



HEALTHY FROM TOP TO TOE

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An Integrated Curriculum For The Washington Post Newspaper In Education Program

A Word About Healthy From Top to Toe

Students of all ages and many disciplines can embrace wellness from the top of their heads to their toes. In this guide we examine hair products, discuss concussions and the trillions of cells within the human body that aren't even human, and take a closer look at shoes.

The Word Study focuses on the root “bio” and microbiology terms. A guide to planning graphics and a template for a how-to layout make producing articles easier. In suggested activities students conduct further research, write articles and prepare media programs.

The reprinted *Post* articles demonstrate how the newspaper is an extension of the textbook. Rob Stein writes of the most recent research in microbes (“Good bugs’ may be key to staying healthy”) and debate about vaccination (“Possible study of anthrax vaccine’s effectiveness in children stirs debate”). Medical exploration of laughter can be read and discussed by the youngest students. In addition to stories on concussion, the Sports section provides a high interest story on Haitian amputees and injured U.S. troops.

Academic Content Standards make the connection to the suggested activities, worksheets, discussion questions and the many approaches to using *The Washington Post* in your classrooms.

A reminder to *Post* INSIDE program teachers: If you plan to use articles in this guide in the e-Replica format more than three months after their publication date, remember to bookmark them.



ABOUT THE COVER

The photo collage, from top: Skateboarding helmut, Bell Sports; Teenager, Photodisc; red shoes, Martin Carlsson for *The Washington Post*; Collage illustration by Carol Porter

Lessons: Embrace wellness, from top to toe, inside and out. Health is influenced by concussions, hair products, microbes within the body, and the function and fashion of shoes. Students learn to study, apply and communicate for a healthier community.

Level: Low to High

Subjects: Health, Microbiology, Journalism

Related Activity: Art, Biology, Chemistry, Cosmetology, Debate, English, Physical Education, Technology

NIE Online Guide

Editor — Carol Lange

Art Editor — Carol Porter

Available Online

All Washington Post NIE guides may be downloaded at www.washpost.com/nie.

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Healthy From Top to Toe

The Washington Post *Health and Science* reporters are a source for the latest developments. Taking a look at the human body from top to toe, inside and out, yields fascinating information for all ages and disciplines to study and apply. The following lesson ideas and activities begin at the head, move through the body to the toes and end with a current question of medical ethics.

Consider Sports Terms

Health, Physical Education, Journalism, English

The “In the Know” sidebar on this page defines terms related to concussion. Before giving students the definitions, teachers may ask students to explain “sport” and “contact sport.” Which sports offered in your school system (fall, winter and spring) would be considered contact sports? Tell students that there are three other terms that help to define more clearly contact sports: collision sport, limited-contact sport and non-contact sport. Can they distinguish these terms?

Have students compile lists of sports by season, girls and boys, school-based and professional. Once these lists have been made, ask students to categorize them by collision, limited-contact and non-contact. This latter classification could be done in groups.

Explain the term “concussion.” In which of the sports listed, is a concussion most likely to occur? Have any of your students experienced concussion? Know a concussed athlete?

Determine Concussed Condition

Health, Physical Education, Technology, English, Journalism

As the public has become more aware of brain trauma, schools have focused on student athletes and concussions. Arthur Allen, a freelance writer, reports on baseline testing that is taking place in schools

across the U.S. Before students read “Concussions get new scrutiny,” teachers could ask students to define or explain “concussion” and TBI.”

If athletes in your class have taken any measure of their reaction time, recall and processing speed, ask them to explain the procedure to their classmates. To prepare for reading this article, teachers should know what is done in their schools.

Be sure that students know these terms: “baseline,” “CDC,” “concussion,” “contact sport,” “liability,” and “neurocognitive.”

Discussion after reading the article might include:

- What does the ImPACT test measure?
- What are the benefits of such baseline measures?
- What are the drawbacks of baseline measures?
- What factors determine whether a concussed athlete is allowed to resume play?
- What is considered the best treatment for a concussed athlete?
- What does the example of Steve Katz’s son add to the article?
- Who has been interviewed for this article? What does each source add to the content?
- What do the photographs add to readers’ understanding of the topic?
- Does your school require athletes who have been hit in the head to sit on the bench? What guidelines

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In the Know

Collision Sport: Sport in which athletes purposely hit or collide with each other or inanimate objects, including the ground, with great force. The Committee on Sports Medicine and Fitness cites boxing, football and rodeo as examples.

Concussion: Mild traumatic brain injuries (TBI) that occur from both mild and severe blows to the head, either direct or indirect.

Contact Sport: A sport that necessarily involves body contact between opposing players, but with less force than in collision sports. The Committee on Sports Medicine and Fitness cites basketball as an example.

Limited-Contact Sport: Rules in these sports are designed to prevent contact between players. Intentional or unintentional contact may result in fines. Examples include baseball, basketball, field hockey, squash and track and field.

Non-Contact Sport: Athletes participate individually or in separate lanes making contact unusual. Examples include golf, gymnastics, tennis and volleyball.

Sport: Active diversion requiring physical exertion and competition

Student-Athlete Protection Act (Va. SB 652): Law requires benching the players suspected of having a concussion until they receive medical clearance from a doctor or athletic trainer to return to play (effective July 1, 2011) [Maryland HB 858 and SB 771, May 19, 2011; Athletic Concussion Protection Act, D.C. B19-7 covers all athletes under the age of 18, July 27, 2011]

Zackery Lystedt Law: The seminal legislation enacted in the state of Washington to raise awareness of the effects of concussions

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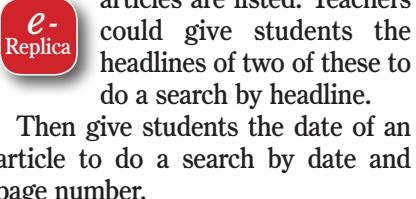
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are used by coaches and athletic trainers?

Tackle the Concussion Problem

Health, Physical Education, Technology, Print and Broadcast Journalism

This e-Replica activity uses the basic search feature. In the sidebar on page 7 of this guide, a few previous articles are listed. Teachers could give students the headlines of two of these to do a search by headline.



Then give students the date of an article to do a search by date and page number.

Follow this with a search by key word or search term “concussion.” Give students “Search | Tackle the Concussion Problem.” As students follow the steps in this activity sheet, they will become familiar with each search approach.

Students might be asked to set up My Monitor for “concussion” and “sports injury” to follow the story through different seasons.

If time allowed, students could be divided into groups to review how other media cover concussions of athletes. The list might include:

NEWSPAPERS

The Dallas Morning News,
Los Angeles Times,
The New York Times,
The Seattle Times,
St. Petersburg Times,
USA Today

TELEVISION

Local stations and *ESPN*

RADIO

Local stations and *NPR*

SPORTS BLOG

<http://thecussionblog.com/>
 The Concussion Blog
www.sportsinjuryclinic.netblog/
 Sports Injury Clinic

Cover Concussions

Health, Physical Education, Technology, Print and Broadcast Journalism

Information discovered in the e-Replica search can be a starting point for further research. Resources listed in the sidebar on page 4 offer information that is current and accurate. Review the websites to determine what will benefit your students to review alone and in class.

Form reporting teams to localize the concussion story and to inform your school community. Give students “Cover Concussions in Your Community.” These considerations will help you to get a reporting plan in place. One team may gather information on the fall sports season while others look toward winter and spring sports. Another approach would be to organize by collision, limited-contact and non-contact sports. Teams may look at freshman sports, female sports, junior varsity and varsity teams.

Teachers should act as editors to brainstorm with each group the focus it will take on the topic. You will be their writing coach.

“Knocked from the game” by Steve Yanda is a good model for an interview-based story. Do a close reading of the article with students. Yanda uses time and numbers to give perspective on events. As details unfold readers are privy to the process that took place from the training camp kick-off to the decision to bench McCartin permanently. Readers also get to know McCartin through his actions, his words and those of others.

“Concussions get new scrutiny” is a different type of story model. Anecdotes are included, but the article is more of a news story on

Concussion Discussion

cdc.gov/concussion

Concussion

“Don’t Hide It. Report It. Take Time to Recover” video and other resources

www.cdc.gov/concussion/sports/index.html

Injury Prevention & Control:

Tramatic Brain Injury

Heads Up Concussion in Youth Sports, fact sheet for athletes provided by the Centers for Disease Control and Prevention, posters, online concussion training for coaches, links

www.childrensnational.org/score/

SCORE

Children’s National Medical Center’s Safe Concussion Outcome Recovery & Education Program website. FAQ and materials for parents, coaches, schools, healthcare workers.

www.ncaa.org

National Collegiate Athletic Association

The NCAA created rules designed to prevent the injury, educate student-athletes and coaches, and protect against athletes returning too soon. Go to “Academics and Athletes.” Links to policies, articles and educational materials.

www.cib.vt.edu

Virginia Tech-Wake Forest Center for Injury Biomechanics

Latest on the work of the engineering and medical interdisciplinary research

www.cdc.gov/media/subtopic/matte/pdf/031210-Zack-story.pdf

The Lystedt Law

“A Concussion Survivor’s Journey,” story of a 13-year-old athlete, his injury, recovery and inspiration for legislation

Carroll, Linda and David Rosner

The Concussion Crisis: Anatomy of a Silent Epidemic

Simon & Schuster, 2011

Microscopic examinations, personal stories of peewee to professional athletes’ concussions and sports culture

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baseline testing. Arthur Allen gives the national and local context for the use of the computerized ImPACT test. Discuss with students how Allen achieves balance so this does not become an endorsement of ImPACT.

Depending on your class, students will write articles, prepare podcasts, tape broadcasts or hold a live radio/TV talk show. Visit Online Course in Science Journalism (www.wfsj.org/course/en) for help.

Smooth or Curl Your Hair?

Cosmetology, Health, Chemistry, English, Journalism

Teachers may show students a collage of advertisements for beauty products and hair styles worn by the stars. Which TV and movie stars, singers and pop culture figures made their hair part of their image and identity? Were influential enough to get fans to wear the same style, cut and color?

Do students consider any hair care products as unhealthy? Discuss their experience and that of individuals they know.

Read "Harsh words for smoothers." Discussion might include:

- What are Brazilian treatments?
- What are the health concerns about it and similar products?
- What is a "carcinogen"?
- Why are these organizations involved in the debate: OSHA, FDA, Environmental Working Group, Personal Care Products Council and Brazilian Blowout?
- Why did OSHA initially get involved?
- What is the chemistry involved in hair relaxers?
- What does the inclusion of David Cohen add to the article?

- Would students advise the Brazilian treatment? The use of hair smoothers?

Inform Your Student Community

Cosmetology, Health, English, Journalism, Media Arts, Science, Mathematics

After reading and discussing "Harsh words for smoothers," encourage students to explore more topics related to hair, its care and importance. Give students "Cover a Hairy Issue."

This project will engage students in research and interviews. They will need to observe, illustrate and photograph their classmates and staff. Mathematics will be applied in creating informational graphics. Science will be involved in understanding the composition of hair and the chemistry of products.

Teachers should refer to *Informational Graphics: The Visual Dimension*, *The Washington Post's NIE* January 8, 2008, online guide (www.washingtonpost.com/nie). Many resources are provided including "Informational Graphics Collection," two pages that illustrate the types of graphics.

Students could create a double truck in your school newspaper, a display for a bulletin board or case, or an online posting. Online audio and video podcasts and photo galleries with captions could stimulate dialogue in your school. Broadcast students could create a series of reports. That should encourage students to tune in.

Expand Coverage With Graphics

All disciplines

Although nothing replaces accurate, balanced and clear reporting,

De-Feet



<http://headoverheelshistory.com/>

The History of Shoes

From antiquity to contemporary, shoes are beautifully illustrated, text is informative

<http://ngm.nationalgeographic.com/2006/09/joy-of-shoes/newman-text>

The Joy of Shoes

National Geographic Magazine article by Cathy Newman and photographs by Mitchell Feinberg (includes gallery with informative captions)

www.nlm.nih.gov/medlineplus/foothealth.html

Foot Health

Use the links on this website to further examination of related topics; ranging from babies booties to athletic shoes, foot care and abuse, swollen ankles to foot push-ups

<http://www.drribut.com/sports/spock.html>

Rock Your Socks

Dr. Stephen M. Pribut's sports medicine commentary on the selection of the right socks for athletes

www.drribut.com/sports/spshoe.html

Athletic Shoes: A Quick Look

Pribut, past president of the Academy of Podiatric Sports Medicine, offers suggestions for selecting the best athletic shoe for you

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informational graphics enhance a story.

