

## QUESTION

Can measuring of sGaw and RV/TLC help in the diagnosis of asthma with episodic/chronic suggestive symptoms?	
POPULATION:	Population of adults (>18 yrs old) with diagnostic uncertainty of asthma
INDEX TEST:	RV/TLC, sGaw
GOLD STANDARD :	<ol style="list-style-type: none"> <li>1. Bronchodilation &gt; 12% AND &gt; 200 ml improvement</li> <li>2. Airway hyperresponsiveness: PC20 &lt; 16 mg/ml (or 8 mg/ml) of Methacholine (or Histamine) or PD mannitol &lt; 625 mg or fall in FEV<sub>1</sub> &gt; 10% after exercise</li> </ol>

## ASSESSMENT

Test accuracy How accurate is the test?		
JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<ul style="list-style-type: none"> <li>○ Very inaccurate</li> <li>○ Inaccurate</li> <li>○ Accurate</li> <li>○ Very accurate</li> <li>X Varies</li> <li>○ Don't know</li> </ul>	<p><b>RV/TLC</b></p> <ul style="list-style-type: none"> <li>- Poor sensitivity ranging from 16.7% (Stanbrook et al, cut-offs 125%, 130% and 135%) to 54.5% in the paper of Bougard et al.</li> <li>- Good specificity ranging from 87% for Bougard et al (Threshold 99%) to 95.9% for Stanbrook et al.</li> <li>- Paper of Bougard et al: prediction of positive PC20: AUC: 0.74, p&lt;0.0001) – the logistic regression analysis found that RV/TLC was significantly associated with positive PC20.</li> </ul> <p><b>sGaw:</b></p> <ul style="list-style-type: none"> <li>- Comparison with BD tests: Good specificity ranging from 74% (Topalovic et al, cut-off &lt; 0.98) - Poor sensitivity: 50% (Topalovic et al)</li> <li>- Comparison with PC20M: highly variable sensitivity 86.4% - specificity 49.4% - Threshold &lt;0.73</li> <li>- Comparison with PC20M : Paper of Bougard: sGaw had intermediate AUC of 0.69 (p&lt;0.0001) - prediction of positive PC20: AUC:0.69, p&lt;0.0001.sGaw was not associated with PC20 In the logistic regression analysis.</li> </ul>	

## Desirable Effects

How substantial are the desirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<input type="radio"/> Trivial <input type="radio"/> Small <input checked="" type="radio"/> Moderate <input type="radio"/> Large <input type="radio"/> Varies <input type="radio"/> Don't know	<p>For RV/TLC: very good specificity but poor sensitivity.</p> <p>For sGaw:</p> <ul style="list-style-type: none"> <li>- good specificity for BD but poor specificity for PC20</li> <li>- poor sensitivity for BD, good sensitivity for PC20</li> </ul>	

## Undesirable Effects

How substantial are the undesirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<input type="radio"/> Large <input type="radio"/> Moderate <input type="radio"/> Small <input checked="" type="radio"/> Trivial <input type="radio"/> Varies <input type="radio"/> Don't know	None	

## Certainty of the evidence of test accuracy

What is the overall certainty of the evidence of test accuracy?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<input type="radio"/> Very low <input checked="" type="radio"/> Low <input type="radio"/> Moderate <input type="radio"/> High <input type="radio"/> No included studies	<p>Low quality of evidence for RV/TLC: few data in the literature. good specificity in the two studies detected in the literature.</p> <p>Low quality of evidence for sGaw– few data in the literature – poor accuracy.</p>	

## Certainty of the evidence of management's effects

What is the overall certainty of the evidence of effects of the management that is guided by the test results?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<ul style="list-style-type: none"><li><input type="radio"/> Very low</li><li><input type="radio"/> Low</li><li><input type="radio"/> Moderate</li><li><input type="radio"/> High</li><li><input checked="" type="radio"/> No included studies</li></ul>		

