Tuning Your Body – Part 1

-by Traci Pearson

If you spent as much time on your body as you do on your car, you would improve your driving and make racing more fun. You'd be nearly as fast on your last lap as your first and, in the event of an injury, you'd heal faster and more completely. Your lap times would drop, and you'd be a lot less beat up after racing. The more in shape you are, the better you can deal with the physical and mental demands of racing.

No matter what anyone else may think, racers are *real* athletes and racing is a true endurance sport. Racers heart rates are typically 80% of their maximum for the entire race, the same rate it should be at if you're running. And most runners don't run in 2 or 3 layers of Nomex® and a helmet, in a hot car.

Racing also takes strength, flexibility, and coordination. You're moving your body constantly: steering, braking and throttling, clutching and shifting. Your body is fighting high g-forces at the same time.

And, let's face it: age makes it harder to stay in shape every year. But no matter what age you are, you can become incredibly fit, which will not only help you race better but will delay aging!

So let's start tuning up your organic engine and chassis. By the time Spring rolls around, you won't believe the difference.

Getting Started

Use common sense. If you haven't worked out in a while, start slowly. Don't try to make up for time lost all at once. And *please* consult your physician before starting a new workout program.

• Pay attention to your body. Strengthening muscles means that you have to actually damage them first. That's the "burn" you feel when you're working out. But learn to be aware of bad pain or tightness, loud or painful clicking in your joints that doesn't feel right, next-day pain that doesn't go away within a day or two or even worsens.

• Stretch before and after every workout. Stretching before warms up the muscles and prevents injury, and stretching afterwards helps retain flexibility and avoid some of the next-day pain.

• Stay hydrated; drink water.

Don't let your workout routine lapse more than a day if you can avoid it. Racing every weekend is not nearly enough to stay in shape for racing. After two days, you actually start to lose strength and endurance, and after two weeks you will notice the difference. Plus, unless you've been working out a long time and have truly made a habit of it, you'll find it harder to get started again. Work out at least every other day or three times a week. If you want to work out every day, that's fine, but don't work the same muscle groups two days in a row. Work your legs and hips one day, your upper back and shoulders and arms the next, then go back to your legs and middle. This is far more efficient than stressing the same muscles day after day. Regularity is the most important part of any fitness program.

You don't have to work out an hour each day to make a difference. Recent research has shown that, if you're strapped for time, good 10-minute workout sessions, 2–4 times a day, are nearly as good as one or two 20-minute workout sessions. Also, vigorous workouts are only slightly more valuable than moderate workouts. In other words, an energetic 20-minute walk is nearly as good as a 20-minute run.

One thing you can do is to be constantly aware of your posture. Whether you're standing, sitting, or walking, stand, sit, or walk tall. Don't over-tense your spine, but keep it straight and keep your head balanced comfortably and straight above it. Shoulders comfortably back, abs tucked in. Picture a wire from the sky running down through your head and attached to the length of your spine, holding you up. If you do this, your body will fall into a natural, comfortable, healthy alignment.

Working on Aerobic Endurance

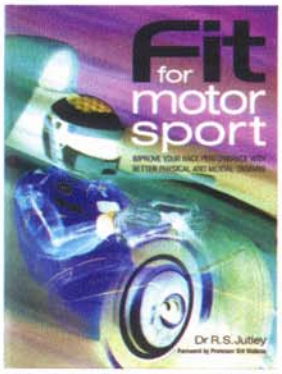
Building your aerobic or cardiopulmonary endurance is the best thing you can do for your racing. When your body tires, your judgment and concentration is affected and you're more prone to "brain fade" and accidents.

The key goal of endurance workouts, besides moving your body, is to raise your heart rate and keep it up for a while. For healthy adults, a good formula for figuring your maximum heart rate is: 208 – (0.7 x age). During your aerobic workout, you should try to keep your heart rate at 60–80% of your maximum. Be aware that this is only a guideline! Use your common sense and build up gradually if you need to.

Running is perhaps the best way to increase your endurance. But there's ways to exercise that are easier on your joints and more appropriate when you're just starting. Walking is excellent, but there's also biking, hiking, cross-country skiing, step machines, and elliptical trainers. Take the stairs instead of the elevator. Park at the far end of the parking lot. Try inline skating. Take a low-impact class at your community recreation center. Any physical activity where you move and keep moving will build your endurance.

Working on Strength

Building muscle tone (muscle endurance) is more important than building muscle bulk (raw strength). Which is not to say that lean, toned muscle isn't strong! But it can work longer and is more flexible.



