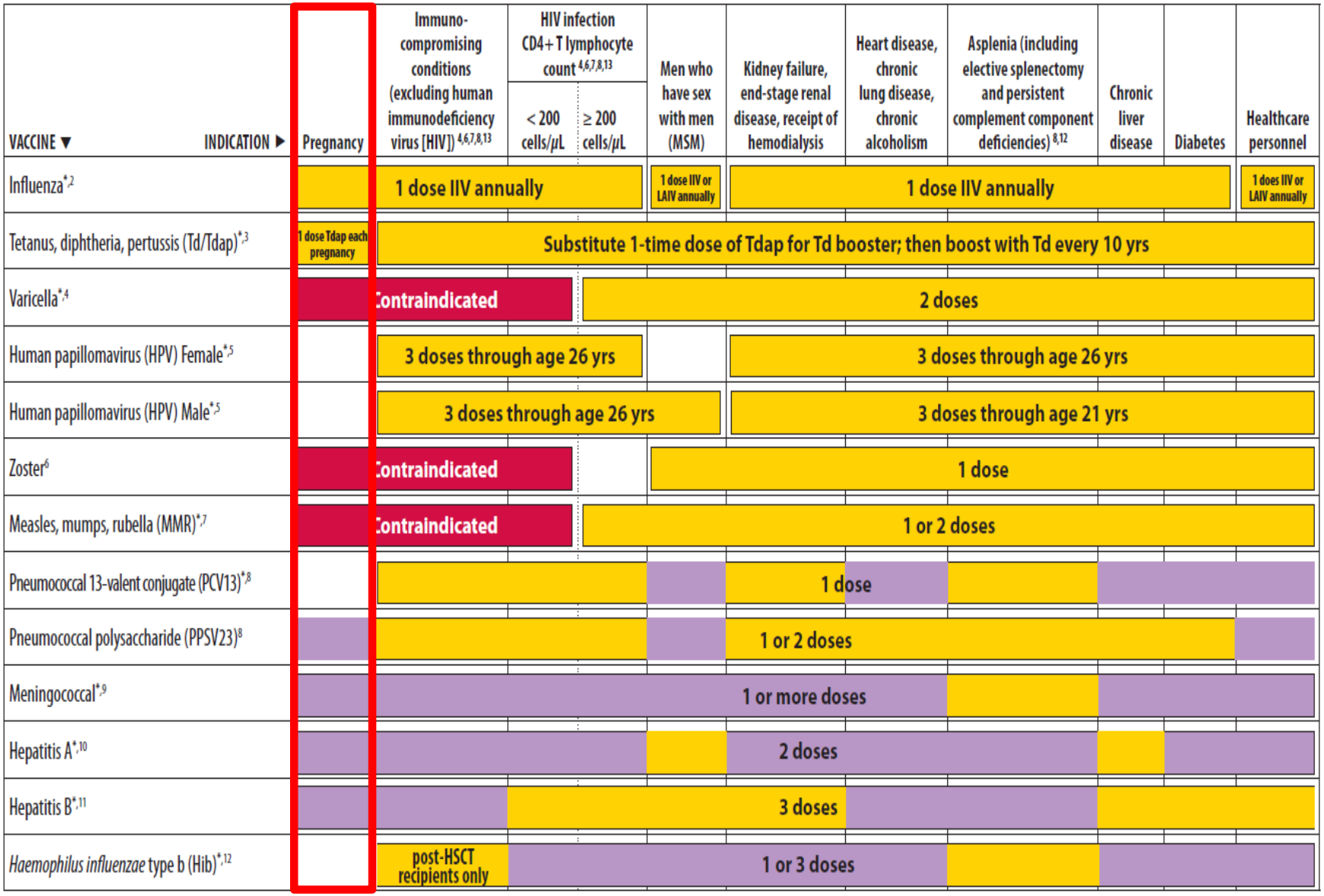
Figure 2. Vaccines that might be indicated for adults based on medical and other indications[1]



Source: CDC. http://www.cdc.gov/vaccines/schedules/downloads/adult/adult-schedule.pdf

Protecting children (& mom) with vaccines begins before conception

PRECONCEPTION

Preconception Vaccines

- Consider any “pre-conception” visit as an excellent opportunity to update immunization history and catch-up on any missed doses
- Especially Think: MMR and Varicella
  - Vaccines that are contra-indicated during pregnancy
  - ie. LIVE viral vaccines
  - Also consider protecting families who are pursuing international adoption!

Congenital Varicella Syndrome

- varicella infection in the first 20 weeks' gestation
  - incidence is estimated to be about 2%
- characteristic symptoms
    - skin lesions in dermatomal distribution (76%)
    - neurologic defects (60%)
    - eye diseases (51%)
    - skeletal anomalies (49%)
- 30% of infants die in the first months of life

Source: Sauerbrei A, Wutzler P. The congenital varicella syndrome. J Perinatol. 2000 20:548-54.

Congenital Rubella Syndrome

- CRS results from rubella virus infection during pregnancy
  - risk is highest during the first 12 weeks of gestation
  - decreases after the 12th week of gestation
  - defects rare after the 20th week of gestation
- Serious consequences
  - Miscarriages and Stillbirths
  - constellation of severe birth defects
    - cataracts, congenital heart disease, hearing impairment, and developmental delay
    - hearing impairment is the most common single defect

Source: CDC. http://www.cdc.gov/vaccines/pubs/surv-manual/chpt15-crs.html

Martínez-Quintana E, Castillo-Solórzano C, Torner N, Rodríguez-González F. Congenital rubella syndrome: a matter of concern. Rev Panam Salud Publica. 2015;37(3):179–86.

