When to say NO

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Severe Anemia in Children

- Low levels of Hb in paediatrics when and is transfusion necessary ?
- Severity
- Signs and Symptoms
- Underlying Cause
- Delayed until a definitive diagnosis is made

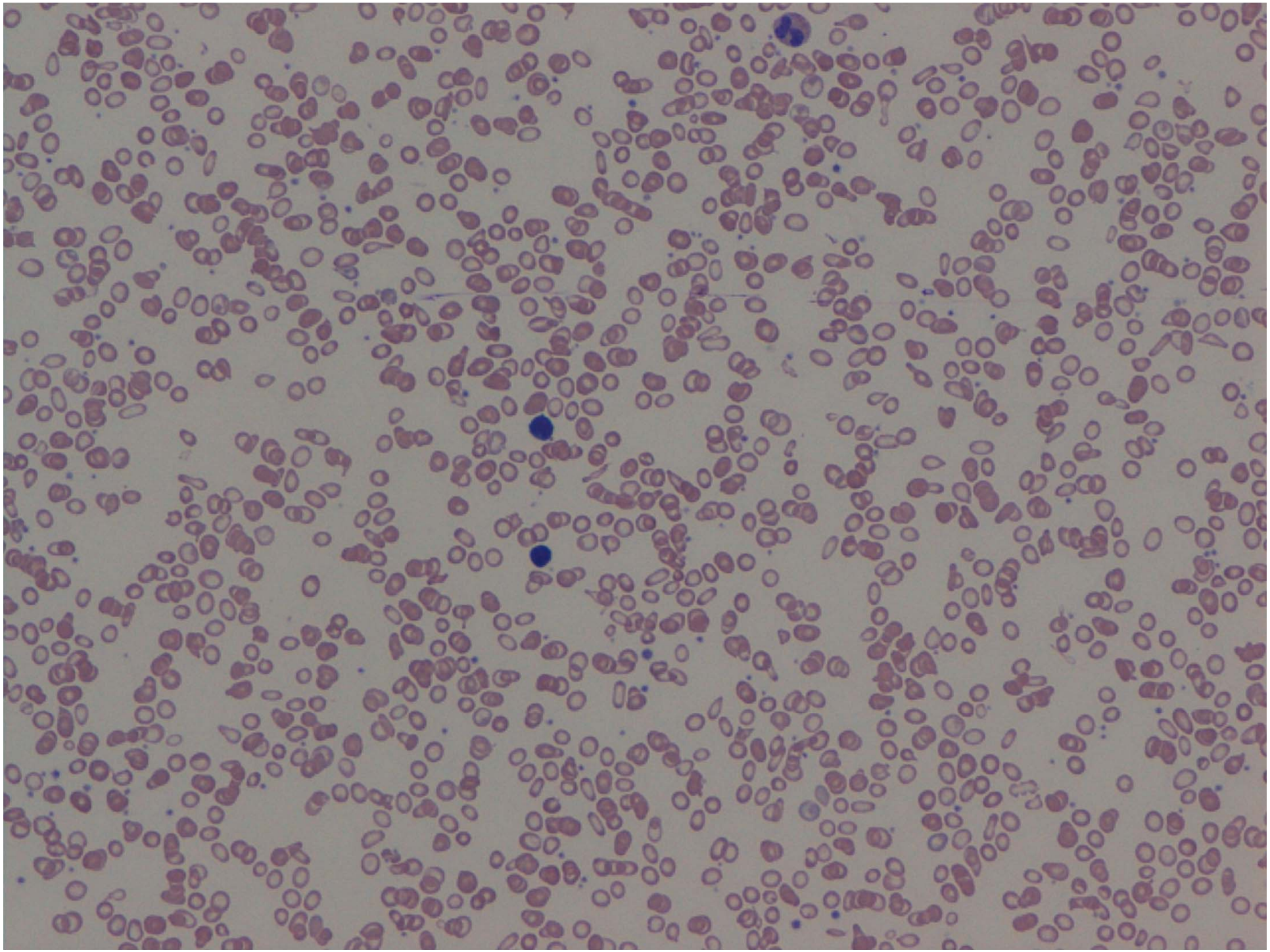
Case Study 1

- 2 yr old child presented at Pathology, Coffs Harbour Base Hospital referred from a private doctor on a Friday afternoon for blood tests.
- No clinical history supplied.
- FBC, Iron studies, UEC and MSU were requested.

