

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

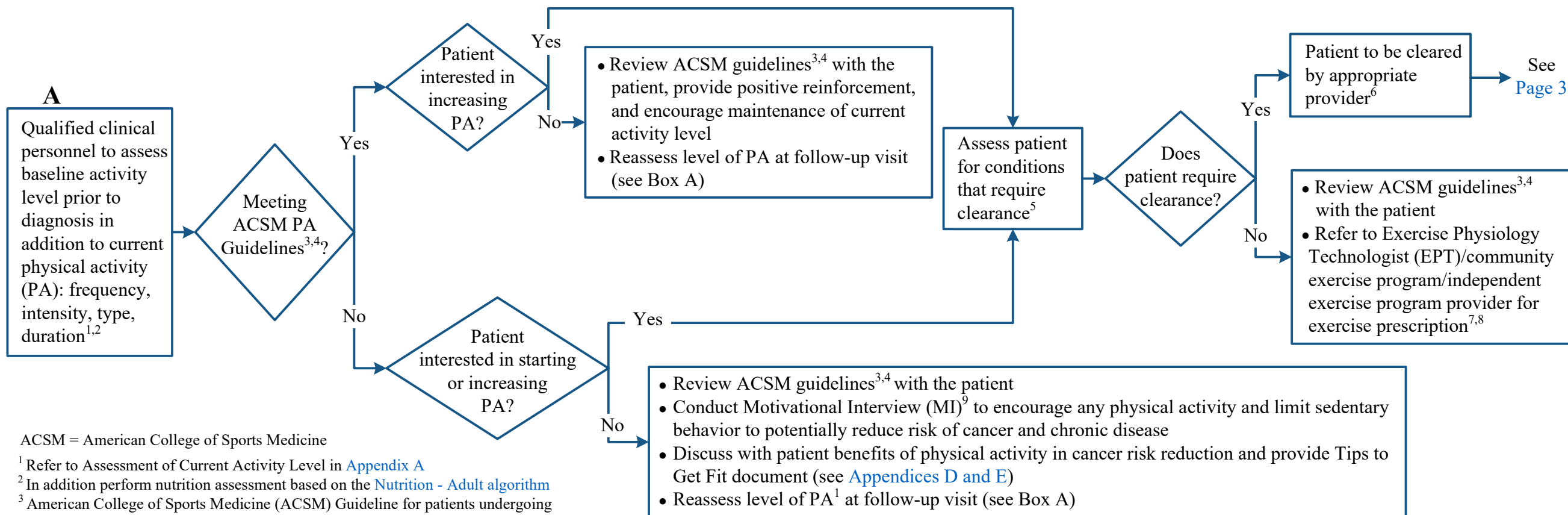
TABLE OF CONTENTS

Initial Assessment and Follow-up	Pages 2-3
APPENDIX A: Activity/Exercise Prescriptions	Pages 4-5
APPENDIX B: Conditions that Require Medical Clearance	Page 6
APPENDIX C: Conditions that Require PT Supervised Activity	Page 6
APPENDIX D: Benefits of Physical Activity in Cancer Risk Reduction	Page 7
APPENDIX E: Tips to Get Fit	Page 7
Suggested Readings	Page 8
Development Credits	Page 9

PT = physical therapy

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

INITIAL ASSESSMENT



ACSM = American College of Sports Medicine

¹ Refer to Assessment of Current Activity Level in [Appendix A](#)

² In addition perform nutrition assessment based on the [Nutrition - Adult algorithm](#)

³ American College of Sports Medicine (ACSM) Guideline for patients undergoing cancer treatment includes:

- Weekly activity of at least 90 minutes (30 minutes per session) of moderate-intensity activity
- Two weekly sessions of strength training that include major muscle groups (2 sets of 12-15 repetitions for each exercise)

⁴ American College of Sports Medicine (ACSM) Guideline for patients not undergoing cancer treatment includes:

- Weekly activity of at least 150 minutes of moderate-intensity activity or 75 minutes of vigorous-intensity activity or equivalent combination
- Two or more weekly sessions of strength training that include major muscle groups

⁵ Refer to Conditions that Require Medical Clearance in [Appendix B](#) and Conditions that Require PT Supervised Activity in [Appendix C](#)

⁶ Appropriate Provider: Primary care provider or provider treating condition needing clearance (surgeon, cardiologist, oncologist, etc.)

