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Better Life Gazette

Focus

Indians who run 100 miles on 1500 calories per day

For hundreds of years the Tarahumara (Tara-hu-mara) Indians of Mexico have taken part in a traditional race called kickball. The typical contest brings together two teams of three members each who run 100 miles over rugged mountain paths in the black of night, kicking a small wooden ball.

No formal training is needed to prepare the contestants for the races, because these people walk, jog, and run all their lives from early childhood. There are races for the women and children as well as for the men. Their ordinary diet consists of corn products and beans, with a total daily intake estimated at 1200 to 1500 calories. Milk, meat, eggs, and fruit are scarce and so are rarely eaten.

A thorough investigation of six Tarahumara runners and ten other men was recently conducted by a twenty-three-member team of physicians, exercise physiologists, a nutritionist, and distance runners sponsored by the Foundation for Optimal Health and Longevity. They found the runners and the ten others (control group) to have similar physiological measurements. Blood pressures averaged 120/60; cholesterols ranged from 115 to 180. (Most were in the 120-140 range.) Resting heart rates averaged 60. The men were relatively small in stature, 60-68 inches, and weighed 104-160 pounds. Blood sugars were well within normal limits. It is interesting to note that close relatives of the Tarahumaras, the Pima Indians in Arizona, who are obese and lead a sedentary life, have the highest rate of diabetes ever recorded (50 per cent of adults).

The Tarahumaras demonstrate that extraordinary physical stamina can be achieved (1) without formal training and (2) on a diet far lower in calories, proteins, and vitamins than currently believed necessary for good health. Adapted from *The Physician and Sportsmedicine,* February, 1976, pp. 38-42.

Sound Effects

By Audrey Kastris

Each dawn the birds in combat boots
Tramp merrily across my roof.
Compared to noonday though, it's great—
That's when the squirrels rollerskate.

ILLUSTRATED BY CHARLES COOK

What's new?

New Van Lift

The new Compass Mark I Van Lift is a second-generation design from one of the early manufacturers of van lifts. Safety of the passenger has been emphasized by several unique features: (1) minimal side sway due to heavier bearings and support arms; (2) greatest lifting capacity of any lift (750 lbs.); (3) 4,000 lb.-test safety side straps; (4) clear, "see-through" polycarbonate in top third of platform; and (5) a powered exit flap that prevents rolling backward on entry. In addition, a totally new electronic control system stops the motor with no "coast" or "overrun" at the three essential positions, i.e., folded, van level (for platform entry or exit), and ground (for departure or entrance).

Also shown in the attached photograph is the Compass Commuter, the Cadillac of wheel chairs. The Commuter enables the owner to travel "cross-country" up to 25 miles. Four forward and reverse speeds provide a wide range of control for indoor or outdoor travel. For further information contact Compass Industries, 715 15th Street, Hermosa Beach, California 90254. Phone: (213) 379-7080.

Small but effective

A collection of antique nineteenth-century toothbrushes and a modern instrument. Antique brushes generally consisted of animal hairs implanted in a handle—the three middle brushes shown have wild pig hairs in ivory handles. The top brush is unusual . . . a round piece of tufted soft wood in a special silver holder. As the little ring was slid down, the loop holding the wood opened, permitting replacement of the "tufts."

The modern toothbrush in the picture is a multitufted "soft" nylon-bristled brush—the kind most dentists recommend. The invention of nylon paved the way for the development of today's modern toothbrushes.

The Oral-B® 35 tooth-gum brush is ideal for daily home use. Inset shows an enlargement of the innovative head. It's small enough to reach all tooth surfaces in the mouth. Yet it contains more bristles than a lot of larger brushes.

C(r)ash Diet

Corinne Adria Bariteau

The appetite depressant
That beats a diet pill
Is the shock I get for *free*
When I see my grocery bill!

A smile a day

"For Christmas," a woman remarked to her friend, "I was visited by a jolly, bearded fellow with a big bag over his shoulder. My son came home from college with his laundry."

Did you know?

- About 1 in 7 Americans will be admitted to a hospital by year's end.
- The average man loses slightly less time from work than the average woman because of acute conditions.
- Americans make more than one billion visits to physicians a year, an average of about five visits per person.

- About 7 in 10 persons in the U.S. see or talk to a physician within a year.
- About 1 in 7 Americans has not visited a doctor in more than two years.
- About 1 in 100 Americans has never visited a doctor.

Health Insurance News, July, 1976.

Focus

Cancer-causing chemical found in apple cider

Unfermented apple juice has recently been found to contain a fungus product called patulin (also known as clavacin, expansin, claviformin, and clavatine). Patulin has not only produced cancers in rats and chickens; it has caused large numbers of abnormal cells (with extra sets of chromosomes) in human cell cultures (isolated cells grown artificially outside of the human body).

Penicillium expansum, the fungus that causes a storage rot of apples, is related to the mold from which we derive penicillin. The sap from such rotted fruit frequently contains patulin. Although information is lacking, it is possible that other apple products such as applesauce might also contain the substance.

