# Asthma

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# Contents

- “Asthma” as a keyword
  - Pubmed
  - JAN 2015 ~ MAR 2016
  - Clinical studies published in English
  - >230
  - Medications, Managements, Alternative medicines....

# LABA vs LAMA
# LAMA in asthma

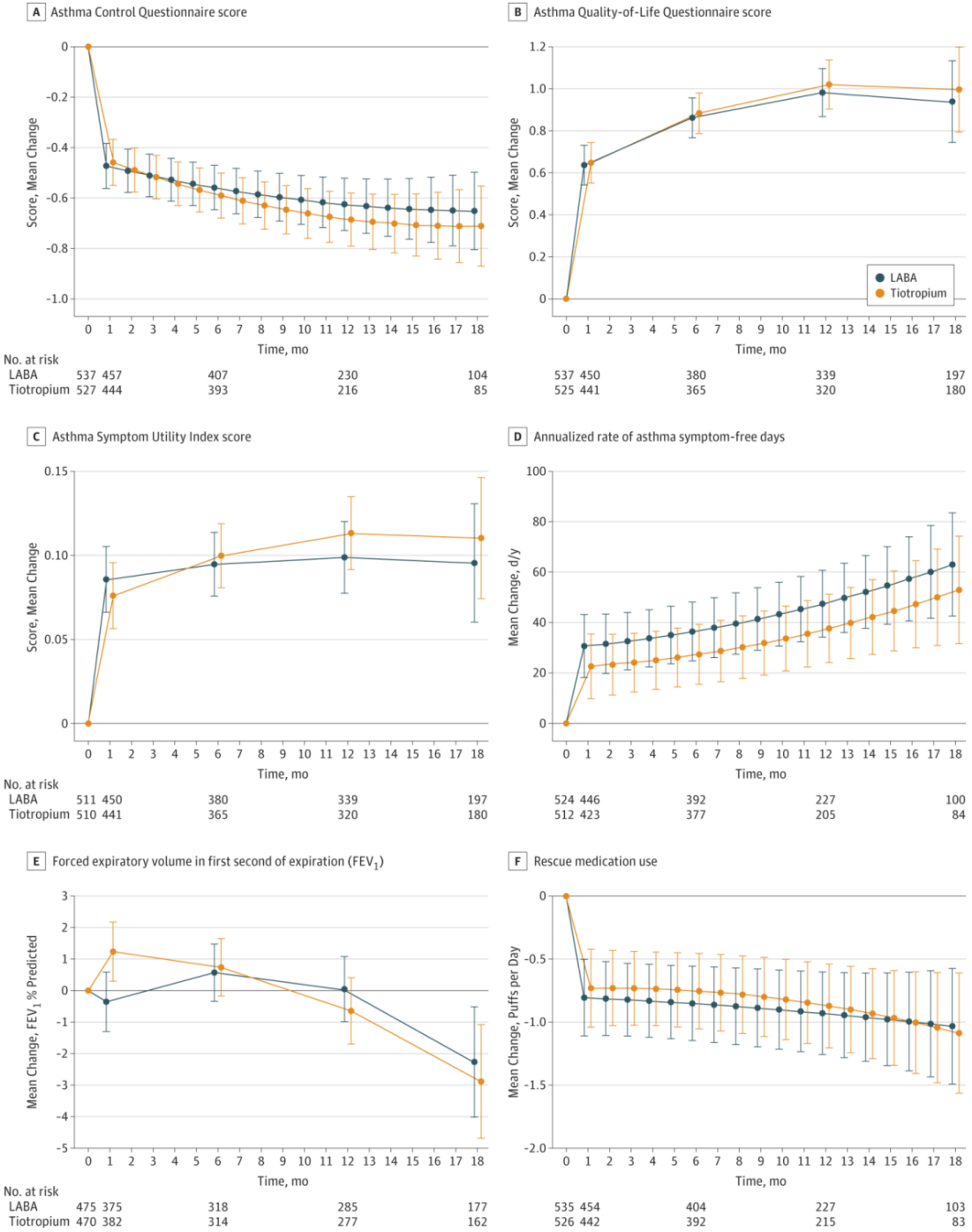
# Anticholinergic vs. Long-Acting β-Agonist in Combination With ICS in Black Adults With Asthma: The BELT RCT

JAMA 2015 Oct 27;314(16):1720-30

Wechsler ME, et al.

- To compare the effectiveness and safety of tiotropium vs. LABAs, when used with ICS in black adult asthmatics
- To determine whether polymorphisms of β2-adrenergic receptor (ADRB2) gene is associated with treatment response.

- A multicenter, open-label RCT in black moderate to severe asthma in US
- ICS + TIO vs. ICS + LABA (n = 532 vs 538) for 18 months.


A Asthma Control Questionnaire score
Score, Mean Change
0
-0.2
-0.4
-0.6
-0.8
-1.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time, mo
No. at risk
LABA 537 457 407 230 104
Tiotropium 527 444 393 216 85
B Asthma Quality-of-Life Questionnaire score
Score, Mean Change
1.2
1.0
0.8
0.6
0.4
0.2
0
LABA
Tiotropium
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time, mo
537 450 380 339 197
525 441 365 320 180
C Asthma Symptom Utility Index score
Score, Mean Change
0.15
0.10
0.05
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time, mo
No. at risk
LABA 511 450 380 339 197
Tiotropium 510 441 365 320 180
D Annualized rate of asthma symptom-free days
Mean Change, d/y
100
80
60
40
20
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time, mo
524 446 392 227 100
512 423 377 205 84
E Forced expiratory volume in first second of expiration ($FEV_1$)
Mean Change, $FEV_1$, % Predicted
3
2
1
0
-1
-2
-3
-4
-5
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time, mo
No. at risk
LABA 475 375 318 285 177
Tiotropium 470 382 314 277 162
F Rescue medication use
Mean Change, Puffs per Day
0
-0.5
-1.0
-1.5
-2.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Time, mo
535 454 404 227 103
526 442 392 215 83

- **RESULTS**
  - No difference in
    - Time to 1st exacerbation, FEV1 change at 12, 18 months
    - ACQ in 18 months
    - Arg16Gly genotypes (Arg/Arg vs Arg/Gly or Gly/Gly)

## CONCLUSIONS

ICS + TIO = ICS + LABA in exacerbation

Not affected by polymorphisms of ADRB2

Not support the superiority of ICS + LABA compared with ICS + TIO for black patients

# Long-Term Once-Daily Tiotropium Respimat® Is Well Tolerated and Maintains Efficacy over 52 Weeks in Patients with Symptomatic Asthma in Japan

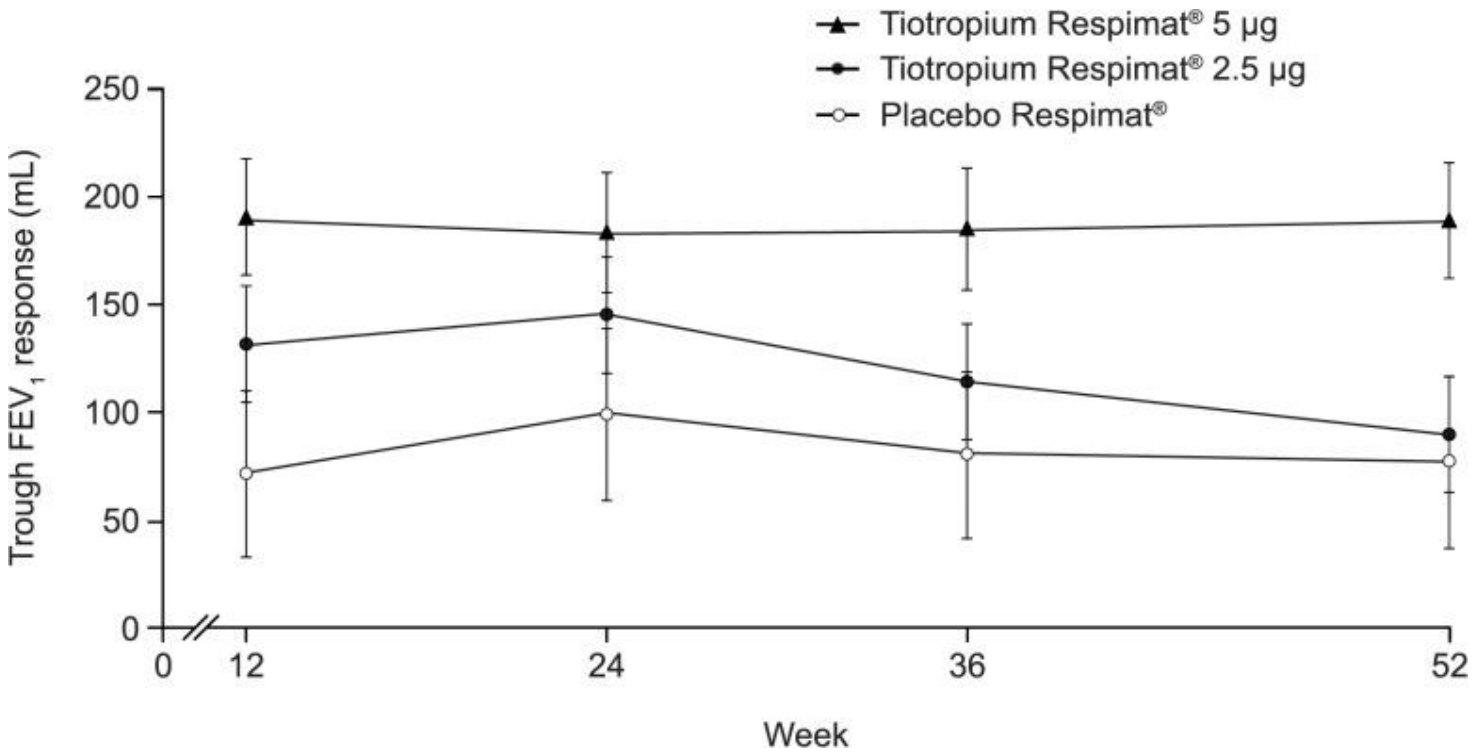
Plos One, 2015 Apr 20;10(4):e0124109

Ohta K, et all

- Long-term safety and efficacy of TIO Respimat in asthma
  - added on to ICS±LABA