Benefit of Maternal Vaccination

- Randomized controlled study of 340 mothers (3rd Trimester)
- Infants of vaccinated mothers had less influenza
  - 6 cases vs. 16 cases
  - Vaccine effectiveness of 63% (95% CI, 5 to 85)
- Among mothers, reduction of 36% in respiratory illness with fever (95% CI, 4 to 57)

Zaman K, et al. Effectiveness of maternal influenza immunization in mothers and infants. *N Engl J Med*. 2008;359:1555-1564.

Original Investigation

Duration of Infant Protection Against Influenza Illness Conferred by Maternal Immunization

Secondary Analysis of a Randomized Clinical Trial

Marta C. Nunes, PhD; Clare L. Cutland, MD; Stephanie Jones, MD; Andrea Hugo, MD; Richard Madimabe, BTech; Eric A. F. Simões, MD; Adriana Weinberg, MD; Shabir A. Madhi, MD, PhD; for the Maternal Flu Trial Team

JAMA Pediatrics 2016: doi:10.1001/jamapediatrics.2016.0921

Influenza and Pregnancy

- UK study of 221 maternity hospitals
  - 256 pregnant women admitted with confirmed H1N1
  - 1220 pregnant women for comparison
- Outcomes
  - Perinatal mortality ↑ in infants of infected women
    - 39/1000 vs. 7/1000 ($P < 0.001$)
  - Increase in the rate of stillbirth
    - 27/1000 vs. 6/1000 ($P = 0.001$)
  - Increase in premature birth
    - adjusted OR = 4.0, 95% CI 2.7 to 5.9

Image: CDC
James Gathany

Perinatal outcomes after maternal 2009/H1N1 infection: national cohort study. BMJ. 201; 342:d3214

Maternal Infection Requiring Hospitalization During Pregnancy and Autism Spectrum Disorders

J Autism Dev Disord (2010) 40:1423–1430
DOI 10.1007/s10803-010-1006-y

Hjördis Ó. Atladóttir · Poul Thorsen · Lars Østergaard · Diana E. Schendel · Sanne Lemcke · Morsi Abdallah · Erik T. Parner

Maternal Infection During Pregnancy and Autism Spectrum Disorders

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DOI 10.1007/s10803-013-2016-3

Ousseny Zerbo · Yinge Qian · Cathleen Yoshida · Judith K. Grether · Judy Van de Water · Lisa A. Croen

ARTICLE

Autism After Infection, Febrile Episodes, and Antibiotic Use During Pregnancy: An Exploratory Study

AUTHORS: Hjördis Ósk Atladóttir, MD, PhD,[a] Tine Brink Henriksen, MD, PhD,[b] Diana E. Schendel, PhD,[c] and Erik T. Parner, PhD[d]

www.pediatrics.org/cgi/doi/10.1542/peds.2012-1107

Safety and Efficacy of Tdap

- VAERS Study
  - No new unexpected vaccine safety concerns
  - Limited number of pregnancy reports with repeat doses
  - CDC will continue to monitor
- VSD study
  - Increased risk for chorioamnionitis
    - RR = 1.11 (1.03-1.21) 5.5% of unvaccinated; 5.6% of vaccinated
  - Decreased risk of pre-term labor
    - RR = 0.83 (0.77-0.90) 7.8% of unvaccinated; 5.3% of vaccinated
- Vaccine Effectiveness - UK evaluation
  - Vaccine effectiveness estimated to be 91% (95% CI 84 to 95)

Moro P. Safety of Tdap vaccine during pregnancy: enhanced surveillance in VAERS.
www.cdc.gov/vaccines/acip/meetings/downloads/slides-2014-02/02-Tdap-Moro.pdf
Kharbanda EO et al. Receipt of pertussis vaccine during pregnancy across 7 Vaccine Safety Datalink Sites. Prev Med. 2014. doi: 10.1016/j.ypmed.2014.05.025.
Amirthalingam G et al. Effectiveness of maternal pertussis vaccination in England: an observational study. Lancet. 2014; doi: 10.1016/S0140-6736(14)60686-3.

Clinical Infectious Diseases® 2015;61(11):1637–44

MAJOR ARTICLE

Antibody Responses After Primary Immunization in Infants Born to Women Receiving a Pertussis-containing Vaccine During Pregnancy: Single Arm Observational Study With a Historical Comparator

Shamez N. Ladhani,[1,2] Nick J. Andrews,[3] Jo Southern,[1] Christine E. Jones,[2] Gayatri Amirthalingam,[1] Pauline A. Waight,[1] Anna England,[4] Mary Matheson,[4] Xilian Bai,[5] Helen Findlow,[5] Polly Burbidge,[6] Vasili Thalasselis,[6] Bassam Hallis,[4] David Goldblatt,[6] Ray Borrow,[5] Paul T. Heath,[2] and Elizabeth Miller[1]

[1]Immunisation, Hepatitis and Blood Safety Department, Public Health England, [2]Paediatric Infectious Diseases Research Group, Institute for Infection and Immunity, St. George's, University of London, [3]Statistics, Modelling and Economics and Immunisation, Public Health England, London, [4]Immunoassay Laboratory, Public Health England, Porton Down, [5]Vaccine Evaluation Unit, Public Health England, Manchester Royal Infirmary, and [6]Immunobiology Unit, Institute of Child Health, University College, London, United Kingdom