

The FITT principle – training guidelines for aerobic fitness





Proper Exercise Guidelines

- **Health versus Fitness**

Will influence risk of injury

- **Frequency, duration and intensity**

- **High impact versus low impact and no impact**

Change in impact on legs from jogging to walking to water wading

- **Warm-up and cool down**

Important to ready heart for exercise, prevent drop in blood pressure, decrease muscle strain enhance range of motion



AEROBIC EXERCISE PRESCRIPTION – the FITT principle

- **F**REQUENCY - INCREASE THIS FIRST – AIM FOR 3-5 DAYS per week
- **I**NTENSITY – INCREASE THIS **LAST** - START LOW THEN WORK UP TO WHERE THE EXERCISE SEEMS “SOMEWHAT CHALLENGING” BUT NOT DEBILITATING (ALSO TRY TALK/SING TEST) – TARGET SOMEWHERE BETWEEN 60-90% OF MAXIMAL HEART RATE. *MAXIMAL HEART RATE IN ROUGHLY 220-AGE*
- **T**IME – INCREASE SECOND AFTER FREQUENCY - START WITH AS LITTLE AS A FEW MINUTES THEN WORK UP TO 15 TO 60. YOUR UNIT WORKOUTS MUST INCLUDE AT LEAST 20 MINUTES IN A TARGET ZONE (NOT INCLUDING WARMUP/COOL DOWN OR STRENGTH COMPONENTS)
- **T**YPE OF EXERCISE – CHOOSE EXERCISES THAT USE THE LARGEST AMOUNT OF MUSCLE TO GET THE MOST BANG FOR YOUR EXERCISE AND WEIGHT LOSS BUCK





Target Intensity Guidelines

Intensity - use talk test, Rating of Perceived Exertion (RPE) or Target Heart Rates to gauge intensity of exercise

RPE - rating system from 6 to 20 to gauge exertion

Target Heart Rates (60 to 90%) of maximal heart rate. Round up to nearest age to use chart

RPE	AGE	Target Range
6		
7 very very light	15	123 – 184
8	20	120 – 180
9 very light	25	117 – 176
10	30	114 – 171
11 fairly light	35	111 – 167
12	40	108 - 162
13 somewhat hard	45	105 – 158
14	50	102 – 153
15 hard	55	99 - 149
16	60	96 - 144
17 very hard	65	93 - 140
18	70	84 - 135
19 very very hard	75	81 - 130
20		



The Four Main Types of Aerobic Exercise Routines

- **Long Slow Distance (LSD)** – mild intensity – longer duration
- **Interval Training** – alternating bouts of high intensity and low intensity recovery periods for as little as 10 or 15 seconds up to a few minutes
- **Hill Work** – training with increased muscular load (i.e., running up hill, using a higher tension on a stationary bike)
- **Tempo or Threshold Training** – training at a constant challenging intensity pace near the anaerobic threshold



Benefits of the main types of aerobic workouts

- **Long Slow Distance (LSD) - TARGET HR around 70% of max.** LSD increases aerobic fitness, increases cellular enzymes and facilitates shift to fat metabolism, increase strength of connective tissue and ligaments, increases heat dissipation mechanisms and readies the mind for long distance events (i.e. marathon) and self efficacy. This workout substitutes longer time for lowered intensity. Elite athletes may work up to 4 hours during LSD training – [Gelindo Bordin example](#).
- **Interval or Speed Work – HR's reach upper levels of target zone 85 to 90% MAX during intervals and drop down to 70 to 75 percent during recoveries.** Increases exercise efficiency, increases muscle strength and helps reduce injury, increases lactic acid threshold and tolerance and may increase stride length, increases fast twitch recruitment, allows pace recognition, feel the pain, elicits final improvement in VO2 max. These are short intense workouts 20 to 40 minutes.



Benefits of the main types of aerobic workouts

- **Hill/Overload Work - Again challenging workout.** Heart rates rise up to 85 to 90% of max by top of hill interval and drops again on descent to 70 to 75% of max. Hill work increases leg strength, reduce injury and increase running efficiency, stride length and lactate acid threshold and tolerance, another method to increase VO2 effectively without added speed, less impact with uphill running than other running methods. These are also short intense workouts 20 to 40 minutes.
- **Tempo or Threshold Workout/Runs – also a tough workout, try to keep a consistent heart rate at around 80 to 85% of max.** Tempo runs are an outstanding means of improving VO2 Max & lactate threshold and tolerance – train for 20 to 40 minutes at that edge of a hard pace that requires most of your concentration and effort to maintain



What to do with those new to Training - LSD and Walk/Jog

- Encourage members *especially those new to regular aerobic exercise* to start their aerobic training on any piece of equipment with several weeks of LSD workouts and pick low impact regimens to start (walking versus running, walking on grass, pea gravel, mulch versus concrete etc).
- Later, I would suggest to your members to limit high impact exercise (running) to 2 days per week and cross train on other days. An army study found a 50% increase in injury rate going from a 2 day per running program to a 3 day running program in beginning runners.