Patulin has antibiotic properties, which made it of interest in treating infections soon after its discovery in 1941. It relieved many symptoms of the common cold. However, this value was offset by its marked toxicity in experimental animals.

Juice produced from apples grown on organic farms where trees have not been sprayed is likely to contain considerable quantities of rotted-apple fungus extract. This fact should concern advocates of organic farming. Obviously, only apples free of rot or decay should be used for juice or sauce, let alone eating raw.

So now patulin, a chemical that has previously been rejected for *treatment* of human ailments because of its adverse effects, appears as another fungus toxin that can *cause* cancer and is capable of finding its way into human foodstuffs.

Patulin, a Carcinogenic Mycotoxin Found in Cider. *Nutrition Rev.* 32: 55-56, February, 1974.

Health highlights

Knit-pickin' hazard

By Aileen Mallory

Some types of wool yarn imported from Pakistan and sold in the U.S. last year can cause anthrax, sometimes fatal. Skeins were priced between $1 and $2 each and the balls between $4 and $7 each. If you think you bought some, check with the U.S. Consumer Product Safety Commission at its toll-free number. It is (800) 492-2937 in Maryland, and (800) 638-2666 in other States. It is important to dispose of contaminated yarn properly.

First symptom of anthrax is a blister that develops a dark crust. The disease is not passed from person to person but transmitted mainly through skin contact with contaminated objects.

Johns Hopkins Removes Cigarette Machines

All cigarette machines have been removed from the Johns Hopkins Hospital.

The recent action came in response to a Resolution on Smoking approved unanimously by the Johns Hopkins medical board.

Stating that the hospital "should take steps to restrict smoking within the hospital environment," the resolution also prohibits doctors, nurses, or students from smoking in patient-care areas. These include convalescent rooms, nursing stations, elevators, and hallways. To set a good example for their patients, professional staff members are even requested not to smoke in patient lounges or waiting areas.

Smoking by professional staff is now permitted only in a separate smoking area designated within the public dining room, in the doctors'

dining room, research labs, offices, and other areas where patients are absent.

The smoking resolution was spurred by a letter to a hospital committee by Dr. Robert Mason, associate professor of cardiovascular medicine. "In its official position as a healing institution, the hospital should refuse to endorse the sale of cigarettes," he wrote.

Scientists at the Johns Hopkins Medical Institutions conducted much of the research leading to the original Surgeon General's report on the health hazards of cigarettes.

Johns Hopkins Medical Institutions news release, July 21, 1976.

Thirty-five mph ambulance—a boat

Star of Life I, a 31-foot Uniflite cruiser with emergency medical equipment valued at $12,000, will be based in Stamford, Connecticut, to provide free medical emergency rescue and patrol duty on Long Island Sound from Norwalk to Greenwich, Connecticut. Owned by Fairfield Medical Products Corporation of Stamford, the boat will be staffed by volunteers —doctors, nurses, emergency medical technicians from the Stamford Ambulance Corps, Stamford Marina Police, and U.S. Coast Guard Auxiliary. Clearly marked with the new international emergency medical service symbol, a six-pointed blue "star of life" (on the flying bridge and after section of the deckhouse, both sides), it also has a siren and high-intensity blue emergency light mounted above the bridge. With twin 225-hp engines, the boat has a top speed of 35 mph.

Emergency medical instrumentation in the cabin of the *Star of Life I* ambulance boat provides medical and paramedical personnel with the equipment to start vital life-saving medical care the moment the victim is brought aboard for transport ashore to a hospital.

The things I cannot change

By Dorothy Kleppe

In December of 1949 I came home from the hospital to a lopsided Christmas tree decorated by my sons Tom, 12, and 6-year-old Jim, with the help of their dad. Three-month-old Mike had not helped with the home-cut paper chains held together with flour and water paste. However, he shared my view of those and the patiently strung popcorn chains, which breathed love into a superb creation. That Christmas tree was the most beautiful sight I had ever seen.

I entered the hospital in November, 1949, for an appendectomy and tubal ligation, and was assigned to a four-bed ward. My roommates teased about which one would inherit the new gown I splurged on, if I didn't come back. Little did I know how close to reality that joking was to come.

I came out of surgery with a CVA (cerebral vascular accident, cerebral meaning the brain, and vascular meaning the blood vessels that go to the brain). I lay in a coma for three weeks and I recall coming out of it thinking it was the same day as my surgery.

I couldn't figure out what was wrong I knew something was wrong, but what? I couldn't talk, and my right arm and right leg wouldn't move. I was in a criblike bed that brought on claustrophobia. I recall crying a lot. I didn't know what day or month it was, and didn't really care. I remember my food having cooled off by the time they fed me, then being scolded for not eating. The frustrations of not being able to communicate were unbearable. It seemed those around me felt that if I couldn't communicate, neither could I hear. There were several excruciating instances when I heard discussions about myself. It was as though I were a vegetable. Yet I remained a listening, feeling, loving, hoping person, trapped by circumstances I could not change.

