TABLE E-1 Review of Literature on Diagnosis of Rotator Cuff Disease*

Study	Diagnosis	Test Studied	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	LR
Park et al.[4] (2005)	Bursitis	Neer	86	49	21	96	1.69
		Hawkins-Kennedy	76	45	17	92	1.36
		Painful arc	71	47	12	94	1.33
		Supraspinatus muscle	25	67	9	87	0.76
		Speed	33	70	14	88	1.10
		Cross-body adduction	25	80	15	89	1.25
		Drop-arm	14	77	8	86	0.60
		Infraspinatus muscle	25	69	9	88	0.12
	Partial-thickness tear	Neer	75	48	18	93	1.44
		Hawkins-Kennedy	75	44	17	92	1.36
		Painful arc	67	47	15	91	1.27
		Supraspinatus muscle	32	68	11	88	1.00
		Speed	33	71	16	89	1.13
		Cross-body adduction	17	79	10	87	0.78
		Drop-arm	14	78	8	87	0.64
		Infraspinatus muscle	19	69	10	88	0.63
	Full-thickness tear	Neer	59	47	41	65	1.12
		Hawkins-Kennedy	69	48	45	71	1.33
		Painful arc	76	62	61	76	1.98
		Supraspinatus muscle	53	82	68	71	3.00
		Speed	40	75	50	67	1.62
		Cross-body adduction	23	81	45	62	1.22
		Drop-arm	14	78	8	87	2.79
		Infraspinatus muscle	19	69	10	88	3.16
Leroux et al.[33] (1995)	Impingement syndrome	Neer	88	NA	NA	NA	NA
		Hawkins-Kennedy	87	NA	NA	NA	NA
		Yocum	78	NA	NA	NA	NA
Caliş et al.[34] (2000)	Impingement syndrome	Neer	89	31	76	52	1.29
		Hawkins-Kennedy	92	25	75	56	1.23
		Speed	69	56	79	42	1.57

		Yergason	37	86	87	36	2.64
		Painful arc	33	81	81	33	1.74
		Drop-arm	8	97	88	30	2.67
MacDonald et al.[35] (2000)	Bursitis	Neer	75	48	36	83	1.44
		Hawkins-Kennedy	92	44	39	93	1.64
		Neer or Hawkins-Kennedy	96	41	39	96	1.63
		Neer and Hawkins-Kennedy	71	51	36	82	1.45
	Rotator cuff pathosis	Neer	83	51	40	89	1.69
		Hawkins-Kennedy	88	43	38	90	1.54
		Neer or Hawkins-Kennedy	88	38	36	89	1.42
		Neer and Hawkins-Kennedy	83	56	43	58	1.89
	Bursitis or rotator cuff tear	Neer	77	63	70	71	2.08
		Hawkins-Kennedy	89	60	71	83	2.23
Holtby and Razmjou[68] (2004)	Supraspinatus tendinitis or partial rotator cuff tear	Supraspinatus	62	54	NA	NA	1.35
	Full-thickness cuff tear		41	70	NA	NA	1.37
	Large to massive cuff tear		88	70	NA	NA	2.93
Naredo et al.[69] (2002)	Supraspinatus lesion	Physical examination	79.3	50	95.8	14.2	1.59
	Impingement	Physical examination	65	72.7	81.2	53.3	2.38
	Tendinosis	Physical examination	72.2	38.4	61.9	50	1.17
	Supraspinatus tear	Physical examination	18.7	100	100	53.5	NA
Smith et al.[70] (2003)	Tendinosis	Physical examination	NA	NA	43	9	NA
		Physical examination and magnetic resonance imaging	NA	NA	65	7	NA
	Partial rotator cuff tear	Physical examination	NA	NA	13	19	NA
		Physical examination and magnetic resonance imaging	NA	NA	32	18	NA
	Full-thickness cuff tear	Physical examination	NA	NA	89	43	NA
		Physical examination and magnetic resonance imaging	NA	NA	88	27	NA

*PPV = positive predictive value; NPV = negative predictive value; LR = likelihood ratio; NA = not available.

TABLE E-2 Review of Literature on Diagnosis of Full-Thickness Rotator Cuff Tears and Cuff Integrity*

