

Introduction

Primary hyperparathyroidism is the most prevalent cause of hypercalcemia, estimated at 0.86% among the American population. Classic symptoms are encapsulated in the well-known phrase, "stones, bones, groans, and psychiatric overtones."

Prior research has highlighted the necessity for a deeper exploration of the role of parathyroidectomy in addressing neurocognitive symptoms in patients with primary hyperparathyroidism. Further research is needed to delineate the specific neurocognitive deficits experienced by these patients.

To delve into this area of interest comprehensively, a systematic review was undertaken to investigate the impact of parathyroidectomy on neurocognitive test outcomes for individuals diagnosed with primary hyperparathyroidism.

Methods and Materials

A systematic review adhering to PRISMA guidelines was conducted utilizing EMBASE, PubMed, and Ovid as search databases.

Search Terms

Parathyroidectomy OR hyperparathyroidism AND depression, mood disorder, neuropsychological, concentration, sleep, cognition, or neurocognitive.

Inclusion Criteria

Included studies evaluated neurocognitive function in adult patients with primary hyperparathyroidism preoperatively and postoperatively.

Exclusion Criteria

Studies were excluded if they lacked pre/postoperative comparisons, quantitative neurocognitive testing, pertained to secondary or tertiary hyperparathyroidism, or were not published in the English language.

