Table S1: Item difficulty and selectivity for parameters of Classical Test Theory (CTT) and Item Response Theory (IRT) regarding all variables for EC as well as for CAP in both the game and the OSCE. CRP, C-reactive protein; PCT, procalcitonin; TOE, transoesophageal echocardiography; ABG, arterial blood gases

| Variables Endocarditis | Serious game | | | | OSCE | | | |
|------------------------|--------------|----------------|----------------|---------|----------------|----------------|---------|----------------|----------------|----------------|---------|
|                        | CTT-item difficulty | CTT-selectivity | IRT-parameter (SE) | CTT-item difficulty | CTT-selectivity | IRT-parameter (SE) |
| History: Allergies     | 0.57          | -0.029          | 0.13 (0.22)      | 0.47               | 0.019          | 0.42 (0.17)      |
| Examination: Temperature| 0.42          | 0.172           | 0.84 (0.23)      | 0.33               | -0.029         | 1.03 (0.18)      |
| Bloods: CRP or PCT     | /             | /              | /                | 0.89               | 0.050          | -1.83 (0.25)     |
| Bloods: Creatinin      | 0.94          | 0.031           | -2.43 (0.42)     | 0.65               | -0.114         | -0.37 (0.18)     |
| Investigation: TOE     | 0.69          | 0.205           | 2.06 (0.29)      | 0.72               | 0.050          | -0.99 (0.20)     |
| Investigation: Blood culture | 0.43        | 0.357           | 0.78 (0.23)      | 0.92               | 0.023          | -2.12 (0.28)     |
| Correct diagnosis      | 0.79          | 0.341           | -1.06 (0.26)     | /                  | /              | /                |
| Treatment: Gentamycin  | 0.25          | 0.578           | 1.34 (0.25)      | 0.83               | 0.403          | -1.33 (0.22)     |
| Treatment: Ampicillin  | 0.22          | 0.529           | 1.53 (0.26)      | 0.74               | 0.352          | -0.84 (0.19)     |
| Treatment: Flucloxacillin | 0.15        | 0.570           | 2.06 (0.29)      | 0.73               | 0.410          | -0.66 (0.18)     |
| Patient transfer       | 0.48          | 0.135           | 0.38 (0.22)      | 0.91               | 0.278          | -1.96 (0.27)     |

| Variables Community-acquired pneumonia | Serious game | | | | OSCE | | | |
|----------------------------------------|--------------|----------------|----------------|---------|----------------|----------------|---------|----------------|----------------|----------------|---------|
|                                        | CTT-item difficulty | CTT-selectivity | IRT-parameter (SE) | CTT-item difficulty | CTT-selectivity | IRT-parameter (SE) |
| History: Allergies                    | 0.59          | 0.038           | -0.15 (0.22)     | 0.57               | 0.051          | 0.22 (0.17)      |
| Examination: Temperature              | /             | /              | /                | 0.56               | -0.123         | -0.07 (0.17)     |
| Bloods: CRP or PCT                    | 0.89          | 0.290           | -1.40 (0.28)     | 0.91               | 0.217          | -2.20 (0.29)     |
| Bloods: Creatinin                     | 0.78          | 0.353           | -0.65 (0.23)     | 0.61               | -0.052         | -0.19 (0.17)     |
| Bloods: ABG                           | 0.77          | 0.189           | -0.93 (0.24)     | 0.67               | 0.199          | -0.25 (0.17)     |
| Urine: Legionella antigen             | 0.04          | -0.007          | 3.37 (0.5)       | 0.16               | 0.213          | 2.20 (0.24)      |
| Investigation: Blood culture          | 0.30          | 0.278           | 1.16 (0.24)      | 0.68               | 0.203          | -0.84 (0.19)     |
| Investigation: Sputum smear           | 0.19          | 0.237           | 1.81 (0.28)      | 0.23               | -0.043         | 1.38 (0.19)      |
| Correct diagnosis                     | 0.93          | -0.033          | -2.36 (0.39)     | /                  | /              | /                |
| Treatment: Ampicillin + Subbactam     | /             | /              | /                | 0.50               | 0.040          | 0.14 (0.17)      |
| Patient transfer                      | 0.26          | 0.151           | 1.33 (0.24)      | 0.45               | 0.032          | 0.42 (0.17)      |

Notes. EC: Cronbach’s Alpha for EMERGE: 0.600; Cronbach’s Alpha for OSCE: 0.358. CAP: Cronbach’s Alpha for EMERGE: 0.418; Cronbach’s Alpha for OSCE: 0.335.