一般內科訓練核心課程

第一章　　症狀或徵候

第一節　貧血（Anemia）

血液腫瘤科 李典錕醫師

一、Complete blood count reticulocyte count blood smear

（一）Microcytix hypochromic anemia

（二）Macrocytic normochromic anemia

（三）Normocytic normochromic anemia

二、Approach to Anemia（1）

（一） Microcytic hypochromic：iron deficiency

anemia,thalassemia,siderblastic anemia,chronic disease.

（二） Macrocytix normochromic：

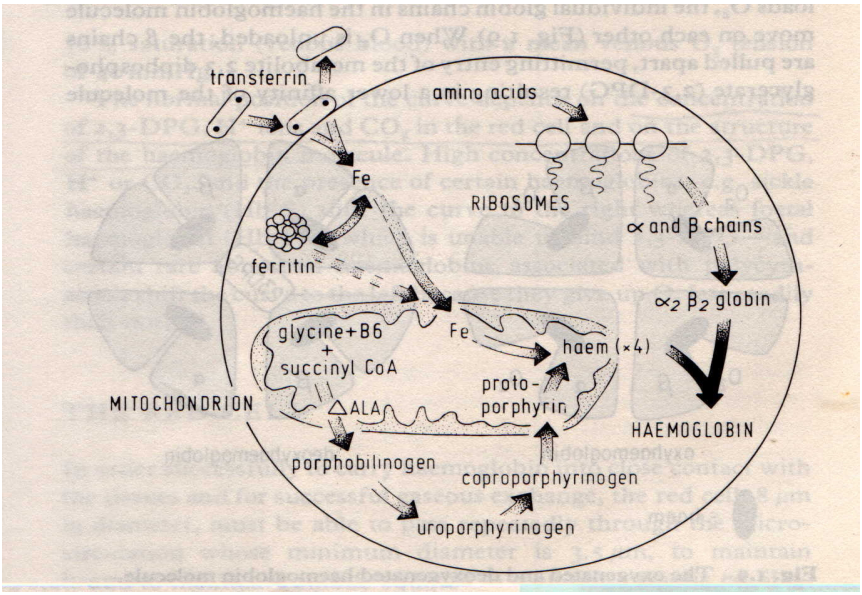
1.megaloblastic---cyanocobalamin defixiency,folix acid deficiency,lnot responsive to vit B12 or folate：eg,drug-induced.

2.non-megaloblastic---study as normocytic issue.

三、Approach to Anemia（2）---normocytic normochromic

四、Microcytic hypochromic anemia

- lron deficiency anemia



Reticulocyte ↓ Reticulocyte ↔	WBC/Plt↔：chronic disease，liver disease，renal disease，endocrine deficiency，bone marrow disease
	WBC/Plt ↓：pancytopenia
Retixulocyte ↑	Acute bleeding，hemolytic anemia， intracorpuscular，extracorpuscular

五、Mechanism of hypochromic anemia

（一）Poor available iron

1.deficiency in iron stores→IDA

2.defective availability of iron→ anemia of chronic disease

（二）Defective heme synthesis→sider oblastic anemia

（三）Defective globin chain synthesis→thalassemia

六、Approach to microctic hypochromic anemia

（一）IDA→serum ferritin

1. low---IDA
2. normal or high---complicated by chronic disease，marrow iron stain if necessary

（二）Thalassemia→hemoglobin study

1. Hb electrophoresis---beta-thalassemia
2. HbH body by BCB stain---alfa-thalassemia

（三）Anemia of chronic diseaseà→ general assessment for primary disease （四）Sideroblastic anemia→ ringed-sideroblast in marrow iron-stained smear

七、Failure of therapy in IDA

（一）Non-compliance

（二）Incorrect diagnsis

（三）Multifactorial anemia

（四）Continuing blood loss

（五）Inappropriate iron therapy

（六）GIT malabsorption

（七）Suppressive effects on marrow response and iron absorption by initial blood transfusion

八、Microcytic hypochromic anemia

- thalassemia

Defect of globin---thalassemia

•C 11 5' _____3'

γ δ β•C 16 5'_____3'

α α# α-tha

$\beta_2\beta_2$ (β_4) HbH body

β-tha $\alpha_2\delta_2$ HbA_2

$\alpha_2\gamma_2$ HbF

九、Practical diagnosis of Thalassemia

（一）Hemoglobin electrophoresis：

percentage of Hb A1,HbA2,HbF.for beta-thalassemia.

（二）Hb H inclusion body：

by BCB stain of wet smear.for alfa-thalassemia.

Table 5 Laboratory diagnosis of thalassaemic syndromes.

	Haemoglobin electrophoresis				HbH bodies	Chain synthesis
	HbF	HbA	HbA_2	Other Hb		
β Thalassaemia Major	↑↑	absent or ↓↓	↑	Various combinations with other chain disorders	—	β absent or ↓↓↓
β Intermedia	variable	depends on the severity		Hb S, D, E, C	—	
β Minor Trait	↑	↑	↑	Hb Lepore	—	β ↓
					—	
α Trait	N	N	N	Hb Barts at birth	+	α ↓
α Hb H disease	N	N or ↓	N	HbH	+ + +	α ↓↓
α Barts hydrops	—	—	—	Hb Barts	—	absent

十、Microcytic hypochromic anemia

- Sideroblastic anemia

十一、Causes of sideroblastic anemia

（一）Congenital --- usually sex-linked recessive disorder, rarely responding to vit B_6.

（二）Acquired ---

1. primary: may be vit B_6 responsive.
2. secondary:
   - MDS or due to hematologic malignancy.
   - toxic: lead poisoning, alcohol.
   - drug: INH, chloromycin, some cytotoxics.
   - nutritional: malnutrition, alcoholism.

十二、Normocytic normochromic anemia determination of reticulocyte count

（一）Normal or decreased

1. normal WBC and platelet count→ liver disease, renal disease, chronic disease, endocrine deficiency.

2. decreased WBC and platelet count→pancytopenia

Increased - hemolytic anemia

- acute blood loss **十三、Normocytic normochromic anemia with decreased reticulocyte count**

- Chronic disease：infectious disease,inflammatory disease,malignancy.

