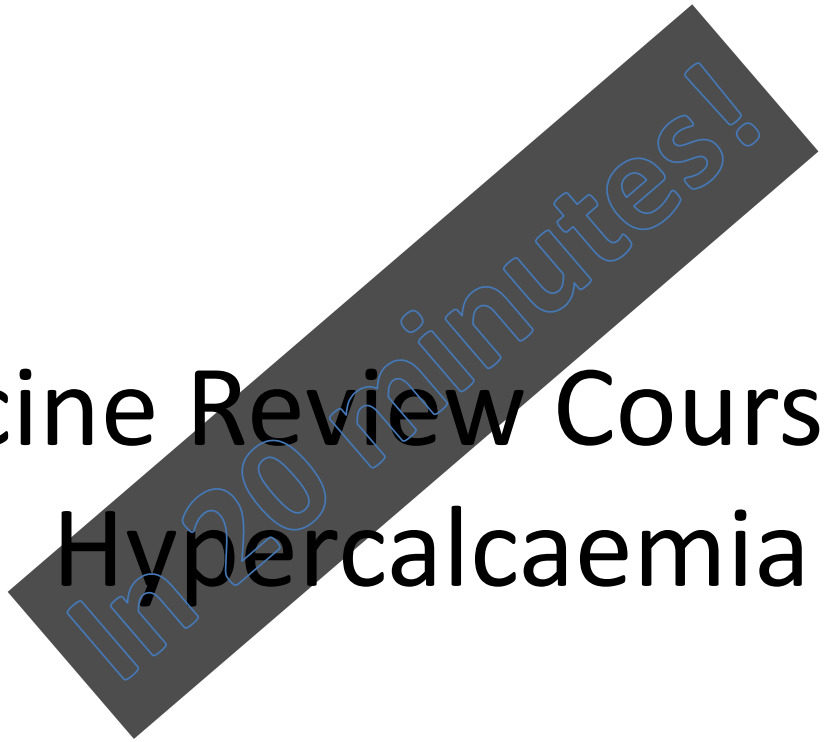
Medicine Review Course 2015
Hypercalcaemia



Endean Tan

MBBS(Singapore), MRCP(UK), FAMS(Int Med)

Scope

- The Three Rules of Medicine
- A mnemonic for ALL diagnoses
- The Factory Line
- Management
- Summary

In exams and real life…

- Hyperparathyroidism (+MEN, +lithium)
- Cancer
- Familial hypocalciuric hypercalcaemia
- Vitamin D excess

1. An asymptomatic 55-year old female was found to have the following results during a health screen:

Component	Result	Normal Range
Sodium	138	135-145
Potassium	4.1	3.5-4.0
Urea	3.8	2.5-7.5
Creatinine	88	60-110
Calcium (adjusted)	**2.76**	2.2-2.6
Phosphate	0.86	0.8-1.4
ALP	86	45-105
PTH	**5.7**	0.9-5.4
24h urinary Calcium	**0.5**	2.5-7.5

What is the most likely diagnosis?

