

臨床分析

造成昏倒的咳嗽

出現窒息感、氣
吸不上來

咽喉痙攣性
咳嗽

咽喉發炎後水腫

咽喉肌肉肥厚

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咽喉感覺神經敏感

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咽喉痙攣性
咳嗽

劉伯伯的咽喉：
因感染稍有紅腫，並沒有
比一般人狹窄或肌肉肥厚
對壓舌板的反應較敏感，
甚至出現頭暈！

咽喉發炎後水腫

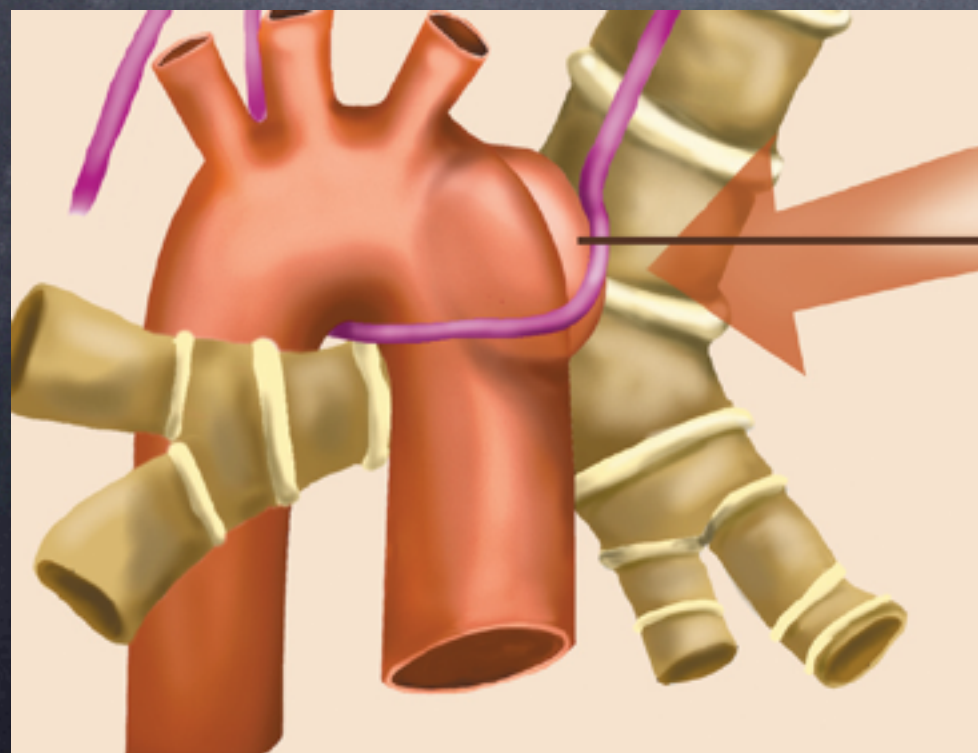
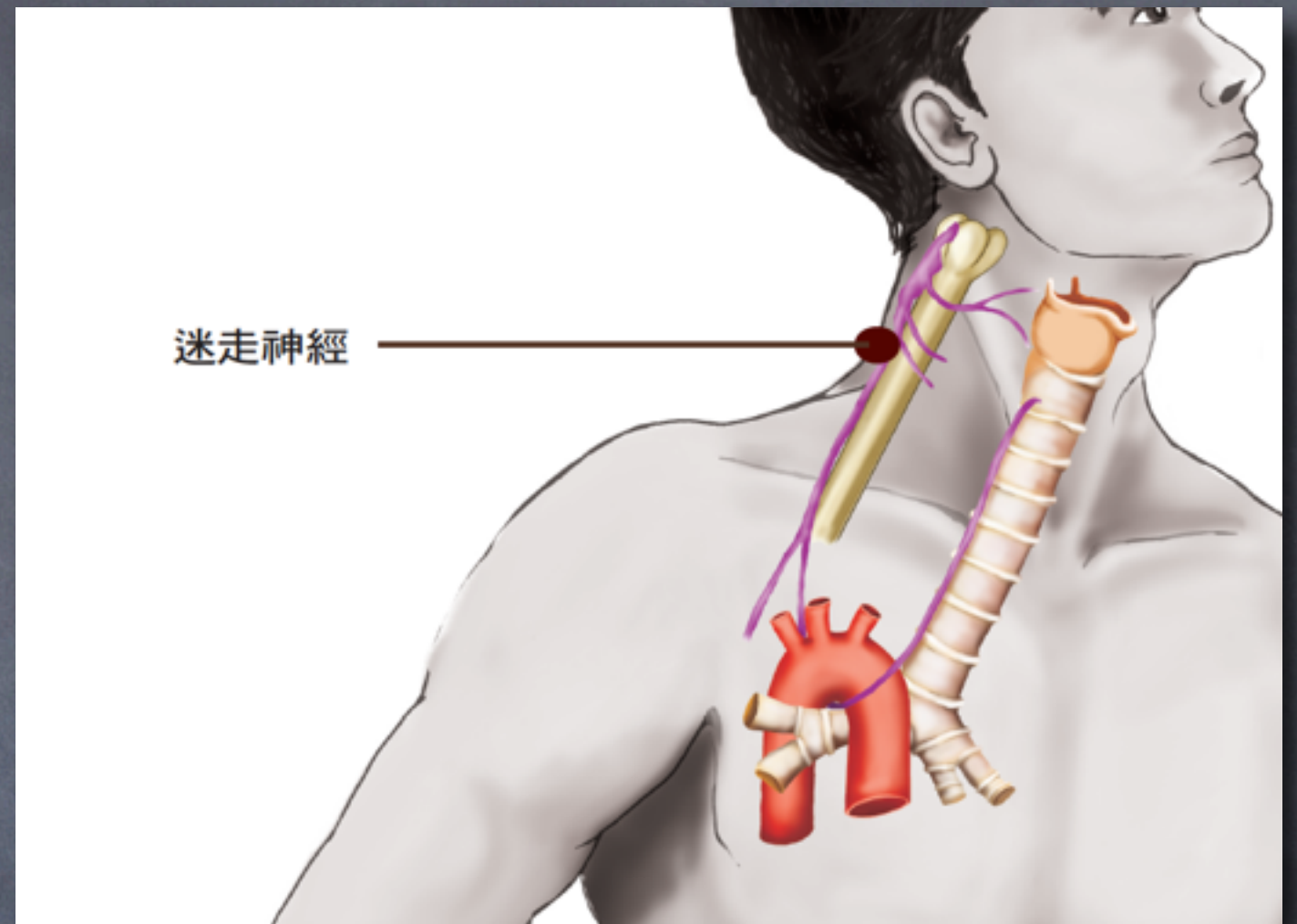
咽喉肌肉肥厚

