Infectio

A quarterly Magazine

3rd Issue, 2014

Next issue will be a special edition on Pediatric Infectious Diseases

Current News

Primary Amebic Meningoencephalitis (PAM)

Primary Amebic Meningoencephalitis (PAM) is caused by parasite, *N. fowleri;* a rarely occurring, highly fatal disease with about 99% mortality. In Pakistan, a total of 10 cases (all fatal) were reported from different tertiary care hospitals of Karachi (7 during 2012 and 3 cases during 2013). First case in this context was detected on 3 July 2012. *N. fowleri* "brain-eating amoeba", is a unicellular, free-living microscopic organism & grows best at higher temperature up to 46°C & is naturally found in warm fresh water environments feeding on bacteria and other microbes.

Transmission to humans occurs primarily through inhalation of infested water during swimming in freshwater places or putting contaminated water in to the nose during ablution. Disease however, does not occur by drinking contaminated water or by swimming in sea.

Lab Diagnosis:

PAM and *N. fowleri* infection can be diagnosed in the laboratory by detecting:

1. *N. fowleri* organisms in cerebrospinal fluid (CSF), biopsy, or tissue specimens, or
2. *N. fowleri* nucleic acid in CSF, biopsy, or tissue specimens, or
3. *N. fowleri* antigen in CSF, biopsy, or tissue specimens.

Treatment:

The combination of three drugs; Amphotericin B (AMB) (IV+/Intrathecal), Rifampicin (Oral 10 mg/kg/day) & Fluconazole (IV or oral 10 mg/kg/day) is used along with steroids. Azithromycin has both *in vitro* and *in vivo* efficacy against *N. fowleri* and may be tried as an adjunct to AMB.

Prevention & Control:

The municipality public health authorities must ensure that adequate levels of chlorine are maintained in the supplied tap water along with strict monitoring arrangements. Any of the suspected cases should immediately be reported to health authorities for corrective measures.

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Introduction

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Message of the Chairman/Head of Project

Infectio

The response to last two issues of the quarterly *Infectio* magazine has been tremendously positive. We aim to continue and provide you with latest news & information about infectious diseases that may be of interest to you.

In the last issue of Infectio magazine we focused important topics like Community Acquired Pneumonia, Emerging epidemic of antibiotic resistance in Pakistan, Measles & highlights of ICON-2014. The 3rd issue contains valuable information on infectious diseases, 2014 updates of adult immunization programs and other articles related to viral hepatitis by leading experts.

There is emergence of rare infectious diseases some of which like Ebola virus, Avian Influenza and MERS-CoV and viral hemorrhagic fever are potential threats for world-wide spread through ease of travel facilities. In current issue, Prof. Badar Jahan Farooqi has discussed emergence of *Aeromonas hydrophilia* as a potential infective agent for multi–system disease. Dr. Afridi also considers *Achromobacter xylosoxidans* as a potential nosocomial pathogen. Additionally this issue contains seasonal awareness alert by SAAL.

I would also like to congratulate winners of second quiz and thank all doctors who participated in the quiz.

I wish this magazine a great success in achieving its aim.

Prof. Dr. Ejaz Ahmed Vohra
Chairman Dept. of Medicine
Dean Post Graduate (Clinical)
Dr. Ziauddin University Karachi

Editorial

Prof. Ejaz Ahmed Vohra
Chairman/Head of Project

Infectious disease surveillance and control at mass gathering

The ease of traveler at frequent public gatherings of large number of people are potential threats for spread of indigenous infectious diseases along with rare disease of serious nature such as: H1N1 Influenza Infections.

The Hajj or pilgrimage to Makkah, Saudi Arabia, is one of the largest yearly religious mass gathering worldwide, with more than 2 million people from more than 184 countries. Saudi Government has established global center for mass gathering medicine in partnership with the WHO collaborating center and other neighboring countries, Gulf co-operation council states and U.K universities and public health institutions globally.

Ziad A Memish and colleagues recently described in a Lancet article, (Lancet Vol 383 June 14, 2014). Efforts to control of Infectious diseases and minimize spread of infectious disease during Umrah and Hajj. The numbers of pilgrims undertaking the Hajj has increased from 58584 in 1920 to 3161573 in 2012. The advanced planning and other measures taken by Saudi Ministry of Health provide a framework to other countries. The mass gatherings occur in Pakistan like Tablighi Jamaat Conference in Raiwind and annual gathering at various shrines pose major health problems.

The Saudi Government has a well-established system for the planning, communication, security, health, safety and administrative issues in relation to the Hajj to minimize the health risks to the pilgrims. The details of Saudi Government's efforts including Public health measures for provision of safe water and food supplies, sanitation and vector control, daily inspection of water treatment plant are done to ensure chlorination and inspection of all water supplies resources and water tank, food stores are also inspected. The personnel working in kitchen at hotels and hospitals to identify potential carriers of gut pathogens and to ensure standards of food hygiene are maintained. All kitchen and samples of food /water are inspected to ensure compliance with the health regulation. Vector control is done via wide spread insecticides spray. During Hajj, Saudi Government provides free medical care to all pilgrims.

Vaccination is required for pilgrim including quadrivalent conjugate meningococcal vaccine (ACYW135). A single dose of polio vaccine is administered to pilgrim on arrival to Saudi Arab from every country where Polio has reported. Specific guidelines have been issued for prevention and control of MERS-CoV.

The establishment of command and control center, the formation of the center will provide better treatment of all communicable diseases and monitor, rapid exchange of information and collect research evidence of outbreak of infectious diseases and measures to control it.

There is a need to collect health information during mass gatherings in Pakistan. Ministry of health should establish similar centers in Pakistan. The leading academic centers in Pakistan should also conduct research on this important public health problem.

