DO PATIENTS WITH ASTHMA REALLY NEED EXERCISE?

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RETIRED ASTHMA ZEALOT

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DISCLOSURE

- No conflicts of interest

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AGENDA

- Welcome & Introduction
- Review of objectives and agenda
- Introduction of pediatric and adult patients with asthma
- Overview of the importance of exercise for patients with asthma
- Breakout groups to develop exercise plan for each patient
- Summary of exercise plans for patients with asthma

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OBJECTIVES

After completion of this workshop participants will be able to:

1. Discuss the importance of exercise for patients with asthma
2. Educate adult and pediatric patients with asthma on safe exercise routines
3. Develop personalized exercise plans that could be safely executed for pediatric and adult patients with asthma

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PATIENT INTRODUCTIONS

AMANDA & JOSEPH

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Amanda is presented to your office by her father, Jose with the chief compliant of exercise causing asthma symptoms. She is an established patient at the clinic and where she is being treated for allergies and moderate asthma.

Her father reports that her asthma has been "okay" but when she tries to play soccer, she coughs and is unable to stay in the game. The albuterol inhaler gives her some relief but she says she is tired the remainder of the day following a soccer game.

AMANDA – 6 YEAR OLD

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AMANDA

She has told her father she doesn't want to play soccer anymore. He is a coach for her team and would like her to continue to play. Amanda says to her father that she would like to play but is scared about her asthma. She was prescribed an ICS inhaler at her last visit but does not always use twice a day because it doesn't seem to help.

On **history** no current nasal or chest symptoms reported, coughing at least 2-3x/night that awakens her up at least weekly but her father hears her coughing every night, and complete avoidance of exercise except walking where she has to go.

Spirometry testing report:
Baseline: **FVC** is 95 % predicted & **FEV1** is 72 % predicted
Post Bronchodilator: FVC is 96 % predicted & FEV1 is 78 % predicted

Treatment: Provider started her on ICS/LABA 2 inhalations BID today; and advised her to use albuterol 2 inhalation pre-exercise and prn symptoms; Zyrtec 5 mg daily prn allergy symptoms

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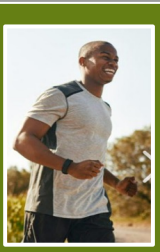
JOSEPH – 37 YEAR OLD

Joseph is a new patient to your clinic. He received the diagnosed of severe asthma today. He has had seasonal asthma since childhood which he has treated with prn albuterol and has been using it about 2-4 times daily for symptoms/pre-exercise but he says the albuterol is not working anymore.

He is in a running group at his place of employment and has not been able to run with the group in several months. He is highly motivated to start back running but had to go to the ED last time he tried. The doctor at the ED prescribed prednisone for 7 days and he was greatly improved while on it but the relief did not last.



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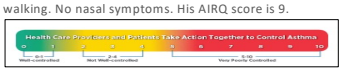
JOSEPH

On **history** he reports daily cough for 2 months, awakening every night needing to use albuterol at least 2 inhalations, and is unable to exercise. He gets short of breath even walking. No nasal symptoms. His AIRQ score is 9.



Spirometry: FVC is 47% predicted and **FEV1** 32% predicted; post bronchodilator improvement to FVC 69% predicated and FEV1 of 51% predicted

Treatment: Provider at your clinic started him on ICS/LABA 2 inhalations BID, a 5 day steroid burst, albuterol pre-exercise and only as needed, call if using more than twice weekly prn

Follow up: Provider asked him to speak with you about an asthma action plan and exercising with asthma prior to leaving the office. He is to follow-up scheduled in one week.

