УДК 796.355.015
ББК 75.579
3-28

The series was founded in 2009
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Zankavets, U.
3-28 If you want to retire from hockey – destroy your body / Uladzislau Zankavets. Minsk: A.N. Varaksin publ., 2014, 160 p.

ISBN 978-985-7092-23-9

This book will help you improve efficiency of the training process and find new training means.

For everyone who is fond of sports and are looking for new ways of self-improvement.

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AUTHOR'S FOREWORD

Dear readers! I am glad to present a book on physical training in hockey. It would seem that so much has already been written on the topic. So how can this book be different from others? The main feature of this work is that it was not written primarily for coaches (like most other books on this topic), but for active players (although coaches can certainly benefit from reading it). The obvious advantage is in its "versatility". This is one of the few books that is based on the analysis of scientific papers written by the leading scientists from different countries including the USA, Canada, Russia, Belarus, Czechoslovakia. While working on the book the author adopted experience by means of live communication and questioning more than 100 coaches from the NHL, the AHL, the KHL, and other top championships of Europe and Asia including the national teams. Being a former professional hockey player and a current head strength and conditioning coach of the KHL team provided the author the opportunity not only to communicate with hockey players, scouts and other professionals in this field, but to see the game of hockey from inside and let it flow all through every day.

Despite the volume of the information received, the book reflects all the basic principles of the author:

1. The art is in expressing the thoughts tersely and in plain language. Indeed, the book is compact numbering just 160 pages! And this is despite the fact that:
2. The font should be large.
3. The book must include a sufficient number of illustrations.
4. The manner of presentation should be easy and understandable for everyone.

I'm sure the book will be informative and useful to all who are passionate about sport and looking for the ways of self-improvement. Enjoy the reading!

Yours faithfully,
Uladzislau Zankavets

INTRODUCTION

"Changes temper the strongest. The changes allow them to leave the rivals behind. Changes are your best ally."

- Author unknown –

There are plenty of hard-working players in the world. Every time visiting the hockey rink, you can see someone who "is working extra". Children attend additional skating skills sessions and having returned home continue to practice shots and the puck handling technique at the backyard. Profs are constantly bicycling, while the guys from the junior leagues feel like living at the rink!

A great many eagerly work to improve their performance and skills. However, very few know how to do it properly. You might even have stuck at a certain level and your results have stopped growing. Routine exercises are uninteresting and do not lead to progress. How to improve the efficiency of training? Unfortunately, this question is not so easy to answer.

It is obvious that every hockey player wants his work to be as effective as possible. This is possible only if the training process is correctly and efficiently organized, science-based in compliance with the laws of physiology, and if its effectiveness is proven in practice. Otherwise, neither any sports nutrition nor the coolest recovery aids and activities will help. This book is designed to help find methods and means of training that would be optimal for you in order to get better and not destroy your body with hit-and-miss workouts.

Picture 1 – a young athlete is destroying his body

CHAPTER 1. PHYSICAL TRAINING OF A HOCKEY PLAYER

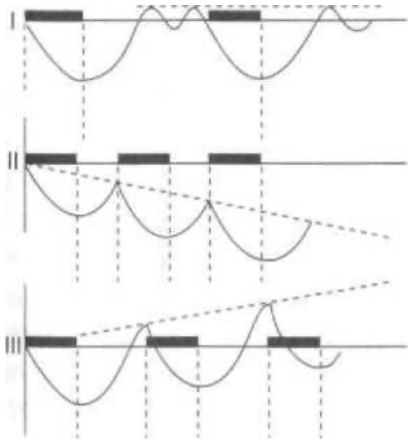
"A strong desire to learn something makes 50 percent of success."

- Dale Carnegie -

Stable expression of a high level of a modern hockey player depends on his physical performance including the level of development of speed abilities, strength, endurance, agility, flexibility, and complex manifestation of the above qualities. The only way to achieve the required level of perfection of these qualities is to train.

