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# PERTUSSIS VACCINATION IN PREGNANT WOMEN AT THE EMMC FAMILY MEDICINE CENTER

EASTERN MAINE MEDICAL CENTER (BANGOR, ME)

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SEPTEMBER 2016

PROJECT MENTOR: ROBIN PRITHAM, MD



# INFANT PERTUSSIS PREVENTION VIA PRENATAL IMMUNIZATION: PERTUSSIS SUCKS

- DEFINITION: HIGHLY CONTAGIOUS BACTERIAL RESPIRATORY INFECTION ALSO KNOWN AS WHOOPING COUGH
- SYMPTOMS: VIOLENT COUGHING THAT IMPEDES BREATHING; CAN LASTS WEEKS TO MONTHS
- THERE WERE MORE THAN 18,000 CASES OF PERTUSSIS IN THE US IN 2015
- MAINE REPORTS 3X THE US AVERAGE OF ANNUAL PERTUSSIS CASES PER CAPITA AND HAS THE 3<sup>RD</sup> HIGHEST RATE OF PERTUSSIS CASES PER CAPITA (BEHIND NEBRASKA AND MONTANA)
- INFANTS < 6 MONTHS OF AGE ARE THE MOST AT RISK OF COMPLICATIONS; 60% OF CASES REQUIRE HOSPITALIZATION
- INFANTS ACCOUNT FOR 90% OF PERTUSSIS HOSPITALIZATIONS, BUT ONLY 13.2% OF REPORTED CASES
- MORBIDITY: PNEUMONIA (12%), RESPIRATORY DISTRESS/FAILURE (16%), SEIZURES (<1%), ENCEPHALOPATHY (0.2%)
- MORTALITY: 1% OF INFANT HOSPITALIZATIONS

# INFANT PERTUSSIS PREVENTION VIA PRENATAL IMMUNIZATION: VACCINES ARE AWESOME!

- VACCINATION PREVENTS 85% OF PERTUSSIS CASES
  - REMAINING 15% HAVE Milder disease course resulting in decreased risk of hospitalization
- INFANTS DO NOT RECEIVE THEIR FIRST DOSE OF PERTUSSIS VACCINE UNTIL 2 MONTHS OF AGE
  - THEREFORE, ADDITIONAL EFFORT NEEDS TO BE MADE BY THE PHYSICIAN TO ENSURE PROTECTION VIA MATERNAL IMMUNIZATION
- IN ORDER TO IMPROVE PROTECTION DURING THE EARLY POST-NATAL PERIOD, THE CDC'S ADVISORY COMMITTEE OF IMMUNIZATION PRACTICES (ACIP) UPDATED PERTUSSIS VACCINATION GUIDELINES IN 2013
  - WOMEN ARE RECOMMENDED TO GET IMMUNIZED BETWEEN 27-36 WEEKS FOR EVERY PREGNANCY
  - THIS BOOSTS MOM'S ANTIBODIES ALLOWING TRANSPLACENTAL TRANSFERENCE TO BABY

# PUBLIC HEALTH COST

- PERTUSSIS CASES FOR 1,000 HOSPITALS WITHIN 4 STATES (CA, FL, MD, MA) FROM 1996 – 1999
  - COST \$29.4 MILLION IN HOSPITAL STAYS FOR 9,000 CASES
    - MEDICAID PAID FOR 54% OF THE HOSPITALIZED CASES
    - AVERAGE INFANT HOSPITALIZATION = 6 DAYS AND COST \$9,580
  - NATIONALLY IN 2015:
    - 18.2K REPORTED CASES IN THE US
    - 90% OF CASES ARE INFANTS (16.8K)
    - 60% OF INFANT CASES REQUIRE HOSPITALIZATION (9.8K)
    - AVERAGE STAY OF 6 DAYS WHILE CONSIDERING A 150% INFLATION RATE = \$14,300
    - APPROXIMATELY **\$140.8 MILLION SPENT IN INFANT HOSPITAL STAYS NATIONALLY**
  - MAINE IN 2015:
    - 273 TOTAL CASES, ~ 246 INFANT CASES OF WHICH ~147 REQUIRED HOSPITALIZATION
    - APPROXIMATELY **\$2.1 MILLION SPENT IN INFANT HOSPITAL STAYS IN MAINE**

