

# Newsday

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## Saving Bobby


The tale of an LI miracle



Bobby Palange, 3, jumps rope in the kitchen with his brother Jacob at the family's home in North Bellport.

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NEWSDAY PHOTO / MICHAEL E. ACH



**T**he North Bellport father backs his family's Dodge Durango down the driveway on a snowy morning in February and accidentally crushes his young son's head.

One year later, the 3-year-old boy is alive and remarkably well. Not because there was any one defining moment in the struggle to save Bobby Palange.

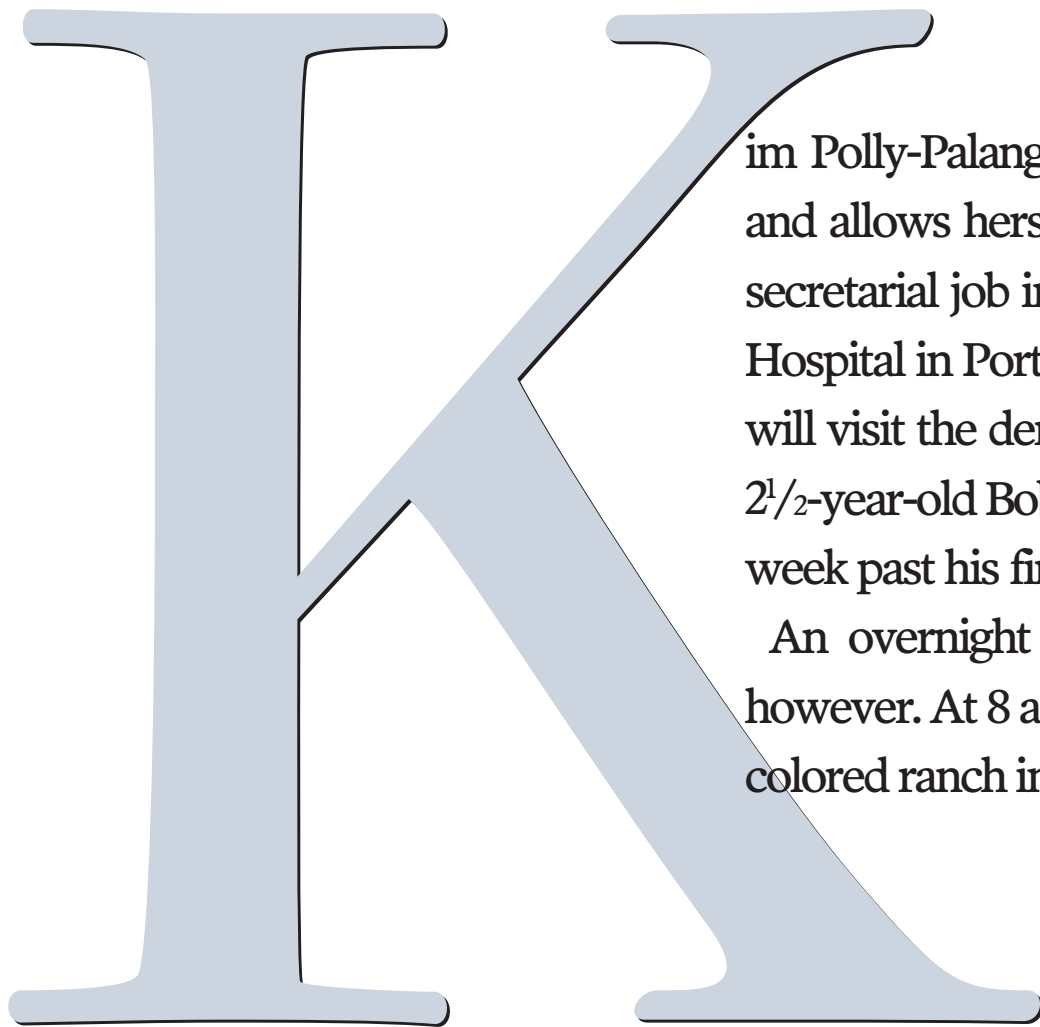
But because there were so many.



backed over him in their driveway a year ago.

# PART 1

BY BRYN NELSON  
STAFF WRITER



Kim Polly-Palange has just finished a month of jury duty and allows herself a rare day off before returning to her secretarial job in the radiology department at St. Charles Hospital in Port Jefferson. The 35-year-old mother of five will visit the dentist with her three oldest children, while 2½-year-old Bobby and his younger brother Jacob — one week past his first birthday — will go along for the ride.

An overnight snowstorm has complicated her plans, however. At 8 a.m., the snowflakes floating by her cream-colored ranch in North Bellport give way to freezing rain.

**Everything  
falls  
apart  
on a  
Monday.**

**Presidents  
Day.**



**Bobby Palange before the accident.**

Robert Palange, Kim's 30-year-old husband, heads outside soon afterward and begins to shovel away the four inches of wet snow blanketing the driveway. The Palanges have regrouped after a rough spell in their relationship, and they now agree on a plan: He will free the family's Dodge Durango first and back it out of the driveway so his wife can do the same with her Ford Windstar.

In a quieter moment of the day, Bobby might be coaxed to sit through a reading of his favorite book, "Brown Bear, Brown Bear," or to nap with his favorite stuffed animal, a floppy-eared dog named Snoopy.

This is not one of those moments.

A boy in perpetual motion, he is seemingly always running. Or jumping or throwing a ball in that uncanny pitcher's motion, whether at home or at the Tutor Time day care center he has attended since he was eight weeks old.

Bobby adores his father and follows him everywhere, even carting around a play set of tools when Robert works on the car. It's only natural that the toddler should head into the driveway after him, bundled up in a coat, gloves and knit cap and towing his own little shovel.

But there are plenty of distractions, to his mother's exasperation.

"He'd come in, and I'd feed him breakfast, he'd want to go

### The story

This account is based on medical records, police reports, direct observation of one surgery and dozens of interviews with family members, neighbors, police officers and medical personnel from four Long Island institutions. Conversations are based on observations, interviews, eyewitness accounts and police records.

back out again," Kim recalls. "He'd come in, and as soon as I started to take off his jacket, he'd want to go back out again."

Bobby runs out and Kim closes the outer glass door, which has fogged up like a bathroom mirror. Then he's back, nose dripping, gloves missing, waiting to be let in.

"Oh, my hands are cold."

"OK, well why don't you stay in?" Kim asks.

"No I want to go outside."

So his mother tries to lure him in for good — or at least until everyone else is ready for the trip to the dentist.

"Do me a favor. Go get your gloves. Where are your gloves?"

"By daddy."

"OK. Go get your gloves and bring them to me."

It will take Kim about a week to figure out what happens after Bobby bounds from the front door, past the white porch columns with their gingerbread brackets and down the walk to the driveway.

He doesn't find his gloves or his dad behind the 2001 Duran-

go, where a path has now been cleared to the street. But surely his dad will be there soon and help Bobby look.

In the meantime, the toddler waits behind the sport utility vehicle and all but disappears.

Consumer Reports recently tested how well drivers could see a 28-inch traffic cone through the mirrors or rear window of various vehicles. For a 5-foot 8-inch driver like Robert in a 2004 Dodge Durango Limited, the testers marked off a blind spot extending 19 feet and one inch from the rear bumper.

Within this "blind zone," as advocates call it, young children can essentially vanish.

Robert returns from the side of the house, where he's put his shovel away. He doesn't see Bobby but notes that the front door has shut again. Surely Bobby must be back inside.

At 9:33 a.m., Robert gets into the Durango, turns the key in the ignition and shifts the 2.2-ton SUV into reverse.

Robert runs over something hard with the left rear tire.

It must be leftover snow or a pile of bluestone, he reasons, and continues to back up. But there it is again, this time beneath the left front tire.

He stops the vehicle and gets out to take a look. To his horror, Bobby is lying facedown on the driveway.

"What did I do?" he yells.

Kim opens the door and her husband is holding their son. There is blood and she is thinking, "OK, what did he do now?" Bobby's always getting into something.

But then she sees her son's face, and the way his eyes have

**See BOBBY on 7**



With the scars of skull surgery still visible, Bobby sits on his mom's lap less than three weeks after the accident.

# Six frantic hours

The miraculous rescue of Bobby Palange from a near-fatal auto backover on Feb. 21, 2005, involved a coordinated effort from police, ambulance and hospital workers, doctors and more. In some cases, times listed are approximate.

Visit [Newsday.com/bobby](http://Newsday.com/bobby) to take an interactive look at the coordinated effort from police, ambulance and hospital workers, doctors and others who played a role in saving Bobby Palange.

## THE ORDEAL

### 9:33 a.m.

Accident at the Palange home.

### 9:37 a.m.

Suffolk County 911 dispatcher makes a call to South Country Ambulance.

### 9:38 a.m.

Ambulance en route.

### 9:41 a.m.

Ambulance arrives at the end of the block where the Palange home is in North Bellport.

### 9:43 a.m.

Ambulance departs Palange home for Brookhaven Memorial Hospital Medical Center.

### 9:50 a.m.

Ambulance arrives at hospital. Bobby stays at Brookhaven Hospital for about an hour before being transferred.

### 11 a.m.

Ambulance arrives at Stony Brook University Hospital.

### 11:05 a.m.

Bobby is officially admitted to the hospital's emergency department.

### 11:30 a.m.

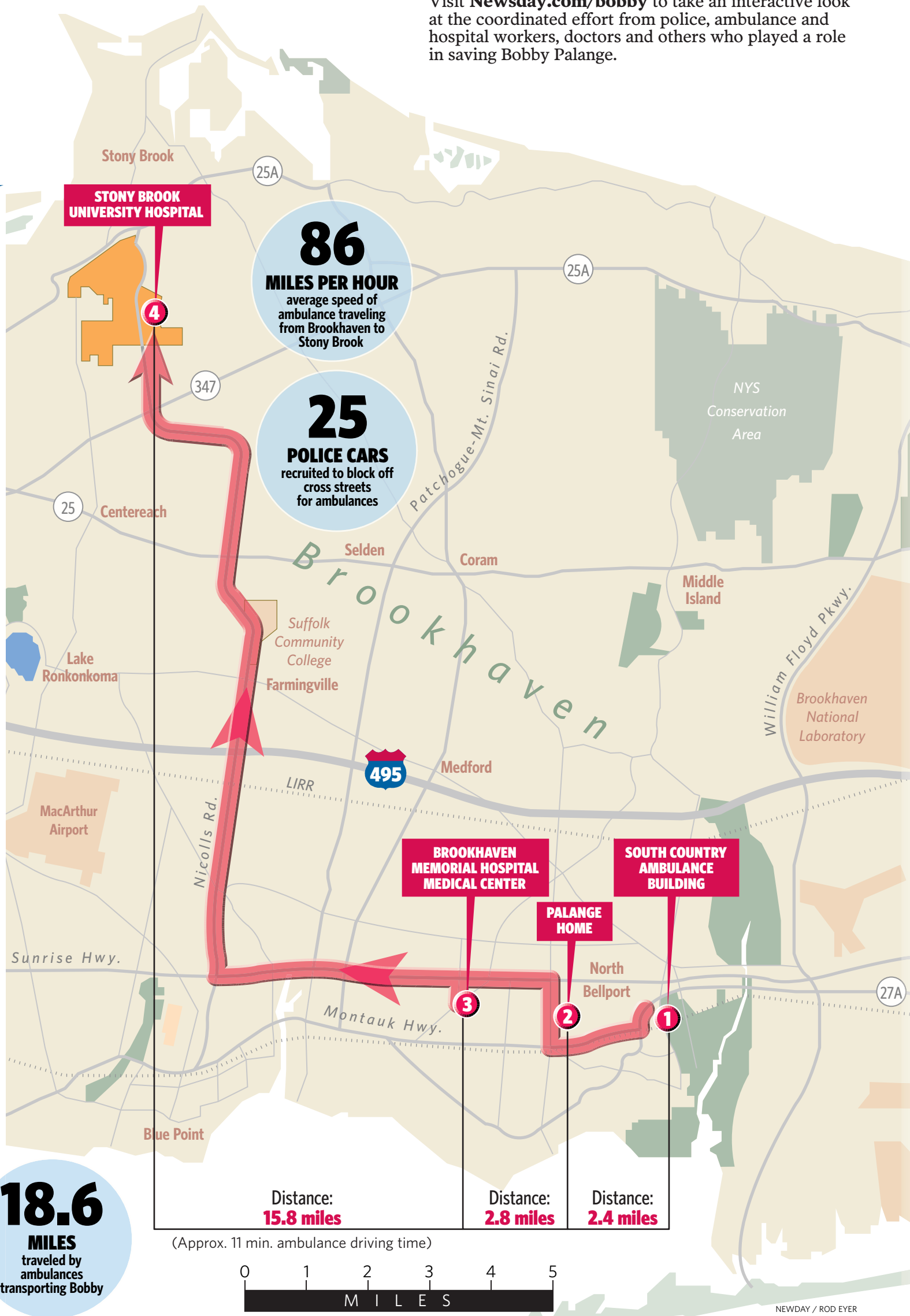
Bobby is taken to an operating room to prepare for surgery.

### Noon

Surgery begins and lasts about three hours, after which Bobby is placed in a barbiturate coma and kept under observation for about another half-hour.

### 3:25 p.m.

Bobby is taken to hospital's intensive care unit.



**17**  
MINUTES  
from accident to arrival at Brookhaven hospital

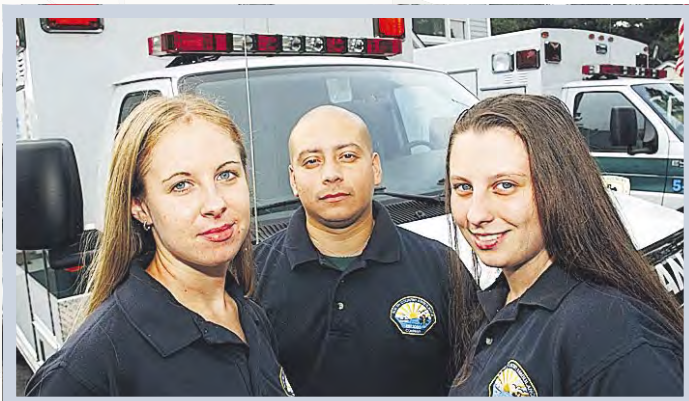
**18.6**  
MILES  
traveled by ambulances transporting Bobby

# THE FIRST TO HELP



PHOTO BY HOWARD SCHNAPP

**THE POLICE** Suffolk County Police Officers Robert Mudzinski and Brian Curry were first to arrive on the scene to treat Bobby Palange after the accident.



NEWSDAY PHOTO / MICHAEL E. ACH

**THE EMTS** From left, emergency medical technicians Jamie Johnson, Luis Salinas and Nicole Navratil gave aid to Bobby in an ambulance during the drive to Brookhaven hospital.



NEWSDAY PHOTO / MICHAEL E. ACH

**THE TRAUMA TEAM** From left, Beth Anne Brauneisen, Dr. Robert Ehlers, Audrey Georgakopoulos, Lorraine Lomonaco, Leroy Reid and Serina Fahie of Brookhaven hospital.

## BOBBY from 4

rolled up into his head. There's the Durango at the end of the driveway and she knows. She screams.

## THE CALL COMES IN AT 9:37 A.M.

The morning crew at South Country Ambulance Co. in Brookhaven is setting up folding chairs and hauling out the Resusci Anne and Resusci Junior mannequins in the building's second-floor classroom. Brookhaven's Boy Scout Troop 4 is due in little more than 20 minutes for a community first aid and CPR course.

As one of Suffolk County's busiest ambulance companies, with an average of 2,500 calls handled in each of the past five years, South Country relies on a roster of 126 trained volunteers and six employees. Greg Miglino Jr., the company's chief, describes the daily routine as "boredom interrupted by a mad dash."

