SFAR
CONGRÈS
du 23 au 25 Septembre 2021
PALAIS DES CONGRÈS DE PARIS

10 minutes pour comprendre

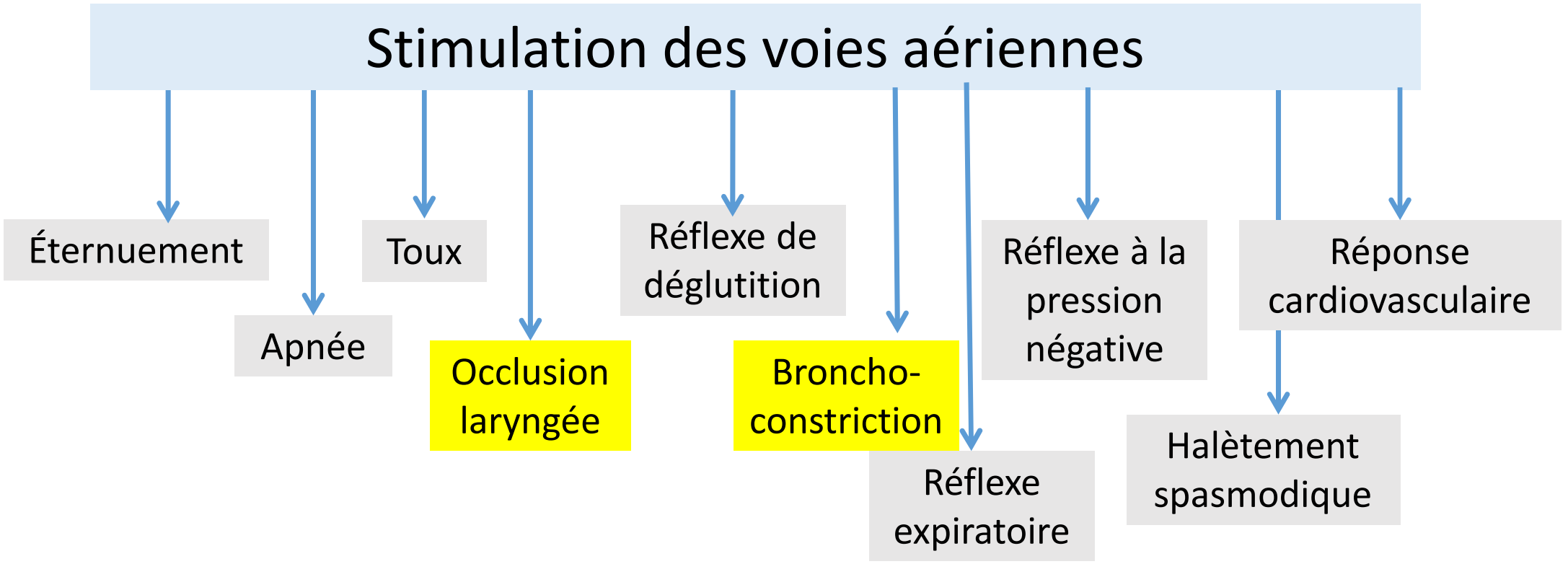
Laryngospasme et bronchospasme chez l'enfant

Corinne Lejus-Bourdeau
Hôtel Dieu - H.M.E. - C.H.U.de Nantes

LE SiMU DE NANTES
LABORATOIRE EXPÉRIMENTAL DE SIMULATION DE MÉDECINE INTENSIVE DE L'UNIVERSITÉ DE NANTES

HUGO
Hôpitaux Universitaires Grand Ouest

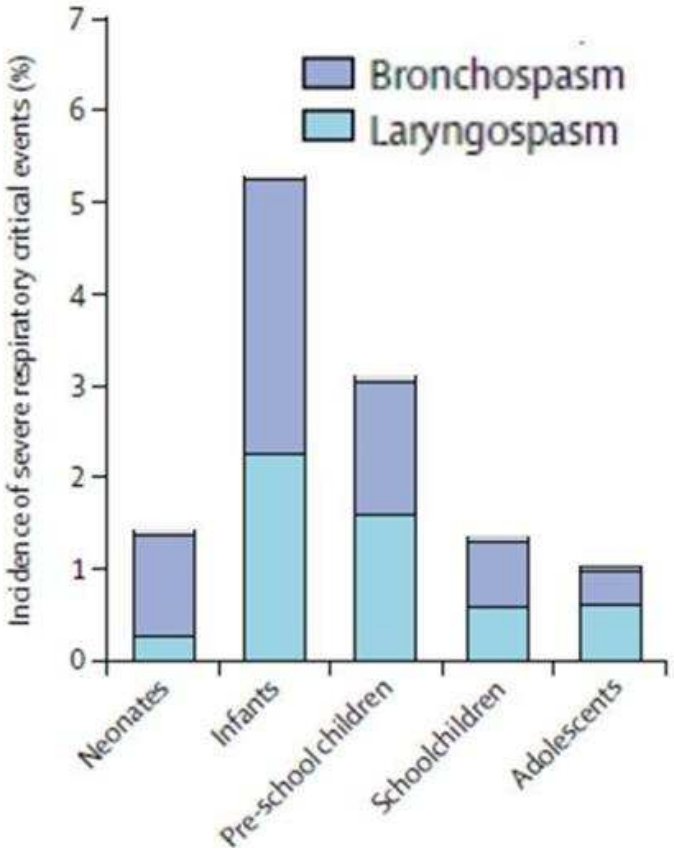
Les P'tits Doudous Nantais



Assurer la perméabilité des voies aériennes
Maintenir leur calibre
S'opposer, protéger, expulser, défendre

1,18%

	Laryngospasm (n=368)	Bronchospasm (n=371)
Time of occurrence, n (%)		
Induction	132 (35·0%)	118 (29·5%)
Maintenance	69 (18·2%)	99 (24·7%)
Awakening	165 (43·6%)	167 (41·7%)
Post-anaesthesia care unit	12 (3·2%)	16 (4·0%)
Treatment, n (%)		
Propofol	255 (52·5%)	..
Succinylcholine	69 (14·2%)	..
Intubation/prolonged intubation	73 (15·1%)	56 (12·1%)
Bronchodilators	..	224 (48·3%)
Epinephrine	..	19 (4·1%)
Deepening anaesthesia	..	85 (18·3%)



Infection récente des voies aériennes

Asthme

Tabagisme passif

Chirurgie ORL

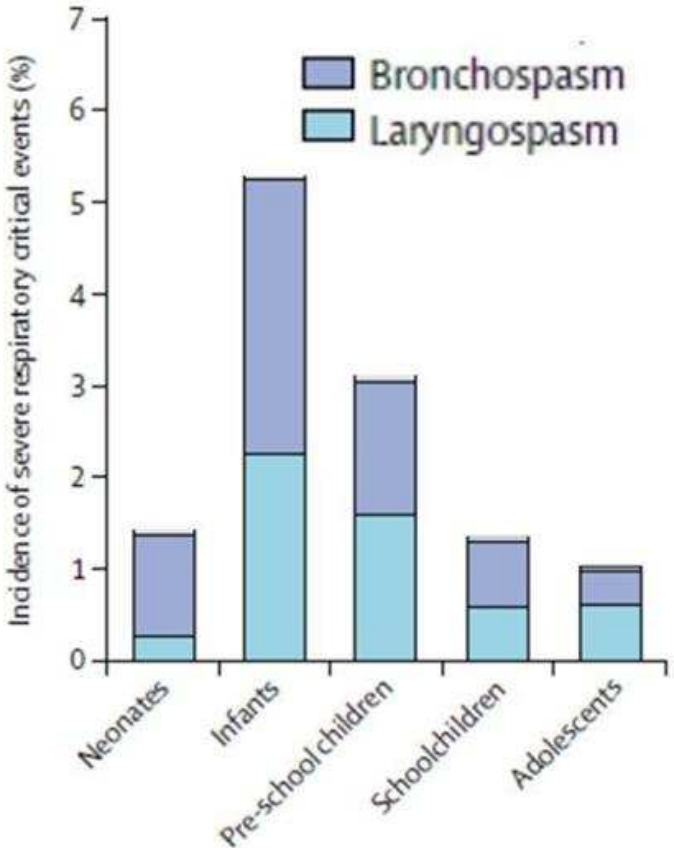
Compétence

Modalité de gestion des voies aériennes / anesthésie

Habre W, Lancet Respir Med 2017 (APRICOT, européenne 261 centres, 31 127 procédures)

1,18%

	Laryngospasm (n=368)	Bronchospasm (n=371)
Time of occurrence, n (%)		
Induction	132 (35·0%)	118 (29·5%)
Maintenance	69 (18·2%)	99 (24·7%)
Awakening	165 (43·6%)	167 (41·7%)
Post-anaesthesia care unit	12 (3·2%)	16 (4·0%)
Treatment, n (%)		
Propofol	255 (52·5%)	..
Succinylcholine	69 (14·2%)	..
Intubation/prolonged intubation	73 (15·1%)	56 (12·1%)
Bronchodilators	..	224 (48·3%)
Epinephrine	..	19 (4·1%)
Deepening anaesthesia	..	85 (18·3%)



Infection récente des voies aériennes

Asthme

Tabagisme passif

Chirurgie ORL

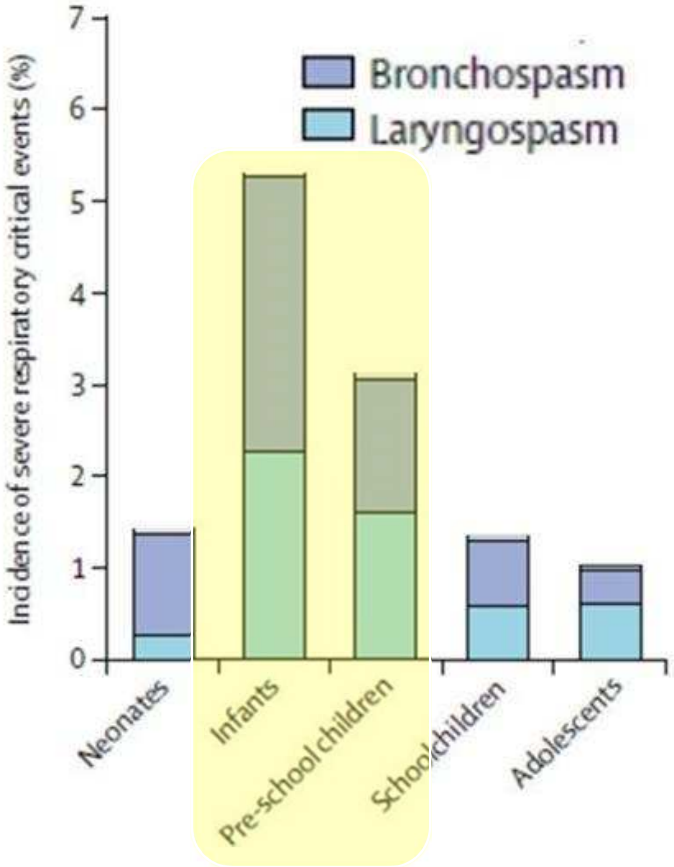
Compétence

Modalité de gestion des voies aériennes / anesthésie

Habre W, Lancet Respir Med 2017 (APRICOT, européenne 261 centres, 31 127 procédures)

1,18%

	Laryngospasm (n=368)	Bronchospasm (n=371)
Time of occurrence, n (%)		
Induction	132 (35·0%)	118 (29·5%)
Maintenance	69 (18·2%)	99 (24·7%)
Awakening	165 (43·6%)	167 (41·7%)
Post-anaesthesia care unit	12 (3·2%)	16 (4·0%)
Treatment, n (%)		
Propofol	255 (52·5%)	..
Succinylcholine	69 (14·2%)	..
Intubation/prolonged intubation	73 (15·1%)	56 (12·1%)
Bronchodilators	..	224 (48·3%)
Epinephrine	..	19 (4·1%)
Deepening anaesthesia	..	85 (18·3%)



Infection récente des voies aériennes

Asthme

Tabagisme passif

Chirurgie ORL

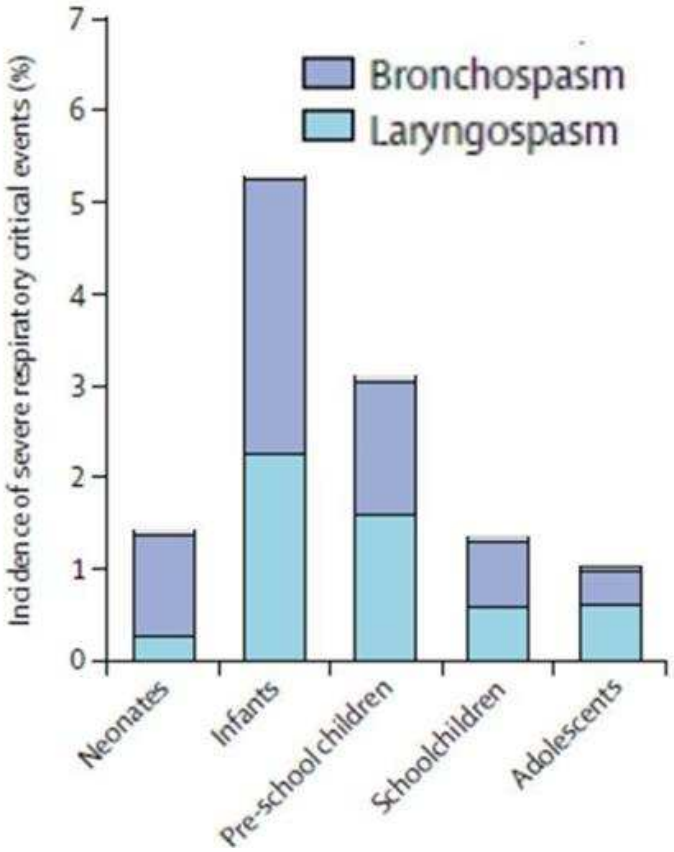
Compétence

Modalité de gestion des voies aériennes / anesthésie

Habre W, Lancet Respir Med 2017 (APRICOT, européenne 261 centres, 31 127 procédures)

1,18%

	Laryngospasm (n=368)	Bronchospasm (n=371)
Time of occurrence, n (%)		
Induction	132 (35·0%)	118 (29·5%)
Maintenance	69 (18·2%)	99 (24·7%)
Awakening	165 (43·6%)	167 (41·7%)
Post-anaesthesia care unit	12 (3·2%)	16 (4·0%)
Treatment, n (%)		
Propofol	255 (52·5%)	..
Succinylcholine	69 (14·2%)	..
Intubation/prolonged intubation	73 (15·1%)	56 (12·1%)
Bronchodilators	..	224 (48·3%)
Epinephrine	..	19 (4·1%)
Deepening anaesthesia	..	85 (18·3%)



Infection récente des voies aériennes

Asthme

Tabagisme passif

Chirurgie ORL

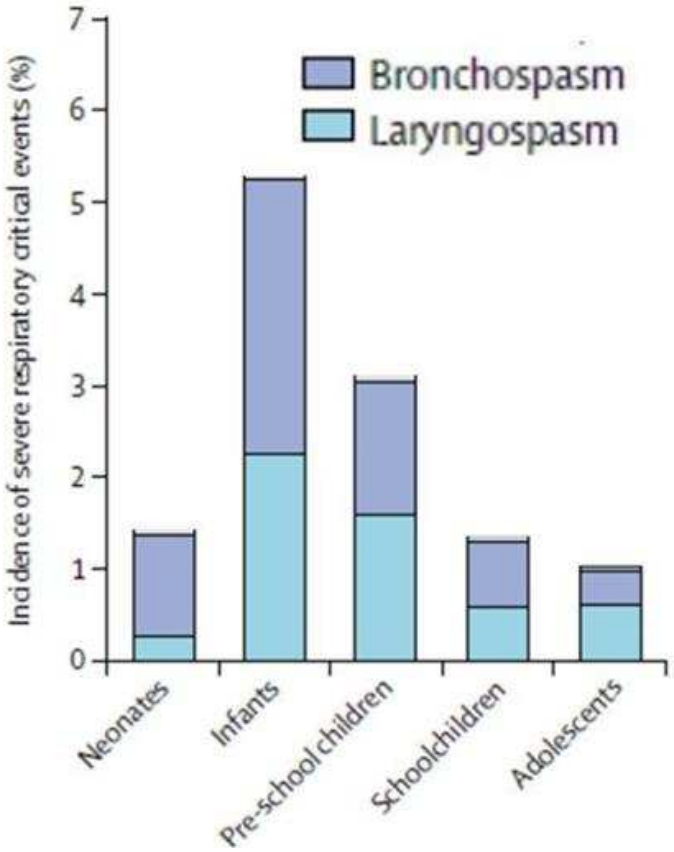
Compétence

Modalité de gestion des voies aériennes / anesthésie

Habre W, Lancet Respir Med 2017 (APRICOT, européenne 261 centres, 31 127 procédures)

1,18%

	Laryngospasm (n=368)	Bronchospasm (n=371)
Time of occurrence, n (%)		
Induction	132 (35·0%)	118 (29·5%)
Maintenance	69 (18·2%)	99 (24·7%)
Awakening	165 (43·6%)	167 (41·7%)
Post-anaesthesia care unit	12 (3·2%)	16 (4·0%)
Treatment, n (%)		
Propofol	255 (52·5%)	..
Succinylcholine	69 (14·2%)	..
Intubation/prolonged intubation	73 (15·1%)	56 (12·1%)
Bronchodilators	..	224 (48·3%)
Epinephrine	..	19 (4·1%)
Deepening anaesthesia	..	85 (18·3%)



Infection récente des voies aériennes

Asthme

Tabagisme passif

Chirurgie ORL

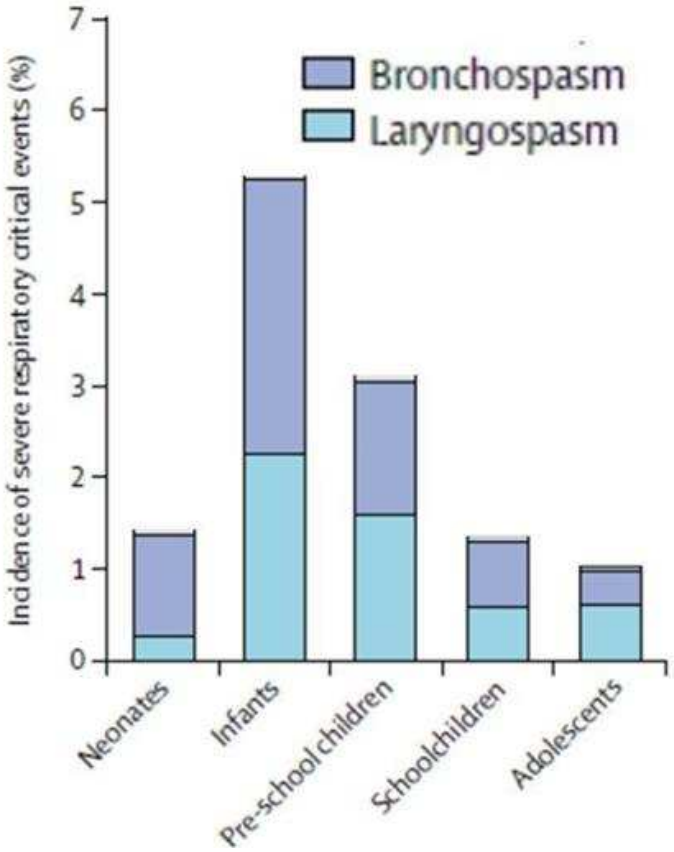
Compétence

Modalité de gestion des voies aériennes / anesthésie

Habre W, Lancet Respir Med 2017 (APRICOT, européenne 261 centres, 31 127 procédures)

1,18%

	Laryngospasm (n=368)	Bronchospasm (n=371)
Time of occurrence, n (%)		
Induction	132 (35·0%)	118 (29·5%)
Maintenance	69 (18·2%)	99 (24·7%)
Awakening	165 (43·6%)	167 (41·7%)
Post-anaesthesia care unit	12 (3·2%)	16 (4·0%)
Treatment, n (%)		
Propofol	255 (52·5%)	..
Succinylcholine	69 (14·2%)	..
Intubation/prolonged intubation	73 (15·1%)	56 (12·1%)
Bronchodilators	X	224 (48·3%)
Epinephrine	..	19 (4·1%)
Deepening anaesthesia	..	85 (18·3%)



Infection récente des voies aériennes

Asthme

Tabagisme passif

Chirurgie ORL

Compétence

Modalité de gestion des voies aériennes / anesthésie

Habre W, Lancet Respir Med 2017 (APRICOT, européenne 261 centres, 31 127 procédures)

October, 1949 CALIFORNIA MEDICINE 271

Laryngospasm from the Anesthesiologist's Viewpoint

EARL T. HULL, JR., M.D., *Los Angeles*

October, 1949 CALIFORNIA MEDICINE 271

Laryngospasm from the Anesthesiologist's Viewpoint

EARL T. HULL, JR., M.D., *Los Angeles*

J Oral Surg (Chic). 1954 Oct;12(4):286-92.

