Täiskasvanute astma käsitlus esmatasandil
Tõendusmaterjali kokkuvõte

Kliiniline küsimus nr 3c

Kliinilise küsimuse tekst: Kas astma diagnoosiga patsiente tuleks nõustada järgmistel teemadel:
c. füüsilise treenituse (*fitness*) parandamine vs mitteparandamine

Kokkuvõte, sh kriitiliste tulemusnäitajate kaupa:

Kolmes süstemaatilises ülevaates (Carson 2013 , Heikkinen 2012 , Pacheco 2012) hinnati kehalise aktiivsuse mõju astmale.

Carson 2013 –Füüsiline koormus suurendab VE_{max} ja VO_{max} (vastavalt maksimaalset ekspiratoorset mahtu ja maksimaalset hapnikutarbimist) – VT GRADE tabel selle kasti järel (madala kvaliteediga tõendusmaterjal). Kehalist koormust talusid astmapatsiendid hästi.
Elukvaliteet – andmete heterogeensuse tõttu ei olnud võimalik meta-analüüsi läbi viia, kuid 5 seda küsimust käsitletud uuringus nelja tulemuseks oli elukvaliteedi paranemine.
Astma ägenemine- NA
Suremus (astmast tingitud või olenemata põhjusest e *all-cause mortality)*
Päevaste sümptomite esinemine- NA
Öösümptomid/unehäired- NA
Hooravi vajadus- NA
Hospitaliseerimine (olenemata põhjusest)- NA
Ravi katkestamine kõrvaltoime tõttu- NA
Füüsilise aktiivsuse piiratus- NA
Ravikulu- NA

Heikkinen 2012 : hinnati **regulaarse** kehalise treeningu mõju, peamised tulemusnäitajad selles meta-analüüsis on FEV_1 muutus ja VO_{2max} muutus.
Regulaarse treenimise tulemusel suurenes VO2 max (keskmiselt 3,66 ml/min/kg võrra , 95% CI 3,44-3,88 ml/kg/min). FEV_1 muutus ei olenud statistiliselt oluline.

Elukvaliteet – regulaarsete treenijate rühmas paranes (2 randomiseeritud uuringu tulemused)
Astma ägenemine - NA
Suremus (astmast tingitud või olenemata põhjusest e *all-cause mortality) - NA*
Päevaste sümptomite esinemine - NA
Öösümptomid/unehäired - NA
Hooravi vajadus – vähenes (1 RCT: keskmise hooravi vajaduse vähenemine treeningu tulemusel 4,91 annuselt nädalas 3,41 annusele nädalas)
Hospitaliseerimine (olenemata põhjusest) – regulaarselt treenijate rühmas haiglaravi päevade koguarv lühenes (1RCT)
Ravi katkestamine kõrvaltoime tõttu - NA
Füüsilise aktiivsuse piiratus - NA
Ravikulu- - NA

Pacheco 2012: aeroobne treening parandas elukvaliteeti

LIsaks on hiljem publitseeritud 2 RCT (Manusco 2013 ja Latorre-Roman 2014 – uuritavateks lapsed) , mille tulemused samasuunalised.

SUMMARY OF FINDINGS FOR THE MAIN COMPARISON *[Explanation]*

Physical training for asthma

Patient or population: patients with asthma aged eight years or older
Settings: indoor or outdoor track, gymnasium and pool; university hospital, laboratory and physiotherapy department
Intervention: Physical training of whole body exercise lasting more than 20 minutes, twice a week, for at least four weeks

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Physical training				
Asthma symptoms measured using various techniques. Follow-up: 6 to 24 weeks	See comment	See comment	N/A	315 (9 studies)	⊕○○○ **very low**[1,6,7]	We were unable to pool data for this outcome due to heterogeneity in the instruments used; 3 studies found symptoms lasted fewer days, 5 studies reported symptoms were unchanged; 1 study reported significant improvement
Quality of life Measured using various scales. Follow-up: 12 to 18 weeks	See comment	See comment	N/A	212 (5 studies)	⊕○○○ **very low**[1,6,7]	We were unable to pool data for this outcome due to heterogeneity in the quality of life scales used. 4 studies found clinically significant improvement for total scores immediately after physical training,1 study found no significant difference

