SUPPLEMENTAL MATERIAL

SM1

Sample size calculation.

The original WHYSTOP study found that a negative POCT result increased clinicians' willingness to stop antibiotics significantly (p<0.01). Specifically: prior to receiving the negative POCT result, clinicians were willing to stop antibiotics 54% of the time (138/258); after receiving the result, they were willing to stop antibiotics 70% of the time (180/258; chi-square=25.82, df=1, p<0.01, w=0.32). Using G*Power 3.1, we estimated that a minimum of 77 responses would be required to replicate this effect, with power at 80%, alpha at 0.05, and 1 degree of freedom. To account for clustered data (with each participant seeing 4 scenarios), we then calculated the "design effect" (DE)(1), using the formula $1+(n-1)\rho$, where n is the cluster size (4) and ρ the intraclass correlation/Cronbach's alpha (2) from Singh et al.'s study (0.061). Multiplying the number of required responses (77) by the DE (1.183) suggested that 91 responses were needed (77 x 1.183). At 4 responses per participant, 23 participants were required (91/4).

1. Donner A, Klar N. *Design and Analysis of Cluster Randomization Trials in Health Research.* London: Arnold; 2000. Available from: https://www.jameslindlibrary.org/donner-a-klar-n-2000/ [Accessed May 24, 2022].
2. Bi J, Kuesten C. Intraclass Correlation Coefficient (ICC): A Framework for Monitoring and Assessing Performance of Trained Sensory Panels and Panelists. *Journal of Sensory Studies.* 2012; 27 (5): 352-364. doi: 10.1111/j.1745-459X.2012.00399.x.

SM2a

The *improvement* vignette

Details of admission:

A 68-year-old male presented following a fall at home. He sustained rib fractures to his right anterior 5th and 6th ribs and was admitted for pain control. He has a background of poorly controlled insulin-dependent type 2 diabetes. Two days into admission, he developed hypoxia and pyrexia. His observations were the following:

Respiratory rate	26/min
SpO2	90% on room air
Heart rate	90/min sinus rhythm
Blood pressure	111/81 mmHg
Temperature	38.0 C

There was right sided consolidation on his chest radiograph and nil else. His blood tests demonstrated a WBC of 15 and CRP of 78. He was initiated on Co-amoxiclav.

Five days later:

7 days into his admission (5 days following antibiotics), he had improved shortness of breath and was afebrile. His observations were:

Respiratory rate	18/min
SpO2	99% on room air
Heart rate	83/min sinus rhythm
Blood pressure	112/80 mmHg
Temperature	37.0 C

He was pain free and mobilising on the ward. His repeat blood tests demonstrated a WBC of 8 and CRP of 15.

SM2b

The *overall worse* vignette

Details of admission:

A 78-year-old male was admitted with a 4-day history of worsening shortness of breath and a productive cough. He has a background of hypertension, Type II Diabetes Mellitus and a previous TIA (2019). He has no known drug allergies. His admission observations were:

Respiratory rate	22/min
SpO2	87% on room air
Heart rate	101/min sinus rhythm
Blood pressure	106/62 mmHg
Temperature	37.9 C

There was right basal consolidation on his chest radiograph. His blood tests demonstrated a WBC of 12 and a CRP of 70. He was empirically started on Levofloxacin and Clarithromycin. Within 24 hours he deteriorated and required mechanical ventilation.

Five days later:

5 days into his admission and after an initial improvement in ventilation, he became febrile. His observations were:

Respiratory rate	25/min
SpO2	90% on FiO2 21%
Heart rate	120/min sinus rhythm
Blood pressure	110/58 mmHg
Temperature	38.9 C

Further clinical assessment does not identify an alternative source of infection. However, his repeat blood tests demonstrated a WBC of 15 and a CRP of 150.