***Fit for Motorsport*, by Dr. R.S. Jutley, published by Haynes Publishing.**

To build muscle endurance, work out with lighter weights using slow, controlled movements (concentrate on the muscles you're working on) and more repetitions. For racing, upper body strength and endurance is most important, but don't ignore your lower body.

The most important factor when exercising is your *form*. A good physical trainer can teach you the best form, but in general you want to keep your back and neck straight and your weight balanced.

• Free weights are better than machines. Free weights concentrate the work at a specific muscle or set of muscles but you also have to use small stabilizing muscles throughout your body at the same time, and you get a much better overall workout.

• When you're ready and able to, add some sort of balance challenge to your workouts. This will increase the strength and endurance of your core and stabilizing muscles. Instead of a bench, use a workout ball. You can also buy small air- or gel-filled disks to stand on. Your abs, lower back, and hip, knee, and ankle stabilizers will all become stronger.

• Don't overdevelop one set of muscles and neglect the opposing set of muscles. For example, if you build a strong chest and neglect your upper back, you'll find your shoulders persistently pulled forward, which can cause shoulder and neck problems and poor circulation and nerve function in your arms and hands. So if you work your chest, work your upper back just as much.

If you're going to spend money anywhere to start with, make an appointment with a good personal trainer. Working with her, figure out where you are now and where you want to be. Develop an exercise routine to start with, figure

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out when you'll know to add to that routine and what to add when you're there, and set some measurable goals. Learn good workout form from your trainer and never forget to use it!

There are a lot of workout systems out there. Some are better than others; some are more challenging than others. There are plenty of VHS tapes and DVDs of exercises and workouts. You see them on TV all the time. (Don't buy every little gadget you see on TV; most of them are gimmicks.) Go to your local library and check out some of their tapes or DVDs and see what you think of them and whether they will work well for you.

Working on Flexibility

Flexibility will not only help keep you from being injured if you're in a crash, but it will increase the speed and accuracy of your physical reactions in the car and increase your endurance.

Stretch before and after every workout; this will help keep you from injuring yourself while engaged in any physical activity. Stretch gently and don't bounce. Hold each stretch for 20–30 seconds. If you haven't stretched for a while, take it easy; your flexibility will increase over time. Also, by working on muscle tone instead of raw muscle strength, you'll increase your flexibility as well.

Working on Coordination, Agility, and Speed

Any sport or activity that increases your balance, coordination, agility, speed, and reflexes will improve your driving. Not only will you react more quickly and accurately but you'll be able to "feel" the car far better. Racquet sports, including handball, are excellent for this, as are martial arts. Any skill-oriented sport or activity that you enjoy will help.

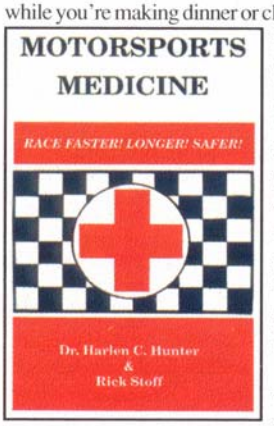
All-around Workouts

Tai Chi, yoga and Pilates are all excellent all-around workouts. They're easy on your joints and they work your entire body. Tai Chi and yoga are less intense and are quite calming. Need to relax? Try them! Pilates, depending on the style, can be challenging, but if you find the right instructor, you can start slow and easy and keep growing until you can do the tough workouts. Taking a martial art will not only increase your overall fitness but will sharpen your concentration, coordination, and speed.

Avoiding Burnout

Two of the worst problems that people run into when getting fit, healthy, and strong are getting bored and losing motivation. These can kill any fitness program. The most important thing is to be active and stick with it.

To avoid getting bored, spice up your workouts. Don't do the same thing day after day or even every other day. Figure out how to work out in front of the TV if you must. Get creative and have fun. Find more than one exercise for the same set of muscles. Put on some music to work out to! Dancing around while you're making dinner or cleaning your garage is a great cardio workout; if you like moving that way, go take a dance class! Find something you enjoy and go do it. Like to fish? Park your car a mile from your fishing spot and hike or bike in.



***Motorsports Medicine*, by Dr. Harlen C. Hunter and Rick Stoff.**

Working out with a partner can solve both problems; make a commitment to meet at a gym or trailhead once a week. Another way to help stay motivated is to write down specific, measurable goals and keep them with you. Think about and write down *why* you want to get fit and how great you're going to feel when you become stronger, have more endurance, and lose weight. Visualize yourself in a new, slimmer driving suit; see yourself bounding out of the car not completely worn out at the end of a race.

