

health, science, technology  
**EXPLORE**

**E**

Editor: Pauline Clay  
(804) 649-6632  
pclay@timesdispatch.com

Health  
notes • E3

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/www.TimesDispatch.com/

PLUGGED IN

**Remotely backing up is a breeze**

Most of us treat our computers as if they were as invulnerable as a vegetable platter in a roomful of toddlers.

We feed our photos, home movies, music, résumés, business records and financial information into them without giving much thought to the possibility it all could vanish.



**DOUG STANLEY**

Most people don't create proper backups of critical files because it's just too much trouble. What's more, the minority who do back up files may be only a little better off than those who make no backups at all.

If fire destroys your home or business, for example, how useful are the backups you put on the shelf or on an external or network drive?

If a burglar steals your computer, chances are that external drive is going with it. So what's the answer? Automated backups to a remote location are an easy set-it-and-forget-it option.

Let's look at two remote backup solutions promising peace of mind to home users and small businesses.

◆ ◆ ◆

**Mozy:** First up is Mozy (<http://mozy.com>), a Utah-based startup that offers 2 gigabytes of free storage space. The catch — and it's a small one for getting that much secure storage for nothing — is you'll receive an e-mail once a week containing advertising.

Two gigabytes is enough space to store about 500 songs, 500 to 1,500 photos or 150 hefty spreadsheets. Need more space? Mozy will provide it for a fraction of the cost of many of its competitors. For \$2 a month, you get 5GB; for \$5, 30GB; and for \$10, 60GB.

To ensure the privacy of your data, Mozy encrypts your files before they leave your computer. The files are then transferred to Mozy's servers using 128-bit Secure Socket Layer encryption, the same technology used by online banks.

To use the service, you simply download and install Mozy's software. It will make suggestions about what you should back up. Next, you tell Mozy when to do its work. You can choose automatic backups, which occur when your computer is idle, or you can opt to schedule backups in the middle of the night so you'll be sure Mozy doesn't get in your way.

From there, you can pretty much forget about Mozy until you need it to restore one, some or all of your files.

◆ ◆ ◆

**Carbonite:** Next up is Carbonite (<http://carbonite.com>). For a mere \$50 a year, it will back up just about everything on your hard drive regardless of how much storage space is used. The Boston-based company, also a startup, offers a 15-day free trial so you don't have to commit a dime unless you like the service.

To use Carbonite, you download and install the associated software and select what files to back up. That done, you reboot the computer, and Carbonite backs up your files in the background when your computer is idle. Carbonite, like Mozy, uses double encryption to safeguard your files.

After losing data to a hardware failure or your own error (who hasn't accidentally deleted a file?), you can choose to restore a file, a folder or everything you've backed up.

Carbonite won't back up system files or programs, and it also won't back up individual files that are larger than 2GB — something to be aware of if you have large digital video files.

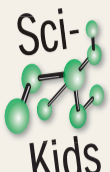
Whether you use Carbonite, Mozy or something else, a backup routine is critical. Do something — anything — rather than risk losing your important documents, cherished photos and purchased music.

• Doug Stanley is a staff writer for The Tampa Tribune in Florida.



**Jane Brody**

Casting new light on migraine headaches **E3**



**Sci-Kids**

Vitamin C is required for good health **E3**

**Try this**

Make a thin film of soapy water and convert it into a bubble **E3**

**Drink up!**

**Staying cool**

Heat-related illness is responsible for hundreds of deaths annually in the United States. From 1999-2003, a total of 3,442 deaths were blamed on exposure to extreme heat, according to data from the Centers for Disease Control and Prevention.

There is no shortage of information on athletes, hydration and practicing or playing in the heat. The American College of Sports Medicine ([www.acsm.org](http://www.acsm.org)), the National Federation of State High School Associations ([www.nfhs.org](http://www.nfhs.org)), the National Athletic Trainers' Association ([www.nata.org](http://www.nata.org)), the Virginia High School League ([www.vhsl.org](http://www.vhsl.org)) — they all have statements and/or guidelines.