Laryngospasm in oral surgery.

HUBBELL AO.

1954

Acta Anaesthesiol Scand. **1984** Oct;28(5):567-75.

Laryngospasm during anaesthesia. A computer-aided incidence study in 136,929 patients.

Olsson GL, Hallen B.

1984

Laryngoscope. 2012 Feb;122(2):425-8. doi: 10.1002/lary.22423. Epub 2012 Jan 17.

Incidence of laryngospasm and bronchospasm in pediatric adenotonsillectomy.

Orestes MI, Lander L, Verghese S, Shah RK.

2012

October, 1949 CALIFORNIA MEDICINE 271

Laryngospasm from the Anesthesiologist's Viewpoint

EARL T. HULL, JR., M.D., *Los Angeles*

J Oral Surg (Chic). 1954 Oct;12(4):286-92.

Laryngospasm in oral surgery.

HUBBELL AO.

1954

Acta Anaesthesiol Scand. **1984** Oct;28(5):567-75.

Laryngospasm during anaesthesia. A computer-aided incidence study in 136,929 patients.

Olsson GL, Hallen B.

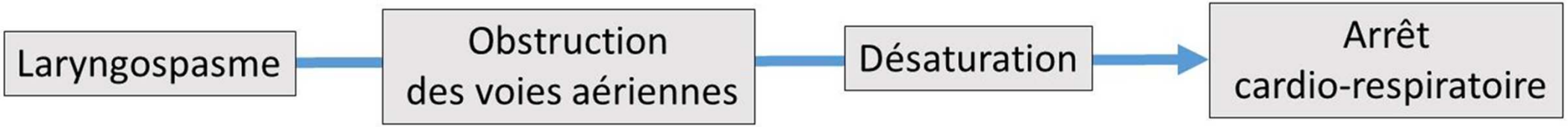
1984

Laryngoscope. 2012 Feb;122(2):425-8. doi: 10.1002/lary.22423. Epub 2012 Jan 17.

Incidence of laryngospasm and bronchospasm in pediatric adenotonsillectomy.

Orestes MI, Lander L, Verghese S, Shah RK.

2012



October, 1949 CALIFORNIA MEDICINE 271

Laryngospasm from the Anesthesiologist's Viewpoint

EARL T. HULL, JR., M.D., *Los Angeles*

J Oral Surg (Chic). 1954 Oct;12(4):286-92.

Laryngospasm in oral surgery.

HUBBELL AO.

1954

Acta Anaesthesiol Scand. **1984** Oct;28(5):567-75.

Laryngospasm during anaesthesia. A computer-aided incidence study in 136,929 patients.

Olsson GL, Hallen B.

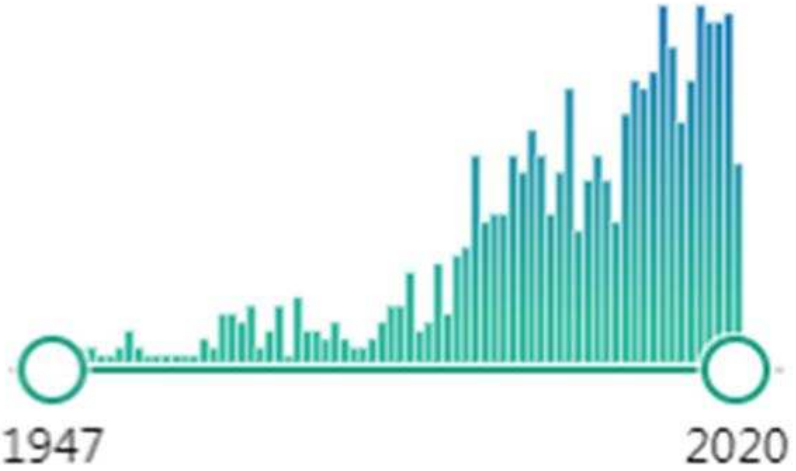
1984

Laryngoscope. 2012 Feb;122(2):425-8. doi: 10.1002/lary.22423. Epub 2012 Jan 17.

Incidence of laryngospasm and bronchospasm in pediatric adenotonsillectomy.

Orestes MI, Lander L, Verghese S, Shah RK.

2012



Laryngospasme → Obstruction des voies aériennes → Désaturation → Arrêt cardio-respiratoire

October, 1949 CALIFORNIA MEDICINE 271

Laryngospasm from the Anesthesiologist's Viewpoint

EARL T. HULL, JR., M.D., *Los Angeles*

J Oral Surg (Chic). 1954 Oct;12(4):286-92.

Laryngospasm in oral surgery.

HUBBELL AO.

1954

Acta Anaesthesiol Scand. **1984** Oct;28(5):567-75.

Laryngospasm during anaesthesia. A computer-aided incidence study in 136,929 patients.

Olsson GL, Hallen B.

1984

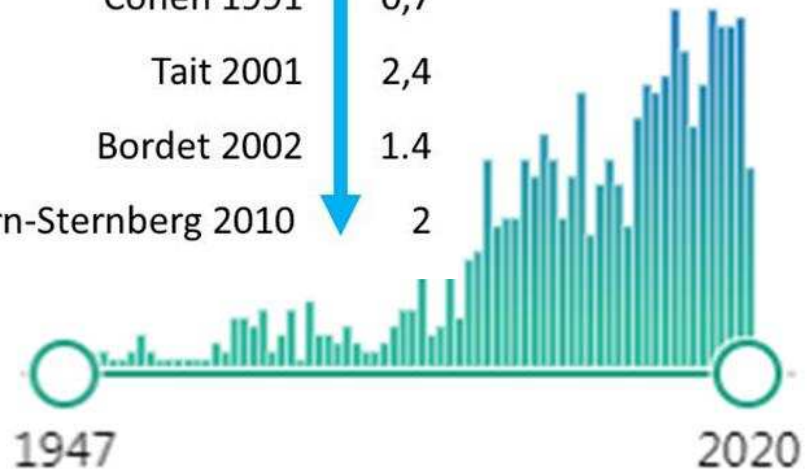
Laryngoscope. 2012 Feb;122(2):425-8. doi: 10.1002/lary.22423. Epub 2012 Jan 17.

Incidence of laryngospasm and bronchospasm in pediatric adenotonsillectomy.

Orestes MI, Lander L, Verghese S, Shah RK.

2012

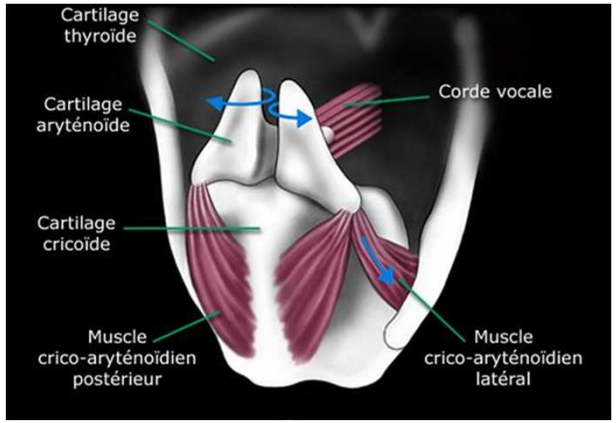
Incidence %	
Olson 1984	1,7
Cohen 1991	0,7
Tait 2001	2,4
Bordet 2002	1.4
Von Ungern-Sternberg 2010	2

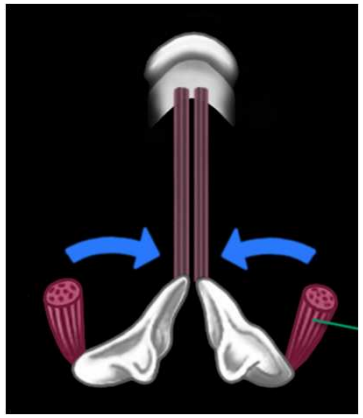


Laryngospasme → Obstruction des voies aériennes → Désaturation → Arrêt cardio-respiratoire

Muscles intrinsèques constricteurs du larynx

Crico-aryténoïdiens latéraux

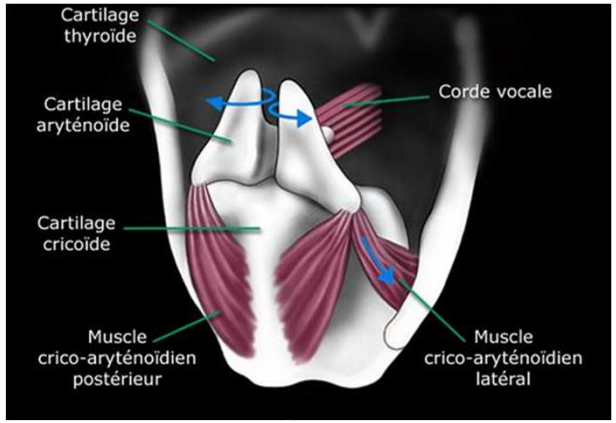




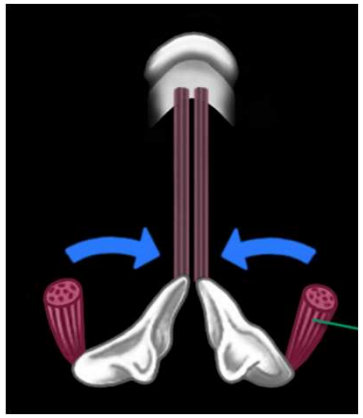
Anatomie du Larynx, Université Catholique de Louvain

Muscles intrinsèques constricteurs du larynx

Crico-aryténoïdiens latéraux



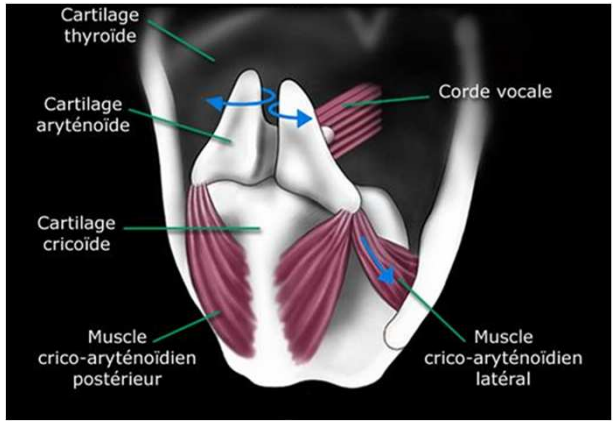
Inter-aryténoïdien

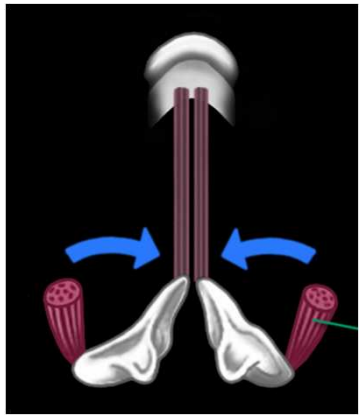


Anatomie du Larynx, Université Catholique de Louvain

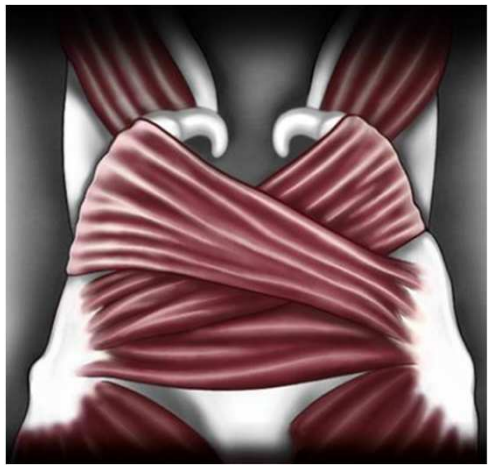
Muscles intrinsèques constricteurs du larynx

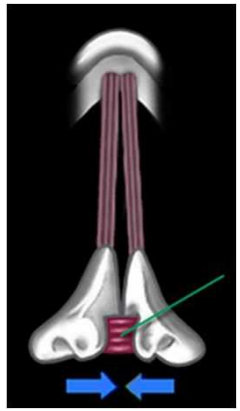
Crico-aryténoïdiens latéraux





Inter-aryténoïdien

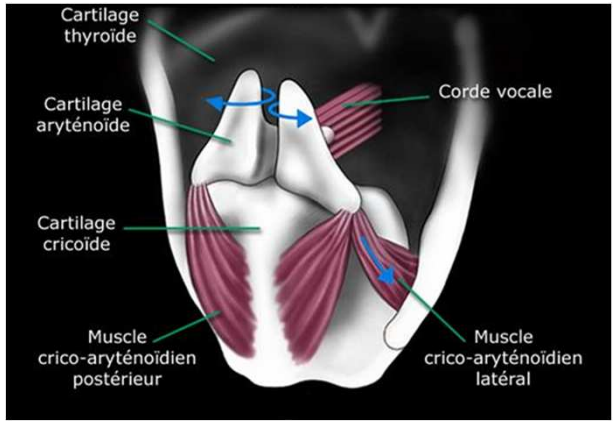




Anatomie du Larynx, Université Catholique de Louvain

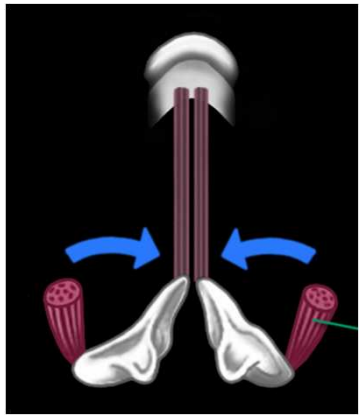
Muscles intrinsèques constricteurs du larynx

Crico-aryténoïdiens latéraux

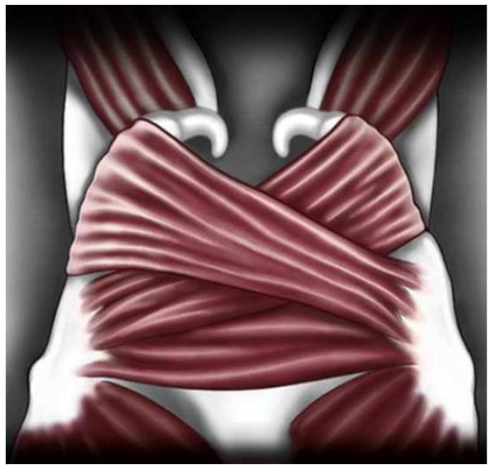


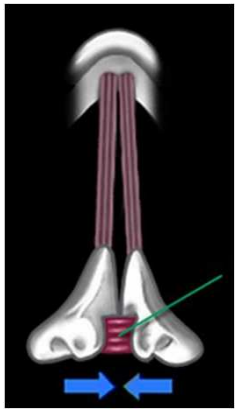






Inter-aryténoïdien

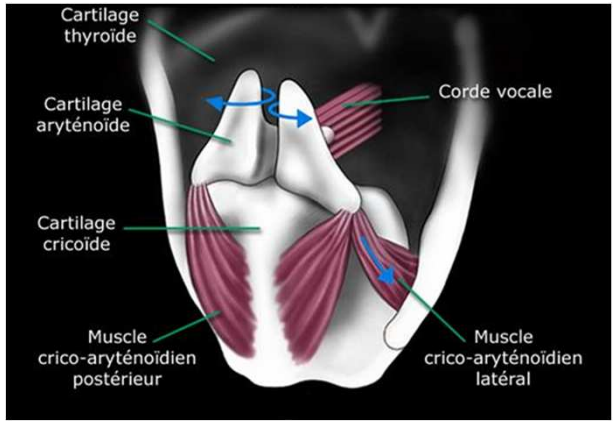




Anatomie du Larynx, Université Catholique de Louvain

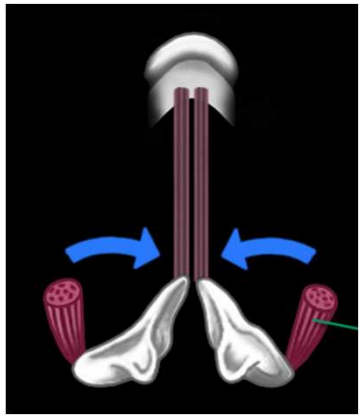
Muscles intrinsèques constricteurs du larynx

Crico-aryténoïdiens latéraux

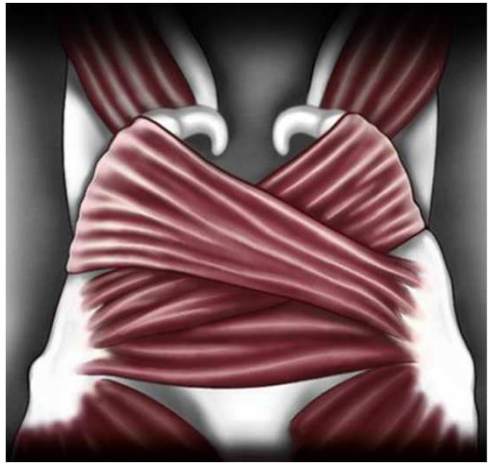


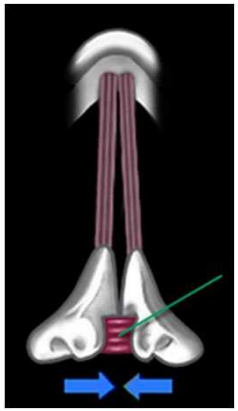




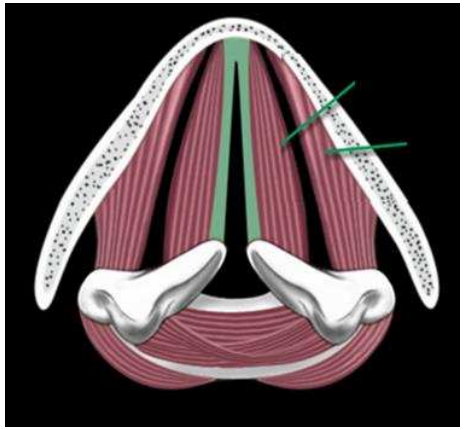


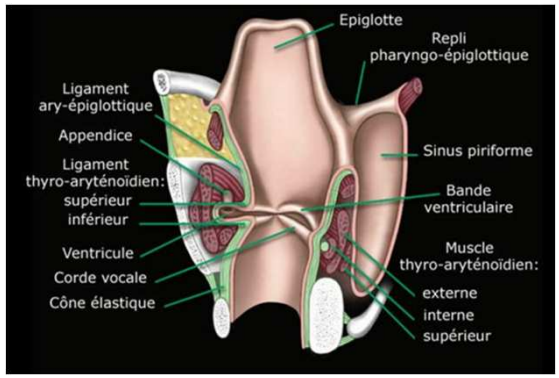
Inter-aryténoïdien





Thyro-aryténoïdiens

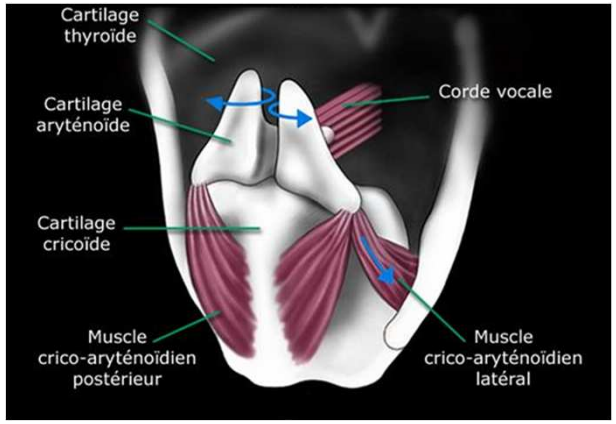




Anatomie du Larynx, Université Catholique de Louvain

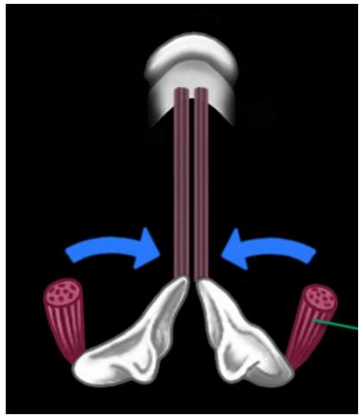
Muscles intrinsèques constricteurs du larynx