In hockey, there is the law, according to which, if you train like everyone else, you will play accordingly. It is widely believed that if you want to become better, you have to train a lot more (to perform a much larger amount of work). But there is no direct dependance between the quantity of training load and performance of an athlete! This is confirmed in the textbook on sports physiology, edited by Ya.M.Kots, "There is no linear relationship between the volume of training load and the training effect." Light loads do not lead to progress, excessive training leads to the exhaustion of the body and the drop in the level of performance. Positive results in the form of increased performance can only be achieved due to optimal loads, which correspond to the current capabilities of the athlete! The same applies to the recovery process. Insufficient rest does not contribute to the improvement of performance. This is clearly seen in the following diagram from "Practical Recommendations on the Recovery of the Athletes," prepared by K.S.Modenov, the head of the RFU biomedical service.

The role of recovery processes in changes of performance:



black rectangles – the period of application of training load;
horizontal line – the initial level of performance;
I – maintaining the original performance due to long intervals of rest;
II – decreased performance due to insufficient recovery;
III – increased efficiency when performing repetitive work during the phase of supercompensation (optimal recovery).

Optimization of training load, regenerative processes and relaxation is the key to success! S.Ye.Pavlov, the author of the book "The "secrets" of training of hockey players", gives the universal pedagogical advice: "Raising special fitness of an athlete can only be ensured by a full recovery of the athlete's body after adequate to his or her abilities, well-planned and carefully executed training work. No recovery, no increased fitness!"

Adaptation of the body to physical load is a very important aspect of training. General adaptation syndrome (GAS) lies in the basis of any sports activity. It has three stages:

1) alarm;
2) resistance;
3) exhaustion.

"The human body strives to maintain homeostasis, i.e. a constant internal milieu. It resists changes, so as not to lose its rest state. Whenever the body is under load, for example, during continuous cycling, or lifting weights, there comes the alarm reaction. Stressor upsets the natural homeostasis of the body and takes it out of the comfort zone. The second phase occurs when the body tries to reduce the effects of stress, adapting to it. As a result of the adaptation process, the body graduates to a new, higher level of homeostasis. Ideally, during training there is a constant alternation of the 1st and 2nd phases, which leads to the development of strength and improves overall resistance of the body to stress. If you overdo it, the load begins to exceed the adaptive capacity of the organism. In this case, there comes exhaustion, the third phase of GAS. Thus, training is the skillful balance between stress and recovery. Make sure you take enough time to rest," explains Shannon Sovndal, MD, founder and owner of "Thrive Health and Fitness Medicine."

It should be added that excessive training load leads to degradation of speed and power expression and fatigue (overtraining). “The deviations from rational regime of training sessions, failure to comply with the values of loads and duration of rest lead to the development of overtraining and overstrain,” write A.S.Solodkov and Ye.B.Sologub in the manual on physiology of sports. It is especially dangerous for young players because the entire training process takes place on the background of the formation and growth of the body.

Sergei Portugalov, a leading Russian sports pharmacologist, is convinced: “The winner is not who practices more, but who practices properly!”

The main thing in training is quality, not volume!

This thesis is confirmed by one of the most famous experts in physical training, President and CEO of “Twist Conditioning Incorporated” Peter Twist: “The basic principle which we should bear in mind is that we must always give priority to quality over quantity.”

“There is nothing more exhausting for the nervous system and stressful for the body than nonsystematic training, which adversely affects sports results,” says Professor Yuri Nikonov, Ph.D., the Merited Coach of the Republic of Belarus.

Another point that I would like to emphasize is the formation of the trainability threshold, caused by the use of the same (albeit very good) exercises. Yes, adaptation occurs more rapidly if the load remains standard for some time. In this case, it is easier for the body to adapt to it. However, the body adapts to the same stress quickly, and fitness ceases to grow. Additionally, the monotony weights upon psychologically. Diversity of the training methods, alternation of training means, introducing novelty (sometimes it is enough to modify an exercise a bit) – that’s the effective way to progress! “The more experienced you become <...>, the more you need to diversify the range of exercises to encourage further progress. The closer you get to the genetically established limits of strength [as well as speed and other qualities – author’s note], the harder it is to maintain the instantaneous level of improvement. Only unusual training methods and means (more weight, higher load volume, new movements, etc.) can have a positive effect. There is no universal training program suitable for everyone, because every human body is constantly changing. Keep on searching for unfamiliar exercises that may seem useful, and try them,” appeals Eric Cressey, a famous strength coach and

record-setting powerlifter, the author of the books and co-author of the DVD on physical training.