It can be intimidating to go to a gym when, honestly, you're really not in good shape or you've got a significant amount of weight to lose. You can certainly start at home, and you don't even need any fancy, expensive equipment. A set of weights or workout bands is nice to have, but there are plenty of things you have around the house you can use as weights: soup cans, bottles of water. Get inventive! If you're just starting out, you will not need heavy weights; if you want to, buy pairs of 2#, 3#, and 5# dumbbells. Wait until you're ready for them to buy the heavier weights. Just get started and then wait to see what you need.

For most people, getting fit and healthy, developing endurance and losing weight, can be frustrating at first. But the benefits are so great! Getting fit is as much a mental commitment as racing. You don't have to be a great athlete to be a good racer, and you don't have to run marathons or compete in power lifting competitions to be a better racer. A little goes a long way. A ten-minute walk every day, some efficient sit ups, a reasonable weight—these things *will* pay off on the track and in every area of your life. Working out improves your mood, staves off illness and injury, helps you sleep better, and will definitely improve your performance and enjoyment on the track.

A Note on Weight Loss

It is more important to be fit than to be thin. Skinny people are not necessarily fit or healthy! On the other hand, too much fat is hard on your heart and your joints and…well, we all know the evils of being overweight. Losing weight is not only significantly healthier, but, for instance, a 10-pound weight loss in a Formula Ford works out to be about 1 extra horsepower! Be careful losing weight; don't starve yourself and make sure you have plenty of energy for the race weekend. In general, losing 2 pounds per week is safe.

Losing weight simply for the sake of losing weight might not be your primary focus (unless your doctor has told you you're dangerously overweight and *must* lose weight). Focus on getting fit, active, and healthy and eating sensibly and you'll find the weight will come off anyway!

Resources

Two excellent books for race car drivers are:

• *Motorsports Medicine*, by Dr. Harlen C. Hunter and Rick Stoff. This book is out of print, but you might find a copy for sale online. You can also contact Dr. Hunter at 604 Heltonville Road East, Bedford, IN, 47421.

• *Fit for Motorsport*, by Dr. R.S. Jutley, published 2003 by Haynes Publishing.

My favorite online resource is:

• www.exrx.net

Stay tuned for Part II, which will introduce exercises and stretches recommended specifically for race car drivers! ■

Tuning Your Body – Part II

-by Traci Pearson

-photos by Andy Gould Photography

In part one of this article, I discussed how important muscle endurance is to your racing. This article covers some excellent exercises that will not only strengthen your body and build muscle endurance, but will greatly improve your overall health and quality of life and slow the aging process. Since muscle endurance is more important than raw strength for racing, use lighter weights, more reps, and slow, controlled movements. Once again, please consult your physician before starting a new workout program.

General Form Tips

Form is most important when lifting weights, not only to make each exercise as effective and efficient as possible but also to avoid injury. Again, I urge you to go see a personal trainer so you can learn the best possible form.

In general, keep your back straight and concentrate on the muscle groups you're actually working on. Never lock your joints, particularly your knees and elbows. Don't hunch your shoulders (except during the Shrug). When you're standing, keep your feet about shoulder width apart, maybe a bit more, with your toes turned out slightly. Keep your pelvis tucked in if you're standing straight; if you're bent over, a little sway in your lower back is OK. When doing exercises where you bend your knees, never let your knees go farther forward than your toes. Hold the weights as gently as possible. And always stop when something really hurts.

Most of these exercises have at least one possible variation, some of which I've listed here. These variations work slightly different muscle groups, and sometimes they can make the muscles work harder. For instance, you can hold your weights three different directions for exercises such as bench presses, chest presses, bicep curls, and tricep extensions, just by turning your hand so that your palm faces a different direction. By doing this, you'll be working the muscles a slightly different way. Another great variation is to just hold each exercise at its hardest point, where your muscles are doing the most work.

When you work out, start with the large muscle groups, then move to the smaller muscle groups. This wears out the naturally stronger big muscles first so the smaller muscles are forced to work and grow strong. Also, it's best to work the same muscle groups every other day, not every day.

How Much is Enough?

Ideally, if you have the time, the motivation, and the health, you should do a cardio workout (walking, jogging, biking, dancing, whatever) for 30 to 45 minutes, 3 to 6 days a week. Then you should alternate the rest of your exercises every other day (totaling 6 days a week). For your strength workouts, try to do each exercise twice during a workout (that's 2 sets), and try to do each move 20 times (that's 20 repetitions, or reps).

You may not, however, be able to do all of that. If you look at the exercises below, you could call the straight-leg deadlift a lower body exercise and do that when you work your legs. Same with your crunches. Maybe split these exercises into three groups and do them every third day. Or do only one set. If your chest muscles are particularly strong, skip those exercises and work on your upper back.