十四、Mechanism of anemia in chronic disease（infection,inflammatory or malignant disorders）

（一）Erythropoiesis : EPO ↓ and poor marrow response to EPO→ RBC production ↓

（二）RBC life span: decreased

（三）Plasma volume: increased

（四）Iron metabolism: iron deposit in RE cells→ ↓ availability of iron in heme synthesis

Acute leukemia/ myelodysplastic synd.

（二）Hypoplastic anenia/ PNH.

（三）Megaloblastic anemia.

（四）Hypersplenism.

（五）Myelofibrosis / myelophthisis.

（六）Hypothyroidism.

（七）SLE.

（八）Hemophagocytic syndrome / HMR.

（九）Overwhelming infection.

（十）HIV infection.

十七、Features of Hemolytic Anemia

（一）Signs of excessive blood destruction:

anemia, hemoglobinemia, hemoglobinuria, increased indirect bilirubin and LDH, decreased heptoglobin.

（二）Signs of increased RBC regeneration: reticulocytosis.

十八、Conditions sometimes mistaken for Hemolytic Anemia

（一）By anemia and reticulocytosis：

1. hemorrhage.
2. recovery from iron,folate or vit B12 def.
3. recovery from iron,folate or vit B12 def.

（二）By jaundice and anemia：

1.ineffective erythropoiesis（intramedullary hemolysis）

2.bleeding into a body cavity or tissue.

（三） By jaundice without anemia：

-defective billrubin conjugation,Gillbert’s syndrome.

（四） Marrow invasion：myelofibrosis,metastatic disease.

（五） Myoglobinuria.

十九、Approach to hemolytix anemia：clinical features and blood smear

（一）Spherocytosis: direct Coombs' test

- positive à AIHA
- negative à hereditory spherocytosis

（二）Schistocytosis

- Heinz body hemolytic anemia
- microangiopathic hemolytic anemia (MAHA)

（三）Specific morphology: malaria, target cells, sickle cells, acanthocytes, stomatocytes

（四）Pancytopenia and hemoglobinuria → r/o PNH

二十、Classification of AIHA

（一）Warm reacting Ab --- IgG

- idiopathic
- secondary: malignancy, autoimmune disease, infection

（二）Cold reacting Ab

- IgM agglutinin:

1. recent acute infection: mycoplasma pneumonia
2. chronic: idiopathic
   secondary --- lymphoma
   autoimmune disease

- IgG hemolysin ---- paroxymal cold hemoglobinuria

1.recent acute infection: measles, mumps, chicken pox, infectious mononucleosis

2.chronic: idiopathic/ syphilitic

二十一、Clinical syndromes associated with MAHA

（一）Hemolytic uremic syndrome

（二）Thrombotic thrombocytopenic purpura

（三）Malig hypertension/ toxemia of pregnancy

（四）Vascular malformations

（五）Autoimmune disorders: vasculitis

（六）Hemorrhagic fevers

（七）Malignancy

（八）Disseminated intravascular coagulation

（九）Cardiac and large vessel diseases

二十二、Macrocytic anemia：marrow smear

（一）Megaloblastic → biochemical study

1.vit B12 deficiency: Schilling's test→ intrinsic factor deficiency→ pernicious anemia

2.folate deficiency

3.normal: drug-induced (cytosar, hydrea)，inborn error metabolism, myelodysplastic syndrome

（二）Non-megaloblstic→ study as in normocytic issue;

such as: reticulocytosis, liver disease, alcoholism, hypothyroidism,hypoplastic anemia

二十三、Megalobiastic anemia not responsive to cobalamin or folate

（一）Antineoplastic agents ---

1.purine inhibitor: 6-MP, 6-TG, Imuran.

2.pyrimidine inhibitor: 5-FU, FUDR.

3.deoxyribonucleotide inhibitor: ara-C.

4. intercalating agent: adr, novant.

（二）Inborn error of metabolism ---

1. hereditory orotic aciduria.

2.inborn error of folate metabolism.

（三）Myelodysplastic syndrome.

第二節　　胸痛（Chest Pain）

心臟內科 林庭光醫師

1. chest pain with cold sweating, unstable vital signs, always think about
   (1) acute coronary syndrome
   (2) pulmonary embolism
   (3) aortic dissection
   (4) myocarditis
   (5) tension penumothorax
2. chest pain has to be clarified with palpitation, dyspnea , epigastragia,..

3. chest pain may origin from skin, muscle, skin, lung , pleura , intraabdominal (kidney, gall bladder ,pancrease , stomach ..), mediastrium, aorta, esophagus. Neurosis
4. complete PE and history taking to D.D. the chest pain
5. Typical chest pain for angina pectoris: precordial location, tightness sensation, effort related and relived by rest and NTG sl.
6. AMI and unstable angina is atypical chest pain. (diagnosed by 2/3 of chest pain. EKG change and elevated cardiac enzyme)
7. In the early phase of Chest pain (in 4- 6 hours) , the cardiac enzyme is still within normal range
8. chest pain MUST do EKG and CXR for further D.D
9. EKG can rule in acute coronary syndrome (ST change, T wave change, wide QRS, new LBBB, now RBBB, VPCs or other arrhythmia)
10. normal EKG can not r/o acute AMI (esp. LCX artery lesion) , so the cardiac echo can see the regional wall motion and further elevated cardiac enzyme (check cardiac enzyme > 12-24 hours)
11. chest pain with elevated cardiac enzyme ,EKG change , can not r/o myocarditis
12. chest pain with EKG change, pleuritis , dyspnea can not r/o pulmonary embolism (may check FDP, chest CT and V/Q scan)
13. chest pain with back pain, even wide mediastrium , high BP, can not r/o aortic dissection, please do contrast CT
14. PE and CXR sometimes can r/o lung lesion (pneumonia, asthma, COPD with AE, pleural effusion, lung cancer ..)
15. chest wall tenderness, chest pain with related dermatology may be muscle pain, bone pain, T spine lesions , bone metast) asis

