BELGISCHE VERENIGING - GROUPEMENT BELGE DE NEONATOLOGIE

Neonatal seizures : still a challenging exercise

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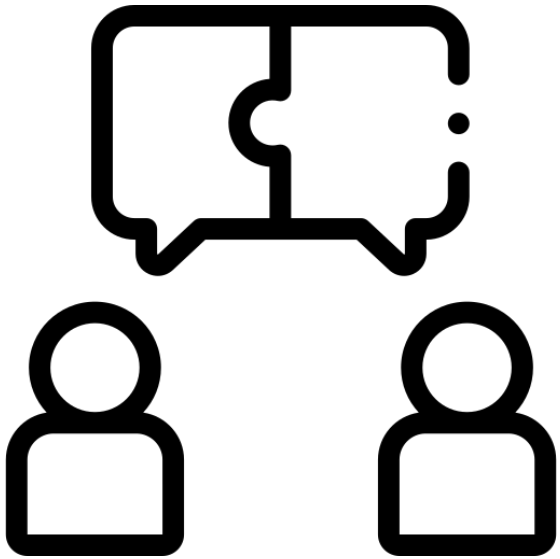
GRAND HOPITAL DE CHARLEROI

UCLouvain



« L'union fait la force »

« Eendracht maakt macht »

« Unity makes strength »

wooclap

1 Allez sur wooclap.com

2 Entrez le code d'événement dans le bandeau supérieur

Code d'événement

GBNBVN

What would you like to know ?

HISTORY

CLINICAL EXAMINATION

Clinical presentation

History

- ❑ No particular event related to birth
- ❑ No temperature, no infectious context
- ❑ **Multiple episodes per hour** for the past 16 hours →
  - loss of consciousness
  - clonic asymmetric movements
  - lasting from 15 to 30 seconds each
- ❑ Difficulty gaining **weight** but no feeding issues

Clinical examination

- ❑ Axial and peripheral **hypotonia**
- ❑ Palor, hypersialorrhea
- ❑ Light and unknown **systolic murmur**
- ❑ Suspected **clitoral hypertrophy**