In addition, local sports medicine experts offered these suggestions:

- Fluid-replacement beverages should be in individual containers that are easily accessible. Avoid beverages with caffeine or those that are more than 8 percent carbohydrates.
- Players should drink before, during and after practice.
- Be alert to signs of heat illness, including nausea, muscle cramps, upset stomach, heavy sweating or cessation of sweating, mental confusion such as being unable to follow drills, personality changes or bizarre behavior, shallow breathing, rapid pulse or elevated temperature.
- Create a buddy system where players are paired and asked to be alert to changes in each other that might indicate heat illness.
- Monitor your urine. If it's deep yellow, you're probably dehydrated. It should be light yellow or clear.
- Have some type of cooling system available, at a minimum quantities of ice that can be used to cool a player. Ice packed under the armpits and on the groin can speed up cooling, but be careful not to cool down too quickly.
- Medications, bouts of fever and illness that deplete fluids, such as diarrhea and vomiting, can affect hydration. Coaches should be informed when a player has been ill.



DON LONG/TIMES-DISPATCH

**Dr. Katherine Dec, medical director for women's sports medicine at CJW Medical Center, checks Cosby High School player Joshua Wilburn during practice to make sure he drinks enough water.**

**Young athletes beat heat, tough workouts by staying hydrated**

**BY TAMMIE SMITH**  
TIMES-DISPATCH STAFF WRITER

High school football coach Greg DeFrancesco tells his players to show up for practice a little sloshy.

He wants them to feel the water in their bellies — that way DeFrancesco knows they drank the 24 ounces of water he tells them to consume in the mornings before practice.

Convincing the players they need to stay properly hydrated, particularly during practice on hot days, and telling them what they need to do is not all that complicated, said DeFrancesco, head football coach at James River High School in Chesterfield County.

He believes the players are getting it. Just in case they don't, anyone whose weight drops too much between the start and end of morning practice will sit out the afternoon practice if they don't rehydrate sufficiently during the two-hour break.

"You expect them to lose 2 percent of their body weight," DeFrancesco said. "If they lose more than 2 percent, they can't go back unless they rehydrate."

The concern is warranted. Here and across the nation, the deaths of high school and college football players during or after practice in hot weather has raised concerns that some still don't understand that dehydration can lead to potentially fatal heatstroke. Not all the deaths have been confirmed as the result of heat illness, but signs point to heat as at least a contributing factor.

A 16-year-old Stafford County High School student, Joey Robertson, died Aug. 11, three days after collapsing during the team's second practice. Heatstroke was determined as the cause of death, according to his family.

"There is such heightened awareness of this; I don't think people are missing the boat," said Dr. Doug Cutter, director of the

SEE DRINK UP, PAGE B3 ►

**Migration: It's more than a wing and a prayer**



**Savannah sparrows navigate using sunlight patterns at dawn and dusk.**

SCIENCE MAGAZINE

**Tech research finds that sparrows depend on polarized sunlight cues**

**BY JILL SAKAI**  
TIMES-DISPATCH STAFF WRITER

Since long before the advent of GPS or atlases, birds have used natural landmarks and internal compasses to navigate during migration.

New research shows that small songbirds called Savannah sparrows stay on course by using sunlight patterns at dawn and dusk. The study was published last week in *Science*.

From research during the past few decades, scientists knew that birds and animals navigate using internal compasses based on sun position, star patterns, magnetic fields deep in the Earth, and polarized sunlight, which they see as characteristic patterns in the sky based on where the sun is.

Though birds can calculate directions from four sources, they can only use one source at a time.

Now, Virginia Tech biologist John Phillips and his colleagues have found that sparrows rely on polarized sunlight cues visible at the horizon at sunrise and sunset to reconcile the different compasses.

"The problem arises when you have all these alternative compasses and you've got to switch back and forth depending on whether it's day or night or the sky is cloudy," Phillips said.

"You have to calibrate all the systems so that when you switch from the magnetic compass to the star compass you don't go off in some wildly different direction."

To reconcile the differences, Rachel Muheim, a researcher from Phillips' lab, studied wild Savannah sparrows as they prepared to head south from Alaska last fall. She focused on the importance of the sun when it was at the horizon.