16. If hiccup, epigastragia, epigastric tenderness , Acid regurgitation, abd fullness, constipation are noted , chest pain may caused by GI upset, peptic ulcer disease and reflux esophagitis
17. otherwise, chest tightness and palpitation may caused by arrhythmia or neurosis
18. How to treat is depending on the diagnosis
19. if chest pain with cold sweating, please contact CV man as soon as possible.
20. more risk factors, more favor acute coronary syndrome (DM, HTN, smoking, sex, age , FHx and other vascular damage history(CVA,AMI,POAD,Ischemic bowel history))

- chest pain→ general appearance and complete PE, history taking→ may do EKG and CXR→ may f/u cardiac enzyme for a least 12 hours → consult CV man
- chest pain with cold sweating→ critical

第三節　　腹痛（Abdominal pain）

腸胃內科 曾國枝醫師

A.Type: separated into three categories

a. **Visceral pain**:
   1.Felt at the primary stimulation
   2.Usually dull, aching and poor localized
   3.Difficult to describe

b. **Parietal pain**:
   1. Deep somatic pain that arises from irritation or inflammation of parietal peritoneum or root of mesentery
   2. Easy define and describe than visceral pain

c. Referred pain:
   1. Pain felt at a site other than that stimulated
   2. In an area supplied by the same or adjacent neural segment

**** Location of pain from specific organs****

Organ	Location
Esophagus	Substernal;occasionally neck,jaw,arm,or back
Stomach	Epigastrium;occasionally left upper quadrant and back
Duodenal bulb	Epigastrium;occasionally right upper quadrant and back
Small intestine	Periumbilical; occasionally above the lesion
Colon	Below umbilicus,on the side of the lesion
Splenic flexure	Left upper quadrant
Rectosigmoid	Suprapubic region
Rectum	Posteriorly,over the sacrum
Pancreas	Epigastrium or back
Liver and gallbladder	Right upper quadrant,right shoulder,and posterior chest

B. Acute abdominal pain

The most common causes are **acute gastroenteritis, inflammatory disease (appendicitis, cholecystitis, diverticulitis, pancreatitis, salpingitis)**

**** Some important causes of abdominal pain****

I . Pain originating in the abdomen

A.Parietal peritoneal inflammation

1.Bacterial contamination(e.g.,perforated appendix,pelvic inflammatory disease)

2.Chemixal irritation(e.g.,perforated ulcer,pancreatitis,mittelschmerz)

B.Mechanical obstruction of hollow viscera

1.Obstruction of the small or large intestine

2.Obstruction of the biliary tree

3.Obstruction of the ureter

C.Vascular disturbances

1.Embolism or thrombosis causing intestinal ischemia

2.Nonocclusive intestinal ischemia

3.Rupture of an abdominal aortic aneurysm

4.Sickle cell anemia

D.Abdominal wall disorders

1.Distortion or traction of mesentery

2.Trauma or infection of muscles

3.Distention of visceral surfaces(e.g.,hepatic or renal capsules)

II . Pain referred from extraabdominal sources

A.Thorax(e.g.,pneumonia,referred pain from coronary occlusion)

B.Spine(e.g.,radiculitis from arthritis)

C.Genitalia(e.g.,torsion of the testicle)

III . Metabolic causes

A.Exogenous

1.Black widow spider bite

2.Lead and other poisoning

B.Endogenous

1.Uremia

2.Diabetic ketoacidosis

3.Porphyria

4.Allergix factors(C'1-esterase deficiency)

IV . Neurogenix causes

A.Organic

1.Tabes dorsalis

2.Herpes zoster

3.Causalgia

B.Functional

a. Clinical features:

1. Acute gastroenteritis

(1) anorexia, nausea, vomiting (common)

(2) crampy, rather poorly localized abdominal pain and tenderness

(3) diarrhea(common)

(4) fever and leukocytosis (common)

2. Acute appendicitis

(1) perforation is uncommon before 24-36 hours from onset of symptom; initially pain is diffuse epigastric or periumbilical, eventually shifting to RLQ

(2) nausea and acute loss of appetite

(3) tenderness, muscle spasm, and rebounding tenderness over RLQ are frequently absent at the onset, but become more evident after24 hours

(4) fever is slight to moderate, esp during first 12 hours

(5) leukocytosis with neutrophilia is a late finding

3. Acute cholecystitis

(1) previous history of fatty food intolerance, flatulence, postprandial fullness and RUQ discomfort (common, but less specific)

(2) Steady and severe pain in RUQ or epigastrium

(3) Tenderness, muscle guarding and rebounding pain (common)

(4) Anorexia, nausea and vomiting (common)

(5) Fever and leukocytosis (common)

(6) Mild hyperbilirubinemia

4. Acute diverticulitis

(1) lower abdominal pain, esp LLQ (common)

(2) Tenderness, muscle guarding and rebounding pain (common)

(3) Fever and leukocytosis (common)

(4) Constipation (common)

(5) Nausea and sometimes vomiting (common)

(6) Finding like those of acute appendicitis, but L't sided

5. Acute pancreatitis

(1) three causes: alcohol, cholelithiasis and hyperlipidemia

(2) variable abdominal pain,from mild to severe, typically epigastric pain radiated to back; possible accompany with shock

(3) nausea and vomiting (common)

(4) Fever and leukocytosis (common)

(5) Elevated amylase and lipase

6. Acute intestinal obstruction

(1) depend on location of obstruction

(2) usually abdominal pain, vomiting and distension

(3) X-ray can give clue

7. Perforated viscus

(1) most common produced by perforated of peptic ulcer

(2) sudden onset of severe abdominal pain , aggravated by movement

(3) tenderness, rigidity and rebounding pain

(4) Free air below diaphragm by X-ray
(5) Shock (commom)

8. Mesenteric vascular infarction (ischemia bowel dx)
(1) moderate to severe abdominal pain
(2) vomiting or bloody diarrhea (inconstant)
(3) abdominal distension, pain and rigidity in severe cases
(4) Hypotension and shock in severe cases

9. Acute salpingitis
(1) lower abdominal pain
(2) fever and chillness
(3) Hx of sexual exposure
(4) Vaginal discharge and adnexal mass by echo

Chronic and recurrent abdominal pain

** pain present for weeks or months, think below disease

1. Peptic ulcer disease:
2. Biliary tract disease
3. Pancreatic disease
4. Small intestinal disease
5. Irritable bowel disease
6. Colon cancer
7. Other causes:
(1) Chronic diverticulitis
(2) Intermittent intestinal obstruction
(3) Tuberculosis peritonitis
(4) Systemic disease and intoxication (such as, connective tissue disease, DM, lead intoxication ..)
(5) Pancreatic cancer

*** Adapted from Problem-Oriented Medical Diagnosis***

第四節　　水腫（Edema）

心臟內科 林庭光醫師

一、Pathology:

1. hydrostatic pressure
2. osmotic pressure
3. permeality of capillary
4. lymphatic drainage
5. cell damage ..

