

PLAYING IT SAFE

BLEEDING DISORDERS, SPORTS AND EXERCISE



Playing It Safe – Bleeding Disorders, Sports and Exercise

The National Hemophilia Foundation (NHF) is dedicated to finding better treatments and cures for inheritable bleeding disorders and to preventing the complications of these disorders through education, advocacy and research.

Written by

Alice Anderson, PT, DPT, PCS
Angela Forsyth, PT, DPT

Based on an original publication by

Marvin S. Gilbert, MD

Managing Editor

Sarah Goto, MPH

NHF would like to thank Steven Pipe, MD, and Julie Jaffray, MD, the working groups, and all those individuals who reviewed drafts of this publication.

This publication was supported by a grant from the American Legion Child Welfare Foundation, Inc., and by a Cooperative Agreement from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the American Legion Child Welfare Foundation or of the CDC.



This booklet is intended for informational purposes only. It is not intended to be used to make healthcare coverage or treatment determinations. NHF's Medical and Scientific Advisory Council (MASAC) recommends that the product and corresponding treatment regimen used by an individual should remain a decision between patient and physician.^{1,2}

© 2017 National Hemophilia Foundation. Material in this publication may not be reproduced without written permission from the National Hemophilia Foundation.

¹ MASAC Document #240 (2016) Recommendation Concerning Products Licensed for the Treatment of Hemophilia and Other Bleeding Disorders. Available at www.hemophilia.org

² MASAC Document #166 (2005) MASAC Resolution Regarding Preferred Drug Lists. Available at www.hemophilia.org

Table of Contents

Authors' Note	2
Why People with Bleeding Disorders Should Participate in Physical Activity	2
Research Says "Yes to Exercise"!.....	4
So, What's Stopping You?	4
An "Electronic" Barrier to Being Physically Active.....	5
Healthy Steps for Each Severity and Life Stage	6
For People with Mild or Moderate Bleeding Disorders.....	6
For Parents of Infants, Toddlers and Preschoolers.....	7
For Parents of School-Age Children.....	8
For Teens and Adults.....	10
Before You Start	11
Conditioning.....	11
Strengthening.....	12
Choosing Activities: What to Think About	13
Sports and Exercise Bleeding Complications.....	13
Safety.....	15
Continuing in Sports and Exercise After Bleeding Episodes	17
Playing It Safe Physical Activity Ratings	18
About the Ratings.....	18
How to Use the Ratings.....	19
Table of Activity Ratings.....	20
Activity Ratings in Detail	22
Summing It Up: Prepare Yourself, Choose Wisely...and Have Fun!	60
Appendix: Barriers to Being Active Quiz by CDC	61
References	64

How to use this booklet

People with bleeding disorders vary widely in how they respond to taking part in sports, exercise and activity. This booklet will provide you with general information about the benefits and the risks of participation, and how to participate safely.

Remember, each person is unique, with different interests, goals and bleeding complications.

In this booklet, you'll find information that can help you and your healthcare providers have a discussion about your activity choice. Potential modifications for safety are listed for each activity.

This booklet is meant to complement a consultation with your medical providers. It is important to work together with your healthcare providers to develop activity and treatment plans that are right for you! **Always consult with your healthcare provider** prior to engaging in any sport, activity or exercise regimen.

Why People with Bleeding Disorders Should Participate in Physical Activity

If you're questioning whether you should be physically active, the answer is a definite "Yes!" You can choose among a wide range of physical activities, from sports like tee-ball and tennis to other forms of exercise like walking, weight lifting and yoga.

Regular physical activity has great benefits, such as:

Improved

Cardiovascular fitness | Muscular fitness | Bone health | Body composition/healthy weight | Cognitive function¹ | Academic performance | Sleep | Self-esteem, self-confidence² | Energy³

Reduced

Feelings of anxiety and depression | Weight | Fatigue³

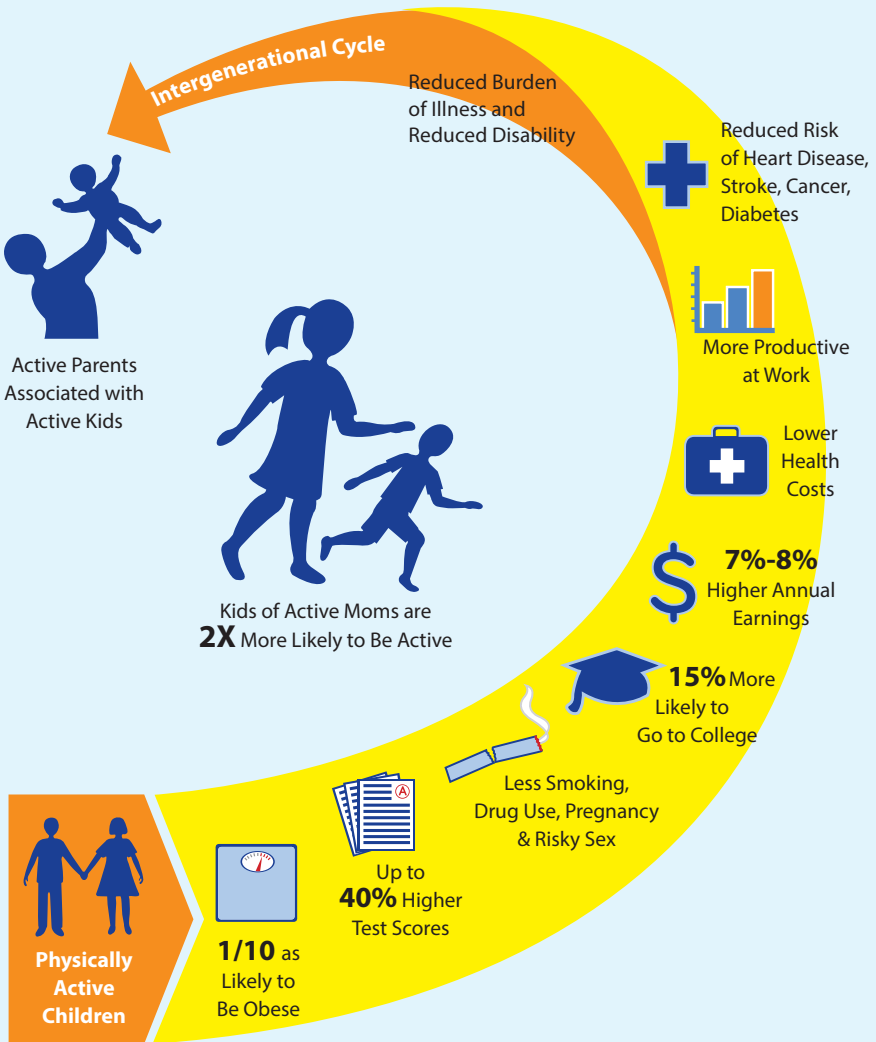
Lower Risk of

Spontaneous joint bleeds⁴ | Heart disease | Stroke | High blood pressure | Type 2 diabetes | Colon cancer

While physical activity benefits people of all ages, there are benefits especially for kids.

ACTIVE KIDS DO BETTER IN LIFE

WHAT THE RESEARCH SHOWS ON THE COMPOUNDING BENEFITS



Early Childhood

Adolescence

Adulthood

Credit: Adapted with permission from "Facts: Sports Activity and Children". The Aspen Institute—Project Play.

Research says “Yes to Exercise”!

Is there research on exercise in people with bleeding disorders?

Yes! There has been an increase in research on exercise in people with bleeding disorders, and there is evidence to support that exercise can have positive benefits.

In a study by Ruth Mulvany, PT, DPT, MS, and colleagues, the authors described their results in 20 people with bleeding disorders ranging in age from 7-57 years old who participated in a professionally designed, individualized supervised exercise program for six weeks. Before the study began, 65% of participants reported participating in minimal exercise, and 50% indicated a fear of exercise-induced bleeding, pain or physical impairment.

During the study, each patient was prescribed a six-week, twice-weekly, individualized supervised exercise program, including exercises for strength, flexibility and cardiovascular function. There were only positive changes associated with the exercise activities. The authors concluded: “No exercise-induced injuries, pain, edema or bleeding episodes were reported. Significant improvements occurred in joint motion, strength and distance walked in six minutes, with no change in joint circumference. The greatest gains were among the individuals with the most severe joint damage and coexisting illness.”⁵

Although this was a small study, the results are encouraging!

So, What’s Stopping You?

Have you experienced barriers to being more active?

Many people resolve to begin a sports or exercise program, but face obstacles such as fear of injury or lack of time. These barriers can vary from one person to the next person. **Use the quiz in the Appendix on page 61 to identify your individual barriers.**



An “Electronic” Barrier to Being Physically Active

Children in the US are spending an increased amount of time on “screen” activity, such as computers, television and mobile technology devices. Sitting in one place for extended periods while using these devices cuts into time spent engaging in physical activity, and on overall general physical fitness and health.

According to a 2014 data brief from the Centers for Disease Control and Prevention (CDC), excessive screen-time behaviors, such as using a computer and watching TV, for more than two hours daily have been linked with elevated blood pressure, elevated cholesterol and being overweight or obese among youth. Establishing appropriate screen time behavior at an early age is very important. Habits that are developed during childhood have been shown to continue into adulthood.⁶

Although screen time can be a positive distraction during infusions or while healing from a bleed, it is important to encourage physical activity when safe. Parents can do many things to help overcome barriers to your children becoming more physically active. The American Academy of Pediatrics suggests that you can make a big impact in your child's life by taking these simple steps:

1. Remove the TV set from your child's bedroom. Kids who watch television in their rooms watch an average of 4.6 more hours a week and are more likely to be overweight.
2. Limit children's total entertainment media time to no more than one to two hours per day. Studies have shown that for each additional hour children spend watching TV a day, there is a 2% increase in the chance that they'll be overweight.
3. Watch TV with your child and discuss the content.
4. Encourage activities for your children that combine physical and social activities. Suggest joining school and community clubs, such as a dance team, soccer team or walking club. Enroll your child in a tai chi class or suggest family hikes or bike rides. Physical activity can not only help control weight and lower blood pressure but it also helps reduce feelings of depression and anxiety.

The same statistics that are out there for your kids also apply to you. Too much screen time is a problem for many adults. Listen to your body, and balance your screen time with some time spent on physical activity and exercise.

Healthy Steps for Each Severity and Life Stage

For People with Mild or Moderate Bleeding Disorders

Because the levels of circulating factor in the blood are higher in those with mild or moderate bleeding disorders, this offers some protection from everyday musculoskeletal wear and tear, and minor injuries. Many individuals with mild forms bleed only after significant trauma, therefore they can safely participate in more vigorous activities without medical treatment. However, while activity-related bleeds are usually quickly detected in people with severe bleeding disorders due to their experience with previous bleeds,

this may not be the case in those with mild or moderate forms. Because people with mild bleeding disorders do not bleed as often, they may be less likely to recognize the warning signs of a bleed or seek immediate treatment following injuries. They are also less likely to be on a home infusion therapy program. It should be noted that all bleeds are important to recognize and treat. Even a single bleeding episode, in people of any severity level, can trigger damage to the joint structures, which can eventually lead to permanent joint damage in the future. Even if your bleeding disorder is mild, it's still necessary to learn the safest ways to participate in sports and exercise.

If you have a moderate bleeding disorder, determining which sports or activities are safe is usually made on the basis of your history and bleeding frequency. If there is a history of many bleeding episodes similar to someone with severe disease, activity choices may require more thought and planning.

For Parents of Infants, Toddlers and Preschoolers

From infancy, children learn by interacting with their environment, so providing your child with plenty of opportunities to explore and play will help their brains and bodies develop. Infants with bleeding disorders can enjoy the same activities as other infants. Give your child soft toys and stuffed animals to hold.

As your baby begins to move around—rolling, crawling and standing—try to balance exploration with safety. Learning to stand and walk involve many falls for any toddler. For the child with a bleeding disorder, these milestones also mean more bruises. At this stage, you may feel more anxious, but keep in mind that superficial bruises are common. They are not a concern unless they are painful and cause your child to have limited movement, which may indicate a joint or muscle bleed.

Toddlers should be encouraged to try running, jumping, climbing and riding wheeled toys that are low to the ground. Their playtime should be well supervised at this age. Further, they should use appropriate safety equipment, such as a helmet, and elbow and knee pads. At home, consider putting cushioned, protective corners on tables and other furniture, carpeting on hard floors, and gates at the tops and bottoms of staircases. Toddlers begin playing with other children, so be ready to help your child learn how to play safely and cooperatively.

