Mitchells Plain
We exceed expectations

UNIVERSITEIT STELLENBOSCH UNIVERSITY

ANAEMIA AND HIV

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Discovery Foundation

ANAEMIA

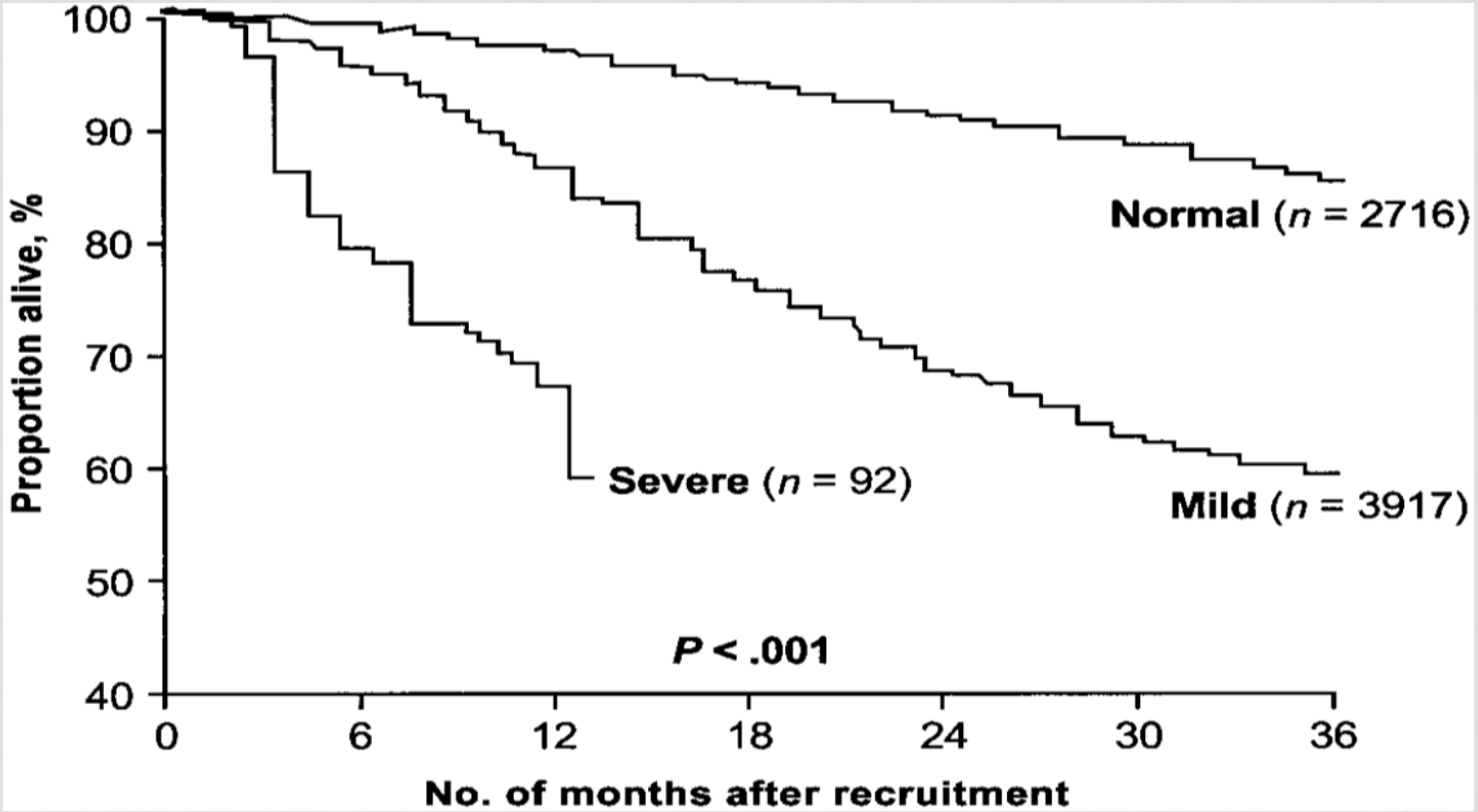
- **Most common** cytopaenia in HIV
  - 95% of patients in the disease course
- Anaemia is **NOT** a diagnosis
- Multitude of possible causes
- Often multifactorial

…..difficult in the setting of HIV!!