- RCT in 285 patients with symptomatic asthma, despite treatment with ICS±LABA
- 2:2:1 to once-daily tiotropium 5 µg, tiotropium 2.5 µg or placebo for 52 weeks

- RESULTS
  - No difference in ADR
  - FEV1, PEFR, ACQ-7




- **CONCLUSIONS:**
  - The long-term tiotropium Respimat safety profile was comparable with that of placebo
  - Compared with placebo, tiotropium 5 µg > 2.5 µg, significantly improved lung function and symptoms, supporting the long-term efficacy of the 5 µg dose.

# Lebrikizumab

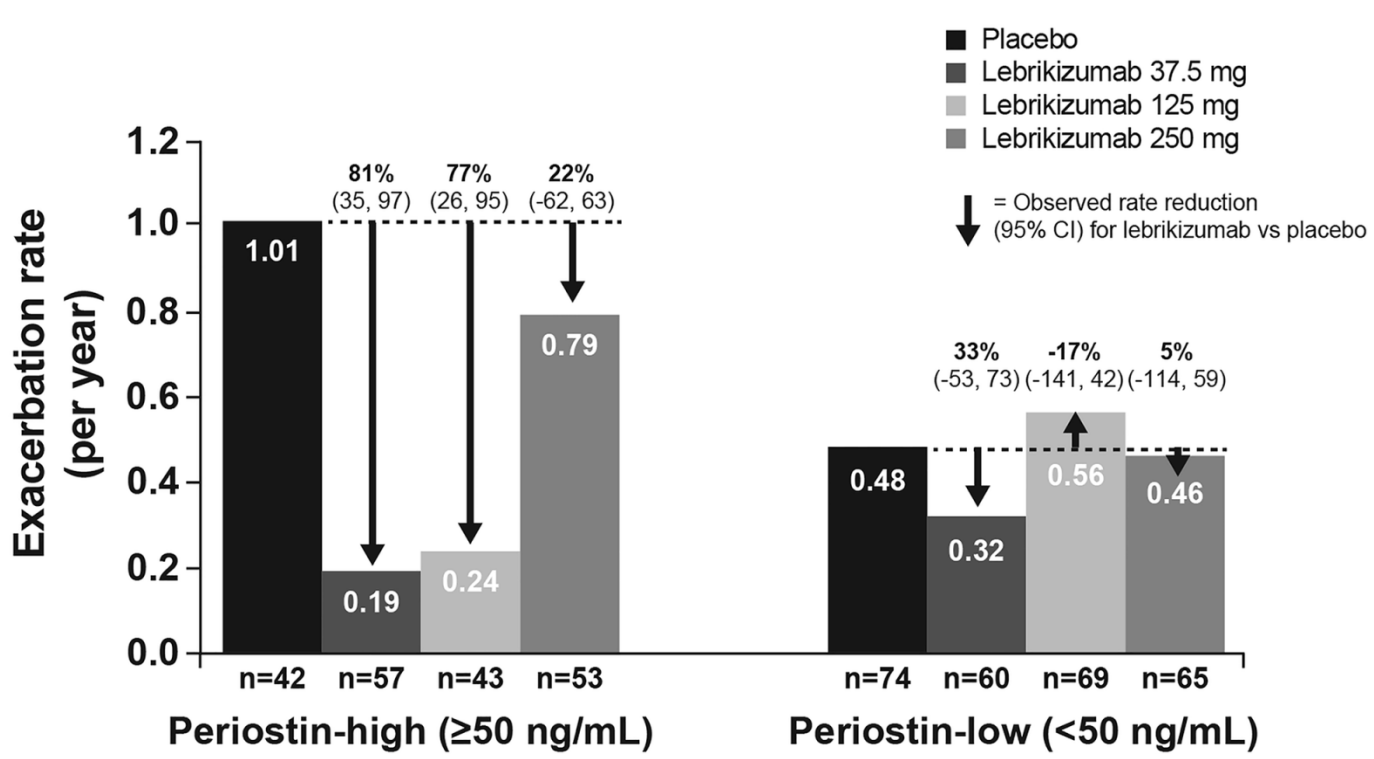
# Lebrikizumab in moderate-to-severe asthma: pooled data from two RCTs

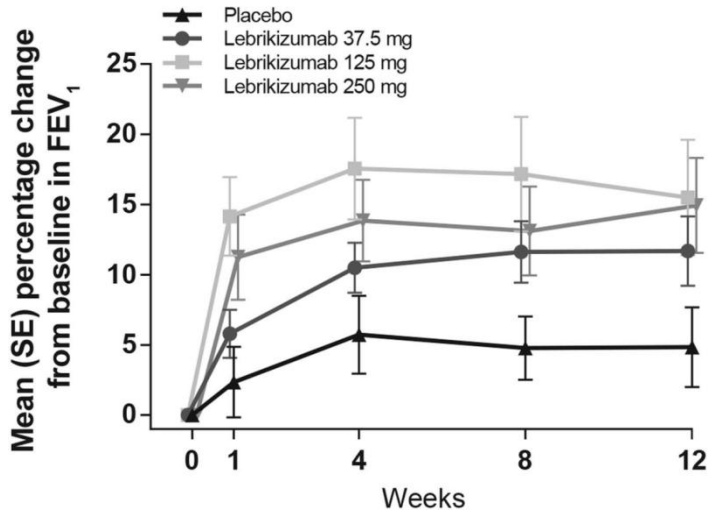
Thorax 2015 Aug;70(8):748-56.

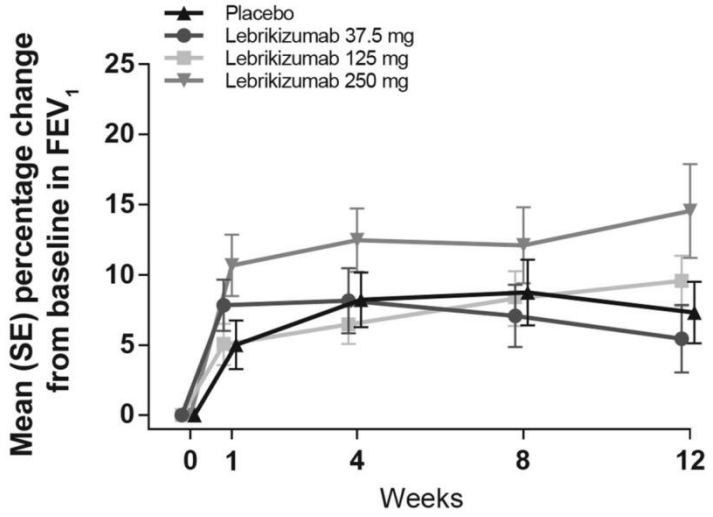
Hanania NA, et al.

- Lebrikizumab
  - a humanised, monoclonal antibody blocking IL-13
  - q 4 weeks for 24 weeks
  - Pooled data from two phase IIb trials

- **CONCLUSIONS:**
  - Consistent with previously published results
  - Lebrikizumab improves asthma exacerbations and lung function in uncontrolled moderate-to-severe asthmatics despite current standard-of-care treatment.


Placebo
Lebrikizumab 37.5 mg
Lebrikizumab 125 mg
Lebrikizumab 250 mg
= Observed rate reduction
(95% CI) for lebrikizumab vs placebo
Exacerbation rate
(per year)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
81%
(35, 97)
77%
(26, 95)
22%
(-62, 63)
1.01
0.19
0.24
0.79
33%
(-53, 73)
-17%
(-141, 42)
5%
(-114, 59)
0.48
0.32
0.56
0.46
n=42
n=57
n=43
n=53
n=74
n=60
n=69
n=65
Periostin-high (≥50 ng/mL)
Periostin-low (<50 ng/mL)


Placebo
Lebrikizumab 37.5 mg
Lebrikizumab 125 mg
Lebrikizumab 250 mg
Mean (SE) percentage change
from baseline in FEV1
25
20
15
10
5
0
0
1
4
8
12
Weeks


Placebo
Lebrikizumab 37.5 mg
Lebrikizumab 125 mg
Lebrikizumab 250 mg
Mean (SE) percentage change
from baseline in FEV1
25
20
15
10
5
0
0
1
4
8
12
Weeks

# GATA3-specific DNAzyme

# Allergen-induced asthmatic responses modified by a GATA3-specific DNAzyme.

NEJM 2015 May 21;372(21):1987-95.

Krug N, et al.

- GATA3
  - Transcription factor of the Th2 pathway
  - A novel DNA enzyme (DNAzyme) that inactivate GATA3 mRNA.

