

# Gastroenteritis



Assoc.Prof. Murat Sayan

Kocaeli Üniversitesi, Rutin PCR Lab. Sorumlu Öğt.Üyesi

Yakın Doğu Üniversitesi, DESAM Kurucu Öğrt. Üyesi

[sayanmurat@hotmail.com](mailto:sayanmurat@hotmail.com)

0533 6479020

Medical Virology,  
11 Dec 2015.

### **Contents of Teaching in Medical Virology Lecture:**

1. [Introduction to virology](#)
2. [Laboratory diagnosis](#)
3. [Childhood illnesses](#)
4. [Human herpesviruses](#)
5. [Respiratory infections](#)
6. **Gastroenteritis**
7. [Acute neurological syndromes](#)
8. [Hepatitis](#)
9. [Human retroviruses](#)
10. [Human papillomaviruses](#)

# Gastroenteritis

## Clinical features

- Infection occurs via the faecal-oral route.
- Viral gastro-enteritis has a short incubation period (about 24 hours).
- It presents with a sudden onset of vomiting and profuse watery (secretory) diarrhoea.
- The condition is self limiting and lasts for 2-3 days.
- Morbidity and mortality is due to dehydration and young infants are at greatest risk.

## Pathogenesis

- Viruses infect enterocytes of the upper small bowel, causing inflammation and transient blunting of the villi.
- In addition, some viruses (such as rotavirus) produce enterotoxins that promote fluid and electrolyte loss from enterocytes.
- Virus is cleared and symptoms resolve with the development of a local immune response.
- Specific secretory IgA antibodies confer immunity and prevent symptomatic re-infections with antigenically related viruses.

The four commonest  
viral causes of diarrhoea are:

- Rotaviruses
- Caliciviruses (Norovirus and Sapovirus)
- Adenoviruses
- Astroviruses

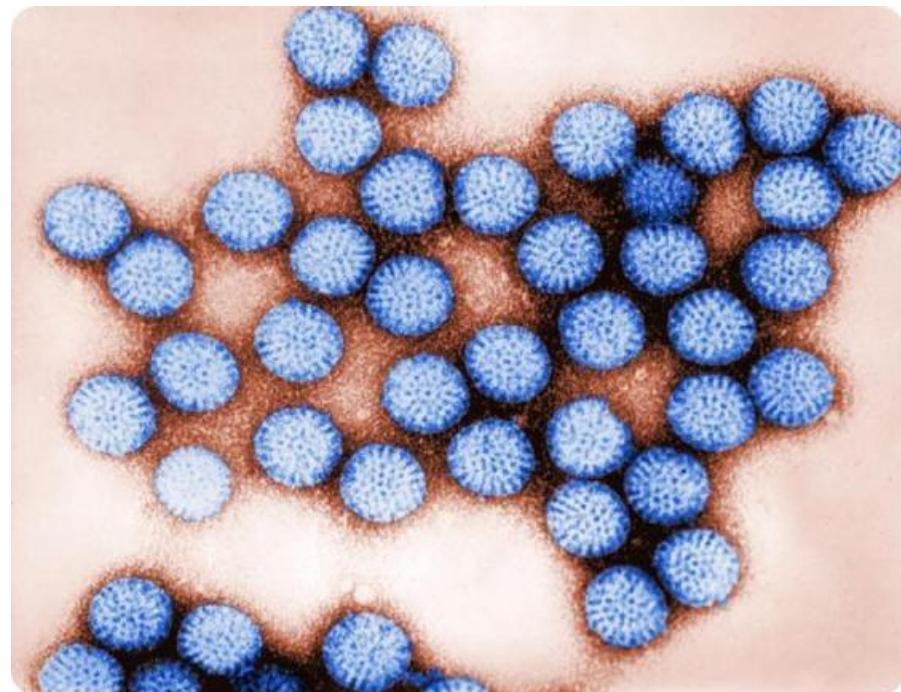
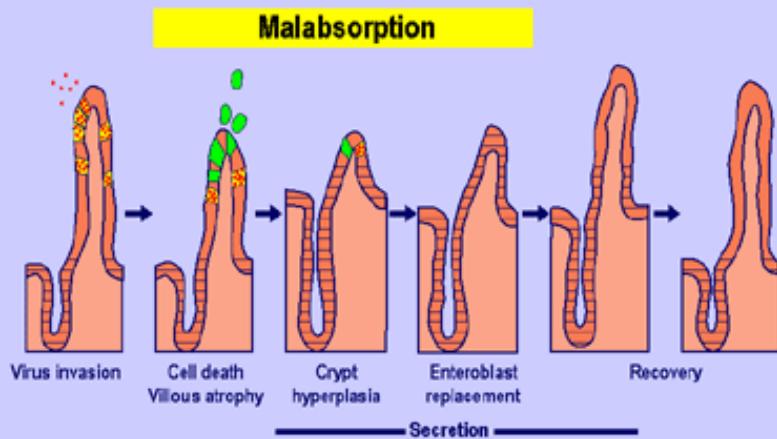
## Virology of diarrhoeal viruses