咽喉感覺神經敏感

迷走神經受到壓迫：

過度反應

神經痲痹

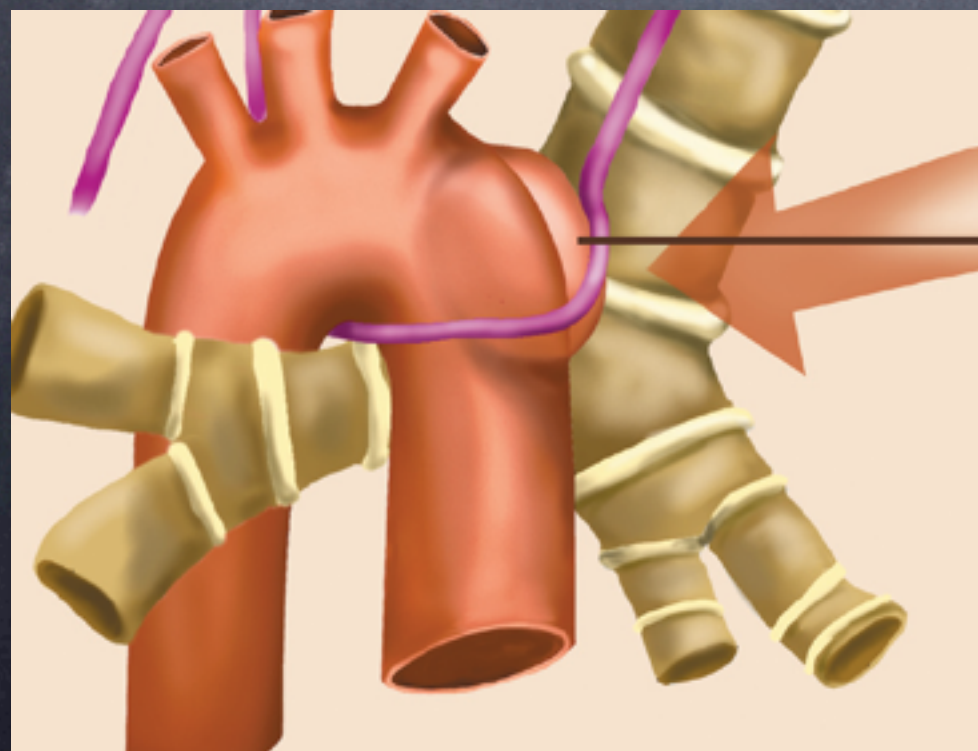
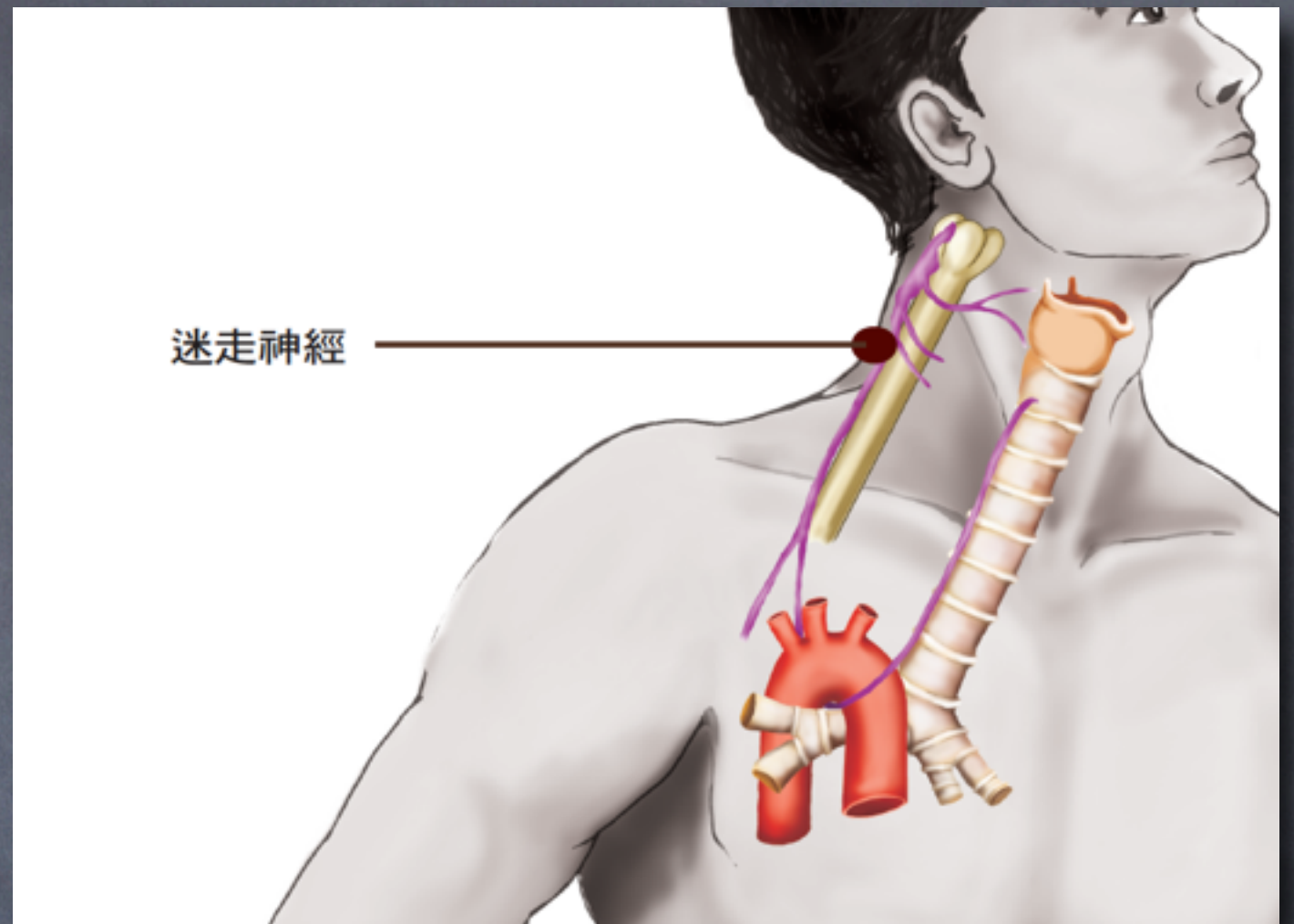


