Figure 1. Flowchart of literature review process (Questions 1 & 2)

Medline search
(427 citations)

Papers retrieved
(225)

Preliminary included papers
(24)

Excluded papers
(200)

Phase I Screening
(abstracts)

Phase II Screening
(full-text)

Studies eligible for data extraction (by question)

1a
(11)
Clinical tests

1b
(13)
Clinical & Electrodiagnostic tests
Figure 2. Flowchart of literature review process (Question 3)

Medline search (1710 citations)

Phase I Screening (abstracts)

Papers retrieved (333)

Phase II Screening (full-text)

Preliminary included papers (35)

Excluded papers (295)

Studies eligible for data extraction (by question)

- 1576 Excluded abstracts + 199 Papers identified from other questions and manual bibliographic checks

Q3 (35)
Figure 3. Flowchart of literature review process (Question 4)

1. Medline search (1710 citations)
   - Papers retrieved (97)

2. Phase I Screening (abstracts)
   - Preliminary included papers (33)
   - Excluded papers (64)

3. Phase II Screening (full-text)
   - 1635 Excluded abstracts
   + 22 Papers identified from other questions and manual bibliographic checks

4. Studies eligible for data extraction (by percent of patients with positive tests and outcomes)
   - Q4a (2)
   - Q4b (2)
   - Q4 a&b (20)
   - Excluded (2)

5. Studies eligible for data extraction (by pre- and post-surgical NCS means)
   - Q4b (14)
Figure 4. Flowchart of literature review process (Question 5)

Medline search (1710 citations)

Papers retrieved (33)

- 1690 Excluded abstracts
  + 13 Papers identified from other questions and manual bibliographic checks

Phase I Screening (abstracts)

Preliminary included papers (20)

Excluded papers (12)

Phase II Screening (full-text)

Studies eligible for data extraction (by treatment)

Steroid (12)

Ergonomics (1)

Splint (5)

"Other" Scales of Relief Assessment (2)

Boston Questionnaire (3)

VAS (1)

VAS+BQ (1)

NSS (1)

VAS+NSS+SSS (1)

VAS+FSS+SSS (1)

FSS+SSS (2)

Boston Questionnaire (1)

SSS (1)

VAS+BQ (1)

NSS (1)

VAS+NSS+SSS (1)

"Other" Scales of Relief Assessment (1)
Figure 4.1. Studies on clinical tests

Figure 4.2. Studies on electrodiagnostic tests
Figure 4.3. Studies on signs/symptoms

Figure 4.4. Studies on median nerve electrodiagnostic tests
Figure 4.5. Studies on comparative electrodiagnostic tests
Figure 5. Level of evidence of studies addressing questions 1 & 2

Figure 6. Level of evidence of studies addressing question 3
Figure 7. Level of evidence of studies addressing question 4

Figure 8. Level of evidence of studies addressing question 5
Figure 9. Types of study design that compare CTS diagnostic tests

Study Design for Questions 1 & 2

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Number of Studies</th>
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<tr>
<td>Cross-Sectional</td>
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<td>Cohort</td>
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<td>Case Control</td>
<td>21</td>
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Study Design Question 3

<table>
<thead>
<tr>
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<tr>
<td>Case-Control</td>
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<tr>
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<tr>
<td>Cross-Sectional</td>
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</table>
Figure 10. All tests

Figure 11. Case-control study design (electrodiagnostic and clinical tests)
Figure 12. Cohort study design (electrodiagnostic and clinical tests)

Figure 13. Cross sectional study design (electrodiagnostic and clinical tests)
Figure 14. Electrodiagnostic tests case-control study design

Figure 15. Clinical tests case-control study design
Figure 16. Clinical/Psychomotor tests

Figure 17. Flick, Thenar sign
Figure 18. Pinch strength

![Graph showing SROC curve with sensitivity on the y-axis and 1-specificity on the x-axis. The AUC is 0.9959, SE(AUC) is 0.0140, Q = 0.1097, and SE(Q) is 0.0099.]

Figure 19. Provocative tests

![Graph showing ROC plane with sensitivity on the y-axis and 1-specificity on the x-axis. Various points are scattered across the plane, indicating the performance of different tests.]
Figure 20. Carpal compression tests

![Carpal compression tests graph](image)

Figure 21. Phalen’s test

![Phalen’s test graph](image)
Figure 22. Tinel’s sign

Figure 23. Pressure provocative tests
Figure 24. Sensory tests

Figure 25. Touch tests
Figure 26. Vibrometry

![Vibrometry Diagram]

Figure 27. Two-point discrimination, Semmes-Weinstein monofilament, ridge/gap detection

![Two-point Discrimination Diagram]
Figure 28. Systematic

Figure 29. Median mixed nerve – ulnar mixed nerve
Figure 30. Ulnar comparative amplitude

