Esophageal Doppler was confirmed as a useful non-invasive tool for management of fluid replacement in elective surgery. The aim of this study was to assess the effect of early optimization of intravascular volume using esophageal Doppler on blood lactate levels and organ dysfunction development in comparison with standard hemodynamic management in multiple-trauma patients.

This was a randomized controlled trial. Multiple-trauma patients with blood loss of more than 2,000 ml admitted to the intensive care unit (1CU) were randomly assigned to the protocol group with esophageal Doppler monitoring and to the control group. Fluid resuscitation in the Doppler group was guided for the first 12 hours of ICU stay according to the protocol based on data obtained by esophageal Doppler, whereas control patients were managed conventionally. Blood lactate levels and organ dysfunction during ICU stay were evaluated. Eighty patients were randomly assigned to Doppler and 82 patients to control treatment. The Doppler group received more intravenous colloid during the first 12 hours of ICU stay (1,667±426 ml versus 682±322 ml; $p < 0,0001$), and blood lactate levels in the Doppler group were lower after 12 and 24 hours of treatment than in the control group (2,92±0,54 mmol/1 versus 3,23±0,54 mmol/1 [$p = 0,0003$] and 1,99±0,44 mmol/1 versus 2,37±0,58 mmol/1 [$p < 0,0001$], respectively). No difference in organ dysfunction between the groups was found. Fewer patients in the Doppler group developed infectious complications (15 [18,8%] versus 28 [34,1%]; relative risk = 0,5491; 95% confidence interval = 0,3180 to 0,9482; $p = 0,032$). ICU stay in the Doppler group was reduced from a medián 8,5 days (interquartile range [IQR] 6 to 16) to 7 days (IQR 6 to 11) ($p = 0,031$), and hospital stay was decreased from a medián of 17,5 days (IQR 11 to 29) to 14 days (IQR 8,25 to 21) ($p = 0,045$). No significant difference in ICU and hospital mortalities between the groups was found.

Optimization of intravascular volume using esophageal Doppler in multiple-trauma patients is associated with a decrease of blood lactate levels, a lower incidence of infectious complications, and a reduced duration of ICU and hospital stays.