	Rotavirus	Norovirus	Adenovirus	Astrovirus
Family	Reoviridae	Caliciviridae	Adenoviridae	Astroviridae
Genome type	dsRNA	ssRNA	dsDNA	ssRNA
Genome organisation	Segmented	Linear	Linear	Linear
Enveloped	No	No	No	No
Morphology	Spherical with wheel-like surface structure	Small with star-like surface structure	Icosahedral	Small, with star-like surface structure

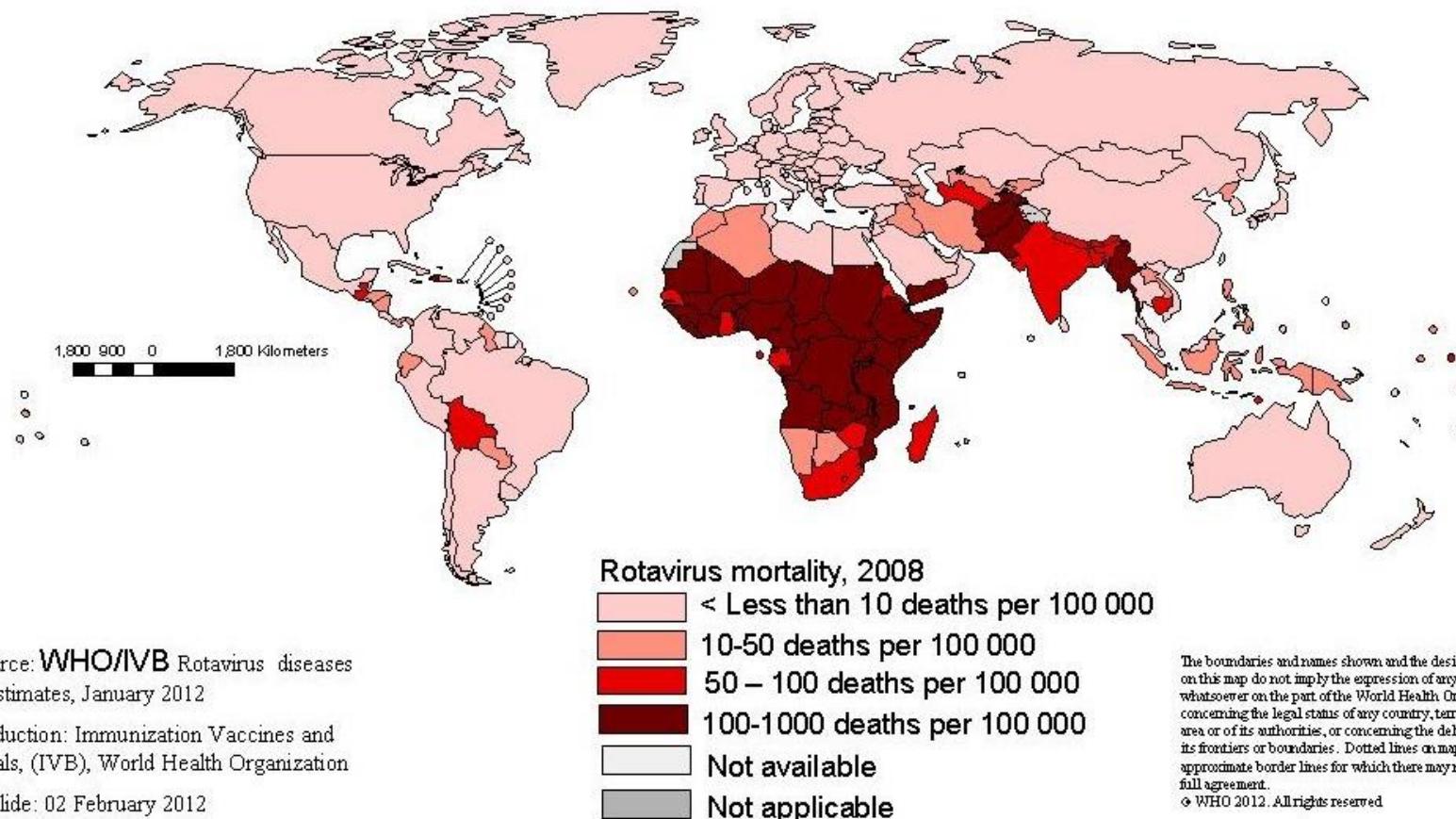
# Rotavirus

- Rotaviruses account for approximately 35% acute diarrhea in developing countries.

Figure 3. Rotavirus Pathogenesis



