

# TRAINERS JOURNAL

SECTION

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## Physiologic Automatism in Athletics

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IN THE performance of athletic feats, we notice that each individual tends to make certain automatic adjustments. A right-handed individual will throw naturally with his right hand, and as the right hand comes forward, he will transfer his body weight from the right to the left foot. One high jumper approaches the bar from the right, another from the left, in order to be in his best position for the take-off. These and many other automatisms enable the athlete to use his body to the best advantage. For this reason, they should not be tampered with by one teaching new skills. The skill should be taught in such a way that useful automatisms will be retained. Fortunately, most automatic adjustments persist in spite of instructions to the contrary. But meanwhile, any attempted changes through adverse teaching have resulted in a loss of energy, and a certain amount of confusion and inefficiency.

**Dominance.** This means that in accomplishing certain tasks, preference is shown to one part of the body rather than to another. Thus, the feet are dominant over the arms in most forms of locomotion, and in right-handed individuals, the right hand is dominant over the left in the manipulation of implements. Unless otherwise specified, the term dominance refers to lateral preference, that is, whether the right or left side of the body dominates.

The reason for lateral dominance is not difficult to find. It is due to a preponderance of muscle strength on one side of the body. This, in turn, is due to the arrangement of neural patterns. The nervous system operates in such a way that the favored side is innervated more strongly and more frequently than the non-dominant side. The dominant side is called upon to do more than half the work and in adapting itself to such use, it becomes superior in strength to the non-dominant side.

The high jumper takes off from his dominant (best) leg. Obviously the direction of his approach to the bar is determined by the position that must be achieved at the take-off. In other words, the whole skill must be built around this element, dominance. Any other procedure puts the performer under a handicap. He should be allowed "to put his best foot forward" as it were, if maximum achievement is his purpose.

Occasionally the purpose of learning a skill is to achieve symmetrical development of the two sides of the body. In handball, swimming or volleyball, it is important to cultivate the non-dominant side, so that the person will be able to add to his resources and minimize his vulnerability to attack.

Dominance may be classified as natural or acquired. Natural dominance is sometimes called basic or physiologic. Natural

dominance may be enhanced, or it even may be reversed by the process of conditioning. Certain unnatural, but socially approved, forms of dominance represent a reversal of the basic form. This occurs when a left-handed athlete learns to use a field hockey stick. The rules of the game do not permit the use of left-handed sticks, therefore every player must conform to the pattern of right-handed dominance.

A question that arises among trainers and coaches is, how is one to tell which side of the body is physiologically dominant? There are tests available for determining this characteristic. Although these tests have brought forth many useful and interesting facts, they need not be employed before teaching most skills.

It has been demonstrated, for example, that in starting a sprint the foot of the dominant leg of the runner must be against the back block if the natural sequence of movements is to result, and the fastest starting time performed. How is the trainer, or the coach, to know which leg of the sprinter is dominant? This question is answered simply by having the sprinter assume a starting position and observing which foot he puts back. If he has a preference for the right side, the right foot goes back automatically, but if the left is dominant, it is placed back. The sprinter needs no advice as to the relative position of the dominant leg,

since this comes under the heading of automatic adjustment.

It might be added, however, that there are circumstances where it is necessary to violate the law of dominance. An example of this is in some hurdle races where it is better to reverse the feet so that the take-off leg is in proper position at the first hurdle. In this instance, the coach may feel that the advantage, gained at the hurdle, overbalances the time lost in getting started. It is believed that, except on rare occasions, movement patterns should be initiated by the dominant side of the body. Where dominance plays a part it should be allowed to rule automatically.

**Movement Patterns.** In many sports certain movement patterns occur automatically. Even though an attempt is made to change them, they persist, and occur naturally in spite of any attempted change. For example, when a sprinter leaves his marks, a certain sequence of movements tends to occur. It has been proven that this movement sequence should occur naturally, without interference, if the best performance is to be accomplished. The first movement which a right dominant sprinter makes in leaving his marks is to lift his left hand. This movement is followed by the lifting of the right hand. Next, the right foot drives off followed by the left. In case of a left dominant sprinter, the sequence of movement is reversed accordingly. These patterns are reflex and should not be disturbed. In case they are, poorer performance results.

**Respiration.** There has been some tendency in the past to advise athletes concerning their respiration during sport performance. In many cases advice relative to respiration may lead to confusion and poorer performance.