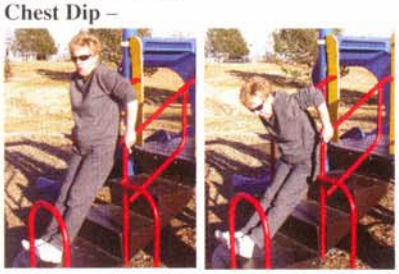
You can start all of these exercises without weights, then add weights as you feel comfortable. When you can do your second set of 20 reps easily, try a heavier weight for a third set. If you can almost do it, you're ready to do that exercise with heavier weights.

Upper Body Exercises: Large Muscle Groups

Pushups –

Keep your elbows close to your body and keep your spine straight and your body in line. Start on your knees and work up to where you can use your feet. Try balancing your hips or upper thighs on a workout ball. Eventually, try putting your feet up on chair.

Chest Dip –



Find a set of parallel bars on a playground or fitness walk; I've found that preschool playground sets have bars narrow enough to work quite well. This variation is a good place to start because you don't have to lift your entire body weight. Keep your body behind your hands as much as possible.

Tricep Dip –

Place your hands on the sides of a chair with your body in front of the chair, feet on the floor in front of you. When you're ready, put your feet up on another chair or on an exercise ball.

Paraspinals –

Get on your hands and knees on the floor. Extend your left arm in front of you and your right leg behind you, both parallel to the floor. Then switch sides.

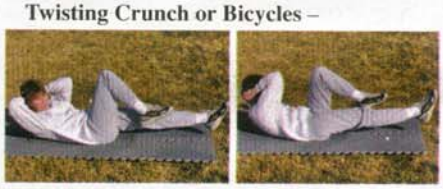
Straight-leg Deadlift –

Stand straight with your weights in front of your thighs. Slowly bend over from your hips, keeping your back and knees straight (but not locked). If you can go all the way to the floor, great. If not, don't worry about it. Go as far down as you can and then back up. This exercise works your lower back, the muscles that run from your skull to your pelvis, and your hamstrings.

Crunches –

We used to call these situps because we sat up all the way. But that's not necessary and is a waste of time. Keep your lower back flat against the floor and tighten your ab muscles throughout the exercise. Come up to about 45°; when your ab muscles start to disengage, you've gone too far. Make sure you don't use your leg muscles to help pull you up. Try this with your feet up on a chair or exercise ball. Don't strain your neck as if you were using it to lift you.

Twisting Crunch or Bicycles –



A twisting crunch is just like a straight crunch except that on one rep or set you move your left shoulder toward your right knee and then your right shoulder toward your left knee. A bicycle is a fast version of the twisting crunch and a nice cardio workout!

Upper Body Exercises: Smaller Muscle Groups

Bench Press –

You can do this on the floor, a bench, or on an exercise ball. Don't hunch your shoulders toward your ears; keep them pulled down and as neutral as possible. Try this with your hands holding the weights three ways: palms toward your head, parallel to your body, and toward your feet.

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Steering Wheels –


Extend your arms straight (but not locked) in front of you and rotate clockwise and counterclockwise as if turning a steering wheel. Don't hunch your shoulders, and use your upper back muscles as much as or more than your chest muscles.

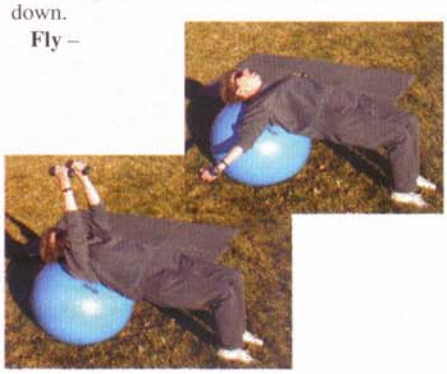
Shoulder Press –


Don't drop the weights below your ears. Try this with your hands holding the weights in three positions again, the same as the bench press.

Lateral Raise –


Do this exercise to both the front and the side. Start with your weights in front of or beside you, keep your elbows bent at least 10°, and raise your arms to shoulder height. Try this with your palms turned up, parallel to your body, and turned down.

Fly –



Best to use a bench or exercise ball for this. Lay on your back, arms extended above you, elbows bent at least 10°. Lower your arms straight out to the sides and back up. Don't hunch your shoulders toward your ears; keep them down and as neutral as possible.

Bent-Over Fly –


Bend over from your hips, keeping your spine and knees straight (but not locked). Bend your elbows at least 10°. At the top of the exercise, with your arms out to each side, squeeze the muscles of your upper back to get the most from the exercise, but don't hunch your shoulders.

Upright Row –


Hold your weights in front of your thighs. Bend your elbows to the side and lift straight up until your hands are at chest level.

