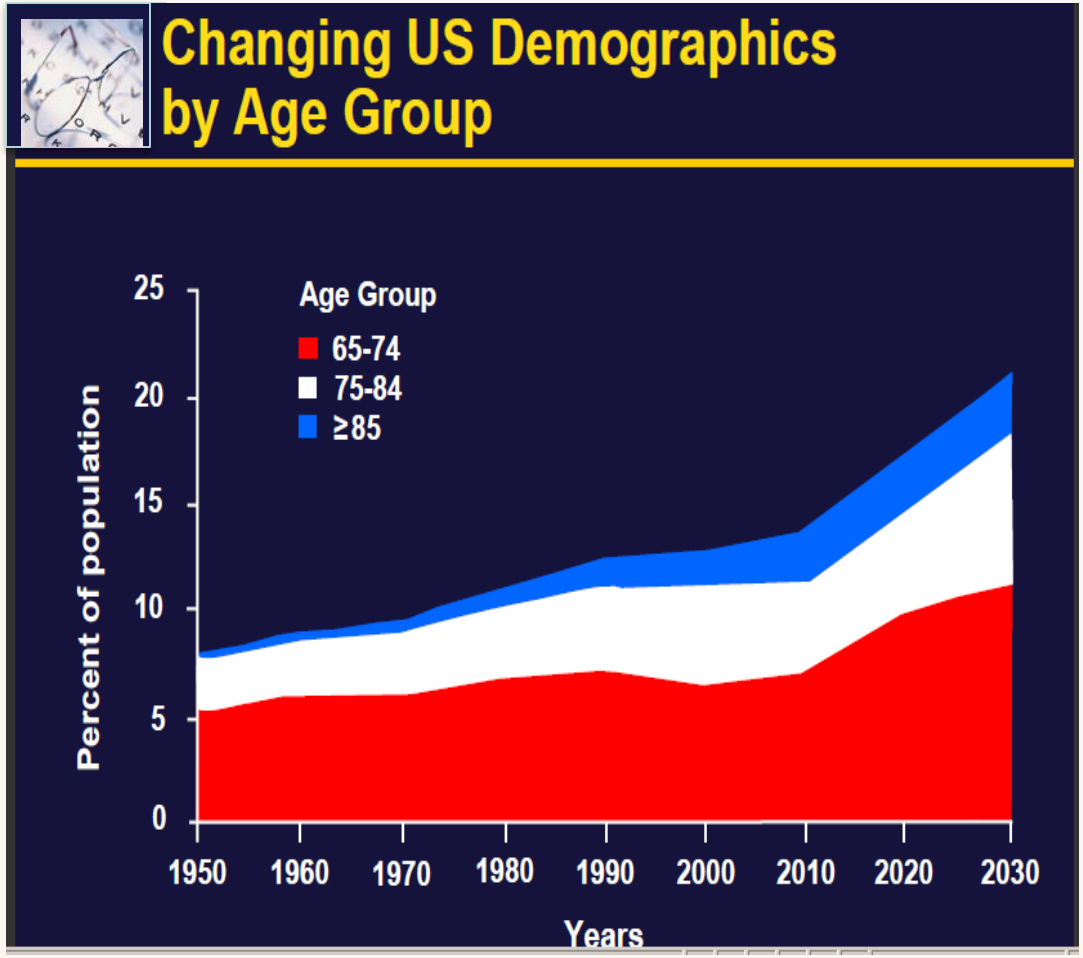
For more information, call 1-800-CDC-INFO (1-800-232-4636) or visit www.cdc.gov/vaccines

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Disparities in Vaccination Rates...

