



CPC

‘Waiting for a diagnosis’

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ESIM Riga 2017

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Introduction

Internal medicine case

Brief introduction to the case

Work through the possible diagnoses

Final discussion

History

Male, Age 59 , Milkman

Admitted Internal Medicine

Unwell for 2 months

Intermittent fevers

Weight loss of 17kg over 8 weeks

Buttock/back pain-diffuse

Mr B: Further history

Past Medical History:

COPD

Investigated for pulmonary TB in 2008-negative

Recent episode of testicular pain-epididymo-orchitis

Drug History: Salbutamol inhaler, no allergies

Social History: White, born UK, lives in a town, with wife

No recent travel outside UK

Ex-smoker, 30/day for 30 years

Alcohol <10u per week

On examination

White male

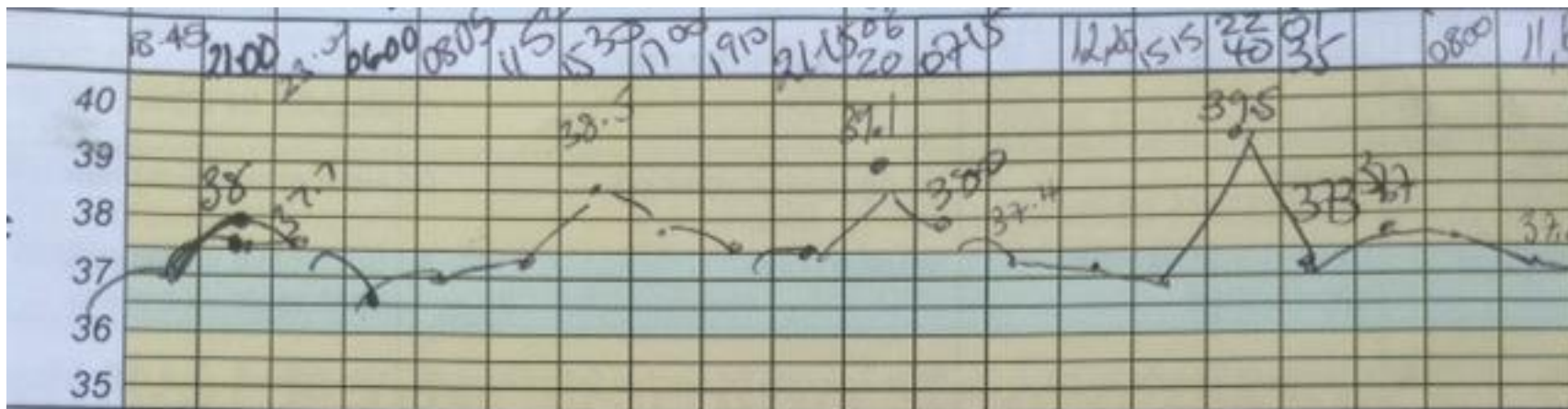
Cachectic 46 kg, BMI 17 kg/m² (<18.5)

