Trial Description

**Title**
Visualization of alpha power in the perioperative EEG

**Trial Acronym**
[---]*

**URL of the trial**
[---]*

**Brief Summary in Lay Language**
Intraoperative neuromonitoring can help avoid unnecessarily high administered doses of anesthesia, which is a risk factor for the occurrence of perioperative neurocognitive disorders (PNDs) (1). Previous studies demonstrated that not only the delivered dose of anesthetic, but also the presence or absence of certain EEG patterns are correlated with the incidence of PNDs. In particular, pronounced alpha oscillations in the frontal EEG during maintenance of and emergence from anesthesia appear to be predictors for favorable neurocognitive outcomes. However, elderly patients show a general decrease in EEG power, which renders visual inspection of the alpha band a more challenging task. Here we propose a simple, yet effective approach to optimize the visual detection of EEG alpha activity in the perioperative setting.

All medical students and anesthesiologist are welcome to participate in the study.

**Brief Summary in Scientific Language**
Intraoperative neuromonitoring can help avoid unnecessarily high administered doses of anesthesia, which is a risk factor for the occurrence of perioperative neurocognitive disorders (PNDs). Previous studies demonstrated that not only the delivered dose of anesthetic, but also the presence or absence of certain EEG patterns are correlated with the incidence of PNDs. In particular, pronounced alpha oscillations in the frontal EEG during maintenance of and emergence from anesthesia appear to be predictors for favorable neurocognitive outcomes. However, elderly patients show a general decrease in EEG power, which renders visual inspection of the alpha band a more challenging task. Here we propose a simple, yet effective approach to optimize the visual detection of EEG alpha activity in the perioperative setting.

In good approximation, EEG spectra follow a power law distribution $X(f) \sim f^{-\gamma}$. For decay parameters $\gamma$ close to one, discrete differentiation of the EEG in the time domain hence acts as a whitening filter in the frequency domain. This may facilitate an optimized visualization of narrow-band oscillations against the equalized background activity. We applied this approach to the frontal EEG of patients undergoing non-neurological, non-cardiac surgery under general anesthesia, which was inducted using propofol, and maintained either with propofol or sevoflurane. Data from a previously published study were used.
Do you plan to share individual participant data with other researchers?

No

Description IPD sharing plan

An IPD sharing plan is not applicable to this study as this trial is an online based survey. We do not collect any patient data or randomize patients to an intervention.

Organizational Data

- DRKS-ID: DRKS00020888
- Date of Registration in DRKS: 2020/03/13
- Date of Registration in Partner Registry or other Primary Registry: [*-]*
- Investigator Sponsored/Initiated Trial (IST/IIT): yes
- Ethics Approval/Approval of the Ethics Committee: Approved
- (leading) Ethics Committee Nr.: 11/20 S, Ethik-Kommission der Fakultät für Medizin der Technischen Universität München

Secondary IDs

- ICD10: F05.8 - Other delirium

Health condition or Problem studied

Interventions/Observational Groups

- Arm 1: We present 180 power spectral density (PSD) plots of 10 sec of the raw EEG, and 180 PSD plots of the time-discrete first derivative of the EEG (diffPSD) to the members of the department of anesthesiology.

Characteristics

- Study Type: Non-interventional
- Study Type Non-Interventional: Epidemiological study
- Allocation: Single arm study
- Blinding: [*-]*
- Who is blinded: [*-]*
Study Type: **Non-interventional**
Study Type Non-Interventional: **Epidemiological study**
Allocation: **Single arm study**
Blinding: [---]*
Who is blinded: [---]*
■ Control: **Uncontrolled/Single arm**
■ Purpose: **Prevention**
■ Assignment: **Single (group)**
■ Phase: **N/A**
■ Off-label use (Zulassungsüberschreitende Anwendung eines Arzneimittels): **N/A**

**Primary Outcome**

Can the participants detect more alpha peaks in the power spectral density using the first derivative of the raw EEG?
To measure the primary outcome parameter we present 180 power spectral density (PSD) plots of 10 sec of the raw EEG, and 180 PSD plots of the time-discrete first derivative of the EEG (diffPSD) to the members of the department of anesthesiology and ask for the presence of an alpha peak.

**Secondary Outcome**

Does the presentation of the power spectral density of the first derivative of the EEG result in a more homogeneous evaluation? Does the number of detected peaks correlate with experience/training?

**Countries of recruitment**

■ DE Germany
■ CH Switzerland
■ US United States
■ NZ New Zealand

**Locations of Recruitment**

■ University Medical Center **Klinikum rechts der Isar, München**

**Recruitment**
Planned/Actual: Planned
(Anticipated or Actual) Date of First Enrollment: 2020/03/01
Target Sample Size: 100
Monocenter/Multicenter trial: Multicenter trial
National/International: International

**Inclusion Criteria**

- Gender: Both, male and female
- Minimum Age: 18 Years
- Maximum Age: no maximum age

**Additional Inclusion Criteria**

Medical students, anesthesiologists

**Exclusion criteria**

None

**Addresses**

**Primary Sponsor**

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Sources of Monetary or Material Support

Institutional budget, no external funding (budget of sponsor/PI)

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Status

Recruitment Status: Recruiting planned
Study Closing (LPLV): [---]*
Trial Publications, Results and other documents

* This entry means the parameter is not applicable or has not been set.
*** This entry means that data is not displayed due to insufficient data privacy clearing.