Pet dedicated EEG device and telediagnostic platform development to improve the diagnosis of neurological diseases in veterinary medicine

Catherine Escriou[1], Stéphane Besnard[2], Hervé Pochat[3], Elsa Lyon[4]
[1] VetAgro Sup ; [2] Unicaen ; [3] Amset Medical ; [4] Elyope SAS

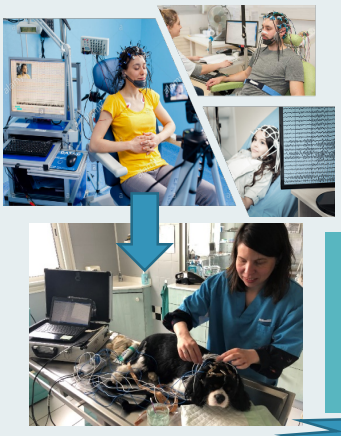
ELYOPE Project

EEG

EEG : background and rationale

The electroencephalogram (EEG) is widely and routinely used in **human medicine** to explore and characterize nervous diseases where brain electrical activity is modified such as epilepsies, encephalopathies or comas. **It's an essential tool for the diagnosis, prognostic and treatment of the neurological patient with numerous available devices and interpretation knowledge and competences**.

Although pets and humans share the same nervous diseases and dogs are useful animal models for many neurological genetic disease, **to date, no pet dedicated, adapted and easy to use EEG devices are commercialized.** Pet EEG database is lacking (normal and pathologic), veterinary expertise in pet EEG lecture is anecdotic even among veterinary neurology specialists.



Why EEG is not routinely used in pets ?

THE METHOD IS NOT OPTIMIZED FOR PETS

Use of needles: cause pain, difficult to place, need to be taped on the head of the dog, cannot be adjusted during the exam

Use of anesthesia or sedation *(at least to place the needles)*: risk and/or contraindication in severe neurological patient, modify the EEG pattern, decrease EEG sensibility to detect epileptic events

Human devices: Too big, too heavy and complicated devices

THE HUMAN DEVICES ARE NOT ADAPTED TO PETS

OUR SOLUTION, OUR PROPOSITION

A NEW INNOVATIVE METHOD

Pet adaptable EEG headset with specific pain- free electrodes (*non-resistive contactless electrodes)*

A NEW INNOVATIVE DEVICE

Pain-free

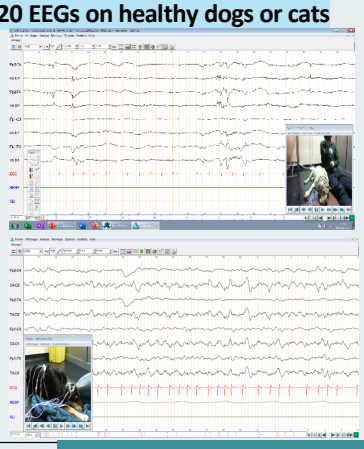
Pet adapted

Allowing EEG to become an easy-to-use routine exam in veterinary ambulatory practice

PROOF OF CONCEPT

20 EEGs on healthy dogs or cats

Physiologic

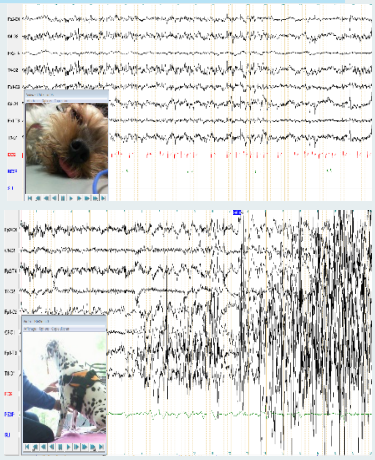


3Y F Sheepdog
Slow waves and K complex

4Y F Labrador
Slow wave and REM sleep

50 EEGs on neurological patients

Pathologic



9Y Yorkshire
Status Epilepticus treated with phenobarbital and midazolam
Spikes and wave at the EEG despite no movement and coma
NOT CONVULSIVE STATUS EPILEPTICUS
ALLOW TO ADJUST TREATMENT

1,5Y pregnant Dalmatian
Permanent clonic ears movements
Spikes at the EEG
FOCAL MYOCLONIC EPILEPSY
ALLOW TO INTRODUCE ANTI-EPILEPTIC TREATMENT
REMISSION

EEG DATABASE AND EEG lecture EXPERTISE DEVELOPMENT : a multidisciplinary team work

National and International

Proof of concept

Ag/AgCL Electrodes use

+ Pet adapted Head set (Helmet prototype) development,

EEG device Test on pets

Telediagnostic Platform creation (EEG exam download)

EEG lecture and interpretation

Full hardware set up

Industrialisation of a new EEG device (electrodes and helmet)

Holter EEG device development

Partnership

Financial Support

Expertise development

Pet EEG database development (Healthy and pathologic (real clinical cases demonstrating EEG contribution to veterinary diagnostic)

Commercial development (Veterinary Market + Research and pharmaceutical Market)

A complete and Pet adapted Product (helmet + electrodes + Holter device)

A service (training of EEG use,

Telediagnostic by an expert using a dedicated Platform)

An innovative, easy to use complementary exam for veterinary medicine to facilitate neurological diagnosis and improve therapeutic care
An essential tool for medical research (epileptology, pharmacology, toxicology)

Contact : info@elyope.fr