Photographs often draw a reader to the story. Candid photographs that capture the action, tell a story and provide a face to meet will stop the reader from turning the page. The very busy reader will read the informative caption, then move on. Many other readers will turn to the headline and begin reading the article.

There are many forms of informational graphics that help to explain the story. Maps and timelines convey spatial and time elements much faster than words. Graphs and charts compare and contrast, indicate quantities and communicate fast facts with visual clarity.

Review the informational graphics that accompany the articles included in this guide. Discuss the information provided and evaluate the effectiveness of the type of graphic used. As students plan their articles, ask them to create an informational graphic. Use *Informational Graphics: The Visual Dimension*, The Washington Post's NIE January 8, 2008, online guide (www.washingtonpost.com/nie) to present different visual options.

INSIDER "How to Plan Your Graphics" and INSIDER "Design a How-to Layout" are provided to give student steps to follow. The graphics planner should help writer and graphic designer to communicate more effectively with each other. Younger students can use "Design a How-to Layout" as a template on which to paste their drawings, photographs and text. Older students will find the layout allows concise presentation of an introduction to the topic, list of supplies, steps to follow and a photograph or illustration of the end-project or desired item.

Add Life to Your Vocabulary

English, Science

Science and technology are two career areas that continue to add new words to our vernacular. "Word Study: Bring Life to Your Vocabulary" focuses on new and standard terms used in biology.

Give this handout to students before or after reading Rob Stein's "Good bugs' may be key to staying healthy." All of the terms are found in Stein's article. After students have completed their study of prefixes, roots and suffixes, ask them what the title of the assignment had to do with the words they studied. What other words have the same (bio) root?

Learn About Human and Other Cells

Biology, Microbiology, Technology

Students will get a different perspective on what is going on within their bodies when they read "Good bugs' may be key to staying healthy." Science journalist Rob Stein reports on the latest discoveries of the composition of the human body.

After a study of cells and cell structure, DNA decoders or microbes, students will take a closer look at the 100 trillion cells in their bodies — of which only 10 trillion are human.

After reading and discussing the article's content, talk with students about the comment of Rob Knight of the University of Colorado: "In terms of potential for human health, I would place it [role of microbial ecosystems] with stem cells as one of the two most promising areas of research at the moment." Why would this be true? What does this mean for research they might do as a career?

Debate Medical Ethics

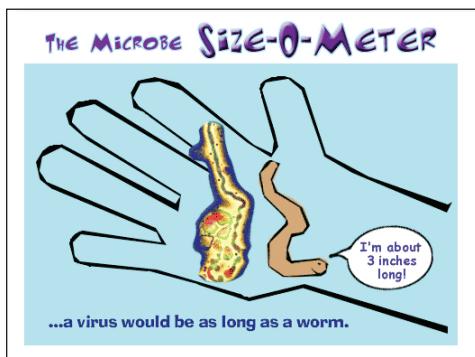
Science, Health, Debate, English

Microbes Within

www.microbeworld.org

Microbe World

American Society for Microbiology website addresses key microbiological issues for youth and adults; view items that are current or "most popular," national and international research, issues and debate



www.amnh.org/nationalcenter/infection/01_mic/01_mic.html

Infection, Detection, Protection

American Museum of Natural History's child-friendly exploration of microbes. Click the terms to link to colorfully illustrated identifications, comparisons and functions.

<http://4hgarden.msu.edu/kidstour/zoo/>
Welcome to the Microbe Zoo!

Students visit the Animal Pavilion, DirtLand and other attractions to discover the many environs of hidden microbes, from Michigan State Univ. and NSF.

www.washingtonpost.com/national/health-science

Health & Science

The Washington Post's most recent coverage of health and science topics. Site includes Medical Mysteries, videos and Patterson Clark's illustrated Urban Jungle features.

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Discuss with students the usual procedure for testing the effects and effectiveness of new medicines. Include in your discussion the story of penicillin, development of polio and measles vaccines, and clinical trial protocol. Teachers may also wish to remind students of their school system's requirement for vaccination of children attending their schools.

Vocabulary that may be reviewed before reading include "bioterrorism," "dormant," "pathogen," and "vaccine."

Read "Possible study of anthrax vaccine's effectiveness in children stirs debate" written by science journalist Rob Stein. Questions for consideration include:

- What is bioterrorism? If teachers have given students the word study activity, "Bring Life to Your Vocabulary, students will recognize the meaning of "bio."
- What is anthrax?
- When and where has anthrax been used to attack individuals?
- Who has been immunized since 1998? Why are they immunized?
- What important question did Dark Zephyr raise?
- Has Rob Stein fairly covered the issue? Have the views of many "sides" been presented?

The heart of the scientific, social and ethical dilemma is found in the fourth paragraph in the quotation of Daniel B. Fagbuyi of Children's National Medical Center in Washington, who chaired the National Biodefense Science Board. Come back to this question after reading and discussing the article. Students might debate the answer or write a commentary.

Be Inspired

Physical Education, Health, English, Journalism

Post Sports writer Teresa Tomassoni reports on a scrimmage between Team Zaryen and the U.S. National Amputee Soccer team. More important than the final score are the reasons these teams exist and their impact on others. Give students "A level playing field."

Discussion questions would include:

- What is amputee soccer? Who participates in it?
- Why had Haiti's Team Zaryen come to the D.C. area? (Not the scrimmage.)
- What is the societal view of amputees in Haiti? What impact did this have after the earthquake?
- What is the meaning of "zaryen"? Why is it an appropriate name for the team?
- Mackenson Pierre's story is told. Why do you think Tomassoni included it in this article?

Does the Shoe Fit?

Health, Physical Education, Art, Biology, Debate

What might appear to be a light health concern — choice of what shoes to wear — sends many women and men to the podiatrist. "On Your Feet" is a short article that younger and older students can read to learn about the fight between fashion and function, between style and sore feet. Although published in 2007, the article refers to many shoe styles that are worn today — and the debate remains the same.

Before reading the article, students could be asked to collect pictures of shoes from advertising and fashion magazines. A quick e-Replica search of advertising thumbnails and photographs could also be a source of images. Also, refer to the resources in the sidebar on page 5 of this guide. As

Past Post Coverage

Janice D'Arcy

"Expert Advice: Sports injury prevention"
On Parenting blog
www.washingtonpost.com/blogs/on-parenting/post/expert-advice-sports-injury-prevention/2011/10/11/gIQA3HpoOL_blog.html

Steve Yanda

"Knocked from the game"
September 11, 2011, Sports, D5

James Wagner

"Will newer helmets reduce concussions?"
August 12, 2011; Sports, D5

James Wagner

"Taking the impact out of two-a-days"
August 22, 2011; Sports, D1

Preston Williams

"After suicide, Prince William schools making sure athletes are taking concussions seriously"
August 24, 2011; Sports, D1

Cindy Skrzycki and Caroline Mayer

"A Head Start on Bicycle Safety; CPSC Set to Approve Mandatory Helmet Guidelines"
February 4, 1998; Style, C11

www.washingtonpost.com/sports/highschools

AllMetSports
Search for "An eye on helmet safety," a photo gallery

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students discuss the pictures they have brought to class, do any of them present the idea of comfort?

Read "On Your Feet." Some points to consider during discussion:

- What are the pro and con of going barefoot?
- What is the social statement made by "cruel shoes"?
- If women are going to wear three-inch or higher heels, what rule should they follow?
- Why don't flip-flops and ballet flats offer a safe alternative to heels?
- What damage to the feet can ill-fitting shoes cause?

Have students point to their legs and feet to locate the knee, patella, femur, calf, gastrocnemius and soleus muscles, Achilles tendon and ankle. What is the function of each of these body parts? Use the informational graphic, "Effects of High Heels on Body" to help.

Use the informational graphics to illustrate the points made in the article. They may also be used to teach skills in reading pictorial information sources and charts.

Using "Exercising Sense in the Shoe Department" chart, label the images of shoes that students brought to class. How many of shoes could be classified as "good" and how many as "bad"?

Students could design a pair of comfortable, foot-friendly shoes for women and for men.

Laugh For Health

Health, Physical Education, Biology

Your health is a laughing matter. Read "Laughing is good for your health? It's no joke." The youngest students can appreciate this article for the basic information about laughter. Elmo, giggling babies and laughter yoga have it right: laughing is good for you.

Do students laugh while watching YouTube videos, hearing a joke and sharing a funny story with friends? With older students, focus on the studies that have been conducted. What are "endorphins," "immune system," and "social context"? Distinguish the studies and their findings.

What experiment might students devise to test the premise? ■

Read About HeLa

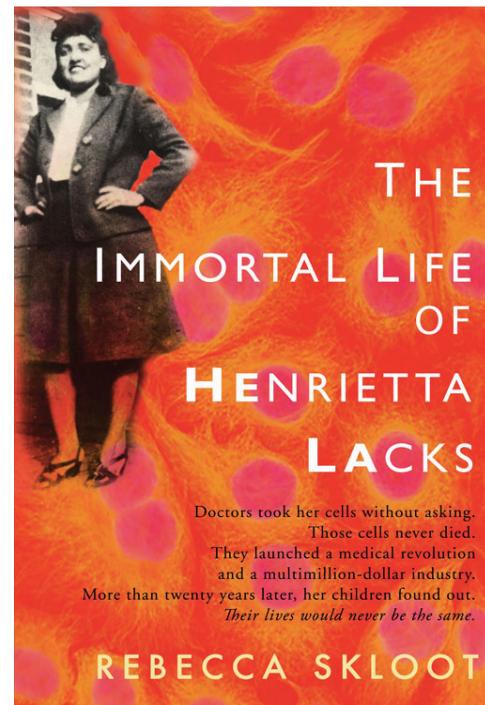
Rebecca Skloot, a science journalist who specializes in narrative writing, wrote *The Immortal Life of Henrietta Lacks*. As an extension to Rob Stein's article on cells, read this work.

In addition to the questions for discussion in the book, visit Rebecca Skloot (<http://rebeccaskloot.com/the-immortal-life/>) for more resources (timeline, individuals, audio and FAQ). Among the questions provided, teachers in different disciplines may include:

- What inspired Rebecca Skloot to write the book?
- Skloot begins the book with a quotation from Eli Wiesel: "We must not see any person as an abstraction. Instead, we must see in every person a universe with its own secrets, with its own sources of anguish, and with some measure of triumph." Discuss this quotation in reference to the book. Did the scientific community and the media view Henrietta and her family as abstractions?
- There is often a tension between religious faith and science. Explore the importance of both religious faith and understanding in the lives of the Lacks family. How does religious faith help frame the Lackses' response to, and interpretation of, the scientific information they receive about HeLa?
- In Part Three Rebecca Skloot

becomes a significant part of the story. Why do you think the author decided to include herself as a character in the book? What effect did this have on the understanding of the Lacks family?

- After reading this story, what considerations might you take in your future research that you had not thought about before? Explain.



- There are many powerful topics discussed in this book: racism, medical ethics, poverty, hope, trust, pride, child abuse, disabilities, lack of education and medical advancements. Select two that interest you the most and discuss how Rebecca Skloot explored them.

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Search | Tackle the Concussion Problem

As more attention has been given to student athletes who suffer concussions, reported incidents, visits to emergency wards and physicians, and media coverage have increased. Do a survey of *The Washington Post* reporting to evaluate the information that is available to readers.

1. Use the **Search** feature to locate the search term “concussion.”

How many articles are found in each of these time frames:

Last days This month
 This week Anytime

2. Skim the articles in the “Anytime” time frame.

- A. In which sports have athletes suffered concussions?
- B. Do reports include high school, collegiate and professional concussed athletes?
- C. Has *Post* coverage been sufficient to inform readers? Explain your response.

3. Read the Injury Reports found in the search.

- A. How many concussions are reported in each Injury Report?
- B. Does there appear to be a pattern? Do certain positions have more concussed players?