動脈瘤壓迫迷走神經

迷走神經受到壓迫：

過度反應

神經痲痹



主動脈瘤壓迫迷走神經

梅毒感染的
後遺症：主動脈瘤

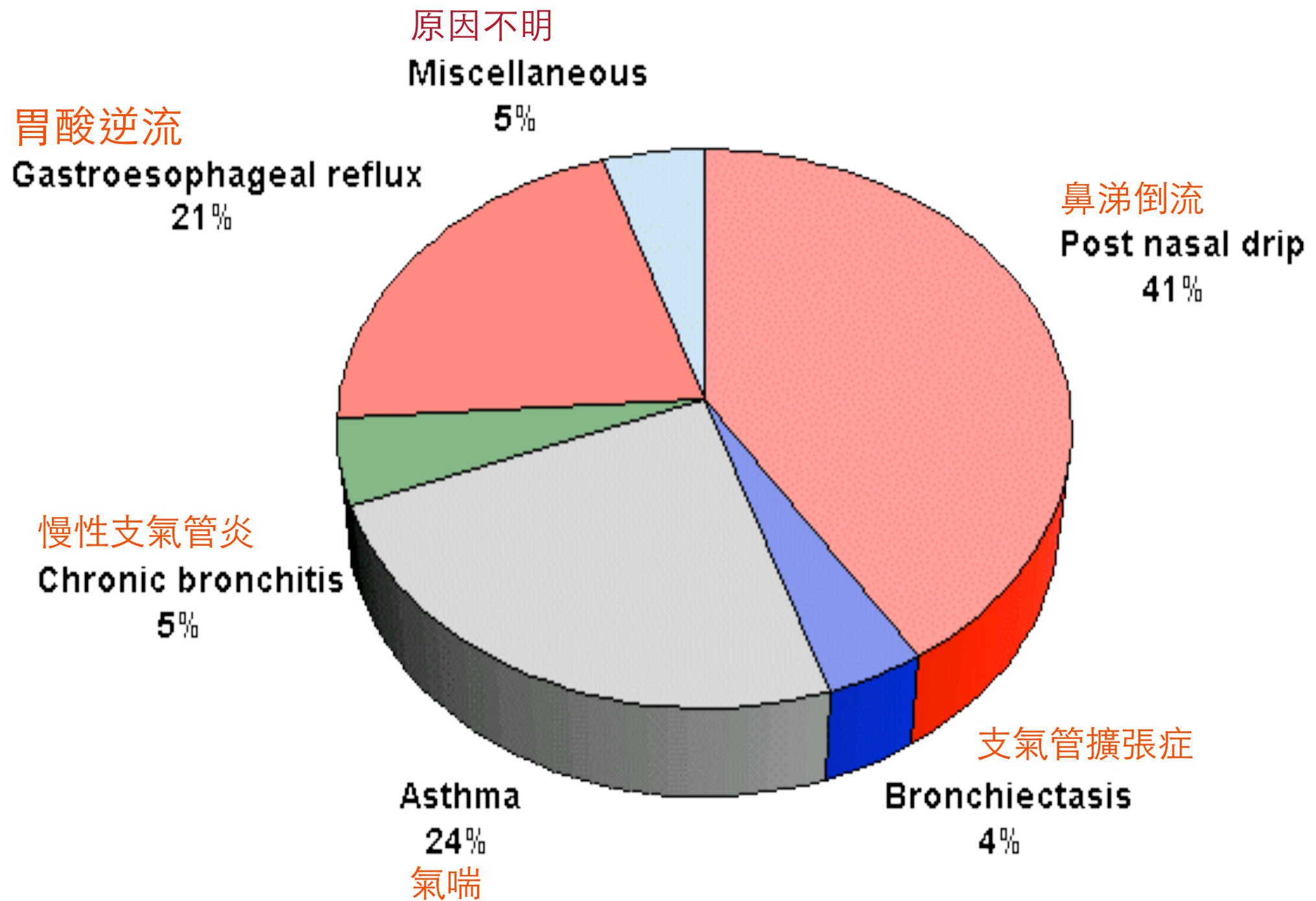
那，造成咳嗽的原因？

慢性咳嗽定義