One night I buzzed for assistance to

SKIP BAKER

use the bedpan. A nurse stuck her head in and exclaimed, "You're all right, Mrs. Kleppe. It's 2:00 A.M.; go back to sleep." Well, I wasn't all right. I ended up having a bowel movement and wetting the bed. I cried myself to sleep.

Another day a nurse came in and announced she was tired of brushing my teeth. She handed me the brush with toothpaste and a basin. I knew the brush should go in my mouth, but proceeded to brush my hair with the toothpaste, as I could not manipulate well. If she had guided my hand I'm sure I would have made it. She laughed at me, not with me, and I threw the basin, toothpaste, and brush at her, with inspired coordination. She put me in restraints and explained to the doctor in my presence that I had had a temper tantrum and she couldn't control me.

Another time a visiting friend noticed that my drinking water was warm, stagnant, and placed next to a dirty glass. When she asked for fresh water the nurse replied, "Mrs. Kleppe doesn't know the difference."

In honesty and fairness I should say that today the majority of my best friends are nurses, doctors, aides, and hospital personnel. Their encouragement, understanding, and compassion has been invaluable. The rare incidents in the first weeks of my twenty-five year handicap leave me with no bitter feelings. That was a long time ago.

Every day the doctor would say, "Three months and you'll be up and running." Three months came and went, and I was released from the hospital, but definitely not up and running. To this day I have very limited use of my right arm and right leg, and several years went by before I regained any semblance of speech. The speech section of my brain had been severely damaged.

When first home from the hospital I rejected the wheel chair proffered by friends. I refused to visualize myself in a wheel chair. Frustrations and self-pity built up. When company came I refused to eat, even though hungry. The fear of dripping and spilling food was too much for me.

Crawling from room to room I crawled around the house from bedroom to bathroom to kitchen, still refusing the wheel chair, at times overwhelmed by the awareness that three sons needed my care.

One day, while extremely depressed, I contemplated suicide. Crawling into the bathroom, I grabbed hold of the toilet seat and from there grabbed the sink. I took a bottle of sleeping pills from the shelf, intending to swallow them all. At that critical moment my baby, Mike, began crying. Tossing the pills aside, I inched along to him. Then came the realization—God was with me. I knew in that moment He still had a purpose for my life.

The summer of 1950 I started going to the Curative Workshop, a rehabilitation center. Three times a week I took occupational and physical therapy and speech. My speech pathologist told me to spit out everything I had on my mind, but my thinking processes seemed unbearably slow. My youngest son's language developed much faster than mine. Trying to talk on the telephone was very difficult, so unless I was expecting a call, I didn't answer its ring.

Why me? Over and over in my silence the thought would flash, "Why did this happen to me?" We think such things can happen to everyone but ourselves. During this time I was having five or six seizures a week, and the doctors were trying to find the right medication to control them.

In the midst of my troubles I received a helpful letter from my older brother, Jeff. In it was a poem that changed my life—the "Serenity Prayer":

God grant me the serenity
To accept the things I cannot change,
Courage to change the things I can,
And the wisdom to know the difference.

I graduated from the Curative Workshop, with honors. Persons suffering a cerebral hemorrhage or CVA today are usually given physical, speech, and occupational therapy almost immediately. They are also helped to a faster recovery through the use of a swimming pool or Hubbard whirlpool tub.

What you could do The effects on the patient are still the same, though. Here are some suggestions for anyone caring for a person with a similar problem:

1. It is most important that the patient know what his problems are; he must be able to establish communication between himself and his doctor.

2. Talk directly to the patient, not over him. He can usually hear, even though he cannot talk.

3. Discuss his physical condition in a positive way whenever he can hear you.

4. Treat him with compassion

and understanding, as one human being to another.

5. Don't be too helpful. Encourage the patient to do everything he can for himself.

6. Praise him, remembering he is lonely, frustrated, and frightened. Noncommunication is mental torture.

7. Slow down in conversation. The average person speaks too fast. Often the patient catches the beginning and ending words of sentences, but misses what is in between.

8. Never answer merely to pacify. I recall a nurse standing next to me saying, "I bet you're glad to be going home tomorrow." Just to see what she would say I answered, "I think I'll murder my family." Without hesitation she replied, "That will be fine"!

9. Simple words and gestures will sometimes help.

10. Try not to answer for the patient. When I was learning to speak again, I found practicing in front of a mirror was a great help.

11. Physical therapy, occupational therapy, and speech therapy are vitally important, as are exercises for the face, mouth, and tongue. I chewed gum to keep from getting a drooped lip.

12. Don't be alarmed over occasional emotional outbursts.

13. Place a book or tablet by the patient's bed for visitors to sign. This helps family members know who has visited.

14. Encourage the patient to keep well-groomed. There is much truth to the adage, "If you look good you feel good."

15. When asking a question, watch the patient's eyes and reactions. It is easier to say No than Yes, but it's easier to nod Yes than to shake the head No. I still have to concentrate to shake my head No.