- Multicenter RCT of SB010 for 4 weeks
- 40 allergic asthma with sputum eosinophilia and biphasic response to laboratory-based allergen provocation.

- **RESULTS:**
  - Late asthmatic response in FEV1 34% in SB010 (1% in placebo, p = 0.02)
    - Allergen-induced eosinophilia in sputum
    - IL-5 in plasmainterleukin-5.
    - Not in FeNO, AHR

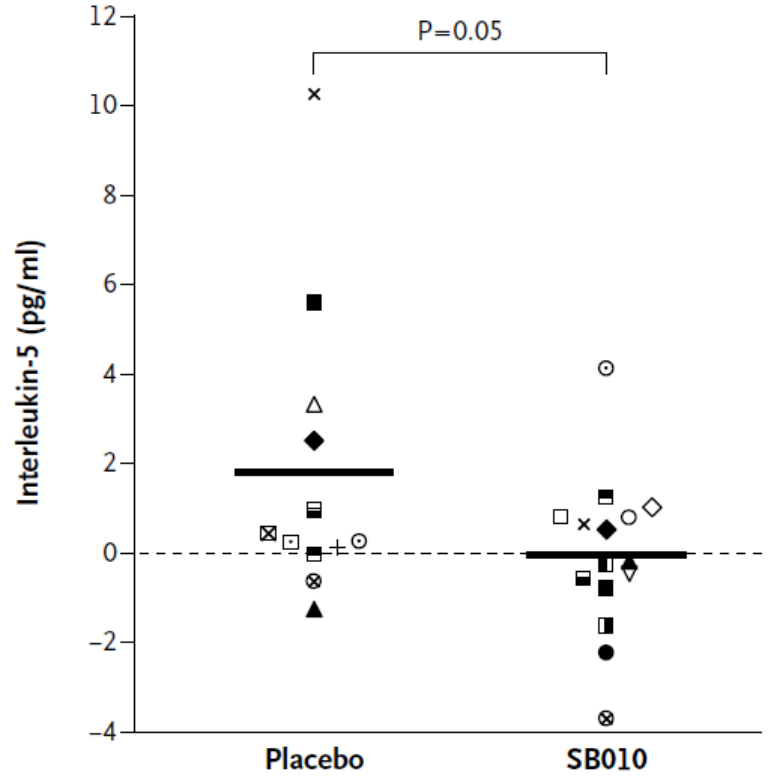



Figure 3. Changes from Baseline in Plasma Levels of Interleukin-5 after an Allergen Challenge.

- **CONCLUSIONS:**
  - GATA3-specific DNAzyme significantly attenuated both late and early asthmatic responses after allergen provocation in allergic asthma.
  - Th2-regulated inflammatory responses

# Vitamin D

# Vitamin D reduces eosinophilic airway inflammation in nonatopic asthma.

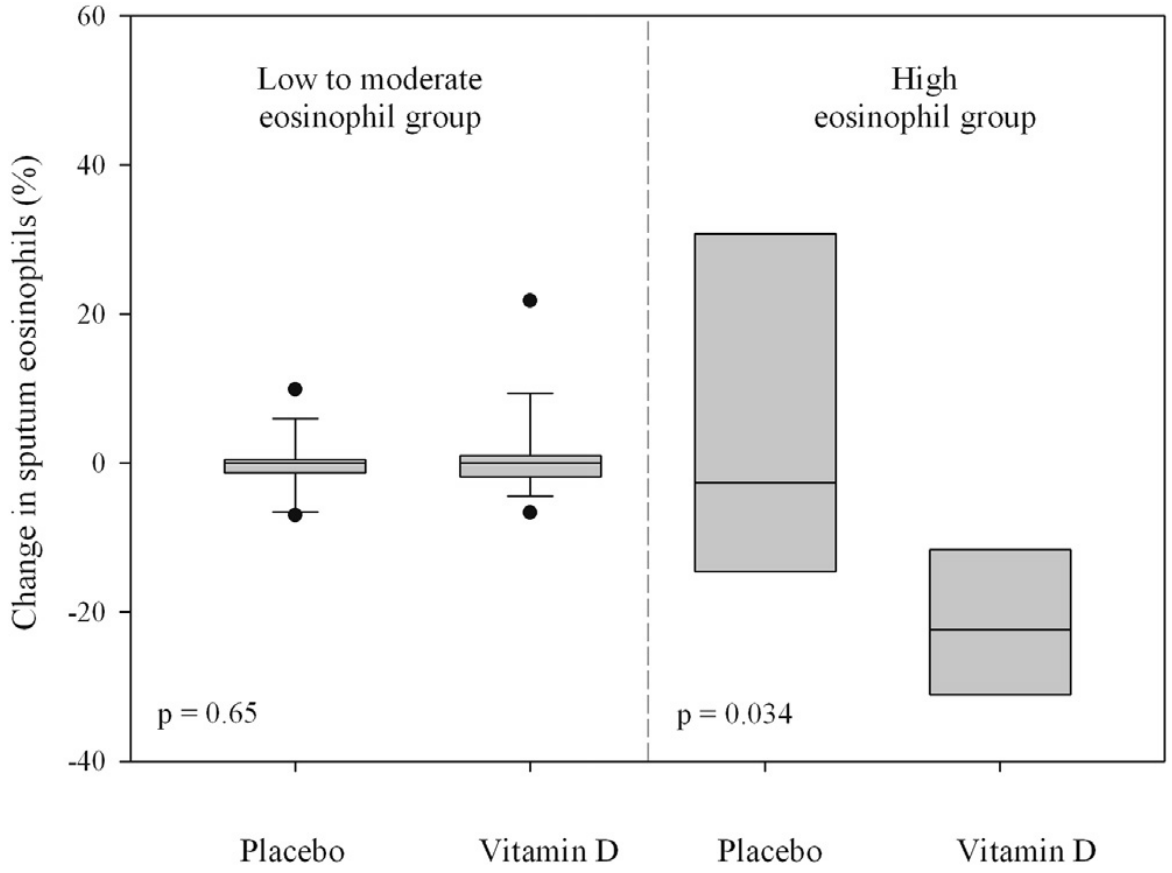
JACI 2015 Mar;135(3):670-5

de Groot JC, et al.

- VtD insufficiency
  - asthma severity, airway remodeling, and exacerbation, especially in nonatopic asthma.
  - By reduced steroid responsiveness or impaired antimicrobial defense
- To assess VtD supplement on airway inflammation in nonatopic asthma.

- DBRCT for 9 week
- 44 nonatopic asthma with neutrophilic (≥53%) and/or eosinophilic (≥3%) sputum

- **RESULTS:**
  - VtD3 not affect sputum neutrophils or eosinophils
  - VtD3 is effective dependent on baseline sputum eosinophil levels.
  - With sputum eosinophil >26.2%, eosinophils decreased from 41.0% to 11.8%
  - Slightly better Asthma Control Questionnaire scores (P = .08).




- **CONCLUSIONS:**
  - VtD3 supplementation reduced <u>eosinophilic airway inflammation</u> in nonatopic asthma with severe eosinophilic airway inflammation, but did not affect sputum neutrophils.
  - A small effect on asthma control
  - VtD as an add-on treatment option in eosinophilic asthma.

# 25-OH vitamin D levels are associated with childhood asthma in a population-based study in Peru

Clin Exp Allergy 2015 Jan;45(1):273-82.

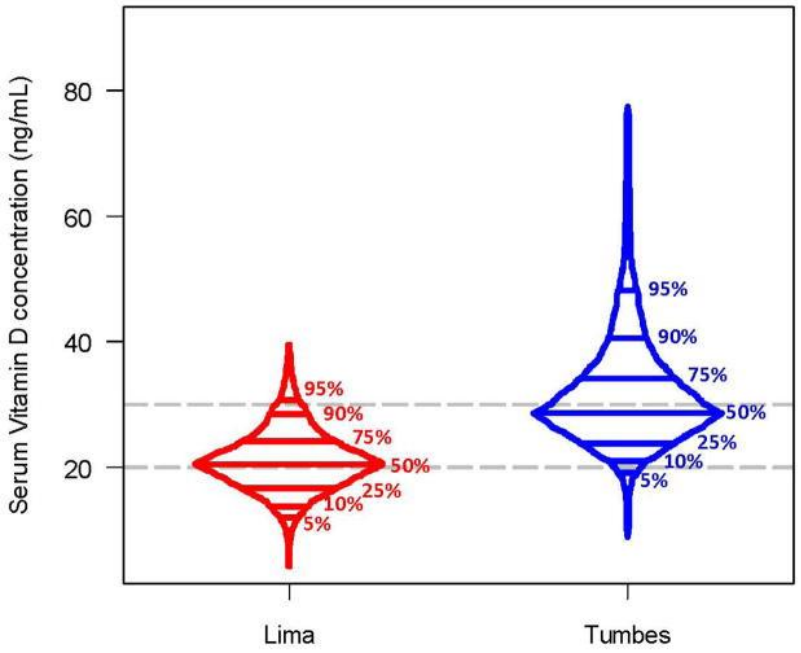
Checkley W, et all, PURA Study Investigators

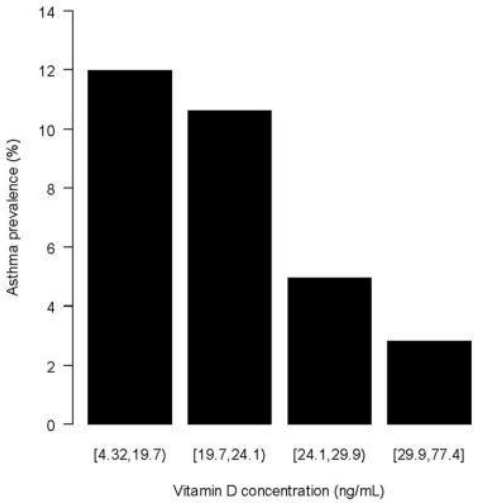
- Vitamin D deficiency may be associated with an increased risk of asthma.

