

Postoperative Pain Trajectories After Oncologic Breast Surgery: A Systematic Review and Meta-Analysis

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Introduction

- Oncologic breast surgery is associated with significant postoperative pain, with previous studies reporting variable incidence of moderate to severe acute and persistent pain among individuals¹⁻⁴
- There is no consensus on an optimal analgesic regimen
- This systematic review aims to construct average pain trajectories in oncologic breast surgery patients, in order to:
 - Identify critical time points of high postoperative pain
 - Evaluate differences in trajectory with various analgesic approaches

Material and Methods

- Six electronic databases were searched for randomized controlled trials and meta-analyses published between May 31, 2006 and July 15, 2021 involving patients undergoing oncologic breast surgery
- 129 studies with 8,288 patients were identified as eligible
- Pain scores at rest and with movement (i.e. dynamic pain) were extracted from each study
- Pain trajectory curves were constructed for patients receiving:
 - Basic analgesia (treatment with only NSAIDs, nefopam, acetaminophen, opioids, or combinations of these)
 - Multimodal analgesia (treatment with IV lidocaine, dexmedetomidine, clonidine, metamizole, magnesium, ketamine, or duloxetine)
 - IV dexamethasone
 - Gabapentinoids
 - Erector spinae block (ESPB)
 - Paravertebral block (PVB)
 - Serratus anterior block (SAPB)
 - Pectoralis block (PECS)
 - Wound infiltration