Viral Hepatitis

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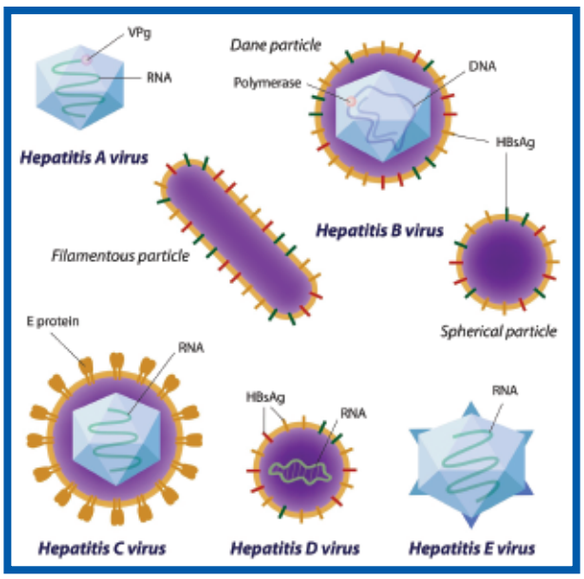

History

Hippocrates first described the existence of jaundice as early as 400BC. The land mark events that led to increase in our knowledge were the distinction between infectious and serum hepatitis by Krugman and colleagues in 1967 and the discovery of Australia antigen later that year by Blumberg and co-workers. The use of serological marker, the Australia antigen helped in characterizing the epidemiology of Hepatitis B virus infection. In 1973 Hepatitis A virus (HAV) was detected in stool by immune electron microscopy. Epidemics of infectious hepatitis were linked to HAV.

In 1975 Krugman produced a crude vaccine for Hepatitis B virus (HBV) infection. Subsequently a new antigen was detected in some patients with HBV infection and this led to the identification of Delta virus or Hepatitis D virus (HDV). In 1980 existence of another enterically transmitted virus was suspected. Virus was identified in the feces of volunteers infected with fecal material of a person suspected of having enterically transmitted Non-A, Non-B virus.

Viral Hepatitis - Background

Viral hepatitis is an inflammation of the liver, generally refers to disease, caused by one of the five well-described Hepatitis viruses, referred to as types A, B, C, D and E. Other viruses that can cause hepatitis but are not primary cause of acute / chronic viral hepatitis include Epstien Barr virus, Herpes simplex virus, Mumps, Rubella, Rubeola, Varicella-Zoster virus, Yellow fever virus, coxsackie B virus and Adenovirus.

Mode of infection

Types A and E are transmitted by contaminated water or food and closely associated with poor sanitation and poor personal hygiene (e.g. use of unwashed hands). Type E infection is associated with increased morbidity and mortality in pregnant women and newborns.

Types B, C are transmitted by exposure to infectious blood, semen, and other body fluids (e.g. through unsafe injections or unscreened blood transfusions). They can be transmitted from infected mothers to infants at the time of birth, or from family members to infants in early childhood.

Type D only infects persons who are already infected with active infection by type B.

Hepatitis B & Hepatitis C poses a significant risk to health care workers who sustain accidental needle-stick injuries while caring infected people.

Chronic carrier state

HAV and Hepatitis E virus do not exist as chronic carrier state. HBV, Hepatitis C virus, HDV exist both as acute and chronic carrier state. Chronic carrier state act as reservoir of infection and may lead to chronic hepatitis, cirrhosis and hepatocellular carcinoma.

Measures for Prevention and Control of Hepatitis.

Measures that can reduce the transmission of viral hepatitis are:

- **Raising awareness** of all types of viral hepatitis infections. It helps in reducing transmission in the community.
- **Implementation of blood safety strategies,** including blood supplies based on voluntary non-remunerated blood donations, effective public education on blood donation, donor selection, and quality-assured screening of all donated blood and blood components used for transfusion can prevent transmission of HBV and HCV.
- **Infection control precautions** in health care facility and community settings can prevent transmission of viral hepatitis.
- **Safe injection practices** can protect against HBV and HCV transmission.These include use of disposable syringes, no re-capping and proper disposal of syringes. Needles should not be shared.
- **Safer sex practices,** including minimizing the number of partners and using barrier protective measures (condoms), protects against Type B and C transmissions.

- **Occupational safety measures** prevent transmission of viral hepatitis to health care workers. Standard precautions should be followed for all patients admitted in the hospital regardless of the status of diagnosis.
- **Safe food and water** provides protection against Type A & E infections.
- **Vaccination,** safe and effective vaccines are widely available for the prevention of type A & B and a vaccine for type E has recently been licensed. The hepatitis B vaccine provides protection from HDV infection. There is no vaccine against HCV.

Hepatitis A vaccination

Hepatitis A vaccination is the mainstay of prevention of hepatitis infection. Two inactivated vaccines are available; both are highly immunogenic and efficacious. Children and adolescents develop antibodies within a month. Travelers to endemic areas should get the first dose at least a month before travelling to endemic areas. In case of HAV infection, close contacts should receive immunization within two weeks of exposure.

Hepatitis B vaccination

Prevention of HBV infection relies on vaccination of all children at birth. The vaccination schedule comprises of three dose vaccine series. First dose is followed by second dose one month apart and third is given after six months. If the vaccination series is interrupted after the first dose, the second dose should be administered as soon as possible. The second and third doses should be separated by an interval of at least 2 months.

If only the third dose is delayed, it should be administered when convenient. One month after completion of the 3-dose vaccination series person should be tested for anti-HBs to see the protective antibody response (Anti-HB greater than 10 mIU/ml in 90 % of adults and 95 % of infants, children and adolescents). Larger vaccine doses or increased number of doses are required in hemodialysis patients.

Persons who do not respond to the primary vaccine series (i.e., anti-HBs <10 mIU/mL) should complete a second 3-dose vaccine series. Revaccinated persons should be retested at the completion of the second vaccine series for Anti HBs.

Persons who do not respond to an initial 3-dose vaccine series have a 30%-50% chance of responding to a second 3-dose series .

Nonresponders to vaccination who are HBsAg-negative should be considered susceptible to HBV infection and should be counseled regarding precautions to prevent HBV infection and the need to obtain Hepatitis B immune globulin prophylaxis for any known or probable parenteral exposure to HBsAg-positive blood.

