



10th International Equine Colic Research Symposium
Indianapolis, Indiana
July 26-28, 2011

Final Report

The American Association of Equine Practitioners (AAEP) Foundation hosted the 10th International Equine Colic Research Symposium, July 26-28, 2011, in Indianapolis, Indiana.

The Symposium, alternating every three years between Europe and North America, is designed to bring together leading researchers, practitioners, residents and graduate students to share knowledge about equine colic, the leading cause of premature death in horses.

As with previous symposiums, this meeting facilitated the exchange of new information about colic among investigators while stimulating new collaborations and ideas for research projects. This year's symposium attracted top researchers from around the world to present the newest information on a variety of colic-related topics. A total of 45 oral presentations and 72 poster presentations were presented during the Symposium.

Sponsors

The investigators and clinicians owe special thanks to the sponsors for making this symposium and research planning panel possible. The Symposium was presented by:

- Boehringer Ingelheim Vetmedica, Inc.

The following companies and organizations provided additional sponsorship support;

- American Quarter Horse Foundation
- British Equine Veterinary Association
- Bioniche Animal Health, USA, Inc.
- Equine Feed Oat Project
- Grayson-Jockey Club Research Foundation
- The Horse Trust
- Merck Animal Health
- Morris Animal Foundation
- North American Equine Ranching Information Council
- Nutramax Laboratories, Inc.
- Nutrena
- Platinum Performance

This cooperative effort is helping to identify priorities for equine colic research and will benefit the owner, veterinarian, supporting industries and most importantly the horse.

Equine Colic Research Priority Planning Panel & Report

After the Colic Research Symposium in 2005, a panel of researchers discussed and proposed research priorities as a way to direct resources to areas, which would have the best chance of elucidating causes, new treatments and prevention for colic. A similar panel met after the 2011 Colic Research Symposium to evaluate research over the last six years and to establish priorities for future research. The panel was challenged to identify the most likely direction colic research should take in the next five to ten years, to find mutual areas of collaboration and make estimates of required funding. The 2011 report will be shared with funding agencies, sponsors, AAEP members, representatives of the equine industry and government agencies. The goal is to highlight the current priorities and needs for equine colic research.

2011 Equine Colic Research Panel Report

Panel Members

Drs. Frank Andrews, Debbie Archer, Fairfield Bain, Anthony Blikslager, Vanessa Cook, Contanze Fintl, David Freeman, Tim Mair, James Moore, Eric Mueller, Chris Proudman, Louise Southwood and Nathaniel White.

The following task and questions were used during panel discussions to elicit the information about the most important areas of study and where resources should be used to find answers about the causes and responses to acute intestinal diseases that result in colic.

List the most important diseases and priorities based on the need for research.

Although no specific diseases were identified as being the most important, specific areas of study were identified as priorities for future research. There was general agreement that epidemiology should be a primary focus of future research with separation of simple colic from the more fatal diseases. Surveys should be completed to examine all diseases on a large scale (recommend an international effort) with an emphasis towards determining risk factors for simple colic, after which interventional studies should be performed to alter nutrition and management practices to determine if colic incidence can be decreased.

Similar surveys are recommended for fatal diseases to collect clinical data as well as horse and management information to try and identify specific risk factors for individual diseases such as large colon volvulus. Information collected from these studies should include clinical recognition of systemic inflammatory response syndromes, intestinal ischemia and obstruction, and endotoxemia. Information about the response to treatment and mortality also needs to be included in these surveys.

Though much progress has been made in understanding the response to intestinal obstruction and the horse's systemic response, research is still needed to help understand intestinal inflammation that accompanies colic and how better to treat shock and intestinal damage. There is still a major

lack of knowledge about intestinal physiology including the response to different nutrients, changes in intestinal flora and abnormal motility.

Research technology has advanced allowing investigation of physiological alterations at the molecular level. The increased cost of this technology is a challenge both in supporting research funding and attracting researchers to a career in equine research. Entire industry support will be needed to make significant advances in understanding the causes and determining how to prevent colic.