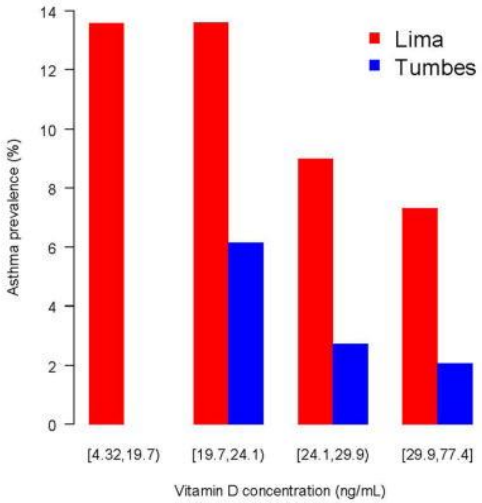
- 1441 children in Lima and Tumbes in Peru

- **RESULTS:**
- 14.8 years
- OR = 1.7 per 10 ng/mL decrease in 25-OH vitamin D levels

| | Lima | Tumbes | P value |
|---|---|---|---|
| Asthma | 12% | 3% | <0.001 |
| Atopy | 59% | 41% | <0.001 |
| 25-OH VtD | 20.8 ng/mL | 30.1 ng/mL | <0.001 |
| VtD deficiency | 47% | 7% | <0.001 |




- **CONCLUSIONS**
  - Both asthma and 25-OH VtD deficiency were common among children living in Lima (latitude = 12.0 °S) but not in Tumbes (3.6 °S).
  - The relationship between 25-OH VtD deficiency and asthma was similar in both sites.

# The association of serum 25-OH VtD with atopy, asthma, and lung function in a prospective study of Danish adults

Clin Exp Allergy 2015 Jan;45(1):265-72.

Thuesen BH, et al.

- To investigate associations of 25-OH VtD with atopy, asthma, and lung function in a prospective study of Danish adults.

- 4999 adults aged 30-60 years in 1999-2001. 3032 adults followed-up for 5 yrs. 3727 adults 10-year follow-up questionnaire.

- **RESULTS**
  - No significant associations with atopy and doctor-diagnosed asthma.
  - Low levels of 25-OH VtD were associated with lower FEV1% in the cross-sectional analyses. OR = 0.66

- **CONCLUSIONS**
  - 25-OH VtD do not influence the development of asthma and allergy among adults.
  - Not consistently support that 25-OH VtD levels associate with lung function.

# DBRCT of bolus vitamin D3 supplementation in adults with asthma (ViDiAs).

Thorax 2015 May;70(5):451-7.

Martineau AR, et al.

- VtD insufficiency associates with susceptibility to URI.
- RCT of VtD3 for the prevention of asthma exacerbation and URI

- 250 asthmatics
- Six 2-monthly oral doses of 3 mg vitamin D3 (n=125) or placebo (n=125) over 1 year

- **RESULTS:**
  - 206/250 participants (82%) were vitamin D insufficient at baseline.
  - No difference in
    - First severe exacerbation, first URI, ACQ, FEV1

- **CONCLUSIONS:**
  - Bolus-dose VtD3 supplementation did not influence time to exacerbation or URI in adult asthmatics with a high prevalence of baseline VtD insufficiency.

# Vitamin D3 supplementation in patients with COPD (ViDiCO): a multicentre, DBRCT

Lancet Respir Med 2015 Feb;3(2):120-30.

Martineau AR, et al.

- **Conclusions**
  - VtD3 supplementation in VtD3 insufficient COPD patients
    - protected against moderate or severe exacerbation
    - Not in upper respiratory infection

# DBRCT of VtD3 supplementation for the prevention of acute respiratory infection in older adults and their carers (ViDiFlu).

Thorax 2015 Oct;70(10):953-60

Martineau AR, et al.

- **CONCLUSIONS:**
  - Addition of intermittent bolus-dose VtD3 supplementation to a daily low-dose regimen did not influence risk of ARI in older adults and their carers, but was associated with increased risk and duration of URI.

# Distinct endotypes of steroid-resistant asthma characterized by IL-17A and IFN-γ immunophenotypes: Potential benefits of calcitriol.

JACI 2015 Sep;136(3):628-637

Chambers ES, et al

- To investigated the immunologic differences between steroid-sensitive (SS) and SR asthma and the effect on immunophenotype of oral calcitriol
- CD8-depleted PBMCs from 12 SS and 23 SR and cultured for 7 days with anti-CD3 and IL-2 with or without dexamethasone.
- **RESULTS:**
  - SR asthma produced significantly increased IL-17A and IFN-γ
  - Production of IL-17A was inversely and production of IL-13 was positively associated with response to prednisolone.
  - Oral calcitriol therapy with SR asthma significantly improved dexamethasone-induced IL-10 production in vitro while suppressing dexamethasone-induced IL-17A production.
- **CONCLUSIONS:**
  - IL-17A and IFN-γ immunophenotypes exist in patients with SR asthma.
  - Beneficial clinical effects of VtD in SR by directing toward SS immune phenotype

# Sex hormones

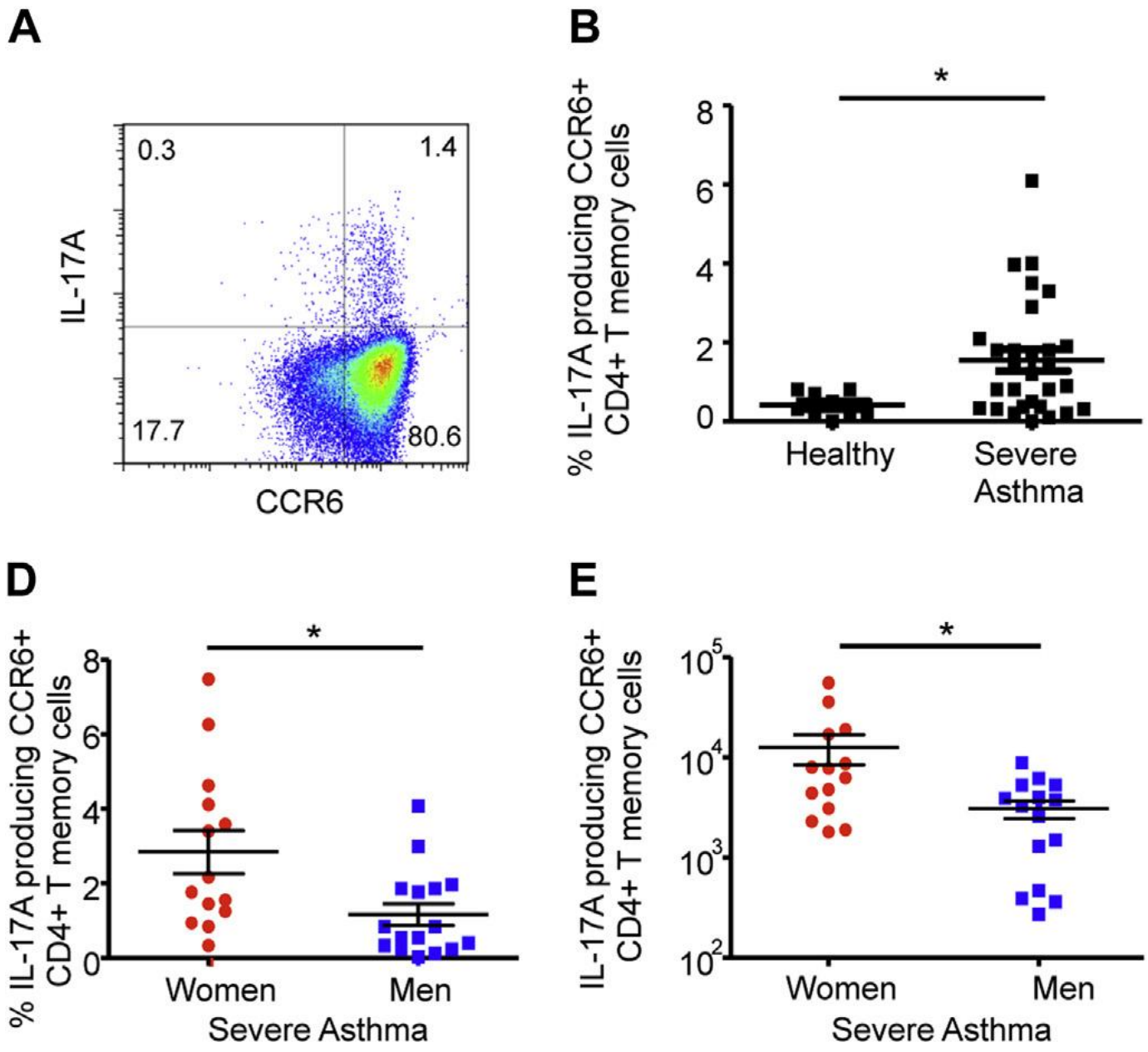
# Estrogen and progesterone decrease let-7f microRNA expression and increase IL-23/IL-23 receptor signaling and IL-17A production in patients with severe asthma