16. Be careful of words that sound alike but have different meanings. As an example, a doctor was talking to a nurse across me and asked, "How is she?" The nurse must have replied, "She's very apathetic today." Thinking she had said I was "pathetic," I became so overwrought they had to calm me down with a shot.

17. Finally, to doctors, nurses, and aides: don't go "by the book" all the time, except for medications. You need to be firm when it's for the patient's good, but your patients will be fortunate if you have an attitude of warmth and personal interest, sprinkled with a sense of humor.

This story has taken me many years and countless hours to put on paper because I was so determined to express it in my own thoughts and write it myself. This is indeed an accomplishment for me, because a CVA patient is often left with a short attention span and the inability to coordinate thoughts and keep events in proper sequence. Also, I was right-handed, and with my right side paralyzed, I knew if I was ever going to write again it had to be with my left hand. I do it all by printing.

At one point, after I was finally able to talk again, my husband and I had a spirited dispute. He recalled how long he had prayed for me to talk again, but decided he hadn't realized how well off he had actually been! We ended up laughing.

I have Ray, three sons, their wives, six adorable grandchildren, and many relatives and friends. As someone has said, "It's not what you have lost; it's what you have left." &

In 1965, Dorothy Kleppe was given a meritorious service citation by the mayor of Minneapolis for helping the handicapped in her hometown.

Dorothy Kleppe was named Handicapped Person of the Year for the State of Minnesota in 1965. In 1973 Fairview Hospitals of Minneapolis presented her with a pin, recognizing her 3,000 hours of volunteer work there. In February of this year Mrs. Kleppe received a Certificate of Award from the Carnation Company and Voluntary Action Center in Minneapolis "In Recognition of Distinguished Service."

PHOTOS BY STEVE MUELLER

The flying nurses

By Lisa Levering Berger

Eleanor Lust grabs one of the seven large, black cases with the initials O.D. on it. Dressed in paratrooperlike hiking boots and a blue jump suit with zipper pockets on her arms, chest, and legs, she runs outside to the helipad.

The rotors begin to gain momentum as she stashes her case beneath the litter and slams shut the sliding glass doors. The blades of the red-and-white helicopter reach air speed, the helicopter hovers, lifts off, and then banks sharply toward the mountains in the west. Like twelve other people at St. Anthony's, Eleanor Lust is a flight nurse.

Eleanor spends a lot of time in "the box," a square, windowless room nestled on St. Anthony's Hospital roof. She is a member of the Flight for Life program in Denver, Colorado.

In the box she fills in charts, writes reports, and checks insulin, IV fluids, syringes, and other lifesaving supplies that line one wall of the room. And she waits for the telephone to ring.

When a call is received, the dispatch room contacts a pilot by telephone or walkie-talkie. The team takes an average of three minutes to become airborne. Averaging five flights a day and more than 3,000 flights since 1972, calls for the emergency helicopter come from police, fire departments, mountain rescue teams, forest service, private physicians, and other hospitals.

Flight nurses are the heart of the Flight for Life program. They transfer premature babies and respiratory cases in and out of Colorado hospitals; they fly into Rocky Mountain ski-country to rescue injured skiers; they treat auto-accident victims who are sometimes trapped in cars.

The helicopter has been converted into a flying emergency room that is fitted with snowshoes and pivoting wheels to make mountainous landings possible. Inside is an electrocardiograph monitor, a defibrillator, suction apparatus, endotracheal tubes, intravenous fluids,

oxygen, and emergency drugs. And, of course, there are two stretchers that slide in and out of the chopper.

The dispatch room is equipped with two full-time operators, seven telephones, nine radios, and a twenty-track tape recorder.

Rigorous training Helicopters are not new in emergency medical service. What makes St. Anthony's program special is the flight nurses. To become one, a person must be a registered nurse and have at least a year's experience in an area of critical care, such as emergency room or intensive care.

The special training program for the flight nurses includes a six- to eight-week orientation program, a nine-month class in critical care practicum, and constant work in the emergency room.

The flight nurses view video tapes and discuss the problems they will encounter; they practice intubation with the anesthesiologist; they make rounds with cardiologists and pulmonary doctors; they study the patients in the intensive care units. The next step is flying with experienced nurses.

Security precautions are necessary while the flight nurse is working on the patient. People are inevitably attracted by the excitement of a helicopter and an emergency situation. The police do their best to clear the area of both the curious and the concerned.

But the flight nurse is still working under conditions very different from a hospital setting. She must often contend with the people around her, including, sometimes, the victim's family.

Doctors are sometimes present With very serious cases, such as premature babies, a doctor will accompany a flight nurse. But most of the time she works alone. Many of the emergency calls are for vehicle accidents—cars, trains, airplanes, and even snowmobiles.

"We walk a tightrope. We usually have only our own judgment to go on."

Cardiac arrests are also common.

Whatever the emergency, the flight nurse must immediately assess the patient's condition and begin initial treatment and stabilization. This has added a new dimension to their nursing.

"We walk a tightrope. We usually have only our own judgment to go on. But with a helicopter, we can haul the patient back to the hospital as quickly as possible so the appropriate physician can take over," said Barbara Lockwood, flight nursing supervisor.