Focus on Aging in America

- Adults aged 65+ is a fast growing population
  - 55 million in 2010
  - 80 million by 2040



Vaccination Gaps in Older Adults

Healthy People 2020 Vaccination Gaps

Objectives	Baseline Data 2008 and *2006	Healthy People 2020 Goals
INFLUENZA VACCINE		
Adults 18 to 64 years	25%	80%
High-risk adults 18 to 64 years	39%	90%
High-risk adults 65 years +	67%	90%
*Institutionalized adults 18 years +	62%	90%
Health care personnel	45%	90%
PNEUMOCOCCAL VACCINE		
Adults 65 years +	60%	90%
High-risk adults 18 to 64 years	17%	60%
*Institutionalized adults	66%	90%
HERPES ZOSTER VACCINE		
Adults 60 years +	7%	30%

Other vaccines: Tdap, HPV, hepatitis, MMR, meningococcal

Healthy People 2020. Immunization and Infectious Diseases. Available at: www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=23

Burden of Vaccine-Preventable Diseases

	United States/Annual Rates
INFLUENZA	• 200,000 hospitalizations • 36,000 deaths (>85% elderly)
INVASIVE PNEUMOCOCCAL DISEASE	• 44,000 cases • 4500 deaths • Higher rates in elderly, AA, persons with comorbidities
HEPATITIS B	• 51,000 infections (>95% adults) • 2000-3000 deaths • 1.25 (m) chronic HBV infection

