

Background

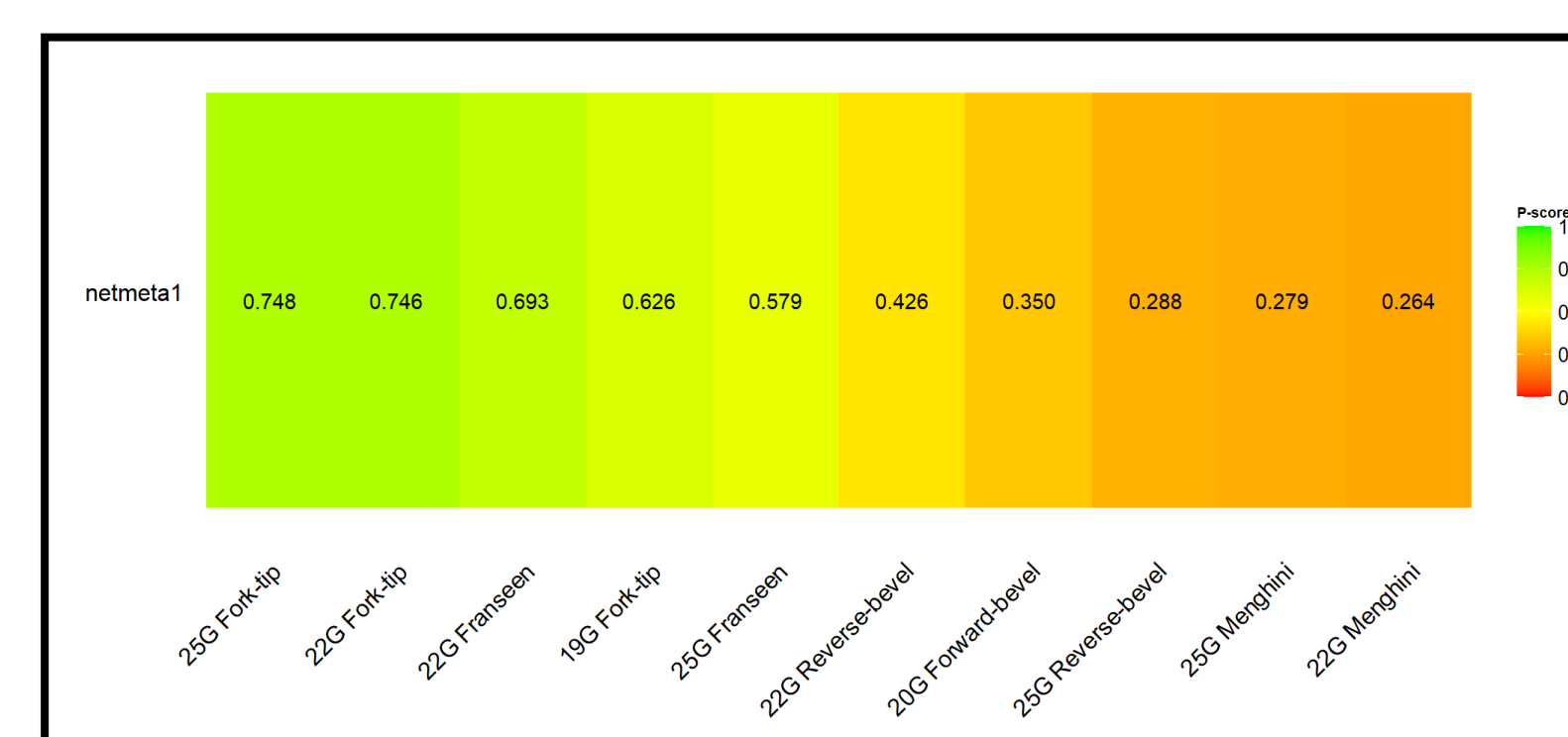
Several needle designs are available in different sizes for endoscopic ultrasound (EUS)-guided tissue acquisition (TA) of solid pancreatic masses, and they offer different efficacy and safety profiles. No clear guidelines exist for the choice of needle for TA in this context. Our Aim: To compare the needles regarding efficacy (diagnostic adequacy, technical failures) and safety (adverse effects), and to create a ranking of all available needle types through network meta-analysis.