Self-analysis Even when a nurse leaves "the box" and the helipad, her flight nursing continues. Once a week, the Flight for Life team has a critique session.

Doctors, nurses, and pilots meet to talk about how they can improve their service. The pilot is concerned with security, about knowing he can land without a bystander getting caught by the chopper rotors. The session gives the nurses a chance to discuss procedure and treatment with the physicians.

"In the chopper meetings," said Barbara, "we often just fire questions at the doctors: 'O.K., I had this kind of patient with these problems. This is what I did. What could I have done better?' And we get lots of feedback from them."

Dr. Dan Dracon, St. Anthony's director of emergency medical services, sees the program becoming the model for similar programs throughout the country. "I think this proves beyond a shadow of a doubt that the helicopter and its team are an integral part of emergency medical service."

We were still on the hospital roof when the helicopter returned from a midmorning flight to a mountain clinic in Evergreen. To one side of the helipad was an orderly, who was bundled in an orange ski parka because of the freezing winds on the rooftop, waiting with a stretcher.

The chopper floated onto the pad, and John waited for the pilot's signal before pushing out the stretcher. Eleanor crawled out of the helicopter, IV bag in hand, and helped John put the patient on the stretcher. The young man, suffering from a drug overdose, was mumbling incoherently as they rolled him off the helipad and onto the express elevator. &

Lisa Levering Berger has taught English in a high school north of London. She graduated from the University of Colorado, and is now writing reports on charities for a consumer organization in Washington, D.C., as well as doing free-lance writing.

HOW TO SAVE A SEVERED BODY MEMBER

By Gary K. Frykman, M.D., and Virchel E. Wood, M.D.

Figure 1 This thumb was amputated when it became caught in the reins of a horse's bridle.

Figure 2 The appearance of the thumb after restoration of the blood supply.

LOMA LINDA UNIVERSITY

Have you wondered what to do if you or someone else loses a finger, hand, arm, or leg in an accident? Of course, the first thing to do is to stop the bleeding by a pressure dressing or properly applied tourniquet to prevent shock. Before leaving for the hospital in a panic, one should try to retrieve the amputated part and take it along also. It may be useful to the surgeon and the patient.

Although it might seem obvious that a perfectly good hand that has been cleanly amputated from the arm should not be thrown away, that is exactly what was done with all amputated parts until the first severed arm was successfully reattached in 1962. This began the era of reattachment of severed limbs (called replantation).

Although all severed parts cannot be reattached, particularly if they are severely crushed or mutilated, one thing is certain: The severed part cannot be reattached if it is not saved and brought to the hospital. Relatively cleanly amputated parts can be considered potentially alive if blood circulation is re-established.

Successful major replantation has had to await the development of vascular surgery. In the first decade of the twentieth century some surgeons showed that severed blood vessels could be successfully joined together. However, during the next 30 years until after World War II, tying off the ends of injured vessels was the standard practice, which subsequently required the amputation of 49 per cent of limbs with vascular injury. It was not until the Korean War that injured blood vessels were routinely repaired and the amputation rate with similar injuries was then reduced to 13 per cent. It was not possible to successfully repair vessels smaller than 4 mm. until the development of microvascular surgical technique.

Successful in 1962 The first case of replantation of a severed arm was in 1962 by Dr. Malt and co-workers in Boston on a 12-year-old boy. In 1964 the first successful hand replantation was reported by Horn, a British surgeon working in China. The first successful replantation of a completely cut-off digit (finger or toe) was performed in Peking in 1964. However, this information was unknown to the Western world until the opening of the scientific exchange with China about five years ago. The Chinese are the world leaders in numbers of successful replantations. Surgeons in America have been replanting digits only occasionally during the past several years. Now it is becoming much more common.

It was not possible to restore the circulation into

fingers until after 1960 when surgeons started using the microscope for blood vessel repairs, along with specialized micro instruments. Miniature and delicate tipped instruments are necessary in order to not further damage the blood vessels. Specialized miniature suture material has made possible the successful repair of blood vessels as small as 1/2 the diameter of a pinhead (0.5 mm.). The surgeon generally works under a magnification from 5-25 times. Of course, a small tremor, which everyone has, is magnified under the microscope, and developing steady hands to repair blood vessels this small takes much practice and patience. A surgeon cannot do this surgery well if he is emotionally upset or has "coffee nerves."

Blood clotting problem The clotting of blood in the tiny repaired vessels is a problem only partly solved. The development of a suture smaller than a human hair has helped considerably by decreasing the amount of foreign material in the vessel. The use of these tiny sutures attached to a needle 3/1,000 of an inch in diameter has become standard practice in repair of these tiny vessels.

After cleaning the wound of all visible dirt and foreign material, at least one artery must be repaired for each part that is reattached, as well as two veins for each artery. The nerves, tendons, muscles, and bones are all repaired, using standard surgical technique. Following surgery most patients are placed on medications to prevent the blood clotting in the newly repaired blood vessels.

