Preventing Catheter-Related Bloodstream Infections

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The use of non-tunneled central venous catheters is increasing among patients in all settings including intensive care units as they enhance medical care. However, catheters and their placement provide an opportunity for bacteria to enter the bloodstream causing infection, or a catheter-associated bloodstream infection (CABSI). These infections contribute significantly to patient morbidity and mortality and are costly to healthcare systems. However, they are preventable. While evidence based guidelines to prevent these infections exist, they are complicated and have been difficult to implement in the healthcare setting. The salient elements have not been systematically translated into a format so that 1) healthcare workers know what they need to do, 2) institutions know how to facilitate the behavior with supplies and 3) the outcomes are communicated to the healthcare workers. The science behind a simple ''bundle of non-technologic but infection prevention and control interventions'' which can be used in resource limited and rich settings includes the use of 1) hand hygiene prior to placing the line, 2) a chlorhexidine based skin preparation prior at the insertion site of the line, 3) the subclavian vein site over other sites for line placement whenever medical feasible, 4) full barrier drapping of the patient during the procedure, and 5) daily attempts to remove the line. In addition, appropriate line care and dressing use once the insertion is completed were taught. In this paper we will use the experience at an institution and in several other settings to demonstrate how to operationalize such an intervention. We will look at the impact on CABSI rates in adult and pediatric settings.

The intervention can be put in context of a behavioral modification model proposed by Rodgers et al. In this model elements of the intervention include factors that enhance knowledge and facilitate behavior and attitude change. We will review enabling factors primarily from the institution that will improve behavior and we will look at techniques to reinforce behavior.

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27.003

Relevant Vaccines for Health Care Workers

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Immunization among HCWs has two purposes, both which allow for better prevention. Immunization's first purpose is to protect HCWs from several infectious diseases they may be exposed to through professional activities. A second purpose is to minimize the odds of infecting the patients they are taking care of. It should be clear that both objectives are extremely important and should be a priority to any health system. Another consideration is the importance of establishing this preventive measure in low-income regions where

The landscape of public health has plenty of examples of neglected situations. In developing regions the protection of HCWs has been ignored in the most flagrant circumstances. There is a lack of regulations to establish vaccination programs and the protection needed for accidental injuries.

Any health care service or system should establish an employee health program in collaboration with the infection control department that includes a vaccination schedule for HCWs. It is essential that vaccines for Hepatitis B, Influenza (yearly), Measles, Mumps, Rubella, Tetanus and Diphteria are administered. According to regional epidemiological circumstances other vaccines may be considered, such as BCG, Yellow Fever, Varicella-zoster, Hepatitis A, Cholera and Influenza A H5 N1.

Surprisingly, HCWs are reluctant to accept vaccination programs as is shown by multiple reports for very low rates of acceptance. This is a challenge every program needs to address, and strategies to improve acceptance should be evaluated. Establishing a wide and continuous vaccination program should be a high priority project in any health care system.

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27.004

Prevention of Surgical Infections

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Surgical site infections (SSIs) are the second most common cause of nosocomial infections resulting in considerable increase in morbidity and mortality. The U.S. Centers for Disease Control and Prevention (CDC) estimate that 500,000 SSIs occur annually in the United States. Patients who develop SSIs are up to 60% more likely to require intensive care, are up to 5 times more likely readmitted for complications, and twice as likely to die as patients without an SSI. In addition, SSIs increase health care costs by $ 5—10,000 and double mortality after procedures. Dozens of risk factors have been identified that partly predict the incidence of SSIs. The can be basically classified in risk factors by the underlying diseases of the patient, risk factors of the intervention, risk factors by the surgical team and management, and environmental factors. Multiple strategies have been developed to decrease the incidence of SSIs, but many are given by the patient such as age and underlying diseases. The CDC has developed key compounds that increase the risk of SSIs: Surgery exceeding the T-time, level of contamination of surgery (contaminated or dirty) and ASA score >3. In addition, Wenzel RP and colleagues already demonstrated in the seventies that surgical volume is associated with SSIs. Established risk factors are ongoing infections other than the surgical site, insufficient heating of the patient during surgery, failure to give appropriate oxygen supply and failure to give appropriate, timely antimicrobial prophylaxis. The latter is likely the most important, but very difficult to introduce in a busy operating theatre. Common infection control practices that are poorly supported by clinical trials are laminar air flow for implant surgery, hand antisepsis

prior to surgery, and disinfection of the surgical site. Last, but not least, surveillance of SSIs is a well-established, well documented approach to lower the incidence of SSIs. Many hospitals still do not follow this recommendation despite its effectiveness. Endoscopy and robotic surgeries are new developments that further help to keep rates of SSIs at the lowest possible level. However, as patients leave the hospital at a very early stage, post-discharge surveillance becomes mandatory. Many studies indicate that about 50% of the SSIs undergo undetected unless postdischarge surveillance is performed.