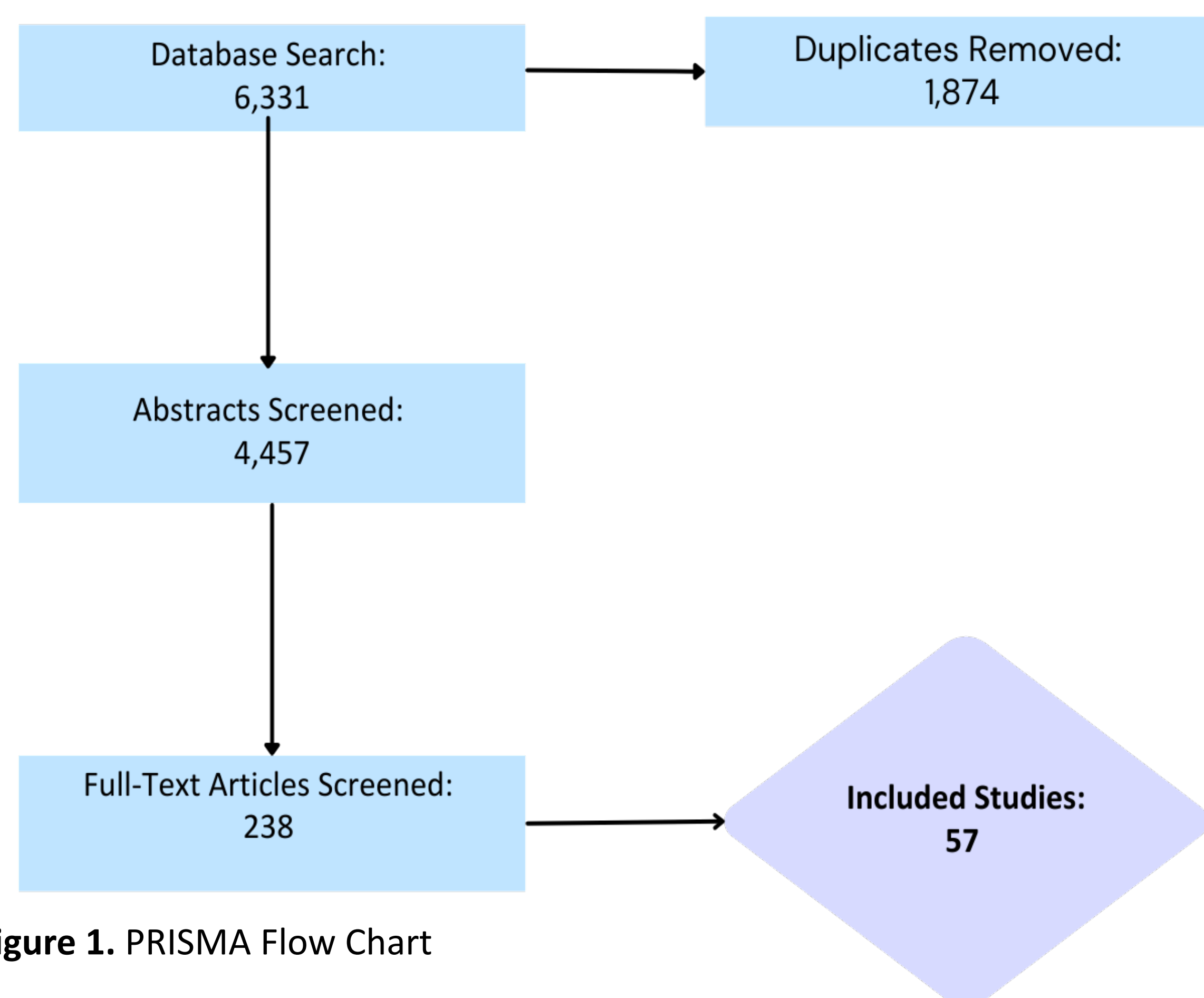


Figure 1. PRISMA Flow Chart

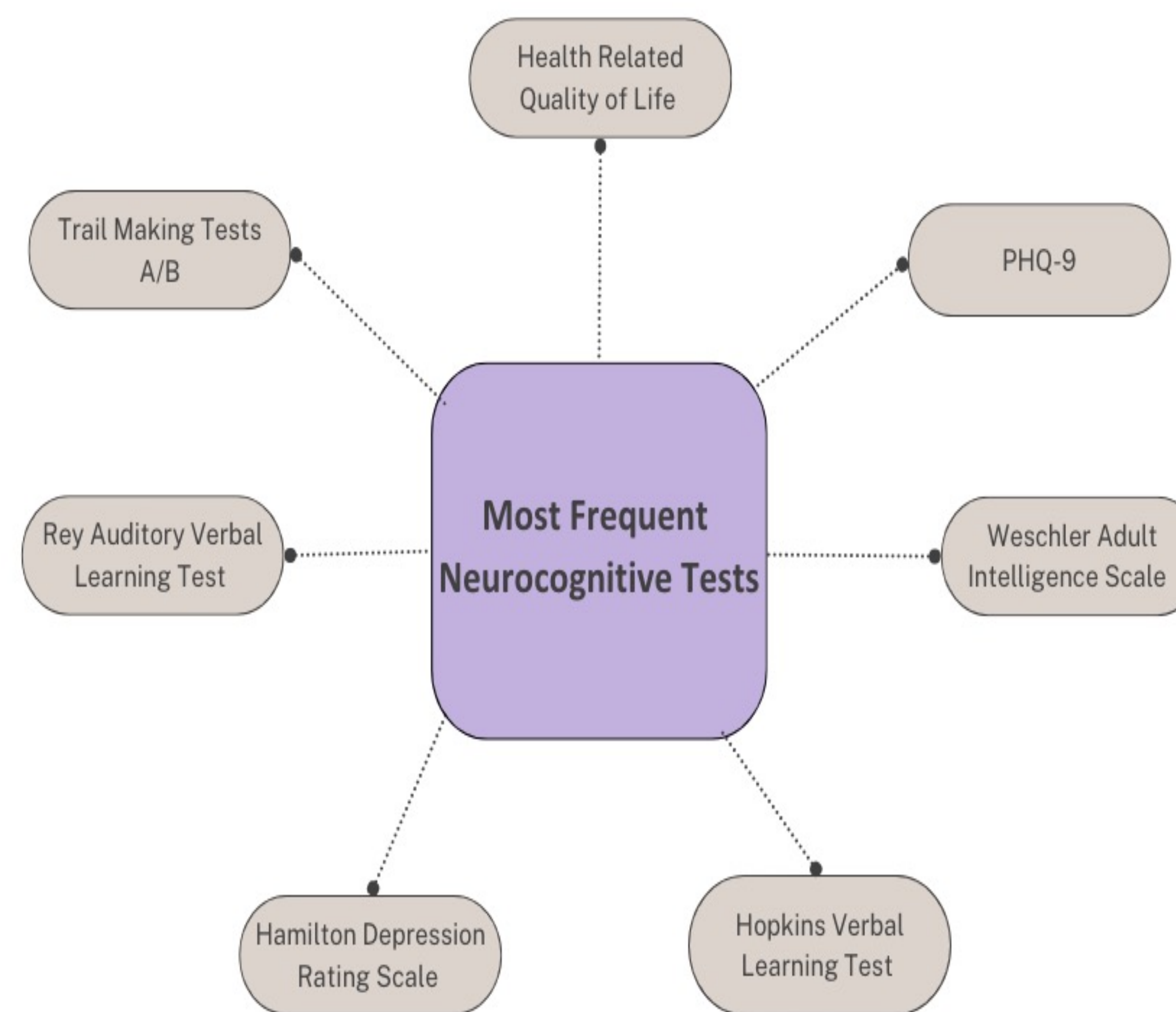


Figure 2. Most Common Neurocognitive Tests

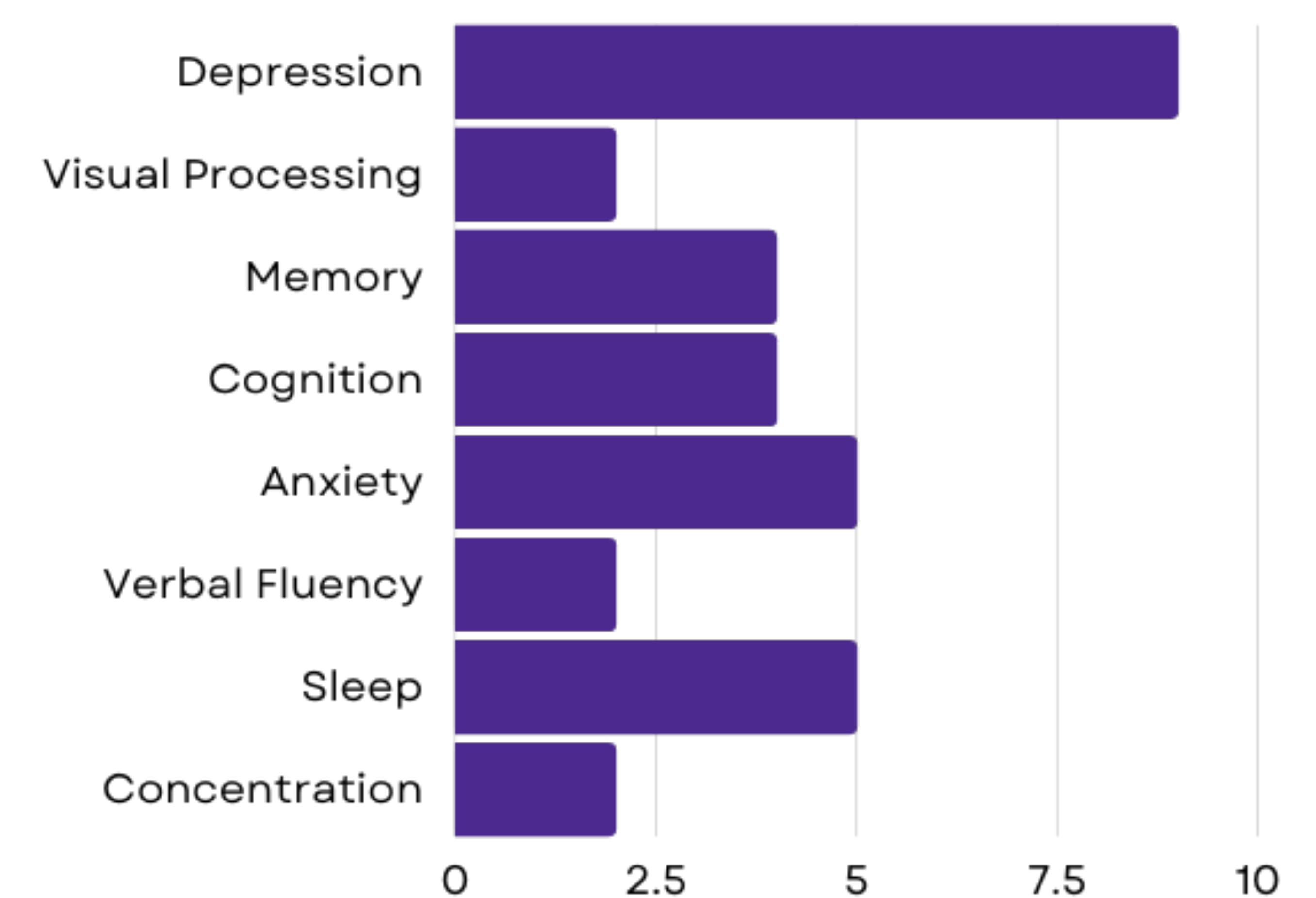
Results

- The existing body of research reveals a diverse array of neurocognitive tests, comprising a **total of 98 distinct assessments within this dataset.**
- Among those studies reporting statistically significant findings, the most frequently employed neurocognitive tests were:
 - Health-related quality of life
 - Trail making test
 - Wechsler Adult Intelligence Scale
 - Hamilton Depression Rating Scale
 - PHQ-9
 - Rey Auditory Verbal Learning Test
 - Hopkins Verbal Learning Test.
- Neurocognitive domains which displayed statistically significant postoperative improvement in multiple studies include:
 - Depression
 - Anxiety
 - Sleep
 - Memory
 - Cognition
 - Visual processing
 - Verbal fluency
 - Concentration
- It is worth highlighting that depression emerged as the most prevalent and statistically significant postoperative improvement observed in these studies.

Discussion

- The mechanism for the neurocognitive effects of hyperparathyroidism are unknown, based on previous research there is additionally no correlation with biochemical markers (calcium/PTH)¹
- Studies suggest higher preoperative rates of depression and anxiety in patients with primary hyperparathyroidism compared with the general population which appear to be responsive to surgery⁴
- Depression and anxiety are known confounders of Neurocognitive testing, the extent to which this impacts the other documented neurocognitive outcomes and quality of life measures is unclear³

Figure 3. Neurocognitive Domains with Statistically Significant Postoperative Improvement



Conclusions

- The current body of research is heterogenous without conclusive evidence to support parathyroidectomy for neurocognitive symptoms.
- There is evidence to suggest responsiveness of neurocognitive symptoms to surgical intervention.
- Of the statistically significant results in this data set, depression was the most frequently documented postoperative improvement.
- The use of standard symptom-based screening questionnaires such as PHQ-9
- Further research is warranted to investigate neurocognitive response with a standardized neurocognitive testing battery specifically aimed at previously documented responsive domains as outlined in this study.

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Disclaimer

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