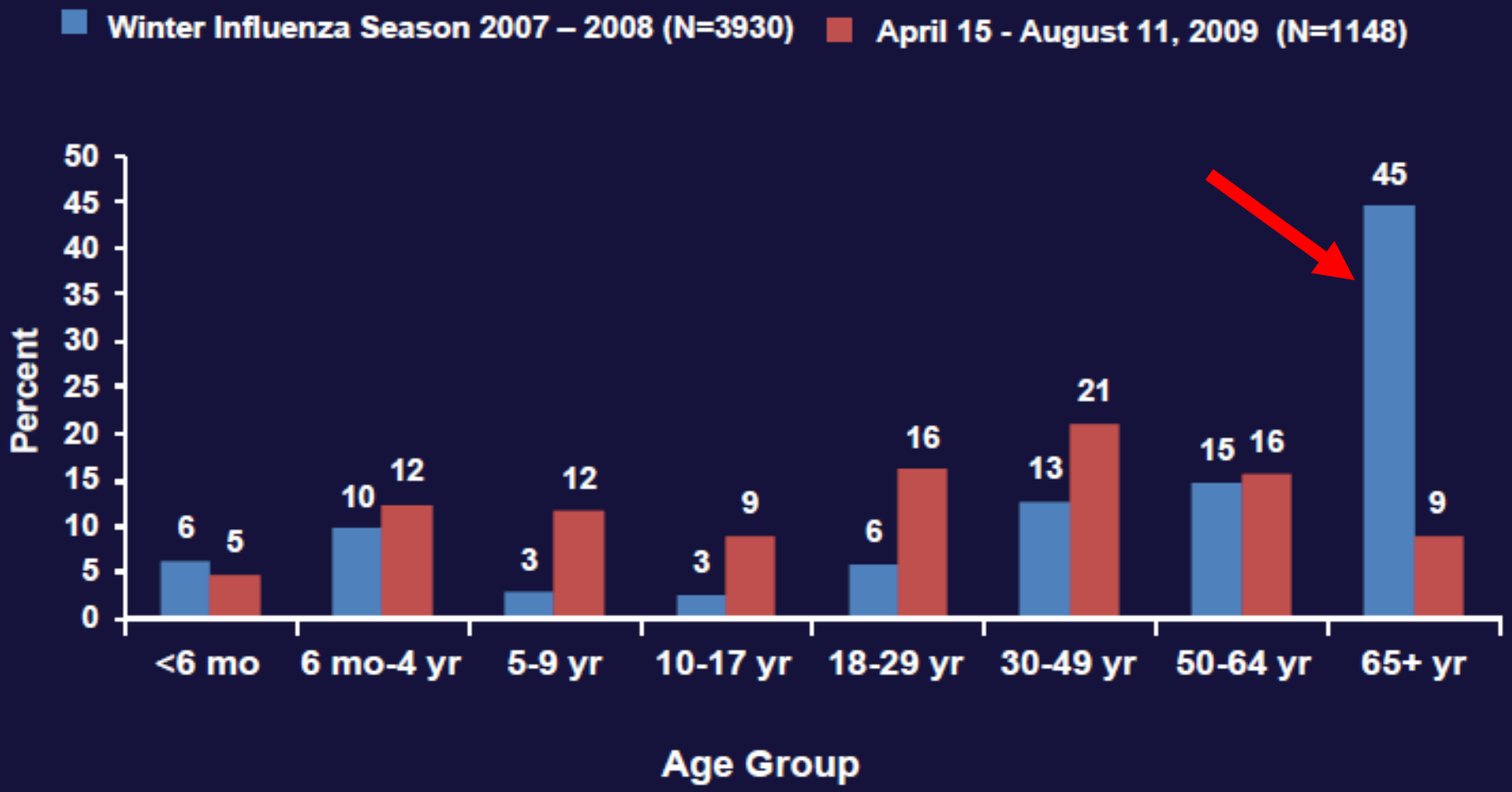
Vaccination Gaps in Older Adults

- **Influenza is the most important vaccine preventable contagious infectious disease for older adults**

Complications of Flu

- **Bacterial pneumonia, ear infections, sinus infections, dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes.**

Distribution by age group of persons hospitalized with laboratory-confirmed influenza* – U.S.



*Evidence of a positive influenza test result by viral culture, DFA/IFA, RT.

Vaccination Gaps in Older Adults

Older Adults Own the Bulk of Influenza's Morbidity and Mortality

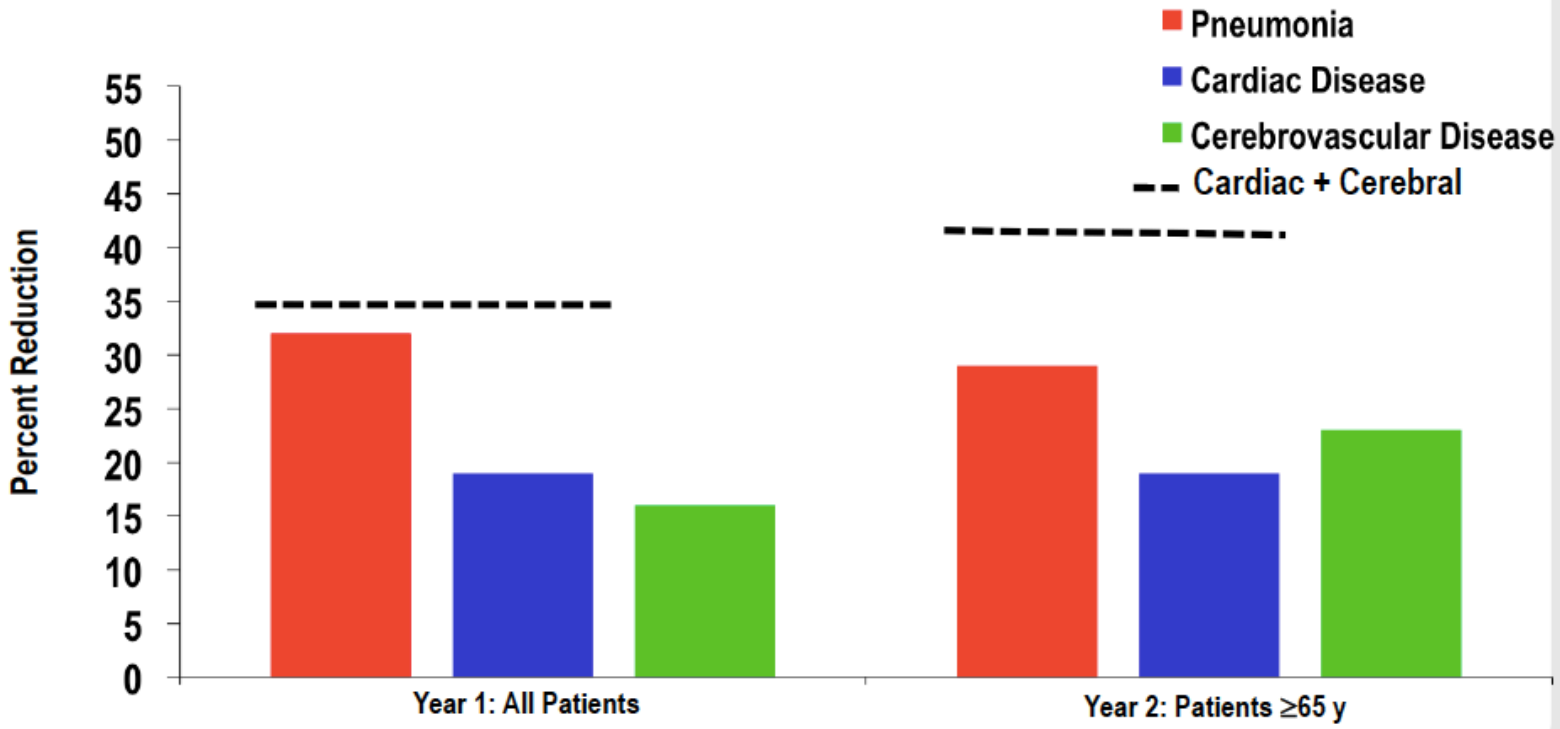
- Adults ≥65 years of age represent:
  - 13% of the US population[1]
  - 63% of influenza-related hospitalizations[2]
  - 90% of influenza-related deaths[3]
  - 64% of the total economic burden of influenza[4]

