

For patients who have suffered traumatic brain injury, the U-M Department of Physical Medicine and Rehabilitation offers a team approach and technological innovation to support them on

The Long Road to Recovery

It takes but an instant, and it can happen to anyone. A driver runs a red light, or a sidewalk turns out to be unexpectedly icy. The skull crashes against pavement or steel. Suddenly, its cranial defenses breached, the brain — and the person whose life functions it controls — is grievously damaged.

Late in the morning of September 30, 2004, it happened to Amnon Rosenthal, M.D., a celebrated pediatric cardiologist at the University of Michigan.

After enjoying excellent health for decades, Rosenthal had become ill toward the end of a trip to Italy the previous spring. What initially seemed to be a bad case of flu developed into a urinary tract infection, severe dehydration and weight loss, a significant worsening of his diabetes, and profound orthostatic hypotension, a condition in which blood pressure drops precipitously whenever a person stands up.

But Rosenthal had been feeling better for a couple of months prior to his Kellogg Eye Center visit that early autumn day for a routine examination. When it was finished, he stood up, took a few steps, then lost his balance and fell, hitting his head on the floor. That evening, he underwent emergency surgery to remove a blood clot from his brain. ➤



Prudence and Amnon Rosenthal

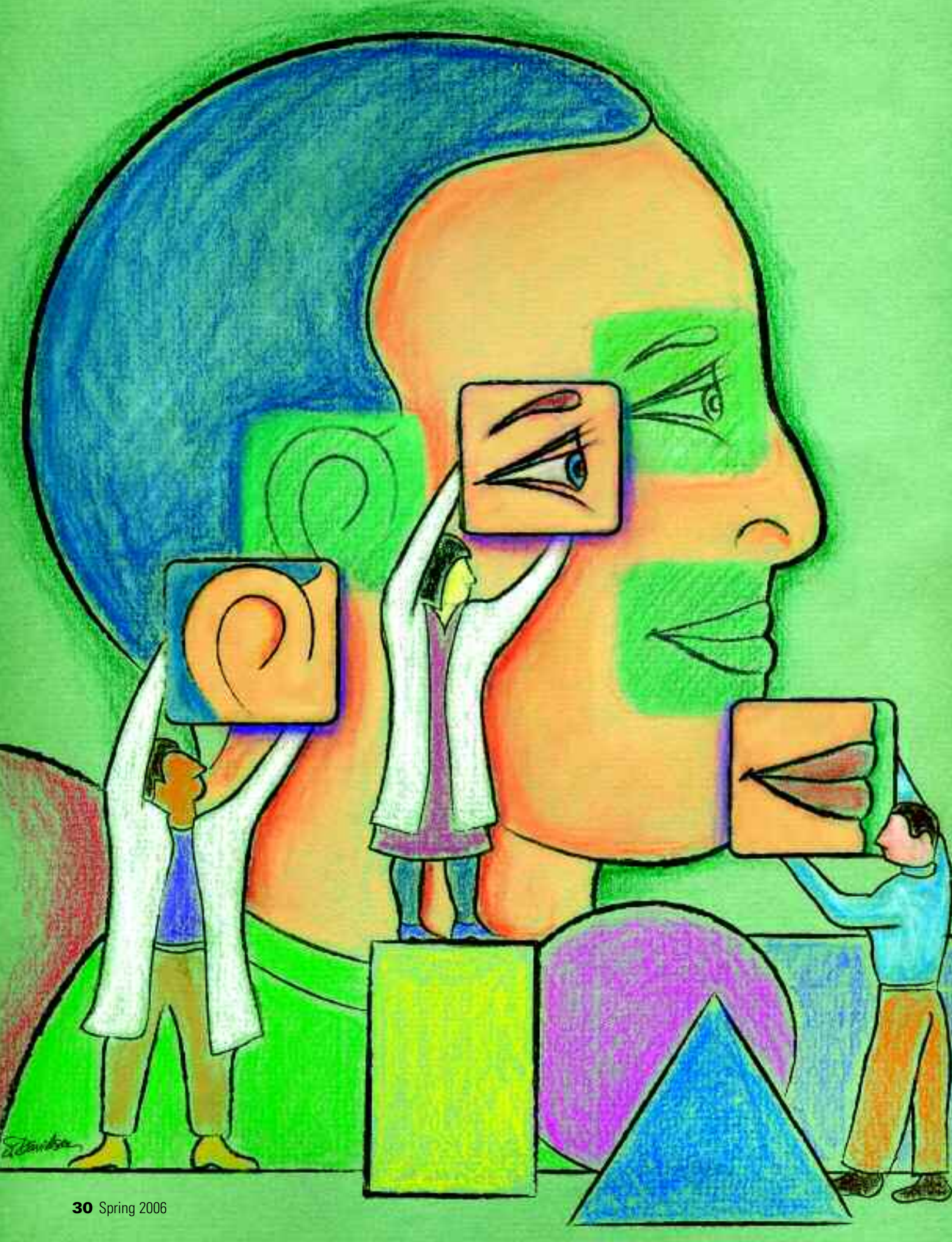


Illustration: Sharpe Davidson



Percival Pangilinan

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—Percival Pangilinan, M.D.,
U-M Department of Physical Medicine and Rehabilitation



“The outlook was very grim at that time,” says Rosenthal’s wife, Prudence. “They really didn’t think he was going to do very well. The temple bones on either side of his forehead were cracked and broken. He hit the back of his head, so it pushed his brain forward against his skull and caused bleeding. My daughter-in-law and son, who are doctors, told me many months later that there had been some question if he would survive.”

