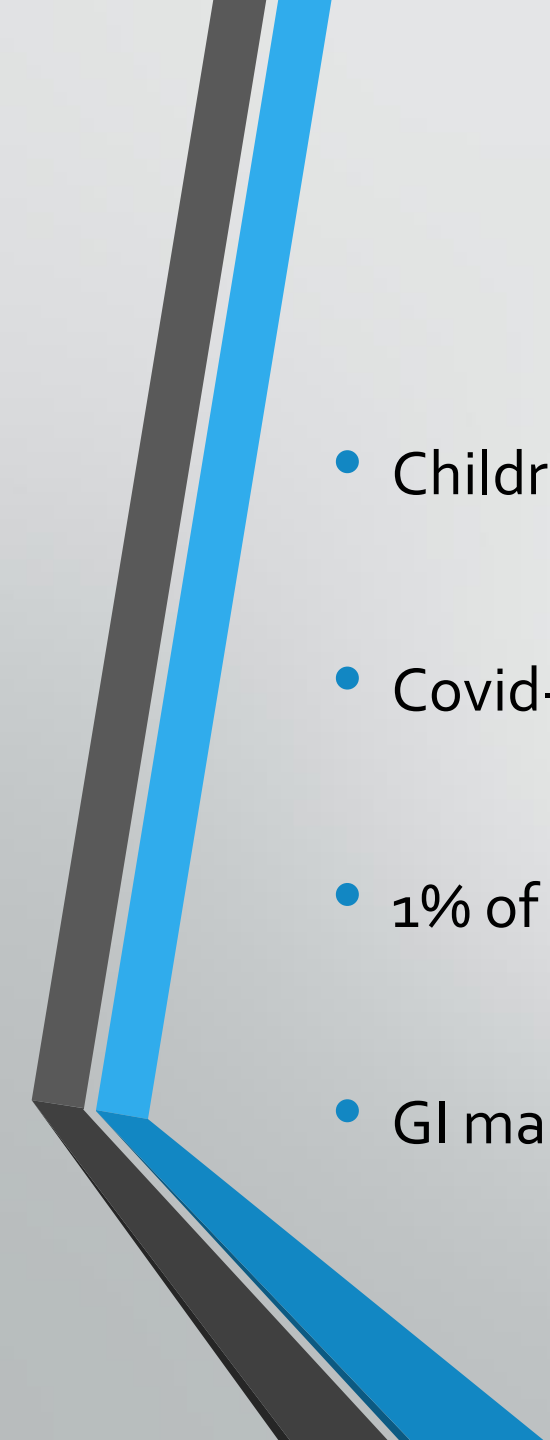




Covid-19 in children

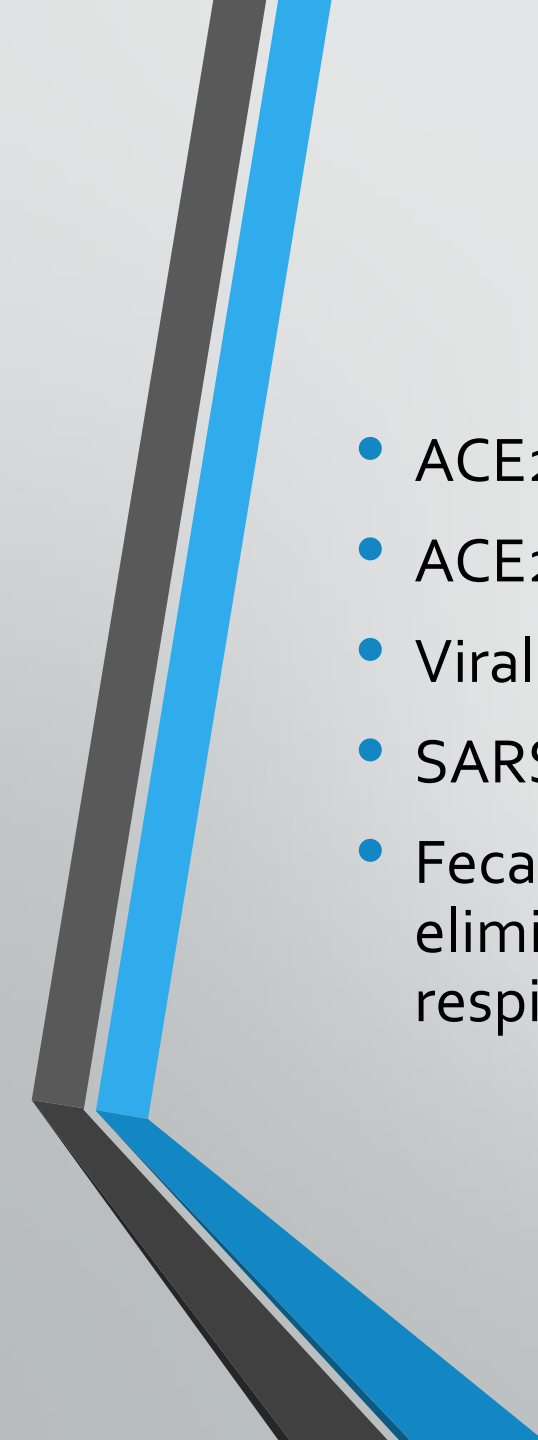
Dr soufi

Pediatric gastroenterologist

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- Children represent approximately 2% of all confirmed cases.
 - Covid-19 is generally milder in children than in adult
 - 1% of children develop severe disease
 - GI manifestations were reported to rang from 5%-20%