Fluctuating pyrexia T 38.5 C







Cardiovascular/Respiratory/Abdominal/
neurological systems all normal

No lymphadenopathy


Joints/spine normal



Initial Investigations

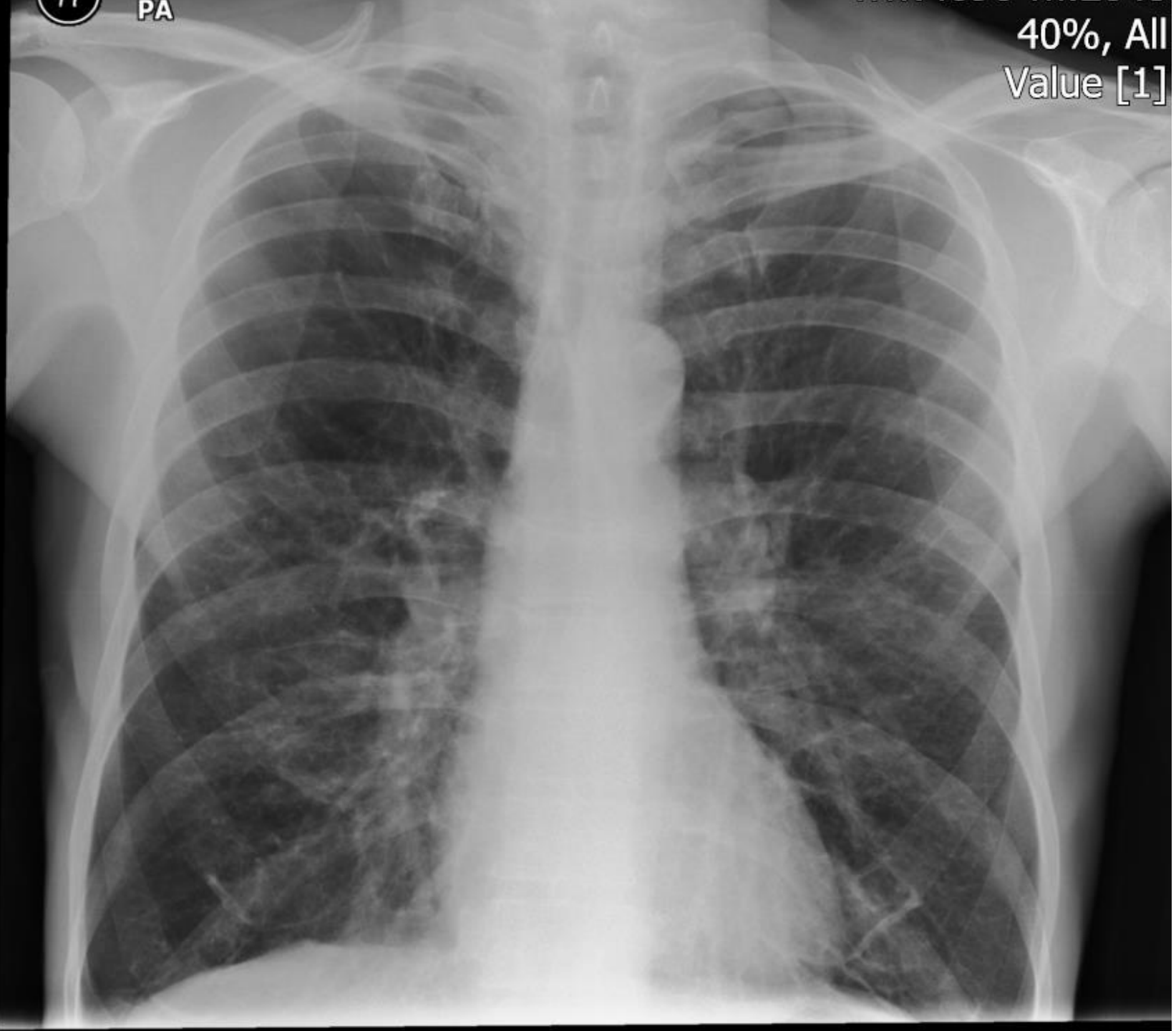
Hb	106	g/L	(130-170)	
MCV	80	fl	(80-100)	
wbc	29	$\times 10^9/L$	(4-11)	
Neut	26.8	$\times 10^9/L$	(2-7)	
Plt	912	$\times 10^9/L$	(140-400)	
CRP	260	mg/L	(<11)	
PV	2.22	mPa.s	(1.5-1,72)	

Initial Investigations

Sodium	133	mmol/L	(133-146)	
Potassium	4.3	mmol/L	(3.5-5.5)	
Creatinine	54	umol/L	(65-105)	
Albumin	23	g/L	(35-50)	
Bilirubin	7	umol/L	(4-25)	
Alk Phos	167	U/L	(40-130)	
ALT	40	U/L	(10-50)	
Calcium	2.37	mmol/L	(2.2-2.6)	

77 PA

40%, All Value [1]



m

cm

X ray
Lumbar
spine



Imagine you are the resident looking
after this patient...

1. What is the differential diagnosis?
2. What further investigations would you arrange?
3. What treatment would you start?

