

Healthy as a Horse: Investigating Impaction Colic



Educational Elements

Key Concept:

Awareness of impaction colic and evaluation of horses' risk

Overview:

The *Healthy as a Horse: Investigating Impaction Colic* lesson plan is designed to teach participants about impaction colic and the horse management principles used to prevent it. The lesson can be taught with or without the accompanying video. In both lesson methods, participants evaluate a pasture and develop a list of things that may decrease or increase the risk of impaction colic.

Age Level:

Ages 13 to 18

Life Skills:

Critical thinking, problem solving

Success Indicators:

After participation in this activity, participants will be able to:

- ▶ Define the term “colic” as well as identify three general types of colic in horses.
- ▶ Explain horse management principles that can be used to prevent impaction colic.
- ▶ Evaluate pastures to determine the risk of impaction colic in horses that graze there.

Materials & Methods

Preparation Time:

- ▶ Video Lesson: 10–15 minutes
- ▶ On-farm lesson (no video): 30 minutes

Lesson Time:

30–45 minutes

Space:

- ▶ **Video lesson:** Enough seating for all participants, a place for the facilitator to stand and write comments from participants, room for projection equipment and screen or wall
- ▶ **On-farm lesson (no video):** A pasture with grazing horses, enough seating for all participants, a place for the facilitator to stand and write comments from participants

Materials:

Video lesson:

- Healthy as a Horse: Investigating Impaction Colic* video: <https://youtu.be/ZiMZyxxvaM>
- Flipcharts, dry erase board or blackboard, or easel pads and easel
- Writing utensil for facilitator (based on paper or board selection)
- Note-taking materials for each group recorder (paper and pens, cell phones with note app, or other means of taking notes)

On-farm lesson (no video):

- Access to a pasture with horses grazing, or recently having grazed
- Flipcharts, dry erase board or blackboard, or easel pads and easel
- Writing utensil for facilitator (based on paper or board selection)
- Note-taking materials for each group recorder (paper and pens, cell phones with note app, or other means of taking notes)

Vocabulary:

- ▶ **cecum** – A space or pouch at the beginning of the large intestine.
- ▶ **colic** – Serious abdominal pain.
- ▶ **depressed** – A depressed horse may lack interest in its surroundings, feed, people, and other horses. It may appear withdrawn and may stand with its head in a lower position than normal.
- ▶ **digesta** – Partially digested feed in the digestive tract.
- ▶ **euthanasia** – Humane death; putting to death or allowing to die painlessly.
- ▶ **gas colic** – Colic caused by excessive production of gas in any portion of the horse's intestinal tract.
- ▶ **herbivore** – An animal that eats only plants.
- ▶ **Impaction** – Blockage or obstruction.
- ▶ **impaction colic** – Pain caused by obstructions in the bowel, typically in areas where the large intestine changes in direction or diameter.
- ▶ **nonruminant** – A simple-stomached animal.
- ▶ **prognosis** – A forecast of the likely outcome of a disease or situation.
- ▶ **spasmodic colic** – Painful contractions of the smooth muscle in the intestines.

Background Information:

What is colic in horses?

Colic in horses may be defined as serious abdominal pain caused by a variety of things. The degree of pain can range from mild to serious, depending on its cause. In some cases, colic may be fatal. In fact, colic is the number one killer of horses.

Common types of colic

Three common types of colic include gas colic, spasmodic colic, and impaction colic. While this lesson will focus on impaction colic, we will start with a definition of gas and spasmodic colic.

Gas colic is caused by excessive production of gas in any portion of the horse's intestinal tract. Since sudden changes in feed may contribute to gas colic, owners must make sure that horses have constant access to good quality hay and clean water. Changes in feed should be gradual. If treated promptly, the chance of recovery from gas colic is usually very good.

Spasmodic colic is defined as painful contractions of the smooth muscle in the intestines. This type of colic typically responds well to treatment by a veterinarian. It may be caused by overexcitement or stress. Spasmodic colic is similar to indigestion in humans.

Impaction colic is caused by obstructions in the bowel, typically in areas where the large intestine changes in direction or diameter. These obstructions may be caused by dry, firm masses of feed, or foreign material such as dirt or sand. Impaction colic can be very serious, or even fatal, and often requires treatment by a veterinarian.

Signs of colic

A horse that is experiencing abdominal pain or colic may stretch its body, paw, roll frequently, look at its flank or belly, start to sweat, or seem depressed. Typically, a horse experiencing colic will demonstrate some, but not necessarily all, of these signs. Occasionally, a horse with colic will lie down and stay quiet, but not roll. If this is the case, you need not force the horse to walk, as tradition often dictates, although movement may help move the impaction along the tract. However, if the horse does start rolling violently, walk it until veterinary help arrives.