A Few Concerns About Running

- It's a high impact Activity (both feet are off the ground at the same time – unlike walking)
 - These impact stress can effect weak spots across our “kinetic” chain – feet, ankles, shins, knees, hips, back even shoulders and neck!
 - These impact stresses can be reduced through reasonable training progression (walk/jog programs), utilizing proper running form, picking the correct footwear, utilizing proper foot strike, choosing shock absorbing running surfaces whenever possible
 - Incorporating cross training, stretching exercise and targeted strength training for musculoskeletal “run hardening and range of motion” is another way to prevent injury



What to do with those new to Running, LSD and Walk/Jog

- Someone not presently running? – To avoid injury, first make sure they have proper running footwear.
- Start them out walking for several weeks (4 or 5 weeks), for the entire duration of the aerobic portion of your class.
- During this time they should slowly be building up pace during these early weeks, working towards a 15 min per mile walking pace or better. They should also be increasing the incline of their walks if possible (try hilly routes for your class or encourage members to use some incline (3 to 6% grade) on the treadmill).
- Finally they should then slowly replace 10% of their walk with a short period of jogging – (for example jog for a 10 strides out of every hundred walking strides). Increase number of running strides by ten each week until reaching goal of a continuous LSD distance run for the duration of your class.



A Few Simple Rules of Running

Don't Run too often

Just as important as training days are your rest days. These give your joints and muscles time to recover. A two days break between runs can help build your strength, especially for those who are beginner and intermediate runners. Without these recovery days you will not only have a greater chance for injury, but many of you may not improve at all due to an insufficient recovery time.

Don't be a slave to your distance, pace or watch

Believe it or not running can be fun - but not if you make every workout all or none effort. Some days your mood, your sleep level, environmental conditions etc may just make running fast that day impossible. On those days just go out for a comfortable run maybe even running with a slower buddy and enjoy the scenery for a change



Simple Rules of Running

Always warm-up first. To Warm-up:

- Perform a series of low intensity whole body movements
- Then as you start you run start out with a few minutes of brisk walking and slow jogging before reaching workout pace

WARMING-UP IS DIFFERENT FROM STRETCHING!

Stretching a “cold” muscle may lead to increased injury rates!



A FEW SIMPLE WARM-UP EXERCISES, COMPLETE

10 TO 15 REPS OF EACH PRIOR TO STRETCHING AND EXERCISE

UPPER BODY	CORE	LOWER BODY	WHOLE BODY
SHOULDER CIRCLES	TRUNK TWISTS (KEEP SOFT KNEES)	KNEE LIFTS	MOUNTAIN CLIMBERS
SWORD DRAW TO CHEST OPENERS	SIDE BENDS	HEEL TOE ROLLS	HALF JACKS
PRESS AND ROW	ELBOWS TO KNEES	SIDE LUNGE	HALF SQUATS



Running Form Hints

■ Head

- You should try and keep you head still while running. Don't let it bob up and down. Your eyes should look forward, as if looking between the shoulder blades of a person running about 3 feet in front of you

■ Chest

- Keep you chest "open" to allow for easy breathing. Your chest should be slightly lifted upwards and outwards.

■ Arm Swing

- Swing through the shoulder, not with the shoulder. Your upper torso should not be rotating as you're running. If it does expect to put a direct rotational force on your knees and low back every time you take a step.
- Think about having a pin going through your shoulder directly from the side. Rotate your upper arm through this pin like a puppet.
- The range of motion is similar to that of drawing and shooting a six shooter pistol. i.e. you shoot straight ahead, not up to the Sun. In addition, when you return the pistol to your holster you don't put it in your back pocket but on the side of your hip.
- Your hands should be relaxed and not gripping tightly

■ Foot Plant:

- Most, but not all runners strike the ground first with their heel. Then ones rolls onto the outside of the foot and then gradually you roll inwards and pushes off with your big toe. The key here is MOST. The point at which you contact the ground, where you foot rolls, i.e. inwards abruptly or stays on the outside the entire time, and where you push-off all help to determine which shoe is right for you.



Now introduce the other types of Aerobic training regimen to your unit workouts

- Introduce or encourage members (who are now acclimated to running the entire distance) to try one day a week of interval, Hill or Tempo training. For all interval work encourage members to slowly accelerate and decelerate out of the intervals
- But remember - you will always have members in varying states of fitness and training. Even on a day when the entire unit is supposed to be running – some may still be walking, others walk/jog, others slow jogging and finally the fittest folk trying fast intervals or hill work.
- It is beneficial for the fittest folks to encourage the less fit by running with them periodically *but* if that's all they end up doing, they will quickly lose interest and faith in the benefits of the program for them. What can you try?



How can I meet the needs of this diverse group?

- On exercise equipment, it's no big deal. The fit folks merely choose a higher speed or a treadmill or workload on a spinning bike etc. to reach their target intensity and work right along side of a less fit counterpart on another piece of equipment.
- Outside on a group running day it might be tougher. How can they train to their fitness level yet still have some semblance of a unit training group!
- Formation or Indian runs are not the best answer. They do keep members in close proximity but only really benefit (and possibly overstress) the least fit. Your goal should be to try to assist and encourage everyone to succeed without pushing one person too hard or holding others back.



Try these four running ideas to keep the group together!

