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- Meningococcal Disease
- Periodontitis
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# Contents



## *Editorial*

Dear Doctor,

We are delighted to present you this edition of "the *SQUARE*" healthcare bulletin!

This issue of "the *SQUARE*" features a variety of articles including “Meningococcal Disease”. Meningococcal disease is the acute infection caused by *Neisseria meningitidis,* which has humans as the only natural host. The disease is widespread around the globe and is known for its epidemical potential and high rates of lethality and morbidity.

We have also focused on “Periodontitis” that can affect people of any age, including young children.. Moreover we have published a special feature on “Technological Abuse in Children” which is a growing concern at present. Besides, we have a write-up on "Ca- Stomach”, a major health burden worldwide. It is the most common cancer in the world after lung cancer and is a major cause of mortality and morbidity.

We believe you will enjoy reading this publication as well! Please send your feedback to help us provide the highest quality and most useful service.

On behalf of the "*SQUARE* family", wishing you all and your family a very healthy, happy and prosperous life.

Thank you!

*Omar Akramur Rab*

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# Meningococcal Disease

Meningococcal disease describes infections caused by the bacterium *Neisseria meningitidis* (also termed meningococcus). It carries a high mortality rate if untreated but is a vaccine-preventable disease. While best known as a cause of meningitis, widespread blood infection can result in sepsis, which is a more damaging and dangerous condition. Meningitis and meningococcemia are major causes of illness, death and disability in both developed and under-developed countries.

There are approximately 2,600 cases of bacterial meningitis per year in the United States, and on average 333,000 cases in developing countries. The case fatality rate ranges between 10 and 20 percent. The incidence of endemic meningococcal disease during the last 13 years ranges from 1 to 5 per 100,000 in developed countries, and from 10 to 25 per 100,000 in developing countries. During epidemics the incidence of meningococcal disease approaches 100 per 100,000. Meningococcal vaccines have sharply reduced the incidence of the disease in developed countries.

The disease's pathogenesis is not fully understood. The pathogen colonises a large number of the general population harmlessly, but in some very small percentage of individuals it can invade the blood stream and the entire body but most notably limbs and brain, causing serious illness. Over the past few years, experts have made an intensive effort to understand specific aspects of meningococcal biology and host interactions, however the development of improved treatments and effective vaccines is expected to depend on novel efforts by workers in many different fields.

While meningococcal disease is not as contagious as the common cold (which is spread through casual contact), it can be transmitted through saliva and occasionally through close, prolonged general contact with an infected person

**History and etymology**

From the Greek *meninx* (membrane) + kokkos (berry), meningococcal disease was first described by Gaspard Vieusseux during an outbreak in Geneva in 1805. In 1884, Italian pathologists Ettore Marchiafava and Angelo Celli described intracellular micrococci in cerebrospinal fluid and in 1887, Anton Wiechselbaum identified the meningococcus (designated as *Diplococcus intracellularis meningitidis*) in cerebrospinal fluid and established the connection between the organism and epidemic meningitis.

**Epidemiology**

The importance of meningitis is as significant in Africa as HIV, TB and malaria. Cases of meningococcemia leading to severe meningoencephalitis are common among young children and the elderly.

Deaths occurring in less than 24 hours are more likely during the disease epidemic seasons in Africa and Sub-Saharan Africa is hit by meningitis outbreaks throughout the epidemic season. It may be that climate change contributes significantly the spread of the disease in Benin, Burkina Faso, Cameroon, the Central African Republic, Chad, Côte d'Ivoire, the Democratic Republic of the Congo, Ethiopia, Ghana, Mali, Niger, Nigeria and Togo. This is an area of Africa where the disease is endemic: meningitis is "silently" present and there are always a few cases. When the number of cases passes five per population of 100,000 in one week, teams are on alert. Epidemic levels are reached when there have been 100 cases per 100,000 populations over several weeks.

**How do peoples get meningococcal disease?**

Neisseria meningitidis bacteria are spread from person to person by inhaling airborne droplets when an infected person coughs or sneezes or just by close contact.

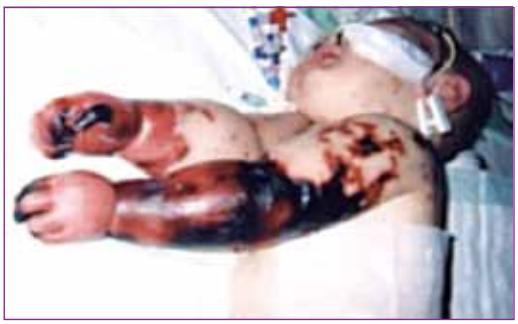
In many cases, the bacteria is spread by infected individuals that are carriers of *Neisseria meningitidis,* but do not show any symptoms. *Neisseria meningitidis* is present in the nose and throat of these individuals, but the body's natural defence mechanisms contain the infection by producing antibodies against the bacteria so that spread to other parts of the body is prevented. Carrier rates depend on age and the highest rate is found in young adults (15-24 years) at 20-40%.

Rarely, exposure to *Neisseria meningitidis* will lead to meningococcal disease where bacteria spreads to the blood and brain, causing meningococcemia and/or meningococcal meningitis. This may occur if the body has not had enough time to build up an antibody defence or in those with defective immune systems.

**Who is at risk of meningococcal disease?**

Most patients with meningococcal disease are otherwise healthy individuals. However, there are some patient groups whom are at an increased risk for developing meningococcal infection.

- Children 6 months to 4 years : until about 6 months immunity from the mother is present. Beyond 4 years many children have developed immunity to many strains of *Neisseria meningitidis.*
- Individuals with complement deficiencies : Complement is a part of the immune system required for the breakdown of meningococcal bacteria.



*Charlotte Cleverley-Bisman, one of the youngest survivors of the disease. The infected arms had to be amputated later.*

- Individuals without spleens (asplenic).
- Individuals taking immunosuppressive drugs such as prednisone or ciclosporin.
- Individuals with a current viral infection.

**Types :**

**Meningococcemia**

Meningococcemia, like many other gram-negative blood infections, can cause disseminated intravascular coagulation (DIC), which is the inappropriate clotting of blood within the vessels. DIC can cause ischemic tissue damage when upstream thrombi obstruct blood flow and haemorrhage because clotting factors are exhausted. Small bleeds into the skin cause the characteristic petechial rash, which appears with a star-like shape. This is due to the release of toxins into the blood that break down the walls of blood vessels. A rash can develop under the skin due to blood leakage that may leave red or brownish pinprick spots, which can develop into purple bruising. Meningococcal rash can usually be confirmed by a glass test in which the rash does not fade away under pressure.

**Meningitis**

Meningococcal meningitis is a form of bacterial meningitis. Meningitis is a disease caused by inflammation and irritation of the meninges, the membranes surrounding the brain and spinal cord. In meningococcal meningitis this is caused by bacteria invading the cerebrospinal fluid, circulating through the central nervous system. Sub-Saharan Africa, the Americas, Western Europe, the UK and Ireland still face many challenges combating this disease, 200 years after the discovery of bacterial meningitis.

**Other types**

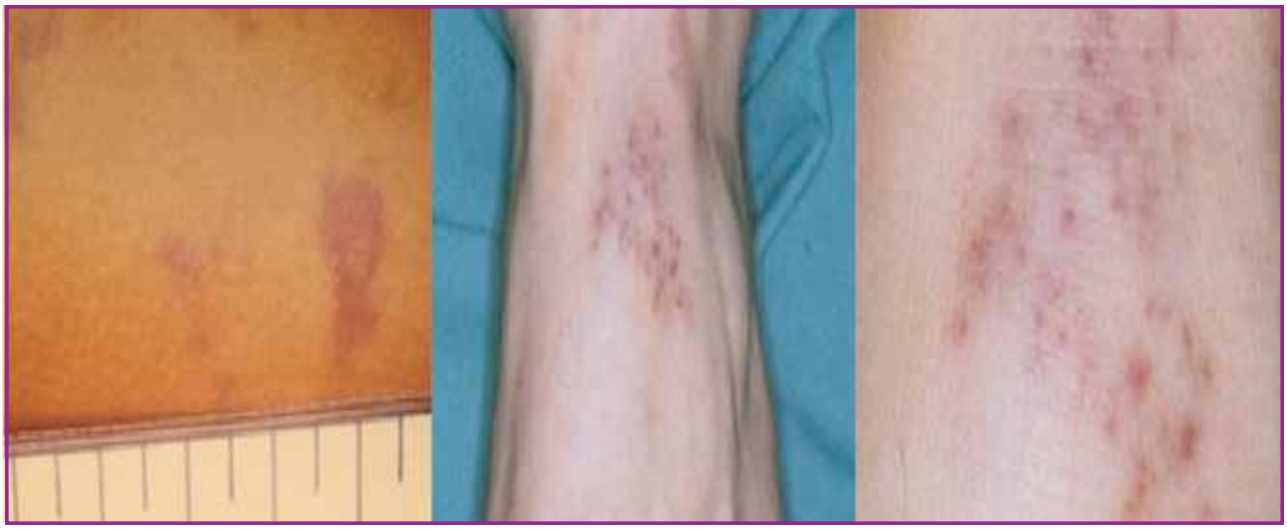
As with any gram-negative bacterium, *N. meningitidis* can infect a variety of sites.

