



“Yes, your child should be able to play sports” Pediatric asthma and exercise

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Oct. 16

UAB MEDICINE
PEDIATRICS





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“Can he play football?”

- 12yo male with a history of asthma, seasonal allergies, and obesity presents for an annual physical exam and inquires about playing football
- Past Medical History
 - Full-term, no complications
 - Asthma: diagnosed at age 4
- Social History
 - Lives with mom and siblings
 - No vaping/ tobacco exposure
 - No routine exercise or current recreational sports activity
- NKDA
- Family History
 - No significant cardiac history
 - HTN: mom and grandmother
- Medications
 - Cetirizine prn
 - Albuterol prn
 - Fluticasone 110mcg prn with illness

Asthma History

- Uses albuterol as needed, less than once a week
- Coughs 2-3 nights per week
- “Never had much stamina” due to his asthma
 - Reports feeling winded with exercise
 - Teacher lets him sit on the bleachers during PE or recess
 - Really struggles with the “Pacer” test at school
 - Family doesn’t really let him go outside and play due to “pollens”
 - No history of stridor, dizziness, chest pain or syncope with exercise
- 1-2 MD visits per year for asthma flare (last about 6 months ago)
- Seasonal allergic rhinitis (no history of testing)
- PE: significant for obesity and swollen pale nasal turbinates

Exercise induced bronchospasm

- Cough, chest tightness, sob, wheezing during or following exercise
 - Typically resolves within 60 min
 - Deconditioning resolves quicker and not worse after exercise
- Can occur in the setting of asthma or absence of chronic asthma
 - 10% population
 - Up to 90% of patients with known asthma may have symptoms with exercise
- Higher prevalence in specific populations
 - Elite endurance athletes
 - 2022 Study of European athletes at Summer Olympics 16.5%
 - 2010 London Marathon 32%
 - Unique environments
 - Cold
 - Pollution
 - Allergy
 - Pools, Ice Rinks
- Airway narrowing with exercise
- Diagnosed by provocative testing
 - Exercise testing
 - Pre/Post Bronchodilator
 - Mannitol/ Hypertonic saline challenge
- Avoidance, deconditioning, poor performance, avoidance cycle
 - Improve breathing
 - Improve lung function
 - Reduce stress and anxiety