Crico-aryténoïdiens latéraux

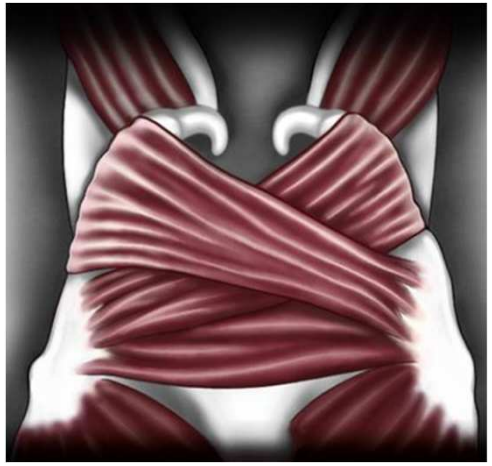


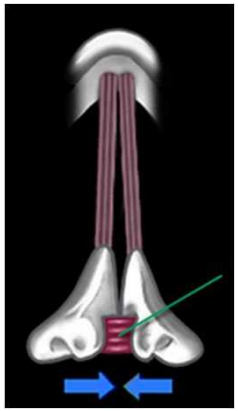




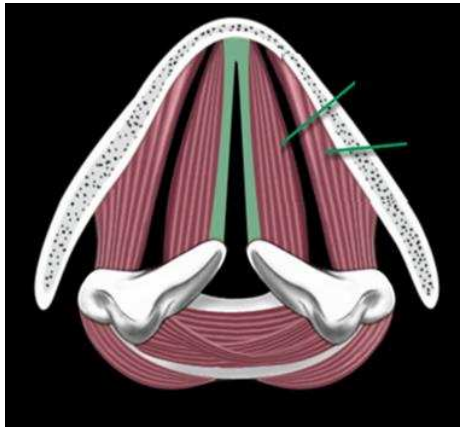


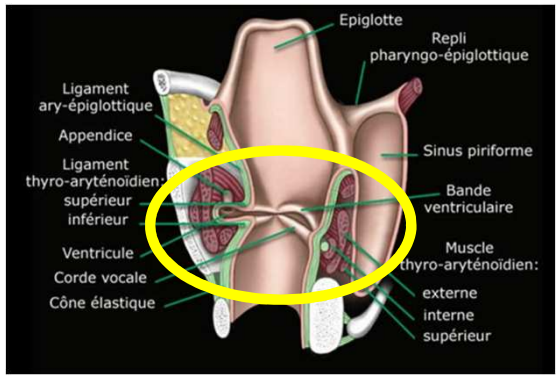
Inter-aryténoïdien



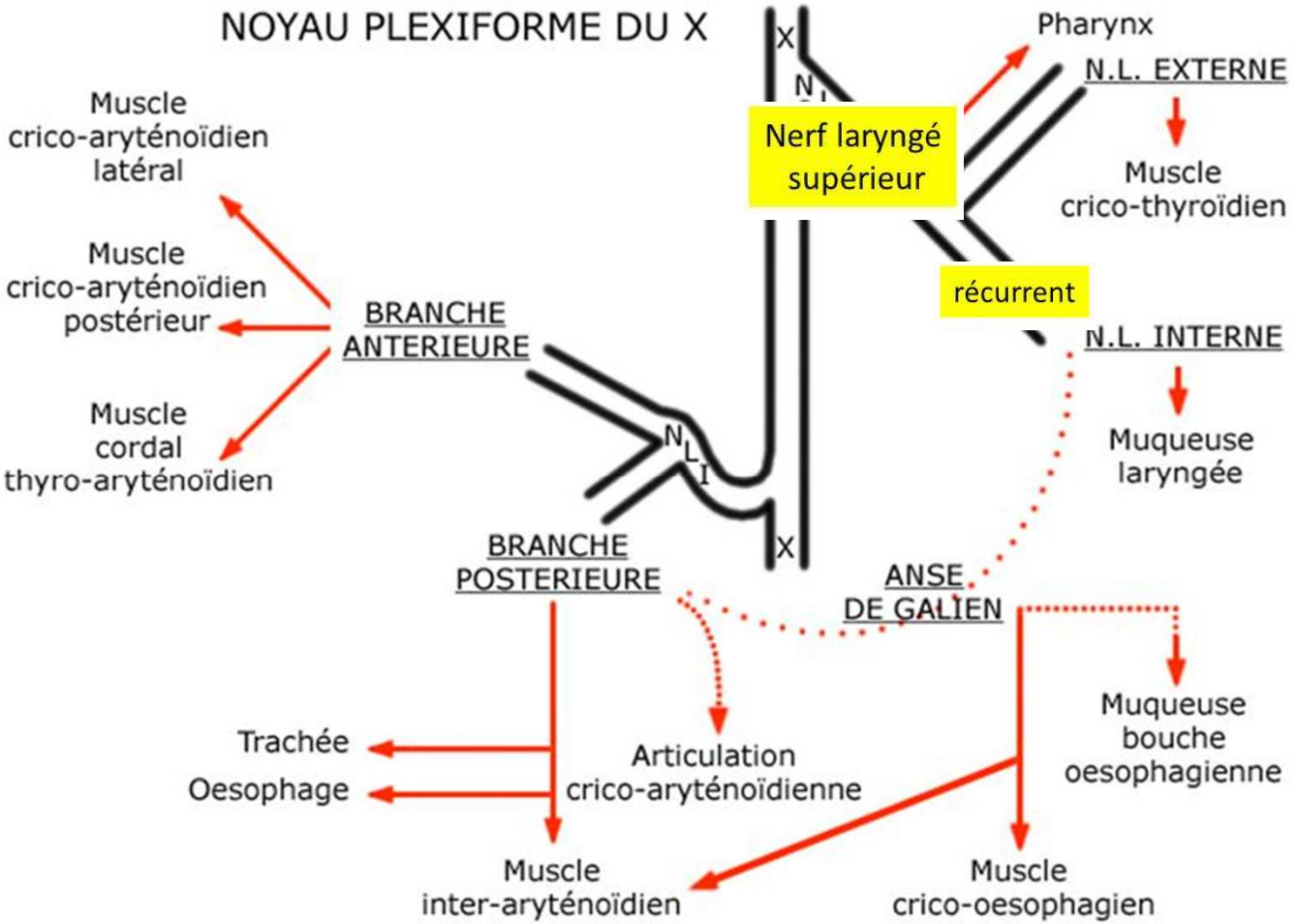


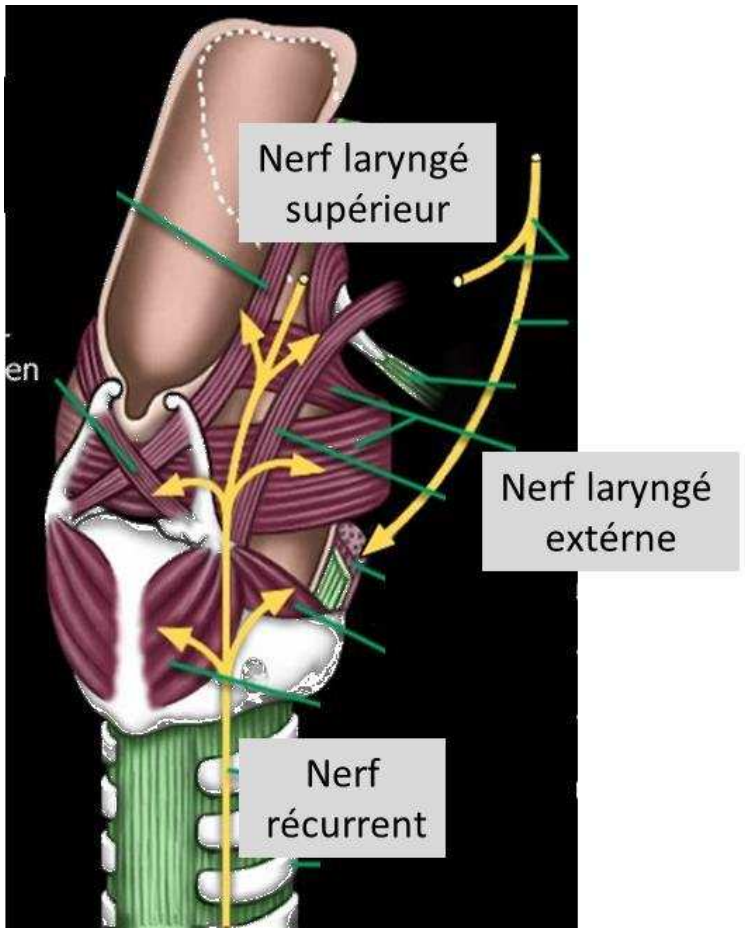
Thyro-aryténoïdiens



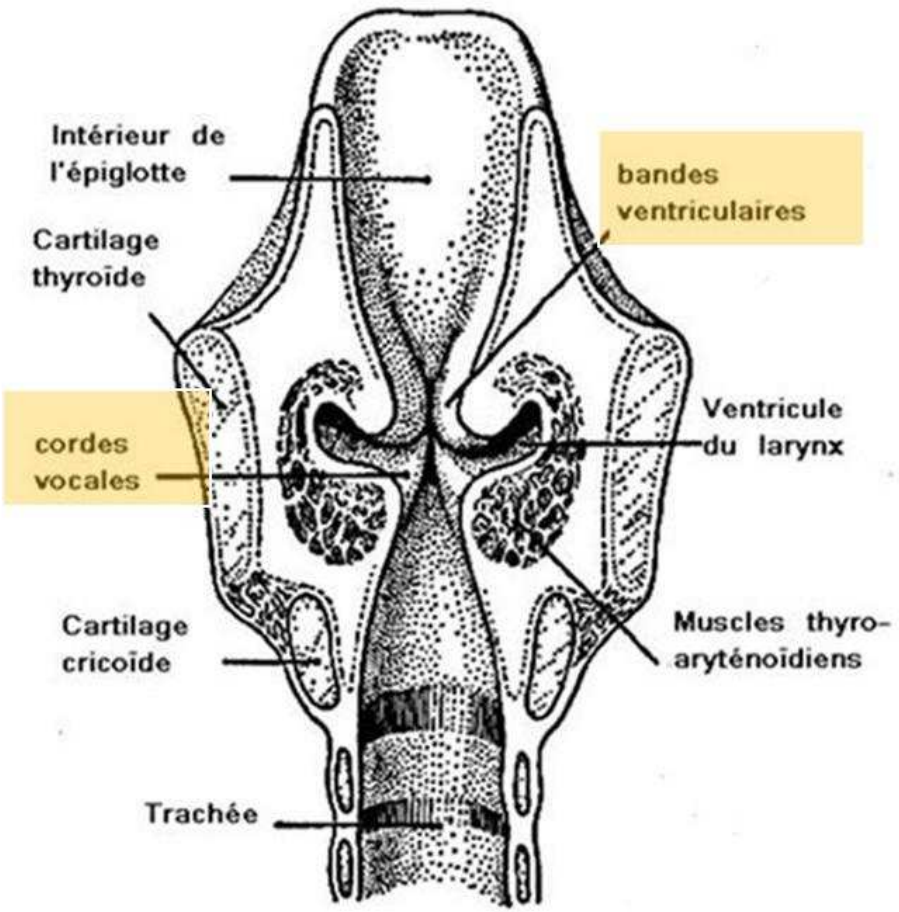


Anatomie du Larynx, Université Catholique de Louvain

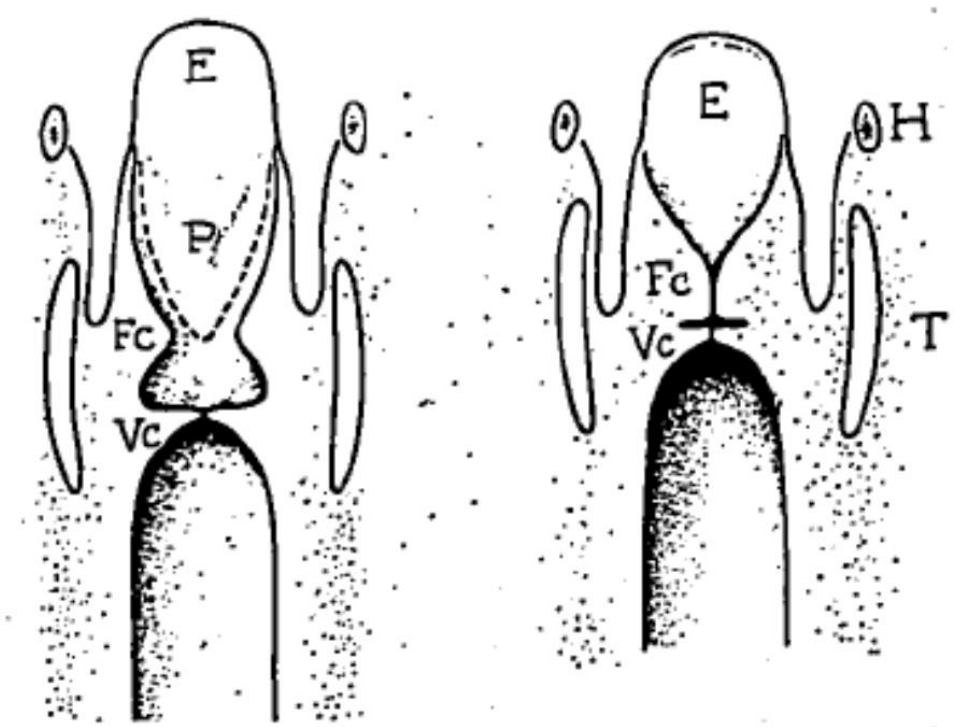




Nishino T et al Jpn J Physiol 2000;50:3-14



E = Epiglotte
Fc = Fausse corde vocale
Vc = Vraie corde vocale
T = Thyroïde
P = Paraglotte
H = Os hyoide



FINK BR. The etiology and treatment of laryngeal spasm. *Anesthesiology*. 1956;17:569-77

