THE LANCET Respiratory Medicine

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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Table 4. Between group comparisons of proportion of participants by marginal of change in Asthma Quality of Life Questionnaire (AQLQ) score (12m-Baseline)

a. DVD vs Usual care

| | | DVD | |
|----------------------|----------|-----------------|--------------|
| Usual care | Improved | Stayed the same | Deteriorated |
| | (0.725) | (0.212) | (0.063) |
| Improved (0.606) | 0.44 | 0.13 | 0.04 |
| Stayed the same | 0.21 | 0.06 | 0.02 |
| (0.295) | | | |
| Deteriorated (0.010) | 0.07 | 0.02 | 0.01 |
| | | | |
| NNT for DVD vs usual | 8.2 | | |
| care | | | |

c. Physiotherapy vs DVD

| | | DVD | |
|----------------------|----------|-----------------|--------------|
| Physiotherapy | Improved | stayed the same | Deteriorated |
| | (0.725) | (0.212) | (0.063) |
| Improved (0.746) | 0.54 | 0.16 | 0.05 |
| Stayed the same | 0.15 | 0.04 | 0.01 |
| (0.211) | | | |
| Deteriorated (0.044) | 0.03 | 0.01 | 0.00 |
| | | | |
| NNT for | 41.0 | | |
| physiotherapy vs | | | |
| DVD | | | |

b. Physiotherapy vs Usual care

| | | Physiotherapy | |
|---|----------|-----------------|------------|
| Usual care | Improved | Stayed the same | Deteriorat |
| | (0.746) | (0.211) | (0.044) |
| Improved (0.606) | 0.45 | 0.13 | 0.03 |
| Stayed the same | 0.22 | 0.06 | 0.01 |
| (0.295) | | | |
| Deteriorated (0.010) | 0.07 | 0.02 | 0.00 |
| NNT for Physiotherapy vs usual care | 6.8 | | |

^{*} The number needed to treat for one participant to benefit from breathing retraining is calculated by adding up cells of those who improved, subtracting the cells of those who deteriorated and dividing 1 by the result.

Table 5. Calculation of proportion of participants who benefited from receiving treatment in the BREATHE trial between treatment arms*

a. DVD vs Usual care

b. Physiotherapy vs Usual care

| | | DVD | |
|----------------------|----------|-----------------|--------------|
| Usual care | Improved | Stayed the same | Deteriorated |
| | (0.725) | (0.212) | (0.063) |
| Improved (0.614) | 0.45 | 0.12 | 0.04 |
| Stayed the same | 0.21 | 0.06 | 0.02 |
| (0.290) | | | |
| Deteriorated (0.010) | 0.07 | 0.02 | 0.01 |
| | | | |
| NNT for DVD vs | 7.92 | | |
| usual care | | | |

| | | Physiotherapy | |
|---|----------|-----------------|--------------|
| Usual care | Improved | Stayed the same | Deteriorated |
| | (0.755) | (0.2) | (0.045) |
| Improved (0.614) | 0.46 | 0.12 | 0.03 |
| Stayed the same | 0.22 | 0.06 | 0.01 |
| (0.290) | | | |
| Deteriorated (0.010) | 0.07 | 0.02 | 0.00 |
| NNT for Physiotherapy vs usual care | 6.86 | | |

c. DVD vs Physiotherapy

| | | DVD | |
|-----------------------|----------|-----------------|----------------------|
| Physiotherapy | Improved | stayed the same | Deteriorated (0.063) |
| | (0.725) | (0.212) | |
| Improved (0.755) | 0.56 | 0.15 | 0.05 |
| Stayed the same (0.2) | 0.15 | 0.04 | 0.01 |
| Deteriorated (0.045) | 0.03 | 0.01 | 0.00 |
| | | | |
| NNT for DVD vs | 55.52 | | |
| physiotherapy | | | |

^{*-} The number needed to treat for one participant to benefit from breathing retraining is calculated by adding up cells of those who improved, subtracting the cells of those who deteriorated and dividing 1 by the result.