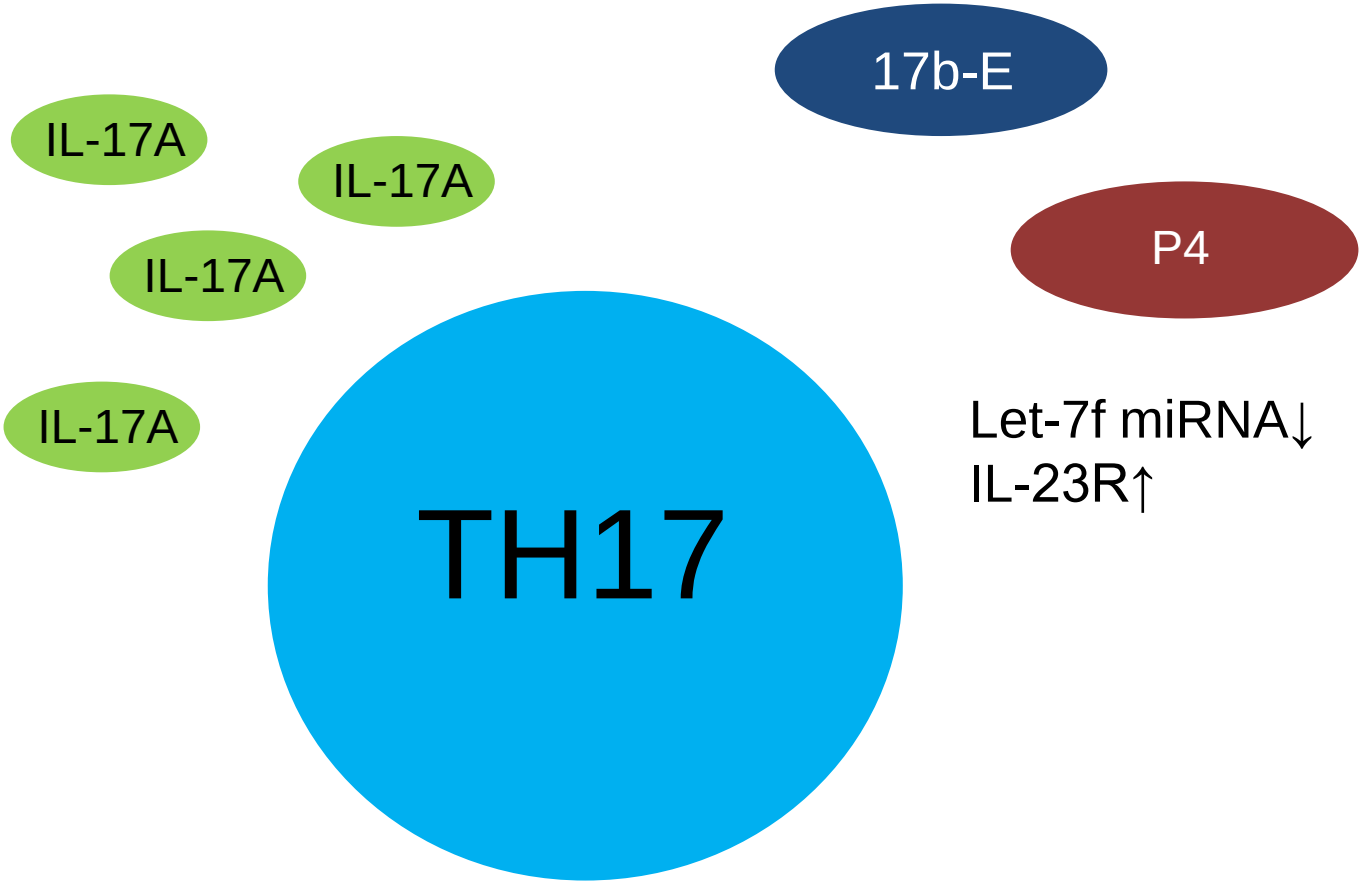
JACI 2015;136:1025-34

Dawn Newcomb, et al

- Severe asthma  in Women > Men
- IL-17A is associated with severe asthma and requires IL-23R signaling, which is negatively regulated by let-7f microRNA.
- To determine the mechanism by which 17b estradiol (E2) and progesterone (P4) increase IL-17A production.

- IL-17A production in Th17 from Women (n=14) and Men (N=15) with severe asthma


A
0.3
1.4
17.7
80.6
IL-17A
CCR6
B
% IL-17A producing CCR6+ CD4+ T memory cells
*
Healthy
Severe Asthma
D
% IL-17A producing CCR6+ CD4+ T memory cells
*
Women
Men
Severe Asthma
E
IL-17A producing CCR6+ CD4+ T memory cells
*
Women
Men
Severe Asthma




- Conclusions
  - Increased IL-17A production from TH17, providing a potential mechanism for the increased prevalence of severe asthma in Women > Men.

# Complementary and Alternative Medicines

# Effect of a soy isoflavone supplement on lung function and clinical outcomes in patients with poorly controlled asthma

JAMA 2015 May 26;313(20):2033-43.

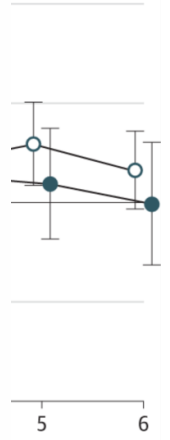
Smith LJ, et al,

- To determine whether a soy isoflavone supplement improves asthma control in poorly controlled asthmatics

- Multicenter DBPCT for 24 weeks
- 386 symptomatic asthmatics (>12 yr-old), 100mg isoflavones

- **RESULTS:**
  - No difference in
    - FEV1, ACT, exacerbation, FeNO

- **CONCLUSIONS**
  - No improvement in asthma control with a soy isoflavone supplement


| No. of | | | | | | | |
|---|---|---|---|---|---|---|---|
| Placebo | 192 | 184 | 181 | 175 | 173 | 171 | 179 |
| Soy isoflavone | 191 | 182 | 178 | 172 | 168 | 167 | 166 |

# Acupoint Herbal Patching for Asthma: A Systematic Review and Meta-analysis of RCT

Medicine, 2016:95(2):p e2439

**Lee, Sun Haeng, et al.**

- Acupoint herbal patching (AHP), which involves local point stimulation with a herbal medicine patch
- 16 RCTs with 1287 asthmatics
- Results
  - FEV1 by 13% (MD=12.99%, 95% CI 5.17%–20.81%) and asthmatic symptoms by 60% over placebo
  - No additional benefits of AHP with Chinese herbal medicine
- Conclusions
  - AHP efficacy is encouraging, but not conclusive, because of clinical diversity and the high risk of bias in the examined studies.

# A RCT in patients with mild and moderate asthma undergoing treatment with traditional Chinese acupuncture.

Clinics (Sao Paulo). 2015 Oct;70(10):663-9.

Pai HJ, et al.

- To verify the effects of acupuncture as an adjuvant treatment for the control of asthma.

- RCT, cross-over trial in Brazil, 74 mild/moderate, persistent asthma
- 10 weekly acupuncture – 3-week washout period – 10 weekly sham acupuncture

- RESULTS:
  - Sham acupuncture
    - less coughing ($p$=0.037), wheezing ($p$=0.013) and dyspnea ($p$=0.014)
  - Real acupuncture
    - less coughing ($p$=0.040), wheezing ($p$=0.012), dyspnea ($p$<0.001), nocturnal awakening episodes ($p$=0.009).
  - No difference in Spirometry, FeNO

- CONCLUSION:
  - Real and sham acupuncture have different effects and outcomes on asthma control. Thus, sham acupuncture cannot serve as a placebo in trials with acupuncture as the main intervention for asthma.

# Aerobic training

# Aerobic training decreases bronchial hyperresponsiveness and systemic inflammation in patients with moderate or severe asthma