SM2c

The *disc clin better* vignette

Details of admission:

A 60-year-old male was admitted to ITU with a 6-day history of pyrexia, shortness of breath, and a productive cough with rusty sputum. He has a past medical history of well controlled, uncomplicated HIV (CD4 count >500 and viral load undetectable 3 months ago). His observations were the following:

Respiratory rate	32/min
SpO2	80% on room air
Heart rate	115/min sinus rhythm
Blood pressure	95/52 mmHg
Temperature	38.4 C

A chest radiograph demonstrated left midzone and basal consolidation. His blood tests demonstrated a WBC of 13 and a CRP of 50. Sputum culture grew MRSA. He was intubated and ventilated and empirically started on Linezolid. His initial blood gas findings were:

- FiO2 0.6
- PaO2 of 7.7 kPa
- PaCO2 5.2 kPa
- Base excess of -4

Seven days later:

7 days into his admission, he was improving on ventilation and extubated and weaned onto room air. He was feeling notably better. Clinical assessment does not identify any clinical source of infection. His observations were:

Respiratory rate	18/min
SpO2	96% on room air
Heart rate	82/min sinus rhythm
Blood pressure	124/70 mmHg
Temperature	36.9 C

However, his repeat blood tests demonstrated a worsening with a WBC of 15 and a CRP of 60.

SM2d

The *disc clin worse* vignette

Details of admission:

A 59-year-old male was admitted to ITU with a 3-day history of vomiting, pyrexia and a productive cough. He has a background of alcohol excess. His observations were the following:

Respiratory rate	30/min
SpO2	88% on room air
Heart rate	130/min sinus rhythm
Blood pressure	115/64 mmHg
Temperature	38.3 C

A chest radiograph demonstrated bilateral pulmonary infiltrates. His blood tests demonstrated a WBC of 20 and a CRP of 82. He was intubated and ventilated and empirically started on Piperacillin/Tazobactam. His initial blood gas findings on ventilation were:

- FiO2 0.5
- PaO2 of 8.2 kPa
- PaCO2 4.5 kPa
- Base excess of -5

Five days later:

5 days into his admission, he was making a good recovery, onto low pressure support ventilation and FiO2 down to 0.3. Chest radiograph findings were unchanged at this point. However, 1 day later, he developed new pyrexia to 37.8 C and increased oxygen requirement to FiO2 0.45. Investigations ruled out a pulmonary embolus.

Seven days later:

7 days into his admission, his observations were:

Respiratory rate	20/min
SpO2	92% on FiO2 0.45
Heart rate	100/min sinus rhythm
Blood pressure	130/70 mmHg
Temperature	37.8 C

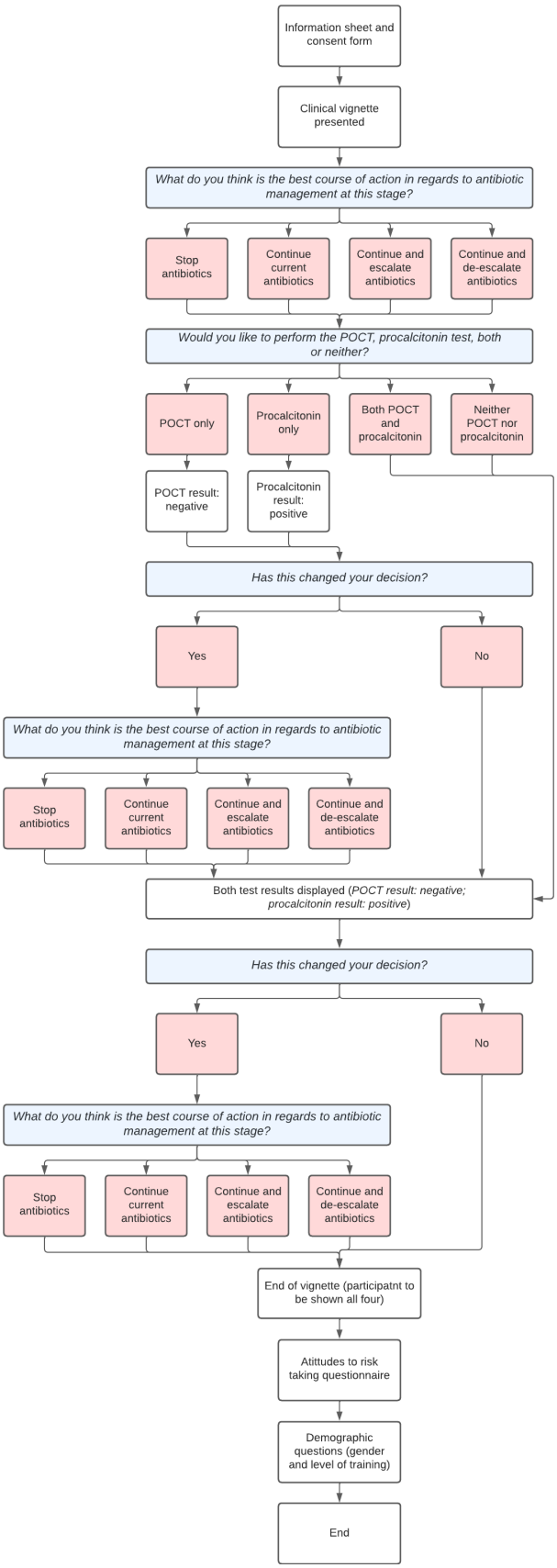
Clinical assessment does not identify an alternative source of infection.