Through their pagers, the crew members receive the Suffolk County 911 dispatcher's call advising them of a child in traumatic cardiac arrest after a vehicle-pedestrian accident. Luis Salinas, the company's chief of operations and advanced life support supply manager, can only think "Oh, no" as he rushes down the stairs and out the door.

Suffolk County Police Officers Brian Curry and Robert Mudzinski, classmates from the county police academy and partners for the past year, are stopped at a traffic light 2½ blocks from the Palange house when they hear the same call.

It won't be a routine one, they sense, and they immediately ask for assistance from their 5th Precinct colleagues to clear a path through the tapering mix of snow and rain.

Kim is cradling Bobby on the walkway by the front door when the officers arrive, less than a minute later. A trail of red leads back to the Durango.

While her husband frantically relayed the accident to a 911 operator, Kim had tried to stanch the flow of blood with a towel. But it continues to flow — from Bobby's head, his eye, his nose, his ears.

He has a heartbeat and is cry-

ing, contrary to the dispatcher's initial report. Then the cries stop, the breaths become shallow, and the officers know they have little time to lose as they carry him from his stunned parents and into the backseat of their police car.

"Bobby, hold on! Bobby, stay with me!" they both say. "Everything is going to be OK!"

They've nearly made it to the end of the block, at 9:41 a.m., when South Country's first responder vehicle rounds the corner, with Salinas and emergency medical technician Amy Price in the back. Fellow EMTs Jamie Johnson and Nicole Navratil have followed in ambulance 5-42-16.

Salinas jumps out, and the officers hand him the limp boy.

The Durango's tire treads have left ugly marks across the toddler's right arm and leg. Bobby's right eye is swollen shut, but his left pupil is dilated — the ominous sign of a traumatic brain injury.

Salinas gingerly carries him to the side door of the ambulance with his hands and arms bracing the boy's head and spine. He must be stabilized quickly and the poor weather rules out a helicopter flight to Stony Brook University Hospital, Suffolk County's only Level I trauma center.

Driving 17.7 miles to the hospital through slushy roads will only delay the medical attention Bobby urgently needs, so Salinas instead directs the ambulance toward Brookhaven Memorial Hospital Medical Center in East Patchogue, less than 3 miles away.

## A race against time

Curry and Mudzinski escort the ambulance north on Station Road and west along Sunrise Highway, as their fellow officers begin closing side streets, and Kim and Robert follow close behind in the Durango.

After strapping the patient to a yellow-framed stretcher and pediatric board, the ambulance crew places a plastic bag valve mask over Bobby's mouth and nose, delivering hope in the form of pure oxygen from an on-board tank.

The human brain, like other parts of the body, swells when injured. With traumatic brain injuries, though, the principal threat arises from the spike in

intracranial pressure.

Brain cells instigate it by firing in unison, blanketing their surroundings with a confetti-like burst of signaling chemicals known as neurotransmitters. Amid the ensuing free-for-all, glutamate neurotransmitters latch onto receptors jutting from the cells, setting up a chain reaction that evicts potassium and sends sodium rushing in as a replacement.

Extra sodium causes brain cells to retain water as if they were billions of tiny sponges. Unlike a sponge or swollen knee, however, the brain is confined by the bony parameters of the skull, restricting the bulging mass in every direction except down through the foramen magnum, where the brain stem meets the spinal column.

This forced expansion into new territory, or herniation, progresses as the intracranial pressure intensifies. Blood vessels and nerves become compressed and arteries struggle to pump blood-borne glucose and oxygen back to the 100 billion neurons of the brain's message delivery service. Herniation can eventually asphyxiate the brain and crush the brain stem, turning off the neuron-mediated communication channels like banks of lights in a darkening warehouse.

Unless the pressure is relieved, death or lasting brain damage is nearly inevitable.

Bathing Bobby's brain cells with oxygen in the back of the ambulance may help meet the heightened energy demands of battered neurons seeking repairs and re-equilibration. And it may compensate for the difficult passage of oxygen to these brain cells, reducing the rate of swelling and accompanying rise in pressure, perhaps buying him a little more time.

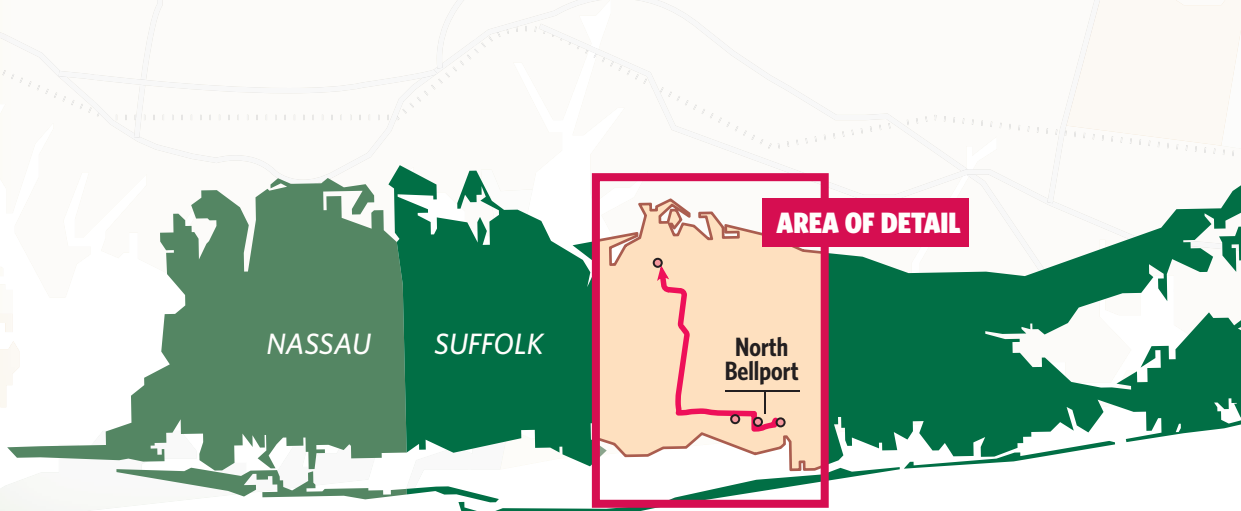
He'll need far more aggressive measures and Price radios ahead to warn Brookhaven's emergency department of an impending arrival.

## Lifesaving moments

During the seven-minute ride, Navratil sits in a gray captain's chair as she stabilizes Bobby's head and neck with a pediatric collar and her hands.

Price and Johnson crouch

See BOBBY on 8



The accident was the lead story in Newsday on Feb. 22, 2005.



## BOBBY from 7

over the sides of the stretcher, with Johnson squeezing a lavender bag once every three seconds to deliver oxygen to the mask and Price splinting Bobby's right arm and monitoring a pelvic injury that the tire marks and developing bruises suggest. If any pelvic fracture has torn a major blood vessel such as the descending aorta, internal bleeding could dramatically compound the danger.

The external bleeding from

Bobby's head wounds must be controlled with steady pressure and sterile bandages, and the condition of his lungs examined with a stethoscope.

Barely conscious, he cries softly and fights the oxygen mask. He tries to lift his splinted arm and touch his head. Price gently lowers his arm back to his side.

Salinas coordinates his crew's response and sets up two monitors. For one, he attaches a probe to Bobby's left earlobe and connects the cord to a black handheld device. The

pulse oximeter will measure the boy's heart rate and amount of blood-borne oxygen reaching his cells. Salinas also affixes three color-coded electrocardiogram stickers to Bobby's chest, where they translate the electrical activity of his heart into a succession of green waves traversing a small screen on a counter above the ambulance's built-in cabinets.

The resting heart rate for a toddler ranges from 80 to 130 beats per minute, but the heart beats faster after an injury or

when trying to pump more oxygen to the brain. During the ride, Bobby's heart rate bounces between 100 and 178, "which tells you that the body is trying to compensate for shock and deliver more blood and maintain a pressure," Miglino says later.

"Kids are very weird," he says. "They're not just shrunken-down adults." Children can lose a greater percentage of their blood and still maintain a stable blood pressure, Miglino says, but the pressure can plummet at a far steeper rate than in

adults once blood loss overwhelms the body's ability to compensate.

"If you're not on top of this, and monitoring all these systems at one time, one of them will let loose and it will be too late," he says. "Kids do not very often give you a second chance."

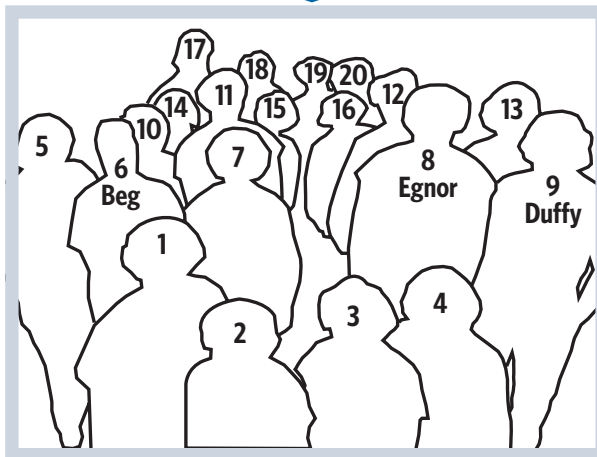
### A crucial score

With his crew, Salinas runs through a checklist routinely used to gauge the depth and duration of a patient's unconsciousness. Known as the Glas-





NEWSDAY PHOTO / MICHAEL E. ACH



- The Stony Brook University Hospital emergency surgical team and surgical support staff that worked to save Bobby Palange:
1. Registered nurse James Cassar
  2. Registered nurse Kim Fenster
  3. Surgical technician Christine Neuwirth
  4. Registered nurse Mary Zegers
  5. Registered nurse Valerie Bagnasco
  6. Dr. Tazeen Beg
  7. Dr. Margaret Parker
  8. Dr. Michael Egnor
  9. Physician's assistant Dennis Duffy
  10. Registered nurse Katherine Morales
  11. Dr. Richard Scriven
  12. Dr. Rich Dickinson
  13. Registered nurse Juan Serna
  14. Registered nurse Kathleen Culver
  15. Registered nurse Kathryn Sheriff
  16. Registered nurse Jamie Farruggia
  17. Registered nurse Bill Dempsey
  18. Paramedic Ian Mauro
  19. Paramedic David Sterne
  20. Dr. Favid Visram

gow Coma Scale, the scoring system covers three types of response and provides vital if somewhat subjective clues to a patient's condition.

Although harder to assess in young children, a lower score in each category indicates increasing impairment. Verbally, Bobby is making incomprehensible sounds, giving him two out of five possible points. His eyes open intermittently, but only in response to pain: two out of four points. Initially, Bobby withdraws from pain,

but his motor responses deteriorate to the point that Salinas assigns three out of six points.

Seven out of 15 points, a score that suggests a severe brain injury.

Bobby reaches the brick columns of Brookhaven hospital's ambulance bay at 9:50 a.m., 17 minutes after the accident.

Through the double set of sliding glass doors. To the left and down a brightly lit hallway of linoleum diamonds.

To the left again, past the frosted glass window of Trau-

ma Room 2.

Salinas holds Bobby's pediatric collar in place, bracing the boy's head and neck as he tells Brookhaven's assembled emergency team what his crew has seen and done while en route.

After the hand-off, Salinas lingers at the edges of the trauma room, watching anxiously.

He thinks about his own 8-year-old son.

He remembers how Bobby fought against the oxygen mask on the way to the hospital. How he had that energy.

Salinas thinks to himself, and then tells his crew, that the boy will either have severe and lasting disabilities, or recover so completely that he'll be remembered for years.

"You watch . . ."

He waits. And he watches.

### TIME IS THE ENEMY IN THIS ROOM.

More than 60,000 patients will pass through Brookhaven hospital's emergency department in 2005 — 60,000 clocks ticking with their own urgencies.

How then has this one hour become so ingrained in memory? The knowing glances, the drugs delivered, the rush of time that still separates so neatly into stop-motion scenes?

Registered nurse Beth Anne Brauneisen remembers being remarkably clearheaded, as if Bobby's crisis has sharpened her focus to a shining point.

Everyone feels it.

"Of course, everything changes when it's a child," says Dr. Robert Ehlers, who recalls the adrenaline and urgency. "Everybody steps it up a notch."

They do because they must, because the boy is the child of parents in the hallway, whose anguished faces have stayed with Ehlers months later.

Trauma Room 2 fills quickly: Brauneisen and Ehlers and Dr. Jason Winslow; five other nurses and two nursing assistants; and emergency department secretary Audrey Georgakopoulos, who remembers how Salinas held the child's head so long.

The department swells with a sea of concern. Amid the commotion, Brauneisen marvels at the staff's lockstep movements, the unity of mission.

"Kismet," she says later. "The flow — everyone was a team."

Bobby's airway is open, he's breathing and his heart is beat-

ing. Good.

A blood pressure cuff is wrapped around his right arm, the injuries to his head and right eye and arm and pelvis examined. Specialized X-rays known as computed tomography scans, or CT scans, will provide multiple scenes of his broken body to confirm the staff's suspicions.

Brauneisen selects a large bore intravenous catheter from a drawer in the pushcart labeled "IV AND BLOOD CART" and inserts it near the inner bend of Bobby's left elbow, opening a key portal to the central veins in his arm.

Even then, he seems to pull away a little from the sharp jab.

### Emergency action

It's still a fight, though the wire-framed clock on the back wall refuses to slow. His Glasgow Coma Score has dropped from seven to four, with only the slightest physical response giving the unconscious boy one point above the minimum.

A dire prognosis.

Through the IV, Brauneisen injects two drugs: Atropine, a common lead-in for anesthesia that dries up saliva and bronchial secretions and counteracts the lowered heart rate that sometimes accompanies the insertion of an endotracheal breathing tube; and the sedative Versed to prevent any more physical protests.

To the right is the pediatric crash cart donated by the Patchogue Kiwanis, with its nine color-coded drawers. Each drawer contains a stash of emergency supplies for children within specific size ranges, a design meant to save time

and prevent critical mistakes.

A drawer near the middle holds the laryngoscope that Ehlers and Winslow will use to peer down Bobby's trachea; and the blade and handle, a curved metal device resembling a long-handled shoehorn that will open that airway. Here is the flexible endotracheal tube that will deliver oxygen through the airway to his lungs; and a urinary catheter for draining urine from his bladder.

The two doctors confirm the position of the inserted endotracheal tube and pure oxygen flows through it in quick bursts, first from a handheld bag and then from a mechanical ventilator. Hyperventilation, Ehlers says, can lower the level of carbon dioxide in brain tissue — and maybe the pressure building within it — by constricting the size of blood vessels in the brain and decreasing the blood flow.

Another drug shoots through the IV: vecuronium, to hold the boy in a temporary state of paralysis during his intubation.