Increase in the older adult population globally represents a substantial challenge for influenza vaccination programs

References:
1. US Department of Health & Human Services Administration on Aging. http://www.aoa.gov/aoaroot/ aging_statistics/Census_Population/census2010/Index.aspx. Accessed March 8, 2012.
2. Thompson WW, et al. *JAMA*. 2004;292(11):1333-1340.
3. CDC. *MMWR*. 2010;59(33):1057-1062.
4. Molinari NM, et al. *Vaccine*. 2007; 25(27): 5086-5096.
5. Nichol KL, et al. *Clin Infect Dis*. 2009;48(3):292-298.

Flu Vaccine Prevents other Diseases in Geriatric Patients

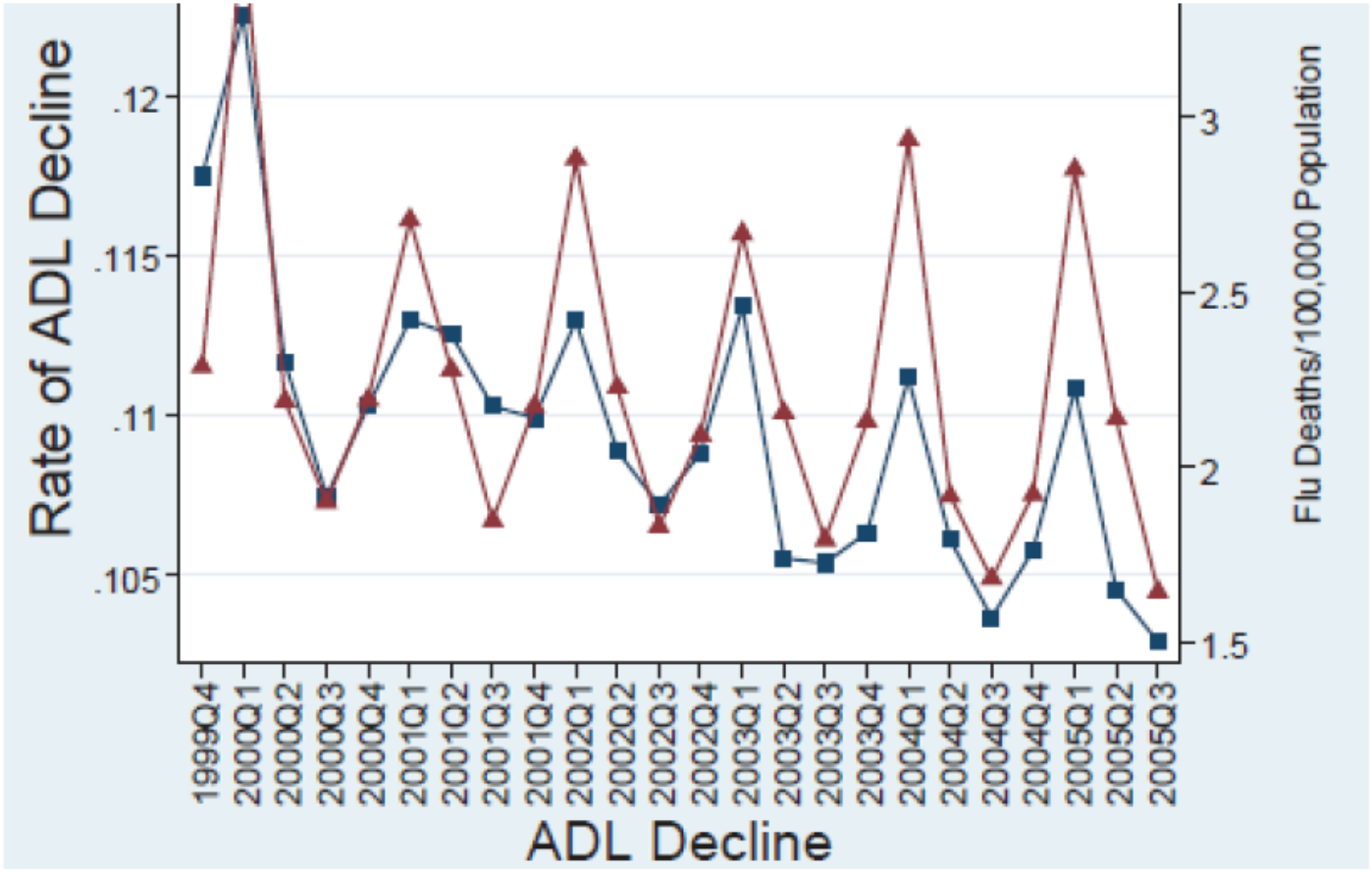
Influenza Vaccine Reduces PNA, MI, and CVA in Older Patients