二、Etiology:

Pressure and fluid overloading (CHF, renal failure, fluid

overload, liver cirrhosis , pulmonary HTN, DVT), hypoalbuminemia(liver cirrhosis , nephrotic syndrome) , capillary dysfunction and cell damage (ARDS, sepsis, toxin, drugs , trauma, infection, hypothyroidism, shock, allergy), lymphatic drainage obstruction (malignacy , trauma, Op, parasite)

三、How to DD:

history taking , Physical exam (location of swelling , congestive signs..) , Lab study (renal function, albumin, sodium , urine protein) , cardiac echo , abd echo, CXR, duplex of lower ext. veins.

四、How to management:

1. find the pathology and etiology
2. treat the underline disease (like CHF, ARDS, sepsis, DVT, hypothyroidism, allergy, hypoalbuminemia ..)
3. give overdose diurtics may cause dehydration , renal failure , even shock.

五、Cardiac echo and right heart cath can evaluate the fluid and pressure status in the difficult cases.

第五節　　心悸（Palpitation）

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1. Introduction

- Definition-Any conscious sensation of cardiac activity
- 通常會有 Unpleasant feeling,因為正常狀況下應不會感覺到自己的心跳
- Not necessarily an indication of the presence of heart disease or of any specific arrhythmia

2. Etiology

- Normal

1. ↑heart rate or myocardial contraction associated with physical activity or emotional stress-例如在劇烈運動時或上台表演時
2. Commonly at night who sleep on left side and audible in the dependent ear-左側躺比右側躺常見
3. Prosthetic valve-特別是 mechanical valve

- Neurocirculatory asthenia(cardiac neurosis)
  1. Awareness of the heart-beat in the absence of physical exertion or emotional stress
  2. 常合併感覺到 Shortness of breath, lightheadedness, precordial pain, inability to "get enough air in" or a feeling of suffocation
  3. 可能會導致 Hyperventilation
  4. 某些情況下可能會合併有真正的 CV disease

- Palpitation not associated with cardiac arrhythmia
  1. Noncardiac disorders
     (1) Anxiety
     (2) Anemia
     (3) Fever
     (4) Thyrotoxicosis
     (5) Hypoglycemia
     (6) Pheochromocytoma
     (7) Aortic aneurysm
     (8) Migraine
     (9) AV fistula
     (10) Drugs(β-agonist, theophylline, vasodilator, vasopressors)

(11) Diaphramatic flutter

2. Cardiac disorders

(1) Aortic regurgitation

(2) Aortic stenosis

(3) PDA

(4) VSD

(5) ASD

(6) Marked cardiomegaly

(7) Acute LV failure

(8) Hyperkinetic heart syndrome

(9) Tricuspid insufficiency

(10) Pericarditis

(11) Prosthetic valves

(12) Electronic pacemakers

- Palpitation associated with cardiac arrhythmia
  1. Premature contractions-APCs, VPCs.
  2. Paroxysmal tachycardias
  3. Bradycardias
  4. Pre-excitation syndromes(WPW, Lown-Ganong-Levine syndrome)
  5. Sick sinus syndromes
  6. Atrial fibrillation/flutter

3. Diagnostic Approach

- History and physical examination

1. Palpitation is not equivalent with arrhythmia
2. Heart disease history? Any previous or present ECG, CXR

3. Feeling of persisted or isolated beats
4. What it the heart rate while palpitation? Is it more than 140 bpm?

   Dit it occurred abruptl? Can it be terminated by vagal maneuvers or any other methods or medications?
5. Did syncope follow palpitation?
6. Can coffee, tea, alcohol, tobacco, anti-arrhythmic drugs trigger palpitation?
7. SVT(supraventricular tachycardia), PAT(paroxysmal atrial tachycardia): common in young women during pregnancy
8. Is there any coexisting disease? Pheochromocytoma, hyperthyroidism, or viral infection, etc
9. Did the patient have the history of mitral valve prolapse(MVP) (click-murmur syndrome)?
10. Did the patient have the history of hyperkinetic heart syndrome?

- Electrocardiography-taken while palpitation attack and normal condition
- Electrocardiographic monitoring- may arrange cardiac echo to evaluate heart funrction and arrhythmia related heart condition(such as mitral stenosis and atrial fibrillation, myocardial infarction or LV dysfunction with ventricular tachycardia)
- Electropysiologic testing- for documenting some arrhythmia that cannot be detected clinically, evalutation pathophysiology of arrhythmia(AVRT, AVNRT, sinus nodal dysfunction, ventricular tachycardia) and possible catheter ablation.

第六節　　氣促（Dyspnea）

胸腔內科 范國聖

壹、定義

氣促是一種呼吸困難，呼吸費力，或呼吸不舒服的主觀感覺，且其與運動程度不成比例。有人形容為呼吸短促，合併有吸不到氣的感覺，或是沒有辦法吸得夠快夠深。氣促，大部分是從多處來源傳來的感覺，而非來自單一的神經接受器。而且，氣促的嚴重度與感覺在不同病人身上有很大地差異性。