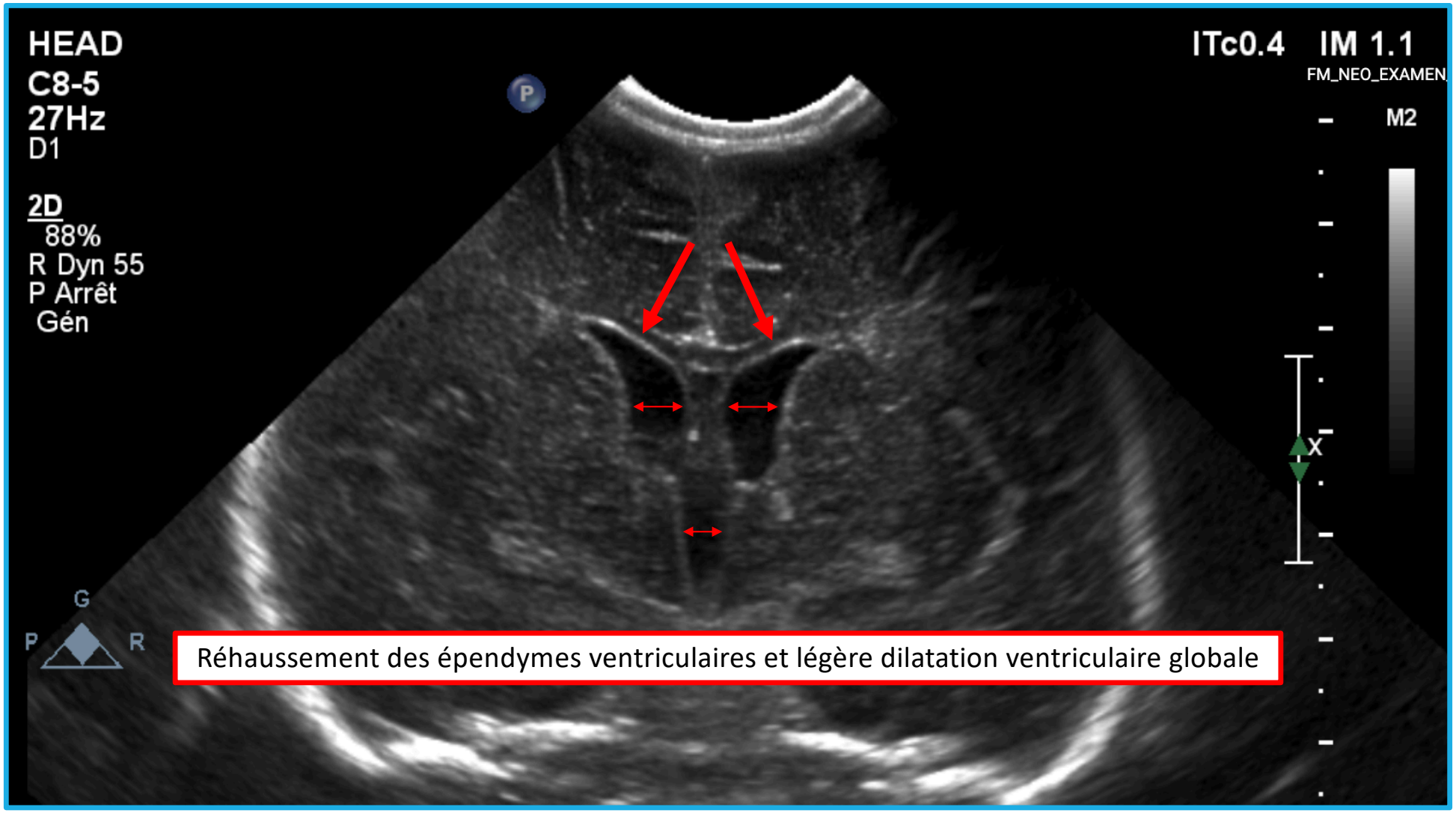
pH : 7.41
pCO2 : 48.0 mm Hg
pO2 : 73.8 mm Hg
Sat. O2 (mesurée) : 96.9 %
Bicarbonate : 30.0 mmol / L
Excès de base : 4.6 mmol / L
Hémoglobine : 11.9 g / dL
Carboxyhémoglobine : 0.2 %
Méthémoglobine : 0.6 %
Sodium : 114 mmol / L
Potassium : 4.1 mmol / L
Chlore : 82 mmol / L
Ca ionisé : 1.27 mmol / L
Glycémie : 209 mg / dL
Acide lactique : 1.81 mmol / L
Bilirubine : <2,0 mg / dL