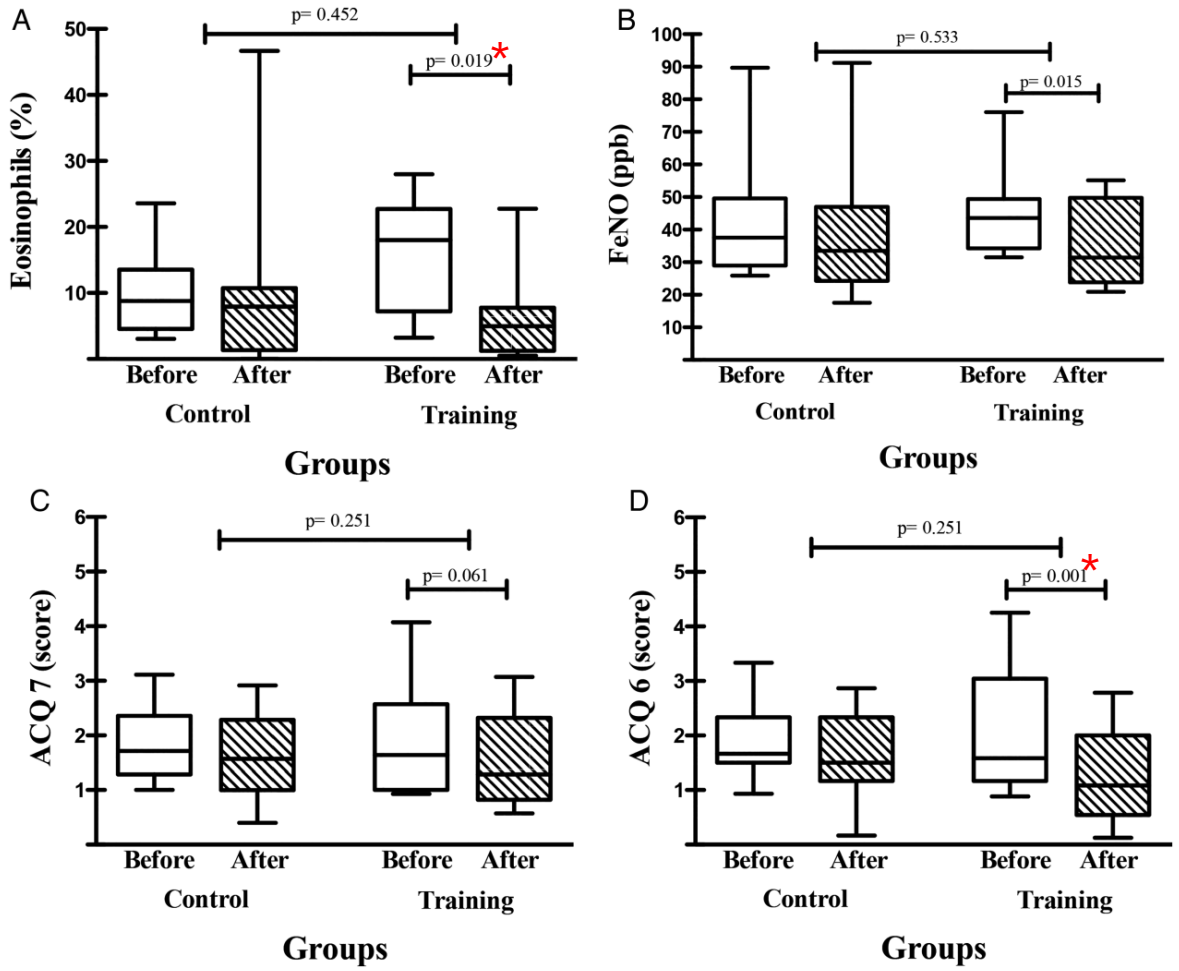
Thorax 2015 Aug;70(8):732-9

Andrezza FP, et al

- To investigated the effects of aerobic training on BHR, inflammatory cytokines and AQLQ

- RCT in 58 asthmatics for 3 months
- Control group (CG) or the aerobic training group (TG).

- **RESULTS:**
  - In TG improved in BHR by 1 doubling dose, reduced IL-6, MCP-1, improved AQLQ and asthma exacerbation
  - No difference in
    - IL-5, IL-8, IL-10, sputum cellularity, FeNO or Asthma Control Questionnaire 7 (ACQ-7; $p>0.05$)




- **CONCLUSIONS:**
  - Aerobic training reduced BHR and serum proinflammatory cytokines and improved quality of life and asthma exacerbation in patients with moderate or severe asthma.
  - Adding exercise to pharmacological treatment could improve the main features of asthma.

# AERD

# Treatment of AERD with a low salicylate diet: a pilot crossover study

Otolaryngol Head Neck Surg 2015 Jan;152(1):42-7

Sommer DD, et al.

- AERD
  - ASA sensitivity, bronchial asthma, and nasal polyposis.
  - Treatment includes topical/systemic steroids, endoscopic sinus surgery, and/or aspirin desensitization.

- A RCT crossover study (n = 10) for 6 weeks
- Regular diet (R) or low salicylate diet (LS).

| | Baseline vs LS *P* Value | Baseline vs R *P* Value |
|---|---|---|
| Sino-nasal outcome test-22 (SNOT-22) | .0059 | .5566 |
| Asthma Control Questionnaire-7 (ACQ-7) | .375 | .3223 |
| Nasal Symptom Severity Score (NSSS) | .0195 | .4258 |
| Lund-Kennedy | .0039 | .7422 |
| Perioperative Sinus Endoscopy (POSE) | .002 | .6953 |

- **CONCLUSION:**
  - Low salicylate diet improves the nasal symptoms and nasal endoscopy findings of individuals with AERD

# Aspirin-intolerant asthma in the population: prevalence and important determinants.

Clin Exp Allergy 2015 Jan;45(1):265-72.

Thuesen BH, et al.

- To investigate the population-based prevalence and risk factors of AIA

- A questionnaire on respiratory health was mailed to 30,000 randomly selected subjects aged 16-75 years in West Sweden, 29,218 could be traced and 18,087 (62%) responded.

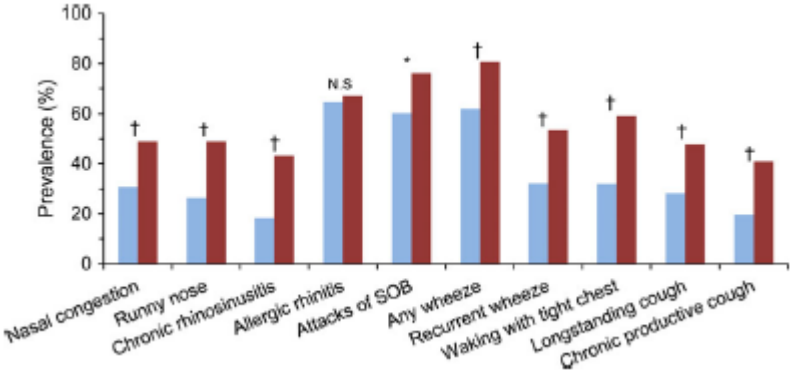
- **RESULTS:**
- The prevalence of AIA was 0.5%, 0.3% in men and 0.6% in women (P = 0.014).
- AIA > ATA
  - Sick leave, emergency visits, lower respiratory symptoms
- Obesity as a strong risk factor (BMI > 35: OR = 12.1)

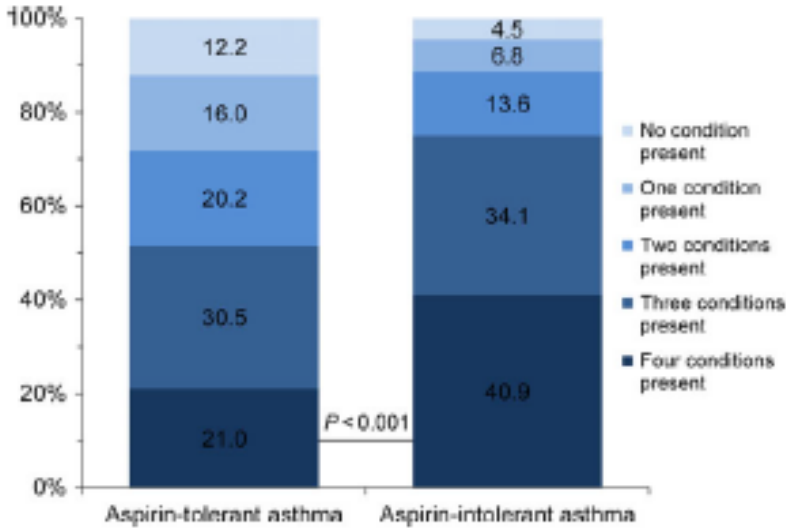
- **CONCLUSION:**
  - AIA in the general population was associated with a high burden of symptoms, uncontrolled disease and a high morbidity.
  - Risk factors: obesity, current smoking

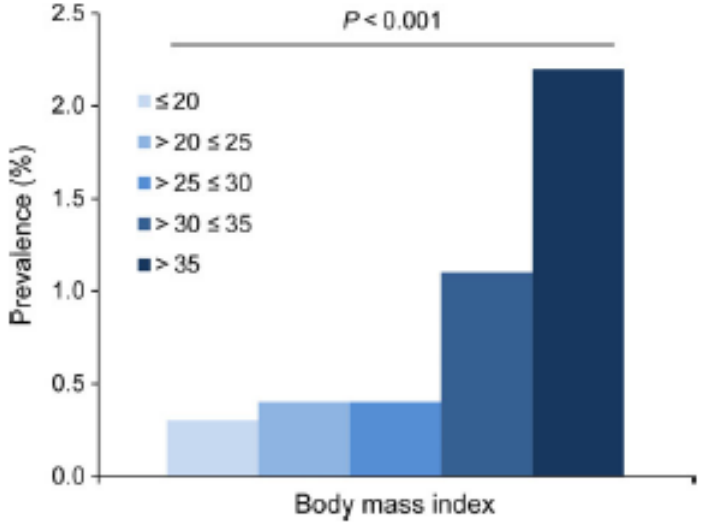
Table 1. Prevalence (%) of aspirin-intolerant asthma (AIA) and aspirin-tolerant asthma (ATA) by age and sex

| | n | AIA | P-value* | ATA | P-value* |
|---|---|---|---|---|---|
| All ages | | | | | |
| Total | 18 087 | 0.5 | 0.014 | 9.1 | < 0.001 |
| Men | 8190 | 0.3 | | 8.2 | |
| Women | 9897 | 0.6 | | 9.8 | |
| 16–35 years: | | | | | |
| Total | 5723 | 0.4 | 0.53 | 10.8 | 0.76 |
| Men | 2471 | 0.3 | | 10.6 | |
| Women | 3252 | 0.5 | | 10.9 | |
| 36–55 years: | | | | | |
| Total | 6515 | 0.7 | 0.021 | 8.7 | 0.008 |
| Men | 2958 | 0.4 | | 7.6 | |
| Women | 3557 | 0.9 | | 9.5 | |
| 56–75 years: | | | | | |
| Total | 5849 | 0.4 | 0.39 | 7.8 | < 0.001 |
| Men | 2761 | 0.3 | | 6.5 | |
| Women | 3088 | 0.5 | | 9.0 | |

*Difference by sex (Fisher's exact test, two-sided).