Nichol KL, et al. *N Engl J Med*. 2003;348:1322-1332.

Vaccination Gaps in Older Adults

Influenza severity associates with loss of ADL in nursing homes[1]



[1]Gozalo PL, et al. J Amer Geriatr Soc 2012 Jul;60(7):1260-7.

Pneumonia Infection in Adults

2013: Estimated 13,500 cases of invasive pneumococcal disease (IPD) in adults 65 and older

- **In adults 65 and older:**
  - **PCV 13 serotypes were to blame for**
    - **20-25% of IPD**
    - **10% of community-acquired pneumonia (CAP)**
    - ***Potentially* preventable with PCV 13 vaccine**

Older Adult Vaccination Rates Too Low in Minority Populations

INFLUENZA	
≥65	66%
50-64	40%
19-49	33%
HCW	65%
PNEUMOCOCCAL	
≥65 AA Hispanic	62% 48% 43%
19-64 (high risk)	20%
TDAP	
19-64	13%

HCW, health care worker; TDAP, tetanus, diphtheria, and pertussis.

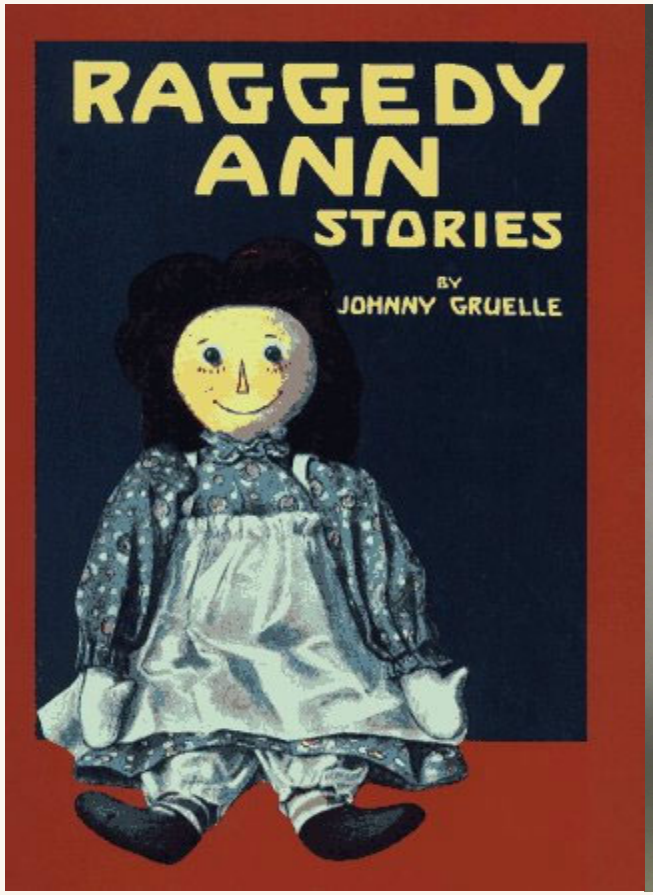
Centers for Disease Control and Prevention. National Health Interview Survey. 2011; Williams WW. Presented at: ACIP meeting; February 21, 2013; Atlanta, GA. http://www.cdc.gov/ vaccines/acip/meetings/downloads/slides-feb-2013/02-Adult-Vax-Williams.pdf. Accessed April 25, 2013