OPIE, Jessica. Haematological complications of HIV Infection. **South African Medical Journal**, p. 465-468, mar. 2012.

WHAT IS THE SIGNIFICANCE OF ANAEMIA IN HIV?

- Independent predictor of survival prior to HAART



Anaemia and survival in HIV. **CID** 2003:37

WHAT IS THE SIGNIFICANCE OF ANAEMIA IN HIV?

- Predictor of disease progression
- Impact on quality of life…

APPROACHES TO ANAEMIA

- A morphological approach
- A **pathophysiological** approach
  - Red cell loss
  - Decreased red cell production
  - Increased red cell destruction

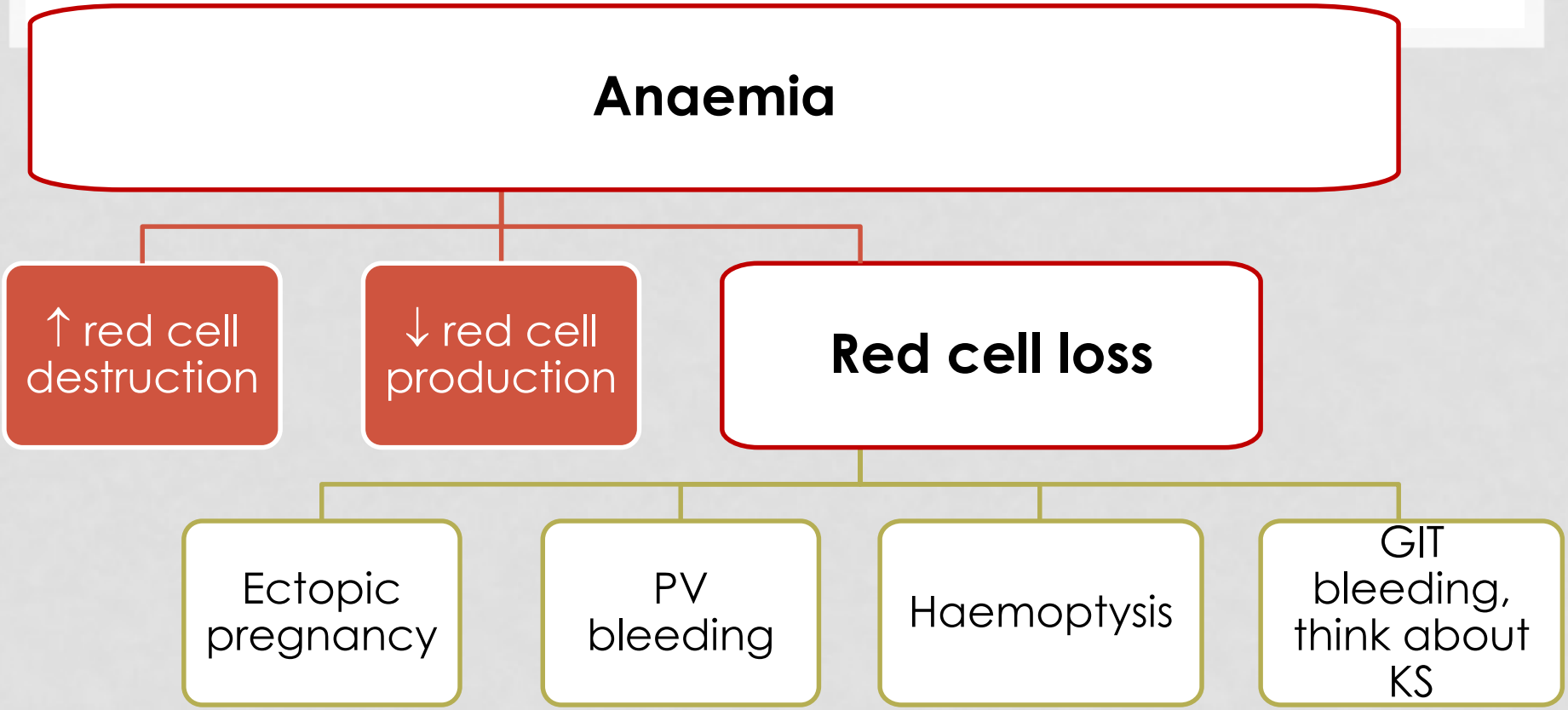
IMPORTANT QUESTIONS:

- Acute or chronic?
- Isolated anaemia – or 2 or more cell lines affected?
- Is it just a blood problem – other systems involved?