Table 6. Adjusted change in physiological parameters at 12 months in DVD, physiotherapy and usual care treatment arms on the intention to treat population and per protocol populations

| | | Intention to treat | | Per protocol | | | | |
|------------------|----------------------|-------------------------|-------------------|--------------------|-----------------------|----------------------|--|--|
| Parameters | Adjuste | ed mean difference¹ (95 | 5% CI) | Adjust | ed mean difference1 (| 95% CI) | | |
| | Physiotherapy vs | DVD vs Usual care | DVD vs | Physiotherapy vs | DVD vs Usual care | DVD vs | | |
| | Usual care | | Physiotherapy | Usual care | | Physiotherapy | | |
| FEV1 | -0.04 (-0.11,0.04) | -0.001 (-0.07,0.07) | 0.03 (-0.05,0.12) | 0.02 (-0.06,0.11) | -0.01 (-0.08,0.07) | -0.03 (-0.12,0.06) | | |
| | | | | | | | | |
| FVC | -0.04 (-0.16,0.08) | -0.03 (-0.14,0.07) | 0.01 (-0.12,0.13) | 0.03 (-0.09,0.16) | 0.02 (-0.09,0.13) | -0.01 (-0.14,0.12) | | |
| | | | | | | | | |
| FEV1/FVC ratio | -0.01 (-0.02,0.01) | 0.004 (-0.01,0.02) | 0.01 (-0.01,0.03) | 0.01 (-0.02,0.02) | -0.003 (-0.02,0.01) | -0.004 (-0.03,0.02) | | |
| , | | | | | | | | |
| FEV1 % predicted | 0.44 (-3.23,4.12) | 0.53 (-2.75,3.81) | 0.09 (-3.81,3.99) | -1.49 (-5.33,2.36) | -0.98 (-4.35,2.39) | 0.51 (-3.55,4.57) | | |
| 1 | | | | | | | | |
| PEFR | -4.79 (-22.35,12.77) | -1.99 (-17.83,13.85) | 2.80 (- | 3.19 (- | 2.91 (- | -0.29 (-20.10,19.53) | | |
| | | | 15.94,21.54) | 15.41,21.80) | 13.66,19.48) | | | |
| FENO+ | 1.05 (0.95,1.23) | 1.13 (0.98,1.29) | 1.07 (0.91,1.25) | ,, | 1.14 (0.98,1.31) | 1.08 (0.92,1.28) | | |
| | 1.00 (0.23,1.20) | 1.10 (0.70,1.27) | 1.07 (0.71,1.20) | 1.05 (0.89,1.23) | 1.11 (0.70,1.01) | 1.00 (0.72)1.20) | | |

¹ Adjusted for pre-specified list of covariates ⁺ Geometric mean difference

Table 7. Unadjusted change in physiological parameters from baseline to 12 months post-intervention in DVD, physiotherapy and usual care treatment arms on the intention to treat and per protocol populations a. ITT

| | | Baseline | | | 12 months | | U | nadjusted mean diffe | rence (95% C |
|---------------------|-------------|---------------|-------------|--------------|---------------|-------------|--------------------|----------------------------|---------------|
| Parameters | DVD | Physiotherap | Usual care | DVD | Physiotherap | Usual care | Physiotherapy vs | DVD vs Usual care | DVD v |
| | (n=261) | у | (n=262) | (n=143) | y (n=92) | (n=189) | Usual care | | Physiothe |
| | | (n=132) | | | | | | | |
| FEV1 | 2.6 (0.8) | 2.5 (0.7) | 2.6 (0.8) | 2.6 (0.8) | 2.4 (0.7) | 2.5 (0.7) | 0.01 (-0.06,0.09) | -0.02 (-0.08,0.04) | -0.03 (-0.09 |
| FVC | 3.5 (0.9) | 3.3 (0.9) | 3.4 (0.9) | 3.6 (1.0) | 3.2 (0.8) | 3.4 (0.9) | 0.01 (-0.11,0.13) | -0.01 (-0.09,0.09) | -0.01 (-0.10 |
| FEV1/FVC ratio | 0.8 (0.1) | 0.8 (0.1) | 0.8 (0.1) | 0.8 (0.1) | 0.7 (0.1) | 0.8 (0.1) | 0.003 (-0.02,0.02) | -0.02 (-0.02,0.02) | -0.005 (-0.0) |
| FEV1 % predicted | 90.5(18.8) | 88.8 (18.1) | 91.9 (21.6) | 90.5(19.2) | 89.5 (19.5) | 91.9 (17.4) | -2.05 (-5.78,1.68) | -2.02 (-4.9,0.89) | 0.03 (-2.89 |
| PEFR | 425.5(115.7 | 414.9 (110.0) | 423.4 | 422.7(122.3) | 400.1 (114.7) | 415.1 | 4.49 (- | 2.32 (- | -2.17 (|
| |) | | (120.7) | | | (117.2) | 11.15,20.13) | 11.36,15.99) | 15.54,11 |
| | | | | | | | Unadjus | ted Median differenc | e p-value |
| FENO | | | | | | | | | |
| Median (IQR) | 21 (14,35) | 23 (15,33) | 23 (14,34) | 20 (13,33) | 21 (13,32) | 20 (13,31) | Z=-1.09,r=-0.071, | Z=-2.412, r=- | Z=-0.941, r= |
| | 'CC+ | | | | | | p=0.28 | 0.14 ¹ , p=0.02 | p=0.3! |