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OVERVIEW OF ASTHMA & EXERCISE

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EXERCISE

- **Exercise in the form of vigorous physical activity improves health**
  - Reduction in all-cause mortality
  - Reduced risk of CVD, obesity, diabetes, cancer, osteoporosis
  - Improves cognition
  - Reduction in anxiety & depression in adults and children
- **Muscle and bone-strengthening physical activities recommended**

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AEROBIC ACTIVITY

- In this kind of physical activity (also called an endurance activity or cardio activity), the body's large muscles move in a rhythmic manner for a sustained period of time. Brisk walking, running, bicycling, jumping rope, and swimming are all examples. Aerobic activity causes a person's heart to beat faster, and they will breathe harder than normal.
- Aerobic physical activity has three components:
  - Intensity, or how hard a person works to do the activity. The intensities most often studied are moderate (equivalent in effort to brisk walking) and vigorous (equivalent in effort to running or jogging);
  - Frequency, or how often a person does aerobic activity; and
  - Duration, or how long a person does an activity in any one session.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf.

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MUSCLE-STRENGTHENING ACTIVITY

- This kind of activity, which includes resistance training and weight lifting, causes the body's muscles to work or hold against an applied force or weight.
- These activities often involve lifting relatively heavy objects, such as weights, multiple times to strengthen various muscle groups. Muscle-strengthening activity can also be done by using elastic bands or body weight for resistance (climbing a tree or doing push-ups, for example).
  - Intensity, or how much weight or force is used relative to how much a person is able to lift;
  - Frequency, or how often a person does muscle-strengthening activity; and
  - Sets and repetitions, or how many times a person does the muscle-strengthening activity, like lifting a weight or doing a push-up (comparable to duration for aerobic activity).
- The effects of muscle-strengthening activity are limited to the muscles doing the work. It is important to work all the major muscle groups of the body—the legs, hips, back, abdomen, chest, shoulders, and arms.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf.

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OTHER TYPES OF ACTIVITY

- **Bone-Strengthening Activity**: This kind of activity (sometimes called weight-bearing or weight-loading activity) produces a force on the bones of the body that promotes bone growth and strength. This force is commonly produced by impact with the ground. Examples of bone-strengthening activity include jumping jacks, running, brisk walking, and weight-lifting exercises. As these examples illustrate, bone-strengthening activities can also be aerobic and muscle strengthening.
- **Balance Activities**: These kinds of activities can improve the ability to resist forces within or outside of the body that cause falls while a person is stationary or moving. Walking backward, standing on one leg, or using a wobble board are examples of balance activities. Strengthening muscles of the back, abdomen, and legs also improves balance.
- **Flexibility Activities:** These kinds of activities enhance the ability of a joint to move through the full range of motion. Stretching exercises are effective in increasing flexibility, and thereby can allow people to more easily do activities that require greater flexibility.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf.

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KEY GUIDELINES FOR PRESCHOOL-AGED CHILDREN

- Preschool-aged children (ages 3 through 5 years) should be physically active throughout the day to enhance growth and development.
- Adult caregivers of preschool-aged children should encourage active play that includes a variety of activity types.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf.

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KEY GUIDELINES FOR CHILDREN AND ADOLESCENTS

- Young people should be offered opportunities and encouragement to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety.
- Children and adolescents ages 6 through 17 years should do 60 minutes (1 hour) or more of moderate-to-vigorous physical activity daily:
  - **Aerobic:** Most of the 60 minutes or more per day should be either moderate or vigorous intensity aerobic physical activity and should include vigorous-intensity physical activity on at least 3 days a week.
  - **Muscle-strengthening:** As part of their 60 minutes or more of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days a week.
  - **Bone-strengthening:** As part of their 60 minutes or more of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days a week.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

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KEY GUIDELINES FOR ADULTS

- Adults should move more and sit less throughout the day.
- Adults should do at least 150 minutes (2 hours and 30 minutes) to 300 minutes (5 hours) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) to 150 minutes (2 hours and 30 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity.
- Additional health benefits are gained by engaging in physical activity beyond the equivalent of 300 minutes (5 hours) of moderate-intensity physical activity a week.
- Adults should also do muscle-strengthening activities of moderate or greater intensity and that involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

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KEY GUIDELINES FOR OLDER ADULTS

