

# Neonatal Isoerythrolysis (Fading Kitten Syndrome) in Cats

 [www.cat-world.com.au/neonatal-isoerythrolysis.html](http://www.cat-world.com.au/neonatal-isoerythrolysis.html)

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## What is neonatal isoerythrolysis?

Neonatal isoerythrolysis (NI) or *hemolytic icterus* is a serious and life-threatening condition caused when kittens who have type A blood nurse from their mother who has type B blood during the first 24 hours of life. Problems occur when the kitten ingests colostrum from the mother (queen) which contains naturally occurring alloantibodies against the kitten's type A blood group. This leads to the destruction of the kitten's red blood cells. It is believed to be a major cause of *fading kitten syndrome* due to hemolytic anemia (destruction of the red blood cells).

Unlike other animals who can develop *alloantibodies* as a result of previous pregnancies to offspring with different blood groups, cats with B type blood have naturally occurring alloantibodies to A type blood and do not need to have had a prior exposure. Cats with type A blood also have naturally occurring alloantibodies to type B blood, however in much lower numbers and this generally doesn't pose a problem to kittens.

Type B mother	Type A kitten	Unsafe for first 24 hours
Type B mother	Type B kitten	Safe
Type A mother	Type A or B kitten	Safe

The queen's first milk is known as colostrum. Colostrum is produced in the first 24 – 72 hours after birth and provides newborns with essential nutrients and antibodies which protect the kitten from infection.

## Cat blood groups:

Cats have one of three blood groups, A, B and AB (AB is very uncommon).

A being dominant and b recessive (dominant genes are always listed in *UPPER CASE* and recessive genes in *lower case*). Genes come in pairs (one from the mother, one from the father) and their blood group may be the following:

- A/A (homozygous)

- A/b (heterozygous)
- b/b (homozygous)
- AB (heterozygous)\*

\*Note: Ab (heterozygous) is completely different to the AB blood group.

Type A blood group is the most common blood group in cats. Type B can occur between 10-60% in Devon Rex, Cornish Rex, Exotic Shorthair, Abyssinian, Turkish Van, Turkish Angora and British Shorthair cats. Type AB is extremely rare.

The mortality rate of neonatal isoerythrolysis is high, urgent and aggressive medical treatment is required if the affected kittens(s) have any hope of survival. The condition is seen more often in purebred cats than domestic/mixed breed types.

## Symptoms:

Kittens are healthy at birth but within the first few days of life, their health deteriorates rapidly due to the destruction of the red blood cells and resulting anemia. Symptoms include:

- Lethargy
- Rapid pulse
- Increased respiration
- [Jaundice](#) (yellowing of the mucous membranes) in the mouth and eyes
- Brownish-red urine
- Tail tip necrosis
- Respiratory difficulty
- Some kittens will stop nursing from the mother
- Failure to thrive
- Sudden death

Some kittens will be affected more than others, this may be down to the amount of colostrum consumed.

## How is it neonatal isoerythrolysis diagnosed?

A presumptive diagnosis may be made based on presenting symptoms. Confirmation will be via blood testing of the queen and the affected kitten(s).

## How is it neonatal isoerythrolysis treated?

Type A kittens need to be taken away from their mother immediately, type B kittens can continue to nurse.

- Your veterinarian may perform a blood transfusion, preferably washed blood which removes the serum component containing alloantibodies from the kitten's mother. This sounds counter-intuitive, why would you transfuse a different type of blood into the kitten, however, the queen's blood is not going to respond to her own type B antibodies in the kitten's blood. If the queen can not make a blood donation, then another type B cat should be used, again once the blood has been washed. After 3 days the kitten should be producing antibodies against type B blood, therefore if a second transfusion is required down the line, type A blood should be used in the Type A kitten.
- Even with treatment, the prognosis is guarded.

## How to prevent neonatal isoerythrolysis:

Prevention is the best way to address blood type incompatibilities. Avoiding mating a queen with a B blood type with a tom who has an A blood type.

If such a mating does occur, preventing the kittens from drinking the colostrum will be necessary. It is always important to know the blood group of the queen prior to mating. With this knowledge, if you know the queen has a type B blood group, and are able to determine the blood type of the kitten(s) prior to her nursing any kittens with the same blood type as the queen (ie: B type), are fine to nurse. Any kittens which have type A blood with a type B queen must avoid nursing for the first 24 hours. They can either be fostered to a queen who has A blood type or given kitten milk replacer (KMR). After this, they can be returned to their mother.

### **Why is it safe to return the kitten to its mother after 24 hours?**

When kittens are born, their gut is extremely permeable, this means that antibodies can easily travel through the intestinal wall and into the rest of the body. Normally this is good as it allows antibodies from the mother's colostrum to easily get into her kittens and give them *passive immunity* while their immune system develops. However after 24 hours permeability has declined significantly and the queen's colostrum (which contains high numbers of antibodies) changes to milk, with lower numbers. So, decreased gut permeability PLUS lower numbers of antibodies in the milk.