References

Available on request

AEROMONAS HYDROPHILA

Professor Badar Jahan Farooqi
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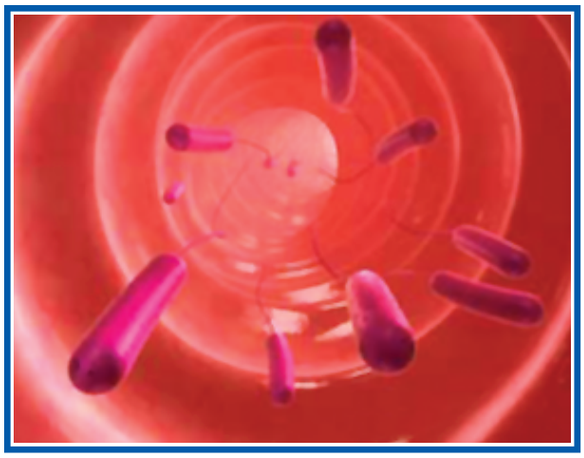

Aeromonas are Gram negative rods. They are ubiquitous inhabitants of fresh water sources. They can tolerate variety of conditions and temperature. Most species are motile. They are catalase and oxidase positive and reduce nitrates to nitrites. They grow as non-lactose fermenters on MacConkey agar medium (Figure-1) and show large zones of hemolysis around colonies on blood agar.

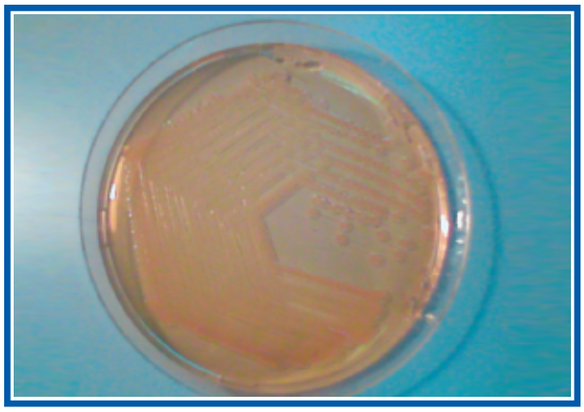

Figure1: Non-lactose fermenting colonies of *Aeromonas hydrophila* on MacConkey agar.

Infection is spread via fecal-oral transmission during direct ingestion or drinking of contaminated food or water. Infection can also be transmitted by eating contaminated meat, or fish. The most common infection caused by *Aeromonas species* are gastrointestinal infection, skin and soft tissue infections and bacteremia in immunocompromised host.

Around 68 % of human infections are caused by *Aeromonas hydrophila (A. hydrophila)* among *Aeromonas species*. Remaining infections caused by *Aeromonas sobria* (17%) and *Aeromonas caviae* (10%).

A. hydrophila has become an increasingly important pathogen in humans in the past three decades.

Aeromonas infection has been reported to lead to severe opportunistic infections such as diarrhea, perianal abscess, endocarditis, cellulitis, necrotizing fasciitis, cholangitis, peritonitis, traumatic osteomyelitis, and meningitis in children and immunocompromised adults.[5]

Pathogenesis of Aeromonads includes production of haemolysins and cytotoxins which serve as virulent factors.

Antimicrobial susceptibility testing should be done to optimize antimicrobial management (Figure-2). Hochedez P *et al*. reported that cefotaxime, ceftazidime, imipenem, gentamicin, and ciprofloxacin had highest activity against *A. hydrophilia*.

Another study revealed similar results with the addition of piperacillin/tazobactam and more than 90 % strains of *A. hydrophila* complex were susceptible to these antibiotics. The major mechanism of beta-lactam resistance in *A. hydrophila* are chromosomally mediated inducible beta lactamases.

Clinicians should be aware of the risk of emergence of cephalosporin resistant mutants from wild type strain during the treatment of invasive A. hydrophila infection. One study showed 29 to 73 % mortality rate due to *A. hydrophila* infection.

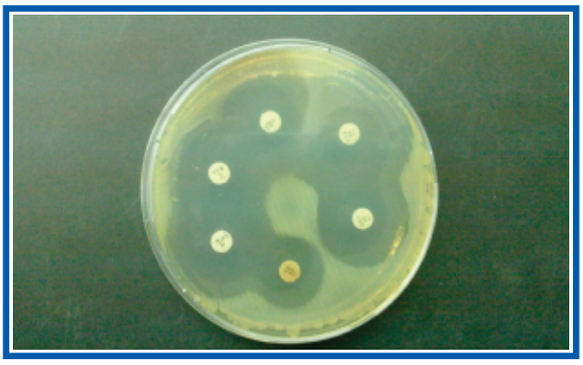

Figure 2: *In vitro* sensitivity testing of *Aeromonas hydrophila* on Mueller hinton agar.

Early treatment with adequate antibacterial chemotherapy is the only possible means for a cure. Susceptibility has been shown for 1% sodium hypochlorite, 2% glutaraldehyde, 70% ethanol, iodines, phenolics, and formaldehyde. It is also sensitive to silver in water and free chlorine.

In Summary, *A. hydrophila* is a virulent organism especially in immunocompromised patients. It must be suspected and identified correctly so that correct treatment can be given to reduce the fatality rate especially in immunocompromised patients.