# COMMUNITY PERSPECTIVE

DR. DUSKA THURSTON, MD (PEDIATRICS ATTENDING) – DT

DR. CHARLOTTE RUTKOWSKI, MD (FAMILY MEDICINE RESIDENT, PGY3) - CR

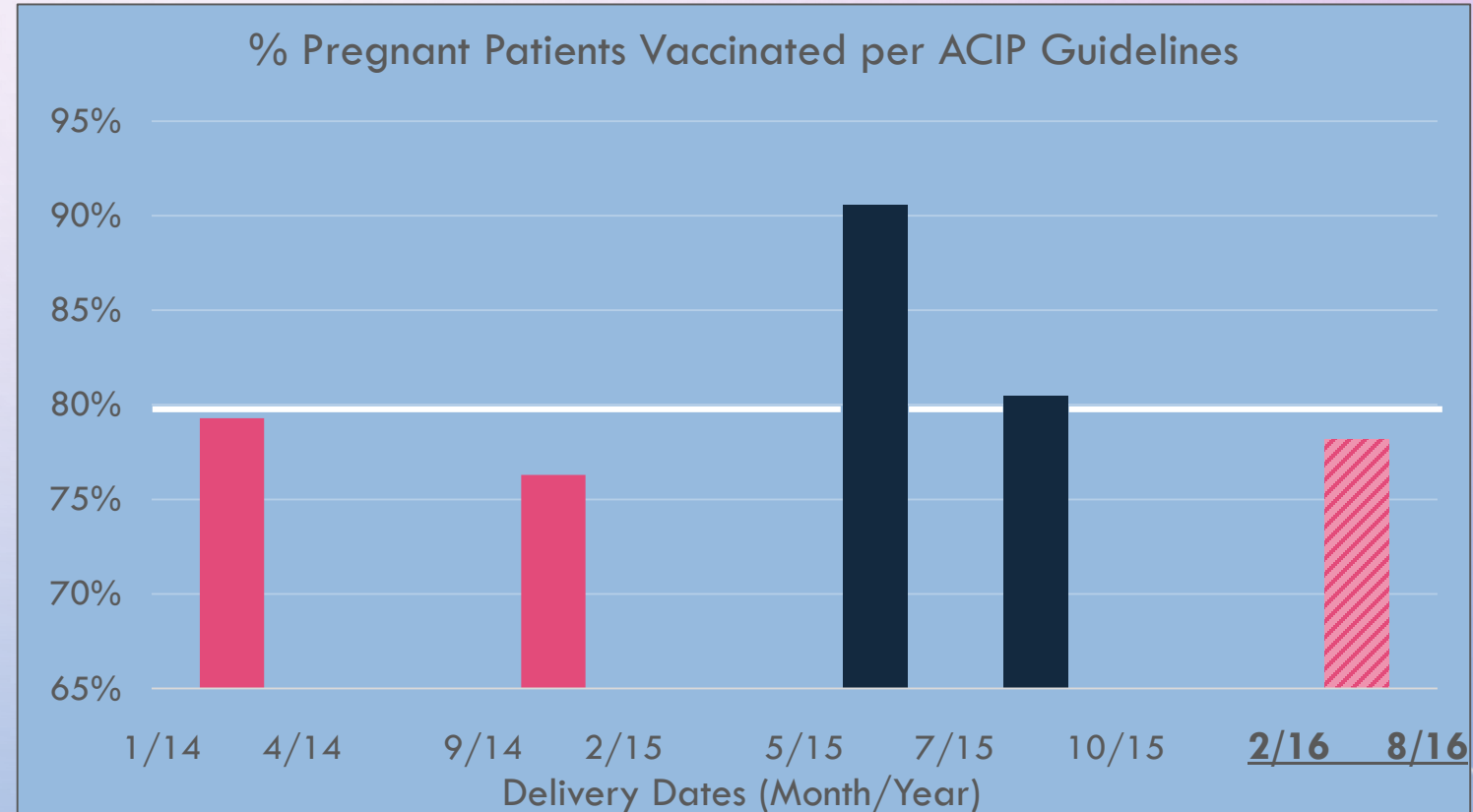
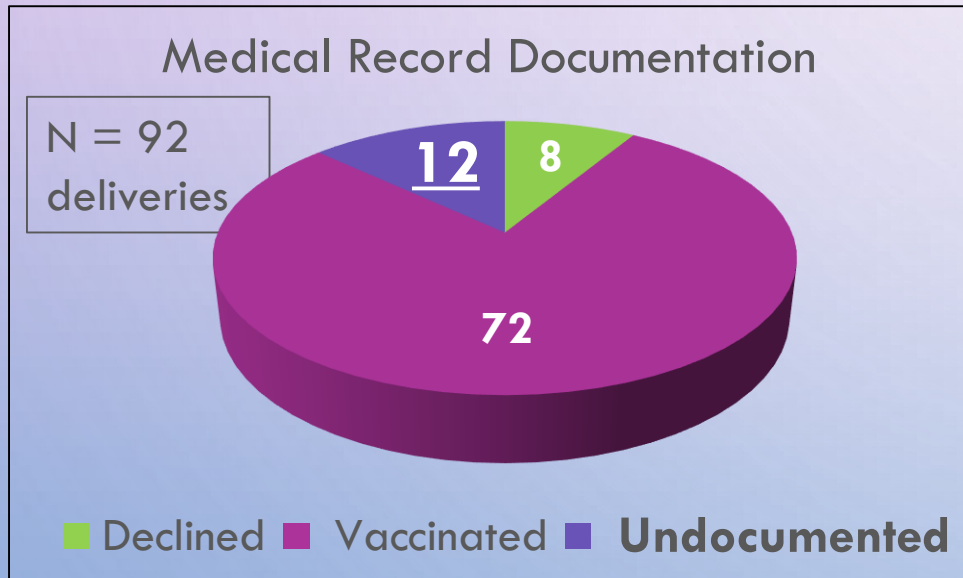
- PROFESSIONAL EXPERIENCE TREATING INFANT PATIENTS WITH WHOOPING COUGH
  - DT: “NEWBORNS MAY PRESENT WITH APNEA AND NO OTHER SYMPTOMS – OTHERWISE APPEAR “WELL”. INFANTS UNDER 6 MONTHS OF AGE ARE AT A VERY HIGH RISK FOR INCREASED MORBIDITY AND MORTALITY WITH TYPICAL HOSPITALIZATION OF ABOUT 5 WEEKS. THE BABY WILL COUGH ON AVERAGE 3 MONTHS. THIS IS VERY STRESSFUL FOR THE FAMILY WITH FEELINGS OF HELPLESSNESS AS THE COUGH TREATMENT IS SUPPORTIVE.”
  - CR: “NO EXPERIENCE TREATING NEWBORNS YET.”
- IMPORTANCE OF THE TIMING REGARDING PERTUSSIS VACCINATION
  - DT: “GIVEN NEAR THE END OF PREGNANCY WILL MAXIMIZE THE AMOUNT OF ANTIBODY PASSING THROUGH THE PLACENTA TO THE BABY SHORTLY BEFORE BIRTH. THIS PROTECTS THE BABY DURING THE NEONATAL PERIOD SINCE BABY WILL NOT BE ABLE TO RECEIVE THE PERTUSSIS VACCINE UNTIL 6-8 WEEKS OF AGE.”