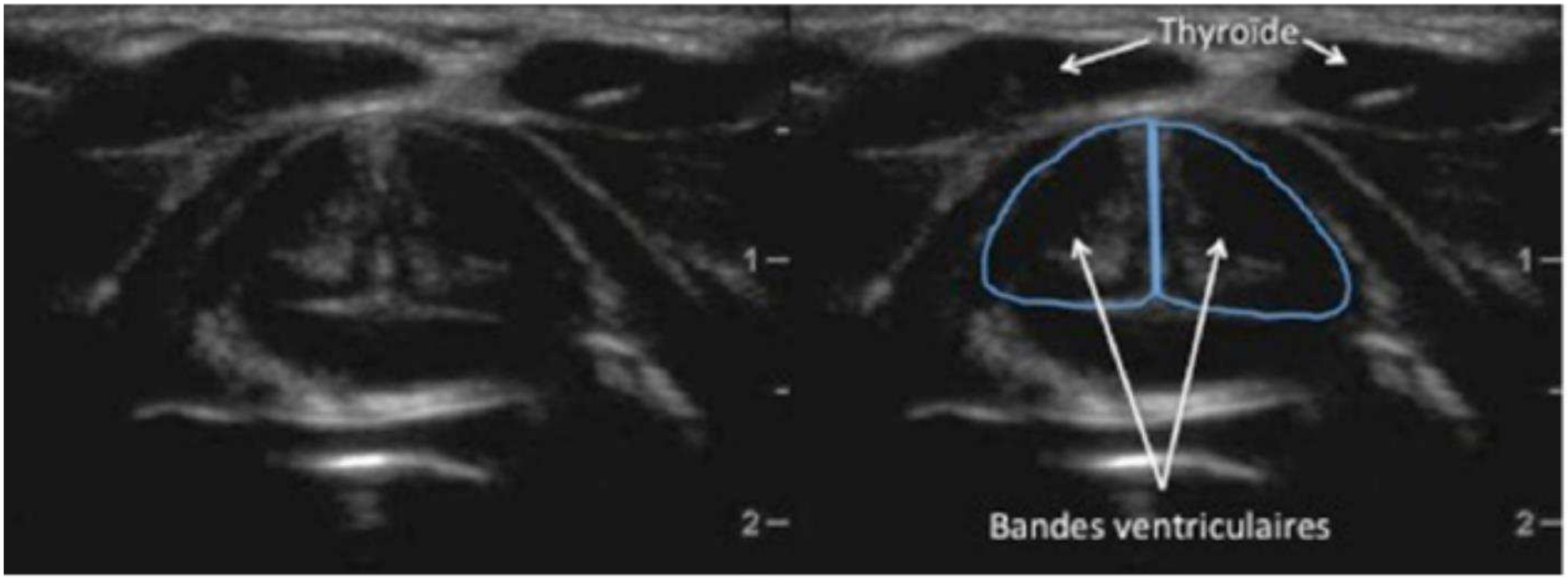


Image ultrasonographique d’un laryngospasme

Godet T et al, Le Praticien en Anesthésie Réanimation 2015;19:289-97

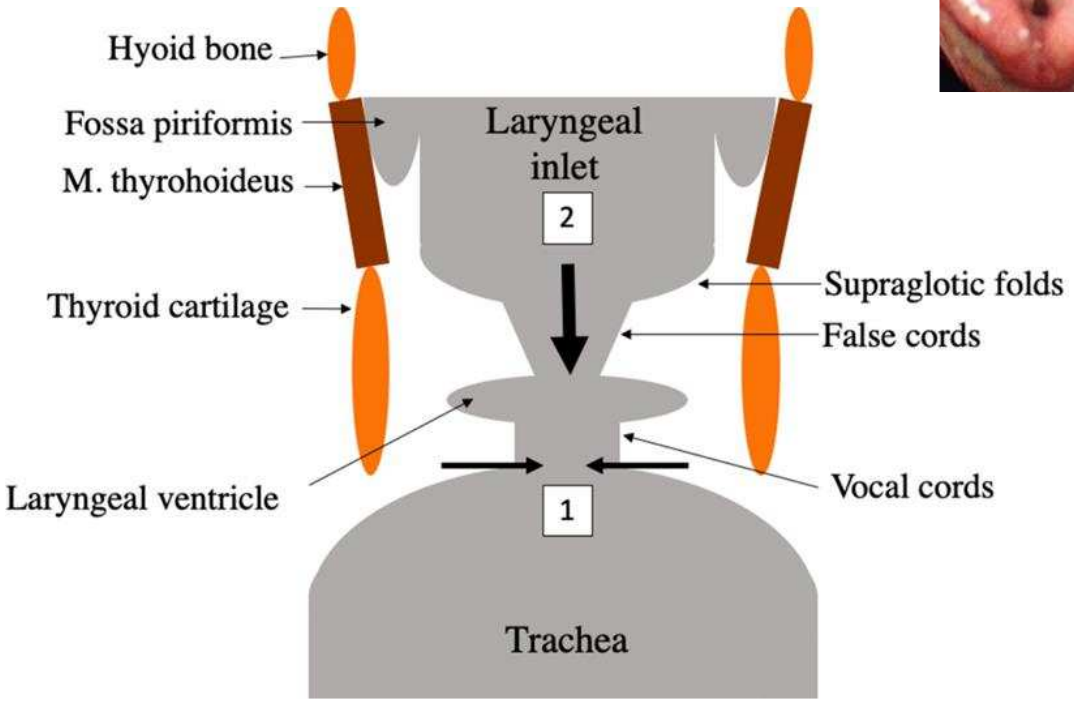
Erb O et al, 2020; 30:353-61







1 - Obturation



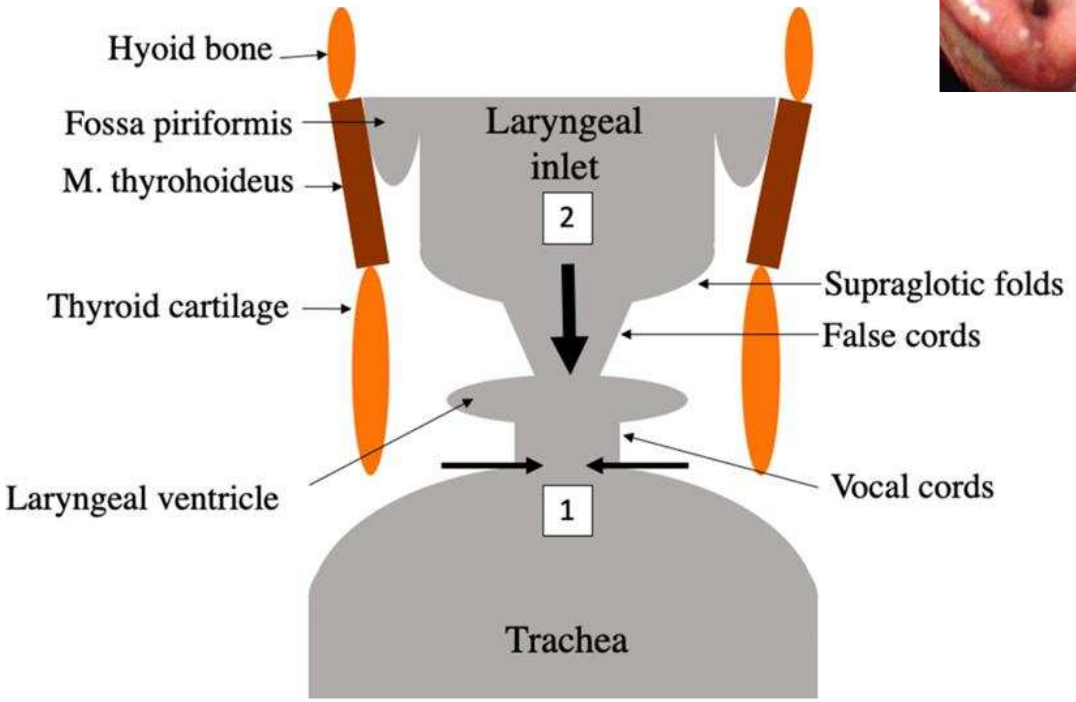
Erb O et al, 2020; 30:353-61







1 - Obturation



Stridor

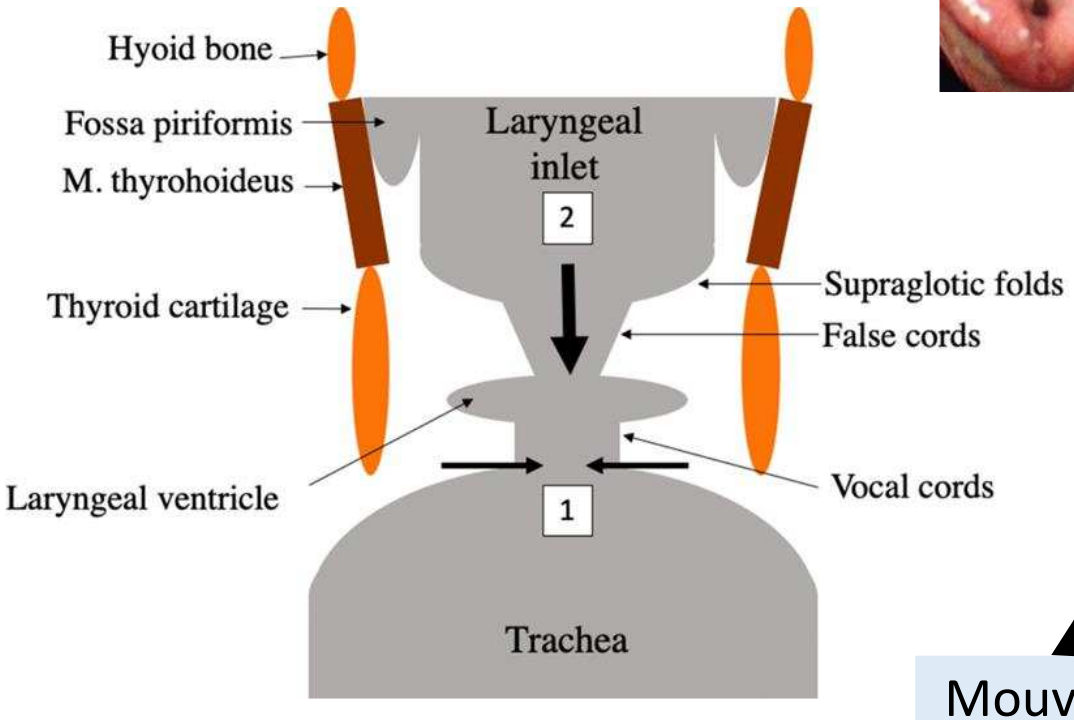
Erb O et al, 2020; 30:353-61







1 - Obturation



Stridor

Mouvements paradoxaux

Absence capnogramme/mouvement ballon

Erb O et al, 2020; 30:353-61





1 - Obturation



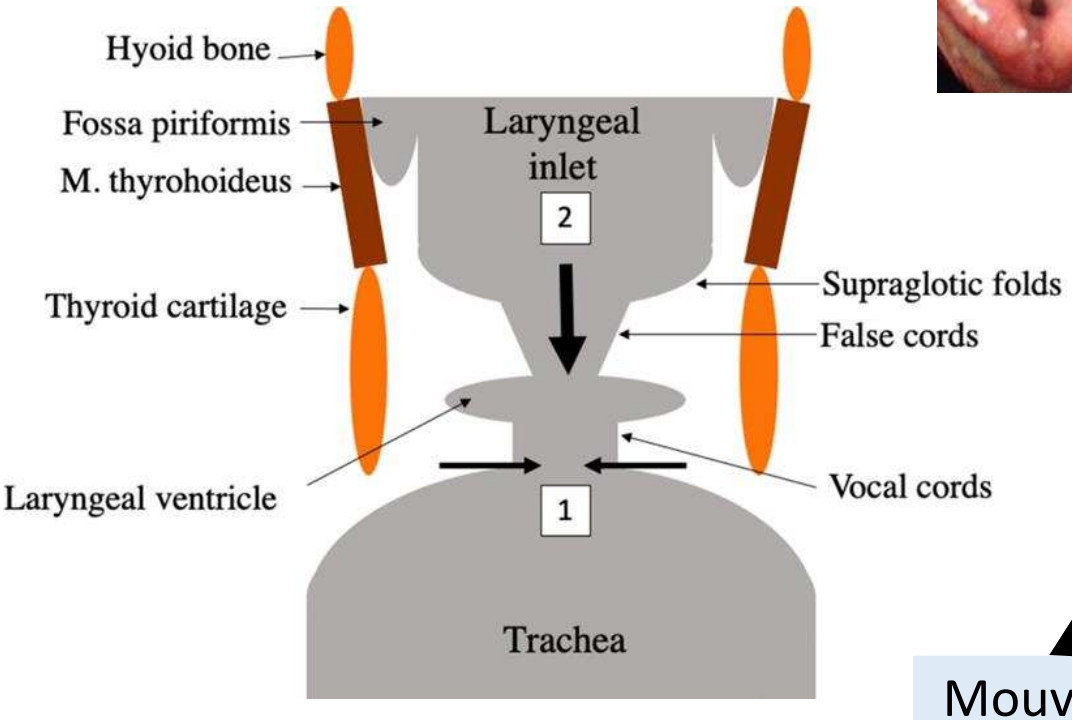








2 – Clapet ou valve à bille



Stridor

Mouvements paradoxaux

Absence capnogramme/mouvement ballon

Erb O et al, 2020; 30:353-61





1 - Obturation



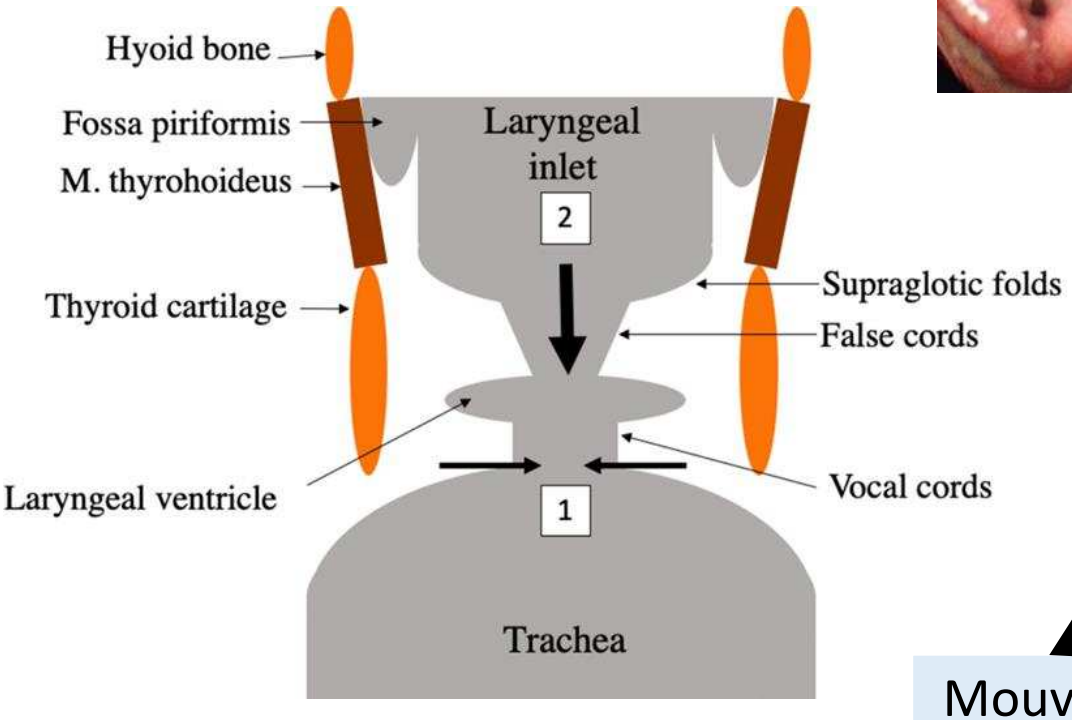








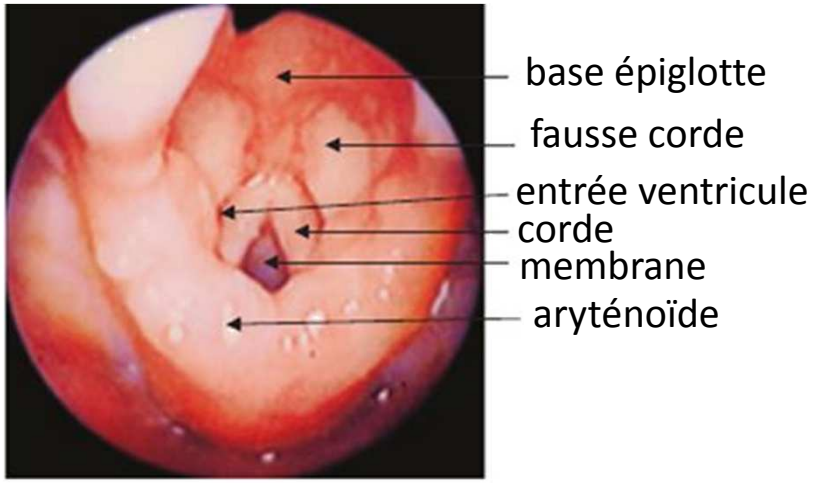
2 – Clapet ou valve à bille

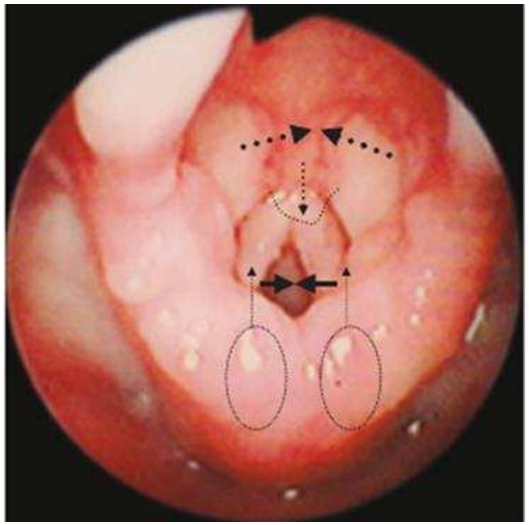


Stridor

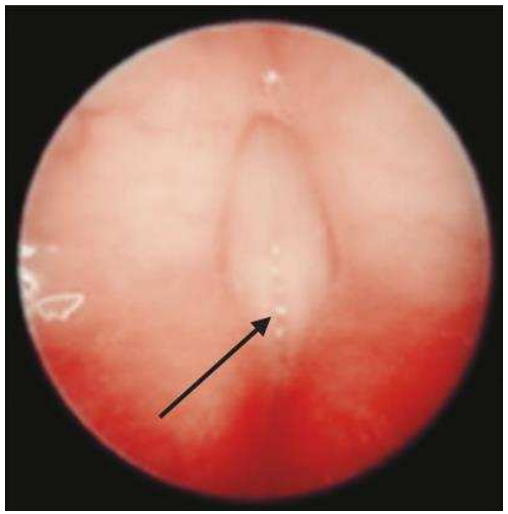
Mouvements paradoxaux

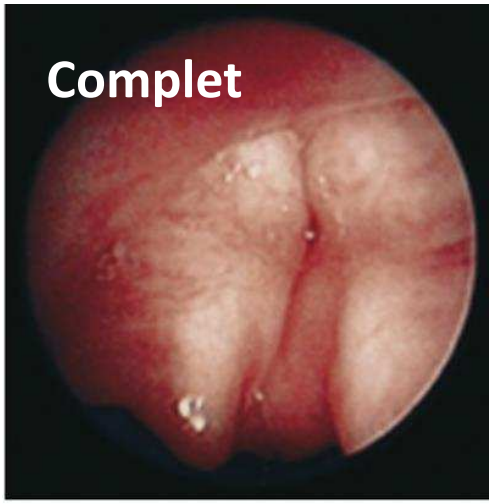
Absence capnogramme/mouvement ballon



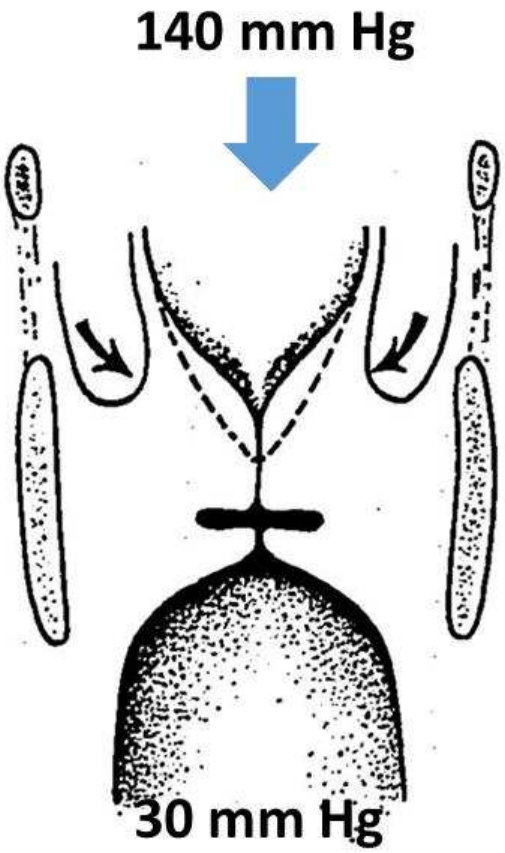


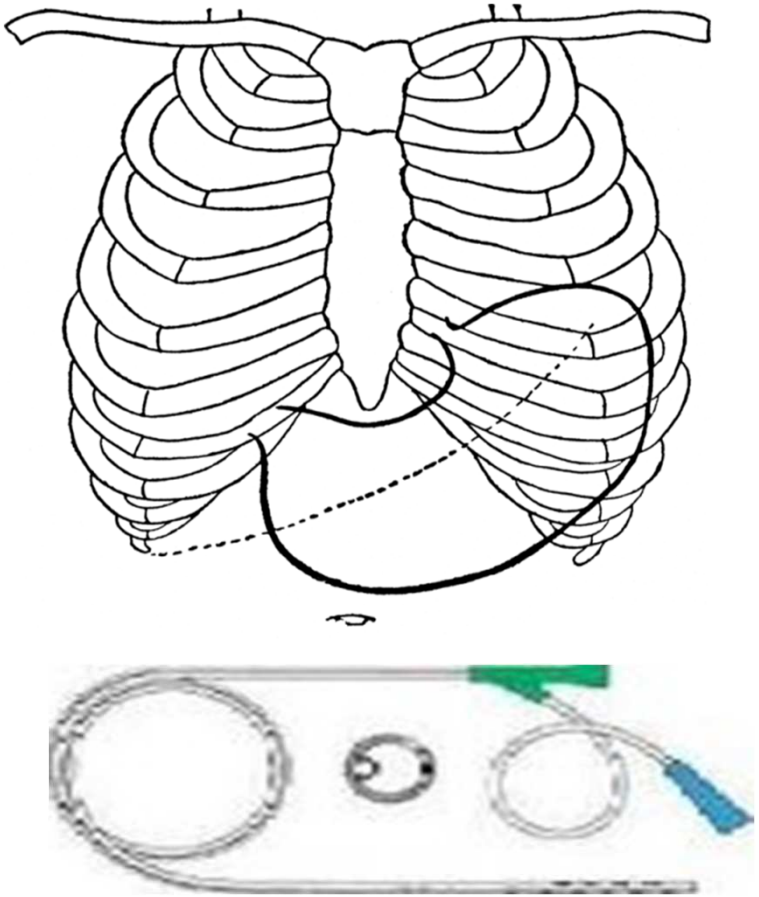






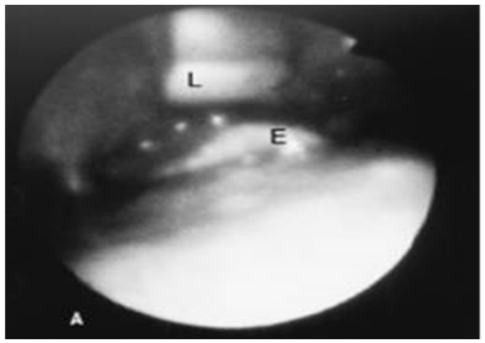
HolzKi J, Ped Anesth 2008; 18: 1144-6

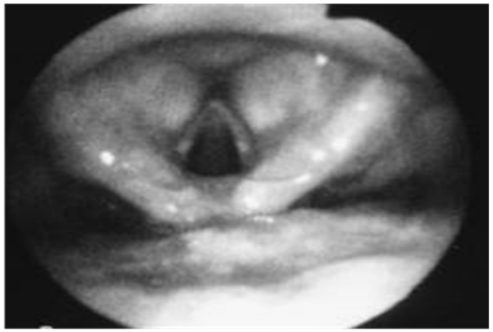




FINK BR. The etiology and treatment of laryngeal spasm. *Anesthesiology*. 1956;17:569-77

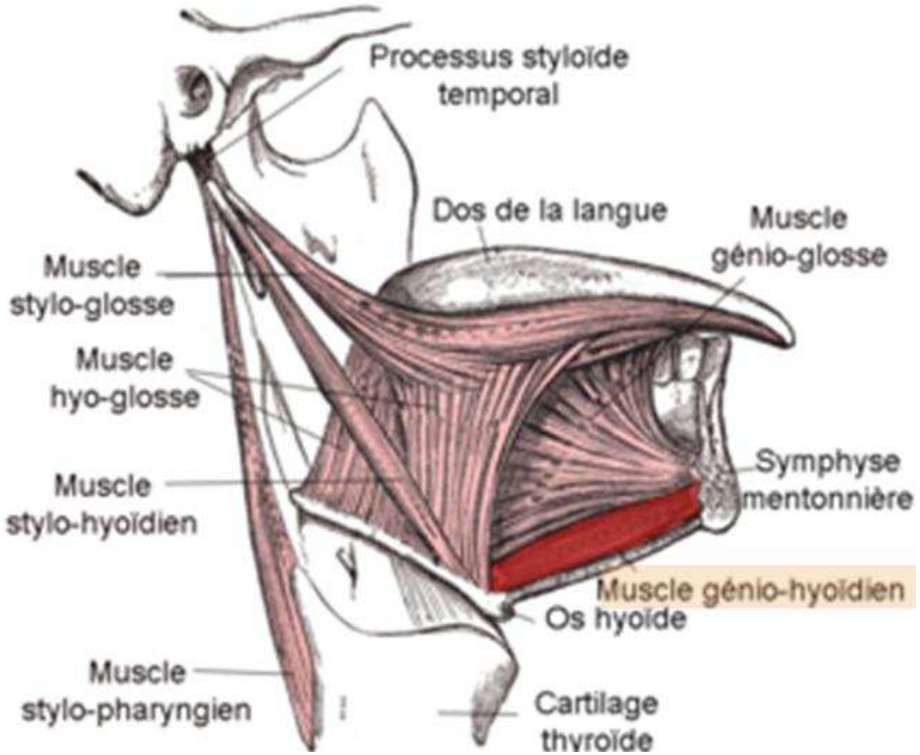


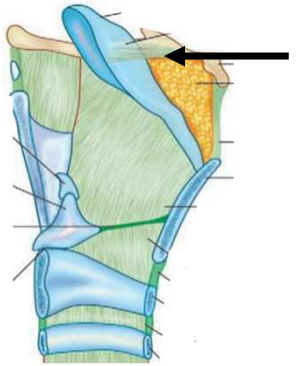




Manœuvre de « Jaw trust »

Heiberg J. A new expedient in administering chloroform. Medical Times and Gazette 1874; 36. 2.