貳、病理生理學

在心血管性氣促合併組織氧氣運送不足；在肺因性氣促或是呼吸

驅動增加，呼吸生理改變，甚至是氣體交換異常的狀況下，都可以產生氣促的感覺。頸動脈與主動脈被刺激時，就可以改變換氣頻率。

參、氣促的嚴重度

第一級：只有在劇烈運動後喘

第二級：未負重物爬陡峭的坡，爬超過二層，或攜帶中等重物走在平地上會喘。

第三級：未負重物爬不陡峭的坡，爬不超過兩層樓，或攜帶輕量的物品走在小山丘上會喘。

第四級：走在平地上就會喘。

第五級：休息也會喘。

肆、病因學

雖然很多的疾病都會產生氣促，但是有三分之二的原因都是心因性或肺因性的，其它的原因，像是貧血，酸中毒，或神經肌肉疾病都必須考慮在內。氣促的鑑別診斷包括四大類：

心因性：鬱血性心衰竭、冠狀動脈疾病、心肌梗塞、心肌病變、瓣膜功能不良、左心室肥大、心包膜炎、心律不整。

肺因性：COPD、氣喘、侷限性肺病、氣胸。

心肺疾病混合性氣促：Cor pulmonale、慢性肺栓塞、外傷。

非心因或肺因性氣促：DKA、GERD、Pain、神經肌肉疾病、功能性焦慮或恐慌、過度換氣。

伍、診斷與治療

氣促之後潛藏的主要問題包括心臟，肺臟或神經肌肉之異常，這些可經由醫師經病史之詢問與物體之檢查而作鑑定。

Time course	Common causes	Uncommon causes
Acute	Asthma Pneumonia Cardiogenic pulmonary edema Psychogenic dyspnea Pneumothorax	Acute PE PCP Chest wall injury Foreign body in major airway
Subacute	ARDS PCP Cardiogenic pulmonary edema Pneumonia	Alveolar hemorrhage Foreign body Pleural effusion Tuberculosis Fungal infection
Recurrent	Asthma Psychogenic dyspnea	Recurrent PE Pneumothorax
Chronic dyspnea	COPD Chronic interstitial lung disease Chronic heart disease	Pulmonary hypertension Severe anemia Chronic asthma

陸、身體檢查

一、 評估基本外觀、生命徵象，評估喘的嚴重程度、呼吸形態、呼吸速率、有無使用輔助呼吸肌，評估意識狀況。

二、 評估呼吸道的通暢性，仔細的聽診，若出現鳴喘，則表示有上呼吸道阻塞。

三、 監測心律、血行動力狀態、週邊有無水腫、有無發紺。

Finding	Possible diagnosis
Wheezing, pulsus paradoxus, accessory muscle use	Acute asthma, COPD exacerbation
Wheezing, clubbing, barrel chest, decreased breath sounds	COPD exacerbation
Fever, crackles, increased fremitus	Pneumonia

Edema, neck vein distention, S3, or S4 hepatojugular reflux, murmurs, rales, hypertension, wheezing	CHF, Pulmonary edema
Wheezing, friction rub, lower extremity swelling	Pulmonary embolism
Absent breath sounds, hyperresonance	Pneumothorax Croup
Inspiratory stridor, rhonchi, retractions	Epiglottitis
Stridor, drooling, fever	Foreign body aspiration
Stridor, wheezing, persistent pneumonia	Bronchiolitis
Wheezing, flaring, intercostals retractions, apnea, sighing	Hyperventilation

柒、狀況不穩定病人的認定和處理

找出喘的原因，儘快維持病人生命徵象之穩定。不穩定病人常有下列一些臨床症狀：

一、 低血壓、意識狀態改變、心律不整、低血氧

二、 呼吸出現喘鳴聲，可能有上呼吸道阻塞情形。

三、 氣管移位、低血壓、單側呼吸消失。

四、 呼吸速率大於 40 次／分、發紺。

剛開始治療時包括先給氧氣，病人若有呼吸急迫而影響到血行動力時，或預期病人即將呼吸衰竭時，則要考慮氣管內插管，使用機械呼吸器。當危急性命、血行不穩另外依 ACLS 之原則處理且建立 IV-line，若病人有氣胸時，考慮置放胸管，肺水腫時，則要給予利尿劑。若有慢性阻塞性肺病時，則要給予吸入性氣管擴張劑。

第七節　　發燒（Fever）

老人醫學科 蔡坤維醫師

一、正常體溫

健康的年青人他的舌下體溫應在 36.5°C 至 37.7°C 之間，正常人的肛溫比舌下體溫約高 0.4°C，比耳溫高 0.8°C。在體弱的老年人他正常的體溫變異可能會較大，而在感染時比較不會發高燒。

人類的體溫也有晝夜的週期性，通常最高點是在下午四至六時，最低點則在上午六時，因此發燒的定義應該是體溫在早晨六時高於 37.2 C 或是在下午四至六時高於 37.7C。這種 ”溫差” 在發燒時也會存在，即使是細菌性心內膜炎，雖然細菌照造成的外來致熱原不斷在產生，病人的體溫也呈現週期性的變化。

二、調溫

人類會以適當的生理變化或行為來調節以及維持體中心的溫度(core temperature)。當他需要釋放出過多的熱量時，體表的血液循環會增加來散熱，同時他會以出汗蒸發水份來降低體溫，如果他需要保留體內的熱能時，體表的血液循環會降低以減少散熱。如果體內仍需要更多的熱量他會以發抖的動作及週邊血管收縮來增加熱量的產生，這種體溫調節的總控中樞被認為是在 preoptic area of the hypothalamus。

三、致熱細胞素 PYROGENIC CYTOKINES

外來致熱原 (Exogenous pyrogens)通常是微生物或其毒素(例如葛蘭氏陰性細菌的內毒素 endotoxins 一種 lipopolysaccharide)。它們並不能通過 Blood-brain barrier 而對下視丘的調溫中心產生作用，但他們會刺激白血球產生致熱的細胞素 cytokines (例如 interleukin-1, interleukin-6, tumor necrosis factor α, interferon).。藉由這些 cytokines 再影響 hypothalamic endothelium 產生 prostaglandin E2 (PGE2)，後者作用於 glial cells 的 PGE2 receptor 再產生 cyclic AMP. Cyclic AMP 刺激調溫中心的神經末梢而提高下視丘 set point. PGE2，同時會刺激週邊組織而產生肌肉或關節疼痛的症狀。

四、發燒的病因

發燒的因包括感染、腫瘤、自體免疫病、內分泌失調、甲狀腺機能亢進、腎上腺功能不足與中樞神經系統疾病等。由於這些疾病調溫中心受 cytokines 的刺激而調高體溫，只有在病因去除或退燒藥的作用之下體溫才會下降。.

