



In the winter of 1971-72, Judy Taylor returned to normal life in her new home near Bobcaygeon, Ont.

This is the conclusion to a two-part series. Part one appeared in last week's Medical Post.

By SHIREEN A. JEEJEEBHROY

On July 11, 1971, Judy Taylor was discharged from Toronto General Hospital, nine months after admission. Her husband Cliff was there to pick her up. She sat in the front seat, avidly soaking up the passing scenery while he drove them north to their new home in Bobcaygeon, Ont.

She was so weak from the drive that Cliff assisted her to a chair in their new living room. After saying hello to her welcoming family, she napped. But in the days ahead, "she surprised all the hell out of Jeej," as Cliff described it.

Her time in hospital changed her. As Cliff said, "she saw life a lot different than the way we saw it, eh? Every day was precious to her." Her gratitude at being alive was reflected in the smile that always graced her face, and she moved beyond her pain to help others. Her reputation spread beyond Canada's borders, and people came to see her.

Judy was also popular at the annual Oley Conference in Saratoga Springs, N.Y., as her friend Sandra Lapenny recalls: "It was almost with awe the way those doctors came to Judy." The Oley Foundation recognized Judy's courage by awarding her the first "Lifeline Award," named after all those who live on TPN—their lifeline.

But, the current nutritional knowledge of the time limited the completeness of the TPN, and Judy's general good health soon was marred by odd signs.

In November 1971, Judy showed her dry, scaly and cracking skin to Dr. Jeejeebhoy. He thought of essential fatty acid deficiency, a nutritional deficiency heretofore seen mostly in malnourished children and elderly diabetics. Her blood test results supported this unusual diagnosis: she had low levels of linoleic acid and an excess of 22-polycarbon polyunsaturates. And now fat was depositing in her liver.

Jeej restarted her Intralipid. Her linoleic acid levels almost doubled in only three days; her

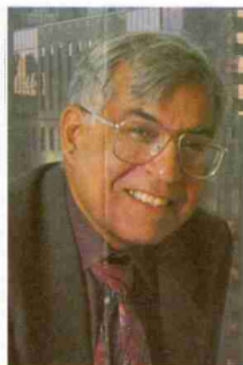
skin cells stopped flaking and cracking, and successive liver biopsies showed fewer fat deposits. Jeej surmised therefore that lipid was required to keep the fat out of the liver, "so we then replaced her carbohydrate with lipid and sure enough that's what happened."

The latter was a startling discovery. Carbohydrates caused fatty livers. Jeej's instinct for complete nutrition was right.

Two years later, he made another extraordinary nutritional discovery: chromium is an essential trace element.

After three years on TPN, Judy started to lose weight—five kilograms in three months. She may not have been too concerned because she always argued with Jeej about reducing her weight. He was concerned, though, and added another 600 calories to her TPN. Her weight stayed down. Then her plasma glucose levels rose and her hemoglobin dropped. A year later, Judy talked of "walking on cotton wool."

A specialist diagnosed diabetic neuropathy, and accordingly Jeej added insulin to her TPN. The insulin reduced her plasma glucose



Dr. Khursheed Jeejeebhoy

levels, but her neuropathy remained. Although it looked like diabetes, it wasn't.

Jeej searched the literature for answers to this puzzle. "We gave her the insulin. It increased her weight, but she didn't at all improve. And frankly I didn't know what was wrong with her for a whole year."

Then he came across an animal study by W. Mertz on chromium deficiency. The symptoms described in the paper fit

Judy. Jeej telephoned Mertz and asked if he knew of any human cases. He didn't. But his animal study was so compelling that Jeej brought Judy back into the hospital to infuse her with chromium.

They added massive chromium supplements to her TPN, and in the first three days her chromium stores built to the saturation point, and her plasma glucose fell almost to normal. Jeej said, "The results were absolutely dramatic, you know. Her glucose intolerance went away and her neuropathy disappeared."

Jeej published his clinical and laboratory findings in 1977 in the *American Journal of Clinical Nutrition*. The American Diabetes Association views this study as proving that for people on TPN, chromium is an essential trace element that works closely with insulin in carbohydrate and protein metabolism.

Unlike with chromium and intravenous fat, Judy did not experience problems with vitamin D until several years after starting TPN. From the beginning, Judy's G-tube caused her much pain, and so when her ribs started fracturing, the pain of that was swallowed up in the G-tube pain. Unfortunately, Jeej could offer her

nothing but rest.

While she scaled back her activities to less-strenuous ones, like becoming a literacy tutor, Jeej began to investigate this metabolic bone disease afflicting Judy and his other TPN patients.

Back in 1970, researchers knew that sunlight produces vitamin D in the body, that it's fat soluble, and that it's stored for a long time, but they did not really know the dietary requirements for it. Even so, the TPN formula contained vitamin D.

By the late '70s, an unusual type of metabolic bone disease began appearing in Jeej's TPN patients. Not all his patients suffered to the same degree; some had severe bone pain and fractures, while others like Judy suffered only from breaking bones. Through bone biopsies, he discovered that they were forming bone that was not calcifying. He hypothesized that his patients were experiencing an abnormal response to the vitamin D.

To test his hypothesis, he removed vitamin D from the TPN. He observed that vitamin D increased calcium absorption, which raised the blood calcium levels and shut off the secretion of the parathyroid hormone. When the parathyroid hormone shut off, bone stopped remodeling. And then it crumbled.

However, he also discovered that different people responded differently to the vitamin D, and duration of TPN was not correlated with the severity of disease. Judy developed osteoporosis, but not osteomalacia, while others on TPN for only a few months developed severe osteomalacia.

For them, the removal of vitamin D led to bone pain disappearing and fractures healing. Unfortunately, for Judy it did not. Her ribs continued to break. By the late '80s and early '90s, she suffered from several other problems until she died in intensive care at Toronto's St. Michael's Hospital on Mar. 3, 1991.

Yet her legacy lives on. Her courage to be a guinea pig gained her 20 more years on Earth, and has given us an invaluable understanding of our own nutritional health.

Shireen Jeejeebhoy, a writer in Toronto, is currently writing a book on Judy Taylor's life, *Lifeline: The Judy Taylor Story*.

# The life of a 'lifeline'

Thanks to a home version of total parenteral nutrition developed for her by Toronto internist Dr. Khursheed Jeejeebhoy, Judy Taylor was alive and ready to go home. But there were still some surprises in store

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