Test Studied	Study	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	DA *(%)*	LR
Supraspinatus/Jobe empty can	Park et al.[4] (2005)	53	82	NA	NA	NA	3
	Boileau et al.[66] (2004)	81	NA	NA	NA	NA	NA
	Holtby and Razmjou[68] (2004)	41	70	NA	NA	NA	1.40
	Litaker et al.[71] (2000)	64	65	NA	NA	NA	1.80
	Itoi et al.[72] (1999)	89	98	NA	NA	NA	45.00
	Hertel et al.[26] (1996)	84	54	NA	NA	NA	2.00
	Leroux et al.[33] (1995)	86	50	NA	NA	NA	1.70
Lift-off	Barth et al.[38] (2006)	18	92	NA	NA	NA	2.30
	Scheibel et al.[73] (2005)	58	NA	NA	NA	NA	NA
	Hertel et al.[26] (1996)	62	98	NA	NA	NA	31.00
	Leroux et al.[33] (1995)	17	60	NA	NA	NA	0.43
	Gerber and Krushell[21] (1991)	92	NA	NA	NA	NA	NA
Speed	Park et al.[4] (2005)	40	75	NA	NA	NA	1.60
	Boileau et al.[66] (2004)	48	NA	NA	NA	NA	NA
	Leroux et al.[33] (1995)	63	35	NA	NA	NA	0.97
Neer	Park et al.[4] (2005)	59	47	NA	NA	NA	1.10
	MacDonald et al.[35] (2000)	83	51	NA	NA	NA	1.70
Hawkins-Kennedy	Park et al.[4] (2005)	69	48	NA	NA	NA	1.30
	MacDonald et al.[35] (2000)	88	43	NA	NA	NA	1.50
Drop-arm sign	Park et al.[4] (2005)	35	88	NA	NA	NA	2.90
	Murrell and Walton[36] (2001)	10	98	NA	NA	NA	5.00
External rotation lag sign	Walch et al.[74] (1998)	98	98	NA	NA	NA	49.00
	Hertel et al.[26] (1996)	69	98	NA	NA	NA	35.00
Internal rotation lag sign	Scheibel et al.[73] (2005)	75	NA	NA	NA	NA	NA
	Hertel et al.[26] (1996)	97	96	NA	NA	NA	24.00
Belly-press	Barth et al.[38] (2006)	40	98	NA	NA	NA	20.00
Bear-hug	Barth et al.[38] (2006)	60	92	NA	NA	NA	7.50
Belly-off	Scheibel et al.[73] (2005)	38	NA	NA	NA	NA	NA
Full can	Itoi et al.[72] (1999)	86	57	NA	NA	NA	2.00
Hornblower sign	Walch et al.[74] (1998)	95	92	NA	NA	NA	12.00

*PPV = positive predictive value; NPV = negative predictive value; DA = drop-arm sign; LR = likelihood ratio; NA = not available.

TABLE E-3 Review of Literature on Diagnosis of Acromioclavicular Joint Lesions*

Study	Test Studied	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	DA *(%)*	LR
Chronopoulos et al.[2] (2004)	Cross-body adduction	77	79	20	98	79	3.67
	AC resisted extension	72	85	20	98	84	4.80
	Active compression	41	95	29	97	92	8.00
	Neer impingement sign	57	41	6	94	59	0.97
	Hawkins-Kennedy impingement sign	47	45	4	94	45	0.80
	Painful arc sign	50	47	4	95	47	0.94
	Drop-arm sign	35	72	6	96	70	1.25
	Speed	24	71	5	94	68	0.82
Walton et al.[43] (2004)	Active compression	16	90	NA	NA	NA	1.60
	Paxinos	79	50	NA	NA	NA	1.58
	Pain with palpation	96	10	NA	NA	NA	1.07
O'Brien et al.[19] (1998)	Active compression	93	96	NA	NA	NA	23.10

*PPV = positive predictive value; NPV = negative predictive value; DA = drop-arm sign; LR = likelihood ratio; AC = acromioclavicular; NA = not available.

TABLE E-4 Review of Literature on Diagnosis of Anterior Shoulder Instability*

Test Studied	Criteria	Study	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	DA *(%)*	LR
Apprehension	Pain or apprehension	Lo et al.[44] (2004)	53	99	98	73	NA	NA
	Relief of pain	Farber et al.[45] (2006)	50	56	14	88	NA	1.1
	Apprehension	Farber et al.[45] (2006)	72	96	75	96	NA	20.00
Anterior drawer	Pain	McFarland[13] (2006)	28	71	13	86	65	0.97
	Reproduction of symptoms	McFarland[13]	53	85	35	92	81	3.57
	Grade II or III laxity	McFarland[13]	60	74	26	92	72	2.28
Relocation	Relief of pain or apprehension	Lo et al.[44] (2004)	46	54	44	56	NA	1.00
	Relief of pain	Speer et al.[46] (1994)	30	58	38	49	45	0.71
		Lo et al.[44] (2004)	40	43	15	73	NA	0.70
		Farber et al.[45] (2006)	30	90	19	94	NA	3.00
	Relief of apprehension	Speer et al.[46] (1994)	57	100	100	73	80	NA
		Lo et al.[44] (2004)	32	100	100	65	NA	NA
		Farber et al.[45] (2006)	81	92	53	98	NA	10.13
Surprise	Pain or apprehension	Lo et al.[44] (2004)	64	99	98	78	NA	NA
		Gross and Distefano[75] (1997)	92	89	NA	NA	NA	8.30

*PPV = positive predictive value; NPV = negative predictive value; DA = drop-arm sign; LR = likelihood ratio; NA = not available.