五、HYPERTHERMIA

有些體溫上升的情況並非由 pyrogenic cytokines 所引起，此時我們稱之為 hyperthermia 而不是發燒 fever。這種體溫上升不是因為調溫中心的失調，而且沒有生理機轉來對抗，常規的退燒藥也無效。中暑就是一個典型的 hyperthermia.，有關 hyperthermia 的進一步討論, 請參考本文所附的文獻.

體溫超過攝氏 41.5 度時, 稱為高燒 (hyperpyrexia). 這樣的高溫通常發生於中樞神經系統出血, 或是嚴重的感染. 不過在抗生素被發現以前, 因感染性疾病引起的發燒也很少高於攝氏 41 度.

六、發燒原因的探討及不明熱

對一位內科醫師而言, 所有的發燒在最初都是原因不明的. 經過病史詢問, 理學檢查後大多數的發燒原因都會相當明顯. 如果能再作常規實驗室的檢驗或影像醫學的檢查, 發燒原因大多會被確定. 如果發燒高於 38.3°C 持續二至三週, 而經過各種詳細的檢查後其原因尚不能定案時, 我们稱之為不明熱 (Fever of Unknown Origin, FUO). 不明熱的原因很少是罕見的疾病. 大多數是常見的疾病但有不尋常的表徵. 經過專家的統計, 不明熱的原因為: 感染三分之一強, 惡性腫瘤約五分之一, 自體免疫病百分之八.

不明熱原因的探討必須有系統性. 病史的詢問應包括當地的流行病學, 病人的旅遊史, 職業, 動物的接觸史, 用藥史 (包括處方藥, 自購藥, 中藥), 食物史 (尤其注意是否有食用生魚及半熟肉類的習慣), 及性行為的傾向與習慣等. 其他如毒品, 酒精, 及菸草的使用, 蟲類的叮咬, 藥物過敏, 疫苗接種, 輸血等病史, 也不能忽略. 家族史則應包括各種感染病 (包括結核病), 以及自體免疫病.

理學檢查應特別注意眼底, 淋巴結, 指甲床, 心血管系統, 胸, 腹部, 肌肉骨骼系統, 神經系統, 前列腺(肛門檢察不可遺漏), 睪丸及副睪丸, 婦女的骨盆腔檢察以及皮膚表徵.

實驗室的檢驗必須包括 complete blood count; urinalysis; biochemical tests; serologic studies for fungal infections and for connective tissue disorders; stool occult blood; bacterial cultures of urine, sputum, and blood; thyroid function; chest radiography; electrocardiography, 以及 lumbar puncture. 影像醫學的檢查則可選腹部超音波, 腸胃內視鏡. 如果仍然無法確定發燒原因, 可進一步作腦, 胸部, 及腹部的斷層掃描. 有時候可作淋巴管顯影 lymphangiography 或 gallium scintigraphy.

如果上述步驟仍然無法找到發燒原因, 內科醫師可有三種選擇: (一) 重複以上的評估, (二) 對可能的病 (例如結核病) 作嘗試性治療, (三) 持續觀察.

七、發燒需要治療嗎

大部分的發燒病來自病毒感染而會自然痊癒. 如果發燒原因不明而且是低燒時, 則不應隨便使用退燒藥, 因為它們會掩蓋發燒而使病程不明. 很多疾病會呈現特殊的發燒 pattern. 例如瘧疾, 回歸熱. 如果任意退燒, 可能延誤診斷. 但在有心血管疾病, 腦血管疾病, 及肺功能不良的病患, 發燒會導致氧需求的增加, 每增加攝氏一度, 氧消耗量增加 13%, 因此退燒是必要的.

體溫的昇高, 並不會加速熱病的痊癒, 也不能提高身體的免疫力. 因此如果熱病的原因已經明確, 用退燒藥降體溫可緩和身體的不適, 但不會影響感染性疾病的治療.

在有器質性腦病變的病人, 或有癲癇的小孩, 如有發燒的情況, 應積極處理.

八、發燒的治療

既然 PGE2 是造成發燒的主要因素. 而 PGE2 的製造需要 cyclooxygenase 這酵素. 因此cyclooxygenase 的拮抗劑是最有效而快速的退燒藥. 常用的退燒藥有二: 一為 Aspirin, 二為 Acetaminophen. Aspirin 是 COX inhibitor. Acetaminophen 雖然在週邊組織沒有 cyclooxygenase inhibitor 的作用, 但它在腦內會被 p450 cytochrome system 氧化. 其氧化物則有抗 cyclooxygenase 的作用. 它在腦內也有抗 COX-3 因而退燒的作用. COX-3 只在 CNS 存在. 這兩種藥都有很長久的使用史. 在許多臨床實驗中, 他們的退燒效果是相等的. 而且他們也有減輕附帶症候的效果 (如疼痛, 頭痛, 倦怠). 但是在沒發燒的病人這兩種藥並不會降低體溫. Aspirin 對胃黏膜及血小板會有不良的影響. 它也被認為是 Reye's syndrome 的導因. 因此有胃潰瘍史和易出血的病人以及小兒都應該避免使用. 有肝疾患的病人則要避免使用 Acetaminophen. 另外 glucocorticoids 也可退燒. 它的作用有二: 一是減少 PGE2 的合成, 二是阻止 pyrogenic cytokine 的 mRNA transcription.

如果體溫很高, 或是有中暑的現象, 須要以物理散熱的方式 (例如用涼水擦拭體表)來降溫. 這時應避免使用冰水, 以免導致冠狀動脈收縮, 或引起發抖而增加氧的消耗.