¹⁻Cohen's effect size

b. PP

| | | Baseline | | | 12 months | | U | nadjusted mean diffe | rence (95% |
|---------------------|----------------|---------------------------|-----------------------|----------------|--------------------------|-----------------------|--|--|----------------------|
| Parameters | DVD (n=215) | Physiotherap y (n=110) | Usual care (n=231) | DVD (n=134) | Physiotherap y (n=83) | Usual care (n=180) | Physiotherapy vs Usual care | DVD vs Usual care | DVD Physioth |
| FEV1 | 2.6 (0.8) | 2.4 (0.7) | 2.6 (0.8) | 2.6 (0.8) | 2.4 (0.7) | 2.5 (0.7) | -0.003 (-0.08,0.08) | -0.03 (-0.001,0.07) | -0.02 (-0. |
| FVC | 3.5 (0.9) | 3.2 (0.8) | 3.4 (0.9) | 3.5 (1.0) | 3.3 (0.8) | 3.4 (0.9) | -0.004 (-0.13,0.13) | -0.02 (-0.13,0.09) | -0.01 (-0. |
| FEV1/FVC ratio | 0.8 (0.1) | 0.8 (0.1) | 0.8 (0.1) | 0.8 (0.1) | 0.7 (0.1) | 0.8 (0.1) | -0.0004 (- 0.02,0.02) | -0.001 (-0.02,0.02) | -0.00 0.02,0 |
| FEV1 % predicted | 90.3(19.3) | 87.6 (17.9) | 92.2(21.8) | 90.5 (16.6) | 89.8 (18.9) | 91.6 (17.3) | -3.29 (-7.16,0.57) | -2.39 (-5.45,0.66) | 0.90 (-1.9 |
| PEFR | 422.5(118.8 | 410.5 (108.1) | 421.9(120.4 | 419.6 (121.4) | 401.3 (110.2) | 413.3 (118.0) | 3.0 (-13.56,19.57) | 3.3 (-11.05,17.71) | 0.33 13.67,1 |
| EENO | | | | | | | Unadjusted | Median difference, p | -value |
| FENO Median(IQR) | 21 (15,35) | 22 (15,34) | 22.5(14,34.5 | 19 (13,33) | 21 (13,32) | 20 (13,31) | Z=-0.85, r=-0.05 ¹ , p=0.40 | Z=-2.12, r=-0.13 ¹ , p=0.03 | Z=-0.91, r= p=0.1 |

¹⁻Cohen's effect size

Sensitivity analyses

A. Pre-specified sensitivity analysis on the primary outcome

As per the pre-specified statistical analysis plan (SAP), we carried out a sensitivity analysis on the primary outcome data, the change in AQLQ scores between baseline a 12 months. In this analysis, we included all randomised patients regardless of whether baseline or follow-up AQLQ data was present. Two different methods were employed during this sensitivity analysis, last observation carried forward (LOCF) and multiple imputation.

1. Using LOCF

For baseline AQLQ, scores for each domain were calculated provided at least two-thirds of the items were scored, otherwise the domain score was set to missing. If any domain score was missing, the overall AQLQ score was also set to missing (Juniper et al, Asthma Quality of life during 1 year of treatment with budesonide with or with formoterol. Eur R J 1999; 14: 1038-43). For missing baseline AQLQs, scores were replaced by their cohort mean (White & Thompson Adjusting for partially missing baseline measurements in randomized trials, Statistics in Medicine 2005; 24:993-1007).

For missing 12m AQLQ scores, the method of LOCF was applied. If 12m AQLQ score was missing, the 6m AQLQ score was taken. If both the 12m and 6m were missing, the 3m AQLQ score was used to replace. If all the 3m, 6m and 12m were missing (that is, no followup information available), then it was assumed that the subject returned their baseline AQLQ and the baseline AQLQ score was used to replace.

Hence both baseline and 12m have equal 'n'.