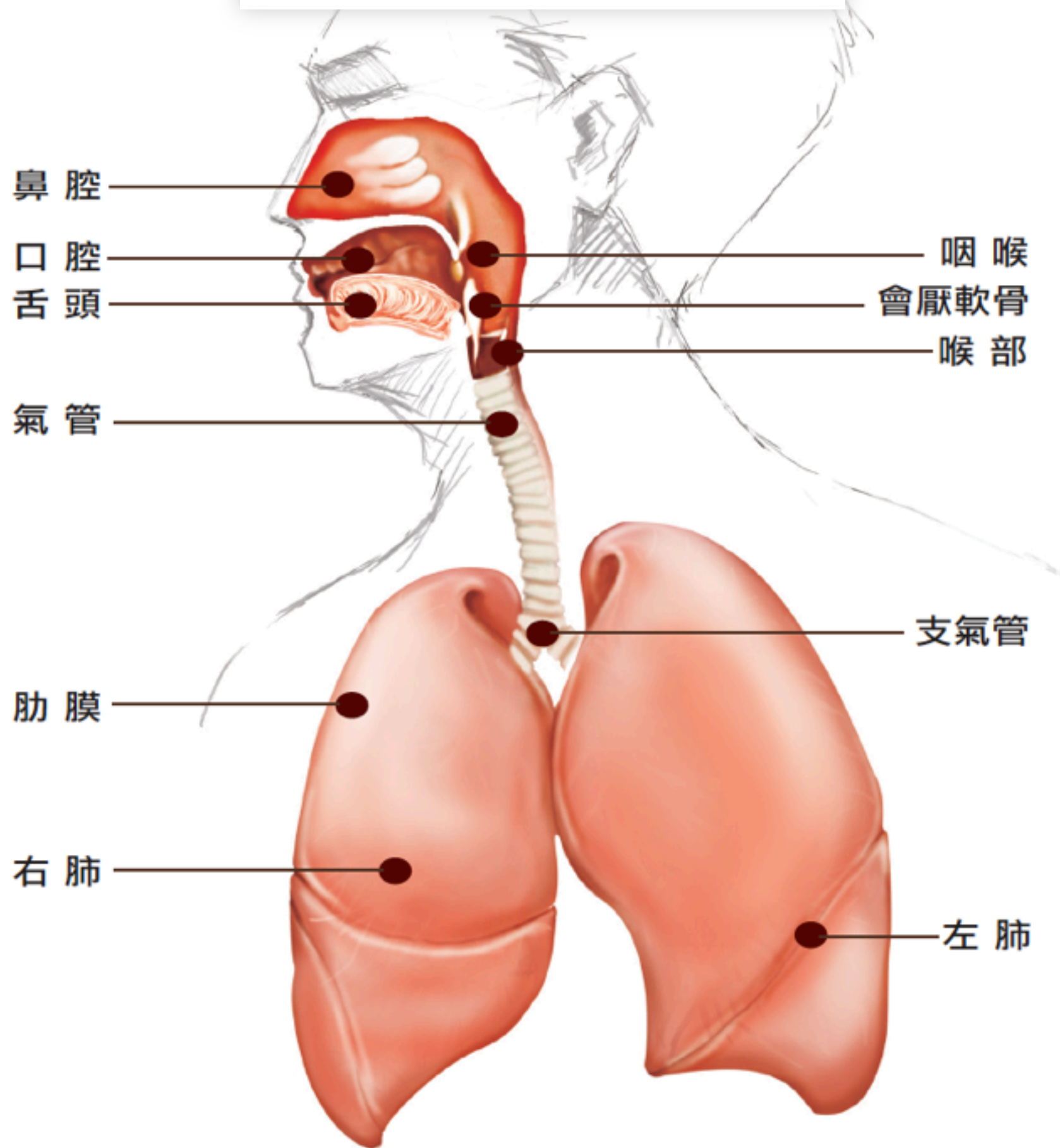
- 咳嗽超過**三週**
- 咳嗽是**唯一**表現的症狀
- 沒有合併咳血
- 沒有先前的肺部疾病可以解釋咳嗽原因
- 胸部X光**正常**，**無法診斷**咳嗽原因
- 咳嗽可能伴隨有痰或無痰