There are three aspects to the question of breathing during athletic performance. The first has to do with attention, the second with the fixation of the chest, and the third with the adequacy of ventilation. As the sprinter awaits the command, "on your marks," he should breathe normally. However, as soon as he hears the command "get set," he takes a deep breath and holds it until the gun is fired. When a golfer is getting ready to drive the ball, he takes a deep breath. This occurs during the back swing. Then he holds his breath until contact with the ball is made. In fact, during any attentive process the breath is held in inspiration. This is a natural reflex pattern which provides for a certain amount of stability so that the arm and shoulder girdle muscles can move the arms more effectively in relation to the trunk. Since breath-holding facilitates paying attention, it should be allowed to operate undisturbed.

Just what to tell an athlete concerning breathing, while he is making a strenuous effort, has been much debated. Now, except in a sport such as swimming, it seems best to tell him nothing. Respiration is a process which automatically removes carbon dioxide and provides oxygen to the best advantage of the organism. The mechanism for doing this is largely under chemical control. Ventilation is increased when there is an excess of carbon dioxide in the blood.

There are certain advantages which may be taken of the process of respiration. Just before an athlete is called to his marks, especially in short races, he will profit by breathing deeply for a minute or so. This process has physiologic significance since by so doing the blood is rid of some of its carbon dioxide and thus respiratory activity may be reduced during the race. This practice has confused

some since they believed that extra oxygen was supplied to the cells of the body. This is an erroneous belief. Overventilation is concerned only with ridding the body of some of its carbon dioxide.

The use of pure oxygen has been introduced in certain swimming events as an aid to endurance. Such practice has been claimed to account for unusual performance by some. The use of pure oxygen introduces psychologic reactions which, no doubt, account for some of the beneficial effects. The mere fact that one believes that certain procedures are beneficial to performance actually results in better performance. This result has been experimentally proven. On the other hand, if pure oxygen is used properly a physiologic advantage may be obtained. To improve performance, the oxygen must be breathed after a period of forced breathing. Otherwise it is ineffective except for the psychic effect noted above. Experiments have demonstrated that one can hold one's breath in inspiration significantly longer after a period of forced breathing. The length of time the breath can be held after overventilation is then appreciably increased, if a few deep breaths of pure oxygen are taken. Although an athlete can attribute slightly better performance to the fact that he breathed pure oxygen before participating in some forms of sport, such an aid is not ordinarily advised.

We have pointed out only some examples of automatisms which are involved in sports. There are many others, some of which are peculiar to a single sport, others which are common to all. Since natural automatic adjustments are more adequate than any which man can suggest, better economy of performance results, if interference with them through teaching is avoided.

# The Analgesic Pack

By Frank Cramer

Cramer Chemical Company, Gardner, Kansas

ONE of the safest and most universally satisfactory training room treatments is the analgesic pack. Its use once learned, this simple bandage will work wonders for you. It will save time and money and speed recovery in deep bruises and bumps, where the skin is not broken.

Because of its many advantages, it will pay you to become proficient in its application, right now!

Nature accomplishes its rebuilding processes slowly. The blood stream must carry the required rebuilding materials into an injured area, but the swelling and hemorrhage that accompanies even a mild injury greatly reduces, or may even completely eliminate, circulation through

the area. The blood stream is also responsible for the elimination of breakdown products resulting from tissue injury. Insult is added to injury if these products are allowed to remain in the area.

Congestion in an injured area results from excessive stimulation of muscle tissue. The blood vessels, especially those carrying arterial blood, are very muscular, and are subject to wide variations in blood-carrying capacity. Injury in a given area markedly reduces the blood flow because of a spasm-like muscular activity, and this excessive activity may continue for hours, or even days, if something is not done to produce relaxation in these muscles.

Every trainer and coach knows the

value of heat in the production of muscular relaxation. Some, however, lose sight of the fact that time is also a factor in the production of complete relaxation. The process takes time. Relaxation, with the accompanying increased flow of blood and the resulting tissue repair and elimination of breakdown products, is not accomplished in a few magical seconds. The heat must be a sustained heat, lasting for hours, hence the analgesic pack.

## Reasons for Use

1. It is quickly applied.
2. Its heat lasts for from six to eight hours.
3. It produces sustained low temperature heat.

4. It may be applied to so many parts of the body.
5. The light, constant, firm pressure of the bandage acts as gentle massage.
6. This light firm pressure—constant for hours at a time—helps nature force the absorption of hemorrhage and extraneous matter. Swelling and pain are thus reduced.
7. It will not blister or damage the skin.
8. It reduces nerve tension by relaxing injured muscles.
9. Once applied, the athlete can attend classes and meals.
10. Left on over night, it works while you sleep.
11. It gives added support—where support is needed.
12. On a charley horse, it aids by lifting "the lump."
13. It is economical.
14. Only one application procedure need be learned, regardless of body area to be treated.

The analgesic pack is ideal treatment for the foot and ankle, including pulls of the tendons of the peroneus longus muscle. It may be used on shin splints, twisted knees, charley horse, groin, hands, wrists, elbows and shoulders. For low-back injuries, the pack should be prepared and

taped on, and should cover an area about a foot square.

