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Current News

Researchers identify role of blood-filtering organs in fighting against viral infections

New data about how and where the innate immune system fights off viral infections that enter through the skin could lead to better treatments for viruses like Zika, dengue and measles, according to researchers at Penn State College of Medicine, United States. They recently found that some viruses get past the local lymph node, enter the blood and are fought off at a third checkpoint: organs that filter the blood.

"If you have a deficit in immunity in organs that filter the blood, it's actually much worse than if you have a deficit in the local lymph node," Researchers said. Results were published in PLOS Pathogens.

Future studies could focus on boosting the response of liver and spleen macrophages in people with ongoing viral infections, Researcher said. The findings could also be used to identify populations that are at risk for particular infections. "Future research should look at if susceptible people had profiles of biomarkers in blood that correlate with a lack of function of these cells," For instance, if you've got hepatitis B infection, then you're going to have impaired macrophage function in the liver, which is going to impair the ability of those cells to go on and respond to other viruses

Source:
http://news.psu.edu/story/477328/2017/08/15/research blood-filtering-organs-fight-infections-enter-through-skin

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Introduction

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Message of the Chairman Infectio®

The previous year was monumental for the infectious diseases in Pakistan. A new wave of diseases gripped the country, and while many people were treated, a lot of work still remains to be done. Infectio® was conceived out of need to help the healthcare professionals to be on pace with the developments in the area of infectious diseases. The mission, which is taken by the competent team behind the magazine, is on the right track towards supporting the maximum number of medical professionals.

For 2018, we are looking forward to collaborate with WHO and develop a magazine on recent updates in IMCI guidelines. With their support we will distribute the information that will help the doctors in management of childhood illness with their best. Being a responsible healthcare professional, it is our duty to prescribe the right products for the ailments. Therefore, we will publish articles on the antibiotics usage and their consequences upon misuse. Further, we are working on special issue on Gastrointestinal diseases, which is in line with the objective to minimize the increase in GI maladies.

After initial success in Punjab to eradicate dengue, it has again appeared in large number in KPK. The issue was managed by the control of larvae, but still it is enduring in Sindh and Punjab. The current issue includes report by NIH Pakistan on seasonal infections, as well as emphasizes the need for adult immunization. Research on infectious diseases remains neglected by major pharmaceuticals, which can become a major problem in the future. WHO should lay emphasis on list of orphan infectious diseases, and preventive guidelines must be adopted by local health authorities. Important articles on Asthma and Maternal & Neonatal health aspects are also highlighted in this issue.

We are grateful to unconditional support from SAMI Pharmaceuticals for their continuous efforts to collaborate with the medical professionals, for the benefit of medical community. I would also like to appreciate the efforts of the editorial board and the contributors of this edition of Infectio® Magazine. In the end, I would like to congratulate the winners of previous issue and acknowledge the determination of all quiz participants.

Thank you

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Frequency of cutaneous bacterial infections in patients with Type II Diabetes Mellitus

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ABSTRACT

Introduction: Diabetes Mellitus is a syndrome with disordered metabolism and inappropriate hyperglycemia due to either deficiency of insulin secretion or combination of insulin resistance and inadequate insulin. Infections constitute the main bulk of cutaneous manifestations of diabetes mellitus with incidence ranging between 20–50%. Bacteria and fungi can cause infective complications involving skin and nails of the diabetic patients. The major share of infections in Diabetes Mellitus is contributed by bacteria. The most common causative organisms are Staphylococcus aureous and beta-hemolytic Streptococci.

Material and methods: Current study was carried out in the Department of Dermatology and Medicine, Dr. Ziauddin University Hospital, KDLB Campus, Karachi from 1st January 2017 till 31st March 2017 over a period of three months. Adult patients already diagnosed to be suffering from type 2 Diabetes Mellitus presenting with cutaneous manifestations were included in the study. Patients fulfilling the selection criteria were enrolled after an informed consent. Relevant laboratory investigations were advised where required. Current study targeted bacterial infections only and Chi-square test was used to determine *P value*. Data obtained was compiled, tabulated and analyzed by SPSS.

Result: Total of 302 cases of Type 2 Diabetes Mellitus having some cutaneous manifestations were enrolled. There were 124 (41%) males and 178 (59%) females. Mean age of presentation was 50 ± 11 years, the age range being 30-80 years. The mean duration of diabetes was 8.5 ± 7 years (range being 1-30 years). Unsatisfactory glycemic control was present in 205 (68%) patients. Among the enrolled subjects bacterial infections were the most frequently seen skin disease accounting for 79 patients (26%). Among the patients with these bacterial infections uncontrolled Diabetes was a feature in 61 (77%). The breakup of bacterial infections (59) in the descending order of frequency stood as follows: cellulitis 22 (28%), carbuncle 17 (21%), furuncle 14 (18%), ecthyma 13 (16%), folliculitis 09 (12%), and impetigo 04 (5%).

Conclusion: Cutaneous infections are a common feature in patients with Type II Diabetes Mellitus, bacterial infections being the most common.

Key words: Diabetes Mellitus, HbA1C, bacterial infections, hyperglycemia, insulin, cutaneous manifestations

INTRODUCTION

Diabetes Mellitus (DM) is a syndrome with disordered metabolism and inappropriate hyperglycemia due to either deficiency of insulin secretion or combination of insulin resistance and inadequate insulin.[1] It is a major endocrine cause of morbidity and mortality all over the world and the incidence is increasing globally. The worldwide prevalence of diabetes for all age groups was estimated to be 2.8% in 2000 and 4.4% by 2030.[2] In Pakistan, prevalence approaches 10% among adults and even greater number with glucose intolerance.[3]

Diabetes Mellitus affects all systems of the body. Skin is also frequently involved. According to a study, 30% of diabetics have some type of skin manifestation during the course of their disease [4] whereas in some studies figures as high as 96% have been reported [5], indicating how common is skin involvement in patients with diabetes mellitus. Skin findings may be used as an indicator of patient's present as well as past metabolic status or it can be the presenting symptom in some patients not diagnosed to have diabetes as yet.

Infections constitute the main bulk of cutaneous manifestations of diabetes mellitus with incidence ranging between 20–50%.[6] Bacteria and fungi can cause infective complications involving skin and nails of the diabetic patients. The major share of infections in diabetes mellitus is contributed by bacteria. The most common causative organisms here are Staphylococcus aureous and beta-hemolytic Streptococci[6]. Different studies have been conducted in our country from time to time to determine the frequency of cutaneous changes in Diabetes Mellitus. However, with regard to bacterial infections, there is a conflicting data regarding its prevalence in diabetic patients. [7,8] Therefore, the current study was aimed to determine the frequency of cutaneous bacterial Infections in patients with type II Diabetes Mellitus, attending outpatient clinic in a tertiary care hospital.

Material and Methods: Current study was carried out in the Department of Dermatology and Medicine, Dr. Ziauddin University Hospital, KDLB Campus, Karachi from 1st January 2017 till 31st March 2017 over a period of three months. Adult patients already diagnosed to be suffering from type 2 Diabetes Mellitus presenting with cutaneous manifestations were included in the study. Patients having skin changes secondary to pregnancy, other systemic illnesses and iatrogenic factors were excluded. An informed consent was obtained from all the enrolled subjects. The demographic details of all the enrolled subjects were also documented.

A detailed history was obtained from the enrolled patients including duration of diabetes and mode of treatment for diabetes (i.e. diet only, oral hypoglycemic, insulin therapy or combination therapy). After a detailed general, systemic and cutaneous examination, the clinical diagnosis of dermatological findings was established. Their fasting blood sugar, random blood sugar and HbA1c were advised to assess the glycemic control. Unsatisfactory glycemic control was defined as HbA1c > 7 as per American Diabetic Association (ADA) criteria.

Other relevant laboratory investigations were advised where required including blood complete picture, renal profile, liver function tests, lipid profile, urine examination and pus for culture and sensitivity. Any special tests like Wood's lamp examination, fungal scrapings, skin biopsy, Tzank smear, nail biopsy and nail clippings were performed in doubtful cases. All the findings were recorded on a specially designed Performa.

Data obtained was compiled, tabulated and analyzed by SPSS (Statistical package for social sciences) version 17. Mean and standard deviation were used to represent quantitative variables like age duration of diabetes, fasting blood sugar, random blood sugar and HbA1c. Descriptive variables like presence of various skin changes were presented as frequencies and percentages. The current study targeted bacterial infections only and Chi-square test was used to determine P value, a value less than or equal to 0.05 was considered significant

Results: Total of 302 cases of Type 2 Diabetes Mellitus having some cutaneous manifestations were included in the study. All the patients had at least one skin finding. There were 124 (41%) males and 178 (59%) females. Mean age of presentation was 50 ± 11 years, the age range being 30-80 years. The mean duration of diabetes was 8.5 ± 7 years (range being 1-30 years). The glycemic profile showed mean fasting blood sugar

(FBS) 156 ± 50 g/dl (range= 69-360 g/dl), random blood sugar (RBS) 213±79 (range = 98-550 g/dl). Mean HbA1c was 8.6 ± 1.5 % (range = 6 - 13%). Unsatisfactory glycemic control was present in 205 (68%) patients **(Table 1)**.

Among the enrolled subjects with Type 2 Diabetes Mellitus, bacterial infections were the most frequently seen skin disease accounting for 79 patients (26%). There were 31 males (39%) and 48 females (61%) ($P < 0.05$). Among the patients with these bacterial infections uncontrolled Type 2 Diabetes Mellitus was a feature in 61 (77%) while good glycemic control was seen in 18 (23%) ($P < 0.05$).

In the current study, breakup of bacterial infections (79) in the descending order of frequency stood as follows: cellulitis 22 (28%), carbuncle 17 (21%), furuncle 14 (18%), ecthyma 13 (16%), folliculitis 9 (12%), and impetigo 4 (5%).