In general, do not rush from one extreme to another. Keep to a balance between consistency and diversity. American physiologists John H. Willmore and D.L.Costill advise: “Do not change the set of exercises more often than once in 3-4 weeks in order to summarize training effects and avoid the problems with adaptation.” However, after 4-6 weeks of use, it must be done as this is the point of almost complete adaptation of the body when the effectiveness drops (N.D.Luchkin; F.F.Bogdanovsky; V.M.Zatsiorsky; Zh.K.Kholodov, V.S.Kuznetsov).

To improve training efficiency, follow the recommendations below:

- from physiology standpoint, the highest efficiency of the body is observed at both 10-12 a.m. and 5-7 p.m. It is desirable that the time of training sessions is stable and the sessions are held at these hours if possible;
- train in good shoes (sneakers and skates);
- a warm-up before each workout is mandatory;
- after a workout, when your muscles are warmed up, do the stretching. A long stretch before a training or game is not necessary. 5 minutes of dynamic stretching is enough;
- during a training pay attention to the technique. The correct execution is superior (It is more important than weights lifted or all other things)! Improper technique leads, albeit in a remote perspective, to injury. Correction of malformed techniques is a long and very difficult process;
- try to develop all the physical qualities and all the muscle groups in optimal proportions. You can reach peak performance only if all systems of the body are balanced;
- you must constantly vary the load and change the exercises every 4-6 weeks to prevent habituation and, as a consequence, reduction of sports results improvement;
- during off-ice training, use visualization: imagine how this or that exercise will affect your game. It is believed that this substantially increases the effect of training. While squatting with the barbell, for example, imagine yourself performing a sprint and scoring the winning goal!;
- do stretching after every workout with no exception (as a supplement, you can use other means described in the chapter titled “Cooling down”);
- after a hard workout, be sure to let stressed muscles rest for some time (usually 24 to 72 hours);

- preparation for the game should not lead to exhaustion;
- before, during and after work-outs and competitions drink plenty of liquid;
- eat well;
- keep your spirits up, be positive and enjoy training, games, and life!

For careful planning of the training process, developing the optimal diet and liquid intake, it is best to consult with experts in these fields, or to read special literature.

COMMON INJURIES AND CHRONIC PAIN CAUSES

The reasons why a hockey player gets hurt or feels constant pain, in most cases, are basically the same. These include:

- irregularities in the kinetic chain, including the lack of the joints' mobility, muscles and fascia* rigidity;
- a low-quality warm-up or its absence;
- excessive and poorly-planned training load;
- unequally developed muscles;
- poor flexibility;
- insufficient recovery or overtraining;
- prolonged exposure to stress;
- poorly chosen shoes and other equipment.

Any of these factors could, under certain conditions, cause injuries. We will talk how to prevent this further on.

** Fascia is the connective tissue that covers organs, blood vessels, nerves, and intertwines with them. It is the human muscle shell.*

KINETIC CHAIN

It's no secret that the body is an integral unit. This is a complex system, in which everything is interconnected according to the principle of the kinetic chain.

This means that all the body parts are closely interrelated. The kinetic chain enables your body to perform complicated movements that involve the entire body from the head to feet. Thus, for example, a knee injury can be caused by rigid thigh muscles and fascia, and the source of back pain may be weakened glute muscles. Why does this happen? Again, all the body parts work in harmony like a single mechanism, or a very united team. And if any part of the body is weakened, or, for any other reason, is not performing its functions, the others, as a dedicated partner in the line, intercedes for it, trying to compensate "shortcomings." However, it starts to experience excessive stress and wear out in time, which leads to

pain. Remember: you are as strong as your weakest link. This phrase will constantly accompany you throughout this book.