Exercise tolerance Measured using 6MWD Follow-up: 18 weeks	See comment	See comment	N/A	34 (1 study)	⊕⊕○○ **low** [3,5]	There was a statistically insignificant increase in the 6MWD in one study
PEFR L/min Follow-up: 6 to 12 weeks	See comment	See comment	N/A	77 (2 studies contributed data to meta analysis) 153 (4 studies in total)	⊕○○○ **very low**[1,2,3]	We were unable to pool data for this outcome due to heterogeneity between study populations as per the I^2 statistic; The results were originally analysed for two of the four studies assessing this outcome using the fixed-effect model, when the random-effects model was applied, the statistical significance disappeared. The minimally important difference is estimated to be a mean change of 11.9 (95% CI 7.3 to 16.1) (Karras 2000) , which has been met in both these analyses. Data from two studies showed no change in PEFR, however, we were unable to combine data due to a high dropout rate in one study and unsuitable data for imputation in the other. Possible sources of clinical heterogeneity include swimming versus gymnasium activities and 6 versus 12 week intervention duration

VEmax Follow-up: 6 to 24 weeks	The mean VEmax ranged across control groups from **47.17 to 87.3 L/min**	The mean VEmax in the intervention groups was **3.08 higher** (-0.63 to 6.79 higher)	200 (5 studies)	⊕⊕◯◯ **low**[1,4]
VOmax Follow-up: 6 to 24 weeks	The mean VOmax ranged across control groups from **20.36 to 55.4 ml/kg/min**	The mean VOmax in the intervention groups was **4.92 higher** (3.98 to 5.87 higher)	267 (8 studies)	⊕⊕◯◯ **low**[1,4]
HRmax bpm Follow-up: 3 to 6 months	The mean HRmax ranged across control groups from **185.46 to 187 bpm**	The mean HRmax in the intervention groups was **3.67 higher** (0.90 to 6.44 higher)	34 (2 studies)	⊕⊕◯◯ **low**[1,4]

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Methods of randomisation, allocation concealment and/or any attempts to blind outcome assessors were not described for the majority of studies assessing this outcome (limitations of design (-1))
[2] Significant heterogeneity (I^2 = 96%) (inconsistency (-1))
[3] Few participants in few studies (imprecision (-1))
[4] Moderate heterogeneity (I^2 = 45%)
[5] Single study
[6] Possible sources of clinical heterogeneity include swimming versus gymnasium activities and 6 versus 12 week intervention duration (inconsistency (-1))
[7] No results to pool (imprecision (-1))
Abbreviations: 6MWD: six-minute walking distance; bpm: heart beats per minute; HRmax: maximum heart rate; PEFR: peak expiratory flow rate; VEmax: maximal expiratory volume (the maximum volume of air that can be breathed in 1 min during exercise); VOmax: maximal oxygen consumption (the maximum amount of oxygen in millilitres used while exercising).

Ravijuhendid

Kokkuvõte ravijuhendites leiduvatest soovitustest:

> Küsimust käsitleb SIGN juhend, kus leitakse, et füüsilise treenituse parandamisel on üldine positiivne toime kardiopulmonaalsele staatusele. Otsesest soovitust ei ole. Ettevaatust nende patsientide puhul, kel on füüsilise pingutusega provotseeritavad astmahood.
>
> Lisatud 2014: GINA-2014 juhendis on soovitus: encourage peole with asthma to engage with regular physical activities because of its general health benefiits.

Viited alapunkti c kohta

Kokkuvõte (abstrakt või kokkuvõtlikum info)	**Viide kirjandusallikale**
Although many guidelines recommend regular exercise for adults with asthma, the empirical evidence on the effect of exercise on adult asthma has been inconsistent and there are no previous systematic reviews on this topic. To fill in this gap of knowledge, we synthesized the data on the effects of regular exercise on physical fitness, asthma control and quality of life of adult asthmatics. We performed a Medline search from 1980 through June 2011. In the systematic review we included all clinical trials that provided information on the effects of regular exercise on adult asthma. We conducted meta-analyses of maximal oxygen consumption (VO(2)max) and forced expiratory volume in 1 s (FEV(1)) based on 9 studies. A total of 11 studies were included in the analyses, but only 6 of them had a non-exercising reference group of asthmatics. The meta-analyses of randomized controlled trials showed that regular exercise significantly improved VO(2)max. There was no obvious	Eur J Epidemiol. 2012 Jun;27(6):397-407. doi: 10.1007/s10654-012-9684-8. Epub 2012 Apr 25. **Effects of regular exercise on adult asthma.** Heikkinen SA, Quansah R, Jaakkola JJ, Jaakkola MS. http://www.ncbi.nlm.nih.gov/pubmed/22531972