Table

Demographic variables	
(N=302)	
Mean	50 ± 11
Range	(30-80)
Gender	
Male	124 (41%)
Female	178 (59%)
Duration of diabetes	8.5±7 (1-30)
Mean ± SD (Range)	
< 5 years	90 (30%)
5-9 years	100 (33%)
>10 years	112 (37%)
Mode of treatment for diabetes	
Insulin therapy	69 (23%)
Oral hypoglycemics	166 (55%)

Combination therapy	54(18%)
Diet control only	13 (4%)
Fasting Blood Sugar (mg/dl)	
Mean ± SD (range)	156 ± 50 (69-360)
<130	109 (36%)
>130	193 (64%)
Random blood sugars (mg/dl)	
Mean±SD (range)	213 ± 79 (98-550)
<180	130 (43%)
>180	172 (57%)
HbA1C (%)	
Mean±SD (range)	8.6 ±1.5 (6-13)
Glycemic control	
Satisfactory	97 (33%)
Unsatisfactory	205 (68%)

Discussion

Skin, being the largest organ of the body, is almost invariably affected by Diabetes Mellitus. The skin manifestations of Diabetes Mellitus are numerous and different studies have reported a variable frequency ranging from 30-100%.[1,3] Skin involvement may also be the initial presenting sign in such patients. Therefore, skin changes may even be seen sometime before the development of diabetes. Most of the diabetic patients develop skin manifestations eventually. Patients with longstanding diabetes have more severe skin pathologies[9]. These skin changes are in turn the result of different metabolic abnormalities of diabetes like persistent hyperglycemia leading to glycosylation of various tissue components in the skin. Other factors accounting for dermatologic complications are neuropathy, micro- or macroangiopathy, immunosuppression, and dyslipidemia. There are some cutaneous features specific to insulin resistance and hyperinsulinemia.

Patients with type II Diabetes Mellitus develop infections frequently while those with type 1 Diabetes Mellitus have a frequent association with autoimmune type dermatologic manifestations.[8] Mean age of presentation in our study i.e. 50 ± 11 years is similar to the reports from Ahmed et al.1 and Basit et al. [10].

Dermatological manifestations were seen more commonly in women in our study as a higher number of females were enrolled, indicating greater disease burden among females. On the contrary, some regional studies have shown a preponderance of males.[1]

The mean duration of diabetes in our patients was 8.5 years; majority of patients (37%) had diabetes for 10 years or more. Poorly controlled diabetes with an HbA1c mean value of 8.6% featured in 64%, the findings seem to be in agreement with Bhat et al.[11]

Ahmed et al.1 have reported a higher frequency (93%) of uncontrolled diabetes in a similar series of patients. However, the results can vary from one study to another depending upon the study design and setting. This in turn may be correlated with medical facilities, hygiene, literacy level and lack of awareness about the disease.[1,2]

Infections were the most common group of dermatoses (57%) seen in our study comprising bacterial infections, fungal infections and viral infections. The overall frequency of skin infections in patients with Diabetes Mellitus varies between in 20-50%.[8] Cutaneous infections are especially seen more frequently in patients with type II Diabetes Mellitus. Patients with poor glycemic control were found to be more prone to infections especially bacterial. In our study, the frequency of bacterial infections was 26%. Basit et al.[10] have reported a higher frequency of skin infections in a similar set of patients. This in turn may be due to increased exposure to the infectious organisms and humid climatic conditions.[10] Vahora et al.[12] have reported a lesser frequency

of bacterial infections in such patients. The frequency of bacterial infections in type II Diabetes Mellitus was reported to be higher by Ahmed et al.[1] Few studies have also reported a varied frequency of bacterial infections in association with type II Diabetes Mellitus.[13-15] On the contrary, Galdeano F et al.[16] have reported a lower frequency of bacterial infections in a similar series of patients. Again it can be stated that the frequency of such findings can vary from one study to another depending upon the study design and setting. Moreover, sample size can also influence pattern of diseases. Bacterial infections most commonly seen in diabetics are Staphylococcus aureus and Streptococcus pyogenes leading to the development of impetigo, folliculitis, furunculosis, carbuncle, ecthyma, cellulitis, and erysipelas. Hot and humid weather of the metropolitan city can also account for a relatively higher frequency of cutaneous bacterial infections in our study.

In the current study, the breakup of bacterial infections (79) in the descending order was cellulitis, carbuncle, furuncle, ecthyma, folliculitis, and impetigo. However, the relative frequency of these bacterial infections in diabetes mellitis can vary in different studies.[13-16] Cellulitis, carbuncle and furuncles were more frequent in a study from Sudan.[17] In a study from Sargodha, findings reported seem to be in agreement with our study.[18] The findings reported in different regional studies also correspond to the observations made in our study.[19-21] Khortoum et al.[17] Also compared studies by Basheer AHH, with varying results in different studies with frequency of cutaneous bacterial infections to be as low as 4% and as high as 24%.[22]

Radhu et al.[21] claims fungal infections to be more common in such patients as compared to the bacterial infections although he has claimed infections to be more common. The relative high prevalence of skin infections in these subjects could be due to poor hygienic conditions as well as uncontrolled diabetes mellitus which increase the risk of development of micro-angiopathy and related sequelae.

Conclusion

It can be concluded that cutaneous infections are a common feature in patients with Type II Diabetes Mellitus, the bacterial infections being the most common. Poor glycemic control, old age and poor hygiene contribute to the higher frequency of bacterial infections in such patients. Prevalence of hot humid environment further increases the risk of cutaneous bacterial infections in these patients.

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Role of infection in the development and exacerbation of asthma

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Introduction

Respiratory infections are associated with all ages, causing wheezing symptoms. It can also impact the development and severity of asthma. Respiratory tract infections caused by viruses, Chlamydophila or Mycoplasma have been hypothesized to have significant roles in the pathogenesis of asthma. Of these respiratory pathogens, viruses have been shown to be epidemiologically associated with asthma in several ways.

First, particular viruses associated with infantile wheezing have been theorized to lead to the initiation of the asthmatic phenotype. Second, children who experience severe viral respiratory infections in early life are more likely to have asthma later in childhood. Furthermore, in children and adults with established asthma, viral upper respiratory tract infections (URIs) play a key role in producing acute exacerbations that may require interventions

Several host factors, such as allergic sensitization and virus-induced interferon responses, modify the risk of virus-induced wheezing. For microbial infections, interest has focused on Chlamydophila and Mycoplasma as possible contributors to both acute exacerbations and the severity of chronic asthma. Finally, colonization of the upper airways in infancy with common bacterial pathogens has been demonstrated to increase the risk of subsequent asthma. We review these various associations as they pertain to the development and exacerbation of asthma.

Epidemiology

Incidence, noninfectious risk factors & remission: are childhood & adult-onset asthma the same disease?

Several studies have documented that the incidence of asthma peaks in early childhood with rates as high as five new cases per 1000 population per year, more commonly in boys. Incidence declines in adolescence and then climbs again in early adulthood, with a reversal of gender tendency favoring women after puberty. The triggers of adult-onset disease are less well defined; Occupational exposures and a personal history of smoking contribute in a minority of cases, while allergic or nonatopic rhinitis has been associated with adults in multiple studies. With respect to remission rates, there is up to a 63% chance in patients who develop disease before 10 years of age, but only 5–15% for adult-onset disease. Nonetheless, respiratory infection is the most common acute inflammatory trigger in incident asthma.

Two of the most common viral illnesses leading to lower respiratory tract infection (LRI) and wheezing in infancy are those caused by respiratory syncytial virus (RSV) and human rhinoviruses (HRVs). Using multiple virus detection methods, bronchiolitis is a severe form of RSV infection that occurs in a minority of children. By 1 year of age, 50–65% of children will have been infected with this virus, and by 2 years of age nearly 100% have been infected. Children 4 months of age and born close to the onset of the viral season have a higher likelihood of developing lower respiratory tract symptoms, and this is likely due to an airway, lung parenchyma and/or immunologic maturation. Host factors such as allergic sensitization or decreased lung function in infancy may also influence the development of recurrent wheeze and/or asthma. Premorbid measurements of lung function indicate that children with reduced levels of lung function in infancy appear to be at an increased risk of the development of chronic lower respiratory tract sequel after viral infections and an obstructive pattern of lung function into adulthood. Thus, viral infections act synergistically with allergic sensitization and reduced lung function in infancy, leading to asthma in later life.

Viral respiratory infections & acute exacerbations of asthma

The association between viral infections and asthma exacerbations has been illuminated by the development of sensitive diagnostic tests based on PCR and/or microarray technology, for viruses that are difficult to culture, such as HRV, hMPV and bocaviruses. Prospective studies of subjects with asthma have demonstrated that up to 85–95% of exacerbations of wheezing or asthma in children are caused by viral infection. This rate is as high as 60% for adults with seasonal trends that occur 1–2 weeks later than in children, suggesting household transmission of the same strain. HRVs are most often detected, especially during the Spring and Fall seasons. HRV infections are frequently found in children older than 2 years of age who present to emergency departments with acute wheezing and in children hospitalized for acute asthma. A newly discovered HRV species, HRV-C, is associated with asthma flares in children during the Fall and Winter, and new strains of HRV and coronaviruses have been identified by the Virochip method in adults. Influenza infections are also associated with increased healthcare utilization among children with asthma compared with healthy children. Bocaviruses have been associated with up to 19% of acute wheezing episodes in children. Other viruses that are less frequently associated with exacerbations of asthma include metapneumovirus and coronaviruses. Together, these studies provide evidence of a strong relationship between viral infections, particularly those due to HRV, and acute exacerbations of asthma.

Chronic infections & asthma development

It has been hypothesized that chronic viral and bacterial infections or colonization with pathogenic bacteria could lead to chronic lower airway inflammation, impaired mucociliary clearance, increased mucous production and eventually asthma. Organisms implicated in this progression include adenoviruses, Chlamydophila pneumoniae, Mycoplasma pneumoniae, Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catarrhalis.

It has been demonstrated that 94% of children with steroid-resistant asthma had detectable adenovirus antigens compared with 0% of controls. In adults, both with and without asthma, evidence of adenoviral infection has been observed to be as high as 50% of the individuals tested. There is more literature regarding the association between chronic Mycobacterium or Chlamydophila infection and asthma in children and adults; however, these studies have produced contradictory results, probably due to the limitations of current diagnostics.

