HOW YOUR COMMUTE COULD CHANGE METRO, B1

The year in stocks
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The Sunday Oregonian

DECEMBER 31, 2006 VOICE OF THE NORTHWEST SINCE 1850 ★★★ SUNRISE EDITION +c PORTLAND, OREGON $1.50

JAMIE FRANCIS/THE OREGONIAN

Dr. John Epley, a Portland ear surgeon, devised a simple cure for positional vertigo that has practically eliminated the need for surgery in most cases.

Doctor and invention outlast jeers and threats

Vertigo | John Epley's chair conquers dizziness, wins acceptance and has a business plan, thanks to his daughter

By JOE ROJAS-BURKE
THE OREGONIAN

He is a doctor and an innovator. Years ago, he took aim at a medical curse that has disabled millions of people and defied treatment. He came up with a cure that was astonishingly simple. No surgery. No pills.

Now, think: Would his colleagues cheer his stroke of ingenuity by spreading the news — and practice — of the treatment to relieve suffering?

No. Inexplicably, they rejected him, ridiculed him, heaved accusations that threatened his license to practice medicine.

Portland ear surgeon John Epley persevered quietly. His daughter grew up largely unaware of his struggle. When by chance she found out, the discovery changed her life — and his.

» Online: To see a demonstration of Dr. John Epley's Omniax machine, go to **oregonlive.com/multimedia**

Stirring disbelief

John Epley's stooped shoulders and gentle eyes gave him a turtlish look. He wore a thickly knotted necktie and wrinkled sport coat. No amount of combing could tame the stubborn cowlick in his short hair.

His audience of ear surgeons muttered skeptically and shook their heads. Few at the October 1980 meeting in Anaheim, Calif., believed Epley's claim to have developed a cure for the most common cause of chronic vertigo.

In any given year, tens of thousands of people seek treatment for the disorder's strange, crippling attacks. Provoked by a casual tilt or turn of the head, the victim's surroundings whirl. The eyeballs twitch involuntarily. Nausea overwhelms the senses. On-and-off bouts may torment a sufferer for years.

Physicians were baffled. The best they could offer as treatment was a drastic last resort: surgically destroying nerves to the inner ear, impairing patients' balance and possibly their hearing.