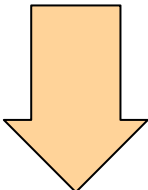
成年人常見的原因



身體的咳嗽接受器



High Cortical Center
高級皮質中樞

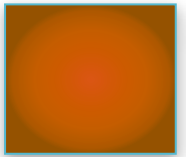


Afferent pathway
傳入路徑

Central portion
神經中樞

Efferent pathway
動作路徑

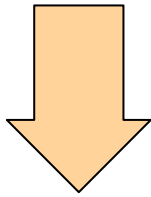
Brain Stem
腦幹



ganglion



High Cortical Center
高級皮質中樞



Afferent pathway
傳入路徑

Central portion
神經中樞

Efferent pathway
動作路徑

Rapidly adapting receptor
Bronchial /Pulmonary C-fiber

Brain Stem
腦幹

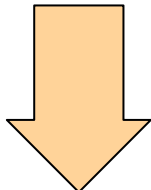


ganglion



AirwaySmooth muscle
Respiratory muscle:
Diaphragm
Accessory muscle

High Cortical Center
高級皮質中樞



Afferent pathway
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Central portion
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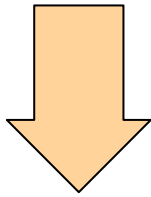
ganglion



Excessive stimulation (過度刺激)
Receptor threshold (閾值改變)

AirwaySmooth muscle
Respiratory muscle:
Diaphragm
Accessory muscle

High Cortical Center
高級皮質中樞



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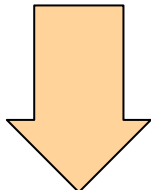
Lessen filtering effect
(過濾效應變差)



AirwaySmooth muscle
Respiratory muscle:
Diaphragm
Accessory muscle

Excessive stimulation (過度刺激)
Receptor threshold (閾值改變)

High Cortical Center
高級皮質中樞



Modulation

Afferent pathway
傳入路徑

Central portion
神經中樞

Efferent pathway
動作路徑

Rapidly adapting receptor
Bronchial /Pulmonary C-fiber

Brain Stem
腦幹



ganglion



Enhanced reflex

Lessen filtering effect
(過濾效應變差)



AirwaySmooth muscle
Respiratory muscle:
Diaphragm
Accessory muscle

Excessive stimulation (過度刺激)
Receptor threshold (閾值改變)

臨床上對於慢性咳嗽的思考方向

- 發生部位：Where?
 - Stimulation sites
- 產生咳嗽的刺激特性：What?
 - Mechanical, physical (temp. pH, osmolarity): RAR
 - Chemical (inflammatory, vapour, acid, alkali): C-fiber
- 如何產生咳嗽：How?
 - Excessive stimulation
 - Impaired modulation (psychological)
 - Lowering threshold
 - Enhanced reflex (Familiar sensory hyper-reflex, inflammation)

臨床上對於慢性咳嗽的思考方向

- 發生部位：Where?
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 - Mechanical, physical (temp. pH, osmolarity): RAR
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- **如何產生咳嗽：How?**
 - **Excessive stimulation**
 - **Impaired modulation (psychological)**
 - **Lowering threshold**
 - **Enhanced reflex (Familiar sensory hyper-reflex, inflammation)**

如何會產生咳嗽？

- **Excessive stimulation** (大量刺激)
- **Impaired modulation** (神經調整缺損)
 - **psychological**
- **Cough receptor threshold** (咳嗽接受器閾值改變)
- **Cough reflex enhancement** (咳嗽反射增強)

咳嗽時，咳嗽的神經反射改變了嗎？

	Cause
Increased Cough Reflex	All respiratory disorders Use of ACE inhibitors
Normal cough reflex	Inhaled of irritant substances Psychogenic cough Throat clearing
Decreased cough reflex	Cerebrovascular injury Decreased activities of daily living Antipsychotic drugs Sleep Vitamin B12 and folate deficeincy Anaesthetics Coma Disturbance of conciuosness Cerebrovascular diseases