The detection of C. pneumoniae infection by PCR and serology (secretory IgA) was similar during symptomatic and asymptomatic episodes (23 vs 28%, respectively). Children who experienced multiple episodes also tended to remain PCR positive for C. pneumoniae, suggestive of chronic infection. It is possible that chronic Chlamydophila infection promotes persistent airway inflammation that increases susceptibility to other stimuli such as viruses, allergens, or both associated with asthma exacerbations.

A comprehensive evaluation of the role of both Chlamydophila and Mycoplasma infections in chronic asthma was reported by Johnston et al. The authors concluded that although many studies investigating the association between asthma and these pathogens have been uncontrolled and have provided conflicting evidence, there are biological mechanisms that could account for such a link, and that there may be a role of antibacterial therapy in the management of asthma. In another study by Biscardi et al., 119 children aged 2–15 years with asthma hospitalized for a severe asthma exacerbation were tested for acute infection due to M. pneumoniae or C. pneumoniae by serologic testing. Nasopharyngeal aspirate PCR was also performed. Acute M. pneumoniae infection by positive serology was found in 20% and C. pneumoniae infection was found in 3.4% of the patients during the current exacerbation. Out of 51 patients experiencing their first asthma flare, acute M. pneumoniae infection was demonstrated in 50% and C. pneumoniae in 8.3% of the patients. Out of the children infected with M. pneumoniae or C. pneumonia and experiencing their first asthma exacerbation, 62% had recurrent asthma but only 27% without these infections had recurrent asthma. Thus, chronic Chlamydophila infection may promote ongoing airway inflammation.

As stated previously, M. pneumoniae has also been associated with both acute and chronic asthma. Again, the results of trials have been contradictory and investigators have not been able to firmly establish a causal relationship between mycoplasmal infections and asthma exacerbations. Although some have reported infection in up to 25% of children with wheezing, others have not been able to confirm these observations.

Unlike the inconsistent relationship between Mycoplasma species and acute asthma exacerbations, associations of this pathogen with chronic asthma have been more firmly established. Using PCR techniques on bronchial biopsy specimens, Mycoplasma species have been detected in 25 out of 55 adult asthmatic subjects and in only one out of 11 controls. Case reports of chronic asthma commencing with M. pneumoniae infection suggest that this pathogen is a potentially causative agent in some patients. Potential mechanisms of Mycoplasma-induced airway inflammation have been explored, including augmented Th2 responses and inflammatory neuropeptides. Children with acute M. pneumonia have an elevated IL-4/IFN-γ ratio compared with children with pneumococcal pneumonia or controls, and mice experimentally infected with M. pneumoniae develop airway hyperresponsiveness (AHR), which is associated with the diminished production of mRNA for IFN-γ. Last, asthmatic patients with M. pneumoniae infection detected by PCR have increased levels of neurokinin-1, which decreases in response to treatment with a macrolide antibiotic.

The microbiome of the lower airway has not been thoroughly evaluated to date, but there is a growing sense that it is not a sterile compartment, and that its constituents may differ between healthy persons and patients with asthma. A recent study by Bisgaard and coworkers found that neonates colonized in the hypopharyngeal region with S. pneumoniae, H. influenzae or M. catarrhalis, or with a combination of these organisms, are at increased risk for recurrent, early-life wheezing and asthma at 5 years of age.

Although these preliminary studies are intriguing, additional data are needed to establish causality to asthma pathogenesis and to define the mechanisms contributing to these associations in both adult and pediatric patients. Another possible mechanism for these associations is that a person with immune function that is biased towards atopy may have both altered host defenses that increase susceptibility to bacterial and viral infections and an increased risk of developing asthma. Collectively, these studies regarding chronic bacterial infection/colonization have formed the basis for randomized, placebo-controlled, double-blind clinical trials of prolonged courses of macrolide antibiotics on acute and chronic asthma control. The effect of these drugs has unfortunately been variable depending on the population.

Viral infections of the lower airway

Respiratory syncytial virus and influenza infections are well-recognized causes of bronchitis, bronchiolitis and pneumonia. Historically, HRV was considered to be solely an upper airway pathogen because of its association with common cold symptoms and the observation that HRV replicates best at 33–35°C, thought consistent only with the temperature of the upper airway. In fact, lower airway temperatures have been recorded using a bronchoscope equipped with a small thermistor. During quiet breathing at room temperature, airway temperatures are favorable to HRV replication down to fourth-generation bronchi, and surpass 35°C only in the periphery of the lung. Finally, HRV has been observed in lower airway cells and secretions by several techniques after experimental inoculation. In support of the experimental infection model data, HRV is frequently found in infants and children with lower respiratory signs and symptoms, including children hospitalized for pneumonia. In infants with recurrent respiratory symptoms, HRV was detected in lower airways by bronchial biopsy in 45%, and the majority of these HRV-positive infants also showed increased airway resistance. Viral clearance may also be affected in asthma, in that two studies with adults under conditions of stable disease have demonstrated evidence of viral pathogens in sputum samples or transbronchial lung biopsies.

Together, these findings imply that respiratory viruses, including HRV, are likely to promote wheezing illnesses and exacerbations of asthma largely by infecting lower airways and causing or augmenting lower airway inflammation, and that these pathogens may be incompletely cleared in select patients.

Interactions between viral infections & allergy

The effect of allergic sensitization on the asthmatic airway response to viral infection has been a topic of much research. The relationship between these two factors appear to be bidirectional, as the atopic state can alter the lower airway response to viral infections, viral infections can affect the development of allergen sensitization, and synergistic interactions can emerge when individuals are exposed concurrently to both allergens and viruses. As previously suggested, atopic individuals may have both altered host defenses that increase susceptibility to bacterial and viral infections, and an increased risk of developing asthma.

There is data to support that allergic sensitization is a risk factor for wheezing with common cold infections in later childhood. In an emergency department setting, risk factors associated with acute wheezing episodes were reported. These included the detection of a respiratory virus, most commonly HRV, positive allergen-specific IgE, and the presence of eosinophilia. Notably, viral infections and allergic inflammation synergistically augmented the risk of wheezing. Moreover, experimental inoculation with HRV is more likely to increase airway responsiveness in allergic individuals compared with nonallergic individuals. Finally, the risk of hospitalization among virus-infected individuals is amplified in patients who are both sensitized and exposed to respiratory allergens. These results imply that individuals with respiratory allergies or eosinophilic airway inflammation are at increased risk for viral-induced wheezing. However, this theory has not been confirmed with experimentally induced colds, as allergen administration before viral inoculation did not increase cold symptoms.

Viral infections are proposed to interact with allergic inflammation, leading to airway dysfunction through several mechanisms. Viral infections could potentially damage the barrier function of the airway epithelium, leading to an enhanced absorption of aeroallergens across the airway wall and subsequent inflammation. Moreover, the production of various cytokines and adhesion molecules (ICAM-1) may further up regulate cellular recruitment, cell activation and the ongoing inflammatory response. Several studies have also demonstrated that HRV infection increases airway hyper responsiveness in patients with atopy and asthma. Finally, a recent study has demonstrated that the use of prednisolone was associated with less recurrent wheezing in young

children with HRV infection but not those with RSV or non-HRV/RSV infections. Thus, HRV infection may be a marker for wheezing children that will respond favorably to corticosteroid treatment.

Expert commentary

Respiratory infections, and particularly those caused by viruses, are significant causes of wheezing illnesses in all ages, and progress is being made toward establishing the mechanisms by which these agents can cause acute wheezing and impact the pathophysiology of asthma. Whether there are true asthmagenic strains of these viruses will require additional epidemiological study over several cold seasons, with sampling from diverse geographic regions. Host factors likely contribute to the risk of asthma inception and exacerbation, and these contributions may also vary with respect to early- versus adult-onset disease. These include epithelial barrier defense, IL-13, interferons and/or danger receptors such as P2X7. Once these mechanisms are understood, it may be possible to identify patients who are at the greatest risk for wheezing with viral infections, or those whose virus-induced wheezing heralds the onset of asthma. This would be a key step as preventive therapy could then be focused to the groups with the greatest need.

Key issues

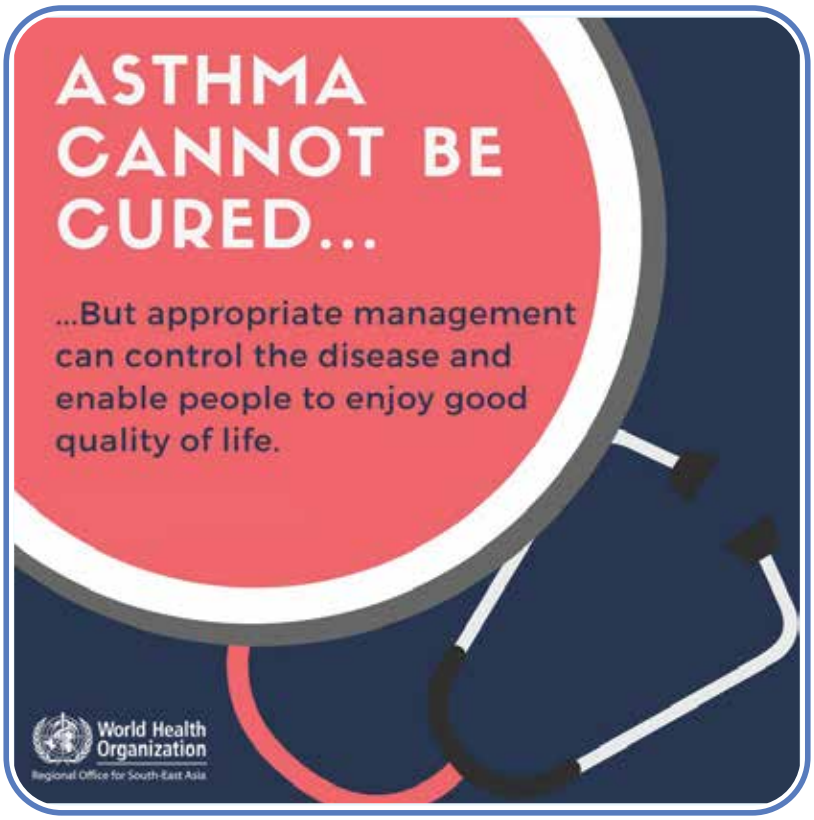
- Respiratory tract infections caused by viruses, Chlamydophila or Mycoplasma have been hypothesized to have significant roles in the pathogenesis of asthma.

