

ABOUT ROSICKY,  
DJOKOVIC  
AND ABILITY TO  
OBSERVE

# How to get rid of body pain

He is the most respected Czech physiotherapist with a huge reputation. He can find the real cause of pain, he can identify pain sources others do not even know that may exist. This is one of the reasons why Prof. PaedDr. PAVEL KOLÁŘ, Ph.D.(53) is a member of the Czech national teams in football, hockey, and tennis trying to help in other sports as well. Jaromir Jagr, Tomas Rosicky, Czech president Milos Zeman and many others rely on his exclusive knowledge and skills. And it is not just his "gold hands" that make him so popular, but also his modesty and friendly personality. However, most of his career he has devoted to disabled and sick children at Motol Hospital. Those stories will never make it on pages of newspapers and magazines.

Physiotherapist Pavel Kolar with the goalie from the Czech Team Petr Cech at the 2016 European Championships



■ **When someone passes you or just sits down, do you recognize immediately if he is in pain?**

To some extent, it can be recognized. This is what I teach in my courses. Students need to learn how injury or disease affect motion, or vice versa - how poor movement function can cause orthopedic abnormalities and other problems. Posture and movement is kind of a mirror of any pathological changes in the body, and therefore clinical examination helps to identify patient's problems. For proper clinical examination basic knowledge of various medical disciplines is necessary. The clinician should be able to perform basic orthopedic, neurological, internal, but also functional assessment. It is not enough to base diagnosis and treatment just on X-ray or MRI. I try to ask the question in reverse. Let's do clinical assessment first and then try to predict what we would be found on patient's X-ray, MRI or diagnostic ultrasound. Such attitude also helps to determine how to prevent any further problems.

■ **In the case of a damaged meniscus, the orthopedic surgeon first performs an MRI and then recommends treatment based on the MRI results. Is it true that you are more interested in the cause of the injury?**

Meniscus tears and most other orthopedic disorders present with the well defined, clear image. However, it is more difficult to identify its functional cause and any consequence of these disorders, and also to recognize how injury will affect the motion. Meniscus damage, intervertebral disc prolapse etc. usually do not occur randomly or as a result of injury, but most frequently result from chronic overuse due to poor movement stereotypes.

■ **"I should predict what I find on a patient's X-ray."**

But this is more difficult to prove and therefore the exact anatomical diagnostic approach to orthopedic disturbances prevails over the functional approach.

■ **For example, if you look at the technique of tennis player Rafael Nadal, can you determine whether if his atypical forehand causes him any health problems? After all, he was injured for a long time.**

When you analyze Nadal's movement pattern, you can see that his stroking technique is not ideal for his movement system. He uses an extreme spin adjusting his posture which is not biomechanically optimal mainly for his knees and back. Such repetitive overstrain is the real cause of his injuries. This was also true for golf player Tiger Woods when he was a world leader. His technique was not biomechanically ideal for his knee loading. At the end of swing his knee was rotated too much and therefore greatly overloaded. Thus you can predict that some athletes will not have such a long of a sport career as others, e.g. Federer or Jagr.

■ **Do you remember a tennis player Karel Novacek, who had problems with his knees and finally it was discovered that his teeth were the primary source?**

Yes, I remember it well, it's been a long time though. For me, it was quite a lesson at that time, but also inspiring. I've learned from it. He had knee problems for quite a long time but it could not be clearly explained by the morphological findings. Then he saw an old dentist in Monaco, who filed down his teeth, changing his occlusion (*contact between upper and lower teeth*) a little bit.

And suddenly his knee has improved significantly. Nowadays neurostomatology applies such an approach. It was found that changing jaw position can affect the strength by ten to twenty percent. This means that jaw position and occlusion significantly affect the function of upper and lower extremities. This principle is now respected in sport teeth protector's production. A special examination is done to produce protectors that set up occlusion optimally. Similarly, special teeth braces are now produced that greatly influence cervical spine function, hip joints etc. The whole global system (body) reacts to a single local change in function of one structure. In this way you can affect the whole body posture by changing foot or hand function, occlusion etc.

■ **For example, you described that a tongue position influences the sport performance of a javelin thrower Jan Zelezny.**

It is a good example that illustrates how individual body parts are interconnected in a movement purpose. Activation of orofacial movement - whether it is the position of the eyes, tongue or jaw - is precisely integrated within a context of the global movement function. Movement is not a matter of a single joint, muscle or muscle group, but it always results from an interplay integrating all body segments, with each segment playing a specific role, like when you connect the cogwheels. Changing a function of a single segment, re-coordinates the whole system. It simply explains how foot is functionally related to hand or foot is connected with tongue and so on.

