

Supplementary Material 4. Information relating to studies and values of diagnostic accuracy of clinical test

Study	Setting	Index test	Reference standard	Participant	Operator who have done index test	Prevalence	Sensitivity, % (95% CI)	Specificity (95% CI, %)	LR+ (95% CI)	LR- (95% CI)	PPV (95% CI, %)	NPV (95% CI, %)
Appelboom et al. (2008) [24]	ED	Elbow extension test	X-ray and phone call	1,740 Participants in 960 adults > 15 years and 780 children 3-15 years presented in the center within 72 hours of the trauma	Physicians and nurses	0.3	All: 96.8 (95.0-98.2) Adults: 98.4 (96.3-99.5) Children: 94.6 (90.7-97.2)	All: 48.5 (45.6-51.4) Adults: 47.7 (43.7-51.6) Children: 49.5 (45.2-53.7)	All: 1.88 (1.78-1.99) Adults: 1.88 (1.75-2.03) Children: 1.87 (1.72-2.05)	All: 0.06 (0.04-0.10) Adults: 0.03 (0.01-0.08) Children: 0.11 (0.06-0.19)	All: 45.8 (42.9-48.7) Adults: 48.1 (44.2-52.0) Children: 42.8 (38.4-47.3)	All: 97.2 (95.5-98.3) Adults: 98.4 (96.3-99.5) Children: 95.8 (92.6-97.8)
Hawksworth et al. (1991) [26]	ED	Elbow extension test	X-ray	100 Patients of all ages (1-85 years) who presented in ED in 12 weeks after trauma to the elbow	ED nurses	0.54	All: 90.7 (79.7-96.9)	All: 58.7 (43.2-73.0)	All: 2.2 (1.54-3.13)	All: 0.16 (0.07-0.38)	All: 72 (64.4-78.6)	All: 84.4 (69.4-92.8)
Arundel et al. (2014) [28]	ED	ER2: elbow extension+ bruising + tenderness	X-ray and phone call	492 Patients of all ages (2-96 years), adults (348) children (144)	Nurses, academics and physicians	NA	For elbow extension test: All: 84.0 (77.0-88.0) Adults: 86.0 (81.8-89.3) Children: 78.0 (66.0-87.0) For cluster: Adults: 100.0 (97.0-100.0)	Per elbow extension test: All: 54.0 (53.0-58.0) Adults: 48.7 (43.4-54.1) Children: 58 (51.0-62.0) For cluster: Adults: 24.0 (19.0-30.0)	For elbow extension test: All: 1.83 Adults: 1.68 (1.45-1.94) Children: 1.86 For cluster: Adults: 1.32	For elbow extension test: All: 0.3 Adults: 0.29 (0.18-0.46) Children: 0.38 For cluster: Adults: 0	For elbow extension test: All: NA Adults: 45 (39.7-50.4) Children: NA For cluster: Adults: NA	For elbow extension test: All: NA Adults: 87.7 (83.7-90.9) Children: NA For cluster: Adults: NA
Baker et al. (2011) [22]	Pediatric ED	ROM elbow	X-ray	177 Children between 3-16 years (within 24 hr from the trauma)	Physicians, specialists and academics	0.6	ROM elbow: 93.4 (86.9-97.3) Flexion: 88.7 (81.1-94.0) Extension: 80.2 (71.3-87.3)	ROM elbow: 33.8 (23.0-46.0) Flexion: 45.1 (33.2 - 57.3) Extension: 64.8 (52.5 - 75.8)	ROM elbow: 1.41 (1.19-1.68) Flexion: 1.62 Extension: 2.28	ROM elbow: 0.2 (0.09-0.43) Flexion: 0.25 Extension: 0.31	ROM elbow: 67.8 (59.6-75.3) Flexion: 70.7 (62.2-78.2) Extension: 77.3 (68.3-84.7)	ROM elbow: 77.4 (58.9-90.4) Flexion: 72.7 (57.2-85.0) Extension: 68.7 (56.2-79.4)