That is why the modern training process, based on the latest achievements of science and "fresh" ideas about the effectiveness of training is articulated on exercises and activities that involve the largest possible number of muscle groups. It is generally recognized that it is also necessary to pay great attention to preventing limitations of the joints' mobility. Thus, players often have problems with the hip joint mobility. This in turn affects the muscles and fascia, which have to compensate for this kind of failure. Then, when the latter also fail, cartilages begin to erode, and you feel the pain.

To avoid this, it is necessary to pay close attention to the development of flexibility and elasticity, as well as to roll-out muscles and fascia with a foam roller.

"The natural movements involve all the joints of the body. If the mobility of some of them, such as the hip, is limited, the result may be an increase in the load on the adjacent parts of the body and joints. In time, this leads to degenerative changes of intervertebral disks, sciatica pinch, cartilage destruction (whereby you may need to install an artificial knee or hip joint), ilio-tibial tract syndrome (so-called "runner's knee") or plantar fasciitis. Maintaining muscles, fascia and hip joints in a good condition helps prevent to a large extent the onset of such consequences," says Dr. Cal Goldfarb.

This contributes to the harmonious development and strengthening of the entire body and preventing impairments in the kinetic chain.

LOAD DISTRIBUTION

While training independently, especially during the off-season period, when you develop your own schedule, be sure to plan at least one day off every week. To ensure that your training is more efficient you should vary the loads. Planning your training program, occasionally make room for unloading weeks. Such an approach would bring more benefits than permanent increase of training stress and endless workouts with maximal effort.

"If we continually pump ourselves up, at one point we will finally break. This is for sure," warns Todd Durkin, the founder of the world-class fitness center "Fitness Quest 10" and one of the leading fitness coaches in American college football.

Here is what Eric Cressey writes in this regard: "One of the most common mistakes <...> is that you distribute the load so that it is more or less the same

every week. A much better strategy is to alter the load every week in order to strengthen the body in the long run.

Due to the weeks in which you get lower loads, you can give your muscles greater opportunity to adapt to stress caused by the weeks of hard training than you would have given if you left loads at the same higher level. The whole training process is associated with the development of the stimulus and adaptation to stress, but both cannot take place simultaneously; these phenomena occur in sequence. Hard training creates prerequisites for the body to adapt to stress conditions in the presence of the stimulus. A lighter sequential training simplifies the process of adaptation to stress and prepares the body to ensure that it is ready for much more stimuli."

The inevitability of undulating loads is emphasized by the Soviet scientists Zh.K.Kholodov and V.S.Kuznetsov: it is "substantiated by the complex of interrelated reasons. The most significant of them are:

- Phasal and heterochronic character of recovery and adaptation processes during training;
- Periodic undulations of the body capacity caused by natural biorhythms and general environmental factors;
- The interrelation of exercise volume and intensity due to which these components are changed in certain phases of the training process both multi- and unidirectionally."

ADAPTATION TO TRAINING

After the holidays, when the players are full of energy and desire to exercise, it is necessary to restart practices from the adaptation period, which lasts about two weeks. It is characterized by small loads, low sprinting speed and intensity which gradually increase. Disaccustomed muscles and body in general, need time to adapt to the new, higher requirements. Adaptation processes cannot be forced, because its capacity is limited.

ENERGY SYSTEMS OF THE BODY

There are two pathways to supply energy to the body: aerobic and anaerobic. It is worth noting that it is not possible that during exercise only one system was engaged. In fact, when performing any work, all three systems – anaerobic-alactic, anaerobic-glycolytic, and aerobic are involved. Simply their contribution varies during exercises performed with different efforts. It is accepted to point the predominant contribution of a particular system.