Bent-Over Row –


Bend over from your hips, keeping your spine and knees straight (but not locked). Lift the weights to your side, keeping your elbow next to your body. Concentrate on squeezing the muscles in your upper back.

Shrug –


Hang your arms at your sides and just shrug your shoulders. Add to this by squeezing your upper back muscles at the same time, pulling your shoulders back.

Upper Body Exercises: Smallest Muscle Groups

Neck – Sitting upright and straight, place your right hand on the right side of your head and push your head against it using only your neck. Do the same on the left side. Place both hands behind your head and then on your forehead and push the same way.

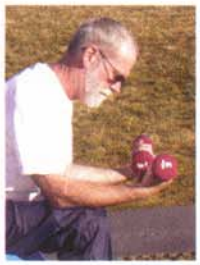
Bicep Curls –


Hold your elbow at your side, stand or sit straight, and concentrate on squeezing the bicep muscle, especially at the top of the curl. You can turn your hand (with the weight) three different ways on this exercise too.

Tricep Extensions –


You can do this standing, sitting, or laying on a bench. Extend your arms straight over your head, lower your weights behind your head and back up again. You can also use turn your hands three ways for this exercise.

Wrist Curls –

Brace your elbow against your side or knee and use only your hand and wrist to curl a light weight in your hand. You can do this all four directions. For the fourth direction (curling the weight outward toward your pinkie) you will need to lay your arm behind you, such as on a bench while you're sitting on the floor.

Special thanks to Bob (Formula Ford) and Diane (B Sports Racer) Alder for demonstrating these exercises, and to Andy Gould for taking the photos. And, yes, the third person in these pictures is me.

Stay tuned for Part III, which will discuss lower body excercises, plus age-related fitness challenges and how you can work to overcome them! *©2005 Traci Pearson • pearsontechcomm@frii.com* ■

Tuning Your Body – Part III

-story by Traci Pearson
-photos by Andy Gould Photography

In part one of this article, I discussed how important muscle endurance is to your racing. Part two introduced basic exercises to help you build the strength and endurance to go faster, safer, and longer. As promised, here are the lower body exercises to go with the upper body exercises shown in Part II:

Lower Body Exercises

Squat or Deadlift –


Stand with feet shoulder width apart or a little more, feet turned out just slightly. Lower your body until, if possible, your thighs are parallel with the floor, but do not let your knees go forward farther than your toes. Keep your back straight, let your butt stick out, and concentrate on your vastus medialis, the muscle just above your knee on the inside of your thigh. Add a soccer ball or similar size ball between and just above your knees and squeeze it to work your inner thigh muscles.

Lunge –

Step forward with one leg. Drop the back knee (lifting the back heel) nearly to the floor, then rise back up. Don't let your front knee go forward farther then your toes. You can also do lunges to the back and to the sides.

Step-ups –


This is an easy one! Stand on a step and step backwards with one foot and then back up without putting your full weight on your back leg. Keep your back straight and look straight ahead.

Hamstring Press or Pelvic Lifts –



Lay on your back on the floor. With your knees bent at about 45°, left your hips off the floor until your body is in line between your shoulders and your knees, then lower your body again. Try this with your feet on a balance ball for a great core workout too! Most people have one leg stronger then the other; to work on balancing your legs, hold one leg in the air, foot toward the ceiling, and do the exercise with only one leg. Don't do any more reps with your strong leg than you can do with your weak leg.

Calf Raises –


Stand with the balls of your feet on the lip of some sturdy surface, such as a step or hearth, with your heels hanging off. You can add a folded towel underneath for comfort. Lower your heels and raise them again, keeping your body upright. You can even start this exercise sitting on a chair, with maybe a phone book on your thighs for weight.

Reverse Calf Raises –


Stand with your heels on the same surface you use for regular calf raises, with your toes hanging off. Lower and raise your toes. You can also start this exercise sitting in a chair.

Age & Excercise

The remainder of this article addresses some of the natural physical changes we face as we age and how, by exercising, we can work to overcome or mitigate them.

The age at which certain physical changes begin to occur, the speed at which they progress, and the degree to which they become real problems are not absolutes. The following is simply a discussion of the challenges healthy people generally face as they age. Genetics play a huge part in your health and aging process, as does your past medical and physical history.

In general, we are at our greatest physical potential by the time we're about 25. After that, the body begins slipping; we have to work to maintain our strength, endurance, and flexibility and keep our weight down. The good news is that you *can* maintain and even improve your physical condition for years. After about age 50, the slope gets more slippery, but you can still create good physical health.