Categories listed for future research:

Inflammatory Disease

- Ischemia/Reperfusion
- Postoperative - System Inflammatory Response Syndrome (SIRS)
- Preoperative - treatment
- Dysmotility - ileus
- Shock
- Sepsis

Epidemiology

- International collaboration
- Multi-Center studies to accumulate sufficient data
- Anonymous collection of information
- Feedback to those supplying data
- Analytical support for data management and analysis
- Risk factors for simple colic and for individual fatal diseases

Nutrition

- Affect on physiology
- Nutritional risk factors for colic

Motility – Broad approach

- Normal physiology
- Ileus
- Affect of feeds

Intraluminal Physiology

- Microbiota
- Normal vs. disease

Prognosis - Indicators

- Accumulate data
- Multiple factors
- Combine factors
- Uniform measures
- Definitions
- Survival vs. performance

Diagnosis

- Medical behavior
- Referral criteria

What are the priorities or the next steps needed for equine colic research?

Each panelist chose three categories and topics. Their scores were added to create the following list of research priorities.

- Inflammatory Disease (10)
 - SIRS - Ileus
- Intestinal Physiology (9)
 - Nutrition
 - Microbiota
 - Motility
- Epidemiology (7)
- Diagnostics (4)
- Sociology - Reaching the Owner (2)
- Ischemia - Reperfusion (1)
- Medical Behavior (1)

Specific recommendations: What are the most important research project priorities and the estimated cost? (Three major areas were identified)

I. Epidemiology

1. Central Database

- a. Survival
- b. Referral
- c. Probability scores
- d. Will require incentive for data collection
- e. Project manager - needs a technician
- f. iPad/iPhone app for collection
- g. \$250,000**

2. Case Control - Risk Factors

- h. Veterinarian based
 - i. Nutrition
 - ii. Management
 - iii. Exercise
 - iv. Transport
 - v. \$250,000 - \$500,000**

3. Clinical Audit

- i. Hospital based
- j. Project manager
- k. Web on iPad/iPhone based
- l. Sharing of data
- m. Best practices
- n. \$200,000**

II. Inflammatory Disease

1. SIRS - Sepsis - Complex Disease
2. Ileus - complex disease
3. Preoperative
 - Basic science approach - applied to horse
 - Tissue Bank - consortia for research cooperation of funding agencies
 - Funding - road blocks
 - Overhead - indirect costs needed
 - Form - consortia
 - Investigators
 - Funding sources
 - **Starts at \$1,000,000**

III. Intestinal Physiology

1. **Characterize normal motility - \$500,000**
2. **Characterize normal microbiota - \$500,000**
 - a. Relationship of -
 - i. Diet
 - ii. Microbiota
 - iii. Metabolites
 - iv. Motility

How can funding be increased?

Possible Industry Funding

- Feed/nutrition companies
- Racing
- Pharmaceutical companies
- Matched funding
- Seek more private funding

Propose how to attract and keep researchers devoted to equine research on colic.

Young Researchers

- Early involvement
 - High school
- Higher Pay - NIH (?) - Pay scale and benefits
- Fellowships
 - Veterinary student scholarship
 - NIH-NRSA: T-32 post doctoral fellowships
 - **\$50,000**

- Allow increased allotment of time for research
- DVM-PhD programs
- Translational research
 - Basic scientist and clinician teams

What are the most important messages for horse owners to prevent colic?

I. Marketing - “Best Practices”

- Owner education
- Colic prevention

II. Reaching the horse owner for prevention:

- Colic research Facebook page
- Twitter account
- Colic crusade
- *EQUUS* and *The Horse: Your Guide to Equine Health Care*
- Ask horse owners what they want to know

III. Marketing the message language

- Topics:
- Parasites
- Nutrition
- Need a reliable source of information
- Info needs to be shared with vets
- Keywords to convince the owner
- Reliable source on the website
- Need keywords for searches

List of priorities and specific study from each panel member:

1. Clinical trials
 - a. Flunixin, firocoxib or lidocaine, polymixin
2. Pilot study for international audit
3. Audit for best outcome with treatment
4. Pathophysiology of ileus
5. Understand ischemia at cellular level
6. Characterize the basic physiological processes involved in generating normal intestinal motility patterns.
7. Perfect supplement for prevention of gastric ulcers
8. Fluid therapy
 - a. Develop equine maintenance fluid
9. Nutritional prevention of colon disease
10. Fluid administered to prevent ischemia and ileus
11. Understand the dietary determinants of colic
12. Modify peritoneal response to facilitate healing and prevent adhesions