Table 8: Baseline to 12 month unadjusted change in Asthma Quality of Life Questionnaire (AQLQ) score in the DVD, physiotherapy and usual care arms on the

intention to treat population using LOCF

| AQLQ score | Baseline | | | 1 | 12 months | | | Unadjusted mean difference (95% CI) | | |
|------------|-----------|--------------|------------|--------|--------------|-----------|--------------------|-------------------------------------|------------------------|--|
| | DVD | Physiotherap | Usual care | DVD | Physiotherap | Usual | Physiotherapy | DVD (n=261) vs | DVD (n=261) vs | |
| | (n=261) | y (n=132) | (n=262) | (n=261 | y (n=132) | care | (n=132) vs Usual | Usual care | Physiotherapy | |
| | | | |) | | (n=262) | care (n=262) | (n=262) | (n=132) | |
| | | | | | | | (Total=394) | (Total=523) | (Total=393) | |
| Total | 4 2 (0 0) | 4.2 (0.0) | 4.2 (0.0) | 5.3 | F 2 (1 1) | E 1 (1 2) | 0.26 (0.05.0.40)* | 0.17 (0.01 0.25) | 0.00 (| |
| Total | 4.3 (0.9) | 4.2 (0.9) | 4.3 (0.9) | (1.2) | 5.3 (1.1) | 5.1 (1.2) | 0.26 (0.05,0.48)* | 0.17 (-0.01,0.35) | -0.09 (- 0.31,0.12) | |
| Symptoms | 4.2 (1.0) | 4.1 (1.1) | 4.2 (1.0) | 5.1 | 5.1 (1.2) | 4.9 (1.2) | 0.37 (0.10,0.63)** | 0.17 (-0.04,0.38) | -0.19 (- | |
| | | | | (1.3) | | | | | 0.45,0.06) | |
| Activities | 5.0 (1.3) | 4.8 (1.4) | 5.0 (1.3) | 5.8 | 5.6 (1.4) | 5.6 (1.4) | 0.16 (-0.09,0.42) | 0.11 (-0.09,0.32) | -0.05 (- | |
| | | | | (1.4) | | | | | 0.30,0.20) | |
| Emotion | 4.0 (1.3) | 4.1 (1.3) | 4.0 (1.3) | 5.2 | 5.4 (1.4) | 5.0 (1.6) | 0.31 | 0.25 (-0.01,0.50) | -0.06 (- | |
| | | | | (1.6) | | | $(0.001, 0.62)^*$ | | 0.37,0.24) | |
| Environmen | 4.0 (1.1) | 3.8 (1.2) | 3.9 (1.1) | 5.0 | 5.0 (1.4) | 4.8 (1.5) | | 0.13 (-0.10,0.37) | -0.08 (- | |
| t | | | | (1.5) | | | 0.21 (-0.05,0.48) | | 0.36,0.20) | |

^{*} p<0.05 ** p<0.001

radie 9: Baseline to 12 month unaujusted change in Asthma Quanty of the Questionnaire (AQLQ) score in the עעם, physiotherapy and usual care arms on the per protocol population using LOCF

| AQLQ score | Baseline | | | 1 | 2 months | | Unadjuste | ed mean difference (| (95% CI) |
|------------|-----------|--------------|------------|--------|--------------|-----------|-------------------|----------------------|----------------|
| | DVD | Physiotherap | Usual care | DVD | Physiotherap | Usual | Physiotherapy | DVD (n=261) vs | DVD (n=261) vs |
| | (n=261) | y (n=123) | (n=262) | (n=261 | y (n=123) | care | (n=123) vs Usual | Usual care | Physiotherapy |
| | | | |) | | (n=262) | care (n=262) | (n=262) | (n=123) |
| | | | | | | | (Total=385) | (Total=523) | (Total=384) |
| Total | 4.3 (0.9) | 4.2 (0.9) | 4.3 (0.9) | 5.3 | 5.3 (1.1) | 5.1 (1.2) | 0.30 (0.08,0.52)* | 0.17 (-0.01,0.35) | -0.13 (- |
| | | | | (1.2) | | | | | 0.35,0.09) |
| Symptoms | 4.2 (1.0) | 4.0 (1.1) | 4.2 (1.0) | 5.1 | 5.2 (1.1) | 4.9 (1.2) | 0.40 (0.12,0.67)* | 0.17 (-0.04,0.38) | -0.22 (- |
| | | | | (1.3) | | | | | 0.49,0.04) |
| Activities | 5.0 (1.3) | 4.8 (1.4) | 5.0 (1.3) | 5.8 | 5.6 (1.4) | 5.6 (1.4) | 0.19 (-0.08,0.45) | 0.11 (-0.09,0.32) | -0.08 (- |
| | | | | (1.4) | | | | | 0.33,0.18) |
| Emotion | 4.0 (1.3) | 4.0 (1.3) | 4.0 (1.3) | 5.2 | 5.5 (1.3) | 5.0 (1.6) | 0.36 (0.04,0.68)* | 0.25 (-0.01,0.50) | -0.11 (- |
| | | | | (1.6) | | | | | 0.43,0.20) |
| Environmen | 4.0 (1.1) | 3.8 (1.2) | 3.9 (1.1) | 5.0 | 5.0 (1.4) | 4.8 (1.5) | 0.27 (- | 0.13 (-0.10,0.37) | -0.13 (- |
| t | | | | (1.5) | | | 0.005,0.53) | | 0.42,0.15) |