4. *Washington Post* reporter Steve Yanda profiled a UVa athlete in “Knocked from the game.”

- A. Read the lead. Notice the uses of time and numbers in the three paragraphs. Write a summary of the lead.

McCartin's career with Cavs is over because of concussions

Charlottesville — Eighteen days after he was told it was no longer safe for him to play the game he loved, Connor McCartin still looked the part of a football player. His shoulders broad, his paws meaty, McCartin sat down Tuesday on a bench outside the Virginia football team's headquarters.

McCartin, a 19-year-old junior, summoned memories of the two concussions he suffered playing high school football, as well as the two he's received during his time with the Cavaliers. He did not respond well to the latest one, which occurred during the first week of the team's training camp in August. The hit occurred on a kickoff, another chance for McCartin — a cog to Virginia's special teams unit — to put a good lick on somebody.

After the concussion, Virginia's medical staff ran a battery of tests on McCartin. On the day before Virginia's season opener, he was told he would not be cleared to play football again. Ever.

- B. After reading the lead to the September 11, 2011, article (Sports, D5), do a search to locate the whole article. Read the article and answer the five questions.

1. How did McCartin receive the two concussions in his collegiate experience?
2. What factors complicated his getting medical approval to return to play?
3. In what ways has the coaching staff been supportive of McCartin?
4. What impression of McCartin do you get through the quotations included in the article?
5. What advice would you give to McCartin?

Cover Concussions In Your Community



STEVE DYKES — ASSOCIATED PRESS

University of Maryland right tackle Jacob Wheeler, left, and assistant trainer Kate Goeler, right, use the Nintendo Wii Fit to establish his baseline balance score.

Concussions have the attention of the NCAA, coaches and sports journalists. Your school's student athletes and school community need to be informed. Also known as traumatic brain injury (TBI), this event may happen during a dramatic play on the field, a jostling during practice, or an accidental fall. Newborns to 14-year-olds account for almost half a million emergency room visits for TBI each year.

Review the following topics as you prepare to research and write about concussions. They will help you find your focus.

Angle of Coverage

- Which sport(s) will be included?
- Will you look back on the previous season, feature the current season or focus on upcoming sports?
- Will a concussed athlete provide the anecdote to localize the story?

Sources

- Where can you get current data on concussed students in your school, school system and state?
- Who are the reliable, informed sources in your school and community? Who should be interviewed? Who would be willing to be a guest speaker, perhaps in a press conference format?
- Which online sources of data are the most reliable? Most current?

Reality Check

What are the perceptions about collision sports and the reality of data? According to the CDC, concussions "may occur in any sport or recreation activity." The three age groups most likely to sustain a TBI are 0-4, 15-19 and more than 65 years.

- Have students in your school suffered concussions in limited-contact and non-contact sports?
- Do students believe being knocked down, hit in the head by the ball or a player, and falling are part of the sport. A player can't be pulled out of play when this happens.
- What are the signs that a player is concussed?
- Should a student's medical history include the number of concussions suffered? Why would this information be helpful to collegiate trainers and team physicians?

Concussion-Management Plans

The NCAA requires every member school have a concussion-management plan. This plan must give student-athletes information about the signs and symptoms of concussions. Schools must have a procedure for removing and reinstating students exhibiting signs of a concussion. A physician must clear an athlete who has been diagnosed with a concussion. Does your state or school have similar requirements?

- Are athletes in your school required to take baseline testing? If yes, which ones and when are they given? In no, why have school officials made this decision? [Read "Concussions get new scrutiny" for background on baseline testing.]
- What guidelines for diagnosed concussed students are enforced in your school? Do these apply to all sports?

Cover a Hairy Issue

How important is hair to students in your school?

Cut, color and control of hair strands may indicate coolness. Students may state their attitudes through different colors, changing the shades on a weekly basis. Identity can be reflected in the length, thickness and texture of the hairdo. Think about athletes who shave their heads in season.



FROM LEFT TO RIGHT, CHRIS PIZZELLO — AP PHOTO;
DAYNA SMITH; MARGARET THOMAS AND GERALD
MARTINEAU — THE WASHINGTON POST

Topics for articles include:

- Hair styles among female students
- Hair styles among male students
- Methods used to color one's hair
- Thefts at beauty supply stores — where and what is stolen
- Accessories for everyday and special occasions
- How to ...
- If an anniversary year for your school: hair styles then and now
- Senior pictures of teachers and their comments about the hair styles popular then
- The best ingredients for healthy hair
- Hairloss from chemotherapy, trichotillomania or balding

What photographs could accompany each of the articles?

- Kid-in-the-hall coif shots
- Step-by-step illustrations
- Before and after comparisons
- Results of experiments with hair care products
- Close-ups of hairdos
- Archived photographs
- Display of hair products

What informational graphics could accompany the articles or be used to inform readers about another related topic?

- Percent of students who go to a beauty shop each week
- Hair products used by students
- Percent of spending money spent on hair products
- Amount of time spent daily caring for one's hair
- Composition of human hair
- Definitions of terms
- Map showing the locations of beauty shops and other advertisers



How to Plan Your Graphics

Whether in print, online or broadcast, media is a team activity. Writers follow a beat, work with editors to develop story ideas, and even get tips from the public. Writers work with editors, graphic artists, photographers and other skilled individuals to produce the finished product.

You are a writer who has conducted research and interviews. The facts have been verified. You are writing the article. Now is the time to plan the graphics that will accompany your story.

1. Know What You Want to Tell Readers

Write down the main points to be made. This is not necessarily in the order that the article will be written. Indicate the number of points of view, key issues, comparisons and contrasts, statistics, and other important information you have gathered.

Did you take photographs or did a photographer accompany you? Get these images together with the captions. Select the five to ten best photographs to tell the story.

2. Meet with Your Editor and Graphic Artist

Share the information and photographs you have collected. You will consult to develop the concept. By brainstorming, you will determine which information is better presented in visual form.

If you are preparing a print and an online story, will the photographs work in a photo gallery? In what order will you sequence the photographs?

Informational graphics explain and expand the story. Review the many types of informational graphics. What information might work in each format?

- Bar graph
- Pie chart
- Illustration
- Map with an inset map
- Cross-section
- Procedural flow chart
- Line or fever-line graph
- Labeled drawing or graphic
- Illustration that shows an inset magnified for detail
- Cutaway drawing
- Organizational chart
- Poll chart

3. Make a Decision

Of the options you have to visually present information, which will you use? Why is this the best approach? Defend your decision.

4. Finish the Story and Prepare the Layout

After you complete writing and editing the article, you are ready to work on layout. You will need the following elements: headline, byline, the article, photograph and caption, informational graphic and sources. Draw a rough draft of the layout.

Title for a Simple How-To Guide

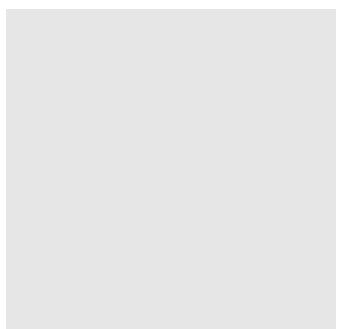
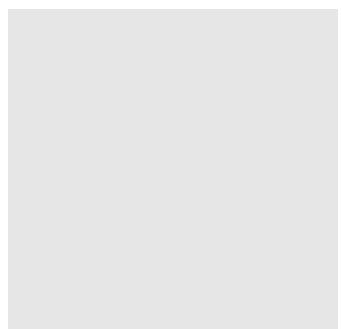
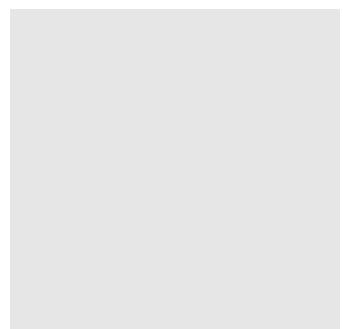
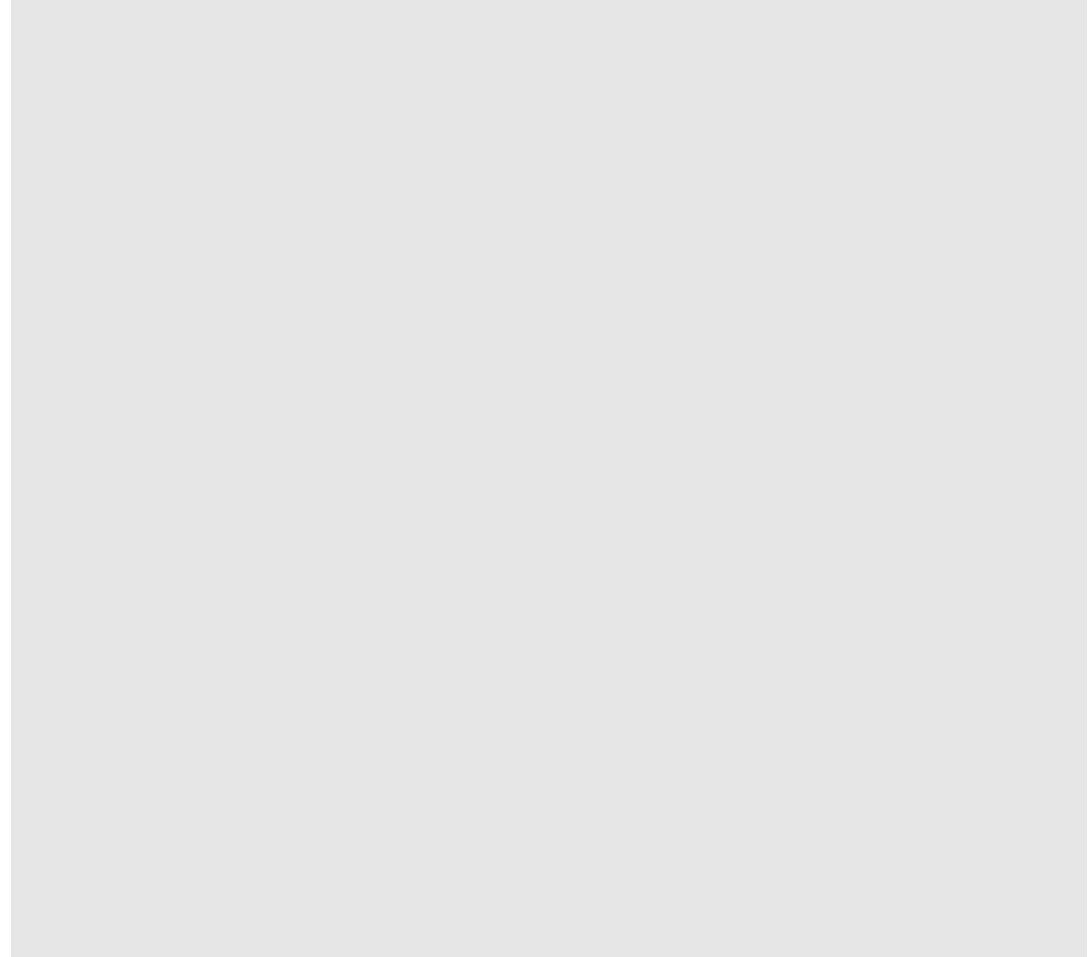
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WordStudy

Bring Life to Your Vocabulary

Terms to Know

When reading about microbes and humans

Antibiotics

Bacteria

Cell

Ecosystem

Equilibrium

Microbe

Microbiome

Microbiota

Molecular

Probiotics

Supraorganism

Virus

As discoveries are made, new words are needed to describe and to distinguish the “things” and actions. These terms are formed from known prefixes, roots and suffixes as well as names of scientists.

What word would you create to describe the human body composed of its own variety of 10 trillion human cells and the additional 90 trillion microbial cells that live within it?

“The ‘human supraorganism’ is one term coined to describe the human host and all the attendant microorganisms,” said Lita M. Proctor, who leads the Human Microbiome Project at the National Institutes of Health, which is mapping this world.” *Washington Post* science reporter Rob Stein writes about the project and microbial colonies in “Good bugs’ may be key to staying healthy.”

An “organism” is defined as an individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent; a living being. The prefix “micro” means small; therefore, a “microorganism” is a small being. “Supra” is a Latin prefix that means above or beyond. A supraorganism is a system or organism made up of multiple organisms that work together as a single organism — it is beyond other organisms.