### Another ambulance

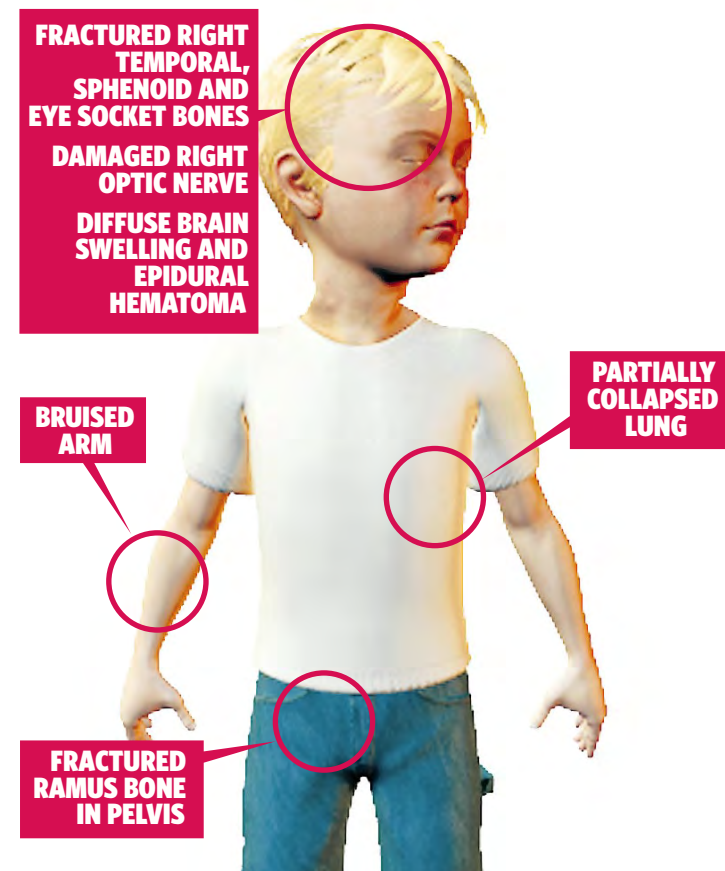
In the meantime, Bobby receives another unexpected lift. An ambulance has been summoned from Stony Brook University Hospital to transport him there for emergency surgery, but a gurney is already rolling through Brookhaven's sliding doors, sent with a second ambulance to take a non-critical heart patient to Stony Brook for some tests.

Someone calls out in surprise, "Are you here for the baby?"

See BOBBY on 10

## Bobby's injuries

He suffered a series of injuries, some life-threatening, that included the following:



# The push for new vehicle safety laws

Their stories all begin the same way: An unseen toddler. A parent or relative backing up a sport utility vehicle. And then the awful discovery.

Since October 2002, three similar accidents on Long Island have ended in a child's death and a fourth nearly so. But out of unspeakable tragedy, several parents have found their voices and made the Island a focal point in the push for better car safety laws.

"When you go through the trauma of it as a parent, there are no words to explain it," says Oyster Bay pediatrician Dr. Greg Gulbransen. "It's just shock."

Gulbransen and his wife, Leslie, lost their 2-year-old son Cameron on Oct. 19, 2002, when the toddler slipped unnoticed behind the family's BMW X5 sport utility vehicle as Greg was backing it into their Woodbury

driveway for the night.

Since then, he has recounted his story dozens of times — something he hates doing but continues out of concern for what he views as an epidemic.

"I don't want anyone to go through my story," he says.

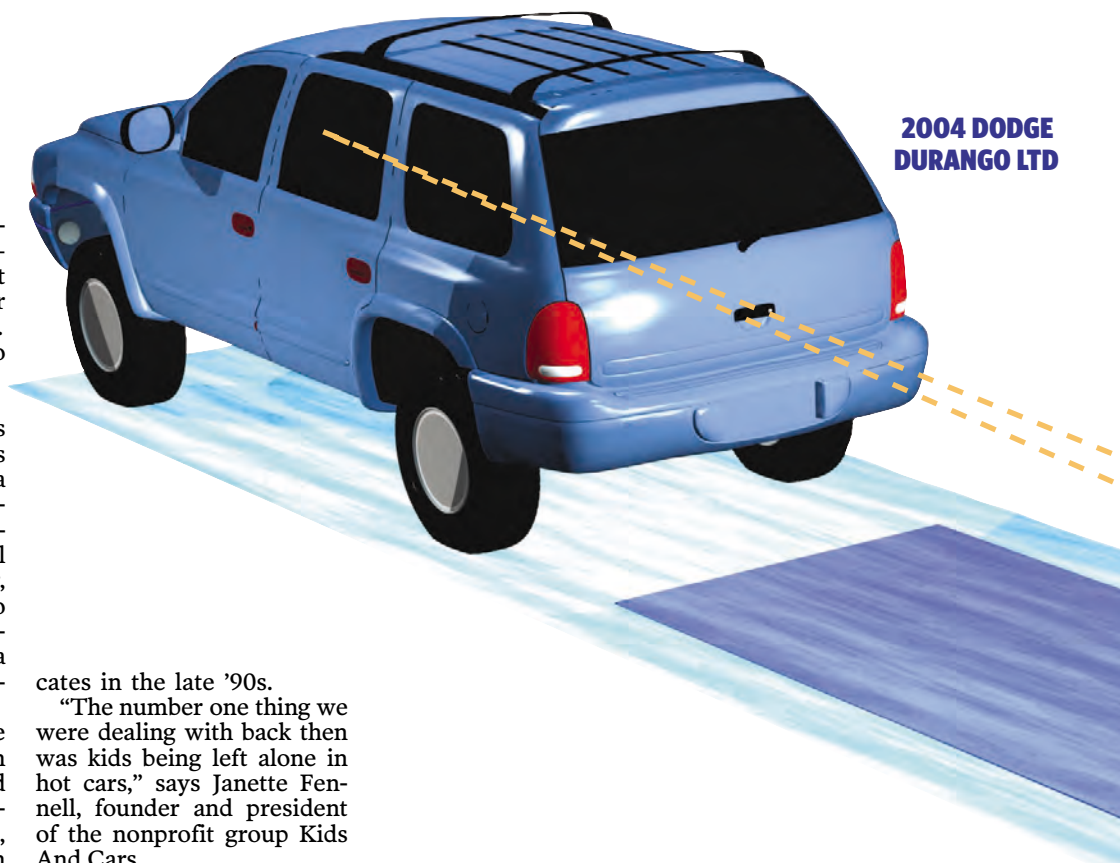
Others already have.

Bill and Adriann Nelson's son Alec was only 16 months old when a relative backing a Ford Explorer out of the family's Dix Hills driveway accidentally killed the toddler on April 24, 2004. Two months later, 2-year-old Agatha Cavallaro died after her father accidentally backed over the toddler in a Ford Expedition during a family outing in Muttontown.

The Nelsons have since joined the Gulbransens in organizing fundraisers and pressing for more awareness of backover accidents, a phenomenon barely on the radar of safety advo-

## What drivers don't see

Illustration below and chart at right show rectangular blind-zone lengths of selected vehicles for small-and average-size drivers. The length begins at the rear bumper and ends at the point in which a driver can see the top of a 28-inch safety cone in the side- and rear-view mirrors or through the back window.



2004 DODGE DURANGO LTD

cates in the late '90s.

"The number one thing we were dealing with back then was kids being left alone in hot cars," says Janette Fennell, founder and president of the nonprofit group Kids And Cars.

Backovers now account for more than half of the fatalities she tracks, with more than 100 in each of the past two years. Fennell believes the real toll is two or three times higher.

The rising numbers, she says, have tracked the popularity of SUVs, minivans and pickup trucks, some of which have "blind zones" that extend more than 40 feet behind the rear bumper for shorter drivers.

Most victims are toddlers, too young to recognize the danger but old enough to run into the driveway when separation anxiety compels them. Fennell calls it the "bye-bye syndrome," but a lack of good statistics has made the problem hard to quantify.

That may change. In last year's national transporta-

**Newsday.com**

Visit [Newsday.com/bobby](http://Newsday.com/bobby) to check out Consumer Reports information on the blind spots for most types of vehicle makes and models.

tion bill, advocates succeeded in inserting language requiring the National Highway Transportation Safety Administration to gather data on backovers and on ways of preventing them.

Last May, Rep. Peter King (R-Seafood) co-introduced the "Cameron Gulbransen Kids And Cars Safety Act of 2005," which would require automobile manufacturers to make safety measures such as back-up warning systems standard in all new cars. On Halloween, with the Long Island Children's Museum and costumed

trick-or-treaters as a backdrop, Sen. Hillary Clinton (D-N.Y.) announced her co-sponsorship of a similar bill in the Senate.

As supporters work to gather more co-sponsors, Gulbransen envisions a different story he'd like to tell. It's about going to a car dealership when his two children are old enough to drive and seeing back-up safety features on every single car.

And then he'd tell them that their brother Cameron helped to make it all a reality.

— BRYN NELSON



NEWSDAY PHOTO / MICHAEL E. ACH

The Palange home shortly after the accident

### BOBBY from 8

Juan Serna, the ambulance's critical care transport flight nurse, heads to Trauma Room 2, and his priorities change the moment he walks through the door. Stony Brook's second ambulance, perhaps a half-hour behind, will come instead for the heart patient.

And so the combined forces of two hospitals wheel their small patient to Brookhaven's CT scan room, just a few quick steps to the right and then down a hallway to the left.

The boy lies very still on a white table, except for the venti-

lator-assisted rise and fall of his chest. His body slides into the oversized ring along with his pediatric collar and IV tube and oxygen mask for an array of scans, while the emergency department staffers dash behind a lead-reinforced wall to avoid the radiation.

#### Vital drugs

Head, neck, chest, abdomen, pelvis: Dozens of images pop up on a computer screen in the glassed-in control room, each a 5-millimeter-thick accounting of the accident's internal wreckage. And then Serna is on the wall-mounted phone, reporting

the results to Stony Brook and consulting with Ehlers, whom he has known for four years.

They are able to look at each other and know what they need to do. Serna knows Brauneisen only by sight, but a friendship is developing between them as well, forged within these few frantic moments.

More drugs course through the IV: Thirty grams of a sugar alcohol known as mannitol, then a slower drip of 120 grams. One of the few drugs able to cross the blood-brain barrier, mannitol is a diuretic that can wick moisture away from brain cells. The substance used to coat chewing

gum to prevent stickiness may help to reverse the swelling and reduce the intracranial pressure building within Bobby's brain.

And Decadron, a steroid that likewise suppresses brain inflammation but can interfere with the body's ability to ward off infections. To make up for that deficit in flows an antibiotic called ceftriaxone and then nafcillin, a penicillin derivative commonly used against staphylococcus infections.

In goes the urine catheter retrieved from the crash cart, to collect fluids the mannitol is forcing out. And then the comatose boy is lifted from the white table onto Stony Brook's

gurney and wheeled back into the hallway, toward the sliding doors, toward his parents.

In Brookhaven's brightly lit corridor, Curry and Mudzinski have introduced the Palanges to a chaplain from the Police Benevolent Association.

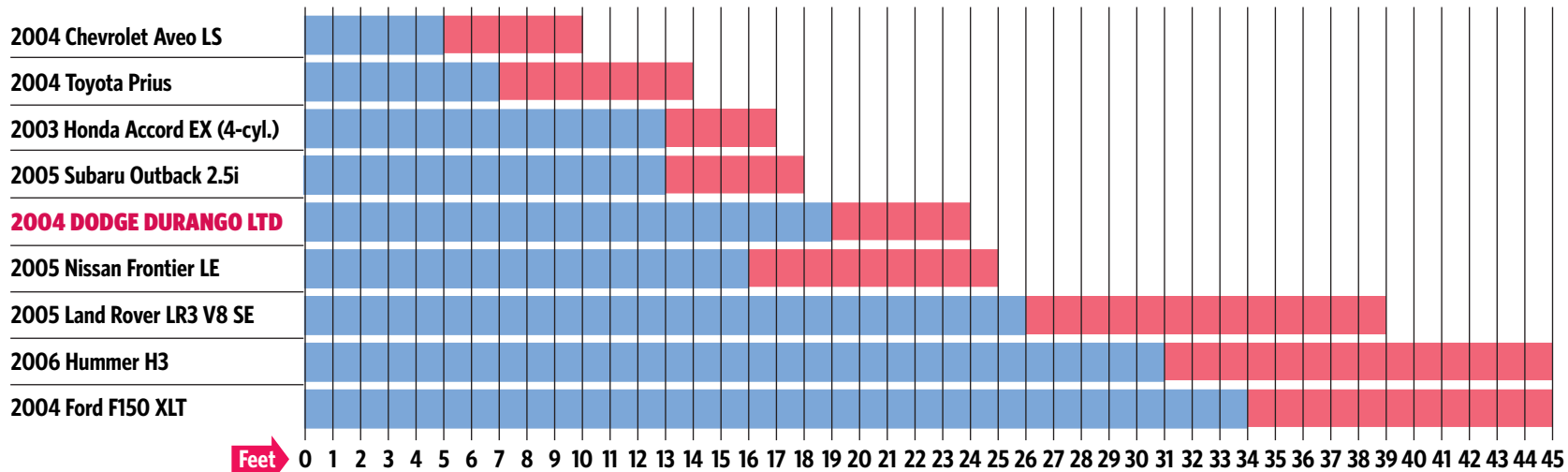
"You just try to put yourself in their shoes," Curry recalls. "It's horrific."

Stony Brook's three-man ambulance crew pauses before whisking Bobby away. Not everyone survives the trip, and so the Palanges are allowed to see him one more time.

Kim knows now that no one expects her son to live.

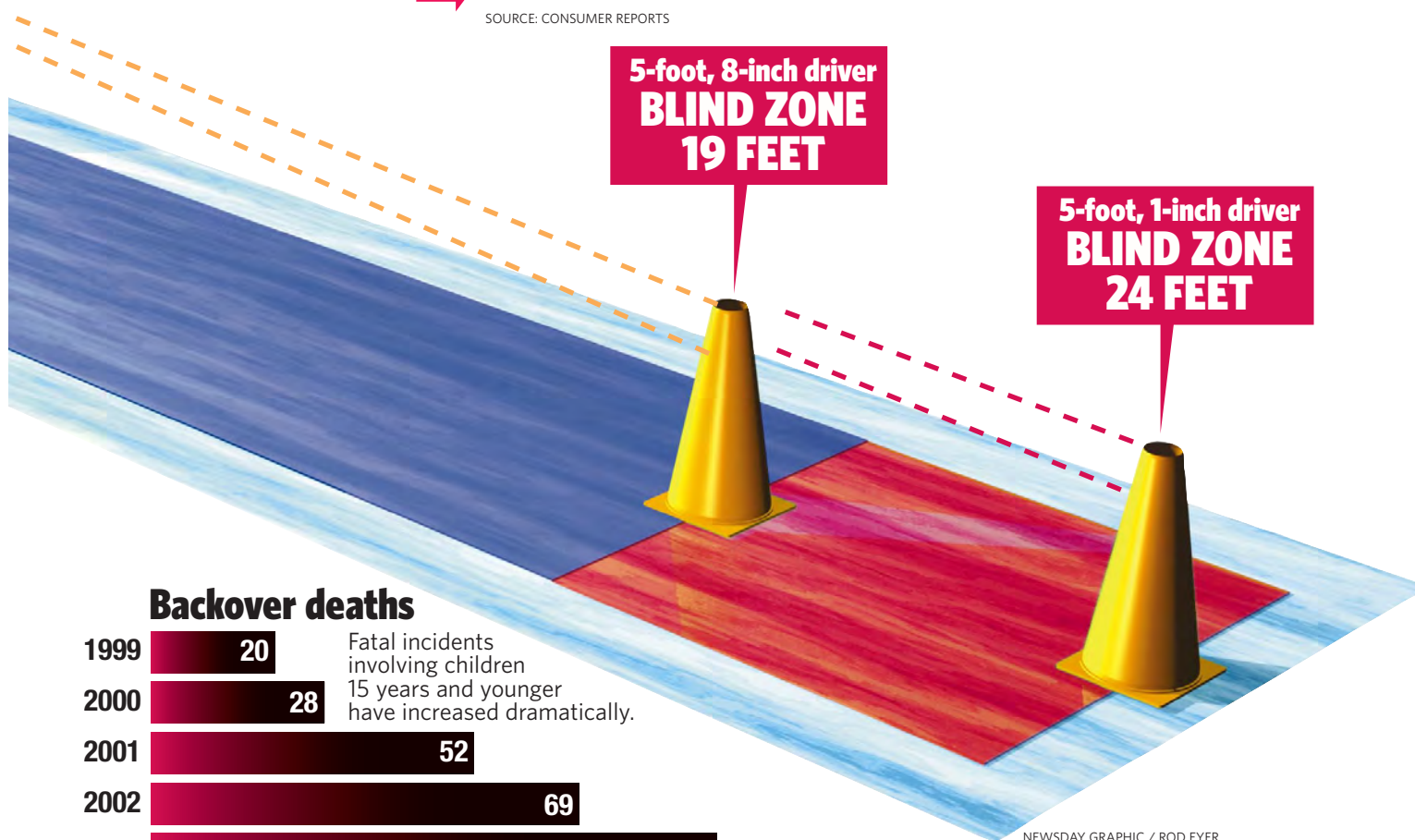
## BLIND ZONES

■ **5-FOOT, 8-INCH DRIVER** ■ **5-FOOT, 1-INCH DRIVER**  
(Size of Robert Palange)



Feet

SOURCE: CONSUMER REPORTS



NEWSDAY GRAPHIC / ROD EYER

**70%**

Kids and Cars estimate of fatal backover accidents since 1999 in which a parent or close relative of the victim is driving.