^{*} p<0.05

Table 10: Adjusted mean difference in 12 month Asthma Quality of Life Questionnaire (AQLQ) score in the DVD, physiotherapy and usual care treatment are on the intention to treat and per protocol populations using LOCF

| | Intention to treat | | Per protocol | | | |
|----------------------|---|--|--|---|---|--|
| Adjusted mean differ | rence¹ (95% CI) | | Adjusted mean diffe | rence¹ (95% CI) | | |
| Physiotherapy vs | DVD vs Usual care | DVD vs | Physiotherapy vs | DVD vs Usual care | DVD vs | |
| Usual care | | Physiotherapy | Usual care | | Physiotherapy | |
| 0.21 (0.02,0.40)* | 0.17 (0.02, 0.33)* | -0.04 (-0.23,0.15) | 0.25 (0.06, 0.44)* | 0.17 (0.01, 0.33)* | -0.08 (-0.27,0.12) | |
| 0.26 (0.04,0.47)* | 0.16 (-0.02, 0.34) | -0.09 (-0.31,0.12) | 0.29 (0.07,0.51)* | 0.16 (-0.02, 0.34) | -0.13 (-0.35,0.09) | |
| 0.06 (-0.14,0.27) | 0.13 (-0.05, 0.30) | 0.06 (-0.15,0.27) | 0.10 (-0.11,0.31) | 0.12 (-0.05,0.30) | 0.02 (-0.19,0.24) | |
| 0.32 (0.06,0.58)* | 0.23 (0.02,0.45)* | -0.09 (-0.34,0.17) | 0.36 (0.10,0.62)* | 0.23 (0.02, 0.44)* | -0.13 (-0.39,0.14) | |
| 0.16 (-0.07,0.40) | 0.18 (-0.02,0.38) | 0.01 (-0.23,0.25) | -0.18 (-0.46,0.9) | 0.22 (-0.03, 0.46) | -0.04 (-0.29,0.21) | |
| | Physiotherapy vs Usual care 0.21 (0.02,0.40)* 0.26 (0.04,0.47)* 0.06 (-0.14,0.27) 0.32 (0.06,0.58)* | Adjusted mean difference ¹ (95% CI) Physiotherapy vs Usual care 0.21 (0.02,0.40)* 0.26 (0.04,0.47)* 0.16 (-0.02, 0.34) 0.06 (-0.14,0.27) 0.13 (-0.05, 0.30) 0.32 (0.06,0.58)* 0.23 (0.02,0.45)* | Adjusted mean difference¹ (95% CI) Physiotherapy vs DVD vs Usual care DVD vs Physiotherapy 0.21 (0.02,0.40)* 0.17 (0.02, 0.33)* -0.04 (-0.23,0.15) 0.26 (0.04,0.47)* 0.16 (-0.02, 0.34) -0.09 (-0.31,0.12) 0.06 (-0.14,0.27) 0.13 (-0.05, 0.30) 0.06 (-0.15,0.27) 0.32 (0.06,0.58)* 0.23 (0.02,0.45)* -0.09 (-0.34,0.17) | Adjusted mean difference¹ (95% CI) Adjusted mean diffe Physiotherapy vs Usual care DVD vs Usual care DVD vs Physiotherapy Physiotherapy vs Usual care 0.21 (0.02,0.40)* 0.17 (0.02, 0.33)* -0.04 (-0.23,0.15) 0.25 (0.06, 0.44)* 0.26 (0.04,0.47)* 0.16 (-0.02, 0.34) -0.09 (-0.31,0.12) 0.29 (0.07,0.51)* 0.06 (-0.14,0.27) 0.13 (-0.05, 0.30) 0.06 (-0.15,0.27) 0.10 (-0.11,0.31) 0.32 (0.06,0.58)* 0.23 (0.02,0.45)* -0.09 (-0.34,0.17) 0.36 (0.10,0.62)* | Adjusted mean difference¹ (95% CI) Adjusted mean difference¹ (95% CI) Physiotherapy vs Usual care DVD vs Usual care Physiotherapy vs Usual care DVD vs Usual care 0.21 (0.02,0.40)* 0.17 (0.02, 0.33)* -0.04 (-0.23,0.15) 0.25 (0.06, 0.44)* 0.17 (0.01, 0.33)* 0.26 (0.04,0.47)* 0.16 (-0.02, 0.34) -0.09 (-0.31,0.12) 0.29 (0.07,0.51)* 0.16 (-0.02, 0.34) 0.06 (-0.14,0.27) 0.13 (-0.05, 0.30) 0.06 (-0.15,0.27) 0.10 (-0.11,0.31) 0.12 (-0.05,0.30) 0.32 (0.06,0.58)* 0.23 (0.02,0.45)* -0.09 (-0.34,0.17) 0.36 (0.10,0.62)* 0.23 (0.02, 0.44)* | |

