



A throat-swab test at the doc's office could provide a clue.

When a child behaves vastly differently than ever before, it's time to take a closer look.

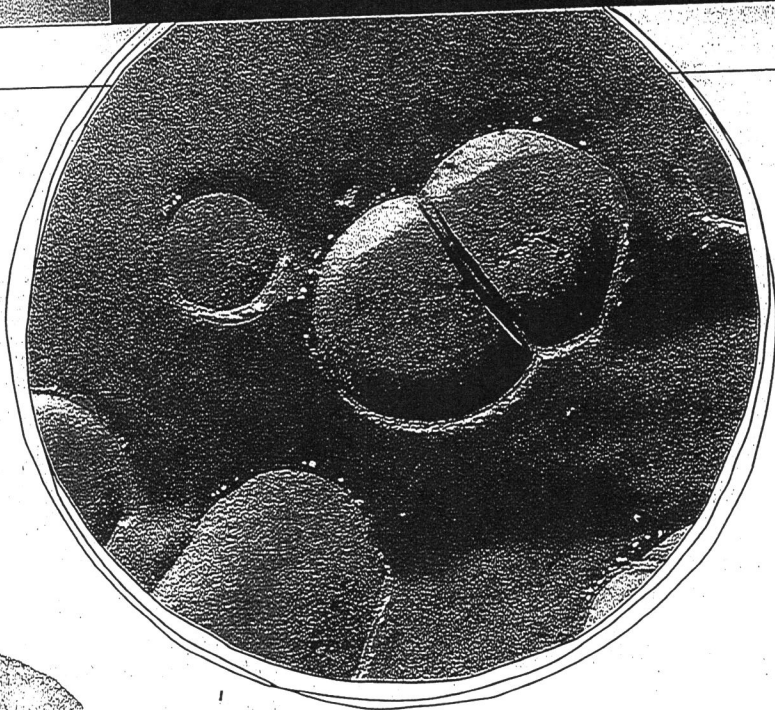
# *what* happened *to my* child?

Could a sudden, severe change in behavior be brought on by something as common as strep throat? Many experts—and distraught parents—say yes. We dig deeper to find out what's going on, and which children are at risk.

by GAIL O'CONNOR

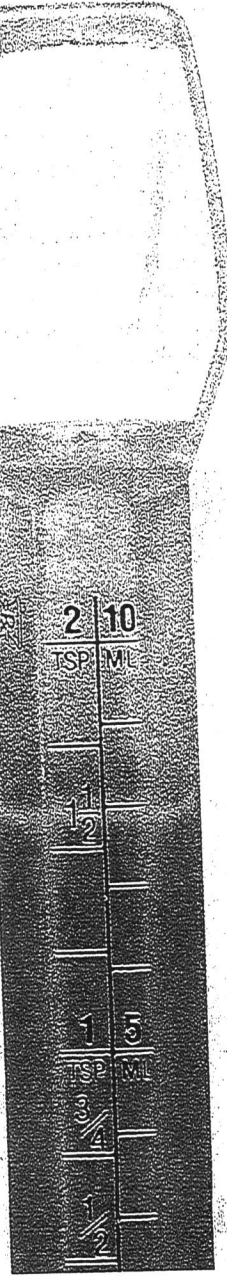
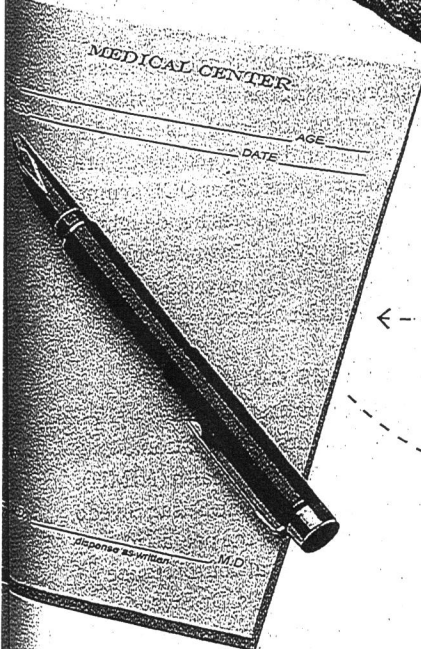


Exposure to strep throat can trigger symptoms of OCD in some kids.



