Background:
Vital signs are an important part of the hospital triage algorithms, which priorities patients according to urgency of treatment. Most vital signs are assessed by the nursing staff on arrival to the emergency department (ED). In the previous years, studies have focused on the possibilities of a uniform triage and investigated the agreement between prehospital providers and ED personnel. However, little is known about the agreement of the recordings of normal vital sign ranges between prehospital providers and ED nurses. The aim of the study was to investigate if the normal vital sign ranges measured by the prehospital providers are consistent with the recorded values of the ED nurses?

Methods:
The study was prospective and observational. Patients transported to the ED by ambulances were included. Vital signs were measured by prehospital providers on arrival to the hospital, and by ED nurses upon arrival to the ED. Normal vital signs ranges were: Respiratory rate (RR) < 20 breaths/min, Glasgow Coma Score (GSC) = 15, saturation of peripheral oxygen (SpO2) > 94, heart rate (HR) ≥ 60 and ≤ 100 beats/min, systolic blood pressure (SBP) > 90 and < 160 mmHg, temperature (Tp) < 38°C. The measurements by the prehospital providers were the reference. An agreement analysis was conducted and Bland-Altman plots were performed.

Results:
292 patients were included in the study. Pair-wise analyses showed small mean differences.

### Vital sign | Range | Group | n | Mean | SD | n pair | Mean diff | 95% CI | 95% prediction interval
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RR | 8-25 breaths/min | PP | 267 | 17.5 | 2.8 | 236 | 0.5 | 0.0-1.1 | -0.9 to 9
HR | 50-100 beats/min | PP | 260 | 81.3 | 14.2 | 259 | -0.9 | -2.2-0.5 | -23 to 21
SpO2 | ≥ 95% | PP | 255 | 97.6 | 1.5 | 252 | -0.2 | -0.5-0.1 | -5 to 4
SBP | ≥ 90mmHg | PP | 284 | 135.4 | 22.7 | 282 | 0.3 | -1.8-2.5 | -37 to 37
Tp | 35-38°C | PP | 186 | 36.8 | 0.6 | 163 | 0.0 | -0.1-0.1 | -0.9 to 0.9

### Bland-Altman comparison

Table 1 Variation within each vital sign. Prehospital providers (PP), Respiratory rate (RR), Glasgow Coma Score (GSC), heart rate (HR), saturation of peripheral oxygen (SpO2), systolic blood pressure (SBP), temperature (Tp), confidence interval (CI), differens (diff), standard deviation (SD)

Conclusion:
The study showed no clinical important differences in overall mean of the vital signs recorded by prehospital providers and ED nurses for normal ranges. The limits of agreement were however larger. Normal vital signs measured by the prehospital providers are only to a moderate degree predictive of the emergency nurses’ measurements.