Case 1

- Initial results

55 g/L L
4.55 x10^12/L
0.229 L/L L
50 fl L
12 pg L
240 g/L L
24.4 % H
7.7 10^9/L
3.0 x10^9/L
3.7 x10^9/L
0.7 x10^9/L
0.2 x10^9/L
0.0 x10^9/L
419 x10^9/L H
88 x10^9/L



Case 1

- A phone call was received from the Paeds Registrar requesting a transfusion of 225 ml of packed cells as per the Children's Hospital, Sydney.
- I consulted with our Haematologist, Dr Martin Browne. He had consulted with the Children's Hospital, and a decision was made NOT to transfuse the child.

Case 1

- The child's diet consisted of little or no milk, no meat and a high carbohydrate diet.
- Weight 12 Kg, 60 percentile range.
- Displayed behavioral problems and irritability.
- Cause of anemia was Iron Deficiency.
- Prescribed oral iron 6mg/kg.

Case 1

- After iron replacement after 1 month:

Haematology			
Hb	114 g/L	94 g/L L	55 g/L L
RCC	5.72 x10^12/L H	5.85 x10^12/L H	4.55 x10^12/L
HCT	0.388 L/L	0.383 L/L	0.229 L/L L
MCV	68 fl L	66 fl L	50 fl L
MCH	20 pg L	16 pg L	12 pg L
MCHC	294 g/L L	245 g/L L	240 g/L L
RDW	---- %	---- %	24.4 % H
WCC Corrected	6.5 10^9/L	6.5 10^9/L	7.7 10^9/L
Neutrophils Absolute	3.2 x10^9/L	2.9 x10^9/L	3.0 x10^9/L
Lymphocytes Absolute	2.0 x10^9/L L	2.7 x10^9/L	3.7 x10^9/L
Monocytes Absolute	1.3 x10^9/L H	0.6 x10^9/L	0.7 x10^9/L
Eosinophils Absolute	0.0 x10^9/L	0.2 x10^9/L	0.2 x10^9/L
Basophils Absolute	0.0 x10^9/L	0.0 x10^9/L	0.0 x10^9/L
PLT	243 x10^9/L	323 x10^9/L	419 x10^9/L H
Reticulocytes Absolute	13 x10^9/L L	110 x10^9/L H	88 x10^9/L
Iron	5 umol/L		2 umol/L L
Transferrin	3.1 g/L		4.8 g/L H
Ferritin	22 ug/L		2 ug/L L
Transferrin Saturation	6 % L		2 % L (c) Modified

Case 1

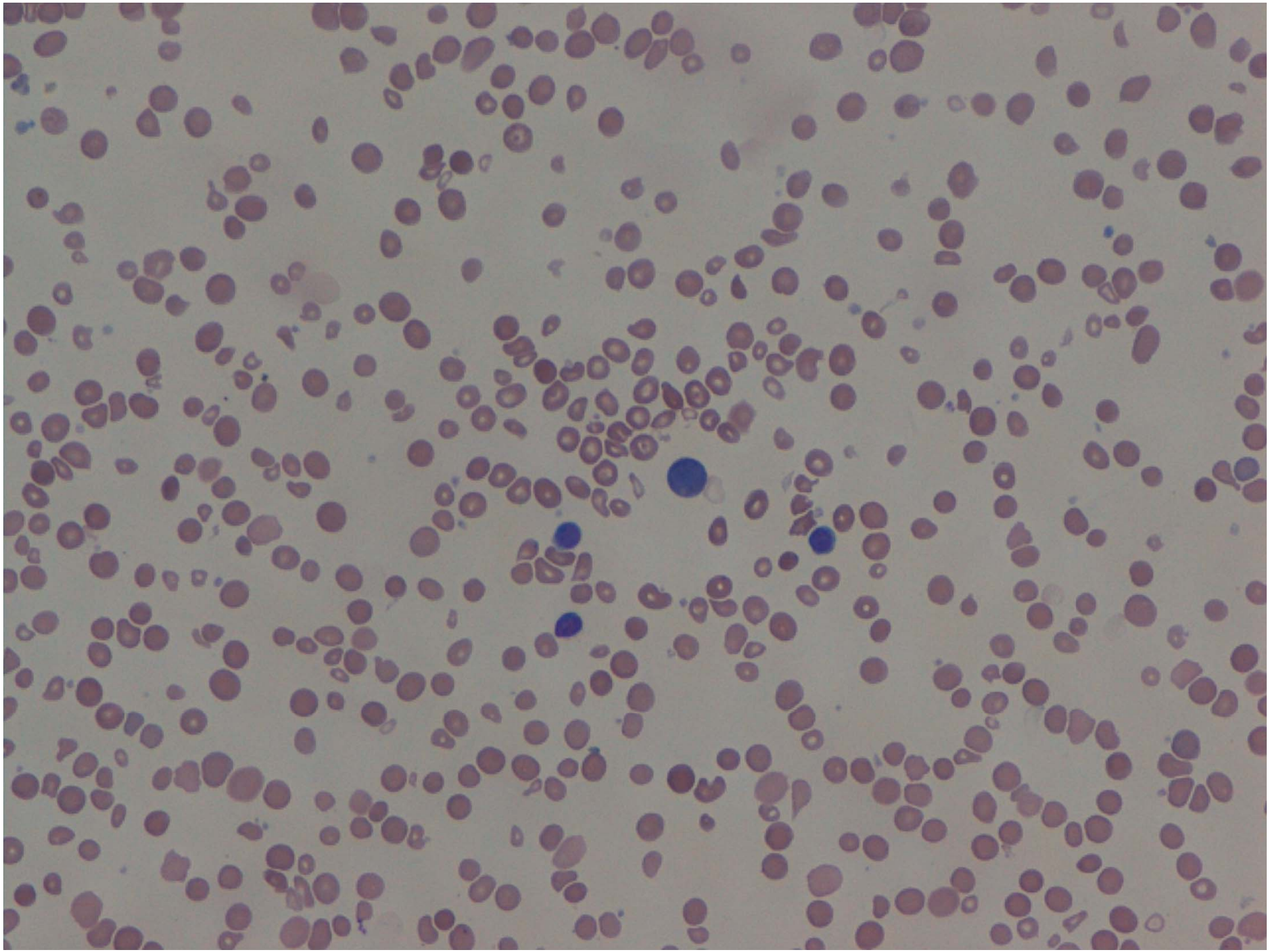
- After therapy, the child was described as completely different. No behavioral problems, happy and attentive.
- Iron is essential for normal neurodevelopment. Low levels during infancy and childhood can have long-lasting detrimental effects.