Antibiotics can help the child get better.

When Kelly Bossman's daughter Karli started kindergarten in 2008, there were no signs that anything was amiss. Karli made friends easily and enjoyed being a big sister to her three siblings at the Bossmans' home in Clayton, North Carolina. • Then one morning in November, Karli screamed that she didn't want to go to school. Her underwear, she complained, was too tight. Bossman offered her another pair, but Karli also cried that her shoelaces were too loose, then too snug. Everything, down to the seams of her socks, hurt. • What Bossman figured was



an "off" morning quickly became a pattern. Karli threw objects in protest. She'd hit, kick, and spit at her parents and siblings. Other upsetting behaviors followed over the next several days: Karli feared traveling in the family's minivan, because she was convinced it would run out of gas. "Some mornings she was tantruming so badly, I couldn't get her into the car," says Bossman. At school, she became withdrawn. She was terrified of making mistakes. Easy homework took more than an hour to complete; she erased her work until the paper tore.

After getting no answers from her pediatrician, Bossman went to another pediatric practice—then another. Then she consulted a child psychologist, who gave a name to Karli's set of symptoms: obsessive-compulsive disorder (OCD). The average age of children affected by early-onset OCD is 10. Karli was only 5.

Bossman left with a pamphlet about OCD, which said that one possible cause was PANDAS, short for Pediatric Autoimmune Neuropsychiatric Disorders Associated with

A distinguishing feature of PANDAS is how quickly it comes on, says one doctor. "The symptoms literally begin overnight."

Streptococcal infections. A relatively new and controversial disorder, PANDAS means that in some children, exposure to Group A strep (the bacteria that cause strep throat) triggers the severe symptoms of OCD.

When Bossman reminded her pediatrician that Karli had had strep throat six months before, he dismissed the possibility of PANDAS, saying it was rare. So she consulted an allergist, a behavior therapist, and a neurologist but couldn't find a doctor who'd treat PANDAS—or, in some cases, had even heard of it. Bossman faithfully took Karli to cognitive behavioral therapy, but her OCD symptoms didn't improve.

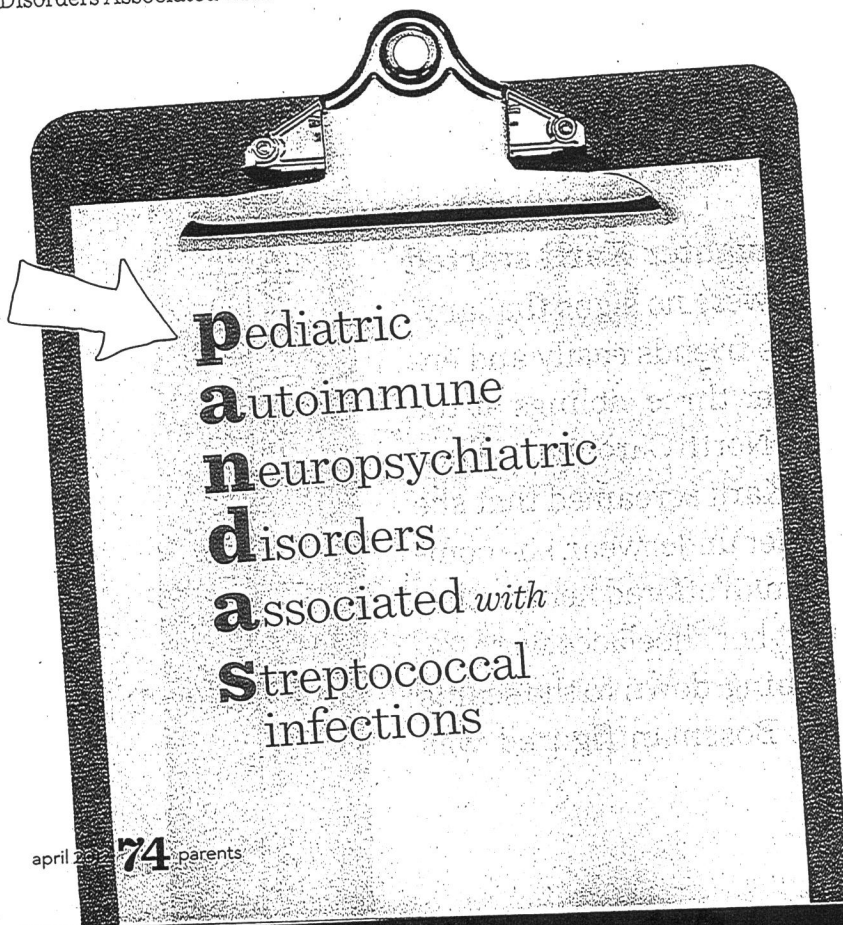
After two years, Bossman found the name of Denis A. Bouboulis, M.D., a board-certified immunologist who specializes in treating PANDAS. But he was in Darien, Connecticut, a ten-hour car ride away. So she did what any desperate mom would do: She made an appointment, got in her car with Karli one morning before dawn, and drove.

