

Neutropenia

Neutropenia is an absolute neutrophil count (ANC) of $<1.5 \times 10^9/L$. There is an increased risk of severe sepsis if the neutrophil count is $<0.5 \times 10^9/L$.

Severity of Neutropenia

• Mild	$1.0 - 1.5 \times 10^9/L$	No further investigation necessary
• Moderate	$0.50 - 0.99 \times 10^9/L$	Neonatal investigation required
• Severe	$0.20 - 0.49 \times 10^9/L$	Refer for immediate Haematology advice
• Very severe	$<0.2 \times 10^9/L$	Refer for immediate Haematology advice

Causes

- Sepsis
- Physiological
- Neonatal alloimmune neutropenia
- Autoimmune neutropenia
- Lineage steal in prematurity or growth restriction
- Inherited
 - Congenital neutropenia
 - Bone marrow failure syndromes
 - Cyclical neutropenia
- Metabolic diseases
- Vitamin B12 and folate deficiency
- Drug-induced neutropenia

Congenital neutropenia (the most serious cause):

It is most important to try to identify neonates with congenital neutropenia as they are at the highest risk of infection. This is an extremely rare condition. Factors that make congenital neutropenia more likely include:

- History of significant infections
- Other cytopenias (corrected for age)
- Clinical findings suggestive of a multisystem disorder e.g., failure to thrive, bone abnormalities
- Family history (although most are autosomal recessive)
- Consanguinity

If congenital neutropenia is suspected from the history, please discuss with haematology.

Commonest causes of neutropenia

Physiological and immune neutropenia are the commonest causes of neutropenia in well neonates and most do not have significant problems with infection. However, this diagnosis is usually confirmed only after resolution of the neutropenia and so advice must be given to parents to present to the RHCYP emergency department if baby becomes unwell, as discussed below.

- Physiological neutropenia

Many babies are found to be slightly neutropenic if they have a FBC done as part of the work up for other neonatal problems. The normal range from birth to 2 months changes rapidly and is much lower than an older baby or child. If in doubt, please discuss with haematology to avoid unnecessary testing.

- Neonatal alloimmune neutropenia

Most cases resolve by ~12 weeks after birth and rates of serious infection are low.

- Autoimmune neutropenia

Almost all cases of autoimmune neutropenia resolve spontaneously by the age of 5 years and many children have no particular problems with infection. It would be unusual for this to present in the neonatal period.

Neutropenia in preterm infants

New-onset neutropenia (especially in association with overall leucopenia) in preterm infants would be suggestive of a possible infection. It should be investigated as clinically indicated as these infants are at higher risk for infection. Neutropenia due to lineage steal can be seen in preterm infants who are growth-restricted and usually resolves spontaneously.

Persistent neutropenia can sometimes be seen in 'well', growing, preterm infants. The infants should still be assessed for clinical signs of infection. If truly well, then the guideline for management of neutropenia in 'well' term infants below can be followed.

Neutropenia in term infants

If unwell admit to the unit, perform a septic screen and start antibiotics after discussion with a consultant.

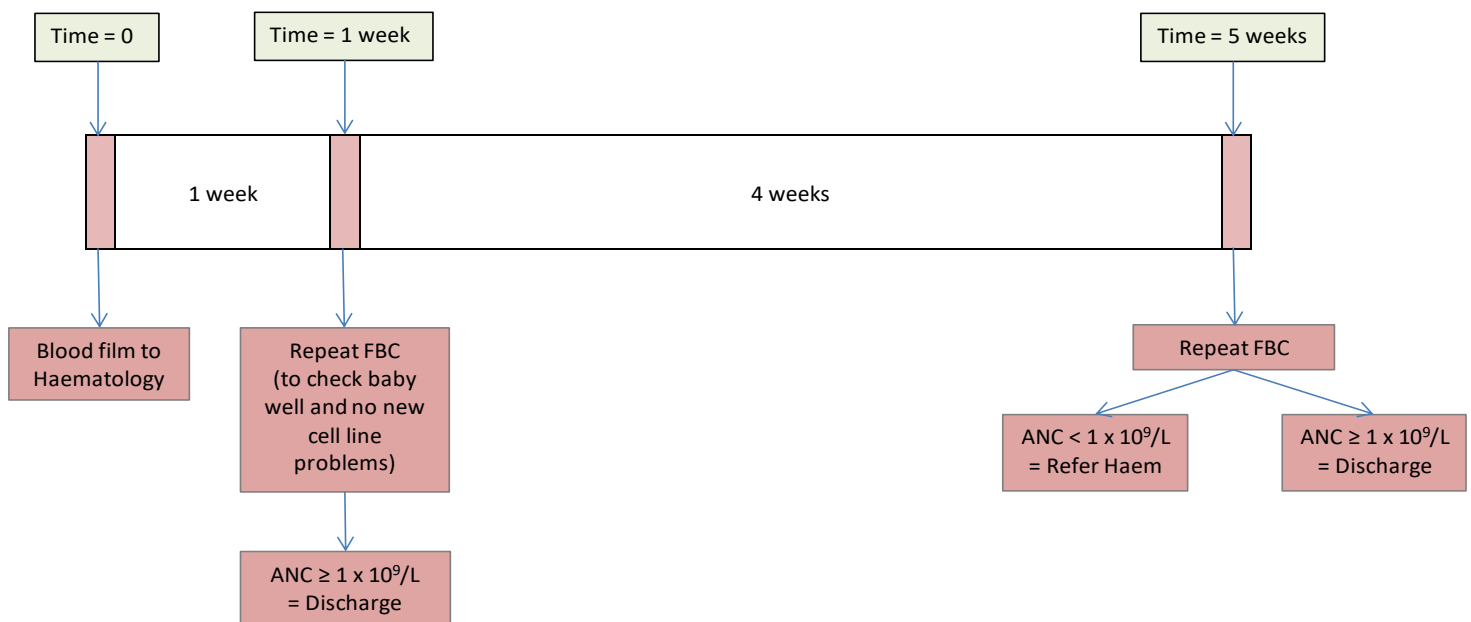
If baby appears well (no evidence of infection, cord infection/detachment problems, failure to thrive, neurological abnormality) and the other components of the full blood count are within normal limits, then if:

ANC 1.0 – 1.5 x 10⁹/L:

- No further follow-up is required.

ANC 0.50 – 0.99 x 10⁹/L:

- Ensure that the blood film has been reviewed by a haematologist.
- Allow home with advice to parents regarding signs of infection and if any emerge, then baby should be seen urgently at RHCYP emergency department (children with suspected infection cannot return to the neonatal unit).
- Advise that immunisations can be given routinely if lymphocyte count is normal.
- Repeat FBC in 1 week. (There is not likely to be a significant improvement in ANC in this time, but it is important to check that the other cell lines remain within normal limits and that baby is well).
 - If there are new FBC abnormalities or clinical concerns at this 1-week time point, discuss with haematology – Bleep 9290
 - If there are no new clinical concerns or FBC problems, plan a final FBC in 4 further weeks
 - If ANC recovers $\geq 1.0 \times 10^9/\text{L}$, then no further follow-up is required
 - If ANC persists $< 1.0 \times 10^9/\text{L}$, refer to Haematology for follow-up



ANC <0.50 x 10⁹/L

- Discuss all cases with haematology – Bleep 9290
- If baby is well and there are no other clinical concerns, then enhanced surveillance as above may be recommended
- If clinical or other concerns, then direct haematology review may be arranged