

## The Future of Clinical Research in the Field of Spine

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### Editorial

The spine is one of the most difficult and challenging constructions in human beings with high mechanical, functional and sensitive demands. It was phylogenetically constructed for mammals to allow a vertical orientation. The development from the vertical to the upright posture allowed humans to gain a wider perspective, to use their hands independently, and encounter other human beings in a friendly and direct way. The spine is required to include stability and mobility, protection and activity at the same time. Therefore, a complex construction of vertebral bodies, nerves, cartilage, blood vessels, tendons, and muscles is needed.

How does the complexity of the spine influences clinical research in this field?

Clinical research of the spine is challenged by many different influencing factors of the individual situation and at the same time the need for reproducibility and comparability to a larger population. The solution cannot be to capitulate to the gap between the evidence based idea and the individual composition. Abandoning clinical research because of the difficulties to transfer the complexity of an individual to evidence based generalizability is no solution. In contrast, these difficulties should engage us to look for new ways to combine these worlds.

Quality of research includes Good Clinical Practice as well as knowledge about phrasing the right research question, finding the right method, the most suitable setting, the correct target population, recruitment strategy, and statistical analyses plan. As a clinician you might encounter a problem or find an interesting question, to which you would like to receive answers. Telling this to a researcher, you might be asked other aspects and further details concerning your idea. The researcher might be able to help you to develop your idea further into a research project fulfilling quality criteria. An academic discussion starts about the different steps included in the whole research process: Are you really able to answer your question? Is there

a need to answer the question? Do you just want to show your opinion? Is it realistic to recruit enough patients? Is your method correct for your project or do you compare „apples“ with „plumes“? If influencing factors are present in your study, can you separate the influences of your intervention to the causal effect?

The future of clinical research combines different perspectives and experts. Clinicians have to discuss with researchers, and statisticians, orthopedic surgeons have to discourse with specialists for rehabilitation medicine or physiotherapists, infectiologists, or oncologists. Receiving support from a clinical trial unit (CTU) allows respecting legal, ethical, and organizational recommendations. Working together you have to understand each other not only in your personal and professional language but also in your thinking, the theoretical background and quality methods. Future of research will be more complicated, but also more honest. It is not a sign of quality to write an article on your own, but to show research as a result out of a collaborative effort, including all involved parties in your author list.

The result will be visible in a diversity of research designs like intervention and observational studies, retrospective or prospective designs, in cohort studies or single case/ case series studies, in biomedical or psychosocial connecting ideas. Descriptions of good research quality are now reachable for everybody (e.g. [www.care-statement.org](http://www.care-statement.org) for case studies, and CONSORT [www.consort-statement.org](http://www.consort-statement.org) for randomized controlled trials and [www.strobe-statement.org](http://www.strobe-statement.org) for observational studies). The philosophy behind these sites is to share knowledge, respecting authorship, citing honestly, and being thankful for collaboration and stimulating discussion. Feedback is always positive and acknowledges the effort of every person. University associated PhD programs or online-based programs like “Principles and Practice of Clinical Research” ([www.clinicalresearchlearning.org](http://www.clinicalresearchlearning.org)) offer several opportunities to deepen research knowledge in interdisciplinary fields. In awareness of this development, we will improve quality of research and open new perspectives in the field of spine as a complex human construction.