Through the work of the Human Microbiome Project, scientists know that the human body is composed of human cells and microbes — in a one to ten ratio —working together to keep the body healthy.

Review the 12 terms found in Rob Stein’s article. Take the word apart to identify its parts: Does the word have a prefix? What does it mean? What is the core or root of the term? Does it have a suffix to indicate its part of speech? Together, what is the word’s meaning? Your chart will look like the one below.

PREFIX	ROOT	SUFFIX	WORD’S DEFINITION
Supra Above, beyond	Organ individual constituted to carry on life ...	-ism indicates an action, quality, doctrine, condition	system or organism made of multiple organisms that work together as one

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Concussions get new scrutiny

But cognitive exams for student athletes don't prevent injuries

ARTHUR ALLEN

Special to The Washington Post

• Originally Published October 18, 2011

If you have a child playing ice hockey, lacrosse, soccer or football this fall, chances are good he or she has taken a computerized examination called ImPACT, for Immediate Post-Concussion Assessment and Cognitive Testing.

About 2 million U.S. athletes of all ages have taken the test, which measures mental abilities such as word and shape recall, reaction time, attention and working memory. Athletes are given a baseline test at the start of a season; those who suffer a concussion are tested

again before being allowed to return to play.

The increased prevalence of ImPACT reflects growing public unease about the state of our kids' gray matter. News stories about brain-damaged former NFL football players and reports from Afghanistan and Iraq, where 200,000 U.S. service members have suffered head injuries over the past decade, have also raised concerns about concussions, which almost seem routine in some sports.

As research intensifies, scientists seem to be finding evidence of brain injury after apparently benign concussions. At Washington Hospital Center, researchers recently conducted MRI scans on 100 consecutive patients admitted for concussion, which is usually defined as

a blow to the head that shakes the brain inside the skull and causes a variety of cognitive and other symptoms, such as difficulty thinking clearly, headaches, dizziness and mood changes. They found that roughly a third had evidence of damage to brain tissue, Lawrence Latour of the National Institute of Neurological Disorders and Stroke reported last month at a military conference on traumatic brain injury.

In the past two years, 33 states and the District have passed laws requiring medical clearance of concussed athletes, says Jean Rickerson of Sequim, Wash., who started a group advocating for such laws after her son, a high school quarterback, suffered a serious concussion in 2008. While the laws don't explicitly require baseline testing, it is often recommended by specialists.

"We don't want crippled 13-year-olds because they were put back into a sporting event they should have been left out of," says David Milzman, an emergency physician at Washington Hospital Center who has led the introduction of ImPACT at area schools. "It's not that complicated. Enough of this 'Shake it off, kid,' stuff."

Not much can be done

Not much can be done to treat concussion, other than rest, regardless of the severity. But it's important to keep athletes from playing while concussed, mainly to prevent "second impact syndrome" — rare instances of severe brain damage sustained while a person is healing from initial injuries.

Jon Almquist, who is in charge of athletic training for Fairfax County school athletics and began using neuropsychological tests in 2004, says



STEVE DYKES — ASSOCIATED PRESS

Student athletes in Oregon try out the ImPACT test, intended to help measure the effect of concussions. Some pro athletes claim to have intentionally done poorly on the baseline exam to make the results of any post-concussion look better.

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there's also evidence that kids who have suffered even mild concussions recover more slowly if they return to sports too quickly.

"We'll get kids who come to a neurologist a week after getting a hit saying they're having headaches. The doctor asks them when they stopped playing, and they say, 'I'm still playing.' If they'd been rested after the concussion, the headaches might have disappeared sooner and they wouldn't have been stumbling through school for a week."

"Kids don't like being pulled out of a game," says Milzman. "But I ask them, 'Would you rather be sucking oatmeal out of a straw the rest of your life?'"

The 30-minute computer-based ImPACT test, the mostly widely used of several similar concussion-management tools, consists of four sections that measure word and image recall, processing speed and reaction time. More recently, Milzman has also been establishing students' abilities in a balance test invented by North Carolina researcher Kevin Guskiewicz, who won a MacArthur "genius" grant last month.

But as ImPACT's popularity grows — it's available in 15 languages, according to the Web site of its developer, which charges \$2 per test — so have questions about what it can and cannot deliver. Critics note that ImPACT can't prevent concussions and that it may not be as reliable as many assume. They also suggest its introduction has more to do with fear of lawsuits than effectiveness. Several injured athletes have sued colleges for returning them to play after concussions.

"A lot of school districts think they're running liability risk if they're not doing something," says Christopher Randolph, a clinical professor of neurology at Loyola University in Chicago.

Randolph, who was a team physician for the Chicago Bears for seven years,



TRACY A. WOODWARD — THE WASHINGTON POST

In collision sports, as in this Broad Run-Battlefield game, players contact the ground and each other.

Signs of a Concussion

- Amnesia
- Balance problems
- Confusion
- Double or fuzzy vision
- Headache or "pressure" in head
- Irritability
- Loss of consciousness
- Memory problems
- Nausea
- Sensitivity to light or noise
- Slowed reaction time
- Sluggish or lethargic

takes the rather surprising view that fear of concussions is overblown. He notes that most severe sports head injuries are caused by subdural hematoma — internal bleeding and swelling of the brain lining — which isn't the same as concussion, though a hit to the head can cause both.

Supporters of ImPACT testing acknowledge that second impact syndrome is rare.

"It happens maybe once a year on a football team somewhere in the United States — or not even that often," says Ramon Diaz-Arrastia, director of clinical research at the Center for Neuroscience and Regenerative Medicine, a collaboration involving the Uniformed Services University, the National Institutes of Health and area hospitals.

Concussion certainly is not rare. CDC says that as many as 1.7 million of the events occur in the United States each year; the numbers of student athletes annually treated for sports-related brain injuries in emergency rooms increased 62 percent over the past decade, according

to a new CDC study. The CDC said much of the increase may be due to better reporting. Last year alone, 830 of the 25,000 Fairfax County school athletes suffered concussions, Almquist said.

Others argue the opposite point: that concussion's effects are more severe than most physicians realize, and aren't always picked up by neurocognitive tests. Lester Mayers, director of sports medicine at Pace University in New York, argued in a recent *Archives of Neurology* article that concussed athletes should stay out for four to six weeks. Yet an athlete who suffered a bad concussion still might return to baseline on the ImPACT test within a week or so, Mayers says, which raises concerns that the test could give false assurances.

Supporters of ImPACT say that comparisons to baseline should not be used as the sole method of establishing an athlete's readiness to return to play but as one of several tools, including cognitive and balance testing, symptom

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HEADS UP
IN HIGH SCHOOL SPORTS

A FACT SHEET FOR ATHLETES

What is a concussion?
A concussion is a brain injury that:

- Is caused by a bump, blow, or jolt to the head
- Can change the way your brain normally works
- Can occur during practices or games in any sport
- Can happen even if you haven't been knocked out.
- Can be serious even if you've just been "dinged" or "had your bell rung."

All concussions are serious. A concussion can affect your ability to do schoolwork and other activities (such as studying, driving, or working). Most people with a concussion get better, but it is important to give your brain time to heal.

What are the symptoms of a concussion?
You can't see a concussion, but you might notice one or more of the symptoms listed below or that you feel right away, or a few days after, or even weeks after the injury.

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Bothered by light or noise
- Drowsy, sluggish, hazy, foggy, or groggy
- Difficulty paying attention
- Memory problems
- Confusion

How can I prevent a concussion?
Every sport is different, but there are steps you can take to protect yourself:

- Use protective equipment, including personal protective equipment. In order for equipment to protect you, it must be:
 - Worn correctly and the correct size and fit
 - Used every time you play or practice
 - Follow your coach's rules for safety and the rules of the sport.
 - Practice good sportsmanship at all times.

If you think you have a concussion:
Don't hide it. Report it. Take time to recover.

It's better to miss one game than the whole season.

For more information and to order additional materials free-of-charge, visit: www.cdc.gov/concussion.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTER FOR DISEASE CONTROL AND PREVENTION

June 2010

DEPARTMENT OF HEALTH AND HUMAN SERVICES, CENTER
FOR DISEASE CONTROL AND PREVENTION

A fact sheet for high school athletes about sports concussions is offered online by Health and Human Services, CDC.

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questionnaires and talking with the athlete.

Almquist gives baseline tests to ninth graders and 11th-graders, because their brains and neurocognitive abilities are likely to have changed. They get another ImPACT test 24 to 72 hours after a concussion to look for any neurological domains that might be hurt. Before returning to play, students must submit to another ImPACT after their symptoms disappear.

In a case where an individual desperately wants to return to the field, ImPACT may detect a lingering cognitive issue the patient has tried to mask. However, some professional athletes, including Indianapolis Colts quarterback Peyton Manning, claim to have intentionally done poorly on their baseline tests to make the results of any post-concussion test look better.

Skating into trouble

Gina Palermo, in charge of testing at

Howard High School in Ellicott City, says ImPACT tests help educate parents, coaches and teachers. "It isn't the golden ticket giving the athlete the clearance to play. But it gives athletic trainers and physicians the ability to look at how the brain is doing, and it allows the school support staff to make adjustments to the student's education plan."

One of the major issues with a concussed athlete, she says, is that he or she needs cognitive rest, meaning "no reading, writing or arithmetic — not to mention Facebook, Twitter, TV or texting."

Virginia, Maryland and the District each enacted laws in the past year that require the benching of any athlete suspected of having sustained a concussion, with written medical authorization required before return to practice or play. Baseline testing is part of the management program recommended in the laws. Beginning this year, all high school athletes in Howard, Fairfax and Arlington counties use ImPACT, as do many individual teams in the District and Montgomery and Prince George's counties.

Other measures — such as using football helmets with additional padding and the requirement that all hockey players wear chin guards on the ice — have proponents but little proof that they prevent or lessen the severity of concussions.

Five years ago, Steve Katz's son was scrambling for control of a puck near the goal when another player struck him from behind, making him fall forward and smack his forehead on the ice. His son, then in eighth grade, managed to skate off the rink but suffered from headaches and dizziness for several days, and on doctor's orders did not play for three weeks. The rest of his season was uneventful, but the following year, an opponent checked him hard into the boards, causing him to strike the back of his head on the ice. Katz's son has suffered migraines and balance issues since then and no longer plays contact sports.

The boy's injuries occurred before

baseline testing was used in his hockey league, but it wouldn't have made any difference, his father notes. "Once you begin addressing the lasting impact and seriousness of a head injury to a child of any age, the baseline testing becomes a small and distant light in the rearview mirror," says Katz, who lives in Potomac. "Parents should not consider baseline testing as prevention or protection."

If sports authorities want to prevent concussions, Katz says, it would make more sense to address the dangers directly — by banning checking from most recreational hockey. "More-advanced players and parents who want to assume the risks can always find an advanced league to play in," he says.

The Montgomery Youth Hockey Association, following USA Hockey guidelines, last year forbade checking in games involving children younger than 13. Arguably, even older children shouldn't be slamming into each other at high speed on the ice, acknowledges Rob Keegan, coaching director for the league.

But "even without checking you have kids running into each other," he says, adding that there is debate each year about whether to ban checking, at least for lower-level players. "The argument for keeping it is that a lot of these kids are going to play high school hockey," he says. "If they don't have checking experience, you're setting them up for risks."

Some brain experts argue that children shouldn't take part in contact sports at all until their late teens. "My kids don't play tackle football or ice hockey, and they aren't going to," says Philip Schatz, a neuropsychologist at Saint Joseph's University in Pennsylvania. "We're talking about protecting my kids' brains. They won't get a second one." ■

Allen is a freelance writer based in Washington and author of Vaccine: The Controversial Story of Medicine's Greatest Lifesaver and Ripe: The Search for the Perfect Tomato.

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'Good bugs' may be key to staying healthy

Microbe studies prompt concern over C-sections, other modern trends

By ROB STEIN

• Originally Published October 11, 2011

Consider this: The average person's body contains about 100 trillion cells, but only maybe one in 10 is human.

This isn't the latest Hollywood horror flick, or some secret genetic engineering experiment run amok.