Not everyone has the same option Not all patients may want or should be advised to have replantation. It may be that the whole amputated part is too badly damaged for replantation. The patient's general condition and the presence of other more serious injuries may influence attempting replantation. The parts, however, may be used in repair or reconstruction of the remaining, but damaged, limb. One example would be using the skin from the amputated part as a skin graft to cover raw areas remaining. Another would be saving bone as a graft for later reconstruction.

Extra hospitalization is required if replantation is attempted, and there is a 30 to 60 per cent chance that the replanted digit will not survive. However, the survival rate in some centers for reattached hands and arms is nearly 100 per cent. The work time lost by patients who have had their digits replanted may be excessive. For a working person replantation may not be worth the expense and the prolonged period of disability. Nonetheless, replantation can be offered to patients as a reasonable alternative to simple closure of the amputation.

The fact that patients have had positive results of surviving digital replantations is encouraging, but a longer follow-up on a large number of patients will be needed before final judgment can be made, as it is recognized that some of the surviving digits are not completely functional.

What to do with an amputated limb What does one do with the amputated part once he has retrieved it? It should be wrapped in a sterile, or at least clean, cloth and placed in a container and kept moist in a salt solution (best) or water. The part can be placed in a clean plastic bag, a sandwich bag or plastic bread wrapper will do in case of an emergency. Preserving solutions, soaps, or antibiotic solutions should *not* be used. If it will be longer than an hour or so before the patient and part can be brought to a hospital one should attempt to keep the digit cool by placing the bag in a container of ice, taking care not to freeze the amputated part. The shorter the delay before re-establishing the blood supply the greater the success rate. Six hours is the upper limit for preserving survivability of an arm. Amputated digits, however, may survive longer periods of time without blood supply, particularly if the amputated part has been cooled rapidly and kept cool. In China a successful case of replantation has been done as long as thirty-six hours after amputation, while the part was kept cooled.

Our plea is to save all of the parts injured in an accident. Many times, even if a digit or an arm cannot be replanted, bits and pieces of the detached extremity can be used for reconstruction. No prosthesis, lacking as it does the sense of touch, can ever completely replace the amputated part.

Clearly replantation is here to stay, as shown in Figures 1 and 2. The age is past when one must consider an amputated part as irretrievably lost.

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SKIP BAKER

Home, sweet

By Ann H. Banks

For thirty years I have lived with the sad memory of Kathy's death. The saddest aspect of any accident is the knowledge that it could have been prevented.

Our parents were occupied with their visiting as Kathy and I sat on the couch, bored with their chatter. Kathy was my cousin and best friend.

Impatient with our mothers, we left to look through a box of unused toys in the closet. At the bottom of the box my fingers touched some forgotten play dishes. We thrilled at finding one cup and saucer, one plate, and two shining, small, clear glasses—just the things for a play dinner. Passing through the living room, we made our way to the back of the house and headed for the basement with our treasures.

The basement was cool and secluded—a perfect spot for our fun. A card table in the corner, a stool, and an old kitchen chair became our dining set. The worn towel we spread as carefully as if it were fine lace. Looking around for something to complete the table, I saw a partially filled pop bottle half hidden by a water meter. It was out of reach, high on a shelf. Putting a chair in place, I stretched until my fingers closed around the dusty bottle. The cap was gone, so I could easily fill our glasses. The liquid stood thick and dull black, waiting, as Kathy and I made graceful bows. "I want to be the queen," Kathy announced gleefully, as she waved her imaginary scepter. We made a silly toast and lifted our glasses.

The noxious odor made me stop before the glass touched my lips. "It smells rotten," I said. I looked at

ome- a dangerous place for children

Kathy; her glass was empty. Her pale, blue eyes widened in alarm. She opened her mouth but no sound came out. Agony held the cry in her throat. She jumped up, and I wondered if she was mad at me when she knocked the stool over in her flight. She ran from the house, away from the cool place where play had turned to burning pain. Her mother heard her screams and stood frozen helplessly as Kathy ran.

Daddy is driving crazy, I thought, as we sped to the hospital. Kathy lay limp in her mother's arms, the two bodies fused into one.

Trying not to let my mind work, I waited in the car, staring at the heavy hospital door. For a moment the world seemed very still as I envisioned Kathy walking stately, her face aglow, and her head adorned with a precious crown.

The hospital door swung open. It was my mother, my father, and my aunt, but theirs were not the faces I knew. Daddy had his arm around my aunt, and she was letting him support her. I gaped at my mother, for tears were flowing freely down her cheeks.

We drove home slowly. Mother sat very close to me, but the car seemed empty without Kathy. My aunt was silent, gripping her hands tightly in her lap. Daddy whispered softly to my mother, "Ann is too young to understand."

Poison prevention When discussing poison prevention with young mothers, I am shocked that some are unrealistic about the danger. But accidents can happen to anyone. It takes only one unthinking moment, one precaution ignored, to cause injury or death.