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WEATHER

Mostly cloudy
High: **42**
Low: **31**

For complete weather, see **D4**

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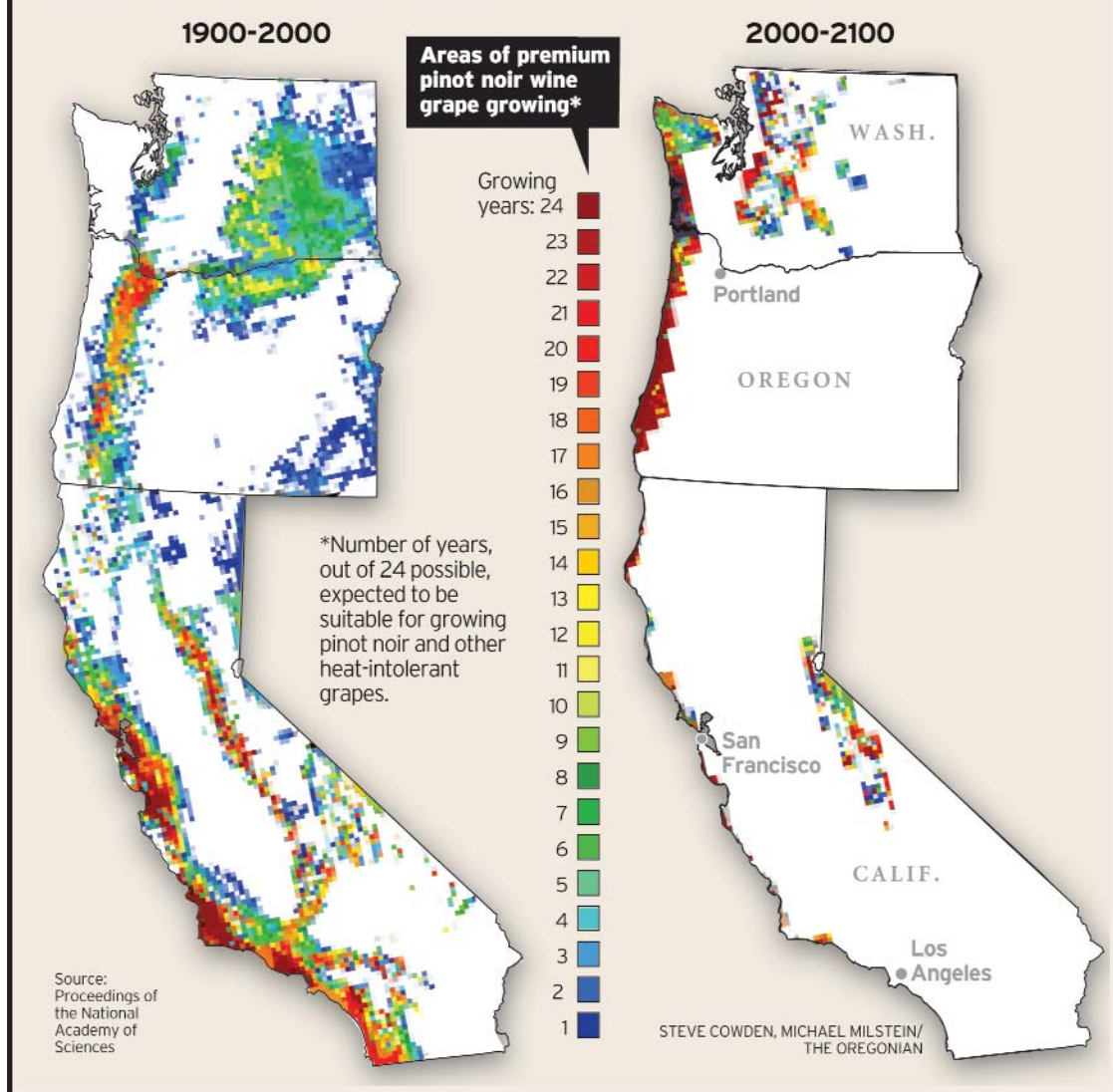
Northwest forecast: dramatic change



Our warmer world | The debate over what to do about global warming remains divisive. But few scientists dispute we live on a planet where temperatures are higher than they were a century ago and will continue to climb. In the Pacific Northwest – a place defined by glacier-clad mountains, rivers and the sea – the effects are now seen and measurable. In this sixth report in an occasional series, The Oregonian examines how higher temperatures exert fundamental change on the Northwest's natural world and built environment.

By MICHAEL MILSTEIN
THE OREGONIAN

Fine wine, abundant electricity, wild salmon — there are things Oregonians take for granted. But keeping them will be harder than ever because we plan and build our lives in the belief that Northwest weather will always be Northwest weather.

It's not so, researchers are finding. We should expect hotter, drier heat waves, heavier rains and quicker snowmelt. The Northwest, a natural target of major storms, will feel it in ways other regions will not.

It particularly challenges public agencies and private businesses, which now must expect climate curveballs, such as the record-setting November deluge — Portland's wettest month since 1938, Seattle's wettest in 115 years.

Warmer summers already have altered the taste of Oregon's signature pinot noir wines, and vintners are shifting their vines uphill to keep them cool. But that will not be enough. By the end of the century, the iconic grape of the state's $1 billion wine industry will grow better along Washington's Puget Sound than it does in the Willamette Valley.

Volcanic debris once locked in place by Mount Hood's ice, now exposed by melting glaciers, ripped away miles of Oregon 35 during the November storm. Crews hurriedly pieced it back together at a cost of $10 million, just in time for ski season, but only a far more

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OREGON DEPARTMENT OF TRANSPORTATION

A surge of mud and debris roared down the southeastern flank of Mount Hood, inundating a once-elevated Oregon 35 by the White River, in early November. Such an event will be increasingly common as glaciers shrink, loosening rocks and material once held in place by ice. Planners must ask: Is merely rebuilding the road adequate?