This, it turns out, is nature's way: The human cells that form our skin, eyes, ears, brain and every other part of our bodies are far outnumbered by those from microbes — primarily bacteria but also viruses, fungi and a panoply of other microorganisms.

That thought might make a lot of people lunge for the hand sanitizer, but that impulse may be exactly the wrong one. Researchers are amassing a growing body of evidence indicating that microbial ecosystems play crucial roles in keeping us healthy.

Moreover, scientists are becoming more convinced that modern trends — diet, antibiotics, obsession with cleanliness, Caesarean deliveries — are disrupting this delicate balance, contributing to some of the most perplexing ailments, including asthma, allergies, obesity, diabetes, autoimmune diseases, cancer and perhaps even autism.

"In terms of potential for human health, I would place it with stem cells as one of the two most promising areas of research at the moment," said Rob

Knight of the University of Colorado. "We're seeing an unprecedented rate of discovery. Everywhere we look, microbes seem to be involved."

Equipped with super-fast new DNA decoders, scientists are accelerating the exploration of this realm at a molecular level, yielding provocative insights into how these microbial stowaways may wield far greater powers than previously appreciated in, paradoxically, making us human.

"The field has exploded," said Jeffrey I. Gordon of Washington University, who pioneered the exploration of humanity's microbial inhabitants, known as the "microbiome" or "microbiota." "People have this sense of wonderment about looking at themselves as a compilation of microbial and human parts."

Some equate these microbial inhabitants to a newly recognized organ. Acquired beginning at birth, this mass of fellow travelers may help steer normal development, molding immune systems and calibrating fundamental metabolic functions such as energy storage and consumption. There are even clues that they may help shape brain development, influencing behavior.

"The 'human supraorganism' is one term coined to describe the human host and all the attendant microorganisms," said Lita M. Proctor, who leads the Human Microbiome Project at the National Institutes of Health, which is mapping this world. "There's been a real revolution in thinking about what that means."

Nurturing microbes

Investigators are trying to identify which organisms may truly be beneficial "probiotics" that people could take to help their health. Others are finding substances that people might ingest to nurture the good bugs. Drugs may mimic the helpful compounds that these organisms produce.

Doctors have even begun microbiota "transplants" to treat a host of illnesses, including a sometimes-devastating gastrointestinal infection called *Clostridium difficile*, digestive system ailments such as Crohn's disease, colitis and irritable bowel disorder, and even, in a handful of cases, obesity and other afflictions, such as multiple sclerosis.

Many advocates of the research urge caution, noting that most of the work has involved laboratory animals or small numbers of patients, that many hypotheses remain far from proven and that nothing has zero risk.

"We have to be very careful in how we state what we know at the present time versus what we think might be true at this point," said David A. Relman of Stanford University. "But it's probably fair to say that our indigenous communities are more diverse, more complex and more intimately and intricately involved in our biology than we thought."

Our inner microbes

Scientists have long known that many organisms evolved with humans and

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perform vital functions, digesting food, extracting crucial nutrients and fighting off disease-causing entities.

"We feed them and house them, and they perform certain metabolic functions for us that we have sort of contracted out," said Martin J. Blaser of the New York University School of Medicine. "The homeboys protect their turf from invaders."

But as microbiologists have begun scrutinizing these colonies, it has become clearer that they create carefully calibrated enterprises, with unique combinations inhabiting individual crevices and identifiable nuances from person to person.

"We just don't pick up willy-nilly any microbe in the soil or air we encounter," Relman said.

European scientists reported in April that people generally seem to have one of three basic combinations that may be as fundamentally important as, say, blood type.

The five-year, \$175 million U.S. Human Microbiome Project is assembling an outline of a "healthy" microbiome by sampling the mouth, airway, skin, gut and urogenital tract of 300 healthy adults, as well as deciphering the genetic codes of 200 possibly key microbes.

Dozens of studies also are underway, including some in which children and adults, including twins, are repeatedly swabbed to gain insights into why one person gets tooth decay, asthma, ulcerative colitis or even cancer, and another doesn't.

"We're using microbes as markers for the onset of various diseases or progression of diseases," said Karen E. Nelson, who runs the J. Craig Venter Institute in Rockville. "We think we're going to have a huge impact on health."

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The human micro-zoo

Scientists have begun to find tantalizing clues to the roles that different ecosystems of microbes play in keeping people healthy and making them sick.



Sources: New York University, California Institute of Technology, National Institutes of Health, University of Maryland, CDC.

Mouth:

The proportion of the "gram-positive" bacteria known as *Streptococcus mitis* in the mouths of patients with oral cancer is about half that of healthy people. Gram-positive bacteria may help detoxify tobacco smoke.

Skin:

Levels of the bacteria *Staphylococcus aureus* appear to increase dramatically in the skin of children during flare-ups of eczema.

Gastrointestinal tract:

Microbes in the gut known as *Helicobacter pylori* appear to help regulate two hormones that play a role in controlling hunger and body weight.

Immune system: *Bacteroides fragilis* produces a compound that can dampen the immune system's inflammatory response, which is thought to play a role in many diseases.

Urogenital tract:

The bacterium *lactobacillus* appears to protect women against vaginosis.

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One intriguing finding is that babies born through Caesarean section apparently miss out on acquiring their mothers' microbiota.

Birth, development, disease

"The birth canal is very heavily colonized by bacteria," said Maria Dominguez-Bello, a University of Puerto Rico biologist who has been studying microbiota around the world, including among isolated tribes in the Amazon. "We think that is not by chance."

The rising number of C-section babies denied this colonization, along with the casual use of antibiotics and other factors that can alter the microbiota, might help explain trends such as rising incidents of asthma and food allergies caused by misfiring immune systems. To explore this, researchers have begun following C-section babies, comparing their microbiomes and their health with babies delivered through the birth canal.

The interaction between the microbiota and the immune system may also play a role in other diseases in adults, including those caused at least in part by chronic inflammation from hyperactive immune systems.

"Gut bacteria have figured out a way to network with our immune system so it doesn't attack them," said Sarkis K. Mazmanian of the California Institute of Technology.

The microbiota apparently sends signals that dampen the "inflammatory

response," a crucial defense also thought to play a role in a variety of diseases, including many forms of cancer, the "metabolic syndrome" caused by obesity, diabetes and heart disease.

The theory is that one reason some people may be prone to these diseases is that they are missing certain microbes. One anti-inflammatory compound produced by a bacterium appears to cure the equivalent of colitis and multiple sclerosis in mice, both of which are caused by misfiring immune systems, Mazmanian found.

Role in obesity?

Similarly, studies indicate that gut dwellers secrete messengers to cells lining the digestive tract to modulate key hormones, such as leptin and ghrelin, which are players in regulating metabolism, hunger and a sense of fullness.

Pregnant women often take antibiotics, and young children can get several rounds to fight ear and other infections, which can kill off these companions. Farmers commonly add antibiotics to animal feed to fatten their animals faster.

"We may have a generation of children growing up without the proper bacteria to regulate their leptin and ghrelin," Blaser said.

Obese people appear to have a distinctive mix of digestive bacteria that make them prone to weight gain. Thin mice get fatter when their microbiota is replaced with the microbes of obese animals.

"Our ancient microbiome is losing the equilibrium it used to have with the host — us — and that has profound physiological consequences," said Blaser, who published his concerns in a paper in the journal *Nature* in August.

Microbes and the mind

Clues also are emerging about how microbes may affect the brain. Manipulating gut microbiomes of mice influences their anxiety and activity, Swedish researchers reported in January in the *Proceedings of the National Academy of Sciences*.

"This may have implications for new lines of thinking to address some of the psychiatric problems you see among humans," said Sven Pettersson, a professor of host-microbial interaction at the Karolinska Institute. "Together with genetic susceptibility, this may influence what doctors classify as autism or ADHD."

In another experiment involving mice, a Canadian-Irish team reported in August that bacteria in the gut appear to influence brain chemistry, and corresponding behaviors such as anxiety, stress and depression, via the vagus nerve.

"What we've shown is, you change behavior as well as make changes in the brain," said John Bienenstock, director of the Brain-Body Institute at McMaster University. "Now we have direct proof how that happens. That's why this is exciting." ■

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Harsh words for smoothers

Health officials warn of dangers in 'Brazilian' hair treatments

LAURA HAMBLETON

Special to The Washington Post

• Originally Published October 18, 2011

When Adelia Varga visited Brazil four years ago, she tried a hair smoothing product and couldn't believe how it tamed her wild, curly hair. She brought it back to the Rockville salon where she works and now regularly uses a similar treatment on herself and her clients.

"My hair looks so healthy," Varga, 38, said recently as another stylist dabbed the white liquid on her brunette hair. "My hair is usually frizzy and bushy. Now it is silky and bouncy."

Health officials say such smoothing products, often known as Brazilian treatments, may pose a hazard to stylists and users alike. That's because most of them contain formaldehyde or chemicals that release formaldehyde, which has been identified as a cancer risk.

In its annual report on carcinogens, the National Toxicology Program this year reclassified formaldehyde from a probable carcinogen to a known one.

Several companies that make formaldehyde-based hair smoothing products are under investigation or have been cited for violations by the Occupational Safety and Health Administration or the Food and Drug Administration for false advertising about their products, and for exposing workers to formaldehyde above legally allowable levels.

The Cosmetic Ingredient Review, a panel funded by the cosmetics industry and backed by the FDA, recently stated that, "in the present practices of use and concentration ... hair smoothing products containing formaldehyde and methylene glycol are unsafe." The problems noted were high concentration of the chemical, overuse of the hair product and inadequate ventilation during application.

Formaldehyde is a colorless, usually strong-smelling chemical that has been in use for about 70 years as a preservative and binding agent. Think frog floating in a science-class jar, corpses, particleboard, carpets, glue, cosmetics — and hair products.

Formaldehyde can be an irritant and an allergen. Some people's eyes tear, their noses run and their throats burns. Some experience more-extreme reactions, such as coughing, wheezing or even asthmalike symptoms. And there have been cases of hair loss and vomiting from hair products with high levels of formaldehyde.

As a result, said David Andrews, a scientist for the Environmental Working Group, an advocacy organization, "these [hair] products have been banned in Europe, Canada and Australia."

OSHA does not regulate the amount of formaldehyde in hair products used in salons. It does, though, stipulate that the air in a salon have no more than 0.75 parts of formaldehyde per million parts (ppm) during an eight-hour shift and no more than 2 ppm during any 15-minute period. Formaldehyde is released into the air when a stylist dries

a client's treated hair with a blow-dryer or straightening iron.

"Our responsibility is to ensure the workplace is free of hazard," said OSHA's top official, David Michaels. "Formaldehyde is a hazard." He estimates that there are 75,000 salons in the United States and about 500,000 people who work in them. OSHA does not track how many of the salons use formaldehyde-based smoothers.

More than zero?

"Relaxers work by breaking the bonds" formed by hair's keratin proteins, said John Bailey, a former FDA official and former chief scientist for the Personal Care Products Council, a trade association. Doing so allows a stylist to reset the hair as curly or straight and it "stays fixed in the different configuration. Formaldehyde [then] bonds the keratin, or protein, to the hair shaft [in that new configuration] and protects it from losing the effect."

The FDA recently sent a warning letter to the company that makes Brazilian Blowout, saying it was "misbranding" its product as formaldehyde-free even though it "contains methylene glycol, the liquid form of formaldehyde, which ... may harm users under the conditions of use prescribed in the labeling."

Michael Brady, chief executive of Brazilian Blowout, said he doesn't believe methylene glycol is the same as formaldehyde. "For every scientist who says methylene glycol is the same as formaldehyde, we have a scientist who says it is different," he said. He

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does agree that once his product is heated with a blow-dryer or hair iron formaldehyde will be a byproduct, but he says it is well within OSHA emission standards.

The company also sells Brazilian Blowout Zero, which uses a "plant-derived" proprietary bonding system and "releases 0% formaldehyde before, during or after the in-salon smoothing treatment," according to the company's Web site.

The OSHA/FDA investigation started a year ago with a complaint from a stylist in Portland, Ore., who used Brazilian Blowout and was "experiencing symptoms such as headaches, nose blood, symptoms consistent with exposure to formaldehyde," said Melanie Mesaros of Oregon's OSHA. "We took examples of original product ... and a range of formaldehyde was found in the products. As far as OSHA is concerned, methylene glycol and formaldehyde are the same, and you have to follow the same rules for exposure."