臨床上如何診斷慢性咳嗽

Hyperresponsiveness

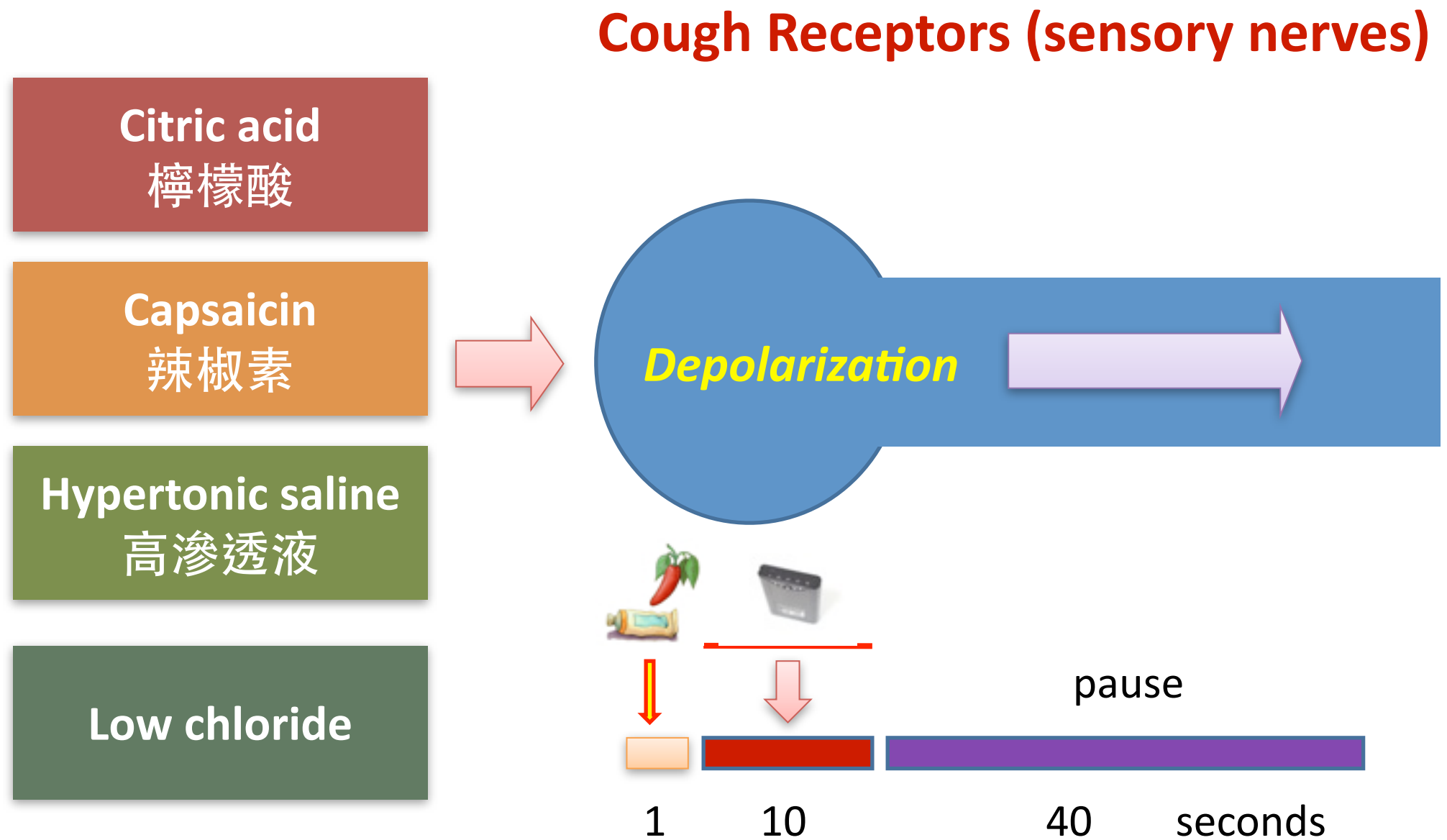
- Underlying inflammation
- Drugs
- Upper airways
 - GERD
 - Pharynx, larynx
 - Post-infectious
 - Familial sensory hyperreflex
 - Mucosa atrophic
 - Mouth breathing
 - Environmental factors
 - Saliva secretion
- Lower airways
 - Cough variant Asthma
 - Eosinophilic bronchitis
 - Asthma/ COPD
 - Bronchiolitis/pneumonitis

Non-hyperresponsiveness

- Excessive triggers
- Upper airways
 - Postnasal drip (irritating)
 - Sinusitis
 - Acid regurgitation
 - Environmental / occupational
- Lower airways
 - Lung/endobronchial tumor
 - Endobronchial TB, foreign body
 - Lung edema, fibrosis
 - Lung infiltrates (e.g. PCP, eosinophilic)
- Others (air, fluid, tumor)
 - Pleural disease
 - Middle or inner ear
 - Mediastinum
 - Diaphragm

咳嗽誘發測試

Cough Challenge Test



Cough Challenge Test

Equipment:

Mefar MB3 CE dosimeter (Mefar s.p.a. Brescia, Italy)

Solutions:

Citric acid is diluted in 0.9% sodium chloride to obtain concentrations of:

1 mM, 3 mM, 10 mM, 30 mM, 100 mM, 300 mM, 1000 mM

Capsaicin (stock solution made up in 100% ethanol) is diluted in 0.9% sodium chloride to obtain concentrations of:

0.1 μM , 0.3 μM , 1 μM , 3 μM , 10 μM , 30 μM , 100 μM

Procedure:

Capsaicin/citric acid is administered in incremental concentrations with two inhalations of normal saline solution randomly interspersed to increase challenge blindness.

Patients are instructed to exhale to functional residual capacity and then to inhale through the mouthpiece for 1 s (single breath inhalation).

The number of coughs in the first 10 seconds after each inhalation is recorded using Digital Audio Tape recorder.

There is a 30-second pause between each inhalation and each concentration of tussive agent is inhaled four times. Concentration response curves are constructed for each test.