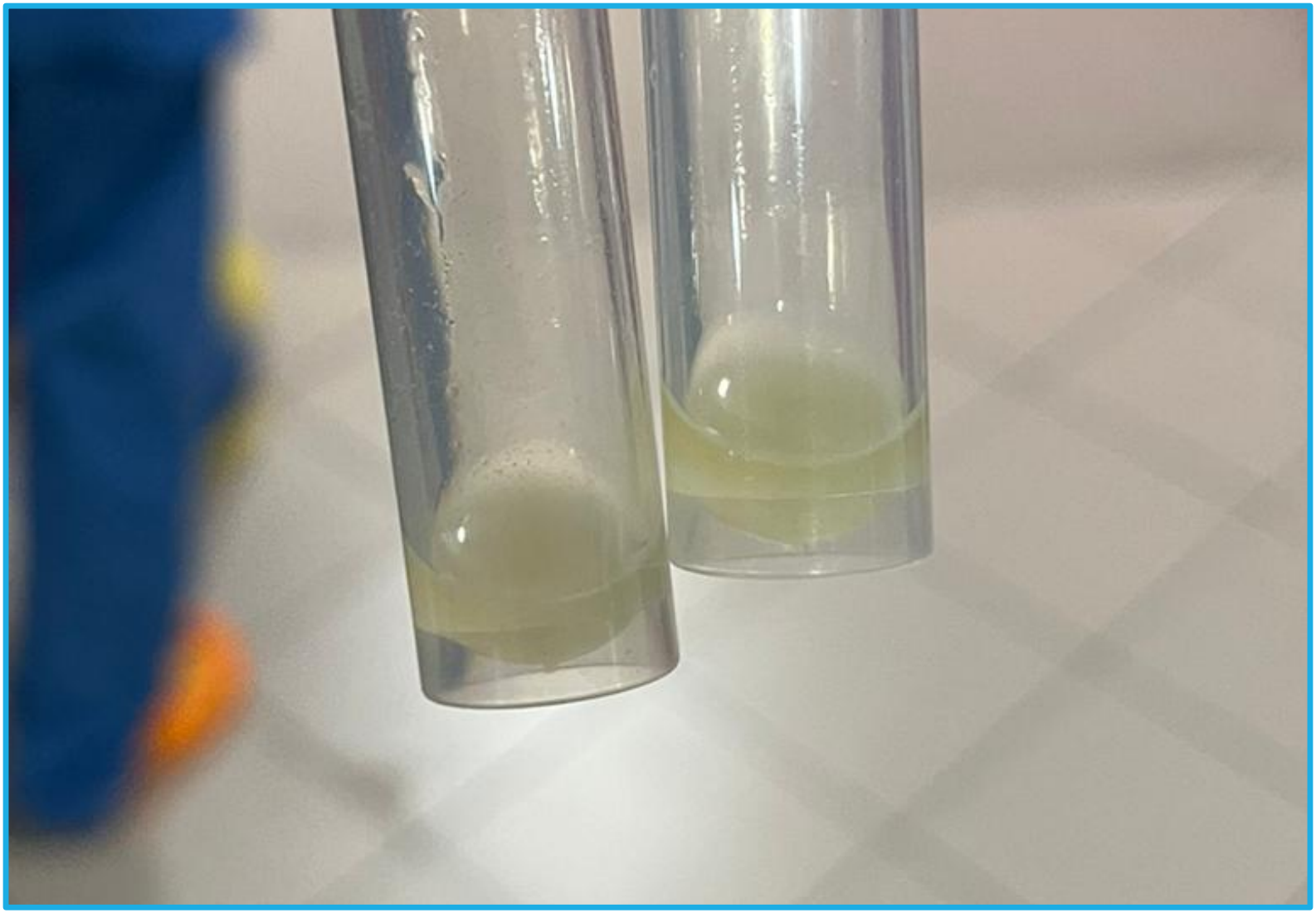
What do you think ?

Diagnostic hypotheses

- Neurological infection
- Epilepsy or equivalent
- Metabolic aetiology
- Dehydration and hyponatremia
- Adrenal insufficiency
- Traumatic mechanism
- Medications
- …

What would you like to do ?


HEAD
C8-5
27Hz
D1
2D
88%
R Dyn 55
P Arrêt
Gén
ITc0.4
IM 1.1
FM_NEO_EXAMEN
M2
G
P
R
Réhaussement des épendymes ventriculaires et légère dilatation ventriculaire globale



HEMATOLOGIE

CRP	+	133.0	mg / L
Hémoglobine		14.0	g / dL
		Nouvelle méthode de dosage à partir du 25/(	
Hématocrite		37.8	%
Globules rouges		4.30	10.6 / mm³
MCV	-	87.9	fL
MCH		32.6	pg
MCHC	+	37.0	g / dL
RDW		15.4	%
Plaquettes (EDTA)	+	714	10.3 / mm³
		Nouvelle méthode de dosage à partir du 25/(	
MPV		10.2	fL
Globules blancs	+	19.6	10.3 / mm³
		Nouvelle méthode de dosage à partir du 25/(	
Neutrophiles		59.3	%
Lymphocytes		23.7	%
Monocytes	+	14.4	%
Eosinophiles		0.0	%
Basophiles		0.0	%
Métamyélocytes	+	2.5	%
Neutrophiles / mm³		11.62	10.3 / mm³
Lymphocytes / mm³		4.65	10.3 / mm³
Monocytes / mm³	+	2.82	10.3 / mm³
Eosinophiles / mm³		0.00	10.3 / mm³
Basophiles / mm³		0.00	10.3 / mm³
Ammonium		36	µmol / L

TOXICOLOGIE ET MONITORING THERAPEUTIQUE

Aucune substance xénobiotique n'a été mise en évidence.