 $^{^{1}}$ Adjusted for pre-specified list of covariates $\ \ ^{*}$ p<0.05

B. Using multiple imputation

At the request of a Lancet statistical reviewer, further analyses were performed using multiple imputation. For baseline AQLQ, scores for each domain were calculated provided at least two-thirds of the items were scored, otherwise the domain score was set to missing. If any domain score was missing, the overall AQLQ score was also to missing (Juniper et al, Asthma Quality of life during 1 year of treatment with budesonide with or without formoterol. Eur R J 1999; 14: 1038-43). For missing baselir AQLQs, scores were replaced by their cohort mean (White & Thompson Adjusting for partially missing baseline measurements in randomized trials, Statistics in Medici 2005; 24:993-1007).

For missing 12m AQLQ scores, assuming missing at random (MAR), a fully conditional specification multiple imputation method was applied (http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.468.9391&rep=rep1&type=pdf Carpenter R and Kenward M; (2013) Multiple imputation and its application. Wiley, Chichester, p. 364. ISBN 978-0-470-74052-1.

тарие 11: вазение to 12 month unaujusted change in Astrima Quanty of the Questionnaire (AQLQ) score in the מעט, physiotherapy and usual care arms on fintention to treat population using multiple imputation

| AQLQ score | Baseline | | | 12 months | | | Unadjusted mean difference (95% CI) | | |
|------------|-----------|--------------|------------|-----------|--------------|-----------|-------------------------------------|-------------------|----------------|
| | DVD | Physiotherap | Usual care | DVD | Physiotherap | Usual | Physiotherapy | DVD (n=261) vs | DVD (n=261) vs |
| | (n=261) | y (n=132) | (n=262) | (n=261 | y (n=132) | care | (n=132) vs Usual | Usual care | Physiotherapy |
| | | | |) | | (n=262) | care (n=262) | (n=262) | (n=132) |
| | | | | | | | | | |
| Total | 4.3 (0.9) | 4.2 (0.9) | 4.3 (0.9) | 5.4 | 5.3 (1.2) | 5.1 (1.2) | 0.29 (0.05,0.52)* | 0.22 (0.03,0.41)* | -0.06 (- |
| | | | | (1.2) | | | | | 0.30,0.17) |
| Symptoms | 4.2 (1.0) | 4.1 (1.1) | 4.2 (1.0) | 5.2 | 5.2 (1.3) | 4.9 (1.3) | 0.39 (0.10,0.68)** | 0.20 (-0.02,0.42) | -0.19 (- |
| | | | | (1.3) | | | | | 0.47,0.09) |
| Activities | 5.0 (1.3) | 4.8 (1.4) | 5.0 (1.3) | 5.8 | 5.7 (1.4) | 5.7 (1.4) | 0.17 (-0.09,0.44) | 0.15 (-0.07,0.36) | -0.02 (- |
| | | | | (1.3) | | | | | 0.30,0.24) |
| Emotion | 4.0 (1.3) | 4.1 (1.3) | 4.0 (1.3) | 5.4 | 5.4 (1.4) | 5.1 (1.6) | 0.31 (-0.01,0.64) | 0.29 (0.02,0.56)* | -0.02 (- |
| | | | | (1.6) | | | | | 0.35,0.30) |
| Environmen | 4.0 (1.1) | 3.8 (1.2) | 3.9 (1.1) | 5.1 | 5.0 (1.5) | 4.8 (1.6) | 0.27 (-0.03,0.57) | 0.20 (-0.04,0.45) | -0.07 (- |
| t | | | | (1.6) | | | | | 0.36,0.23) |