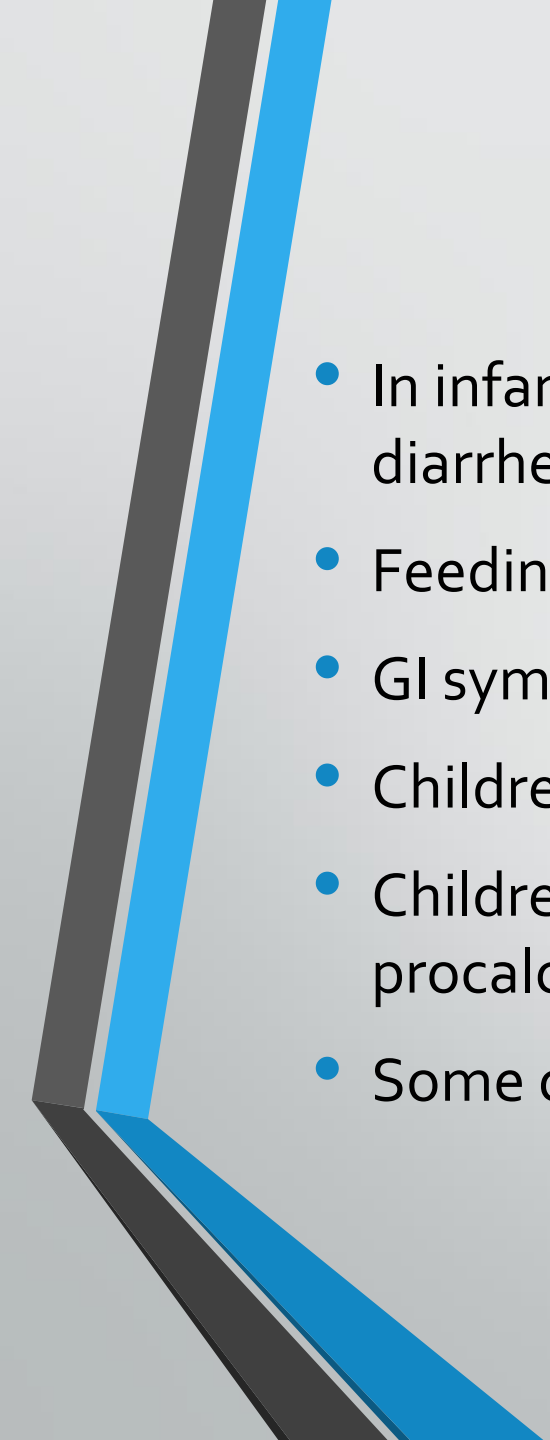
Pathogenesis

- SARS-COV-2 mainly enters intestinal epithelial cell through the angiotensin conversion enzyme 2 (ACE 2) Receptor and transmembrane protease, serine 2 (TMPRSS₂)
- Loss in enterocyte absorption capability and microscopic mucosal damage.
- Absence of macroscopic endoscopic findings and the presence inflammatory activity

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- ACE2 are more expressed in the ileum and colon
 - ACE2 is also expressed on hepatocytes and cholangiocytes
 - Viral RNA is detected in fecal samples of up to 50% of patients with covid-19