- Particular viruses associated with infantile wheezing have been theorized to lead to the inception of the asthmatic phenotype and those children who experience severe viral respiratory infections in early life are more likely to have asthma later in childhood.

- In children and adults with established asthma, viral upper respiratory tract infections play a key role in producing acute exacerbations that may lead to healthcare utilization.

- Both Chlamydophila and Mycoplasma infection may contribute to both acute exacerbations and the severity of chronic asthma.

- Several host factors such as allergic sensitization, epithelial barrier defense and virus-induced interferon responses modify the risk of asthma inception and virus-induced wheezing, and these contributions may vary with respect to early- versus adult-onset disease.



Maternal & Newborn Survival

Prepared by: Prof. Abdul Gaffar Billoo (Sitar-e-Imtiaz)
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Infectio®

Evidence-based plans to improve survival rates

In all cultures across the world, the bond with mother and child is cherished and celebrated with full passion. While this may be possible to do so in the developed countries, the situation is quite the opposite in the developing countries. A UN report on maternal development states that a child born in a developing country is over 13 times more likely to die within the first five years of life than a child born in industrialized country. This statement shows the critical state of affairs among emerging economies and an opportunity to improve the care provision.

The Zero Draft by National Health Policy in 2009 further stated that everyday 900 infants die, out of which 625 are neonates. 32 newborn babies become orphans due to maternal mortality. A report on Pakistan Demographic and Health Survey of 2006-2007 gave a detailed overview of the public health. With over 185 million of total population, Pakistan is the 6th most populous country in the world. The stats show that male-female proportion is 52:48 and out the total number, urban and rural proportion is 33.4:66.6. The population density per square kilometer is 187/person.

Despite of the promising number of people living, the demographic indicators state that Pakistan stands among the nations where there is high mortality and growth rates. Following stats show the picture:

Total Fertility Rate	3.7
Crude Birth Rate	28
Population Growth Rate	1.92
Infant Mortality Rate	74
Under 5 Mortality Rate	86
Mternal Mortality Ratio	270
Contraceptive Prevalence Rate	31

PDHS 2007

Millennium Development Goals (MDG)

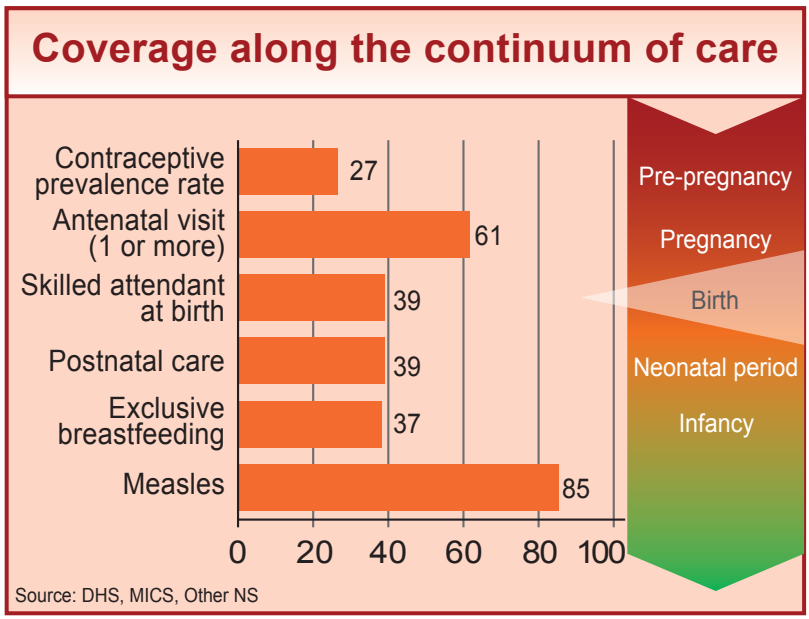
In 2000, The UN Summit gathered with 180 countries as participants who shared common goals. They passed a standard framework for measuring progress in a variety of areas that indicates a country's development. Following are the aims;

1. ***Goal 1: To eradicate extreme poverty and hunger***
2. ***Goal 2: To achieve universal primary education***
3. ***Goal 3: Promote gender equality and empower women***
4. ***Goal 4: Reduce child mortality***
5. ***Goal 5: Improve maternal health***
6. ***Goal 6: Combat HIV/AIDS, Tuberculosis, Malaria and other diseases***
7. ***Goal 7: Promote a global partnership for development***

From the above goals, there is a noticeable focus towards the child mortality and maternal health. This remains one of the top issues across developed as well as developing countries. If we look specifically into Pakistan's scenario, the indicators for the child mortality include; under 5 mortality rate, infant mortality rate, proportion of fully immunized children (12-23 months), proportion of children<1 year immunized against measles and pneumonia, prevalence of under-weight children (under 5 years) and lady health worker's coverage of target population. The statistics for these indicators show a mixed picture where a serious reflection is needed.

Following the trend, the indicators of maternal health in Pakistan are; maternal mortality ratio, proportion of births attended by skilled birth attendants, contraceptive prevalence rate, total fertility rate, proportion of women 15-49 years who had given birth during last 3 years, and made at least 1 antenatal care visit. If we analyze the data, 1 in 89 women in Pakistan will die of maternal causes during her lifetime. The details of the MDG target the maternal health in general and this shows the importance since it also risks the life of the new born child. The situation affects

the mothers and their children who live in rural areas and are economically underprivileged.



Further, the conditions in which the childbirth takes place is deplorable in most of the areas. Only 50% of births take place with the assistance of a skilled healthcare provider (i.e. doctor, nurse, midwife or lady health visitors). If we look further, this ratio is divided into 60% in urban while 30% in rural areas.

Coming to the newborn mortality rates, the main causes of death reported globally by UNICEF are

- **Direct Causes**
  - *Preterm birth and low birth weight* *28%*
  - *Severe infection/Sepsis* *26%*
  - *Asphyxia* *23%*
  - *Neonatal Tetanus* *7%*
- **Indirect Causes**
  - *Low birth weight*
  - *Maternal complications in labor*
  - *Poverty*

The need for a universal strategy that promoted access to antenatal case, skilled birth attendance and early post-natal case will contribute to sustain reduction in maternal and neonatal mortality. It is the duty of the state to analyze the current policies and practices related to pregnancy, childbirth and postnatal case, including facility-based delivery, discharge from facilities after birth, care for mother giving birth at home and the potential role of home visits to improve newborn survival.

Darmstadt et. Al. (2005) shared that 'every year, about 3.7 million babies die in the first four weeks of life. Most of these newborns are born in developing countries and most die at home. Up to 2/3rds of these deaths can be prevented if mothers and newborns receive known, effective, evidence-based interventions'. Skilled care during pregnancy, childbirth and post-natal period has been proven to prevent complications for both mother and newborn. It also allows the early detection of complications and its appropriate management can be devised almost immediately. Even if a birth occurs in a health facility, most of them discharge mothers and newborns within 24 hours and do not follow-up with a healthcare provider until 6th week immunization visit. Here, we have an opportunity to introduce such policies that enforces both caregivers and mothers to look after themselves. Studies have shown that home-based newborn care interventions can prevent 30-60% of newborn deaths in high mortality settings under controlled conditions. On the basis of these findings, the WHO and UNICEF now recommend home visits in the baby's first week of life to improve newborn survival. This can be easily addressed by implementing a law to introduce home visits as a complementary strategy to facility-based postnatal care and to increase newborn survival.

The UNICEF shares in a publication that home visits in Bangladesh, India and Pakistan region reduced newborn mortality rate by 30 to 61%. During a home visit, following parameters are covered for improving practices such as;

- Early initiation of breastfeeding
- Exclusive breastfeeding
- Skin-to-skin contact
- Delayed bathing
- Attention to hygiene (hand washing etc.)
- Clean umbilical cord care (through application of Chlorhexidine)

Following the above interventions, it is necessary to provide the training to new mothers along with counselling on when to take newborn to a health facility. Hygiene practices alone have shown to reduce the transmission rate of infections from mother to child. For a home health visitor, it is important to recognize the troubling signs during the first week of life such as not feeding well, reduced activity, difficult breathing, fever or feels cold, convulsions etc. Counsel the mother to observe for any of these signs and if they are present, then report immediately to a local health facility.

Vaccination according to national schedules must be provided without any delays and for those newborns who require additional care (low birth weight, HIV infected mother), the health worker must educate about the prevention methods to protect the child. For minor issues such as feeding problems, the health worker must have information that can be applied immediately to remedy the situation.

Issues and Challenges

Like other developing countries, Pakistan has its own share of burdens and challenges that needs to be rectified. First and foremost is the inadequate budgetary allocation, with less than 1% of GDP is invested in the healthcare. This includes health facility planning, the recruitment of professionals, medications, training programs and others. Another prominent issue is the high fertility and population growth rate. There is a focus towards curative medicine rather than preventive, which afflicts both caregivers and receivers. The primary healthcare services are rather poor in their provision due to financial as well as other socio-political issues. Finally, the lack of integration of vertical preventive programs are also endangering a vast majority of population in this region.

Other issues include inadequate social sector services delivery, lack of management professionals who specialize in public health administration, high prevalence of communicable diseases, lack of implementation of integrated management of childhood illnesses, malnutrition (prevalence rate of 40%), very low skilled birth attendance (at the rate of 50%), lack of education, insufficient accessibility to maternal health care services especially emergency obstetric care and lack of awareness on prevention of HIV/AIDS.