TABLE E-5 Review of Literature on Diagnosis of Posterior Instability*

Study	Test Studied	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	DA *(%)*	LR
McFarland[50] (2006)	Voluntary instability	42	100	100	98	98	>99.99
	Posterior apprehension, subluxation	25	98	38	97	95	14.50
	Posterior apprehension, apprehension	8	99	25	96	95	8.06
	Posterior drawer, apprehension	42	92	19	97	90	5.30
	Posterior apprehension, pain	50	86	13	98	84	3.45
	Posterior drawer, pain	50	82	11	97	80	2.72
Kim et al.[53] (2005)	Jerk	73	98	NA	NA	94	36.50
Nakagawa et al.[54] (2005)	Jerk	25	80	NA	NA	56	1.30
Kim et al.[53] (2005)	Posterior impingement	80	94	NA	NA	91	13.30
Meister et al.[76] (2004)	Posterior impingement	76	85	NA	NA	NA	5.00

*PPV = positive predictive value; NPV = negative predictive value; DA = drop-arm sign; LR = likelihood ratio; NA = not available.

TABLE E-6 Review of Literature on Diagnosis of Superior Labrum Anterior and Posterior Lesions*

Test	Study	Finding	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	LR
Active compression	O'Brien et al.[19] (1998)	Labral tear	100	98.5	94.6	100	NA
	Guanche and Jones[77] (2003)	Labral tear	63	73	87	40	2.33
	McFarland et al.[63] (2002)	SLAP	47	55	10	91	1.04
	Morgan et al.[78] (1998)	Posterior type II SLAP	32	13	NA	NA	0.37
	Morgan et al.[78] (1998)	Combined type II SLAP	85	41	NA	NA	1.44
	Myers et al.[79] (2005)	Unstable SLAP	77.8	11.1	70	14.3	0.88
	Stetson and Templin[80] (2002)	Labral tear	54	31	34	50	0.78
	Nakagawa et al.[54] (2005)	SLAP	54	60	52	62	1.35
	Oh et al.[81] (2008)	SLAP type II	63	53	55	61	1.34
	Parentis et al.[82] (2006)	SLAP types I and II	62.5	50	35.5	75.4	1.25
Anterior apprehension	Oh et al.[81] (2008)	SLAP type II	62	42	56	49	1.07
Anterior slide	Kibler[20] (1995)	SLAP	78.4	91.5	66.7	80.8	9.22
	McFarland et al.[63] (2002)	SLAP	8	84	5	90	0.50
	McFarland[13] (2006)	Partial biceps tendon tear	23	84	9	94	1.44
	Parentis et al.[82] (2006)	SLAP types I and II	10	81.5	19	67.6	0.54
	Oh et al.[81] (2008)	SLAP type II	21	70	38	50	0.70
Biceps load I	Kim et al.[83] (1999)	SLAP	90.9	96.9	83	98	29.32
Biceps load II	Kim et al.[84] (2001)	SLAP	89.7	96.9	92.1	95.5	28.94
	Oh et al.[81] (2008)	SLAP type II	30	78	59	52	1.36
	Nakagawa et al.[54] (2005)	SLAP	25	100	100	58	NA
Passive compression	Kim et al.[85] (2007)	SLAP	81.8	85.7	87.1	80	5.72

Compression rotation	McFarland et al.[63] (2002)	SLAP	24	76	9	90	1.00
	Nakagawa et al.[54] (2005)	SLAP	25	100	100	58	NA
	Oh et al.[81] (2008)	SLAP type II	61	54	55	61	1.33
Crank	Liu et al.[86] (1996)	Labral tear	91	93	94	90	13.00
	McFarland[13] (2006)	Partial biceps tendon tear	34	77	11	93	1.48
	Myers et al.[79] (2005)	Unstable SLAP	34.6	70	75	29.2	1.15
	Mimori et al.[87] (1999)	SLAP	83	100	100	57	NA
	Nakagawa et al.[54] (2005)	SLAP	58	72	63	68	2.07
	Parentis et al.[82] (2006)	SLAP types I and II	12.5	82.6	23.8	68.4	0.72
	Stetson and Templin[80] (2002)	Labral tear	46	56	41	61	1.05
Forced abduction	Nakagawa et al.[54] (2005)	SLAP	67	67	62	71	2.03
Fulcrum	Nakagawa et al.[54] (2005)	SLAP	83	40	53	75	1.38
Hawkins-Kennedy	McFarland[13] (2006)	Partial biceps tendon tear	55	38	5	94	0.89
	Parentis et al.[82] (2006)	SLAP types I and II	67.5	30.4	29.7	68.3	0.97
Neer	McFarland[13] (2006)	Partial biceps tendon tear	64	41	5	96	1.08
	Parentis et al.[82] (2006)	SLAP types I and II	50	52.2	31.3	70.6	1.05
Pain provocation	Mimori et al.[87] (1999)	SLAP	100	90	95	100	10.00
	Parentis et al.[82] (2006)	SLAP types I and II	15	90.2	40	70.9	1.53
Resisted supination	Myers et al.[79] (2005)	Unstable SLAP	82.8	81.8	92.3	64.3	4.55
Relocation (Jobe)	Guanche and Jones[77] (2003)	Labral tear	44	87	91	34	3.38
	Morgan et al.[78] (1998)	Anterior type-II SLAP	4	27	NA	NA	0.05
	Morgan et al.[78] (1998)	Combined type-II SLAP	59	54	NA	NA	1.28