 - SARS-cov-2 RNA shedding in stool persists between 1-12 days.
 - Fecal shedding in asymptomatic children and prolonged fecal elimination (lasting several days after negativization of RT-PCR on respiratory swabs) have been reported.

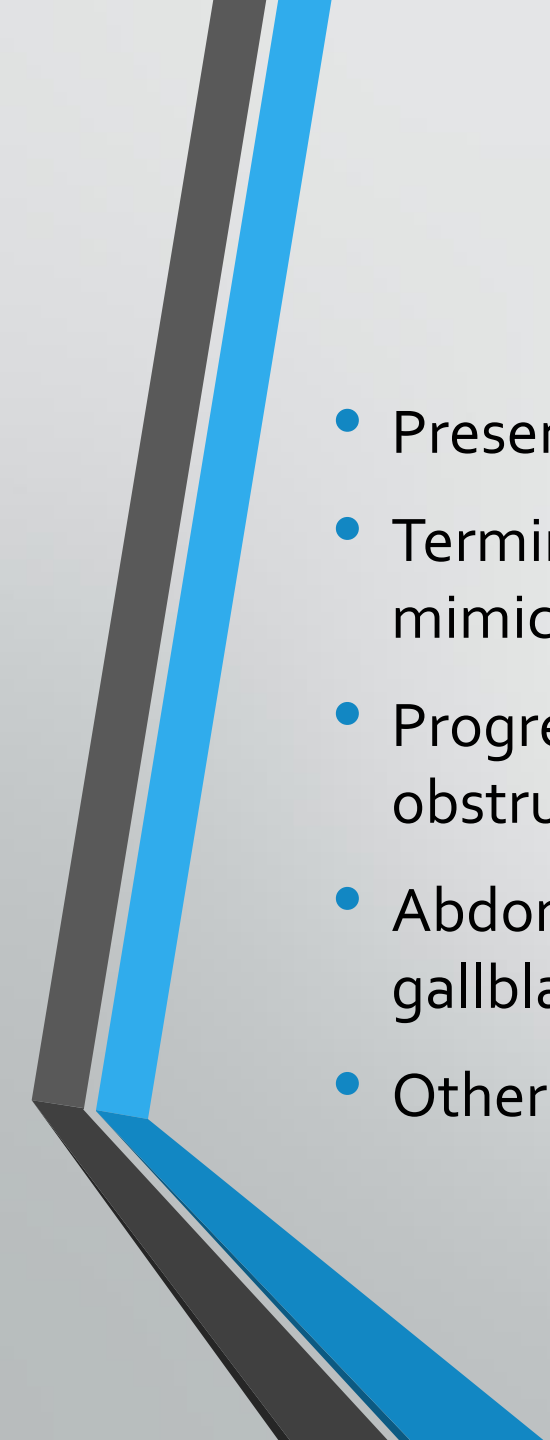
Gastrointestinal manifestations

- Diarrhea, nausea, vomiting, abdominal pain and feeding difficulties up to one-fifth of patients
- Mesenteric adenopathy, terminal ileitis presenting as atypical appendicitis.
- Diarrhea the most common symptom in adults and children.
- Vomiting was found to be more common in children
- Watery diarrhea: more frequently reported
- Bloody diarrhea