In the wild, Phillips said, the "birds go up to the tops of trees. . . . They stop poking at each other and look intently at the sky during sunset or sunrise."

SEE SPARROW, PAGE E3 ►

**WALTER WITSCHY** • special correspondent

## Drink your juice: Vitamin C is required for good health

In the 1500s and 1600s, sailors on long voyages suffered from scurvy — always dangerous and sometimes fatal. They bled and bruised easily. Their hair and teeth fell out. Their swollen joints were very painful.

By the 18th century, it was clear that the sailors' diet lacked a critical element. Sailors believed eating sour things prevented scurvy. British doctor James Lind did a science experiment to learn the truth.

Lind tried different treatments on 12 sailors with scurvy — adding things such as vinegar, sulfu-

ric acid, drugs or cider to their diet. Sailors who got two oranges and a lemon each day recovered quickly. (The other treatments did not work.)

Lind learned to preserve concentrated fruit juice for easy storage on shipboard. Scurvy disappeared as a sailors' problem. By 1795, a daily ration of lemon or lime juice was part of the standing orders of

the British Navy — and their sailors came to be called "limeys."

In the past century, scientists learned most animals do not get scurvy, even when they eat no vitamin C. They make all the vitamin C they need within their bodies. Humans (and our primate cousins) have a genetic defect that prevents us from making vitamin C. We must eat fruits and vegetables that contain it.

Oranges and grapefruit, and their juices, are good sources of vitamin C. So are strawberries, broccoli and red peppers. A half-cup serving contains about 50 milligrams of vitamin C.

Dr. Linus Pauling, who won two Nobel Prizes, claimed that large daily doses (1,000 to 4,000 milligrams) of vitamin C were helpful in treating cancer and cardiovascular disease. He noted that

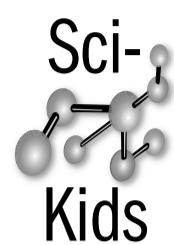
vitamin C is required to make collagen (for joints and blood vessels) and to manufacture a critical nerve and brain chemical.

Many labeled his views quack science, but recent studies may prove him correct. Now the National Institutes of Health recommends a daily diet of 75 to 90 milligrams of vitamin C for healthy adults. Some studies show that 400 milligrams per day is even more beneficial.

After 500 years of study, we still have more to learn about this critical vitamin.

In Virginia's science Standards of Learning, life processes such as these are covered in kindergarten through sixth grade, and in the Life Sciences standards.

• Walter Witschey is director of the Science Museum of Virginia.



shipboard. Scurvy disappeared as a sailors' problem. By 1795, a daily ration of lemon or lime juice was part of the standing orders of

### Try this

## A flying film

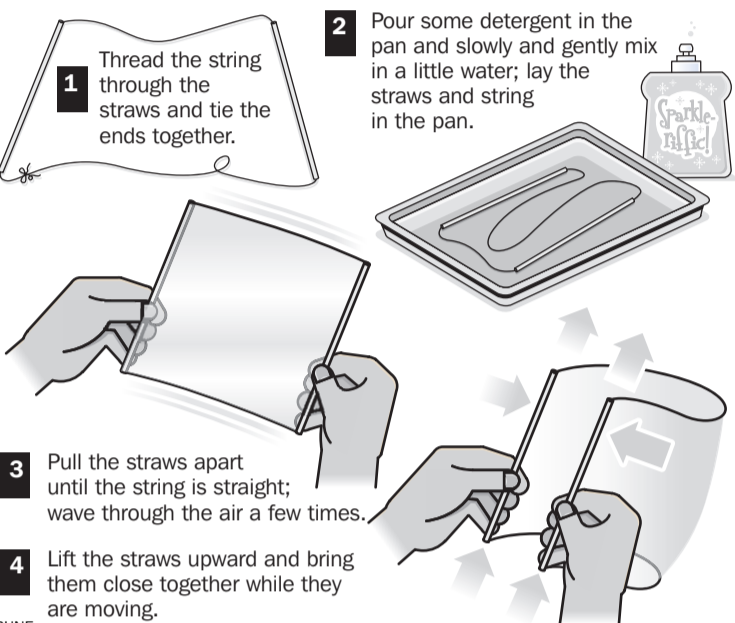
How to make a thin "film" of soapy water and then put air inside it to make a large bubble.