# Rotavirus mortality in children younger than 5 years, 2008



# Properties

- Rotaviruses are stable in the environment for many months and are relative resistant to hand washing.
- They are susceptible to agents such as **95% ethanol, formalin and "Lysol".**
- They are also unstable to pH below 2.





**Rotavirus vaccines:** Protection from re-infection/disease is antibody mediated (especially secretory IgA).

## Rotavirus Vaccine – Present *Two Candidate Vaccines*

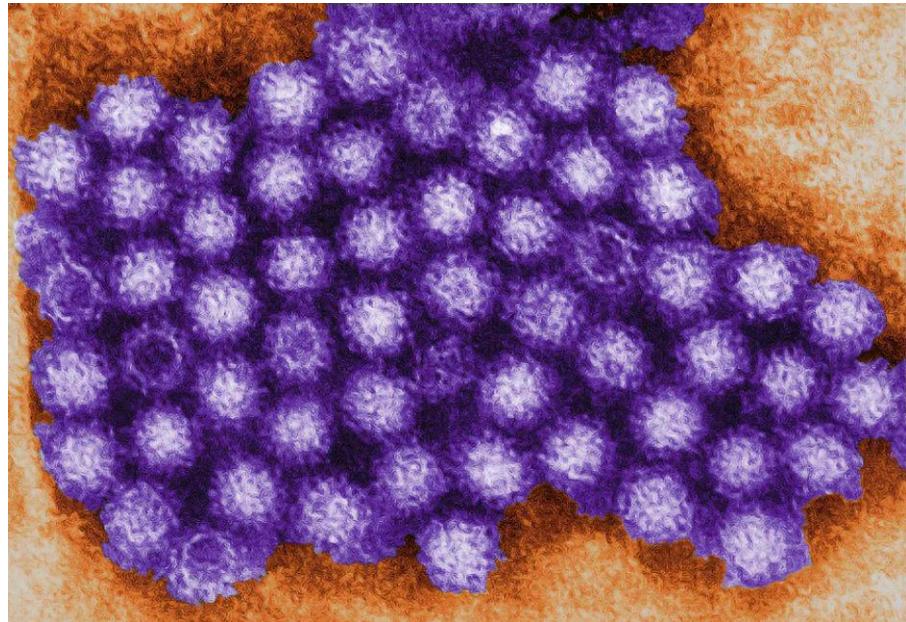
Name	RotaTeq™	RotaRix™
Manufacturer	Merck	GlaxoSmithKline
Basis	Bovine	Human (attenuated)
No. of serotypes	5	1
Initial Site	US	Latin America