IONOGRAMME

Sodium	-	117	mmol / L
		déjà identifiée antérieurement.	
Potassium		4.99	mmol / L
Chlore	-	80	mmol / L
CO2 (Réserve alcaline)		26	mmol / L
Trou anionique		16	mmol / L

Urinocol

Résultat de Microbiologie

Calcium	3,43
Chlore	77
Magnésium	2,61
Nature de prélèvement :	Urinocol
Osmolalité urinaire	348
Phosphore	8,09
Potassium	20,0
Sodium	74

LCR ponction lombaire

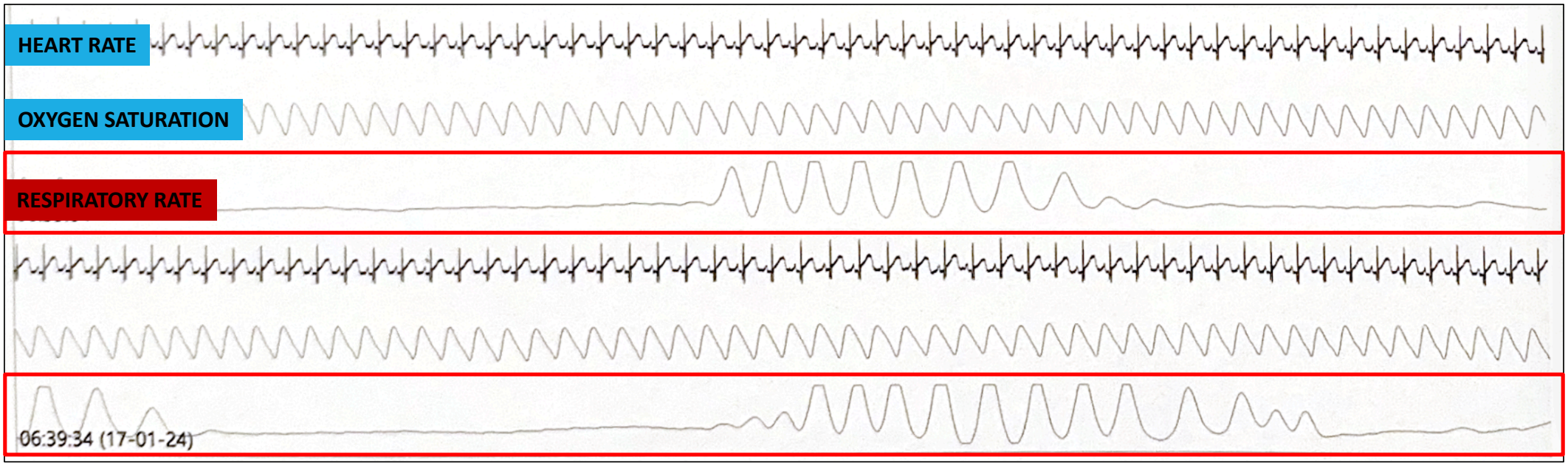
Résultat de Microbiologie

Culture aérobie	1. Escherichia coli
Cellules nucléées	2480
Neutrophiles	70%
Globules rouges	20
Glucose	<5