### You'll need:

- Two plastic straws
- Liquid dishwashing detergent
- Water
- 3-foot string
- Large baking sheet with sides

SOURCE: Simple Science Experiments with Everyday Materials

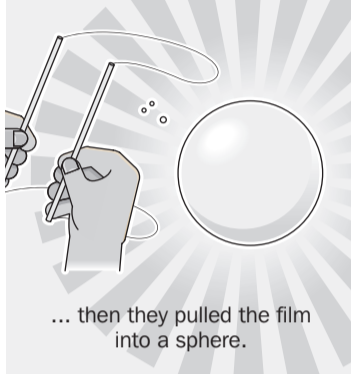
HELEN LEE MCCOMAS, PAUL TRAP/McCLATCHY-TRIBUNE



### What happened?

First you made a "film" (thin layer) of soapy water. Then you pushed air into the film, which closed around the air and made a bubble.

Detergent and water molecules pull toward each other, so first they stretched the film flat ...



The Children's Museum of Richmond performs these experiments every Sunday at 3 p.m. Schedule subject to change. Call 804-474-CMOR (2667) or visit [www.c-mor.org](http://www.c-mor.org) for details.

## HEALTH NOTES

### Brain-injury group

The Brain Injury Association of Virginia/Richmond Chapter will meet Monday at Children's Hospital, 2924 Brook Road.

Networking will begin at 6:15 p.m. in the auditorium, and the meeting will start at 6:30.

For details, call Christine Bagini at (804) 355-5748.

### Ovarian cancer

The Greater Richmond Area

Division of the National Ovarian Cancer Coalition will meet Monday at 6 p.m. at Henrico Doctors' Hospital (Forest).

For details, call Susan Guckenberg at (804) 200-7033.

### Health fair

Cross Over Ministry, Bon Secours Care-A-Van and the Peter B. Ramsey Dental Society are holding a Back-to-School Community Health Fair tomorrow at Cross-Over Health Center, 108 Cowardin Ave.

The health fair will offer school physicals, immunizations, dental

and vision screenings for children ages 5-17. Bring shot records and school physical forms. Registration will begin at 7:30 a.m.

For details, call Mary Moore at (804) 262-3585, ext. 109 or [mmoore@crossoverministry.org](mailto:mmoore@crossoverministry.org).

### MS self-help group

The Hanover MS Self-Help Group, part of the National Multiple Sclerosis Society, will meet next Thursday from 7 to 8:30 p.m. at Commonwealth Wholesale, 10085 Ledbetter Place.

For details, call Dana at (804) 550-2280 or (800) Fight-MS.

### Ehlers Danlos meeting

The Richmond/Central Virginia Ehlers Danlos Chapter will meet Sunday from 2 to 4 p.m. at St. Mary's Hospital in Education Room 163.

For details, call Diana Harris at (804) 272-6701 or [dianaharris1@comcast.net](mailto:dianaharris1@comcast.net).

• Items for Health Notes should be sent at least one week before publication. They can be sent to Pauline Clay, Richmond Times-Dispatch, P.O. Box 85333, Richmond, VA 23293 or e-mailed to [tdhealthnotes@timesdispatch.com](mailto:tdhealthnotes@timesdispatch.com).

## YOUR PERSONAL HEALTH

## Casting new light on migraine headaches

Everything you thought you knew about migraine headaches might be wrong. At least that's what headache researchers now maintain.

From long-maligned dietary triggers to the underlying cause of the headaches themselves, long-standing beliefs have been brought into question by recent studies.

As if that were not enough dogma to overturn, there is growing evidence that almost all so-called sinus headaches are really migraines.

While these findings might not be an obvious cause for joy among the afflicted, the good news is that there are now many drugs that can prevent migraine attacks in the frequently afflicted or abort the headaches once they start.