For more information on physical activity for infants, toddlers and preschoolers, visit the **First Step** section of the **Steps for Living** website: stepsforliving.hemophilia.org.

As toddlers become preschoolers, they'll be catching, throwing, skipping, hopping and using playground equipment. They will develop exciting new motor skills, but also experience falls, bumps and bruises as they practice those skills. To prevent serious injury, be sure that playtime is supervised and that children use safety equipment. Along with their new motor skills, preschoolers also develop new thinking skills. They can begin to learn what is safe and what is not.

The age for starting different activities will vary from child to child, based on their bleeding severity, developmental level and family interest. For example, infants can enjoy assisted activity in the water. Preschoolers may begin to participate in activities, such as dance, martial arts or soccer. Elementary age children are usually ready to ride a bicycle without training wheels.

For Parents of School-Age Children

Sports can play a large part in the life of school-age children, so it's important to work with your healthcare provider to discover appropriate activity choices for your child.

Physical activity also helps school-age children develop socially and emotionally. In competitive sports, they learn teamwork, and how to win and lose. Being recognized for their accomplishments also increases children's self-esteem, especially when the recognition comes from friends and classmates.

Despite these benefits, parents and school personnel often have concerns about sports participation. You might worry that your child's bleeding episodes will sideline him or her on the team or that he or she can't physically keep up with his or her peers.



However, children with bleeding disorders can excel at sports. Work with your child's healthcare provider and encourage your child to choose a sport that he or she enjoys, and that's safe. Allowing your child to practice with other children helps develop the skills and strength he or she will need. Your child's challenges should then be the same as that of any other child who participates in a sport for the first time. Keep in mind that it's important for children to learn to deal with challenging situations. Through trial and error, children learn to set limits on their own behavior and level of involvement.

At school, it's important that your child participates in physical education classes, even if some restrictions or modifications are necessary. Federal law requires that all children in public schools have the opportunity to participate in physical education. Most schools will accept a letter from a healthcare provider stating that the child can participate in particular activities or that some modifications are needed.

In addition to planned activities at school, your child may also have the opportunity to participate in fun impromptu activities, like birthday parties, sleepovers and play dates with friends. Sports and games are a part of childhood and the physical, social and emotional benefits your child will gain should outweigh most of the concerns you may have about participation. In planning for your school-age child, evaluate each activity for risk of bleeding. If the risk for major bleeding is minimal, you may want to let your child try that activity. Be aware that an activity that is fun, exciting and safe for younger children may become more dangerous as it becomes more competitive in older children. Keep a long-range view, guiding your child toward activities he or she is still able to do as he or she gets older. As your child grows, continually evaluate activity choices together. Help introduce new types of activity such as walking home from school, family bike rides, dance classes or swim lessons.

For resources about children at school and how to talk to school personnel about your child's bleeding disorder, visit the **Next Step** section of the **Steps for Living** website at stepsforliving.hemophilia.org.

For Teens and Adults

As you age, you may need or want to switch from one sport or activity to another, depending on target joints, other complications or simply changing interests. While learning a new sport may be harder for adults, many activities can be modified or equipment adapted to accommodate the changes in your musculoskeletal system. Healthcare providers, especially physical therapists, can also help design or adapt exercise programs to accommodate any muscle or joint problems you may have developed.

When choosing a sport or exercise, it is important for you to consider your general health, past bleeding history and present condition of your joints. You'll also want to think about how your joints respond to treatment. For example, if you've had recurrent ankle bleeds, jogging may not be for you, but swimming may be a good option. Work with your healthcare provider to come up with alternative activities.

There are some differences between organized sports and pick-up games. While pick-up games are sometimes less competitive, they are often not supervised and you may not have access to the proper safety gear. Though they can be more demanding and physical, organized sports tend to be better supervised. Keep in mind that when it comes to bleeding disorders, there is no standard rule of thumb for this. Almost every activity is different, based on the setting and who is playing. Think about the activity and about your body, and make your decision about whether to participate based on what is right for you. Also, be sure to take into consideration the advice you've received from your healthcare provider. Weigh the potential risk of the activity with your desire to participate and the benefits of participation.

As you get older, some sports become more physical and the risk for injury may be increased. For example, soccer and basketball are often safer for young children because there is less physical contact, but these sports can result in serious injury in teens and adults.

For more information on physical activity for teens and adults, visit the **Step Up** and **Step Out** sections of the **Steps for Living** website at **stepsforliving.hemophilia.org**.

Before You Start

Once you've selected activities that best suit you, meet with your healthcare provider for an evaluation. This should include a thorough musculoskeletal exam. Even if you have no specific problems, a training program prior to engaging in a sport can help prepare your body for activity. Just as professional and college athletes go through a conditioning program, so should you. It's especially important to plan in advance if you have specific muscles or joints that are weak, because it will take time to build them up.

You'll also want to speak with your healthcare provider about how to identify and manage bleeding episodes. It's important to know the early signs of a bleed, because delaying treatment could make a minor bleed more severe. All bleeding episodes should be treated immediately and with the appropriate medication. Your healthcare provider may change your infusion schedule or dose, or recommend additional prophylactic factor replacement before certain activities to minimize your risk of bleeding.

For students involved in school-related athletic activities, there must be honest communication with school personnel about all aspects of your bleeding disorder. You and your parents should meet with the appropriate school staff, including the physical education teacher, the coach, the athletic trainer and the school nurse. Inviting your healthcare provider to the meeting is also a good idea. Together, you'll set up a plan outlining steps to take in the event you are injured or experience a bleed.

Conditioning

In addition to addressing specific muscle or joint weaknesses, you should begin a general conditioning program. Conditioning can improve the way your muscles function. Although it cannot prevent injury, it will help your body to withstand some minor wear and tear. Your program should focus on the muscles you'll use and the level of endurance you'll need for the sport you've chosen. For example, a soccer player needs running endurance, a golfer less so. A total conditioning program includes:

- 1 improving flexibility;
- 1 using resistance equipment or weight training for increasing strength;
- 1 aerobic training for improving endurance; and
- 1 practicing skills specific to the sport.

Overexertion can lead to injury and bleeding, so take it slowly at the beginning. Increase activity over a given time period agreed upon by your healthcare provider. Be sure to include 10-minute warm-up and cool-down periods in your conditioning program. Warm-ups consist of performing some light activities similar to those you will be doing in the sport itself. Warming up also gradually increases your heart rate. During your cool-down, gradually decrease activity to allow your heart rate to return to normal.

Strengthening

A gradual, well-designed program of regular exercise to increase your muscle strength is another important part of any conditioning program. Normal muscle strength helps to support and protect your joints. It also helps you perform better. A physical therapist can do an assessment that will help you figure out which muscles you need to strengthen. The answer also depends on the activity. For example, to ride a bike, you will need stronger quadriceps, the muscle on the front of your thighs.

Teens and adults with bleeding disorders often have questions about whether weight-training programs can help or harm their joints. Weight training builds strength by increasing resistance or repetitions. It's very important to progress slowly to avoid injury.

Following these guidelines can help you get the maximum benefit from a weight-training program, with the least amount of risk:

- 1 Set goals before beginning your program, based on a physical evaluation that identifies any pre-existing musculoskeletal problems.
- 1 The best place to learn weight training is one that is well supervised by professionals experienced in exercise physiology and sports injuries.
- 1 Instruction in weight-training technique is recommended. It helps reduce injuries.
- 1 Warm-up, stretching and cool-down should always be part of your weight-training program.

In addition, spotting (having another person there to watch and help you) and good breathing technique are also essential. **For more information on weight training, refer to the Playing It Safe Physical Activity Ratings section of this booklet.**

If a bleed occurs during conditioning or strengthening, stop exercising immediately and follow the plan you have established with your healthcare provider. This plan may include modifications of your treatment plan. It may also have recommendations from your healthcare provider for how to rest, and how and when to return to activity. It may also provide other ways to reduce swelling, such as using compression bandages and/or elevation.

Choosing Activities: What to Think About

Before you decide what sport or type of exercise is best for you, here are some questions you will need to answer and discuss with your healthcare provider:

- 1 What activity are you interested in? What are your fitness or participation goals?
- 1 What is your personal history? Do you have any joint or muscle issues from previous bleeds? Do you have any limitations as a result? Will you need a physical therapist to work with you on a target area prior to participating?
- 1 What are the benefits to the activity you are considering? Are there any risks? You can find information on benefits and risks of different activities in the Playing It Safe Physical Activity Ratings section of this booklet.

Sports and Exercise Bleeding Complications:

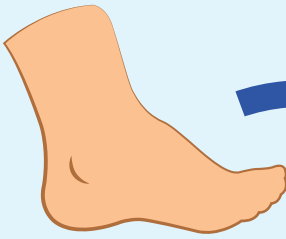
In this booklet, we include injury risk by activity. However, the data supporting this information are based on statistics from the general population, not from people with bleeding disorders. In addition to this information, those with bleeding disorders need to consider that bleeds can occur along with these injuries.

In addition, whenever you have a joint bleed or sustain an injury, the joint can become irritated and inflamed. With each bleed that occurs, the irritation, inflammation and resulting synovitis can lead to irreversible damage in the joint. Be aware that people with bleeding disorders may have sports injuries that take longer to heal, and require additional care and treatment.

So, in addition to the risks that you will read about in the upcoming section, please remember that there can be a bleeding component that you should consider when evaluating activity choice.

SPRAINED ANKLE

No Bleeding Disorder



Rest
Crutches
Pain Meds?
Family Doctor?

With Bleeding Disorder



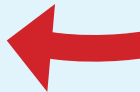
**Sprained Tissue +
Bleeding**



**Inflammation and
Synovitis May Trigger
Ongoing Bleeding**



**Ongoing
Joint Damage**



Also Consider:

I **Your Family Situation**

Where you live affects the types of activities you are likely to consider. Certain sports may be popular in some regions, but not in others. For example, in some parts of the country, skiing is an everyday part of life for many months out of the year. You'll also want to think about the overall expense. Are the fees, costs of the equipment and instruction within your budget? Also consider the safety of the neighborhood or area where the activity takes place.

I **Your Current Activity Level**

If you have not been active in a sport or exercise routine for a while, start slowly. Consult with your healthcare provider and with a physical therapist about the best way to start.

I **Team Activities vs. Individual Activities**

Team activities generally have more inherent risk than individual activities. With an individual activity, you have more control over the way your body moves (how fast, how intense).

For example, in soccer, on offense you have to run to chase the ball or to accept a pass. The defensive players try to prevent you from possessing the ball and may bump, trip or run into you. However, if you are running for exercise, you have more control because you choose the terrain, speed and intensity.

Safety

Maximizing the benefits of activity while minimizing the risk requires thought and planning. Advances in medical management have made it safer for people with bleeding disorders to take part in a variety of activities. However, bleeding cannot be prevented 100% of the time, and bleeding due to injury is a possibility.

Even after you have a plan in place with your healthcare provider and you're physically ready, be vigilant about safety. You should have properly fitted safety equipment specific to your sport. If you play on a field, it should be on an even surface, free of debris and in good condition.

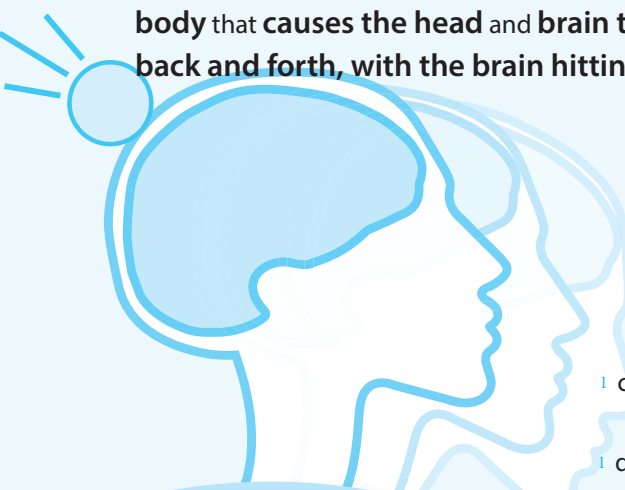
RISK OF CONCUSSION

A **concussion** is a type of traumatic brain injury (TBI) **caused by a bump, blow or jolt to the head, or by a hit to the body that causes the head and brain to move quickly back and forth, with the brain hitting the skull.**

Concussion symptoms can be subtle and may not be noticeable immediately.

Symptoms can include:

- | headache | dizziness
- | trouble concentrating
- | confusion | sensitivity to light
- | nausea⁷ | slurred speech
- | delayed response to questions
- | irritability and memory complaints⁸



People who do **NOT** have bleeding disorders usually feel better within a couple of weeks after their injuries. However, symptoms can occasionally last for months or longer, and require further monitoring or treatment.