Methods

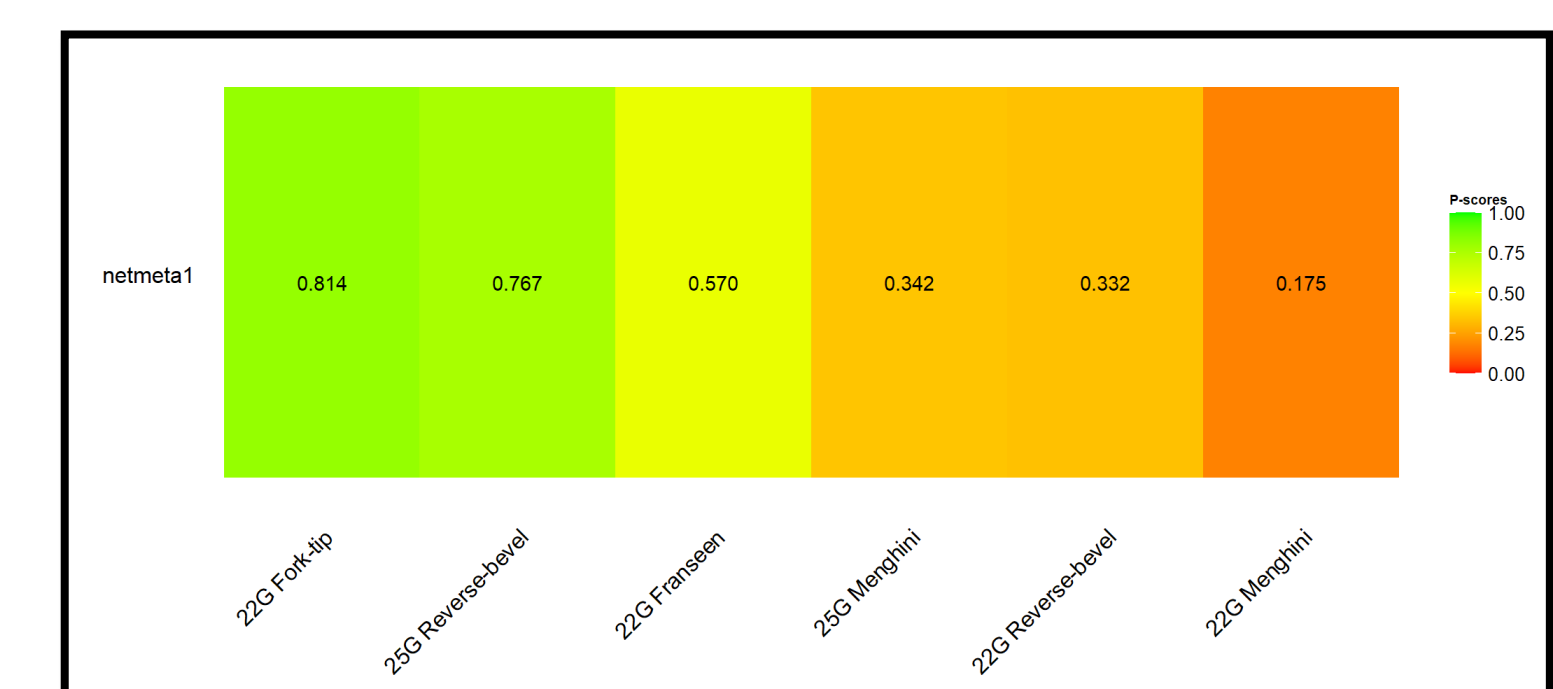
- **Systematic search:** MEDLINE (via PubMed), CENTRAL, Embase, Web of Science and Scopus, until October 2021
- **Inclusion criteria:** Randomized controlled trials, comparing at least two needles of a specified gauge for TA of solid pancreatic masses
- **Statistics:** Odds ratios were calculated, a random effects model applied and the P-score (0 to 1) was calculated to rank the needles.