- Older adults should do multi-component physical activity that includes balance training as well as aerobic and muscle-strengthening activities.
- Older adults should determine their level of effort for physical activity relative to their level of fitness.
- Older adults with chronic conditions should understand whether and how their conditions affect their ability to do regular physical activity safely.
- When older adults cannot do 150 minutes of moderate-intensity aerobic activity a week because of chronic conditions, they should be as physically active as their abilities and conditions allow.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

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KEY GUIDELINES FOR ADULTS WITH CHRONIC HEALTH CONDITIONS & ADULTS WITH DISABILITIES

- Adults with chronic conditions or disabilities, who are able, should do at least 150 minutes (2 hours and 30 minutes) to 300 minutes (5 hours) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) to 150 minutes (2 hours and 30 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Preferably, aerobic activity should be spread throughout the week.
- Adults with chronic conditions or disabilities, who are able, should also do muscle-strengthening activities of moderate or greater intensity and that involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.
- When adults with chronic conditions or disabilities are not able to meet the above key guidelines, they should engage in regular physical activity according to their abilities and should avoid inactivity.

https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

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MOVE YOUR WAY® COMMUNITY RESOURCES

https://health.gov/our-work/nutrition-physical-activity/move-your-way-community-resources

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EXERCISE-INDUCED ASTHMA(EIA) & EXERCISE-INDUCED BRONCHOSPASM(EIB)

- These terms are often used interchangeably to describe symptoms of asthma provoked by exercise
- EIB is the bronchoconstrictive response and EIA is when this response is associated with symptoms
- EIB is common in patients with asthma but it affects more than 10% of otherwise healthy individuals
- The occurrence in elite athletes shows that EIA/EIB if correctly managed should not impair physical activity
- Exercise, despite being the cause of EIA/EIB may also be a new tool for the treatment of asthma

Giacco, S., Firinu, D., Bjermer, L., & Carlsen, K. (2015). Exercise and asthma: an overview. European Clinical Respiratory Journal, 2:27984: 1-10. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4653278/

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EXERCISE AS AN ASTHMA TRIGGER

- Exercise is common trigger for bronchoconstriction leading to asthma symptoms in patients with inadequately controlled asthma
- Symptoms of EIB are cough, chest tightness, and wheezing more commonly during the exhalatory phase of respiratory
- These symptoms classically occur during or just following exercise and are caused by ventilation increases leading to drying of airway mucosa and inflammatory mediator release
- The classic pattern is bronchodilation at the beginning of exercise but then bronchoconstriction within minutes following the end of exercise, which peaks shortly after cessation of activity
- Symptoms that include upper airway sounds, inspiratory sounds or are mainly shortness of breath should alert the clinician that this condition may be vocal cord dysfunction or simple exercise-induced dyspnea without EIB symptoms maybe due to lack of exercise tolerance due to lack of conditioning

Giacco, S., Firinu, D., Bjermer, L., & Carlsen, K. (2015). Exercise and asthma: an overview. European Clinical Respiratory Journal, 2:27984: 1-10. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4553278/

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ASTHMA & EXERCISE

- The ultimate goal for asthma management is to minimize asthma symptoms so that individuals with asthma can lead normal lives, including physical activity & exercise
- Evidence shows that exercise and physical activity in patients with asthma remains low
- Higher adherence to physical activity is associated with the following favorable outcomes:
  - Improved lung function
  - Asthma control
  - Exacerbation rates decreased
  - Lower healthcare use
- Common types of exercise such as walking, jogging, swimming as cycling are generally safe in children & adults with asthma

Pantiogiotou, M., Koulouris, N., & Rovina, N. (2020). Physical activity: A missing link in asthma care. *Journal of ClinicalMedicine*, 9(706):1-19. Retrieved from https://www.mdpi.com/2077-0383/9/3/706

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SAFETY OF EXERCISE IN ASTHMA

- Exercise has activity specific risks regardless of asthma status
- Patient with unstable and poor controlled asthma can expect to have asthma symptoms with exercise (similar if there were exposed to any trigger)
- Exercise in patients with asthma appears to be safely undertaken if precautions are used, to include:
  - Pre-medication
  - Warm-up exercises to include stretching (15 minutes)
  - Cool-down exercises (15 minutes)
  - Protective equipment &/or traffic safety