Initial Diagnosis

1. Sepsis-unknown origin

-Bacterial: Pneumonia, Bacterial endocarditis,

-Viral: HIV or other viral infection

-Septic discitis lumbar spine

2. Malignancy-bronchial carcinoma, other malignancy

3. Haematological malignancy. Eg lymphoma

Initial treatment

IV broad spectrum antibiotics

Co-amoxiclav 1.2g 3x daily

Further Investigations

Infection screen

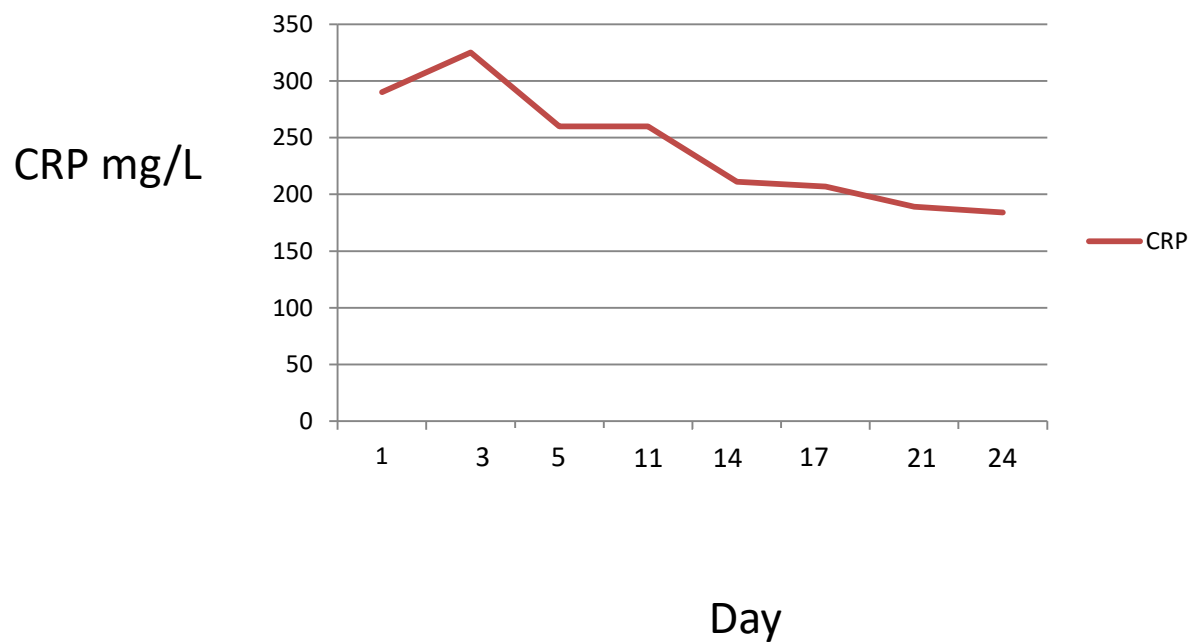
Blood cultures x 3	negative
Urine dip/culture	negative
Hepatitis B/C	negative
HIV 1 and 2	negative

Echocardiogram	normal
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Malignancy

US Abdo , testes	normal
Prostate specific antigen	normal
CT Thorax/Abdomen/Pelvis	Emphysema
Immunoglobulins	normal
Serum Electrophoresis /light chains	normal

CRP



What would you do next?

What happened next? Week 1

Ward 1: Consultant 1, Acute medicine

Broad spectrum antibiotics started . Refer gastroenterology weight loss.

Ward 2: Consultant 2, Gastroenterology

No obvious gastroenterology cause.

Anti TTG antibodies negative.

Refer haematology

Week 1 continued

Consultant 3, Haematology

Check Lactate dehydrogenase

Normal

Bone marrow aspirate

Reactive, no evidence TB

JAK mutation

Negative

Week 2

Consultant 4, Respiratory-emphysema

Hb falling 86 g/L

platelets rising 1216

Consultant 5, Microbiologist

CRP 183-antibiotics changed Merveponem and rifampicin

Week 3

Weight falling BMI 15

MR spine

Diffuse oedema vertebrae

Degenerative changes, no discitis,

no abscess, no evidence of malignancy



Week 3 continued

PET scan

Increased bone marrow uptake-diffuse

Consultant 6, Infectious diseases

About to go on holiday for 2 weeks,
waiting for a bed at teaching hospital

Week 3 continued

Further infection screen- atypical infections - all negative

- Adenovirus
- Coxiella burneti (Q fever)
- Chlamydia Psittacosis
- Enterovirus
- Influenza A /Influenza B/
Parainfluenzavirus
- Mycoplasma pneumoniae
- Respiratory syncytial virus
- Leptospira
- Legionella
- Brucella
- Borrelia burgdorferi
IgG/IgM
- Bartonella

Week 4

Ward 3: Consultant 7, Respiratory

? TB

Mantoux test, Sputum & early morning urine-negative.