Results

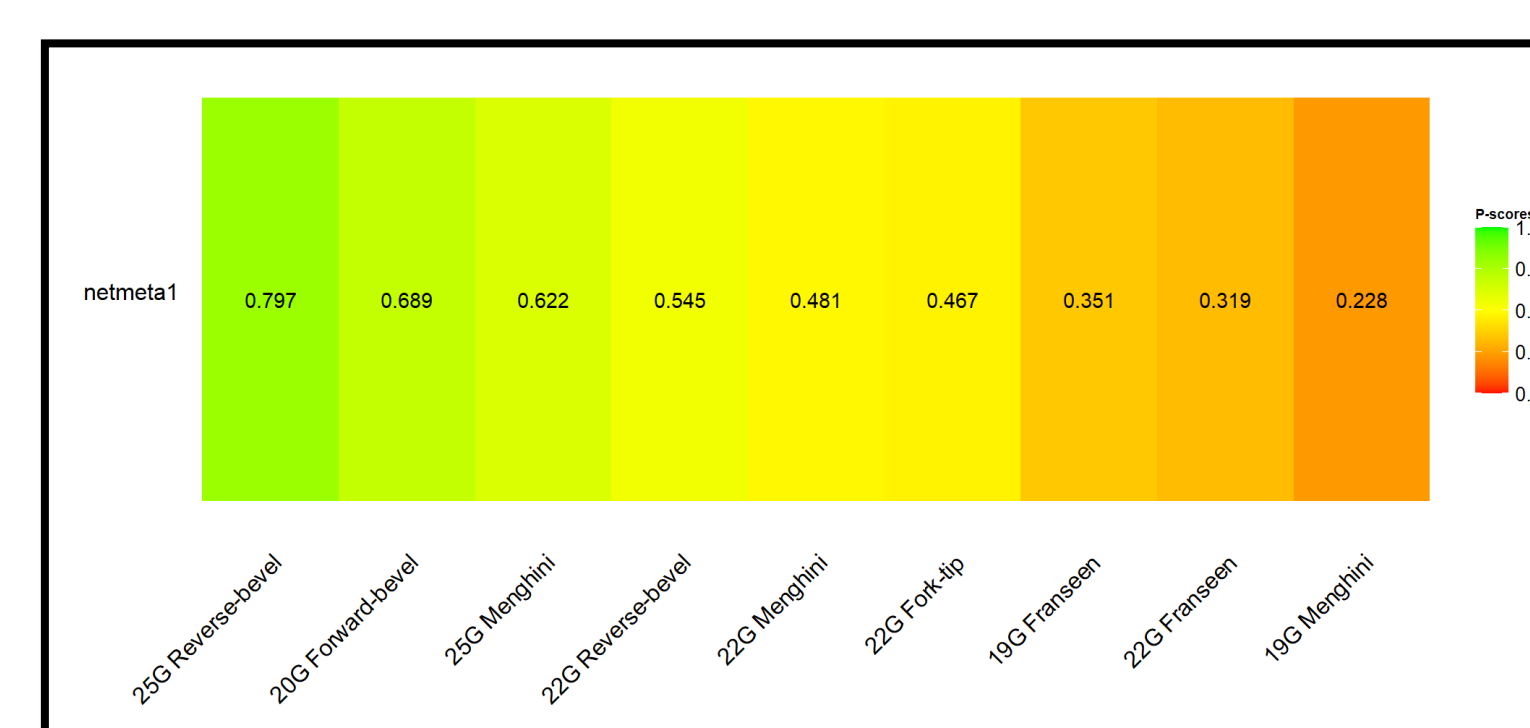
- **35 included studies**
- **Histological adequacy:**
 - **Best:** 25G (0.748) and 22G (0.746) Fork-tip
 - **Worst:** 25G (0.279) and 22G (0.264) Menghini
- **Cytological adequacy:**
 - **Best:** 22G (0.814) Fork-tip, 25G (0.767) Reverse-bevel
 - **Worst:** 22G Reverse-bevel (0.332), 22G Menghini (0.175)
- **Adverse events:**
 - **Best:** 25G Reverse-bevel (0.797), 20G forward-bevel (0.689)
 - **Worst:** 22G Franseen (0.319), 19G Menghini (0.228)
- **Technical failures:**
 - **Best:** 25G (0.845) and 22G (0.742) Franseen
 - **Worst:** 22G Reverse-bevel (0.199), 19G Menghini (0.060)



