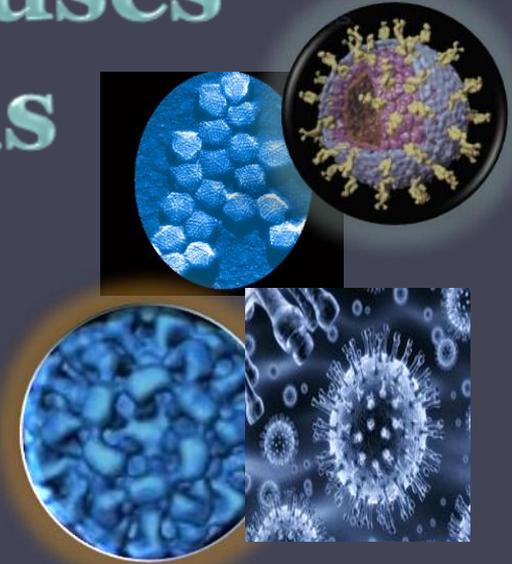


Rota Virus & other viruses causing Gastroenteritis



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Principle Causes of Viral Gastroenteritis

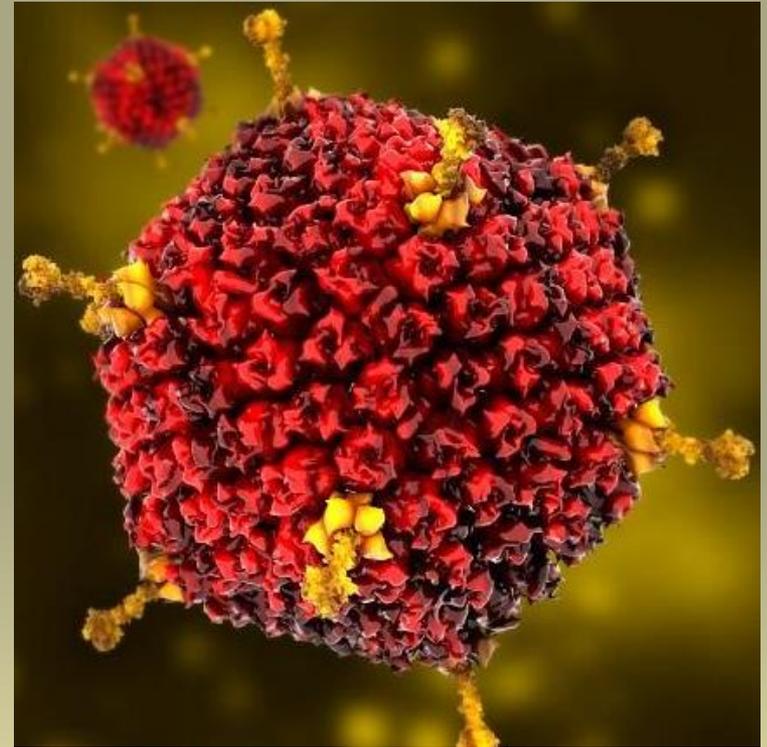
1. Rotavirus

2. Other viruses

- Enteric adenoviruses
- Norwalk virus
- Astroviruses

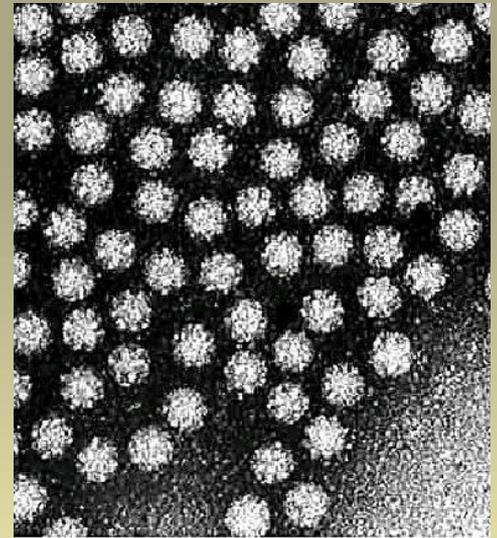
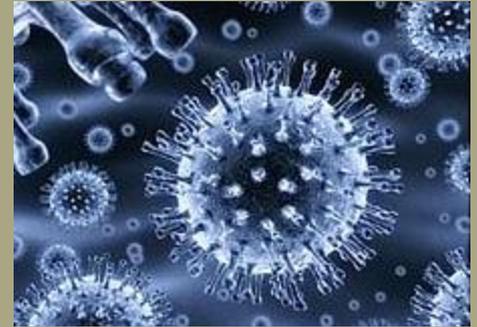
Enteric adenoviruses