Meningococcal pneumonia can appear during influenza pandemics and in military camps. This is a multilobar, rapidly evolving pneumonia, sometimes associated with septic shock. With prompt treatment, the prognosis is excellent. Another alternative is dexamethasone with vancomycin and meropenem. Pericarditis can appear, either as a septic pericarditis with grave prognosis or as a reactive pericarditis in the wake of meningitis or septicaemia.

Myocarditis can be a complication of meningococcemia and can be contributive to shock seen in this form of disease. Pharyngitis and conjunctivitis can

| Signs and symptoms of meningococcal disease | |
|---|---|
| **Meningococcal meningitis** | **Meningococcemia** |
| ***Children >1 year and adults*** | ***Signs on the skin*** |
| ❑ Neck stiffness | ❑ Petechiae occur in 50-75% of cases. |
| ❑ Headache | ❑ Rash may progress to larger red patches or purple lesions (similar to bruises). |
| ❑ Nausea and vomiting | ❑ Most often found on the trunk and extremities but may progress to involve any part of the body. |
| ❑ Neck and/or back pain | ❑ In severe cases lesions may burst and lead to necrosis. |
| ❑ Fever and chills | |
| ❑ Increased sensitivity to light | ***Other signs and symptoms*** |
| ❑ Irritability, confusion | ❑ Acute fever and chills |
| ***Infants*** | ❑ Headache |
| ❑ Refusing feeds | ❑ Neck stiffness |
| ❑ Increased irritability | ❑ Low back and thigh pain |
| ❑ Sleeping all the time | ❑ Nausea and vomiting |
| ❑ Fever | ❑ Confusion or unconsciousness |
| ❑ Bulging fontanelle (soft spot on the top of the head) | ❑ Epileptic fits (seizures) |
| ❑ Inconsolable crying | ❑ Unstable vital signs, eg very low blood pressure, reduced blood flow, low urine output |
| ❑ Epileptic fits (seizures) | ❑ Collapse from septic shock |

Purpura due to meningococcal disease



also appear and can constitute the portal of entry for the bacterium. Septic arthritis due to *N. meningitidis* can be seen, usually accompanying disseminated infection. Other forms of disease can rarely be seen, like osteomyelitis, endophthalmitis and urethritis.

**Signs and symptoms:**

The most common signs and symptoms of meningococcal disease are listed in the table. If an individual has both meningococcal meningitis and meningococcemia, they may present with a mixture

of symptoms and signs characteristic to each of the diseases.

**Diagnosis:**

Meningococcal meningitis and meningococcemia is often suspected from the history and physical examination. Blood culture and/or lumbar puncture are used to confirm diagnosis. A lumbar puncture involves putting a needle in the lower back to obtain some spinal fluid. An increased number of white cells are seen under the microscope.

**Treatment:**

Meningococcemia can kill more rapidly than any other infectious disease. Patients with either meningococcemia or meningococcal meningitis must be hospitalised and treatment with antibiotics and supportive care instituted immediately. Many patients are admitted to an intensive care unit.

In the newly diagnosed patient, parenteral antimicrobial therapy is a top priority and should be given as quickly as possible and certainly within 1 hour of recognition of invasive meningococcal disease (IMD) as recommended in the most recent national and international guidelines (Table 1). It should be noted that patients with IMD can transmit meningococci within the first 24 hours of antibiotic therapy, therefore, measures such as droplet precautions should be taken to minimize exposure to health care workers. Antibiotic therapy rapidly reduces circulating plasma endotoxin levels in patients with IMD; increased endotoxin levels have been associated with severity of illness, including the presence of septic shock, multiple organ failure and death in patients with IMD. Even with antibiotic treatment, IMD carries a 10% mortality rate, but this is considerably lower than the 70%-85% mortality rate observed before the availability of antibiotics.

**Table 1.** Antibiotics and dosages used to treat meningococcal meningitis.

| Antibiotic | Total daily dose | |
|---|---|---|
| | Children >1 month | Adults |
| Penicillin G | 4 x $10^6$ units, q 4 hours | 4 x $10^6$ units, q 4 hours |
| Ceftriaxone | 50 mg/kg, q 12 hours | 2 g, q 12 hours |
| Cefotaxime | 50 mg/kg, q 6 hours | 2 g, q 4-6 hours |
| Ceftazidime | 50 mg/kg, q 8 hours | 2 g, q 8 hours |
| Cefepime | 2 g, q 12 hours | 2 g, q 8-12 hours |
| Ampicillin | 75 mg/kg, q 6 hours | 2-3 g, q 4 hours |
| Nafcillin and oxacillin | 50 mg/kg, q 6 hours | 2 g, q 4 hours |
| Vancomycin | 15 mg/kg, q 6 hours | 10-15 mg/kg, q 8 hours |
| Gentamicin and tobramycin | 2.5 mg/kg, q 8 hours | 2 mg/kg, q 8 hours |
| Amikacin | 10 mg/kg, q 8 hours | 7.5 mg/kg, q 8 hours |
| Rifampin | 6.7 mg/kg, q 8 hours | 600 mg, q 24 hours |
| Meropenemab | 40 mg/kg, q 8 hours | 2 g, q 8 hours |
| Chloramphenicolb | 50 mg/kg, qid 4 hours | 50 mg/kg, qid 4 hours |

Use restricted to >3 months of age.

Use in the case of penicillin allergy.

**Prophylaxis of Close Contacts**

All individuals in close contact with an IMD-infected individual should receive chemoprophylaxis, regardless of previous meningococcal immunization. A number of antimicrobial agents are effective for chemoprophylaxis against *N. meningitidis* (Table 2).

**Prevention**

The most important form of prevention is a vaccine against *N. meningitidis.* Different countries have different strains of the bacteria and therefore use different vaccines. Five serogroups, A, B, C, Y and W135 are responsible for virtually all cases of the disease in humans. Vaccines are currently available against all five strains, including the newest vaccine against serogroup B. The first vaccine to prevent meningococcal serogroup B (meningitis B) disease was approved by the European Commission on 22 January 2013.

Vaccines offer significant protection from three to five years to more than eight years.

**Meningococcal vaccines**

CDC recommends vaccination with meningococcal conjugate vaccine for all preteens and teens. In certain situations, other children and adults could be recommended to get meningococcal vaccines. Below is more information about which meningococcal vaccines are recommended for people by age, as well as information on who should not get meningococcal vaccines.

Taking eculizumab increases the risk for meningococcal disease. Even after receiving meningococcal vaccines, one could still get meningococcal disease.

**Table 2.** Recommended chemoprophylaxis regimens for high-risk contacts and persons with invasive meningococcal disease

| Drug | Dose | Duration | Efficacy (%) | Cautions |
|---|---|---|---|---|
| **Rifampicin** | | | | |
| <1 month | 5 mg/kg, orally, every 12 hours | 2 days | | |
| ≥1 month | 10 mg/kg (maximum 600 mg), orally, every 12 hours | 2 days | 90-95 | Can interfere with efficacy of oral contraceptives and some seizure prevention and anticoagulant medications; may stain soft contact lenses. Not recommended for pregnant women. |
| **Ceftriaxone** | | | | |
| <15 years | 125 mg, intramuscularly | Single dose | 90-95 | To decrease pain at injection site, dilute with 1% lidocaine. |
| ≥15 years | 250 mg, intramuscularly | Single dose | 90-95 | To decrease pain at injection site, dilute with 1% lidocaine. |
| **Ciprofloxacin** | | | | |
| ≥1 month | 20 mg/kg (maximum 500 mg), orally | Single dose | 90-95 | |
| **Azithromycin** | | | | |
| *Azithromycin | 10 mg/kg (maximum 500 mg) | Single dose | 90 | Not recommended routinely. Equivalent to rifampin for eradication of *Neisseria meningitidis* from nasopharynx in one |

* Use only if fluoroquinolone-resistant strains of *N. meningitidis* have not been identified in the community.

**Preteens and teens**

There are two types of meningococcal vaccines for preteens and teens:

- ❏ Meningococcal conjugate vaccines
- ❏ Serogroup B meningococcal vaccines

All 11 to 12 year olds should be vaccinated with a meningococcal conjugate vaccine, with a booster dose given at 16 years old. All teens may also be vaccinated with a serogroup B meningococcal vaccine, preferably at 16 through 18 years old.