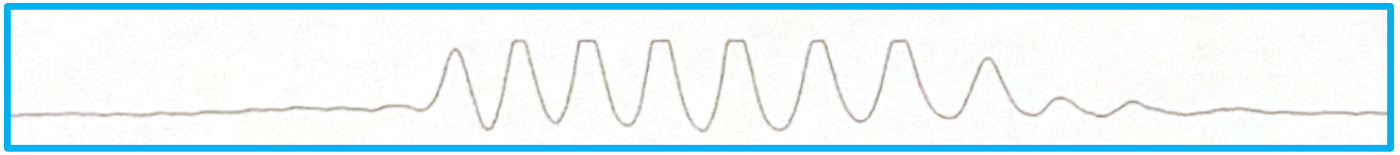
Diagnosis

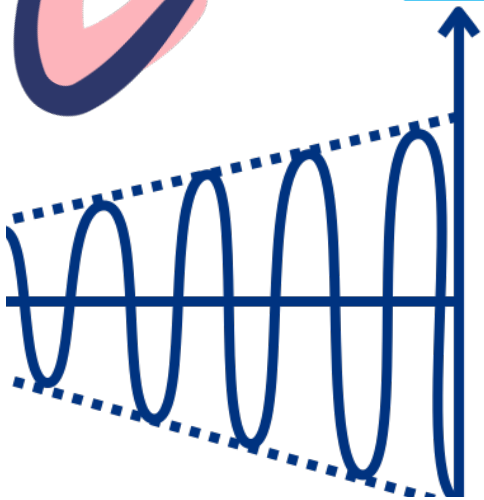
1. Neonatal bacteraemia and **meningitis** caused by **Escherichia Coli**
2. Neonatal **seizures and status epilepticus** on 1/
3. Severe **hyponatremia** secondary to **syndrome of inappropriate antidiuretic hormone secretion** on 1/
4. Post-infectious **hydrocephalus** on 1/ with obstruction of the aqueduct of Sylvius making drainage by lumbar puncture ineffective. Placement of two external ventricular drains.
5. Decompensated **respiratory failure** on 1/

Later…


HEART RATE
OXYGEN SATURATION
RESPIRATORY RATE
06:39:34 (17-01-24)

What is this pattern called ?





Biot's breathing (ataxic breathing)

- Rarely mentioned **(1 in 2018)**
- **NOT** Cheyne-Stokes breathing
- **NOT** Kussmaul breathing
- First described in 1876 as a « meningitic rhythm »
- Damage to the **brainstem**, specifically the medulla oblongata.

Biot's breathing associated with acute bacterial meningitis in a child

Alex Guri,[1] Eric Scheier,[1] Meital Adi,[2] Mikhael Chigrinsky[3]

Here… **Important hydrocephaly and multiple subdural empyema**
→ Therapeutic escalation
→ External ventricular drain

Conclusions

1. Hyponatremia and seizures

- ✓ Importance of being **thorough** when faced with seizures
- ✓ Being able to **question yourself** and your initial thoughts
- ✓ Use **every tool** available
- ✓ Work as a **team**