For a child with a bleeding disorder, a head blow resulting in symptoms of a concussion may be LIFE THREATENING. Call 911 or take your child to the nearest hospital emergency room.

When children with bleeding disorders want to exercise or take part in a sport, particularly in competitive or team activities, their parents, school personnel, coaches, healthcare providers, and even the children themselves, may have concerns. Keep in mind that adults with bleeding disorders also need to prepare and plan to participate in activities.

Possible causes of sports injuries include:

- 1 Inadequate physical exams before participating**
- 1 Failure to warm up and cool down**
- 1 Playing while hurt or tired**
- 1 Stress**
- 1 Playing on very hot or cold days**
- 1 Not eating properly**
- 1 Not drinking enough water**
- 1 Not following proper form/technique**

When you begin a sport, instructors or coaches should explain the basic ability level you'll need in order to play. Consider connecting your coach/trainer with your healthcare provider, so they can best support your safe participation.

A 2009 study on athletic participation of children with severe hemophilia concluded that when children were treated with regular prophylaxis and participated in athletics with adult coaching and supervision, significant bleeding complications were uncommon.⁹

Continuing in Sports and Exercise After Bleeding Episodes

There are no standard guidelines about returning to sports or exercise after a bleeding episode. Each bleed is unique and may or may not be complicated by injury to other structures in the muscle or joint. Any bleed resulting from sports or exercise should be reported to your healthcare provider who will guide you on when to return to activity after a bleed. There is a right time for rest, and a right time to start back to activity. Your healthcare provider can help advise you.

Being physically active is an important component to overall health. However, if bleeding continues to occur in the same joint or muscle, this can lead to permanent joint or muscle damage. A cycle of frequent bleeding can cause you to remain inactive for certain time periods, and limit the ease of future participation in exercise and sports. Take care to properly manage each bleed to minimize this risk.

When ready to start activity again, you can speak to your healthcare provider about rehabilitation needs, how to re-start your activity or making a new choice that is safer for you.

Stay Safe!

Make an activity plan with your healthcare provider.

In general, time your treatment soon before participation in physical activity, so that your factor level is higher.

Report any injury to your healthcare provider.

Playing It Safe Physical Activity Ratings

About the Ratings

These are not recommendations. The ratings and following activity descriptions are intended for informational purposes only. The data supporting this information are based on statistics from the general population, not from people with bleeding disorders.

No matter how well conditioned you are and your level of instruction or proficiency, different activities have different benefits, risks and safety considerations. Understanding all of these factors can help you make good choices about physical activity.

With the color-coded table, you can easily see the level of risk involved in the particular activity you are considering.

The risk of participation in a specific activity will vary, depending on how you choose to play.

In the table that follows, activities are rated on a scale from 1 to 3:

1 Low risk

1.5 Low risk to moderate risk

2 Moderate risk

2.5 Moderate risk to high risk

3 High risk

Level 1

Even though an activity may be rated a “1,” or low risk, there is still no guarantee that you’ll be injury free or that a particular “1” activity may be the best one for you to try. For example, a person with a target shoulder may have difficulty swimming. Work with your healthcare provider to make the best choice on an activity that is right for you.

Level 2

Even though activities rated as “2” or “2.5” have more risks, this does not mean that you need to avoid all of them. For example, if you wear appropriate safety gear and choose not to slide into bases, the injury risk when playing baseball may be in the “1.5-2” range. In contrast, if you choose to routinely slide into bases or play catcher, the risk level could be in the “2-2.5” range. Work with your healthcare provider to make the best choices and maximize the benefits of the activity while minimizing the risk.

Level 3

These activities contain aspects that can be dangerous for **ANYONE** who participates, regardless of a bleeding disorder. The risks of these activities are due to the physical contact with other players, equipment or hard surfaces that may result in serious traumatic injury. These activities result in the highest percentage of injury in the general population. The risk to a person with a bleeding disorder may be even greater due to bleeding.

How to Use the Ratings

Choices that are rated “1-2” generally indicate that the benefits of these exercises or sports **MAY** outweigh the associated risks.

On the pages that follow, you’ll find information regarding each activity listed in the table. Each description is organized into three sections: **(O)** Overview, **(R)** Risks and **(S)** Safety Measures. Any other considerations for the activity are listed at the bottom of the description.

The ratings and activity descriptions were developed by a team of physical therapists, and contain general information.

If you are considering participating in an activity with a rating of 2.5 or 3, keep in mind that the activity is higher risk. Speak with your healthcare provider before participating.

Table of Activity Ratings

Activity	Category	Page
Aquatics	1	22
Archery	1	22
Baseball	1.5–2.5	22
Basketball	1.5–2.5	23
Bicycling	1.5–3	24
BMX Racing	3	25
Body Sculpting Class	1.5	30
Boot Camp Workout Class	2	31
Bounce Houses	2.5–3	25
Bowling	2	25
Boxing	3	26
Canoeing	1.5–2.5	42
Cardio Kickboxing Class	2	31
Cheerleading	1.5–2.5	28
Circuit Training	1.5	54
Dance	1–3	29
Diving, Competitive	2–3	30
Diving, Recreational	2	30
Elliptical Machine (Training Equipment)	1	26
Fishing	1–2	33
Football, Flag or Touch	2	34
Football, Tackle	3	34
Frisbee®	1–1.5	34
Frisbee®, Golf	1.5–2	35
Frisbee®, Ultimate	2–2.5	35
Golf	1	36
Gymnastics	2–3	36
High Intensity Functional Training (Incl. CrossFit®) Class	2–3	31
Hiking	1–1.5	37
Hockey, Field/Ice/Street	2.5–3	37
Horseback Riding	1.5–2.5	38
Indoor Cycling Class	1.5–2	32
Jet-Ski® (Personal Watercraft, PWC)	2–3	38
Jumping Rope	2	39
Kayaking	1.5–2.5	42
Lacrosse	3	40
Martial Arts, Tai Chi	1	41
Martial Arts, Traditional and Mixed	2–3	40
Motorcycle/Motocross (ATV, Dirt Bikes)	3	41

Activity	Category	Page
Mountain Biking	2.5	42
Pilates	1.5–2	44
Power Lifting	3	44
Racquetball	2.5	44
River Rafting	2	43
Rock Climbing, Indoor or Challenge/Ropes Course	1.5–2	45
Rock Climbing, Outdoor	2–3	45
Rodeo	3	46
Rowing	1.5	43
Rowing Machine (Training Equipment)	1.5	27
Rugby	3	46
Running/Jogging	2	47
Scoters, Motorized	2–2.5	48
Scoters, Nonmotorized	1.5–2.5	48
Scuba Diving	2–2.5	49
Skateboarding	1.5–2.5	50
Skating, Ice	1.5–2.5	49
Skating, Inline and Roller	1.5–2.5	50
Skiing, Cross-Country	2	50
Skiing, Downhill	2.5	51
Skiing, Water	2–2.5	51
Ski Machine (Training Equipment)	1.5	27
Snorkeling	1	52
Snowboarding	2.5	52
Snowmobiling	3	53
Soccer	2–3	53
Softball	1.5–2.5	22
Stationary Bike (Training Equipment)	1	27
Stepper (Training Equipment)	1–1.5	28
Strength Training/ Resistance Training/ Weight Lifting	1.5	54
Surfing	2–2.5	54
Swimming	1	55
Tee-Ball	1.5	22
Tennis	2	55
Track and Field	2–2.5	56
Trampoline	2.5–3	56
Treadmill (Training Equipment)	1.5	28
Volleyball	2–2.5	57
Walking	1	58
Water Polo	2.5	58
Wrestling	3	59
Yoga	1.5–2	59
Zumba® Class	1.5–2	33

Activity Ratings in Detail

Aquatics

1

- O**– Aquatics here refers to exercise activity that takes place in the water. Water can provide excellent exercise conditions for people of all ages and levels of fitness. The buoyancy of water allows people with weak arms or legs and joint issues to move less painfully. Chest-high water provides support, allowing people to perform exercises more easily than on land. Water resistance can also be used to strengthen muscles. Water exercise has been shown to improve muscular endurance, flexibility and aerobic fitness. It can also decrease body fat percentage¹⁰, while minimizing stress to joints. Adding props can increase water resistance for a more challenging workout.
- R**– Minimal risk.
- S**– Flotation devices can be used as needed.

Archery

1

- O**– Shooting with a bow and arrow can be done individually or as part of a team, and either recreationally or competitively.
- R**– The overall injury rate is low, 4.4 per 10,000 participants age 6 and over.¹¹ Archery may cause stress to the back, shoulder or elbow, resulting in possible joint bleeds.
- S**– Properly fitted and maintained equipment is required, and safety precautions should be followed to reduce risk of injury. Beginner archers should wear long armguards to protect from string rebound. You can minimize risk by building strength in the back, shoulder and elbow, as well as by using proper technique.¹¹

Baseball/Softball/Tee-Ball

1.5–2.5

- O**– Both recreational and competitive baseball and softball teams are usually well organized and supervised. Playing baseball and softball provide a good cardiovascular workout. In addition, they help improve hand-eye coordination. Further, players develop skills in team play. Tee-ball is a team sport that is used as an introduction to baseball and softball, as the ball is hit from a stationary tee. It is popular among young children.

- R**– Overall, baseball and softball are relatively safe sports. Only 2%-8% of players report injuries. However, serious impact injuries, such as intracranial hemorrhage, can occur if there is contact from a ball or bat to the head, eye area or chest. Additionally, joint trauma can occur from sliding into bases or colliding with other players.¹² The position you play can affect your joints. For example, joint overuse can occur due to pitching, and playing catcher presents additional risks of joint injury or trauma. The injury risk of tee-ball is similar, but is decreased since there is no pitching in this sport.
- S**– Use of “breakaway bases” instead of stationary bases minimizes injury risk from sliding. To maximize safety, players at bat should use certified helmets with ear flaps on both sides, and possibly face guards, a chin strap and eye protection. If you choose to play catcher, wear protective safety gear, including a helmet, facemask and padding. Play safely by choosing a position that fits with your physical ability, and always wear protective gear.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Basketball

1.5–2.5

- O** – Basketball provides a good cardiovascular workout with a focus on agility. Intensity of play can vary. Players can choose to participate in casual games with limited physical contact or more intense, competitive games.
- R**– During competitive games, players are jumping, landing, pivoting, cutting, running forward and backward, changing directions and making physical contact with other players, all of which could lead to musculoskeletal injury. Sprained ankles and knee ligament tears can occur, and may be more serious in a player with a bleeding disorder.
- S**– Injury risk can be minimized by using eye protection, elbow and knee pads, mouth guards, athletic supporters (males) and proper footwear.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

O– From tricycles to multispeed bicycles, bicycle riding is a good nonimpact sport. Children usually have the skills required to ride a tricycle around 3-4 years of age, a bicycle with training wheels around 4-5 years of age and two-wheeled bicycle around 5-6 years of age.¹³ Learning to ride a bicycle safely requires simultaneously using motor and thinking (cognitive) skills, which is challenging for most kids.



R– Many of the bicycle-related crashes resulting in serious injury or death occur because of the rider's poor judgment or not following the rules of the road. Riding a bicycle on very busy roads can bring additional risk.

While recreational bicycle riding can be lower risk when safety rules are followed, distance riding and bicycle racing are higher risk. Bicycle racing has the highest risk due to the possibility of high-speed collisions and falls.

S– Riders need to remember basic safety rules. Riders of all ages should wear bicycle helmets that meet or exceed standards set by the American Society for Testing Materials (ASTM), the US Consumer Product Safety Commission (CPSC) and/or the Snell Memorial Foundation.