To apply, cover the injured area with an analgesic pack about 1/8" thick. Cover the analgesic with four layers of kleenex or equivalent, and apply the elastic bandage. Tape to hold in place.

### Suggestions

The application of the elastic bandage should be snug, but should not retard circulation and should be loosened at night to allow for greater muscular relaxation.

When applying the bandage around the knee, always use cotton in the popliteal area. This will prevent injury to the tendons.

Where a knee is extremely tender, wrap with cotton before applying the elastic bandage. The cotton acts as a cushion.

The types of elastic bandages suggested are ace or tensor, or similar make. If you have old worn out supporters, cut them up and make them into elastic bandages. They will not look as nice, but will serve just as well.

Let the kleenex or cotton extend an inch beyond the place where you will start application of the elastic bandage—both top and bottom. In this way, the band-

age will not cut into the flesh or reduce circulation through the injured area.

In the case of a charley horse, if you wish to use the player, tape a shell pad over the top of the pack to prevent further injury.

When the bandage is used at night and is slightly looser, use more adhesive tape than usual, to secure it in place.

In treating a deep bruise, do not wait for swelling to appear—start treatments at once. Use cold applications for twenty minutes, and then apply a light pack. The injury needs the pressure immediately after it happens. Many experienced trainers apply a pressure bandage, then use the cold applications over the bandage. They even immerse the bandage-covered injury in cold water.

After the cold treatment, take the wet pressure bandage off and apply the analgesic pack as suggested above.

It should be needless to say that the analgesic pack has proved its efficiency in hundreds of training rooms all over the United States. The first thought in the mind of the successful coach or trainer is that of returning the injured athlete to the fray as quickly as possible, through the use of methods that are consistent with his comfort and well being.

# A Few Simple Training Rules

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**T**RAINING has evolved into a science which requires a thorough understanding of the human body, its structures, its functions and its reaction and adaptation to stress and trauma.

Only athletes in the finest of condition can stand the terrific wear and tear of a modern competitive season. Those in relatively poor condition scatter along the wayside, either "gone stale" or disabled by injuries. Thus, the proper conditioning of candidates for a team must be recognized as one of the most essential tasks of the coach and the trainer.

In the field of athletics, leaders have in general been safety conscious, but the information available and the understanding of the relative hazardousness of these activities and the nature of the injuries, as well as the causes of such injuries have been spotty. The public has gleaned its information from newspapers which tend to report only the spectacular, such as fatalities and injuries to players who through the press have been brought to the public eye.

It is not only necessary to know what are the hazards in athletics, when they occur and how they occur, but it is of paramount importance to know what to do when they have occurred and how to have prevented them.

How often have you heard the old adage, "All things being equal the team in the best condition will win." True,

isn't it? It's the little things that really count, in boxing a feint, in basketball a quick step, in football a little timing, and so on.

Training is considered by many as one of the little things in athletics, always being overlooked, always being put off, always pushed into the background by many coaches. Not so with the coach, however, who really concentrates on conditioning, realizing it is his most important duty to condition his squad. He gives up part of his program to the teaching of training to his squad.

Coaches should see to it or appoint someone to supervise bandaging of ankles, issuing of the socks, supports, shirts and shorts. Every week the squad should be given two complete changes, quite expensive but very profitable, in the long run. We all know that many a valuable athlete has been benched every season due to injury, infections that might have been prevented—if only—yes, if only they had followed this. Then you ask, how can we prevent such jinxes? By just doing it yourself. By checking the following items: First of all shoes, not just any

shoes. They are important—a blister and your team is hindered.

Ankle wraps, buy good ones, wraps that can be made to fit perfectly around the foot. Many coaches, trainers and student first aid men do not know how to strap an ankle with adhesive, but with a little practice, they can learn, and once they have learned, they use adhesive at every game. A coach should illustrate the right and wrong method and insist that each player wrap his ankles. The foot should be dry and painted with a foot hardening solution. After the solution has dried, the taping should proceed.

The following is what Percy H. Zuinlan, University of North Carolina, has to say about ankle injuries: "Many a valuable athlete is benched every season in every branch of sport because of an ankle injury. This, of course, should be remedied as soon as possible."

"The six best doctors, you'll agree, and no one can deny it, are sunshine, water, rest, and air, exercise and diet." You agree with the first five. Why not exercise your intelligence on the sixth one? Diet is more a question of quality and quantity than the kind of food. How the food is prepared is also important. Never overload the stomach. Fried foods should be eliminated. Scientific regulation of the athlete's diet is essential, if we are to succeed in our efforts to have him attain maximum efficiency.