Figure 31. Ulnar comparative latency
Figure 32. Median motor – ulnar motor

Figure 33. Second lumbrical – Interosseous (2L-INT)
Figure 34. Thenar studies

Figure 35. Median sensory – ulnar sensory: wrist to ring finger
Figure 36. Sensory ulnar latency comparative

Figure 37. Sensory ulnar velocity comparative
Figure 38. Median sensory – radial sensory: wrist-to-thumb

Figure 39. Radial comparative velocity
Figure 40. Radial comparative latency

Figure 41. Median sensory – median mixed wrist to palm vs. forearm to digit
Figure 42. Segment comparison ratio

Figure 43. Segment comparison latency
Figure 44. Median motor – wrist to palm

Figure 45. Median motor – APB-DML
Figure 46. Median motor – DML amplitude, Non-APB DML

Figure 47. Unique tests
Figure 48. Median sensory/median mixed – wrist to palm

Figure 49. Median sensory/median mixed – wrist to palm test velocity
Figure 50. Median sensory/median mixed – DSL

Figure 51. Median sensory – wrist to palm
Figure 52. Median sensory velocity D2 to wrist, sensory amplitude digit, sensory velocity digit

Figure 53a. Sensory latency digit 1 to wrist
Figure 53b. Sensory latency digit 2 to wrist

Figure 54. Sensory latency digit 3 to wrist
Figure 55. Sensory latency digit 4 to wrist
Figure 56. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Sensory nerves, wrist-to-ring finger”

Figure 57. Case Control Studies Grouped by EDT: “Median Motor nerve, wrist-to-palm”
Figure 58. Case Control Studies Grouped by EDT: “Median Motor nerve, wrist-to-palm” measuring DML

Figure 59. Case Control Studies Grouped by EDT: “Median Sensory/Mixed nerve, wrist-to-palm”
Figure 60. Case Control Studies Grouped by EDT: “Median Sensory/Mixed nerve, wrist-to-palm” measuring DSL

Figure 61. Case Control Studies Grouped by EDT: “Median Sensory/Mixed nerve, wrist-to-palm” measuring wrist-to-palm velocity
Figure 62. Case Control Studies Grouped by EDT: “Median Sensory nerve, wrist-to-digit”

Figure 63. Case Control Studies Grouped by EDT: “Comparison of Median nerve, wrist-to-palm segment to other Median nerve segment (i.e. elbow-to-wrist, palm-to-digit)”
Figure 64. Cohort Studies Question 3: Relationship between Symptoms and EDT

Figure 65. Cross Sectional Studies Question 3: Relationship between Symptoms and EDT
Figure 66. Cross Sectional Studies Grouped by EDT: “Combination of two or more EDT or NCS”

Figure 67. Cross Sectional Studies Grouped by EDT: “Comparison of Median to Ulnar Sensory nerves, wrist to digit”
Figure 68. Cross Sectional Studies Grouped by EDT: “Median Nerve Inching (White, et al. only)”

Figure 69. Cross Sectional Studies Grouped by EDT: “Median Sensory/Mixed nerve, wrist-to-palm”
Figure 70. Cross Sectional and Cohort Studies

Figure 71. Cross Sectional and Cohort Studies Grouped by EDT: “Combination of two or more EDT or NCS”
Figure 72. Cross Sectional and Cohort Studies Grouped by EDT: “Comparison of Median to Ulnar Sensory nerves, wrist to digit” measuring latency difference
Figure 73. Cross Sectional and Cohort Studies Grouped by EDT: “Median Nerve Inching (White, et al. only)”

Figure 74. Cross Sectional and Cohort Studies Grouped by EDT: “Median Sensory/Mixed nerve, wrist-to-palm”
Figure 75. Cross Sectional and Cohort Studies Grouped by EDT: “Median Sensory/Mixed nerve, wrist-to-palm” measuring wrist-to-palm velocity

Figure 76. ROC Space Combination of two or more EDT or NCS
Figure 77. ROC Space Comparison of Median to Ulnar Sensory nerves, wrist-to-digit

Figure 78. ROC Space Median Sensory/Mixed nerve, wrist-to-palm
Figure 79. ROC Space Median Nerve Inching

Figure 80a. ROC Space Median Sensory/Mixed nerve, wrist-to-palm
Figure 80b. ROC Space median motor nerve, wrist-to-palm measuring DML

Figure 81. ROC Space Median Sensory nerve, wrist-to-digit
Figure 82. ROC Space Comparison of Median to Radial Sensory nerves, wrist-to-thumb

Figure 83. ROC Space Comparison of Median nerve, wrist-to-palm segment to other Median nerve segment (i.e. elbow-to-wrist, palm-to-digit)
Figure 84. ROC Space Median Motor nerve TLI