In addition to a meningococcal conjugate vaccine, certain preteens and teens should get a serogroup B meningococcal vaccine if they:

- ❏ Have a rare type of disorder (complement component deficiency)
- ❏ Are taking the medicine called eculizumab
- ❏ Have a damaged spleen or their spleen has been removed
- ❏ Are part of a population identified to be at increased risk because of a serogroup B meningococcal disease outbreak

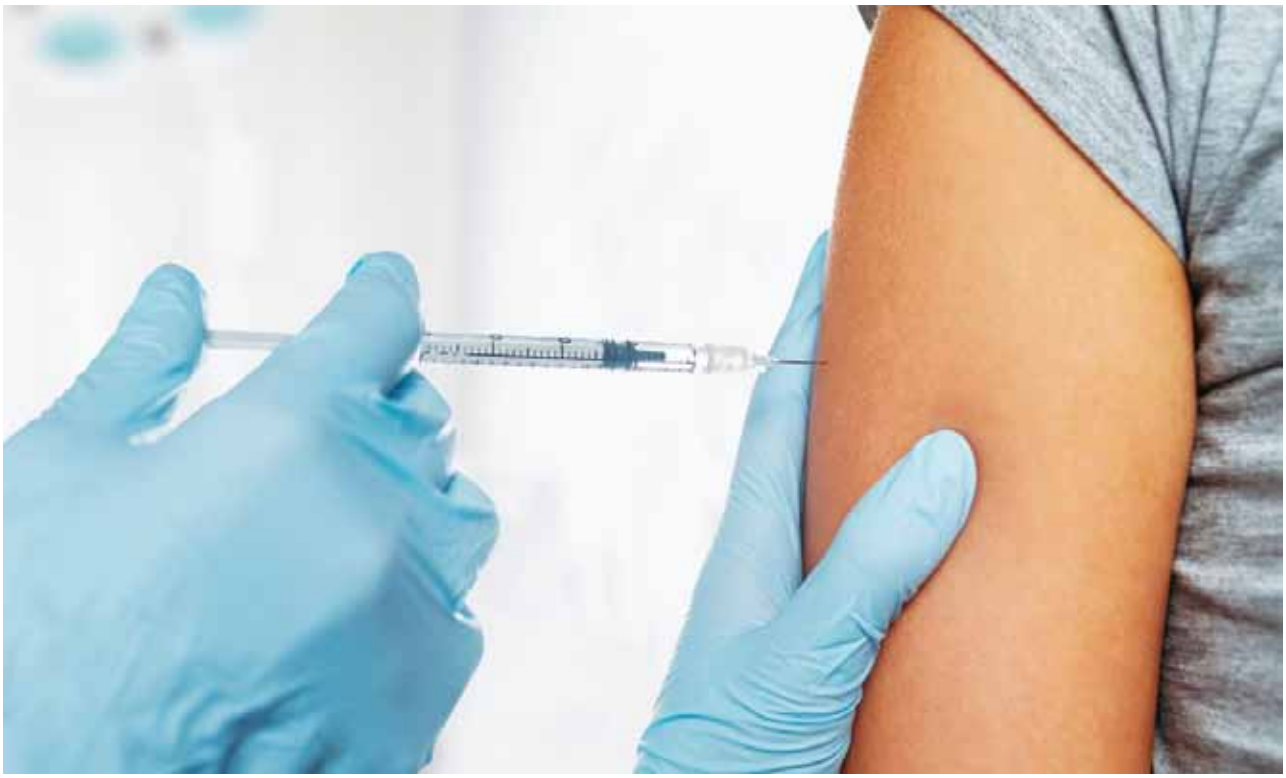
**Babies and children**

CDC recommends a meningococcal conjugate vaccine for children who are between 2 months and 10 years old, if they:

- ❏ Have a rare type of disorder (complement component deficiency)
- ❏ Are taking the medicine called eculizumab
- ❏ Have a damaged spleen or their spleen has been removed
- ❏ Have HIV
- ❏ Are traveling to or residing in countries in which the disease is common
- ❏ Are part of a population identified to be at increased risk because of a serogroup A, C, W or Y meningococcal disease outbreak

CDC recommends a serogroup B meningococcal vaccine for children 10 years or older if they:

- ❏ Have a rare type of disorder (complement component deficiency)
- ❏ Are taking a medicine called eculizumab
- ❏ Have a damaged spleen or their spleen has been removed
- ❏ Are part of a population identified to be at increased risk because of a serogroup B meningo-coccal disease outbreak
- ❏ Are taking a medicine called eculizumab
- ❏ Have a damaged spleen or their spleen has been removed
- ❏ Have HIV
- ❏ Are a microbiologist who is routinely exposed to *Neisseria meningitidis*
- ❏ Are traveling to or residing in countries in which the disease is common
- ❏ Are part of a population identified to be at increased risk because of a serogroup A, C, W, or Y meningococcal disease outbreak



**Adults**

Meningococcal vaccines are recommended for certain groups of adults at increased risk for meningococcal disease. Each meningococcal vaccine is listed below with which groups of adults are recommended to get it.

***Meningococcal conjugate vaccine recommendations***

Adults should get a meningococcal conjugate vaccine if they:

- ❏ Have a rare type of disorder (complement component deficiency)
- ❏ Are not up to date with this vaccine and are a first-year college student living in a residence hall
- ❏ Are a military recruit

***Serogroup B meningococcal vaccine recommendations***

Adults should get a serogroup B meningococcal vaccine if they:

- ❏ Have a rare type of disorder (complement component deficiency)
- ❏ Are taking a medicine called eculizumab
- ❏ Have a damaged spleen or their spleen has been removed

- Are a microbiologist who is routinely exposed to *Neisseria meningitidis*
- Are part of a population identified to be at increased risk because of a serogroup B meningococcal disease outbreak

**Vaccine guidline**

Because of age or health conditions, some people should not get certain vaccines or should wait before getting them.

Before taking vaccine following things are important:

**History of life-threatening allergic reaction or severe allergy.**

- Anyone who has ever had a life-threatening allergic reaction after a previous dose of a meningococcal vaccine should not get another dose of that vaccine.
- Anyone who has a severe allergy to any part of these vaccines should not get another dose of that vaccine. Healthcare professional can tell about the vaccine's ingredients.

**Pregnancy or breastfeeding women.**

- Meningococcal conjugate vaccines may be given to pregnant women who are at increased risk for serogroup A, C, W or Y meningococcal disease.
- Serogroup B meningococcal vaccines should only be given to pregnant or breastfeeding women who are at increased risk for serogroup B meningococcal disease who decide, after talking with a doctor, that the benefits of getting the vaccine outweigh the risk.

**Feeling unwell.**

- People who have a mild illness, such as a cold, can probably get the vaccine. People who are moderately or severely ill should probably wait until they recover. In that case advice from healthcare professional is necessary.

***Children***

Children 2-10 years of age who are at high risk for meningococcal disease such as certain chronic medical conditions and travel to or reside in countries with hyperendemic or epidemic meningococcal disease should receive primary immunization.

Although safety and efficacy of the vaccine have not been established in children younger than 2 years of age and under outbreak control, the unconjugated vaccine can be considered.

***Adolescents***

It is recommended that primary immunization against meningococcal disease with meningitis A,C,Y and W-135 vaccines for all young adolescents at 11-12 years of age and all unvaccinated older adolescents at 15 years of age. Although conjugate vaccines are the preferred meningococcal vaccine in adolescents 11 years of age or older, polysaccharide vaccines are an acceptable alternative if the conjugated vaccine is unavailable.

***Adults***

College students who plan to live in dormitories receive primary immunization with meningitis A, C, Y and W-135 vaccines, although the risk for meningococcal disease for college students 18-24 years of age is similar to that of the general population of similar age. College students consider vaccination against meningococcal disease to reduce their risk for the disease and state that college healthcare providers should take a proactive role in providing information about meningococcal disease to students and their parents.

Routine primary immunization against meningococcal disease is recommended for most adults living in endemic areas or planning to travel to such areas. Although conjugate vaccines are the preferred meningococcal vaccine in adults 55 years of age or younger, polysaccharide vaccines are an acceptable alternative for adults in this age group if the conjugated vaccine is unavailable. Since safety and efficacy of conjugate vaccines in adults older than 55 years of age have not been established to date, polysaccharide vaccines should be used for primary immunization in this group.

***Medical staff***

Healthcare people should receive routine immunization against meningococcal disease for laboratory personnel who are routinely exposed to isolates of *N. meningitidis.* Laboratory personnel and medical staff are at risk of exposure to *N. meningitides* or to patients with meningococcal disease. Hospital Infection Control Practices Advisory Committee (HICPAC) recommendations regarding immunization of healthcare workers that routine vaccination of healthcare

personnel is recommended. Any individual 11-55 years of age who wishes to reduce their risk of meningococcal disease may receive meningitis A,C,Y and W-135 vaccines and those older than 55 years of age. Under certain circumstances if unvaccinated health-care personnel cannot get vaccinated and who have intensive contact with oropharyngeal secretions of infected patients and who do not use proper precautions should receive anti-infective prophylaxis against meningococcal infection (i.e., 2-day regimen of oral rifampicin or a single dose of IM ceftriaxone or a single dose of oral ciprofloxacin).