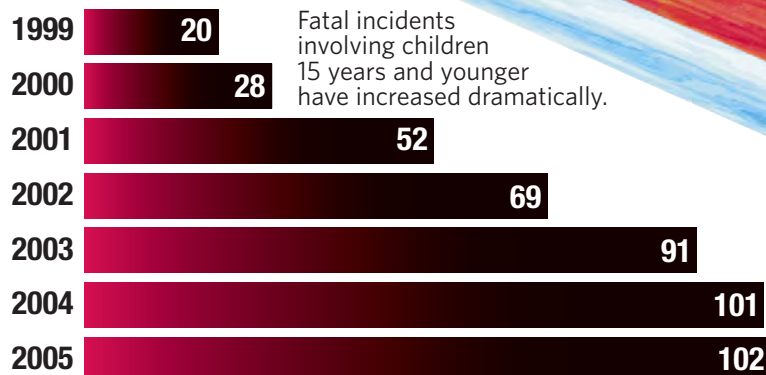
**60%**

Kids and Cars estimate of fatal backover accidents since 1999 involving SUVs, minivans and pickup trucks.

**48**

Centers for Disease Control and Prevention estimate of number of children admitted to hospital emergency rooms for nonfatal backover-related injuries every week.

### Backover deaths



SOURCE: KIDS AND CARS

"Whatever happens to him," she says, "I don't want him to feel the pain."

Serna will not allow himself to dwell on the emotion swirling around him or on the boy's poor prognosis. He knows the brain will herniate whether he's emotional or not, and the surgeon who can prevent it is still nearly 16 miles away.

In the nine years he has transported patients, Serna has received two full police escorts.

Bobby's run makes it three.

Curry and Mudzinski have again called for help, and many of the 10 squad cars recruited from the 5th Precinct are block-

ing key off-ramps and side streets south of the Long Island Expressway. To the north, another 15 cars from the 6th Precinct are doing the same.

Instead of a stop-and-go drive west on Sunrise Highway and then north on Nicolls Road, the ambulance blazes through the 15.8-mile route in about 11 minutes. The police have impounded the Durango as part of their investigation, and so the Palanges follow in the back seat of Curry and Mudzinski's lead car.

Behind them, in the ambulance, Serna has threaded a flexible nasogastric tube through

Bobby's nose, down the back of his throat, down his esophagus and into his stomach. When children are intubated, they tend to swallow air, he explains later. The nasogastric tube, connected to suction, removes excess air and helps prevent a domino effect of extra pressure that begins in the abdomen and ends in the brain — where pressure is still building.

### THE MORNING RUSH HAS ALREADY BEGUN.

Dr. Michael Egnor has finished his rounds and is in his green surgical scrubs when

Stony Brook University Hospital admits Bobby to its emergency department at 11:05 a.m. The hospital's chief of pediatric neurosurgery has been preparing for another case, but an urgent call diverts his attention toward the young boy.

"I was very concerned that he would not survive. I was concerned that we were too late," Egnor recalls. "To have your pupils fixed and dilated when you get to the O.R., it doesn't get any more severe than that."

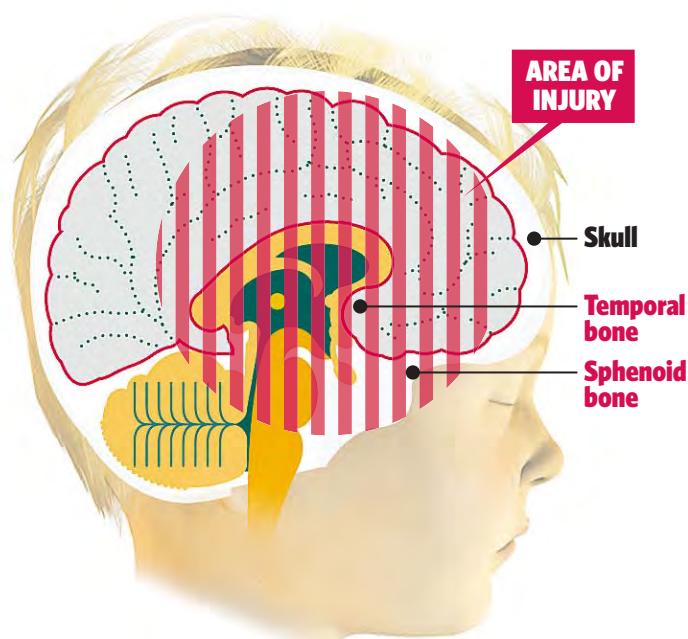
From extensive research, doctors know that a traumatized brain begins to die in a series of steps. Among the last to

go is the brain stem, a stalk-shaped survival bunker that controls reflexes such as breathing and digestion and heart rate. Sometimes called the brain's reptilian core because of the primitive functions it governs, the brain stem also contains a site known as the Edinger-Westphal nucleus.

Nerve cells at this spot normally join forces to constrict the pupil in response to light, but because of the intense pressure bearing down on part of the oculomotor nerve that originates here, Bobby's pupils have

See BOBBY on 12

# THE INJURY



**A** The crushing injury fractures Bobby's right eye socket, damages his right optic nerve and cracks the temporal and sphenoid bones of his skull.

## BOBBY from 10

remained dilated and fixed. "So he was very close to death," Egnor says. "My sense of it was that it was a matter of minutes."

At 11:30 a.m., Bobby is wheeled by a pediatric surgery team into Operating Room A on the hospital's fourth floor.

Anesthesiologist Dr. Tazeen Beg, just finished with another surgery, rushes in to retrieve child-sized syringes and reset the anesthesiology machine to child-appropriate doses. The surgical team, led by Dr. Richard Scriven, threads a central line, or catheter, through the boy's subclavian vein at a point near his shoulder, through the superior vena cava and into the right atrium of his heart. Within this upper chamber, the catheter can monitor the body's hydration levels by tracking trends in the blood pressure, while also

creating a super-highway for Beg's delivery of a critical drug cocktail.

### A glimpse of the damage

The boy is already unconscious, but Beg dispenses low doses of the anesthetic sevoflurane, the pain reliever fentanyl and the muscle relaxant rocuronium to prevent any unexpected movements during surgery.

Even a cough could raise the pressure within his head to precipitous heights. So could the delivery of too much medication.

The full scope of the accident emerges from the battery of CT scans, medical tests and observations: The force of the Durango fractured a branch of Bobby's pelvis known as the ramus and bruised his right arm but fortunately left its bones intact. The intense pressure fractured the right temporal bone of his skull and his right eye socket and split a wing of the butterfly-shaped

sphenoid bone just behind the socket as at least one of the tires angled across his head. Later tests suggest that the fracture also squeezed the right optic nerve in its channel, perhaps damaging it forever.

"It was almost like an earthquake, where the ground shifts," Egnor says.

Darker regions of brain tissue on the CT scans from Brookhaven indicate diffuse brain swelling,

with a lighter area pointing to an epidural hematoma: The skull fracture has ruptured a vessel and left a pool of blood on top of the dura, the outermost of three protective brain coverings. The hematoma is pushing down on his brain as the swelling tissue presses up against his skull. And a rib has punctured and partially collapsed his left lung like a balloon, allowing the leaking air to fill the pleural cavity between his lung and chest wall.

To address this last complication, the surgical team inserts a

suction tube through a small incision between two of Bobby's ribs, draining air from the pleural cavity and allowing the lung to re-inflate on its own.

### Reinventing a procedure

Egnor is needed to address the larger danger.

At birth, the human skull contains 45 bones, most held together by flexible joints, or sutures.

By adulthood, enough bones have fused together to drop the skull's tally to 28: six middle ear bones, 14 facial bones, and eight bones comprising the cranium. Egnor likens the bony helmet, charged with protecting tissue only somewhat firmer than Jell-O, to a pressurized vessel that can plumb the ocean depths without collapsing.

A child's more pliant skull — only one-eighth as strong as an adult's — has yet to acquire its quarter-inch-thick plating, rendering the brain far more suscep-

tible to external blows.

But children aren't completely defenseless. The higher water content within a developing brain may help to resist compression and the skull's compliance, perhaps exaggerated in Bobby's case by the cracked temporal and sphenoid bones, may allow more room for the brain to swell after an injury. Likewise, cold weather can help to reduce both swelling and the brain's metabolic demands, a phenomenon often invoked in dramatic survival stories involving children.

Even so, the crushing injury is as severe as Egnor has ever seen.

For an intervention, he says, "anything short of radical had no chance of succeeding."

Medical success is often firmly rooted in tragedy. A century ago, American neurosurgeon Dr. Harvey Cushing introduced the modern concept of removing part of the skull after a traumatic brain injury to increase the

space available to the swelling brain and thereby delay or prevent a lethal rise in the intracranial pressure. The surgery, now known as a decompressive craniectomy, never proved its mettle in large clinical studies and languished for decades while other advances largely pigeonholed it as a measure of last resort.

Despite lingering doubts about the procedure's effectiveness in adults, a handful of small studies within the past decade have pointed to more positive outcomes in children when the surgery is performed within hours of a severe injury.

"I feel in situations like this that it's worth trying," Egnor says.

While a resident at the University of Miami, the neurosurgeon routinely saw severe head injury. His current strategy, though, didn't begin to evolve until well after he arrived at

Stony Brook in 1991.

About seven years ago, Egnor was confronted by the death of a Long Island boy who — like Bobby — had been run over by a close relative in his driveway. At the time, Stony Brook University Hospital had at its disposal a range of standard procedures to control brain swelling and intracranial pressure, but its surgical orthodoxy for such cases didn't yet encompass a partial removal of the skull.

"That case kind of haunted me, kind of haunted us all," Egnor says.

He believes a host of complications would have stymied even major surgery, but the boy's death led him to reassess his options. Soon, he had developed a technique based on a partial skull-removal surgery for infants with craniosynostosis, a condition in which the sutures between skull bones close prematurely and leave the head mis-

shapen as the skull tries to accommodate the growing brain.

Before Bobby, Egnor had performed the new surgery on six children with traumatic brain injuries. Five survived, but all of them were older. And none of them had sustained a crushing injury like his.

"My sense is that most kids never make it that far," Egnor says. He can recall only one other instance in his career: a young girl rushed to the University of Miami Hospital survived after her head was run over in her family's unfinished driveway, where soil may have softened the impact.

Perhaps, he muses, snow in the Palanges' driveway acted in much the same way.

"Even just a few extra millimeters might be enough to take that pressure off," Egnor says — maybe just enough to spare

See **BOBBY** on 14

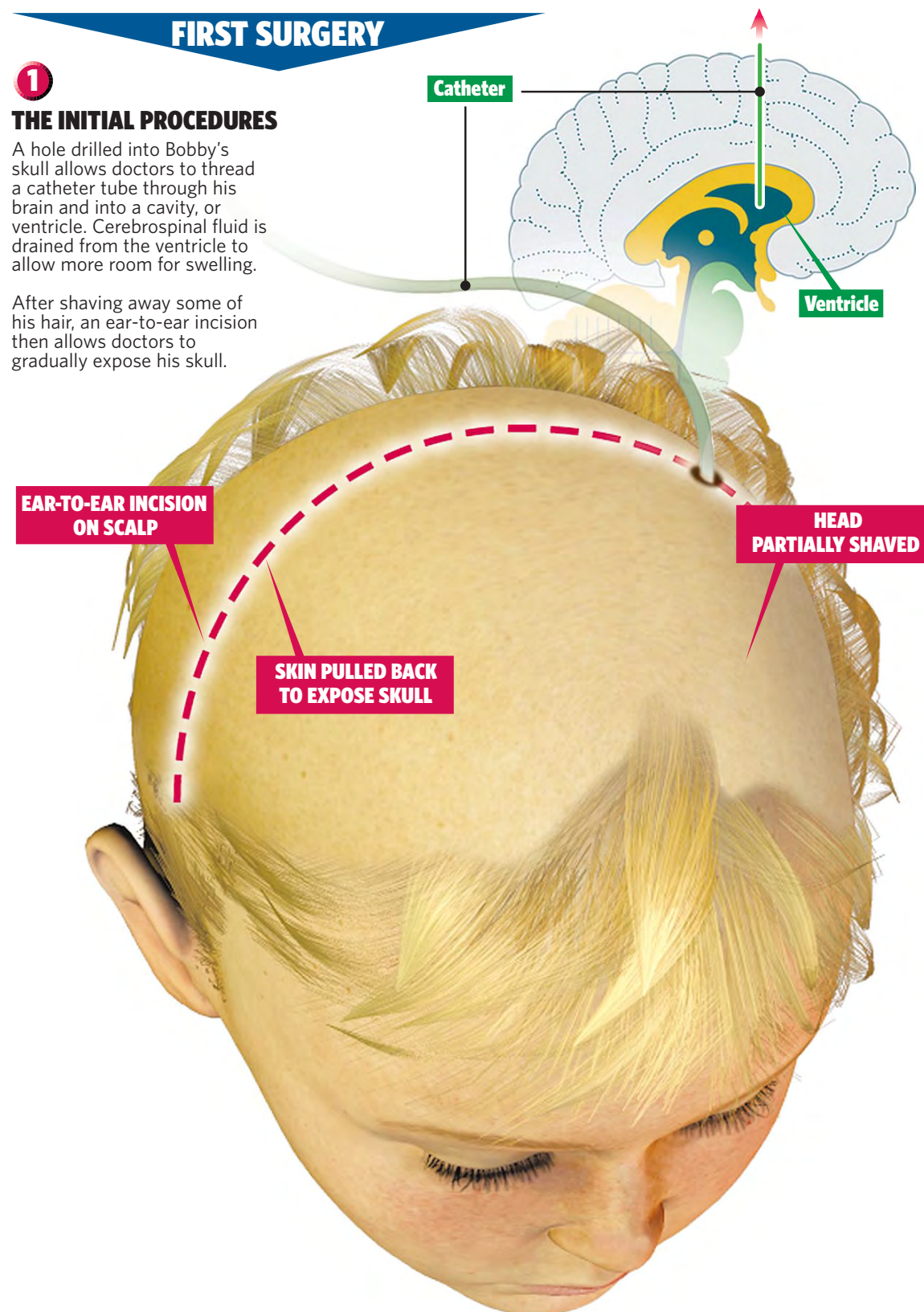
# FIRST SURGERY

1

## THE INITIAL PROCEDURES

A hole drilled into Bobby's skull allows doctors to thread a catheter tube through his brain and into a cavity, or ventricle. Cerebrospinal fluid is drained from the ventricle to allow more room for swelling.

After shaving away some of his hair, an ear-to-ear incision then allows doctors to gradually expose his skull.

