

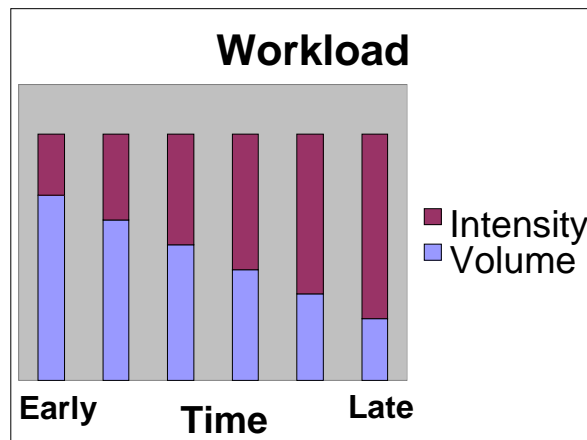


The Relationship between Volume and Intensity

Coaches need to understanding the relationship between volume and intensity when developing season and daily practice plans. There are some basic principles that if applied, will aid the coach in enhancing the development of the athletes. When I recently attended the Canadian Sport for Life Conference in Ottawa and the Ontario Basketball Talent ID Sessions I was reminded of this fact.

Istvan Balyi, an expert in periodization, made a presentation on planning and tapering. He pointed out that the given workload of a practice session is made up of two essentials ingredients:

- intensity – how hard the athlete pushes him/herself
- volume – how long the athlete works



The key relationship that coaches must remember is that:

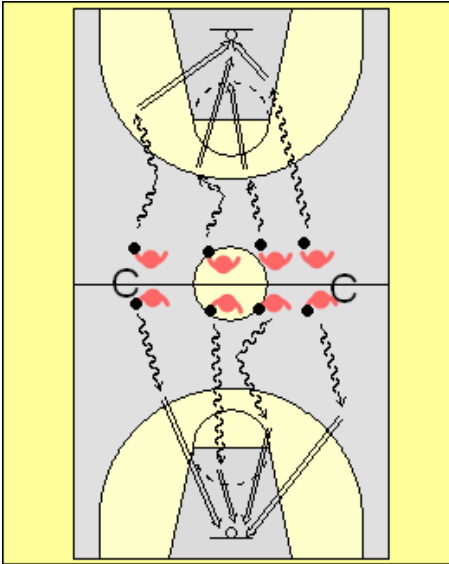
- Early - high volume / low intensity
- Late - low volume / high intensity

| | Early volume | Late intensity |
|----------------------------------|--|--|
| Season plan / weekly plan | Length of practices - long Build capacity of energy systems | Length of practice – short Build power of energy systems |
| Daily practice plan | Start with activation of the aerobic system (long slow activities). | Finish with higher intensity activities that use the anaerobic lactate system. |
| Age of the athlete | Young players need a high volume of activity in a variety of sport. This allows them to learn the fundamental movement skills such as, running, jumping, pushing, pulling, twisting, bending and coordination. Young players cannot handle activities that produce lactic acid. They will stop and have to rest. | As players mature they do not need to spend as much time, or quantity, of practice on repetitive situation which they have already mastered. What they need are quality experiences at a high intensity. |

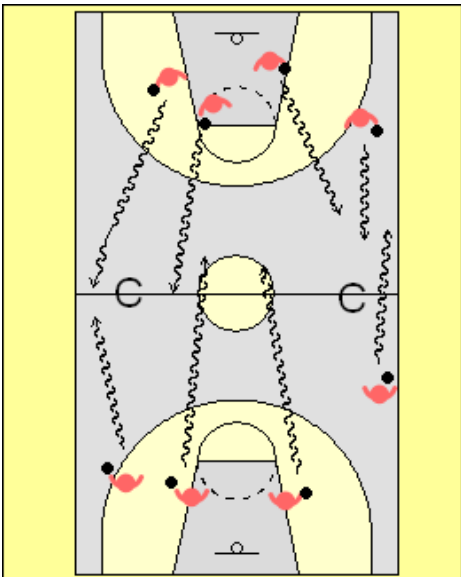
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| Acquisition of a new skill / concept | When first learning a skill/ concept players need lots of repetition at a slow pace. | Once a skill has been consolidated the challenge is to apply the skill with greater speed and variation (decision making). |
| Concentration | Players need to be taught the importance of many different factors that may impact their performance. | To reach the high performance zone athletes need focused concentration on the key elements that are important to them. |
| Team building | Players need to spend time together in order to get to know one another. | Players need to be able to honestly communicate with each other. Truth over harmony. Need time to him/her self. |