Within four days of that meeting and starting treatment on antibiotics, Karli got better. And as the weeks went by, she stayed better. "Ninety percent of her symptoms went away," says Bossman, attributing the success to prolonged courses of antibiotics (one to two months at a time), instead of the standard ten days. Since then, Karli has had recurrences of her OCD symptoms but Bossman believes her daughter has vastly improved. "I wonder what our lives would be like now if I hadn't read that pamphlet," she says.

### a curious cause

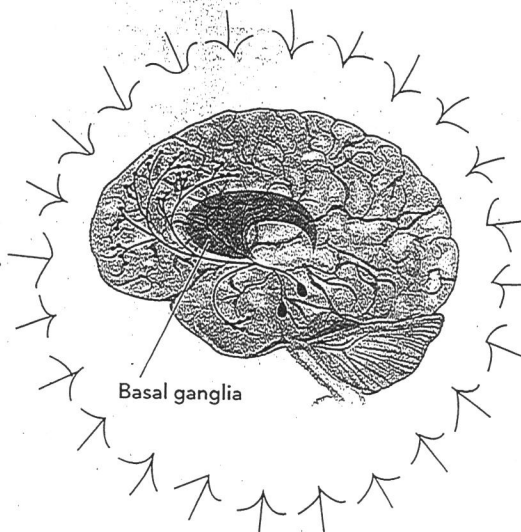
PANDAS was first identified in 1998 by investigators at the National Institute of Mental Health (NIMH) including pediatrician Susan Swedo, M.D., now chief of the pediatrics and developmental neuroscience branch. In the 1980s, Dr. Swedo was among those studying a neurological disease called Sydenham's chorea (SC), marked by involuntary jerky movements, that occurs in up to 20 to 30 percent of children who have acute rheumatic fever, a rare illness caused by a strep infection. When the NIMH investigators began studying children who had severe, sudden-onset OCD without the jerking movements found in SC, they discovered that many of the kids had recently had a strep infection. If strep was known to cause one neurological illness, researchers reasoned, it might cause another.

How does PANDAS take hold? It happens something like this: A bacterial infection such as strep triggers the immune system to produce antibodies. But instead of attacking the infection, they go after the basal



ganglia, the part of the brain that controls emotions, behaviors, and physical movements. And the result is OCD-like behaviors and/or tics. "One distinguishing feature of PANDAS is the abrupt onset of symptoms," says Dr. Swedo, one of the country's leading researchers focusing on the syndrome. "Typically, OCD develops over years or months, but in PANDAS the symptoms literally begin overnight. One parent said, 'It's like my child was possessed.'" While there's no test to detect PANDAS, research published in February in the *Journal of Pediatrics* found that, compared with kids who have typical OCD, those diagnosed with PANDAS were more likely to have biological evidence of a recent strep infection, a sudden onset of psychiatric symptoms, and an easing of those symptoms while taking antibiotics.