- **Staggered starts** – group folks by fitness and have the fittest start a set distance a few minutes later (or seconds later on intervals). After a few workouts you'll find the perfect stagger.
- **Staggered distances** – group folks by fitness and have the fittest run the longest distance for LSD or for their intervals. Again after a few workouts you'll find the perfect stagger.
- **Horn Blast Turnarounds**– start everyone at the same time and place – say 15 minutes later at your horn blast or other signal they turn around and come back to start. This way everyone will end together yet train at their own pace and this again could be used for distance runs or intervals.
- **Make the fittest folks speed walk, side shuffle or perform carioca drills, wear a chest vest etc,** during some interval work while the others merely jog – (watch though it they lose coordination if they fatigue or push themselves too hard)



EQUIPMENT

- SHOES
- SOCKS
- OUTERGARMENTS
- HEADWEAR
- SUNGLASSES/HAT/SUNSCREEN
- RUNNERS WATCH
- HEART RATE MONITOR

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- **TYPE – SELECT A RUNNING SHOE – DA!**
 - NOT AN AEROBICS, TENNIS OR BASKETBALL SHOE – THEY ARE MADE FOR LATERAL MOVEMENT WITH LESS CUSHIONING AND STABILITY IN THE HEEL WHICH IS WHAT IS NEED FOR RUNNING ALSO YOU WANT A TRAINING SHOE NOT A RACING FLAT
 - **PRICE – WHEN IN DOUBT DON'T CHEAP OUT**
 - ITS NOT ALWAYS THE CASE, BUT USUALLY MANUFACTURERS ONLY PLACE THEIR MOST EFFECTIVE CUSHIONING OR IMPACT DAMPENING STRUCTURES IN THEIR MORE EXPENSIVE LINES – SO BE WARY NOT ALL NIKE'S HAVE AIR, OR ASICS HAVE GEL OR BROOKS HAVE HYDROFLOW.
 - **BUYER BE WARE –**
 - IF YOU BUY THE SHOES AT DISCOUNT OUTLETS – ALSO BE WARY OF RETURN POLICIES AND “SECONDS”. SEEK OUT A REPUTABLE RUNNING STORE OR WEB BASED STORE RECOMMENDED *BY YOUR LOCAL RUNNER'S CLUB* FOR YOUR SELECTION. THEY WILL HELP WITH SELECTING THE CORRECT SHOE AND USUALLY HAVE A GOOD RETURN POLICY AND WEB STORES OFTEN HAVE EXCELLENT PRICES

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- **OUTSOLE** – THIS IS THE PART OF YOUR SHOE THAT ACTUALLY CONTACTS THE GROUND. IT'S OFTEN MADE OF THE HEAVIEST RUBBER ON THE SHOE (OFTEN TIRE GRADE) AND MAY BE REINFORCED WITH METAL OR OTHER STRONG FIBER HEEL PLUG. THE OUTSOLE WEAR DOES NOT LIE – ITS WEAR PATTERN PROVIDES INSIGHT TO YOUR STRIDE PATTERN. THE OUTSOLE IN THE HEEL AREA MAY BE VERY THICK AS THIS IS DEVELOPED TO WITHSTAND THE BRUNT OF THE THOUSANDS OF IMPACTS AS RUNNERS STRIKE THE GROUND WITH THEIR FEET.
 - **MIDSOLE** – OFTEN FIRST THING TO GO BUT YOU MAY NOT KNOW IT. IT IS COMPOSED OF A COMPRESSED FOAM AND IT MAY BE THE MOST IMPORTANT PART OF THE SHOE AS IT SUPPORTS THE ENTIRE LENGTH OF YOUR FOOT AND ARCH. OFTEN THE AIR OR GEL PADS OF SHOE ARE LOCATED IN THE MIDSOLE AREA. IT'S WEAR IS SOMETIMES SHOWN AS A YELLOWED OR WRINKLED APPEARANCE BUT YOU REALLY FEEL THE LACK OF SUPPORT AND CUSHIONING IF YOU TRY ON A NEW PAIR OF SHOES OF THE SAME TYPE.

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- **INSOLE** – THIS IS THE LINER OF THE INSIDE OF THE SHOE. ALL GOOD AND MANY POOR RUNNING SHOES HAVE REMOVABLE LINERS – IF YOURS DOES NOT THERE IS A **GREAT CHANCE** IT'S A CHEAPLY MADE SHOE. A REMOVABLE LINER IS A PLUS BECAUSE IT CAN BE REMOVED IF ORTHOTICS ARE USED OR JUST TO AIR AND DRY OUT TO PREVENT MOISTURE, MOLD OR FUNGUS GROWTH. ALSO IT CAN BE REPLACED WITH A NEW LINER IF NEEDED.

- **LAST** – IS THE FOUNDATION FOR THE SHOE. TO SEE WHAT TYPE OF SHOE YOU HAVE YOU MUST REMOVE THE LINER. SHOES HAVE THREE MAIN LAST TYPES
 - **BOARD LASTED** (ACTUALLY HAVING A HARD CARDBOARD LIKE FOUNDATION RUNNING THE ENTIRE LENGTH OF THE SHOE) VERY FEW IF ANY SHOES ANYMORE ARE BOARD LASTED. DUE TO THEIR EXTREME INFLEXIBILITY CAUSING THE FOOT TO BE OVERSTRESSED TO COMPENSATE
 - **COMBINATION LASTED** – THE BOARD MATERIAL RUNS UP TO JUST BEHIND THE BALL OF THE FOOT – THIS IS THE CHOICE FOR THOSE FOLKS WHO'S FEET ARE VERY FLEXIBLE AND TURN IN (PRONATE). THEY NEED THE EXTRA SUPPORT THIS LAST PROVIDES OR ELSE ANKLES, KNEES AND SHINS PAY THE PRICE
 - **SLIP LASTED** - WHERE NO BOARD IS PRESENT AND THE TWO SIDES OF THE SHOE ARE STITCHED TOGETHER ALONG THE BOTTOM OF THE SHOE. THIS IS A FLEXIBLE SHOE LAST AND IS OFTEN SUITABLE FOR FOLKS WITH HIGH TIGHT ARCHES AND INFLEXIBLE FEET – USING A BOARD OR COMBINATION LASTED SHOE WOULD AGGRAVATE THEIR PROBLEM