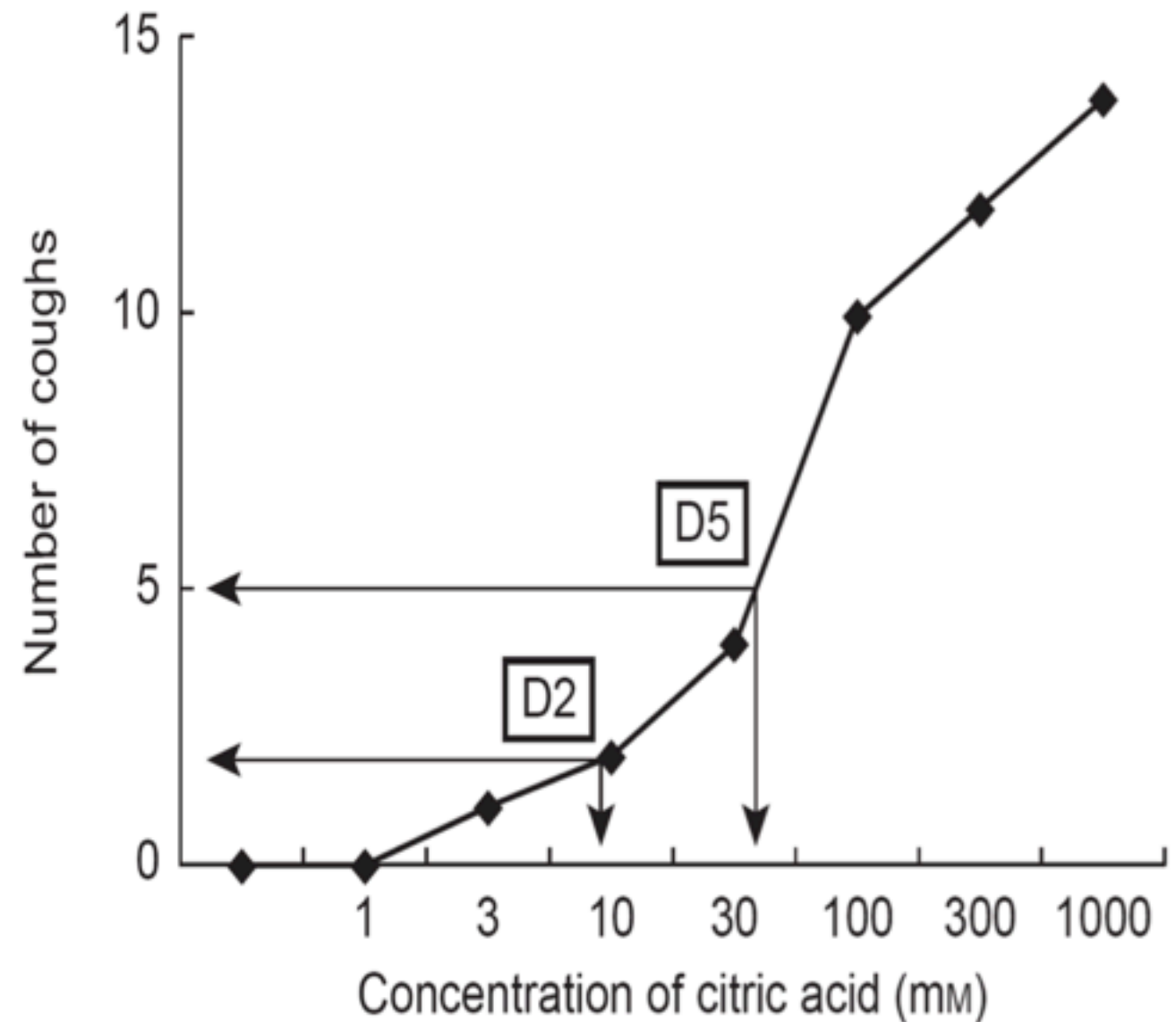
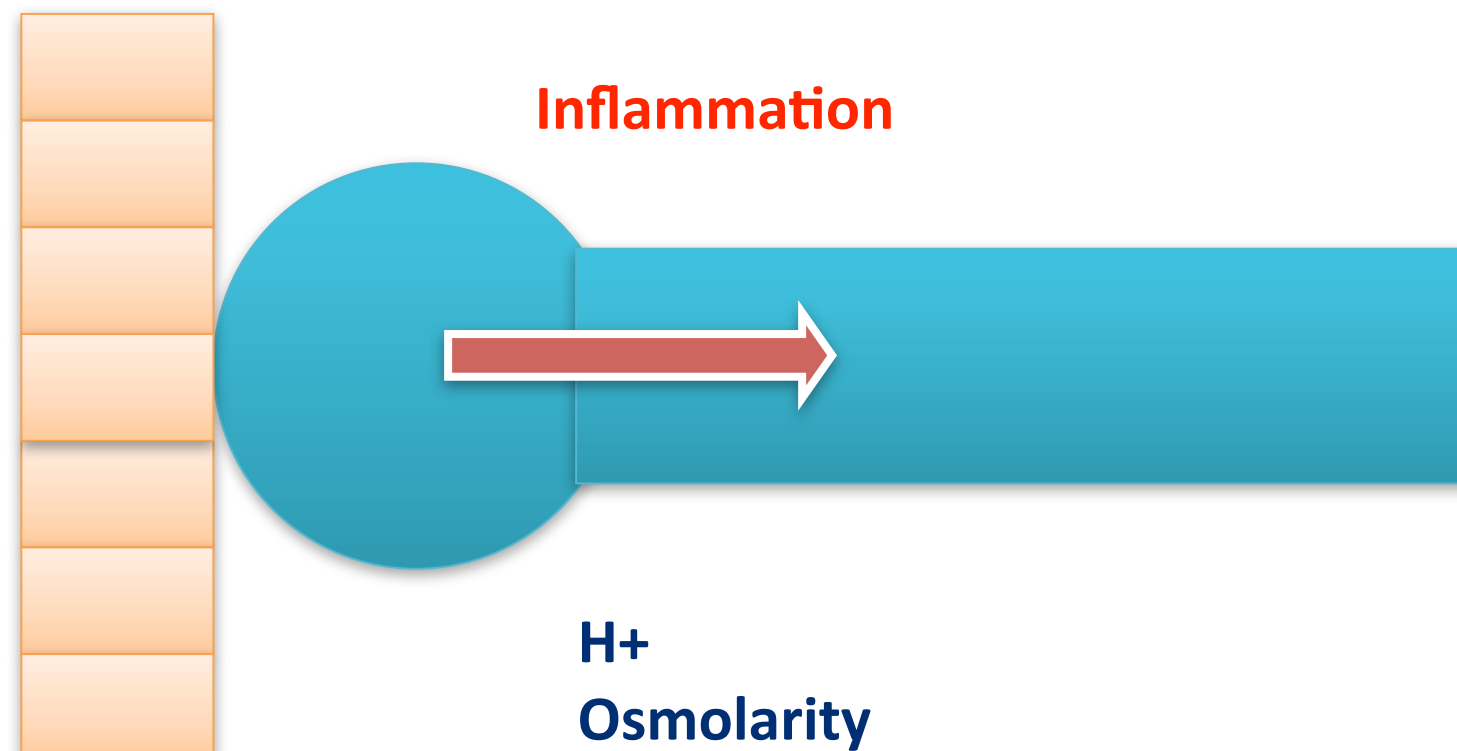


Figure 3 The Hull method of single breath inhalation cough challenge.