■ **Can you identify psychosomatic relationships by analyzing eye or tongue function?**

Of course, because movement reflects symptoms automatically and that can hardly be suppressed voluntarily. Motor behavior conducts reflex relationships that may point to psychological problems. It is possible to assess emotional mood by analyzing movement. Our eyes, breathing stereotype, the way we move, our subconscious automatic posture, skin temperature and skin blood perfusion are all lie detectors, it is motor speech that demonstrate our emotional state. However, sometimes it is more difficult to assess such functions objectively than to evaluate e.g. hip joint function.

■ **Occasionally, a tennis player Novak Djokovic flies to Prague to see you for treatment. They say that his sight is extremely well developed...**

Djokovic can process the anticipatory optical information extremely well. He also has excellent visual depth perception. When he gets acoustic information from the racket, he can immediately estimate speed of the ball, anticipates exactly its trajectory, estimates its distance, and decides how to get the ball right away.

■ **"Bad tongue position took meters away to javelin thrower Zelezny."**

Jagr is similar in this regard, he can perfectly read all the information coming from his joints and muscles. When Djokovic picks up a racket he will recognize the one that is just two grams heavier than the other. Such ability makes him a phenomenal player. These functions can be trained by certain motor programs, otherwise they would remain limited. The problem is that they are genetically determined to a certain extent.

Even if you try to train those functions every day from morning till night, you will probably never meet the level of Jagr or Djokovic. Then you need to compensate the limit using different functions.

■ **Why do some tennis players, mainly females, yell (grunt) so much when hitting the ball? Is it because they use their diaphragm more?**

Every athlete uses his diaphragm. It is not just a breathing muscle it also plays a significant role in stabilization of the motion. If you want to hit a ball with a racket or to kick a ball, first you always need to brace your body; this bracing is performed by the diaphragm, or rather through increasing intra-abdominal pressure. Here, the diaphragm functions like a piston inside the abdominal cavity. When you lift a heavy weight so heavy that you cannot breathe, the diaphragm is playing a purely postural function and needs to suppress breathing for that short lifting moment. But you cannot stop breathing when playing tennis, therefore a tennis player, as well as javelin thrower or a discus thrower tend to produce guttural screams. They close their epiglottis thus creating a resistance in their airways which allows to better utilize the diaphragm in their postural functions.

■ **According to Professor Kolar, talent is essential for great athletic performance, but also good psyche and last but not least appropriate body anatomy. He says that Czech hockey player Jaromir Jagr has such a gift. "Jagr has incredible sensing ability; he can recognize a two grams difference in hockey stick weight," says Pavel Kolar.**





Although Pavel Kolar has been helping others for many year, he has been suffering from ankylosing spondylitis, a chronic inflammatory disease primarily affecting the spinal vertebrae, since he was 28 years of age.

■ What's it like working with hockey player Jaromir Jagr, who can perfectly perceive all signals from his body?

When he has health problems, he often consults me, but he has unique way of thinking and training approach. He uses his personal experience and perception and he can help himself a lot. To some extent, during his whole career, he has his own special approach that is based on intuition and his ability to perceive his body extremely well. When he was younger, he avoided the circuit training and rather practiced what he felt to be optimal for himself and for hockey. On the other hand, when you do a team sport, this individual thinking is a bit inconsistent with the team life. He is a phenomenon.

■ Was it difficult to figure out that his groin problems were related to the position of his big toe? Skate prosthetic solved it all.

It certainly was just one reason, and it's not really that easy. On the other hand, again it relates to what we talked about before. It's not quackery, everything has its simple logic. When you analyze a movement looking at individual phases you can see how each skeleton segment is integrated into the whole body through postural function, as if a cogwheels is moving them. Once you have a problem with one wheel, it's not just a problem of that single wheel, but it affects the entire system in a global pattern. Therefore, if someone has a problem with the groin, shoulder or back, it should be understood

in a global integration model. For example, just a minimal change in a skate blade position will change the foot position influencing hip joint significantly.

■ So poorly adjusted skate blade inclination can cause a hip pain?

Not after one skating session, but we must realize that in such a player, it is not a single movement. The multitude of forces generated by movement repetition will eventually result in morphological changes. When a water drop drips on the ground, you are not going to see anything after half of a day but in a year even such small force will create a hole in the concrete. We often have a tendency to strengthen the muscles, but we must also strengthen the entire movement.