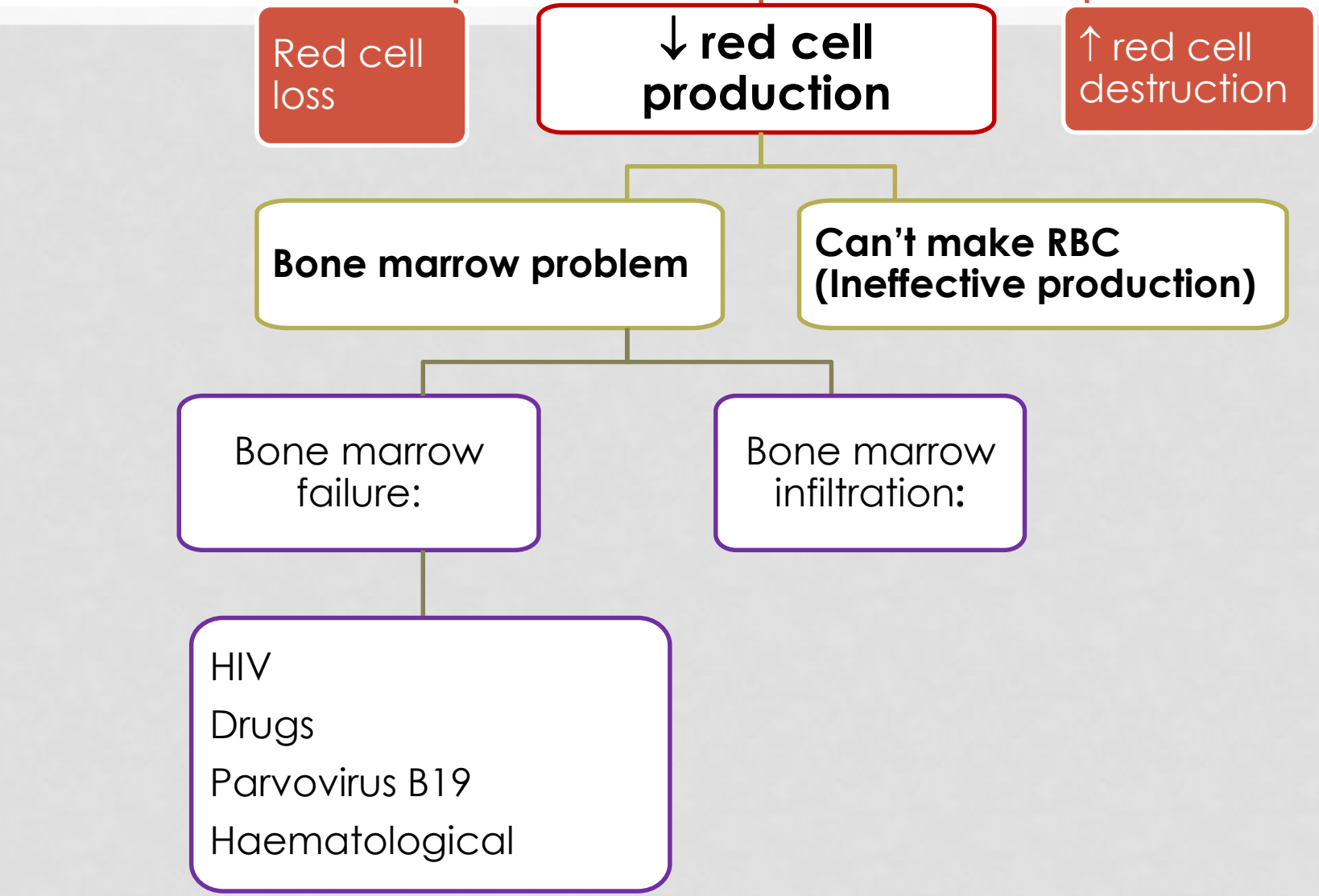
Note:

Transfusion does not 'cure' anaemia – diagnosing and treating the underlying cause is essential

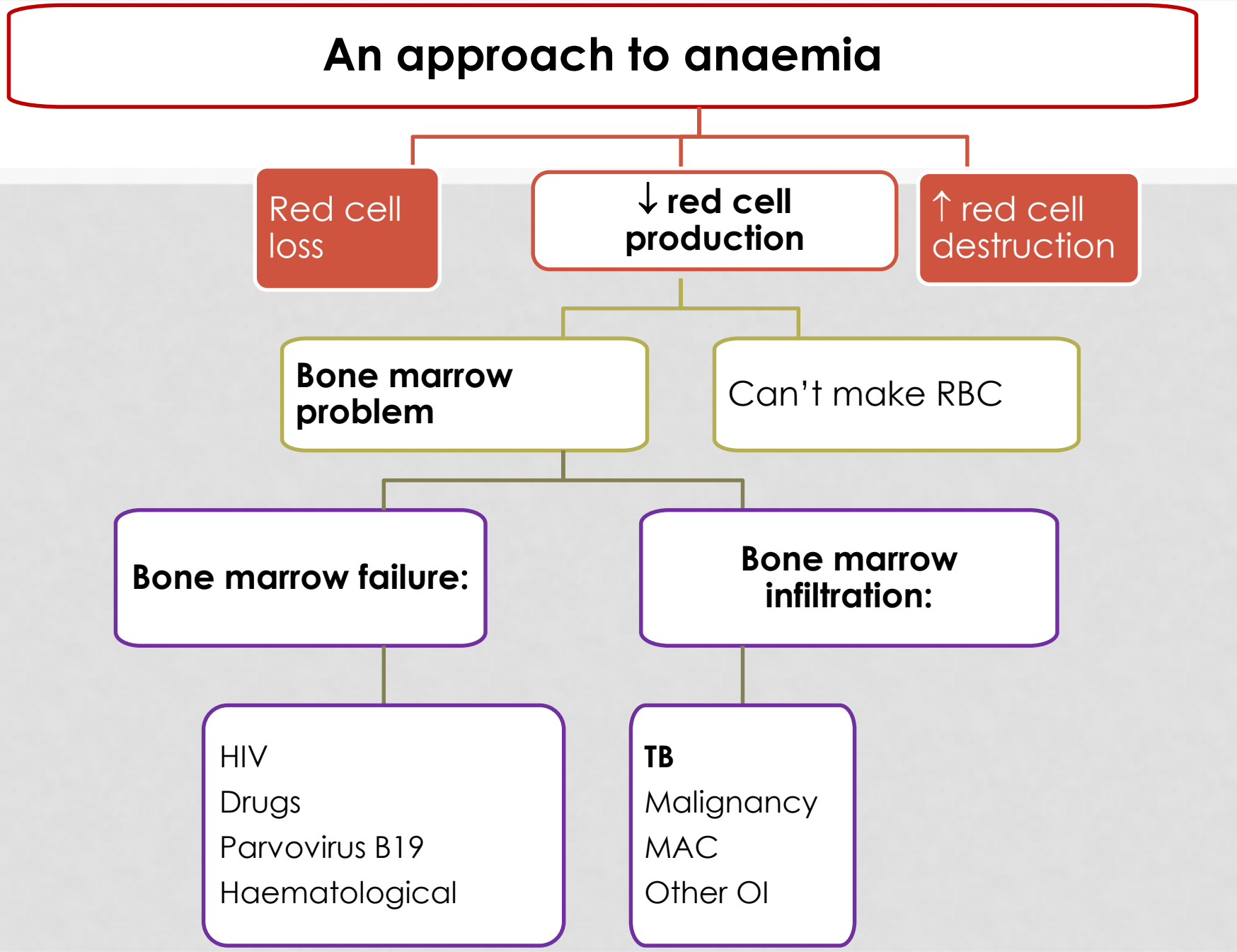
APPROACH TO ANAEMIA



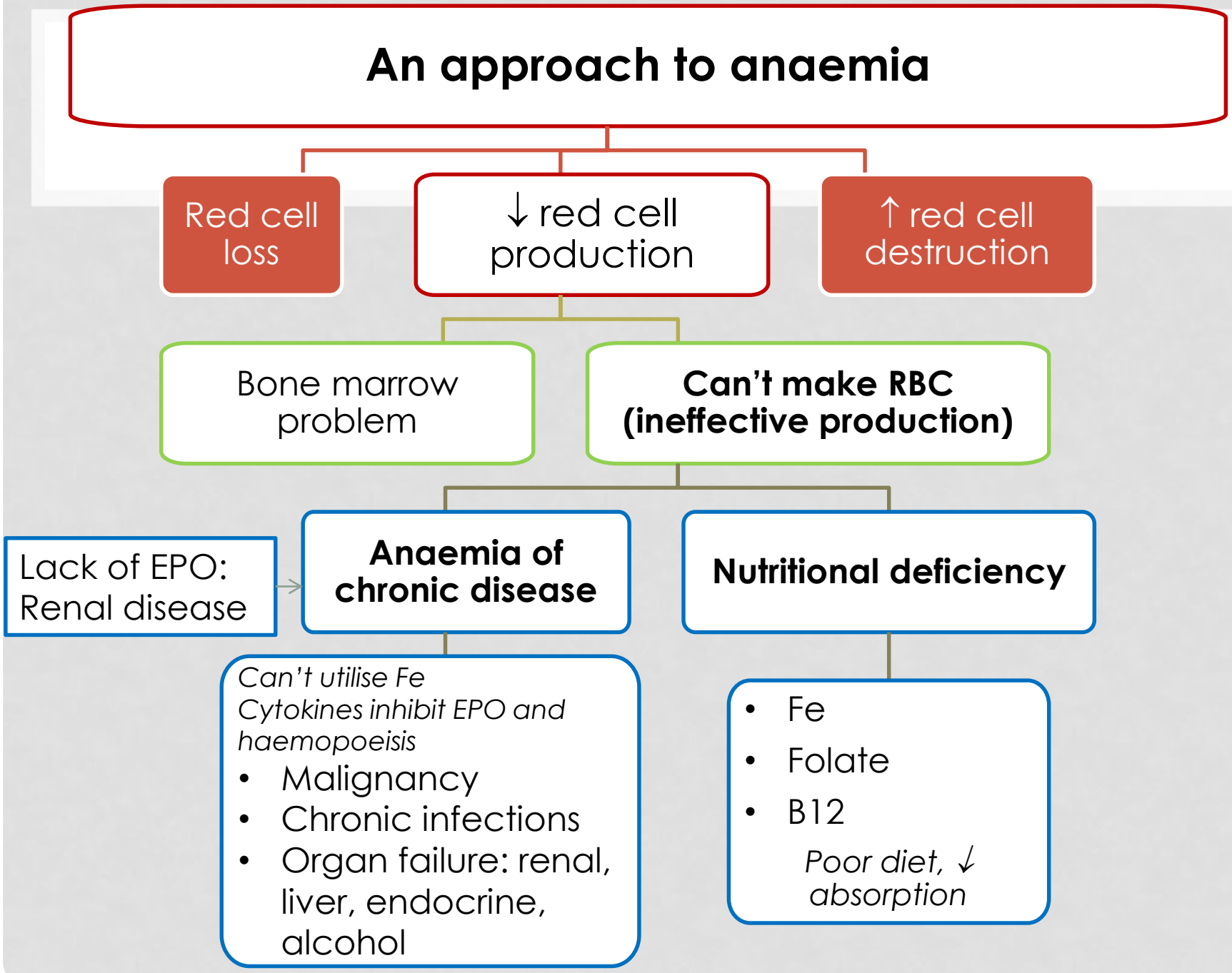
Approach to Anaemia



An approach to anaemia



An approach to anaemia



Approach to anaemia

- Red cell loss
- ↓ red cell production
- **↑ red cell destruction**
  - **Haemolytic anaemia**
    - Intravascular haemolysis
      - MAHA
        - TTP/HUS
        - DIC – sepsis, malignancy
      - Infections
      - Other
    - Extravascular haemolysis:
      - Immune:
        - Autoimmune
        - Drugs: rifampicin, EFZ
      - Inherited:
        - Abnormal membrane
        - Abnormal globin
        - Enzyme defects
  - Other acquired
  - Hypersplenism