In our 20s…

Our muscle mass is at its greatest and our fast-twitch muscles (the ones we use for speed) are as good as they're going to get. We use oxygen most efficiently in our 20s. At the same time, our cartilage is already beginning to degrade.

To help preserve your joints, particularly your knees, build up muscle around the joints. The muscle absorbs some of the shock and strain your cartilage normally would. And it's fine to work out with heavy weights, low reps, and fast movements, to build up your fast-twitch muscles.

In our 30s…

Our physical endurance is excellent, and our mental and emotional maturity, experience, toughness, and motivation help us perform even better. On the other hand, we're just not as fast as we were. We're starting to lose bone density and our muscles start to weaken. Non-athletes' metabolism starts slowing; luckily this doesn't seem to apply to athletes.

Weight training builds bone density and keeps your muscles strong. As an athlete, you'll probably be even better than you were in your 20s.

In our 40s…

We become dehydrated faster; to compound the problem, our thirst response isn't as good, so real dehydration is possible. Our reaction times slow, but our maturity and experience can make up for that. Alas, we start shrinking. Our fast-twitch muscles degrade and we feel the burn of lactic acid build-up sooner. We're also beginning to lose our sense of balance and our fast reflexes.

Working out will generally only improve your slow-twitch muscles (the ones you use for *endurance*), but keep working to preserve your fast twitch muscles anyway. You should be doing balance exercises to preserve your sense of balance. Add a stability ball to your workout, take a yoga class, keep up your tennis game…anything that challenges your balance and reflexes. Don't forget that many athletes are at their best in their 40s.

In our 50s…

Both men and women are losing bone density, but women's loss accelerates because of hormonal changes (menopause). In general, small-boned people need to closely watch their declining bone density. Loss of muscles strength becomes more pronounced. Lung capacity degrades, but not drastically. And how many of us don't have reading glasses?

Again, weight training helps retain and even build bone density, along with sufficient calcium in your diet. Working out also helps maintain your strength. Keep up your cardio workouts to build lung capacity. And find activities that challenge and improve your hand-eye coordination.

In our 60s…

We naturally tend to gain a little body fat, although athletes tend to gain less. And, unfortunately, if we're a serious athlete or weight lifter, we might need to slow down a bit: we can actually accelerate loss of bone density by working out too much. Our joints are probably starting to bother us even if they haven't in the past.

So, take it a little easier. Limit your high-impact activities to preserve your joints and work out with lighter weights. At the same time, if you're cutting back your physical activity, you need to watch more closely what and how much you eat.

In our 70s…

Our sweat glands start shutting down and we're more susceptible to heat stroke. Our quadriceps (our front thigh muscles) have weakened, as have our hands and our trunk muscles. Surprisingly, our overall endurance can still be better than half what it was when we were 40! Also, loss of bone density slows and our heart rate generally gets better.

By your 70s, your physical changes slow; to put it bluntly, once you make it through your 50s and 60s, you generally age more slowly. Stay active! Pay attention to your body and don't push yourself too hard.

Is that it? Hardly! Plenty of people have fun and continue to play into their 80s and 90s, and there are more than a few 100-year-olds who still compete. "Master" athletes have completely blown away previous misconceptions about aging, fitness, and how you "should" act as you grow older. Physical activity, fun, and competition not only help you make the most of life but improve your mood and attitude.

Your body is an amazing machine, and if you give it the care and attention you give your race car, it will perform incredibly well for you. Eat well—you wouldn't put crappy gas in your car or overfill the tank, would you? Watch your weight—you keep your car as light and lean as possible, right? Spend time on your muscles and bones—you spend time on your chassis, steering, drive train, and suspension so that you can go as fast and as safely as possible on the track, so do the same for your body. Tune your lungs and heart and take care of them as well as you take care of your fuel system, brakes, and carb.

If you treat your body as well as your car, your body will help you race faster, longer, better, and safer.

For a "cheat sheet" of the exercises in part two and here, see the Victory Lane website (www.victorylane.com).

Thanks again to Bob (Formula Ford) and Diane (B Sports Racer) Alder for helping me demonstrate these exercises, and to Andy Gould for taking the photos.

To contact Traci Pearson e-mail at (pearsontechcomm@frii.com). ■

Race Prep for Your Body

-by Traci Pearson

You all work out six days a week now, right? Getting in some decent cardio exercises and lifting those weights, aren't you? Well, whether you are or aren't, there's a lot you can do just before and during your race weekend to make sure you make it through the weekend as well as possible. You can plan what and when you eat and drink to build up and maintain your energy, keep your body as cool and as healthy as possible, and help your muscles and brain (your focus) last the weekend.

The following guidelines are great for race workers and crew as well as racers.