What contributes to impaction colic?

Horses are nonruminant herbivores. This means they eat fibrous feeds such as grass and hay, but they do not have large rumens to extensively digest the fiber like cattle and sheep do. As a result, the horse has a complex digestive tract, which includes a relatively small stomach, a small and large intestine that are both very long, and a "cecum" (a space or pouch at the beginning of the large intestine) that contains fiber-digesting microbes. Since the digestive tract is so long, it makes many turns to fit into the abdominal cavity of the horse, and it also changes in diameter periodically. These turns and diameter

changes provide locations where dried feed and foreign substances may get caught, blocking the flow of “digesta” (partially digested feed) through the tract and causing an impaction, or blockage. If the impaction is not released, gas is produced, which enlarges the tract, producing pain, or colic. In severe cases, the tract may rupture, ultimately requiring the euthanasia of the horse to prevent further suffering.

Mature horses *must* consume *at least* 10 gallons of clean, fresh water daily – more in hot weather or when the horse is working. Water will help prevent the horse from dehydrating and keep feed moist, decreasing the risk of impaction colic. Make sure you always have salt blocks available. Top-dress loose salt on grain to encourage horses reluctant to drink.

Providing horses with good quality feed in a sufficient quantity will help prevent impaction colic as well. Mature horses will consume 1.0–2.0% of their body weight in feed daily, the majority of which should come in the form of hay or pasture. Hay or pasture should not contain many weeds or overly mature plants with tough woody stems as these also can cause impaction colic.

When horses overgraze pasture or are allowed to graze on sandy soil, they often consume dirt and sand that can block the cecum and colon, which can also cause impaction colic. Horses should never graze on sandy soil nor graze pastures to a grass height of less than 3 to 5 inches.



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Instructions:

Before the meeting:

Review the lesson and gather any supplies you will need.

During the meeting:

1. The group should choose a facilitator to explain the exercise and to guide the group. This could be the leader or an older teen.
2. Supply note-taking materials to participants.
3. Divide participants into groups of three to four people, if numbers are sufficient. Depending on age range of your group, pair older youth with younger youth, and pair the experienced with the less experienced. Each group should choose a recorder to write down the group’s findings as well as a spokesperson to share the findings with the facilitator who will record them on the flipchart.

Introduction: Read the “Background Information” section aloud. Then have the youth brainstorm things that might increase the risk of impaction colic.

Video lesson:

1. Prepare to show the video *Healthy as a Horse: Investigating Impaction Colic* found at <https://youtu.be/ZiMZyzzxxvaM>. Read aloud or paraphrase the following:

As you watch the following video, keep in mind the factors that contribute to impaction colic. Look for things that might increase and things that might decrease the risk of impaction colic.

2. Show the video. After participants finish watching, read aloud or paraphrase the following:

In your groups, using the note-taking materials supplied, develop a list of possible problems or things you saw in the video that might increase the risk of impaction colic. Then, make a second list of things that decrease the risk of impaction colic.

3. After a sufficient amount of time, bring the group back together to discuss their findings and suggestions. Use the flipchart, dry erase board or easel pad to make a list of everything the group found. Read aloud or paraphrase the following:

What are some of the things you saw in the video that might increase the risk of impaction colic? Explain why they might increase the risk of impaction colic. (Give each group a chance to respond by naming at least one item. Write answers down as they respond. Possible responses appear on page 5.)

What are some of the things you saw in the video that might decrease the risk of impaction colic? Explain why they might decrease the risk of impaction colic. (Give each group a chance to respond by naming at least one item. Write answers down as they respond. Possible responses appear on page 5.)

On-farm lesson (no video):

1. Participants will investigate the pasture, ideally by walking through it, keeping in mind the factors that contribute to impaction colic. Read aloud or paraphrase the following:

As you walk through (or look at) the pasture, keep in mind the factors that contribute to impaction colic. In your groups, using the note-taking materials supplied, develop a list of possible problems or things you saw in the pasture that might increase the risk of impaction colic. Then, make a second list of things that decrease the risk of impaction colic.

2. After a sufficient amount of time, bring the group back together to discuss their findings and suggestions. Use the flipchart, dry erase board or easel pad to make a list of everything the group found. Read aloud or paraphrase the following:

What are some of the things you saw in the pasture that might increase the risk of impaction colic? Explain why they might increase the risk of impaction colic. (Give each group a chance to respond by naming at least one item. Write answers down as they respond. Possible responses appear on page 5.)