If you make an explosive acceleration or make a powerful shot, muscles get energy from the anaerobic-alactic system. A more prolonged activity throughout the shift is "sponsored" by the anaerobic-glycolytic system. The source of energy for less intensive movements and recovery is the aerobic system. The contribution of a system depends on the intensity and duration of the work performed by a hockey player as well as his level of physical fitness and technique. According to the Soviet scientists L.P.Matveev, V.M.Zatsiorsky, N.I.Volkov, and M.A.Godik, an important point to ensure an efficient interaction is the development of various systems and qualities in a certain order.

The following sequence is justified for a single training session:

1) first anaerobic-alactic (maximal speed and power) then anaerobic-glycolytic (speed endurance) exercises;
2) first anaerobic-alactic exercises, then aerobic (general endurance) ones (although in this case, the reverse sequence is also acceptable);
3) anaerobic-glycolytic are to be done before aerobic exercises.

Efficient combinations of training modalities within a single session (by N.I.Volkov)

Sequence	Main training effect
anaerobic-alactic + anaerobic-glycolytic	anaerobic-glycolytic
anaerobic-alactic + aerobic	aerobic
anaerobic-glycolytic + aerobic	aerobic
aerobic (small volume) + anaerobic-alactic	anaerobic-alactic

Another sequence with a great probability will lead to a negative training effect. There will be little use of such practices.

SPECIFICITY

The muscles of a hockey player involved during the game are called specific. Accordingly, the muscles that are not used on ice are non-specific. Any training load causes adaptation of stressed muscles in particular. This is the reason why in order to achieve maximum progress, it is necessary to choose training means that as much as possible relate to hockey. You should seek to involve the greatest possible number of "hockey" muscles. Yet, you cannot dwell exclusively on them. Non-specific components and qualities also need to be developed. Very often they are the basis

for the development of specific ones. Being neglected, they become a weak link, a limiting factor in your development. Remember, you are as strong as your weakest link. You just have to avoid excessive attention to non-specific components, as in this case, they will conflict with the specific ones, which would be deteriorated as a result. In general, do not forget about the non-specific components, but priority must be given to the specific ones.

BREATHING

During training, pay attention to your breath – it cannot be held! Holding your breath during high load can provoke a sharp increase in blood pressure, as well as problems with the heart muscle. High blood pressure, in turn, may cause dizziness or, even worse, loss of consciousness.

RECOVERY

Recovery processes in sports activities are extremely important. They are one of the most important conditions for progress. Like many other processes, recovery is subject to training. In the course of adaptation to training loads, the effectiveness of the recovery processes increases (they run faster, have more pronounced supercompensation phase, i.e. abundant recovery). The more demanding the workout is, the more intensive recovery processes are. However, if the training stress was too heavy (exceeding the optimal level), you will have to wait for recovery much longer. Working out with insufficient recovery would only cause further suppression of an athlete's body. This is a fairly common phenomenon in hockey. In such cases it is necessary to apply special recovery methods. They will be described further in this book.

NUTRITION

Nutrition is a key link between training for the competition and direct actions in the game. Wide variety of food and well-chosen diet allow athletes to act more intensively, set back the onset of fatigue and most importantly, positively influence athlete's health and body condition. Proper nutrition is able to speed up the regenerative processes in the body. As a consequence, the best diet may contribute to the improvement of your results. "The optimal diet provides the energy for workouts, enabling to increase its intensity, removes fatigue and helps to maintain good health and good spirits. <...> Athletes become able to train more frequently. Proper nutrition helps to

improve the results of training both in the physical and physiological aspects," writes Peter Twist.

DRINKING REGIME

Active physical actions on the ice cause abundant sweating. Adequate drinking regime prevents depletion of water resources of the body and plays an important role in the recovery of athletes after strenuous loads. Besides, as 90 percent of the brain consists of water, it is sensitive to dehydration, which is fraught with mental exhaustion and fatigue.