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Study	Setting	Index test	Reference standard	Participant	Operator who have done index test	Prevalence	Sensitivity, % (95% CI)	Specificity (95% CI, %)	LR+ (95% CI)	LR- (95% CI)	PPV (95% CI, %)	NPV (95% CI, %)	
Darracq et al. (2008) [13]	ED	ROM elbow + tenderness head of radius, olecranon, nonepicondyles	X-ray	113 Patients age > 5 years, within 24 hours of the trauma	Physicians, specialists and academics	0.47	All: ROM elbow: 100.0 (93.0–100.0) Extension: 100.0 (93.0–100.0) Flexion: 64 (50.0–69.0) Pronation: 34.0 (22.0–48.0) Supination: 43.0 (30.0–58.0) Point tenderness: 100.0 (93.0–100.0)	All: ROM elbow: 97 (88.5–100.0) Extension: 100.0 (94.0–100.0) Flexion: 100.0 (94.0–100.0) Pronation: 100.0 (94.0–100.0) Supination: 97.0 (88.5–100.0) Point tenderness: 67.0 (53.0–78.0)	All: ROM elbow: 33.33 Extension: max-imum Flexion: maximum Pronation: maximum Supination: inimum Point tenderness: 14.33 Point tenderness: 3.03	All: ROM elbow: 0 Extension: 0.00 Flexion: 0.36 Pronation: 0.66 Supination: 0.58 Point tenderness: 0	NA	NA	NA
Docherty et al. (2002) [25]	ED	Elbow extension test	X-ray	114 Patients age > 14 years and 24 hours after the trauma	Physicians and academics	0.34	All: 97.3 (84.6–99.9)	All: 69.4 (57.3–79.5)	All: 3.19 (2.24–4.53)	All: 0.04 (0.01–0.26)	All: 62.7 (49.1–74.7)	All: 98 (88.2–99.9)	
Dubrovsky et al. (2015) [29]	Pediatric ED	5 Points tenderness + elbow extension	X-ray and phone call	332 Children 0–18 years without signs of articular dislocation within 72 hr of the trauma; excluded pulled elbow	Physicians and specialists	0.55	Index test: 99.0 (97.1–100.0) Extension: 82.5 (75.2–89.9) Point tenderness: 95.1 (91.0–99.3)	Index test: 14.0 (9.5–18.5) Extension: 47.2 (40.7–53.6) Point tenderness: 23.1 (17.7–28.6)	Index test: 1.15 (1.09–1.22) Extension: 1.56 (1.34–1.82) Point tenderness: 1.24 (1.14 – 1.35)	Index test: 0.07 (0.01–0.50) Extension: 0.37 (0.24–0.58) Point tenderness: 0.21 (0.09 – 0.51)	Index test: 34.1 (28.7–39.5) Extension: 41.3 (34.5–48.0) Point tenderness: 35.8 (30.1–41.4)	Index test: 97 (91.1–100.0) Extension: 85.7 (79.6–91.8) Point tenderness: 91.4 (84.2–98.6)	

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Study	Setting	Index test	Reference standard	Participant	Operator who have done index test	Prevalence	Sensitivity, % (95% CI)	Specificity (95% CI, %)	LR+ (95% CI)	LR- (95% CI)	PPV (95% CI, %)	NPV (95% CI, %)
Jie et al. (2014) [30]	ED	ROM elbow+- tenderness head of radius, olecranon epicondyles	X-ray	587 Patients > 3 years and trauma within 72 hr of access	Nurses, physicians and specialists	0.63	All: Extension: 90.8 (86.3-94.2) Point tender- ness: 92.0 (87.2-95.5) Index test: 98.4 (95.4-99.7)	All: Extension: 42.7 (37.6-48.0) Point tender- ness: 17.3 (13.8-23.6) Index test: 8.4 (5.3-12.6)	All: Extension: 1.59 (1.44-1.75) Point tender- ness: 1.11 (1.04-1.19) Index test: 1.07 (1.03-1.12)	All: Extension: 0.21 (0.14-0.33) Point tender- ness: 0.46 (0.26-0.81) Index test: 0.19 (0.06-0.62)	All: Extension: 50.4 (47.9-52.8) Point tender- ness: 45.7 (43.9-47.4) Index test: 44.8 (43.8-45.8)	All: Extension: 87.9 (82.7-91.8) Point tender- ness: 74.1 (62.2-83.3) Index test: 87.5 (67.9-95.9)
Lamprakts et al. (2007) [27]	ED	Elbow extension test	X-ray	70 Patients aged 10-75 years with trauma within 6 hr	Physicians and Specialists in orthopedics	0.34	All: 91.7 (73.0-99.0) Children: 100 (15.8-100.0)	All: 60.9 (45.4-74.9) Children: 57.1 (18.4-90.1)	All: 2.34 (1.60-3.43) Children: 2.33 (0.99-5.49)	All: 0.14 (0.04-0.53) Children: 0 (0.00-0.00)	All: 55 (43.5-64.1) Children: 40 (22.1-61.1)	All: 93.3 (78.5-98.2) Children: 100 (100.0-100.0)