“Skate blade position influences a hip joint.”

When Jan Zelezny threw a javelin, even the wrist position of his non throwing arm played a significant role in the movement technique.

■ How come that Jaromir Jagr can recognize that his skates have been sharpened just one millimeter differently?

He has a great sense for detail. He can recognize not only the position of his body, but also the position of his skates. This gives him the ability to quickly adjust to any situation. He has a great quality of his motor functions. This is his great advantage. This is a part of talent that is necessary for great movement coordination.

■ Another great talent is football player Tomas Rosicky, who also thanks to you, was able to prepare for the European Championship in France. However, his whole career has been full of injuries. Why is that?

We have to see Tomas' injuries from a bit different perspective then that he just accidentally tore his muscle. Although Tomas takes very good care of his body, he suffered injuries where many other factors played a role. The reasons are much more complicated. The movement disorders may also be caused by other



Pavel Kolar has the great accomplishment that injured football player Tomas Rosicky finally made it and could play at the Euro Championship in France.

systems - metabolism, immunity and even hormonal system. These systems can not be separated from orthopedic findings.

■ Karel Skopovy junior was a professional Czech golfer, however, he has not made much progress in his sport performance. Assessment at your clinic revealed that he lacks the necessary mobility of the hip joint. Are athletes often limited by their muscle or joint systems?

To be a good golfer, javelin thrower, football or hockey player, you have to have a certain anatomical morphology of the joints. When I look at the shape of my bones in shoulder, forearm or wrist, I know I would never be a great javelin thrower or good golfer. I used to be a gymnast and some exercises were very difficult for me and others on the contrary, I performed very easily while other colleagues had a problem with them. Someone may have excellent strength, speed, accuracy, and a very good ability estimate, but his anatomy might not let him reach certain joint positions necessary for the sport. As he continues to try to perform these movements, he will slowly injure the joints. It is the same with my shoulders. I injured them, which affected my whole sport carrier through constant shoulder, elbow and wrist injuries. Only now I know it was not a question of bad training, but it was more because of my anatomy that was not shaped well for many of the exercises.

■ Now, you opened a Center of Movement Medicine, you founded your own school

of physiotherapy, you lecture at the medical faculty in Prague and at universities abroad, you travel with top athletes and work with infants and children in the hospital. How do you manage it all?

I try to organize my time to make everything work. I am very lucky working with great colleagues and, of course, it all would not be possible without my family's support. I can really appreciate it, because I teach courses or assist at sport events mostly on weekends and sometimes even instead of vacations. I try to minimize traveling with athletes so I can be at work as much as possible. After all, teaching at the Medical Faculty during the semester, being very busy at Motol Rehabilitation Department and at the Center of Movement Medicine, very extensive traveling is not really possible. I have been lucky that I always somehow manage it all. Just this year I was a little bit more out of Motol Rehabilitation Department

“I would love to help everyone, but it is not possible.”

■ In Motol hospital you constantly see severely sick people, which must be quite stressful. How do you relax?

You must learn to relax. It is always necessary to get away at least for a moment, to escape into solitude, to be isolated from all the hustle and disappear somewhere in nature, for example my house out of town.

Getting more sleep is also important. When I'm working I have little chance to sleep enough. Traveling with athletes has been an escape from stress. It is much less demanding than the pressure from the patients in the hospital. The pressure in Motol hospital and the Center of Movement Medicine is sometimes extreme. I would love to help everyone and it really bothers me when the secretary must say that we have no capacity to see more patients - and we really do not have it. I could be working from dawn to dusk, and it still would not be enough. In addition to this, I get dozens of letters, which I don't have time to read or answer.

■ Before you left for the European Championship with the Czech national football team, all players had to fill the questionnaires evaluating the strain and stress during training. Does this study by Swedish orthopedic surgeon Jan Ekstrand have any fundamental importance for the future?

In his study, the author aims to evaluate the intensity and time of the strain in relation to the frequency of injuries. I'm often skeptical of such studies. We can put a couple of numbers together, do a statistical correlation and the results are presented as unquestionable and binding conclusions. I am quite critical to many studies. The analytical approach dominates over synthesis of all available knowledge in the concept of evidence-based medicine. Detailed facts are considered superior to its organization into integrated global systems. Virtually, and implicit rule exists "the narrower the problem, the greater the scientist."