Ligament hyo-épiglottique

Réflexe laryngé : « exploring Terra Incognita »

Warner DO, Anesthesiology 1998; 88: 1434

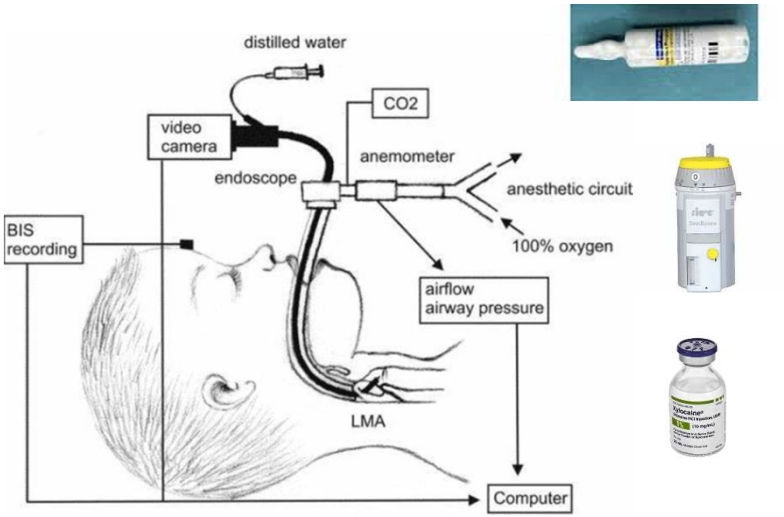
Récepteurs

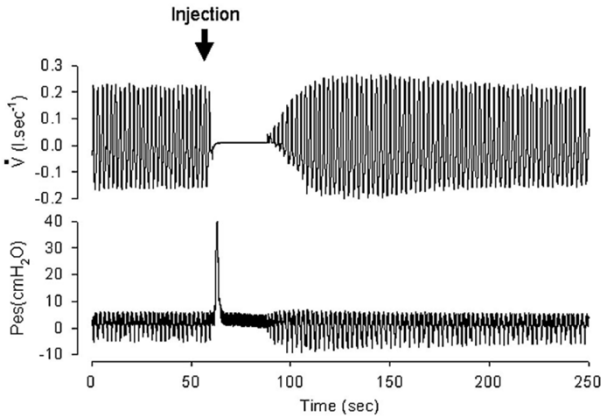
- Muqueux
- Musculaire
- Articulaires

Irritant

Froid
Pression
Mouvement

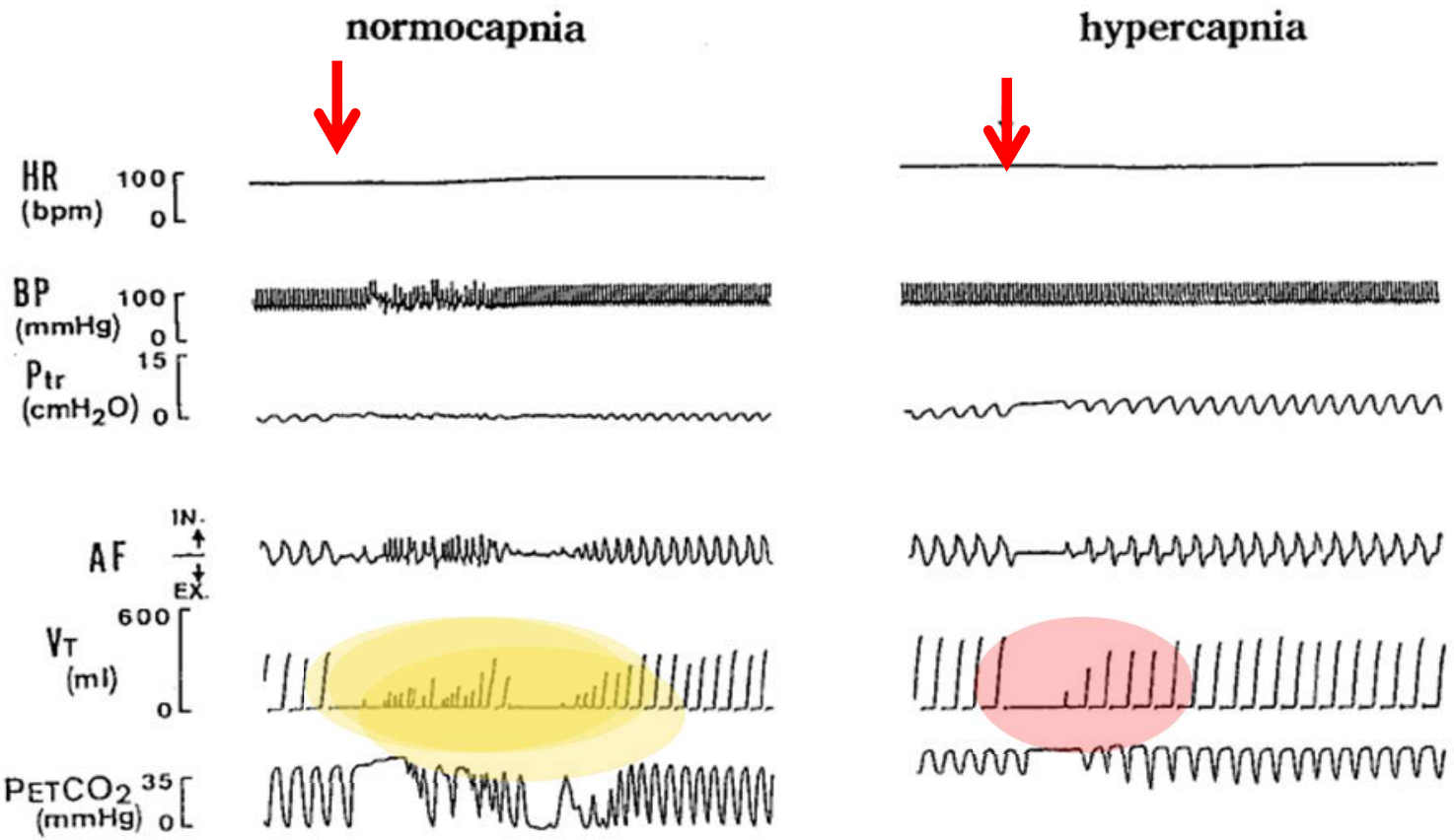
Sécrétion, sang, liquide gastrique
Desflurane
Thiopental
Intubation
Aspiration
Mobilisation
Sonde nasogastrique
Infection des VAS





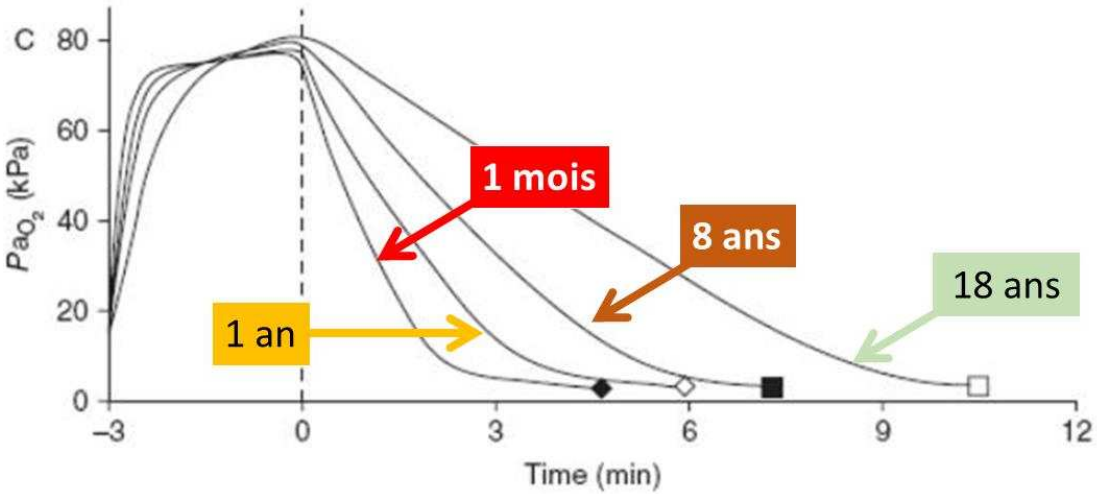
- Tagaito KY et al, Anesthesiology 1998;88: 1459-66
- Oberer C et al, Anesthesiology 2005;103:1142-8
- Erb TO et al, Anaesthesia 2012; 68: 3-20
- Erb TO et al, Pediatric Anesthesia 2017; 27:282-9

Déclenchement laryngospasme

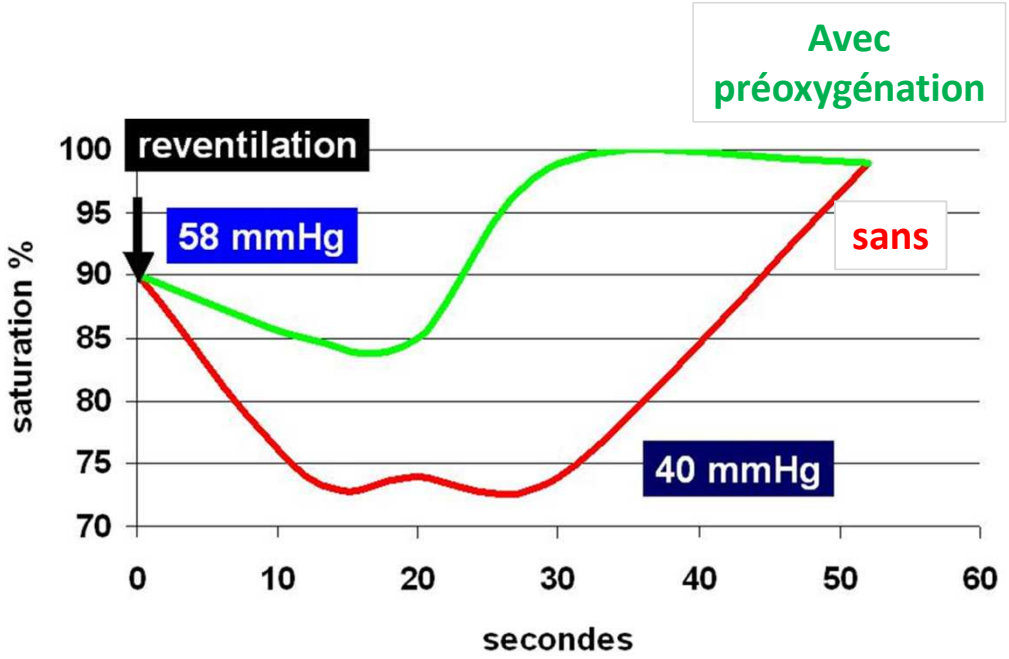


Nishino T, J Appl Physiolg 1989; 66: 2642-6

Désaturation artérielle

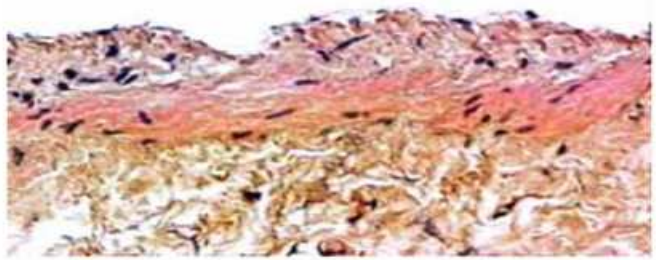


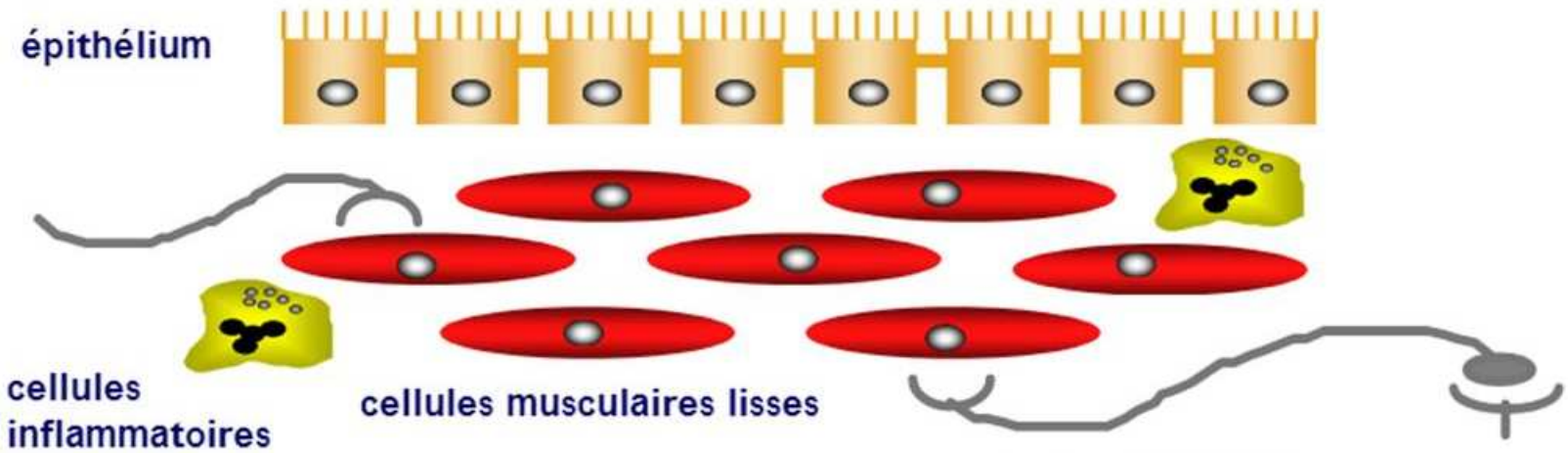
Hardman JG et al, Brit J Anaesth 2006;97:564-70



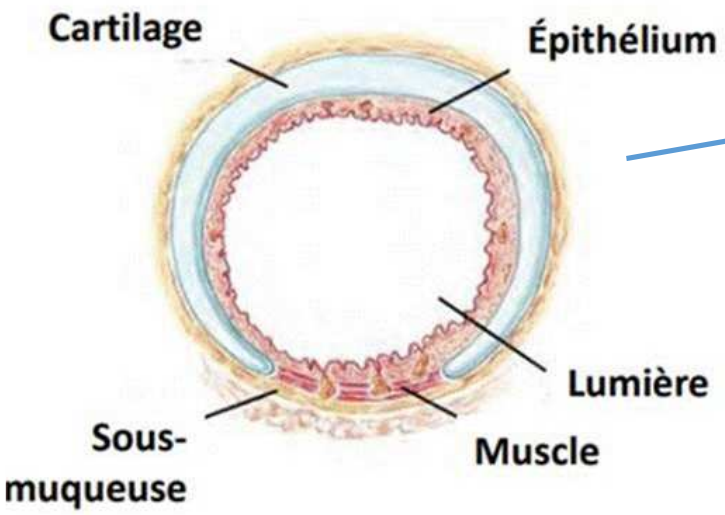
Hue F et al, J Clin Anesth 1995;7: 93 - 96

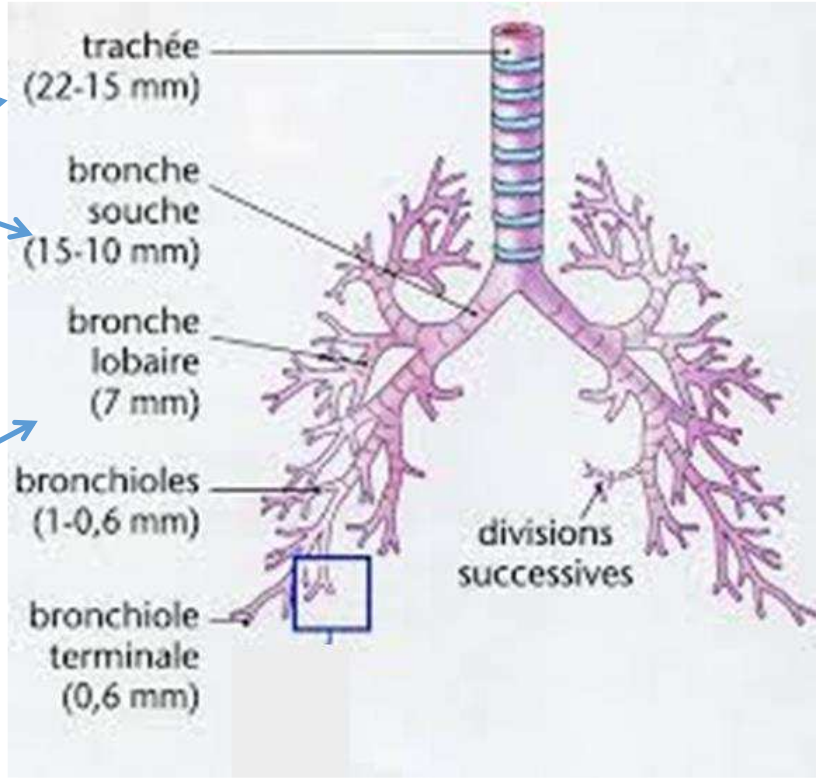
Contrôle de la réactivité bronchique

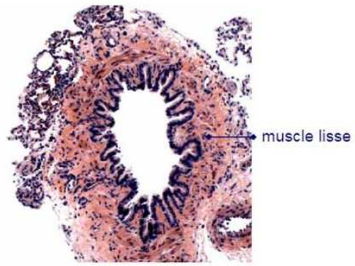




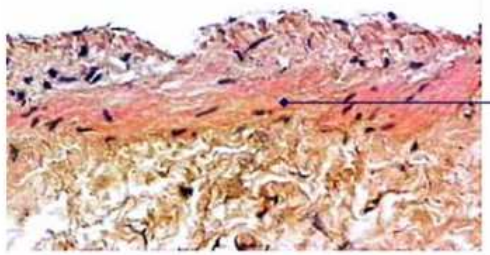
effecteur de la réactivité bronchique :
la cellule musculaire lisse