  - CR: “VERY IMPORTANT TO VACCINATE EACH PREGNANCY, ESPECIALLY IN MAINE GIVEN THE NUMBER OF PERTUSSIS CASES IN PREVIOUS YEARS.”
- BARRIERS AGAINST VACCINATION
  - DT: “POOR EDUCATION REGARDING THE RISKS OF PERTUSSIS AND BELIEF THAT THE DISEASE RISKS ARE OVERSTATED. FEAR OF THAT VACCINES WILL CAUSE HARM TO THEIR UNBORN CHILD.”
  - CR: “AVERSION TO SHOTS. ALSO, GENERALLY IN OUR SYSTEM TRYING TO KEEP TRACK OF IMMUNIZATION HISTORY IS DIFFICULT.”
- EMR DOCUMENTATION DIFFICULTIES
  - DT: “IT CAN BE A JIGSAW PUZZLE TRYING TO PUT ALL THE PIECES TOGETHER. THERE ARE PERSONAL VACCINE RECORD BOOKS, OUTSIDE RECORDS, STATE DATABASE AND OUR OWN RECORDS – NONE OF WHICH ARE OFTEN COMPLETE.”
  - CR: “I THINK IT WOULD BE HELPFUL TO HAVE A BETTER ORGANIZATIONAL SYSTEM AS TO WHETHER OR NOT THE IMMUNIZATION HAS BEEN RECEIVED.”