Vaccination Myths…

Fear of Vaccinations: Smallpox & Raggedy Ann

In 1915, Johnny Gruelle's daughter, Marcella died at age 13 after being vaccinated for smallpox without consent. Authorities blamed a heart defect, but her parents blamed the vaccine. Gruelle became an opponent of vaccination, and the Raggedy Ann doll was used as a symbol by the anti-vaccination movement.

-Raggedy Ann Museum, 2001



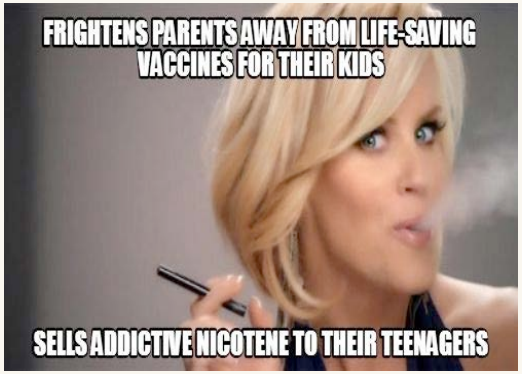
Vaccination Myths: Why are We Still Talking About Vaccines & Autism?

- Science clearly shows no link
- Media Loves Controversy
- Anti-vaccine Movement Has a Celebrity Spokesperson

Vaccinations & Autism Myth

THE LANCET

FRAUD



Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Berelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker-Smith

Summary

Background We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods 12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

Findings Onset of behavioural symptoms was associ... by the parents, with measles, mumps, and rub... vaccination in eight of the 12 children, with meas... infection in one child, and otitis media in ... All 1... children had intestinal abnormalities (rang... from lymphoid nodular hyperplasia to ... ulceration. Histology showed patchy chronic infla... in 11 children and reactive lymphoid hyperplasia in seven, but no granulomas. Be... oural dis... included autism (nine), disintegrati... (one), a... possible postviral or vaccinal encephalitis ...). There were no focal neurological ab...malities and ... and EEG tests were normal. Abn... laboratory results ... were significantly raised urinary ...thylmalonic acid compared with age-matched contro... 03), lo... haemoglobin in four children, ... low ... IgA in ... children.

Inter...tation ... associated gastrointestinal d...se and ...vironmental regression in a group of pre... ...ously normal ch...n, which was generally associated in time ... possible environmental triggers.

Lancet 199...351: 637–41
See Commentary page

Introduction

We saw several children who, after a ... of apparent normality, lost acquired skills, inclu... communication. They all had gastrointestinal ... symptoms, ...luding abdominal pain, diarrhoea, and ...ting and, in some cases, food intolerance. We ...cribe... clinical f...ings, and gastrointestinal featur... these chi...n.

Patients and meth...s

12 children, con...cutive... ...ed to ... department of paediatric gastr...terology ... a hi...y of a pervasive developmental ...der with lost ... skills and intestinal symptoms ...ar... abdomina...n, bloating and food intolerance); were inv...gated. All children were admitted to the ward ...week, accom...ied by their parents.

...ical investigations

... took histo... including details of immunisations and ...posure to infe...s diseases, and assessed the children. In 11 ca... the histor... was obtained by the senior clinician (JW-S). Neur... and psychiatric assessments were done by consultant staff (PH, MB) with HMS-4 criteria.[5] Developmental ... included a review of prospective developmental records from parents, health visitors, and general practitioners. Four children did not undergo psychiatric assessment in hospital; all had been assessed professionally elsewhere, so these assessments were used as the basis for their behavioural diagnosis.