While there is no federal law requiring the use of helmets, many states and local municipalities do have regulations. It is also important to have a properly fitting bicycle that is well maintained. Avoid risky situations such as riding in the dark, and near heavy traffic or road hazards. Consider bike accessories such as flashing lights, reflector strips and wearing a reflective vest to be more visible to cars. Riders less than 10 years old may be safer riding on sidewalks or bike paths rather than streets. Young bicycle or tricycle riders should be closely supervised at all times.¹⁴ If completing a long-distance ride, be sure to train for the event. Make sure you have a bicycle repair kit for breakdowns.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

BMX Racing

3

- O**– Bicycle motocross, or BMX, is a form of off road cycling on specialized bikes. Participants either do sprint races on off-road single-lap racetracks, or focus on jumps and tricks on off-road trails.
- R**– This is a high-collision, competitive sport with the potential for serious traumatic injury. BMX racing is dangerous for all people who participate.
- S**– If you choose to participate, use appropriate safety equipment including a helmet, goggles, padding and gloves.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Bounce Houses

2.5–3

- O**– Inflatable bounce houses are popular at children’s birthday parties and carnivals, and can be a fun, social activity for kids.
- R**– Bounce houses are similar to trampolines and can also lead to injuries ranging from sprains/strains to broken bones and concussions. Children can easily collide with each other in a bounce house that is too crowded, or can land incorrectly after a jump.
- S**– To maximize safety, remove footwear, eyeglasses and jewelry. Group children together by size and do not allow use by those who may exceed the height/weight warning on the equipment. Proper adult supervision is recommended.¹⁵

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Bowling

2

- O**– Bowling can be a family activity and also develop as a life-long sport.
- R**– This sport, although low impact, can cause excessive strain to elbows and wrists.
- S**– To maximize safety, wear the appropriate bowling shoes to minimize slips and falls. Make sure to choose a ball that matches your strength and bowling skill. A general rule of thumb for kids is to choose a ball that is close in weight to their age in years, for example, a 6-pound ball for a 6- or 7-year-old. Teens tend to use balls weighing between 10-12 pounds.

Boxing

3

- O**– Boxing provides benefits for participants, including exercise, self-discipline and self-confidence.
- R**– Boxing is a high-contact, high-collision sport with high risk for injuries. The sport encourages deliberate blows to the head and face, which can result in risk of head injuries (concussions and traumatic brain injury), facial injuries and neck injuries, including chronic and potentially fatal neurologic injuries. The American Academy of Pediatrics opposes boxing as a sport for children and adolescents.¹⁶
- S**– Boxers should always wear a helmet and protective gear. Even with safety gear, there is high potential for injury.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Canoeing

1.5–2.5

See **Paddling Sports** on page 42.

Cardiovascular Training Equipment

1–1.5

The equipment available will vary in different settings, but exercise can be self-paced to achieve the desired type of workout. See specifics below.

Elliptical Machine

1

- O**– This machine is a combination of an exercise bike, stepper and ski machine, with some treadmill attributes. Some have poles to add an upper body workout. Elliptical trainers provide a low-impact and cardiovascular workout, while lessening stress on the joints.
- R**– Minimal risk.
- S**– Practice proper form by keeping correct posture: shoulders back, head up, chin straight, abdominals tight and arms relaxed. Rest hands lightly on the handrails to help with balance (or use the workout bars if available). Try not to lean forward or grip the bars tightly. If needed, lower the resistance level.¹⁷

Rowing Machine

1.5

- O**– Rowing machines offer the benefit of a total body workout with little impact on the joints. In addition to the aerobic benefits, rowing machines can strengthen arm, back, shoulder and abdominal muscles.
- R**– Users should be aware of possible strain to the knees and lower back.
- S**– Proper use requires some degree of coordination and practice. Proper form is key. Reduce risk by getting instruction and performing a proper stroke.¹⁸

Ski Machine

1.5

- O**– Ski machines mimic the movement of traditional ski poles in cross-country skiing. Instead of skis, they have long, narrow boards or foot pads that glide on rollers. Without impact on the joints, they provide a total body workout to the arms, legs, back and abdomen, in addition to the cardiovascular benefits.
- R**– Minimal risk.
- S**– Use proper form to exercise safely.

Stationary Bike

1

- O**– Stationary bikes come in two varieties, either upright or recumbent, a bicycle that places the rider in a laid-back reclining position. Both types can provide a good aerobic workout.
- R**– Minimal risk.
- S**– People with mobility issues, balance concerns or low back pain may find the recumbent bike more comfortable. Some upright bikes have more possible adjustments than others, which allows for a more customized fit and less stress on your body. To minimize risk, adjust the seat and handlebar heights to your comfort, make sure pedal straps are snug but not tight and be cautious when dismounting.¹⁹

For cycling classes, see **Indoor Cycling Classes** on page 32.

Stepper

1-1.5

- O**– Steppers are excellent for exercising the major muscle groups of the lower body while providing a cardiovascular workout. The best steppers keep your feet on an even plane with the floor at all times, allowing natural foot movement.
- R**– Minimal risk.
- S**– To keep risk low, use proper form to bend the knee while maintaining good posture: shoulders back, head up, chin straight, abdominals tight and arms relaxed. Rest hands lightly on the hand rails to help with balance (or use the workout bars if available). Try not to lean forward or grip the bars tightly. If needed, lower the resistance level.

Treadmill

1.5

- O**– Treadmills consist of a power- or manually operated, continuous moving belt on which a person can walk, jog or run in place. Features vary widely; models may have shock-absorbing tracks, uphill grades and preprogrammed workouts. Exercise on a treadmill provides great cardiovascular benefits.
- R**– Minimal risk. Injuries may occur if the treadmill is operated at speeds beyond the user's ability.
- S**– To maximize your safety, use the emergency shut-off tether clip when available, hold handrails and set belt to .5 mph before mounting and dismounting. Use the handrails if needed while exercising, looking forward and taking a comfortable stride. Always keep your position on the belt in the center.

Cheerleading

1.5-2.5

- O**– Cheerleading provides the opportunity to work on a team, and participate in high-energy exercise.
- R**– Basic cheers and jumps present minimal risk. The risk for injury increases with pyramids, lifts and throws, especially in competitive squads. The most common injuries are sprains/strains, usually occurring during stunts.²⁰ However, cheerleaders do have a small risk of catastrophic injuries, such as head and spine injuries.²¹

S– Proper spotting is essential to minimize risk. Aerial moves are not recommended. Safety precautions that include technical skills, such as pyramids, mounts, tosses and tumbling, should not be performed on hard, wet, uneven surfaces or on obstructed surfaces. No cheer events should take place on dirt, vinyl floors, concrete or asphalt. Pyramids and partner stunts should only be performed with spotters on a spring floor or with a landing mat, on either a traditional foam floor or grass/turf. Pyramids should not be more than two people high.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Circuit Training

1.5

See **Strength Training** on page 54.

Dance

1–3

- O**– Dance may involve participation in a structured class with an instructor or can be done individually. There are a wide range of dance styles that can be done for exercise, recreation and/or performance.
- R**– Injury risk varies greatly from very minimal risk in ballroom dancing or beginner ballet all the way to very high risk associated with head-spinning during breakdancing. Injuries tend to be the result of overuse, rather than trauma, and can include stress fractures, tendon injuries, sprains and strains.²²
- S**– To improve safety, get instruction and follow proper technique.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

STOP before you start! Please speak with your healthcare providers prior to engaging in any sport, activity or exercise regimen, especially one with a rating of 2.5 or 3.

Diving

2–3

Diving, Competitive

2–3

- O**– Diving may help improve flexibility, strength, balance and overall fitness.
- R**– Competitive diving is a high-collision sport with potential for serious head and neck injury. A diver on a 10-meter platform enters the water at about 40 miles per hour. Injuries can occur from hitting the board/platform and from overuse injuries, such as frequent jumping, back arching, trunk flexion and back twisting. They can also occur when divers enter the water.
- S**– If diving competitively, diving from a lower platform improves safety.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Diving, Recreational

2

- O**– Diving may help improve flexibility, strength, balance and overall fitness.
- R**– Recreational diving injuries often result from diving into shallow water.
- S**– Safety tips to minimize risk include never diving into shallow water or water that isn't clear enough for you to see obstacles. If you're unsure, always jump in feet first. Also, only allow one person on a diving board at a time.²³

Exercise Classes

1.5–3

Body Sculpting Class

1.5

- O**– These are muscle-toning classes that often include core strengthening. Some have a cardiovascular component. A variety of exercises may be done using equipment, such as small handheld weights or resistance bands.
- R**– Minimal risk.
- S**– There are usually beginner to advanced level classes. Participants can work out at their own pace.

Boot Camp Workout Class

2

- O**–These classes are a mix of strength training and aerobic conditioning, and contain a variety of exercises offered in intervals. In general, body weight exercises, such as calisthenics, are used along with drills and sprints. The high-intensity intervals of activities are generally alternated with lighter activity.
- R**– Rapid movements that are often included in these workouts carry more risk.
- S**– Maximize safety with proper technique, and working at your own level and pace.

Cardio Kickboxing Class

2

- O**– Classes combine cardiovascular exercise with the agility, strength, balance and coordination that can be achieved through martial arts training. Techniques range from easy to hard, with low-impact movements (where at least one foot remains on the ground) to high-impact movements (where both feet leave the ground at the same time), and no contact to full contact.
- R**– Full-contact, high-impact cardio kickboxing carries greater risk of injury through contact and overuse.
- S**– Full-contact, high-impact cardio kickboxing is more demanding on the body. To participate safely, make choices to minimize impact to your body, such as wearing proper footwear.

CrossFit®

2–3

See **High-Intensity Functional Training**.

High-Intensity Functional Training (HIFT) Class

2–3

- O**– These programs have been shown to significantly improve cardiovascular fitness, while decreasing the percentage of body fat.²⁴ HIFT includes programs like CrossFit®, a core strength and conditioning program composed of movements that are constantly varied at high intensity.
- R**– Injury rates are variable, just as the style of training is variable. However, injury rates have been reported as high as nearly 75%.²⁵ Power lifting and Olympic lifting exercises, two main components of the CrossFit® program, have high risk of injury.

(O) Overview • (R) Risks • (S) Safety Measures

S– Participants are less likely to be injured when coaches are monitoring and correcting form. As with any strengthening program, proper form is key to injury prevention. Learn the skill before adding any weight. Use modifications as needed, especially with activities that may stress areas of previous injury or bleeds.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Indoor Cycling Class

1.5–2

O– Indoor cycling class is an indoor group ride on stationary bicycles with energizing music led by an instructor. Bikes are arranged so that each participant can see the instructor. The workout is variable and can include sprints, slower pedaling and added resistance to simulate hills.

R– Injuries are more likely to occur during “jumps,” rapid pedaling and when performing arm exercises while pedaling.

S– To minimize injury, adjust your bike to fit your body. Maintain proper form and posture while exercising. Proper equipment is helpful and includes cycling shoes and padded shorts.

For individual activity on an exercise bike, see **Stationary Bike** on page 27.



- O**– Zumba® combines exercise and dance. It is a total body workout that includes a variety of fitness elements: cardiovascular training, muscle conditioning, balance and flexibility. Instructor-led classes combine high- and low-intensity interval training along with energetic music.
- R**– In one study, there was a 29% rate of injury among participants, most often involving the knee.²⁶
- S**– To reduce risk, attend classes led by an experienced instructor, follow proper technique, wear appropriate footwear and modify moves for your own level if needed.

Fishing

1–2

- O**– Fishing types are variable and can include; saltwater fishing, such as deep sea fishing or surf fishing; freshwater fishing, such as boat fishing or fly fishing; and ice fishing. Each type of fishing may require different knowledge, and provides a different experience.
- R**– Because fishing is practiced in different environments (pier, boat, ocean, rocky coastline, ice, river), risk will be different for each specific location.
- S**– Think about safety precautions each time you decide where to fish. These include: protection from the elements and insects, and appropriate clothing and shoes. Use safe handling techniques with fishing knives, and when baiting, removing hooks and handling fish. Carry emergency/safety gear, use life jackets and follow boating safety procedures. In case of a storm, head to shore if you can.

Remember, you need a license even for catch-and-release fishing. Each state has regulations about fishing licenses and daily limits.

Football

2–3

Football, Flag or Touch

2

- O**– Flag and touch football are alternative options to tackle football and carry less risk. Playing flag football and touch football has cardiovascular benefits and can improve agility.
- R**– Although the sport does not include tackling, there is still a risk for collision between players, and injuries from light contact or falls.
- S**– Improve safety by participating in flag football or touch football in a supervised setting.

Football, Tackle

3

- O**– Football encourages teamwork. Playing football has cardiovascular benefits and can improve agility.
- R**– Football is a high-contact, high-collision sport with potential for serious traumatic injury to the head, neck, spine and extremities. Overuse injuries can occur. However, traumatic injury and concussion are by far the most common. Traumatic injury in a person with a bleeding disorder can be life-threatening.
- S**– If you choose to play, speak with your healthcare providers prior to starting the activity. Wear protective gear and avoid playing positions with heavy tackling.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Frisbee®

1–2.5

Frisbee®

1–1.5

- O**– Recreational Frisbee involves sailing a lightweight plastic disk with a flick of the wrist.
- R**– Recreational Frisbee involves little risk. However, lengthy play could result in stress, strain or bleeding in arm joints and/or muscles.
- S**– Stop playing if you become overly tired, or if you feel any discomfort in arm joints or muscles.