***USA military recruits***

Because the risk of meningococcal disease is increased among USA's military recruits, all military recruits routinely receive primary immunization against the disease.

***Travelers***

Immunisation against meningococcal disease is not a requirement for entry into any country, unlike Yellow fever. Only Saudi Arabia require that travelers to their country for the annual Hajj and Umrah pilgrimage have a certificate of vaccination against meningococcal disease issued not more than 3 years and not less than 10 days before arrival in Saudi Arabia.

Travelers to or residents of areas where *N. meningitidis* is highly endemic or epidemic are at risk of exposure should receive primary immunization against meningococcal disease.

***HIV-infected individuals***

HIV-infected individuals are likely to be at increased risk for meningococcal disease; HIV-infected individuals who wish to reduce their risk of meningococcal disease may receive primary immunization against meningococcal disease.

Although efficacy of meningitis A,C,Y and W-135 vaccines have not been evaluated in HIV-infected individuals to date, HIV-infected individuals 11-55 years of age may receive primary immunization with the conjugated vaccine. Vaccination against meningitis does not decrease CD4+ T-cell counts or increase viral load in HIV-infected individuals and there has been no evidence that the vaccines adversely affect survival.

**Disease outbreak control**

Meningitis A,C,Y and W-135 vaccines can be used for large-scale vaccination programs when an outbreak of meningococcal disease occurs in Africa and other regions of the world. Whenever sporadic or cluster cases or outbreaks of meningococcal disease occur in the US, chemoprophylaxis is the principal means of preventing secondary cases in household and other close contacts of individuals with invasive disease. Meningitis A,C,Y and W-135 vaccines rarely may be used as an adjunct to chemoprophylaxis, one but only in situations where there is an ongoing risk of exposure (e.g., when cluster cases or outbreaks occur) and when a serogroup contained in the vaccine is involved.

It is important that clinicians promptly report all cases of suspected or confirmed meningococcal disease to local public health authorities and that the serogroup of the meningococcal strain involved be identified. The effectiveness of mass vaccination programs depends on early and accurate recognition of outbreaks. When a suspected outbreak of meningococcal disease occurs, public health authorities will then determine whether mass vaccinations (with or without mass chemoprophylaxis) is indicated and delineate the target population to be vaccinated based on risk assessment.

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# Periodontitis

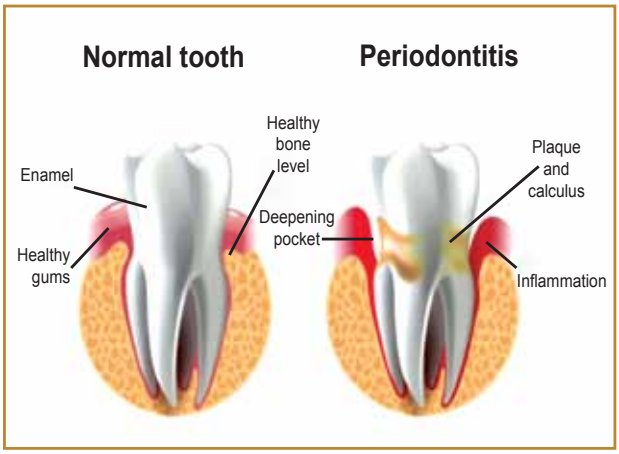
Periodontitis is an inflammatory reaction triggered by bacteria in dental plaque. There is loss of alveolar bone, formation of deep gum pockets and eventually loosening of teeth.

### Epidemiology of periodontitis

Periodontitis is very common and is widely regarded as the second most common dental disease worldwide, after dental decay and in the United States has a prevalence of 30-50% of the population, but only about 10% have severe forms.

### Pathophysiology

Periodontitis usually develops when gingivitis, usually with abundant plaque and calculus beneath the gingival margin, has not been adequately treated. In periodontitis, the deep pockets can harbor anaerobic organisms that do more damage than those usually present in simple gingivitis.




The organisms trigger chronic release of inflammatory mediators, including cytokines, prostaglandins, and enzymes from neutrophils and monocytes. The resulting inflammation affects the periodontal ligament, gingiva, cementum and alveolar bone. The gingiva progressively loses its attachment to the teeth, bone loss begins and periodontal pockets deepen. With progressive bone loss, teeth may loosen and gingiva recedes. Tooth migration is common in later stages and tooth loss can occur.

### Risk factors

Modifiable risk factors that contribute to periodontitis include-

- ❏ Plaque
- ❏ Smoking
- ❏ Obesity
- ❏ Diabetes
- ❏ Emotional stress
- ❏ Vitamin C deficiency

### Classification

The classifications describe based on the American Academy of Periodontology's (AAP) for periodontal diseases and conditions (1999):

- ❏ Chronic periodontitis (formerly called adult periodontitis)
- ❏ Aggressive periodontitis (formerly the early-onset and juvenile periodontitides)
- ❏ Periodontitis as a manifestation of systemic diseases
- ❏ Necrotizing ulcerative periodontitis (formerly called HIV periodontitis)

Other AAP designations are abscesses of the peridontium, periodontitis associated with endodontic lesions and developmental or acquired deformities and conditions. In developmental or acquired deformities and conditions, faulty occlusion, causing an excessive functional load on teeth plus the requisite plaque and gingivitis may contribute to progression of a particular type of periodontitis characterized by angular bony defects.

### Chronic periodontitis

Chronic periodontitis is the most common type of periodontitis. It occurs most often in adults > 35 yr, but adolescents and even children with primary dentition can be affected. It is characterized by its slow rate of progression, with periods of exacerbation and remission and also by a correlation between the extent of destruction and the presence of local factors such as plaque.

About 85% of the population is affected to a mild degree, but the most advanced cases are seen in < 5% of the population. Because of its slow progression, the patient's age at presentation is not always indicative of when the disease started. Patients with significant disease tend to be > 35 yr and tooth loss typically starts in a patient's 40s.

Based on the extent of disease, chronic periodontitis is classified further as

a) Localized: ≤ 30% of teeth affected

b) Generalized: > 30% of teeth affected

### Aggressive periodontitis

Aggressive periodontitis is much less common than chronic periodontitis. It usually occurs in children (sometimes before age 3 yr) or young adults but also occurs in older adults. It is characterized by its familial aggregation and rapid progression of bone loss and even tooth loss. The extent of destruction usually is disproportionate to the extent of plaque or calculus. By definition, patients have no systemic illness, whereas in periodontitis as a manifestation of systemic disease, patients do have a systemic illness. Neutrophil and macrophage/monocyte function may be abnormal.

**Localized aggressive periodontitis** (formerly called localized juvenile periodontitis), occurs mostly in healthy adolescents. Patients often have significant colonization of *Aggregatibacter actinomycetemcomitans* (formerly *Actinobacillus actinomycetemcomitans)* and a strong antibody response to infecting bacteria often occurs. Typically, the signs of inflammation are minor. The disease is detected by periodontal probing or x-rays, which show localized, deep (vertical) bone loss. Disease involves at least two of the 1st molars and incisors and no more than two other teeth. Bone loss progresses faster than in chronic periodontitis, often at a rate of 3 to 4μm/day; it is unclear whether localized aggressive periodontitis can be self-arresting.

**Generalized aggressive periodontitis** (formerly called rapidly progressive periodontitis) occurs mostly in patients aged 20 to 35. It is often associated with *A. actinomycetemcomitans, Porphyromonas gingivalis, Eikenella corrodens* and many gram-negative bacilli, but cause and effect are not clear. A weak antibody response to infecting bacteria often occurs. All teeth may be affected, which must include ≥ 3 that are not 1st molars or incisors.

**Prepubertal periodontitis,** an uncommon type of aggressive periodontitis (and not recognized in the 1999 AAP classification). It affects deciduous teeth, usually shortly after eruption. Generalized acute proliferative gingivitis and rapid alveolar bone destruction are its hallmarks. Patients also have frequent bouts of otitis media and are usually diagnosed by age 4 yrs. In some patients, the disease resolves before the permanent teeth erupt.

### Periodontitis as a manifestation of systemic disease

Periodontitis as a manifestation of systemic disease is considered in patients who have inflammation disproportionate to plaque or other local factors and who also have a systemic disease. However, distinguishing whether a disease is causing periodontitis or contributing to plaque-induced periodontitis is often difficult.