- Enteric **adenoviruses 40 and 41** cause gastroenteritis, usually in **very young children** (under 2 years).
- Throughout the year, but peaks in **autumn and early winter**.
- There is less vomiting and fever, but **diarrhea is prolonged**.



Astroviruses

- **28–30 nm in diameter, single-stranded, positive-sense RNA.**
- **Star-like morphology**
(asterisk : a small starlike symbol (*))
- **Fecal–oral route.**
- **Infants and children, elderly institutionalized patients, and immunocompromised persons (shed for prolonged periods).**

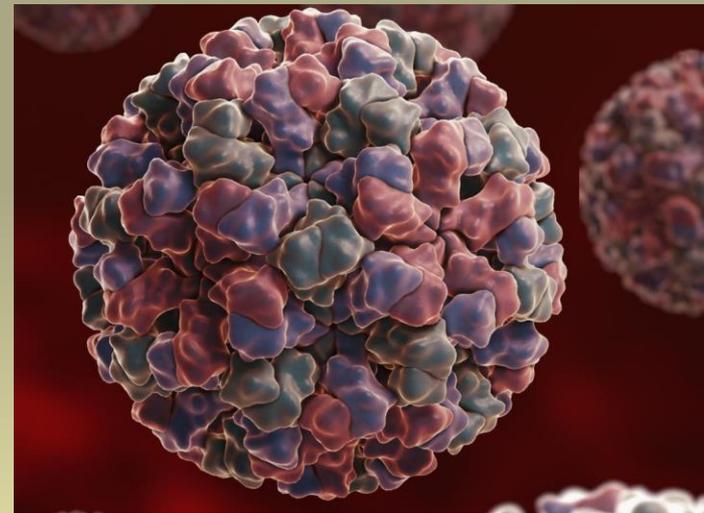


Caliciviruses

- Small, non-enveloped, ssRNA of positive polarity.
- Norwalk virus is the **main human pathogen** in Caliciviruses family and is one of the most common causes of viral gastroenteritis in **adults worldwide**

NORWALK VIRUS

- Non-segmented, ss, positive polarity RNA genome, no virion polymerase.
- Non-enveloped.
- Icosahedral nucleocapsid.



Transmission & Epidemiology

- **Fecal–oral** route (contaminated seafood or water).
- **Outbreaks** typically occur in **group settings**

Pathogenesis & Immunity

- Limited to the mucosal cells of the intestinal tract.
- Watery diarrhea.
- Many asymptomatic infections.
- Reinfection can occur.

Laboratory Diagnosis

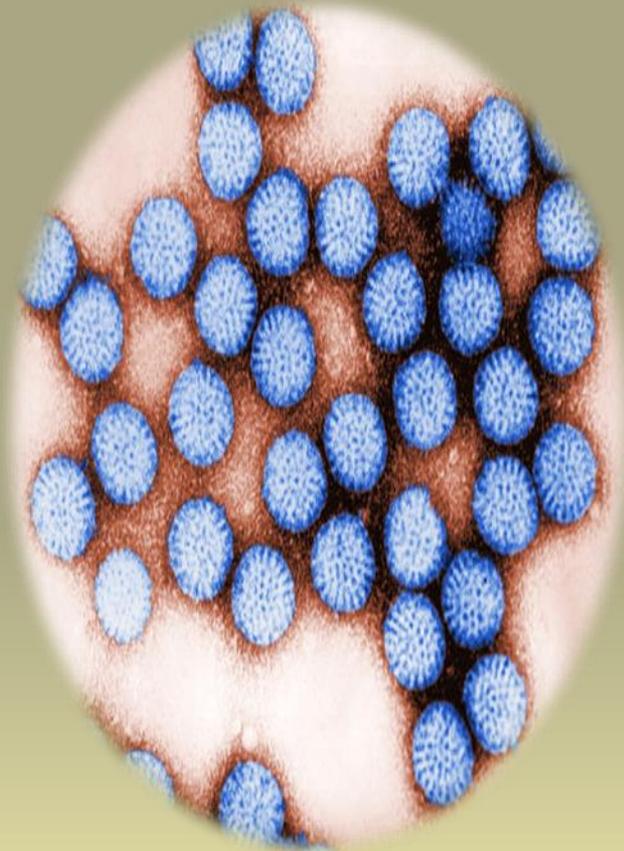
- Clinical, PCR.