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第八節　　寡尿（Oligouria）

腎臟內科 蔡任弼醫師

一、定義

每日總尿量少於 500 cc 為寡尿, 尿量少於 500 cc/day 時，通常意味腎絲球功能已減退，腎臟無法適當排除每日新陳代謝所產生的含氮廢物及水分，造成水份及代謝毒物堆積。

二、病因

尿量減少的原因可分為腎前性(pre-renal)、腎性(renal)和腎後性(postrenal),其發生比例

- Prerenal (about 70% of cases)
- renal (about 25% of cases)
- postrenal (5% or less of cases)

三、腎前性(Prerenal):

主要原因為腎臟灌流不足，最常因為體液缺乏、心臟、血管疾病或肝病。使得腎絲球過濾率減少，並使血中水份及毒性物質無法充分排出造成水份及代謝毒物堆積。

造成原因:

PRERENAL ARF

I. Hypovolemia
- A. Hemorrhage, burns, dehydration
- B. Gastrointestinal fluid loss: vomiting, surgical drainage, diarrhea
- C. Renal fluid loss: diuretics, osmotic diuresis (e.g., diabetes mellitus), hypoadrenalism
- D. Sequestration in extravascular space: pancreatitis, peritonitis, trauma, burns, severe hypoalbuminemia

II. Low cardiac output
- A. Diseases of myocardium, valves, and pericardium; arrhythmias; tamponade
- B. Other: pulmonary hypertension, massive pulmonary embolus, positive pressure mechanical ventilation

III. Altered renal systemic vascular resistance ratio
- A. Systemic vasodilatation: sepsis, antihypertensives, afterload reducers, anesthesia, anaphylaxis
- B. Renal vasoconstriction: hypercalcemia, norepinephrine, epinephrine, cyclosporine, FK506, amphotericin B
- C. Cirrhosis with ascites (hepatorenal syndrome)

IV. Renal hypoperfusion with impairment of renal autoregulatory responses

Cyclooxygenase inhibitors, angiotensin-converting enzyme inhibitors

V. Hyperviscosity syndrome (rare)

Multiple myeloma, macroglobulinemia, polycythemia

四、腎實質性(renal type)

腎臟組織受到病理性的損壞而造成腎臟功能下降、原因為腎血管、腎絲球、腎小 管和間質組織的病變。在做此類診斷時因先排除一些可逆原因（腎前性、腎後性）、並儘速加以校正、同時對腎機能下降的這一段時間給與支持性的療法。

造成的原因如下表:

Table 269-2. Useful Clinical Features, Urinary Findings, and Confirmatory Tests in the Differential Diagnosis of Major Causes of ARF

Cause of Acute Renal Failure	Suggestive Clinical Features	Typical Urinalysis	Some Confirmatory Tests
II. Intrinsic renal ARF			
A. Diseases involving large renal vessels			
1. Renal artery thrombosis	History of atrial fibrillation or recent myocardial infarct; flank or abdominal pain	Mild proteinuria Occasionally red cells	Elevated LDH with normal transaminases, renal arteriogram
2. Atheroembolism	Age usually > 50 years, recent manipulation of aorta, retinal plaques, subcutaneous nodules, palpable purpura, livedo reticularis, vasculopathy, hypertension, anticoagulation	Often normal, eosinophiluria, rarely casts	Eosinophilia, hypocomplementemia, skin biopsy, renal biopsy
3. Renal vein thrombosis	Evidence of nephrotic syndrome or pulmonary embolism, flank pain	Proteinuria, hematuria	Inferior vena cavagram and selective renal venogram
B. Diseases of small vessels and glomeruli			
1. Glomerulonephritis/ vasculitis	Compatible clinical history (e.g., recent infection) sinusitis, lung hemorrhage, skin rash or ulcers, arthralgias, new cardiac murmur, history of hepatitis B or C infection	Red cell or granular casts, red cells, white cells, mild proteinuria	Low C3, ANCA, anti-GBM Ab, ANA, ASO, anti-DNAse, cryoglobulins, blood cultures, renal biopsy
2. Hemolytic-uremic syndrome/thrombotic thrombocytopenic purpura	Compatible clinical history (e.g., recent gastrointestinal infection, cyclosporine, anovulants), fever, pallor, ecchymoses, neurologic abnormalities	May be normal, red cells, mild proteinuria, rarely red cell/granular casts	Anemia, thrombocytopenia, schistocytes on blood smear, increased LDH, renal biopsy
3. Malignant hypertension	Severe hypertension with headaches, cardiac failure, retinopathy, neurologic dysfunction, papilledema	Red cells, red cell casts, proteinuria	LVH by echocardiography/ECG, resolution of ARF with control of blood pressure

Cause of Acute Renal Failure	Suggestive Clinical Features	Typical Urinalysis	Some Confirmatory Tests
C. ARF mediated by ischemia or toxins (ATN)			
1. Ischemia	Recent hemorrhage, hypotension (e.g., cardiac arrest), surgery	Muddy brown granular or tubular epithelial cell casts FE_{Na} >1% U_{Na} >20 mmol/L SG <1.015	Clinical assessment and urinalysis usually sufficient for diagnosis
2. Exogenous toxins	Recent radiocontrast study, nephrotoxic antibiotics or anticancer agents often coexistent with volume depletion, sepsis, or chronic renal insufficiency	Muddy brown granular or tubular epithelial cell casts FE_{Na} >1% U_{Na} >20 mmol/L SG <1.015	Clinical assessment and urinalysis usually sufficient for diagnosis
3. Endogenous toxins	History suggestive of rhabdomyolysis (seizures, coma, ethanol abuse, trauma)	Urine supernatant positive for heme	Hyperkalemia, hyperphosphatemia, hypocalcemia, increased circulating myoglobin, CPK (MM), and uric acid
	History suggestive of hemolysis (blood transfusion)	Urine supernatant pink and positive for heme	Hyperkalemia, hyperphosphatemia, hypocalcemia, hyperuricemia, pink plasma positive for hemoglobin
	History suggestive of tumor lysis (recent chemotherapy), myeloma (bone pain), or ethylene glycol ingestion	Urate crystals, dipstick-negative proteinuria, oxalate crystals, respectively	Hyperuricemia, hyperkalemia, hyperphosphatemia (for tumor lysis); circulating or urinary monoclonal spike (for myeloma); toxicology screen, acidosis, osmolal gap (for ethylene glycol)
D. Acute diseases of the tubulointerstitium			
1. Allergic interstitial nephritis	Recent ingestion of drug, and fever, rash, or arthralgias	White cell casts, white cells (frequently eosinphiluria), red cells, rarely red cell casts, proteinuria (occasionally nephrotic)	Systemic eosinophilia, skin biopsy of rash (leukocytoclastic vasculitis), renal biopsy
2. Acute bilateral pyelonephritis	Flank pain and tenderness, toxic, febrile	Leukocytes, proteinuria, red cells, bacteria	Urine and blood cultures