REFERENCES
Available on request

Achromobacter xylosoxidans... An Emerging Nosocomial Pathogen

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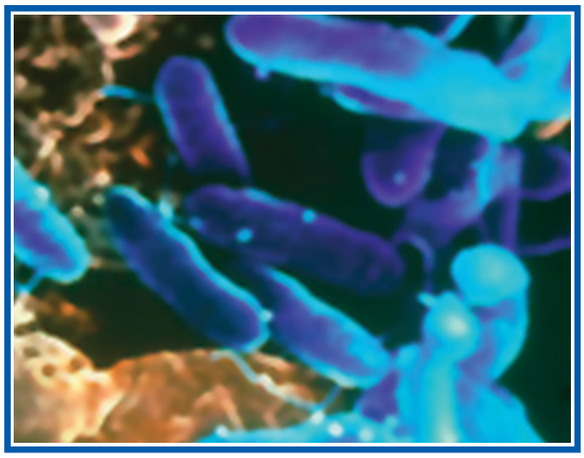
Infectio



Background

Achromobacter xylosoxidans (A. xylosoxidans) is a nonfermentative gram-negative bacillus. Although it is widely distributed in nature, it is especially found in aquatic environment. *A. xylosoxidans* was initially characterized by *Holmes et al.* and further described by Yabuuchi and Ohyama in 1971 from purulent ear discharge of patients with chronic otitis media. The previous name of this organism was *Alcaligenes xylosoxidans* subspecies *xylosoxidans*, but recent 16rRNA sequence analysis support placement of this organism back in genus *Achromobacter*. The identification of *A. xylosoxidans* can be confused with other gram-negative bacilli especially *Pseudomonas species* in clinical specimens, therefore its role as an emerging nosocomial pathogen may be underestimated.

Sources and Outbreaks

The source of *A. xylosoxidans* and its natural habitat are unknown. It probably is part of the endogenous flora of the ear and gastrointestinal tract and is a common contaminant of fluids. However, as stated earlier that *A. xylosoxidans* is a water pathogen.

A. xylosoxidans has been implicated in outbreaks of nosocomial infection associated with contaminated solutions (e.g., intravenous fluids, hemodialysis fluid, irrigation fluids, and mouthwash), pressure transducers, incubators and humidifiers, and contaminated soaps and disinfectants. *A. xylosoxidans* was detected in deionized water in an intensive care unit, tap water and on the hands of two health care workers in a hemodialysis unit.

Shigeta et al. reported an outbreak of cerebral ventriculitis due to contaminated chlorhexidine solution. *A. xylosoxidans* bacteremia is almost always a nosocomial infection. In one large outbreak, nonbacteriostatic saline used to dilute radionuclide tracers became contaminated, and bacteremia subsequently occurred in 10 patients. Contaminated aqueous eosin solution applied to an area of dermatitis led to another case of bacteremia. Contamination of well water was the source of infection in one case of bacteremia. Another outbreak involving four infants was traced back to contaminated eye wash and incubator-humidification equipment in a neonatal nursery.

Clinical Conditions

A. xylosoxidans is the most clinically important organism among other species of the Genus Achromobacter. Clinical conditions that are caused by *A. xylosoxidans* has involved isolates from blood, peritoneal and pleural fluid, urine, respiratory secretions, and wound exudates. Bacteremia, often related to intravascular catheters, is the most commonly reported infection and is frequently polymicrobial in patients with underlying malignancies. Biliary tract sepsis, meningitis, pneumonia, peritonitis, urinary tract infection, conjunctivitis, osteomyelitis, prosthetic knee infection, and prosthetic valve endocarditis have been reported. Patients often have an immunosuppressed state such as cancer and Human Immunodeficiency Virus infection, but this is not always the case, especially in nosocomial outbreaks. *A. xylosoxidans* has been recovered with increasing frequency from respiratory secretions of persons with cystic fibrosis (CF), and colonization has been associated with exacerbation of respiratory symptoms. A recent study by Tan *et al.* indicates that 13(2.3%) of 557 patients in their pediatric and adult CF units were chronically infected with this organism; a further 31(5.6%) patients were intermittently colonized. Recovery in neonatal infection may result from perinatal transfer from the mother.

Identification

A. xylosoxidans is motile, gram-negative, asporogenous, straight rod. Strains of *A. xylosoxidans* grow well on blood agar and MacConkey agar plates; they produce flat, glistening, spreading and rough colonies (Figure 1). They

have peritrichous flagella, feature that help distinguish them from pseudomonads. The organisms are oxidase positive, citrate positive, and catalase positive, oxidize glucose to produce acid, and (as the species name indicates) oxidize xylose readily. Identification of the microorganism can be done by API 20 NE system. Fluorescence *in situ* hybridization and polymerase chain reaction-based assays can be used for the correct identification of *A. xylosoxidans*.

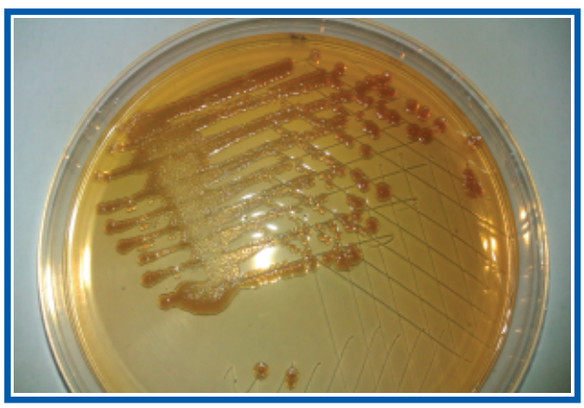


Figure1: Bacteremic isolate of *A. xylosoxidans*. Non-lactose fermenting colonies on MacConkey agar.

Treatment Options

Treatment of *A. xylosoxidans* infections is often difficult, and an optimal antimicrobial regimen has not been determined. Usually, strains of *A. xylosoxidans* are susceptible to co-trimoxazole, ureidopenicillins, carbapenems, ceftazidime, cefoperazone, and β-lactamase inhibitor combinations. Generally, they are resistant to narrow-spectrum penicillins, other cephalosporins (including cefotaxime, ceftriaxone), aztreonam, and aminoglycosides. Susceptibility to the fluoroquinolones is variable. For infections caused by multi-drug resistant *A. xylosoxidans*, antimicrobial combinations such as piperacillin plus gentamicin, azithromycin plus doxycycline, and azithromycin plus co-trimoxazole have been tested with favorable results. Other antimicrobial options in combinations that have shown additive activity include chloramphenicol plus minocycline, and ciprofloxacin plus either imipenem or meropenem.

Infection Control and Prevention

Standard infection control practices such as hand hygiene (hand washing upon unit entry before and after patient contact and use of alcohol hand sanitizer between patient contacts), aseptic technique for all invasive procedures, sterile procedures requiring gown, mask, and gloves and environmental cleaning are recommended. If an outbreak is suspected then cohorting and contact precautions with gown and glove use on entry to rooms of patients infected with *A. xylosoxidans* and enhanced environmental cleaning should be instituted.

