Introduction:
Sex differences in the metabolic response to critical illness are unknown. This retrospective analysis examines potential differences in the evolution of insulin sensitivity (SI) and its variability (\(\%\Delta SI\)) between sexes. Significant differences would suggest differences in the metabolic stress response and glycaemic response to insulin therapy, and, thus, the need for more personalised glycaemic control (GC).

Methods:
Retrospective data from 145 ICU patients (N=8710 hours) are used to hourly identify hourly model-based SI and its rate of change \(\%\Delta SI\) in 6-hour blocks from ICU admission to 72 hours. The evolution of SI and \(\%\Delta SI\) are compared for males and females. Hypothesis testing (95% confidence interval (CI) bootstrapped difference in medians) assesses if differences are significant, and equivalence testing assesses if differences are clinically equivalent.

Results:
Females have significantly lower SI levels than males (p<0.05), and this difference is not clinically equivalent (Figure 1; top). Differences in \(\%\Delta SI\) are not significant (p>0.05), and these differences are clinically equivalent (Figure 1; bottom).

Conclusion:
Given significantly lower SI levels, but equivalent variability, for women, equally safe and effective GC should be achievable for both sexes. However, women may require more insulin to achieve these goals. GC protocol designs should thus account for these differences in the future.
Hypothesis and Equivalence testing results on SI (top) and %ASI (bottom) between males and females for each 6-h block. Blue solid lines give equivalence range. Equivalence accepted if 95% CI of percentage difference in bootstrapped median SI values is within equivalence range. Difference in median SI and %ASI levels are considered statistically significant (p<0.05) if the 95% CI of difference in bootstrapped medians SI and %ASI crosses 0.