» Online: To read previous stories in this series, go to **www.oregonlive.com/special/**

Saddam now likely to become a martyr

Analysis | The execution's timing, at the start of the holiest Muslim holiday, angers the Sunni minority that is driving the Iraq insurgency

By MOHAMAD BAZZI
LA TIMES-WASHINGTON POST SERVICE

BEIRUT, Lebanon — The timing and drama surrounding Saddam Hussein's execution make it likely that he will become a martyr for Sunni nationalists fighting U.S. forces and the new Iraqi government.

By executing Saddam at the start of Eid al-Adha, the holiest of Muslim holidays, the Shiite-dominated Iraqi government made a strategic blunder: It further angered the Sunni minority that formed the core of his regime and now is driving the insurgency.

As news of Saddam's hanging spread Saturday across the Sunni-dominated Middle East, many Arabs criticized the timing — even those who despised the dictator. Relations between Sunnis and Shiites are already strained by the regional ascendance of Shiite-led Iran, its growing influence on the Iraqi leadership, and its involvement in other countries with large Shiite communities, especially Lebanon.

"Holding this execution at the start of Eid is only going to make relations worse" between Sunnis and Shiites, said Nazem al-Jassour, an Iraqi political analyst. "There was no good reason why the execution could not be delayed until after Eid. … It's going to be perceived by Iraqi Sunnis as one

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Inside

Saddam Hussein curses "spies" and Americans in his final moments | **A4**

Gerald R. Ford | Remembering a president

LAWRENCE JACKSON/POOL

An honor guard carries President Ford's casket into the Capitol for a state funeral Saturday after a nighttime motorcade from Andrews Air Force Base. The motorcade stopped at the World War II Memorial, then snaked past the White House to the steps of the Capitol, where cannon thundered and dignitaries crowded the Rotunda to celebrate Ford's life. He will lie in state until Tuesday. **Story on Page A17.**

Bigger school budget won't end crowding

Education | Most of the governor's extra money would be eaten up by rising costs

By STEVEN CARTER and SCOTT LEARN
THE OREGONIAN

Most of the hundreds of millions in new money that Gov. Ted Kulongoski has proposed for Oregon schools in the next two years will be swallowed by rising payroll and other costs and won't reduce class sizes or restore programs, an analysis by The Oregonian shows.

Of the $750 million-plus increase in state support for schools that Kulongoski seeks, at least $500 million would go toward salary increases, rising employee health costs, pension contributions, rising enrollment and higher prices for supplies and services, the state projects.

Education leaders say the governor's two-year $6.06 billion budget — a 14 percent increase from current school spending — would make only modest improvements in Oregon's class sizes, which are among the nation's largest.

"We don't want to be spoiled brats and not be appreciative — the good news is, it's not forcing us to cut," says Heidi

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Vertigo: Epley sticks his neck out and helps patients

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Epley proposed an elegant alternative.

His talk concluded with a demonstration, a young woman acting as his patient. Epley and his research collaborator, audiologist Dominic Hughes, began by tilting the woman flat on her back, her head hanging over the end of an exam bench. Hughes cradled her head in his hands and rotated it about 45 degrees to his right, then he and Epley rolled the woman's head and shoulders back to the left in a counterclockwise move that ended with her face down. In a final move, Hughes and Epley lifted the woman to a sitting position.

And that was it.

By then, audience members were walking out. One doctor stomped up to Epley and slapped down a comment card before exiting. He'd scrawled, "I resent having to waste my time listening to some guy's pet theory."

Solving the riddle

Epley diagnosed many patients at his Glisan Street medical office with a condition known by a cumbersome name: benign paroxysmal positional vertigo, or BPPV.

A Viennese physician first described the disorder in 1921. Decades later, nobody had nailed down the cause or devised a satisfactory treatment.

To Epley, it was a challenge ripe for picking.

By nature, the Klamath Falls native was a hands-on problem-solver. In college, he tinkered in the physics laboratories at the University of Oregon. His zeal for experimentation continued after he earned a medical degree from the school now called Oregon Health & Science University. During his surgical residency at Stanford University Medical Center, he helped develop an early cochlear implant to restore hearing. He opened a solo practice across the street from Providence Portland Medical Center in 1965.