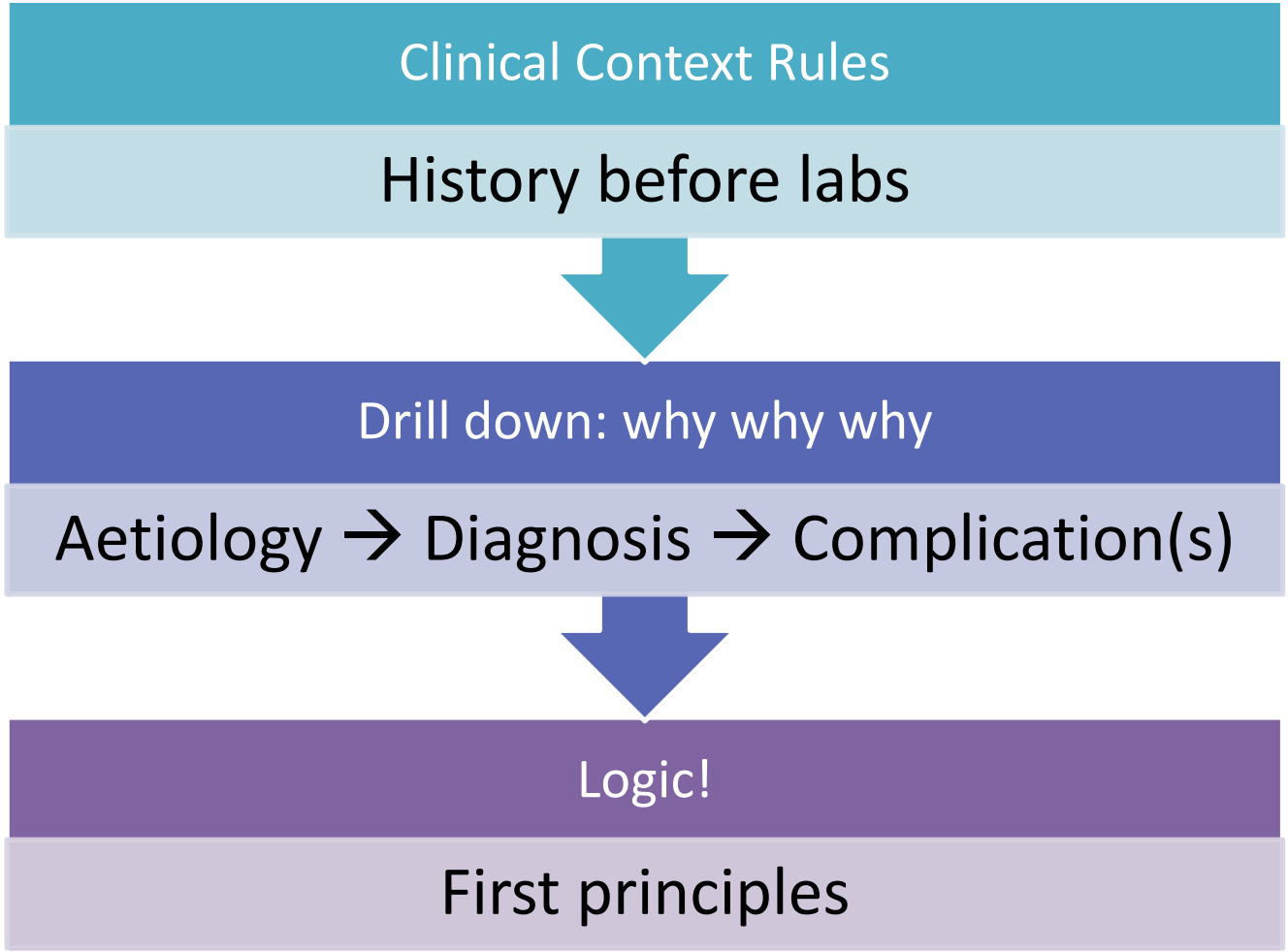
A. Primary hyperparathyroidism
B. Secondary hyperparathyroidism
C. Tertiary hyperparathyroidism
D. Familial hypocalciuric hypercalcaemia
E. Vitamin D intoxication

MRCP Part 1

Real Life, and Inside the Brain of Examiners

THE RULES & A MNEMONIC

The Three Rules of Medicine



6. The Cheat Sheet

When asked:

- What do you think is the possible cause?

Answer: Sir/Ma'am...