Systemic diseases associated with hematologic disease that can manifest as periodontitis include-

- ❏ Acquired neutropenia
- ❏ Agranulocytosis
- ❏ Leukemias
- ❏ Lazy leukocyte syndrome
- ❏ Hypogammaglobulinemia

Systemic diseases associated with genetic disorders that can manifest as periodontitis include

- ❏ Familial and cyclic neutropenia
- ❏ Down syndrome
- ❏ Leukocyte adhesion deficiency syndromes
- ❏ Papillon-Lefèvre syndrome
- ❏ Chédiak-Higashi syndrome
- ❏ Histiocytosis syndromes
- ❏ Glycogen storage disease
- ❏ Infantile genetic agranulocytosis
- ❏ Ehlers-Danlos syndrome (types IV and VIII)
- ❏ Hypophosphatasia
- ❏ Cohen syndrome
- ❏ Crohn's disease

### Necrotizing ulcerative periodontitis

Necrotizing ulcerative periodontitis is a particularly virulent, rapidly progressing disease. It is often called **HIV-associated periodontitis** because HIV is a common cause. Clinically, it resembles acute necrotizing ulcerative gingivitis combined with generalized aggressive periodontitis.

### Symptoms and signs

Pain is usually absent unless an acute infection forms in one or more periodontal pockets or if HIV-associated periodontitis is present. Impaction of food in the pockets can cause pain at meals.

Abundant plaque along with redness, swelling and exudate are characteristic. Gums may be tender and bleed easily and breath may be foul. As teeth loosen, particularly when only one third of the root is in the bone, chewing becomes painful.

**Diagnosis**

- ❏ Clinical evaluation
- ❏ Sometimes dental x-rays

Inspection of the teeth and gingiva combined with probing of the pockets and measurement of their depth are usually sufficient for diagnosis. Pockets deeper than 4 mm indicate periodontitis.

Dental x-rays reveal alveolar bone loss adjacent to the periodontal pockets.

**Treatment**

- ❏ Treatment of risk factors
- ❏ Scaling and root planning
- ❏ Sometimes oral antibiotics, antibiotic packs or both
- ❏ Surgery or extraction

Treatment of modifiable risk factors such as poor oral hygiene, diabetes and smoking improves outcomes.

For all forms of periodontitis, the first phase of treatment consists of thorough scaling and root planing (removal of diseased or toxin-affected cementum and dentin followed by smoothing of the root) to remove plaque and calculus deposits. Thorough home oral hygiene is necessary and includes careful brushing, flossing and use of a rubber tip to help clean. It may include chlorhexidine swabs or rinses. The patient is reevaluated after 3 weeks. If pockets are no deeper than 4 mm at this point, the only treatment needed is regular cleanings. Sometimes a flap of gum tissue is made to allow access for scaling and planning of deeper parts of the root.

If deeper pockets persist, systemic antibiotics can be used. In addition, a gel containing doxycycline or microspheres of minocycline can be placed into isolated recalcitrant pockets. These drugs are resorbed in 2 weeks.

Another approach is to surgically eliminate the pocket and recontour the bone (pocket reduction/elimination surgery) so that the patient can clean the depth of the normal crevice between the tooth and gingiva. In certain patients, regenerative surgery and bone grafting are done to encourage alveolar bone growth. Splinting of loose teeth and selective reshaping of tooth surfaces to eliminate traumatic occlusion may be necessary. Extractions are often necessary in advanced disease. Contributing systemic factors should be controlled before initiating periodontal therapy.

Ninety percent of patients with necrotizing ulcerative periodontitis due to HIV (HIV-associated periodontitis) respond to combined treatment with scaling and planning, irrigation of the sulcus with povidone-iodine, regular use of chlorhexidine mouth rinses, and systemic antibiotics, usually metronidazole 250 mg per oral three times a day for 14 days.

Localized aggressive periodontitis requires periodontal surgery plus oral antibiotics (eg, amoxicillin 500 mg four times a day or metronidazole 250 mg three times a day for 14 days).

**Prevention**

Good oral hygiene is paramount to preventing gum disease. Most people clean their teeth with a toothbrush but also cleaning between teeth is important to help prevent gum problems. This can either be with floss, toothpicks or interdental brushes.

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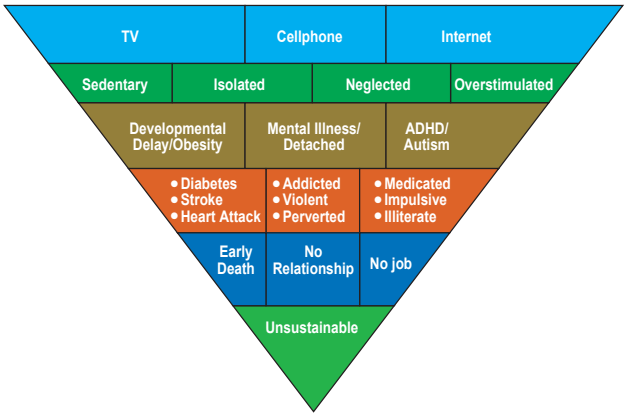
# Technological Abuse in Children



Reminiscing about the good old days when people were growing up is a memory trip well worth taking when trying to understand the issues facing the children of today. A mere 20 years ago, children used to play outside all day, riding bikes, playing sports and building forts. Masters of imaginary games, children of the past created their own form of play that didn't require costly equipment or parental supervision. Children of the past moved a lot and their sensory world was nature based and simple. In the past, family time was often spent doing chores and children had expectations to meet on a daily basis. The dining room table was a central place where families came together to eat and talk about their day and after dinner became the center for baking, crafts and homework.

Children now rely on technology for the majority of their play, grossly limiting challenges to their creativity and imaginations, as well as limiting necessary challenges to their bodies to achieve optimal sensory and motor development. Sedentary bodies bombarded with chaotic sensory stimulation are resulting in delays in attaining child developmental milestones, with subsequent negative impact on basic foundation skills for achieving literacy. Hard-wired for high speed, today's young are entering school struggling with self-regulation and attention skills necessary for learning, eventually becoming significant behavior management problems for teachers in the classroom.

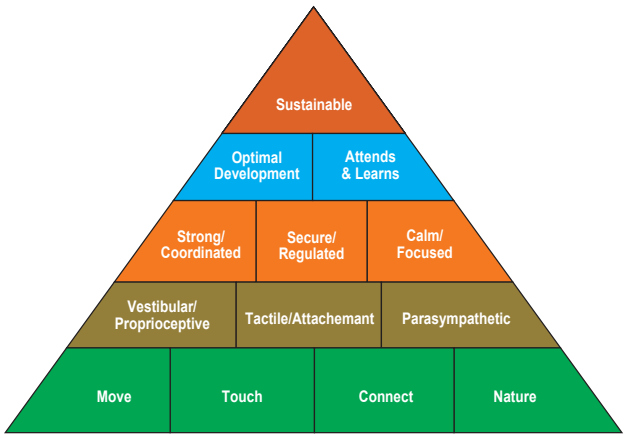
Children's developing sensory, motor and attachment systems have biologically not evolved to accommodate this sedentary, yet frenzied and chaotic nature of today's technology. The impact of rapidly advancing technology on the developing child has seen an increase of physical, psychological and behavior disorders that the health and education systems are just beginning to detect. Child obesity and diabetes are now national epidemics in both Canada and the U.S., causally related to technology overuse. Diagnoses of ADHD, autism, coordination disorder, developmental delays, unintelligible speech, learning difficulties, sensory processing disorder, anxiety, depression and sleep disorders are associated with technology overuse and are increasing at an alarming rate. An urgent closer look at the critical factors for meeting developmental milestones and the subsequent impact of technology on those factors, would assist parents, teachers and health professionals to better understand the complexities of this issue and help create effective strategies to reduce technology use.




**Virtual Futures**

Four critical factors necessary to achieve healthy child development are movement, touch, human connection and exposure to nature.

These types of sensory inputs ensure normal development of posture, bilateral coordination, optimal arousal states and self-regulation necessary for achieving foundation skills for eventual school entry. Young children require 2-3 hours per day of active rough and tumble play to achieve adequate sensory stimulation to their vestibular, proprioceptive and tactile systems. Tactile stimulation received through touching, hugging and play is critical for the development of praxis or planned movement patterns.




**Building Foundations**

Touch also activates the parasympathetic system lowering cortisol, adrenalin and anxiety. Nature and green space has not only a calming influence on children, but also is attention restorative and promotes learning.

# Technological Abuse in Children

Children who overuse technology report persistent body sensations of overall shaking, increased breathing and heart rate and a general state of unease. This can best be described as a persistent hypervigilant sensory system, still on alert for the oncoming assault. While the long term effects of this chronic state of stress in the developing child are unknown, it's well known that chronic stress in adults results in a weakened immune system and a variety of serious diseases and disorders.

**Impacts of mobile phones / TABs on children:**

Today's children are growing up in a radio-frequency environment that never existed in human history before. The radiation emitted by mobile phones and mobile phone masts can have adverse effects on children. Some include:

**1. Health hazard:**

The Journal of the American Medical Association stirred the debate when it investigated the repercussion the mobile phones could have on the brain activity. The possible health hazards of mobile phones for children are as follows:

***a. Non-malignant tumors:***

The study has shown that children who use mobile phones have a possibility of developing non-malignant tumor in the brain and ear.