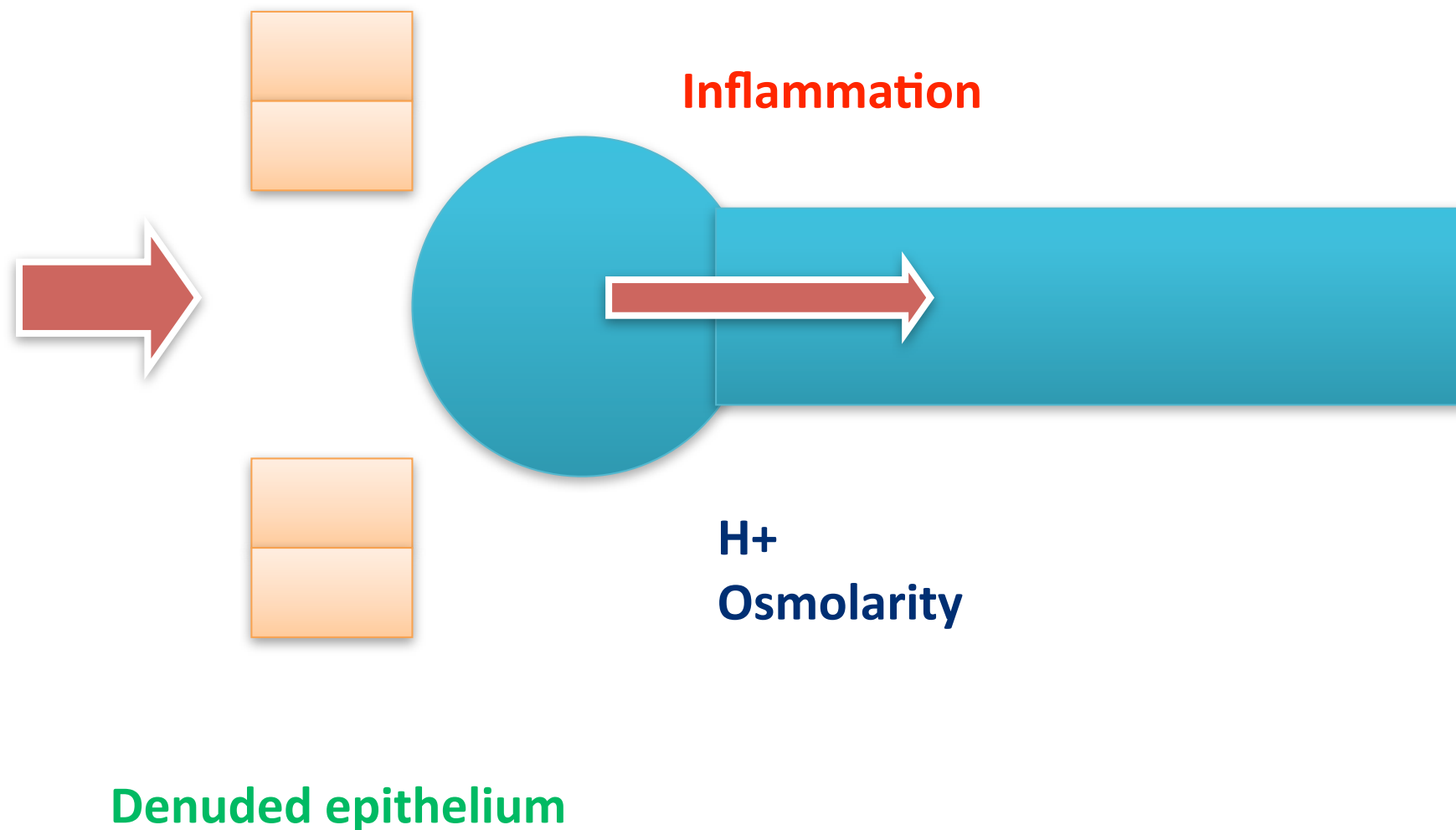
Positive Cough Challenge Test

- Citric acid: C2 <100 mM C5 <250mM



Positive Cough Challenge Test

- Citric acid: C2 <100 mM C5 <250mM



會想咳嗽，但咳嗽神經正常
(不會過度敏感)

刺激增加但咳嗽神經反射不變

(Negative Cough Challenge test)

- Mechanical (機械性)
 - Endobronchial lesions:
 - tumor
 - Foreign body
 - Fluid (post-nasal drip, pleural, pulmonary edema)
 - Air (pneumothorax, interstitial emphysema)
 - Irritants (environmental, occupational)
 - Flow (phonation, snoring, hyperventilation)
- Physical (物理性)
 - Temperature
 - pH (acid regurgitation, bile regurgitation)