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- In infants younger than 3 months of age revealed a similar incidence of diarrhea and vomiting
 - Feeding difficulties were reported in 24% of the infants.
 - GI symptoms were shown to be associated with more severe disease.
 - Children with GI manifestations have an increased risk of admission to ICU
 - Children with GI manifestations show increased levels of CRP and procalcitonin suggestion more severe disease
 - Some children presented with diarrhea or vomiting as first symptom

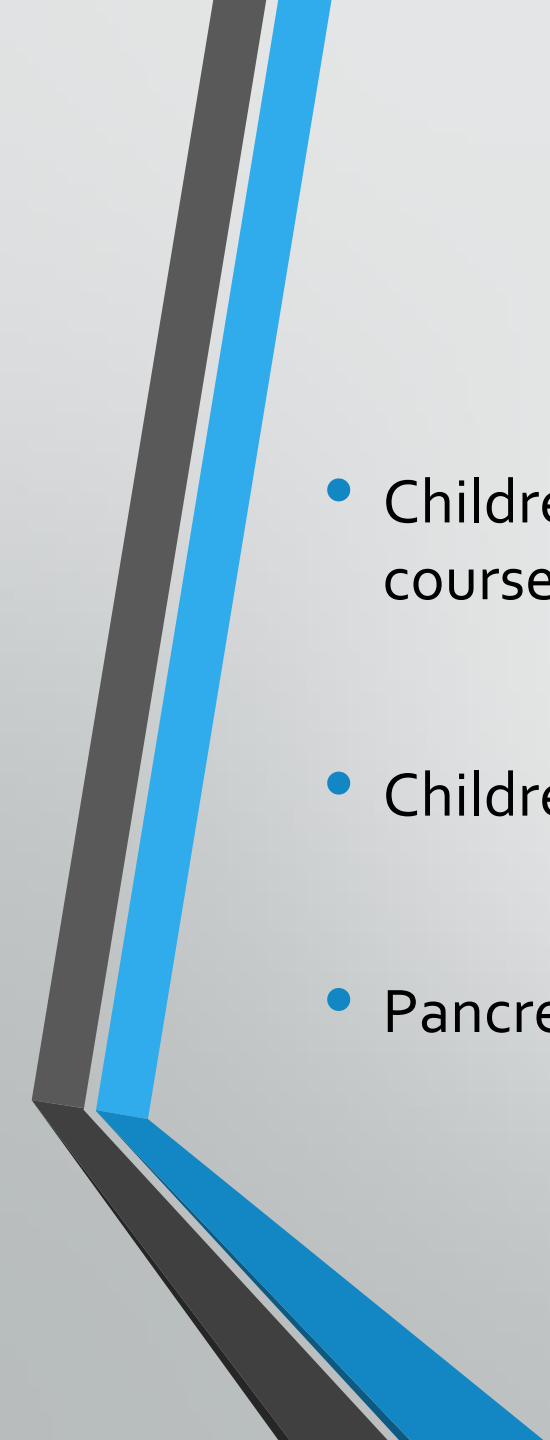
GI symptoms of COVID-19 multisystem inflammatory syndrome

- Severe systemic hyper inflammation : MIS-C
- Present with persistent fever, abdominal pain, vomiting, diarrhea, skin rash, mucocutaneous lesions and in severe cases with hypotension and shock.
- GI symptoms: abdominal pain, vomiting, diarrhea
- Common and prominent in MIS-C up to 90% of patients.