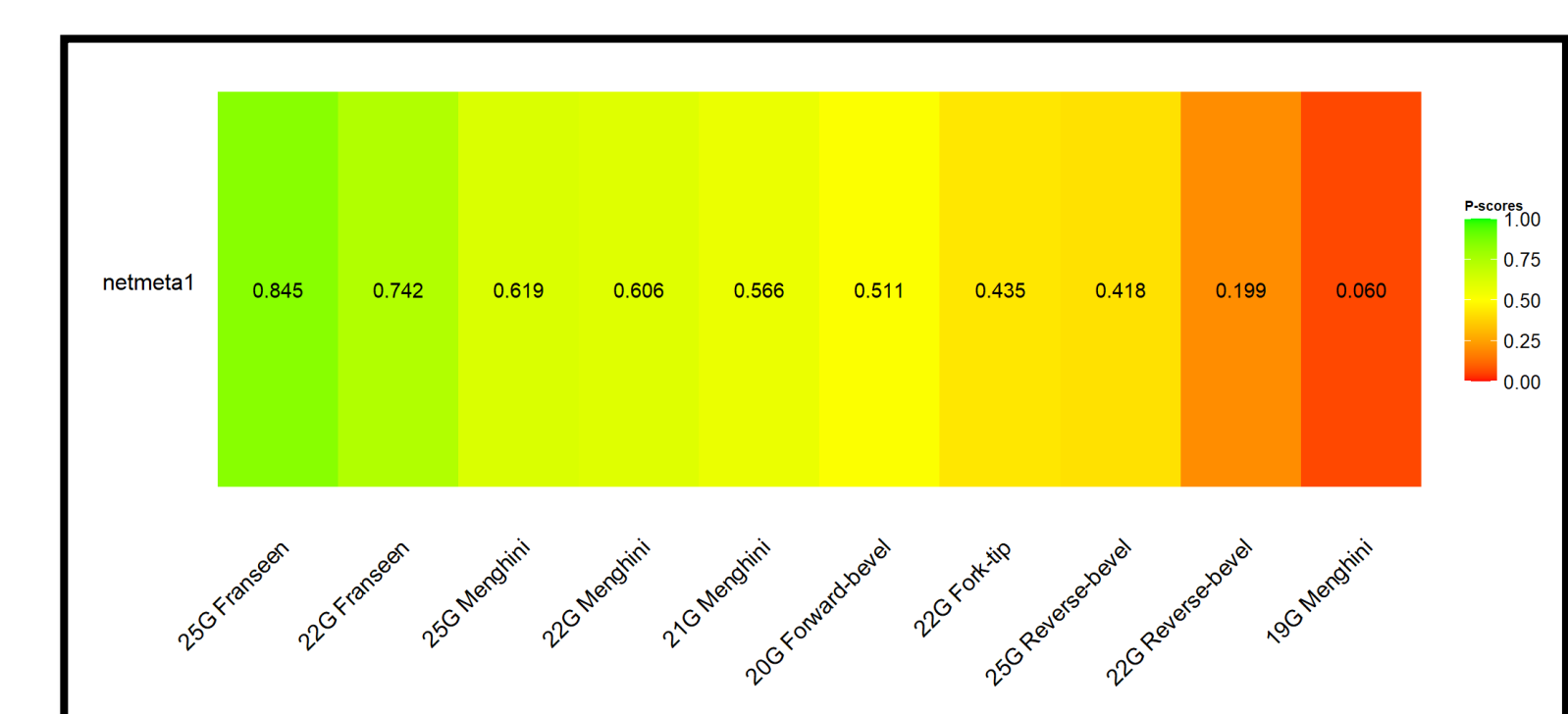
Ranking of histological adequacy with P-score



Ranking of cytological adequacy with P-score



Ranking of adverse effects with P-score



Ranking of technical failures with P-score

Summary

Based on our results, fork-tip needles can be recommended for their higher diagnostic adequacy but with a slightly increased risk of adverse events. Menghini needles performed worst for nearly all outcomes. Limitations of the review are large uncertainties due to low event numbers for adverse events and technical failures and a small number of direct comparisons.