Advantages and Opportunities

Despite of a dismal situation, there are initiatives that have been implemented to alleviate the situation, with contribution from public as well as private sector. The redesign of health system infrastructure with purpose-built facilities to cater to the health needs, improving fiscal environment through financial incentives for health system, functional community-based LHW programs must be initiated, strategies to reduce poverty rates including inflation control and forex rate must be implemented to stabilize the economy of Pakistan.

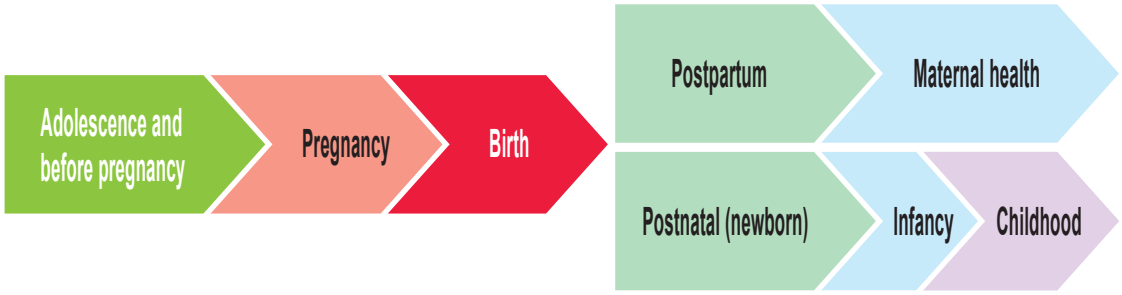
The government has a list of focused programs including National Program for Family Planning and Primary Health Care, Food and Nutrition, Women Health Project, Reproductive Health Project, Expanded Program on Immunization (EPI) and Maternal-Neonatal-Child Health Care Program. The NCHD health program focuses on access to health services through primary healthcare extension, national ORS campaign, national school health program and other plans to strengthen the primary healthcare system.

Coming back to the topic of how can maternal and neonatal mortality be reduced, is answered by use of low-tech, low-cost interventions. These interventions, as reported in the WHO publication, would help save the lives of mothers and prevent stillbirths to those who are most in need. It can save up to 3-4 million newborns effectively and a number of countries have successfully managed to lower their deaths by half. Countries such as Malaysia, Sri Lanka, Thailand and Tunisia are living examples with outstanding family planning services, skilled birth attendance, emergency obstetric care and essential early newborn care programs.

For Pakistan, we must fortify our health systems through collaboration with international community in terms of technical support, as well as improving our funding for healthcare. We must also provide continuum of care across life and locations for more successful maternal & child health.

FIGURE2

The lifecycle continuum of care



Proposed Interventions

Following is a list of interventions that can be easily implemented throughout our country for saving countless lives;

- Pre-pregnancy: increased access to family planning
- During pregnancy: four visits to quality antenatal care services
- Childbirth: Increased access to skilled birth attendant for every childbirth
- Immediate postnatal period: home-based visits for mothers and newborns

The neonatal period is often neglected, on the assumption that having survived childbirth, no further intervention is needed. This misconception has costed lives and ruined families. It is also proven that globally, 3.5 million babies die in the first month of their life, mostly in the first week.

For better health services, it requires to remain steadfast to the coherent policies. Socioeconomic determinants of health cannot be ignored and they must be addressed accordingly. It is the menace of policy coherence that is particularly important in countries that depend of foreign aid. Issues arise when the policies of external agencies are not aligned to nationally agreed priorities and goals.

Therefore, robust national strategies and plans provide the best means of ensuring alignment of external agencies.

Dr. Mahbub-ul-Haq, former commerce minister and deputy chairman planning commission, wrote in 1971 that **'The problem of development must be defined as a selective attack on the worst forms of poverty. Development goals must be defined in terms of progressive reduction and eventually elimination of malnutrition, disease, illiteracy, unemployment and inequalities. We were taught to take care of our GNP because it would take care of poverty. Let us reverse this and take care of poverty because it will take care of the GNP. In other words, let us worry about the content of the GNP even more than its rate of increase.**

Conclusion

Following the above discussion, the need for improving the healthcare scenario is Pakistan is imminent. Quoting from the progress of the nations (UNICEF), I would urge everyone to play their part in this mission.

The Day will come when the progress of nations will be judged not by their military or economic strength nor by splendor of their capital cities and public buildings but by the wellbeing of their people, by level of their health, nutrition, education and by the protection afforded to the growing minds and bodies of their children.

Recommended Immunization Schedule for Adults Aged 19 Years or Older, 2017

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In February 2017, the Recommended Immunization Schedule for Adults Aged 19 Years or Older, United States, 2017 became effective, as recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the Centers for Disease Control and Prevention (CDC). The 2017 adult immunization schedule was also reviewed and approved by the following professional medical organizations:

- American College of Physicians (www.acponline.org)
- American Academy of Family Physicians (www.aafp.org)
- American College of Obstetricians and Gynecologists (www.acog.org)
- American College of Nurse-Midwives (www.midwife.org)

CDC announced the availability of the 2017 adult immunization schedule at www.cdc.gov/vaccines/schedules/hcp/index.html in the Morbidity and Mortality Weekly Report (MMWR).[1] The schedule is published in its entirety in the Annals of Internal Medicine.[2]

The adult immunization schedule describes the age groups and medical conditions and other indications for which licensed vaccines are recommended. The 2017 adult immunization schedule consists of:

- Figure 1. Recommended immunization schedule for adults by age group
- Figure 2. Recommended immunization schedule for adults by medical condition and other indications
- Footnotes that accompany each vaccine containing important general information and considerations for special populations
- Table. Contraindications and precautions for vaccines routinely recommended for adults

Consider the following information when reviewing the adult immunization schedule:

- The figures in the adult immunization schedule should be read with the footnotes that contain important general information and information about vaccination of special populations.
- When indicated, administer recommended vaccines to adults whose vaccination history is incomplete or unknown.
- Increased interval between doses of a multi-dose vaccine does not diminish vaccine effectiveness; therefore, it is not necessary to restart the vaccine series or add doses to the series because of an extended interval between doses.
- Adults with immunocompromising conditions should generally avoid live vaccines, e.g., measles, mumps, and rubella vaccine. Inactivated vaccines, e.g., pneumococcal or inactivated influenza vaccines, are generally acceptable.
- Combination vaccines may be used when any component of the combination is indicated and when the other components of the combination vaccine are not contraindicated.
- The use of trade names in the adult immunization schedule is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Details on vaccines recommended for adults and complete ACIP statements are available at www.cdc.gov/vaccines/hcp/acip-recs/index.html. Additional CDC resources include:

- A summary of information on vaccination recommendations, vaccination of persons with immunodeficiencies, preventing and managing adverse reactions, vaccination contraindications and precautions, and other information can be found in General Recommendations on Immunization at www.cdc.gov/ mmwr/preview/mmwrhtml/rr6002a1.html.
- Vaccine Information Statements that explain benefits and risks of vaccines are available at www.cdc.gov/vaccines/hcp/vis/index.html.
- Information and resources regarding vaccination of pregnant women are available at www.cdc.gov/vaccines/adults/rec-vac/pregnant.html.
- Information on travel vaccine requirements and recommendations is available at wwwnc.cdc.gov/travel/destinations/list.
- CDC Vaccine Schedules App for clinicians and other immunization service providers to download is available at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html.
- Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger is available at www.cdc.gov/vaccines/schedules/hcp/index.html.

Report suspected cases of reportable vaccine-preventable diseases to the local or state health department.

Report all clinically significant post-vaccination reactions to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or by telephone, 800-822-7967. All vaccines included in the 2017 adult immunization schedule except herpes zoster and 23-valent pneumococcal polysaccharide vaccines are covered by the Vaccine Injury Compensation Program. Information on how to file a vaccine injury claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382.

Submit questions and comments regarding the 2017 adult immunization schedule to CDC through www.cdc.gov/cdc-info or by telephone, 800-CDC-INFO (800-232-4636), in English and Spanish, 8:00am–8:00pm ET, Monday–Friday, excluding holidays.

The following acronyms are used for vaccines recommended for adults:

HepA	hepatitis A vaccine
HepA-HepB	hepatitis A and hepatitis B vaccines
HepB	hepatitis B vaccine
Hib	Haemophilus influenzae type b conjugate vaccine
HPV	vaccine human papillomavirus vaccine
HZV	herpes zoster vaccine
IIV	inactivated influenza vaccine
LAIV	live attenuated influenza vaccine
MenACWY	serogroups A, C, W, and Y meningococcal conjugate vaccine
MenB	serogroup B meningococcal vaccine

MMR	measles, mumps, and rubella vaccine
MPSV4	serogroups A, C, W, and Y meningococcal polysaccharide vaccine
PCV13	13-valent pneumococcal conjugate vaccine
PPSV23	23-valent pneumococcal polysaccharide vaccine
RIV	recombinant influenza vaccine
Td	tetanus and diphtheria toxoids
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
VAR	varicella vaccine

1-MMWR Morb Mortal Wkly Rep. 2017;66(5). Available at www.cdc.gov/mmwr/volumes/66/wr/mm6605e2.htm?s_cid=mm6605e2_w.
2- Ann Intern Med. 2017;166:209-218. Available at annals.org/aim/article/doi/10.7326/M16-2936.

Figures 1 and 2 should be read with the footnotes that contain important general information and considerations for special populations.