Results

● Pain at rest

▲ Pain with movement

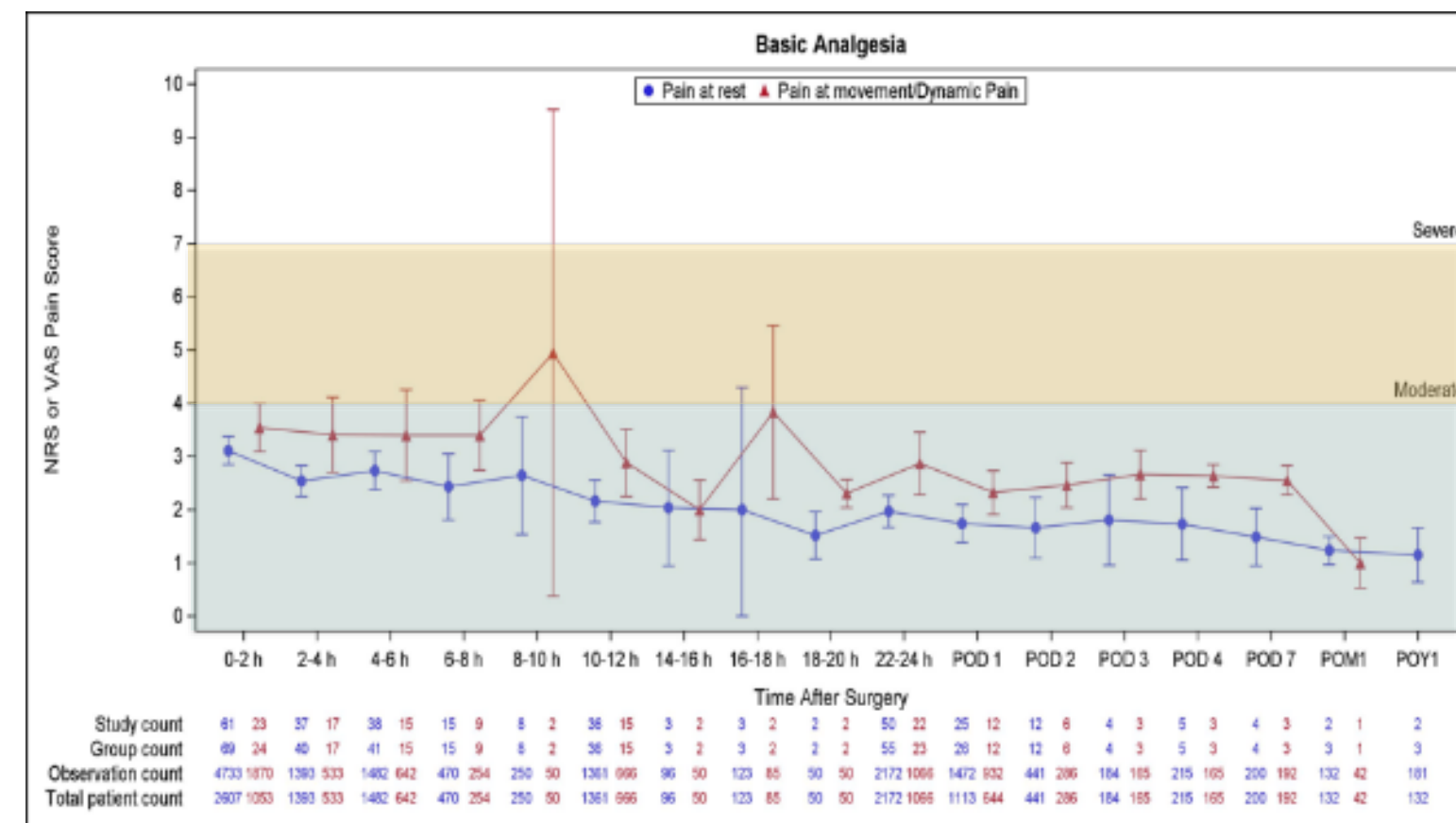


Figure 1. Pain trajectories for patients receiving basic analgesia. POD: postoperative day; POM: postoperative month; POY: postoperative year