Conclusion

A. xylosoxidans has the potential to cause serious infections especially in patients with underlying illnesses and hospitalized neonates. The organism probably exists in a water environment and can be confused with *Pseudomonas species*. Antimicrobial susceptibility profile for every case should be taken into account for determining the therapy. Strict contact precautions are recommended for infection control purpose.

References

Available on request

Recommended Adult Immunization Schedule - 2014

Infectio

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

VACCINE ▼ / AGE GROUP ▶	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza [2]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap) [3]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella [4]	2 doses					
Human papillomavirus (HPV) Female [5]	3 doses					
Human papillomavirus (HPV) Male [5]	3 doses					
Zoster [6]					1 dose	
Measles, mumps, rubella (MMR) [7]	1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13) [8]	1 dose					
Pneumococcal polysaccharide (PPSV23) [9,10]	1 or 2 doses					1 dose
Meningococcal [11]	1 or more doses					
Hepatitis A [12]	2 doses					
Hepatitis B [13]	3 doses					
Haemophilus influenzae type b (Hib) [14]	1 or 3 doses					

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)

No recommendation

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

VACCINE ▼ / INDICATION ▶	Pregnancy	Immuno-compromising conditions (excluding human immunodeficiency virus [HIV]) [4,6,7,8,15]	HIV infection CD4+ T lymphocyte count [4,6,7,8,15] < 200 cells/μL	HIV infection CD4+ T lymphocyte count [4,6,7,8,15] ≥ 200 cells/μL	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, receipt of hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia (including elective splenectomy and persistent complement component deficiencies) [8,14]	Chronic liver disease	Diabetes	Healthcare personnel
Influenza [2]	1 dose IIV annually				1 dose IIV or LAIV annually	1 dose IIV annually					1 dose IIV or LAIV annually
Tetanus, diphtheria, pertussis (Td/Tdap) [3]	1 dose Tdap each pregnancy	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs									
Varicella [4]	Contraindicated			2 doses							
Human papillomavirus (HPV) Female [5]		3 doses through age 26 yrs				3 doses through age 26 yrs					
Human papillomavirus (HPV) Male [5]		3 doses through age 26 yrs				3 doses through age 21 yrs					
Zoster [6]	Contraindicated				1 dose						
Measles, mumps, rubella (MMR) [7]	Contraindicated			1 or 2 doses							
Pneumococcal 13-valent conjugate (PCV13) [8]					1 dose						
Pneumococcal polysaccharide (PPSV23) [9,10]					1 or 2 doses						
Meningococcal [11]					1 or more doses						
Hepatitis A [12]					2 doses						
Hepatitis B [13]					3 doses						
Haemophilus influenzae type b (Hib) [14]		post-HSCT recipients only			1 or 3 doses						

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

No recommendation

Recommended Adult Immunization Schedule - 2014

Footnotes — Recommended Immunization-2014
Schedule for Adults Aged 19 Years and Older

1. Additional information

- Additional guidance for the use of the vaccines described in this supplement is available at www.cdc.gov/vaccines/h-cp/acip-recs/index.html.
- Information on vaccination recommendations when vaccination status is unknown and other general immunization information can be found in the General Recommendations on Immunization at www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm.
- Information on travel vaccine requirements and recommendations (e.g., for hepatitis A and B, meningococcal, and other vaccines) is available at http://wwwnc.cdc.gov/travel/destinations/list.
- Additional information and resources regarding vaccination of pregnant women can be found at http://www.cdc.gov/vaccines/adults/rec-vac/pregnant.html.

2. Influenza vaccination

- Annual vaccination against influenza is recommended for all persons aged 6 months or older.
- Persons aged 6 months or older, including pregnant women and persons with hives-only allergy to eggs, can receive the inactivated influenza vaccine (IIV). An age-appropriate IIV formulation should be used.
- Adults aged 18 to 49 years can receive the recombinant influenza vaccine (RIV) (FluBlok). RIV does not contain any egg protein.
- Healthy, nonpregnant persons aged 2 to 49 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (LAIV) (FluMist), or IIV. Health care personnel who care for severely immunocompromised persons (i.e., those who require care in a protected environment) should receive IIV or RIV rather than LAIV.
- The intramuscularly or intradermally administered IIV are options for adults aged 18 to 64 years.
- Adults aged 65 years or older can receive the standard-dose IIV or the high-dose IIV (Fluzone High-Dose).

3. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination

- Administer 1 dose of Tdap vaccine to pregnant women during each pregnancy (preferred during 27 to 36 weeks' gestation) regardless of interval since prior Td or Tdap vaccination.
- Persons aged 11 years or older who have not received Tdap vaccine or for whom vaccine status is unknown should receive a dose of Tdap followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter. Tdap can be administered regardless of interval since the most recent tetanus or diphtheria-toxoid containing vaccine.
- Adults with an unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series including a Tdap dose.
- For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6 to 12 months after the second.
- For incompletely vaccinated (i.e., less than 3 doses) adults, administer remaining doses.
- Refer to the ACIP statement for recommendations for administering Td/Tdap as prophylaxis in wound management (see footnote1).

4. Varicella vaccination

- All adults without evidence of immunity to varicella (as defined below) should receive 2 doses of single-antigen varicella vaccine or a second dose if they have received only 1 dose.
- Vaccination should be emphasized for those who have close contact with persons at high risk for severe disease (e.g., health care personnels and family contacts of persons with immunocompromising conditions) or are at high risk for exposure or transmission (e.g., teachers; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers).
- Pregnant women should be assessed for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the health care facility. The second dose should be administered 4 to 8 weeks after the first dose.
- Evidence of immunity to varicella in adults includes any of the following:
  - documentation of 2 doses of varicella vaccine at least 4 weeks apart;
  - U.S.-born before 1980, except health care personnel and pregnant women;
  - history of varicella based on diagnosis or verification of varicella disease by a health care provider;
  - history of herpes zoster based on diagnosis or verification of herpes zoster disease by a health care provider; or
  - laboratory evidence of immunity or laboratory confirmation of disease.