Since then, OSHA and its state partners have conducted inspections at approximately 24 salons that use hair smoothers and at nine manufacturers and distributors based on complaints around the country, and have received more than 300 requests for assistance from stylists and salon workers.

OSHA has cited salons in New York and New Jersey and four manufacturers and distributors in Florida for allegedly failing to protect their workers from formaldehyde exposure and for failing to "communicate with the products' users, such as salons and stylists, about the hazards of formaldehyde exposure," according to an OSHA press release. The agency said it found "formaldehyde overexposure or dangerous levels" in the air in some salons.

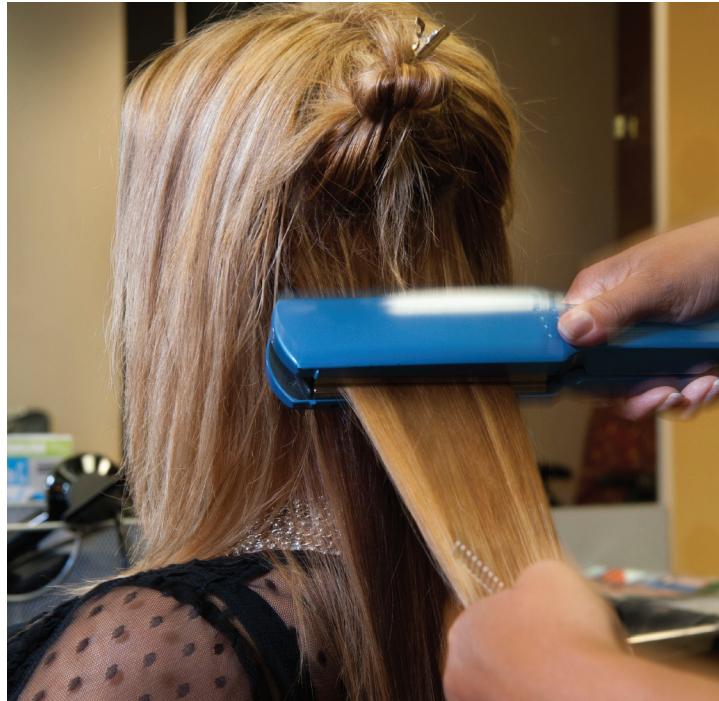
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Mahshud Hosseini (left) has her hair styled by Stylist Adelia Varga of David's Beautiful People Salon in Rockville, Md. The hottest, incredibly popular hair-straightening system, the Brazilian, uses formaldehyde.

MARVIN JOSEPH — THE WASHINGTON POST

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FRITZ HOFFMAN—NATIONAL GEOGRAPHIC IMAGE COLLECTION

The Brazilian, which uses formaldehyde, was recently labeled as carcinogenic by the FDA. The treatment has adverse health effects for the stylist who applies it and the user, according to health officials.

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\$160 and up

At David's Beautiful People in Rockville, where Varga works as a stylist, owner David Cohen says he limits the number of Brazilian treatments to two a day so as not to overwhelm his salon with formaldehyde. He also runs a ventilation system and an air purifier at all times.

"I stopped taking appointments for Brazilian treatments online so we didn't overbook," he said. Still, his clients are clamoring for the products, which range from \$160 for a mild, formaldehyde-free smoother that will last up to six weeks to a \$450 treatment with formaldehyde that will last up to six months.

"The true non-formaldehyde formulas are not as good as the low-formaldehyde smoothers," he said, though "they are a good alternative as long as the client and stylist understand the difference between the two."

He said he is sure many clients will continue to opt for the formaldehyde formulations unless the government decides they should not be sold anymore. "It's amazing stuff," Cohen said. "We do a color treatment, then put on the Brazilian and it keeps the color. It seals the hair."

Varga acknowledged she is concerned about possible long-term consequences to her health from applying the product day after day. "I use a mask" when putting the liquid on customers' hair, she said.

The desire for smooth, straight hair can be powerful. "You don't know how many times my scalp was burned," said Lori Pemberton, a 43-year-old District resident, remembering the sodium hydroxide, or lye, applied to hair when she was a child. This summer she tried a formaldehyde-based smoothing treatment for the first time. "I prefer this any day," she said. "This seems a lot easier. My hair is shinier. It's easier to

style. I work out every day. I get up at 5 in the morning. Now my hair isn't frizzy. My hair stays straight."

Nor have worries about formaldehyde stopped Laurie Taylor, a 37-year-old recruiting coordinator for a District law firm. She once spent more than 45 minutes a day to blow-dry her hair, put it in rollers and then smooth it with a flatiron. "Now I don't have to do all those extra steps," she said. "Today, I woke up, washed it, put it in a bun. It will be wavy, with a soft wave."

And carcinogens?

"There are so many bad things out there," she said. "I enjoy my hair. I don't think too much about it."

Hambleton is a Washington-based freelance writer and documentary filmmaker.

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On Your Feet

How do shoes affect your feet? Is there a good way to walk in heels? Want to know about Morton's neuroma? How about hammertoe and pump bumps?

JANUARY W. PAYNE

The Washington Post Staff Writer

• Originally Published May 8, 2007

They're made for walking, jogging, hiking, even dancing.

But in the centuries since our ancestors first wrapped their feet in woven grasses and animal skins to protect them from

rough surfaces, function has clashed with fashion in the design of our shoes. The crocodile-hide loafers and cowboy boots that cross paths with dress oxfords on today's city streets are often chosen for what they say about their wearer rather than for comfort.

Among women's shoes, fashion has truly trumped function. As the summer months approach, colorful sandals, flip-flops, wedges, high heels and ballet flats dot the sidewalks. One of trendiest shoes this season is YSL's platform

"Tribute" — with a tottering 5 1/2-inch heel. Often painstakingly selected to complete outfits, shoes like these put stress not just on feet, but on ankles, knees and backs, contributing to the approximately \$3.5 billion spent annually in the United States for women's foot surgeries, which cause them to lose 15 million work days yearly.

Enduring discomfort to participate in fashion or show status is an age-old

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PHOTO ILLUSTRATION BY MISTERFILE

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trend, said Elizabeth Semmelhack, a curator at Toronto's Bata Shoe Museum, which has about 13,000 footwear artifacts; the oldest is 4,500 years old, and the most recent was collected in 2006. "It's absolutely clear to me ... when I look at cultures that impracticality is one of the primary features among the privileged [class]," she said.

Experts warn against what one group of foot doctors calls "cruel shoes" — such as the high heels that Semmelhack says have historically been "one of the primary ways to express what [people] don't have to do," such as walk long distances and do strenuous work.

Shoes with "pointed toes, shoes with thin soles, and shoes with high spike heels" are of the cruel variety, according to the Web site of the American Orthopaedic Foot & Ankle Society, because they can "cause crowding of the toes and increased pressure," which can result in hammertoes and bunions. The American Society of Podiatric Sports Medicine reports that a three-inch heel creates seven times more stress than a one-inch heel.

Years ago, lower classes did their best to mirror trends established by upper classes, Semmelhack said. For example, "in the 18th century, lower-class [women] might have heels, but [they] won't be as high" as those owned by upper-class women.

When humans walked barefoot, "societies seemingly had a low incidence of foot deformities and pain," according to a 1994 essay published in the *Journal of the Southern Orthopaedic Association*. The first shoes "were made in the shape of the foot and were sandals," wrote Sally A. Rudicel, an orthopedist at Tufts-New England Medical Center. But "over time ... as the shape of shoes changed, they became deforming forces on the foot and the source of pain."

Today, despite mounting evidence of the damage ill-fitting shoes can cause, women squeeze their toes to fit into oh-so-popular pointed-toe shoes, and they readily break the American Academy of Orthopaedic Surgeons' rule of thumb: no more than three hours in three-inch heels. Wearing heels causes your foot to slide forward, "redistributing your weight, creating unnatural pressure points and throwing your body's natural alignment out of whack," according to the Mayo Clinic. High heels have "been linked to overworked or injured leg muscles, osteoarthritis of the knee and low back pain," continues Mayo. "You also risk ankle injuries if you lose your balance and fall off your high heels."

For those women who want fashion plus function, so-called comfort-brand shoes claim to offer the best of both worlds. Among them: Naturalizer, Ecco, Aerosole, Cole Hahn and Taryn Rose, created by a former orthopedic surgeon who brought her first line of luxury shoes to the market in 1998. And they're not your grandmother's orthopedic shoes.

Foot doctors often recommend these lines to patients. "Comfort shoes tend to have a rounded toe box, more cushioning [and] more arch support," said Theresa Fahy, a podiatrist with offices in Vienna and Leesburg. The shoes make "you more comfortable when you're standing," she added.

Still, the lines aren't a cure-all for everyone, Fahy said. "It really depends on the foot. ... You don't really have a universal shoe for every foot."

But when it comes to properly fitting shoes, women often find a lack of options. "Men's shoes on the whole are available in a greater variety of widths and conform more closely to the outer dimensions of their feet," the foot and ankle society reports.

As a result, women are at greater risk

for shoe-related health problems than men, according to the society, which released a recent position statement declaring that foot problems "resulting from poorly fitting shoes have reached epidemic proportions and pose a major health risk for women in America." Women account for about 90 percent of surgeries performed for the most common foot ailments, the society reports.

That risk can include bunions, stress fractures, joint pain in the ball of the foot, Morton's neuroma, "pump bumps" (enlargement of the bony area on the back of heel), corns and calluses, hammertoe, toenail problems and tight heel cords (shortening or tightening the Achilles tendon).

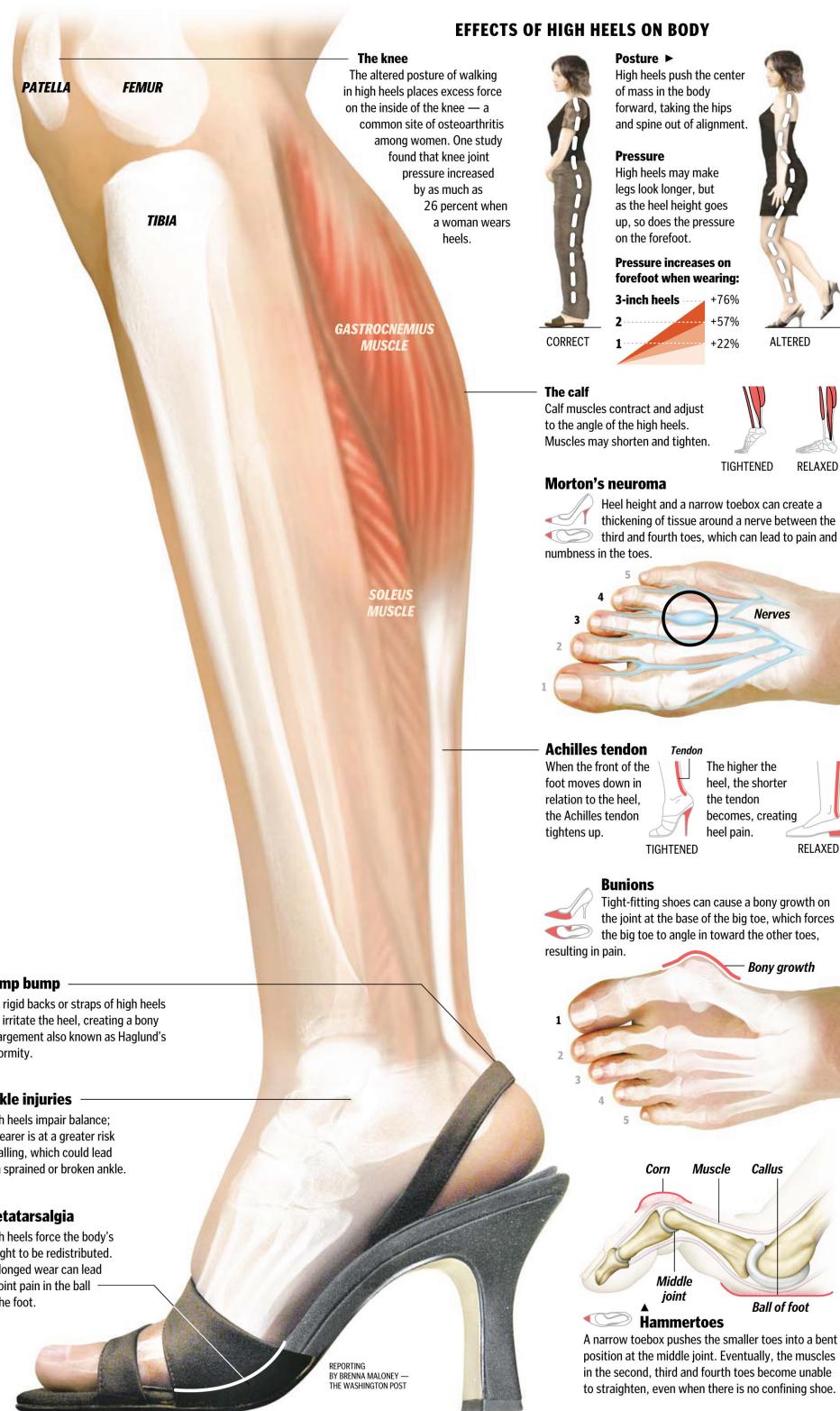
Women often think they're doing their feet a favor when they ditch the heels and put on flip-flops or ballet flats because there's no heel, no pointed toe, no reason to worry. Right?