HIV AND THE BONE MARROW

"in most patients with advanced HIV pancytopenia is the rule"

- The main mechanism for anaemia is a **disruption of bone marrow cytokine homeostasis.**
  - HIV is cytotoxic to T-helper lymphocytes →leads to dysregulation of B cells /altered release of cytokines.
  - HIV-infected T cells **directly suppress growth of bone marrow progenitors**, thus suppressing haemopoiesis.
- CD4 is carried by T-helper lymphocytes, monocytes and microvascular endothelial cells (found in marrow)
- The infection of monocytes in the marrow →alters release of cytokines →**haemopoietic progenitor cells fail to adequately respond to anaemia** and other cytopenias.

OPIE, Jessica. Haematological complications of HIV Infection. **South African Medical Journal**, p. 465-468, mar. 2012.

DRUGS AND ANAEMIA

AZT:

- Anaemia and neutropaenia
- Macrocytosis (not B12 / folate deficient)
- D4T has same effects, but anaemia less common and less severe

3TC:

- Pure red cell aplasia
- Rare
- Diagnosis of exclusion
- Stop 3TC, give alternative NRTIs

DRUGS AND ANAEMIA

Cotrimoxazole:
- Megaloblastic anaemia (via folate inactivation)
- Neutropaenia
- Thrombocytopaenia

Rifampicin:
- Haemolytic anaemia
- Immune thrombocytopenia

Amphotericin B:
- Hypochromic, normocytic anaemia
- Decreased erythropoetin production

PARVOVIRUS B19 INFECTION

- Only one of the Parvovirus group that is a human pathogen

Clinical manifestations:

- Erythema infectiosum – slapped cheek syndrome in children
- Febrile arthropathy in adults
- Nonimmune hydrops fetalis – in utero infection
- Aplastic crises in sickle cell pts
- **Chronic PRCA** in immunodeficient patients; mostly low CD4 counts

PARVOVIRUS B19

- Infects actively replicating erythroid progenitor cells, which are destroyed

Immunocompromised:

- **Failure to make neutralising Abs**
- **Results in persistent viraemia**
- **And chronic red cell aplasia**

Normal host:

- erythroid aplasia transient, no detectable reduction in Hb

PARVOVIRUS B19

Diagnosis:

- **Parvovirus PCR**
- Serology: parvovirus IgM, but may be poor Ab response in HIV pts
- Giant abnormal pronormoblasts on bone marrow biopsy: pathognomonic

Treatment:

- Blood transfusion: may contain neutralising Abs, so cause temporary ↑ in erythropoiesis
- HAART
- IVIG: most pts respond
- If don't respond – look again for other causes

