Causes of Thrombocytosis

- Reactive
  - Increased bone marrow activity
    - Acute bleeding/haemolysis
    - Iron deficiency
  - Infection
  - Splenectomy
    - 30% of platelet is sequestrated in spleen
  - Inflammation
    - Autoimmune
    - Malignancy
    - Trauma/Surgery
    - Smoking
- Primary
  - Myeloproliferative neoplasm

Clinical relevance of thrombocytosis in primary care: a prospective cohort study of cancer incidence using English electronic medical records and cancer registry data

Sarah ER Bailey, Obioha C Ukoumunne, Elizabeth A Shephard and Willie Hamilton
Br J Gen Pract 2017; 67 (659): e405-e413. **DOI:** https://doi.org/10.3399/bjgp17X691109

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- Prospective Registry Data
- Associated
  - Lung
  - Colorectal
  - Urogenital
- Annual Risk of Cancer

	Elevated %/NNT	Persistent (within 6m)	4-12m	13-24m	Baseline
Male	11.6%/(13)	18.1%/(7.1)	3.9%	2.7%	4.1%
Female	6.2%/(25)	10.1%/(12.7)	2.4%	1.8%	2.2%

- Few comment
  - Lack of multivariate analysis is frustrating
  - Clear evidence of chronic inflammation causes cancer
    - Chicken or Egg
- What to do?
  - Debatable but similar to unprovoked VTE
  - Routine CXR
  - Rest symptom guided??

Laboratory Findings - MF

		Ref. Range
Haemoglobin	149	(130 – 175)
RBC	4.89	(4.30 – 6.0)
HCT	0.46	(0.40 – 0.52)
MCV	94	(80 – 99)
MCH	30.5	(27.0 – 33.0)
Platelets	512	(150 – 400)
WBC	16.4	(4.0 – 11.0)
Myelocytes	0.2	
Neutrophils	13.4	(1.90 – 7.50)
Lymphocytes	1.5	(1.00 – 4.00)
Monocytes	0.6	(0.20 – 1.00)
Eosinophils	0.5	(<0.51)
Basophils	0.2	(0.00 – 0.20)
Nucleated Red Cells	0.2	

- Typical Findings
  - Anaemia (normocytic normochromic)
  - Increased platelet and WBC
  - Blood film very important
    - Leucoerythroblastic blood film
      - Nucleated red cell & immature granulocyte
      - Rare blasts can be seen
    - Teardrop red cells
    - Variable platelet size and granulation

NZ Perspective

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Prognostic	Risk	Management

DIPPS/DIPPS+
 	
MIPPS70
MIPPS70+
	Low	• Asymptomatic
		  • Observation or consider treating as per ET
		• Symptomatic
		  • Hydroxycarbamide
		  • Splenomegaly, vascular risk, hyperviscosity
		  • Anaemia
		  • ESA, IMIDs

	Int-1	• Consider allogenic bone marrow transplant*
		• *Asymptomatic*
		  1. Hydroxyurea
		  2. Peginterferon
		• Symptomatic
		  1. **Ruxolitinib**
		  2. Hydroxycarbamide
		  3. Peginterferon

	Int-2 & High	• Consider allogenic bone marrow transplant • **Clinical trial** • Ruxolitinib • HU/Peginterferon +/- Ruxolitinib

Goals of Treatment

Specialist

- Prevent comorbidity
  - Thrombosis
    - Aspirin
    - Venesection (PV)
    - Cytoreductive therapy
      - Hydroxyurea
      - Novel therapy
- Curative in selected cases
  - Allogeneic stem cell transplant
    - Fit and young patient with advanced MF or transformed AML