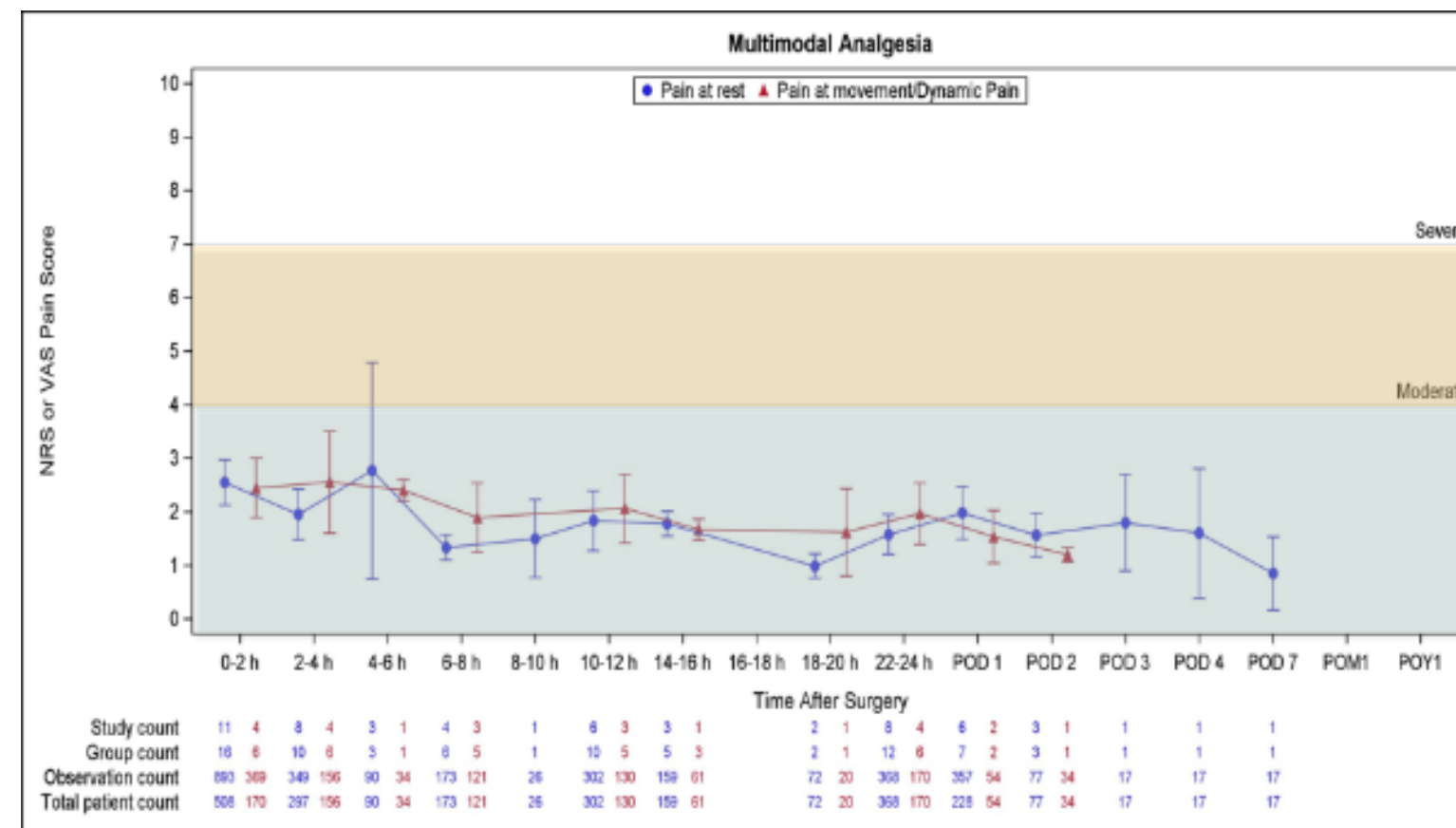


Figure 2. Pain trajectories for patients receiving multimodal analgesia

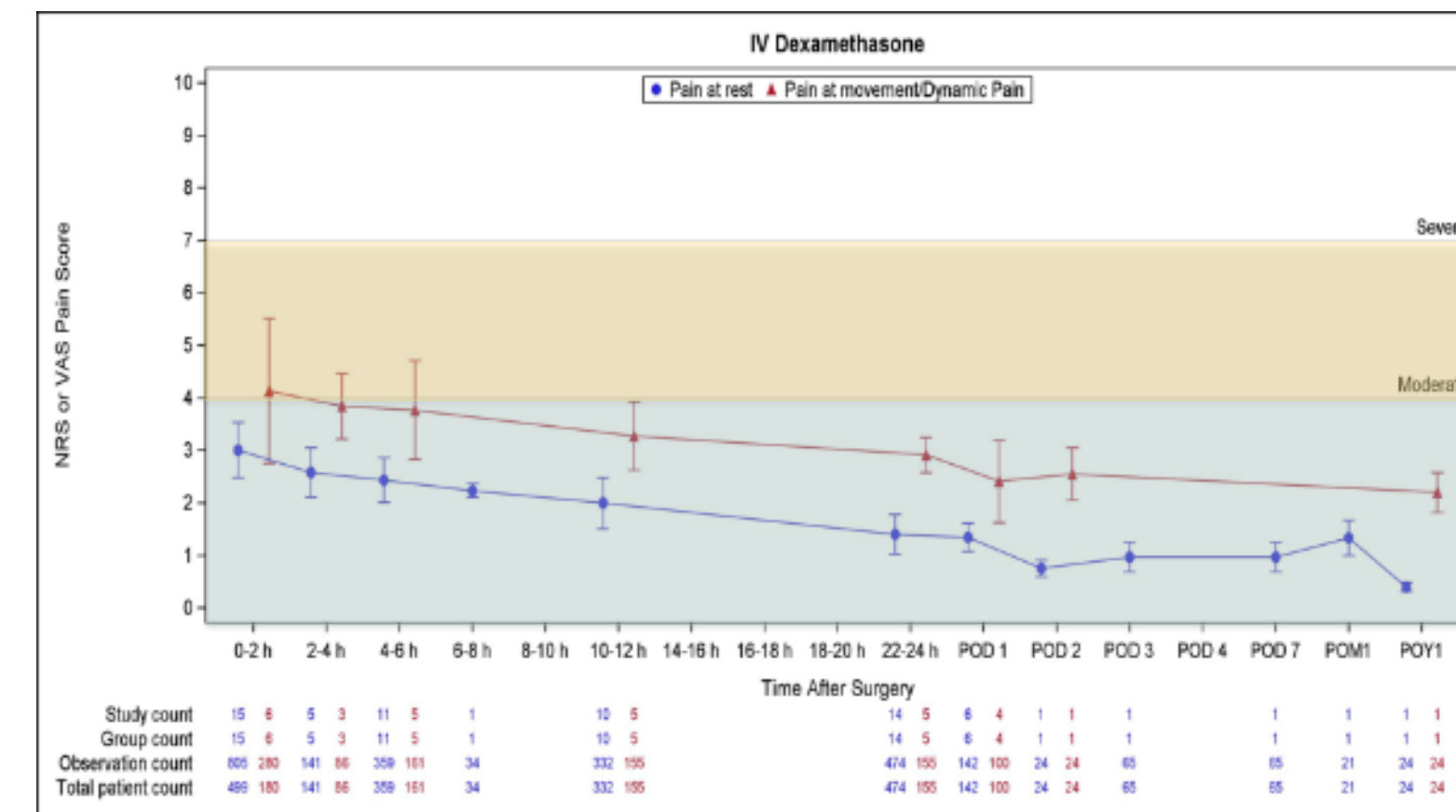


Figure 3. Pain trajectories for patients receiving IV dexamethasone

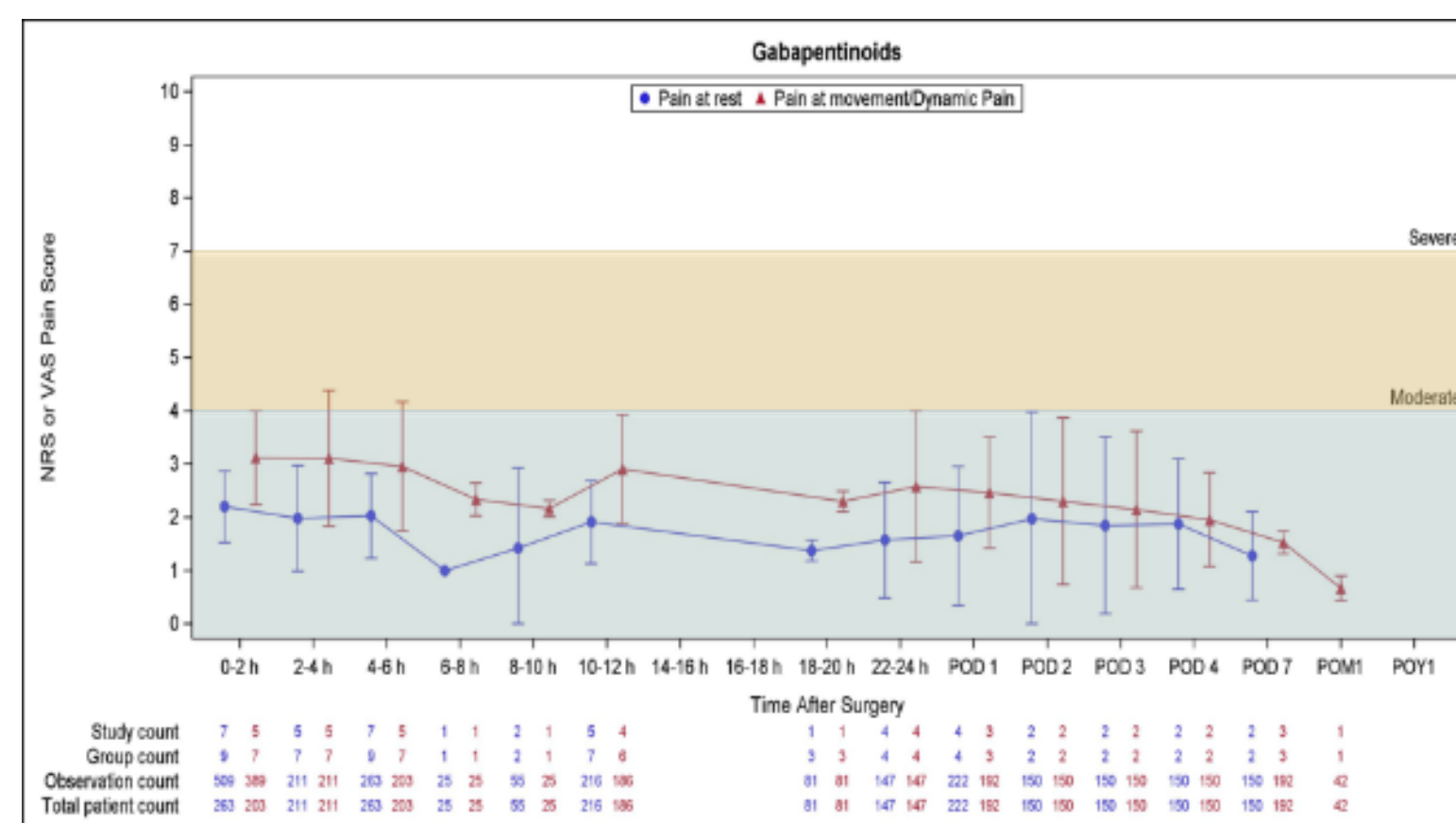


Figure 4. Pain trajectories for patients receiving gabapentinoids

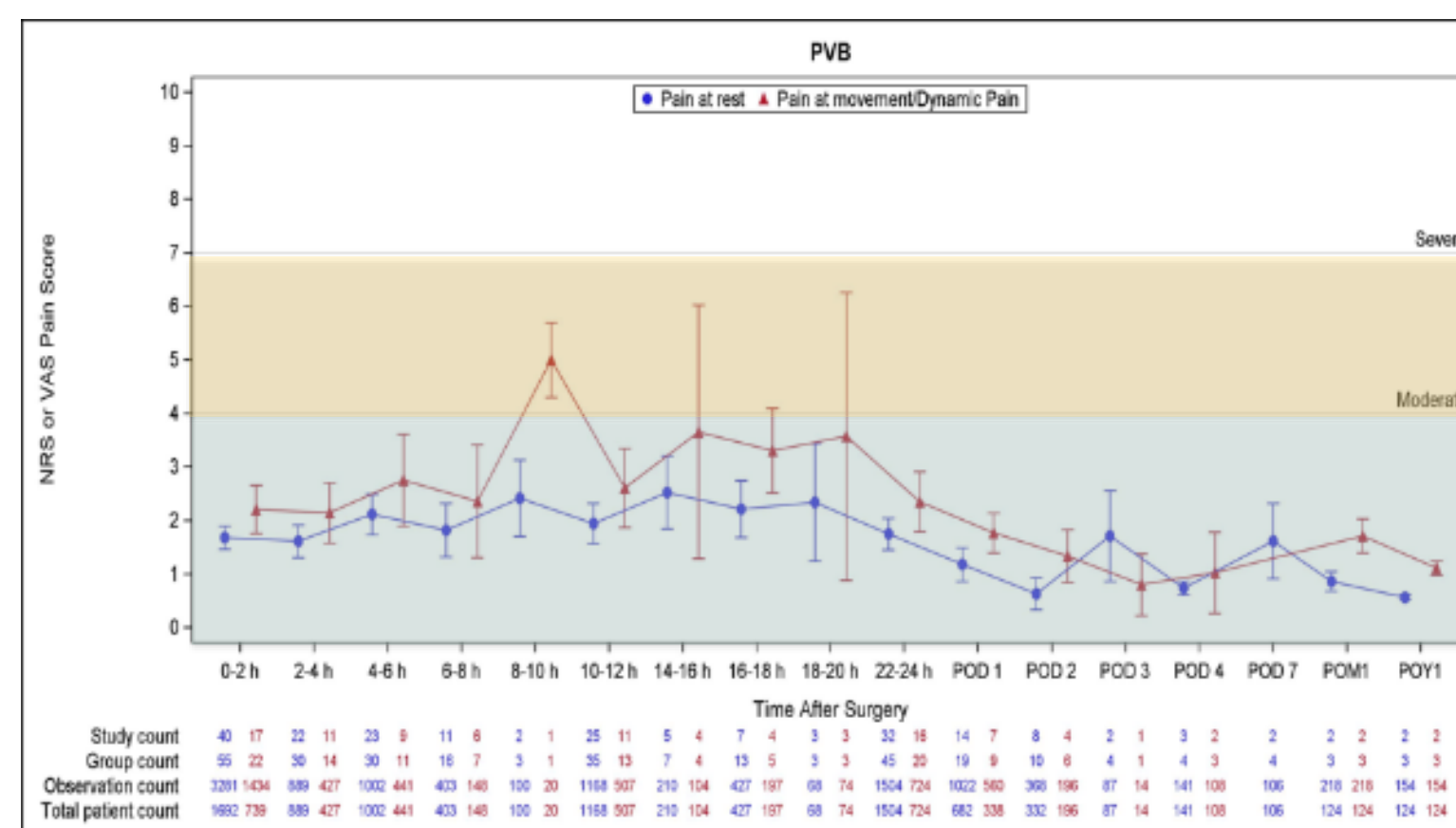