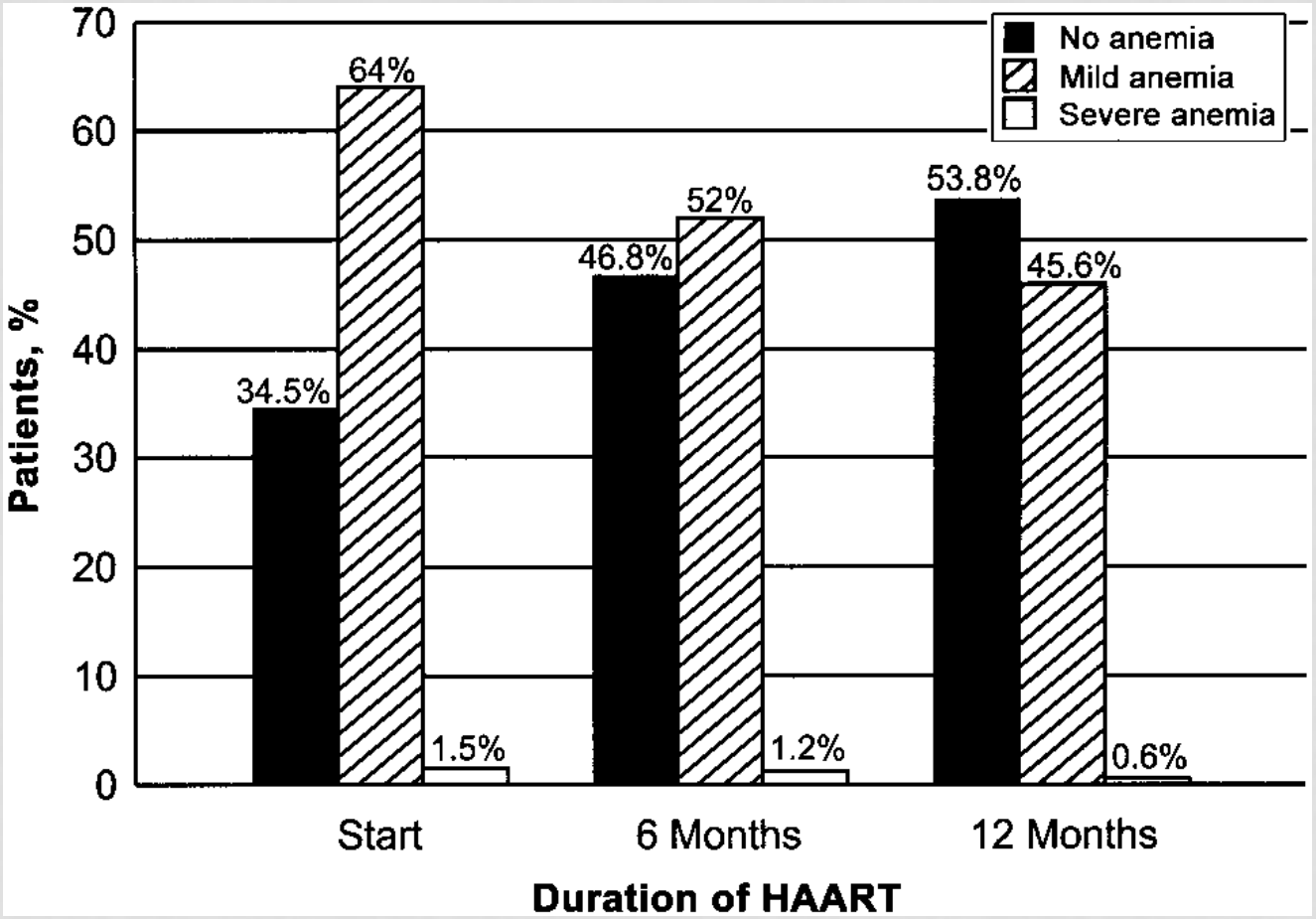
AUTO-IMMUNE HAEMOLYTIC ANAEMIA

- Rare in HIV
- However: 20-44% of asymptomatic HIV infected patients can be Coombs test +

Why?