- The possible aetiologies are:

V	: Vascular
I	: Infective
T	: Traumatic
A	: Auto-immune
M	: Metabolic/Endocrine
I	: Inflammatory/Iatrogenic
N	: Neoplastic
D	: Drugs/Deficiency
C	: Congenital/Child

Absorption → Utilisation → Excretion

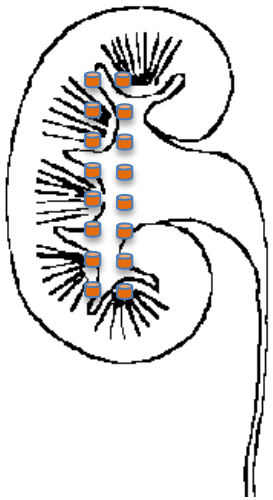
THE FACTORY LINE

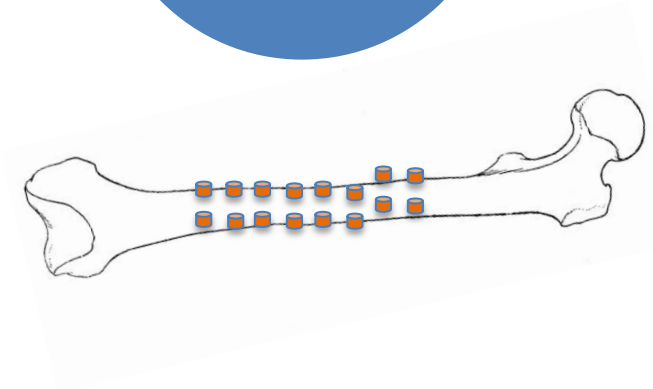