His repeat blood tests demonstrated an ongoing reduction with a WBC of 10 and a CRP of 12.

SM3. Reasons for Clinicians' choice of diagnostic test when offered.

Reasons for performing POCT only	**Reasons for performing PCT only**	**Reasons for performing both POCT and PCT**	**Reasons for performing neither POCT nor PCT**

• I trust the POCT; • The POCT is necessary in this case; • I feel confident interpreting the POCT results; • I do not trust the procalcitonin test (I have concerns regarding the accuracy of the test); • The procalcitonin test is unnecessary in this case; • I do not feel confident interpreting the procalcitonin test results; • Other (if selected, the participant was asked to elaborate using free text).	• I trust the PCT test; • The PCT test is necessary in this case; • I feel confident interpreting the procalcitonin test results; • I do not trust the POCT (I have concerns regarding the accuracy of the test); • The POCT is unnecessary in this case; • I do not feel confident interpreting the POCT; • Other (if selected, the participant was asked to elaborate using free text).	• To supplement my clinical judgement; • I trust these tests; • The tests are necessary in this case; • I feel confident interpreting these tests; • Other (if selected, the participant was asked to elaborate using free text).	• I prefer to rely on my clinical judgement; • I do not trust these tests; • These tests are unnecessary in this case; • I don't feel confident interpreting these tests; • Other (if selected, the participant was asked to elaborate using free text).


Information sheet and consent form
Clinical vignette presented
What do you think is the best course of action in regards to antibiotic management at this stage?
Stop antibiotics
Continue current antibiotics
Continue and escalate antibiotics
Continue and de-escalate antibiotics
Would you like to perform the POCT, procalcitonin test, both or neither?
POCT only
Procalcitonin only
Both POCT and procalcitonin
Neither POCT nor procalcitonin
POCT result: negative
Procalcitonin result: positive
Has this changed your decision?
Yes
No
What do you think is the best course of action in regards to antibiotic management at this stage?
Stop antibiotics
Continue current antibiotics
Continue and escalate antibiotics
Continue and de-escalate antibiotics
Both test results displayed (POCT result: negative; procalcitonin result: positive)
Has this changed your decision?
Yes
No
What do you think is the best course of action in regards to antibiotic management at this stage?
Stop antibiotics
Continue current antibiotics
Continue and escalate antibiotics
Continue and de-escalate antibiotics
End of vignette (participatnt to be shown all four)
Atittudes to risk taking questionnaire
Demographic questions (gender and level of training)
End

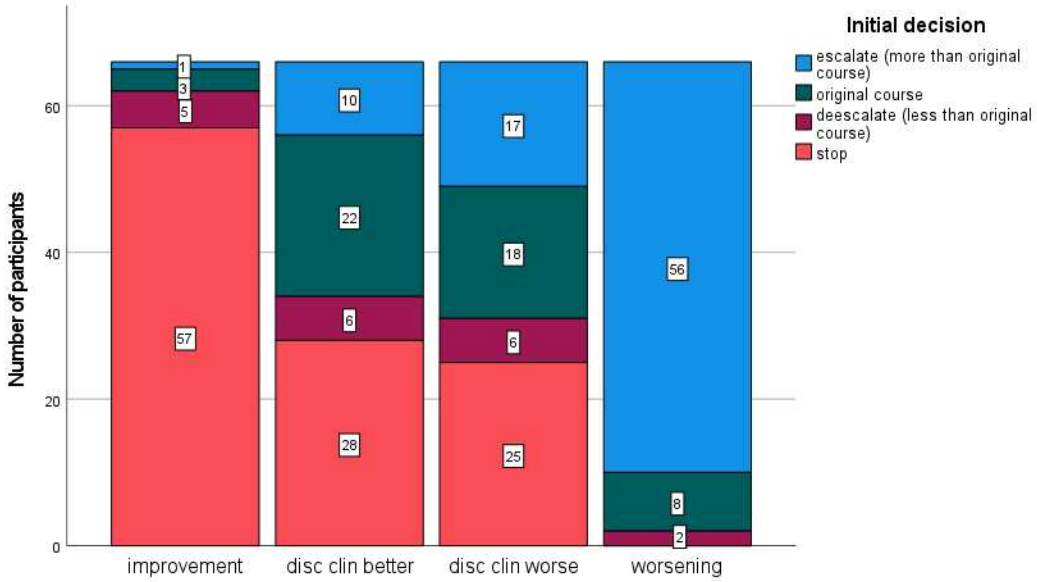
SM4. Graphical representation of the survey flow and procedure. Blue boxes indicate key questions, with the boxes below (red) displaying the possible responses. Created using Lucidchart (Lucid Software Inc., Utah, USA).

