
TOUCHING BASE WITH WAYNE MCILWRAITH



Dr. C. Wayne McIlwraith is a renowned international practitioner, surgeon, and researcher at Colorado State University.

What is your title in your primary professional capacity?

Sorry, but I have 3. University Distinguished Professor, Barbara Cox Anthony University Endowed Chair in Orthopaedics, and Director of the Orthopaedic Research Center. I also still work as an equine surgeon.

Please describe for us one of your research projects which gave you particular satisfaction, and why it was important?

There are a lot of them but one that stands out is our biomarker research. In our most recent biomarker project that was funded by the Grayson-Jockey Club Research Foundation, Dave Frisbie and I in collaboration with equine veterinarians in Southern California showed that we had significant change in serum biomarkers up to 6 weeks before a horse sustained an injury and the predictability was 79%. Before this project we did two other studies to clarify change in biomarkers with exercise versus changes with early bone and joint disease in exercising horses so we can use them as a predictive marker. The most recent project put us well down the road towards getting a commercial biomarker platform whereby we could be able to identify horses at risk for injury with monthly blood samples and then get them into more definitive imaging diagnostics. Preventing both career ending and fatal injuries is the goal.

Have you ever been involved in research or an experiment during which you became aware at a specific moment or day that a significant point of progress had been achieved?

We have seen hints of positive signs as we go along with projects such as, for example, a diagnostic arthroscopic evaluation of the condition of a joint at time points intermediate in the study. However the scientific process is such that we need to collect all our data and analyze it blinded to treatment groups before we can make a definitive defensible statement.

When you are conducting a project as principal investigator how important is it that you recruit the proper assistants? What qualities do you look for in forming your research team?

Recruiting the proper assistants is critical because in science you can't afford errors at any level. We built our program up to where we have six principal investigators, Drs. Kawcak, Frisbie, Goodrich, Kisiday, Haussler as well as me. There is good communication with the whole team. Principal Investigators have their specific projects but we have one animal care coordinator, an ORC veterinarian who looks after the general health and a research laboratory coordinator who makes sure that the details of every project including timing and the research books are kept well. We have a good team of research associates (technicians), some of whom look after the horses, do clinical work, and help in surgery and our basic science laboratory technicians. Adding to the team, we have excellent student hourlies as well as volunteers, and they have clear coordination from our research trial and research laboratory coordinators.

What do you regard as the chief strengths of the equine scientific research community?

Passion and scientific ability. If we look at the community nationally, we are strong in the various areas/disciplines that collectively we have the ability to both identify the most important questions to be answered and the methods as to how they should be done. Peer review is critical and currently the Advisory Board for the American Association of Equine Practitioners (AAEP) Foundation Laminitis Epidemiologic Study is a good example. The project is being led by Dr. Noah Cohen, but there is an advisory committee to support the priorities and design the best studies.

How would you describe your participation on the Grayson-Jockey Club Research Foundation's Research Advisory Committee?

I have served on this committee for two terms of three years. Larry Bramlage created a good model for how it should be run with four people (two scientists and two veterinary clinicians) looking at each grant and coming to committed opinions before we, the entire 32-person committee, get together. Those four people meet face-to-face to discuss any discrepancies in their evaluation and then it is considered by the whole committee. I still consider it the model for evaluating submitted equine research proposals.

Given an era of cutbacks in university budgets, what is your level of concern about the next generation of equine research?

In an era of cutbacks my concern is huge. It's already been identified as a principal concern of the AAEP Foundation Advisory Committee which I chair – where do we get the next generation of equine researchers? We have to train residents for specialty qualifications and we need to train PhD students. In our situation at CSU none of that funding comes from the University and so we have to get it. Funding of PhD students has been a mixture of donor related discretionary funding and research grants that we have obtained. It was never simple, but has been exacerbated by the recession. It remains an important part of our mission, but it could not have been done without our tremendous equine donor support. We have had four years of university cutbacks. The president of the university, who is a veterinarian, has done a great job in keeping the legislature on our side as well as supporting strong programs, but cuts have had to come so we just need to get on with it.

What area of your professional duties tends to give you the most satisfaction?

I see myself as having two main jobs: Director of the Orthopaedic Research Center at CSU and consulting and doing surgery on equine clinical patients. Leading the program that we have at CSU is terrifically exciting and satisfying. We have gained a lot of knowledge in a lot of areas and still have stuff to do, but it is all good. Sometimes studies don't go the way you would like or hypothesize and it's equally satisfying to me to go and "fix" horses and work with horses. I'm lucky as I have the best of both worlds.

Please discuss the intellectual process of writing a scientific paper for peer review. Do you find it tedious? Does the exercise help cement in your mind what has been learned? In general, do you feel there can be a problem of papers describing good research, but not being published because the researcher is not sufficiently effective at writing?

There are two main parts to the process:

- 1) Designing a good study that will answer the question either way. Unfortunately, there are still too many studies that lack statistical power (that is the ability to be confident that the answer from your sample accurately reflects the total equine population and relies on having sufficient numbers to say that the difference is a statistically different one or is not different because that is the true result).*
- 2) The second part of the process, presuming a good study, is writing it clearly, and that can also be a challenge for people depending on their writing skills. The peer review process, when done by good reviewers, points out inadequacies in the writing and generally this can be redone as long as the data is defensible. On the other hand, the reviewers can't be expected to totally rewrite the paper and as a peer reviewer we see totally unrealistic expectations there as well. Not many people are natural scientific writers so the process can be tough and exasperating to people. However writing grants and writing papers is reality if you are going to be an effective researcher.*

What drew you along the career path you have taken?

It was a progression of events with a bit of fate involved. I went to veterinary school in New Zealand with the idea of being a farm animal veterinarian, but realized there were a lot of other options by the time I graduated. I did two years of mixed practice to consolidate my degree (which I think gave me a great foundation) and then went overseas pursuing my passion of alpine climbing. During a break in that I decided I wanted to specialize in equine surgery, and when I was doing my surgical residency at Purdue, Dr. Dave Van Sickle talked me into doing a PhD with him. He was an expert in canine arthritis and there was very little that had been done in horses. In a research project I had during the residency, the idea of diagnostic arthroscopy to monitor the arthritis that I was working with came up and I went to one of the first human courses as the only veterinarian. The arthroscopic side led into doing a lot of clinical work and developing some of the arthroscopic techniques. My research training led me into pursuing the pathway of joint disease and I guess I followed my nose into trying to solve joint related problems principally from basic biology to surgical management. One has to keep evolving, particularly in research, and so I came to Colorado State University. I tried to keep up with my graduate students and younger and brighter faculty to drag me along the way! It's been a great time.

What is your favorite vacation spot?

New Zealand. Nancy and I built a house there looking over the ocean, northwest South Island.

Favorite restaurant?

Our kitchen at home.

Favorite type of music?

Classic rock.

Favorite sports team?

The New Zealand All Blacks (won the World Rugby Cup last year!). In the US, the Denver Broncos (hopefully on the up again this year!).

Please tell us something about yourself that might surprise people who know you or know about you.

My other passion is climbing. I started when I was 18 and quickly got involved in serious alpine climbing in New Zealand and then overseas. Forty-five years later I am still letting a younger and better climbing partner drag me up rock routes – not often enough, but still the best escape I know.