Though no longer connected to a university, he devised surgical methods and instruments — innovations that medical journals published. As he dreamed up ideas, he sometimes forgot the patients cramming into his waiting room, Hughes observed.

The audiologist shared Epley's fascination with dizziness. With no graduate degree, Hughes was an unlikely collaborator. Epley had hired him to do workplace hearing tests. But Hughes had been a research assistant at the University of Chicago Medical School and had spent three years studying hearing and balance problems at a Japanese university. Over a long lunch two or three times a week, the two debated the latest studies and hashed out their own ideas.

To maintain balance, the brain coordinates messages from the eyes, from muscles pulling against gravity and from motion sensors inside the inner ear's maze of fluid-filled canals.

Another researcher had reported finding chalklike particles in the inner ears of vertigo patients and proposed that these particles clumped onto ears' motion sensors to trigger false sensations of motion. But the hypothesis failed to explain the on-again-off-again nature of positional vertigo: If particles stuck on sensors, why did dizziness ever go away?

Epley and Hughes reasoned that the particles must float freely. Head movements might shift them, causing a siege of dizziness until the particles settled or shifted. It might be possible, they figured, to move the particles where they wouldn't cause mischief. Since the particles are denser than inner-ear fluid and sink, gravity could do the work.

Hughes used plastic tubing to build a model of the inner ear. To simulate loose particles, he put BBs in the coiled tubes. He and Epley flipped and turned the hand-size model as they might a kid's puzzle, to work out a sequence of moves to reposition the tiny metal balls.

They began testing the moves on people straightaway, tilting and rolling them on an exam bench. Odd as the treatment sounded, frustrated patients were keen to try it.

The first two or three subjects seemed to gain immediate relief. At first, Epley wasn't too impressed. The condition often clears up by itself, he recalls reminding himself. He didn't know whether he had made any difference.

But when the treatment cured several more patients, including one who had endured dizziness for a decade, he and Hughes realized they'd hit upon a great discovery.

Hard sell

In Portland, some of Epley's colleagues were so skeptical that they began to question his medical skills. Some doctors stopped referring patients.

On one occasion, Epley scheduled time in an operating room at Providence Portland Medical Center so that a patient could be put under anesthesia while he and Hughes performed the repositioning maneuvers. The patient was an elderly woman disabled by vertigo; she had to be pushed around in a wheelchair with her head cradled in a brace. Epley applied a handheld vibrator behind the affected ear to help mobilize the particles while rolling the patient.

The anesthesiologist glared at Epley, dumbfounded. He later pulled Epley aside. "I don't think you know what you are doing," Epley recalls him saying.

But when the woman awoke, her vertigo was gone. The results amazed even Hughes. The anesthesiologist, impressed in a different way, filed a complaint at the hospital. The hospital's audit committee soon dropped the matter, but tensions resurfaced.

By 1983, when Epley had cured several more cases, he and Hughes submitted their first article. The Journal of Otology rejected it, explaining that the treatment defied established theory. The two revised the paper and submitted it to other journals but got nowhere. Hughes struck out on his own after completing his doctoral degree.

Epley labored on. Rejection drove him to work harder to convince colleagues. He no longer had time for hobbies or socializing, his wife, Norma, and daughter Cathy noted.

In front of hostile crowds, he kept presenting his findings. Ken Aebi, a medical supply salesman in Portland who'd become Epley's friend, felt helplessly embarrassed for him. Epley struggled at the lectern, reading too much from notes and occasionally wandering off on tangents. Some doctors rolled their eyes. Others laughed openly.

The surgeon launched into a project to design and build a motorized chair that would enable him to better treat balance disorders, even in patients with fragile necks or who were obese.

He tracked cases he treated, using handwritten index cards for a database. In 1992, he submitted a report to the journal of the American Academy of Otolaryngology. In it, he described the 100 percent cure rate of his "canalith repositioning" maneuver in 30 patients.

The journal published the report. More than 10 years after Epley took on BPPV, he'd finally gained the recognition that was vital to acceptance among his peers. But the stamp of approval did not sway the skeptics. Many doctors rejected or ignored Epley's breakthrough, even in his hometown.