Figure 1. Recommended immunization schedule for adults aged 19 years or older by age group, 2017

Vaccine	19–21 years	22–26 years	27–59 years	60–64 years	≥ 65 years
Influenza[1]	1 dose annually				
Td/Tdap[2]	Substitute Tdap for Td once, then Td booster every 10 yrs				
MMR[3]	1 or 2 doses depending on indication				
VAR[4]	2 doses				
HZV[5]				1 dose	
HPV–Female[6]	3 doses				
HPV–Male[6]	3 doses				
PCV13[7]	1 dose				
PPSV23[7]	1 or 2 doses depending on indication				1 dose
HepA[8]	2 or 3 doses depending on vaccine				
HepB[9]	3 doses				
MenACWY or MPSV4[10]	1 or more doses depending on indication				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with additional medical conditions or other indications

No recommendation

Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, 2017

Vaccine	Pregnancy[1-6,9]	Immuno-compromised (excluding HIV infection)[3-7,11]	HIV infection CD4+ count (cells/μL)[3-7,9-11] < 200	HIV infection CD4+ count (cells/μL)[3-7,9-11] ≥ 200	Asplenia, persistent complement deficiencies[7,10,11]	Kidney failure, end-stage renal disease, on hemodialysis[7,9]	Heart or lung disease, chronic alcoholism[7]	Chronic liver disease[7-9]	Diabetes[7,9]	Healthcare personnel[3,4,9]	Men who have sex with men[6,8,9]
Influenza[1]	1 dose annually										
Td/Tdap[2]	1 dose Tdap each pregnancy	Substitute Tdap for Td once, then Td booster every 10 yrs									
MMR[3]	contraindicated	1 or 2 doses depending on indication									
VAR[4]	contraindicated	2 doses									
HZV[5]	contraindicated				1 dose						
HPV–Female[6]		3 doses through age 26 yrs									
HPV–Male[6]		3 doses through age 26 yrs			3 doses through age 21 yrs						3 doses through age 26 yrs
PCV13[7]		1 dose									
PPSV23[7]		1, 2, or 3 doses depending on indication									
HepA[8]		2 or 3 doses depending on vaccine									
HepB[9]		3 doses									
MenACWY or MPSV4[10]		1 or more doses depending on indication									
MenB[10]		2 or 3 doses depending on vaccine									
Hib[11]		3 doses post-HSCT recipients only			1 dose						

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with additional medical conditions or other indications

Contraindicated

No recommendation

Footnotes. Recommended Immunization Schedule for Adults Aged 19 Years or Older, 2017

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1.Influenza vaccination

General information

- All persons aged 6 months or older who do not have a contraindication should receive annual influenza vaccination with an age-appropriate formulation of inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV).
- In addition to standard-dose IIV, available options for adults in specific age groups include: high-dose or adjuvanted IIV for adults aged 65 years or older, intradermal IIV for adults aged 18 through 64 years, and RIV for adults aged 18 years or older.
- Notes: Live attenuated influenza vaccine (LAIV) should not be used during the 2016–2017 influenza season. A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm.
  Special populations
- Adults with a history of egg allergy who have only hives after exposure to egg should receive age-appropriate IIV or RIV.

  Adults with a history of egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis, or who required epinephrine or another emergency medical intervention, may receive age-appropriate IIV or RIV. The selected vaccine should be administered in an inpatient or outpatient medical setting and under the supervision of a healthcare provider who is able to recognize and manage severe allergic conditions.
- Pregnant women and women who might become pregnant in the upcoming influenza season should receive IIV.

2. Tetanus, diphtheria, and acellular pertussis vaccination

General information

- Adults who have not received tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap) or for whom pertussis vaccination status is unknown should receive 1 dose of Tdap followed by a tetanus and diphtheria toxoids (Td) booster every 10 years. Tdap should be administered regardless of when a tetanus or diphtheria toxoid-containing vaccine was last received.
- Adults with an unknown or incomplete history of a 3-dose primary series with tetanus and diphtheria toxoid-containing vaccines should complete the primary series that includes 1 dose of Tdap. Unvaccinated adults should receive the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second dose.
- Notes: Information on the use of Td or Tdap as tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm.
  Special populations

Special populations

- Pregnant women should receive 1 dose of Tdap during each pregnancy, preferably during the early part of gestational weeks 27–36, regardless of prior history of receiving Tdap.

3. Measles, mumps, and rubella vaccination

- Adults born in 1957 or later without acceptable evidence of immunity to measles, mumps, or rubella (defined below) should receive 1 dose of measles, mumps, and rubella vaccine (MMR) unless they have a medical contraindication to the vaccine, e.g., pregnancy or severe immunodeficiency.
- Notes: Acceptable evidence of immunity to measles, mumps, or rubella in adults is: born before 1957, documentation of receipt of MMR, or laboratory evidence of immunity or disease. Documentation of healthcare provider-diagnosed disease without laboratory confirmation is not acceptable evidence of immunity.
  Special populations
- Pregnant women who do not have evidence of immunity to rubella should receive 1 dose of MMR upon completion or termination of pregnancy and before discharge from the healthcare facility; non-pregnant women of childbearing age without evidence of rubella immunity should receive 1 dose of MMR.
- Adults with primary or acquired immunodeficiency including malignant conditions affecting the bone marrow or lymphatic system, systemic immunosuppressive therapy, or cellular immunodeficiency should not receive MMR.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count ≥200 cells/µl for at least 6 months who do not have evidence of measles, mumps, or rubella immunity should receive 2 doses of MMR at least 28 days apart. Adults with HIV infection and CD4+ T-lymphocyte count <200 cells/µl should not receive MMR.
- Adults who work in healthcare facilities should receive 2 doses of MMR at least 28 days apart; healthcare personnel born before 1957 who are unvaccinated or lack laboratory evidence of measles, mumps, or rubella immunity, or laboratory confirmation of disease should be considered for vaccination with 2 doses of MMR at least 28 days apart for measles or mumps, or 1 dose of MMR for rubella.
- Adults who are students in postsecondary educational institutions or plan to travel internationally should receive 2 doses of MMR at least 28 days apart.
- Adults who received inactivated (killed) measles vaccine or measles vaccine of unknown type during years 1963-1967 should be revaccinated with 1 or 2 doses of MMR.
- Adults who were vaccinated before 1979 with either inactivated mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection, e.g., work in a healthcare facility, should be considered for revaccination with 2 doses of MMR at least 28 days apart.

4. Varicella vaccination

General information

- Adults without evidence of immunity to varicella (defined below) should receive 2 doses of single-antigen varicella vaccine (VAR) 4–8 weeks apart, or a second dose if they have received only 1 dose.

- Persons without evidence of immunity for whom VAR should be emphasized are: adults who have close contact with persons at high risk for serious complications, e.g., healthcare personnel and household contacts of immunocompromised persons; adults who live or work in an environment in which transmission of varicella zoster virus is likely, e.g., teachers, childcare workers, and residents and staff in institutional settings; adults who live or work in environments in which varicella transmission has been reported, e.g., college students, residents and staff members of correctional institutions, and military personnel; non-pregnant women of childbearing age; adolescents and adults living in households with children; and international travelers.
- Notes: Evidence of immunity to varicella in adults is: U.S.-born before 1980 (for pregnant women and healthcare personnel, U.S.-born before 1980 is not considered evidence of immunity); documentation of 2 doses of VAR at least 4 weeks apart; history of varicella or herpes zoster diagnosis or verification of varicella or herpes zoster disease by a healthcare provider; or laboratory evidence of immunity or disease.

Special populations

- Pregnant women should be assessed for evidence of varicella immunity. Pregnant women who do not have evidence of immunity should receive the first dose of VAR upon completion or termination of pregnancy and before discharge from the healthcare facility, and the second dose 4–8 weeks after the first dose.
- Healthcare institutions should assess and ensure that all healthcare personnel have evidence of immunity to varicella.

  Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive VAR.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count ≥200 cells/µl may receive 2 doses of VAR 3 months apart. Adults with HIV infection and CD4+ T-lymphocyte count <200 cells/µl should not receive VAR

5.Herpes zoster vaccination

General information

- Adults aged 60 years or older should receive 1 dose of herpes zoster vaccine (HZV), regardless of whether they had a prior episode of herpes zoster.
  Special populations

Special populations

- Adults aged 60 years or older with chronic medical conditions may receive HZV unless they have a medical contraindication, e.g., pregnancy or severe immunodeficiency.
- Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive HZV.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count <200 cells/µl should not receive HZV.

6. Human papillomavirus vaccination

General information

- Adult females through age 26 years and adult males through age 21 years who have not received any human papillomavirus (HPV) vaccine should receive a 3-dose series of HPV vaccine at 0, 1-2, and 6 months. Males aged 22 through 26 years may be vaccinated with a 3-dose series of HPV vaccine at 0, 1–2, and 6 months.
- Adult females through age 26 years and adult males through age 21 years (and males aged 22 through 26 years who may receive HPV vaccination) who initiated the HPV vaccination series before age 15 years and received 2 doses at least 5 months apart are considered adequately vaccinated and do not need an additional dose of HPV vaccine.
- Adult females through age 26 years and adult males through age 21 years (and males aged 22 through 26 years who may receive HPV vaccination) who initiated the HPV vaccination series before age 15 years and received only 1 dose, or 2 doses less than 5 months apart, are not considered adequately vaccinated and should receive 1 additional dose of HPV vaccine.
- Notes: HPV vaccination is routinely recommended for children at age 11 or 12 years. For adults who had initiated but did not complete the HPV vaccination series, consider their age at first HPV vaccination (described above) and other factors (described below) to determine if they have been adequately vaccinated.

Special populations

- Men who have sex with men through age 26 years who have not received any HPV vaccine should receive a 3-dose series of HPV vaccine at 0, 1-2, and 6 months.
- Adult females and males through age 26 years with immunocompromising conditions (described below), including those with human immunodeficiency virus (HIV) infection, should receive a 3-dose series of HPV vaccine at 0, 1–2, and 6 months.
- Pregnant women are not recommended to receive HPV vaccine, although there is no evidence that the vaccine poses harm. If a woman is found to be pregnant after initiating the HPV vaccination series, delay the remaining doses until after the pregnancy. No other intervention is needed. Pregnancy testing is not needed before administering HPV vaccine.
- Notes: Immunocompromising conditions for which a 3-dose series of HPV vaccine is indicated are primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity, e.g., B-lymphocyte antibody deficiencies, complete or partial T-lymphocyte defects, HIV infection, malignant neoplasm, transplantation, autoimmune disease, and immunosuppressive therapy.