Not so, say podiatrists, who treat foot problems often exacerbated by improper footwear. "The thing that flip-flops do best is carry patients into my office," said Stephen Pribut, a D.C. podiatrist. The repeated process of lifting your heel away from the shoe surface (creating that characteristic flip-flop sound) creates tension in the foot, said Pribut, which can worsen such painful inflammatory conditions as plantar fasciitis.

Erika Schwartz, a podiatrist in private practice in the District and Chevy Chase, advised that ballet flats and flip-flops "really shouldn't be worn for any kind of excessive walking [because there's] really nothing giving you support underneath."

Nobody is advocating going barefoot on today's hard, trash-strewn surfaces; it's all about the right fit. "If your foot doesn't hurt during or within 24 hours after wearing a shoe," Pribut said, "go ahead and wear it. Otherwise, toss it and start over again." ■

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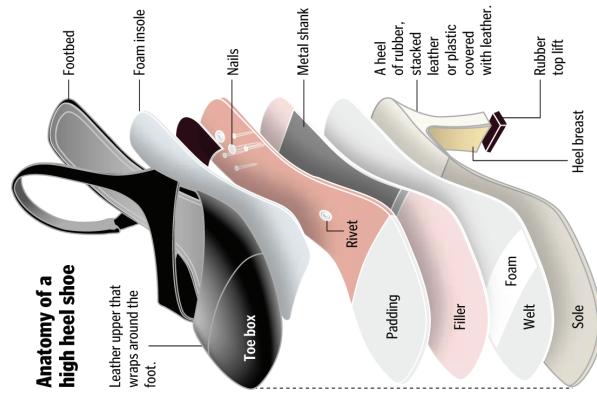


SOURCES: American Academy of Orthopaedic Surgeons, American Apparel & Footwear Association, American Orthopaedic Foot & Ankle Society, Mayo Clinic, Society of Chiropodists and Podiatrists, "Women's Shoes and Knee Osteoarthritis," by D. Casey Kerrigan, Jennifer L. Lelas, Mark E. Karvosky, *The Lancet* 2001: 357: 1097-1098

Exercising Sense in the Shoe Department

SURE, FASHION CAN BE A PAIN, but you don't have to feel it in your feet. Here are some expert shoe-buying tips:

- Judge a shoe by how it fits, not its size. If shoes feel tight, don't buy them. There is no such thing as a "break-in period."
- Shop for shoes at the end of the day, when your feet are often larger because of swelling.
- Measure both feet; sizes often differ. Always fit to the larger size. Stand when being fitted. Allow a half-inch space from the end of your longest toe to the end of the shoe. Try on both shoes.
- Select breathable, flexible materials, such as leather or nylon mesh.
- Don't wear high heels more than three hours at a time. If you wear them often, stretch muscles daily to lengthen them.



Healthwise, all shoes aren't created equal. Here are pros and cons for some common styles.

	FOR MEN	THE GOOD	THE BAD
Loafers and Dress Oxfords		Many are roomy in the toe box. Lace-up shoes offer added stability.	Some have narrow toe boxes, which can squeeze toes.
Dress Sandal		Many provide arch support, plenty of room for toes and a heel strap that helps keep foot in place.	Lack of support in sandals without heel strap can aggravate heel spurs or plantar fasciitis, common causes of heel pain.
Flip-Flop/Thong		Some slide-on sandals offer arch support.	Lack of heel support in flip-flops can cause heel pain. Thong-toe sandals can cause blisters. Experts suggest those who suffer from heel pain avoid flip-flops altogether.
FOR WOMEN			
Ballet Flats		Colorful, fashionable.	Thin soles may provide inadequate cushioning and support, which can result in heel and arch pain.
High Heels With Pointed Toe		Fashion staple of the business, dress and casual wardrobe.	Foot may rock on narrow heel, causing sprained ankle. Risk of sprain increases with height. "A heel that is three inches high creates seven times more stress than a one-inch heel," reports the American Academy of Podiatric Sports Medicine. Pointed-toe shoes may squeeze toes and cause hammertoes and bunions.
Wedge		Adds height without a narrow heel, may be more comfortable than high heels.	Can cause instability. Wedges that are too high may lead to falls and ankle rolls.
Flip-Flops		Affordable, colorful. Natural material — such as soft leather — is kinder to feet than plastic, which may cause blisters.	Don't provide stability or support for sides, back or top of feet. (See men's flip-flops, above.) Flat shoes with open backs can cause Achilles tendinitis — an inflammation of the tendon connecting calf muscles to heel.
Rounded-Toe Heels		Fashionable. Offer more room for the toes than pointed-toe heels.	Narrow heels and high heels can cause instability and push the foot too far forward, increasing pressure on toes and joints. The higher the heel, the bigger the problem.
UNISEX			
Crocs		Sturdier than flip-flops but still flexible. Have a wide toe box and soft soles. Some people with neuromas, bunions and hammertoes may find them more comfortable.	Shoes' flexibility may aggravate plantar fasciitis because the heel lifts repeatedly off the shoe surface.
Ugg/Fur-Lined Boots		Supportive, warm and fashionable.	Some copycat boots offer less arch support.

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RICKY CARIOTI — THE WASHINGTON POST

Pierre Richard Arindal, center, of Haiti's Team Zaryen celebrates after a teammate scores a goal against the U.S. National Amputee Soccer Team in an exhibition match at RFK Stadium. The Haitian players, victims of last year's earthquake, held clinics at RFK.

A level playing field

Haitian amputees thank U.S. troops for earthquake aid with lessons in soccer

TERESA TOMASSONI

• Originally Published October 20, 2011

Cheers erupted on the sidelines of a practice field outside RFK Stadium as Sandy Jean Louis Louiseme, the youngest member of a Haitian soccer team composed entirely of amputees, dribbled toward the goal.

Amputee soccer has rhythms, and risks, all its own, which became clear when Louiseme collided with the goalie

of the U.S. National Amputee Soccer Team, crutches flying in every direction. Only after Louiseme sat up with a smile on his face did the crowd exhale.

Louiseme's squad, Team Zaryen, scrimmaged with the U.S. national team Tuesday as part of a five-day "Haitian Inspiration Tour," in which the amputees, victims of last year's earthquake, held clinics in amputee soccer for U.S. service members who have lost legs while stationed in Afghanistan and Iraq. The clinics, held at Walter Reed National Military Medical Center in Bethesda on Monday and the RFK practice field Tuesday, were the team's way of thanking

the U.S. military for its work evacuating and caring for victims of the disaster.

Amputee soccer was founded 30 years ago in Seattle by Don Bennett, a sportsman who lost his leg in a boating accident at age 42. Now, people who have lost a limb play the sport around the world, on crutches. All prosthetics are left on the sidelines to level the playing field.

Justin Masellas, 25, a Marine sergeant who lost his right leg below the knee in July after a rocket blast in Afghanistan, watched the action Tuesday. Although

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he had never been a soccer fan, his opinion changed after attending two of Team Zaryen's clinics this week. Now, he said, he's ready to challenge his two-legged friends to a game of soccer, "the amputee way."

"It gets a lot more complicated when you have to use one less leg," he said.

Team Zaryen's trip was sponsored by Knights of Columbus, a Catholic charitable organization, and Project Medishare, a nonprofit organization based in Miami that helped found Team Zaryen in September 2010.

Prosthetic arms and legs have transformed the lives of hundreds of Haitians who lost limbs in the earthquake, including Team Zaryen members, said Jason Miller, a physical therapist who directs the rehabilitation program at Project Medishare's Hospital Bernard Mevs in Port-au-Prince.

Historically, amputees there have been stigmatized, Miller said. "Disabled people have always been on the fringe of society in Haiti," he said.

Many of those injured during the earthquake didn't want their limbs amputated, said Adam Finnieston, a prosthetist who has worked with Project Medishare to fit Haitian amputees with mechanical limbs, including all Team Zaryen players. "They would risk their lives to keep their limbs," Finnieston said.

Mackenson Pierre, 28, was trapped for three days under the rubble of a collapsed school in Port-au-Prince and lost a leg to infection after he was rescued. An avid soccer player before the earthquake, he said he was "overwhelmed" with emotion after losing his leg, especially while sitting on the sidelines watching his friends play the game he loved.

When he visited Project Medishare one day to see about getting a prosthetic, someone there asked whether he played soccer. "I can't play soccer with just one leg," he responded. But he quickly



RICKY CARIOTI — THE WASHINGTON POST

A member of Team Zaryen amputee soccer team relaxes on the bench before the exhibition match against the U.S. Amputee Soccer team at RFK Stadium practice fields.

accepted an offer to join Team Zaryen. Amputee soccer was part of what Project Medishare calls its Return to Sport Initiative for Haitians who lost limbs in the earthquake.

Soon, Pierre was playing several times a week.

One of the lessons amputee soccer taught Pierre and his teammates was when to put their prosthesis aside in favor of crutches.

They happily do so while playing but gratefully put them back on after the game.

The word "zaryen" is Creole for tarantula, a spider that can grow back a leg. When a team member has a prosthesis, "they grow another leg," said Cedieu Fortilus, the coach and co-founder.

Pierre would miss a lot of balls at first as he tried to kick them with his phantom right leg. When that happened, he said, he'd tell the coach, "I'm sorry. I'm a righty."

These days, Pierre is one of more than 20 Haitian men, women and children who have started to play soccer with Team

Zaryen in Haiti, dramatically changing the way people with disabilities are viewed in their country. When they wear their uniform shirts, people cheer for them in the streets, said Robert Gailey, director of rehabilitation at Project Medishare's base in Miami.

On Saturday, Haiti's president, Michel Martelly, came to watch them play, Gailey said.

"Kids see them play, and they're heroes," Miller said.

With each game, the team gets closer to its dream of playing in the 2012 Amputee Football World Cup, the most elite of international competitions for disabled soccer players. Playing the U.S. team Tuesday was just a warm-up.

This week, though, teaching military veterans that they, too, can do something they thought they never could after losing a leg was the team's primary goal. Bennett, the amputee game's founder, watched Tuesday's game and clinic with a sense of pride: Team Zaryen changed veterans' lives. Now, he said, "they know they can play the fastest one-legged sport in the world." ■

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Possible study of anthrax vaccine's effectiveness in children stirs debate

By ROB STEIN

• Originally Published October 24, 2011

The Obama administration is wrestling with the thorny question of whether scientists should inject healthy children with the anthrax vaccine to see whether the shots would safely protect them against a bioterrorism attack.

The other option is to wait until an attack happens and then try to gather data from children whose parents agree to inoculate them in the face of an actual threat.

A key working group of federal advisers in September endorsed testing, sparking objections from those who consider that step unethical, unnecessary and dangerous. The National Biodefense Science Board (NBSB), which advises the federal government, is to meet Friday to vote on its working group's recommendation.