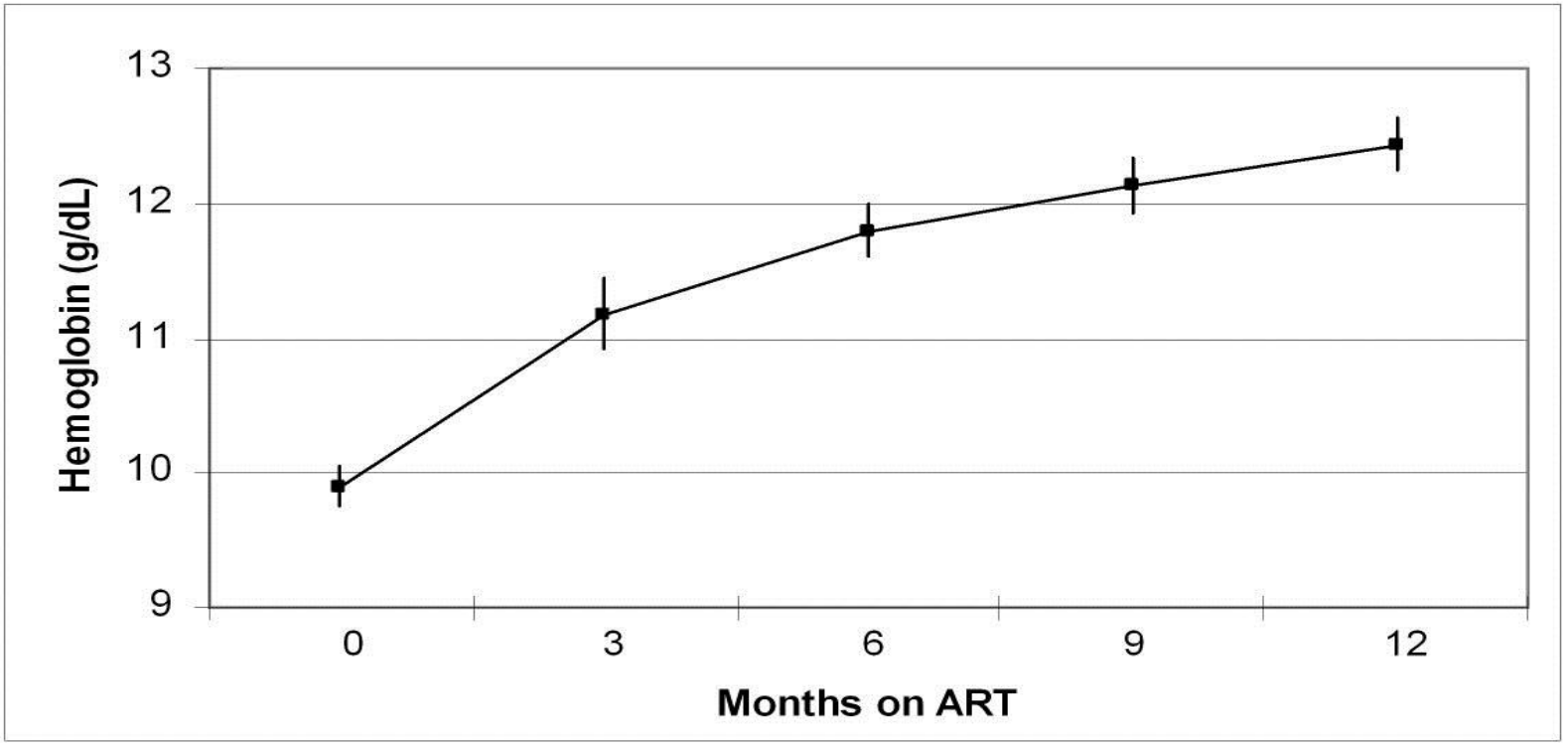
- Non-specific binding of antiphospolipid antibodies
- Deposition of immune complexes on erythrocytes
- Coombs test is not a useful investigation in HIV pts

EFFECT OF HAART



CID 2004:38

HAART IMPROVES ANAEMIA



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Johannessen *et al. BMC Infectious Diseases* 2011 **11**:190

BLOOD TRANSFUSION

'Blood transfusion is like marriage: it should not be entered upon lightly, unadvisedly or wantonly, or more often than is absolutely necessary.'

Role of blood transfusion:

- Not a cure for anaemia
- '*symptomatic anaemia*' – symptoms often due to underlying cause rather than anaemia itself: eg TB in patients with advanced HIV
- Severe respiratory symptoms: aim for Hb of 10
- Otherwise we usually transfuse if Hb < 5.5 g/dL

A review of the use of blood and blood products in HIV-infected patients. SAJHIVMED June 2012

SUMMARY

- ✓Anaemia is not a diagnosis
- ✓Look for the cause of the anaemia
  - Is the anaemia acute or chronic?
  - Is the patient bleeding?
  - Look for KS
  - Look for TB, including NTM
  - Exclude and treat other causes; think of malaria
  - Change any implicated drugs
  - Treat Fe/ folate / B12 deficiencies if present
- ✓Treat the cause/Remove the offending drug/HAART
- ✓Responsible use of blood transfusion

THANK YOU

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