- **SHAPE** – THIS IS JUST WHAT IS SAYS – THE SHAPE OR THE SHOE. IF YOU LOOK AT THE BOTTOM OF A RUNNING SHOE YOU’LL SEE THREE MAIN SHAPES (ALTHOUGH MANUFACTURERS HAVE MANY VARIATIONS ON THE THEME)
 - **STRAIGHT** – THE BOTTOM OF THE SHOE LOOKS LIKE AN OVAL
 - **SEMICURVED** – THE BOTTOM OF THE SHOE LOOKS SLIGHTLY MORE “FOOT LIKE” THE HEEL AND FOREFOOT WILL BE SLIGHTLY LARGER THAN THE ARCH AREA
 - **CURVED** – THE BOTTOM OF THE SHOE RESEMBLES A CURVY FOOT. THE HEEL AND BALL OF THE FOOT WILL BE MUCH WIDER THAN THE ARCH AREA.
- **WHAT CHOICE TO MAKE HERE?** USUALLY MATCHING YOUR FOOT SHAPE WITH A SIMILAR SHOE SHAPE FITS THE BILL

- **THE HEEL COUNTER** – THIS IS THE BACK OF THE SHOE THAT CRADLES THE BACK OF YOUR HEEL. IT SHOULD BE MADE OF A RIGID MATERIAL TO KEEP YOUR ANKLE IN AN UPRIGHT ALIGNMENT. IT IS NOT MEANT FOR SIDE TO SIDE MOVEMENT. IN FACT PLAYING BASKETBALL AND OR TENNIS IN A RUNNING SHOE IS NOT ONLY BAD FOR THE SHOE BUT PUTS YOU AT RISK OF ANKLE SPRAIN BECAUSE OF THE RIGID HEEL COUNTER COUPLED WITH THE THICK TALL HEEL FOUND IN RUNNING SHOES. A NICE FEATURE IN A GOOD RUNNING SHOE IS AN ACHILLES NOTCH CUT INTO THE TOP OF THE HEEL COUNTER TO PREVENT FRICTION ON THAT PART OF YOUR FOOT.
- **THE UPPER** – THIS IS THE TOP OF THE SHOE AND MAY BE LEAST IMPORTANT. HOWEVER A GOOD SHOE SHOULD BE WELL VENTILATED, WELL STITCHED AND HAVE REINFORCED EYELETS FOR THE LACES. A NICE EXTRA IS FOR A SHOE TO HAVE SOME REFLECTIVE MATERIAL ON THE SIDES AND BACK FOR MOTORISTS AND OTHERS TO SEE AT A DISTANCE.
- **LASTLY** – YOUR SHOE SHOULD FEEL COMFORTABLE AND BEND FAIRLY EASILY WHERE YOUR FOOT DOES. OFTEN GOOD SHOES WILL HAVE DIAGONAL CREASES NEAR THE BALL OF THE OUTSOLE TO FACILITATE THIS. THOSE WITH PRONATED FEET (WHICH ROLL IN) MAY WANT SOME TYPE OF ANTI PRONATION DEVICE ON THE MEDIAL SIDE OF THE OF THE SHOE (OFTEN SHOWN AS A RUBBER SECTION OF DIFFERENT COLOR)

■ BASIC RUNNING SHOE TYPES

- **MOTION CONTROL SHOES** – MADE FOR PRONATORS NEEDING SUPPORT
- **STABILITY SHOES** – MADE FOR THE AVERAGE PERSON WITH NORMAL FOOT MOTION
- **CUSHIONED SHOES** – FLEXIBLE SHOES MADE FOR THOSE WITH HIGHER ARCHES AND INFLEXIBLE FEET



SHOES - FINAL WORDS

- **FIT** – HAVE A THUMB WIDTH AT THE END OF YOUR SHOE AND TEST AT END OF THE DAY WHEN THE FEET ARE AT THEIR LARGEST, AND FIT WHILE WEARING YOUR NORMAL PADDED RUNNING SOCKS – WATCH WIDTHS – NOT MANY RUNNING SHOES OFFER VARYING WIDTHS
- **REPLACE SHOES OR USE FOR GARDENING EVERY 500 MILES OR SIX MONTHS WHICHEVER COMES FIRST (PERIODICALLY TRY LEAN OR NEW SHOE WALK TESTS IF YOU STILL DON'T BELIEVE ME)**
- **DO NOT MACHINE WASH!** AND TAKE OUT YOUR LINER AFTER EVERY RUN
- Nice shoe links runnersworld.com or roadrunnersports.com