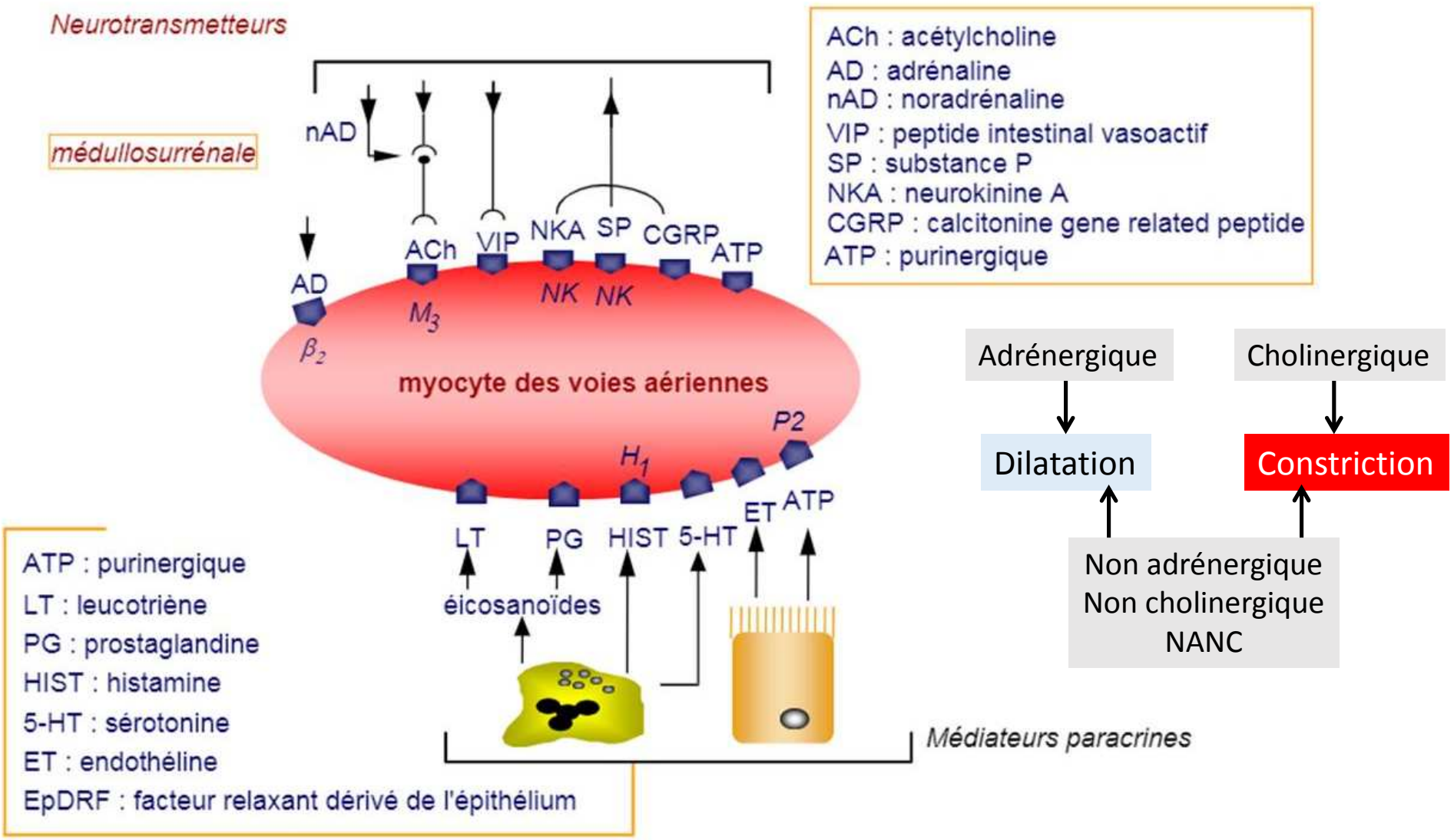




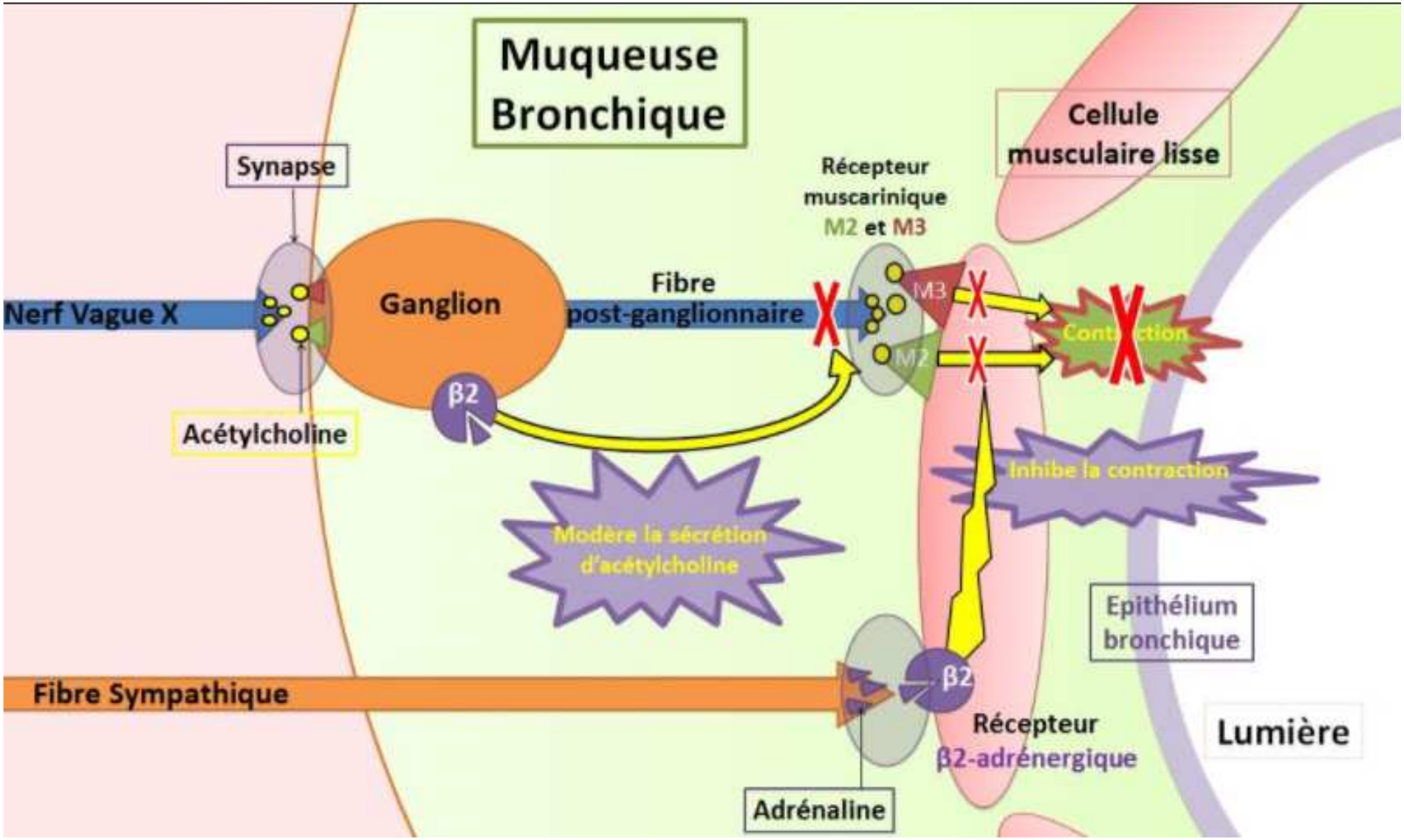


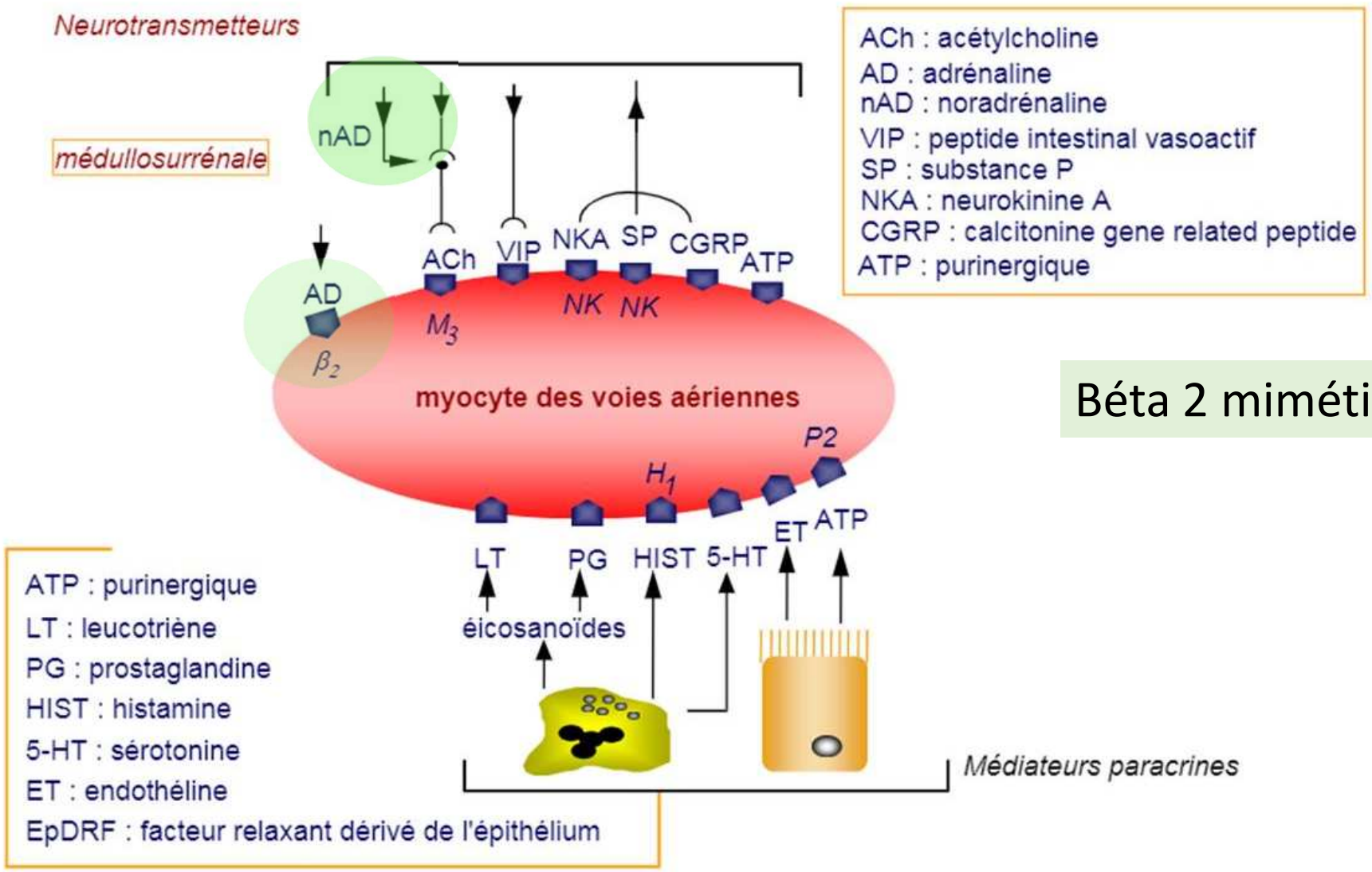


Récepteurs multimodaux
Epithélium bronchique et alvéolaire
Mécanorécepteurs
(muscle lisse bronchique)



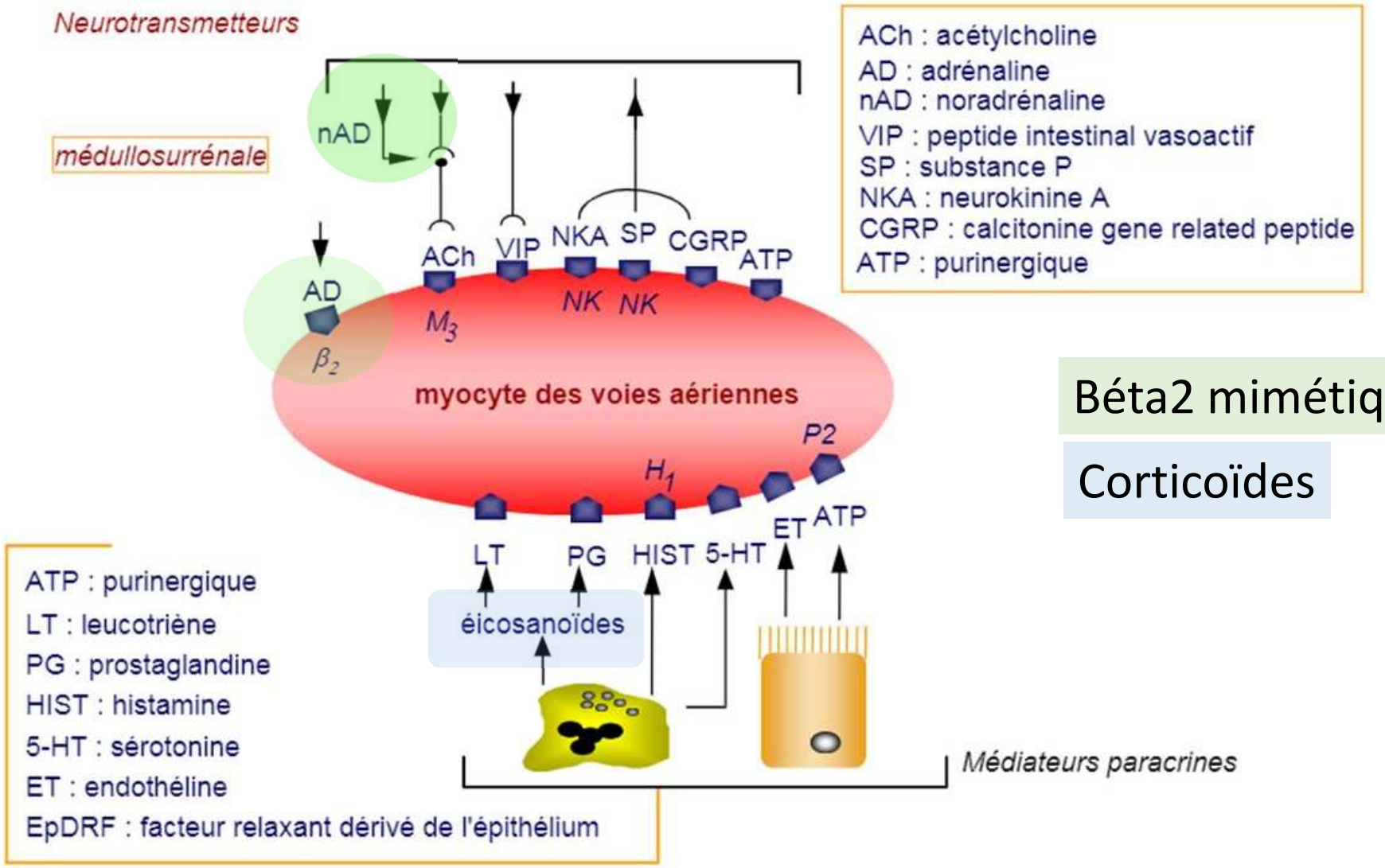
Roux Etienne, Réactivité des voies aériennes, Master 2, Université de Bordeaux


Muqueuse Bronchique
Cellule musculaire lisse
Synapse
Récepteur muscarinique M2 et M3
Nerf Vague X
Ganglion
Fibre post-ganglionnaire
M3
M2
β2
Acétylcholine
Modère la sécrétion d'acétylcholine
Inhibe la contraction
Epithélium bronchique
Fibre Sympathique
β2
Récepteur β2-adrénergique
Lumière
Adrénaline



Béta 2 mimétiques

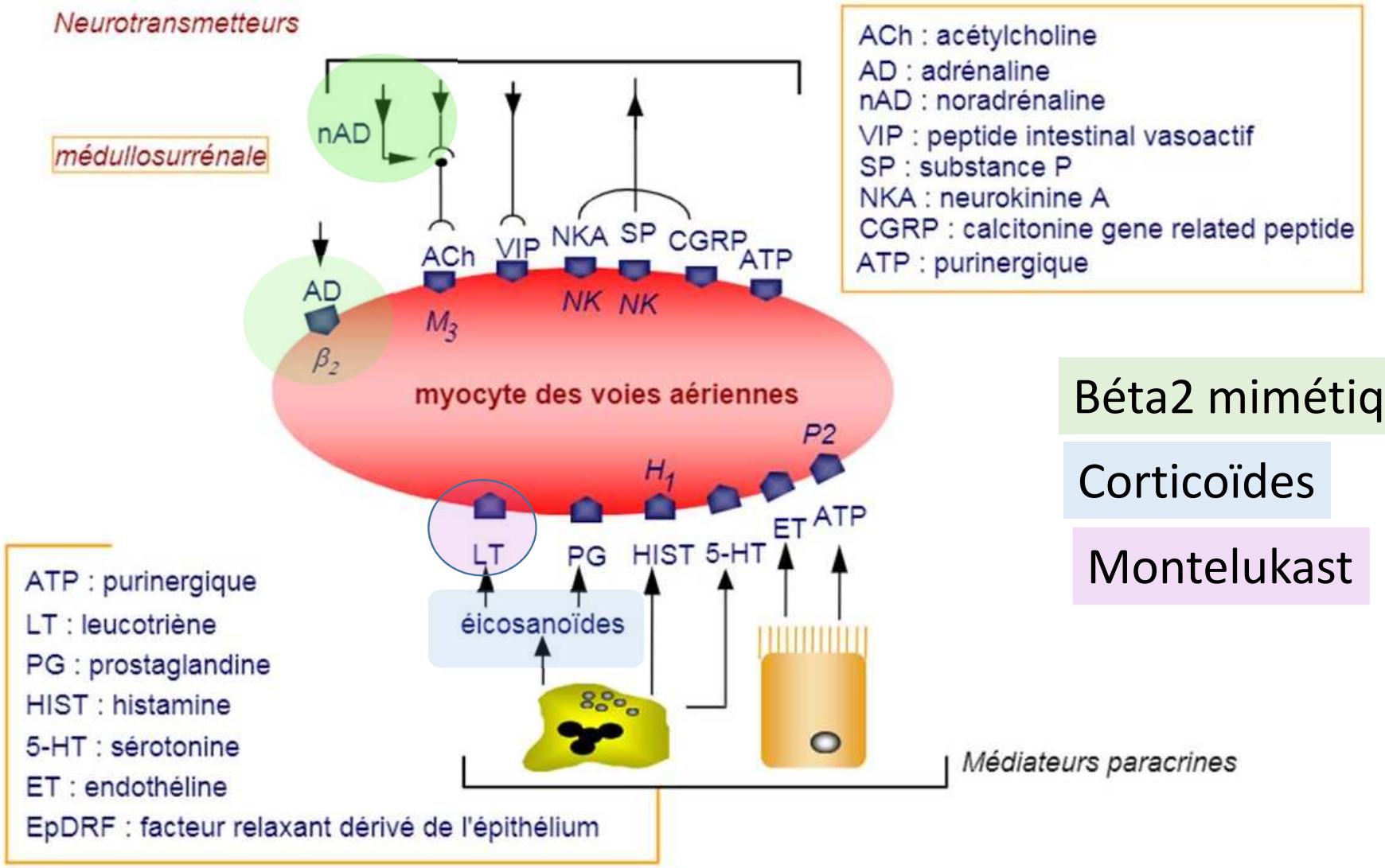
Roux Etienne, Réactivité des voies aériennes, Master 2, Université de Bordeaux