A lot of research has been performed in the last decade: However, many hospital still fail to implement these new knowledge into clinical practice.

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New Generation Multivalent Vaccines Designed to Do More (invited)

28.001

Multivalent Protection Against a Severe Pediatric Disease - Rotavirus

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Rotaviruses are the foremost cause of severe gastroenteritis in young children, being responsible for 600,000 deaths, 2 million hospitalizations, 25 million clinic visits, 111 million episodes and 56% of hospitalizations for febrile gastroenteritis worldwide, each year. Every child is infected by age five years. Rotateq™ is an oral, ready-to-use, 3-dose regimen vaccine, containing 5 human-bovine reassortant rotavirus serotypes given at 2, 4, 6 months of age, that is easily integrated into pre-established immunization schedules. The product has been studied in over 70,000 infants from all five continents. Rotateq™ has proven efficacy of 98% against severe gastroenteritis for G1-4 strains, was well tolerated, including with respect to intussusception in prelicensure and postmarketing surveillance, with no increase in fever, irritability, or hematochezia, while it reduced health care contacts for rotaviruses by nearly 100%. Rotateq™ has FDA-approval and is now in use in 70 countries, with application pending in another 75 countries, worldwide. RotateqTM is now widely available in USA, Canada, Australia, eleven countries in Europe, Latin America, the Caribbean and also in other parts of the world. RotateqTM is now in the review process for WHO-prequalification. Given the universal nature of rotavirus gastroenteritis, this vaccine is an extremely important public health priority.

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28.002

Long Term Benefits of the Quadrivalent Human Papillomavirus Vaccine (HPV)

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It is now realised that 99.7% of cervical cancers are caused by oncogenic HPV infection: and worldwide HPV types 16 and 18 consistently account for 70% to 80% of cases. Moreover HPV types 16 and 18 contribute to 50% of high-grade dysplasias, and 25% of low-grade dysplasias. In addition, HPV is the most common viral infection with condylomata accuminata or genital warts (90% caused by HPV 6/11) being the most common viral sexually transmitted disease. Genital warts peak in the mid-20 age group, commonly recur post-treatment, and consequently are a costly burden in sexual health settings, as well as causing significant psychosocial morbidity to those infected.

In phase III clinical trials of the quadrivalent human papillomavirus vaccine (6,11,16,18), vaccine HPV type-related CIN2/3, VIN 2/3 and VaIN 2/3 were used as surrogate endpoints in determining efficacy against cervical, vulvar and vaginal cancers, respectively. Randomized, placebo-controlled, double-blind trials involving more than 25,000 women aged 15 - 26 years have shown up to 100% efficacy against HPV 6, 11, 16 and 18 related CIN2/3, AIS (adenocarcinoma in situ), VIN, VaIN, as well as genital warts. Through 5 years of follow-up, the clinical efficacy was maintained with no breakthrough cases observed in the vaccine group. In mid adult women aged 24 - 45, the efficacy of quadrivalent HPV vaccine in the prevention of HPV6/11/16/18-related CIN or external genital lesions (EGL) was 92.4%, with efficacy against HPV16/18-related CIN or EGL being 87.8%. Efficacy against HPV6/11-related CIN or EGL was 100%.

In all studies, vaccine was generally well-tolerated, with a significant but slightly higher proportion of subjects reporting one or more injection site adverse experiences than the placebo group.

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28.003

Value of the Quadrivalent HPV Vaccine

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Vaccines provide long-term protection by inducing immune memory - the ability to rapidly produce high antibody levels on subsequent encounters with pathogens targeted by the vaccine. Prophylactic administration of a quadrivalent HPV (types 6/11/16/18) L1 VLP vaccine (GARDASIL®, Merck & Co., Inc.) to 16- to 23-year-olds was 96% effective in preventing HPV 6/11/16/18 persistent infection or related disease through 5 years of follow-up (Villa et al., Br J Cancer, 2006). Sustained efficacy against disease was maintained with no breakthrough cases of HPV 6, 11, 16 or 18-related infection or disease. In the same study, at the 5 year mark, an antigen challenge was given that demonstrated that GARDASIL® (formulated on a proprietary aluminum adjuvant) had induced immune memory, a hallmark of vaccines