What are some of the things you saw in the pasture that might decrease the risk of impaction colic? Explain why they might decrease the risk of impaction colic. (Give each group a chance to respond by naming at least one item. Write answers down as they respond. Possible responses appear below.)

Possible participant responses

May increase risk of impaction colic:

- ▶ Overgrazed pastures with bare spots present
- ▶ Sandy soil
- ▶ Hay fed on ground as opposed to in feeders
- ▶ Broken automatic waterers, limiting water intake
- ▶ Dirty or empty buckets or water tanks, limiting water intake

May decrease risk of impaction colic:

- ▶ Grass height is 3 to 5 inches or greater
- ▶ Hay fed on feeders or rubber mats
- ▶ Salt blocks
- ▶ Plenty of clean fresh water
- ▶ Clean water tanks or buckets

Check for Understanding:

Is it possible to manage how a horse is kept to decrease the risk of some types of colic?

Yes, proper management can decrease the risk of some types of colic. Using the methods of care mentioned such as keeping horses grazing on tall grass, feeding from feeders, supplying salt and plenty of fresh clean water can decrease the risk of some types of colic.

Can all types of colic be prevented through proper horse management?

No, there are different kinds of colic, and while some types of gas and impaction colic can be prevented through management, it is typically more difficult to prevent spasmodic colic or colic caused by infectious diseases.

Learn More:

Learn more about the equine digestive tract and find out how it functions at:

- ▶ MyHorseUniversity.com Online Courses, Michigan State University: http://www.myhorseuniversity.com/online_courses
- ▶ Pratt-Phillips, S. (2013, Nov. 20). The equine digestive system. *The Horse*. (Note: You will have to sign in to read this article.) <http://www.thehorse.com/articles/32922/the-equine-digestive-system>
- ▶ PurinaMills TV. (2010, June 30). *3D Horse Digestion Guide*: <https://www.youtube.com/watch?v=maWXVKI-gq4>



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Ways to Extend:

Build an equine digestive system and explain how food is processed through the digestive system using the following University of Maryland fact sheet:

Burk, A. (n.d.). *Teaching basic equine nutrition, Part 1: Making the equine digestive tract model*. (Fact Sheet 847a). College Park, MD: Maryland Cooperative Extension. http://extension.umd.edu/sites/default/files/_docs/programs/horses/FS-847a%20Teaching%20Basic%20Equine%20Nutrition%20Part%201.pdf

Alignment to Science and Engineering Practices

How does 4-H increase science literacy?

4-H has a long-standing reputation of engaging youth in experiential, inquiry, hands-on activities. These activities enhance formal (public school) science education through their alignment to the eight Science and Engineering Practices identified by the National Research Council on page 42 in their report *A Framework for K-12 Science Education* (<http://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts>). Alignment to the practices was determined by Tracy D'Augustino, Michigan State University Extension educator.

Alignment to the National Research Council Science and Engineering Practices

Science & Engineering Practice	Action	Activity Step Number
1. Asking questions and defining problems	Youth define the problem – things that might cause impaction colic. Youth discuss – ways to reduce the risk of impaction colic.	(During the Meeting 3) (Video Lesson 3, On-Farm Lesson 2)
2. Developing and using models		
3. Planning and carrying out investigations	Youth carry out the investigation – identifying things that increase the risk of impaction colic.	(Video Lesson 3, On-Farm Lesson 2)
4. Analyzing and interpreting data	Youth look at and discuss how the different items impact the risk of impaction colic.	(During the Meeting 3, Video Lesson 3, On-Farm Lesson 2)
5. Using mathematics and computational thinking	Youth discuss food and water consumption.	(During the Meeting 3)
6. Constructing explanations and designing solutions	Youth explain why and how different items can increase or decrease the risk of impaction colic.	(Video Lesson 3, On-Farm Lesson 2)
7. Engaging in argument from evidence	Youth discuss different environments (barns, fairs, pens) and determine ways to identify and reduce the risk of impaction colic.	(Video Lesson 3, On-Farm Lesson 2)
8. Obtaining, evaluating, and communicating information	Youth gather evidence using the video or on-farm experience, background information and additional resources to determine ways to reduce risk, and share that information with their group and others.	(Video Lesson 3, On-Farm Lesson 2, Check for Understanding)

References & Resources:

Evans, J. W., Borton, A., Hintz, H., & VanVleck, L. D. (1990). *The Horse*. New York: W.H. Freeman and Company.

The Horse: Your Guide to Equine Health Care. thehorse.com

MyHorseUniversity.com, Michigan State University:
<http://myhorseuniversity.com/>

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academies Press.

Acknowledgments:

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This bulletin was produced by ANR Communications (anrcom.msu.edu).