## Certainty of the evidence of test result/management

How certain is the link between test results and management decisions?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<ul style="list-style-type: none"><li><input type="radio"/> Very low</li><li><input checked="" type="radio"/> Low</li><li><input type="radio"/> Moderate</li><li><input type="radio"/> High</li><li><input type="radio"/> No included studies</li></ul>	<p>Moderate quality of evidence for RV/TLC</p> <p>Low quality of evidence for sGaw</p>	<p>The TF panel made a judgement of low certainty about the likelihood that the appropriate asthma management will follow on from sGaw test results.</p>

## Balance of effects

Does the balance between desirable and undesirable effects favor the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<ul style="list-style-type: none"><li><input type="radio"/> Favors the comparison</li><li><input checked="" type="radio"/> Probably favors the comparison</li><li><input type="radio"/> Does not favor either the intervention or the comparison</li><li><input type="radio"/> Probably favors the intervention</li><li><input type="radio"/> Favors the intervention</li><li><input type="radio"/> Varies</li><li><input type="radio"/> Don't know</li></ul>	<p>sGaw and RV/TLC are a test currently performed in patients with symptoms suggestive of asthma and <b>RV/TLC</b> can be used to approach asthma diagnosis (Bougard et al). When combined with FeNO, the prediction is even better to predict a positive PC20 according to Bougard et al.</p> <p>sGaw is not a good test for asthma diagnosis: poor specificity for PC20 and poor sensitivity for bronchodilation test.</p>	

## Resources required

How large are the resource requirements (costs)?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS

<input type="radio"/> Large costs <input checked="" type="radio"/> Moderate costs <input type="radio"/> Negligible costs and savings <input type="radio"/> Moderate savings <input type="radio"/> Large savings <input type="radio"/> Varies <input type="radio"/> Don't know	RV/TLC and sGaw measurement are feasible in secondary care (not available in primary care), requires lung function testing and a nurse to perform the test.	
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## Equity

What would be the impact on health equity?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<input type="radio"/> Reduced <input type="radio"/> Probably reduced <input type="radio"/> Probably no impact <input checked="" type="radio"/> Probably increased <input type="radio"/> Increased <input type="radio"/> Varies <input type="radio"/> Don't know	None Identified	

## Acceptability

Is the intervention acceptable to key stakeholders?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
<input type="radio"/> No <input type="radio"/> Probably no <input type="radio"/> Probably yes <input checked="" type="radio"/> Yes <input type="radio"/> Varies <input type="radio"/> Don't know	RV/TLC and sGaw measurements are easy to perform. Requires measurement of lung volumes.  Not accessible at home. Completion at the clinic.	

## Feasibility

Is the intervention feasible to implement?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
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<input type="radio"/> No <input type="radio"/> Probably no <input type="radio"/> Probably yes <input checked="" type="radio"/> Yes <input type="radio"/> Varies <input type="radio"/> Don't know	RV/TLC and sGaw requires a lung function cabin, not feasible in primary care.  More comfortable to the patient than Bronchial Challenge.	
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## TYPE OF RECOMMENDATION

Strong recommendation against the intervention	<b>Conditional recommendation against the intervention</b>	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	Strong recommendation for the intervention
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## CONCLUSIONS

### Recommendation

The TF suggests not measuring sGaw and RV/TLC by whole body plethysmography to help in the diagnosis of asthma (conditional recommendation against the intervention, low quality of evidence)

sGaw does not perform better than FEV<sub>1</sub>/FVC ratio to predict positive methacholine challenge in patients with normal baseline FEV<sub>1</sub>

RV/TLC >130% predicted has a high specificity (>90%) but poor sensitivity (25%) to predict a positive methacholine challenge in patient with normal FEV<sub>1</sub>/FVC

## Justification

The current evidence with RV/TLC is too limited to recommend using it to ascertain a diagnosis of asthma. The two studies suggest a high RV/TLC might be a useful physiological index to consider asthma diagnosis. Whole body plethysmography can provide sophisticated lung function measurements including the early physiological sign of hyperdistention as a consequence of small airway obstruction, not revealed by spirometry. Where RV/TLC may hold some promise, measuring sGaw does not bring additional value to the measurement FEV<sub>1</sub>/FVC ratio by spirometry. Whole body plethysmography, however, requires technical expertise from laboratory personnel and the cost and relatively limited access even in specialist secondary care may preclude use of this test on a large scale.