2. Continuous monitoring

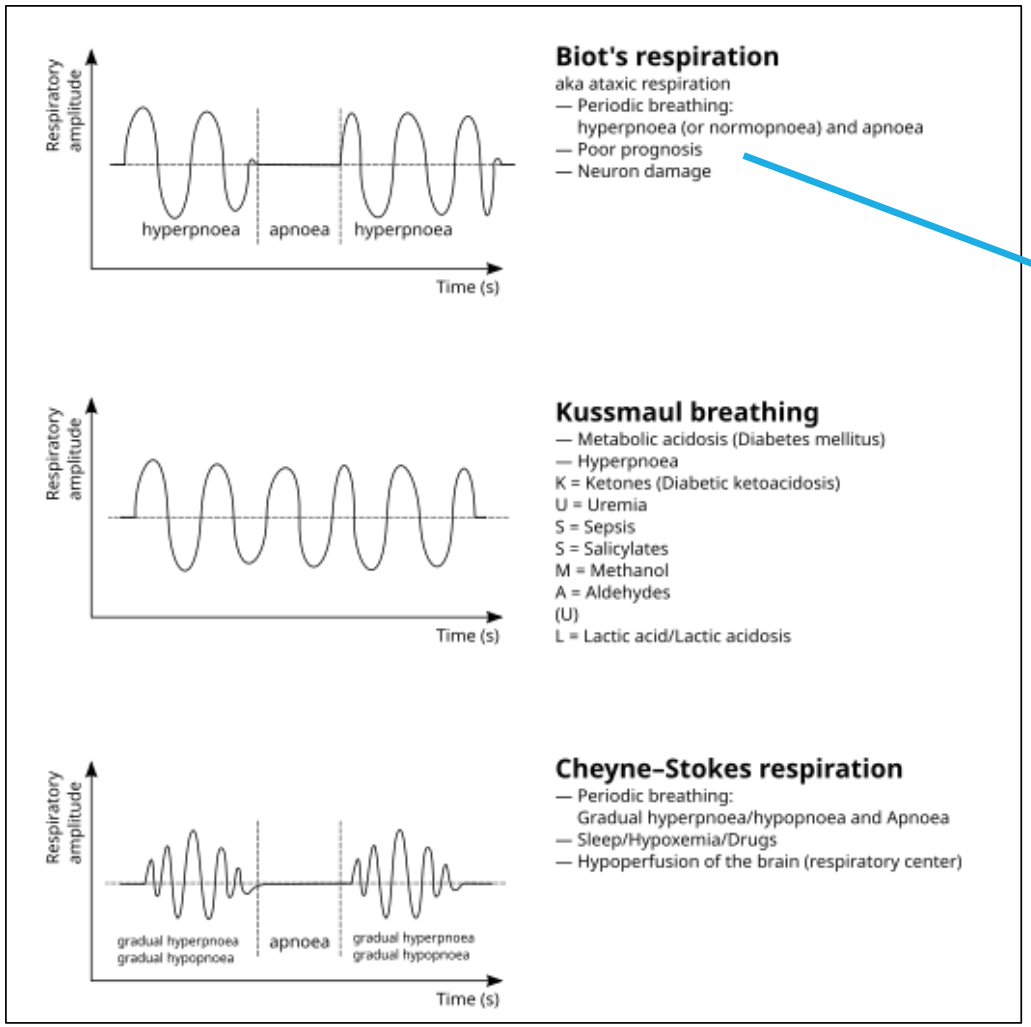
- ✓ Stay **alert**
- ✓ Discuss as a **team**
- ✓ Don’t underestimate the **power of the clinic**
- ✓ When in doubt, **search and learn**