Remember that this is not a pure science. We must always apply the **Goldilocks Effect** when dealing with people. This means is that too much or too little of something has the power to do harm. The key is to find what is just right. Be careful using principles as an absolute. Coaches must learn to pay attention to the subtle signals that their athletes will give, when making the final determination of what is just right. I do suggest that coaches log their practice plans and make use of field tests to judge the fatigue of the athletes. Some examples of things I have used or seen done:

- Always be alert to what is happening in their life outside of basketball. Exam time or monthly test week can be a time of more stress.
- Watch out for flu and colds on the team. Too many people at one time may indicate you have crossed the barrier. It is interesting to note that after you train your immune system is more vulnerable to disease. Athletes should be particularly alert to washing their hands and not sharing water bottles, or putting their hands in their mouth or nose. A basketball that has bounced on a dirty floor is a great way to spread germs.
- Jack Donohue taught me to watch the eyes and body language of your players when you bring them in at the start of practice. If you see a lot of tired people you may have fatigue on your hands.
- Record morning heart rates. If you notice a raised heart rate it can be an indication of fatigue.
- Talk to your players. Ask them how they feel.
- Field tests
 - Istvan Balyi used to have players perform five consecutive long jumps at the end of the warm up. By comparing the distance covered with previous jumps in other practices he could judge the fatigue of individuals and the team. Note: You do not have to tell the players what you are doing. Some players can get very smart at figuring out how to get out of working hard.
 - I had certain drills that I did where I could judge our fitness. One was called bursts. The player went for 30 seconds alternating right and left hand lay ups. One worked while the other rested.
 - Dribbling from the foul line and back
 - Mikan
 - Block to block power
 We recorded the makes and misses. I was primarily concerned with the number of attempts. If I saw a drop off I knew the players were fatigued.
 - Mark Walton does an excellent drill, fastbreak shooting, with our NEDA girls that again, allows you as the coach to judge fatigue.



All the player line up at half with their own ball. On the signal to start the players dribble to one of the main baskets and shoot a shot. The players are working on their shots off the dribble.



The player gets his/her own rebound. If the ball went in the player can dribble to the other end in the middle lane. If the shot was missed the player must dribble to the other end on the outside of the court. Have a coach or a pylon at half to indicate where to dribble.

The players will go for back and forth for **two minutes**. Each player records the number of makes and misses. At the end of the two minutes the players rest. I suggest you do an active rest and shoot foul shots for one minute. They now go for **one minute**. The goal is to get half of the number of reps plus one that they did in two minutes. For example, if they had 14 attempts in two minutes they are trying to get 8 in the one minute $\{(1/2 \text{ of } 14) + 1 = 8\}$. Variations:

- Go for one minute, rest 30 seconds and then shoot for 30 seconds.
- 30 seconds, 30 second rest, 10 seconds (two shots in ten seconds)

The easiest way to reduce volume is by lowering the length of time that an athlete practices. This can be done by:

- Shortening the length of a practice session
- Shortening the number of practices
- Shortening the length of time of a given drill

As basketball coaches we are often leery of giving up practice time. Basketball is a sport that requires teamwork and high levels of skills. If we stay away from practice for too long the fear is that we will lose our shooting touch or our team chemistry. I would tend to agree with this statement, but we do need to reduce the volume of practice late in the season or before the big game. For that reason it is best that we reduce the length of time at practice.

Increasing intensity is about practicing at game speed. As players learn skills and team concepts they need to be able to demonstrate the skills in a game like environment. This has to do with speed of execution and also the physicality that comes with game. Playing against defence means the intensity of decision making is also increased. The coach is constantly searching for ways to increase the intensity.

Too little intensity in practice

The athlete will not have success performing the skill in the game. When they try to use the skill at speed more errors will occur. Shooting is an example I see today. When I chart shots taken in games many are not the ones I see teams practicing. At a recent CIS game I charted the shots taken in the first quarter. The majority were dribble jump shots, bending and twisting to avoid defence and quick releases from odd angles. Most players never practice these shots in the traditional shooting drills we do as coaches.

