



# PEN

**NHS**  
 Doncaster and Bassetlaw  
 Teaching Hospitals  
 NHS Foundation Trust

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## What is PEN?

Welcome to the Paediatric Education Newsletter, a monthly education bulletin highlighting learning points, announcements, clinical cases & latest paediatric news.

## Announcements

For feedback/queries/or wanting to contribute - please fill in the google form

<https://forms.gle/23Ap6szGC7sms0E57>

## Upcoming Events



## Adenovirus Infection

*Written by Holly Walker*

A 2-year-old boy was admitted with symptoms of cough, increased work of breathing and high grade fevers. On examination he had bilateral conjunctivitis. He was febrile and required wafting oxygen to maintain saturations. His chest Xray showed bilateral haziness with no focal or lobar consolidation. The blood tests showed a viral picture on FBC and a very high CRP of 220. Nasopharyngeal aspirate sent for respiratory PCR is pending. They were diagnosed with suspected Adenovirus infection.

Adenovirus causes 5-8% of respiratory infections, but has other clinical manifestations including conjunctivitis, cystitis, and gastroenteritis (McIntosh, 2000 and Doerfler, 1996). Other biometric features include a strong inflammatory response with higher CRP values in Adenovirus infection compared with influenza virus or respiratory syncytial virus (Kawasaki et al, 2002). This might explain why, in an observational study by



Rocholl et al (2003) 46% of children with adenovirus infection were treated with antibiotics, but only 1% had documented bacterial infection.

Children aged between 6 months and 2 years of age are most susceptible (Doerfler, 1996). Complications of Adenovirus infections in children include chronic lung disease, severe infection, and intussusception (Stanford Children's Health, 2021).

In addition to the clinical manifestations of infection, Adenovirus has been used as a vector in gene therapy (Doerfler, 1996) and more recently in vaccine development (Chang, 2021). This has played an important role in the largest vaccination campaign in history against coronavirus. However, a study recently published by Baker et al has shown adenoviruses deployed as vaccination vectors bind to platelet factor 4. This may explain the underlying mechanism leading to thrombosis with thrombocytopenia syndrome, an ultrarare side effect observed in adenovirus-vectored coronavirus vaccination (Baker et al, 2021).

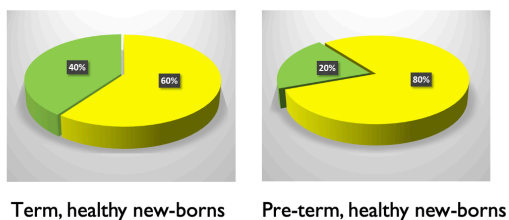
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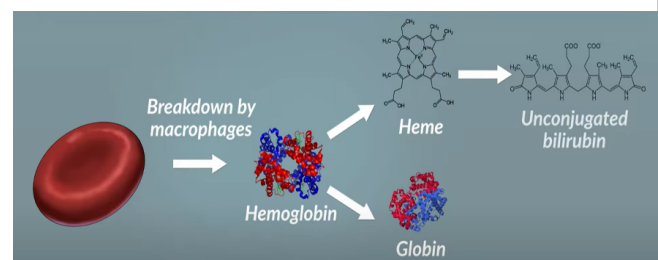
# Early Neonatal Jaundice

*Written by Afsban Tooba*

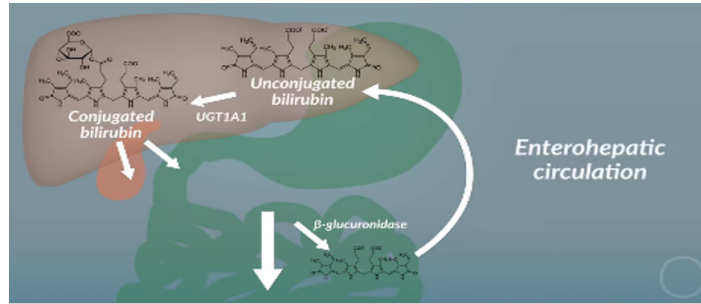
Neonatal Jaundice is a common physiologic variant as up to 60% of term and 80% of pre-term new-borns exhibit some degree of jaundice in the first week of life. Jaundice is a yellow colouration of the skin and sclerae caused by the accumulation of bilirubin.



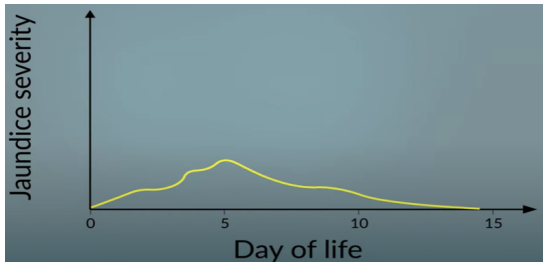
Bilirubin is a product of red blood cell breakdown. When red blood cells are broken down by macrophages, they release haemoglobin. Haemoglobin is broken down to haem and globin. Haem is further metabolised to become unconjugated bilirubin.