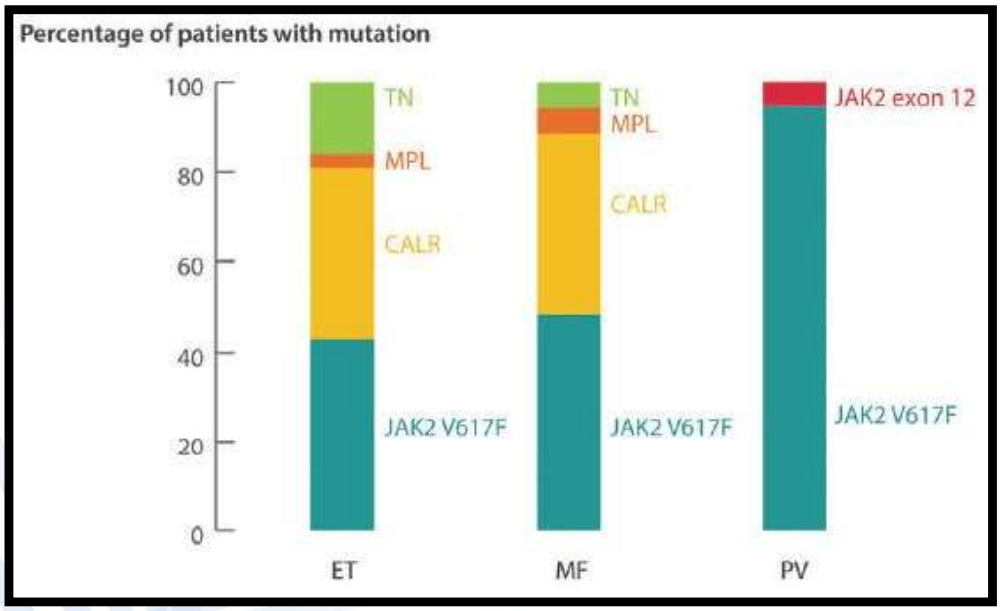
GP

- Prevent comorbidity
  - Lifestyle modification
  - Aggressive vascular modification
    - 6 monthly vascular RF assessment
- Avoid iron replacement in PV
- Psychosocial support

Summary

- MPN is prevalent in our community
  - Rare “cancer” with long survival
- Diagnosis is often delayed
  - Asymptomatic
  - CBC/FBC trend is very important
- Primary care play a critical role in disease management
  - Vascular risk factor modification
  - Avoid iron replacement in PV
    - Inform haematology service
  - Psychosocial support
    - Leukaemic Blood Cancer NZ

Molecular Investigations (old)



Grinfeld J, et al. Haematologica. 2017;102:7-17

- PV
  - **JAK2 V617F** +/- exon 12
  - **Serum erythropoietin**
- ET/MF
  - **BCR-ABL1**
  - **JAK2 V617F** if negative then proceed to **CALR and MPL** mutation

Molecular Investigations (new)

Grinfeld J, et al. Haematologica. 2017;102:7-17

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Molecular Investigations (new)

- From 20/10/25 new molecular platform
  - CML
    - BCR-ABL (Mon to Thur)
  - PV
    - JAK2 V617F
    - Serum erythropoietin
  - ET/MF
    - MPN NGS panel (haematologist only)