There's no one right way to get yourself through the weekend, and you probably already know a lot of what does and doesn't work for you, so use common sense when applying the following guidelines. Also, don't change your eating habits all at once; modify them gradually to see how effectively each change works for you.

Working Out and Stretching

Some say you should not work out the day before a race weekend; others say a light workout the day before is not a bad idea. Working out improves your mood, and a light workout can relax and uplift you. Just don't push your limits or wear out yourself.

Stretch before and during the race weekend. Be careful not to over-stretch, but keeping loose and limber all weekend will help keep your mind relaxed and focused and your body free to function at its best. And, if you happen to be in a wreck, flexible muscles will resist injury.

Get plenty of rest and sleep before and during your race weekend.

Nutrition

You put good quality, correct octane fuel in your car the entire race weekend; why would you want to put crappy fuel in your body? Processed sugars and fatty foods, for instance, are just that: crappy fuel. Oh, a snack now and then is fine, and a diet too low in fats can contribute to low energy and depression, but they don't provide energy for your race weekend and actually sap your energy. Different foods are appropriate at different times before and during the race weekend, so you don't have to miss out on variety and taste.

Racers burn a lot of calories, so make sure your organic fuel tank is full. There are better ways to judge just how many calories (and no more) you need to ingest each day, but here's a decent rule of thumb for race days: your weight x 16 = the number of calories you will need. Of course, each of us has our own genetic, physical, and metabolic make up, and you may need more or fewer calories. Also, that number is only for race days or days when you're very physically active. (For a sedentary person, for instance, on almost any given day, that number is more like your weight x 13.)

When you put fuel in your race car, it comes pre-distilled and ready-to-use. Your body, on the other hand, has its own miniature distillery—your digestive tract—to create your fuel. And your body stores fuel in more than one way, in more than one form.

The most obvious and least useful form of stored energy—fat—is where the body stores the extraneous calories it ingests. Your body also stores a lot of toxins in fat; talk about crappy fuel! And fat weighs a lot more than it's worth; remember that every extra five pounds of weight in a Formula Ford costs you _ horsepower. Your body has to expend a lot of energy and oxygen to burn your fat; if you burn fat for energy while you're on the track, you're using a very inefficient fuel source. Depending on fat for fuel during a race weekend is like carrying your big fuel can on the track with you, full of old, questionable gas from a rusting-out storage tank, and pulling to the side of the track every few laps to top off your little 1-gallon fuel cell.

The most useful form of energy your body stores is called glycogen, a form of glucose stored in your muscles and liver. Glycogen is super pure, specially formulated high-octane fuel for your body. It's easy to use and exactly what you need to get through a race. Glycogen comes from carbohydrates. Toss that low-carb, high-protein diet; protein is necessary for your body and essential for building muscle strength and density, but it's lousy endurance fuel.

Carb Loading

You've probably heard of carb loading, in which athletes concentrate on eating carbs—and storing valuable glycogen—before an endurance event. This is a valid practice. For two or three days before a race weekend, make sure 60 to 70% of what you eat is made up of carbs, and avoid fats. By doing this, you'll build up stores of pure glycogen fuel for your weekend.

Types of Foods

Carbohydrates – Cereals and grains (pasta, noodles, rice, and whole-grain foods) and fruits and vegetables are good sources of carbs. Fruits and veggies also add vitamins and minerals and a little bit of natural fat plus valuable fiber and antioxidants to your diet.

Sugar obviously contains carbs, but it's far too easily processed and usually stored as fat. Sugar peaks quickly in your system, giving you a short-term energy boost, but then your body overcompensates with insulin and the boost is followed by an energy slump that lasts much longer.

Protein – Our body uses protein to build and maintain muscle and connecting tissue, and protein is essential to our chemical, neurological, respiratory, and immunological systems. Just a few ounces of meat, fish, poultry, eggs, beans, and/or nuts each day satisfies those needs. Avoid red meat, eggs, butter and cheeses, as these contain a lot of fat, and avoid fried foods. Your body cannot store protein, so you need to eat it regularly, but it also requires effort by your stomach, liver, and kidneys to process, so avoid it during a race day.

Dairy – Dairy foods have a lot of good stuff in them but also a lot of fat. Opt for low-fat versions of milk and yogurt.

Fats – Fats are some of the best-tasting foods in our diet: rich sauces and gravies, dressings, marbled red meats, butter and cheese, ice cream, and junk food. Eat these sparingly.

Race Days

Until the end of the day, avoid proteins and fats, which won't help your energy that day and take too long to digest. Avoid sugary, salty, 'heavy,' and fried foods. Avoid anything that might upset your stomach. Avoid coffee and soft drinks or drink only a little; that caffeine won't do you good for very long, and can dehydrate you.