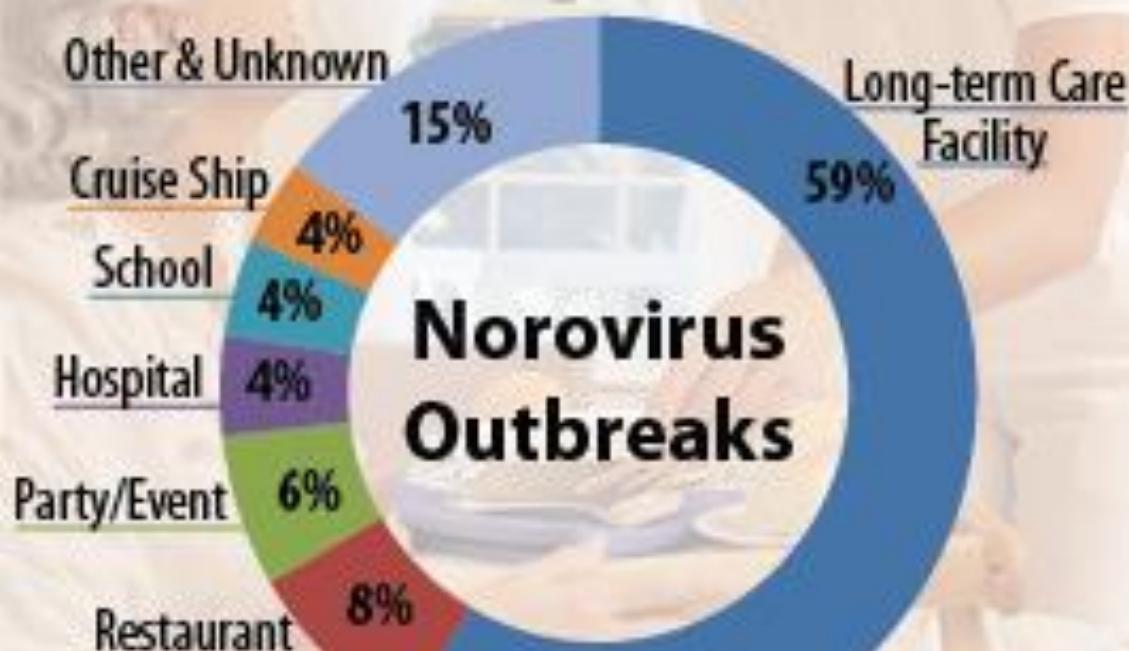
# Caliciviruses (genus Norovirus)

## Norovirus

- Within the calicivirus family, noroviruses are a recognized cause of gastro-enteritis.
- They account for approximately 10% acute diarrhea in children under 5 years in developing countries..
- Noroviruses have been famously responsible for large food borne outbreaks (epidemics) in cruise ships and other gatherings.
- Clinical features of infection are similar to other viral causes of gastroenteritis. Stool and vomitus are highly infectious. Transmission of infection is via faecal oral route, but also through aerosolized droplets.
- High attack rates are seen during outbreaks (in both children and adults). Immunity following infection is short lived and re-infections are common.
- There are no vaccines available



