

# Impact of menstrual cycle on postoperative quality of recovery in premenopausal women: a prospective cohort study

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## Background

Women have poorer quality of postoperative recovery from general anaesthesia than men. This persists for at least 3 days postoperatively, and is more pronounced in premenopausal women. Studies of menstrual cycle effects on pain or postoperative nausea and vomiting report conflicting results. Our aim was to determine whether menstrual cycle stage affects quality of recovery after surgery in premenopausal women.

## Methodology

Eligible women aged 18-45 years undergoing wisdom teeth extraction or laparoscopic cholecystectomy were recruited from Epworth HealthCare Richmond in Melbourne, Australia from 2019-2021. Questionnaires and progesterone levels were used to determine cycle stage (luteal or non-luteal). Linear mixed and generalised linear regression models were fitted to examine differences in Quality of Recovery-15 (QoR-15) score on postoperative days 1 (primary outcome) and 3, and secondary outcomes (pain, analgesic effectiveness, postoperative nausea and vomiting, prolonged hospital admission), between groups, adjusting for confounders.

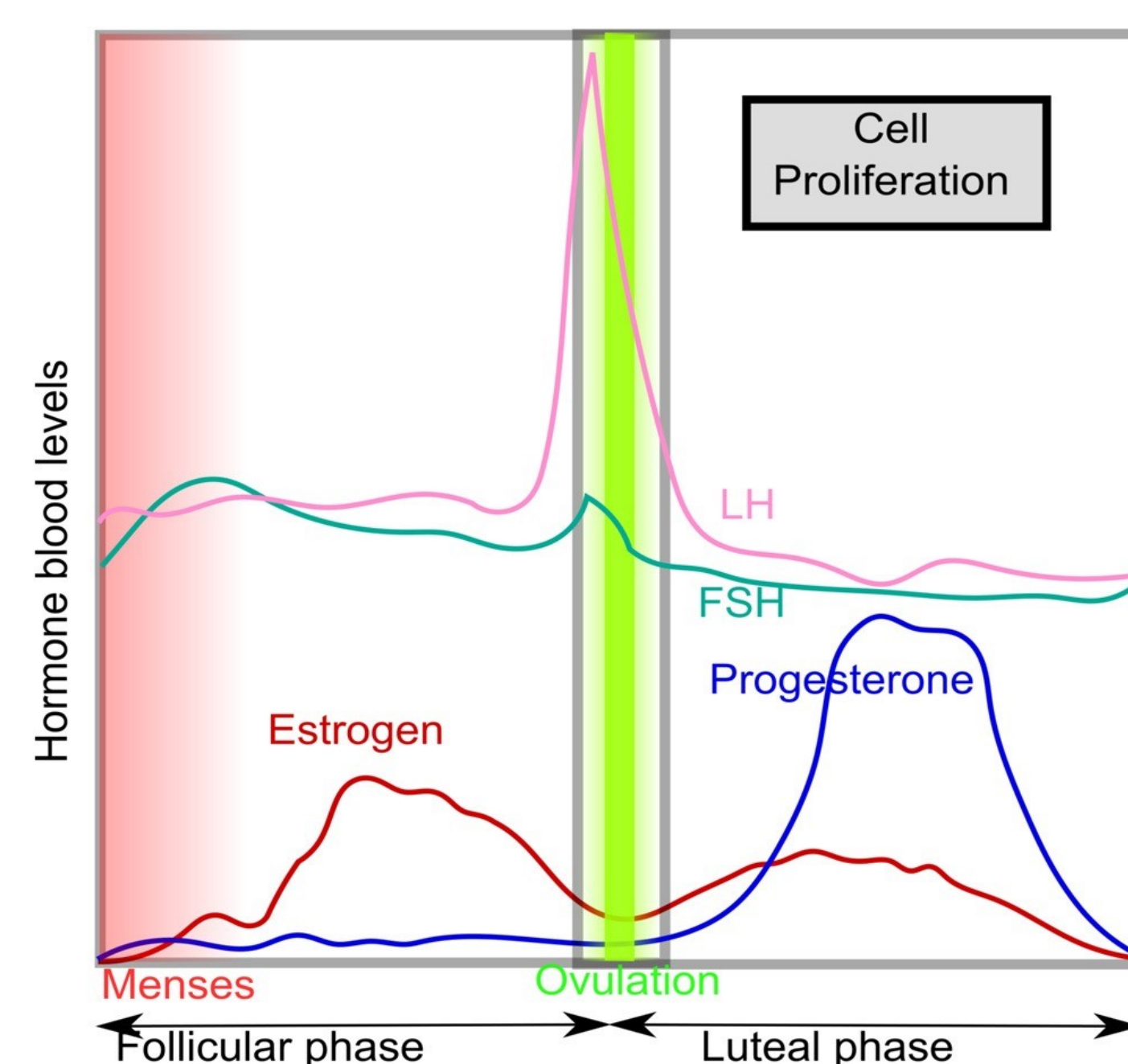
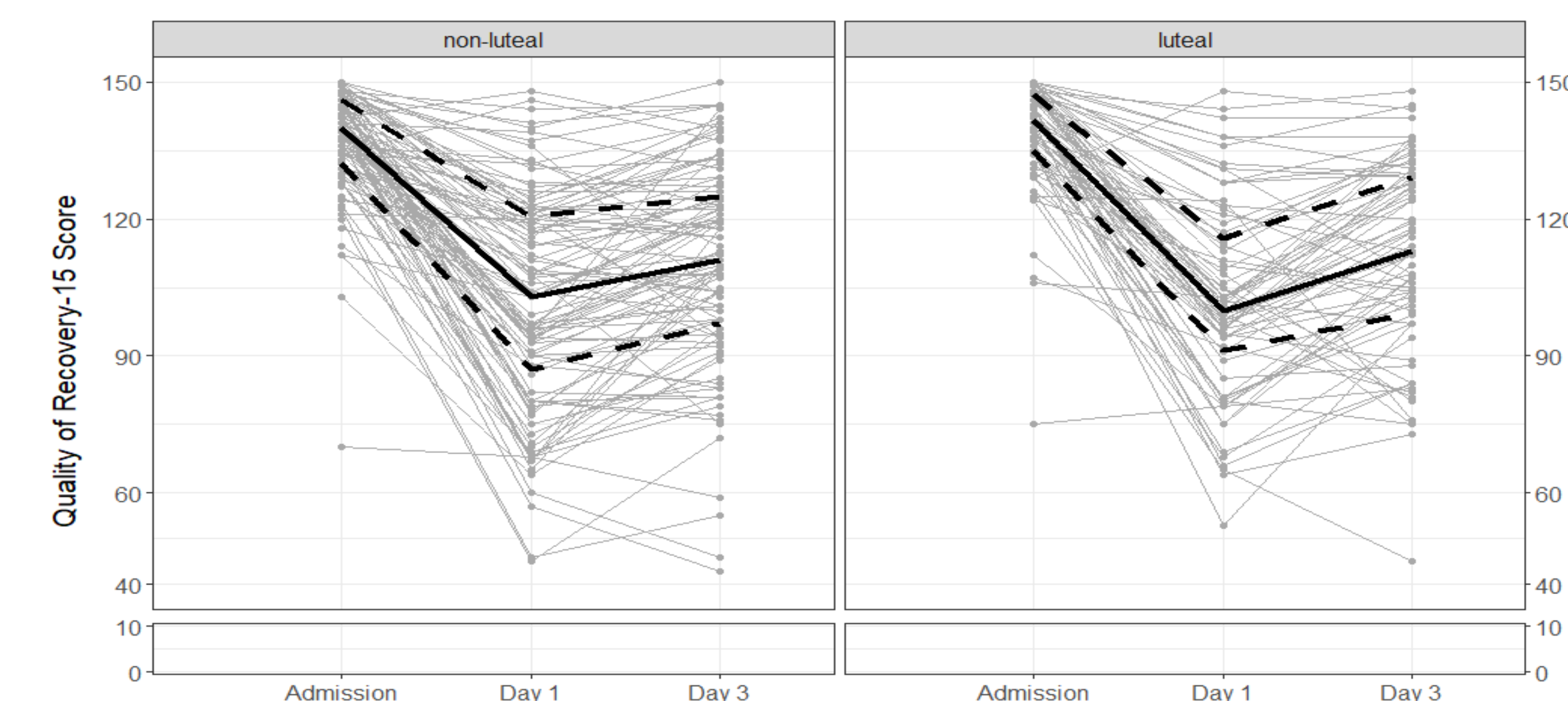


Figure 1. Menstrual cycle stages: the luteal progesterone peak and continuous oestrogen levels

## Results

177 women were recruited (74 luteal, 103 non-luteal), with 153 (86%) willing to schedule future surgery around cycle if an effect was found. Only 6 (3%) underwent laparoscopic cholecystectomy. Estimated mean differences (95% confidence interval; p-value) in adjusted QoR-15 scores between groups were -0.05 (-5.86, 5.76; p=0.986) and 1.4 (-4.41, 7.21; p=0.636) on postoperative days 1 and 3, respectively. Secondary outcomes were similar between groups.

Figure 2. Patient 15-item quality of recovery scores, with median (solid line), 25<sup>th</sup> and 75<sup>th</sup> percentiles (dashed lines) at each time point by cycle stage



## Conclusion

There was no significant difference in postoperative QoR-15 score or other outcomes between women in the luteal and non-luteal phases of their cycle. Women can be reassured that cycle stage does not impact postoperative quality of recovery when undergoing minor surgery.

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