5. Human papillomavirus (HPV) vaccination

- Two vaccines are licensed for use in females, bivalent HPV vaccine (HPV2) and quadrivalent HPV vaccine (HPV4), and one HPV vaccine for use in males (HPV4).
- For females, either HPV4 or HPV2 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years and for those aged 13 through 26 years, if not previously vaccinated.
- For males, HPV4 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years and for those aged 13 through 21 years, if not previously vaccinated. Males aged 22 through 26 years may be vaccinated.
- HPV4 is recommended for men who have sex with men through age 26 years for those who did not get any or all doses when they were younger.
- Vaccination is recommended for immunocompromised persons (including those with HIV infection) through age 26 years for those who did not get any or all doses when they were younger.
- A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be administered 4 to 8 weeks (minimum interval of 4 weeks) after the first dose; the third dose should be administered 24 weeks after the first dose and 16 weeks after the second dose (minimum interval of at least 12 weeks).
- HPV vaccines are not recommended for use in pregnant women. However, pregnancy testing is not needed before vaccination. If a woman is found to be pregnant after initiating the vaccination series, no intervention is needed; the remainder of the 3-dose series should be delayed until completion of pregnancy.

6. Zoster vaccination

- A single dose of zoster vaccine is recommended for adults aged

60 years or older regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the U.S. Food and Drug Administration for use among and can be administered to persons aged 50 years or older, ACIP recommends that vaccination begin at age 60 years.

- Persons aged 60 years or older with chronic medical conditions may be vaccinated unless their condition constitutes a contraindication, such as pregnancy or severe immunodeficiency.

7. Measles, mumps, rubella (MMR) vaccination

- Adults born before 1957 are generally considered immune to measles and mumps. All adults born in 1957 or later should have documentation of 1 or more doses of MMR vaccine unless they have a medical contraindication to the vaccine or laboratory evidence of immunity to each of the three diseases. Documentation of provider-diagnosed disease is not considered acceptable evidence of immunity for measles, mumps, or rubella.

Measles component:

- A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who:
  - are students in postsecondary educational institutions;
  - work in a health care facility; or
  - plan to travel internationally.
- Persons who received inactivated (killed) measles vaccine or measles vaccine of unknown type during 1963–1967 should be revaccinated with 2 doses of MMR vaccine.

Mumps component:

- A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who:
  - are students in a postsecondary educational institution;
  - work in a health-care facility; or
  - plan to travel internationally.
- Persons vaccinated before 1979 with either killed mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection (e.g., persons who are working in a health care facility) should be considered for revaccination with 2 doses of MMR vaccine.

Rubella component:

- For women of childbearing age, regardless of birth year, rubella immunity should be determined. If there is no evidence of immunity, women who are not pregnant should be vaccinated. Pregnant women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health care facility.

Health care personnel born before 1957:

- For unvaccinated health care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, health care facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval for measles and mumps or 1 dose of MMR vaccine for rubella.

8. Pneumococcal conjugate (PCV13) vaccination

- Adults aged 19 years or older with immunocompromising conditions (including chronic renal failure and nephrotic syndrome), functional or anatomic asplenia, cerebrospinal fluid leaks, or cochlear implants who have not previously received PCV13 or PPSV23 should receive a single dose of PCV13 followed by a dose of PPSV23 at least 8 weeks later.
- Adults aged 19 years or older with the aforementioned conditions who have previously received 1 or more doses of PPSV23 should receive a dose of PCV13 one or more years after the last PPSV23 dose was received. For adults who require additional doses of PPSV23, the first such dose should be given no sooner than 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.
- When indicated, PCV13 should be administered to patients who are uncertain of their vaccination status history and have no record of previous vaccination.
- Although PCV13 is licensed by the U.S. Food and Drug Administration for use among and can be administered to persons aged 50 years or older, ACIP recommends PCV13 for adults aged 19 years or older with the specific medical conditions noted above.

9. Pneumococcal polysaccharide (PPSV23) vaccination

- When PCV13 is also indicated, PCV13 should be given first (see footnote 8).
- Vaccinate all persons with the following indications:
  - all adults aged 65 years or older;
  - adults younger than 65 years with chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma), chronic cardiovascular diseases, diabetes mellitus, chronic renal failure, nephrotic syndrome, chronic liver disease (including cirrhosis), alcoholism, cochlear implants, cerebrospinal fluid leaks, immunocompromising conditions, and functional or anatomic asplenia (e.g., sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]);
  - residents of nursing homes or long-term care facilities; and
  - adults who smoke cigarettes.
- Persons with immunocompromising conditions and other selected conditions are recommended to receive PCV13 and PPSV23 vaccines. See footnote 8 for information on timing of PCV13 and PPSV23 vaccinations.
- Persons with asymptomatic or symptomatic HIV infection should be vaccinated as soon as possible after their diagnosis.
- When cancer chemotherapy or other immunosuppressive therapy is being considered, the interval between vaccination and initiation of immunosuppressive therapy should be at least 2 weeks. Vaccination during chemotherapy or radiation therapy should be avoided.
- Routine use of PPSV23 vaccine is not recommended for American Indians/ Alaska Natives or other persons younger than 65 years unless they have underlying medical conditions that are PPSV23 indications. However, public health authorities may consider recommending PPSV23 for American Indians/Alaska Natives who are living in areas where the risk for invasive pneumococcal disease is increased.
- When indicated, PPSV23 vaccine should be administered to patients who are uncertain of their vaccination status and have no record of vaccination.

10. Revaccination with PPSV23

- One-time revaccination 5 years after the first dose of PPSV23 is recommended for persons aged 19 through 64 years with chronic renal failure or nephrotic syndrome, functional or anatomic asplenia (e.g., sickle cell disease or splenectomy), or immunocompromising conditions.
- Persons who received 1 or 2 doses of PPSV23 before age 65 years for any indication should receive another dose of the vaccine at age 65 years or later if at least 5 years have passed since their previous dose.
- No further doses of PPSV23 are needed for persons vaccinated with PPSV23 at or after age 65 years.