Inf Gamma Release Assay (IGRA)-requested-not done

? Vasculitis

'Vasculitis screen' ANA/ANCA negative

Albumin falling 22 g/L (35-50)

Consultant 8, Cardiology no evidence endocarditis

Week 4 continued

Developed diarrhoea, transferred to
isolation ward

IGRA cancelled

Ward 4: Consultant 9, Care of Elderly

Diagnosis: ? Inflammatory bowel disease

Week 5

Consultant 10, Gastroenterology, no evidence of inflammatory bowel disease

Stool sample positive for Clostridium Difficile toxin (CDT)

Oral metronidazole started

Nasogastric tube inserted for feeding

Patient

‘ I had given up, I was feeling so weak, I thought I was dying’

Week 6

Consultant 11, Gastroenterology

Diagnosis not clear

Suggests trial of prednisolone

Rheumatology opinion

Week 7

No diagnosis but started
prednisolone 30 mg daily

Dramatic improvement

CRP 9, Albumin 35

Week 7

Consultant 12, Rheumatology

Diagnosis made

Diagnosis?




Polyarteritis nodosa (PAN)

Medium/small vessel vasculitis

ANCA negative

PAN-Classification Criteria

at least three of the following criteria:

- Otherwise unexplained weight loss greater than 4 kg 
- Livedo reticularis
- Testicular pain or tenderness 
- Myalgias – weakness/tenderness of leg muscles 
- Mononeuropathy or polyneuropathy
- New-onset diastolic hypertension
- Elevated levels of or creatinine
- Evidence of hepatitis B virus infection
- Characteristic arteriographic abnormalities
- A biopsy of small- or medium-sized artery containing pmn cells

American College Rheumatology 1990

Treatment for Vasculitis

3 x IV Methylprednisolone 1g daily

Followed by oral prednisolone 1mg/kg

Pulse IV cyclophosphamide 10mg/kg every
3 weeks for 6 pulses

Progress

Appetite improved-eating normally

Nasogastric tube removed

Weight improving-1 kg gain in 1 week

Mood improved

Physiotherapy

Hb	119	g/L	(130-170)
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CRP	4	mg/L	(<11)
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Albumin	34	g/L	(35-50)
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Progress

Week 9: Home

Reducing dose of prednisolone

Completed 6 x pulse IV cyclophosphamide

Started azathioprine

So why did it take so long to
reach a diagnosis?

Multiple errors

1. Failure to broaden diagnoses when initial investigations negative. Vasculitis was only considered as a diagnosis in week 4
2. Diagnosis of vasculitis dismissed because ANCA negative
3. Multiple changes of wards (4)
4. Multiple consultants (11) -silo mentality

Silo Mentality

Each person sits inside their own silo
Failure to problem solve across broad boundaries



Patient Harm

1. Multiple unnecessary treatments and investigations
2. Iatrogenic infection-C. Difficile
3. Psychological- patient still has bad dreams, doesn't want to go back into hospital again

Systems/Organisational errors

6 weeks of cost of hospital in-patient care

Cost of all investigations

Unnecessary ward moves

This case argues for all patients to be under a supervising physician practising internal medicine

Diagnostic errors- clinical problem solving

‘The most important predictor of successful problem solving is the quality of the hypotheses that are generated early in the process. Once generated, a correct diagnosis is hardly ever rejected, but the case will not be solved if this process fails’

Custers et al, Clinical problem analysis: a systematic approach to teaching complex medical problem solving. Acad Med 2000

Avoiding diagnostic errors

Pattern recognition vs analytical reasoning

Pattern recognition- take a shortcut, easy, you've seen it before, you know what it is

If you are faced with a situation where you don't know what is going on-slow down, avoid short cuts, switch to analytical reasoning

Analytical reasoning

‘Thinking slow’