Desperate patient

At an emergency room in 1995, a doctor couldn't figure out the cause of a sudden attack of vertigo that struck Joseph Delahunt.

He had crawled from the living room of his North Portland house out to his car so that his wife could drive him to the hospital. Delahunt hung his head out the window and vomited most of the way. An Air Force veteran in his mid-50s, he was healthy and active — selling real estate and practicing yoga — until the attacks started.

Delahunt consulted his family doctor, then tried a neurologist and an ear, nose and throat doctor. They prescribed motion-sickness drugs and other medicines that didn't help much. One told him he'd have to learn to live with the "benign" condition. None mentioned Epley's treatment. His wife discovered it on the Internet.

Delahunt's condition worsened. To avoid unbearable, spinning nausea, he sat as still as he could in a reclining chair. For nearly three months, he left the recliner only to go the bathroom.

At Epley's office, an assistant helped Delahunt down a long hallway to a gray-walled room with closed blinds. An ungainly apparatus filled much of the room. Inside a giant steel ring hung a padded chair that reminded Delahunt of an ejection seat. Motors, gears and drive-chains were rigged to flip and twirl the chair like a carnival ride.

Delahunt stepped up to a platform and into the chair. An assistant clipped straps across his chest and ankles. She covered his eyes with a bulky mask. It contained a video camera to track his eyes. She clipped a vibrator behind his ear. It buzzed gently, more lightly than a cell phone on vibrate.

"Are you comfortable?" the assistant asked. Delahunt nodded, grateful for the Valium he'd taken.

Epley fingered a joystick controller to tilt the chair back until Delahunt was face up. A flick of the joystick rotated Delahunt like a barbecue skewer. On a black-and-white computer display, Epley monitored his patient's eyes for a characteristic twitching movement triggered by positional vertigo. He repeated the series of calibrated tilts and whirls. Then he swung the chair upright and face-forward.

No waves of vertigo struck when Delahunt moved his head. The nausea had cleared. He stopped taking the medications other doctors prescribed and resumed his life.

Threat to livelihood

In Portland, many doctors still dismissed Epley as a crank.

The conflict flared into a crisis in 1996. The Oregon Board of Medical Examiners notified Epley that he was under investigation for alleged unprofessional conduct.

His medical license and livelihood were on the line.

At issue was Epley's development and use of another cutting-edge technique: the infusion of a drug to deaden nerves suspected of causing inner-ear disturbances. The case dragged on for five years before hearing officer Marilyn Litzenberger ruled.

Epley kept his feelings to himself, even at home. But his wife and daughter knew that the investigation weighed heavily. Epley's stoop worsened, they could see. His health faltered. He had to break into his retirement savings to pay for his legal defense.

Epley's accusers, two Portland physicians, testified that Epley was administering the nerve-deadening drugs recklessly, based on inadequate diagnostic testing.

Epley's main defender, a Harvard-affiliated specialist from Boston, described Epley as "a forward thinker who has been right virtually every time he stuck his neck out."

Litzenberger left no doubt whom she found most credible, portraying the board's medical experts as hostile, one-sided and ill-informed. In the summer of 2001, Litzenberger dismissed all claims.

By then, a review article in the prestigious New England Journal of Medicine had credited John Epley as the inventor of the "treatment currently recommended" for positional vertigo. In clinical trials, about 90 percent of patients were cured by a single treatment. Doctors applying treatment around the world referred to it as the "Epley maneuver."

Daughter's mission

Epley's daughter, Cathy, may have never heard the full story of her father's travails if not for a terrible coincidence.

On Sept. 11, 2001, Cathy was attending a medical convention in Denver, hoping to find job leads. At 43, she had worked as an editor for a business magazine during the Internet boom, then switched to politics, managing anti-tax activist Bill Sizemore's unsuccessful campaign for governor in 1998. She moved on to a job in marketing with a medical device start-up. But the firm couldn't afford to keep her on full time. So she tagged along with her father to Denver.