11. Meningococcal vaccination

- Administer 2 doses of quadrivalent meningococcal conjugate vaccine (MenACWY [Menactra, Menveo]) at least 2 months apart to adults of all ages with functional asplenia or persistent complement component deficiencies. HIV infection is not an indication for routine vaccination with MenACWY. If an HIV-infected person of any age is vaccinated, 2 doses of MenACWY should be administered at least 2 months apart.
- Administer a single dose of meningococcal vaccine to microbiologists routinely exposed to isolates of Neisseria meningitidis, military recruits, persons at risk during an outbreak attributable to a vaccine serogroup, and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic.
- First-year college students up through age 21 years who are living in residence halls should be vaccinated if they have not received a dose on or after their 16th birthday.
- MenACWY is preferred for adults with any of the preceding indications who are aged 55 years or younger as well as for adults aged 56 years or older who a) were vaccinated previously with MenACWY and are recommended for revaccination, or b) for whom multiple doses are anticipated. Meningococcal polysaccharide vaccine (MPSV4 [Menomune]) is preferred for adults aged 56 years or older who have not received MenACWY previously and who require a single dose only (e.g., travelers).
- Revaccination with MenACWY every 5 years is recommended for adults previously vaccinated with MenACWY or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia, persistent complement component deficiencies, or microbiologists).

12. Hepatitis A vaccination

- Vaccinate any person seeking protection from hepatitis A virus (HAV) infection and persons with any of the following indications:
  - men who have sex with men and persons who use injection or noninjection illicit drugs;
  - persons working with HAV-infected primates or with HAV in a research laboratory setting;
  - persons with chronic liver disease and persons who receive clotting factor concentrates;
  - persons traveling to or working in countries that have high or interme diate endemicity of hepatitis A; and
  - unvaccinated persons who anticipate close personal contact (e.g.,household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. (See footnote 1 for more information on travel recommendations.) The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.
- Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6 to 12 months (Havrix), or 0 and 6 to 18 months (Vaqta). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule may be used, administered on days 0, 7, and 21 to 30 followed by a booster dose at month 12.and 21–30, followed by a booster dose at month 12.

13. Hepatitis B vaccination

- Vaccinate persons with any of the following indications and any person seeking protection from hepatitis B virus (HBV) infection:
  - sexually active persons who are not in a long-term, mutually monoga mous relationship (e.g., persons with more than 1 sex partner during the previous 6 months); persons seeking evaluation or treatment for a sexually transmitted disease (STD); current or recent injection drug users; and men who have sex with men;
  - health care personnel and public safety workers who are potentially exposed to blood or other infectious body fluids;
  - persons with diabetes who are younger than age 60 years as soon as feasible after diagnosis; persons with diabetes who are age 60 years or older at the discretion of the treating clinician based on the likelihood of acquiring HBV infection, including the risk posed by an increased need for assisted blood glucose monitoring in long-term care facilities, the likelihood of experiencing chronic sequelae if infected with HBV, and the likelihood of immune response to vaccination;
  - persons with end-stage renal disease, including patients receiving hemodialysis, persons with HIV infection, and persons with chronic liver disease;
  - household contacts and sex partners of hepatitis B surface antigen–positive persons, clients and staff members of institutions for persons with developmental disabilities, and international travelers to countries with high or intermediate prevalence of chronic HBV infection; and
  - all adults in the following settings: STD treatment facilities, HIV testing and treatment facilities, facilities providing drug abuse treatment and prevention services, health care settings targeting services to injection drug users or men who have sex with men, correctional facilities, end-stage renal disease programs and facilities for chronic hemodialysis patients, and institutions and nonresidential day care facilities for persons with developmental disabilities.
- Administer missing doses to complete a 3-dose series of hepatitis B vaccine to those persons not vaccinated or not completely vaccinated. The second dose should be administered 1 month after the first dose; the third dose should be given at least 2 months after the second dose (and at least 4 months after the first dose). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, give 3 doses at 0, 1, and 6 months; alternatively, a 4-dose Twinrix schedule, administered on days 0, 7, and 21 to 30 followed by a booster dose at month 12 may be used.
- Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 mcg/mL (Recombivax HB) administered on a 3-dose schedule at 0, 1, and 6 months or 2 doses of 20 mcg/mL (Engerix-B) administered simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

14. Haemophilus influenzae type b (Hib) vaccination

- One dose of Hib vaccine should be administered to persons who have functional or anatomic asplenia or sickle cell disease or are undergoing elective splenectomy if they have not previously received Hib vaccine. Hib vaccination 14 or more days before splenectomy is suggested.
- Recipients of a hematopoietic stem cell transplant should be vaccinated with a 3-dose regimen 6 to 12 months after a successful transplant, regardless of vaccination history; at least 4 weeks should separate doses.
- Hib vaccine is not recommended for adults with HIV infection since their risk for Hib infection is low.

15. Immunocompromising conditions

- Inactivated vaccines generally are acceptable (e.g., pneumococcal, meningococcal, and inactivated influenza vaccine) and live vaccines generally are avoided in persons with immune deficiencies or immunocompromising conditions. Information on specific conditions is available at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.

Face to face with Prof. Dr. A.Gaffar Billoo

Sitara-e-Imtiaz
DCH, DTM&H, MRCP, FRCP
Head & Chairman Department of Paediatrics
The Aga Khan University Karachi
Interviewed by: Dr. Muhammad Salman

Dr. Abdul Gaffar Billoo is truly a shining star in the field of Medicine specially pediatrics segment in Pakistan. He did his MBBS from Dow Medical College (Now Dow University of Health Sciences) in 1959. Then he went to United Kingdom for further studies where he completed his MRCP. After coming back to Pakistan, Dr. Ghaffar Billoo served Dow Medical College as Professor and Head of the Department of Paediatrics. He also served as the Dean, Faculty of Medicine, University of Karachi from 1994 to 1997. He is also the member of many esteemed national and international organizations. Currently he is working as Professor Emeritus and Chairman, Department of Paediatrics, Aga Khan University Hospital. He is also the founder member of a non governmental organization that works for the welfare of rural and urban people of Pakistan. For his outstanding performance in the field of medical education, Prof. A. Gaffar Billoo has been recently nominated, by Governor of Sindh and Chancellor of Universities, to be the member of syndicate (in category of Person of Eminence) in the newly created Dow University of Health Sciences. Furthermore, President of Pakistan has awarded him the most prestigious civilian award, Sitara-i-Imtiaz(S.I) in the field of child health and community development on 23rd March, 2007.