Repairing Damage, Recovering Function

Today’s brain surgeons save lives that would have been lost not so very long ago; Rosenthal’s was one of them. But repairing the damage is one thing, and recovering the life a patient was living is quite another.

“The surgeon told me before the operation that he could become a very different person,” says Prudence Rosenthal. “He could have very little brain function, he could become aggressive, he could become lethargic. When you go into that part of the brain, you just don’t know ...”

After spending eight days in the Neuro Intensive Care Unit at University Hospital, Rosenthal was transferred to the rehabilitation floor where he began his battle to regain functionality. In Rosenthal’s case, there was a high degree of functionality to regain. Director of Pediatric Cardiology at C.S. Mott Children’s Hospital, his ground-breaking research in congenital heart disease, including over 300 published articles and abstracts, has resulted in techniques that have helped thousands of children with heart problems lead normal lives.

Now it was an open question whether he would ever again be able to lead a normal life himself, much less be the person his family and friends would recognize as “Ami”: polite, gentle and good-natured, with an impish sense of humor and a pronounced stubborn streak.

“Our goal is to get people back doing what they were doing before,” says Percival Pangilinan, M.D., of the U-M Department of Physical Medicine and Rehabilitation, who attended Amnon Rosenthal during his hospital stay. “One of our greatest limitations in medicine is that we don’t know how to regrow brain cells or spinal cords, but the connections that brain cells make from one to another can regenerate, and the connections can be stimulated.”

Putting that knowledge to work has made a stunning difference in the lives of patients like Rosenthal. Putting that knowledge to work with intense multidisciplinary coordination and a high level of creativity has made the department’s Adult Neurorehabilitation Day Treatment Program, where Rosenthal was an outpatient for eight months after his discharge from the hospital, exceptional.

Rosenthal’s goal was to get back to work, and he’s done that. Although retired now (as planned before his

accident), he still spends considerable time in his office. In general, he performs all the life tasks that people whose brains haven’t been damaged take for granted. And, says Prudence Rosenthal, after months of cheerful compliance with his therapeutic regimen, “He’s back to his old self.”

Says Rosenthal, “They streamline you beautifully back to activity.”

“I looked forward to going there, which often, especially when you do rigorous physical therapy, isn’t the case. It was actually a pleasant experience after a horrendous illness.”

Says Ned Kirsch, Ph.D., director of the Adult Neurorehabilitation Day Treatment Program since its inception in 1989: “We believe we can effectively help people return to their lives only if every aspect of their lives that can potentially be affected by their injury is addressed intensively, and you can do that only if you have a team that communicates very well.”

Communication, Community and Coordination are Key

Creating such an environment has been Kirsch’s mission from the beginning, and it requires a whole that is more than the sum of its parts, even when the parts are as accomplished as the therapists who serve in the program. It requires communication not only among the health professionals but also between them and family members, employers, schools and community agencies. And it requires the flexibility to shape each patient’s therapy to his or her particular needs.

“When I came here, we were providing intensive rehabilitation services on the inpatient unit at the hospital,” Kirsch says, “but there was no transitional, community-based program like this. After patients were discharged from the inpatient program, there was no clear way to provide them with continuing rehabilitation care that helped them promote their reintegration into the community. This population has such complex ▶



Ned Kirsch

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—Ned Kirsch, Ph.D., director of the Adult Neurorehabilitation Day Treatment Program

needs that it often isn't possible to provide them with the services they require in an outpatient setting where the treatment plan is not so intensively coordinated.”

The treatment program team includes two psychologists, a social worker, two occupational therapists, two speech pathologists, a physical therapist and a therapeutic recreation specialist, who work with a patient population that ranges from 15 to 20 individuals at any given time. It all happens in a 2,700-square-foot suite of rooms in one of seven U-M Health System buildings opposite Briarwood Mall on the southern edge of Ann Arbor. The spaces include conference and treatment/activity rooms, a computer lab, a small lounge that's stocked and supported by patients, and both physical and occupational therapy areas.

“There's intensive daily communication among all the team therapists, so that each person's information fits into the big rehabilitation picture,” Kirsch says. “The families are also active members of the treatment team. It's not uncommon for family members to be here every day, spending time with the patient and with team members, interacting with us, meeting with our social worker on a frequent basis to discuss the impact the injury has had on family functioning, and the sort of things family members can do at home or in the community to help the patient generalize to other settings the kinds of skills they're learning in the clinic.”