Figure 5. Pain trajectories for patients receiving PVB

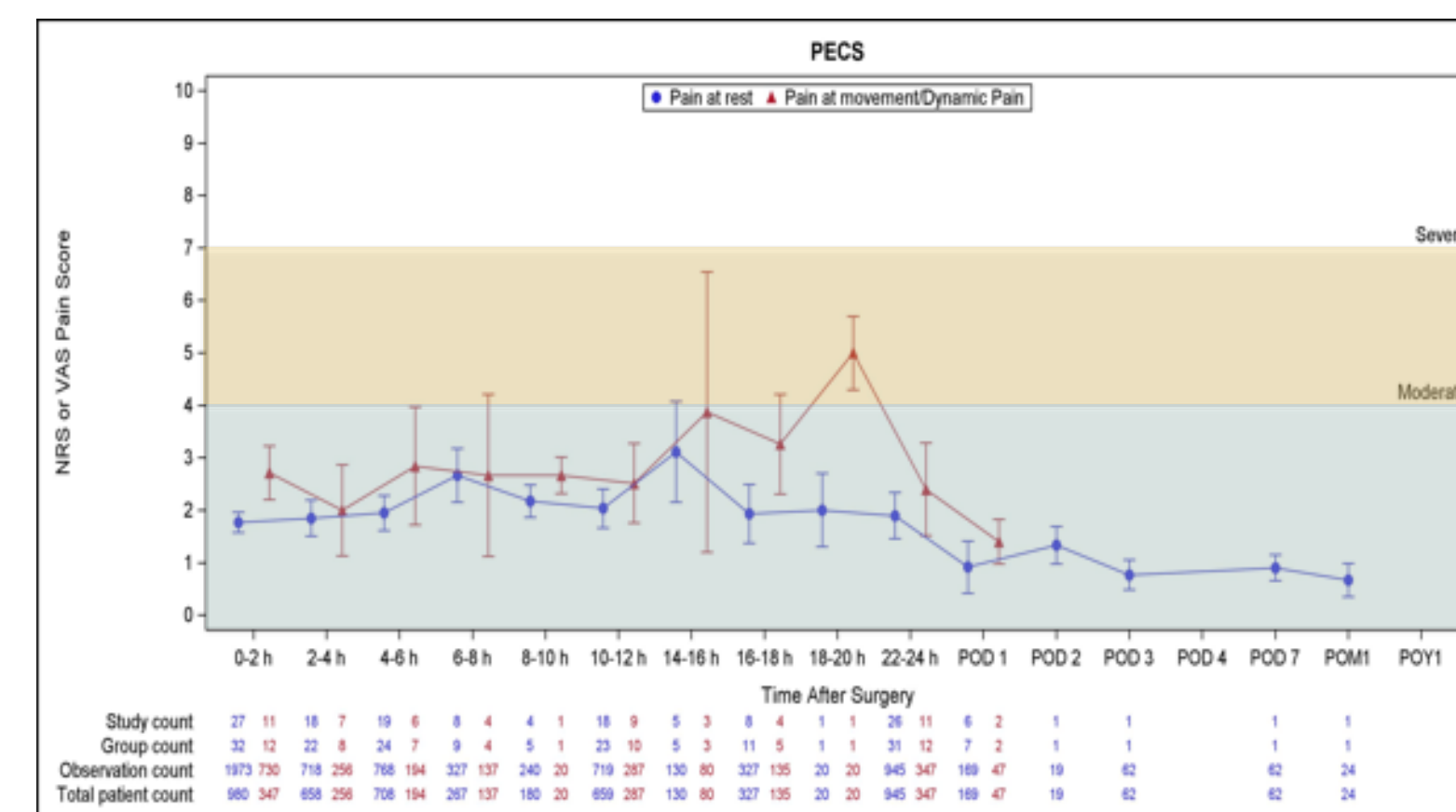


Figure 6. Pain trajectories for patients receiving PECS block

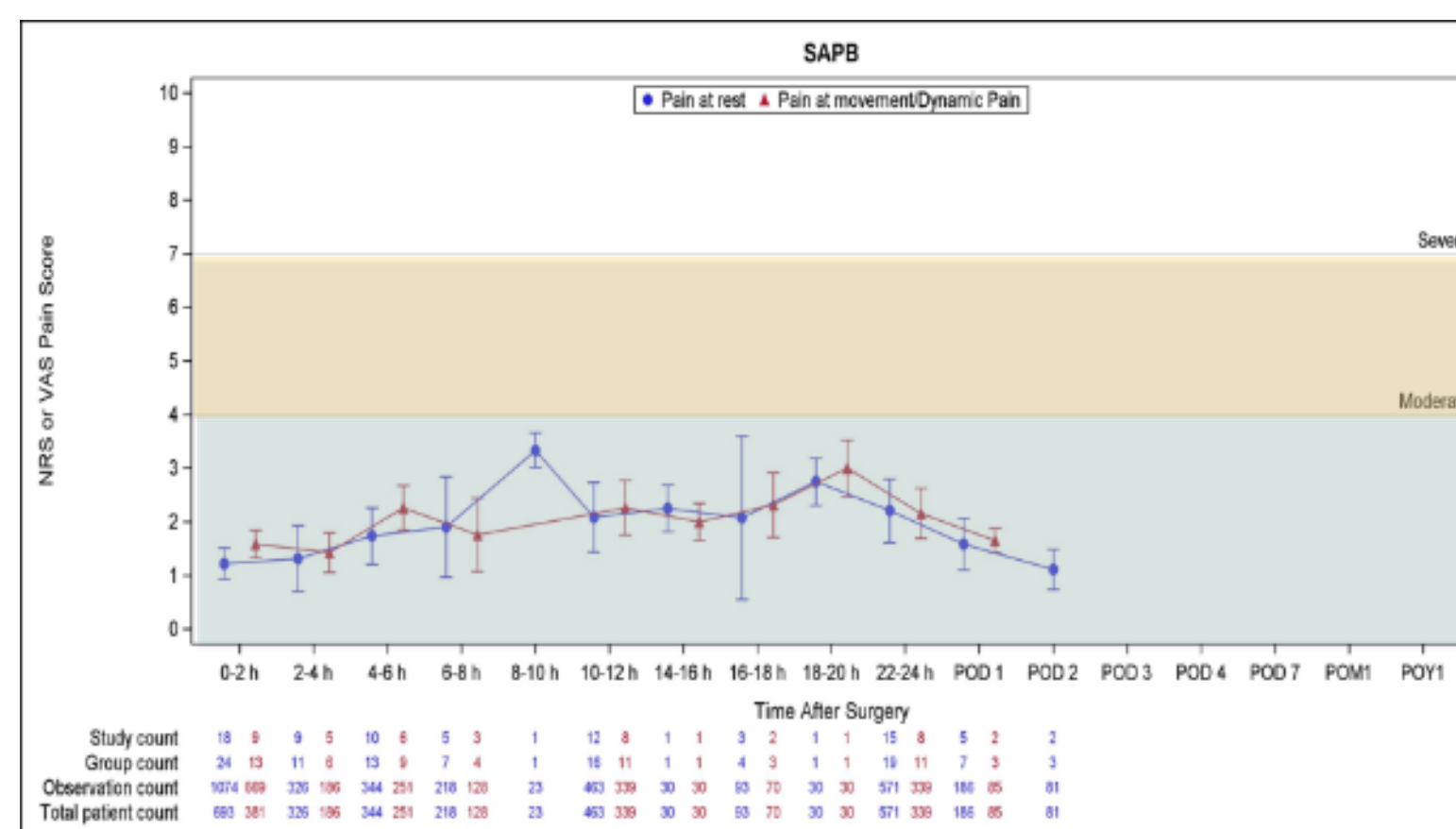


Figure 7. Pain trajectories for patients receiving SAPB

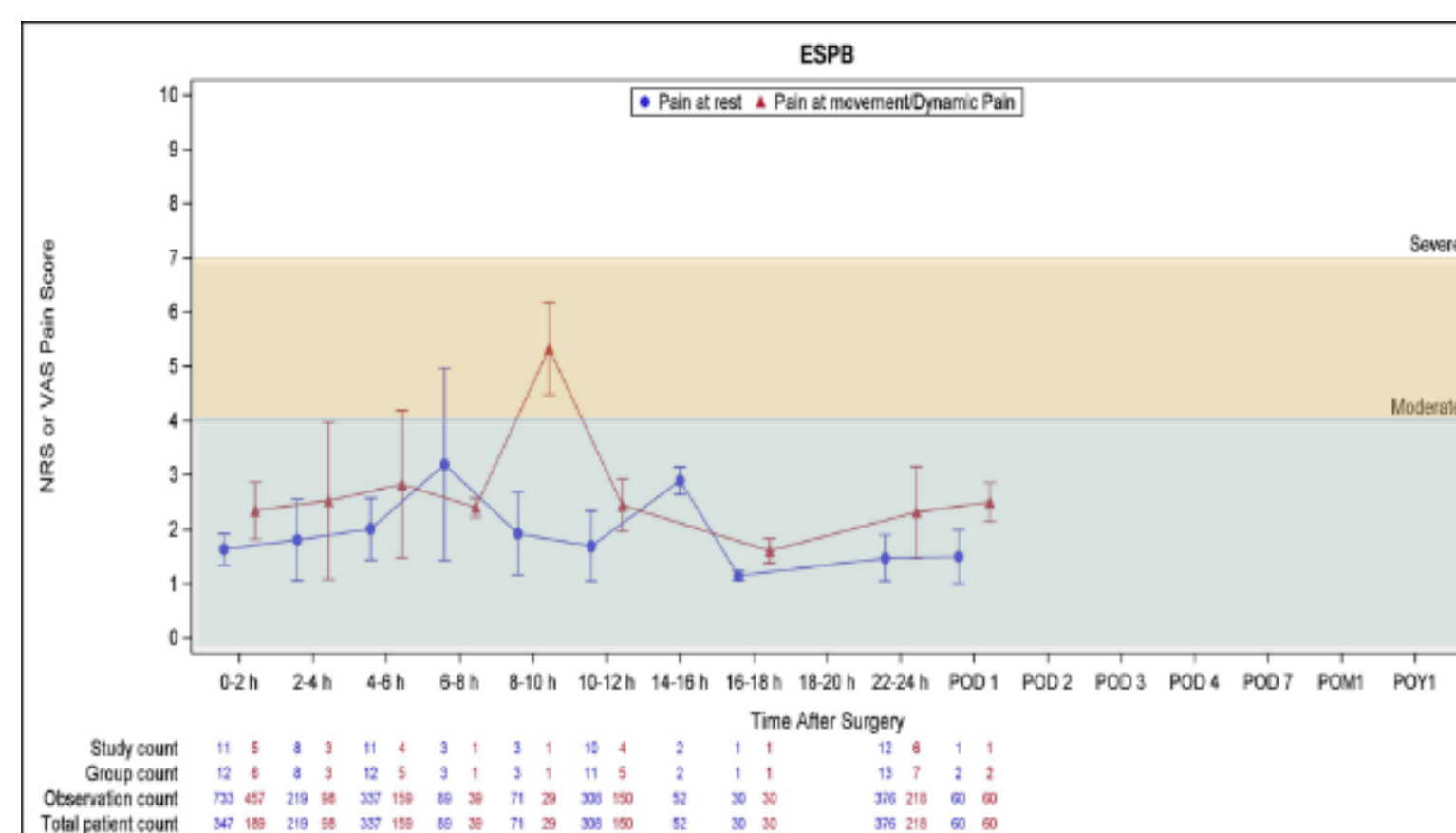


Figure 8. Pain trajectories for patients receiving ESPB