SM5. Piloting process

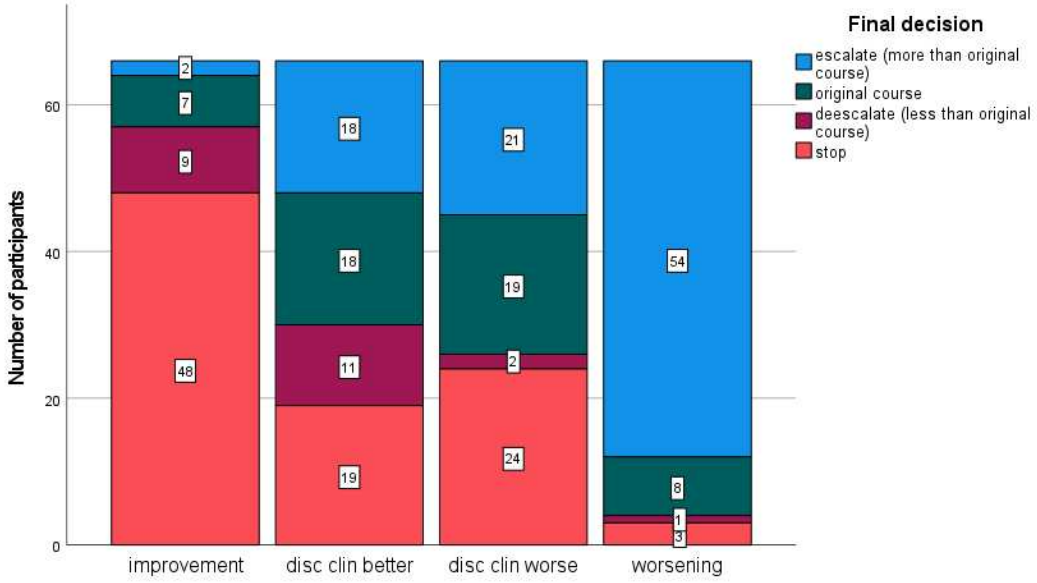
The survey was constructed and tested between the authors before piloting began. Two non-participating intensive care clinicians (SpR trainees) known to the authors were recruited to pilot-test the vignettes and survey. Feedback was given regarding the clarity and accessibility of the survey, as well as its format and structure. Feedback was very positive regarding the structure of the survey and contents of the vignettes, with only minor changes made to the survey. Particularly, we inserted a statement within the vignettes to suggest that there was no sign of alternative infection, as was suggested. Following this, the survey was trialed on other non participating ICU clinicians, then finalized and participant recruitment began.

SM6. Demographic and experience characteristics of the sample (n = 66).