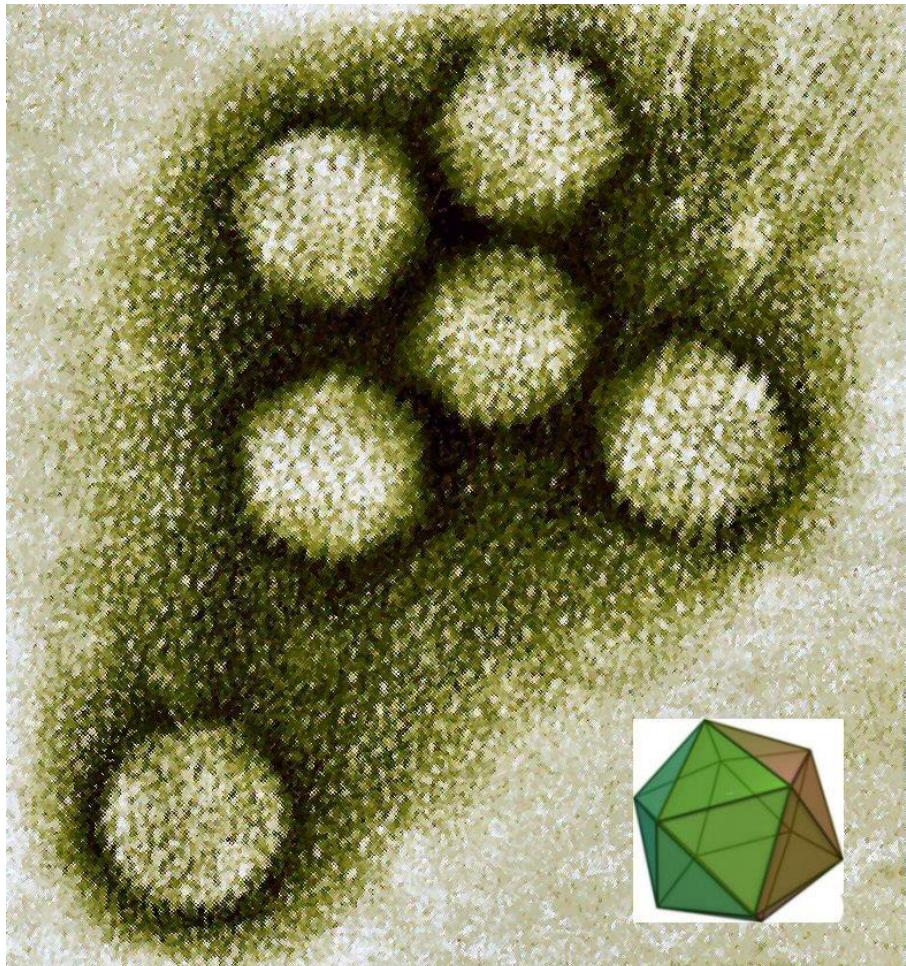
# Setting of 1,518 Confirmed Norovirus Outbreaks, U.S. 2010–2011



# Adenovirus

## Enteric Adenoviruses

- Responsible for a range of clinical conditions involving respiratory, gastrointestinal, ocular and urinary tracts.
- Two serotypes are responsible for causing acute gastro-enteritis, namely adenovirus 40 and 41 (group F adenoviruses).
- Enteric adenoviruses 40 and 41 are responsible for around 6.5% acute diarrhea in children under 5 in developing countries.
- Their relative importance as a cause of gastro-enteritis varies in different parts of the world.
- There is no vaccine



# Diseases caused by Adenoviruses

Group Affected	Syndromes	Serotypes
Neonates	Fatal disseminated infection	3, 7, 21, 30
Infants	Coryza, pharyngitis	1, 2, 5 (C)
Children	Upper respiratory disease	1, 2, 4-6
	Pharyngoconjunctival fever	3, 7 (B)
	Hemorrhagic cystitis	7, 11, 21 (B)
	Diarrhea	2, 3, 5, 40, 41 (F)
	Intussusception	1, 2, 4, 5
	Meningoencephalitis	2, 6, 7, 12
Young adults	Acute respiratory disease and PNA	3, 4, 7
Adults	Epidemic keratoconjunctivitis	8, 19, 37 (D)
Immunocompromised patients	PNA with dissemination	5, 31, 34
	Liver infection	1, 2, 5 (C)
	Urinary Tract Infection	35, 39
	Intestinal Infection	42-51 (D)
	CNS disease including encephalitis	7, 12, 32

# Astrovirus

- Account for about 3.5% of acute gastro-enteritis.
- There is no vaccine