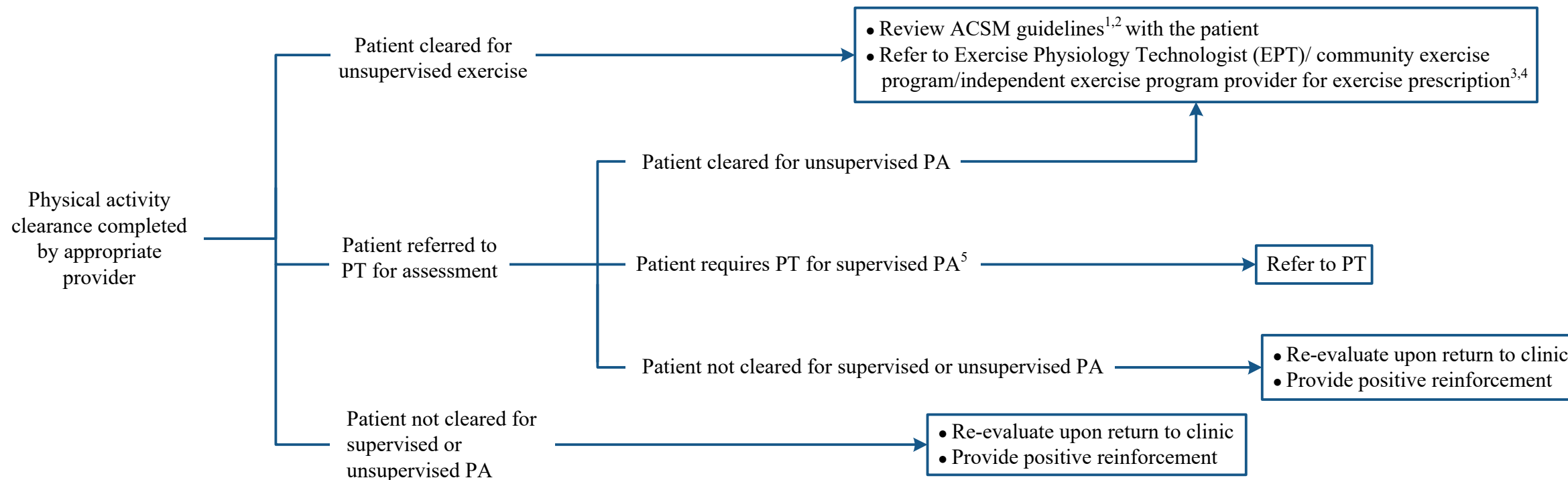
⁷ Adjust exercise prescription as needed if health status and/or exercise tolerance change, see [Appendix A](#)

⁸ Refer to Progression of Levels of Activity in [Appendix A](#)

⁹ If MI is not conducted, encourage and counsel patient on importance of meeting ACSM guidelines

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

INITIAL ASSESSMENT - continued



¹ American College of Sports Medicine (ACSM) Guideline for patients undergoing cancer treatment includes:

- Weekly activity of at least 90 minutes (30 minutes per session) of moderate-intensity activity
- Two weekly sessions of strength training that include major muscle groups (2 sets of 12-15 repetitions for each exercise)

² American College of Sports Medicine (ACSM) Guideline for patients not undergoing cancer treatment includes:

- Weekly activity of at least 150 minutes of moderate-intensity activity or 75 minutes of vigorous-intensity activity or equivalent combination
- Two or more weekly sessions of strength training that include major muscle groups

³ Adjust exercise prescription as needed if health status and/or exercise tolerance change, see [Appendix A](#)

⁴ Refer to Progression of Levels of Activity in [Appendix A](#)

⁵ See [Appendix C](#) Conditions that Require PT Supervised Activity

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

APPENDIX A: Activity/Exercise Prescriptions

Inactivity is detrimental to health; therefore regular physical activity should be promoted for reduction of cancer risk¹ as well as other chronic diseases. If the ACSM Physical Activity guidelines^{2,3,4} are unable to be met then recommend any form of activity beyond activities of daily living (ADL), even if the only opportunity is to replace sitting with standing.