One mother boldly told me her children didn't get into her cupboards, so she didn't worry what was within their reach. And yet some children have died in places where they were investigating for the first time. Children have proved they will eat anything. The odor or consistency will not necessarily stop them, as the sharp smell of deadly poison stopped me some thirty years ago.

Poison prevention begins at the supermarket. Parents would not knowingly bring poison into a home where an active child played, without serious precautions. They may do so unknowingly, however, when buying products to clean floors, polish furniture, or remove stains, if they do not read the label and heed the warnings.

Floor wax packaged like food While shopping I noticed the floor waxes on the shelf. That one looks good enough to eat, I thought. And that may be the very thing to entice a 2-year-old to try it. Check the shelf and study the labels, asking yourself, "Is there a safer container, a safer closure, or a safer form of the product?"

In most instances, liquid products that come in a spray container have less potential for serious trouble than their counterparts in a large mouthed jar or bottle, simply because the liquid comes out in smaller amounts. Don't buy a product that in its packaging resembles food or drink containers.

Safety caps may prevent an accident, but are no guarantee. As an added precaution, purchase baby aspirin in thirty-six-tablet-sized bottles. Regular aspirin also should be purchased in small quantities.

Many aerosol cans contain products poisonous to children, but all aerosol cans can be dangerous in a small child's hand. The nozzle can shoot fluid into a child's eyes with such force that permanent damage may be caused.

Don't call medicine candy Never bribe a child to take medicine by referring to it as good or as candy. Don't make the taking of it fun and games, and never give medicine in the dark.

After returning home and finding that a baby-sitter had left the fly spray on the kitchen table, I decided to label frequently used products with my own reminder. The hair spray, dishwashing detergent, deodorant, and fly spray now are labelled CAUTION, PUT UP. Such words are a reminder to parents, older children, and baby-sitters to do just that.

Leaving medication in a purse, a suitcase, or an unlocked trailer house or camper can be deadly.

Poisonous household substances and medication should be locked up separately and stored away from food. Cosmetics such as nail polish and perfume also should be out of sight and out of reach of children.

The memory of Kathy's death has made me, personally, acutely aware of accidental poisoning. Yet there is still the threat of being unaware for one fatal moment. When the children are tired or hungry, when the parent is rushed or too busy, or when one's mind is preoccupied—these are the most critical times. The kitchen, bathroom, garage, basement, or patio can each pose a real threat to a child's safety. Such a threat should be given constant, thorough, and serious consideration.

I eat what I do by choice

By Janice L. Booker

I sat in that room surrounded by other fat women and wondered why I was there. I'd spent a lifetime on diets that were successful at first, then I would gain the lost weight all back—so what was the use? Perhaps I should just give up. After all, other aspects of my life were more than satisfactory, did I have to look perfect, too?

For more than forty years I had agitated and tussled with obesity. A lifetime struggle, peppered with mild successes, but obesity was never overcome.

Habits entrenched The overweight woman approaching middle age has a formidable problem, whether it is a childhood carry-over or insidiously creeping pounds due to the proximity of the kitchen all her adult life. Habit patterns have a way of getting entrenched, and when they involve a pleasurable and necessary activity such as eating, it becomes all the more difficult to control. How could I ignore a behavior modification program at The University of Pennsylvania Hospital, right in my own backyard?

There were eight women in the group. All were in their forties, attractive and pleasant. One of the admission requirements to the program is that an applicant be at least 20 per cent overweight. I suspected that two of our members barely filled that requirement. They looked O.K. to me, and I was overcome with the same feelings of anger I experienced the few times I had attended other weight-reduction meetings—and a resentment of the spate of size 10's.

I learned not to be so angry at these women. As I got to know the people in our group better, I realized that the frustrations and self-anger of people engulfed in the constant struggle to control their weight is universal.

Weighing in The first order of business was to get weighed. Naturally! This was done privately in a separate room. Although two of the group leaders were present to record and graph the weight at each session, numbers of pounds were never discussed within the group meetings, and, in fact, any discussion of gains or losses by scale figures was immediately discouraged.

Although weight loss is the focus, particularly in the initial months, the major objective of the program is to change eating habits, and discussions concentrate on these. If the program is followed, weight loss will come naturally; however, the thrust is to change behavior and concentrate on new eating patterns for a lifetime.

While we were weighed individually, I carefully examined our professional staff. There was a psychiatrist who was young, handsome, possessed a fine sense of humor, an adorably dimpled chin, and was very slim. The psychologist was dark, attractive, with an intense face that belied his calm manner, and unbelievably thin. The psychiatric nurse was blonde, young, vivacious, and—you guessed it—slim as a reed. The fourth member of the team was the psychiatric social worker, motherly, sweet, attractive, and——I won't bother you with the rest. You know.

Throughout the program I was struck by the incomparable sensitivity of the staff. They really understood what it is to have a weight problem—and treated it just like that, a problem that perhaps could be solved by applying new behavior patterns to the situations that create overeating. That the staff believed implicitly in behavior modification and this weight-control program was obvious in many ways. They all kept the same food records the participants did and applied the theories to other parts of their lives.