improvement in lung function measurements. Some individual studies showed evidence of improvement in quality of life and asthma control. Meta-analyses provided evidence that regular physical exercise improves physical fitness of adult asthmatics. The results on effects on lung function were inconclusive. There is insufficient evidence to assess the effects of exercise on asthma control and quality of life.	
People with asthma may show less tolerance to exercise due to worsening asthma symptoms during exercise or other reasons such as deconditioning as a consequence of inactivity. Some may restrict activities as per medical advice or family influence and this might result in reduced physical fitness. Physical training programs aim to improve physical fitness, neuromuscular coordination and self confidence. Subjectively, many people with asthma report that they are symptomatically better when fit, but results from trials have varied and have been difficult to compare because of different designs and training protocols. Also, as exercise can induce asthma, the safety of exercise programmes needs to be considered. **OBJECTIVES:** To gain a better understanding of the effect of physical training on the respiratory and general health of people with asthma, from randomised trials. **SEARCH METHODS:** We searched the Cochrane Airways Group Specialised Register of trials up to January 2013. **SELECTION CRITERIA:** We included randomised trials of people over eight years of age with asthma who were randomised to undertake physical training or not. Physical training had to be undertaken for at least 20 minutes, two times a week, over a minimum period of four weeks. **MAIN RESULTS:** Twenty-one studies (772 participants) were included in this review with two additional 2012 studies identified as 'awaiting classification'. Physical training was well tolerated with no adverse effects reported. None of the studies mentioned worsening of asthma symptoms following physical training. Physical training showed marked improvement in cardiopulmonary fitness as measured by a statistically and clinically significant increase in maximum oxygen uptake (mean difference (MD) 4.92 mL/kg/min; 95% confidence interval (CI) 3.98 to 5.87; P < 0.00001; 8 studies on 267 participants); however, no statistically significant effects were observed for forced expiratory volume in 1 second (FEV1), forced vital capacity (FVC), minute ventilation at maximal exercise (VEmax) or peak expiratory flow rate (PEFR). Meta-	Cochrane Database Syst Rev. 2013 Sep 30;9:CD001116. [Epub ahead of print] Physical training for asthma. Carson KV, Chandratilleke MG, Picot J, Brinn MP, Esterman AJ, Smith BJ. http://www.ncbi.nlm.nih.gov/pubmed/24085631

analysis of four studies detected a statistically significant increase in maximum heart rate, and following a sensitivity analysis and removal of two studies significance was maintained (MD 3.67 bpm; 95% CI 0.90 to 3.44; P = 0.01). Although there were insufficient data to pool results due to diverse reporting tools, there was some evidence to suggest that physical training may have positive effects on health-related quality of life, with four of five studies producing a statistically and clinically significant benefit. **AUTHORS' CONCLUSIONS:** This review demonstrated that physical training showed significant improvement in maximum oxygen uptake, though no effects were observed in other measures of pulmonary function. Physical training was well tolerated among people with asthma in the included studies and, as such, people with stable asthma should be encouraged to participate in regular exercise training, without fear of symptom exacerbation. More research is needed to understand the mechanisms by which physical activity impacts asthma management.	
OBJECTIVE: The purpose of this review was to analyze, based on a review of the current literature, the effects of physical activity on the quality of life (QoL) of subjects with asthma. **METHODS:** The authors conducted a search of randomized controlled trials (RCTs) between January 2000 and August 2010 in a group of major databases of health sciences (Academic Search Complete, Directory of Open Access Journals, Elsevier--Science Direct, Highwire Press, PubMed, Scielo Global, Scirus, Scopus, SpringerLink, Taylor & Francis, and Wiley Interscience) with the keywords asthma, QoL, physical activity, exercise, training, and program in all possible combinations. Citations and references of each study selected were also examined. **RESULTS:** Of the 1075 studies identified, only 11 were included. Five of these studies were performed in children between the ages of 7 and 15 and the remaining studies were performed on adults. Intervention programs were divided into aerobic training programs and breathing exercises programs. All aerobic training programs showed improvements in QoL, demonstrating a positive influence of aerobic training on asthma. **CONCLUSIONS:** There is a noticeable trend in the benefit of aerobic training programs in the QoL for individuals with asthma. The	J Asthma. 2012 Jun;49(5):487-95. doi: 10.3109/02770903.2012.680636. Epub 2012 May 3. Exercise-related quality of life in subjects with asthma: a systematic review. Pacheco DR[1], Silva MJ, Alexandrino AM, Torres RM. http://www.ncbi.nlm.nih.gov/pubmed/22554022