Treatment & Prevention

- Intravenous fluids. Personal hygiene and public health measures,

REOVIRUSES

- REO is an acronym for **respiratory enteric orphan**.
- Called because it was initially not known to be related to any specific disease, and so was named Respiratory Enteric Orphan virus.
- **Rotaviruses** are the most important human pathogens in the *reovirus* family.



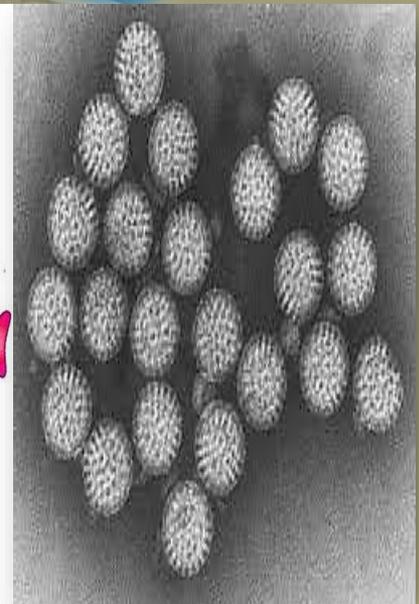
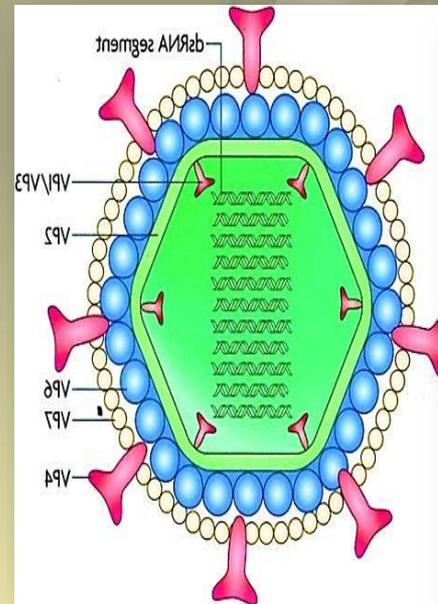
ROTA VIRUS

Disease:

Common cause of **viral gastroenteritis** in young children.

Important Properties

- 70-nm-diameter **wheel-shaped particles**. **Naked double-layered capsid** with 11 segments of **double-stranded RNA**.
- **Resistant to stomach acid** → reach the small intestine.
- There are at least **six serotypes**.

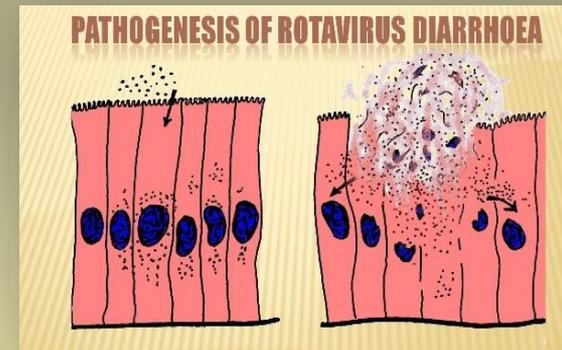


Transmission & Epidemiology

- **worldwide** , **fecal–oral route**.
- By age 6 years most children have antibodies to at least one serotype.