Use frameworks to explore all avenues

Discuss the case with colleagues/grand rounds

A framework to prompt analytical problem solving

V
I
T
A
M
I
N

A framework to prompt analytical problem solving

V	Vascular
I	Infection-bacterial, viral, other
T	Trauma/injury
A	Autoimmune/inflammatory
M	Metabolic/endocrine
I	Iatrogenic/Medicines
N	Neoplasia-benign, malignant

- Rigby et al, Student BMJ 2008

How about using Dr Google?

testicular pain AND fever AND weight loss - Google Search - Windows Internet Explorer provided by Warwickshire ICT Services

https://www.google.co.uk/search?q=testicular+pain+AND+fever+AND+weight+loss&hl=en-GB&gbv=2&oeq=8&gs_l=

testicular pain AND fever AND weight loss - Goo...

+You Search Images Maps Play YouTube Gmail Drive More - Sign in

Google testicular pain AND fever AND weight loss

Web Images Videos News Shopping Maps Books

About 409,000 results

Any country
Country: the UK

Any time
Past hour
Past 24 hours
Past week
Past month
Past year

All results
Verbatim

Testicular Pain: Get the Facts on Causes - MedicineNet
www.medicinenet.com/testicular_disorders/article.htm
15 Jul 2014 ... Learn about pain in the testicles (testicular pain) symptoms and ... of mumps include fever, headache, muscle aches, tiredness, and loss of ...

Testicle pain: MedlinePlus Medical Encyclopedia
www.nlm.nih.gov/medlineplus/ency/article/003160.htm
Abdominal pain may occur before testicle pain in some conditions. ... like swelling, redness, change in the color of your urine, fever, or unexpected weight loss?

Nausea or vomiting, Pain or discomfort and Testicular pain - WebMD ...
symptomchecker.webmd.com/multiple-symptoms?symptoms...vomiting%7Cpain...discomfort%7Ctesticular-pain...
Food poisoning can cause abdominal pain, diarrhea, nausea, vomiting, fever, chills, and ... reaction to gluten, can cause gas, diarrhea, bloating, and weight loss.

Testicle pain and Weight loss - Symptom Checker - check medical ...
symptoms.rightdiagnosis.com/cosymptoms/testicle-pain/weight-loss.htm
List of causes of Testicle pain and Weight loss, alternative diagnoses, rare ... AND Testicle symptoms (2 matches); AND Acute fever in children (2 matches); AND ...

Symptom combinations for Testicular pain - RightDiagnosis.com
www.rightdiagnosis.com/symptoms/testicular_pain/symptom-search.htm
Symptom searches for co-occurring symptoms for Testicular pain including full ... Testicular pain and Fever (10 causes) · Testicular pain and Skin symptoms (10 ... Testicular pain and Chronic Crohns-like weight loss symptoms (2 causes) ...

Polyarteritis Nodosa - Types of Vasculitis
www.hopkinsvasculitis.org/types-vasculitis/polyarteritis-nodosa/
Classic symptoms of Polyarteritis Nodosa: What causes Polyarteritis Nodosa? ... with fever, sweats, weight loss, and severe muscle and joint aches/pains: ... Weight loss of > 4 kg since beginning of illness; Livedo reticularis; Testicular pain or ...