Unconjugated bilirubin is water insoluble, so it is carried in the blood stream on albumin until it is delivered to the liver. In the liver, it is conjugated and excreted into the gall bladder and duodenum. Once in the intestinal tract, most conjugated bilirubin is excreted in the faeces, but some is reverted back to unconjugated form and reabsorbed into the blood stream to start the cycle all over again, a process call enterohepatic circulation.



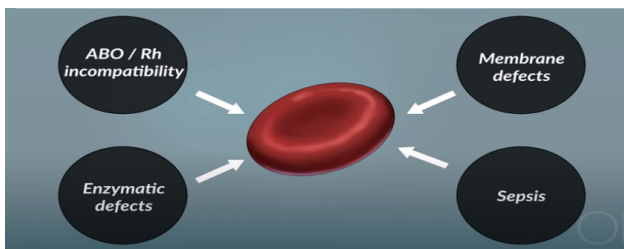
New-borns are prone to have physiological jaundice which could be due to a variety of reasons. First they typically have high haematocrits on average around 60 and foetal red blood cells with shorter life span both of which increases their potential for red blood cell turnover and thus unconjugated Bilirubin production. Physiological jaundice often peaks around day 5 of life and resolves by one to two weeks.



Some of the risk factors for jaundice are decreased gestational age/preterm delivery, low infant birth weight, sibling born with jaundice requiring phototherapy/other treatment, poor caloric intake/increased neonatal weight loss and breastfeeding.

Simple jaundice which is isolated yellowing of the skin and sclera without other symptoms. Sometimes can lead to acute bilirubin encephalopathy (>425 micromol/l total bilirubin)

Jaundice presenting in the first 24 hours is pathological. Investigations to search for other causes are crucial. It is important to consider other mechanisms that might also be contributing. The first mechanism is increased haemolysis of red blood cells, which leads to increased production of unconjugated bilirubin. Of these aetiologies, the one you will encounter most commonly is an ABO incompatibility, which occurs when a mother is blood type O and an infant is blood type A,B, or AB.



It is important to know that ABO incompatibility is present in about 15% of pregnancies, but significant haemolysis only occurs in about 4% of ABO incompatible pregnancies. So most new-borns of ABO incompatible pregnancies will not have hyperbilirubinemia. Rh incompatibility is less common these days due to improvement in prenatal care. Do consider other reasons like infection.

The choice of treatment will depend on a number of factors, including the underlying cause of the jaundice which include

- No treatment — physiological or breastmilk jaundice and a bilirubin level below the treatment threshold
- Treatment of any underlying illness (such as infection)
- Phototherapy — absorption of light through the skin converts unconjugated bilirubin into products that are more easily excretable in the stool and urine
- Exchange transfusion — if the baby has signs of bilirubin encephalopathy and considered if the risk of kernicterus is high or jaundice is not responding to phototherapy

# QUIZ

*By Aaron Phua*

(Answers on the bottom of the last page)

Q1: 7 year old boy whom teacher reports him struggling in school. He is often alone and doesn't play with his classmates. He is good at math but struggles with other subjects. He struggles when events of the day changes and doesn't provide good eye contact when talking to him.

What differentials are you thinking of?

- A) Attention Deficit Hyperactivity Disorder (ADHD)
- B) Autism
- C) Behavioural Difficulties
- D) Safeguarding - Neglect
- E) Normal Child

Q2: Which four (4) of the following are traits of a child with Autism

- A) Social and communication difficulties
- B) Full of energy
- C) Repetitive and restrictive behaviour
- D) Highly focused interest or hobbies
- E) Anxiety
- F) Cannot pay attention or sit still

Q3: Which three (3) of the following are traits of a child with attention deficit hyperactive disorder (ADHD)?

- A) Short attention span - easily distractible
- B) Sensitive to a specific touch, sounds, smell.
- C) Constantly changing activity or task
- D) Unable to wait for their turn
- E) Poor eye contact
- F) Unable to communicate

Q4: Who can refer a child with suspected autism for an assessment?

- A) GP
- B) School Teacher
- C) Health visitor
- D) Consultant Paediatrician
- E) Special Education Needs staff (SENCO)
- F) All above

Q5: Which questionnaire given to parents & school assesses for autism?

- A) SNAP tool
- B) CAST tool

Q6: What is the prevalence of autism in the United Kingdom?

- A) 1 in 10
- B) 1 in 100
- C) 1 in 1,000
- D) 1 in 10,000
- E) 1 in 100,000

Q7 Autism more common in girls than boys? (True or False)

- A) True
- B) False

Remember: Diagnosing autism doesn't cure the child of this condition. It allows us to understand why they have challenges in their social communication & interaction. This allows us to extend a helping hand & providing them with the right support to have a good quality of life.

Autism Spectrum Disorder (by BMA) and its challenges.

<https://www.bma.org.uk/what-we-do/population-health/improving-the-health-of-specific-groups/autism-spectrum-disorder>

# Merry Christmas... & Happy New Year..!

From PEN team.