Pathogenesis

- Rotavirus infection is **limited to the gastrointestinal tract, especially the small intestine**.
- Replicates in the mucosal cells of the small intestine → **excess secretion of fluids and electrolytes** into the bowel lumen → **loss of salt, glucose, and water** → **diarrhea**.
- **No inflammation, diarrhea is watery** (non-bloody).

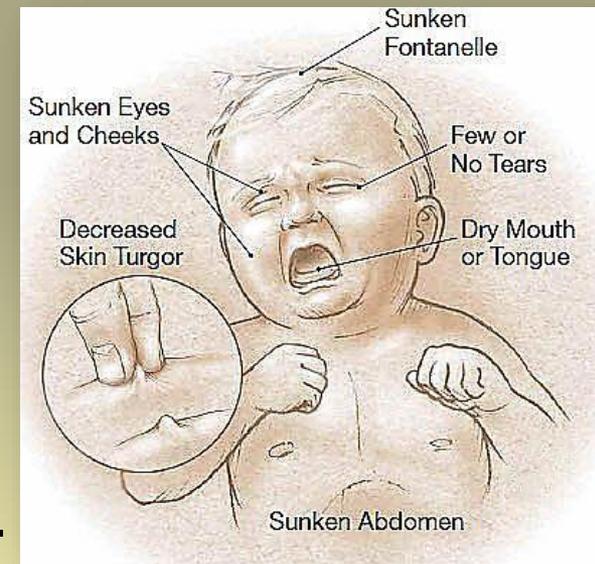


Immunity

- **Intestinal IgA** against **specific serotypes** protects against reinfection.
- **Colostrum IgA** protects newborns **up to the age of 6 months**.

Clinical Findings

- Nausea, vomiting, and watery, non-bloody diarrhea.
- **Gastroenteritis** is most serious in **young children**, in whom **dehydration and electrolyte imbalance** are a major concern.
- **Adults** usually have minor symptoms.



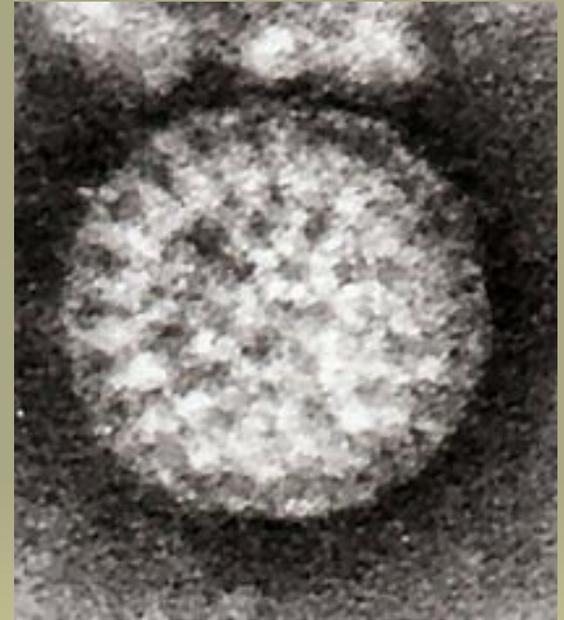
Laboratory Diagnosis

- ❑ **immuno-electron microscopy.**

This technique is not feasible for routine clinical use.

- ❑ **Rotavirus antigen detection in the stool** by using **radioimmunoassay** or **ELISA.**