Frisbee® Golf

1.5–2

- O**– Played recreationally or competitively, the object of the game is to throw the disk into the target in the fewest number of throws. Players use forehand, backhand or overhead throws to accomplish different goals and work on developing skills including hand-eye coordination. This sport can involve weighted disks.
- R**– Repeated throwing carries a risk for elbow overuse injuries, as well as joint and muscle bleeding, especially when weighted disks are used. Preferential use of forehand throws has been shown to carry an increased injury risk.²⁷
- S**– Injury risk can be minimized by limiting the number of throws per day, using backhand throws instead of forehand and allowing for recovery between play.

Frisbee®, Ultimate

2–2.5

- O**– Ultimate is played by two teams of 7 players with a flying disk on a field with end zones, similar to a football field. Players score by catching a pass in the opponent's end zone. Ultimate is a limited-contact team sport that can be played recreationally or competitively. Participants run, cut, guard, jump, throw, catch and dive in order to catch the disk.
- R**– Frequent cutting moves, physical contact and jumping are risk factors for injury. Jumping, cutting and diving maneuvers carry the highest injury risk, especially for the knee and ankle.²⁸
- S**– To improve safety, players should train for aerobic conditioning to support the need for constant running during a game.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Golf

1

- O**– Golf is a low-impact, lifetime sport that provides a better workout for those who walk the course rather than use a cart.
- R**– Golfing injuries are usually related to limited flexibility and/or repetitive, high-velocity movement of the spine, arms and legs required during the golf swing. The more balls struck per week, the higher the risk of injury. The most commonly injured areas of the body are the back, shoulder and elbow.
- S**– To avoid golf injuries, it is important to develop a solid swing technique. Prior to play, warm up with active flexibility exercises and warm-up swings, starting with the wedge and gradually working up to the driver.

Gymnastics

2–3

- O**– Participating in gymnastics can help improve strength and flexibility.
- R**– Young gymnasts whose bodies are still growing and developing are at increased risk of injury due to their immature bones and joints, as well as the stress associated with repeated twisting, flipping and landing. The more difficult the routine (jumping dismounts or aerial moves), the higher the risk of injury.²⁹ Injuries most commonly occur in the low back, ankles, feet, knees, wrists, hands, often from overuse. Of greater concern for people with bleeding disorders is the inherent risk of traumatic injury, concussion and/or a bleed resulting from a blow to the head during a fall.
- S**– Maximize safety by using proper technique and wearing recommended safety gear, such as wrist guards, hand grips, footwear and knee/elbow/heel pads. Make sure all equipment is in good working condition. Use safety harnesses and spotters when learning new skills. Look for a well-supervised setting that includes proper instruction and good spotting.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

STOP before you start! Please speak with your healthcare providers prior to engaging in any sport, activity or exercise regimen, especially one with a rating of 2.5 or 3.

Hiking

1-1.5

- O**– Hiking typically involves a long walk on dedicated paths or trails that may have sharp inclines or varied, rugged terrain. Walking is one of the lowest impact activities, allowing the cardiovascular benefits of other aerobic activities, without the stress, strain and pounding that come with high-impact activity.³⁰ Hiking can be a good social experience when done in groups, and it is an excellent lifetime activity. Equipment needs vary according to the duration, distance, terrain and the environment. Equipment can include hiking boots and walking poles.
- R**– Aerobic effort, impact, balance and muscular workout increase with more challenging terrain and weight carried in a backpack.
- S**– While overall risk is low, make sure to only hike on terrain that is appropriate for your ability.



Hockey, Field/Ice/Street

2.5-3

- O**– Hockey is a team sport, played on various surfaces, such as ice rinks, and on grass and pavement.
- R**– Often, hockey played as a younger child carries less risk of high-impact, high-collision injuries. However, there is still a risk for traumatic injuries from the puck or ball, as well as collisions with rink barriers, hockey sticks or players, or the ground. The rate of injury increases along with the size and the speed of players, and when checking is part of the game.
- S**– Hockey carries less risk at a lower competitive level when participants wear the proper safety gear and play under supervision. If you choose to play, always wear a helmet, padding and appropriate safety gear.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

- O**– Horseback riding can be safe for people with bleeding disorders, depending on how they participate.
- R**– The risk associated with horseback riding varies with the type of riding performed. For example, therapeutic horseback riding or going on a trail ride with trained staff carry less risk. Alternatively, galloping across rugged terrain, racing or jumping carry higher risks of injury. Most horseback riding injuries occur when a rider falls or is thrown from a horse. Serious injuries may also result from horse kicks. The most common injuries are ankle sprains, wrist injuries to bones and/or ligaments, and head injuries, including concussions.
- S**– To promote safety, stables should be well maintained and staffed with trained professionals who provide proper horse care (feeding, shoeing, etc.). Riders should never walk behind a horse or make sudden movements or loud noises. They should not ride horses with unknown temperaments. Riders should always be supervised by trained staff. A trained professional should safety check all equipment prior to riding, including the girth or cinch, stirrup leathers, stirrups and reins. Stirrup length should be adjusted to fit each rider. A hard, well-fitting helmet should always be worn. Helmet use has reduced the rate of traumatic brain injuries by 40%-50%.³¹ Sturdy riding boots should have a short heel and cover the ankle.

**Activities with a rating of 2.5 or 3 are higher risk
for people with bleeding disorders.**

- O**– Maneuvering a Jet Ski® requires balance and coordination, and also provides a cardiovascular workout.
- R**– Operating a personal watercraft (PWC) involves straddling a vehicle similar to a motorcycle and driving, potentially at high speeds, across the water. This activity carries significant risks for anyone who participates, because a major accident can result in serious, potentially life-threatening injuries. The small size of PWCs makes it difficult for other boaters to see them. Visibility is further impaired when the PWC is being driven at a high speed, especially if the oncoming boat is also driving at a high speed. Accidents may also result from driver inattention and the inability to predict a

boater's oncoming path. In a collision, participants frequently break bones in the head, neck, arms or legs, and/or may sustain traumatic brain injury due to the sudden deceleration.

- S**– PWC drivers can minimize the risk of injury by following safety guidelines. Anyone driving a PWC should complete a boater safety course. Wear a US Coast Guard-approved life vest or personal flotation device. Always attach the engine shut-off cord (lanyard) to the wrist and keep it free from the handlebars so that the engine stops if the driver falls off. Ride within your limits, stay alert to your surroundings and avoid aggressive driving. These measures will help reduce the risk of losing control, being thrown off the PWC and collision.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Jumping Rope

2

- O**– An excellent form of cardiovascular exercise with muscle toning benefits, jumping rope can provide a vigorous workout. There are a variety of footwork patterns that can be practiced that can also improve agility and coordination. When performed with proper technique, this is a relatively low-impact activity because you only jump high enough to clear the rope (about one inch off the ground).
- R**– Because the activity is generally performed on the balls of the feet, this may cause stress to the ankles of people with bleeding disorders who have joint damage.
- S**– Minimize impact by wearing proper footwear and practicing on a wood or rubberized surface versus a hard surface, such as concrete. Use a rope that is the proper length to decrease the risk of falling.

Kayaking

2.5

See **Paddling Sports** on page 43.

- O**– Lacrosse is a high-contact, high-collision sport played between opposing teams, using a small, hard rubber ball and a long-handled lacrosse stick. Developing teamwork skills is a benefit of lacrosse. There are also cardiovascular benefits.
- R**– Lacrosse is fast paced, and can include body checking and stick checking. Injuries occur frequently and can be serious. Common injuries are concussions, sprains and strains.³² There is potential for serious traumatic injury to the head, eye, neck, spine and extremities.
- S**– If you decide to play lacrosse, wear padding and protective headgear, including a mouth guard.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

- O**– Studying low-contact forms of martial arts under the supervision of a qualified instructor can provide good physical conditioning.
- R**– Traditional and mixed martial arts practices differ in technique, regulations, equipment and intensity. As a result, participation may result in a wide range of injuries from mild to severe. The most common martial arts injuries are sprains, strains, cuts, bruises and broken bones. These injuries often affect the knee, ankle, shoulder and elbow. Striking arts may result in injuries to the face, nose, mouth and hands. They can also cause concussions and traumatic brain injuries in people with bleeding disorders. Any martial art using kicks, punches and falls onto the opponent can result in rib fracture or injury to the chest.

Karate, taekwondo and kung fu **can be modified for safer participation.** Striking martial arts (including breaking objects), mixed martial arts, jujitsu, judo, competitive fighting, being thrown by an opponent and receiving submission holds are **high risk** due to the possibility of serious injury.

- S**– To maximize safety, consider the following recommendations. Using proper safety equipment, such as headgear, protective cups, mouth guard and footwear, is essential when sparring. Wrap hands using proper technique with appropriately

sized wraps. If you wear glasses, use safety glasses for proper eye protection.³³ Always practice in a well-padded area. A coach or supervisor should spot participants at all times. Protecting oneself during a fall should be one of the first techniques learned and perfected. New techniques should initially be practiced at half speed. Practice precise movements, including strikes, punches, blocks and kicks, in a disciplined manner.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Martial Arts, Tai Chi

1

- O**– Tai chi is a mind-body exercise focusing on core stability, posture, flexibility, strength, breathing and movement control. The emphasis on slower movements, breathing and meditation makes this activity appropriate for most people.
- R**– Minimal risk. Tai chi practice can involve standing on a partially bent knee.
- S**– People with a history of knee injury or repeated joint bleeds may need to modify some techniques in this form of martial arts.

Motorcycle/Motocross (ATV, Dirt Bikes)

3

- O**– Riding a motorcycle can be either a mode of transportation or recreational activity. Motocross is an off-road motorcycle race on a closed circuit. Movements involved in steering a bike strengthen abdominal muscles.
- R**– Both motorcycling and motocross have the potential for serious, life-threatening injury. Possible injuries include traumatic brain injury, concussions, spinal cord injuries, fractures and dislocations, in addition to chest and abdominal injuries. These activities are extremely dangerous for anyone.
- S**– If you decide to ride a motorcycle, always wear a helmet and protective gear.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Mountain Biking

2.5

- O**– Mountain biking provides excellent cardiovascular exercise and builds muscle strength. Because mountain biking is done off-road, the terrain can be rough. However, there can be variety in incline and path conditions, making it a fun challenge to negotiate the trails.
- R**– Risk involves falls and collisions with obstacles due to the rough, uneven terrain. In a study of injuries in downhill mountain bikers, the most common areas injured were the lower leg and forearms. The most common injury types were cuts and bruising.³⁴
- S**– As with regular bicycling, helmets are essential. Additional safety equipment may include elbow pads, shin guards, gloves and eye protection. Maximize safety by riding a bike that fits you and that is well maintained. Always carry a bike/tire repair kit.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Paddling Sports

1.5–2.5

Canoeing/Kayaking

1.5–2.5

- O**– Paddling sports can be excellent total body endurance activities. Although paddling in relatively calm water can be relaxing and enjoyable, it can also provide a strenuous aerobic workout. Canoeing and kayaking can be done in calm water or in fast-moving water.

- R**– The risk level of canoeing and kayaking is low in calm water, and higher in fast-moving rivers and the ocean. The majority of injuries in canoeists and kayakers involve straining the arms. The most serious injuries occur in the shoulder. Portaging, or carrying the canoe or kayak, can also be very strenuous.

- S**– Sit in the center of the canoe to avoid sudden, jerky movements that may result in capsizing. Wear a US Coast Guard-approved life vest/personal flotation device at all times. A helmet is required when floating on white water. Stay aware



of water currents to prevent floating farther downstream than you planned. If the current becomes too fast, or if you see rocks or fallen trees in the water ahead, paddle away from them. Because the unexpected may happen, learn basic rescue techniques. Paddlers are urged to complete paddler safety courses.³⁵

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

River Rafting

2

- O**– Paddling sports can be excellent total body endurance activities. Although paddling in relatively calm water can be relaxing and enjoyable, it can also provide a strenuous aerobic workout.
- R**– Rafting in fast-moving water increases the risk of the activity. The most common injuries in rafting occur in the face and knees.
- S**– When going on a guided trip, choose a reputable company with experienced guides who are familiar with the body of water. Wear a US Coast Guard-approved life vest/personal flotation device at all times. A helmet is required when floating on white water. Stay aware of water currents to prevent floating farther downstream than you planned. If the current becomes too fast, or if you see rocks or fallen trees in the water ahead, paddle away from them. Because the unexpected may happen, learn basic rescue techniques. Paddlers are urged to complete paddler safety courses.