News of multiple jet crashes halted the convention. With airliners grounded, convention goers scrambled to book rental cars from a hopelessly inadequate supply. Cathy Epley accepted an offer to share a ride back to Portland with her father's old friend Ken Aebi and his wife. They headed west trying to make sense of the terrorist strikes, compulsively gleaning news from the radio. As the drive wore on, the conversation turned to John Epley and his struggles.

Cathy Epley felt enraged.

But as she absorbed the details, her anger solidified into something more like resolve: She had to help her father get his due. The rest of the drive, Epley spent talking with Aebi about ways to help her father earn money from his inventions.

Back in Portland, she tried to interest venture capitalists in commercializing her father's work. Several listened to her pitch, but all had the same message: She was unlikely to land venture funding. Endless meetings with fund managers, however, weren't fruitless. One suggested she seek startup money from the National Institutes of Health's small-business innovation program.

Cathy Epley went out on a limb. With scant knowledge of running a company, she worked 10 months without pay, writing grant proposals and a business plan. She named the business Vesticon, and she and her father held monthly "board meetings" at American Dream Pizza, across Glisan Street from the elder Epley's office.

Soon federal grants started rolling in: more than $348,000 in 2003, $1.4 million in 2004 and $1.6 million in 2005. Cathy Epley hired an engineer and technicians to build a sleeker version of the "Omniax" chair. The company leased an office and set up a crowded laboratory in Southeast Portland.

In January, specialists in Louisiana, San Diego and Portland are set to begin clinical trials of the chair. The study should take four to six months. If it stays on track and yields satisfactory results, the U.S. Food and Drug Administration could allow Vesticon to begin sales next summer. Cathy Epley has already begun negotiating with distributors.

Epilogue

On a recent day in the building where Epley has practiced since 1965, the doctor stood by the controls of his rotating chair.

"We're going to roll you back," he said to a patient from Idaho. She'd suffered intermittent vertigo since a rollover car accident and was back for a follow-up on a successful earlier treatment. Epley piloted the chair through rolls and twists. The device showed signs of modifications: a radio transmitter lashed to its frame with nylon straps, a video camera clamped to an adjacent shelf, cables to added components snaking beneath ceiling tiles pushed ajar.

At 76, Epley sees patients three days a week. He spends the two other days of the workweek at Vesticon. His daughter's startup has already launched development of two of Epley's other inventions.

In a pause between patients, Epley reflected on the reasons other doctors refused to accept his findings for so many years.

"If I look back at medical school, much of it was misinformation," he said. "Physicians learn to just do the routine, to do the accepted things — don't go too far out.

"They've got so much to lose if they stick their neck out."