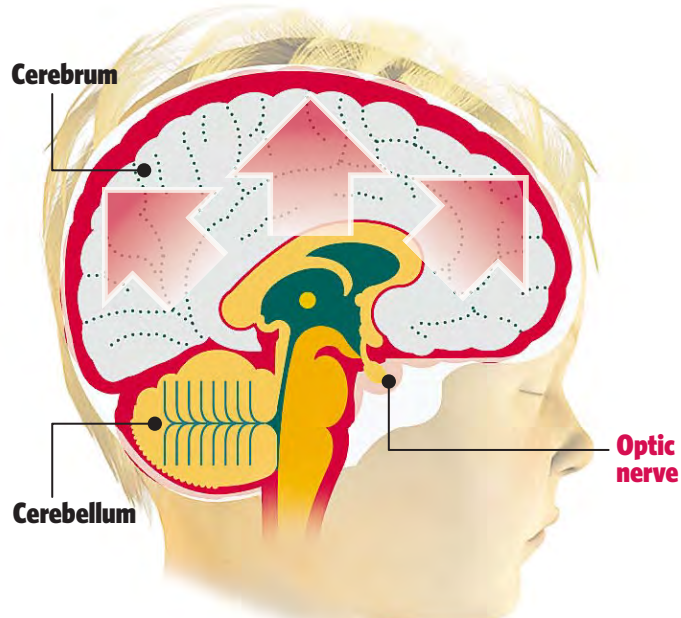
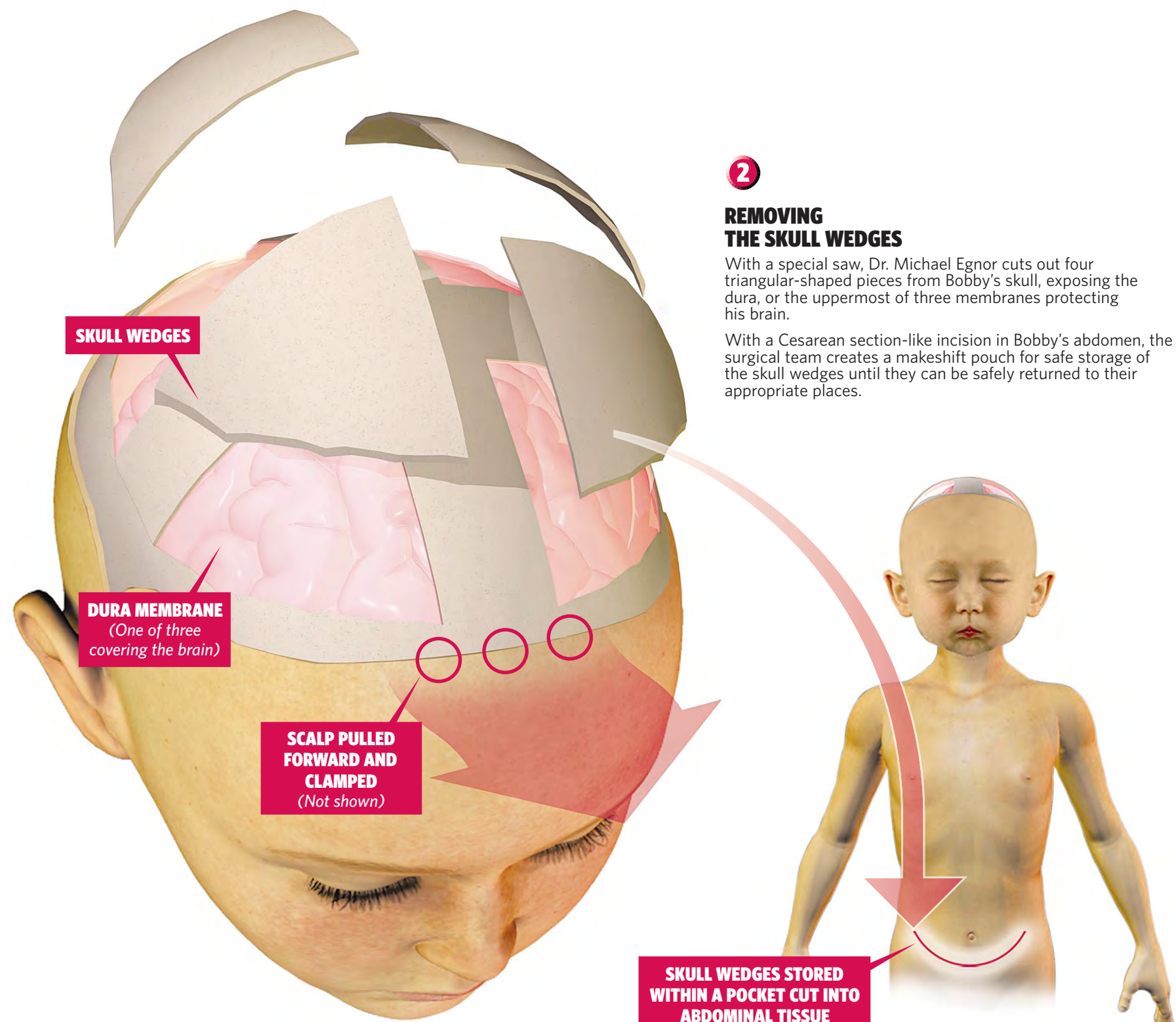


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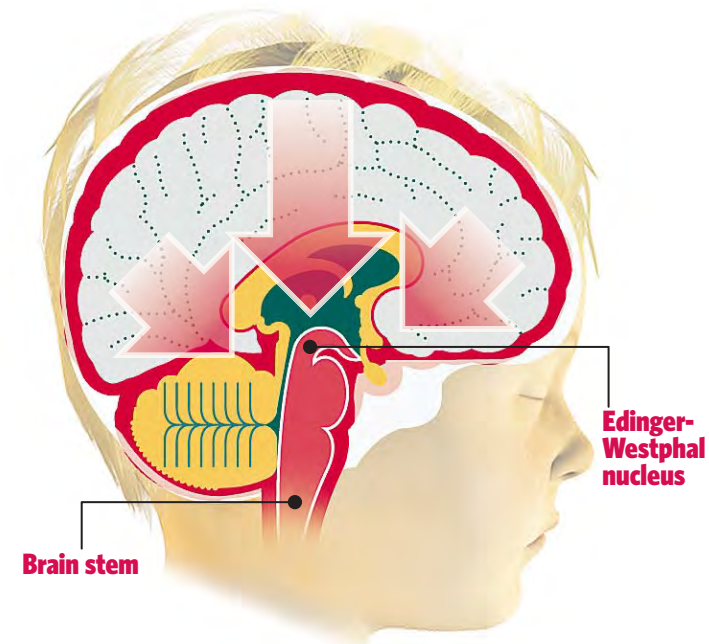
## REMOVING THE SKULL WEDGES

With a special saw, Dr. Michael Egnor cuts out four triangular-shaped pieces from Bobby's skull, exposing the dura, or the uppermost of three membranes protecting his brain.

With a Cesarean section-like incision in Bobby's abdomen, the surgical team creates a makeshift pouch for safe storage of the skull wedges until they can be safely returned to their appropriate places.



**B** The brain begins to swell as pressure builds in the cranium, but the skull's rigidity limits upward expansion.



**C** The swelling is forced downward and impinges on the brain stem, where functions such as breathing, heart rate and dilation of the pupil are governed. The pupils of Bobby's eyes become fixed and dilated, a sign of imminent death.

**BOBBY from 13**

his patient the very worst.

Two years before Bobby's accident, the neurosurgeon's technique changed again when a 15-year-old girl arrived in his Stony Brook operating room with a severe head injury from a car accident. With the aid of Dennis Duffy, a registered and certified physician's assistant who had recently transferred from Winthrop-University Hospital in Mineola, Egnor cut away two sections from the sides of her skull in a surgery called a biparietal craniectomy.

**Unorthodox storage**

He was preparing to temporarily store each piece in a canister of liquid nitrogen, the container of choice for many hospitals, when Duffy asked, "Why are you doing that? Why don't you put it in the belly?"

Egnor asked if the procedure had worked well for him. Duffy

replied that it had and Egnor has used it ever since.

Depositing skull fragments within a pouch created by slicing open the abdomen may seem unusual. But doing so eliminates the need to stow the bones outside the body and avoids the risk of contaminating or losing them before they can be returned to their rightful positions.

Most patients seem to forget about the short-term relocation, as the abdominal bin poses fewer cosmetic or range-of-motion complications than other potential holding cells.

"It's a good place to store things," Duffy says.

In an operation lasting about three hours, Bobby's belly will become a similar repository, beginning with the same curving incision an obstetrician would

use for a Cesarean section. By teasing apart the upper layer of abdominal fat from underlying bands of connective tissue known as fascia, the surgeon can create a pocket for stashing the wedges of bone.

Instead of removing skull bones from the sides, Egnor reasons that cutting away four triangular pieces from the top of Bobby's skull may relieve pressure on the superior sagittal sinus, a major blood vessel that ushers blood out of the brain. Compression of this vein can cause blood to pool and the intracranial pressure to escalate.

To prevent the swelling brain from forcing its way through the skull's open spaces or catching on a rough edge of bone — likely leading to brain damage — Egnor will saw through the ends of the cross-

shaped bone left behind. The floating cross will shield the brain from above but allow room for expansion below.

More room will come from slicing open the dura, the brain's leathery outer covering, along the outer edge of each triangular window. A collagen-based substitute gently laid over the four incisions will offer some protection while providing flexibility.

"Our theory is that swelling of the brain may not be all that dangerous, if there isn't pressure," Egnor says. But swelling can increase the brain's volume by 20 percent. "It's surprising how little volume you need to get a change in pressure."

His strategy is not without risks. Opening the dura could lead to infection. The surgery could damage key veins, and the boy must recover from the physical trauma of the bone-re-

moval process.

"It's fraught with potential disasters," Duffy says later. "But the alternative is severe neurological impairment or death."

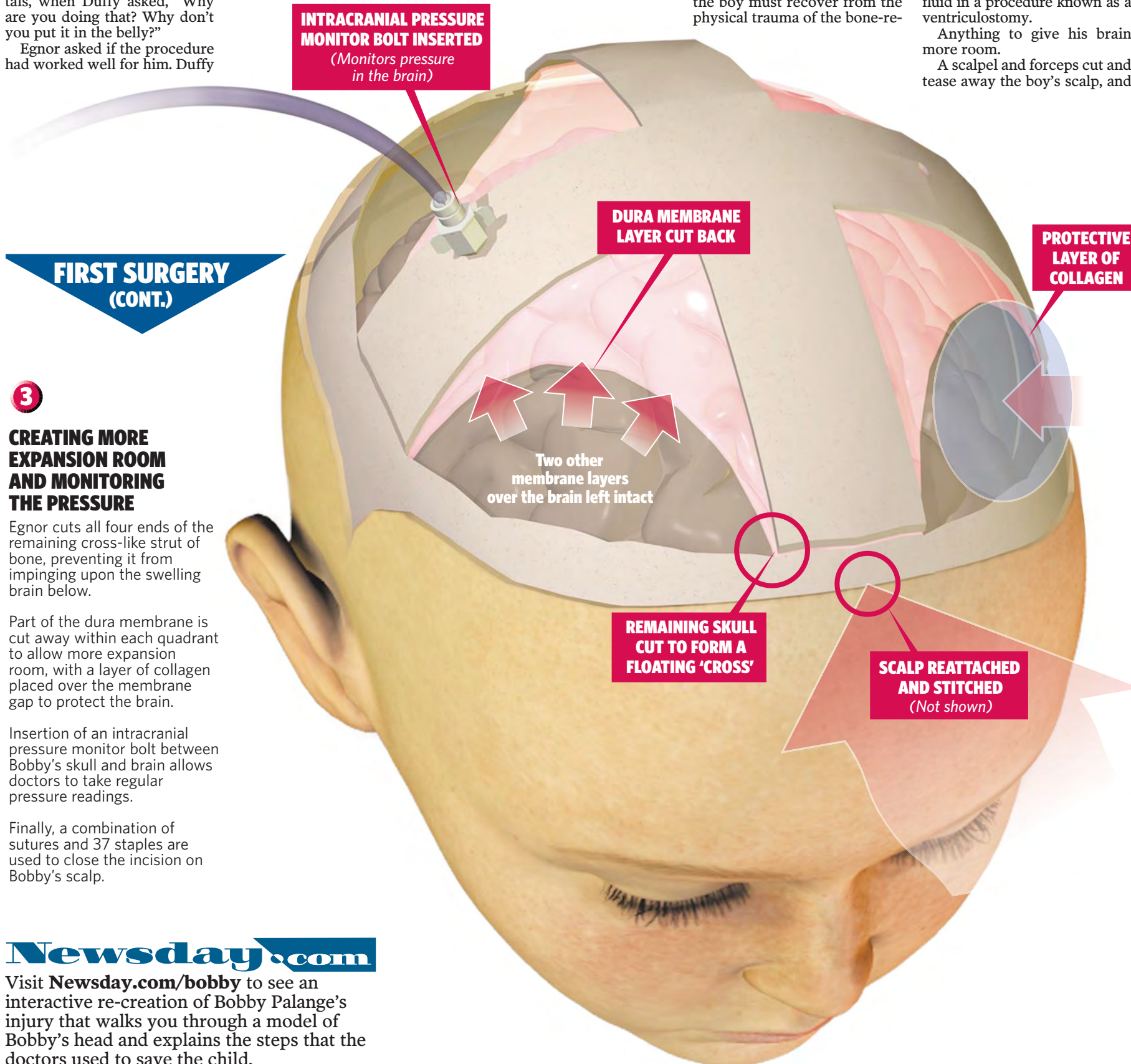
Egnor meets with Bobby's mother after assessing the boy's injuries. He can offer no promises but explains the surgery and pledges to do his best.

"Do whatever you have to do," Kim tells him. "Whether he lives or not, I just don't want him to be in pain."

The apprehension mounts in Operating Room A as Egnor begins by shaving away a patch of blond hair from his small patient. A hole drilled into the left side of Bobby's skull allows the surgical team to insert a catheter into one of his brain cavities — called a ventricle — and drain away some of the cerebrospinal fluid in a procedure known as a ventriculostomy.

Anything to give his brain more room.

A scalpel and forceps cut and tease away the boy's scalp, and



Egnor cuts all four ends of the remaining cross-like strut of bone, preventing it from impinging upon the swelling brain below.

Part of the dura membrane is cut away within each quadrant to allow more expansion room, with a layer of collagen placed over the membrane gap to protect the brain.

Insertion of an intracranial pressure monitor bolt between Bobby's skull and brain allows doctors to take regular pressure readings.

Finally, a combination of sutures and 37 staples are used to close the incision on Bobby's scalp.

**Newsday.com**

Visit [Newsday.com/bobby](http://Newsday.com/bobby) to see an interactive re-creation of Bobby Palange's injury that walks you through a model of Bobby's head and explains the steps that the doctors used to save the child.



NEWSDAY PHOTO / MICHAEL E. ACH

**Bobby arrived at Stony Brook University Hospital about 90 minutes after the accident.**

an air-driven craniotome saw cuts through the bone beneath.

"I've seen swelling where it's horrendous, almost explosive," Egnor says later.

Those are the patients who almost never survive.

But now, with Bobby's cranium open, the neurosurgeon finds that the initial swelling is less than he had feared. He says so to his surgical staff, that the boy may have a better chance after all, and the mood begins to brighten.

Four wedges of bone soon

trade their anatomical positions within the skull for two stacks within the boy's abdomen. The remaining cross of bone is then set adrift above his dura, newly opened.

In the right arm of the cross, the surgical team drills a second hole and inserts an intracranial pressure monitor bolt, threading through it a fiber-optic cable that screws into place between the dura and the skull. The pressure exerted on the cable from the swelling brain can be record-

ed as a relative measure of the pressure inside Bobby's head.