Rowing

1.5

- O**– Paddling sports can be excellent total body endurance activities. Rowing can provide a strenuous aerobic workout. Rowers sit in a boat, facing backwards, and use an oar to propel the boat through the water.
- R**– The main muscles used to propel the boat are the legs, back and arms. Overuse injuries can occur.
- S**– Wear a US Coast Guard-approved life vest/personal flotation device at all times. Because the unexpected may happen, learn basic rescue techniques. If you become tired, rest and do not overexert yourself.

Pilates

1.5–2

- O**– Pilates is a mind-body exercise focusing on core stability, posture, flexibility, strength, breathing and movement control. The practice may include mat- or equipment-based exercise. Equipment-based exercises tend to be safer, easier to learn and may promote better core strength.
- R**– Pilates exercises should be performed properly to receive the maximum benefit and to maximize safety. Precisely performed Pilates exercises require joint mobility and stability of the shoulders, hips, spine and neck. Participants with histories of shoulder or hip bleeds/injury as well as spine injury need individualized specific instruction by a certified instructor to avoid further damaging these high-risk areas.
- S**– If a specific activity hurts, or is difficult due to strength or range of motion limitations, ask your instructor for modifications.

Power Lifting

3

- O**– Power lifting is a discipline of competitive weight lifting in which athletes demonstrate maximum lifting ability through sudden moves. Power lifting builds strength.
- R**– Lifting maximal weight can cause micro-tearing of the muscles, which is accompanied by bleeding.³⁶ This could lead to serious complications in a person with a bleeding disorder.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Racquetball

2.5

- O**– Playing racquetball can improve reflexes and hand-eye coordination.
- R**– Because of the speed of the ball, as well as racquet-induced injury, there is a high risk for internal and external eye injury, with the potential for vision-threatening consequences.³⁷ Similar to other racquet sports, the muscles and joints of the arm are susceptible to overuse injuries due to repeated swinging. Although the court is not as large as a tennis court, there are still running, lunging and cutting moves that can lead to ankle sprains or other injury to the joints and muscles of the leg.
- S**– Because racquet sports are one of the sports reporting the most eye injuries, protective eyewear is recommended.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

(O) Overview • (R) Risks • (S) Safety Measures

River Rafting

2

See **Paddling Sports** on page 43.

Resistance Training

1.5

See **Strength Training** on page 54.

Rock Climbing

1.5–3

Rock Climbing, Indoor or Challenge/Ropes Course

1.5–2

- O**– Rock climbing uses ropes and harnesses. Strength and range of motion are important components of rock climbing, but the activity can be done with modifications. Climbing on indoor walls and challenge courses with proper instruction and supervision can provide a safe environment.
- R**– The primary risk of this sport is falling. The most common causes of injury are human error and equipment malfunction.³⁸
- S**– Climbing activities should be supervised by trained staff at all times. All equipment must meet the International Climbing and Mountaineering Federation (UIAA) guidelines and standards. Never attempt to repair damaged or malfunctioning equipment. Ensure all equipment has been well maintained and safety checked. Learn correct climbing and belaying before climbing or belaying someone else, and ensure your partner has done the same. Wear specialized shoes for climbing. Don't climb above the site's safe boundary zone. Practice to improve your skills. Rest when you're tired or need a break to catch your breath.

Rock Climbing, Outdoor

2–3

- O**– Like indoor rock climbing, strength and range of motion are important for outdoor climbing. Some modifications may be possible.
- R**– Rock climbing in natural settings increases the risk because, though rare, the potential exists for falls resulting in serious trauma and life-threatening injury. The most common injuries range from cuts and bruises to sprains/strains and fractures. Injuries tend to occur in the fingers and shoulders. Teen injuries carry the risk of growth plate fractures.³⁹ Bouldering or any other climbing without harnesses or ropes is high risk for people with bleeding disorders.

(O) Overview • (R) Risks • (S) Safety Measures

S– See **Indoor Rock Climbing** for safety considerations. In addition to those safety measures, learn correct climbing and belaying techniques through a formal class and/or in indoor climbing gym before heading outside to scale real rocks. Learn the language involved, and use proper communication terms and commands. Always use safe anchors. Wear appropriate clothing for the climate and proper shoes for the terrain. Watch for falling rocks. Keep an eye on the weather. At certain altitudes, it can change dramatically, often without warning.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Rodeo

3

- O**– Rodeo can include various activities such as riding broncos and roping calves. Specific skills are required for each activity.
- R**– In this high-collision, high-contact activity, there is potential for serious traumatic injury to the head, neck, spine and extremities.⁴⁰

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Rowing

1.5

See **Paddling Sports** on page 43.

Rugby

3

- O**– Rugby is a high-contact, high-collision team sport that involves handling and passing a ball, running, kicking the ball and tackling opposition players. A benefit of playing rugby is that it helps improve endurance.
- R**– Similar to American football, rugby players have the risk for the same serious traumatic injuries, such as to the head, neck, spine and extremities.
- S**– If you choose to play, learn proper positioning during game play to minimize risky moves. Use a properly fitted mouth guard, and participate at a level consistent with ability.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

- O**– You can choose to run recreationally and/or to participate in fun runs or races, individually or as part of a team. Since running is an individual sport, you can control the intensity of participation and where you run. Benefits of running include improved cardiovascular health and toning.
- R**– Running and jogging are higher impact than walking, and therefore pose a great risk of injury to the weight-bearing joints of the lower body. Injuries include sprains, strains and stress fractures. This impact and wear and tear may increase the number of bleeds and contribute to severity of joint disease.
- S**– To maximize safety, get instruction, start at your own level and progress at your own pace. Wear proper footwear, fitted by a professional. Choose a safe area for the activity.



STOP before you start! Please speak with your healthcare providers prior to engaging in any sport, activity or exercise regimen, especially one with a rating of 2.5 or 3.

Scooters

1.5–2.5

Scooters, Motorized

2–2.5

- O**– Gas- and electric-powered scooters can be used for recreation or as a way to get around.
- R**– Riding a motorized scooter carries the risk for serious traumatic injury. The most common injuries are cuts, bruises and fractures. Most injuries are due to rider error or the terrain.
- S**– The risk of injury can be minimized by wearing a helmet and protective pads for elbows, knees and wrists. Ride only on smooth surfaces free of dirt, sand, gravel and water. Avoid riding at night or in bad weather. Owners of power scooters should check with local laws, as many jurisdictions prohibit the use of powered scooters on roadways and sidewalks. The Consumer Product Safety Commission strongly discourages children younger than 13 from riding high-speed motorized scooters.⁴¹

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Scooters, Nonmotorized

1.5–2.5

- O**– Nonmotorized scooters can provide an excellent aerobic workout. They can be used for recreation or as a way to get around.
- R**– Falls and crashes are possible on a scooter. The most common injuries occur in the wrist, followed by the face and head.
- S**– Practice slowing, stopping and balancing before venturing out. Novices should stay in safer environments without traffic, hills, obstacles and uneven surfaces. Riders should wear a helmet and protective pads for elbows, knees and wrists. Wearing wrist guards can decrease the number of wrist injuries by 87%; elbow pads can decrease the number of elbow injuries by 82%; kneepads can decrease the number of knee injuries by 32%. Further, helmets can decrease head injuries by 85%.⁴² Follow traffic rules. Children under 8 should ride with adult supervision at all times.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Scuba Diving

2–2.5

- O**– Scuba (self-contained underwater breathing apparatus) diving is an underwater activity that requires the proper equipment and training, including dive certification. Scuba diving develops flexibility and strength, as you move your muscles to propel yourself through water, which provides resistance.
- R**– This activity carries inherent risks related to the depth of the water and the need for proper maintenance of equipment and oxygen supply. There is also the potential for encountering hazardous marine life. According to the CDC, injury to the ear due to failure to equalize pressure is the most common injury. More serious injury can occur during improper ascending, which can cause lung collapse and decompression sickness.⁴³
- S**– Minimize risk by scuba diving in a more controlled setting in shallow depths.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Skating/Skateboarding

1.5–2.5

Skating, Ice

1.5–2.5

- O**– Ice skating provides a solid aerobic workout, and is good exercise for leg muscles.
- R**– Figure skaters are at risk for both overuse and traumatic injuries. The greatest risk is falling on the ice, hitting the head or breaking a bone. The most common injuries are injuries to the legs and low back. The risk of injury increases with jumps, aerial skills and competitive participation.⁴⁴
- S**– To minimize the risk of injury, participate in off-ice workouts that develop flexibility, strength and core stability. Make sure your skates fit well and are broken in. Stiff boots limit ankle and foot range of motion, which stresses your legs and back. Skates should be sharp, but not too sharp. Check the ice for chips and bumps that can lead to falls. Limit the number of repetitions of any skill performed in one session to prevent overuse.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Skating, Inline/Roller/Skateboarding

1.5–2.5

- O**– Similar to ice skating, inline skating, roller skating and skateboarding all provide an excellent aerobic workout. They also strengthen leg muscles.
- R**– The most common injuries occur in the wrist, followed by the face and head.
- S**– Practice slowing, stopping and balancing before venturing out. Novices should stay in safer environments without traffic, hills, obstacles and uneven surfaces. Always follow traffic rules. While head injuries are fairly uncommon, participants should wear helmets to prevent these serious injuries. Protective pads for elbows, knees and wrists should also be worn. The risk of injury increases with aerial skills and competitive participation.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Skiing

2–2.5

Skiing, Cross-Country

2

- O**– Cross-country skiing is a recreational or competitive sport usually performed on relatively flat terrain, using narrow cross-country skis with boots that allow you to lift your heel, so you can glide more easily. It is an excellent aerobic lifetime activity that may be done using a variety of techniques and at different intensity levels. This activity may also be performed on an indoor cross-country ski machine.
- R**– Due to the repetitive nature of the sport, overuse injuries can occur. Soft tissue and ligament injuries can result from falls.⁴⁵
- S**– Warm up properly before beginning activity, and stop activity when tired to avoid overuse.

STOP before you start! Please speak with your healthcare providers prior to engaging in any sport, activity or exercise regimen, especially one with a rating of 2.5 or 3.

Skiing, Downhill

2.5

- O**– Downhill skiing exercises leg muscles, and also uses core muscles for balance.
- R**– Common skiing injuries occur in the knee, head or face, and include bruises, ligament injuries and fractures. Most injuries occur during a fall or crash. Traumatic brain injury is the leading cause of serious injury and death.⁴⁶ Moguls, aerial skills and jumps carry increased risk.
- S**– Maximize safety by getting instruction, using a specialized skiing helmet, goggles and properly fitted boots. Make sure to follow all trail rules, and choose trails that match your skill level. Avoid icy conditions and steep elevations.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Skiing, Water

2–2.5

- O**– Physical benefits include balance and strengthening.
- R**– The most common water skiing injuries are sprains/strains, most often in the legs. Many water ski injuries result from collisions with docks or other solid objects. Water skiing can be stressful to the muscles and joints of the lower extremities, and to the elbows and shoulders. You may have difficulty water skiing if you have a history of elbow and shoulder bleeding or injury.
- S**– Always have a spotter sitting at the back of the boat to watch the skier and communicate with the driver. Review basic hand signals with a spotter. Make sure the boat driver is experienced with both the boat and the body of water. Always wear a US Coast Guard-approved protective flotation device (PFD, life jacket). Learn how to get out of the water and use a tow rope safely. Do not ski in shallow water, near docks or other areas that may have obstacles around the water level, other boats or swimmers. Always look ahead. Be aware of your surroundings and where you are going at all times.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Snorkeling

1



O– Snorkeling is a low-impact recreational activity that requires little effort, and no complicated equipment or training. Activity in the water can be beneficial to those with bleeding disorders due to the support and buoyancy of water, and reduced stress on the joints.

R– Minimal risk.

S– To maximize safety in a natural setting be aware of surroundings, tides and water temperature. Follow proper water safety.

For those wishing a more gentle experience remaining on the water's surface, a U.S. Coast Guard-approved life vest or personal flotation device may be used.