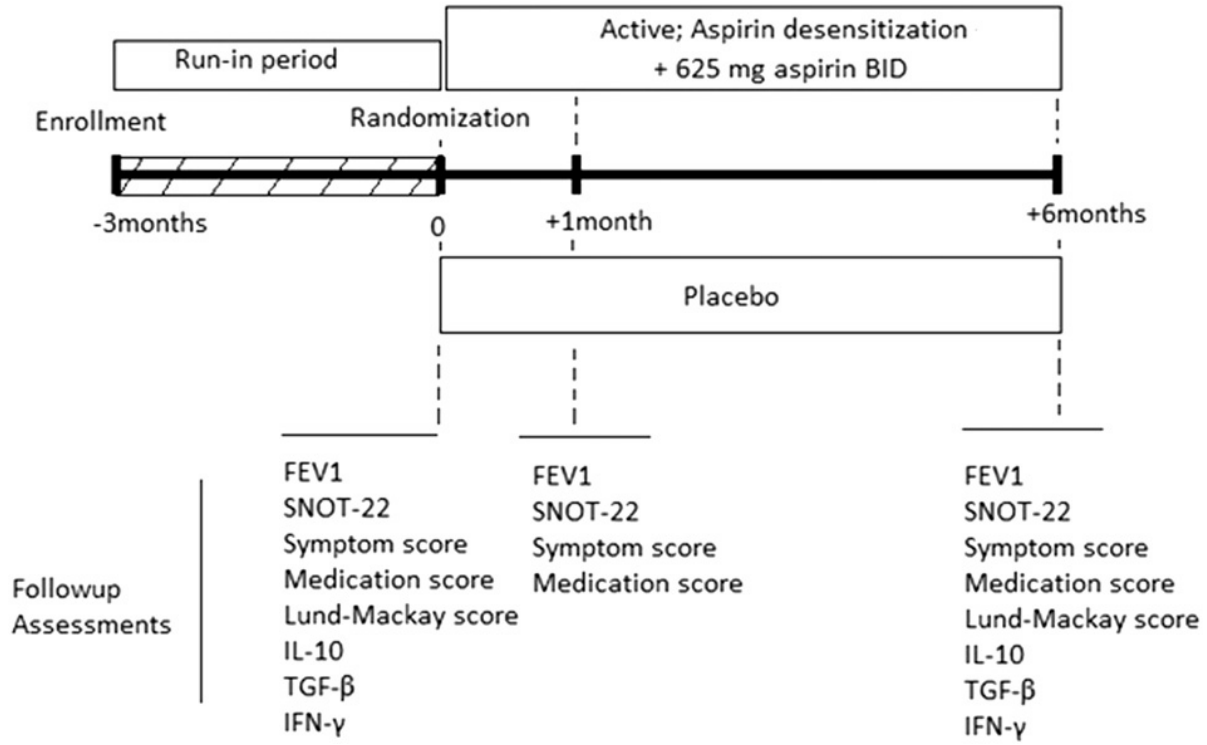



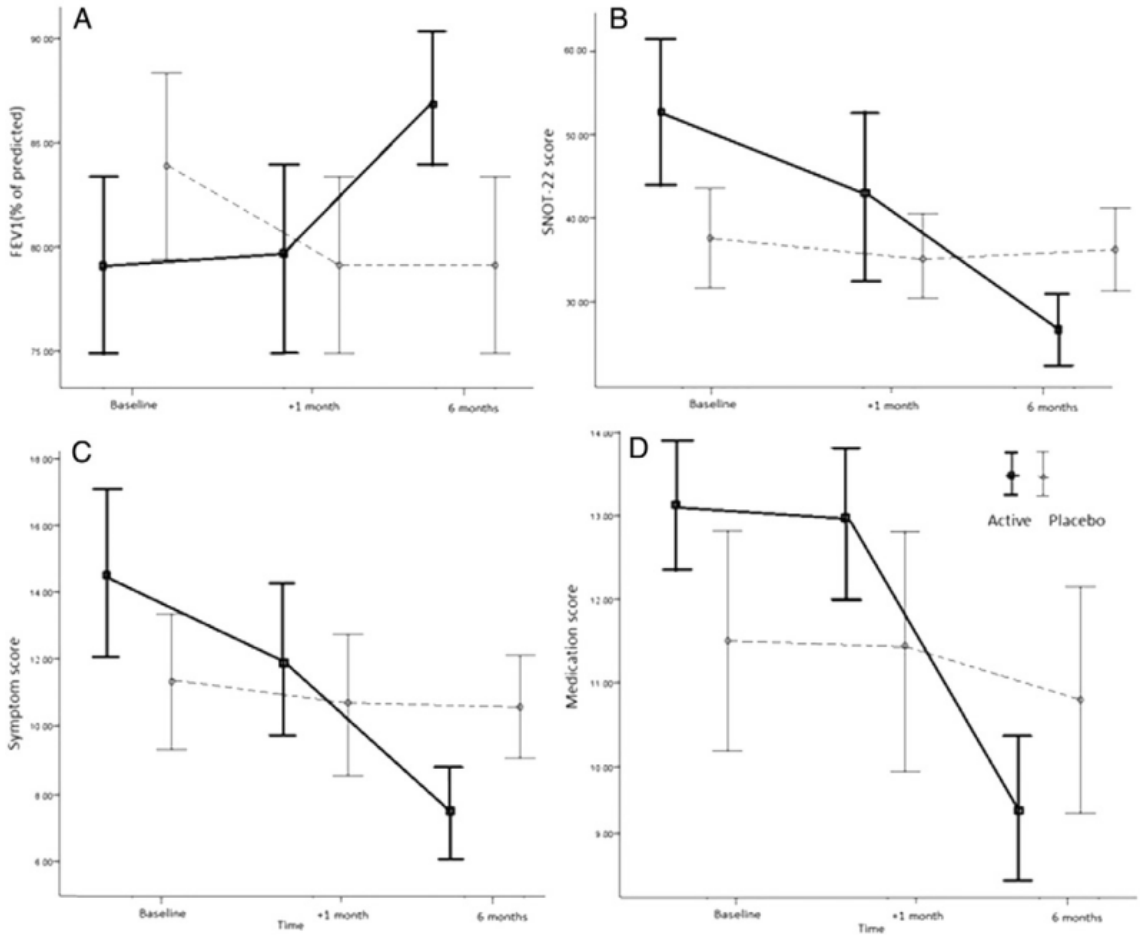
# Aspirin desensitization for patients with AERD: DBRCT

Clin Immunol. 2015 Oct;160(2):349-57

Esmaeilzadeh H, et al.

- DBRCT, 34 with chronic rhinosinusitis, nasal polyps, and AIA
- Aspirin (60, 125, 325, and 625 mg) + 625 mg bid for 6 months






- Conclusions
  - Improvement in FEV1, SNOT-22, ACT, medication score
  - No difference in biologic markers (IL-10, IFN-γ, TGF-β)

# Asthma management

# Study protocol for a RCT evaluating the efficacy of a telehealth program - management of asthma with supportive telehealth of respiratory function in pregnancy (MASTERY©)

BMC Pulm Med. 2015 Jul 31;15:84.

Zairina E, et al.

- Telehealth has the potential to improve asthma management through regular monitoring of lung function and/or asthma symptoms by health professionals in conjunction with feedback to patients.
- To evaluate the use of telehealth for remotely monitoring lung function and optimising asthma control during pregnancy.

# Telehealth to improve asthma control in pregnancy: A RCT

Respirology 2016 Mar Epub

Zairina E, et al.

- RCT asthma (n = 72) in Melbourne, Australia
  - Telehealth programme (MASTERY©) supported by a handheld respiratory device and an Android smart phone application (Breathe-easy© Bluetooth-enabled COPD-6® X2/day) and written asthma action plan
  - Usual care

- **RESULTS:**
  - At 6 months, MASTERY group had better asthma control (P = 0.02) and asthma-related quality of life (P = 0.002)
  - No difference in
    - lung function, unscheduled visits, days off work/study, oral corticosteroid use, or perinatal outcomes

- **CONCLUSION:**
  - Telehealth interventions supporting self-management are feasible and could potentially improve asthma control and asthma-related quality of life during pregnancy.

# Planning for Action: The Impact of an Asthma Action Plan Decision Support Tool Integrated into an Electronic Health Record at a Large Health Care System.

J Am Board Fam Med 2015 May-Jun;28(3):382-93

Kuhn L, et al.

- Electronic asthma action plan decision support tool (eAAP) into the medical record to streamline evidence-based guidelines for providers at the point of care, create individualized patient handouts, and evaluate effects on disease outcomes.