**The operation ends**

As his staff inserts the last of the 37 staples that will hold the boy's scalp together while it heals, he examines Bobby's pupils and notes, with gratification, that they are no longer dilated. Five and a half hours after the accident, the pressure is finally beginning to drop.

More mannitol will help keep the pressure off, and Beg delivers the first dose of a barbiturate called pentobarbital that will send Bobby into a sort of suspended animation. The pentobarbital coma will keep his metabolic activity to a bare minimum, greatly reducing the brain's workload while it heals, and narrowing blood vessels to reduce the swelling and relieve the pressure.

After a half-hour of observation, Bobby is wheeled to the intensive care unit at 3:25 p.m., where nurses induce a mild state of hypothermia. A cooling

blanket will maintain his body temperature at or slightly below 98.6 degrees, aided by round-the-clock Tylenol suppositories. His intracranial pressure is now well within the normal range, but an increase in his body temperature could raise the brain's metabolism, spurring the blood vessels to dilate in an effort to keep pace and ratcheting the pressure back up in the process.

Kim is in a daze, unable to think properly, unsure whether she's at Brookhaven or Stony Brook. The immediate danger may be diminishing, but no one can yet say for certain whether her son will recover — or what brain function he will retain.

The day turns darker when the police return to the hospital and arrest Robert at 4:53 p.m.

His license had been suspended, and Kim told a police detective during an initial interview that she was driving the Durango at the time of the accident, out of fear that her husband would spend the night in jail instead of with their son.

They have since admitted to the truth in a second interview, though no charges will be filed because Robert never drove out of his driveway in the SUV.

But the police are forced to arrest him anyway. By his very presence at home, Robert has violated a court-issued order of protection that Kim had petitioned for the prior August. He has been living at home with her consent for months, though the "stay away" order technically remains in effect.

Out of respect for the family, the police allow Robert to see his son — to know that he's still alive. He and Kim say goodbye, and then he is led away.

With her husband gone and her son in critical condition, an anguished mother now faces an overwhelming sense of déjà vu.

On Feb. 11, 1978, not long after a snowstorm, Kim's older sister Lori walked out of their Middle Island home to make an evening call from a phone booth by a deli. The 19-year-old began to cross Route 25 but stopped midway when she saw a car heading east.

It was too close.

She stepped backward over the yellow line and never saw the white pickup truck heading in the other direction. She was pronounced dead on arrival at John T. Mather Memorial Hospital in Port Jefferson, the victim of massive head injuries.

And again on April 17, 1999.

Kim was separated from her first husband at the time, but worried when he failed to show up for a scheduled visit with their children, Chuck and Becky. He'd been taken to Stony Brook University Hospital instead, the victim of a traumatic brain injury after falling at a Waldbaum's in Selden and cutting his forehead. When he awoke from his medically induced coma, he had temporarily forgotten he had children.

And now, again.

A mantra forms in Kim's mind, perhaps to keep all other thoughts at bay, as she watches her comatose son.

"He needs his stuffed animal," she says. "He needs his puppy."

It's all she can think about. He won't sleep without it.

Kim and her first cousin, JoAnn Fowler, spend the night in Bobby's hospital room, while JoAnn's daughter Felicia and a family friend stay with the other four children back in North Bellport. JoAnn's husband, Brian, has retrieved Snoopy and the dingy white dog joins the vigil.

As she watches over the boy, JoAnn thinks about how Kim's children have bonded so closely with their "Aunt JoAnn," as they know her.

But not Bobby, always hiding behind Kim's legs and avoiding her gaze.

She speaks to him now in a soft voice, holding his hand while Kim sleeps.

"We're going to make a deal here," she says. "You're going to pull through and me and you are going to be best buds when you wake up."

"Me and you," she says.

**SIX WEEKS LATER**

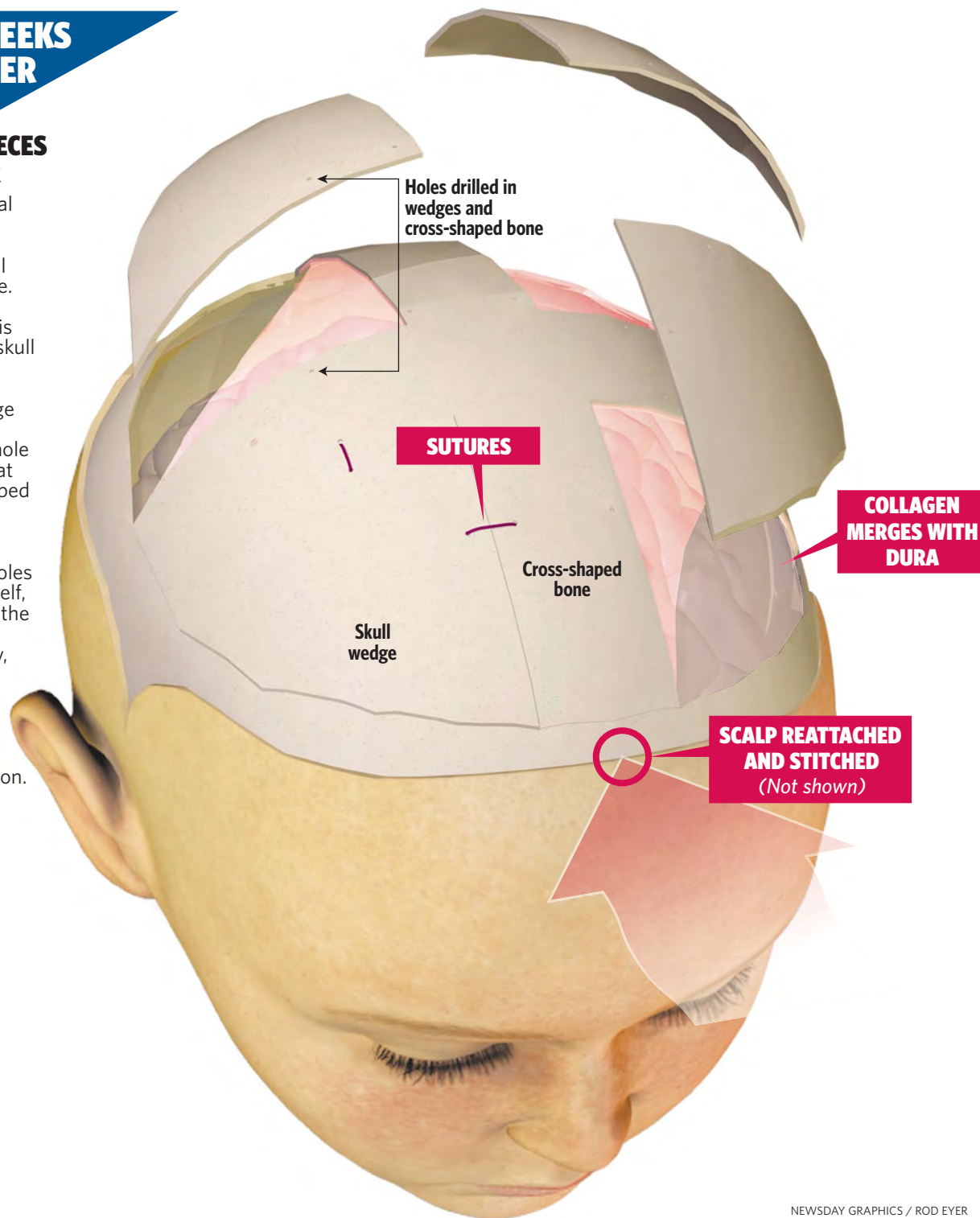
**PUTTING THE PIECES BACK TOGETHER**

Egnor and his surgical team first cut open Bobby's abdomen to retrieve the four skull wedges tucked inside.

Then they re-open his scalp to expose the skull and its bone-free quadrants. To return each triangular wedge to its former space, Egnor drills a small hole through the sides that adjoin the cross-shaped bone separating the quadrants.

He drills matching holes through the cross itself, allowing him to lash the bones together with sutures — eventually, they will reattach on their own.

The team then uses sutures and staples to close up the incision.

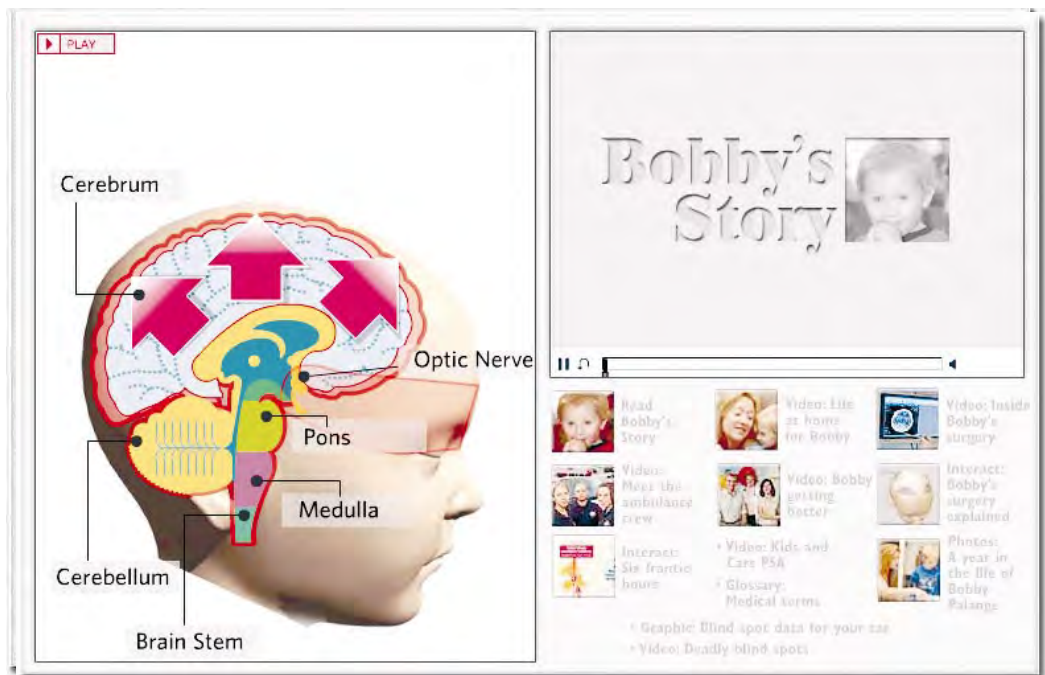


NEWSDAY GRAPHICS / ROD EYER

# Online Features

## How they did it

An interactive model walks you through Bobby Palange's injuries and explains the steps that doctors used to save him.



### "We need to do something radical"

Watch a video interview with Stony Brook's Dr. Michael Egnor who performed the lifesaving surgery on Bobby the day of the accident.

### Bobby getting better

Watch a video from St. Charles Hospital in Port Jefferson where Bobby undergoes physical therapy. Newsday's Bryn Nelson explains how the hospital uses toys to help test Bobby's agility.



### "We knew it was a serious call"

Paramedics and first responders from the South Country Ambulance Co. explain to Newsday's Robert Cassidy what they did to treat Bobby immediately and describe their harrowing trip from the scene to the hospital.

### Six frantic hours

Take an interactive look at the coordinated effort of police, ambulance and hospital workers, doctors and more who all played a role in saving Bobby.



### "I thank God on a daily basis"

In a video interview with Newsday's John Paraskevas, Bobby's mother, Kim Polly-Palange, discusses the day of the accident and how Bobby has improved since then.

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Bobby clings to his mother, who talks about the operation as Dr. Michael Egnor, who performed the surgery, looks on at a March 2005 news conference.

NEWSDAY PHOTO / KAREN WILES STABLE

## PART 2

**Bobby  
wakes up  
on a  
Sunday.**

In the six days since the accident, he has been seen by a small army of medical specialists: anesthesiology, emergency medicine, neurosurgery, neurology, ophthalmology, radiology, pediatrics.

He has received a small pharmacy's worth of medicine.

The anti-inflammatory steroid Solu-Medrol out of initial concern (later dismissed) that he might have a spinal cord injury. Dilantin to prevent seizures. Morphine to fight pain. Versed and Ativan to sedate him and Pavulon to relax his muscles.

Drugs to control blood pressure. Antibiotics to fight infection. A blood infusion and fresh frozen plasma and Factor VII — the same treatment given to hemophiliacs — to fight a complication that can disrupt the body's blood-clotting cascade.

Kim Palange has left the hospital only to run errands or ready her other children for school, while her mother-in-law watches Bobby. But Kim is never away for more than three hours at a time. Her anxiety won't allow it.

"If God doesn't take him today, he isn't going to tomorrow either," she thinks as she prays. She hasn't permitted herself to focus on anything except her comatose son and the numbers telling her the pressure inside his head has eased.

It has, despite a CT scan taken at Stony Brook the day after his surgery that shows a brain so badly swollen Egnor believes any neurosurgeon reading only the scan would

conclude the child hadn't survived. Within the darkened mass depicted in the scan, formerly sharp details and landmarks are completely obscured, as if snapped by an unfocused camera in dim light.

And yet the intracranial pressure was essentially normal, suggesting that a rare separation between swelling and pressure had been achieved by expanding the space available to Bobby's injured brain.

Robert has rejoined Kim at their son's bedside, released the morning after the accident with a not-guilty plea in Suffolk County Criminal Court on charges of second-degree criminal contempt for violating the restraining order. An amended order of protection has permitted the home improvement contractor to help care for the couple's other four children.

And he has, staying busy with them and with errands and bills to keep the overwhelming sense of guilt at bay.

Kim's cousin JoAnn has become cautiously optimistic, after her own fervent prayers for a few more hours of life for the boy: "God, let us make it through the first 12."

And then, "All right, let us

make it through the first 24."

When the Stony Brook staff begins to wean Bobby from the pentobarbital on Saturday and then from the Versed and morphine and breathing tube on Sunday morning, maybe the worst is behind them.

A few hours later, the pressure within his brain shoots up. So does the carbon dioxide within his blood, while his heart rate and blood pressure fall and he struggles for air.

Whether he's had a seizure, a common complication after head injuries, likely will never be determined. But the artificial coma keeping him in a medicated torpor has dissipated too soon, and his body is rebelling.

Kim sees a blur of hospital staff running into his room.

She knows enough to stay out of their way. But she can't shake the thought that begins to form in her head. Instead of going through it all again, the nightmarish back and forth, the suffering, maybe it would be better for him to just . . . go.

But he doesn't.

With more Versed and Pavulon and morphine and the reinsertion of his breathing tube at 3

See **RECOVERY** on 18

NEWSDAY PHOTO / KAREN WILES STABLE





www.newsday.com  
PHOTO BY HOWARD SCHNAPP

## RECOVERY from 17

p.m., Bobby stabilizes and re-enters his medicated coma until the morning of March 2.

Nine days since the accident, and so much left unknown.

Medical knowledge gleaned from working at St. Charles Hospital has helped to calm Kim, and Robert in turn, though she wonders with a sense of dread if Bobby will be unable to talk or walk. She wonders if her 2½-year-old boy will be like a

newborn again, helpless.

Instead, he wakes up and smiles.

Weakly at first, but he has recognized his mother, and there's Felicia, who has babysat for him so often and who is making his face light up. And JoAnn too, who is literally gaping at the boy.

He has responded to her. Bobby, the boy who wanted nothing to do with her.

He is smiling the next day, too, at least until pediatric nurse practitioner Nancy

Strong arrives with the thankless job of removing the "Frankenstein-like" ICP monitor bolt that surgeons had inserted during the initial surgery to monitor his intracranial pressure.

It's no longer needed.

Bobby's doctors are wary of giving him too much sedative for the minor procedure, especially after his recent scare, and so there's nothing to be done except soothe his tears as Strong removes the device and closes the hole with two staples.