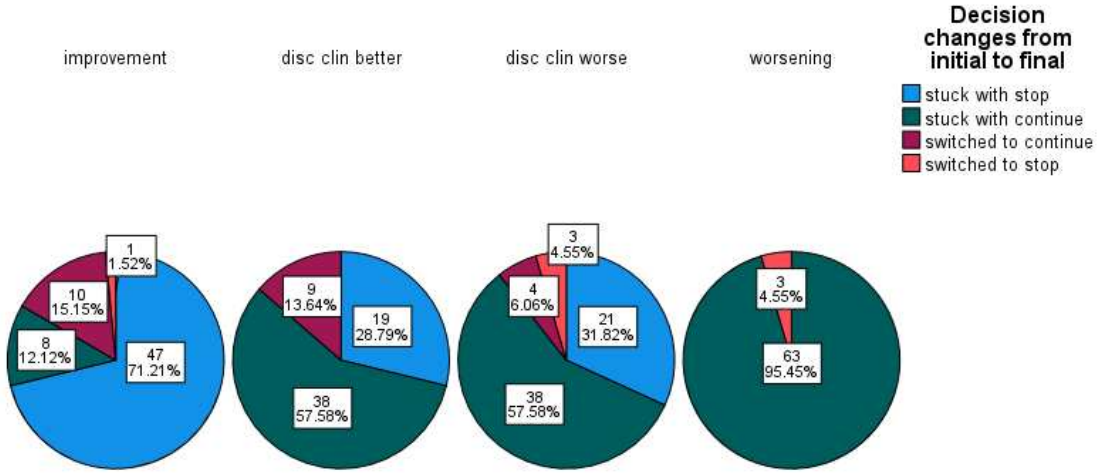
	n (%)	***Mean (SD),* range**
Gender		
Male	39 (59.1%)	
Female	25 (37.9%)	
Prefer not to say	2 (3.0%)	
Grade		
Consultant	34 (51.5%)	
SpR trainee	17 (25.8%)	
SHO trainee	13 (19.7%)	
FY trainee	2 (3.0%)	
Experience: consultants		
Number of years since consultancy awarded		9.77 (7.67), 0 - 25
Experience: trainees		
>24 months on ICU ward	12 (37.5%)	
12-24 months on ICU ward	5 (15.6%)	
6-12 months on ICU ward	3 (9.4%)	
3-6 months on ICU ward	12 (37.5%)	



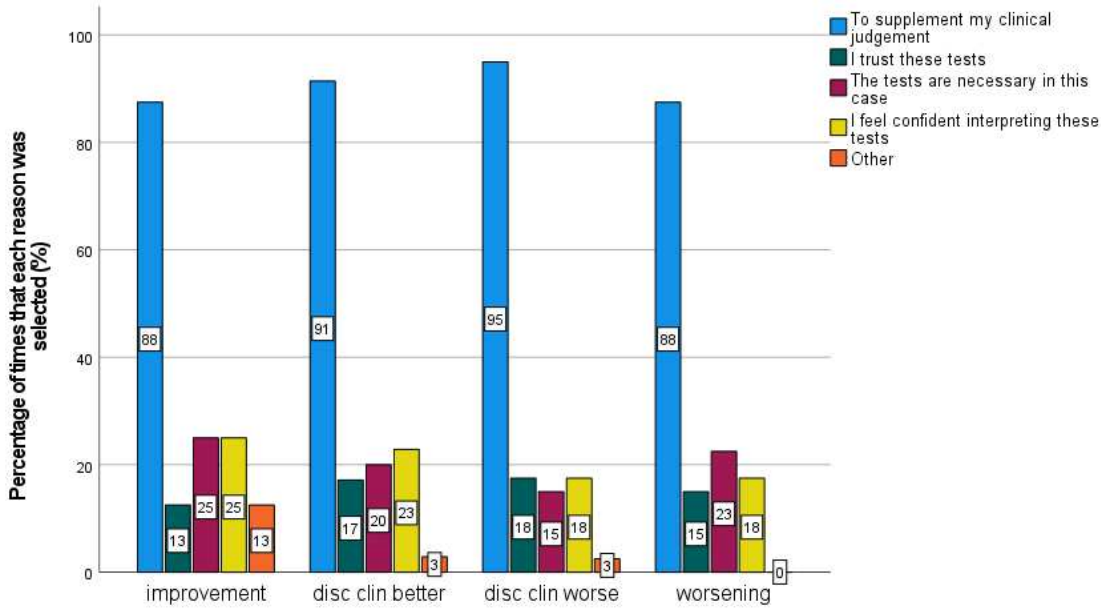
SM7a. Antibiotics decisions per scenario before (initial decision) POCT and PCT results, (n=66 for each scenario). Participants were given the opportunity to choose between four antibiotic decisions in each scenario: escalate antibiotics (more than the original course), continue with the original course, de-escalate antibiotics (less than the original course) and stop antibiotics.