Recommendation-RBC Transfusion

- In neonatal and paediatric patients, the decision to give a RBC transfusion should not be dictated by a Hb concentration alone. The decision should also be based on assessment of the patient's underlying condition, anaemia-related signs and symptoms, and response to previous transfusions.

Case Study 2

- 9 month old baby girl presented to the Ed department of Kempsey Hospital at 4pm on a Friday afternoon
- Presented for vomiting and yellowing skin
- FBC and EUC ordered
- Hb 48 MCV 102 PLT 111 WCC 5.1
- Does this child need to be transfused immediately?



Case Study 2

- No, the child was clinically stable and was transferred to PMBH for further investigation
- Iron studies and B12 folate were ordered but not available until the next day.
- Iron levels were normal.
- B12 was <61 (normal range 138-652pmol/L)
- Severe B12 deficiency with megaloblastic anemia.

Case Study 2

- Further investigation child was fully breast fed not receiving solids or any supplements
- Mother is has a vegan diet with out support.
- The child was given B12 injection then oral supplements
- Mother given education on what foods to be given to a child raised on this diet.

Case Study 2

- Results 1 month later

Haematology						
Haemoglobin Total		111 g/L			76 g/L L	48 g/L L
Hb						
RCC		4.5 x10^12/L *			3.0 x10^12/L * L	1.5 x10^12/L * L (c) M
HCT		0.35			0.28	0.15 L
MCV		79 fL			95 fL	102 fL H
MCH		25 pg			25 pg	32 pg
MCHC		314 g/L L			268 g/L L	316 g/L L
RDW		20.6 % H			28.2 % H	38.1 % H
WCC		9.4 x10^9/L *			8.1 x10^9/L *	5.1 x10^9/L *
WCC Corrected						
Neutrophils Absolute		2.2 x10^9/L			2.1 x10^9/L	0.7 x10^9/L L
Lymphocytes Absolute		5.5 x10^9/L			5.1 x10^9/L	4.2 x10^9/L
Monocytes Absolute		1.2 x10^9/L			0.6 x10^9/L	0.2 x10^9/L
Eosinophils Absolute		0.4 x10^9/L			0.2 x10^9/L	0.0 x10^9/L
Basophils Absolute		0.0 x10^9/L			0.0 x10^9/L	0.0 x10^9/L
PLT		430 x10^9/L *			614 x10^9/L * H (c) Modified	111 x10^9/L * L

Pathology North

Both of these Children did not need this from SANTA !

NSW GOVERNMENT Health Pathology

References

- Patient Blood Management Guidelines Module 6- NeonatalandPaediatrics.

www.blood.gov.au/pbm-module-6

Kuhne T, Bubl R Baumgartner R. Ma J Pediatrternal vegan diet causing a serious infantile neurological disorder due to vitamin B12 deficiency. Eur J Pediatr. 1991 Jan; 150 (3): 205-8.