A quickly inserted "Barney" tape quiets his sobs afterward.

His speech is indistinct, but he knows what he wants.

"I want Daddy," he says almost immediately. And then Robert is there with him.

A few days later, officers Curry and Mudzinski stop by for a visit and present Bobby with a Build-A-Bear in a police uniform. He doesn't remember them, but he can recall all of his Tutor Time classmates by name, along with the friends and fami-

ly populating the growing forest of pictures in his room.

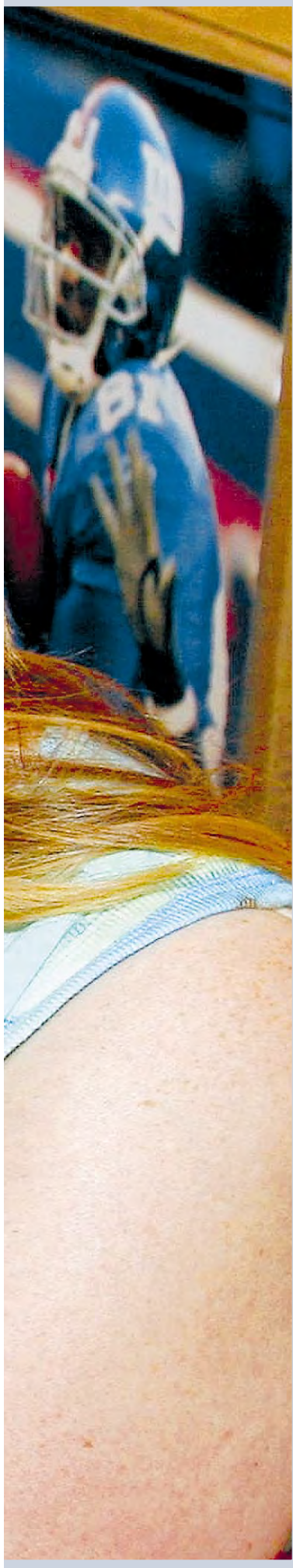
He doesn't move his right arm at first and has lost some vision in his right eye due to the damaged optic nerve. And he's unsteady on his feet, though he is starting to walk with assistance.

Bobby faces weeks of rehabilitation and a second surgery to re-attach his skull bones. Despite the physical reminders of his accident, however, Egnor is unable to find any evidence of missing brain tissue or other signs of last-

The long road to recovery for Bobby included many hours under the care of, from left, Melanie Tanner, occupational therapist, Bill Cunningham, physical therapist, and Dr. Jennifer Semel-Concepcion, at St. Charles Hospital in Port Jefferson.



Bobby gives his mom, Kim, a hug at last June's fundraiser for his mounting medical expenses.



limited assistance, though he occasionally loses his balance. He has lost some strength in his legs and his wide gait suggests he is still recovering from a pelvic fracture.

Long Island's only intensive rehabilitation center for seriously injured children has treated youngsters with traumatic brain injuries stemming from strokes and cancers, from near drownings and car accidents. But assessing a child's deficiencies and devising a course of rehabilitation is difficult when dealing with the attention span of a 2- or 3-year-old. Most standardized tests are all but useless.

Evaluation and therapy must be disguised as child's play.

And so the white linoleum flooring within the gym has entrapped a blue octopus, a green turtle, a white whale and other sea creatures, while nautical scenes drift across its walls. There's even a red-striped lighthouse whose light spins around in response to a pushed button.

If the children in this room momentarily forget they're staying in a hospital when they turn the pilot's wheel or climb the stairs of a platform with rope-adorned railings, all the better.

A team of therapists will evaluate Bobby here to determine all that he has lost and what he might regain, with family interviews giving them a sense of his mental and physical abilities before the accident.

"Bobby, what did you have for breakfast?" asks Dr. Jennifer

Semel-Concepcion, the hospital's director of physical medicine and rehabilitation.

He seems uncertain. But is the short-term memory of this 2½-year-old boy faulty or just underdeveloped?

**Physical limitations**

From Kim's recollections of his daily activities, the therapists know Bobby is smarter than other children his age, allowing them to more easily spot neurological deficits.

His short-term memory is one of them, unlike his sharp long-term recall.

Physical therapist Bill Cunningham begins his first session with Bobby by scattering toys across the gym's floor. Bobby has trouble seeing the smaller toys at a distance, consistent with the partial loss of vision in his right eye. When he squats or sits to retrieve the toys, he can barely get up. When asked to crawl, he is especially fearful. And he has trouble standing on one foot and reaching for a toy.

Bobby's first session with Melanie Tanner, a pediatric occupational therapist, includes Play-Doh to test his somewhat faulty fine motor skills and a game of hide-and-seek to further test his memory.

"If he was sitting on the floor with all the other kids, you would think nothing was wrong," she says later.

But the therapists estimate that he will need four to six weeks to become steady on

his feet and improve his ability to go from a sitting to a standing position, to walk and run and climb so that the movements become more natural. Each therapist will spend an hour a day with him, acclimating their patient to the new routine.

At first, Bobby turns away when he sees Cunningham walking toward him and clings to his mother. With gentle prying, the boy finally consents to go along, but the hour-long session ends abruptly after 15 minutes.

"I want my mommy," Bobby insists and Cunningham can only oblige, guiding him to Kim for some brief consolation before the therapy resumes.

"You've got to have the trust with them," Cunningham says. "Hopefully, if you lose it, you can gain it back the next day."

An uninterrupted 15-minute session becomes 20 minutes, then 25, then 30.

"Is your name Bobby Pancake?" Cunningham teases.

"No!" the boy protests. "It's Bobby Palange!"

But he is smiling. Even so, words like "therapy" are verboten.

"We're here to play," Tanner says instead. "Do you want to play with me?"

Eventually, Bobby does and the toys he gravitates toward become part of each session.

"They pick it, and we try to make it therapeutic," Tanner says. Often, therapists can lead children recovering from trau-

matic injuries in certain directions by leaving strategic toys in plain sight, increasing the chances that at least one will be grasped by an eager hand.

**Small milestones**

The first time JoAnn sees Bobby bend over and pick up a ball and then kick it down the hallway, she notices how wobbly he is, but she knows it's a milestone nonetheless.

There are others. He becomes increasingly proficient at "swimming over the bolsters," in which he crawls over rows of cushions while reaching between them for red beanbag frogs. He can stand for longer periods while playing games placed on higher surfaces. Towers of building blocks teeter less.

Bobby loves to play hard, especially with Spider-Man toys. He is prone to tantrums, just like before. And he loathes the protective dark blue helmet that allows only his ears to poke through holes on the sides and that covers everything else except his face — the helmet he wears when he's not in his hospital bed and which he often tries to remove by undoing the Velcro straps beneath his chin.

But even when he's uncooperative, Bobby has an uncanny ability to charm.

"Those big blue eyes," Tanner says. "You just melted."

A bit past 8 a.m., midway through his 3½-week stay at St.

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ing brain damage.

On Friday, March 11, with Bobby clinging to her, Kim tearfully tells a crowded room of reporters that her son is expected to fully recover.

"It's definitely a miracle," she says.

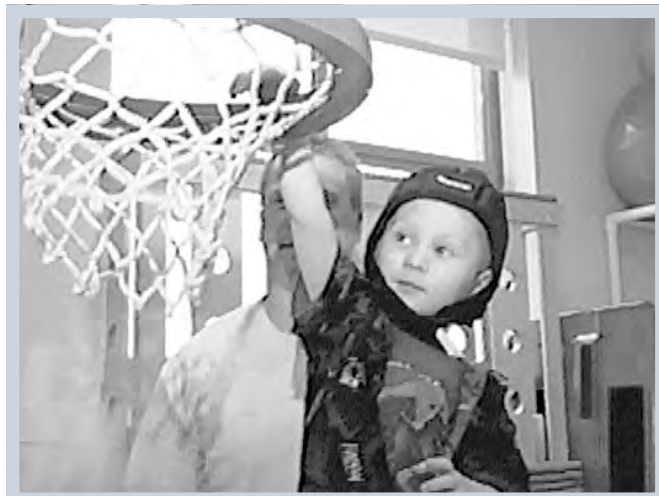
**THREE WEEKS AFTER THE ACCIDENT.**

On the morning of March 15, a young patient walks to St. Charles Hospital's third-floor gym with



VIDEO IMAGES COURTESY OF ST. CHARLES HOSPITAL

Video clips from one of Bobby's rehabilitation sessions at St. Charles Hospital. From top, Bobby's father Robert gives him a kiss and an embrace during a break from shooting baskets; a close-up shows his special protective headgear; with his father watching, Bobby scores; Bobby punches a soft bag as therapist Bill Cunningham watches.



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Charles, the boy is growing restless in his foam helmet. His mother hasn't yet returned from getting everyone at home ready for school and he fidgets in a chair by Semel-Concepcion while she attends to some computer work in her office.

He can sit still no longer. Bobby reaches up and yanks off the computer's glare cover with both hands.

"I broke it," he announces. Semel-Concepcion calmly notes the apt use of his fine motor skills. At this moment, she knows that her patient will recover nicely.

Other impromptu toys demonstrate his growing abilities. He repeatedly opens the door of a mock car designed to help patients practice getting into the passenger's side.

Every nurse or therapist seemingly has an irresistible pen.

"Oh, I like that," Bobby says. "Oh, you want it?"

They cannot possibly say no. He is particularly smitten with a blue light attached to Semel-Concepcion's key chain to help her locate her car. She observes that he has enough vision in his right eye to play with the light while another therapist puts a piece of paper or a hand over his left eye — at least until it's impatiently batted away. She notes that he can manipulate the light more easily every time he plays with it.

She also knows that he won't leave the hospital without it.

In a hospital-produced video of one therapy session, Bobby sits in a small chair in the gym, wearing his helmet and Spider-Man shirt and playing with Semel-Concepcion's key chain light. And there, beside him, is his father.

At Cunningham's suggestion, the boy throws a toy frog into a green pail, then gives the key chain to Robert, who is kneeling on the floor and smiling at him.

Bobby stretches up to dunk an orange ball in a hoop, and Robert kisses him on the head. Bobby kicks a red cushion, then a blue one, then a green one.

The last one he pushes over. And, of course, the lighthouse obliges with its spinning light when he presses the red button.

"Want to look outside?" his dad asks. "Yeah? Come on."

And then Bobby is in his arms, looking out toward Port Jefferson Harbor.

"You see the white boat coming in this way?" Robert asks. "That's the ferry. It's got cars on it, and people. Yeah." He kisses his son on the cheek.

"You want to go on that boat when we leave here?"

The video ends with Bobby and his father walking down the hallway, hand in hand.

The recovery

By the third week, Bobby wants therapy even when it's not scheduled. "I want to go to the gym," he declares.

He proves adept at hammering wooden circles and squares and triangles through the correct slots, or just hammering away at anything within reach.

He graduates to the outdoor

playground beneath a trio of black locust trees, where soft black matting can cushion unexpected falls. Bobby likes to climb and has steadily improved at walking up and down indoor ramps, so Cunningham has him walk up one side of the playground's double red plastic slide to improve his balance.

He can even run, as long as someone accompanies him.

Along with the recovery of physical skills, doctors once believed that a child's intellectual or cognitive abilities could bounce back after a traumatic brain injury far better than those of an adult. The rapidly developing brain can rewire or adapt to sidestep the damage, according to a notion based on research with monkeys and called the Kennard Principle.

The principle spawned a slew of studies that have more recently suggested just the opposite: Children before the age of 4 or 5 are far more susceptible to lasting cognitive damage because of all the critical connections required by their fast-growing brains.

Parents may discover this unwelcome truth well after an accident, when an otherwise bright child proves unable to learn math or stay organized or play

with others or control a temper that never seemed as hot.

No one can say for sure what's in store for Bobby. But a recovery that nearly all of his medical providers have described as "unbelievable," "remarkable," or "miraculous" points toward the potent combination of rapid intervention, intensive therapy and the surgery known as a decompressive craniectomy.

The few medical reports that directly address the surgery suggest that children are more likely to benefit from it than adults after a severe head injury, but very little has been reported about the long-term recovery of children afterward.

Within the past few years, Semel-Concepcion has been struck by the successful rehabilitation of more than a half-dozen children who have passed through St. Charles after undergoing similar procedures — most often at Stony Brook. Bobby's rapid progress has only heightened her interest, and a collaboration with Stony Brook's Egnor may net some more definitive answers.

Their extraordinary patient, though, must still pass another major surgical milestone.



Kim works with Bobby at home in North Bellport on

## RAIN HAS FALLEN STEADILY ALL MORNING.

On this Friday in April, less than an hour after the burial of Pope John Paul II, a boy lies face up on an operating table.

Only two more hours until a resolution that seemed so unlikely 6½ weeks ago. Kim knows all this, as she sits with Robert in a fourth-floor waiting room at Stony Brook hospital, but she frets about the physical trauma and potential infections or anesthesia complications from a surgery she understands is necessary.

Let it be over soon.

"It's just a sticker, just a sticker," says a nurse in Operating Room A as she affixes one to Bobby's chest, where electrodes will listen in on the electrical activity of his heart and report their findings back to an electrocardiogram monitor.

An oral dose of the sedative Versed is already coursing through his body, while a Velcro strap encircles his waist.

As Beg, the anesthesiologist, and other members of the surgical team prepare Bobby's oxygen mask, registered nurse Kim Fenster directs his attention toward a partially inflated bulb on the anesthesia machine.

"Look at the green balloon. It's a green balloon," she coos. He turns his head to see for himself.

With the mask over his mouth and nose, Bobby receives pure oxygen, then a mixture of oxygen and sevoflurane to lull him into an anesthetic slumber and allow the insertion of an otherwise painful IV into the back of his left hand.

The IV catheter directs a flow of the muscle relaxant rocuronium, the painkiller fentanyl and hydrating fluids. Tape secures the tubing to white padding beneath his left arm.

"That's for after surgery," says Ricardo Aranguren, the chief physician's assistant. "He doesn't understand that the IV is his friend. So when he wakes up and starts crying, flinging around..."

A laryngoscope verifies that Bobby's airway is open and a breathing tube, secured with more tape, ensures that he will receive the right mix of oxygen and anesthesia. A green cuff around his upper right arm will measure his blood pressure and a pulse oximeter on his fingertip will monitor the oxygenation of his blood.

His heart rate registers 130 beats per minute, at the upper

end of the normal range.

A heating pad and blanket have replaced Bobby's diaper and green one-piece pajamas, while his blue eyes have been filled with drops and taped shut to keep them from sticking to their lids. It's a necessary precaution, Aranguren says, since general anesthesia tends to dry them out.

Egnor enters the room and delicately shaves away some hair that has re-grown along the scar seemingly connecting the sedated toddler's ears.

"This is going to be much easier than the first surgery," says Duffy, who has entered the room as well.

The boy's belly, only slightly distended from the skull bone stowaways, receives a full Betadine scrub. As his chest rises and falls, the disinfectant in his belly button quivers slightly.

Bobby's heart rate is now 111.

A blue cloth secured with a skin stapler follows the scar line across his head, while a second cloth draped over his face and stapled in parallel gives them both the look of a burqa. His pale body soon becomes completely sheathed in sterile blues except for the upper window and its lower counterpart

surrounding the smile-shaped scar below his belly button.

At 8:50 a.m., Egnor injects Bobby's scalp with lidocaine, first at the very top of his head, and then along the scar.

In adherence with the hospital's safety rules, Beg announces the case: "Bobby Palange" and Egnor politely thanks her before injecting more lidocaine into the boy's belly.

Egnor begins his work in the lower window, where he cuts and teases away the abdominal skin and underlying fat with a scalpel and forceps, then uses a cautery to seal off blood vessels. A puff of smoke curls up from the incision site, and a brief but pungent burning smell emanates outward.