That was Diana Pohlman's experience. Founder of the parent-volunteer resource and support group [pandasnetwork.org](http://pandasnetwork.org), Pohlman says her typically developing son had what she calls a "sudden, catastrophic" onset of OCD symptoms that began on his first day of second grade in Northern California. "After school, he collapsed on the sidewalk outside our home and wouldn't move," says Pohlman. "When I got him through our front door, he crashed to the floor." He screamed that the electronics in their house needed to be shut off or their radiation would kill him. He had terrible separation anxiety at bedtime, needing to say "I love you" 20 times or more. While he kept his emotions in check at school, the moment he walked in the house he'd burst from anxiety and rage, and follow with tearful apologies. This led doctors to suspect problems at home, despite neurological symptoms like a loss of coordination and cognitive lapses.



It's believed that PANDAS affects the basal ganglia, the part of the brain that controls emotions and movement.

Helping her son became a massive endeavor. "We lost everything," says Pohlman, who quit her job and sold their home to pay for treatments that tallied six figures. But in the end, the struggle to get him help—which culminated in flights to a PANDAS specialist in Chicago—was worth it: Today he's a happy sixth-grader with no traces of OCD.

### questioning the condition

PANDAS has its skeptics, who see it as more of a hypothesis than a real disorder. One is neurologist Roger Kurlan, M.D., director of the movement disorders program at Atlantic Neuroscience Institute at Overlook Medical Center, in Summit, New Jersey. He calls studies linking strep and PANDAS flawed, contending that their evidence has been mostly anecdotal and unreliable. "It's not uncommon for tics and OCD to wax and wane," he says. Parents often take their child to the doctor when her symptoms have peaked, he adds, so the fact that they subside after treatment with antibiotics doesn't prove anything. Dr. Kurlan isn't convinced that symptoms come on as suddenly as parents report, either. Most children diagnosed with PANDAS, he says, have had prior tics or obsessive-compulsive

symptoms, often for months or years. "The so-called 'onset' is just more severe."

This raises the question: Why is PANDAS linked to strep? "Because strep is extremely common, it can be connected to almost anything," says Dr. Kurlan. Back in the 1950s, researchers tried to lay blame for autism on strep, he notes.

Even PANDAS advocates don't know how common it really is. Some experts estimate it affects 10 to 30 percent of children with OCD (OCD affects 1 to 2 percent of children).

Others believe that figure is much higher. Researchers are trying to pinpoint which kids are most susceptible. "Studies have shown that both autoimmune and developmental disorders can increase the risk of OCD and tics," says Tanya Murphy, M.D., professor of pediatrics and psychiatry at the University of South Florida, in Tampa. "So can birth complications, such as maternal infection at birth, prolonged labor, prematurity, and low Apgar scores. And children who have ADHD may have a higher risk."

One reason parents and doctors don't connect strep or other potential infection triggers like mycoplasma (which causes walking pneumonia) to a sudden change in a child's behavior is because there's often a lag, from one to six weeks. Also, many cases of strep are never even diagnosed. Without clear criteria to diagnose PANDAS, there continues to be controversy surrounding not only its existence but the methods used to treat it.

Some doctors, including Dr. Murphy, prefer antibiotics as a first line of treatment. Antibiotics kill strep bacteria, putting the brakes on the antibodies that are meant to attack strep but in PANDAS mistakenly target the brain instead. Some children improve dramatically, particularly those with severe symptoms, says Dr. Murphy. She writes a one-month

prescription and then monitors her patient's progress. Others write scrips for a full year's supply before discussing more invasive, costly treatments. Those would be plasmapheresis, a "blood-cleaning" procedure that removes the harmful antibodies, and intravenous immunoglobulin (IVIG) therapy, thought to boost the immune system by delivering concentrated amounts of antibodies from healthy blood donors. A study in *The Lancet* showed both procedures to be effective in treating strep-induced OCD and tics, and a study at NIMH to replicate those results is currently underway.