五、腎後性(Post-renal)

多見於兩側的尿路阻塞(例如尿道、攝護腺肥大、膀胱、或雙側輸尿管阻塞)，而少見於單側的尿路阻塞（例如結石、血塊、天生性輸尿管瓣膜、腫瘤或是手術後疤痕壓迫等）。

POSTRENAL ARF (OBSTRUCTION)

I. Ureteric
Calculi, blood clot, sloughed papillae, cancer, external compression (e.g., retroperitoneal fibrosis)
II. Bladder neck
Neurogenic bladder, prostatic hypertrophy, calculi, cancer, blood clot
III. Urethra
Stricture, congenital valve, phimosis

六、鑑別診斷:

1.病史及理學檢查

2.超音波、電腦斷層、泌尿道攝影及膀胱鏡等檢查有助於腎後性

診斷。但是腎前性及腎質性，則還需要靠血液及尿液中的生化檢查來加以區別。

臨床上常用的一些檢驗數值來幫忙判別腎實質性或腎前性

Index	**Prerenal**	**Renal**
BUN/Cre 比值	10-15/1	>20/1
Urinary sodium (mmol/L)	<20	>40
Fractional excretion of Na+ (%)	<1	>1
Ratio of U/P creatinine	>40	<20
Ratio of U/P osmolarity	>1.5	<1.1
FEBun (%)	<35	>35

＊＊所取的 urine 檢體為單次尿

$$\textbf{FENa} = \frac{\text{Urine Na} \times \text{Plasma Cre}}{\text{Urine Cre} \times \text{Plasma Na}} \times 100\%$$

FEUrea (FEBun) --- Change Na to BUN

六、治療

病人產生寡尿(無尿)時、最重要的是先找出造成的可能原因、設法去除病因、並輔以其他支持性的治療。

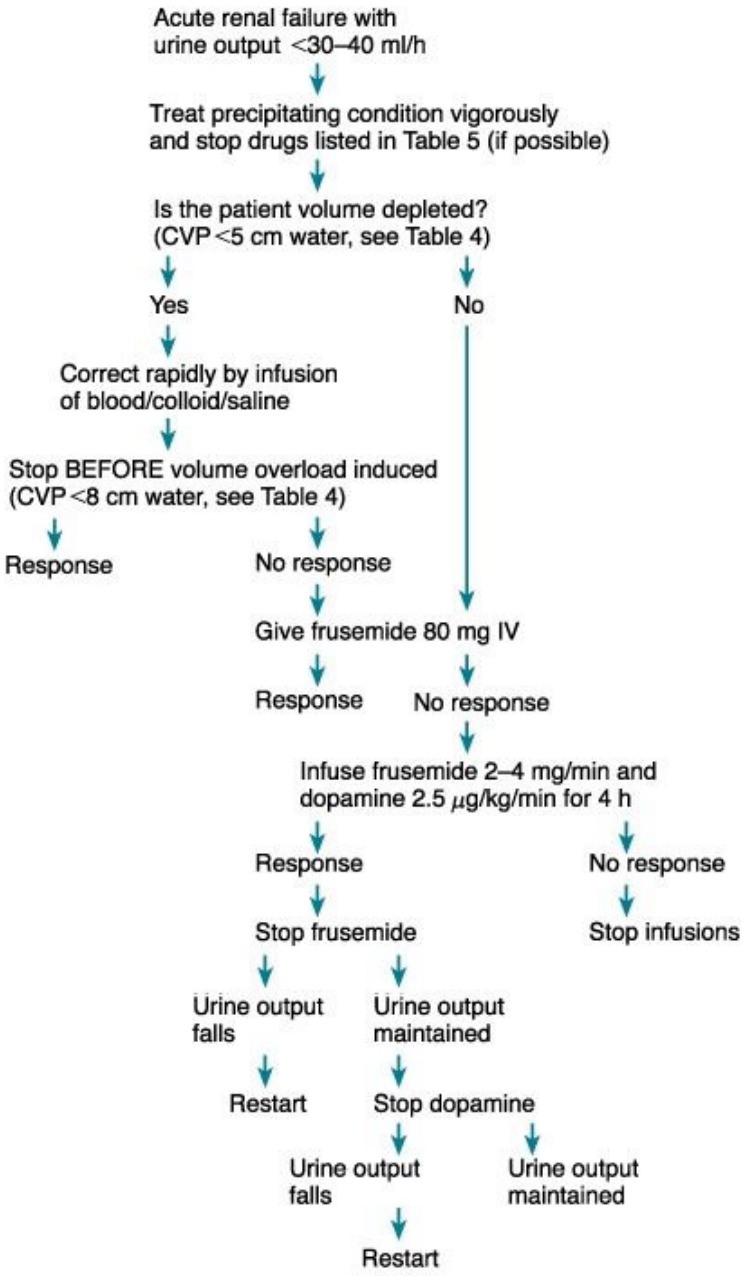
A、腎前性寡尿的處理:

校正造成腎臟血流不足的原因，並與以擴充有效容積，若是病人有出血，可以給予輸血補充。補充體液的過程必須監視水份的補充是否不足或過量、若是病情較為複雜的病患，應該使用中心靜

脈插管(甚至用Swan-Ganz)監測。

B、腎性寡尿的處理:

主要以支持性治療為主，防止病人的腎功能更惡化，並加速腎臟的修復。臨床治療上的流程如下:



C、腎後性寡尿的處理:

Relief 之 Time	Complete recovery Rate
Within 7 days	Almost 100%
Within 14 days	70%
Within 28 days	30%
Within 56 days	Almost 0%

由於腎臟在阻塞時，約 24 小時腎絲球過濾率就會很快降到原來的 20%，因此須立即找出阻塞的原因並儘早加以排除。

＊ 排除阻塞的時間和腎功能回復之比例:

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