“We also interact closely with the various college offices of services for students with special needs, and with home care agencies, transportation agencies, the team of people throughout the community that's concerned with the patient's welfare,” Kirsch says. “My clinical experience in the past is that, without this intensive communication, the patient's needs often fall through the cracks.”

And without someone to coordinate all that communication, it could happen anyway. That someone is the case manager. “Part of the case manager's role is to be the glue that holds the program together,” says Kirsch, sealing the cracks “by assuring that all of the communication, not only among team members but also others concerned with the patient's welfare, takes place.”

Prudence Rosenthal can attest to how well the case managers do their job. “When Ami first went to rehab, he didn't think it would do him any good,” she says. “It didn't have ways to measure his progress, which is what he was used to in his work at the hospital. So I called and said, ‘He doesn't seem to think this is really very important. He's just doing it to please the people who looked after him and to get his job back. He's not going to take this seriously unless you show him there are measurable goals.’”

She was stunned, albeit pleasantly, by the response. “They got together and discussed how they would change his treatment so he would have ways to identify where he was going and how he would get there. The key was that everybody talked to everybody, so they all knew what was happening with him as soon as it hap-

pened. I didn't have to say it twice, and they understood what it was that he needed, which made it tremendously easy for me and for him.”

This type of highly adaptive, individualized therapy is a vital part of the program, but so are the group activities that strengthen the task-juggling and interpersonal skills demanded by day-to-day living.

Group Therapy and High-Tech Tools

“A very strong component of our program is group therapies,” says Kirsch. “Each group has a specific focus — putting out a newsletter, running the snack shop, holding a fund-raiser — but the broader purpose of all of the groups is to promote effective interpersonal function. The snack shop is open on a regular basis, and the patients who operate it need to do inventory, plan what stock is going to be kept, purchase supplies, walk around the building to let people know the snack shop is open, and manage the money. All these activities have entertainment or pleasure value, but they're also designed so all of the components have therapeutic value, too.”

A report of her husband's behavior in one group therapy session convinced Prudence Rosenthal that the light at the end of the tunnel was burning brighter. “According to his social worker, he had spent quite a bit of time helping other people,” she says. “One woman had been in a car accident where the other person had died, and she was struggling with that. He's a very religious man, and also as a physician has dealt with death, so he was able to help her.”

When the individual and collective approaches converge, so much the better.

“We had a patient in our program who really enjoyed having tea parties with friends,” Kirsch says. “An important part of her therapy was a tea-serving intervention that we designed for her. She would make tea and crumpets and walk around the building and hand them out to people. The feedback she got — ‘the tea is so good,’ ‘the crumpets are so tasty,’ ‘how you serve is so attractive’ — gave a tremendous boost to her self-esteem. We develop ad hoc interventions like these all the time. This treatment team is incredibly adept at creating individual interventions that incorporate the entire community of patients and staff.”

The program treats people at all levels of impairment, so goals need to be adjusted accordingly. “We're trying to maximize function for each individual, given what their level of disability is on a long-term basis,” says Kirsch. “For some people, like Dr. Rosenthal, that may mean essentially returning to the same life they were living before they were hurt; for others, it may mean

radically different ways of life than they have ever encountered before, but hopefully just as rewarding.”

Kirsch believes the U-M's program is unique in adapting off-the-shelf technological tools to help such patients. “We have developed some special expertise in a type of intervention that is specifically designed for people who have trouble with cognition and behavior due to their injuries,” he says.

One example is providing patients with personal digital assistants to remind them when to monitor their blood sugar, or pick up their kids from school, or even that they need to behave more appropriately. “We have had success in providing people with a portable device that, at fixed intervals, sends them a message that says something like ‘be brief,’” says Kirsch.

Thanks to the devices' digital recording capability, the reminder can be in the patient's own voice, or the voice of his or her social worker. “Contrary to what you might think, people find that cues which help them behave more appropriately are more acceptable coming from an electronic device than from another person,” says Kirsch. “The relationship issues of being criticized by another person are much more difficult to accept than being given instructions by an electronic device.”

The program's therapists have also developed wireless, interactive, internet-based interventions using devices for people with cognitive and behavioral problems. One patient was having trouble finding offices within the department, each of which is identified by a colored circle above the door. “We gave him a PDA, telling him to look for a color, then tap on the screen,” says Kirsch. “We could then deliver timely instructions about what to do, how to do it and how to behave while he was doing it.”

It may seem counter-intuitive, he adds, but “many of our patients say that being able to behave in a more adaptive way as a result of electronic cuing gives them a feeling of more independence, rather than less.”

The technological aids never entered the picture for Ami Rosenthal. For one thing, he was fortunate enough not to need them. “It tends to be more of an issue for people who are living on a long-term basis with really significant difficulties,” says Kirsch. For another, says Prudence Rosenthal, “When they asked him if he needed to relearn how to use a computer or his PDA, it became sort of a family joke. He never knew how to use them anyway.” 