^{*} p<0.05 ** p<0.001

Table 12: Baseline to 12 month unadjusted change in Asthma Quality of Life Questionnaire (AQLQ) score in the DVD, physiotherapy and usual care arms on per protocol population using multiple imputation

| AQLQ score | Baseline | | | 12 months | | | Unadjusted mean difference (95% CI) | | |
|-------------|-----------|--------------|------------|-----------|--------------|-----------|-------------------------------------|-------------------|----------------|
| | DVD | Physiotherap | Usual care | DVD | Physiotherap | Usual | Physiotherapy | DVD (n=261) vs | DVD (n=261) vs |
| | (n=261) | y (n=123) | (n=262) | (n=261 | y (n=123) | care | (n=123) vs Usual | Usual care | Physiotherapy |
| | | | |) | | (n=262) | care (n=262) | (n=262) | (n=123) |
| | | | | | | | (Total=385) | (Total=523) | (Total=384) |
| | | | | | | | | | |
| Total | 4.3 (0.9) | 4.2 (0.9) | 4.3 (0.9) | 5.3 | 5.3 (1.1) | 5.1 (1.2) | 0.31 (0.08,0.54)* | 0.22 (0.04,0.41)* | -0.09 (- |
| | | | | (1.2) | | | | | 0.31,0.14) |
| Symptoms | 4.2 (1.0) | 4.0 (1.1) | 4.2 (1.0) | 5.1 | 5.2 (1.1) | 4.9 (1.2) | 0.42 (0.15,0.69)* | 0.20 (-0.02,0.42) | -0.19 (- |
| | | | | (1.3) | | | | | 0.47,0.08) |
| Activities | 5.0 (1.3) | 4.8 (1.4) | 5.0 (1.3) | 5.8 | 5.6 (1.4) | 5.6 (1.4) | 0.20 (-0.07,0.48) | 0.15 (-0.07,0.39) | -0.02 (- |
| | | | | (1.4) | | | | | 0.29,0.25) |
| Emotion | 4.0 (1.3) | 4.0 (1.3) | 4.0 (1.3) | 5.2 | 5.5 (1.3) | 5.0 (1.6) | 0.41 (0.07,0.74)* | 0.29 (0.02,0.58)* | -0.09 (- |
| | | | | (1.6) | | | | | 0.41,0.23) |
| Environment | 4.0 (1.1) | 3.8 (1.2) | 3.9 (1.1) | 5.0 | 5.0 (1.4) | 4.8 (1.5) | 0.31 (0.02,0.61)* | 0.20 (-0.02,0.45) | -0.08 (- |
| | | | | (1.5) | | | | | 0.38,0.22) |

Appendix 3: Missing Baseline primary and secondary outcomes by treatment arm.

| | DVD | Physiotherapy | Usual care | Overall |
|--------------------|-----------|---------------|------------|-----------|
| | (n=261) | (n=132) | (n=262) | (n=655) |
| Mini AQLQ | 17 (6.5%) | 12 (9.1%) | 16 (6.1%) | 45 (6.9%) |
| Nijmegen | 2 (0.8%) | 0 (0.0%) | 0 (0.0%) | 2 (0.3%) |
| HADS | 4 (1.5%) | 1 (0.8%) | 1 (0.6%) | 6 (0.9%) |
| EQ-5D | | | | |
| Mobility | 2 (0.8%) | 0 (0.0%) | 0 (0.0%) | 2 (0.3%) |
| Self-care | 3 (1.1%) | 1 (0.8%) | 0 (0.0%) | 4 (0.6%) |
| Usual activities | 2 (0.8%) | 0 (0.0%) | 0 (0.0%) | 2 (0.3%) |
| Pain/Discomfort | 2 (0.8%) | 1 (0.8%) | 1 (0.4%) | 4 (0.6%) |
| Anxiety/Depression | 2 (0.8%) | 0 (0.0%) | 0 (0.0%) | 2 (0.3%) |
| EQ-5D VAS | 5 (1.9%) | 1 (0.8%) | 4 (1.5%) | 10 (1.5%) |
| ACQ | 3 (1.1%) | 0 (0.0%) | 0 (0.0%) | 3 (0.5%) |
| FEV1 (litres) | 15 (5.7%) | 2 (1.5%) | 9 (3.4%) | 26 (4.0%) |
| FENO (litres) | 23 (8.8%) | 6 (4.5%) | 20 (7.6%) | 49 (7.5%) |
| FVC (litres) | 15 (5.1%) | 2 (1.5%) | 9 (3.4%) | 26 (4.0%) |
| FEV1/FVC ratio | 15 (5.1%) | 2 (1.5%) | 9 (3.4%) | 26 (4.0%) |
| FEV1% predicted | 15 (5.1%) | 2 (1.5%) | 9 (3.4%) | 26 (4.0%) |
| PEFR | 17 (6.5%) | 3 (2.3%) | 13 (5.0%) | 33 (5.0%) |
| Smoking status | 2 (0.8%) | 0 (0.0%) | 0 (0.0%) | 2 (0.3%) |
| Weight in kg | 3 (1.1%) | 0 (0.0%) | 1 (0.4%) | 4 (0.6%) |
| Height in cm | 2 (0.8%) | 0 (0.0%) | 1 (0.4%) | 3 (0.5%) |