***b. Cancer:***

The WHO has classified cell phone radiation as 'possibly carcinogenic to humans'. Children absorb more than 60 percent of the radiation into the brain than adults. Their brain's thinner skin, tissues and bones allow them to absorb the radiation twice than the grown-ups. Their developing nervous system makes them more vulnerable to this 'carcinogen'.

***c. Effects on the brain:***

Scientists have discovered that just 2 minutes of the phone call can alter the electoral activity of the kid's brain for up to an hour. The radio waves from the mobile penetrate deep into the brain, not just around the ear. The disturbed brain activity could impair children's learning ability and other behavioral problems. It could even affect their mood and ability to learn in the classroom if they have used the phone during the break time.

**2. Academics:**

Children, just like the teens, are addicted to mobile phones. They play games, chat and talk to their friends on their mobile phone all the time.

Along with the school supplies, many students make their daily trips to their school with their mobile phones. They talk on the phone during the free time and send messages during the classes. Thus, they miss the lesson taught and fall behind the other students.

**3. Inappropriate behavior:**

Use of cell phones can lead children to engage in inappropriate behaviors. Texting and sending inappropriate pictures is a growing problem with teens. The images go in the wrong hands, giving others access to the private photos. Children can also access pornographic sites from their multimedia devices.

**4. Malpractice in exams:**

Most of the students indulge in exam malpractices and cheating during the internal and external examinations. Some make use of calculator while other store information in it. Some also use it to send objective answers to those in the examination hall. It can end the student's career if caught.

**Mobile phone safety for kids:**

Parents must take preventive measures to minimize children's exposure to the harmful effects of mobile phones. These include:

- ❏ Children's should not have mobile phone before 16 years old. A child's brain is too sensitive to withstand the effects of mobile radiation.
- ❏ Children's should not hold a mobile phone directly up to head. Use an air-tube headset instead.
- ❏ Calling in buses, trains, cars and elevators should be strictly avoided. The mobile phone works harder to get the signal out through the metal, which increases the power level.
- ❏ Children's should not use cell phone when the signal is weak. It will increase the power to the maximum, as the phone attempts to connect to a new relay antenna.
- ❏ Everyone should limit the use of cell phone around children.

- Make sure that there is no mobile phone mast or network tower near home or school.
- Children should not take mobile phones to school.
- People should not leave mobile phones in children's bedroom at night.

**Impacts of television on children**

TV affects children negatively as well. Unfortunately, the adverse effects seem to outnumber the positive ones. Here are a few ways in which TV can be a bad influence on children.

**1. Curbs physical activity**

The term "couch potato" was framed after televisions came into living rooms. Addiction to TV shows reduced the amount of physical activity in children. Sometimes, they refuse to do anything else but watch TV all day.

- Lack of proper physical activity and too much screen time can lead to vision problems.
- Research has also indicated that there is a direct connection between TV time and obesity in kids.

**2. Impacts social development**

Kids who watch a lot of TV do not have time to play or socialize.

Less or no interaction with peers can affect their social development. TV eats away the time they get to interact with other children in their social circle, which may affect their knowledge and understanding of social interactions and behavior.

**3. Affects brain development and behavior**

TV may be educational, but excessive watching could affect child's brain development, according to studies. The first couple of years in child's life are very important for brain development.

- Researchers in Japan found that watching TV too much can alter the brain structure.
- Another study by The John Hopkins University states that toddlers who watch television for more than two hours a day can have behavioral problems.

Even educational shows like Sesame Street and Dora the Explorer are good for children aged six or above.

**4. Exposure to vices**

It cannot be controlled what is shown on television. Parents may also not always be able to control what kid watches on the TV.

- Early exposure to inappropriate content that has sex, alcohol and drugs, could bring up questions in children, the answers to which may be too complicated for them to understand. The worst part is that early exposure can even give them a distorted view of these elements.
- The violence portrayed in a "positive" light in superhero movies and the like give them an idea that it is "okay" to be violent. So kids watching TV shows based on superheroes may start believing that violence is not bad.
- It may even encourage violent and aggressive behavior in some kids, which can be detrimental to their social development. In some children, this behavior may surface immediately while in some, it could come up during the later years.

**5. Gives a distorted view of the world**

Television might lead to the "scary world syndrome" in kids.

- Movies and other television shows may exaggerate reality and create extremely violent scenes online, which may be terrifying for kids.
- The amount of violence and guns used on TV may give them an impression that the world is an unsafe place for them.
- At the same time, animated and cartoon shows, which underplay the effects of violence may desensitize kids to the real world events.

**6. Consumerism**

Another bane of television is consumerism. The number of ads that a child sees on TV exposes them to a variety of brands and products that they may not need.

- Commercials encourage kids to consume unhealthy foods and drinks.
- Children begin to believe that fast food, ice creams and carbonated drinks are good.
- Parents become the victims of consumerism as kids insist on buying something that they saw on

TV. They are forced to spend money on things that their children want but do not need.

**What can parents do -**

Parents have to take a stand when it comes to television. To protect children from the damaging effects of television, here is the list of things that can be done.

**1. To choose the right TV shows**

The first step is to figure out what shows are appropriate for children. It is essential to do some research to understand the content and the message that the show sends out to the audience. It is not wise to pick a show just because it is for children. Following factors should be kept in mind before decide what to watch for kids:

- ❏ The content of the show must be appropriate for child's age.
- ❏ To pick shows with shorter duration. The longer child's watch, the more the chances of them getting addicted.
- ❏ To check the tone and pace of the show, cause it's very harmful for kids to watch an energetic show before going to bed.
- ❏ Watching commercials could be damaging to child's fragile mind. Kids are naive and commercials can be manipulative as their primary goal is to sell products by convincing their impressionable audience.
- ❏ To encourage children to watch educational programs.

**2. To limit TV time for kids**

- ❏ Not to use television during mealtime: People should not allow kids to watch TV while they are eating.
- ❏ To remove TV from the bedroom: TV in bedrooms is a bad idea, especially for kids as prolonged exposure to screens can affect their sleeping habits.
- ❏ TV as a babysitter: It is common for parents to use the television as a babysitter when they want to do something without being disturbed by kids. But it should be consider that during this time kids may expose to inappropriate content.
- ❏ Television in the background: It is common to leave the TV turned on in the background when people are busy in the kitchen, doing the laundry or working from home. That will only draw the child's attention to the idiot box.
- ❏ To set TV time rules for school days: To chalk out specific TV times for kids for weekdays and weekends and stick to them. That will prevent them from watching too much TV on any given day.

**3. Make it a family activity**

Make watching TV a fun family activity, instead of a means to pass the time. That will discourage children to watch it when they are bored or alone at home.

It's important to come together as parents, teachers and therapists to help society wake up and see the devastating effects technology is having not only on child's physical, psychological and behavioral health, but also on their ability to learn and sustain personal and family relationships. While technology is a train that will continually move forward, knowledge regarding its detrimental effects and action taken toward balancing the use of technology with critical factors for development, will work toward sustaining children. While no one can argue the benefits of advanced technology in today's world, connection to these devices may have resulted in a disconnection of children from the society. Rather than hugging, playing, rough housing and conversing with children, parents are increasingly resorting to providing their children with more TV, video games and the latest iPads and cell phone devices, creating a deep and irreversible chasm between parent and child.

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VOL 25 NO 1 March 2018

Gastric cancer is one of the major causes of cancer mortality world-wide. It is the fourth leading cause of cancer death worldwide. The overall prognosis is poor, with less than 30% surviving rate 5 years, although better results are obtained in Japan where the disease is common. It rarely disseminates widely before it has involved the lymph-nodes.

Early diagnosis is necessary for better prognosis. The only curative treatment modality is resectional surgery.

**Incidence**

There is marked geographical variations in the incidence worldwide. The disease is most common in Japan, China, Korea, and Eastern-Europe. In Japan the incidence of the disease is approximately 70 cases per 100,000 populations and in the UK it is about 15 cases per 100,000 populations.

There are small geographical areas in China where the incidence is double that in Japan. These underlying epidemiological data make it clear that this is an environmental disease. Studies of Japanese migrants to the USA have revealed a much lower incidence in second generation migrants, confirming the importance of environmental factors.

Men are more affected by the disease than women the incidence increases with age.