Béta2 mimétiques

Corticoïdes

Roux Etienne, Réactivité des voies aériennes, Master 2, Université de Bordeaux

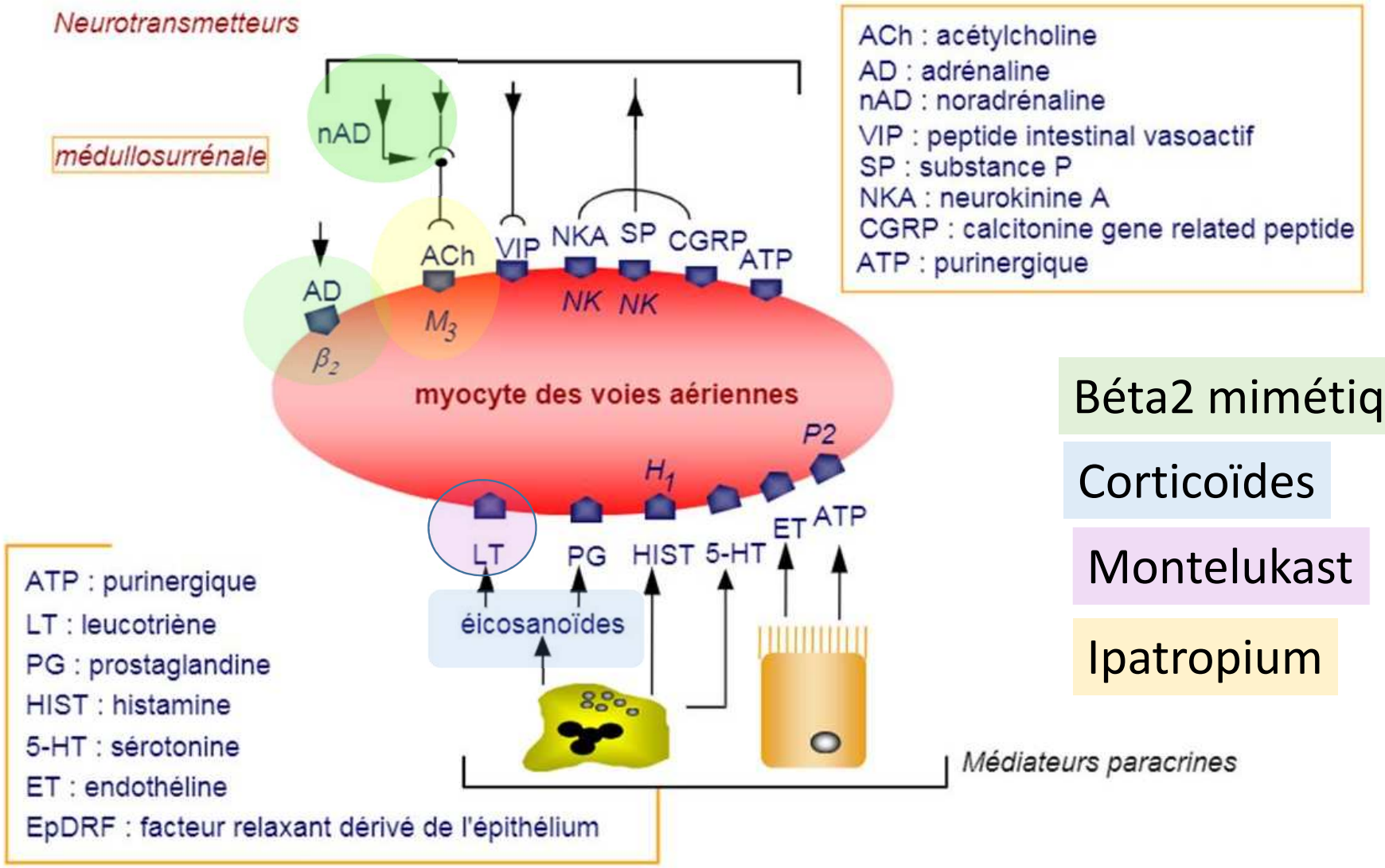


Béta2 mimétiques

Corticoïdes

Montelukast

Roux Etienne, Réactivité des voies aériennes, Master 2, Université de Bordeaux



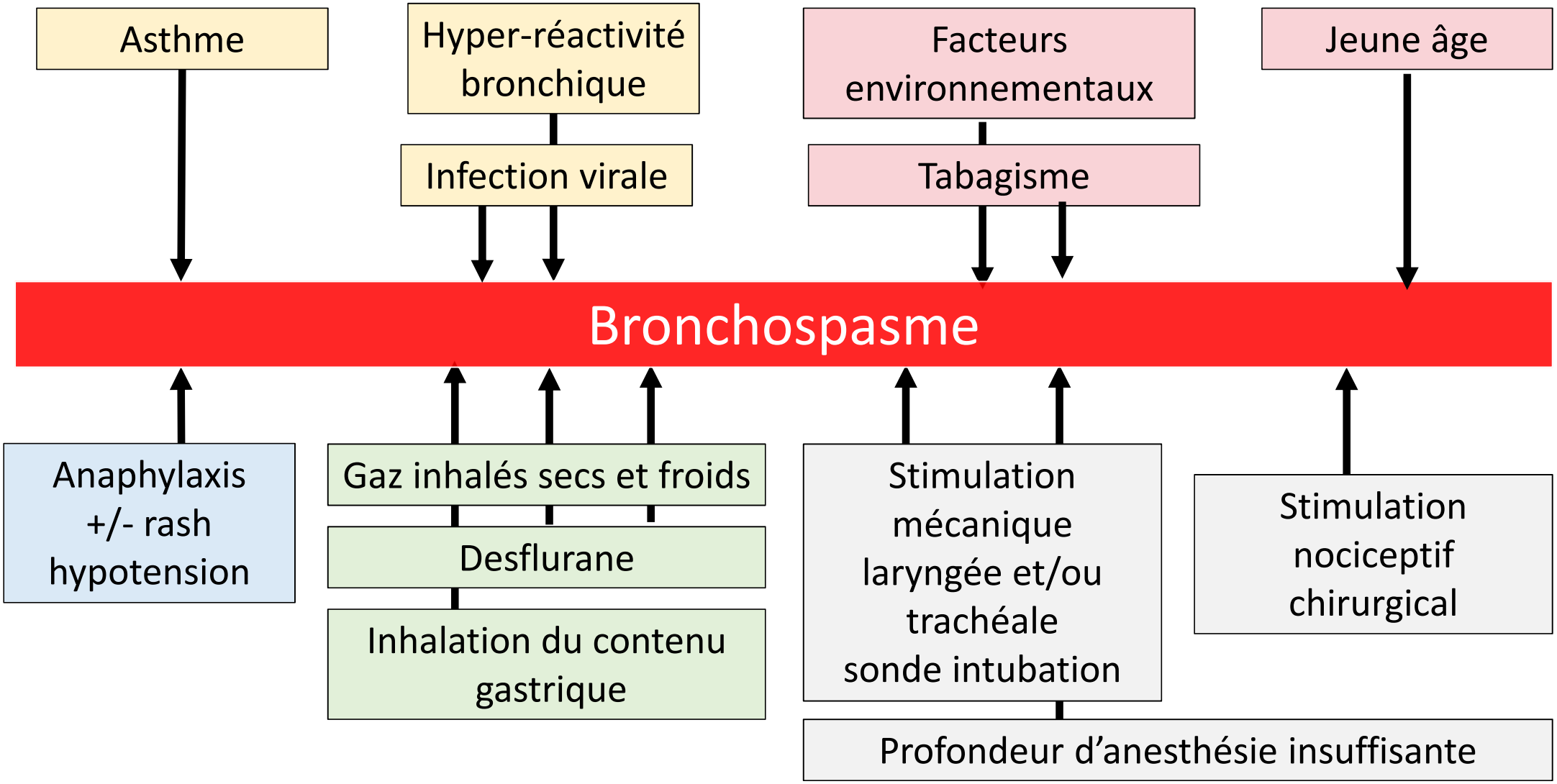
Béta2 mimétiques

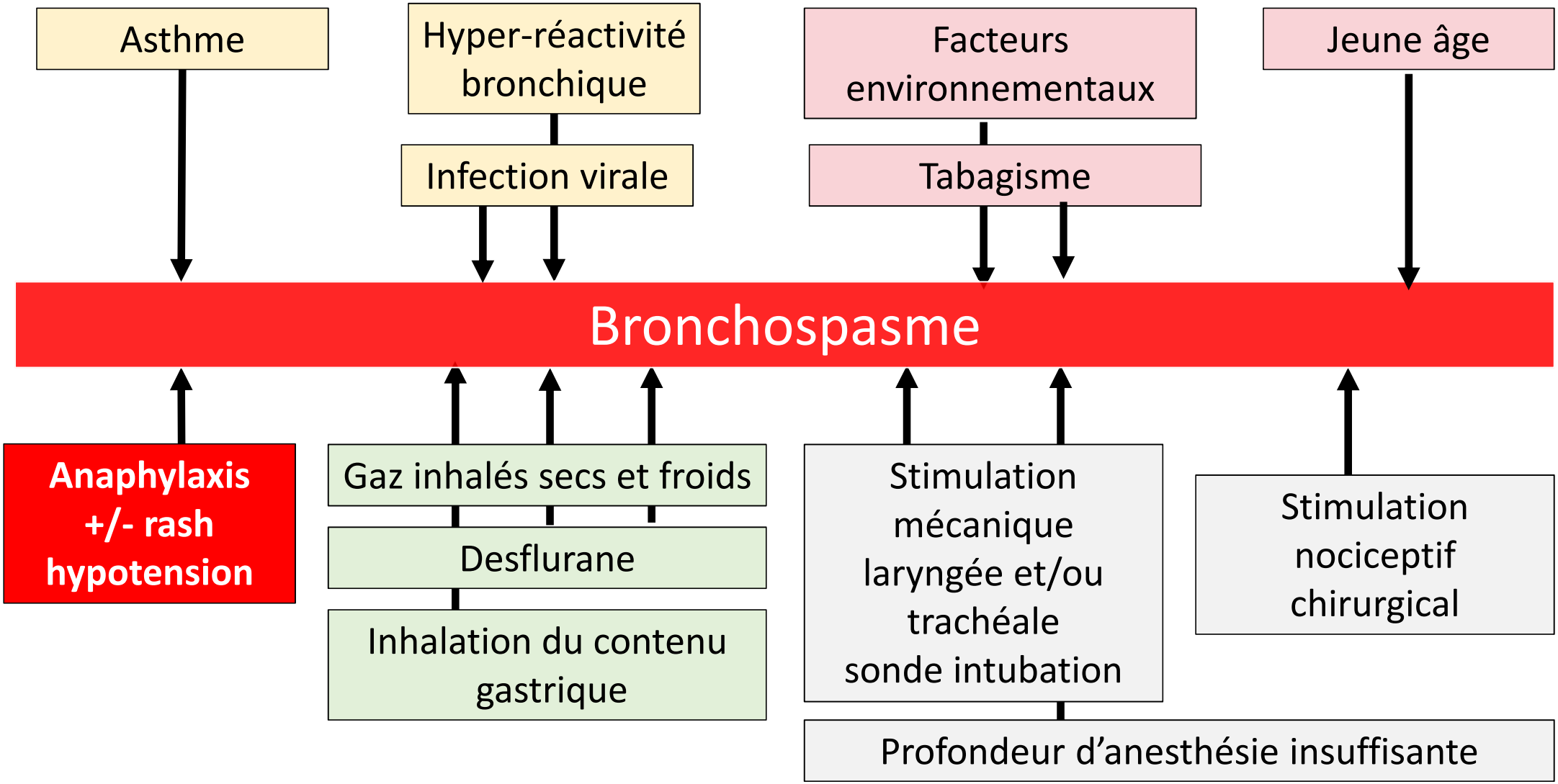
Corticoïdes

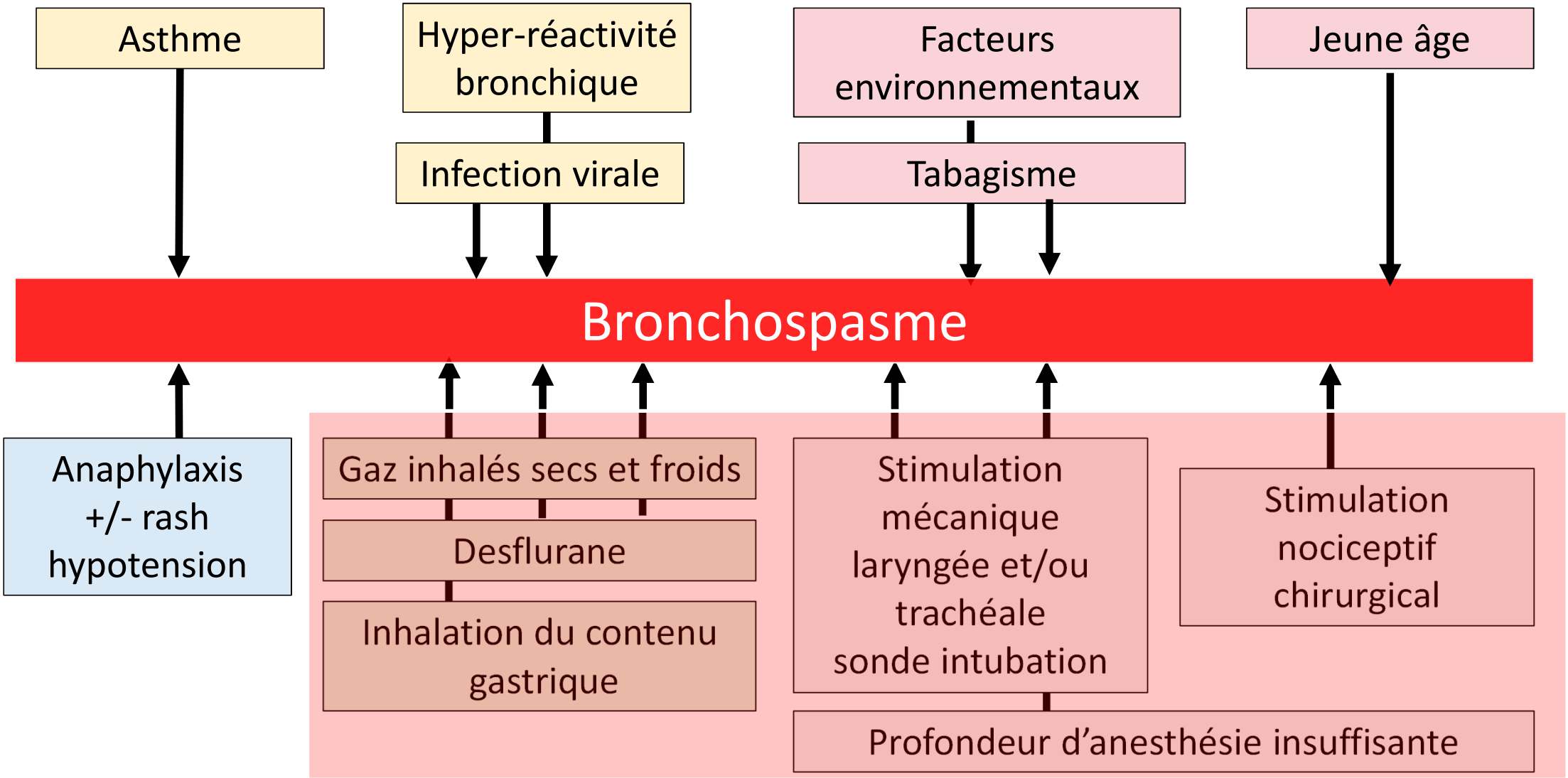
Montelukast

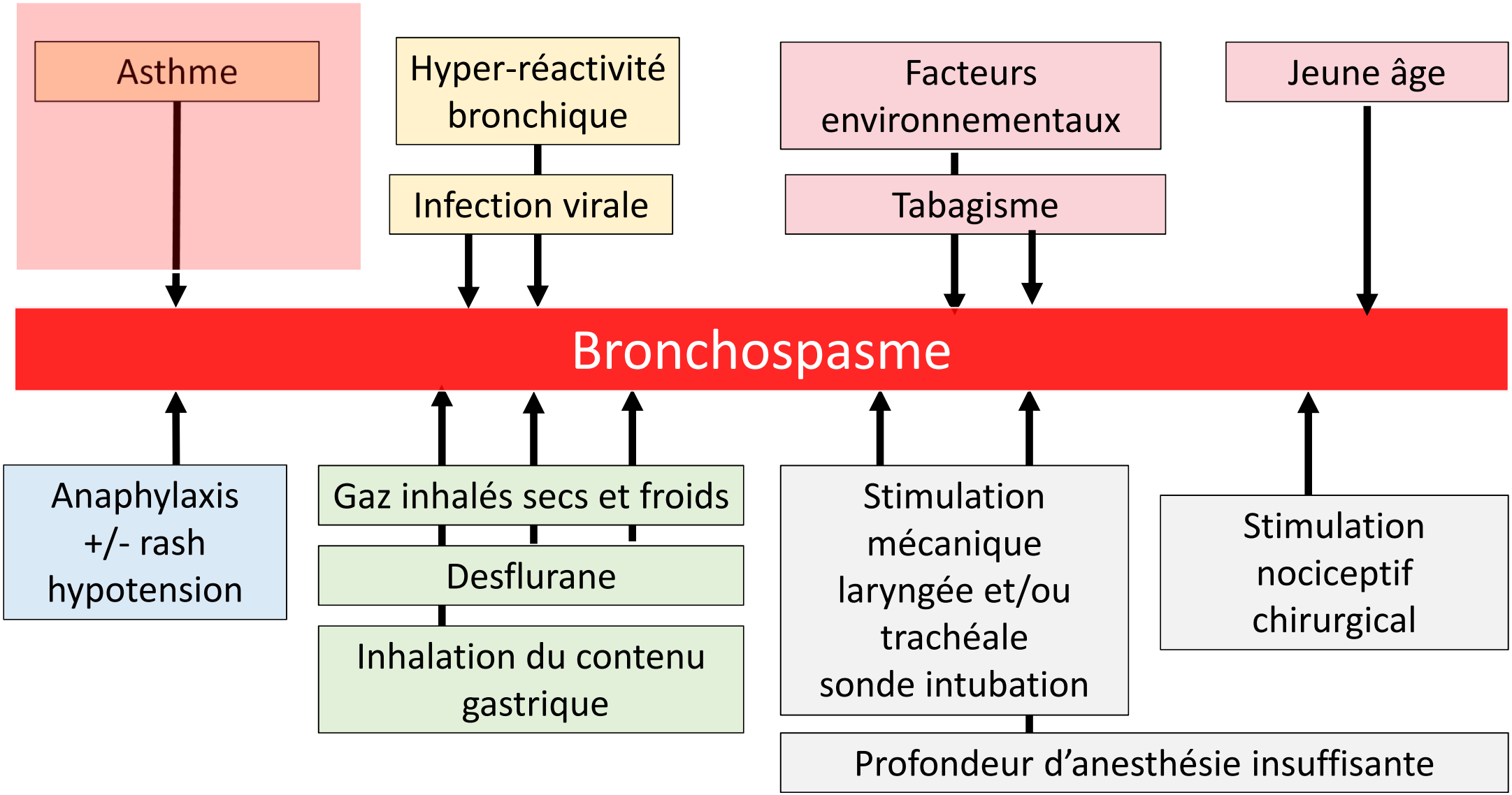
Ipatropium

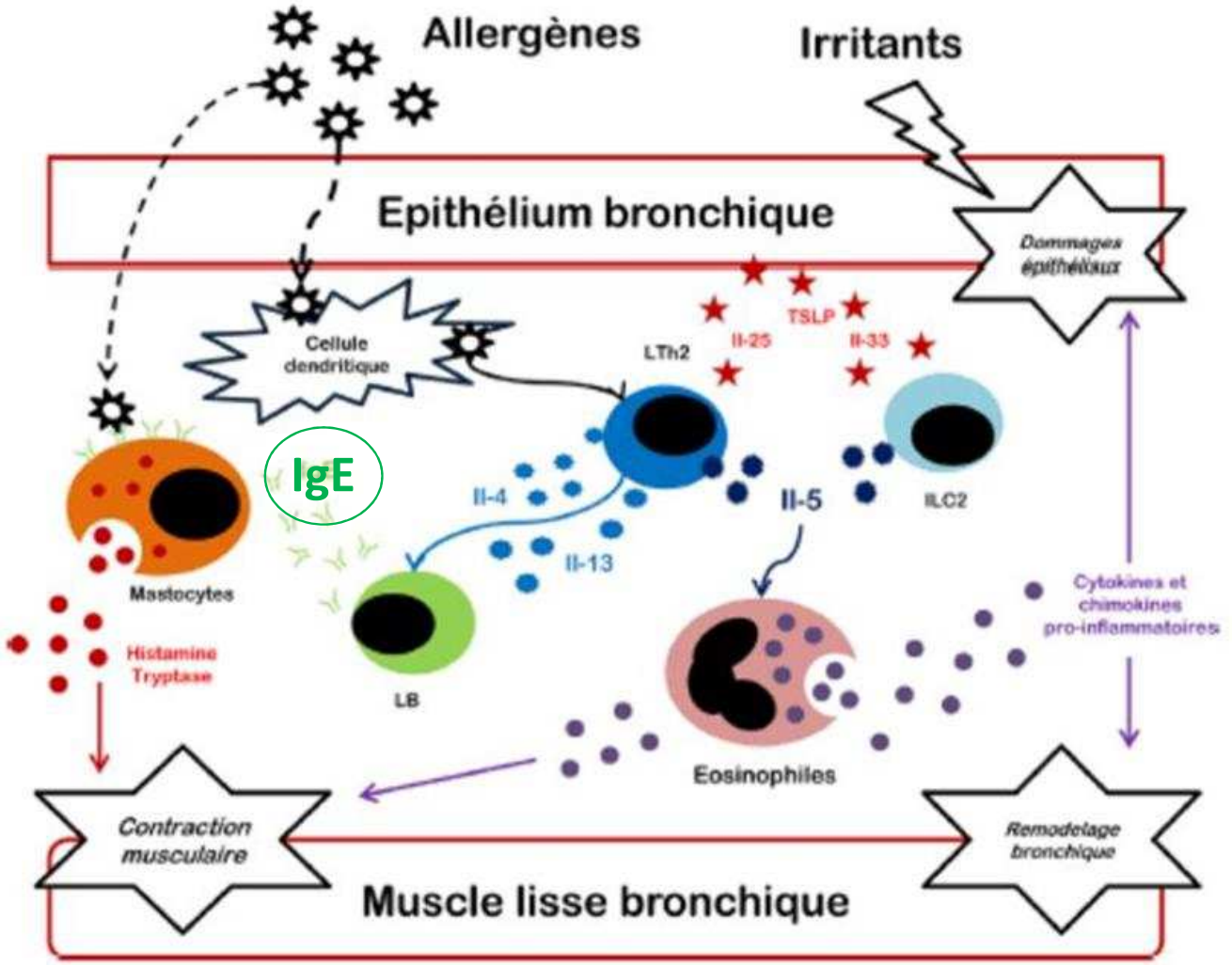
Roux Etienne, Réactivité des voies aériennes, Master 2, Université de Bordeaux