- ❑ **Four-fold or greater rise in antibody titer.**

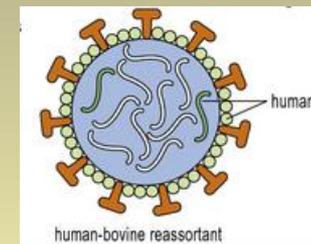
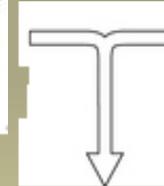
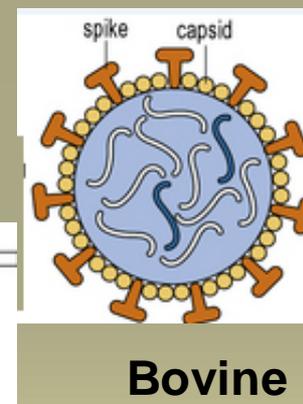
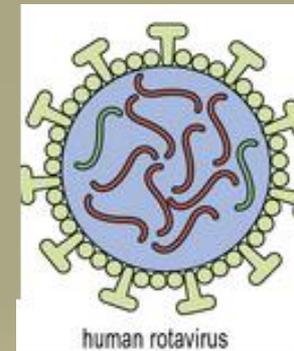


Treatment & Prevention

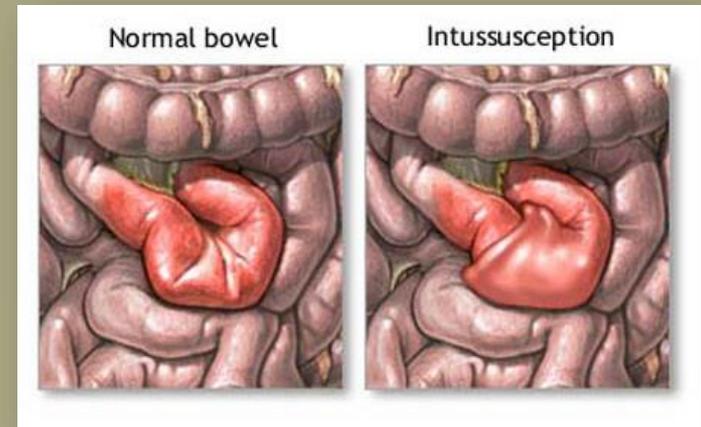
- **No antiviral therapy.**
- **Hygienic measures** such as proper sewage disposal and hand washing are helpful.
- **There are two rotavirus vaccines available.** One is a **live attenuated vaccine (Rotarix)** that contains the single most common rotavirus serotype.



- The other is a **live reassortant vaccine (Rotateq)**, which contains five rotavirus strains.
- The five rotaviruses in the Rotateq vaccine are reassortants in which the gene for the outer surface protein of a human rotavirus is inserted into a bovine strain of rotavirus. **The bovine strain is nonpathogenic for humans, but the human outer surface protein in the vaccine virus elicits protective (IgA) immunity in the GI tract.**



- Patients with a **history of intussusception should not receive either vaccine.**
- It is estimated that a rotavirus vaccine, if used worldwide, could save about **500,000 children each year.**



Bacterial gastroenteritis	Viral gastroenteritis	Protozoal gastroenteritis
High fever	Mild to moderate fever	No fever
Watery diarrhea in many cases Frequency : >5 times up to 20 times daily	Watery diarrhea in many cases Frequency : >5 times up to 20 times daily	Semi-solid diarrhea Frequency : <5 times daily in many cases
Diarrhea could be bloody In some cases	No blood in diarrhea at all	Rarely , diarrhea containing blood
Mild to moderate colic	Mild to moderate colic	Severe colic with Tenesmus
Not containing mucous	Not containing mucous	Mucoid diarrhea
ttt : ORS (Below 2 years),antidiarrheal drug & ANTIBIOTIC cover gram –ve bacteria mainly.	ttt : ORS (Below 2 years),antidiarrheal drug & herbal immunostimulant	ttt : antiprotozoal drug as metronidazole

Characteristics	Viral gastroenteritis	Bacterial gastroenteritis
Blood	Blood is absent	Blood is present
Fecal leukocytes	Fecal leukocytes are usually absent	Fecal leukocytes are often present
Cause	Usually not associated with travel, meat and travel	Usually associated with travel, exposure to animals and meat consumption
Symptoms	<ul style="list-style-type: none">• weight loss• diarrhea• vomiting• nausea• fever• chills and sweating• abdominal pain	<ul style="list-style-type: none">• loss of appetite• fever• nausea and vomiting• diarrhea• cramps and pain in the abdomen• blood in your stools



Thank you