- **RESULTS:**
  - 5174 patients with asthma (～10%) received eAAPs.
  - Association between eAAP receipt and significant reductions in pediatric asthma exacerbations, including 33% lower odds of requiring oral steroids ($P < .001$), compared with controls.

- **CONCLUSIONS:**
  - Patient self-management plays an important role in reducing asthma exacerbations.
  - Guideline-based decision support through an eAAP, addressing known challenges of implementation into routine practice.

# Asthma Action Plan



Practice: _____ Office #: _____ Fax #: _____

**Important Instructions:**

- You / your child should have regularly scheduled asthma check-ups and be seen after any visit to the ER or hospital within 3-5 days
- **No Smoking** in the home or car (even if your child is not with you)
- Annual flu vaccine is recommended for everyone over 6 months of age who has asthma
- Remove or control your / your child's triggers: Smoke, Indoor pets, Pollen, Respiratory infections or flu, Dust, dust mites

## GREEN ZONE - All Clear

**( Your asthma is well controlled )**

**You should have:**

- No wheezing
- No coughing
- No chest tightness
- No waking up at night because of asthma
- No problems with play because of asthma
- Peak flow is more than 138

## Use Controller Medicine Every Day

**Use Spacer with all appropriate inhalers**

**Take these controller medications:**

Qvar (beclomethasone) 80 mcg/spray - 1 puff inhaled twice a day
Zyrtec (cetirizine) 5 mL by mouth at bedtime

15 minutes before exercise use Yellow Zone medicine (below)

## YELLOW ZONE - Take Action

**( Your asthma is getting worse )**

**You may have:**

- Wheezing
- Coughing
- Chest tightness
- First signs of a cold
- Coughing at night
- Peak flow is from 86 to 138

## Take Quick Relief Medicine

**(Continue Green Zone daily medicine and add rescue medicine)**
**Use Spacer with all appropriate inhalers**

**Take these rescue medications:**

Albuterol 2.5 mg/3mL nebulized - 1 neb inhaled every 4-6 hours as needed
OR
Albuterol 90 mcg/puff inhaled HFA - 2 puffs inhaled every 4-6 hours as needed

Call your healthcare provider for an appointment or further instructions if Yellow Zone symptoms continue for 24 hours or you / your child requires rescue medicine more than 2 times a week.

## RED ZONE - Get Help Now

**( This is an Emergency )**

**You may have:**

- Quick relief medicine is not helping
- Wheezing is worse
- Faster breathing
- Blue lips or nailbeds
- Trouble walking or talking
- Chest and neck pulled in with each breath
- Peak flow is less than 86

## Take Quick Relief Medicine

**(Continue Green Zone daily medicine and add rescue medicine)**
**Use Spacer with all appropriate inhalers**

**Take these rescue medications:**

Albuterol 90 mcg/puff inhaled HFA - 4 puffs inhaled every 20 minutes up to 3 times
OR
Albuterol 2.5 mg/3mL nebulized - 1 neb inhaled every 20 minutes up to 3 times

## Do Not Wait! Call Your Provider Now!

If they cannot be reached **Call 911** OR go directly to the **Emergency Room**

**Signatures if needed for school:**

**Provider Signature:** _____ **Date:** _____ **Time:** _____

**Patient/Parent/Responsible Party Signature:** _____ **Date:** _____ **Time:** _____

**School Health Nurse Signature:** _____ **Date:** _____ **Time:** _____

Carolinas HealthCare System

ZZZPTEST, ALLERGY

DOB: 05/25/2008

# Do Patients of Subspecialist Physicians Benefit from Written Asthma Action Plans?

Am J Respir Crit Care Med 2015 Jun 15;191(12):1374-83.

Sheares BJ, et al

- To assess the efficacy of written asthma action plan provided by subspecialist physicians as part of usual asthma care during office visits.

- RCT in 407 children and adults with persistent asthma
- First-time care in subspecial clinic
- Written instructions or no written instructions

- **RESULTS:**
  - Written asthma action plan has no significant effect
    - asthma symptom frequency, emergency visits, quality of life from baseline to 1 yr f/u
  - Both groups had significant reductions in
    - asthma symptom frequency, β-agonist use,. ER visits

- **CONCLUSIONS:**
  - A written asthma action plan form as a vehicle for providing asthma management instructions in subspecialty clinic shows no benefit beyond subspecialty-based medical care and education for asthma.

# Impact of symptom management training among asthmatic children and adolescents on self-efficacy and disease course.

J Asthma 2015 Oct;52(8):858-65.

Cevik Guner U, Celebioglu A.

- To examine the effect of a training program on disease course and self-efficacy.

- RCT 10-18 yr-old asthmatics
- Asthmatic Child Information Form, Disease Evaluation Form, Peak Expiratory Flow Rate Evaluation Form, Asthmatic Child/Adolescent Self-Efficacy Scale

- **RESULTS:**
  - A significant increase in mean self-efficacy score in the experimental group following training sessions.
    - Reduction in asthma symptoms, limitations to daily function, attacks, school abscences, ER visits
    - Increase in conscious of the symptoms of asthma attacks and preventive and rescue medications regularly

- **CONCLUSIONS:**
  - Training program is effective in increasing self-efficacy and improving asthma symptoms among children/adolescents.

# Chest tube

# Effect of Opioids vs NSAIDs and Larger vs Smaller Chest Tube Size on Pain Control and Pleurodesis Efficacy Among Patients With Malignant Pleural Effusion: The TIME1 RCT

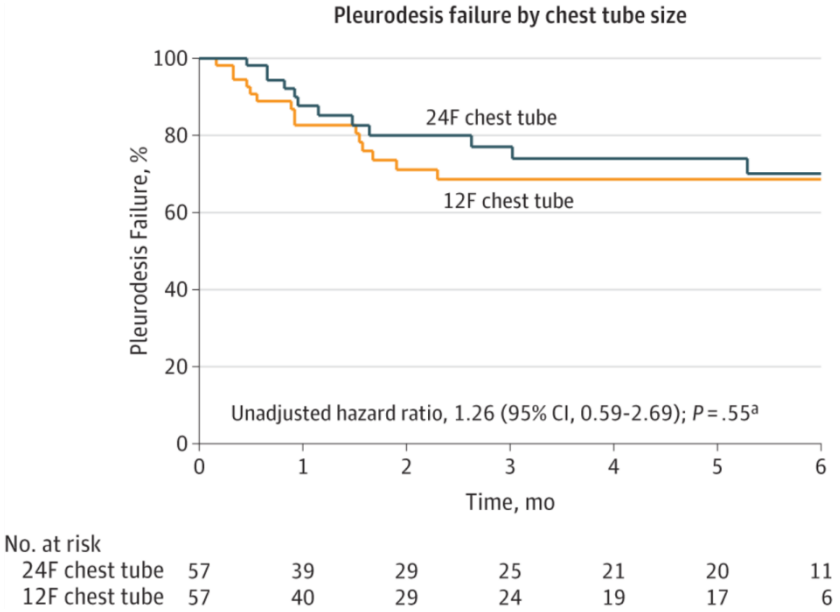
JAMA. 2015 Dec 22-29;314(24):2641-53

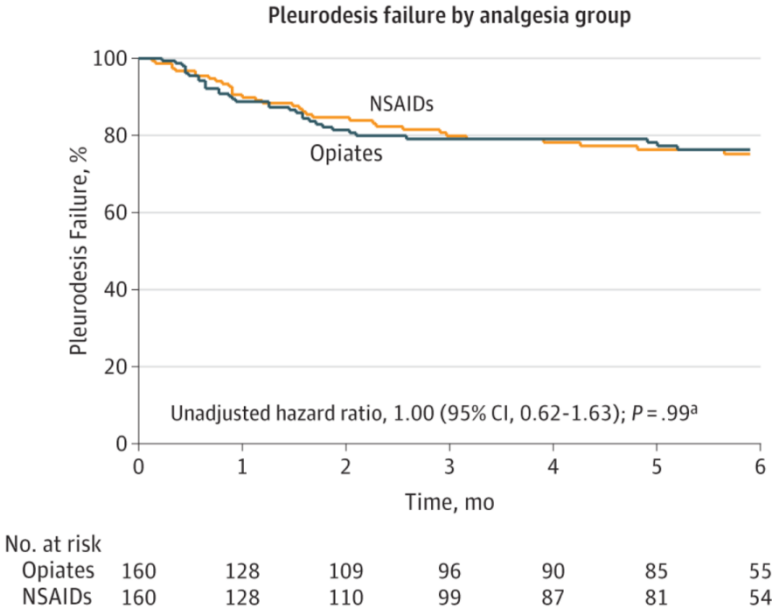
Rahman NM, et al.

- To assess the effect of chest tube size (12F vs 24F) and analgesia (NSAIDs vs opiates) on pain and clinical efficacy related to pleurodesis in malignant effusion

- Multicenter 2×2 factorial phase 3 RCT in 320 patients requiring pleurodesis
- VAS, pleurodesis efficacy in 3 months

- **Results**
  - No difference in opioid and NSAID
    - Pain relief, Pleurodesis failure
    - NSAID group required more rescue analgesia
  - 12F chest tubes
    - higher pleurodesis failure (30% vs 24%), More complication




- **Conclusions**
  - NSAIDs vs opiates in no significant difference in pain scores or in pleurodesis efficacy, but associated with more rescue medication.
  - Low efficacy in 12F chest tubes

경청해주셔서 감사합니다.