ActivPower CANIS

CANINE KNOWLEDGE BASE • CONDITIONING SCIENCE

The Scientific Basis of Resistance Training

Background

The two largest problems in both human and pet health consist of skeletal and joint arthritic issues and obesity. Both problems are directly a consequence of lack of resistance exercise and mismatch of activity versus calorie intake. Todays harried urban residents have few opportunities for providing adequate exercise for their pets. The morning or evening walks are frequently no longer than potty breaks for a pet that has a sedentary house or apartment existence with no opportunity to burn the calories that it consumes. The same applies to the busy urban human.

Fitness experts have long known that the surest way to increase metabolic rate for sustained periods of time is to build muscle. Muscle is a physiologic blowtorch. A blowtorch at its lowest setting always burns hotter than a candle blazing at its highest setting. Similarly a muscle, even when resting, is constantly vibrating and burning calories. In addition the greatest protection of joints resides in the strength of the muscles controlling and stabilizing that joint. While ligaments, tendons and cartilage also contribute to joint health these structures are static load-bearers. That is the load bearing capacity of a tendon or ligament is fixed. It cannot dynamically adjust to varying loads that are put upon that joint as a consequence of normal or accelerated movement. It is the muscles around that joint which can dynamically adjust their load-bearing capacity that are the real protectors of the joint.

There is only one proven way to build muscle and that is to exert effort against resistance. This is what is called resistance training. This differs from cardio training which only builds cardiovascular endurance or stamina but does not directly build power. But resistance training always builds cardio AND power!

Joint Protection and Injury Resilience:

The joints of an animal or human are protected from wear and tear by a number of features:

Anatomic Joint Structure:

The structure and shape and accuracy of the fitness of the articulating surfaces of each joint directly contribute to smooth movement with minimal mechanical grind and wear and tear. Thus when the joint surfaces themselves are damaged or deformed or structurally poorly designed due to genetic factors such as joint dysplasia then there is excessive wear and tear from activities of daily living (ADL) that contribute to accelerated arthritis.

Ligaments:

The bones of every joint are held in optimal alignment by multiple ligaments and tendons that cooperatively bind the joint into the ideal anatomic position and orientation. These ligaments have a limited range of stretch and looseness and this determines to a large degree the range of movement of that joint. One of the reasons for the accelerated arthritis at younger ages that we see in the showline GSD is due to the increased genetic looseness

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(laxity) of the ligaments in these dogs. This increased laxity results in greater degree of micro-misalignments between the articular surfaces of the joints of these dogs as they go through their daily activities and this results in increase mechanical grind and wear & tear of their joints. Ligaments and tendons are static load bearers. This means that their load bearing capacity is fixed and cannot adjust. A ligament that will rupture at a 200 lbs load will generally always rupture at that load. Therefore ligaments are best suited to stabilize and anchor the range of movement of a joint within a predictable range of movement where there is no sudden variation in the forces that pull, push or twist (torque) on the joint.

Large Motor Muscles:

The prime movers of a joint are the large muscles that operate upon it. Large muscles like the quadriceps, hamstrings or iliopsoas contract and forcefully move the joints that they operate upon through the anatomical range of the joints movement. These large muscles also work to absorb the shock of impact when the animal lands upon the ground or on other surfaces during, walking, running or jumping. They do this by reflexively contracting and tightening milliseconds before each impact compresses the joint surfaces against each other. In this manner the large muscles operate to spare the joints from having to deal with the entire force of the impact that comes from movement. Thus cooperatively the large muscles daisy chain their impact absorbing function along the entire axis of the animal. The impact of a working dog launching into the helpers sleeve is no different than the impact of a wolf launching into a bull moose and the large muscles of the neck, shoulder, back and haunches cooperatively absorb, distribute and dissipate this force sparing all the joints of the spine, shoulders and hips in the process. If these muscles are not well developed, the force of this impact would have to be borne disproportionately by the ligaments and by the joints themselves. The result would be a serious injury that would put the animal out of commission whether in the working world or in the wild.

Small Stabilizing Muscles:

Separate from the large motor muscles that muscles that move a joint. Each joint has multiple small muscles that attach around it and perform vital stabilizing functions as the joint moves with power and speed. These stabilizer muscles are vital to enabling the joint to with stand sudden acceleration and deceleration forces or twisting (torque) forces during high intensity athletic performance. These stabilizer muscles provide the joint with vital dynamic load bearing capacities. This means that the stabilizing muscles allow the joint to smoothly tolerate complex, sudden and unpredictable changes in the intensity and direction of force on the joint. Building up these muscles is essential to creating injury resilience in a high performing athlete.

