

Study	Diagnostic test	Reference standard for infection	No of cases	Outcome
Dilisio (2014)	Arthroscopic tissue culture	Positive samples at time of revision surgery	19	Arthroscopic biopsy showed 100% sensitivity and specificity when compared to samples taken at revision. Glenohumeral aspiration showed sensitivity of 16.7% and specificity of 100%
Frangiamore (2015)	Synovial IL-6	Infection classification was divided into 4 groups: (1) definite (At least 1 positive preoperative or intraoperative) finding of infection and >1 positive intraoperative culture or □ 1 positive preoperative (aspirate) culture and 1 positive intraoperative culture); (2) probable (>1 positive intraoperative culture and negative preoperative or intraoperative) findings □ or At least 1 positive	32	Based on ROC analysis cut-off of 359.3 pg/mL: Sensitivity 87%, specificity 90%, positive LR 8.45; negative LR 0.15

		preoperative or intraoperative finding and 1 positive culture□), (3) possible (Negative preoperative or intraoperative) finding and 1 positive intraoperative culture□) (4) no infection (All negative cultures (tissue or aspirate) and no preoperative or intraoperative findings of infection).		
Frangiamore (2015)	Synovial Alpha-defensin	Infection classification was divided into 4 groups: (1) definite (At least 1 positive preoperative or intraoperative) finding of infection and >1 positive intraoperative culture or □ 1 positive preoperative (aspirate) culture and 1 positive intraoperative culture); (2) probable (>1 positive intraoperative culture and negative preoperative or intraoperative) findings□ or At least 1 positive preoperative or intraoperative finding and 1 positive culture), (3) possible (Negative preoperative or intraoperative) finding and 1 positive intraoperative culture) (4) no infection (All negative	33	Sensitivity 63%, specificity 95%, positive LR 12.1, negative LR 0.38,

		cultures (tissue or aspirate) and no preoperative or intraoperative findings of infection).		
Frangiamore (2017)	Synovial fluid levels of 9 cytokines (interleukin [IL] 6, granulocyte-macrophage colony-stimulating factor, IL-1 β , IL-12,	Infection classification was divided into 4 groups: (1) definite (At least 1 positive preoperative or intraoperative) finding of infection and >1 positive intraoperative culture or \square 1 positive preoperative (aspirate) culture and 1 positive intraoperative culture); (2) probable (>1 positive intraoperative culture and negative preoperative or intraoperative) findings or At least 1 positive preoperative or intraoperative finding and 1 positive culture), (3) possible (Negative preoperative or intraoperative) finding and 1 positive intraoperative culture) (4) no infection (All negative cultures (tissue or aspirate) and no preoperative or intraoperative findings of infection).	75	Sensitivity/specificity: IL-6: 82%/87%; GM-CSF: 0.54/0.85; INF-gamma: 60%/80%; IL-1B: 71%/87%; IL-12: 36%/94%; IL-2: 54%/87%; IL-8: 71%/79%; IL-10: 72%/82%; TNF-alpha: 92%/33%. Best combination IL-6 + TNF-alpha +IL-2: 80%/93%

	IL-2, IL-8, interferon- γ , IL-10, and tumour necrosis factor- α			
Grosso (2014)	Serum IL-6	Infection classification was divided into 4 groups: (1) definite (At least 1 positive preoperative or intraoperative) finding of infection and >1 positive intraoperative culture or 1 positive preoperative (aspirate) culture and 1 positive intraoperative culture); (2) probable (>1 positive intraoperative culture and negative preoperative or intraoperative) findings or at least 1 positive preoperative or intraoperative finding and 1 positive culture), (3) possible (Negative preoperative or intraoperative) finding and 1	69	Overall sensitivity 12.5%, Overall specificity 93%

		positive intraoperative culture) (4) no infection (All negative cultures (tissue or aspirate) and no preoperative or intraoperative findings of infection).		
Nelson (2015)	Synovial leukocyte esterase	MSIS criteria	85 (45 primary and 40 revision arthroplasties)	Ten revision patients met modified MSIS criteria for PJI. Sensitivity = 30%, specificity = 67%, Positive predictive value = 43%, Negative predictive value = 83%

<p>Tashjan (2017)</p>	<p>Pre-revision tissue biopsy</p>	<p>Definite infection: positive ESR or CRP result and >1 positive culture (for biopsies —both obtained during the biopsy with the same bacteria; for revisions—both obtained during the re- vision with the same culture) or 1 positive revision culture and 1 positive culture of the same bacteria independent of the ESR or CRP result.</p> <p>Probable infection: positive ESR or CRP and 1 positive culture (for biopsies—the culture is from the biopsy; for revisions—the culture is from the revision with none of the biopsy cultures growing the same bacteria) or a negative ESR and CRP and >1 positive culture (for biopsies—both obtained during the biopsy with the same bacteria; for revisions—both obtained during the re- vision with the same bacteria).</p> <p>No evidence of infection: negative ESR and CRP result and no positive cultures from the biopsy sample for the biopsy definition and no positive cultures from the revision sample for the revision</p>	<p>77</p>	<p>Pre-revision biopsy had a sensitivity of 90% and specificity of 86%</p>
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		definition.		
Villacis (2014)	Serum Interleukin- 6 (IL-6)	Definitive diagnosis of an infection was determined by growth of bacteria on culture of intraoperative specimens	34	Normal serum IL-6 level defined as <10 pg/mL: Sensitivity = 0.14, specificity = 0.95, positive predictive value = 0.67, negative predictive value = 0.61,