

References:

1. Liu AH, Zeiger RS, Sorkness CA, Ostrom NK, Chipps BE, Rosa K, et al. The Childhood Asthma Control Test: retrospective determination and clinical validation of a cut point to identify children with very poorly controlled asthma. *The Journal of allergy and clinical immunology*. 2010 Aug;126(2):267-73, 73 e1. PubMed PMID: 20624640.
2. Juniper EF, Guyatt GH, Cox FM, Ferrie PJ, King DR. Development and validation of the Mini Asthma Quality of Life Questionnaire. *The European respiratory journal*. 1999 Jul;14(1):32-8. PubMed PMID: 10489826.
3. Nathan RA, Sorkness CA, Kosinski M, Schatz M, Li JT, Marcus P, et al. Development of the asthma control test: a survey for assessing asthma control. *The Journal of allergy and clinical immunology*. 2004 Jan;113(1):59-65. PubMed PMID: 14713908.

Supplementary Figure Legends:

Figure E1: Flow diagram for study visits.

Table S1

Allergen	Minimum accepted concentration
Der p1 + Der f1	2 ug/g
Fel d1	1ug/g
Can f1	1ug/g
Mus m1	0.4 ug/g
Bla 2	0.06 ug/g

Table S2: Algorithm for prescribing treatment regimen at Randomization

Current regimen	Current level of control	Regimen for run-in
Step 1	Control level 1 Control level 2 Control level 3 Control level 4	Step 1 Step 2 Step 2 Step 3
Step 2	Control level 1 Control level 2 Control level 3 Control level 4	Step 2 Step 3 Step 3 Step 4
Step 3	Control level 1 Control level 2 Control level 3 Control level 4	Step 3 Step 4 Step 4 Step 5
Step 4	Control level 1 Control level 2 Control level 3 Control level 4	Step 4 Step 5 Step 5 Step 6
Step 5	Control level 1 Control level 2 Control level 3 Control level 4	Step 5 Step 6 Step 6 Step 6
Step 6	Control level 1 Control level 2 Control level 3 Control level 4	Step 6 Step 6 Step 6 Step 6

Table S3: Algorithm for treatment period

Control Level	
1	If on step 1, reduce to albuterol prn. If on steps 2-6, decrease controller regimen by 1 step
2	Increase controller regimen by 1 step; if on step 6 continue step 6
3	If on steps 1-4, increase controller regimen by 2 steps. If on step 5, Increase to step 6. If on step 6, continue.
4	If on steps 1-3, increase controller regimen by 3 steps OR treat with 4 day Prednisone burst and increase controller regimen by 2 steps. If on steps 4-5, increase to step 6 OR treat with step 6 AND 8 day prednisone burst. If on step 6, continue step 6 OR treat with step 6 and a 4 day prednisone burst

Table S4: Characteristics of the Intention-to-Treat Participants at Randomization for Sensitization (allergen-specific IgE) and Exposure *

	Intervention N=125	Usual Care N=122	p-value
Total IgE (kU/L)	190 [105 - 540]	259 [138 - 622]	0.33
Mite IgE (kU/L)	0.76 [0.25 - 9.94]	0.51 [0.25 - 3.72]	0.43
Cat IgE (kU/L)	1.34 [0.25 - 5.12]	1.87 [0.25 - 17.1]	0.41
Roach IgE (kU/L)	1.10 [0.25 - 7.87]	1.63 [0.25 - 8.07]	0.90
Mouse IgE (kU/L)	0.25 [0.25 - 2.44]	0.25 [0.25 - 2.64]	0.97
Dog IgE (kU/L)	1.27 [0.25 - 4.83]	2.61 [0.25 - 12.3]	0.11
Mite Positive > 0.35 (kU/L): Yes	34 (59.6%)	42 (62.7%)	0.87
Cat Positive > 0.35 (kU/L): Yes	36 (63.2%)	46 (68.7%)	0.65
Roach Positive > 0.35 (kU/L): Yes	37 (64.9%)	44 (65.7%)	0.99
Mouse Positive > 0.35 (kU/L): Yes	22 (38.6%)	23 (34.3%)	0.76
Dog Positive > 0.35 (kU/L): Yes	36 (63.2%)	49 (73.1%)	0.32
Bla g 2 bed (ug/g) (LOD 0.034)	0.02 [0.02 - 0.09]	0.02 [0.02 - 0.09]	0.3
Der f 1 bed (ug/g) (LOD 0.069)	0.04 [0.04 - 0.15]	0.04 [0.04 - 0.04]	0.54
Fel d 1 bed (ug/g) (LOD 0.041)	0.06 [0.02 - 0.33]	0.05 [0.02 - 0.29]	0.75
Mus m 1 bed (ug/g) (LOD 0.034)	0.29 [0.12 - 1.13]	0.40 [0.13 - 1.64]	0.21
Can f 1 bed (ug/g) (LOD 0.069)	0.11 [0.04 - 1.71]	0.13 [0.04 - 1.15]	0.67
Bla g 2 bed (ug/g) (LOD 0.086)	0.60 [0.04 - 6.60]	0.45 [0.04 - 5.42]	0.75
Mus m 1 bed (ug/g) (LOD 0.17)	1.30 [0.20 - 10.2]	2.95 [0.40 - 19.7]	0.10
Bla g 2 bed: Yes	57 (46.7%)	43 (35.5%)	0.10
Der f 1 bed: Yes	33 (26.4%)	29 (24.0%)	0.77
Fel d 1 bed: Yes	69 (55.2%)	63 (52.1%)	0.72
Mus m 1 bed Yes/No: Yes	120 (96.0%)	120 (98.4%)	0.45
Can f 1 bed Yes/No: Yes	72 (57.6%)	82 (67.2%)	0.15
Bla g 2 bed Yes/No: Yes	90 (72.0%)	87 (72.5%)	0.99
Mus m 1 bed Yes/No: Yes	104 (83.2%)	108 (88.5%)	0.31
Dog in your home now or 6 months prior: Yes	23 (28.7%)	29 (36.7%)	0.37
Cat in your home now or 6 months prior: Yes	18 (24.0%)	18 (26.5%)	0.88
Rodent in your home now or 6 months prior: Yes	9 (12.7%)	8 (12.3%)	0.99