Eat a good-sized breakfast two to three hours before your first track session, then eat small meals or snacks throughout the day. Four to six smaller meals a day are better than three big ones.

Concentrate on cereals, grains, and fruits, keeping in mind that whole grains are best for you. Forgo hamburgers and hotdogs, fries and chips. Fruit and fruit juices (100% juice is best) and granola bars make good snacks. Remember what is good for you and what you should avoid, and you can come up with a wide range of good-tasting, nutritious foods and snacks.

For dinner, add some protein to make up for the muscle work you did during the day, but don't gorge yourself. If you're racing a two-day event, keep eating those carbs, because you're going to need your glycogen stores replenished for tomorrow. Watch your alcohol intake in the evenings.

Hydration

Making sure you stay properly hydrated throughout the race weekend is even more important than eating properly. Your body is 70% water; your blood is 90% water. Water is critical to proper muscle, organ, and nerve and brain function and is also your body's primary cooling mechanism, whether through radiation, respiration, or sweating.

As you start to become dehydrated, your blood pressure rises and less oxygen and nutrients are delivered to your muscles, organs, and brain. Then come fatigue and loss of coordination and mental alertness. You may get muscle cramps. As you become more dehydrated, your pulse climbs, and later you get dizzy, nauseous, and weak. Further dehydration, and your respiration rate soars as your body tries to dissipate heat using your lungs. Just a little more dehydration and you're looking at heat stroke, organ damage, even death.

Be aware, however, that drinking too much water can also impair your mind and body and land you in the hospital. In recent years, because of the importance placed on athletes staying hydrated, there have been isolated incidents of endurance athletes collapsing from electrolyte imbalances after drinking more water than their bodies can handle. But those incidents are far more rare than incidents of heat stroke and collapse brought on by dehydration.

Since racing is not only a vigorous physical activity but usually undertaken in warm or hot weather, you must make sure your body has enough water to properly regulate its temperature. Unlike a marathon runner, you can't wear a tank top and shorts; you're wrapped toe to neck in Nomex® and wearing a helmet on top. Formula and sports cars have natural air conditioning but no protection from the sun. The heat inside a production car can reach 150° or higher. Worse, as you age, your ability to regulate heat wanes and your thirst mechanism (which tells you when and how much to drink) starts malfunctioning.

You are likely to use a couple gallons of water during a race day. So drink plenty—and plenty of the right stuff.

Pure water is almost always best for you. Coffee and caffeinated drinks can dehydrate you. Soft drinks and sport drinks usually have too much sugar, which can lead to a low blood sugar energy slump. Water is absorbed faster alone than in a sport drink. Some sources say cold or cool water is best; some say room-temperature water is best. It's probably not good to drink a whole lot all at once; 10 or 12 ounces every 15 to 30 minutes should do it. If your races are only 20 to 30 minutes long, you probably don't need water in the car with you. In that case, you could probably drink a sport drink—try diluting it with some water—just before you get on the track. Also, if you are sweating, have some sport drink along with your water to help maintain the salts

(phosphates and chlorides and sulfates and whatnot) in your body. Throw away the salt tablets; they're outdated and counterproductive.

Start drinking more than usual two or three days before the race weekend. You will start the weekend well-hydrated.

An excellent gauge of whether you're getting enough water is (ugh) the volume and color of your urine. If you're peeing fairly regularly and your urine is clear or pale, great! If you're not peeing much and your urine is dark yellow and smells strongly, you're dehydrated. If you're not peeing at all, you're probably already in trouble.

Have other racers, workers, and crew keep an eye on you; they'll probably notice signs of fatigue and dehydration before you do.

Don't rely on your thirst response to tell you when and how much to drink. It kicks in too late and shuts off before you're fully rehydrated.

Hot and Arid Environments

If you're from someplace cool and racing someplace hot, avoid air conditioning. Your body will acclimatize to the heat better and faster. If you're in good physical shape, you'll adapt much more quickly than if you're not.

In low humidity, your sweat evaporates so quickly you might not even know you're sweating. If you're coming from someplace humid to someplace dry, you'll have to drink more than usual and more than you expect. The positive trade-off is that the low humidity will make high temperatures more bearable.

Resources

Again, I recommend two excellent, current books:

• ***Motorsports Medicine**, by Dr. Harlen C. Hunter and Rick Stoff. This book is out of print, but you might find a copy for sale online. You can also contact Dr. Hunter at 604 Heltonville Road East, Bedford, IN, 47421.*

• ***Fit for Motorsport**, by Dr. R.S. Jutley, published by Haynes Publishing.*

These books are comprehensive, far beyond what I've covered here and in previous articles. ■