**Pathophysiology**

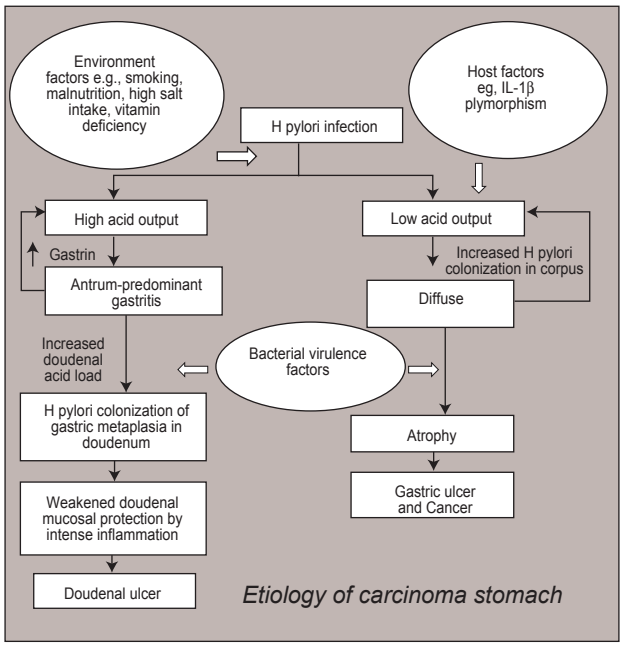
There are so many factors responsible for gastric cancer. But *H. Pylori* infection plays a key pathogenic role. But other factors are also important. *H. Pylori* seem to be principally associated with the carcinoma of the body of the stomach. It has been estimated that *H. Pylori* infection may contribute to the occurrences of gastric cancer almost 65-70% of cases.

Some other risk factors have been identified in association with gastric cancer like smoking, Alcohol, dietary associations (salted, smoked, or pickled foods and consumption of nitrates and diet lacking vitamin a, vitamin c, fresh fruit and vegetables), pernicious anemia, adenomatous gastric polyps, previous partial gastrectomy(>20 years) , menetrier's disease, familial adenomatous polyposis, hereditary diffuse gastric cancer families (HDC-1 mutations).

**Clinical features**

Gastric cancer is usually asymptomatic in early stage but the features of advanced gastric cancer are usually obvious. In advanced stage, Two thirds of patients have weight loss and ulcer like pain.

Early satiety, bloting, distention, hematemesis, malena, vomiting may occur in advanced stage but anorexia, nausea may occur in early stage.



*Etiology of carcinoma stomach*

Anemia from occult bleeding is also common. Dysphagia may occur in tumor of the gastric cardia which obstruct the gastro-esophageal junction. With pyloric involvement the presentation may be of gastric outlet obstruction.

Jaundice and ascities may be seen in case of metastasis. Metastatic lymph node may be palpable, most commonly left supraclavicular lymph node (Virchow's node) that is called troisier's sign.

Tumor spread also occurs to umbilicus (Sister Joseph's nodule) or ovaries (Krukenberg tumor). Paraneoplastic syndrome like acanthosis nigrican, thrombophlebitis (Trousseau's sign) and dermatomyositis also occur but very rare. Metastases arise most commonly in the liver, lungs, peritoneum and bone marrow.

**Staging**

The international union against cancer (UICC) staging system is shown in the table below-

**TNM STAGING OF GASTRIC CANCER**

**T Primary tumour**

| | |
|---|---|
| T0 | No evidence of primary tumour |
| Tis | Noninvasive carcinoma in situ |
| T1a | Extension to lamina propria or Muscularis mucosa |
| T1b | Extension to submucosa |
| T2 | Extension to serosa |
| T3 | Extension through serosa |
| T4 | Invasion of adjacent organs |

**N Regional lymph nodes**

| | |
|---|---|
| N0 | No regional nodal metastases |
| N1 | Metastases in 1 to 6 regional lymphnodes |
| N2 | Metastases in 7 to 15regional Lymph nodes |
| N3 | Metastases in more than 15 regional Lymph nodes |

**M Distant metastases**

M0 No Distant metastases

M1 Distant metastases present

**Staging:**

**Stage 0 :** This is also called carcinoma in situ. The cancer is found only on the surface of the epithelium. The cancer has not grown into any other layers of the stomach. This stage is considered an early cancer (Tis, N0, M0).

**Stage IA :** The cancer has grown into the inner layer of the wall of the stomach. It has not spread to any lymph nodes or other organs (T1, N0, M0).

**Stage IB :** Stomach cancer is called stage IB in either of these 2 conditions:

- The cancer has grown into the inner layers of the wall of the stomach. It has spread to 1 to 2 lymph nodes but not elsewhere (T1, N1, M0).
- The cancer has grown into the outer muscular layers of the wall of the stomach. It has not spread to the lymph nodes or other organs (T2, N0, M0).

**Stage IIA :** Stomach cancer is called stage IIA for any 1 of these conditions:

- The cancer has grown into the inner layer of the wall of the stomach. It has spread to 3 to 6 lymph nodes but not elsewhere (T1, N2, M0).
- The cancer has grown into the outer muscular layers of the wall of the stomach. It has spread to 1 to 2 lymph nodes but not elsewhere (T2, N1, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach. It has not grown into the peritoneal lining or serosa or spread to any lymph nodes or surrounding organs (T3, N0, M0).

**Stage IIB :** Stomach cancer is called stage IIB for any 1 of these conditions:

- The cancer has grown into the inner layers of the wall of the stomach. It has spread to 7 or more lymph nodes but not elsewhere. (T1, N3, M0).
- The cancer has invaded the outer muscular layers of the wall of the stomach. It has spread to 3 to 6 lymph nodes but not elsewhere (T2, N2, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach but has not grown into the peritoneal lining or serosa. It has spread to 1 to 2 lymph nodes but not elsewhere (T3, N1, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach. It has grown into the peritoneal lining or serosa, but it has not spread to any lymph nodes or surrounding organs (T4, N0, M0).

**Stage IIIA :** Stomach cancer is called stage IIIA for any 1 of these conditions:

- The cancer has grown into the outer muscular layers of the stomach wall. It has spread to 7 or more lymph nodes but not to other organs (T2, N3, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach but has not grown into the peritoneal lining or serosa. It has spread to 3 to 6 lymph nodes but not to other organs (T3, N2, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach. It has grown into the peritoneal lining or serosa and has spread to 1 to 2 lymph nodes but not to other organs (T4, N1, M0).

**Stage IIIB :** Stomach cancer is called stage IIIB for any of these conditions:

- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach but has not grown into the peritoneal lining or serosa. It has spread to 7 or more lymph nodes but has not invaded any surrounding organs (T3, N3, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach and has grown into the peritoneal lining or serosa. It has spread to 3 to 6 lymph nodes but has not spread elsewhere (T4, N2, M0).
- The cancer has grown through all of the layers of the muscle into the connective tissue outside the stomach and has grown into nearby organs or structures. It may or may not have spread to 1 to 2 lymph nodes but not to distant parts of the body (T4, N0 or N1, M0).

**Stage IV :** Stage IV stomach cancer describes a cancer of any size that has spread to distant parts of the body in addition to the area around the stomach (any T, any N, M1).

**Investigation**

- Upper gastrointestinal endoscopy with biopsy.
- Barium meal X-Ray
- CT Scan of Abdomen

Upper gastrointestinal endoscopy with biopsy is the investigation of choice. Multiple biopsies from the base and the edge of a gastric ulcer are required. CT Scan will provide evidence of intra-abdominal spread or liver metastases.

Barium meal is a poor alternative since any abnormalities must be followed by endoscopy and biopsy.

**Management**

Treatment options are-

- Surgery (total gastrectomy).
- Surgery followed by chemoradiation therapy or chemotherapy.
- Chemotherapy given before and after surgery.
- A clinical trial of surgery followed by chemoradiation therapy testing new anticancer drugs.

**Surgery**

- Total gastrectomy: In this procedure stomach is removed with the tissue of the entire greater omentum and lesser omentum. The gastrointestinal continuity is reconstituted by means of a Roux loop. The Roux loop may be placed in either an anticolic or retrocolic position.

Total gastrectomy with lymphadenectomy is the operation of choice, preserving the spleen if possible.

- Subtotal gastrectomy: If tumours are distally placed in the stomach it appears unnecessary to remove whole stomach. A subtotal gastrectomy is very similar to a total gastrectomy except that the proximal stomach is preserved.
- Palliative treatment: Palliative surgery and chemotherapy are done for improving survival and palliation of symptoms. 5-fluorouracil, cisplatin ECF or other platinum and taxane-based regimens are used for palliative chemotherapy. The biological agent trastuzumab may benefit some patients whose tumours over express HER-2.Carcinomas at the cardia or pylorus may require endoscopic dilatation or insertion of expandable metallic stents for relief of dysphagia and vomiting. Recanalisation appers to offer better functional results.

**Postoperative complication**

Early and late post-operative complications are given below

- Short term:
  - ✓ Intra-abdominal bleeding
  - ✓ Subphrenic abcesss
  - ✓ Anastomotic leak
  - ✓ Pancreatic fistula
  - ✓ Duodenal stump leak
- Long term:
  - ✓ Weight loss
  - ✓ Diarrhoea
  - ✓ Dumping syndrome
  - ✓ Alkaline reflux

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# Medical Breakthroughs - 2018

Things move fast in the world of modern medicine but if expert predictions about what to expect in 2018 prove true, they might move at a quicker speed than anyone anticipated. It could also see technology companies start to become as important a player in the healthcare world as pharmaceutical companies.