The 2 Major Players

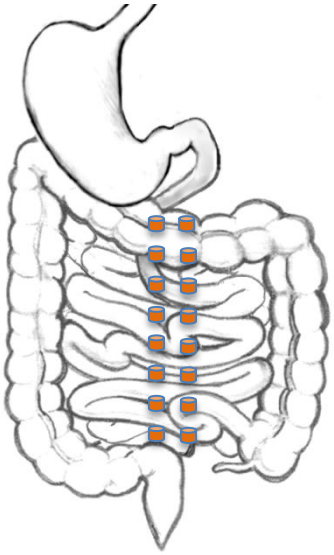
PTH

Vitamin D

Ca^{2+}

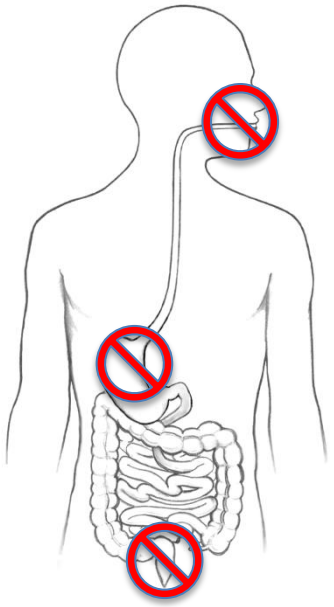






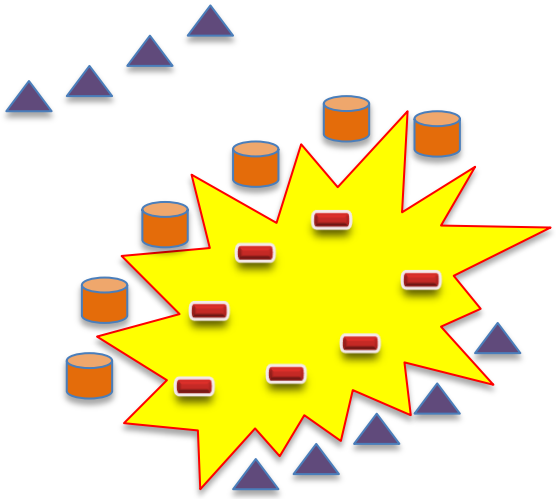
Diagnosis: from HISTORY/PEX

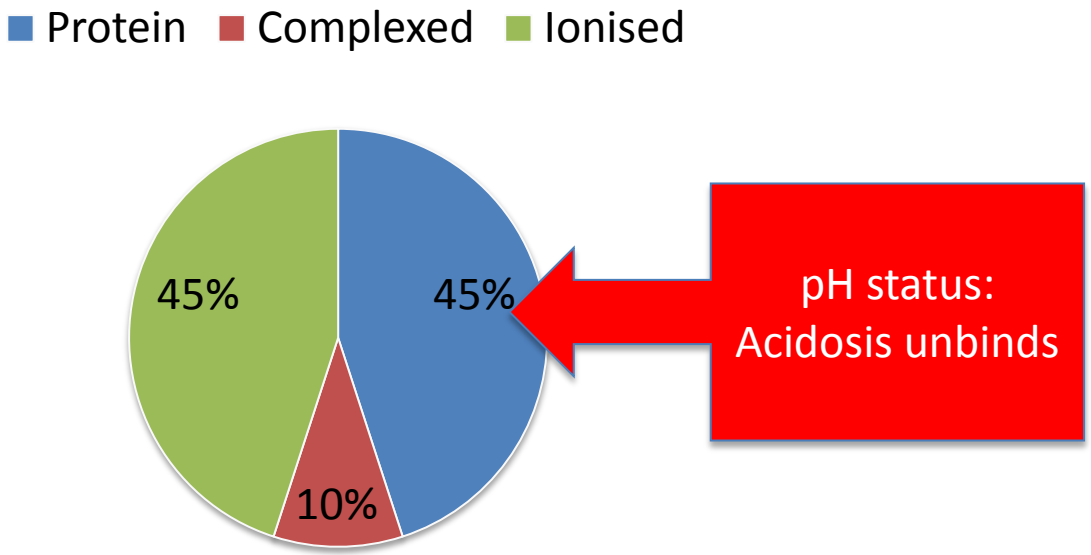
- **GUT** & muscle **SHUT DOWN**
- "Stones, bones, abdominal groans, thrones, psychic moans"