* Values are count (percent) or median [inter quartile range]

LOD: Limit of detection

Table S5: Treatment Effect (change from baseline) during 48 Weeks of Follow-up* Change from Baseline in outcomes (Baseline visit minus final visit)

	Intervention*	Usual Care*	Difference † (95% CI)	p-value
Asthma symptoms (days/2 weeks)	-0.14 ± 0.26	-0.52 ± 0.27	0.38 (-0.37,1.12)	0.32
Rescue (albuterol) inhaler	-0.19 ± 0.23	-0.49 ± 0.24	0.29 (-0.37,0.96)	0.39
Awakened with asthma symptoms	0.10 ± 0.22	-0.07 ± 0.23	0.17 (-0.46,0.8)	0.60
Asthma Control Test (ACT)	-0.61 ± 0.38	-0.33 ± 0.40	-0.29 (-1.36,0.79)	0.60
Childhood ACT	-0.37 ± 0.60	0.24 ± 0.63	-0.61 (-2.36,1.14)	0.49
Treatment Step	0.95 ± 0.11	0.96 ± 0.12	-0.02 (-0.34,0.31)	0.92
eNO *	1.19 ± 0.07	1.05 ± 0.07	0.14 (-0.04,0.33)	0.13
FEV ₁ (% predicted) Pre	1.70 ± 0.76	2.72 ± 0.79	-1.02 (-3.16,1.12)	0.35
FEV ₁ (% predicted) Post	0.75 ± 0.90	1.88 ± 0.94	-1.13 (-3.69,1.44)	0.39
Control Level	0.43 ± 0.11	0.49 ± 0.12	-0.07 (-0.38,0.25)	0.68
Composite Asthma Score	0.15 ± 0.19	-0.09 ± 0.20	0.24 (-0.30,0.78)	0.38
Juniper mini QOL	-0.32 ± 0.14	-0.08 ± 0.16	-0.24 (-0.66,0.18)	0.27

* Plus-minus values are means ±SE over the 48 week treatment period. Change from baseline is calculated as baseline visit minus post baseline visit).

† Unrounded values were used to determine the difference between groups for the 48 week treatment

Table S6: Subgroup Analyses for the primary outcome (treatment step) using different a-priori randomization characteristics*

Subgroup	Group: No		Group: Yes		Interaction p-value*
	Difference (Int-Cntl)	p value	Difference (Int-Cntl)	p-value	
Age	0.18 (0.32)	0.57	-0.05 (0.29)	0.85	0.58
BMI > 30	-0.32 (0.28)	0.26	0.44 (0.34)	0.19	0.09
ETS exposure	0.26 (0.28)	0.36	-0.43 (0.43)	0.32	0.18
Non-Hispanic	-0.02 (0.32)	0.95	0.09 (0.36)	0.80	0.81
Control level > 1	0.20 (0.27)	0.47	0.09 (0.30)	0.76	0.80
Treatment step 6	0.15 (0.24)	0.53	0.10 (0.28)	0.71	0.90
Roach sensitized and exposed	0.24 (0.36)	0.50	-0.17 (0.32)	0.59	0.39
Mouse sensitized and exposed	0.10 (0.27)	0.72	-0.39 (0.53)	0.46	0.41

* All subgroup analyses were pre-specified before examination of the data and are presented in their entirety in this table. We employed the recommended statistical method for assessing the heterogeneity of the effect among the subgroups using a statistical test for interaction, adjusting for the pre specified baseline characteristics. Because they were exploratory, subgroup analyses do not include adjustment for multiple comparisons.

Table S7 Sensitization and exposure to each allergen

Allergen (Sensitized and exposed)	Intervention	Control	p-value
Roach (n, %)	70 (57.4%)	64 (53.8%)	0.67
Mouse (n,%)	35 (28.7%)	21 (17.6%)	0.06
Cat (n, %)	20 (16.0%)	21 (17.4%)	0.91
Dog (n, %)	14 (11.2%)	25 (20.5%)	0.07
Dust (n, %)	3 (2.4%)	4 (3.3%)	0.72

Figure E1: Flow diagram for study visits and home visits.