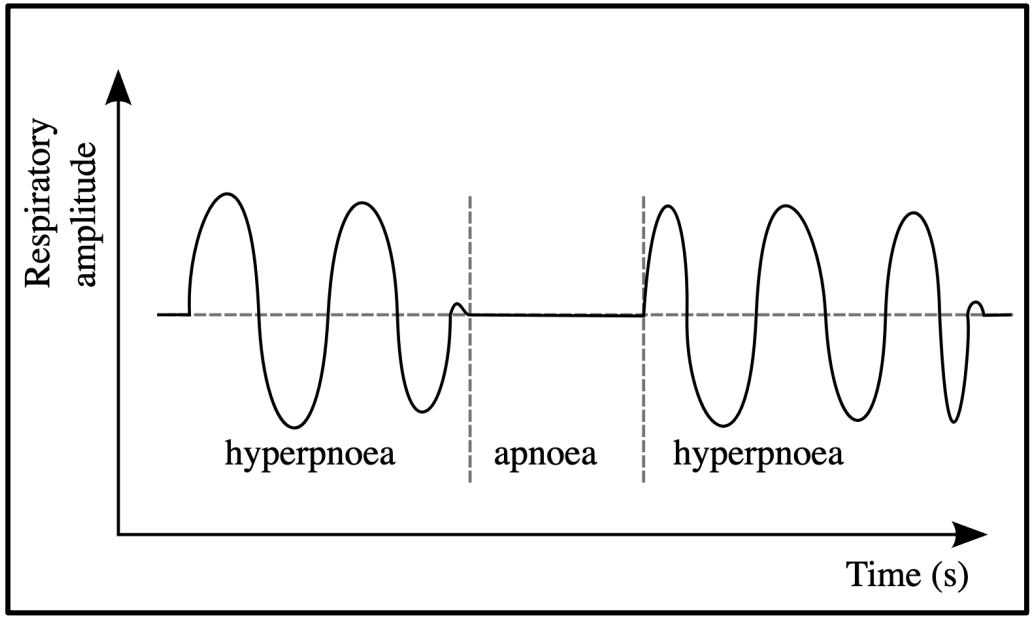
THANK YOU

Bibliography

- *Wijdicks EFM. Biot's breathing. Journal of Neurology, Neurosurgery & Psychiatry. 20 oct 2006;78(5):512-3. doi: 10.1136/jnnp.2006.104919*
- *Guri A, Scheier E, Adi M, Chigrinsky M. Biot's breathing associated with acute bacterial meningitis in a child. BMJ Case Reports. 29 juin 2018. doi:10.1136/bcr-2018-225774*
- *Contributors to Wikimedia projects. (2005, 18 août). Ataxic respiration - Wikipedia. Wikipedia, the free encyclopedia. https://en.wikipedia.org/wiki/Ataxic_respiration#:~:text=Ataxic%20respirations,%20also%20known%20as,who%20characterized%20it%20in%201876.*
- *Icônes et stickers - Des millions de ressources à télécharger. (s. d.). Flaticon. https://www.flaticon.com/fr/*

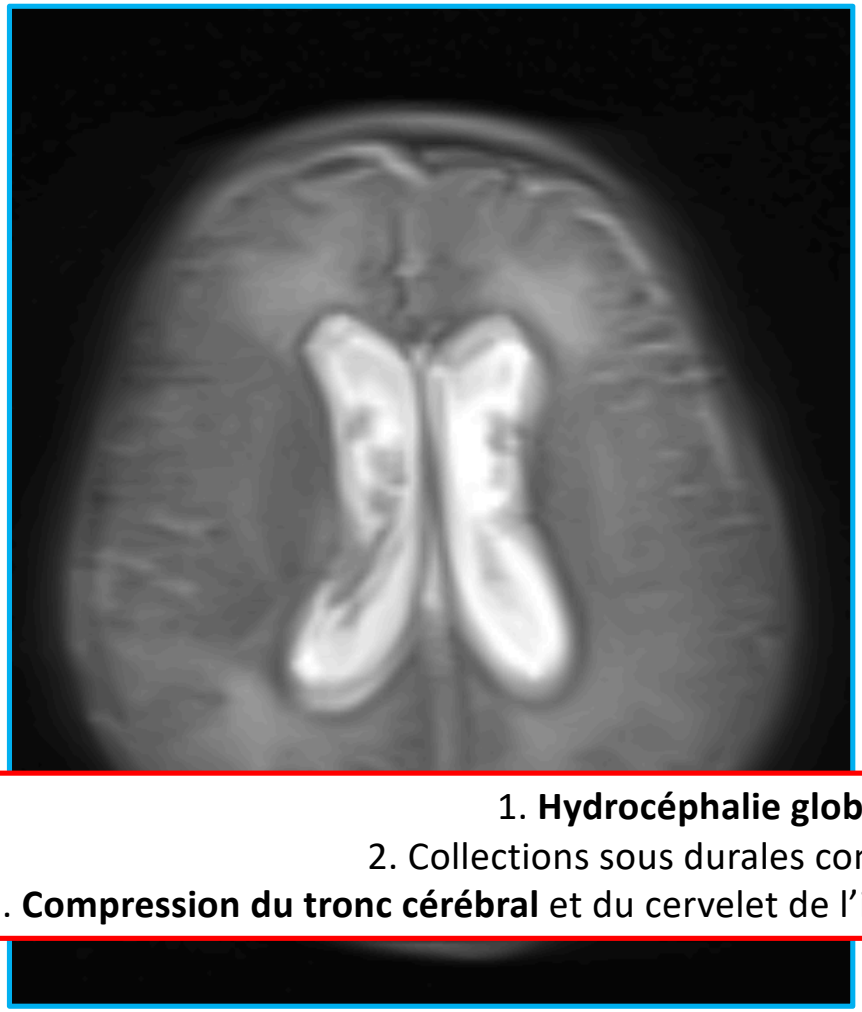
Biot’s breathing (ataxic breathing)