7. Pneumococcal vaccination

General information

- Adults who are immunocompetent and aged 65 years or older should receive 13-valent pneumococcal conjugate vaccine (PCV13) followed by 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 1 year after PCV13.

- Notes: Adults are recommended to receive 1 dose of PCV13 and 1, 2, or 3 doses of PPSV23 depending on indication. When both PCV13 and PPSV23 are indicated, PCV13 should be administered first; PCV13 and PPSV23 should not be administered during the same visit. If PPSV23 has previously been administered, PCV13 should be administered at least 1 year after PPSV23. When two or more doses of PPSV23 are indicated, the interval between PPSV23 doses should be at least 5 years. Supplemental information on pneumococcal vaccine timing for adults aged 65 years or older and adults aged 19 years or older at high risk for pneumococcal disease (described below) is available at www.cdc.gov/vaccines/vpd-vac/pneumo/downloads/adult-vax-clinician-aid.pdf. No additional doses of PPSV23 are indicated for adults who received PPSV23 at age 65 years or older. When indicated, PCV13 and PPSV23 should be administered to adults whose pneumococcal vaccination history is incomplete or unknown.

Special populations

- Adults aged 19 through 64 years with chronic heart disease including congestive heart failure and cardiomyopathies (excluding hypertension); chronic lung disease including chronic obstructive lung disease, emphysema, and asthma; chronic liver disease including cirrhosis; alcoholism; or diabetes mellitus; or who smoke cigarettes should receive PPSV23. At age 65 years or older, they should receive PCV13 and another dose of PPSV23 at least 1 year after PCV13 and at least 5 years after the most recent dose of PPSV23.
- Adults aged 19 years or older with immunocompromising conditions or anatomical or functional asplenia (described below) should receive PCV13 and a dose of PPSV23 at least 8 weeks after PCV13, followed by a second dose of PPSV23 at least 5 years after the first dose of PPSV23. If the most recent dose of PPSV23 was administered before age 65 years, at age 65 years or older, administer another dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.
- Adults aged 19 years or older with cerebrospinal fluid leak or cochlear implant should receive PCV13 followed by PPSV23 at least 8 weeks after PCV13. If the most recent dose of PPSV23 was administered before age 65 years, at age 65 years or older, administer another dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.
- Notes: Immunocompromising conditions that are indications for pneumococcal vaccination are congenital or acquired immunodeficiency including B- or T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders excluding chronic granulomatous disease; human immunodeficiency virus (HIV) infection; chronic renal failure and nephrotic syndrome; leukemia, lymphoma, Hodgkin disease, generalized malignancy, and multiple myeloma; solid organ transplant; and iatrogenic immunosuppression including long-term systemic corticosteroid and radiation therapy. Anatomical or functional asplenia that are indications for pneumococcal vaccination are sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, and splenectomy. Pneumococcal vaccines should be given at least 2 weeks before immunosuppressive therapy or an elective splenectomy, and as soon as possible to adults who are diagnosed with HIV infection.

8. Hepatitis A vaccination

General information

- Adults who seek protection from hepatitis A virus infection may receive a 2-dose series of single antigen hepatitis A vaccine (HepA) at either 0 and 6–12 months (Havrix) or 0 and 6–18 months (Vaqta). Adults may also receive a combined hepatitis A and hepatitis B vaccine (HepA-HepB) (Twinrix) as a 3-dose series at 0, 1, and 6 months. Acknowledgment of a specific risk factor by those who seek protection is not needed.

Special populations

- Adults with any of the following indications should receive a HepA series: have chronic liver disease, receive clotting factor concentrates, men who have sex with men, use injection or non-injection drugs, or work with hepatitis A virus-infected primates or in a hepatitis A research laboratory setting.
- Adults who travel in countries with high or intermediate levels of endemic hepatitis A infection or anticipate close personal contact with an international adoptee, e.g., reside in the same household or regularly babysit, from a country with high or intermediate level of endemic hepatitis A infection within the first 60 days of arrival in the United States should receive a HepA series.

9. Hepatitis B vaccination

General information

- Adults who seek protection from hepatitis B virus infection may receive a 3-dose series of single-antigen hepatitis B vaccine (HepB) (Engerix-B, Recombivax HB) at 0, 1, and 6 months. Adults may also receive a combined hepatitis A and hepatitis B vaccine (HepA-HepB) (Twinrix) at 0, 1, and 6 months. Acknowledgment of a specific risk factor by those who seek protection is not needed.

Special populations

- Adults at risk for hepatitis B virus infection by sexual exposure should receive a HepB series, including sex partners of hepatitis B surface antigen (HBsAg)-positive persons, sexually active persons who are not in a mutually monogamous relationship, persons seeking evaluation or treatment for a sexually transmitted infection, and men who have sex with men (MSM).
- Adults at risk for hepatitis B virus infection by percutaneous or mucosal exposure to blood should receive a HepB series, including adults who are recent or current users of injection drugs, household contacts of HBsAg-positive persons, residents and staff of facilities for developmentally disabled persons, incarcerated, healthcare and public safety workers at risk for exposure to blood or blood-contaminated body fluids, younger than age 60 years with diabetes mellitus, and age 60 years or older with diabetes mellitus at the discretion of the treating clinician.
- Adults with chronic liver disease including, but not limited to, hepatitis C virus infection, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, and an alanine aminotransferase (ALT) or aspartate

aminotransferase (AST) level greater than twice the upper limit of normal should receive a HepB series.

- Adults with end-stage renal disease including those on pre-dialysis care, hemodialysis, peritoneal dialysis, and home dialysis should receive a HepB series. Adults on hemodialysis should receive a 3-dose series of 40 µg Recombivax HB at 0, 1, and 6 months or a 4-dose series of 40 µg Engerix-B at 0, 1, 2, and 6 months.
- Adults with human immunodeficiency virus (HIV) infection should receive a HepB series.
- Pregnant women who are at risk for hepatitis B virus infection during pregnancy, e.g., having more than one sex partner during the previous six months, been evaluated or treated for a sexually transmitted infection, recent or current injection drug use, or had an HBsAg-positive sex partner, should receive a HepB series.
- International travelers to regions with high or intermediate levels of endemic hepatitis B virus infection should receive a HepB series.
- Adults in the following settings are assumed to be at risk for hepatitis B virus infection and should receive a HepB series: sexually transmitted disease treatment facilities, HIV testing and treatment facilities, facilities providing drug-abuse treatment and prevention services, healthcare settings targeting services to persons who inject drugs, correctional facilities, healthcare settings targeting services to MSM, hemodialysis facilities and end-stage renal disease programs, and institutions and nonresidential day care facilities for developmentally disabled persons.

10. Meningococcal vaccination

Special populations

Adults with anatomical or functional asplenia or persistent complement component deficiencies should receive a 2-dose primary series of serogroups A, C, W, and Y meningococcal conjugate vaccine (MenACWY) at least 2 months apart and revaccinate every 5 years. They should also receive a series of serogroup B meningococcal vaccine (MenB) with either a 2-dose series of MenB-4C (Bexsero) at least 1 month apart or a 3-dose series of MenB-FHbp (Trumenba) at 0, 1–2, and 6 months.

Adults with human immunodeficiency virus (HIV) infection who have not been previously vaccinated should receive a 2-dose primary series of MenACWY at least 2 months apart and revaccinate every 5 years. Those who previously received 1 dose of MenACWY should receive a second dose at least 2 months after the first dose. Adults with HIV infection are not routinely recommended to receive MenB because meningococcal disease in this population is caused primarily by serogroups C, W, and Y.

Microbiologists who are routinely exposed to isolates of Neisseria meningitidis should receive 1 dose of MenACWY and revaccinate every 5 years if the risk for infection remains, and either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-FHbp at 0, 1–2, and 6 months.

Adults at risk because of a meningococcal disease outbreak should receive 1 dose of MenACWY if the outbreak is attributable to serogroup A, C, W, or Y, or either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-FHbp at 0, 1–2, and 6 months if the outbreak is attributable to serogroup B.

- Adults who travel to or live in countries with hyperendemic or epidemic meningococcal disease should receive 1 dose of MenACWY and revaccinate every 5 years if the risk for infection remains. MenB is not routinely indicated because meningococcal disease in these countries is generally not caused by serogroup B.
- Military recruits should receive 1 dose of MenACWY and revaccinate every 5 years if the increased risk for infection remains.
- First-year college students aged 21 years or younger who live in residence halls should receive 1 dose of MenACWY if they have not received MenACWY at age 16 years or older.
- Young adults aged 16 through 23 years (preferred age range is 16 through 18 years) who are healthy and not at increased risk for serogroup B meningococcal disease (described above) may receive either a 2-dose series of MenB-4C at least 1 month apart or a 2-dose series of MenB-FHbp at 0 and 6 months for short-term protection against most strains of serogroup B meningococcal disease.
- For adults aged 56 years or older who have not previously received serogroups A, C, W, and Y meningococcal vaccine and need only 1 dose, meningococcal polysaccharide serogroups A, C, W, and Y vaccine (MPSV4) is preferred. For adults who previously received MenACWY or anticipate receiving multiple doses of serogroups A, C, W, and Y meningococcal vaccine, MenACWY is preferred.
- Notes: MenB-4C and MenB-FHbp are not interchangeable, i.e., the same vaccine should be used for all doses to complete the series. There is no recommendation for MenB revaccination at this time. MenB may be administered at the same time as MenACWY but at a different anatomic site, if feasible.

11. Haemophilus influenzae type b vaccination

Special populations

- Adults who have anatomical or functional asplenia or sickle cell disease, or are undergoing elective splenectomy should receive 1 dose of Haemophilus influenzae type b conjugate vaccine (Hib) if they have not previously received Hib. Hib should be administered at least 14 days before splenectomy.
- Adults with a hematopoietic stem cell transplant (HSCT) should receive 3 doses of Hib in at least 4 week intervals 6–12 months after transplant regardless of their Hib history.
- Notes: Hib is not routinely recommended for adults with human immunodeficiency virus infection because their risk for Haemophilus influenzae type b infection is low.