But IVIG isn't for everyone. "Just as you wouldn't use a very strong antidepressant in someone with mild depression, you'd only use IVIG for kids whose anxiety is so profound that it doesn't get better with antibiotics," says Rosario Trifiletti, M.D., Ph.D., a neurologist in Ramsey, New Jersey. The procedure is expensive; the cost is based on a child's body weight—in general, \$1,000 per every 10 pounds—and usually isn't covered by insurance. Unfortunately, without standard guidelines for treatment, IVIG is at risk of overuse.

### building the case

Many PANDAS experts believe that children should take antibiotics through adolescence and beyond as a precaution. Pohlman, for example, whose son had two IVIG treatments before he showed no further symptoms, plans to keep her son on prophylactic antibiotics until he's 23. But couldn't the daily use of antibiotics cause another problem, drug resistance? Dr. Swedo says no, pointing to research that shows the low doses of penicillin used to help prevent strep infections are not harmful. However, she adds, there are risks from indiscriminate use of long-term antibiotics, particularly the broad-spectrum drugs. And critics of PANDAS do see potential problems with the widespread use of antibiotics and in invasive treatments like IVIG.

Dr. Swedo remains steadfast that there's a connection between strep and pediatric sudden-onset OCD and is encouraged by the work of fellow researchers, including microbiologist Madeleine Cunningham, Ph.D., of The University of Oklahoma Health Sciences Center, in Oklahoma City. Dr. Cunningham has found high levels of antibodies in kids with acute attacks of PANDAS; these levels weren't elevated in those with traditional OCD

and tic disorders, supporting the theory that PANDAS operates under its own distinct mechanism.

Meanwhile, roughly two dozen experts around the country treat PANDAS—including neurologists and infectious-disease specialists—and the best-known names draw their patients from many states away. But someday, kids might be able to get treated by their own pediatrician.

One such doctor is Susan Schulman, M.D., who's been in private practice for 35 years in Brooklyn, New York. Dr. Schulman was mystified by the high number of early-onset OCD cases in her practice. When she first learned of Dr. Swedo's research linking strep and OCD, "I almost fell off my chair," she says. "There's a very high incidence of strep in my practice. My focus in patients with OCD symptoms became the connection to strep." She came upon a regimen with an antibiotic that has immune-modulating effects; by using it long term, many patients have improved. "Mental illness in a healthy child is terrifying for parents," she says. "But the recent understanding of how early-onset OCD might happen, and what can be done, changes our whole approach to treating it. The challenge now is to educate doctors and mental-health professionals. Many are still skeptical until they see results for themselves."

In the meantime, Kelly Bossman and other parents are hopeful that their children will continue to get better. At press time, Bossman, now three years into her family's journey with PANDAS, was taking her daughter on another all-day car ride to Connecticut, where Karli would receive her second IVIG treatment. Her daughter was "98 percent back to normal" after the first treatment, says Bossman, but the results didn't last. The fact that Karli improved at all, though, is encouraging to Bossman. "Eventually the OCD behaviors will stop coming back," she says. "We are certain that we can get this under control." ☺

## 7 Signs of PANDAS

### 1 Developmental regression

A child may suddenly start acting much younger than his actual age. He'll often throw temper tantrums or revert to baby talk.

### 2 Acute severe onset of ritual behaviors

The child suddenly engages in frequent hand-washing (a common symptom of OCD) or can't come to the dinner table without bringing nine specific books, for example.

### 3 Tics

These can be vocal or motor and may include head shrugging, throat clearing, and eye twitching or rolling.

### 4 Severe anxiety

She may no longer want to attend school, or she suddenly has fears about catching illnesses.

### 5 Separation anxiety

A child who slept in his own bed now must be in yours, for instance.

### 6 Bedwetting and frequent daytime urination

The child needs to use the bathroom several times per hour or suddenly starts wetting the bed again, even over the age of 8.

### 7 A sudden backslide in handwriting or drawing skills

The motor abnormalities caused by PANDAS can interfere with a child's fine motor skills.