a trend towards decreased 6A carriage was noted in line with the cross-reactive immune response induced by Synflorix™.⁸ These data give the first indications of biological activity and effectiveness of Synflorix™. The efficacy of pneumococcal vaccines needs careful monitoring and ongoing trials (COMPAS⁹ and FinIP¹⁰) will evaluate efficacy and effectiveness, respectively, of Synflorix™ against invasive pneumococcal disease, pneumonia, acute otitis media and carriage.

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3

PREVENTING ACUTE OTITIS MEDIA THROUGH VACCINATION: WHAT MIGHT THE FUTURE HOLD

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Acute otitis media (AOM) constitutes a significant burden in children, in terms of clinical, psychological, social and economic costs.^{1,2} It is the most frequent reason for antibiotic prescriptions in children,³ thus contributing to the development of antibiotic resistance. Therefore, preventing AOM via

vaccination is a promising approach.⁴ The impact of vaccination with the 7-valent pneumococcal conjugate vaccine (PCV7) on AOM visits and episodes in the US has been reported in various studies. There is a broad range of reported impacts, with randomised controlled trials reporting 6-9% decreases and most observational studies reporting 13-26% decreases;⁵ however, one study reported a substantially higher decrease (43%).⁶ The 43% reduction was well outside the range reported in the other studies, possibly due to various methodological limitations.

Synflorix™ (10-valent pneumococcal conjugate vaccine; GlaxoSmithKline Biologicals, Belgium) is licensed in Europe for active immunisation against invasive disease and AOM caused by *Streptococcus pneumoniae* in infants and children from 6 weeks up to 2 years of age.⁷ Although not indicated for protection against AOM caused by non-typeable *Haemophilus influenzae* (NTHi) in Europe, there are data that support the hypothesis that this vaccine may also protect against AOM due to NTHi; these include data from the POET trial indicating efficacy of 33.6%, 51.5% and 35.3% for all-cause AOM, pneumococcal AOM and NTHi AOM, respectively;⁸ immunogenic bridging studies of Synflorix™ to the POET trial;⁹ and pre-clinical efficacy data in chinchillas.¹⁰ Importantly, clinical efficacy (COMPAS) and effectiveness (FinIP) trials are ongoing to evaluate potential indications for AOM and pneumonia.

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4

THE EVOLVING ADOLESCENT IMMUNIZATION SCHEDULE: A NEED FOR ACCELLULAR PERTUSSIS BOOSTER IMMUNIZATIONS

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Routine use of pertussis vaccines globally has led to dramatic declines in the incidence of whooping cough in young children. Yet pertussis is incompletely controlled and causes about 300,000 deaths per year worldwide.¹ Most pertussis cases now occur in the unimmunized, young infants prior to completing their initial pertussis immunizations and importantly in adolescents and adults with waning immunity. In developed countries, infections are now transmitted predominately from older individuals (reservoir of infection) to younger infants who suffer greater morbidity and mortality.

There are several acellular pertussis vaccines for children (variations of DTaP) and lower dose booster formulations for adolescents and adults (Tdap). These vaccines are effective, generally well-tolerated and have clinically acceptable safety profiles, especially in comparison to the whole cell vaccines. However, protective immunity to pertussis wanes over 5-10 years after immunization.²

In addition to preventing pertussis, tetanus and diphtheria, there are multiple reasons for instituting a routine adolescent immunization visit between 10-15 years of age. It also provides an opportunity to immunize with meningococcal and HPV vaccines and for selective use of vaccines such as HBV, MMR, varicella, influenza and hopefully in the near future, vaccines such as herpes type II. Importantly it is also an opportunity to reach adolescents for health screening, education and counseling.

This presentation will review the formulation, immunogenicity, and safety of aP vaccines as well as the rationale for pertussis boosters in the current epidemiological context. The ultimate control of pertussis will require routine pertussis booster immunizations for adolescents and adults as well as for the parents of young infants (cocoon strategy).

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SUCSESSES AND REMAINING CHALLENGES IN MENINGOCOCCAL DISEASE PREVENTION

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Neisseria meningitidis is a leading cause of invasive meningococcal disease (IMD) with a high case-fatality rate, causing 50,000 deaths worldwide annually.¹ Five serogroups of *N. meningitidis* (A, B, C, W-135 and Y) cause the majority of human disease.² Prevalence of each serogroup varies temporally and geographically,^{2,3} and new strains can spread rapidly around the world. Protection against IMD can be achieved using monovalent (A and C only) and multivalent (A, C, W-135 and Y) polysaccharide (PS) meningococcal vaccines, which have demonstrated efficacy and a clinically acceptable safety profiles in children >2-years-old.⁴ However, in infants < 2 years, these vaccines are poorly immunogenic and do not induce immunological memory. Furthermore, duration of immunity is short (3-5 years) and hyporesponsiveness can occur after repeated doses.⁴ Effective protein-polysaccharide-conjugate vaccines are licensed for use in children < 2-years-old,⁵ but only provide protection against serogroup C. GlaxoSmithKline is developing a tetanus toxoid-conjugated tetravalent serogroup A, C, W-135, Y vaccine (MenACWY-TT), which potentially could address some of these issues. In clinical trials, the candidate vaccine demonstrated similar immunogenicity against serogroup C (seroresponse rates >94.8%) to MenC-conjugated vaccines in children aged 1-10 years.⁶⁻⁹ Additionally, immunogenicity of MenACWY-TT post-vaccination was non-inferior to MenACWY-PS vaccines against all four serogroups in adolescents/adults aged 11-55,^{10,11} with significantly higher MenA, MenW-135 and MenY geometric mean antibody titres 1 year post-vaccination in 11-17-year-olds.¹¹ In clinical trials, MenACWY-TT has shown a clinically acceptable reactogenicity and safety profile.^{12,13}

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