"At the end of the day, do we want to wait for an attack and give it to millions and millions of children and collect data at that time?" said Daniel B. Fagbuyiof Children's National Medical Center in Washington, who chaired the group. "Or do we want to say: 'How do we best protect our children?' We can take care of Grandma and Grandpa, Uncle and Auntie. But right now, we have nothing for the children."

The vaccine has been tested extensively in adults and has been administered to more than 2.6 million people in the military. But the shots have never been tested on or given to children, leaving it



S. Daniel Bettis, operation manager, holds a vial with an individual dose of an Anthrax vaccine at VaxGen in San Francisco, California.

uncertain how well the vaccine works in younger people and at what dose, and whether it is safe. Unlike with measles, mumps and other diseases, the chance that children will be exposed to anthrax is theoretical, making the risk-benefit calculus of testing a vaccine on them much more questionable.

"It's hard to believe that it's something that makes a great deal of sense," said Joel Frader, a pediatrician and bioethicist at Northwestern University's Feinberg School of Medicine. "It would be difficult to justify testing it on kids simply on the hypothetical possibility that there might be an attack."

Anthrax is a life-threatening infection caused by a toxin-producing bacteria

long considered a bioterrorist's likely choice because it is relatively easy to produce and distribute over a large area. A week after the Sept. 11, 2001, attacks, letters containing anthrax spores arrived at several media offices and two Senate offices, killing five people and sickening 17 others. The FBI eventually concluded that the letters were mailed by Bruce Ivins, a disgruntled scientist at Fort Detrick in Maryland who committed suicide in 2008, although some experts question the FBI's findings.

As part of broad effort to better protect Americans against bioterrorism, the Pentagon began a controversial

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military anthrax immunization program in 1998 that was challenged in court over questions about the vaccine's safety and reliability. Currently, the Pentagon requires the shots for personnel assigned to bioterrorism defense activities and some other special units, as well as those deployed 15 or more days in the Middle East and some nearby countries, and in South Korea.

The federal government has spent \$1.1 billion to stockpile the vaccine to protect Americans in the event of an attack. Antibiotics would help protect those immediately exposed. The vaccine would defend against lingering spores, which is how the pathogen lurks in a dormant state. The vaccine is made from a piece of a strain of anthrax that doesn't cause the illness.

In April, Nicole Lurie, the assistant secretary in charge of bioterrorism at the Department of Health and Human Services, asked the 13-member biodefense board to evaluate whether the vaccine should be tested in children. A federal simulation of an anthrax attack on San Francisco, called Dark Zephyr, raised questions about how to handle children.

"If there were an anthrax release and we needed to administer anthrax vaccine, we have no experience with kids. It's never been in the arm of a kid," Lurie said. "I started asking myself, 'Is this the right way to respond in an emergency?'"

Those concerns were heightened by the public wariness that had been shown toward the H1N1 influenza pandemic vaccine.

"There is a lot of skepticism on the part of the public about vaccines in general," Lurie said. "If you had a situation where a vaccine has never been given to a child, it's pretty hard to think what you

could say to people about its safety and efficacy."

But testing drugs and vaccines in children is problematic. Parents generally are allowed to let their children participate in studies only if they would face minimal risk or would be likely to benefit directly or indirectly in some way.

"With this, you're putting children at risk for no clear scientific or medical benefit," said Meryl Nass, a doctor in Bangor, Maine, who is one of the most outspoken critics of testing the vaccine in children. Nass and others maintain that there are serious questions about the vaccine's effectiveness in adults as well as concerns about sometimes serious complications among those vaccinated in the military. A variety of complications have been reported, including nervous system and autoimmune disorders, Nass said.

"Really, the core question is 'Why? Why test?'" said Bruce Lesley, president of First Focus, a Washington-based advocacy group for children. "We don't want to be subjecting kids to risks needlessly."

Some question the value of a study, saying that testing in animals indicates it will be difficult to determine what level of immune system response will be protective.

"What exactly are we going to learn?" said Vicky L. Debolt, an associate professor of health administration and policy at George Mason University. "We'll know what antibody levels these infants produce, but do we know those antibodies are going to protect against death due to anthrax exposure?"

After sifting through the scientific, social and ethical conundrums raised by this question, the eight-member working group concluded that it would be ethically justifiable to conduct a study, which would provide crucial information, such

as whether the vaccine is safe and how many doses would be needed.

"A lot of things have happened that we didn't think could happen. I think the threat is real, and we should be prepared," said Fagbuyi, an assistant professor of pediatrics and emergency medicine at the George Washington University School of Medicine.

Fagbuyi and others dispute concerns about the vaccine's safety, noting that the Food and Drug Administration, the National Academy of Sciences and many other independent authorities have concluded that it is as safe as other commonly used vaccines, producing serious complications very rarely.

"Our role is to protect children," said John S. Bradley of the University of California at San Diego, who advised the working group on behalf of the American Academy of Pediatrics. "If the military is telling us there is a credible threat, the best way to protect children is to have the data."

If the board endorses the recommendation, Lurie will meet with counterparts at the FDA, the National Institutes of Health and other agencies to work out the details, including how many children would be studied, at what ages and doses, and how costs would be covered.

"Because it's such a heated issue, I've tried hard to keep an arm's length until the board makes a recommendation to me," Lurie said. "To be honest, the safest and easiest thing to do would be to not make a decision and kick the can down the road. But it seemed to me it that would be socially irresponsible. I would hate for a lot of children to die because we didn't have enough information for the public to feel comfortable getting vaccine." ■

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AnyBODY

Carolyn Butler

Laughing is good for your health? It's no joke.

• Originally Published October 24

Whenever I took a tumble or scraped my knee as a child, my mother typically assessed the situation and then promptly tickled me, counseling, "Laughter is the best medicine." This trick remains remarkably effective with my own boys and, to this day, YouTube videos of laughing babies or cats playing with printers still have the power to make me feel a bit better when I'm under the weather.

But while giggling is certainly a great distraction when you're hurt or feeling low, I can't help but wonder whether the old adage is true: Can laughter really have a positive impact on health?

There is a growing body of research indicating that a good guffaw may improve immune function, help lower blood pressure, boost mood and reduce stress and depression. And despite a dearth of more rigorous, long-term studies, the sum of these findings is compelling, says cardiologist Michael

Miller, a professor at the University of Maryland School of Medicine who has researched the topic.

"We don't have any clinical outcome evidence to show that laughter will reduce heart attacks or improve overall survival. However, we do have a number of studies that have shown that there is a potential upside, in terms of vascular benefits and also overall health," he explains. "These findings certainly support laughter as a

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AMI VITALE/GETTY IMAGES

Participants of the First International Laughter Yoga Conference practice the "lion laugh" together as they celebrate 10 years of the Laughter Club movement on March 20, 2005, in Mumbai, India.

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reasonable prescription for heart health and health in general, especially since there's really no downside."

A new study from Oxford University supports a long-held theory that laughter triggers an increase in endorphins, the brain chemicals that can help you feel good, distract you from pain and maybe deliver other health benefits.

The study reports on six experiments in which people watched television sitcoms or a live comedy performance, either alone or with others. The participants were then subjected to various measures that prompt discomfort, including wearing an ice-cold sleeve or a tight blood-pressure cuff and squatting against a wall for long periods. In all cases, laughing with buddies for just 15 minutes resulted in an average 10 percent increase in pain threshold. A change in affect alone — in other words, getting happy but not laughing out loud — did not have a significant impact on pain sensations.

According to lead author Robin Dunbar, an evolutionary anthropologist, these results back up prior research suggesting that people who laugh need less pain medication after surgery. She explains that if laughing "triggers endorphin activation, then it may have

direct [health] benefits, because there is a possibility that endorphins help to 'tune' the immune system."

Still, we're not just talking about a snicker here and there. The key is that real, true, unforced laughter is "an energetic, stressful activity that stirs up all of our physiological systems ... involving strong vocalization, an increase in heart rate and blood pressure and muscle contractions all over the body," says Robert R. Provine, a neuroscientist at the University of Maryland Baltimore County and the author of "Laughter: A Scientific Investigation." He explains that modern laughter of the "ha-ha" variety evolved from the "pant-pant" of primates and early humans, which he says is "really the sound of rough-and-tumble play." Indeed, the new Oxford study found that endorphins are released only when "we 'laugh till it hurts,'" meaning we end up running out of breath or physically exhausted, says Dunbar. "It is only full belly laughs that do this, not polite titters."

But before you work up a new stand-up routine, Provine points out that laughter often has little to do with jokes. "Real laughter is unconscious — you don't decide to laugh, it just happens — and if you look at what people are doing before or during a laugh, it's usually not

associated with jokes," he says.

Dunbar says the most important benefit of laughter may be that it brings people together, which is clearly good for emotional health. "When you laugh, you're almost always in the presence of another person, whether they're physically present or imagined on radio or TV," agrees Provine, who has shown that laughter in social settings is 30 times as common as when a person is alone.

He says that those studying the effects of laughter need to tease out "to what extent any health benefits of laughter are associated with the social context of laughter." People are far more likely to giggle when others do (which explains laugh tracks on television sitcoms), he says. "It could be that it's the playful interaction with friends, family and lovers that makes the difference [in health measures], and not the physical act of laughter itself."

For now, I intend to keep using the tickle cure on my kids — and I no longer feel guilty about watching those YouTube videos of babies guffawing. In fact, I will no longer feel guilty about inflicting them on others, either. Because who can't use a few more laughs in her life, regardless of how or why or even if they make you healthier? ■

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Academic Content Standards

This lesson addresses academic content standards of Maryland, Virginia and the District of Columbia.

Maryland

Health: Students will demonstrate the ability to use mental and emotional health knowledge, skills and strategies to embrace wellness (Standard 1)

A. Communication

- a. Identify verbal and non-verbal methods of communication.
- b. Demonstrate healthy ways to communicate needs, wants, emotions, opinions, and information. (Grade 4)

B. Emotions

- a. Describe how emotions influence behaviors. (Grade 4)

C. Components of Personal Well-Being

Apply the components of personal well-being to develop lifelong wellness skills and strategies (Indicator, Grade 8)

Health: Students will demonstrate the ability to apply prevention and intervention knowledge, skills, and processes to promote safe living in the home, school and community (Safety and Injury Prevention, (Standard 5)

Reading: Students will use a variety of strategies and opportunities to understand word meaning and to increase vocabulary (Standard 1, Indicator 2, Grade 5)

Virginia

Health: The student will understand the importance of communicating with family about personal and community health issues. (Community Health and Wellness, 4.7, Grade 4)

Health: The student will demonstrate an understanding of health concepts, behaviors, and skills that reduce health risks and enhance the health and wellness of self and others throughout life.
d) behaviors that result in intentional and unintentional injury.
(Knowledge and Skills, 10.1, Grade 10)

Life Science: The student will investigate and understand that all living things are composed of cells. (LS.2)

English: The student will read to determine the meanings and pronunciations of unfamiliar words and phrases. (Reading, 7.4, Grade 7)

English: The student will develop narrative, expository and persuasive writing. (Writing, 7.8, Grade 7)

Washington, D.C.

Health: Students comprehend concepts related to health promotion and disease prevention. (Strand 1, Pre-school-Grade 12)

Describe ways to prevent injuries at school and in the community (4.1.4, Grade 5)

Health: Students demonstrate the ability to apply self-management skills to enhance personal health and safety. (Strand 3, Pre-school-Grade 12)

Analyze the short-term and long-term impacts of injuries on individuals and families, and develop strategies to reduce the incidence of such injuries. (7.3.1, Grade 7)

Health: Students demonstrate the ability to analyze the influence of family, culture, media and technology on health and health behaviors. (Strand 4, Pre-school-Grade 12)

Analyze how societal messages from all media, including music, television programs, movies, advertising, and the Internet influence adolescents' perceptions and behaviors related to sexual activity, diet and body image, alcohol, drug use and violence. (7.4.2, Grade 7)

The Maryland Voluntary State Curriculum Content Standards can be found online at <http://mdk12.org/assessments/vsc/index.html>.

Standards of Learning currently in effect for Virginia Public Schools can be found online at www.doe.virginia.gov/testing/sol/standards_docs/index.shtml

Learning Standards for DCPS are found online at <http://dcps.dc.gov/DCPS/In+the+Classroom/What+Students+Are+Learning>