Asthme
Hyper-réactivité bronchique
Infection virale
Facteurs environnementaux
Tabagisme
Jeune âge
Bronchospasme
Anaphylaxis +/- rash hypotension
Gaz inhalés secs et froids
Desflurane
Inhalation du contenu gastrique
Stimulation mécanique laryngée et/ou trachéale sonde intubation
Profondeur d'anesthésie insuffisante
Stimulation nociceptif chirurgical

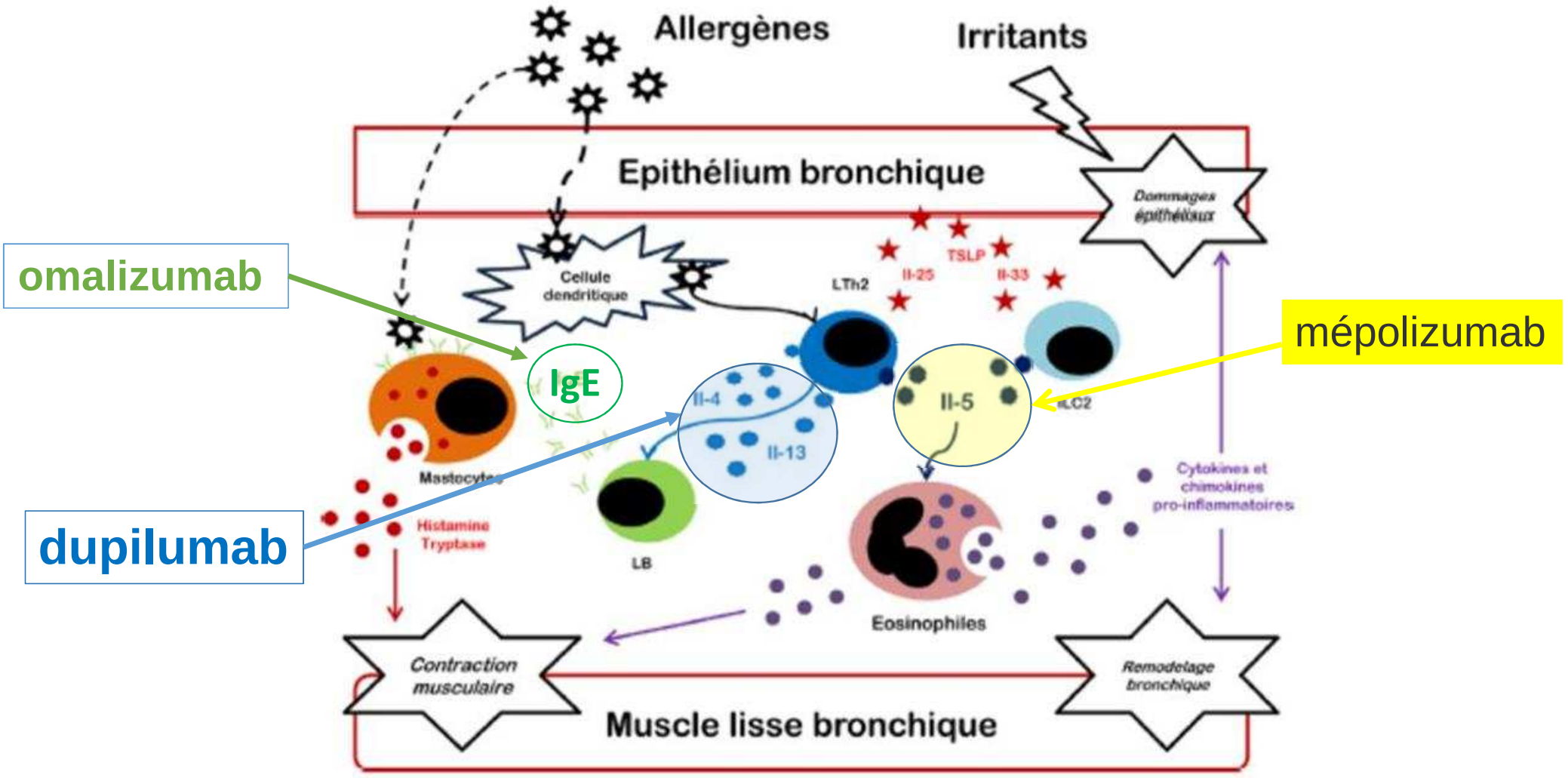

Asthme
Hyper-réactivité bronchique
Infection virale
Facteurs environnementaux
Tabagisme
Jeune âge
Bronchospasme
Anaphylaxis +/- rash hypotension
Gaz inhalés secs et froids
Desflurane
Inhalation du contenu gastrique
Stimulation mécanique laryngée et/ou trachéale sonde intubation
Profondeur d'anesthésie insuffisante
Stimulation nociceptif chirurgical


Asthme
Hyper-réactivité bronchique
Infection virale
Facteurs environnementaux
Tabagisme
Jeune âge
Bronchospasme
Anaphylaxis +/- rash hypotension
Gaz inhalés secs et froids
Desflurane
Inhalation du contenu gastrique
Stimulation mécanique laryngée et/ou trachéale sonde intubation
Stimulation nociceptif chirurgical
Profondeur d'anesthésie insuffisante

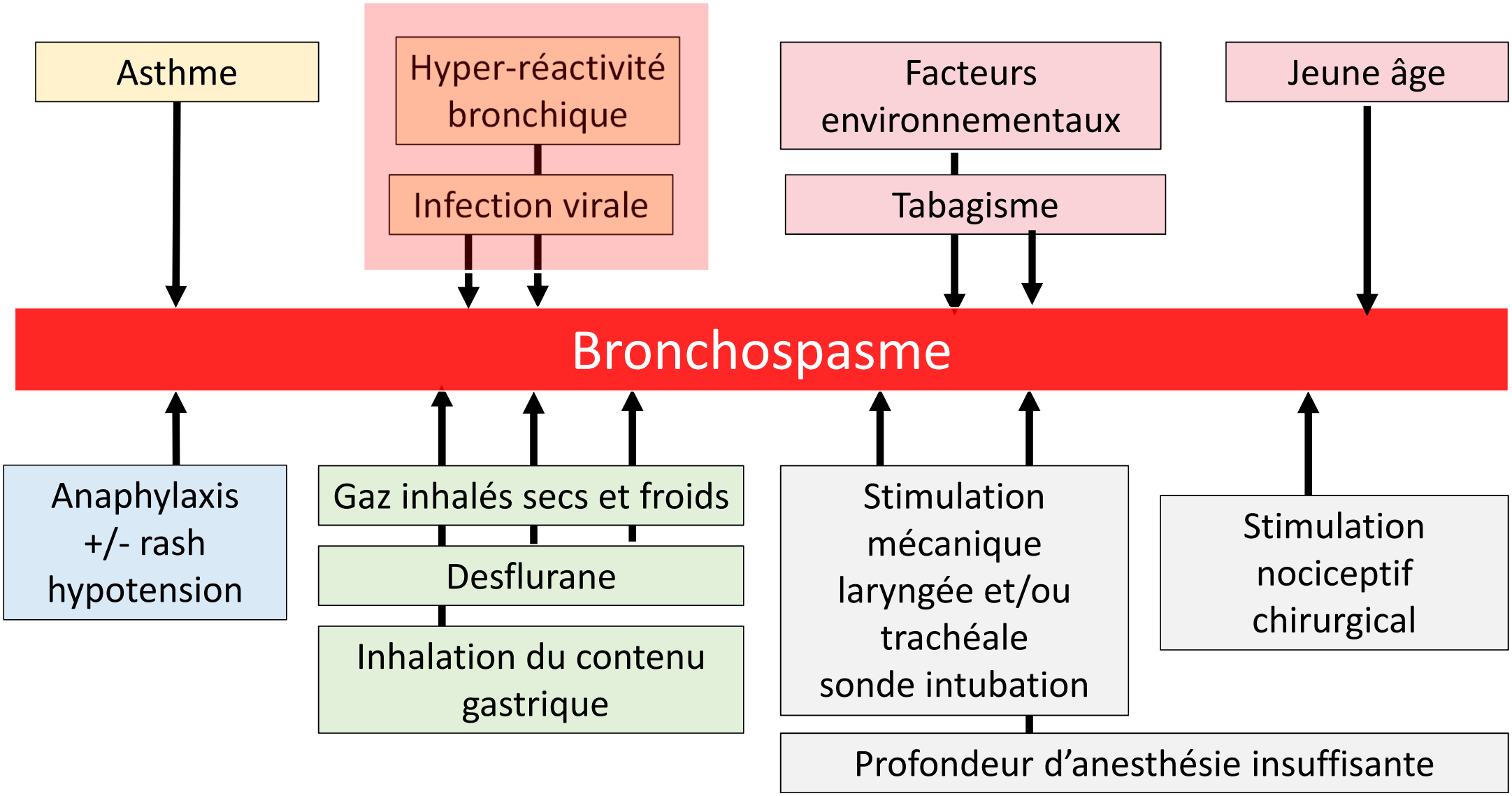

Asthme
Hyper-réactivité bronchique
Infection virale
Facteurs environnementaux
Tabagisme
Jeune âge
Bronchospasme
Anaphylaxis +/- rash hypotension
Gaz inhalés secs et froids
Desflurane
Inhalation du contenu gastrique
Stimulation mécanique laryngée et/ou trachéale sonde intubation
Profondeur d'anesthésie insuffisante
Stimulation nociceptif chirurgical

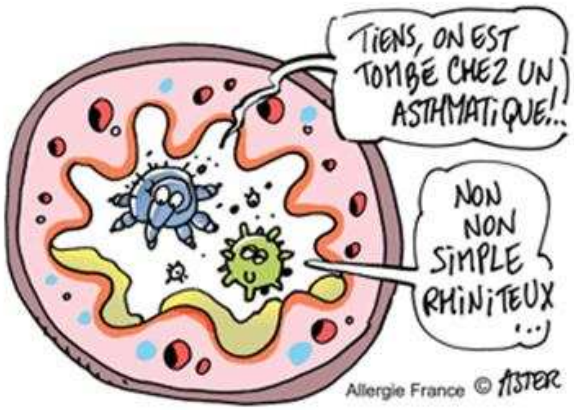


Hassoun D, Rev Med Interne 2019



Hassoun D, Rev Med Interne 2019


Asthme
Hyper-réactivité bronchique
Infection virale
Facteurs environnementaux
Tabagisme
Jeune âge
Bronchospasme
Anaphylaxis +/- rash hypotension
Gaz inhalés secs et froids
Desflurane
Inhalation du contenu gastrique
Stimulation mécanique laryngée et/ou trachéale sonde intubation
Profondeur d'anesthésie insuffisante
Stimulation nociceptif chirurgical



Infection virale

Muqueuse

trachéo-bronchique ← pharyngo-laryngée ← nasale

Desquamation épithélium
Exposition récepteurs cholinergiques
Libération cytokines, histamine, prostaglandines
Potentialisation de la réponse à la stimulation vagale

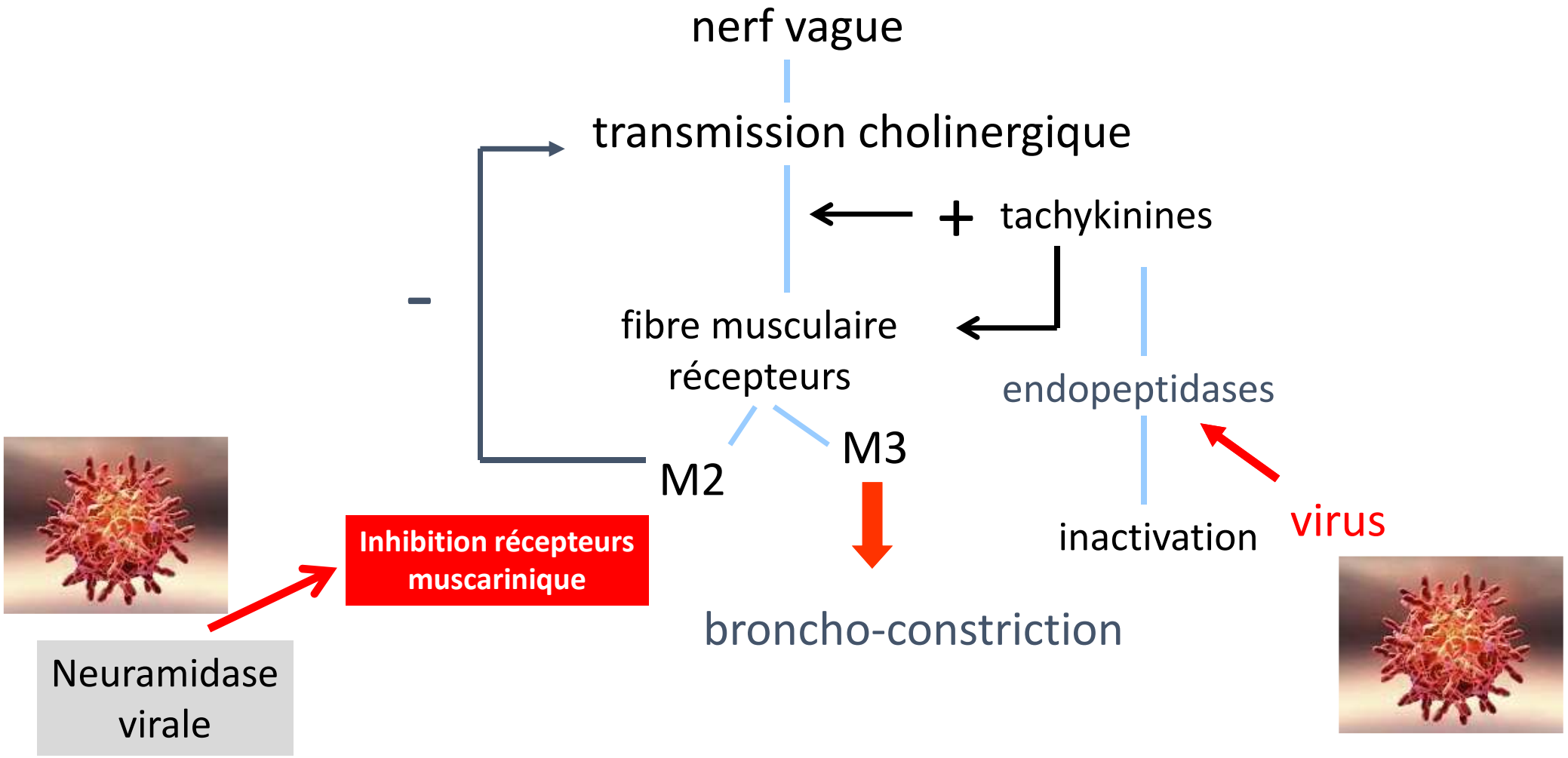
Réaction inflammatoire
Œdème
Secrétion mucus

Hyper-réactivité bronchique
Prolongée +++

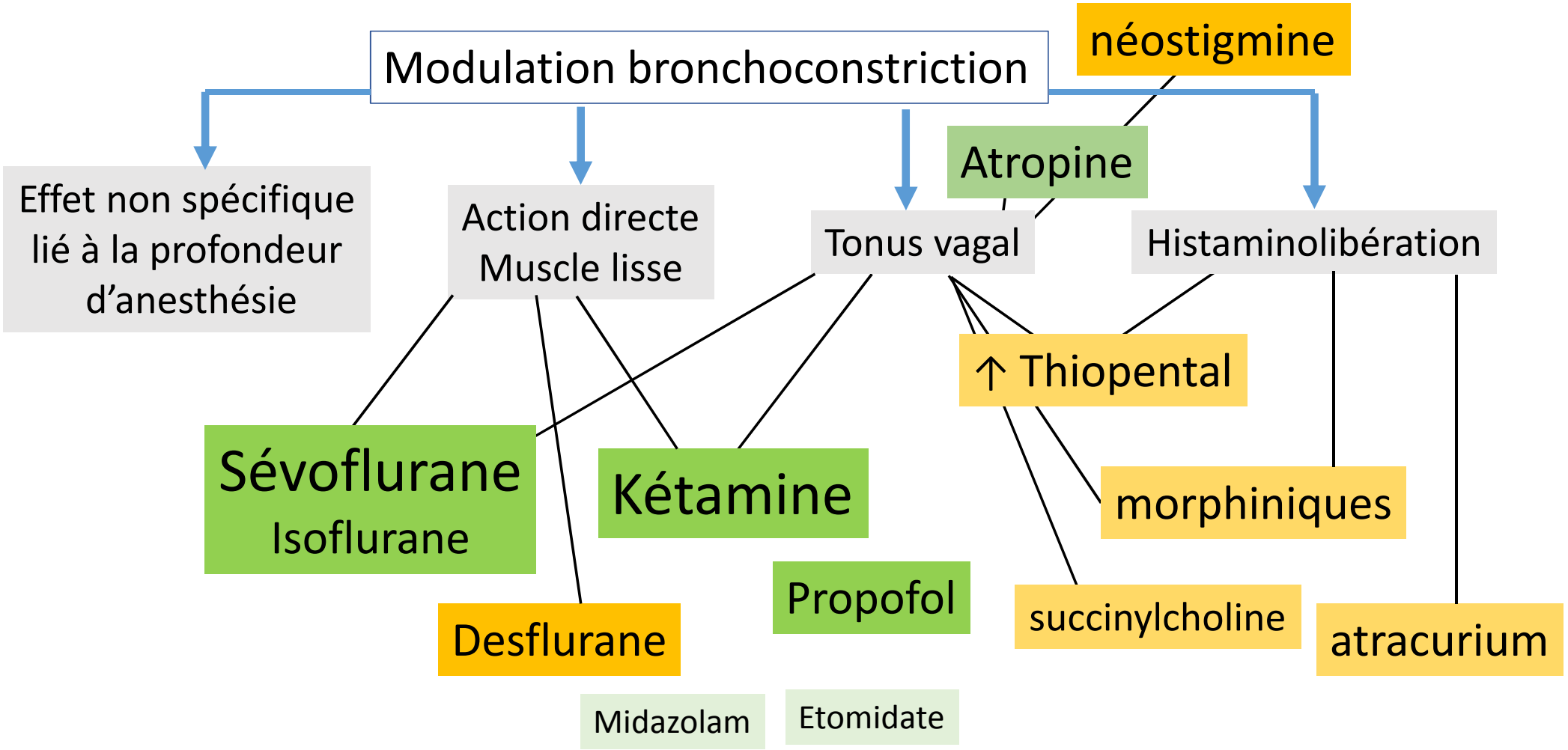
Mécanisme enzymatique

Nardi N, Wodey E, Le Praticien Anesthésie Réanimation 2019;23: 319-29

Potentialisation virale enzymatique



Agents anesthésiques



39e CONGRÈS ANNUEL DE L'ADARPEF

Association des Anesthésistes Réanimateurs Pédiatriques d'Expression Française





Report des dates

INFORMATIONS & INSCRIPTIONS SUR
www.e-adarpef.fr

25 & 26
MARS 2022
MONTPELLIER
Le Corum







Photos : OT Montpellier - Marc Ginot • Fotolia.