

## SUPPLEMENTARY MATERIAL

### Search Strategy

- 1 biopsy, needle/ or biopsy, fine-needle/ or endoscopic ultrasound-guided fine needle aspiration/ or biopsy, large-core needle/ (64788)
- 2 fine needle.ti,ab,kw,kf. (30805)
- 3 ((needle? or FNA or FNAB) adj2 (aspirat\$ or biops\$ or cytolog\$ or specimen?)).ti,ab,kw,kf. (49607)
- 4 puncture biops\$.ti,ab,kw,kf. (1042)
- 5 or/1-4 [Needle Biopsy] (86759)
- 6 ROSE.ti,ab,kw,kf. (61859)
- 7 (onsite? or on-site?).ti,ab,kw,kf. (16836)
- 8 rapid.ti,ab,kw,kf. (604817)
- 9 or/6-8 [Rapid Onsite evaluation] (678520)
- 10 (ROSE adj10 (needle or FNA or biops\$ or diagnost\$)).ti,ab,kw,kf. (482)
- 11 (ROSE adj10 (rapid or onsite or on-site)).ti,ab,kw,kf. (407)
- 12 or/10-11 [ROSE Keyword] (741)
- 13 Medical Laboratory Personnel/ (2559)
- 14 Allied Health Personnel/ (11385)
- 15 ((lab or laboratory) adj2 (person? or person?el? or tech?)).ti,ab,kw,kf. (1539)
- 16 (cytologist? or cytotech\$ or cyto-tech\$).ti,ab,kw,kf. (1370)
- 17 technician?.ti,ab,kw,kf. (13035)
- 18 assistant?.ti,ab,kw,kf. (22821)
- 19 technologist?.ti,ab,kw,kf. (4792)
- 20 or/13-19 [Technologist Keywords] (54805)
- 21 Cytodiagnosis/ (16196)
- 22 (cytodiagnos\$ and (standards or education? or training or job)).ti,ab,kw,kf. (28)
- 23 or/21-22 [Cytodiagnosis Heading or cytodiagnos & education-training-standards terms] (16205)
- 24 and/5,9 [FNA & rapid-quick keywords] (2891)
- 25 12 not 24 [ROSE keyword phrases] (539)
- 26 (and/5,20) not (or/24-25) [FNA & Technologist keywords] (365)
- 27 (and/20,23) not (or/24-26) [Cytodiagnosis & Technician Terms] (251)
- 28 ("28708297" or "27863098" or "24255627" or "27146559" or "26492064" or "26606302" or "25123685" or "25341367" or "25209399" or "25209398" or "25115188" or "24165344" or "24107299" or "23306334" or "26663577" or "22846449" or "22321619" or "22226546" or "21882357" or "17531627").ui. (22)
- 29 28 not 24 (5)

- 30 29 not 25 (3)  
 31 30 not 26 (1)  
 32 31 not 27 (0)  
 33 (animal? or beaver? or beef or bovine or breeding or bull or canine or castoris or cat or cattle or cats or chicken? or chimp\$ or cow or dog or dogs or equine or feline? or foal or foals or fish or insect? horse or horses or livestock or mice or monkey? or mouse or murine or plant or plants or pork or porcine or protozoa? or purebred or rat or rats or rodent? or sheep or simian? or thoroughbred).ti. or veterinari\$.ti,ab,kw,kf,hw. (2321099)  
 34 exp animals/ not humans.sh. (4743200)  
 35 (or/24-27) not (or/33-34) [Results excluding animal studies] (3802)  
 36 remove duplicates from 35 (3539)  
 37 OSEA.ti,ab,kw,kf. (196)  
 38 adequacy.ti,ab,kw,kf. (24676)  
 39 (and/5,38) not (or/24-27,33-34) [Results FNA & osea-adequacy] (535)  
 40 remove duplicates from 39 (500)

### SUPPLEMENTARY TABLE 1: STARD GUIDELINE ADHERENCE

Category	Number	Item	Percent of studies reporting this item
Title or Abstract			
Title	1	Identification as a study of diagnostic accuracy using at least one measure of accuracy	7.7
Abstract	2	Structured summary of study design, methods, results, and conclusions	76.9
Introduction			
	3	Scientific and clinical background, including intended use and clinical role of the index test	100.0

	4.1	Study objectives	100.0
	4.2	Study hypotheses	23.1
Methods			
Study Design	5	Prospective or retrospective data collection	84.6
Participants	6	Eligibility criteria	92.3
	7	Method used to identify potentially eligible participants	84.6
	8	Where and when potentially eligible participants were identified - setting	84.6
	8	Where and when potentially eligible participants were identified - location	76.9
	8	Where and when potentially eligible participants were identified - dates	84.6
	9	Whether patients were selected in a consecutive, random, or convenience series	100.0
Test Methods	10a	Index test described in sufficient detail to allow replication	84.6
	10b	Reference standard described in sufficient detail to allow replication	84.6
	11	Rationale for choosing the reference standard	NA
	12a	Definition of and rationale for test positivity cut-offs or result categories of the index test, distinguishing pre-specified from exploratory	46.2

	12b	Definition of and rationale for test positivity cut-offs or result categories of the reference test, distinguishing pre-specified from exploratory	46.2
	213a	Whether <u>clinical information</u> was available to the performer of the index test	NA
	13a	Whether the <u>results of the reference test</u> was available to the performer of the index test	38.5
	13b	Whether <u>clinical information</u> was available to the performer of the reference test	NA
	13b	Whether the <u>results of the index test</u> was available to the performer of the reference test	46.2
	14	Methods for estimating or comparing measures of diagnostic accuracy	76.9
	15	How indeterminate index test or reference standard results were handled	NA
	16	How missing data on the index test and reference test were handled	NA
	17	Any analysis of variability in diagnostic accuracy, distinguishing pre-specified from exploratory	NA
	18	Intended sample size and how it was determined	15.4
Results			
Participants	19	Flow of participants, using a diagram	7.7
	20	Baseline demographic and clinical characteristics of the participants	53.8

	21a	Distribution of severity of disease in those with the target condition	100.0
	21b	Distribution of severity of disease in those without the target condition	100.0
	22	Time interval and any clinical interventions between index test and reference standard	NA
Test Results	23	Cross tabulation of the index test results (or their distribution) by the estimates of the reference standard	76.9
	24	Estimates of diagnostic accuracy	30.8
	25	Precision of estimate of diagnostic accuracy	7.7
Discussion			
	26	Limitations - sources of bias	23.1
	26	Limitations - statistical uncertainty	15.4
	26	Limitations - generalizability	38.5
	27	Implications for practice including intended use and clinical role of the index test	100.0
Other Information			
	28	Registration number and name of registry	0.0
	29	Where the full study protocol can be assessed	0.0

	30	Sources of funding or other support	23.1
	30	Role of funder	23.1

**SUPPLEMENTARY TABLE 2 – PRISMA CHECKLIST**

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	3
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	3-4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	3
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl.
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4

Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	4
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ ) for each meta-analysis.	4