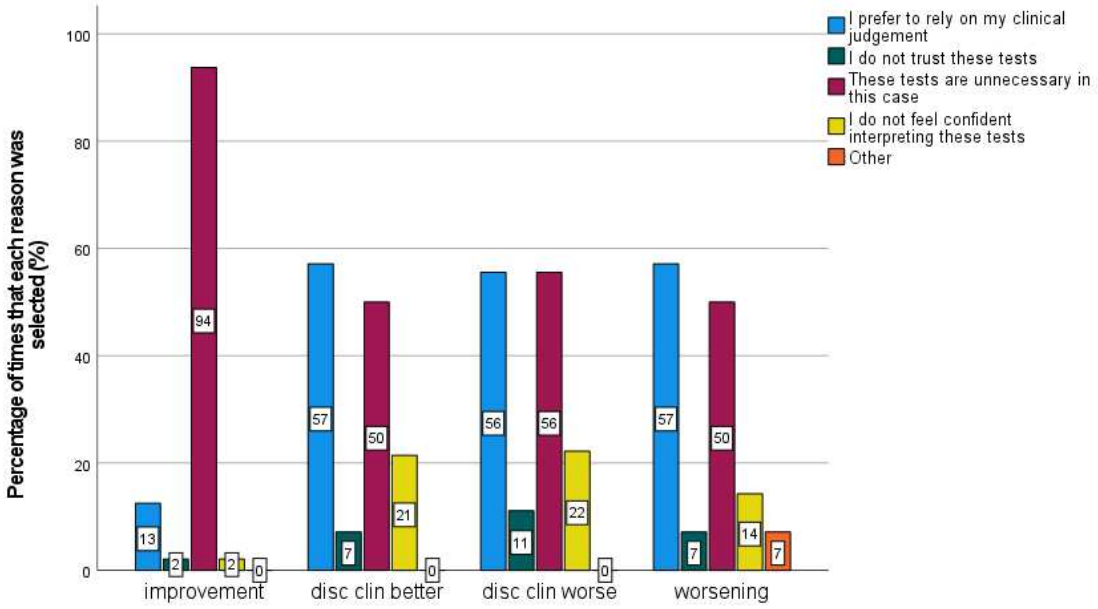
SM7b. Antibiotics decisions per scenario after POCT and PCT results (final decision), (n=66 for each scenario). Participants were given the opportunity to choose between four antibiotic decisions in each scenario: escalate antibiotics (more than the original course), continue with the original course, de-escalate antibiotics (less than the original course) and stop antibiotics.



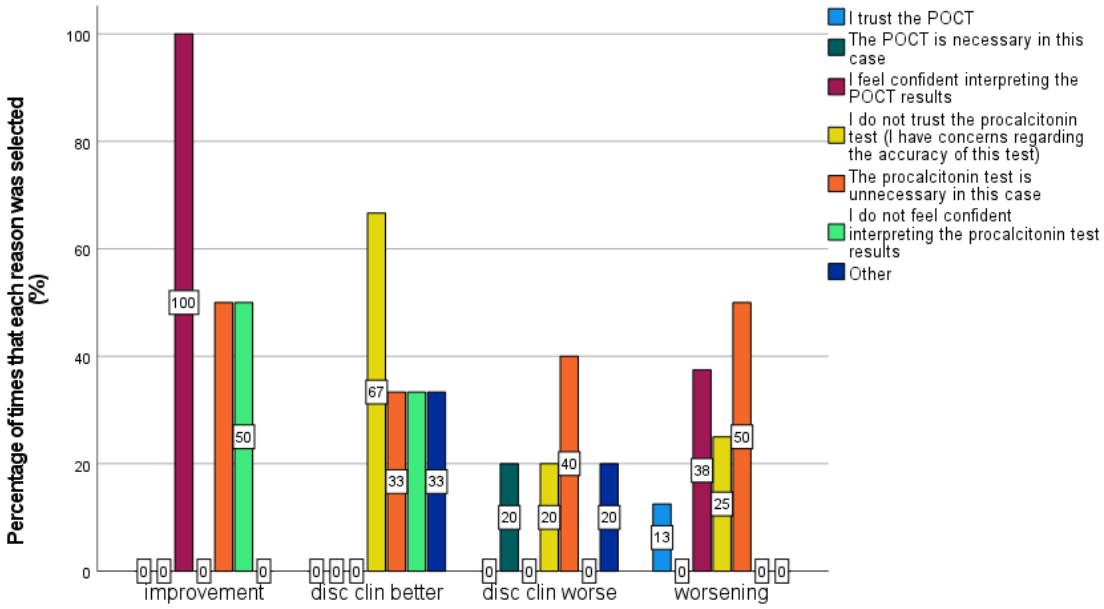
SM8. Decision changes, before vs. after receiving the negative POCT and positive procalcitonin test results, per scenario (n=66 for each scenario). Decisions were classified as “continue” if the participant elected to continue with the original course, escalate, or de-escalate. were all classified as “continue”. Absolute numbers and percentages are shown for each scenario.