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- **SOCKS** – DON'T CHEAP OUT – BUY SOME RUNNING SOCKS THEY HAVE TIGHTER STITCHING IN THE ARCH FOR SUPPORT AND A THICK WELL PADDED HEEL PAD FOR ADDED COMFORT AND EVEN A LITTLE IMPACT ABSORPTION
 - **OUTERGARMENTS** – LIGHT COLORS WORK BEST, THEY SHOULD BE BREATHABLE, AN OLD SOFT WORN OUT T SHIRT IS OFTEN THE BEST, AVOID SHIRTS WITH LARGE SCREEN PRINTS IN FRONT. RUNNING RUBS YOU RAW? TRY RUNNING TIGHTS. REFLECTIVE TAPE OR MATERIAL ON CLOTHES MAKES YOU MORE VISIBLE
 - **SUNGLASSES/HAT/SUNSCREEN** – PROTECTION FROM ELEMENTS AND INCREASED DANGERS OF SUN EXPOSURE (SKIN CANCER EVEN CATARACT RISK) SPLASH HAT WITH WATER FOR INCREASED COOLING



■ **RUNNERS WATCH** – HELPS TO MONITOR IMPROVEMENT OR TO SET ALARMS TO SO DON'T LOSE TRACK OF TIME – BUT DON'T BE A SLAVE TO IT

■ **HEART RATE MONITOR** – SEVERAL TYPES TO CHOOSE FROM BUT CHEST LEAD VERSIONS ARE THE BEST – COSTS RANGE FROM 40 TO 300\$ HOWEVER YOU SHOULD BE ABLE TO GET A QUALITY HR MONITOR (INCLUDING WATCH, HIGH AND LOW HR ALARMS, TIME IN TARGET ZONE AND AVERAGE PULSE FOR WORKOUT) FOR AROUND 60 TO 80 BUCKS IF YOU SHOP AROUND.

■ **SPEEDOMETERS AND MORE!** – AVAILABLE NOW FOR THE REAL TECHNOGEEK! NIKE PRODUCES A TRAINING GADGET THAT INCLUDES A SPORTSWATCH, SPEED AND DISTANCE MONITOR, A HEART RATE MONITOR AND TRAINING SOFTWARE ALL OF WHICH IS DOWNLOADABLE/RELOADABLE BACK TO THE TRAINING UNIT!

■ **GOOD BOOKS** – The New York Marathon Complete Book of Running (by Fred Lebow), Galloway's Book of Running (by Jeff Galloway), nice websites - runnersworld.com or halhigdon.com

Exercising Safely and Stretching
*Reaching your fitness goals in one
piece*





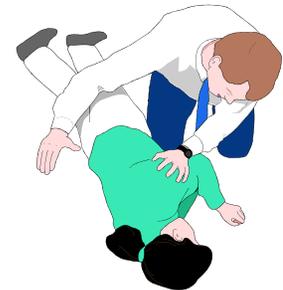
Benefits versus Risks of Exercise

- Benefits of exercise

Cardiovascular, muscular, skeletal, body composition, gastrointestinal, functional, quality/quantity of life

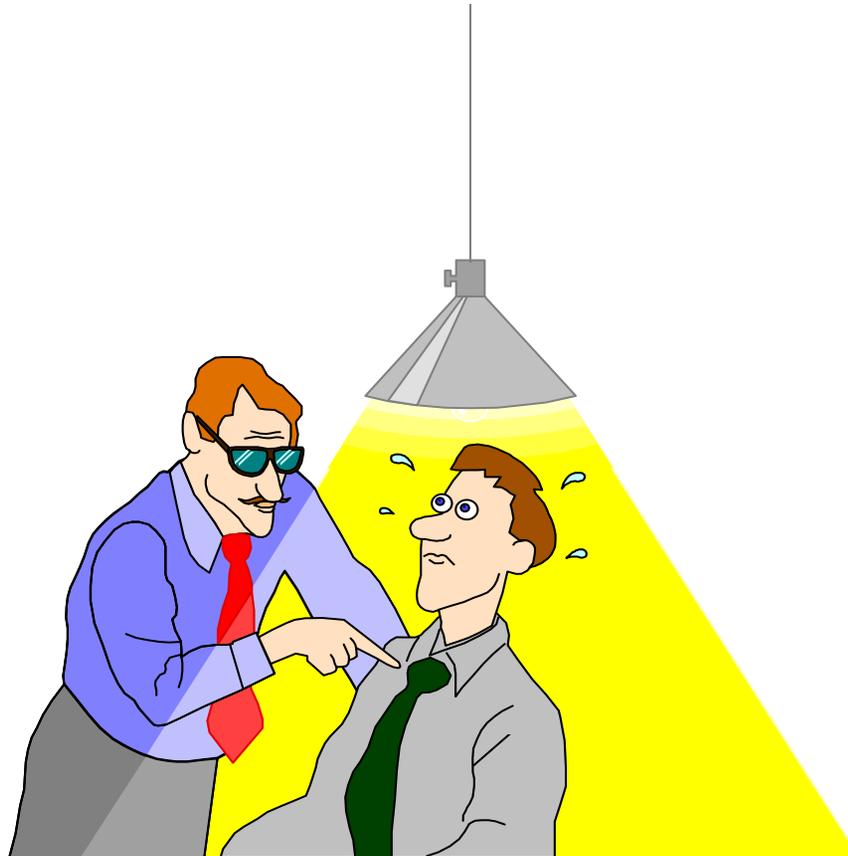
- Incidence of Sports Injuries Make a U Shaped Curve