The World Health Organization ranks migraines among the most disabling ills. About 28 million Americans suffer from severe migraines that leave them temporarily unable to function at work, at home or at play. Many more millions have them in milder forms. All told, they cost employers about \$13 billion a year in lost productivity, with another \$1 billion spent on medical care.

The throbbing pain of a migraine is often accompanied by nausea, vomiting and extreme sensitivity to light and sound. A person feels sick all over.

Symptoms may include nasal stuffiness, blurry vision, diarrhea, abdominal cramps, abnormal sensations of heat or cold, anxiety, depression, irritability and inability to concentrate.

About 4 percent of prepubescent children have migraines. After puberty, the incidence rises to 6 percent among men and 18 percent among women and gradually declines after age 40.

The higher rate among women is linked to fluctuations in blood levels of estrogen; the drop in estrogen just prior to menstruation sets off menstrual migraines, which tend to be more severe and last longer than other forms.

In some, the headache is preceded by an aura of visual, sensory or motor symptoms. They include seeing flashing lights or specks, numbness in the hand, dizziness and an inability to speak.

Though hard to mistake in their classic form, migraines can be — and apparently often are — misclassified as sinus or tension headaches, probably because they can cause nasal congestion, pressure or pain in the forehead or below the eyes, and discomfort on both sides of the face.

Migraine sufferers have long been cautioned to avoid certain foods believed to bring on attacks, especially chocolate, alcohol (red wine in particular) and aged cheese. But the evidence supporting this notion is meager. More common causes include stress (positive or negative), weather changes, estrogen withdrawal, fatigue and sleep disturbances as well as overuse of over-the-counter pain medications.

### about the entire day with barely any odor.

A. Thanks for sharing this unique solution to a common problem. Listerine contains thymol, eucalyptol, menthol and methyl salicylate. These herbal oils have antifungal and antibacterial properties. Although it is not approved for this use, we're glad to learn it works.

Q. I used to get canker sores in my mouth when I was younger. My mother told me to hold a slice of banana tight against the sore with my tongue, and it works.

You have to hold it there until it stings, about four or five minutes. Riper bananas seem to work better. Seldom have I had a sore that lasted longer than a day, and it certainly tastes better than medicine.

A. A slice of banana certainly sounds like a pleasant treatment for canker sores. We don't know how it would work, though.

• Joe Graedon is a pharmacologist. Dr. Teresa Graedon is a medical anthropologist and nutrition expert. E-mail them via their Web site: [www.peoplespharmacy.com](http://www.peoplespharmacy.com). © King Features

**PHARMACY** • joe graedon and dr. teresa graedon

## Mouthwash appears to halt girl's underarm odor

My daughter is entering puberty and dealing with the usual underarm body odors. We tried many different deodorants and antiperspirants, to no avail.

I figured if Listerine killed the germs that cause bad breath, it

might kill the bacteria that cause underarm odor. I checked with the pediatrician first to make sure it would be safe.

Sure enough, Listerine works. She applies it after showering, lets it dry and then applies an antiperspirant. She can go just

"They'll sit all night and hop in the direction that they would have migrated," Phillips said.

Sparrows in cages without a view of the horizon hopped toward the south side of their cage, following the direction of magnetic fields. Birds able to see the horizon at sunrise and sunset instead hopped in the direction that looked like south according to polarized sunlight cues that Muheim gave them.

"It's really the region near the horizon that's

the fundamental reference system," Phillips said. "It seems important to put all these systems in register."

He believes the sparrows use light polarization patterns from sunrise and sunset as their primary cue to figure out north and south and then recalibrate their other compasses accordingly.

The next challenge, Phillips said, is to figure out what parts of the brain are involved.

## Drink up

— FROM PAGE E1

Sports Medicine Center at CJW Medical Center (Chippenham) and a monthly columnist for The Times-Dispatch.

"I think sometimes you have some individuals who are more prone to heat injury," Cutter said. "It's hard to screen for these people. There is nothing like a genetic marker to say this kid is really prone to having a heat injury so he cannot exercise at certain times of the day."

There is classic heatstroke brought on by prolonged exposure to extreme heat. The elderly, people with chronic illnesses and young children are more susceptible. Exertional heatstroke, on the other hand, is brought on by exercise or hard physical activity during hot weather. Victims of exertional heat illness are often fit young men.