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- Presentation can mimic acute appendicitis.
 - Terminal ileitis on abdominal imaging and or colitis on colonoscopy mimicking acute onset of IBD.
 - Progressive bowel wall thickening can lead to luminal narrowing and obstruction.
 - Abdominal imaging finding : ascites, hepatomegaly, bowel wall thickening, gallbladder wall thickening, mesenteric lymphadenopathy, splenomegaly
 - Other organ: pancreatitis, hepatitis, gallbladder hydrops

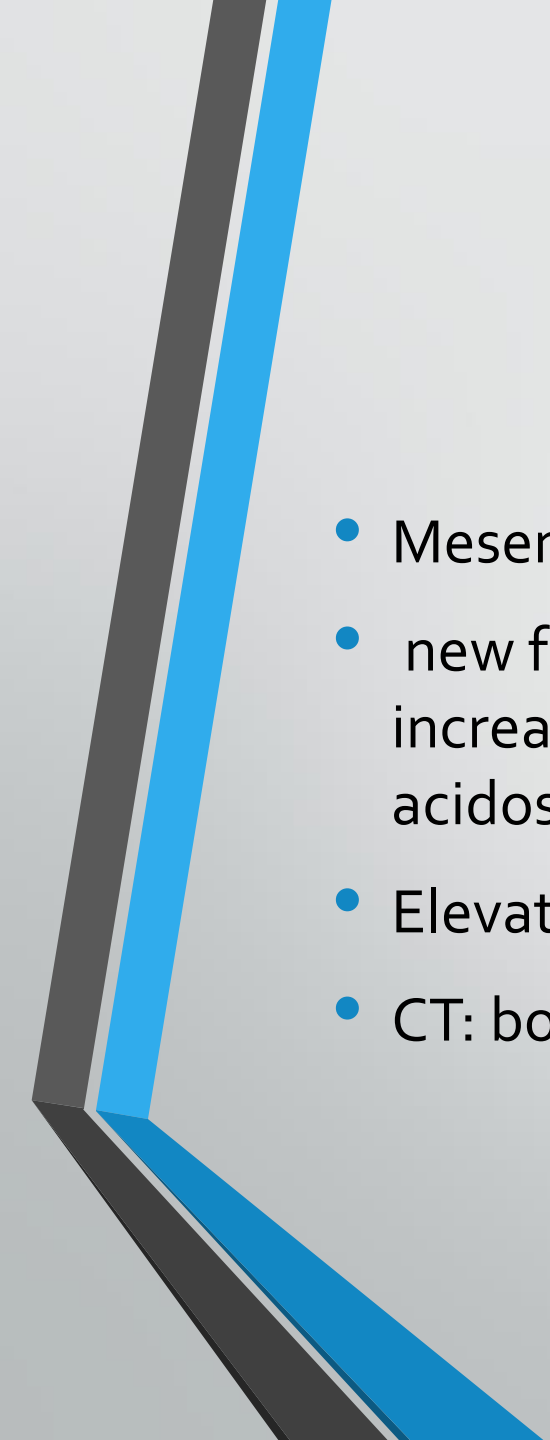
Hepato-biliary pancreatic manifestation

- Liver enzyme are usually normal or only slightly increased
- Severe increase in serum liver enzyme: warning sign
- Pathogenesis: direct invasion, systemic inflammation, hepatic ischemia and hypoxia
- Patients with chronic liver disease do not seem to have a greater risk of contracting COVID-19

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- Children with autoimmune hepatitis may potentially have a more severe course of infection.
 - Children with NAFLD have higher odds of severe disease.
 - Pancreatitis may be more common in children with COVID-19.

Rare GI complication

- Acute appendicitis
- Intussusception : vomiting, diarrhea, acute onset abdominal pain and mucous bloody stool
- Acute functional intestinal obstruction with diffuse jejunal dilation with no mechanical obstruction
- Enteritis: abdominal pain and GI bleeding resolving with conservative management

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- Mesenteric ischemia : in critically ill patients in the ICU.
 - new feeding intolerance, abdominal distention increasing leukocytosis, increasing vasopressor requirements, and /or unexplained metabolic acidosis
 - Elevated lactate : sensitive
 - CT: bowel wall thickening, pneumatosis and/or portal venous air



Thanks for attention