

# ARIIA

## Avoidable Red cell transfusion due to Inadequate Investigation of Anaemia A Retrospective, Multi-Centre Audit

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### Introduction

A red blood cell transfusion is one of the most common procedures performed in hospitals. Despite significant improvements over the past decades in the ways that blood products are collected, processed and administered, transfusion is still associated with appreciable risks of transfusion reactions, alloimmunisation and infections. The use of evidence based guidelines aims to avoid unnecessary blood transfusions and their associated risks, and make best use of blood supplies, which are a scarce and costly resource.

Inadequate investigation into the cause of anaemia and patients therefore receiving potentially avoidable blood transfusion is an issue particularly pertinent to acute care settings such as acute assessment units and emergency departments, where there is often great pressure to treat patients quickly so they can continue their flow through the hospital or be discharged. These patients are at risk of important diagnoses being missed and treatments for anaemia other than blood transfusion not being considered.

### Methods

Data from 828 patients were collected from 15 hospitals across the UK between 1-31/1/2019. The population of interest were patients who received blood transfusion in an acute care setting. We investigated if their blood transfusion was appropriate and if they were adequately investigated for the cause of their anaemia according to NICE guidelines and recommendations. We also identified further blood transfusions for up to 6 months after that date which may have been avoided if a cause for anaemia had been found. The collection of the data was coordinated by the HaemStar network of Haematology Registrars.

### Results

The patients had a median age of 74 (IQR: 62 – 86). The mean Hb(g/L) at the time of presentation in an acute care setting was 73.04 (CI: 71.7 – 74.4) with a mean MCV of 88.5 (CI: 87.6 – 89.4). In 669/828 (80.8%) cases, transfusions were appropriate, but they were inappropriate in 159 out of 828 cases (19.2%) according to the NICE guidelines<sup>1</sup>. In 112/159 (70.4%) cases, the cause was unknown or was identified during the admission. 1 patient had non-major bleeding, but was transfused more than 3 units, while 2 patients were transfused for non-major bleeding without being anaemic. In 87/159 (54.7%) cases, there were alternatives to transfusion that could have been given.

Out of 333 patients that the causes of the anaemia were unknown or identified during admission, only 145 (43.5%) were investigated adequately. Most of the cases of unknown anaemia were normocytic (190, 59%). Not having appropriate investigation for the anaemia did not result in statistically significant increase in further transfusions.

1. National Institute for Health and Care Excellence (NICE) (2015) *Blood Transfusion*[NG24]  
URL <https://www.nice.org.uk/guidance/ng24>

All Transfusions	N = 828
Appropriate	669(80.8%)
Inappropriate	159(19.2%)
<b>Cause of Anaemia</b>	
Major bleeding	116(14%)
Non-major bleeding	206((24.9%)
Other known cause	169(20.4%)
Cause identified	179(21.6%)
Unknown cause	154(18.6%)
Not anaemic	4(0.5%)

Unknown cause of anaemia or identified in admission	N = 333	Further Transfusions
Appropriate Investigation of anaemia	145 (43.5%)	Yes 50(34.5%) No 95(65.5%)
Inappropriate investigation of anaemia	188 (56.5%)	Yes 69 (36.7%) No 119 (63.3%)
<b>Pre transfusion Hb (Median, IQR)</b>		
Microcytic	69 IQR (60-77)	
Normocytic	105 (31.5%)	
Macrocytic	190 (59%)	
	38 (11.4%)	

### Conclusion

This study indicates the need to further educate healthcare professionals regarding the investigation of anaemia in acute care settings and the appropriate indications for transfusion. These have the potential to minimise the risk of transfusion associated adverse events and avoid a wasteful use of a limited resource. Potential measures to achieve that could be incorporation of the investigation pathway to the electronic system when requesting blood and education of the staff by the transfusion team similar to the training provided in regards with the transfusion thresholds and ordering blood. Further studies may be necessary to assess whether inappropriate investigation of anaemia could lead to increased number of blood transfusions.