breathing exercises programs were few and heterogeneous, making it difficult to reach a positive conclusion on whether it could be recommended for the improvement of QoL in this pathology. There is a great need for more RCTs with methodological rigor.	

Täiendavad RCT (alates jaanuar 2013)

The objective of this analysis was to assess longitudinal asthma status in 256 primary care patients in New York City enrolled in a trial to increase lifestyle physical activity. **METHODS:** Patients were randomized to two protocols to increase physical activity during a period of 12 months. At enrollment, patients completed the Asthma Quality of Life Questionnaire (AQLQ) and the Asthma Control Questionnaire (ACQ) and received asthma self-management instruction through an evaluative test and workbook. Exercise and self-management were reinforced every 2 months. The AQLQ was repeated every 4 months and the ACQ was repeated at 12 months. **RESULTS:** The mean age was 43 years and 75% were women. At 12 months there were clinically important increases in physical activity with no differences between groups; thus, data were pooled for asthma analyses. The enrollment AQLQ score was 5.0 ± 1.3 and increased to 5.9 ± 1.1 corresponding to a clinically important difference. Correlations between AQLQ and physical activity were approximately 0.35 ($p < .0001$) at each time point. In a mixed effects model, the variables associated with improvement in AQLQ scores over time were male sex, less severe asthma, not taking asthma maintenance medications, fewer depressive symptoms, and increased physical activity (all variables, $p < .03$). According to the ACQ, asthma was well controlled in 38% at enrollment and in 60% at 12 months ($p < .0001$). **CONCLUSION:** With attention to self-management, increased physical activity did not compromise asthma control and was associated with improved asthma.	J Asthma. 2013 Feb;50(1):103-7. doi: 10.3109/02770903.2012.743150. Epub 2012 Nov 22. Improvement in asthma quality of life in patients enrolled in a prospective study to increase lifestyle physical activity. Mancuso CA1, Choi TN, Westermann H, Wenderoth S, Wells MT, Charlson ME. http://www.ncbi.nlm.nih.gov/pubmed/23173979
The objective of this study is to analyze the effects of a 12-week indoor intermittent training program on lung function, physical capacity, body composition and quality of life in children with asthma. METHODS: Participants were randomized in an experimental group (EG, 58 children, age = 11.55 ± 1.01 years) and in a control group (CG, 47 children, age = 11.51 ± 1.42 years). The training program was conducted indoors and consisted of alternating high- and low-intensity stimuli, for three	J Asthma. 2014 Jun;51(5):544-51. doi: 10.3109/02770903.2014.888573. Epub 2014 Feb 25. The effectiveness of an indoor intermittent training program for improving lung function, physical capacity, body composition and quality of life in children with

sessions of 60 min/week, for 12 weeks. Physical exercise and sports activities were organized to follow the criteria of the American College of Sports Medicine (1999) and previous interventions' studies. RESULTS: In EG, there was a significant improvement ($p < 0.05$) in FEV1, FEV6, 6MWT, handgrip strength, CMJ and flexibility. Reductions in BMI and fat mass as well as an increase in quality of life were all shown. The dyspnea index decreased significantly and there were no episodes of EIA. There is a significant positive correlation ($p < 0.01$) between the ΔFEV1 with Δhandgrip strength and Δ6MWT and a negative correlation with Δfat mass. CONCLUSIONS: An indoor intermittent training program with these characteristics has improved lung function, physical capacity, body composition and quality of life in children with asthma. These training adaptations are particularly relevant for those patients suffering from asthma as a regular physical exercise routine will greatly improve their quality of life.	asthma. Latorre-Román PÁ1, Navarro-Martínez AV, García-Pinillos F. http://www.ncbi.nlm.nih.gov/pubmed/24471516