### Putting the bones back

The surgeon soon exposes a half-inch-thick slab of skin and fat, under which Bobby's four skull fragments have been stored. A metal clamp keeps the skin flaps separated, leaving a disc-shaped opening where the tight smile had been.

108 beats per minute.

All four skull bones are cut away from the abdominal tissue and pried out of the pouch by 9:03 a.m. One by one, the

bones disappear into a foaming solution of hydrogen peroxide within a small metal pan.

Duffy assumes the responsibility of cleaning the now bone-free abdominal space and stitching it back up again, while Egnor quickly shifts his attention to Bobby's head.

The surgeon's scalpel sends the first trickle of blood down toward the boy's blond cowlick. As he cuts, Egnor requests a series of banana-colored clips and positions them in a row along the severed ends of the boy's scalp, clamping back the flow of red with growing arcs of yellow.

"So, you're having your house built?" the surgeon asks Fenster, who is now overseeing the plastic clips and a table full of instruments beside the pan of bubbling hydrogen peroxide. A wastebasket fills with bloody pieces of gauze as they discuss her impending move.

Egnor separates scalp from skull and sears the tissue with a cautery to seal off the blood vessels, as he did with Bobby's abdominal incision. The front of the boy's scalp is now folded over his hair toward his forehead. There is surprisingly little blood as a rough cross of bone begins to appear, a glistening pink surface bordered by four pockets of deeper red.

The outline of a hole remains in the left arm of the cross, where a catheter had drained his cerebrospinal fluid. A hole in the right arm, where the pressure monitor had been, is partially visible as well.

109 beats per minute.

Egnor has peeled away Bobby's scalp over a four-inch expanse, adding to the twin rows of yellow clips as he works. One bone-free quadrant, and then two gradually appear, where the brain's exposed dura covering pulsates in time to the boy's beating heart.

The boy will heal well without the need for titanium plates, Egnor decides, as he gingerly inspects the cross-shaped bone dividing the quadrants. In February, he had cut this cross loose from the surrounding skull, freeing it to float above a swollen brain. Now, search committees of fibrous cells and cartilage have already reached across the divides to lash the bone back to its moorings.

No, sutures will be enough, and the surgeon matches the front left wedge, still dripping with peroxide, to its corresponding gap. Two careful marks, two partially drilled holes, and then he drills through the piece as though preparing a shell for a mobile.

"We've gotten fancier now, but sometimes simpler is better," he says. He drills two holes in the corresponding arms of the bony cross, with Duffy prying a metal lever beneath each edge to shield Bobby's brain.

Egnor threads the suture line through the matched holes with a curved needle — first the wedge, then the cross.

As he works, the discussion turns to Pope John Paul II and the publicly released contents



NEWSDAY PHOTO / MICHAEL E. ACH

exercises designed to strengthen the eye that was injured in the accident, as big sister Megan toys in the background.

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of his will and the speculation over who will replace him.

Egnor lashes the bones together, ties the suture with three granny knots finished by a square knot, and snips the ends.

One down. Three to go.

91 beats per minute.

The front right wedge of bone has partially split, where the initial pressure of the Durango's tire popped the bone's natural suture apart. "But in children, the body remolds," Egnor says. "It doesn't make sense to do anything radical."

### Surgery completed

The wedge is soon reattached. Then the back left wedge, and the back right one.

Egnor rinses the entire site with a light blue bulb full of hydrogen peroxide and the fizzing solution washes over the bones and drips into a catch bag beneath Bobby's head.

The first stitch ties his scalp together in the middle and forms a pucker at either end. Egnor begins on the left and Duffy on the right: curved sutures in, yellow clips off.

They discuss the odds on who will replace the pope while they sew up the boy's head.

"I always break my cardinal rule," Duffy says. "Never discuss religion or politics — and what do we discuss in this room?"

"Religion and politics," he says in unison with Egnor, while Egnor begins stapling over the suture line.

Bobby's heart rate registers 104 beats per minute, just as he begins to rouse from his anesthesia-induced morning nap.

"OK, he's waking up," Duffy announces, as he feels the first stirrings beneath the blue shroud. The last staple is in.

"It's OK, Bobby," Fenster says, and Beg prepares for the endotracheal tube removal as the surgical team finishes bandaging his head and abdomen.

Children often heal much better after an operation than adults, Egnor says. Adults have more anxiety, he says, "whereas kids, once they don't have much pain, they're fine."

He walks to a sheet of CT scans affixed to a light box on the back wall.

"I don't see any signs of brain damage," he says. "The brain looks perfectly normal."

One scan shows a split in the greater right wing of the sphenoid bone, where the bone popped outward due to force. The piece already has moved back toward its initial location, Egnor says, evidence of the body's remarkable healing ability.

Back at the table, he feels the boy's head.

"There's very little give where we put those bones back in — it's pretty solid," he says.

The strips of tape covering Bobby's eyes come off, and more tape covers the stapled incision site, followed by a thick wrap of gauze. He receives a new blue-winged diaper and green hospital-issued pajamas.

"Ideally, you give enough general anesthesia so they wake up immediately after surgery," Duffy says, and the boy



In between all the rehabilitation work and visits to various doctors to check on his progress, Bobby gets in some relaxation time

begins to move again as if on cue, wiggling his left foot. Then, his eyes still mostly closed, Bobby issues a plaintive cry — more a whelp of displeasure than a full-blown wail.

It's a good sign, Duffy says. After surgery in or near the brain, doctors want to know that their patients are moving again as soon as possible.

At 10:49 a.m., Bobby is wheeled out of the operating room and into the recovery room, where his cries are greeted by a mother's joy.

It's over.

By noon, the sun has broken through a bank of clouds, and the pavement is drying quickly.

### A GIRL ON THE STREET SEES A YOUNG BOY.

"What happened to you?" she asks.

"I got hit by a car but I'm OK now." Bobby says. "I got staples in my head. Wanna see?"

A few days later, he marks their removal with an "Ow, ow, ow" — mild protests that gath-

er in strength until he begins to cry. Afterward, though, he declares, "Oh good, they're out."

Other wounds will require more salve in these first few weeks, when attention must be redistributed among five children, when hurt feelings must be soothed and broken routines mended. And after remaining strong for so long, Kim discovers that her emotions have arrived in a torrent.

Flashbacks, bad dreams, crying jags. Her doctor prescribes Xanax, but she worries about staying on it for long and so she derives her own therapy by returning to a familiar routine: Bobby and Jacob go back to their Tutor Time day care and she returns to her job at St. Charles Hospital.

As the weeks advance, the scar recedes beneath her son's mass of blond hair and his confidence returns during playtime. Even so, the Palanges have cleared their backyard of trees out of concern over his uncertain vision and they've fenced in their front yard with a gate across the driveway.

"Don't go into the road," Bobby tells Jacob, now 16 months old. "You could get hit by a car."

At a June fundraiser at an Elks Lodge in Port Jefferson Station, organized by JoAnn and Felicia to help the Palanges cover medical expenses not covered by insurance, the star attraction impatiently poses for pictures and pats on the head. His tennis shoes feature yellow and red lights — on the Velcro straps, on the sides, on the back. They all blink when he moves, which is often.

He begins playing with a green balloon from a bunch scattered around the room.

A friend tries to restrain him. "Let go!" he yells and is running again. Blink, blink, blink.

"It's amazing," one woman says to another as they watch him go by. "Totally amazing."

Kim has been unable to keep up with Bobby's growth spurts — "When he was in the hospital, he grew a size and a half," she says, marveling. She is quick to follow him, though, when he bolts for the door,

through the foyer and entryway and down a short sidewalk toward the lodge's parking lot.

More than 160 businesses and individuals have donated items for the fundraiser, overwhelming her. One is a rearview camera system that allows drivers to see behind their cars.

In all, the fundraiser nets about \$4,200.

Life is moving forward.

### A miracle child

Bobby returns to St. Charles Hospital one afternoon for a routine handoff from Robert to Kim and spies Cunningham sitting with another patient in front of the hospital's Infant Jesus Chapel.

"Hey!" the boy shouts from his car seat. "That's my friend."

The physical therapist smiles as he recalls the moment.

"He had angels on his side," Cunningham says of his former charge.

"It's gotta be God," Kim says later, echoing the sentiment. "He shouldn't have made it past this house, from what I saw."

In an emotional phone call,



NEWSDAY PHOTO/MICHAEL E. ACH

### at home with brother Jacob and sister Megan.

she has also thanked Salinas of South County Ambulance — one of the first among hundreds who ensured that her son has made it home again.

"It's just — he was a miracle baby," Salinas recalls. "Things lined up and it was just a beautiful thing."

Serna, Stony Brook's critical care nurse, sees Brauneisen at her post in Brookhaven's emergency room from time to time and they greet each other warmly with a hug and a kiss, like they've been friends for years. They look at each other and remember little Bobby.

"Everything clicked. This kid was a miracle," Serna says.

"Kismet," Brauneisen says.

With Bobby back in North Bellport, officers Curry and Mudzinski make regular house calls to check on his progress. "The stars seemed to be aligned for this kid," Mudzinski says.

In July, Robert resolves the charges filed against him by pleading guilty in exchange for probation and a fine. Later that month, at an ambitious party organized

by Kim to celebrate their son's third birthday, Bobby spends hours bouncing in an inflatable Bounce House while relatives and neighbors talk and laugh around a grill in the backyard.

The same day, JoAnn receives a call from her husband's relatives in San Antonio, who tell her Bobby's recovery has been featured in the day's "Ripley's Believe It or Not?" cartoon.

"What a handsome boy!" exclaims Egnor at a check-up in August. The picture of calm in a floral tie is smiling at a suddenly shy 3-year-old burying his face in the base of the exam-room table. Bobby peers out warily when Egnor asks him to walk to the wall. The doctor gently lifts him to the wall instead.

"Walk back to mommy. Can you walk back to mommy?"

Bobby runs to Kim in a few efficient steps. A nice stride.

He still lacks some vision in his right eye due to the damaged optic nerve, but a strategy to patch his good eye may force a partial compensation. He is more cautious, fears loud

noises, and tires out by 8 p.m., ceding the bedtime battles to his younger brother.

Before, Kim says, "danger was his middle name."

But his pitching form is returning. The bone irregularities in his skull will largely sort themselves out over time, Egnor reasons, eliminating the need for further surgery. And the neurosurgeon sees scant evidence of the initial injury in a CT scan of his patient's brain and surrounding skull. From the outside, blond hair has now largely concealed the doctor's surgical handiwork.

"Good," he says. "Couldn't ask for more."

Egnor has presented this case in detail to neurosurgery colleagues at UCLA, but the extraordinary outcome is communicated far more powerfully when he tells Kim he won't need to see her son for another six months.

"Bobby, I'm so proud of you," he says, beaming.

Some scars are fading fast. But not all. On a Friday in mid-September, Kim fields a call at work from a mother whose 16-year-old daughter is still recovering from head injuries she sustained in a car accident two years ago. Kim doesn't identify herself, but is able to say with certainty, "I know what you're going through."

It comes back to her in an instant. The call ends and she dissolves into tears at her desk.

Two days later, Bobby agrees to play "patchies" with his sister Megan, while Jacob looks on. Kim retrieves two adhesive bandages and puts one over Bobby's left eye — his good eye — while Megan does the same over her right eye.

Within the two minutes that the game holds his attention, Kim positions him by the glass-topped coffee table in the living room and points to pictures on a sheet of paper.

"A telephone!" Bobby says, correctly, then stumbles over the next few tries before rebounding with a resounding, "A car!" Game over, as he struggles to remove the bandage.

A stuffed dog and pony show in the living room and scarf-assisted jump-rope session in the kitchen offer far more fun, and three children soon fall into a giggling heap on the floor.

Despite the happy chaos around her, Kim readily admits that her family isn't quite the same, isn't yet whole.

It may never be whole.

She tries to keep up with the



#### The Reporter

**Bryn Nelson** has been a science writer at Newsday since April 2000. He has written about the Human Genome Project, stem cell therapy, wildlife biology, archaeology and the West Nile virus. He was a writer on "Long Island: Our Natural World," a yearlong series about the Island's natural wonders.

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## Life-saving terms

**Central line:** A catheter tube inserted to monitor the central venous pressure — and, by extension, hydration — and to provide a portal for drug delivery.

**Cerebrospinal fluid:** A clear, water-like fluid that bathes, protects and nourishes the brain and spinal cord and flows within the brain's four main cavities, or ventricles.

**Collagen:** A protein fiber that dominates the connective tissue in skin, tendons, ligaments, cartilage and bone, providing strength, elasticity and support.

**Craniosynostosis:** A condition in which one or more sutures between the skull bones close prematurely and leave the head misshapen as the skull accommodates the growing brain.

**Decompressive craniectomy:** A surgical procedure, often done after a traumatic brain injury or stroke, that involves removing a portion of the patient's skull to relieve the intracranial pressure.

**Dura:** Also known as the dura mater; the leathery and outermost of three membranes that cover the brain.

**Electrocardiogram:** Also known as an EKG or ECG; a medical test that records the heart's electrical activity and detects abnormalities.

**Endotracheal tube:** A flexible tube that delivers oxygen from a hand or machine-operated pump through a patient's airway to the lungs.

**Fascia:** A band of fibrous tissue that covers muscles and some organs, offering both protection and structure.

**Glasgow Coma Scale:** A scoring system used by medics to assess a patient's condition and prognosis following a traumatic brain injury; the scale includes scores for verbal, motor and eye-opening responses.

**Herniation:** The abnormal expansion of an organ or tissue out of its own space or cavity.

**Hyperventilation:** The delivery of oxygen in quick bursts, to lower the level of carbon dioxide in brain tissue and reduce pressure by constricting the size of blood vessels and decreasing the blood flow.

**Induced mild hypothermia:** Maintaining body temperature at or below 98.6 degrees, sometimes with the aid of cooling blankets and Tylenol suppositories, to keep brain swelling and intracranial pressure to a minimum.

**Intracranial pressure:** The pressure within the cranial part of the skull, which may rise due to swelling of the brain within its confined space.

**Nasogastric tube:** A tube inserted through the nose and into the stomach to deliver liquid food, remove the stomach's contents, or draw out air to prevent a buildup of pressure.

**Oculomotor nerve:** A major nerve that arises in the midbrain and governs nearly all eye movements.

**Pleural cavity:** The tissue-lined cavity between the lungs and the chest wall.

**Superior sagittal sinus:** A major blood channel that runs between the brain's left and right hemispheres, where it collects and drains blood from a variety of smaller vessels.

**Ventriculostomy:** The insertion of a catheter into a ventricle of the brain to drain away cerebral spinal fluid and relieve intracranial pressure.

medical bills as they arrive, but can only guess at a total cost.

Through his wife, Robert has rejected repeated requests to talk about an accident that still weighs heavily on him. He is struggling to move on, Kim says, while she is still trying to find the part of her that was lost after the accident.

If only she could put her finger on what's missing.

Maybe it will return.

Someday.

Four months later, paper hearts in red and pink have been taped to the front door and windows. Bobby is napping in an easy chair with Snoopy and a blanket of quilted trains while "Freaky Friday" plays on the living room's oversized television.

In one of her rare moments of relative peace, Kim confides that her flashbacks have not yet subsided. Nor has her husband's struggle to move beyond his overriding sense that even now, everyone blames him for what happened.

"It's something he'll always remember," she says.

Even so, she's thankful. She knows they're among the lucky ones and she can't imagine the heartache of a parent whose child didn't make it.

On a sunny winter afternoon, the tow-headed toddler fast asleep in her living room offers the quiet and remarkable assurance that nearly anything, for them, is still possible.

And that, for now, is enough.