TRAINING SHOES

To practice off-ice, hockey players are recommended to buy quality shoes with high soles that provide good shock absorption when running and jumping, protect the knees and other body parts from extra loads. You have to be prepared for the fact that you will periodically have to buy new shoes. However, to change the current pair of shoes it is not worth waiting for the moment when it is completely worn down and "dead". The experts in the field of running Joe Puleo and Patrick Milroy say: "When the soles of running shoes are worn so much that the critical degree of wear becomes apparent, this means that it is a long time they do not provide the necessary shock absorption."

A good idea might be the individual fitting of insoles, which is performed in various orthopedic centers. The value of well-fitted insoles is reduction of the stress placed on the foot and knees when running.

More information on the selection of shoes and insoles, and on running in general can be found in the book "Anatomy of Running" (see. References).

References

1. Cressey, E. Maximum power / Eric Cressey. – M .: Eksmo, 2011. – 240 p., ill. – (The Library of Men's Health).
2. Durkin, T. The impact plan for the body / T. Durkin, A. Bornstein, M. Zimmerman; tr. from English by S.E.Borich. – Minsk: Popurri, 2012. – 288 p., ill.
3. Essentials of strength training and conditioning. National Strength and Conditioning Association / Editors T.R.Baechle, R.W.Earle // 3rd ed. – Hong Kong: Human Kinetics, 2008. – 642 p.
4. Godik, M.A. Complex control in sports games / M.A.Godik, A.P.Skorodumova. – M.: Soviet Sports, 2010. – 336 p., ill.
5. High-performance sports conditioning / Editor B.Foran. – Human Kinetics, 2001. – 376 p.
6. Kabeyn, F.O. Charisma: How to influence, persuade and inspire / F.O.Kabeyn; tr. from English. – 2nd ed. – M.: Alpina Publisher, 2014. – 307 p.
7. Koluzganov, V.M. Building training sessions and microcycles for training players / V.M.Kolzuganov // Hockey. Yearbook. – M., 1985. – pp 26-30.
8. Mobile application «WaterBalance».
9. Modenov, K.S. Practical recommendations for restoration of athletes.
10. Nikonov, Yu.V. Physical training of hockey players: study guide / Yu.V.Nikonov. – Minsk: Vitposter, 2014. – 576 p.
11. Nikonov, Yu.V. Training qualified hockey players: study guide / Yu.V.Nikonov. – Minsk: OOO "Asar", 2003. – 352 p., ill.
12. Pavlov, S.Ye. The "secrets" of training hockey players. – M.: Physical Education and Sports, 2008. – 224 p., ill.
13. Platonov V.N. Special physical training of swimmers of higher discharges / V.N.Platonov. – K.: Zdorovya, 1974. – 239 p.

14. Platonov V.N. The system of training athletes in Olympic sports. The general theory and its practical applications / V.N.Platonov. – K.: Olympic Literature, 2004. – 808 p.
15. Puleo, J., Milroy, P. Anatomy of running / J.Puleo, P.Milroy; tr. from English by V.M.Bozhenov. – Minsk: “Popourri”, 2011. – 200 p., ill.
16. Solodkov, A., Sologub, Ye.B. Sport physiology: textbook / P.F. Lesgaft SPbGAFK. SPb., 1999. – 231 p.
17. Sovndal, Sh. Anatomy of a cyclist / Sh.Sovndal; tr. from English.by S.E.Borich. – Minsk: “Popourri”, 2011. – 200 p., ill.
18. Strength training. National Strength and Conditioning Association / Editor L.E.Brown. – IL: Human Kinetics, 2006. – 368 p.
19. The Internet portal: http://sportswiki.ru/ – Encyclopedia of scientific bodybuilding.
20. Wilmore, John. H., Costill, D.L. Physiology of sport and physical activity. – K.: Olympic Literature, 1997. – 504 p.
21. Zankavets, V.E. Kill your body, if you want to be through with hockey / V.E.Zankavets. – Minsk: A.N.Varaksin, 2014. – 160 p.
22. Zatsiorsky, V.M. Physical qualities of an athlete (the basic theory and methods of education) / V.M.Zatsiorsky // 2nd ed. – M.: Publishing House “Physical culture and sport”, 1970. – 199 p.