Pavel Kolar took care of Czech President Vaclav Havel for twenty years. "I'm probably one of only few who could do some sport with him. On vacation at the Canary Islands I played tennis, basketball and football with him" said Professor Kolar.

## INTERVIEW

Pavel Kolar has been often attributed with special healing abilities. "It is not any energy perception or other supernatural things. Perhaps I have a better kinesthesia, it means the ability to perceive my own body well and ability to read the motion of the others." He says.

**Prof. PaedDr. PAVEL KOLÁŘ, Ph.D., (53)**

The world-renowned physiotherapist, building his approach on the work of Professor Vaclav Vojta and other Prague School representatives. Prof. Vojta based his diagnostic and therapeutic methods on the understanding of human motor development. Kolar's method of Dynamic Neuromuscular Stabilization (DNS) is also based on developmental kinesiology.

He graduated in physiotherapy from Faculty of Physical Education and Sport at Charles University in Prague. He used to be a top gymnast training in Center for top athletes in Banska Bystrica, being a member of Czechoslovak national representation sport team.

Since 1987 he has been working at the Department of Rehabilitation at University Hospital Motol in Prague. Since 1999 Prof. Kolar acts as the head of the Department of Rehabilitation and Sports Medicine, 2nd Faculty of Medicine, Charles University and University Hospital Motol in Prague. He also acts as the Vice Dean at 2nd Faculty of Medicine, Charles University, where he established, five-year study program in physiotherapy. He teaches at Czech and foreign universities.

In 2012 he opened Pavel Kolar's Center of Movement Medicine, in Prague, Chodov ([www.cpmchodov.cz](http://www.cpmchodov.cz)) where he combines clinical practice with scientific research.

His clients are professional top level sportmen, especially football players, tennis players, hockey players (prof. Kolar has 2 gold medals from World Ice Hockey Championship) and athletes. He also treats Serbian tennis sport star Novak Djoković.

He was a member of the interdisciplinary medical team carrying for Czech presidents Vaclav Havel and Vaclav Klaus. In 2007 he was awarded the prestigious "Presidential Award for Professional Excellence" by Czech President Vaclav Klaus. Now, he is a member of the medical team caring for Czech President Milos Zeman.

He founded a fund "Movement without help". Prof. Kolar himself, suffers from incurable ankylosing spondylitis, a painful rheumatic disease that causes spinal stiffness. In the past, from the same disease suffered Czech writer Karel Capek (the author of now internationally used word "ROBOT")

Prof. Kolar is married. With his wife Michaela has three children - a daughter Camilla (24), sons Jan (19) and Jacob (12). He loves to spend his free time at his cottage at Rakovnicko.



### ■ Does "scaring by pain" play an important role in the hospital?

Scaring patients has become more popular lately. For evidence based medicine (EBM) to actually produce real medical progress, it must meet all ethical criteria. Considering enormous complexity of all investigated processes it is obvious that meeting all the criteria completely is almost always impossible. From a long time perspective, side effects resulting from excessive pharmacological consumption, such as immune, metabolic, but also other unknown consequences is quite difficult to determine. Therefore, certain "prematurity" of new treatment approaches also presents with serious ethical and to some extent also methodological problems in clinical experiments. The fundamental ethical problem results from the interest of those bringing the new pill, medical procedure, implant etc. to clinical stage of research after spending a great cost on its development, and the interest of those who will make economic profit from its sale or application. This often presents billions of dollars. Medical propaganda based on experimental studies often causes a panic which costs considerable financial resources. Working in a scientific environment, I know the background of some scientific studies resulting in strong conclusions with enormous economic costs, while after some time the expected effect is found to be much smaller or none,

or the side effects turn out to be more serious than the primary expected effect of a given drug or procedure.

### ■ Does this scaring apply to Zika virus during Olympic games as well?

I am convinced that Zika virus threat is very overestimated while the scientists who released a statement seem to be quite unaware of the implications of their statements. In this respect, they should be more careful, even though I do not know whether this is their intention or not. Let's go back to the recent past.

## "Zika virus is an overestimated scarecrow."

On the sales of swine flu vaccine pharmaceutical companies made up to \$ 7 billion. It is no help that the head of the health section of the European Council, Wolfgang Wodarg, after all very expensive hysteria about swine flu said that it had been one of the greatest medical scandals of the century. Poland rejected this business motivated propaganda based on fear, bought no vaccine, while on contrary the UK spent up to 1 billion pounds on swine flu vaccine.

Lubor Černošlák