Table. Contraindications and precautions for vaccines recommended for adults aged 19 years or older*

The Advisory Committee on Immunization Practices (ACIP) recommendations and package inserts for vaccines provide information on contraindications and precautions related to vaccines. Contraindications are conditions that increase chances of a serious adverse reaction in vaccine recipients and the vaccine should not be administered when a contraindication is present. Precautions should be reviewed for potential risks and benefits for vaccine recipient. For a person with a severe allergy to latex, e.g., anaphylaxis, vaccines supplied in vials or syringes that contain natural rubber latex should not be administered unless the benefit of vaccination clearly outweighs the risk for a potential allergic reaction. For latex allergies other than anaphylaxis, vaccines supplied in vials or syringes that contain dry, natural rubber or natural rubber latex may be administered.

Contraindications and precautions for vaccines routinely recommended for adults

Vaccine	Contraindications	Precautions
All vaccines routinely recommended for adults	• Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever

Additional contraindications and precautions for vaccines routinely recommended for adults

Vaccine	Additional Contraindications	Additional Precautions
IIV[1]		• History of Guillain-Barré Syndrome within 6 weeks after previous influenza vaccination • Egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis; or required epinephrine or another emergency medical intervention (IIV may be administered in an inpatient or outpatient medical setting and under the supervision of a healthcare provider who is able to recognize and manage severe allergic conditions)
RIV[1]		• History of Guillain-Barré Syndrome within 6 weeks after previous influenza vaccination
LAIV[1]	• LAIV should not be used during 2016–2017 influenza season	• LAIV should not be used during 2016–2017 influenza season
Tdap/Td	• For pertussis-containing vaccines: encephalopathy, e.g., coma, decreased level of consciousness, or prolonged seizures, not attributable to another identifiable cause within 7 days of administration of a previous dose of a vaccine containing tetanus or diphtheria toxoid or acellular pertussis	• Guillain-Barré Syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine • History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine. Defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine • For pertussis-containing vaccine, progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy (until a treatment regimen has been established and the condition has stabilized)
MMR[2]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], human immunodeficiency virus (HIV) infection with severe immunocompromise • Pregnancy	• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)[4] • History of thrombocytopenia or thrombocytopenic purpura • Need for tuberculin skin testing[5]
VAR[2]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], HIV infection with severe immunocompromise • Pregnancy	• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)[4] • Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
HZV[2]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], HIV infection with severe immunocompromise • Pregnancy	• Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
HPV vaccine		• Pregnancy
PCV13	• Severe allergic reaction to any vaccine containing diphtheria toxoid	

1. For additional information on use of influenza vaccines among persons with egg allergy, see: CDC. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices-United States, 2016–17 influenza season. MMWR 2016;65(RR-5):1–54. Available at www.cdc.gov/mmwr/volumes/65/rr/rr6505a1.htm.
2. MMR may be administered together with VAR or HZV on the same day. If not administered on the same day, separate live vaccines by at least 28 days.
3. Immunosuppressive steroid dose is considered to be daily receipt of 20 mg or more prednisone or equivalent for two or more weeks. Vaccination should be deferred for at least 1 month after discontinuation of immunosuppressive steroid therapy. Providers should consult ACIP recommendations for complete information on the use of specific live vaccines among persons on immune-suppressing medications or with immune suppression because of other reasons.
4. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered. See: CDC. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2011;60(No. RR-2). Available at www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm
5. Measles vaccination may temporarily suppress tuberculin reactivity. Measles-containing vaccine may be administered on the same day as tuberculin skin testing, or should be postponed for at least 4 weeks after vaccination.

*Adapted from: CDC. Table 6. Contraindications and precautions to commonly used vaccines. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices. MMWR 2011;60(No. RR-2):40–41 and from: Hamborşky J, Kroger A, Wolfe S, eds. Appendix A. Epidemiology and prevention of vaccine preventable diseases. 13th ed. Washington, DC: Public Health Foundation, 2015. Available at www.cdc.gov/vaccines/pubs/pinkbook/index.html

Acronyms of vaccines recommended for adults

HepA	hepatitis A vaccine
HepA-HepB	hepatitis A and hepatitis B vaccines
HepB	hepatitis B vaccine
Hib	Haemophilus influenzae type b conjugate vaccine
HPV	vaccine human papillomavirus vaccine
HZV	herpes zoster vaccine
IIV	inactivated influenza vaccine
LAIV	live attenuated influenza vaccine
MenACWY	serogroups A, C, W, and Y meningococcal conjugate vaccine
MenB	serogroup B meningococcal vaccine
MMR	measles, mumps, and rubella vaccine
MPSV4	serogroups A, C, W, and Y meningococcal polysaccharide vaccine
PCV13	13-valent pneumococcal conjugate vaccine
PPSV23	23-valent pneumococcal polysaccharide vaccine
RIV	recombinant influenza vaccine
Td	tetanus and diphtheria toxoids
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
VAR	varicella vaccine

Face to Face with Prof. Salahuddin Afsar (Tamgha-e-Imtiaz)

MBBS (Dow), FCPS, MRCP (UK), FRCP (Edinburgh)
Consultant Physician, National Medical Centre, Karachi
Interviewed by: Dr. Shuja Ajaz

Infectio®

General Physician is a medical doctor who treats acute and chronic illness and provides preventive care and health education to their patients.
A physician manages different types of illness that present in an undifferentiated way at an early stage of development, which may require urgent intervention. The approach of general practice aims to take into consideration the social factors relevant to the care of each patient's illness. Their duties are not confined to specific organs of the body, and they have particular skills in treating people with multiple health issues. They are trained to treat patients of any age and sex to certain levels of complexity.
Prof. Salahuddin Afsar, is one of the leading physician of Pakistan who has received Tamgha-e-Imtiaz, he has expertise in hypertension, diabetes and other chest related diseases (Asthma & COPD). During the interview he shared his real life experiences

Q# 1. Please share about your education & work experience?

A: I have done my MBBS from Dow Medical College, Karachi in 1979 and later I moved to UK for MRCP and FRCP from Edinburgh. After coming back to Pakistan, I got associated with Dow University of Health Sciences at various academic positions. I also completed my FCPS in 2007 from College of Physicians and Surgeons of Pakistan

Q# 2. What is the happiest moment being a doctor in your life?

A: For all the doctors, the treatment of a patient who lose all the hope is the happiest moment and for me too it is the seme. Also the moment when I passed the exam of MRCP from UK in 1986 is the most memorable

Q# 3. Could you please name the most challenging aspects of your life as a doctor?

A: After becoming the principal of Dow Medical College & as 1st Pro-Vice Chancellor of Dow University of Health Sciences, I had faced different academic and administrative challenges including introduction and implementation of modular courses

Q# 4. Sir, why did you choose to specialize as a Physician?

A: Because I deal with the whole body & soul at the same time; I treat the disease and put my patients mind at ease

Q# 5. Who is your inspiration/role model?

A: Every person has inspiration in their life but my role model is Prof. Shafiq Qureshi (Consultant Physician)

Q# 6. How do you keep balance in your professional & personal commitment?

A: It's very difficult for a doctor to maintain balance in profession & family, and like most of other doctors I am also unable to keep the balance as I spend most of the time in clinics

Q# 7. What is the most important piece of advice that you like to give to junior doctors and medical students as you are role model for most of them?

A: My advice to the doctors and post graduates is to work with devotion & commitment in the field and not chase the financial incentives because it shouldn't be the priority in this medical profession

Q# 8. If you were not a doctor then what would you have been?

A: Never thought about that because I was born to be a doctor.

Q# 9. What is the most common disease in Pakistan these days?

A: Nowadays, the most common disease which I face frequently in my practice is Diabetes Mellitus and Hypertension

Q# 10. Any message for betterment of magazine or this initiative?

A: Overall, a good initiative and it is in safe hands because of their advisory committee, I would like to suggest that include some articles regarding the chronic diseases and its awareness among the readers

Quiz & Winners of Lucky Draw

Reported by: Syed Faizan Saeed

Choose the correct answer

1. What are the symptom(s) of asthma?

A. Tightness in the chest
B. Wheezing
C. Sneezing
D. A and B

Winners of Lucky Draw

The editorial board of *Infectio*® magazine is pleased to announce the names of winners for quiz from the 7th edition. Due to high response and appreciation from readers, the board has decided to increase the number of winners to 15 winners from the quiz participants of 7th Edition.

The lucky draw was held in a meeting at Dr. Ziauddin University Hospital, Karachi, on 28th November, 2017. Following are the names of Lucky Draw winners drawn at randomly by **Prof. Ejaz Ahmed Vohra** and his team.

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

1.	**Dr. Abrar Pathan,** Abrar Clinic Kacheri Road, Kotri, Hyderabad
2.	**Dr. Zia Muhammad,** Dabgari Garden, Peshawar
3.	**Dr. M. Ashraf Choudhry,** Polyclinic, Bhimber Road, Gujrat
4.	**Dr. Muhammad Khurram,** DHQ Hospital, Rawalpindi
5.	**Dr. Bashir Abbasi,** Awami Medical Centre, Jacobabad
6.	**Dr. Ajeet Kumar,** Ghulam Muhammad Mahar Medical College, Sukkur
7.	**Prof. Fayaz Burki,** Medical College Swabi, Swabi
8.	**Dr. Sagheer Ahmed,** Park view Clinic, Clifton, Karachi
9.	**Dr. Saleh Muhammad Memon,** Al-Shifa Clinic, Hussainabad, Karachi
10.	**Dr. Samina Batool,** Tahir Hospital, Mianwali
11.	**Dr. Abdul Jabbar,** Saidu Medical College, Swat
12.	**Dr. Murtaza Bukhari,** Riaz Hospital, Mirpur, Kashmir
13.	**Dr. Atif Mansoor,** Al-Ata foundation, Karachi
14.	**Dr. Naimat Ali Gill,** Mian Clinic, Near Ideal Bakers, Satiana Road, Faisalabad
15.	**Dr. Muhammad Arshad Rauf,** Bhatti Hospital, Sargodha