Values are in n(%)

Appendix 4. Mean NHS total cost per patient by arm

The mean NHS service use and cost per patient by treatment arm was aggregated from the costs of asthma-related prescriptions, consultations and hospit admissions. The unadjusted mean cost was highest in the usual-care arm (£356; Table A1), with a similar cost in the physiotherapy arm (£335) and the lowest cost in the DVD arm (£296). The main cost items for each group were asthma-related medications and GP consultations, with lower costs reflecting low levels of use of other services; although there were few hospital admissions (usual-care arm, n = 8; physiotherapy arm, n = 0; DVD arm, n = 4), they we by far the most costly item.

Table 1. Mean NHS resource use and cost, unadjusted, in each treatment arm (2014/2015 prices)

| Treatment | | Categories | Means (SD) for those | Mean for |
|-------------|----------|-----------------|----------------------|-----------|
| arm | | | using service | All (SD) |
| Usual Care: | Cost (£) | All costs | 379(672) n= 246 | 356 (657) |
| N=262 | | Medication | 183(217) n= 242 | 169 (214) |
| | | GP consultation | 100(84) n= 201 | 77 (85) |
| | | Outpatient | 347(321) n= 21 | 28 (130) |
| | | attendance | | |
| | | Hospital | 2581(0) n= 8 | 79 (445) |
| | | admission | | |
| Face-to- | Cost (£) | All costs | 335(254) n= 132 | 335 (254) |
| Face: | | Medication | 173(199) n= 120 | 157 (196) |
| N=132 | | GP consultation | 92(93) n= 99 | 69 (90) |
| | | Outpatient | 203(88) n= 14 | 21 (68) |
| | | attendance | | |
| | | Hospital | n= 0 | 0 (0) |
| | | admission | | |
| | | Intervention | 83(.) n= 132 | 83 (0) |
| DVD: | Cost (£) | All costs | 296(715) n= 261 | 296 (715) |

| N=70T | | месисацоп | 10/(1//) II= 444 | 144 (1/4) |
|-------|--|-----------------|------------------|-----------|
| | | GP consultation | 94(99) n= 186 | 67 (94) |
| | | Outpatient | 221(122) n= 25 | 21 (75) |
| | | attendance | | |
| | | Hospital | 3872(2581) n= 4 | 59 (551) |
| | | admission | | |
| | | Intervention | 3(0) n= 261 | 3 (0) |

Notes: All costs comprise the total of costs incurred. The main components of all costs were the services shown, that is GP consultations, medications, hospital admissio and intervention.

The mean costs in each arm changed only slightly when bootstrapped (Table 2): £377 in Usual Care, £333 in the face-to-face arm and £293 in the DVD arm (Table 31). I differences were not statistically significant at the 5% level.

Given that the intervention costs were higher in the face-to-face group (£83.5) and DVD group (£2.85) compared to Usual Care, the inclusion of NHS costs offset these higher costs, leading to lower overall mean costs in both intervention arms compared to usual care.

Table 2. Mean total costs per person (mean, 95% CI) using bootstrap methods

| Treatment arms | Costs (£) | Incremental cost (£) | |
|----------------|----------------|----------------------|--|
| Usual Care | 377 (310, 459) | | |
| Face-to-Face | 333 (299, 369) | -41 (-134, 33) | |
| DVD | 293 (228, 374) | -83 (-187, 12) | |