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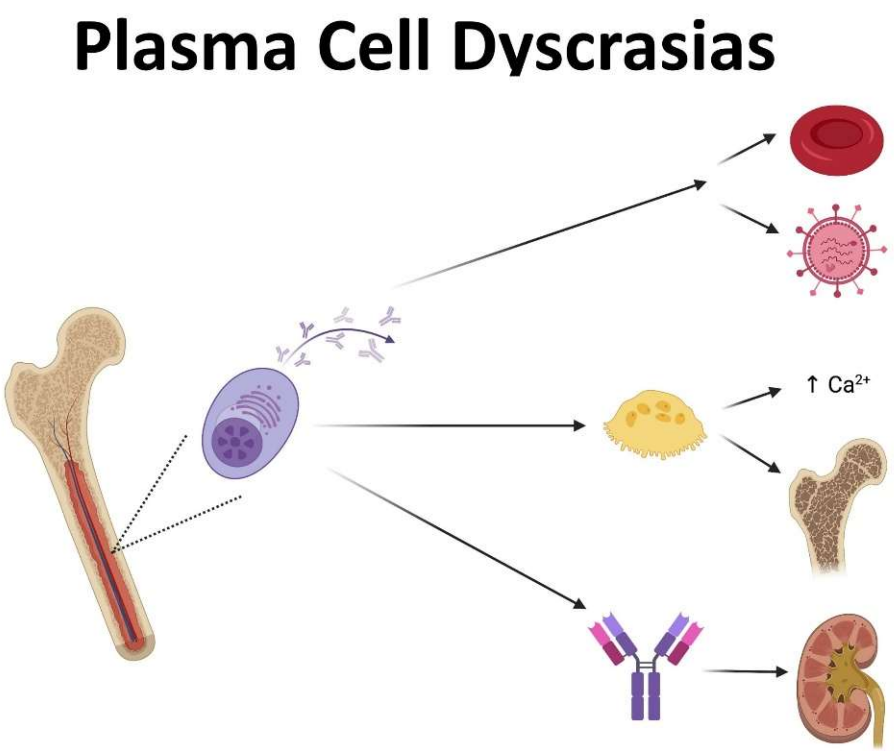
LIGHT CHAIN

Plasma Cell Dyscrasia



- Serum free light chian
  - Kappa or lambda
  - Doesn't distinguish between normal or abnormal
    - Normal ratio
      - Inflammation
      - Abnormal kappa and lambda clone
    - "Abnormal" Ratio
      - Renal function
      - Age
      - Ethnicity

iSTOPMM

- https://istopmm.com/risk-models-and-calculators/
  - MGUS vs myeloma
  - Light chain calculator

Light chain MGUS calculator

Serum free kappa, mg/L

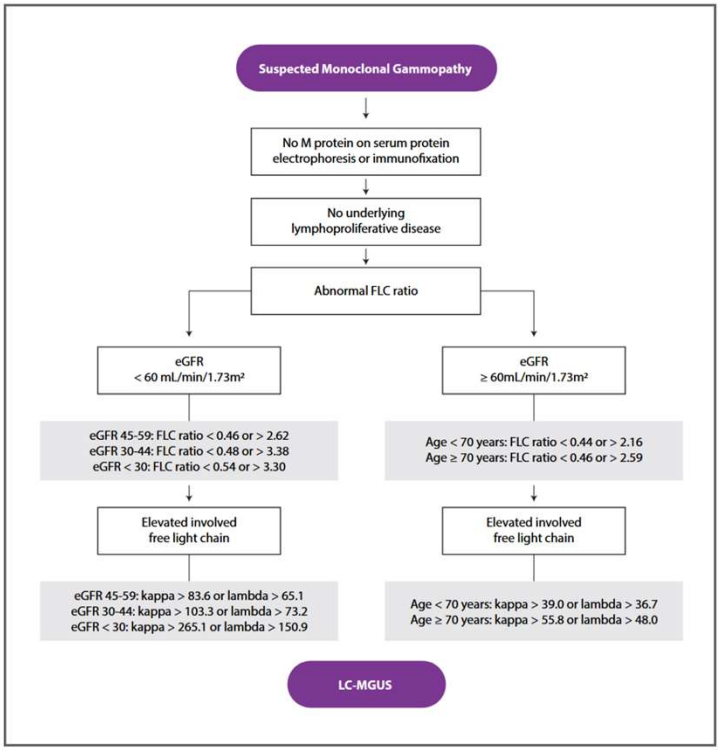
Serum free lambda, mg/L

Age, years

eGFR* mL/min/1.73m2

Please select values

* Serum creatinine based CKD-EPI eGFR equation (2009) was used in the study where these reference intervals were determined. This calculator was developed based on measurements using the Freelite assay.



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