After bowel preparation, ileocolonoscopy was performed by SHM or MAT under sedation with midazolam and pethidine. Paired frozen and formalin-fixed mucosal biopsy samples were taken from the terminal ileum, ascending, transverse, descending, and sigmoid colons, and from the rectum. The procedure was recorded by video or still images, and were compared with images of the previous seven consecutive paediatric colonoscopies (four normal colonoscopies and three on children with ulcerative colitis), in which the physician reported normal appearances in the terminal ileum. Barium follow-through radiography was possible in some cases.

Also under sedation, cerebral magnetic-resonance imaging (MRI), electroencephalography (EEG) including visual, brain stem auditory, and sensory evoked potentials (where compliance made these possible), and lumbar puncture were done.

Laboratory investigations

Thyroid function, serum long-chain fatty acids, and cerebrospinal-fluid lactate were measured to exclude known causes of childhood neurodegenerative disease. Urinary methylmalonic acid was measured in random urine samples from

RETRACTED

MYTH: Thimerosal Causes Harm

- Form of mercury found in thimerosal is ethylmercury (EM), not methylmercury (MM). **MM is the form that has been shown to damage the nervous system.**

- Although **no evidence of harm** has ever been demonstrated, thimerosal was taken out of vaccines as a precaution.

- Since 2001, with the exception of a few influenza vaccine products, **thimerosal has not been used as a preservative in any routinely recommended childhood or adult vaccines.**

MYTH: Other Ingredients in Vaccines are Harmful

- Antibiotics are present in some vaccines to prevent bacterial contamination.

- Aluminum is used in some vaccines as an adjuvant—improves the immune response.

- Aluminum is the most common metal found in nature. It is in the air and in food and drink. Infants get more aluminum through breast milk or formula than vaccines.

- Trying to make vaccines without additives, and preservatives is difficult—they keep vaccines safe and effective.

Myth: I never get sick with flu..

I NEVER Get the flu….

If you think the flu can't affect you, your family, or your friends—THINK AGAIN.

Geriatric Immunosenescence

- Decline in immune function that occurs with aging
- Multiple parts of the adaptive immune system become deregulated
- Is has effects on vaccine responses
- May be driven by chronic infections

MOST COMMON Vaccine Side Effects

- **Any vaccine can cause side effects**
  - **Mild Problems**
    - Reactions on the arm where the shot was given:
    - Tenderness (about 1 person out of 2)
    - Redness & Itching
    - Lump or bruise
  - **Muscle aches & Fatigue**
- **Severe Problems**
  - **Serious allergic reaction (very rare – less than once in 100,000 doses).**