### Cooking your systems

In both instances, the body's core temperature rises when the body is unable to cool itself. Usually, when we get hot, our body responds by sweating. As that sweat evaporates, we cool off. A number of things can interfere with cooling. On a hot, humid day, for instance, less sweat is evaporated, so cooling is impaired.

"For heatstroke . . . the metabolic machinery has just gone crazy because of the temperature," said Dr. Kevin R. Ward, an associate professor of emergency medicine, physiology and biochemistry at Virginia Commonwealth University.

"You literally, for lack of a better term, start cooking yourself," Ward said. "You retain heat. Some organ systems are more sensitive than others. Your skeletal muscles would not be as sensitive as your brain. When your brain really becomes affected — we see this when patients start getting confused — this starts off a deadly series of events. If you cannot get your temperature under control or hydrate completely, there may be permanent neurological damage or death."

By the time signs of heatstroke — such as seizures and changed mental status — are evident, the damage is being done, Ward said. Researchers are looking for physical clues that would give earlier indications that someone is getting in trouble. Ward's research includes projects undertaken as part of the VCU Reanimation Engineering Shock Center, where he is associate director. The center's emphasis is on shock, or multisystem organ failure. Much of the research focuses on the medical care of combat casualties.

One project Ward and collaborators are working on is a 4- to 5-inch-long, strap-on device that monitors heart rate, temperature, how well skin conducts electricity (a factor affected by hydration or sweat) and other physical variables.

"You get a lot of information about the body's metabolism," Ward said. "We would know if you are hemorrhaging or are being overheated dangerously, like in heatstroke."

Such a device has applications on the battlefield and off.

"Something like this could also be used for first responders," Ward said. "Firefighters. If you can imagine fighting a fire having all that gear on, you have no way to lose heat. The devices would have the ability to send out a signal." Such signals, he said, would provide clues when a firefighter, for instance, is becoming dangerously hot and needs to be pulled out.

Researchers are also trying to better understand biological factors that allow some athletes, such as marathon runners, to withstand higher core body temperatures. Some have been measured with core temperatures of 106 or 107 degrees with no ill effects. In one study reported in the journal *Medicine & Science in Sports & Exercise* in May, researchers had 18 soldiers swallow sensors and wear data recorders that tracked their temperatures and heart rates during a 21-kilometer race on a warm, humid day. One runner whose core temperature reached 107.6 degrees Fahrenheit crossed the finish line without any problems.

Some say it's all about acclimation. Over time, with practice, athletes condition their bodies to tolerate higher temperatures.

"An athlete needs to be ready to exercise in the heat," said Dr. Katherine Dec, medical director for women's sports medicine at CJW Medical Center. "Acclimation . . . can take some time. We set up practices at certain times of the day that will not be high-heat times."

### Lifestyle choices

Dec also counsels players about what they drink and eat and about their lifestyle. Eat a balanced diet. Get enough sleep. She recommends sports drinks with no more than 8 percent carbohydrates and staying away from caffeinated drinks. Caffeine increases the body's metabolism and promotes dehydration. "The other thing I find in our clinic is a lot of the kids that drink a lot of caffeinated beverages are not thirsty for water," Dec said. "So it's hard for them to drink enough water to keep up their hydration status."

She said female athletes suffer with heat illnesses, though you rarely hear about such cases. One reason football players seem to get in trouble more than other athletes is probably because of the heavy gear, she said. "Field hockey has lighter gear. Volleyball is indoors. The NFL, college and high school see a lot more problems because of the heavy equipment and heat exposure."

DeFrancesco says you can't emphasize hydration enough. A session with players' parents included 30 minutes on the topic.

The athletes are reminded — with words and pictures. Posters at the field house where the players get ready show different shades of urine. It might be a little crude, DeFrancesco said, but they get it. A deep yellow color is not good.

"It should be clear," he said. "It's a constant reminder."

• Contact staff writer Tammie Smith at [tlsmith@timesdispatch.com](mailto:tlsmith@timesdispatch.com) or (804) 649-6572.

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