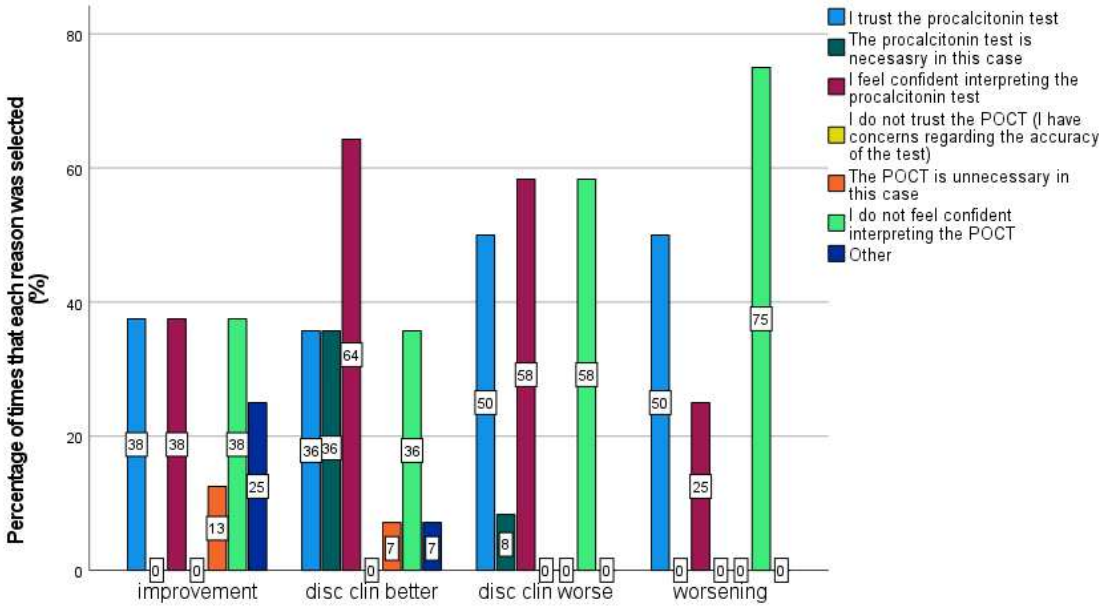
SM9a. Reasons for decision to request **neither** POCT nor PCT given by clinicians in the improvement (n=48), disc clin better (n=14), disc clin worse (n=9) and worsening (n=14) scenarios. Participants were able to select more than one reason for their decision. Data labels indicate the percentage that each reason was selected within each scenario.



SM9b. Reasons for decision to request **both** the POCT and PCT given by clinicians in the improvement (n=8), disc clin better (n=35), disc clin worse (n=40) and worsening (n=40) scenarios. Participants were able to select more than one reason for their decision. Data labels indicate the percentage that each reason was selected within each scenario.



SM9c. Reasons for decision to request the **POCT only** given by clinicians in the improvement (n=2), disc clin better (n=3), disc clin worse (n=5) and worsening (n=8) scenarios. Participants were able to select more than one reason for their decision. Data labels indicate the percentage that each reason was selected within each scenario.



SM9d. Reasons for decision to request the **PCT only** given by clinicians in the improvement (n=8), disc clin better (n=14), disc clin worse (n=12) and worsening (n=4) scenarios. Participants were able to select more than one reason for their decision. Data labels indicate the percentage that each reason was selected within each scenario.

SM10. A mixed effects linear regression model of final willingness-to-stop on 1) initial willingness-to-stop, 2) test(s) requested, 3) attitudes towards risk taking, 4) level of experience (consultant vs. trainee), and 5) scenarios returned the following results. A p-value of less than 0.05 was considered as statistically significant.

Parameter	***b***	**95% Confidence Interval**	***p*-value**
Initial willingness-to-stop	0.70	[0.57 to 0.83]	<0.001
POCT request	1.41	[0.15 to 2.66]	0.028
PCT request	-1.54	[-2.71 to -0.38]	0.009
Experience	0.37	[-0.66 to 1.41]	0.483
Sum of attitude toward risk taking score	0.07	[-0.10 to 0.24]	0.418
Scenario	-0.32	[-1.10 to 0.46]	0.418
Constant	-0.90	[-3.41 to 1.61]	0.484