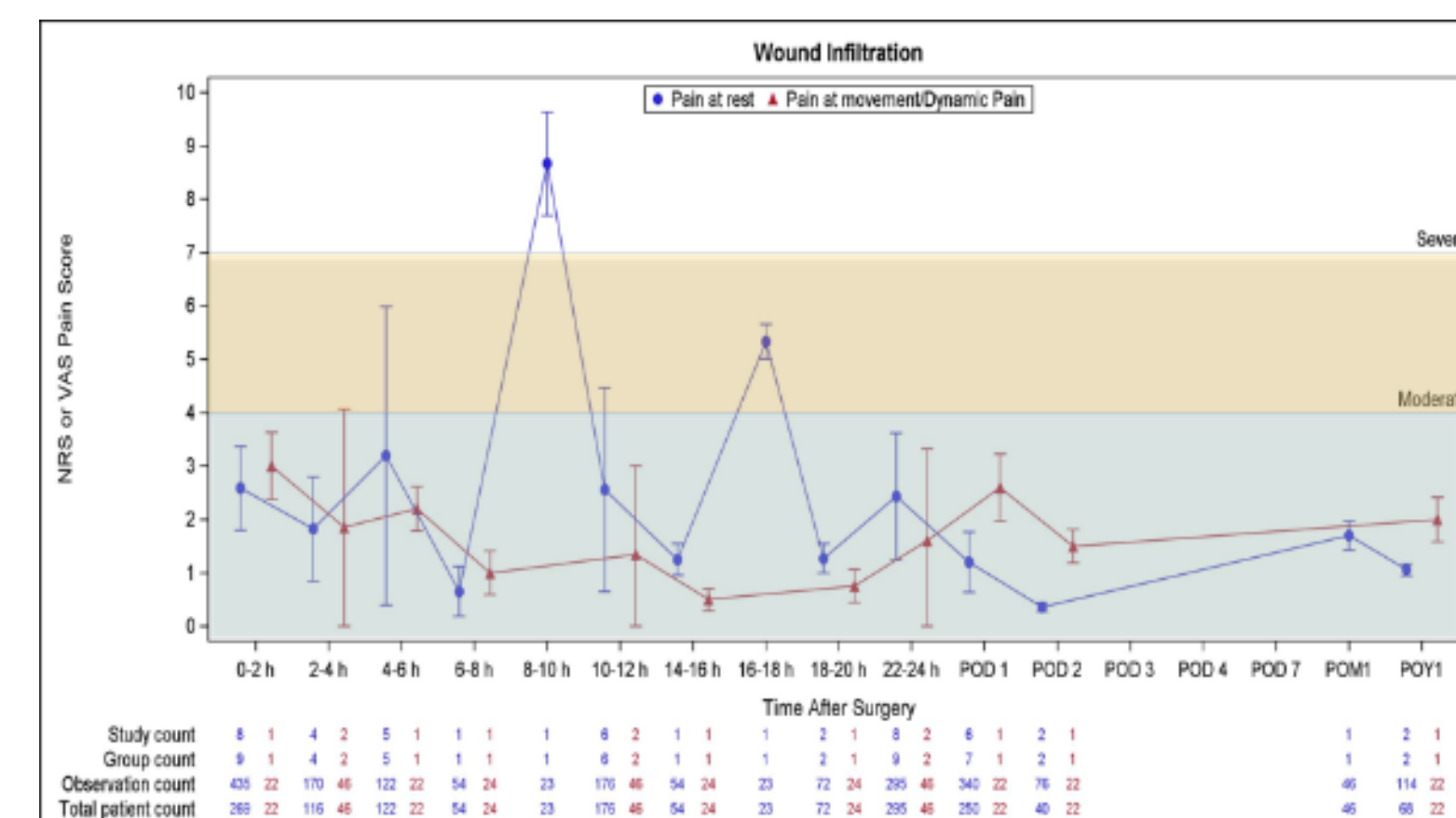


Figure 9. Pain trajectories for patients receiving wound infiltration with local anesthesia

Discussion

- Basic analgesia alone does not optimally treat pain after oncologic breast surgery
- Multimodal analgesia and adjuncts such as dexamethasone and gabapentinoids produced flattened pain curves, especially for pain with movement
- Regional anesthesia techniques produced pain curves with overall low pain scores but with time points of elevated pain within the first 24 hours, likely related to block resolution
 - Out of the four techniques analyzed, SAPB demonstrated the lowest pain scores with most mild increases in pain
- Wound infiltration appears to be inadequate
- Similar research may be done for other procedures to help clinicians improve procedure-specific analgesic treatment
- Limitations:
 - There was considerable heterogeneity between studies
 - Studies often used combinations of analgesic categories (e.g. regional blocks plus multimodal regimens)
 - Data was sparse beyond POD1 or POD2
 - Pain curves do not account for interindividual variability
 - Distribution of type and extent of oncologic breast surgery (lumpectomy, mastectomy, mastectomy with reconstruction, with or without axillary lymph node dissection, etc.) was not factored into our analysis; there are likely differences in pain between each of these groups

References

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