



# Iron deficiency screening in children under five

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## Introduction

Apart from being essential for oxygen transportation, iron is also a structural component of many enzymes which make it indispensable for a wide range of metabolic processes, such as phagocytic antimicrobial activity, neurotransmitters synthesis, DNA synthesis or cellular breathing.

Iron is crucial for brain development. Neurodevelopment begins in the fetus and goes on during infancy, reaching its greatest growth rate in the first years of life. Human brain almost triples its weight from birth to three years; at that age it has reached 85% of the adult weight. Animal models have proved deficiencies in myelination, synaptogenesis and neurotransmitters' synthesis in case of iron deficiency in the fetus or in the first months after birth. In fact, cognitive, motor, sensorial, socioemotional or behavioral impairments are described in iron deficient children, some of them can persist in the long term; in addition to a nutritional lack, iron deficiency can be considered a neurologic risk factor.

We propose the review of the evidence available for the screening of iron deficiency in children less than five years given that it is mostly asymptomatic; moreover, in case of no treatment it can produce anemia, and have consequences in infant development in the short and the long term.

## Evidence appraisal

The best available parameter to know body deposits of iron is ferritin. The levels protecting brain development are not clear because the result of the research is inconsistent. This inconsistency makes that **the quality of the evidence on ferritin threshold is LOW**.

There is no available evidence in favor that iron treatment improves cognitive development of children: there is inconsistency in the results of the different studies, even uncertainty, because

they refer to different age groups and different neurodevelopment domains. **LOW evidence of the effect of iron treatment on neurologic development.**

Taking into account that iron deficiency risk factors are known, it seems reasonable to screen that population with the objective of at least improving their iron deposits, even though we don't have evidence that we can optimize their development. **The benefits outweigh the risks.**

## Prevnfad recommendations

- **We suggest not to do universal screening of iron deficiency in less than five-year-olds.**

**Quality of the evidence: low**

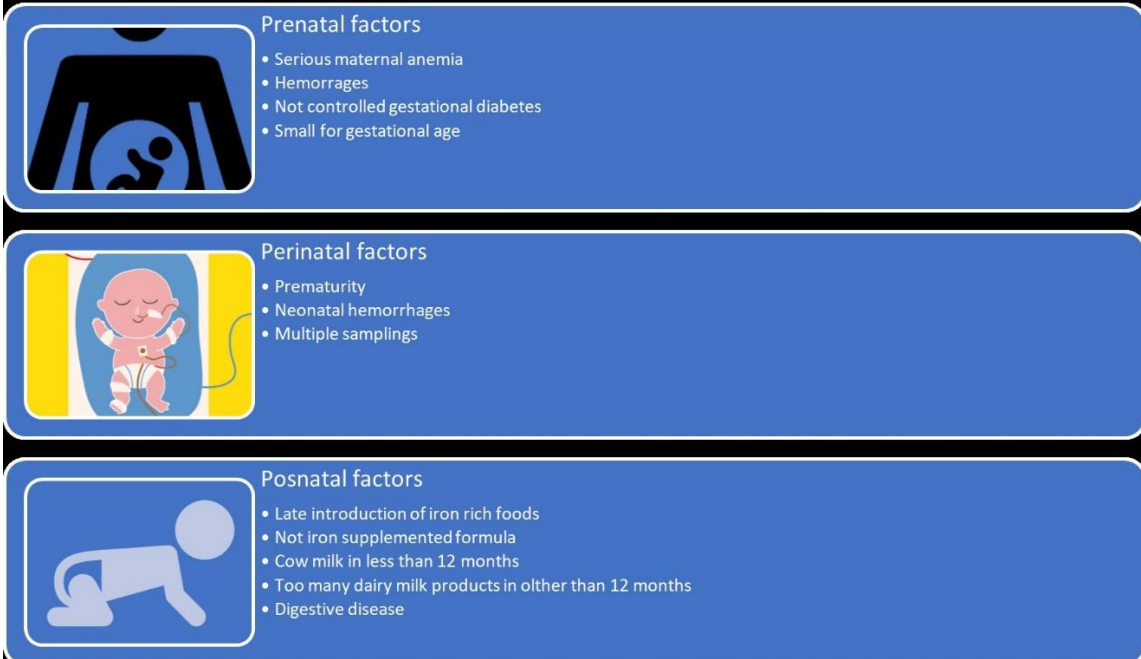
**Strength of the recommendation: weak against**

- **We suggest doing screening of iron deficiency in children less than five years with risk factors.**

**Quality of the evidence: low**

**Strength of the recommendation: weak in favor**

### Iron deficiency risk factors



**Prenatal factors**

- Serious maternal anemia
- Hemorrhages
- Not controlled gestational diabetes
- Small for gestational age

**Perinatal factors**

- Prematurity
- Neonatal hemorrhages
- Multiple samplings

**Postnatal factors**

- Late introduction of iron rich foods
- Not iron supplemented formula
- Cow milk in less than 12 months
- Too many dairy milk products in other than 12 months
- Digestive disease

Conflict of interests: The author declares not having any conflicts of interest regarding the topic of this document.

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