Approximately 1/3 of runners, aerobic dancers or other exercise enthusiasts will experience an injury limiting his/her exercise for at least one week (40% of these or approximately 11% of the total will seek medical care). **So let's be careful out there.**



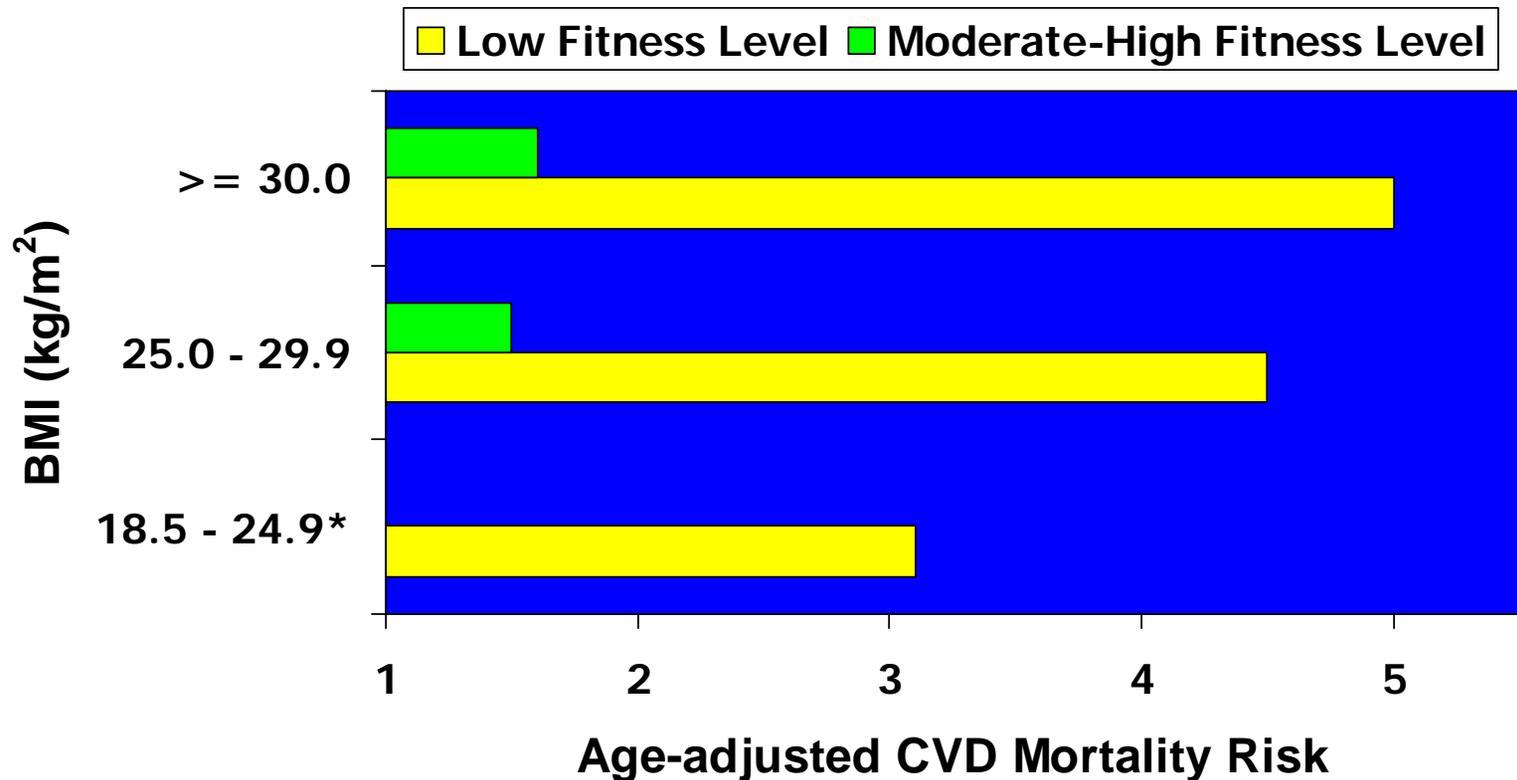
Risk of Not Exercising

- But sometimes a little run is just what the doctor ordered



Obesity, Fitness Level, and CVD Mortality

Lee, Blair and Jackson Am J Clin Nutri. 1999;69:373-380

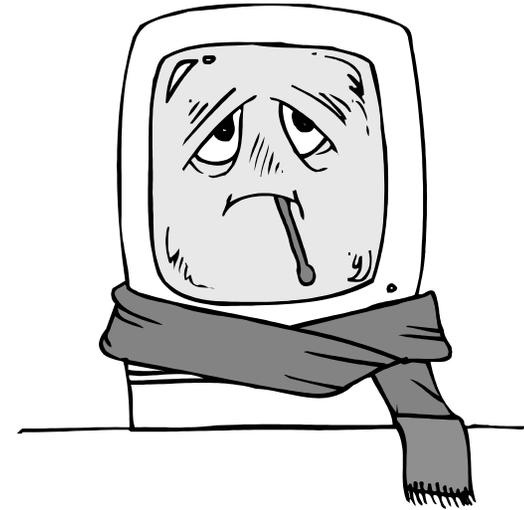


*Unfit, lean men had **2.2 times** the risk for all-cause mortality as fit, obese men

*All cause mortality rate of fit, obese men **was not** significantly different from fit, lean men