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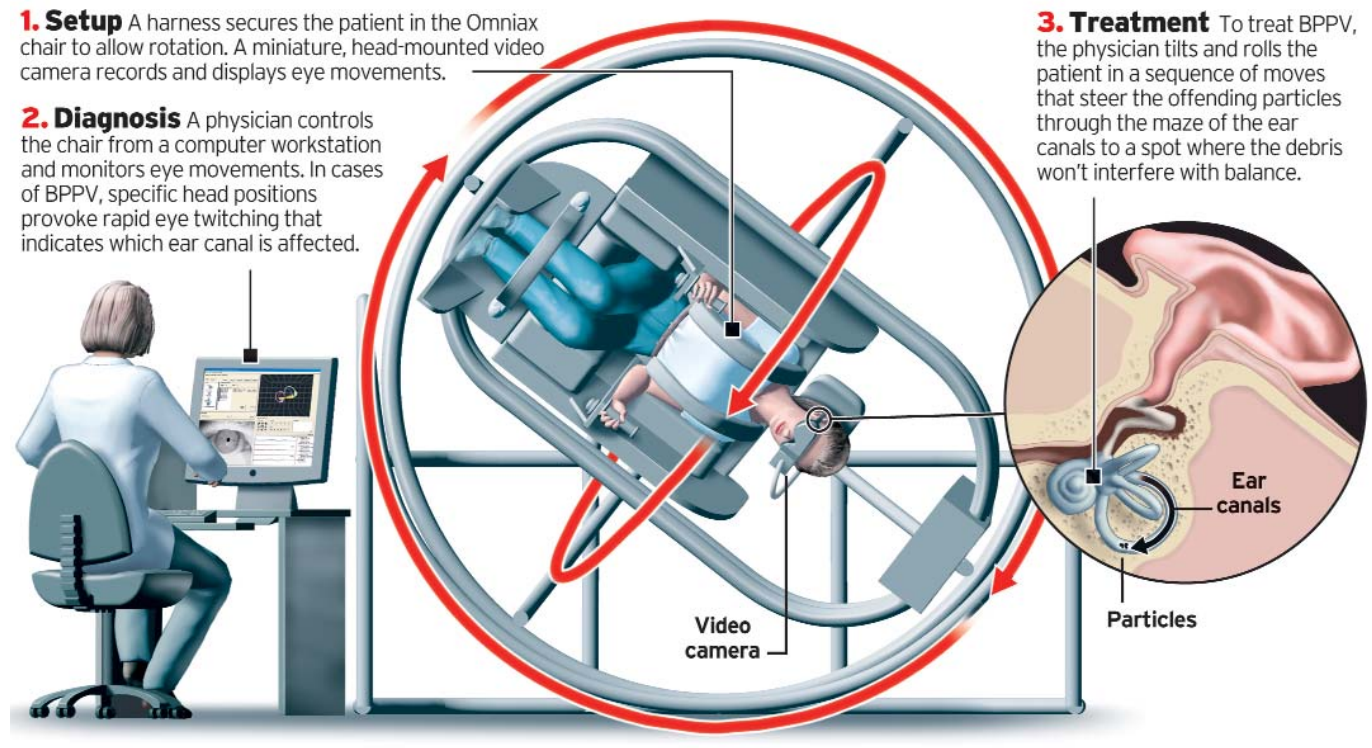
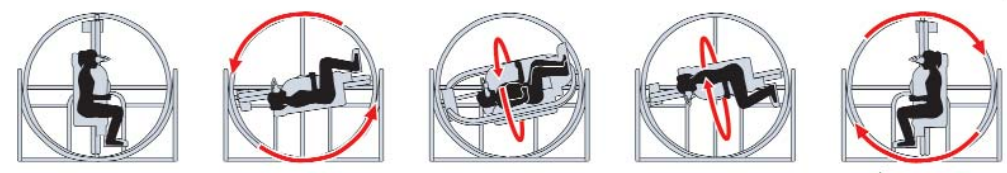
Spin doctor

Attacks of dizziness called benign paroxysmal positional vertigo, or BPPV, are triggered when chalklike particles dislodge in the fluid-filled, balance-sensing inner ear canals. The resulting interference sends false sensations of motion to the brain. To better diagnose and treat this and related balance disorders, Dr. John Epley of Portland developed a rotating, computer-controlled chair, the Omniax.



The moves

This sequence is used to reposition particles affecting the rear canal of the right ear.



STEVE COWDEN/THE OREGONIAN

LEFT | **Cathy Epley founded Vesticon to commercialize the inventions of her father, Dr. John Epley. The firm has raised more than $3.3 million and in January will begin clinical trials of its first product: a system for diagnosing and treating balance disorders.**

BELOW | **Vesticon engineer Jon Birck (left) and company founders Cathy Epley and John Epley demonstrate a goggle system to Dr. James Phillips (right), an associate medical professor at the University of Washington. The computerized goggles measure and record eye movements that can help doctors diagnose balance disorders.**

Photos by JAMIE FRANCIS
THE OREGONIAN

Editor's note

Joe Rojas-Burke of The Oregonian reconstructed Portland ear doctor John Epley's struggle to gain acceptance for his cure for the most common type of vertigo by interviewing a dozen primary sources and consulting a variety of others over the past three months.

Primary sources included Epley; daughter Cathy; Epley's former research partner Dominic Hughes; longtime friend Ken Aebi; colleague Owen Black; and University of Wisconsin neurologist Douglas Lanska.

Secondary sources included technical articles on vertigo and the history of its treatment in The New England Journal of Medicine, Archives of Neurology and other peer-reviewed journals; three patients of Epley's; and documents from an investigation by the Oregon Board of Medical Examiners.

— Ben Santarris, business editor