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13:11
03/06/2015

Using Google to make a diagnosis

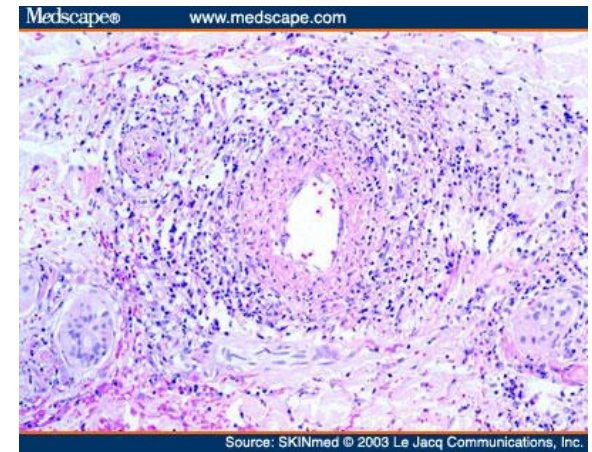
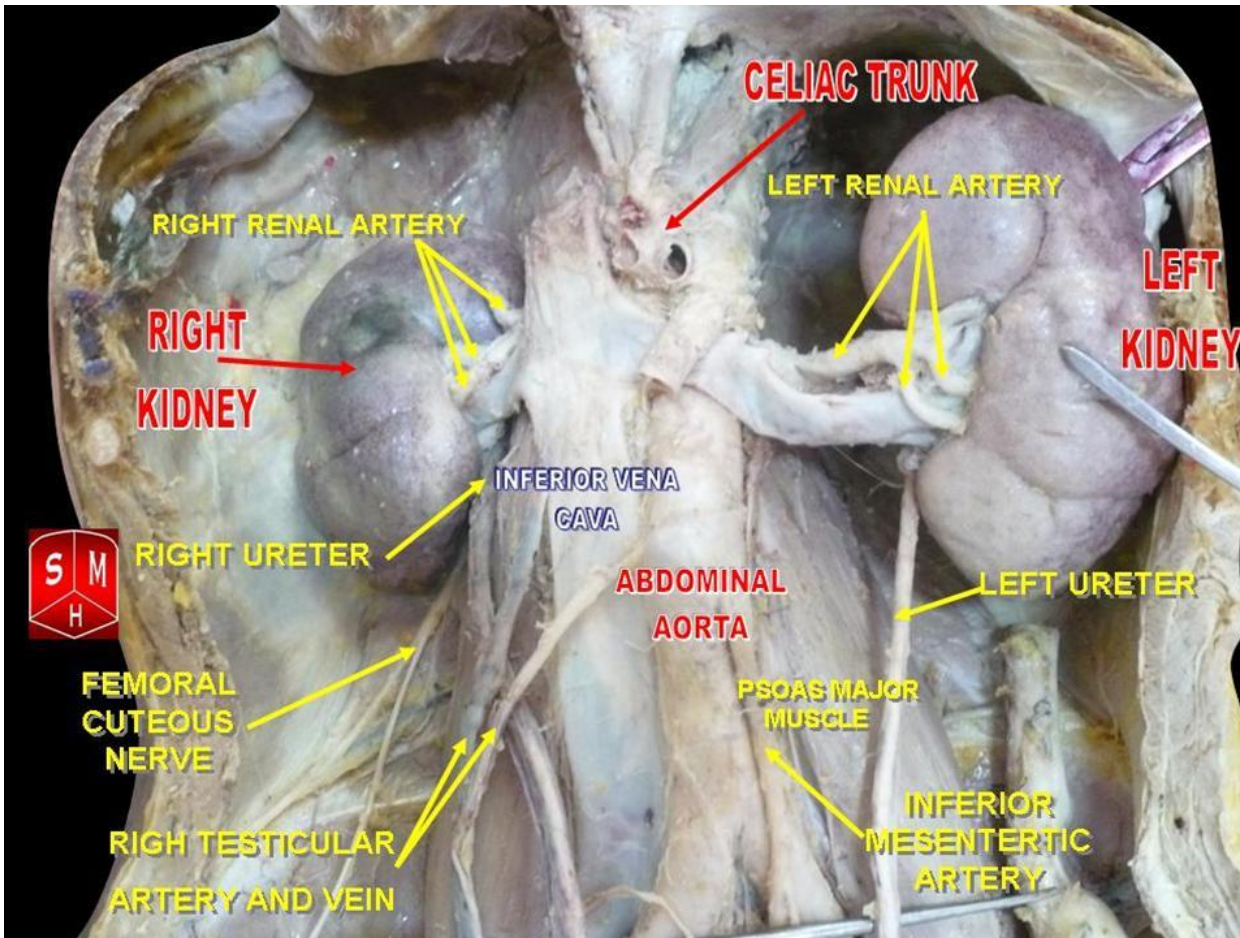
Googling for a diagnosis—use of Google as a diagnostic aid: internet based study

BMJ 2006;333:1143

Google correctly identified the diagnosis in 58% of cases

Why do patients with PAN get
testicular pain?

Why do patients with PAN get testicular pain?



Poiseuille's law
Flow is proportional to r^4

Summary

PAN-rare disease, easy to miss

Use slow thinking when faced with a clinical problem which is difficult to solve

Use a framework to prompt you to think