Inactivity and Bedrest

- V_{O_2}
- Cardiac Output
- Stroke Volume
- Heart and Blood Volume
- Oxygen Extraction Ratio
- Blood Characteristics
- Muscle Characteristics - Enzymes, atrophy, Substrates, etc...
- **Important to note** - fitness takes a much steeper dive with bedrest than compared with inactivity so try to at least get up and move around as soon as you can after an illness or injury





To Reduce Injury

-
- Build up fitness goals gradually
 - Make cross training part of schedule
 - Allow body to rest after challenging workouts



Recognizing Overtraining

- Excess fatigue when running - even on the “easy” days
- Poor workout performance
- Dreading your runs
- Disturbance in sleep patterns
- Feeling sleepy during the day
- Loss of appetite
- Upset Stomach
- Weight Loss
- Irritable
- Stiffness, soreness, tenderness in muscles or joints that doesn't let up

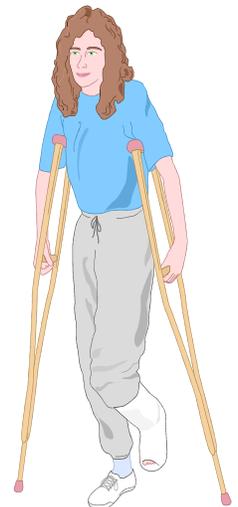


Respiratory Infections and Exercise

- Research at Appalachian State
- Too much of a good thing?
- Body works harder during stress don't add to it or it may fail on you
- Fever or recent fever - not the time to exercise

The Two Classes of Sports Injury

- **Extrinsic** – you screwed up
 - Training parameters, equipment and environment
- **Intrinsic** – you are a walking time bomb
 - Fitness level, body fat, anatomy, prior injury, age, smoking status, muscle strength, flexibility (extremes)





General Treatment for Sports Injury

Can't go Wrong when the PRICE is Right

- **P**rice: protect area if needed from further injury
- **R**est: Chose an alternate form of exercise for 1 to 2 weeks or until the pain stops
- **I**ce: Apply for 20 minutes 2 to 3 times a day
- **C**ompression: Snugly wrap area with an ace bandage to reduce swelling
- **E**levate: Whenever possible, elevate area above the level of your heart, or onto a chair while at work

How To keep Fit With An Injury?

- If your knee hurts try: stationary bike, cross-trainer, rowing machine or swimming.
- If your shins hurt try: stationary bike, stair-climbing machine, cross-trainer, or rowing machine. Injury most likely caused by doing too much too soon.
- If your back hurts try: the recumbent bike or cross trainer or swimming
- If your ankle hurts try: stationary bike with seat slightly lower and heel on pedal versus ball of foot, rowing machine, cross-trainer or swimming.



A Few Common Running Related Maladies

- **Iliotibial Band Syndrome (ITB) (runners knee):** pain usually located at the lateral or medial portion of the knee
- **Chondromalacia:** pain located at the anterior aspect of the knee
- **Shin Splints:** pain located at the anterior portion of the lower leg
- **Plantar Fasciitis:** pain located on the bottom of the foot near the heel
- **Low Back Pain:** usually caused by extra weight, poor ab strength, poor back fitness, & poor gait
- **Poor Carriage** – exhibited as turtle necked and slumped running posture



Try These Simple Treatments

- **ITB syndrome**– rest (cross train) and Ice, avoid cambered, large inclines roads and try ITB stretches
- **Chondromalacia** – prolonged rest, possibly incorporate a motion control shoe, utilize short range of motion mini squats, leg presses and step up as rehab
- **Shin Splints** – rest, ice, massage, get new or try motion control shoes, dorsiflexion exercises, increase stretching exercises of the gastroc soleus complex some trainers have decent results with taping
- **Plantar fasciitis** – heel cord stretches, avoid very stiff shoes, gentle arch rolls with iced pill bottle, heel lift and arch supports may help, taping and night splints (usually doctor prescribed)
- **Low Back Pain** – new shoes, change running surface, proper technique (land with bent knee), work on core strengthening, increase range of motion in hamstrings and hip flexors and strengthen quads and hamstrings
- **Poor Carriage** – strengthen your non mirror muscles by strengthening mid and upper back musculature and add stretches for tight chest muscles work on posture and add chin tucks to you daily routine
- **Good Running Program and Injury Link:** <http://www.runnersworld.com>



Treadmill vs. Outdoor Running

- Treadmills “may” absorb shock better (depending on surface) and weather isn’t an issue but overuse issues may play a role. In addition watch for fatigue, concentration and or form problems on treadmill as falls could be serious
 - Be careful as you change from the treadmill to running outside and vice versa.
- Treadmills actually help pull your foot backwards, thus you’ll need to increase the % grade to at least 1% to equal the energy requirement of running at the same cadence outside

Adjustments to Thermal Stress



- Vascular – blood shifts to and from body surface either to lose or conserve heat
- Muscular Activity – piloerectors muscles kick in and we also start to shiver to maintain heat in the cold
- Hormonal Output – hormones kick in to increase heat production and reduce fluid loss
- Sweating and Evaporation

- Drink ad libitum during exercise but don't force it. Aim for about 6-8 oz at 15 minute intervals
- Start rehydrating early in endurance events as thirst does not develop until 1-2 % body weight has been dehydrated
- Arrange running routes to accommodate water stops
- Check body weight and replace with two cups for every pound weight loss after the event but also eat and even push salty foods as I will mention later
- Before, during and after long runs - carbohydrate and electrolyte replenishment important (only intervention as of yet to decrease incidence on URTI's after hard training programs). Protein intake after runs also important
- Pleasant taste/colder temperature enhance drinking