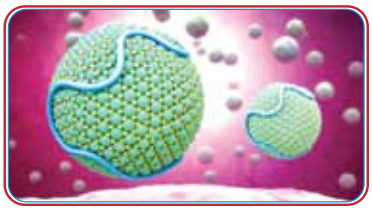
**Gene therapy for retinal diseases**

In a historic move, the FDA has approved gene therapy for inherited retinal diseases. The approval signals a new era for gene therapy, which suffered setbacks for years but is now pressing forward.

Patients that have a defective gene called RPE65, which is responsible for producing a protein that makes light receptors in the eye, suffer from leber congenital amaurosis and retinitis pigmentosa, yet now have hope. The treatment made by Spark Therapeutics is called Luxturna. It is injected into the eye and uses a benign virus to deliver healthy copies of the gene to the retina. While not a cure, it can improve eyesight substantially, according to researchers. But it comes with a whopping price tag: $850,000 per onetime treatment. This breakthrough can be a big first step in medicine.

**Big reductions in LDL cholesterol**

Bad cholesterol known as low density lipoprotein (LDL), is a major factor in heart disease. And certain new drug combinations can lower LDL levels by 75 percent.



PCSK9 inhibitors, along with statins, have proved especially powerful at reducing bad cholesterol numbers. That could also help people truly change their lifestyles to focus more on healthy living. A number of trials are testing this theory now to see just how low LDL levels should go. Doctors now have the tools and research to help reduce cardiovascular death

**A better night's sleep**

Sleep apnea affects 22 million people and can lead to high blood pressure, heart disease and stroke. Popular treatments, like a CPAP machine, might be effective but they still make sleeping difficult for people with sleep apnea.

That's why it is estimated that more than 40 percent of sleep apnea patients refuse to wear the device. Neuromodulation is a new way to treat apnea. Think of it as a pacemaker for poor sleepers. The implant is controlled by a wearable patch that is worn during sleep that stimulates the patient and ensures key airwaves are kept open during sleep. Clinical tests have been encouraging and they're certainly more comfortable for patients than a CPAP device.

**An artificial pancreas**

Diabetes kills more Americans every year than AIDS and breast cancer combined, according to the American Diabetes Association. Now the 1.25 million Americans who suffer from Type 1 diabetes might have a ray of hope on the horizon: A hybrid close-loop insulin delivery system that began rolling out last May.

The technology, essentially an artificial pancreas is expected to become more widespread this year as more patients demand the technology and more insurers reimburse the system. It uses computer algorithms to automatically and continuously deliver an adequate supply of insulin to the body. Approved by the FDA, it enables direct communication between a glucose monitoring device and an insulin pump to stabilize a person's blood glucose level. Ultimately, that could be good news for people with Type 2 diabetes, which is much more common.

## Test Yourself - 45

**Correct Answers :**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | B | 2. | A | 3. | D | 4. | A | 5. | D | 6. | c |

**CONGRATULATIONS!**

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## Test Yourself - 46

**1. The followings are true for "Ca- Stomach" except:**

a. The incidence is most common in Japan, China, Korea and Eastern-Europe.

b. H. Pylori seem to be principally associated with the carcinoma of the pylorus of the stomach.

c. Anorexia, nausea may occur in the early stage of the disease.

d. In case of metastasis most commonly left supraclavicular lymph node may be palpable.

**2. All the followings are correct for "Periodontitis" except:**

a. It is the second most common dental disease worldwide after dental decay .

b. Chronic periodontitis occurs most often in adults < 35 but adolescents and even children can be affected.

c. Smoking, obesity, diabetes are among the modifiable risk factors that contribute to periodontitis.

d. Abundant plaque along with redness, swelling and exudates are characteristic..

**3. All the below are true for "Technological Abuse" except:**

a. ADHD, autism, coordination disorder, learning difficulties are solely associated with technology overuse.

b. Touch, movement, human connection and exposure to nature are the four critical factors necessary for healthy child development.

c. Children absorb more than 60 percent of cell phone radiation into the brain than adults.

d. Toddlers who watch television for more than two hours a day can have behavioral problems.

**4. All the followings are correct for "Meningococcal Disease" except:**

a. Meningitis and meningococcemia are major causes of illness, death and disability in both developed and underdeveloped countries.

b. It can be transmitted through saliva and occasionally through close prolonged contacts with an infected person.

c. Cases of meningococcemia leading to severe meningoencephalitis are rare among young children and the elderly.

d. Meningococcal disease was first described in Geneva in 1805.

**5. The followings are right for "Ca-Stomach" except:**

a. In TNM stage IA the cancer does not spread to any lymph nodes or other organ.

b. Upper gastrointestinal endoscopy with biopsy is the only diagnostic investigations.

c. Intra-abdominal bleeding, subphrenic abscesses pancreatic fistula are among the short term postoperative complications,

d. It is the fourth leading cause of cancer death worldwide.

**6. All the followings are correct for "Meningococcal Disease" except:**

a. Carrier rates depend on age and the highest rate is found in young adults at 20% - 40 %.

b. Like many other gram-negative blood infections, meningococcemia can cause disseminated intravascular coagulation.

c. Serogroups A, B, C and Y are responsible for virtually all cases of the disease in humans.

d. HIV- infected persons are likely to be an increased risk for meningococcal disease

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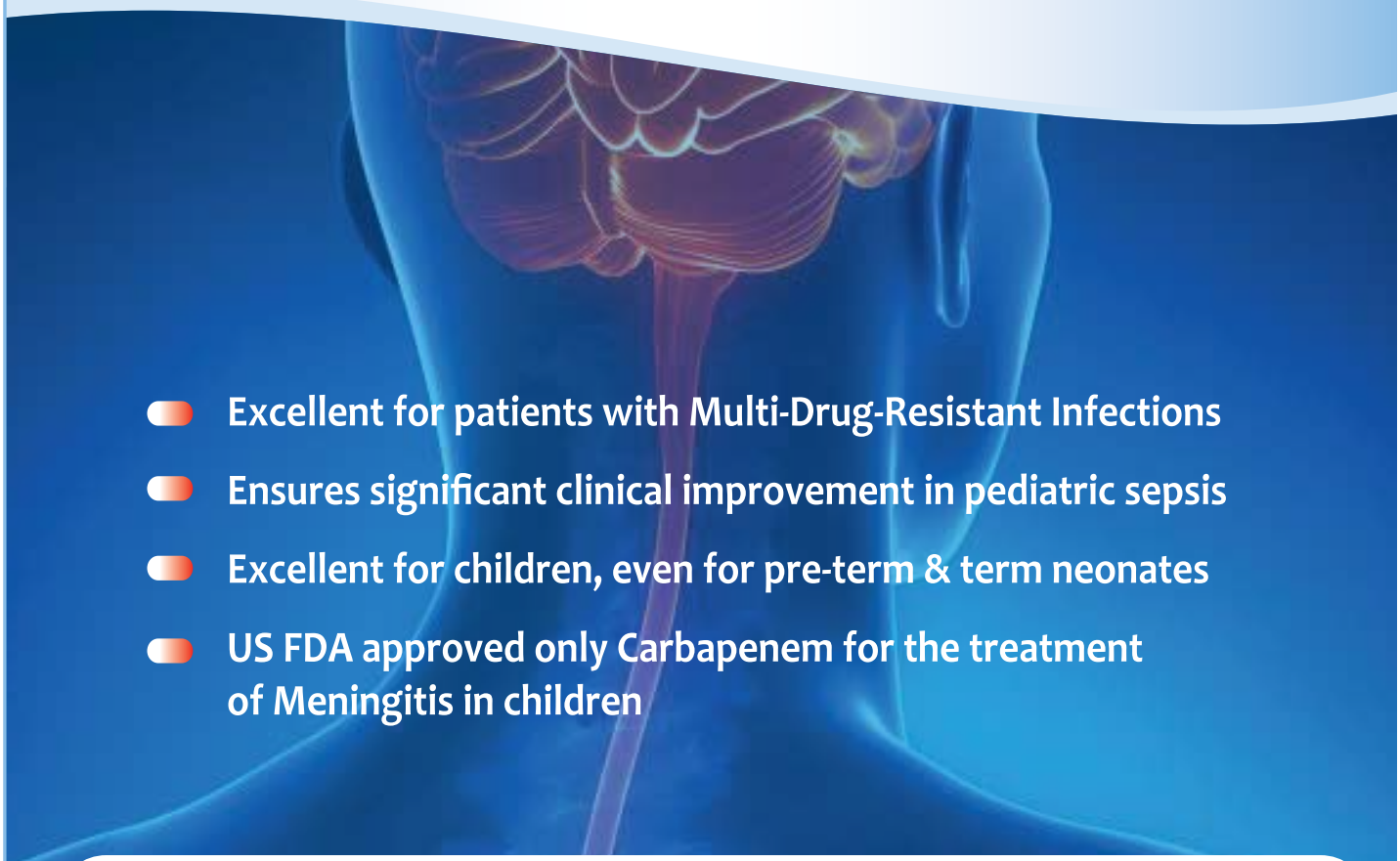

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