# METHODOLOGY & INTERVENTION

- WITHIN THE ELECTRONIC MEDICAL RECORD (EMR), A DATA REPORT WAS PERFORMED TO IDENTIFY PATIENTS WITH EXPECTED DELIVERY DATES BETWEEN FEBRUARY 1<sup>ST</sup>, 2016 AND AUGUST 1<sup>ST</sup>, 2016 THAT RECEIVED PRENATAL CARE AT THE EMMC FAMILY MEDICINE CENTER AND RESIDENCY (FMCR)
  - **VACCINATED**: AN ADDITIONAL FACTOR WAS DEFINED TO COUNT THE INDIVIDUALS THAT RECEIVED THE TETANUS, DIPHTHERIA, AND PERTUSSIS (TDAP) BOOSTER AFTER AUGUST 1<sup>ST</sup>, 2015
  - UNVACCINATED GROUP: INDIVIDUALS THAT DID NOT RECEIVE THE TDAP BOOSTER BETWEEN AUGUST 1<sup>ST</sup>, 2015 AND AUGUST 1<sup>ST</sup>, 2016
    - **DECLINED**: A REPORT WAS PERFORMED TO COUNT THE PATIENTS THAT HAVE DOCUMENTATION WITHIN THE EMR SHOWING THAT THEY WERE COUNSELED ABOUT THE VACCINATION BUT CHOSE TO DECLINE ADMINISTRATION
    - **UNDOCUMENTED**: A REPORT WAS PERFORMED AMONG THESE PATIENTS TO COUNT THE NUMBER OF PATIENTS THAT DID NOT HAVE EMR DOCUMENTATION SHOWING VACCINATION ADMINISTRATION OR DECLINATION
    - CARE WAS TAKEN TO EXCLUDE PATIENTS THAT EXPERIENCED SPONTANEOUS ABORTION PRIOR TO 36 WEEKS GESTATION
- FEEDBACK WILL BE PROVIDED TO CLINIC STAFF AND PHYSICIANS ON THE VACCINATION RATES AND IDEAS FOR INCREASING COVERAGE IN THIS POPULATION

# PRENATAL PERTUSSIS PROTECTION RESULTS

February 1<sup>st</sup>, 2016 – August 1<sup>st</sup>, 2016



ACIP = Advisory Committee on Immunization Practices



# EVALUATION OF LIMITATIONS AND EFFECTIVENESS

- **EFFECTIVENESS**

- ABLE TO IDENTIFY RATE OF DOCUMENTED PERTUSSIS VACCINATION IN THE PRENATAL POPULATION
- DIRECT COMMUNICATION WITH PROVIDERS AT REGULAR INTERVALS SHOULD SERVE AS A REMINDER TO STRESS THE IMPORTANCE OF PRENATAL PERTUSSIS VACCINATION
- PATIENT EDUCATION VIA WAITING ROOM LITERATURE SHOULD DECREASE DECLINES DUE TO FEAR AND MISINFORMATION

- **LIMITATIONS**

- IMPROPER DOCUMENTATION WOULD SKEW RESULTS ABOUT THE COVERAGE WITHIN THE CLINIC
  - UNSURE ON THE PROTOCOL OR GUIDELINES BEING FOLLOWED FOR DELIVERY AT THE HOSPITAL
  - DATA REPORT DIDN'T COMPARE VACCINATION TIME RELATIVE TO DELIVERY TIME (POSSIBLE POSTPARTUM ADMINISTRATION)
- WITHIN THE VACCINATED GROUP, THERE IS ABOUT A 15% CHANCE ACQUIRING A LESS SEVERE COURSE OF PERTUSSIS
- SOME PATIENTS WILL NOT BE CONVINCED OF THE SAFETY, EFFICACY, AND NEED FOR VACCINATION

# FUTURE INTERVENTIONS & RESEARCH

- INTERVENTIONS

- IMPLEMENTATION OF EMR REMINDERS DURING CHART REVIEW
- REMINDER COURSE FOR ALL STAFF & PROVIDERS ABOUT THE IMPORTANCE OF PRENATAL VACCINATION
- REMINDER MEMO ON PROPER DOCUMENTATION REGARDING DECLINING VACCINATION

- RESEARCH

- REVIEW CHANGES IN VACCINATION COVERAGE FOLLOWING INTERVENTIONS
- RATE OF INFANT PERTUSSIS AT THE CLINIC COMPARED TO MATERNAL VACCINATION COVERAGE
  - EFFICACY OF THE VACCINATION FOR THIS CLINIC'S POPULATION
- INVESTIGATE RATE OF INFLUENZA VACCINATION IN PREGNANT WOMEN

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