Rate of Repair:

Most people do not realize that in even the well-muscled canine, the load bearing joints are undergoing micro-injuries every day. These injuries constitute the normal wear & tear of living and the cumulative effect of this process is grossly understood by everyone as aging. But aging like all processes can be manipulated and tweaked to maximize functional lifespan. Apart from the genetics of the animal two modifiable factors are critical in slowing down this aging process.

a. Blood Flow to Target Tissues: Any tissue that receives increased blood flow will heal faster, function better and retain vitality longer. In this regard application of specialized post-exercise liniments to target muscle and joint areas in the golden hour after intense exercise will rapidly promote muscle recovery as well as joint elasticity and vitality. The best specialized post-exercise liniments function in 3 ways. (i) They rapidly penetrate the target muscle area and promote increased blood flow and deliver critical antioxidants that reduce toxic radical stress

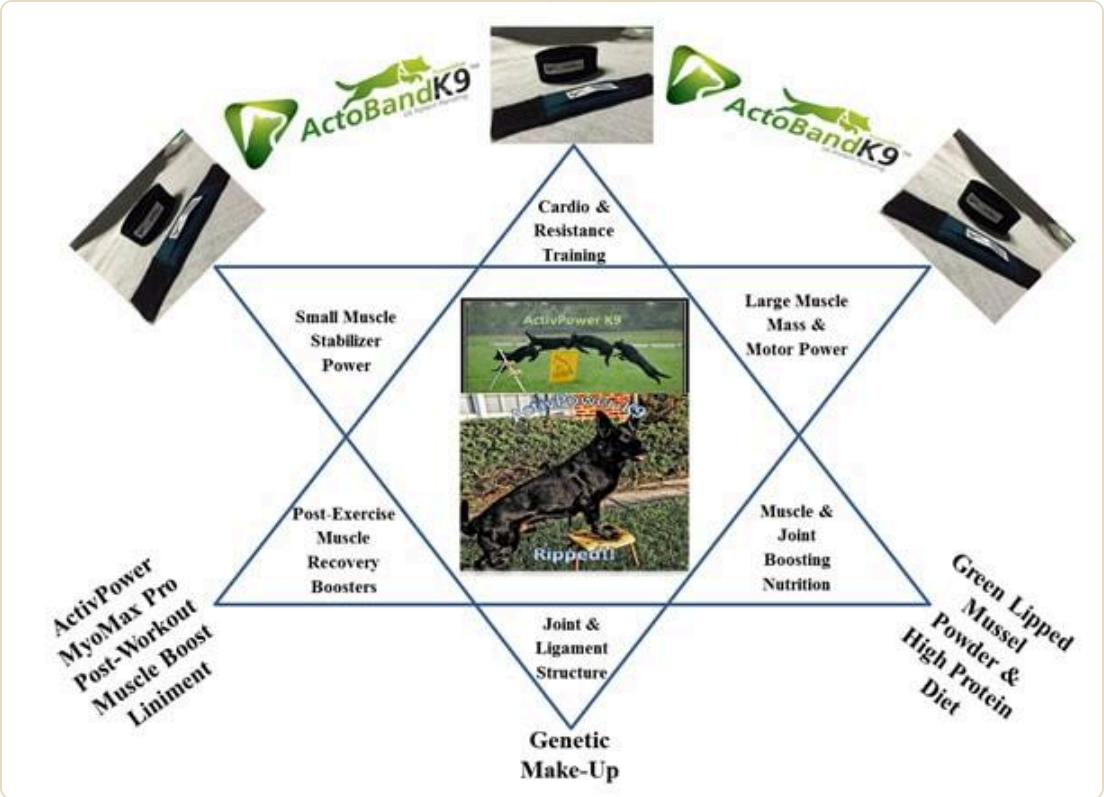
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and damage at the microscopic level; (ii) They relax and soothe tight muscles and ligaments; (iii) They decrease pain and restore mobility.

b. High Quality Nutritional Supplements: The subject of canine nutrition is one of the least understood and most contested of all subjects. But there are a few reliable pieces of information that can be used by most people without too much argument. (i) High Protein diets; It is generally accepted that for maximal benefits in a muscle building resistance training program is the institution of an augmented protein diet. While there is industry proven ready-made protein boosting supplements already available you can get benefits by simply adding an easily procured source of protein like eggs or Chicken to your dog's diet about 3 days a week. Eggs are a complete protein food and when added boiled to a dogs can be an excellent supplement. The egg-shells provide a source of calcium that benefits bone structure. The yolk is 100% cholesterol and is necessary for the repair and building of vital muscle cell membranes as these are broken down during intense exercise. (ii) Joint Protective Supplements; Omega-3 fatty acids, Glucosamine and Chondroitin sulfate, Anti-oxidants are all essential and have been shown to greatly augment bone, joint, cartilage and cardiovascular health. The key in using these supplements is balance since some sources like raw fish oil have been linked to anal gland problems especially when used in excess. One time proven natural source is Green Lipped Mussel farmed and harvested from the frigid waters off the coast of New Zealand. For maximal benefit this supplement must be procured in the freeze-dried and lyophilized powder form since any other form of processing will destroy several vital ingredients that are heat sensitive. The daily dose is 2 scoops of 1/8 teaspoon each into the kibble.

The Power Hexagram

There are 6 elements to developing power and resistance to injury. Of these 5 are directly amenable to our effort while the 6th is the genetics of the animal and is pretty much the material that is given to begin with.....This represents the Power Hexagram & pretty much captures the focus of ActivPower LLC and its products.



The Power Hexagram

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The risk of injury is an ever present possibility in all athletic activity and there can never be a 100% foolproof protection from it. But through attention to some principles it is possible to tip the odds in favor of power in performance and resilience against injury. The competitive canine is a highly tuned athlete and it should never be forgotten that these investments in the dog's fitness are not merely window dressing but are actually essential ingredients that make up a high level performance. Welcome to the ActivPower world!

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