Too much intensity in practice

We risk injury and fatigue. The energy systems needed to perform at high intensity are not infinite. Our aerobic capacity, the energy system used for volume, allows us to go all day, but at a slow pace. The anaerobic lactate and anaerobic alactic systems are short term energy providers. Therefore the body can only maintain a high intensity for so long. If we also go too fast too long we also risk injury. The more speed the more wear and tear on the body and greater the chance of collisions. Most injuries occur when we decelerate. The faster we go the more severe these decelerating forces on the body.

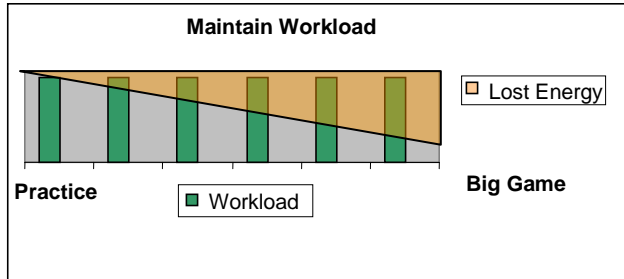
Don M^cRae, former women's national team coach, taught me the concept of planning my practice through the energy systems, not the basketball systems. I always found it a great way to plan practices. Warm up is about aerobic capacity (long and slow) we are increasing body temperature. If we start with high intensity, the players are vulnerable to injury. Also, if you produce lactic acid early in practice your players will not be able to perform later on. They become fatigued too early. Too often we get players warmed up and then have them sit while we talk. Introduce new items at the very beginning. In fact if there is a lot of talking, do this first before the warm up. We next move to speed activities, usually skill work; lay ups, dribbling etc. Finish the practice with the anaerobic lactate system. Your intensity can be high. Once you have produced lactic acid don't let the athletes sit for long periods of time and then expect them to perform at a high intensity again.

Some coaches have told me that this is not how a game is played. Sometimes you need to start hard and fast. I agree, but I hope you have warmed up before you play. If you jump out of the car and sprint onto the court you are risking serious injury and a poor performance. A proper warm up for a game works the same way with the energy systems. Start long and slow and finish with high intensity speed just before you play. You are now ready to play hard and fast as the game begins. If you do a NBA type warm up where the players never do speed they need the first few minutes to get ready.

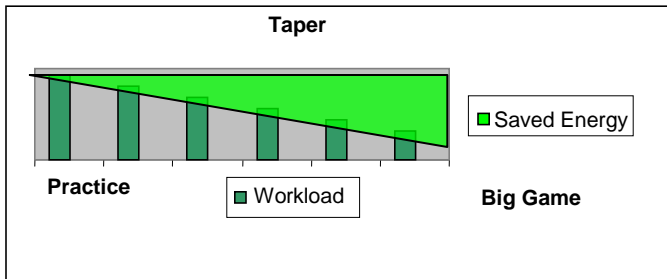
Tapering

The amount of work that a given athlete is able to do is not infinite. There is a finite amount of energy that each player or team can give in a training session. As we all know, through proper training (overloading a given system) a coach can improve the output of the athletes. Done right the coach can ensure that the players will be at their peak at the proper time of the season. When a system is overloaded the benefit of that hard work is not seen immediately the next day. In fact performance will decrease for a short period of time before the improvement occurs. It takes time for the body to recover. Therefore, if you work too hard too close to a major competition you will not see the benefit until weeks later. In fact if you work too hard you will try to compete when the players are in the natural decreased performance stage. On the other side if you try to peak for every game, peaking for Friday, you never overload the system and therefore never improve performance over time. In team sports we sometimes have to learn to train through competition. This means you cannot taper for every game you play.

When there is no taper, the volume of practice remains the same or worse the coach increases the volume by lengthening amount of practice before the big game. It is a trap many coaches fall into; the bigger the game the longer they practice. You need to think of the extra energy used in the practice as lost energy for the game. Many a big game, especially at tournament time, has been lost by having fatigued athletes.



When you taper, by reducing the work load, the energy not used is saved for the competition.



Remember this practice can be very intense but for a brief period of time.