Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

Sleep deprivation and delirium in critically ill patients.

Name of main researcher, title, and e-mail address:

Shin Nunomiya, MD.　Professor and Director
<nunomiya@jichi.ac.jp>

Brief explanation of research activity:

Critically ill patients, especially being under mechanical ventilation, often suffer from severe sleep deprivation, which can lead to the development of impaired cognitive function, delirium. Since delirium itself is one of the independent risk factors of poor outcome of patients in ICU, efforts that prevent and avoid the development of delirium would have supreme importance for critically ill patient's care. Moreover, early detection of delirium and proper intervention should be done to make an improvement of intensive care quality.

Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

Spectral analysis of heart rate variability in critical state.

Name of main researcher, title, and e-mail address:

Masahiko Wada, MD.　Assistant Professor
<mwada@jichi.ac.jp>

Brief explanation of research activity:

Heart rate varies with respiration, blood pressure, etc. The physiologic regulation of heart rate is complex, involving several overlapping control systems. The instantaneous heart rate (R-R interval) is not steady. These small variations are due largely to balance of sympathetic activity and parasympathetic activity to the sinus node. Spectral analysis of Heart Rate Variability (HRV) is a non-invasive monitoring method for autonomic nerve system function. Total spectral powers in the variability signal and the ratio of high frequency to low frequency components (HF/LF ratio) are calculated. The HF/LF ratio represents a measure of parasympathetic/sympathetic balance. Continuous measurement of HF/LF ratio represents circadian rhythm of autonomic nerve system. The purpose of this research is to assess the significance of alterations in HRV parameters measured continuously and analyze under critical states.

※ Relations between circadian rhythm of autonomic nerve system and septic shock state.

2) Does HRV parameters provide a useful indication of sympathetic state in patients with sympathetic storm state of tetanus?

3) Relations between surgical stress and circadian rhythm of autonomic nerve system.

Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

Validation of noninvasive positive-pressure ventilation in ICU

Name of main researcher, title, and e-mail address:

Kazuhide Misawa, MD.　Assistant Professor
<misawa-k@jichi.ac.jp>

Brief explanation of research activity:

Noninvasive positive-pressure ventilation (NPPV) has recently become common in the respiratory care of the patients with acute respiratory failure in ICU. Several NPPV machines have developed for intensive care use. (They have waveform monitor and they can be connected with the piping of oxygen supply.) Further, the most ICU ventilators have optional function of NPPV.

We research

1) the optimal timing of the induction and avoidance of NPPV,

2) the validity of NPPV in ICU, (the rate of VAP formation, the length of ICU stay, ICU mortality rate)

The comparison of NPPV machines and conventional ICU ventilators with NPPV mode

Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

The efficacy and complications of high frequency ventilation (HFV) for the treatment of acute respiratory distress syndrome (ARDS).

Name of main researcher, title, and e-mail address:

Shin-ichiro Tanaka, MD.　Senior resident

<tanashin@jichi.ac.jp>

Brief explanation of research activity:

The fatality rate of ARDS still exceeds 30% despite the management according to the strategies already in widespread use, such as prone positioning and low tidal volume mechanical ventilation, and the dangers of conventional mechanical ventilation has spurred interest in various protective techniques including the application of high levels of positive end-expiratory pressure and low tidal volumes. HFV has been proposed as a ventilatory strategy that may decrease ventilator-induced lung injury and reduce barotrauma in patients with ARDS. It is not widely used in Japan because of its requirement for specialized equipment, limited expertise, and the lack of demonstrated clinical benefit. The purpose of this research is to assess the efficacy and complications of HFV for the treatment of ARDS compared with conventional mechanical ventilation.

Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

The clinical features and pathophysiological mechanisms of sepsis, focusing on the homogenous subgroups.

Name of main researcher, title, and e-mail address:

Kansuke Koyama, MD.　Senior resident

<k_koyama@jichi.ac.jp>

Brief explanation of research activity:

Sepsis is a clinical syndrome that complicates severe infection and is characterized by systemic inflammation and widespread tissue injury. Although remarkable advances in our understanding of the mechanisms of sepsis have been seen during the last two decades, sepsis still remains to be the major cause of death in the ICU. The difficulties in reducing mortality of sepsis might be related to the heterogeneity of the patients with different underlying condition, different sites of infection and microorganisms, and the variety of host inflammatory and immunologic capabilities. We therefore investigate the clinical features and pathophysiological mechanisms of sepsis subgroups, such as pneumonia, and peritonitis.

Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

The original scale of intensive insulin therapy, and its efficacy.

Name of main researcher, title, and e-mail address:

Kansuke Koyama, MD.　Senior resident
<k_koyama@jichi.ac.jp>

Brief explanation of research activity:

The glycemic goals described by Van Den Berghe and colleagues in their landmark study of intensive insulin therapy (IIT) are difficult to achieve in a real life ICU setting. The variety of glycemic control protocols have been proposed after the publication of IIT and shown to be effective, but they required a lot of nursing effort and their risk of hypoglycemia were high. We have developed an original scale of intravenous insulin administration and evaluate the efficacy, safety and nursing workload.

Department/Division:

Division of Intensive Care, Department of Anesthesiology & Intensive Care Medicine

Theme of research:

Ventilator-associated pneumonia surveillance.

Name of main researcher, title, and e-mail address:

Kansuke Koyama, MD.　Senior resident
<k_koyama@jichi.ac.jp>

Brief explanation of research activity:

Ventilator-associated pneumonia (VAP) is a most common hospital-acquired infection among patients with mechanical ventilation, and is related with increased mortality and prolonged ICU stay. We conduct surveillance on incidence and risk factors of VAP and evaluate the prophylactic effects.