	Morgan et al.[78] (1998)	Posterior type-II SLAP	85	68	NA	NA	2.66
	Oh et al.[81] (2008)	SLAP type II	44	54	52	47	0.96
	Parentis et al.[82] (2006)	SLAP types I and II	50	53.3	31.7	71	1.07
Speed	Oh et al.[81] (2008)	SLAP type II	32	66	46	53	0.94
	Parentis et al.[82] (2006)	SLAP types I and II	47.8	67.7	34.8	72.1	1.48
	McFarland[13] (2006)	SLAP type II	28	72	12	91	1.00
	McFarland[13] (2006)	Partial biceps tendon tear	50	67	8	96	1.52
	Nakagawa et al.[54] (2005)	SLAP	6	98	NA	NA	3.00
	Guanche and Jones[77] (2003)	Labral tear	9	74	NA	NA	0.35
	Morgan et al.[78] (1998)	Posterior type-II SLAP	29	11	NA	NA	0.33
	Morgan et al.[78] (1998)	Anterior type-II SLAP	100	70	NA	NA	3.33
	Morgan et al.[78] (1998)	Combined type-II SLAP	78	37	NA	NA	1.24
Whipple	Oh et al.[81] (2008)	SLAP type II	65	42	50	57	1.12
Yergason	Oh et al.[81] (2008)	SLAP type II	12	87	44	53	0.92
	Parentis et al.[82] (2006)	SLAP types I and II	12.5	93.5	45.5	71.1	1.92
	Nakagawa et al.[54] (2005)	SLAP	13	100	100	59	NA
	Guanche and Jones[77] (2003)	Labral tear	12	96	NA	NA	3.00

*PPV = positive predictive value; NPV = negative predictive value; LR = likelihood ratio; NA = not available; SLAP = superior labrum anterior and posterior lesion.

TABLE E-7 Review of Literature on Diagnosis of Biceps Abnormalities*

Test	Study	Finding	Sensitivity *(%)*	Specificity *(%)*	PPV *(%)*	NPV *(%)*	DA *(%)*	LR
Speed	Bennett[16] (1998)	Biceps abnormality	13.8	90	23	83	NA	1.38
	Holtby and Razmjou[88] (2004)	Bicipital tendinosis or partial biceps tear	75	32	50	58	56	1.10
	Gill et al.[67] (2007)	Partial biceps tear	50	67	96	8	NA	1.51
	Ardic et al.[89] (2006)	Biceps abnormality	69	60	NA	NA	NA	1.70
Hourglass	Boileau et al.[66] (2004)	Biceps abnormality	98	NA	NA	NA	NA	NA
Belly-press	Gill et al.[67] (2007)	Partial biceps tear	17	92	88	24	NA	2.01
Biceps palpation	Gill et al.[67] (2007)	Partial biceps tear	53	54	95	6	NA	1.13
Biceps tenderness	Guanche and Jones[77] (2003)	Labral and/or biceps abnormality	44	40	NA	NA	NA	0.73
Lift-off	Gill et al.[67] (2007)	Partial biceps tear	28	89	95	15	NA	2.61
Neer sign	Gill et al.[67] (2007)	Partial biceps tear	64	41	96	5	NA	1.09
Hawkins-Kennedy	Gill et al.[67] (2007)	Partial biceps tear	55	38	94	5	NA	0.89
Crank	Gill et al.[67] (2007)	Partial biceps tear	34	77	93	11	NA	1.49
Active compression	Gill et al.[67] (2007)	Partial biceps tear	68	46	95	8	NA	1.24
Kibler	Gill et al.[67] (2007)	Partial biceps tear	23	84	94	9	NA	1.40

*PPV = positive predictive value; NPV = negative predictive value; DA = drop-arm sign; LR = likelihood ratio; NA = not available.