Neonatal monitoring with BrainRT

Many neonates require specialized care during their first months of life. During this time, they are often connected to monitors to follow vital signals such as oxygen saturation, blood pressure, body temperature and respiration.

As many patients are monitored for days, weeks or even months, it is important to get a good interpretation of all these data. With the BrainRT software, it is possible to do that. You can record signals from the patient monitor and use the extensive review options of the software for further interpretation.
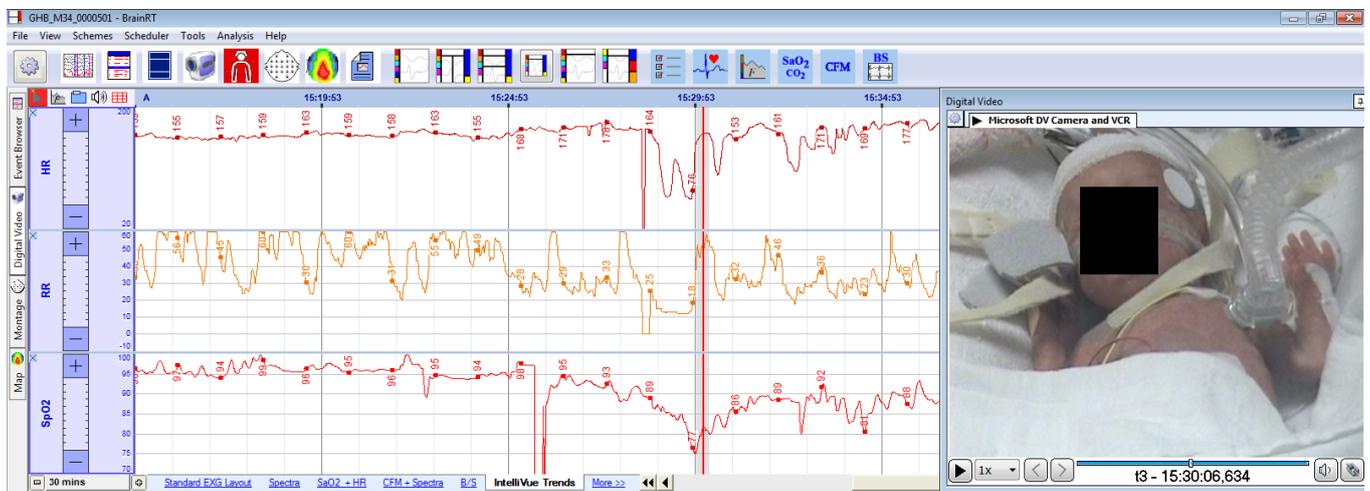
BrainRT example: monitoring of neonatal intensive care patient

Signal and video acquisition with BrainRT software

With the BrainRT software, you can record all the signals that the patient monitor produces. This includes trends with low sampling rates such as the SaO2 and transcutaneous CO2 (1 Hz) but also signals with higher sampling rates such as ECG (125 Hz) and respiration (25 Hz).

Near Infrared Spectroscopy (NIRS) to measure cerebral oxygen saturation

To distinguish artefacts from real problems you can record video signals of the patient. The video recordings are automatically synchronized with the signals and can be reviewed even during the acquisition. Different models of cameras are available.


HD camera

Neonatal brain monitoring with BrainRT software

For neonatal patients who require brain monitoring, you can record **EEG signals** from the patient monitor or use an additional EEG amplifier from BrainRT. These signals can be recorded in synchrony with other patient monitor data. Another useful signal that you can record is the **regional cerebral oxygen saturation** (rSO$_2$) using Near Infrared Spectroscopy (NIRS). Real Time BrainRT analyses for neonatal EEG signals include:

- ## CFM analysis

The Cerebral Function Monitor (CFM) is often used as an easy visual interpretation of the EEG signals. The CFM trend is easy to interpret by non-neurologists and is particularly useful to detect seizures in neonatal patients. The BrainRT software calculates the Real Time CFM trend for one or more EEG derivations.
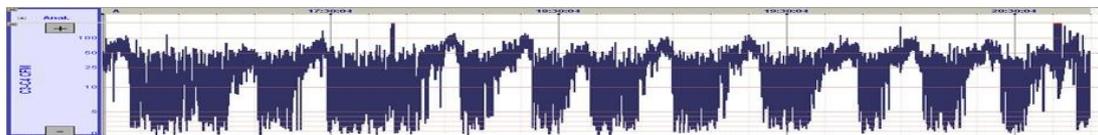
Example of CFM trend in BrainRT

- ## Burst suppression analysis

The burst suppression pattern of neonatal monitoring patients is an important indicator for brain development. In the BrainRT software, the real time burst suppression analysis provides the burst count, inter burst interval, suppression duration and other parameters to analyze the burst suppression pattern.


Neonatal brain monitoring with real time CFM analysis and video

Review options of BrainRT software

During and after the acquisition, the BrainRT software offers many features for review:

- Flexibility for signal display

- Automatic analyses that you can run **during the acquisition** or afterwards

- Add events and notes to the acquisition

- Advanced reporting options for events, trends and result summary

In many cases it is necessary to adjust treatment if the patient does not react well. With BrainRT you can create trends with the number / percentage of events per hour, for example the number of seizures.
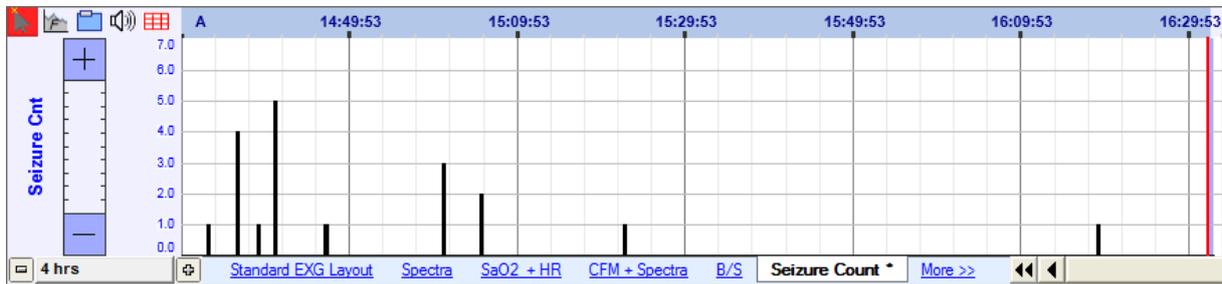
BrainRT trend: number of seizures per hour

BrainRT analyzes the following signals in Real Time:

- **SpO$_2$ & CO$_2$**
  - Saturation dips
  - Hypoxical states
  - End Tidal CO$_2$ levels
- **ECG**
  - Tachycardia, bradycardia
  - Heart rate
  - Ictal tachycardia
- **Blood pressure**
  - Systolic, diastolic and mean blood pressure
  - Baroreflex sensitivity
  - PTT

- **Respiration**
  - Apnea, hypopnea
  - Respiration rate and phase difference
- **EEG analyses**
  - CFM
  - Burst-Suppression
  - Spectrogram
  - Spectral edge
  - Power bands
  - Mean phase coherence
  - Entropy
  - Detection of spindles, alpha, delta, theta, beta

BrainRT Signal database

- BrainRT database for easy management of signals and patients

- Export signals, notes and events to Excel or to the BrainRT database for future use