Snowboarding

2.5

- O**– Snowboarding exercises leg muscles, and also uses core muscles for balance.
- R**– Common snowboarding injuries occur in the wrist and arm, and include bruises, ligament injuries and fractures.⁴⁷ Most injuries occur during a fall or crash. Traumatic brain injury is the leading cause of serious injury and death.
- S**– Maximize safety by getting instruction, using a specialized snowboarding helmet, goggles, properly fitted boots, gloves with wrist guards, elbow and knee pads. Make sure to follow all trail rules, and choose trails that match your skill level.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

(O) Overview • (R) Risks • (S) Safety Measures

Snowmobiling

3

- O**– Snow mobiles can be used for recreation or for transportation.
- R**– Snowmobiling is a high-collision activity with potential for serious traumatic injury. The American Academy of Pediatrics states that head injuries remain the leading cause of mortality and serious morbidity, due to collisions, falls or overturning during operation.⁴⁸ Due to risk of serious injury, snowmobiling is high risk for people with bleeding disorders.
- S**– When snowmobiling, always wear a helmet, drive carefully at safe speeds and be aware of your surroundings.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Soccer

2–3

- O**– Children often participate in supervised soccer games beginning at very early ages. Benefits include building muscle strength, improving coordination and teamwork.
- R**– At older ages, games may become more competitive, resulting in higher contact and risk of injury. The most common injuries are sprains and strains in the lower body. Other injuries include fractures, contusions and overuse injuries. “Heading” the ball carries more risk of neck injury and concussion, although concussion can also occur due to contact with another player or the ground.
- S**– To maximize safety, wear appropriate protective gear, such as shin and mouth guards.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Softball

1.5–2.5

See **Baseball/Softball/Tee-Ball** on page 22.

Strength Training/Resistance Training/Weight Lifting

1.5

- O**– Using weights or resistance to increase muscle strength is a relatively safe activity at all ages and fitness levels. Because it is an individual sport, the participant can easily modify the intensity of training to suit individual needs and goals. Equipment used can include: dumbbells, long bars, kettlebells, medicine balls, cables, stretchy bands or machines. There are many benefits to strength training, which include: cardiovascular fitness, body composition/weight control, bone mineral density, improved cholesterol levels and mental health.⁴⁹
- R**– Injuries to the back, muscle strains and tears, bone fractures and cartilage damage can occur. Power lifting has significantly greater risks. See **Power Lifting** on page 44.
- S**– Maximize safety by following proper technique, getting instruction and participating at your own pace in a supervised environment. Following age-appropriate guidelines is important. The American Academy of Pediatrics states that preadolescents and adolescents should avoid maximal lifts until they reach physical and skeletal maturity.⁴⁹

Surfing

2–2.5

- O**– Surfing has benefits that include improved balance, coordination and strength.
- R**– Traumatic injuries can be caused by a wipeout, when the surfer contacts a ground surface, such as the bottom sand or a reef. Overuse injuries can also occur.⁵⁰ The most common injuries occur in the lower half of the body, face, head and neck. Cuts are the most common injury type.
- S**– To maximize safety, choose a setting that matches your skill level. Surfing in an artificial, more controlled setting is predictable and can be safer than surfing in a natural setting. Consider using a life vest, personal flotation device or helmet as needed.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Swimming

1

- O**– Swimming is a low-impact sport that provides a combination of muscle strengthening and cardiovascular conditioning. Proper technique will minimize the risk for repetitive stress injury. It is an activity that can be continued throughout life.
- R**– Injuries as well as musculoskeletal bleeding related to swimming are usually associated with overuse, as well as using improper stroke technique, especially when fatigued. Swimmers may also develop too much flexibility, especially in the shoulder. Occasionally swimmers may develop hip or knee problems from breaststroke kicking.
- S**– Risk may be minimized by taking care to use proper strokes and resting as needed.

Tee-Ball

1.5

See **Baseball/Softball/Tee-Ball** on page 22.

Tennis

2

- O**– Tennis can be played on a variety of surfaces including grass, clay or pavement. According to a study, tennis has lower injury rates than contact team sports and as compared to noncontact individual sports, such as golf and running.⁵¹ Benefits include improved coordination, muscle strength and endurance.
- R**– Due to repetitive swinging, overuse injuries to the shoulder, elbow and wrist can occur. Because the game also includes quick, repetitive and multidirectional movements, other common injuries are muscle strains, ligament sprains and stress fractures.
- S**– To reduce risk, use proper equipment including footwear, and get instruction on racquet grip and proper technique. Due to the risk of eye injury, which could be more serious in someone with a bleeding disorder, consider protective eyewear certified by the American Society for Testing and Materials (ASTM) for racquet sports.

Track and Field

2–2.5

- O**– Track and field includes many different events, which can be appropriate for different people depending on the condition of their joints and muscles. These range from running in sprints or longer distances to jumping and throwing.
- R**– Participating in track and field can cause stress on joints and muscles, and injuries can result from overuse.
- S**– Because the events are so varied, specific choices about which activities to participate in should be discussed with your healthcare provider.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Trampoline

2.5–3

- O**– Recommendations from the American Academy of Pediatrics (AAP) discourage recreational trampoline use such as at home or at a trampoline park.
- R**– Injuries may occur even with adult supervision. The most common injuries are broken bones, sprains/strains, bruises, concussions, and head and neck injuries. Children younger than 6 years old have an increased risk of fractures and dislocations. Somersaulting, flipping and falls put jumpers at increased risk of head and cervical spine injury with potentially permanent paralysis. Therefore, trampoline use is strongly discouraged by the AAP.⁵²
- S**– Frequently inspect equipment for safety and replace protective padding, net enclosure and any other damaged parts before continued use. Place trampolines at ground level when possible. All trampolines should be surrounded by appropriately placed protective padding. Only one person should jump at a time. Discourage jumpers from performing flipping stunts in the home recreational setting. An adult should actively supervise to ensure the above rules are followed.

STOP before you start! Please speak with your healthcare providers prior to engaging in any sport, activity or exercise regimen, especially one with a rating of 2.5 or 3.

Information is lacking regarding the safety of commercial trampoline parks. The AAP recommends following the same recommendations listed above. Formal structured trampoline instruction with a trained coach and safety equipment is considered permissible. New skills should be taught following progressive skill mastery with appropriate coaching and spotting. Use of safety belts/harnesses is encouraged when learning new skills.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Volleyball

2–2.5

- O**– Volleyball is a team sport that can be played recreationally or competitively on an indoor or outdoor court, or on sand. Volleyball exercises the upper body and the legs.
- R**– Trauma can occur from collision with the ground, the ball or other players. The injury risk in recreational volleyball is lower than competitive volleyball. In general, the most common injuries are ankle sprains, and overuse injuries of the knee and the shoulder.⁵³
- S**– Learn proper technique to reduce the risk of injury. Wear knee and elbow pads, and avoid diving for the ball.

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.



Walking

1

- O**– Whether slow and steady or brisk, walking is an excellent aerobic activity that can be done indoors, outdoors and on varied terrain. It is also a good social experience when done in groups and is a great lifelong activity. Because the individual controls the setting and pace, walking is an activity that can be easily modified to the needs and the goal of the individual.
- R**– Injuries can occur from overuse or improper stepping.
- S**– Maximize safety by choosing a safe location, being cautious of uneven terrain and wearing proper footwear. If you become tired, rest and do not overexert yourself.

Water Polo

2.5

- O**– Benefits of water polo include increased endurance and improved cardiovascular health.
- R**– Water polo is an intense, contact team sport. As in many sports, the risk of injury increases with age due to more competitive play, contact and the size of the athletes. Common traumatic injuries include: contusions, lacerations, sprains, dislocations or fractures. Overuse injuries also occur due to repetitive throws and kicks.⁵⁴ The shoulder is a common area of injury, as well as head/concussion, facial and eye trauma.
- S**– Consider wearing eye protection. Make sure that goggles and facemasks are flexible and free of sharp edges.⁵⁵

Activities with a rating of 2.5 or 3 are higher risk for people with bleeding disorders.

Water Skiing

2–2.5

See **Skiing** on page 51.

Weight Lifting

1.5

See **Strength Training** on page 54.

- O**– Wrestling is a sport involving techniques such as throws and takedowns, joint locks and pins. Wrestling helps develop speed, strength and endurance.
- R**– This is a high-contact sport with potential for traumatic injury including concussion, and ligament and muscle injury. A study revealed the most common injuries presenting to the emergency department as sprains/strains, small bone breaks and bruising.⁵⁶ There is potential for injury related to bleeding.
- S**– Wrestlers should wear protective headgear, kneepads, mouth guards, athletic support (males) and proper footwear.

**Activities with a rating of 2.5 or 3 are higher risk
for people with bleeding disorders.**

- O**– Yoga is a form of mind-body fitness that combines physical activity with an internally directed mindful focus on awareness of the self, the breath and energy. Yoga practice and styles vary widely from restorative and gentle practice to vigorous practice. It can include mat- or equipment-based exercise, as part of a structured class or use of a home video or DVD. Yoga practice has been shown to improve strength, flexibility, and respiratory and cardiovascular function. It also reduces stress, anxiety, pain and depression, and enhances overall quality of life.⁵⁷
- R**– Generally minimal risk. Back pain and minor injuries can occur from overuse. Practicing positions beyond your ability can increase risk.
- S**– To maximize safety, start at a beginner level with a qualified instructor, go at your own pace, modify positions as needed and follow proper technique.



Summing It Up: Prepare Yourself, Choose Wisely...and Have Fun!

People with bleeding disorders should be strongly encouraged to participate in exercise and sports activities. Here are six things to consider:

1. How you choose activities may depend on the severity of your bleeding disorder. The effects of musculoskeletal bleeding could range from frequent bruising to bleeding into joints or muscles that can occur even with little or no trauma. If you experience a bleed, how you manage it and when you return to activity should be a discussion between you and your healthcare provider.
2. Parents should strive for a healthy attitude toward their child's participation in physical activities. It is important that parents provide a safe environment in which their child can grow and develop normally, which includes participation in athletic activities. In general, inactive, overprotected children have more frequent, spontaneous bleeding. A more self-confident, independent lifestyle usually brings marked clinical improvement and fewer spontaneous bleeding episodes.
3. Children choose sports for many reasons, such as natural ability, enjoyment, excitement, friendship and competition. One of the biggest obstacles to their participation may be their parents' fear of injury. Parents should address these concerns by working with their child's healthcare provider and talking with their children about risks and precautions. Make sure children use the appropriate safety equipment.
4. Honest and open communication between people with bleeding disorders, their families, their healthcare providers, school personnel, coaches, activity instructors and trainers is vital. If injuries occur, people should always receive early and appropriate treatment.
5. It is important that people with bleeding disorders be physically fit. Joints that are supported by well-developed muscles are better able to withstand the traumas of daily living. Improving flexibility, strength training, cardiovascular training and sports participation are all ways to achieve fitness.
6. There are many benefits to participating in sports and exercise. Starting at an early age can build a strong routine that will be beneficial throughout life!

Barriers to Being Active Quiz
What Keeps You From Being More Active?

Adapted from *Overcoming Barriers to Physical Activity*.
 Centers for Disease Control and Prevention.

<http://www.cdc.gov/diabetes/ndep/pdfs/8-road-to-health-barriers-quiz-508.pdf>

Directions: Listed below are reasons that people give to describe why they do not get as much physical activity as they think they should. Please read each statement and indicate how likely you are to say each of the following statements:

How Likely Are You to Say?	Very Likely	Somewhat Likely	Somewhat Unlikely	Very Unlikely
1. My day is so busy now, I just don't think I can make the time to include physical activity in my regular schedule.	3	2	1	0
2. None of my family members or friends like to do anything active, so I don't have a chance to exercise.	3	2	1	0
3. I'm just too tired after work to get any exercise.	3	2	1	0
4. I've been thinking about getting more exercise, but I just can't seem to get started.	3	2	1	0
5. I'm getting older so exercise can be risky.	3	2	1	0
6. I don't get enough exercise because I have never learned the skills for any sport.	3	2	1	0
7. I don't have access to jogging trails, swimming pools, bike paths, etc.	3	2	1	0
8. Physical activity takes too much time away from other commitments—time, work, family, etc.	3	2	1	0

How Likely Are You to Say?	Very Likely	Somewhat Likely	Somewhat Unlikely	Very Unlikely
9. I'm embarrassed about how I will look when I exercise with others.	3	2	1	0
10. I don't get enough sleep as it is. I just couldn't get up early or stay up late to get some exercise.	3	2	1	0
11. It's easier for me to find excuses not to exercise than to go out to do something.	3	2	1	0
12. I know of too many people who have hurt themselves by overdoing it with exercise.	3	2	1	0
13. I really can't see learning a new sport at my age.	3	2	1	0
14. It's just too expensive. You have to take a class or join a club or buy the right equipment.	3	2	1	0
15. My free times during the day are too short to include exercise.	3	2	1	0
16. My usual social activities with family or friends do not include physical activity.	3	2	1	0
17. I'm too tired during the week and I need the weekend to catch up on my rest.	3	2	1	0
18. I want to get more exercise, but I just can't seem to make myself stick to anything.	3	2	1	0
19. I'm afraid I might injure myself or have a heart attack.	3	2	1	0
20. I'm not good enough at any physical activity to make it fun.	3	2	1	0
21. If we had exercise facilities and showers at work, then I would be more likely to exercise.	3	2	1	0

Follow these instructions to score yourself:

- 1 Enter the circled number in the spaces provided, putting together the number for statement 1 on Line 1, statement 2 on Line 2, and so on.
- 1 Add the three scores on each line. Your barriers to physical activity fall into one or more of seven categories:
Lack of Time • Social Influences • Lack of Energy • Lack of Willpower • Fear of Injury • Lack of Skill • Lack of Resources

A score of 5 or above in any category shows that this is an important barrier for you to overcome.