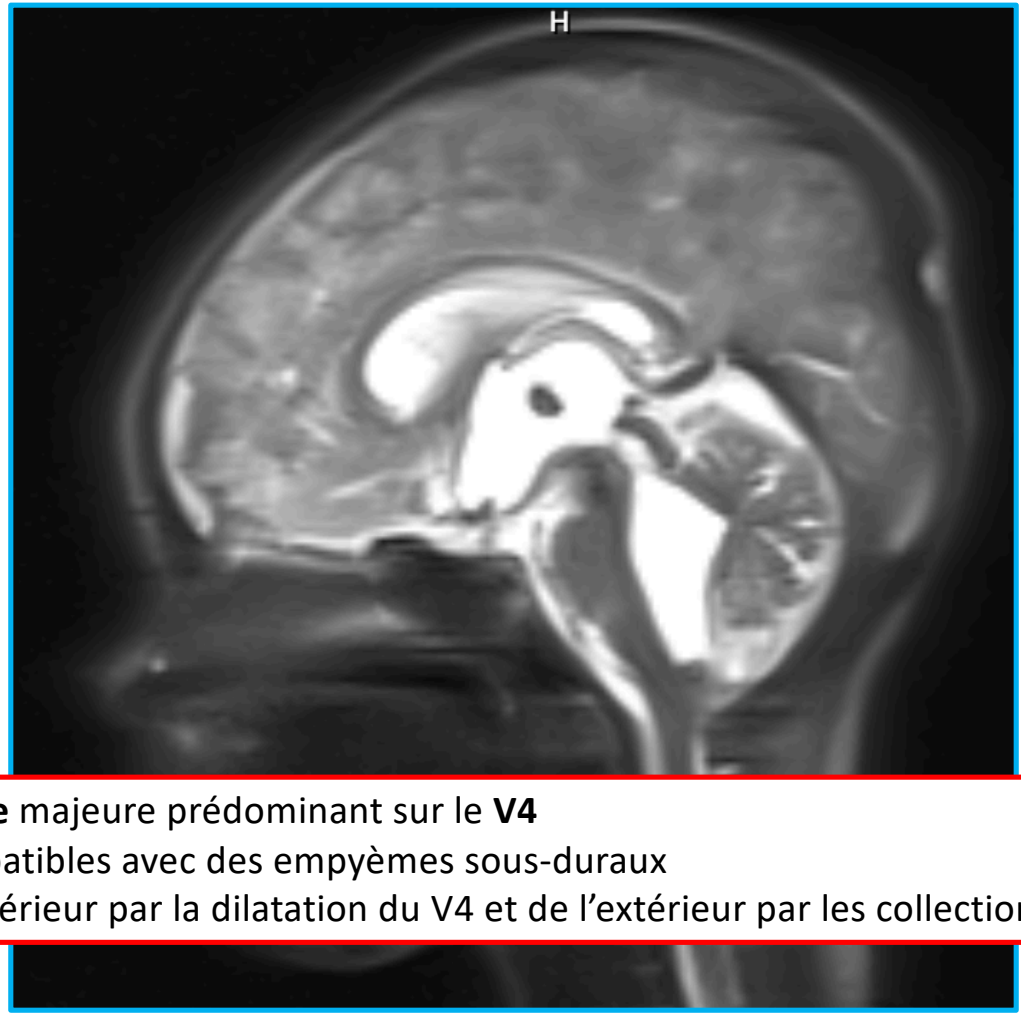




Wikipedia – Various breathing abnormalities

Biot’s breathing, but why?





1. **Hydrocéphalie globale** majeure prédominant sur le **V4**
2. Collections sous durales compatibles avec des empyèmes sous-duraux
3. **Compression du tronc cérébral** et du cervelet de l’intérieur par la dilatation du V4 et de l’extérieur par les collections

Any news?