-CDC Vaccine Update, 2016

Overcoming Vaccination Barriers in Geriatric Patients

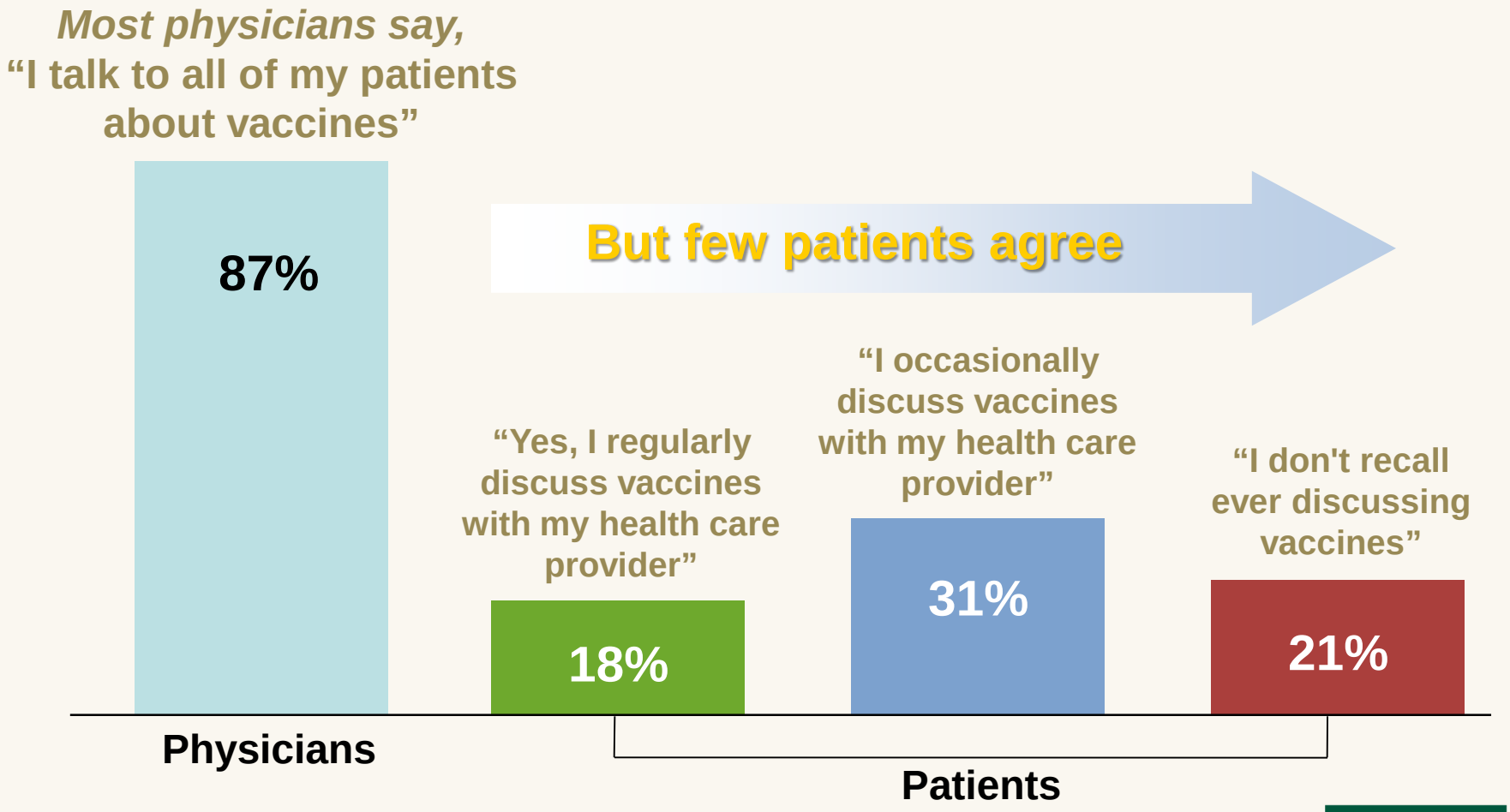
- Facts vs. Myth
- **Affordable Vaccines**
- **Databases**
- Better Communication:

  Poor Health Literacy
- **Transitioning Care: Immunization Records**

Are Vaccines Affordable?

- **Flu-**
  - **Inactivated shot ($12-19)**
    - **Egg-free FluBlok ($32)**
  - **Nasal vaccine (live) ($24)**
  - **Intradermal* ($17.50)**
  - **High dose* ($30)**
- **Hep A ($63-65)- need 2**
- **Hep B ($52-59)- need 3**
- **HPV- Series 3 doses**
  - **HPV2, HPV4, HPV9***
  - **$128 / $147 / $163**
- **Hib* haemophilus influenza type b ($27)**
- **Meningococcal**
  - **ACWY ($71-75)**
  - **B*: Bexsero $160 (need 2)**
    Trumenba $135 (need 3)
- **MMR (live) ($59)- need 2**
- **Pneumococcal**
  - **PPSV 23- ($72)**
  - **PCV 13-($152)**
- **Shingles ($187)**
- **Td/ Tdap ($24 / $37)**
- **Varicella ($100) need 2**

Communication: When It Comes to Vaccines, Doctors and Patients Aren't Hearing One Another



Results are based on surveys by the National Foundation for Infectious Diseases. November 2010.

BE
AN ADVOCATE
FOR
VACCINATING
YOUR GERIATRIC
PATIENTS!

THANK YOU !

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