Assessment of Current Activity Level

Begin with an understanding of the patient's current level of activity

Assess level of current activity:

- Frequency (F)
- Intensity (I)
- Duration (D)
- Type (T)

- Discuss patient's rate of perceived exertion (RPE)⁵ and/or self-evaluation of exercise tolerance⁶
- Consider upcoming, planned medical interventions (surgeries, chemotherapy and/or radiation therapy) when developing an exercise prescription. Re-evaluate patient's level of activity status upon completion of medical interventions.
- Assess, evaluate, and address modifiable barriers prior to assessing for conditions that require clearance

¹ Refer to [Appendix E](#) for Tips to Get Fit

² American College of Sports Medicine (ACSM) Guideline for patients undergoing cancer treatment includes:

- Weekly activity of at least 90 minutes (30 minutes per session) of moderate-intensity activity
- Two weekly sessions of strength training that include major muscle groups (2 sets of 12-15 repetitions for each exercise)

³ American College of Sports Medicine (ACSM) Guideline for patients not undergoing cancer treatment includes:

- Weekly activity of at least 150 minutes of moderate-intensity activity or 75 minutes of vigorous-intensity activity or equivalent combination
- Two or more weekly sessions of strength training that include major muscle groups

Progression of Levels of Activity

The goal of exercise progression is to move from current level of activity to the next level of activity. Consider variation or additional activity when progressing. Progression is encouraged once participant is comfortable performing FIDT. Progression should occur by adding increments of time to the F or D, then increasing I (e.g., incline, resistance, etc.), and/or T change of activity (e.g., walking to jogging). Adjust exercise prescription as needed if health status and/or exercise tolerance changes⁶.

Level of Activity	Aerobic	Resistance (large muscle groups)	Comments
Low	F: 1-5 days/week I: 1-6 RPE ⁵ D: < 90 minutes/week T: Patient preferred, enjoyable, realistic activity	F: 1-2 days/week I: 1-2 sets of 6-10 repetitions D: 4-8 different exercises T: Rest: 2-3 minutes between sets; 48 hours between workouts consisting of same muscle groups	Regardless of physical activity level, sedentary behavior is still detrimental to health. Therefore, it is recommended that
Moderate ^{2,3,4} (meeting ACSM Guidelines)	F: 3-5 days/week I: 5-8 RPE ⁵ D: 90 -150 minutes/week T: Patient preferred, enjoyable, realistic activity	F: 2-4 days/week I: 2-3 sets of 10-15 repetitions D: 8-10 different exercises T: Rest: 2-3 minutes between sets; 48 hours between workouts consisting of same muscle groups	sedentary time be limited and preferably replaced with any movement and/or standing when possible.
High ^{2,3,4} (meeting ACSM Guidelines)	F: 5-7 days/week I: 7-8 RPE ⁵ continuous exercise and/or a combination of 9-10 RPE ⁵ intervals D: >150 minutes/week T: Patient preferred, enjoyable, realistic activity	F: 2-4 days/week I: 2-3 sets of 10-15 repetitions D: 8-10 different exercises T: Rest: 2-3 minutes between sets; 48 hours between workouts consisting of same muscle groups	

⁴ If meeting guideline, provide positive reinforcement, encouragement to maintain activity level, and continued reinforcement of guideline recommendations at follow-up visit

⁵ See [Page 5](#) for Rate of Perceived Exertion (RPE) Scale

⁶ See [Page 5](#) for Changes in Exercise Tolerance

Continued on next page

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

APPENDIX A: Activity/Exercise Prescriptions - continued

Rate of Perceived Exertion (RPE) Scale

0	1	2	3	4	5	6	7	8	9	10
Resting	Light Intensity				Moderate Intensity		Vigorous Intensity		As hard as it can be	

The rate of perceived exertion (RPE) scale is a tool used to subjectively measure one's own exercise intensity. The RPE scale runs from 0 – 10. The numbers on the scale rate how easy or how difficult it is to complete aerobic and resistance activities. For example, an individual might rate their perceived exertion as zero (nothing at all) while sitting in a chair and a ten (very, very heavy) after completing a stress test. The scale can be used to appropriately adjust the exercise intensity as needed.