Figure 85. Case-Control Studies Question 3: Relationship between Symptoms and EDT
Figure 86. Case Control Studies Grouped by EDT: “Combination of two or more EDT/NCS”

Figure 87. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Mixed nerves, wrist-to-palm”
Figure 88. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Mixed nerves, wrist-to-palm” and measuring latency difference

Figure 89. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Motor nerves”
Figure 90. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Motor nerves” comparing 2nd Lumbrical to Interosseous

Figure 91. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Motor nerves” comparing thenar muscles
Figure 92. Case Control Studies Grouped by EDT: “Comparison of Median to Radial Sensory nerves, wrist-to-thumb”

Figure 93. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Sensory nerves, wrist-to-digit”
Figure 94. Case Control Studies Grouped by EDT: “Comparison of Median to Ulnar Sensory nerves, wrist-to-digit” measuring latency difference
Figure 95. Summary of findings as reported by study authors

Number of studies reporting correlation between test results and surgical outcomes

- Clinical Tests:
  - Correlation: 10
  - No Correlation: 1

- Electrodiagnostic Tests:
  - Correlation: 14
  - No Correlation: 9
Figure 96. Correlation of positive surgical outcomes with positive clinical tests

Figure 97. Correlation of positive surgical outcomes with positive electrodiagnostic tests
Figure 98. Correlation of positive surgical outcomes with positive clinical plus electrodiagnostic tests

Figure 99. Meta-regression of positive surgical outcomes with positive clinical plus electrodiagnostic tests
Figure 102

Steroid Injection DML Improvement

![Graph showing DML score improvement over time for various studies.](image)

Duration (months)

Figure 103

Steroid Injection and mean change in SSS scores

![Graph showing SSS score change over time for various studies.](image)

Duration (months)
Figure 104. Magnetic resonance imaging (MRI) - Sensitivity

Summary Sensitivity

<table>
<thead>
<tr>
<th>Study</th>
<th>Sen [95% Conf. Interval.]</th>
<th>TP/(TP+FN)</th>
<th>TN/(TN+FP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seyfert</td>
<td>1.000 (0.79 - 1.00)</td>
<td>16/16</td>
<td>5/8</td>
</tr>
<tr>
<td>Jarvik</td>
<td>0.92 (0.83 - 0.97)</td>
<td>68/74</td>
<td>13/46</td>
</tr>
<tr>
<td>Kleindienst</td>
<td>0.98 (0.91 - 1.00)</td>
<td>56/57</td>
<td>0/1</td>
</tr>
<tr>
<td>Keberle</td>
<td>1.00 (0.78 - 1.00)</td>
<td>15/15</td>
<td>13/19</td>
</tr>
<tr>
<td>Zagnoli</td>
<td>0.72 (0.55 - 0.86)</td>
<td>26/36</td>
<td>22/24</td>
</tr>
</tbody>
</table>

Pooled Sen | 0.91 (0.87 to 0.95)

Chi-square = 21.71; df = 4 (p = 0.0002)
Inconsistency (I-square) = 81.6%
Figure 105. Magnetic resonance imaging (MRI) - Specificity

![Graph showing specificity with data points and confidence intervals]

### Summary Specificity

<table>
<thead>
<tr>
<th>Study</th>
<th>Spe [95% Conf. Interval.]</th>
<th>TP/(TP+FN)</th>
<th>TN/(TN+FP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seyfert</td>
<td>0.625 0.245 - 0.915</td>
<td>16/16</td>
<td>5/8</td>
</tr>
<tr>
<td>Jarvik</td>
<td>0.283 0.160 - 0.435</td>
<td>68/74</td>
<td>13/46</td>
</tr>
<tr>
<td>Kleindienst</td>
<td>0.000 0.000 - 0.975</td>
<td>56/57</td>
<td>0/1</td>
</tr>
<tr>
<td>Keberle</td>
<td>0.684 0.434 - 0.874</td>
<td>15/15</td>
<td>13/19</td>
</tr>
<tr>
<td>Zagnoli</td>
<td>0.917 0.730 - 0.990</td>
<td>26/36</td>
<td>22/24</td>
</tr>
</tbody>
</table>

Pooled Spe | 0.541 0.437 - 0.642

Heterogeneity chi-squared = 32.37 (d.f.= 4) p = 0.000
Inconsistency (I-square) = 87.6 %

No. studies = 5.
Filter OFF
Add 1/2 to all cells of the studies with zero
Figure 106. Magnetic resonance imaging (MRI) – ROC curve

Analysis Options:
Add 1/2 to all cells of the studies with zero
Filter OFF
Symmetric SROC curve fitted using Mantel-Haenszel Model
Defined relevant region: All ROC spac

Symmetric SROC
AUC = 0.8463
SE(AUC) = 0.0338
Q* = 0.7777
SE(Q*) = 0.0318