- **Sports Drinks vs. Water:** If you are exercising for longer than 60 minutes a sports drink is more in order. Using sports drinks during long distance exercise has also been shown to reduce URTI elicited by overtraining.
- **The ongoing fluid and electrolyte losses from sweat and fuel use may not only lead to dehydration but also can lead to electrolyte disturbances/losses** (possibly causing *hyponatremia* a dangerous, possibly lethal condition) and glycogen depletion – **hitting the proverbial wall** during the event and causing a decrease in running speed.
- **Hyponatremia claimed the life one two women marathoners last year, one at the Boston and one at the Marine Corp Marathon.**
- This condition can be aggravated if extremely large volumes of water are consumed. Athletes should be encouraged to drink ad libitum but not force themselves to drink larger quantities than mentioned before. Athletes could also choose sports drinks or water combined with an orange or banana and even salty snacks such as pretzels to satisfy fluid, fuel and electrolyte needs.



Simple Ideas to Deal with Heat Illness

■ Heat Illness

- **Prevention** - acclimatize, prehydrate, FORGET PACE!!, use HR's and RPEs, monitor weight change, keep carbohydrate rich diet, exercise in colder parts of the day, wear breathable materials, take fluids along plan run to pass by rest areas where you could stop and get inside if needed.
- Official AF guidance has yet been published, but in the civilian sector, sport teams are suggested to shorten practices and make them less intense and not wear normal equipment and pads/pads at heat indices 90 or greater and cease practice of any kind at heat indices 110 or over. The heat index is a measure of the combination of the effects of heat and humidity. This data is posted daily in WPAFB.AF.MIL weather site under heading weather sensors, or USAtoday.com/weather/city forecast.
- Please check heat index each day prior to your program. Members should avoid high intensity workouts (intervals and tempo runs) and substitute a mild run/walk program on those days where heat indices rise to 90 or above. In addition, do not allow any 1 ½ mile testing at this time as well. All outside fitness programs should be cancelled if heat indices rise to 110 or above.



Simple Ideas to Deal with Heat Illness

- **Treatment** – in mild cases (headache, cramping, pale, dizzy) move out of sun to a cooler well ventilated area, gentle massage and stretches if cramping, push fluids, have subject remain calm and refer to physician if any there is any question as to whether the condition has abated
- **In extreme heat illness** (labored breathing, loss of consciousness, no sweating, dry very hot skin) – Call ER or transport to ER as quickly as possible and even cool subject as rapidly as possible (hose, ice packs) etc on the way



Simple Ideas to Deal with Cold Weather Concerns

- Cold Weather Concerns
 - **Prevention** – if exercising, you can dress about 20 degrees colder than normally expected because of exercise related heat production. However, dress in layers to trap body heat from leaving and allow you to moderate your body temperature better if you need to discard a garment. Breathable materials such as Gortex is the way to go – it keeps in heat but allows water vapor to pass out but stops wind and water from entering the garment. Make sure to cover all extremities! Utilize short looped running courses.



Simple Ideas to Deal with Heat Illness and Cold Weather Concerns

■ Col Weather Concerns

- **What are exercise limits in Cold** – again not determined yet from AFMOA, but I would suggest not exercising on unsure footing (ice or uncleared snow from a surface). Some members with asthma may have increased difficulty while breathing cold dry air. In addition those with diagnosed coronary vascular disease are placed at a added risk during cold weather wind chill exposure less than 32 degrees. These members - especially if complaining of discomfort - should work out indoors instead.
- However, according to the ACSM, for the average healthy normal exerciser (clothed properly in the cold), wind chills (the combination of wind and temperature) down to minus 10 degrees present little risk. So no need to curtail outside exercise when the temperature drops a little. Remember though to add running or cycling speed when you calculate wind chill. For example the wind chill with at a temperature of 0 degree F and no wind is equal to 0 degrees. But if you are cycling at into it at 15 mph its –36! Better make sure you have your full face stocking cap on that day. Again base and USA today websites have heat index and wind chill information.



Simple Ideas to Deal with Heat Illness and Cold Weather Concerns

- Cold Weather Concerns
 - Treatment - person may feel cold, goose pimples, shivering, numbness in extremities, fatigue loss of coordination,
 - Seek medical help in all but mild cases, but act quickly at the scene to remove person from cold environment, remove wet clothing, provide warm drinks, dry clothing and warm sleeping bag and find heat source, and warm areas gradually

Aerobic Machines on Base



Treadmills



Rowers



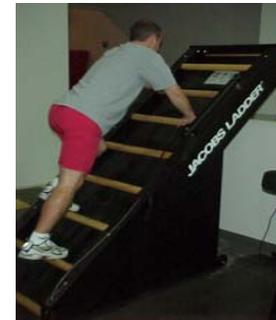
Upright and
recumbent bikes



Elliptical Trainers



Stair climbers



Jacob's
ladder



UBE



AEROBIC PROGRAM/CLASSES ON BASE



Base Running Events



Spinning



AEROBIC, STEP AND CARDIO KICKBOXING CLASSES



Indoor triathlons



Boot Camp



Sports



Boxing Club