Diagnosis: from LABS

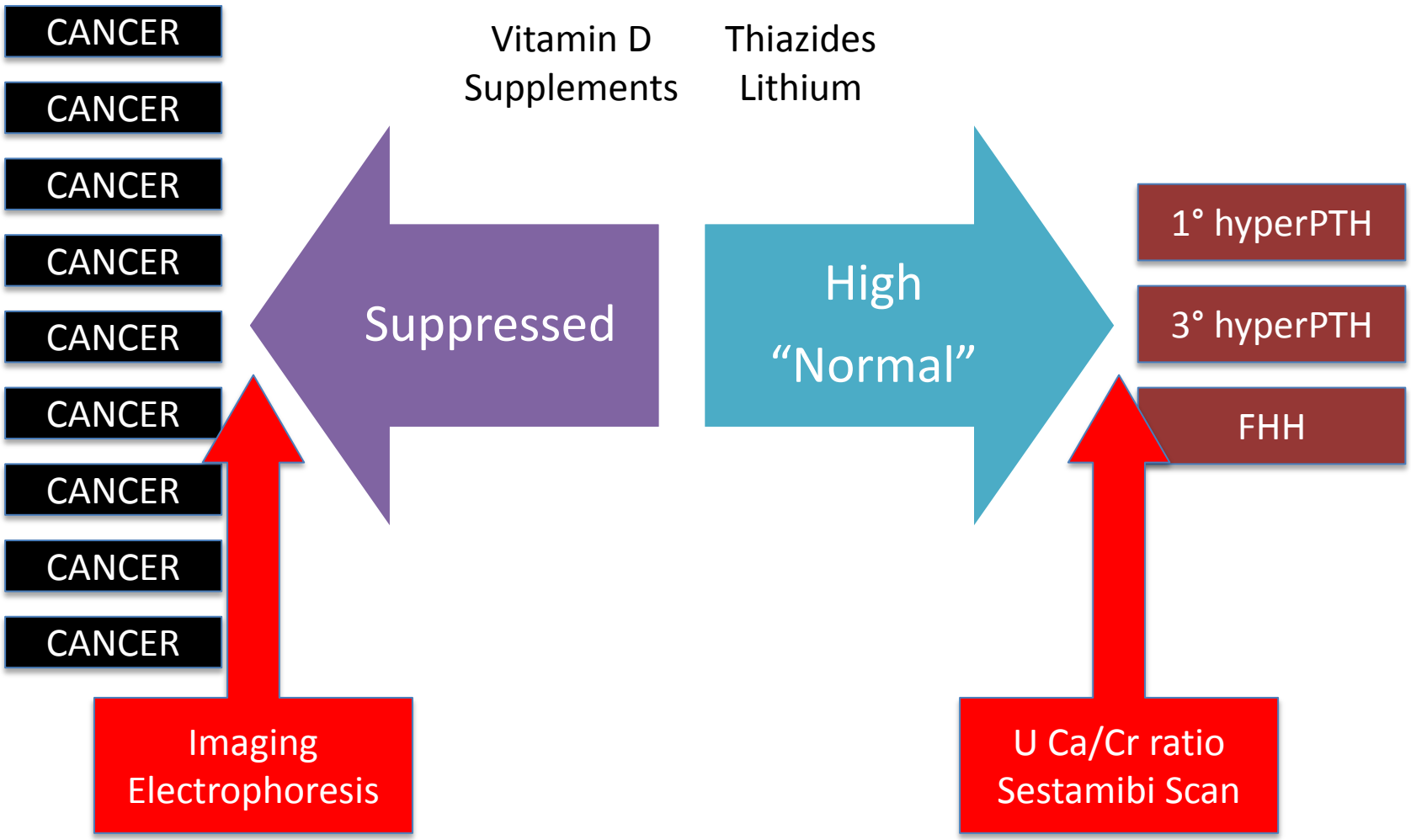
- Adjusted Calcium
- Ionised Calcium





PEARL **Ionised Calcium** is the single best preferred test

Aetiology: PTH Suppression



Admit?

MANAGEMENT

Management Principles

General

- ABC
- Hydration
- ~~Frusemide~~

Specific

- Cinacalcet
- Bisphosphonates
- Calcitonin
- Denosumab
- Prednisolone
  (Vitamin D intoxication)

Advanced

- Dialysis
- Parathyroidectomy

PEARL **Resection** of an underlying malignancy helps

Question Analysis

- A 22-year-old asymptomatic woman presents for screening because of a family history of medullary thyroid carcinoma. Physical examination reveals a blood pressure of $^{155}/_{105}$ mmHg and a 1-cm left thyroid mass. She has no mucosal neuromas.

Component	Result
Calcium (adjusted)	2.72 mmol/L (2.20-2.60)
Phosphate	0.8 mmol/L (0.8-1.4)
Intact parathyroid hormone	5.8pmol/L (1.2-5.8)
Calcitonin	350 pg/mL (< 6.4)
Urine calcium excretion	9.7 mmol/24 h (<7.5)
Urine free catecholamines	1660 nmol/24 h (<591)

What is the appropriate therapy?

A. An oral bisphosphonate
B. Surgery to remove a parathyroid adenoma
C. Surgery to remove a phaeochromocytoma
D. Surgery to remove 3½ parathyroid glands
E. Surgery to remove a medullary thyroid carcinoma

Summary

- Clinical context rules
- Cancer and hyperparathyroidism are chief culprits (FHH, MEN too in exams)
- Say “PTH suppression” to impress
- Hydrate, shift the calcium in, then eliminate it from the body

References

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2. Nusshaum SR. Pathophysiology and management of severe hypercalcaemia. *Metab Clinics North Am* 1993;22:343-362
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4. Walls J, Ratcliffe WA, Howell A, Bundred NJ. PTH and PTHrp in the investigation of hypercalcaemia in two populations. *Clin Endocrinol* 1994;41:407-13

Thank you!

Endean Tan

Dept of General Medicine, Tan Tock Seng Hospital