Changes in Exercise Tolerance

If exercise elicits symptoms of intolerance, as listed below, then adjust FIDT to reduce/alleviate symptoms without promoting sedentary activity. If symptoms of intolerance persist, reduce activity level and seek Physical Activity Clearance (see Appendices B and C).	
Performance	<ul style="list-style-type: none"> • Decreased performance (strength, power output, muscle endurance, cardiovascular endurance) • Increased recovery requirements • Decreased motor coordination
Physiology	<ul style="list-style-type: none"> • New onset of symptoms of cardiovascular and/or pulmonary disease, metabolic disease, or renal disease • Unexplained change in resting heart rate, blood pressure, and respiration patterns • Increased HR during submaximal work • Chronic fatigue • Sleep and eating disorders • Menstrual disruptions • Headaches, gastrointestinal distress • Chronic or extreme muscle soreness or injury • New or increased joint aches and pains
Psychological	New onset of symptoms of depression and apathy, decreased self-esteem, decreased concentration in response to exercise
Immunology	<ul style="list-style-type: none"> • Increased occurrence of illness • Decreased rate of healing • Impaired immune function (neutrophils, lymphocytes, mitogen responses, eosinophils)

FIDT = Frequency (F); Intensity (I); Duration (D); Type (T)

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

APPENDIX B: Conditions that Require Medical Clearance

If the patient reports any of the following, provide the patient with Physical Activity Clearance form to be completed by appropriate provider

Cardiovascular disease (CVD) or pulmonary disease may include:

- Chest discomfort centered under the breastbone and/or slightly to the left characterized by a sensation of heavy pressure, squeezing, or fullness (note: not all CVD causes chest discomfort)
- Pain that begins in the chest and spreads to the shoulders, between the shoulder blades, arms, elbows, back, neck, jaw or abdomen
- Rapid or irregular pulse accompanied by dizziness and shortness of breath
- Feeling short of breath at rest or with minimal exertion
- Dizziness, lightheadedness, or loss of consciousness
- Unusual and excessive fatigue often accompanied by nausea and/or lack of appetite
- Extreme or unexplained weakness
- Profuse sweating with no physical exertion
- Swelling (accumulation of fluid) especially in the feet, ankles, legs, or abdomen
- Intermittent claudication
- Persistent cough, bloody cough or wheezing
- Intense anxiety; sense of impending doom

Metabolic disease:

- Uncontrolled diabetes (signs and symptoms can include increased thirst and urination, blurred vision, numbness/tingling in the feet, non-healing wounds, fruity smell to the breath)

Renal disease:

- Nausea and vomiting
- Passing only small amounts of urine
- Swelling, particularly of the ankles, and puffiness around the eyes
- Unpleasant taste in the mouth and urine-like odor to the breath
- Persistent fatigue or shortness of breath
- Loss of appetite
- Increasingly higher blood pressure
- Muscle cramps, especially in the legs
- Pale skin
- Excessively dry, itchy skin

Patient History/Condition:

- Lung surgery/major abdominal surgery
- Ostomy
- Ataxia
- Severe nutritional deficiencies

APPENDIX C: Conditions that Require Supervised Activity

- Recent decrease in physical abilities, including falling or needing to move with assistance such as a walker, cane or wheelchair
- Low or unstable platelet counts, within the past month
- Bone, joint or soft tissue problems and/or injury in the last month that are made worse by increased physical activity
- Post-surgical activity restrictions or side effects that limit physical activity
- Presence of acute and/or long-term side effects from cancer or cancer treatments that limit activities of daily living (ADL) or ability to exercise
- Unmanaged lymphedema
- Limitations identified by appropriate provider

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

APPENDIX D: Benefits of Physical Activity in Cancer Risk Reduction¹

- Physical activity helps your body work better and reduces your chance of getting certain diseases, including some cancers
- Research suggests that physical activity may lower your chance of getting the following cancers:
 - Colon
 - Breast
 - Endometrial
- Even if your physical activity does not result in weight loss, just moving your body can lower your chance of getting cancer
- Physical activity can however, help you lose fat and maintain a healthy weight. Extra body fat has been shown to increase your chance of getting the following cancers:
 - Esophageal
 - Pancreatic
 - Colon
 - Rectal
 - Breast (postmenopausal)
 - Endometrial
 - Kidney
- Physical activity can help lower stress, increase energy levels and boost your immune system
- Physical activity can reduce your chance of having other health problems.