Q. No.1-Please share details about your education and professional experience.

I acquired my basic school education up to class 7 in pre partition India and then migrated to Pakistan in 1948. I completed my matriculation & intermediate in Sukkur & Karachi. I did my intermediate from prestigious D.J.College Karachi & M.B.BS from Dow Medical College Karachi in 1959. After M.B.B.S, I spent 3 years in UK to obtain post graduate education in pediatrics and acquired a membership of Royal College of Physicians that is M.R.C.P from Glasgow and Edinburgh.

Q. No.2-Why did you choose this career?

While in the school I was impressed by teaching, which motivated me to be a teacher, but in intermediate college the pressure from friends and peers persuaded me to join a medical college. I satisfied myself by the fact that becoming a doctor you can serve the suffering humanity. When I did my first house job in pediatrics, I saw so much suffering among the children and mothers that I decided to devote my whole life to serve children of Pakistan and children of the world.

Q.No.3-How did you feel when you received your doctoral degree?

It was a great moment of excitement for me, my parents, my family members, my friends and the parents of my friends but I also realized that this has to be the first step in my career. I have to go a long way in acquiring further education in the field of child health to really reduce the suffering children of my beloved country.

Q.No.4-What are the key challenges of this field of medicine?

In the field of medicine many challenges still exists after 66 years of independence. People in rural areas have very poor access to basic health needs. Although there are more than 120 Medical Colleges in Pakistan which are producing thousands of doctors every year. Majority of female doctors don't want to serve in rural areas. Many male doctors are seeking the opportunities to serve in civilized countries like USA, UK and Middle East for better compensations.

Q. No.5- What are the most common pediatric diseases in Pakistan?

Among the pediatric diseases there are some major killers like, Respiratory problems, severe infections, low birth weight in new born babies, Pneumonia & Diarrhea in infants and children below the age of 5 years. This is compounded by malnutrition which affects more than 50% children of Pakistan.

Q.No.6-What is the greatest achievement as a doctor?

I get the greatest satisfaction of achieving several things by being a doctor. In addition, to having a very busy practice I have been a Professor in the field of pediatrics. I had been the Dean of faculty of medicine in Karachi University. I have received several awards including **"Sitara-i-Imtiaz"**. I have established one of the biggest nonprofit organizations called **HANDS**, which is serving millions of suffering people all over Pakistan Alhamdulillah. These are just few of my achievements in education to being on the advisory board of many welfare organizations.

Q.No.7-How do you keep balance in organizing time for your professional and personal commitments?

I have to give big personal and family life sacrifices because of my professional life which includes my very busy practice, teaching and contribution in making different institutions.

Q.No.8-What is the meaning of Professor Emeritus?

I am the 4th doctor of AKU to receive this award and this title. This title is an honorary one and it means that I will remain Professor for the rest of my life.

Q. No.9-What were your feelings when you were honored with the prestigious award "Sitara-i-Imtiaz"?

I was honored with Sitara-i-Imtiaz, at the time of receiving this award I had already trained more than 200 pediatricians who are working not only in Pakistan but also in different parts in the world as pediatricians or senior faculty members. I call these my Sitaras, althoughSitara-i-Imtiaz is a great honor as recognition by Government for my contributions to the field of child health and education.

Q.No.10-How would you like to advise or guide new comers in this profession?

Life is becoming more materialistic; doctors are also part of a society so they are also attracted by the materialistic benefits of life, which includes money, fame, power, property and cars which really are the weakness of mankind. If new doctors want to achieve success in their life then they must put to use the knowledge acquired for the benefit of human suffering. All the other things which they need will follow just like if you follow the light and the shadow will follow you. This shadow will bring fame, power, money and all the things.

Quiz

Infectio

Choose the correct answer:

1. What is the correct adult vaccination schedule?

1. 0,1,2 months
2. 0,1,4 months
3. 0,1,6 months
4. 0,2,3 months

2. Aeromonas hydrophilia spreads via

1. Droplet spread
2. IV route
3. Sexual transmission
4. Fecal-oral route

3. Which of the following statement is correct regarding Tetanus, diphtheria and pertussis vaccination?

1. Administer 1 dose of Tdap vaccine during each pregnancy
2. For unvaccinated adult, administer 2 dose at 2 week
3. For unvaccinated adult, administer 3rd dose 4 month after pregnancy
4. For adult 11 years or older with unknown history should be given 2 dose including a Tdap series

4. Which one of the following is not recommended for Pneumonococal Vaccination?

1. Adult 40 or older with no comorbidial risk
2. Adult who smoke cigarette
3. Resident of nursing homes
4. Adult younger than 65 with chronic lung diseases

Winners of quiz lucky draw

Reported by Dr. Muhammad Salman

The editorial board of Infectio magazine is pleased to announce the names of winners of quiz from the 2nd issue. The lucky draw was held in a clinical meeting at Dr. Ziauddin University Karachi on August 18th, 2014. Following are the names of lucky draw winners drawn at random by Prof. Ejaz Ahmed Vohra and his team.

We congratulate the winners and once again thank all contestants for their participation in quiz

1. ***Dr. Cap. Bashir Ahmed*** Larkana
2. ***Dr. Muhammed Akram*** Faisalabad
3. ***Dr. Shoaib Nabi*** Lahore
4. ***Dr. Sana M. Hussain*** Civil Hospital, Karachi
5. ***Dr. Muhammed Asif Khan*** Civil Hospital, Quetta