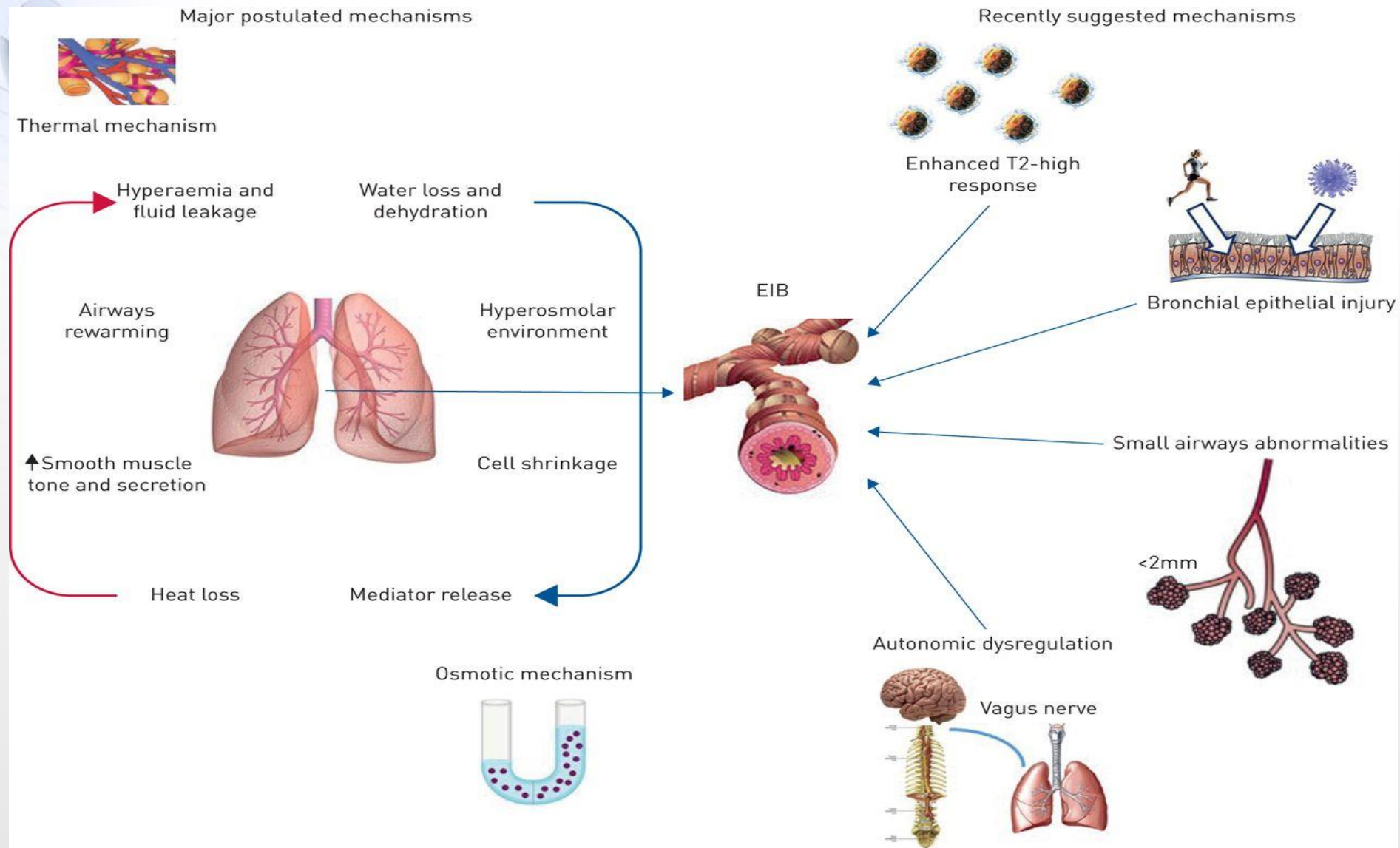
Sports

TABLE I. Sports with different levels of risk of exercise-induced bronchoconstriction²⁰

Risk	Characteristics	Examples of sports
Low	Sports in which the athlete performs a <5- to 8-min effort	Track and field: sprint (100, 200, and 400 m), middle distance (800 and 1500 m), hurdles (100, 110, and 400 m), jumps, throws, decathlon, heptathlon, tennis, fencing, gymnastics, downhill skiing, boxing, golf, body building, weightlifting, martial arts
Medium	Sports in which the continuous effort rarely lasts more than 5-8 min	Soccer, rugby, American football, basketball, volleyball, handball, baseball, cricket, field hockey
High	Sports in which the athlete performs a >5- to 8-min effort and/or in a dry/cold air environment, and/or in a noxious air environment (chlorine exposure, ultrafine particles, traffic air pollution)	Swimming, water polo Track and field: long distance (5000 and 10,000 m), 3000-m steeplechase, pentathlon (mixed), walks (20 and 50 km), marathon Cycling, cross-country skiing, ice hockey, ice skating, biathlon, high-altitude sports

Koya, et al. Management of Exercise-Induced Bronchoconstriction in Athletes, JACI. 2020

Exercise Induced Bronchospasm



Differential Diagnosis of EIB

- Exercise-induced laryngeal dysfunction
- Exercise-induced hyperventilation
- Vascular Rings
- Cardiac Disease
- Obesity
- ILD
- Neuromuscular Weakness
- Exercise-induced dyspnea
- Exertional GERD
- Psychological

Non-pharmacologic interventions

- Warm-up activities
- Maneuvers to prewarm and humidify air during exercise
- Improving physical conditioning
- Weight loss
- Diet

EIB: Medication management

- Treat underlying chronic asthma
- Pretreating before exercise with short-acting beta-agonists should be used less than daily, on average
 - Ideally, it is not scheduled and is more for intermittent use
 - Overuse of albuterol associated with downregulation of Beta2 receptors and tolerance
 - Reduction in response
- Pretreating with long-acting beta agonists alone are not recommended
 - Tolerance also needs to be considered
- Daily ICS recommendations if having breakthrough exercise symptoms or having to use SABA daily or more frequently
- LTRA daily or at least 2 hrs before exercise
 - Magnitude of effect less, but no tolerance
- Mast cell stabilizing agents
- Antihistamines
- Inhaled anti-cholinergic

American Thoracic Society Clinical Practice Guideline, Exercise Induced Bronchospasm, 2013

Patient Recommendations

- Inform patient that deconditioning is normal after periods of inactivity
- Routine physical activity to improve conditioning
- Discuss warm-up and cool down routine
- Weight loss strategies discussed
- Patient not well controlled so would start ICS BID and follow up 3-4 weeks
- Optimize seasonal allergy medications
- School form for albuterol at school and at practice/games
 - Coaches and trainer should be aware that child has asthma
- Can participate as tolerated but needs to rest and only return to play when symptoms resolve
 - If needing to sit out another time during practice should sit out the rest of practice