Lang, J. (2019). The impact of exercise on asthma. *Current Opinion in Allergy and Clinical Immunology*, 19(2):118-125. doi:10.1097/ACI.0000000000000510

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GENERAL TIPS FOR EXERCISE & PHYSICAL ACTIVITY FOR PATIENTS WITH ASTHMA

- Take all asthma medications as prescribed.
- Ask your doctor about taking medicine before you exercise to prevent symptoms.
- Always have your asthma rescue medication on hand when exercising.
- Perform a prolonged aerobic warm-up and cool-down (15 minutes each).
- Postpone exercise if asthma symptoms are not well-controlled of if you have a cold or respiratory infection.
- Check the air quality index (https://airnow.gov/index.cfm?action%aqibasics.aqi/) before exercising outdoors. If air pollution or pollen (if you are allergic) levels are high, try not to work or play hard outside.
- Breathe through the nose as much as possible when exercising.
- When exercising outdoors, avoid areas that contain high concentrations of allergens and irritants (eg, fields, trees, busy roads, factories).
- When exercising indoors, keep windows and doors closed to reduce allergen exposure.

Corbridge, S., & Nyenhuis, S. (2017). Promoting physical activity and exercise in patients with asthma and chronic obstructive pulmonary disease. *Journal for Nurse Practitioners*, 13(1):41-46. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S1555415515304767#!

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PATIENT PERCEIVED BARRIER TO EXERCISE & CLINICAL ASSOCIATIONS IN DIFFICULT ASTHMA

- **Methods:** 62 Patients within the WATCH Difficult Asthma Cohort (Southampton, UK) completed an Exercise Therapy Burden Questionnaire (ETBQ). The results were analyzed with contemporaneous asthma-related data to determine relationships between perceived exercise barriers and asthma and comorbidity characteristics
- **Results:** Patients were reflective of a difficult asthma cohort, 66% were female, and 63% were atopic. They had a high BMI (median [inter-quartile range]) of 29.3 [25.5–36.2], age of 53.5 [38.75, 65.25], impaired spirometry with FEV1 73% predicted [59.5, 86.6%] and FEV/FVC ratio of 72 [56.5, 78.0] and poor symptom control, as defined by an Asthma Control Questionnaire (ACQ6) result of 2.4 [1.28, 3.2].
  - A high perceived barriers to exercise score was significantly correlated with **increased asthma symptoms** ($r = 0.452$, $p < 0.0001$), **anxiety** ($r = 0.375$, $p = 0.005$) and **depression** ($r = 0.363$, $p = 0.008$), **poor quality of life** ($r = 0.345$, $p = 0.015$) and **number of rescue oral steroid courses** in the past 12 months ($r = 0.257$, $p = 0.048$).
  - Lung function, blood eosinophil count, FeNO, Njimegen and SNOT22 scores, BMI and hospitalizations in the previous year were **not** related to exercise perceptions.
- **Conclusion**: In difficult asthma, perceived barriers to exercise are related to symptom burden and psychological morbidity. Therefore, exercise interventions combined with psychological input such as Cognitive Behavioral Therapy to restructure thought processes around these perceived barriers may be useful in facilitating adoption of exercise

Freeman, A., et al. (2020). Patient perceived barriers to exercise and their clinical associations in difficult asthma. Asthma Research and Practice https://doi.org/10.1186/s40733-020-00058-6

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BREAKOUT GROUPS

DEVELOP EXERCISE PLAN FOR EACH PATIENT

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PEDIATRIC & ADULT PATIENT PLANS

PER BREAKOUT GROUPS

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Corbridge, S., & Nyenhuis, S. (2017). Promoting physical activity and exercise in patients with asthma and chronic obstructive pulmonary disease. *Journal for Nurse Practitioners*, 13(1):41-46. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S1555415516304767#!

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