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Study	Setting	Index test	Reference standard	Participant	Operator who have done index test	Prevalence	Sensitivity, % (95% CI)	Specificity (95% CI, %)	LR+ (95% CI)	LR- (95% CI)	PPV (95% CI, %)	NPV (95% CI, %)
Lennon et al. (2007) [23]*	General Hospital	ROM elbow	X-ray	407 Patients of any age (2-96 years) presenting at any time from the trauma	Nurses, physicians and specialists	NA	All: Extension: 47.8 (40.3-55.5) Flexion: 56.5 (48.8-63.9) Pronosupination: 50.9 (43.3-58.5) ROM: 21.1 (15.5-28.1)	All: Extension: 91.6 (86.3-94.9) Flexion: 77.7 (70.8-83.4) Pronosupination: 79.5 (72.7-85.0) ROM: 97.6 (94.0-99.1)	All: Extension: 5.69 Flexion: 2.53 Pronosupination: 2.48 ROM: 8.79	All: Extension: 0.57 Flexion: 0.56 Pronosupination: 0.62 ROM: 0.8	All: Extension: 84.6 (75.8-90.6) Flexion: 71.1 (62.7-78.2) Pronosupination: 70.7 (61.8-78.2) ROM: 89.5 (75.9-95.8)	All: Extension: 66.4 (58.1-70.2) Flexion: 64.8 (58.0-71.1) Pronosupination: 62.6 (55.9-68.8) ROM: 56.1 (50.3-61.7)
Amiri et al. (2012) [21]	ED	ROM elbow	X-ray	102 Patients > 5 years within 24 hours of the trauma	Physicians	0.1	All: Extension: 54.1 (43.6-64.3) Flexion: 61.2 (50.5-70.8) Pronosupination: 51.8 (41.3-62.1) ROM: 25.9 (17.8-36.1) Children: 40.8 (30.4-52.0) Flexion: 51.3 (40.3-62.2) Pronosupination: 50.0 (39.0-61.0) ROM: 15.8 (9.3-25.6)	Adults: Extension: 92.4 (85.7-96.1) Flexion: 74.3 (65.2-81.7) Pronosupination: 80.0 (71.4-86.5) ROM: 96.2 (90.6-98.5) Children: 90.2 (80.2-95.4) Flexion: 83.6 (72.4-90.8) Pronosupination: 78.7 (66.9-87.1) ROM: 100 (94.1-100.0)	Adults: Extension: 7.11 Flexion: 2.38 Pronosupination: 2.59 ROM: 6.82 Children: 4.16	Adults: Extension: 0.5 Flexion: 0.52 Pronosupination: 0.60 ROM: 0.77 Children: 0.66	Adults: Extension: 85.2 (73.4-92.3) Flexion: 65.8 (54.8-75.3) Pronosupination: 67.7 (55.6-77.8) ROM: 84.6 (66.5-93.9) Children: 83.8 (68.9-92.3) Flexion: 79.6 (66.4-88.5) Pronosupination: 74.5 (61.1-84.5) ROM: 100 (75.7-100.0)	Adults: Extension: 71.3 (63.2-78.3) Flexion: 70.3 (61.2-78.0) Pronosupination: 67.2 (58.6-74.8) ROM: 61.6 (54.0-68.7) Children: 55 (45.2-64.4) Flexion: 58 (47.5-67.7) Pronosupination: 55.8 (45.3-65.8) ROM: 48.8 (40.2-57.5)
Vinson et al. (2016) [14]	Two medical centers and an urban academic Level I trauma center	4 way active ROM test	X-ray	251 Patients > 5 years with trauma immediately within 24 hr	Physicians	0.39	All: 99.0 (94.5-100.0)	All: 59.9 (51.6-67.7)	All: 2.47 (2.03-3.00)	All: 0.02 (0.00-0.12)	All: 61.6 (56.9-66.1)	All: 98.9 (92.8-99.8)

CI: confidence interval, +LR: positive likelihood ratio, -LR: negative likelihood ratio, PPV: Positive Predictive Value, NPV: Negative Predictive Value, ED: emergency department, ER2: East riding elbow rule, NA: not applicable, ROM: range of motion.

*This study used an inverse diagnostic question respect to the others for which the sensitivity and specificity values are to be considered inverted for the purpose of the review question.