_____	+	_____	+	_____	=	
1		8		15		Lack of Time
_____	+	_____	+	_____	=	_____
2		9		16		Social Influence
_____	+	_____	+	_____	=	_____
3		10		17		Lack of Influence
_____	+	_____	+	_____	=	_____
4		11		18		Lack of Willpower
_____	+	_____	+	_____	=	_____
5		12		19		Fear of Injury
_____	+	_____	+	_____	=	_____
6		13		20		Lack of Skill
_____	+	_____	+	_____	=	_____
7		14		21		Lack of Resources

For tips and tricks on being physically active
with a bleeding disorder at every stage in your life,
visit stepsforliving.hemophilia.org.

References

- ¹ Verburch M, et al. Physical exercise and executive functions in preadolescent children, adolescents and young adults: A meta-analysis. *British Journal of Sports Medicine* 2014; 48: 973-979.
- ² Babic M, et al. Physical activity and physical self-concept in youth: Systematic review and meta-analysis. *Sports Medicine* 2014; 44(11): 1589-1601.
- ³ Puetz TW, O'Connor PJ, Dishman RK. Effects of chronic exercise on feelings of energy and fatigue: A quantitative synthesis. *Psychology Bulletin* 2006; 132(6): 866-876.
- ⁴ Tiktinsky R, et al. The effect of resistance training on the frequency of bleeding in haemophilia patients: A pilot study. *Haemophilia* 2002; 8(1): 22-27.
- ⁵ Mulvany R, et al. Effects of a 6-week, individualized, supervised exercise program for people with bleeding disorders and hemophilic arthritis. *Physical Therapy* 2010; 90:509-526.
- ⁶ Herrick KA, et al. TV watching and computer use in U.S. youth aged 12–15, 2012. National Center for Health Statistics NCHS data brief, no 157;2014.
- ⁷ National Center for Injury Prevention and Control Centers for Disease Control and Prevention. Concussion Information Sheet. http://www.cdc.gov/headsup/pdfs/youthsports/parent_athlete_info_sheet-a.pdf Updated May 2015.
- ⁸ Mayo Clinic Staff. Concussion. Mayo Clinic 2014 <http://www.mayoclinic.org/diseases-conditions/concussion/basics/definition/con-20019272>
- ⁹ Ross C, et al. Athletic participation in severe hemophilia: Bleeding and joint outcomes in children on prophylaxis. *Pediatrics* 2009; 124(5): 1267-1272.
- ¹⁰ Lee BA, Oh DJ. The effects of aquatic exercise on body composition, physical fitness, and vascular compliance of obese elementary students. *Journal of Exercise Rehabilitation* 2014; 10(3): 184-190.
- ¹¹ Palsbo, SE. Epidemiology of recreational archery injuries: Implications for archery ranges and injury prevention. *Journal of Sports Medicine & Physical Fitness* 2012; 52(3): 293-299.
- ¹² Council on Sports Medicine and Fitness. Baseball and Softball. American Academy of Pediatrics. *Pediatrics* 2012; 129(3).
- ¹³ U.S. Consumer Product Safety Commission (CPSC). Age determination guidelines: Relating children's ages to toy characteristics and play behavior. <https://www.cpsc.gov/PageFiles/113962/adg.pdf> 2002.
- ¹⁴ Ellis J. Bicycle safety education for children from a developmental and learning perspective (Report No. DOT HS 811 880). Washington, DC: National Highway Traffic Safety Administration 2014.
- ¹⁵ Child Injury Prevention Alliance-Inflatable Bouncers. Child Injury Prevention Alliance-Inflatable Bouncers. <http://childinjurypreventionalliance.org/inflatablebouncers.aspx> 2016.
- ¹⁶ Policy statement on boxing participation by children and adolescents. *Pediatrics* 2011; 128: 617–623.

- ¹⁷ Williford H, Olson M. Selecting and effectively using an elliptical trainer or stair climber. *American College of Sports Medicine* 2010.
- ¹⁸ Hosea T. Selecting and effectively using a rowing machine. *American College of Sports Medicine* 2011.
- ¹⁹ Parcell A. Selecting and effectively using a stationary bicycle. *American College of Sports Medicine* 2011.
- ²⁰ Shields BJ, Smith GA. Epidemiology of strain/sprain injuries among cheerleaders in the United States. *American Journal of Emergency Medicine* 2011; 29(9): 1003-1012.
- ²¹ Council on Sports Medicine and Fitness. Policy statement: Cheerleading injuries: Epidemiology and recommendations for prevention. *Pediatrics* 2012;130(5): 966–971.
- ²² Solomon R, Russell J. Preventing dance injuries http://www.stopsportsinjuries.org/STOP/Prevent_Injuries/Dance_Injury_Prevention.aspx 2016.
- ²³ American Red Cross Water and Safety Instructors Manual 2014, Centennial Edition. American Red Cross <http://cdn1.thprd.org/pdfs2/document2721.pdf> 2014.
- ²⁴ Kravitz L. High-intensity interval training. *American College of Sports Medicine* 2014.
- ²⁵ Hak PT, Hodzovic E, Hickey B. The nature and prevalence of injury during CrossFit® training. *Journal of Strength & Conditioning Research* 2013.
- ²⁶ Inouye J, et al. A survey of musculoskeletal injuries associated with Zumba®. *Hawaii Journal of Medicine & Public Health* 2013; 72(12): 433-436.
- ²⁷ Nelson JT, et al. Disc golf, a growing sport: Description and epidemiology of injuries. *Orthopaedic Journal of Sports Medicine* 2015; 3(6).
- ²⁸ Akinbola M, et al. Ultimate Frisbee® injuries in a collegiate setting. *International Journal of Sports Physical Therapy* 2015; 10(1): 75-84.
- ²⁹ Hume P, Bradshaw EJ, Brueggemann GP. Biomechanics: Injury mechanisms and risk factors. *Gymnastics*. DJ Caine K, Russell L Lim. Chichester, UK, John Wiley & Sons, Ltd 2013.
- ³⁰ American Hiking Society. Health Benefits of Hiking <http://www.americanhiking.org/wp-content/uploads/2013/04/Health-Benefits-of-Hiking-fact-sheet.pdf> 2013.
- ³¹ Winkler Y, et al. Adult sports-related traumatic brain injury in United States trauma centers. *Neurosurgical Focus* 2016; 40(4).
- ³² Nationwide Children's Hospital. New Study Finds High School Lacrosse Players at Risk for Concussions, Other Injuries. <http://www.nationwidechildrens.org/news-room-articles/new-study-finds-high-school-lacrosse-players-at-risk-for-concussions-other-injuries?contentid=129470> 2016.
- ³³ Martial Arts Injury Prevention-OrthoInfo-AAOS. Martial Arts Injury Prevention-OrthoInfo-AAOS. 2016.
- ³⁴ Becker J, et al. A prospective study of downhill mountain biking injuries. *British Journal of Sports Medicine* 2013; 47: 458-462.
- ³⁵ American Canoe Association. Top 10 Safety Tips-Canoe-Kayak-SUP-Raft-Rescue. http://www.americancanoe.org/?page=top_10 2016.

- ³⁶ Siewe J, et al. Injuries and overuse syndromes in powerlifting. *International Journal of Sports Medicine* 2011; 32(9): 703-711.
- ³⁷ MacEwen CJ, McLatchie G. Eye injuries in sport. *Scottish Medical Journal* 2010; 55(2): 22-24.
- ³⁸ – Schöffl V, et al. Acute injury risk and severity in indoor climbing—a prospective analysis of 515,337 indoor climbing wall visits in 5 years. *Wilderness & Environmental Medicine* 2013; 24(3): 187-219.
- ³⁹ Schöffl V, et al. Injury trends in rock climbers: Evaluation of a case series of 911 injuries between 2009 and 2012. *Wilderness & Environmental Medicine* (no year); 26: 62-67.
- ⁴⁰ Downey DJ. Rodeo injuries and prevention. *Current Sports Medicine Reports* 2007; 6(5): 328-332.
- ⁴¹ United States Consumer Product Safety Commission. CPSC Staff Powered Scooter Study Shows Just 4 in 10 Victims Wore Helmets. <https://www.cpsc.gov/Newsroom/News-Releases/2005/CPSC-Staff-Powered-Scooter-Study-Shows-Just-4-in-10-Victims-Wore-Helmets-/2005>.
- ⁴² Thinkfirst National Injury Prevention Foundation Roller Sports Safety <http://www.brainline.org/content/2011/04/roller-sports-safety.html> 2011.
- ⁴³ Nord DA. Pre-Travel Consultation Scuba Diving <http://wwwnc.cdc.gov/travel/yellowbook/2016/the-pre-travel-consultation/scuba-diving> 2015.
- ⁴⁴ Porter EB. Common injuries and medical problems in singles figure skaters. *Current Sports Medicine Reports* 2013; 12(5): 318-320.
- ⁴⁵ Howes J, et al. The epidemiology of cross-country skiing injuries. *British Journal of Sports Medicine* 2011; 45: A20.
- ⁴⁶ Meyers MC, et al. Downhill ski injuries in children and adolescents. *Sports Medicine* 2007; 37(6): 485-499.
- ⁴⁷ Child Injury Prevention Alliance-Skiing & Snowboarding Safety. Child Injury Prevention Alliance-Skiing & Snowboarding Safety 2016.
- ⁴⁸ Committee on Injury and Poison Prevention. Snowmobiling hazards. American Academy of Pediatrics. *Pediatrics* 2000; 106(5).
- ⁴⁹ Council on Sports Medicine and Fitness. Strength training by children and adolescents. American Academy of Pediatrics. *Pediatrics* 2008; 121(4).
- ⁵⁰ Klick C, Jones CM, Adler D. Surfing USA: An epidemiological study of surfing injuries presenting to US EDs 2002 to 2013. *American Journal of Emergency Medicine* 2016; 34(8): 1491-1496.
- ⁵¹ Pluim M, et al. Tennis injuries: Occurrence, aetiology, and prevention. *Journal of Sports Medicine* 2006; 40(5): 415-423.
- ⁵² Council on Sports Medicine and Fitness. Trampoline safety in childhood and adolescence. American Academy of Pediatrics. *Pediatrics* 2012; 130: 774.

- ⁵³ Reeser C, et al. Strategies for the prevention of volleyball-related injuries. *British Journal of Sports Medicine* 2006; 40(7): 594-600.
- ⁵⁴ Junge A, et al. Injuries in team sport tournaments during the 2004 Olympic games. *American Journal of Sports Medicine* 2006; 34: 565-576.
- ⁵⁵ USA Water Polo Resources. <http://www.usawaterpolo.org/resources/college-information.html> 2016.
- ⁵⁶ Myers R, et al. Competitive wrestling-related injuries in school-aged athletes in U.S. emergency departments. *Western Journal of Emergency Medicine* 2010; 11(5): 442-449.
- ⁵⁷ Woodyard C. Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International Journal of Yoga* 2011; 4(2): 49-54.

The National Hemophilia Foundation (NHF) is dedicated to finding better treatments and cures for inheritable bleeding disorders and preventing the complications of these disorders through education, advocacy and research.

Established in 1948, the National Hemophilia Foundation has chapters throughout the country. Its programs and initiatives are made possible through the generosity of individuals, corporations and foundations as well as through a cooperative agreement with the Centers for Disease Control and Prevention (CDC).

For more information about physical activity with a bleeding disorder, please visit www.stepsforliving.hemophilia.org

If you have additional questions or require assistance, please call HANDI, NHF's information resource center: 800.42.HANDI, email handi@hemophilia.org or go to www.hemophilia.org



NATIONAL HEMOPHILIA FOUNDATION

for all bleeding disorders

7 Penn Plaza, Suite 1204, New York, NY 10001
(800) 42-HANDI • www.hemophilia.org
www.stepsforliving.hemophilia.org