Seismograph to Measure the Weight of Patients in the Bed

Background: The higher prevalence of age associated diseases and the steady increase in average life expectancy results in an increase of patients at risk and in need for medical treatment and thus patients which need treatment in the intensive care unit. One important aspect in terms of medical treatment and health outcome is the weight of patients during the stay in the intensive care unit. The weight can be either measured by a scale or by estimating the fluid balance. In most case the measuring by scale is not possible and the estimating of the fluid balance is not accurate. Currently there is a lack of technologies which measures accurately the weight of patients directly in the bed. Therefore, there is a high need of new technologies which measure the weight over a prolonged time unobtrusively in the bed. One promising technology to measure the weight of patients directly in the bed over a prolonged time is the seismograph.

Aim: Therefore, the aim of this project is to develop a system by using a seismograph to measure the weight of patients in a hospital bed.

Materials and Methods:
This thesis will consist of four parts. In the first part, the student will learn the concepts of the seismograph. In a second step, a system will be built to measure the weight in a hospital bed. In a third step, an experiment is conducted to validate the system in healthy subjects. At the end the experiment will analysed and compared to the gold standard a scale.

Nature of the Thesis:
Development of the system: 20%
Development of algorithms: 50%
Experiment: 10%
Analysing of the experiment data: 20%

Requirements:
Basic knowledge in data analysis
Good programming skills
Interest to work with healthy subjects

Supervisors:
Dr. Stephan M. Gerber
Michael Single

Figure: Patient in the ICU

Institute:
ARTORG Center for Biomedical Engineering
Research, University of Bern, Gerontechnology and Rehabilitation Group

Contact:
Dr. Stephan Gerber, stephan.gerber@artorg.unibe.ch, Murtenstrasse 50, CH-3012 Bern,
Tel. +41 79 308 17 18.