Examples are:

- Heart disease
- High blood pressure
- Diabetes
- Osteopenia/Osteoporosis

¹ MDACC Patient Education (available through Patient Education Online):

- [Exercise: Tips for Getting Started](#)
- [Patient Education materials](#)
- [Physical Activity and Exercise](#)

APPENDIX E: Tips To Get Fit¹

Staying active can help you maintain a healthy weight and lower your risk for cancer and other diseases. Build up your activity level and lower your cancer risk. Being inactive can increase your risk for colon, postmenopausal breast and endometrial cancers. It also may increase your chances for lung or pancreatic cancers.

Sit Less

Sitting too much may cause you to gain body fat

How to Start:

Get up and move for a minute or two every hour while you're awake

Boost Your Heart Rate

- Do 150 minutes of moderate activity each week. Moderate activities, like brisk walking, dancing or gardening speed up your heart and make you feel a little out of breath.

or

- Do 75 minutes of vigorous activity each week. Running, playing basketball or swimming laps are vigorous, and make you breathe harder so it's hard to speak.

How to Start

- Take a brisk walk for 30 minutes, five times a week
- Swim laps for 25 minutes, three times a week

Get Strong

Do muscle strengthening exercises at least twice a week to maintain a healthy weight. Strength training can include exercises with free weights, weight machines, resistance bands or your own body weight.

How to Start:

- Choose from squats, lunges, leg raises, push-ups, bicep curls, tricep dips and planks
- Always rest your muscles for 48 hours after strength training

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

SUGGESTED READINGS

- American College of Sports Medicine. (2021). *Perceived Exertion*. Retrieved from: <https://blogs.umass.edu/bodyshop/files/2009/07/perceivedexertion.pdf>
- Campbell, K. L., Winters K. M., Wiskemann J., May A. M., Schwartz A. L. ... Schmitz K. H. (2019). Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. *Medicine and Science in Sports and Exercise*, 51(11) 2375-2390. doi:10.1249/MSS.0000000000002116
- Irwin, M. L. & American College of Sports Medicine. (2012). *ACSM's guide to exercise and cancer survivorship*. Champaign, IL: Human Kinetics.
- Jonas, S., & Phillips, E. M. (2009). *ACSM's exercise is medicine: A clinician's guide to exercise prescription*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Liguori, G., Feito, Y., Fountaine, C., & Roy, B. A. (2021). *ACSM's guidelines for exercise testing and prescription* (11th ed.). United Kingdom: Wolters Kluwer.
- Motivational Interviewing Network of Trainers Incorporated. Retrieved from <http://www.motivationalinterviewing.org/>
- National Comprehensive Cancer Network. (2022). *Survivorship* (NCCN Guideline Version 1.2022). Retrieved from https://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf
- Schmitz, K. H., Campbell, A. M., Stuver, M. M., Pinto, B. M., Schwartz, A. L., Morris, G. S., ... Patel, A. V. (2019). Exercise is medicine in oncology: Engaging clinicians to help patients move through cancer. *CA: A Cancer Journal for Clinicians*, 0(0), 1-17. doi:10.3322/caac.21579
- Schmitz, K. H., Courneya, K. S., Matthews, C., Demark-Wahnefried, W., Galvão, D. A., Pinto, B. M., ... Schneider, C. M. (2010). American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Medicine and Science in Sports and Exercise*, 42(7), 1409-1426. doi:10.1249/MSS.0b013e3181e0c112

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

DEVELOPMENT CREDITS

This screening algorithm is based on majority expert opinion of the Physical Activity work group at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

Core Development Team Leads

Therese Bevers, MD, FAAFP (Cancer Prevention)
Whittney Thoman, MS, ACSM-CEP, ACSM-CET (Cancer Survivorship)

Workgroup Members

Karen M. Basen-Engquist, PhD (Health Disparities Research)
Christin Brehm, PT, DPT (Integrative Medicine Center)
Olga N. Fleckenstein, BS♦
Katherine Gilmore, MPH (Cancer Survivorship)
Carol Harrison, MED, CCEP, CET (Behavioral Science)
Ernest Hawk, MD, MPH (Cancer Prevention)
Susan Lilly, SCD, BS, PT (Rehab/Physical Therapy)
Gabriel Lopez, MD (Integrative Medicine Program)
Ana C. Nelson, FNP, RN (Cancer Prevention)
Kentrell White, MS (Integrative Health Services)
Hannah Warr, MSN, RN, CPHON♦

♦Clinical Effectiveness Development Team