The theory of behavior modification sounded so sensible and practical I began to have my first fluttering sensation that this might work. As the weeks went on, Thursday afternoons became a precious time for me. I never thought I would look forward to getting together with a group of obese people to discuss weight, but it became a haven. The ability to talk freely about overeating and weight, problems encountered, successes achieved, failures repeated—what a relief it was to know that I could discuss these with people who really understood.

Did I lack will power? In one of our early sessions one of the group lamented her obsessive lack of "will power" (the argument always used against inability to control food intake), and her wailing raised my consciousness about this question. How could people who were successful in so many areas of their lives lack will power? Obviously, they exercised enormous control over themselves personally and professionally in order to achieve success. With a sense of deliverance I discarded that feeling about myself. I had no lack of will power; I had bad food habits that had to be changed in order to deal with this particular phase of my life that was unsatisfactory.

The more I thought about it, the more ludicrous it seemed that I could have ever considered myself as lacking control. The organized manner in which I structured each day was both a joke and a matter of envy among friends. My everlasting lists were a family wisecrack. What I lacked was the ability to apply this control to eating. It began to look possible.

PHOTOS BY SKIP BAKER

There were weeks when there was no weight loss, and even times when there was a weight gain.

Once the initial forms were filled out we worked out individual charts that told us how much weight we could expect to lose per week within a specific caloric structure. We also found out how many calories we could comfortably ingest eventually, having reached what was considered the proper weight for each individual. Although diet sheets and suggested food lists were never distributed, the emphasis was on calorie counting as the means to weight reduction and maintenance.

When everyone arrived each week, the first thing we did was pass our food records around among ourselves and the staff to review caloric intake and types of food eaten. One of our group had a particular problem with eating almost exclusively carbohydrates, and although she kept them within her prescribed daily intake she was encouraged to expand her diet to include more protein, as there was concern about nutrition and balance.

The important focus of the entire program is individualization. This pertains to weight as well as eating patterns. Ideal weight charts are thrown out the same window as fad diets. Each person is an individual, and his evaluation of where his weight should ideally be is also an individual matter. The program is based on a carefully controlled, week-by-week introduction of techniques governing eating. At each meeting a new process is introduced and added to the growing list. Eventually, the techniques become highly personalized, so that they are adaptable to each individual's life-style and personal circumstances.

Walk from the parking lot

The objective of behavior modification is to alter responses to already learned habit patterns. It is important that techniques used are merely a different application to a familiar pattern so that participants are never expected to introduce alien postures into their lives.

As an example, when the question of increased physical activity was introduced, no one was expected to join a gym or ride a bicycle to work. Experience has shown that grandiose plans such as these are at best transitory, and their failure to work leaves the person frustrated and puzzled. Rather, we were told to alight from a bus a block before our destination, to walk to neighborhood stores rather than drive, to carry shopping bags into the house one by one, to make several trips to distribute laundry.

None of these activities were unfamiliar—all are part of everyone's daily life. What I found most helpful in expanding physical activity was to stop searching for a convenient parking space in a shop-

ping center and to take one fairly distant from my destination and walk to and from the car with each purchase.

There was a carefully calculated approach each week to the introduction of new techniques. We began with what is probably the most important and most continuing, and that is the keeping of individual food records for each day of the week. Printed record sheets were distributed that indicated the time of each meal, its duration, the quantity of food that was eaten, and how many calories. These were totaled at the end of each day.

Later these records were to become more complex, indicating meal companions, places, and special circumstances, with a weekly three-page summary, which showed how many times food was eaten, whether it was a meal or a snack, the person's mood, whether sitting or standing while eating, with whom and where, breakdown of kinds of foods, and additional details designed to help the individual and the staff understand what particular circumstances contributed to each person's food patterns.

Delay the eating part Another technique introduced was to delay the beginning of a meal, with assorted ideas to help in doing just that—such as wrapping silverware in a napkin while setting the table. Other memory-triggering devices were utilized throughout the introduction of all techniques. We were also told we must slow down the eating process, accomplished by placing utensils back on the plate after each mouthful, chewing extra slowly, and precipitating waiting periods between each course.

We learned the importance of restricting eating to one specific place. One of the patterns overeaters share is the tendency to carry food to various rooms in the house and associate snacking with other activities such as reading, watching television, talking on the telephone, et cetera. The thrust of this technique is to isolate meals so that nothing else accompanies the process. Participants were asked to try to eat in a room other than the kitchen, to remove eating from the source of the food.

"I can't eat tonight. I have to paper the bedroom."

There were weeks when there was no weight loss, even times when weight was gained. There were no recriminations, there was no doctor wagging his finger, there was no talk of will power. There was only empathy and practical suggestions of how to "get back on the track." The realization that being truthful about binges or whatever problems occurred during the week would not meet with anger but only identification from staff and fellow members made it possible to be scrupulously honest.

Every dieter consoles herself continuously that "this week was a special circumstance," or "this kind of weekend won't happen again," or whatever rationalizations we use as solace that things will be different "later." Probably the most maturing aspect of the program for me was the deep realization that circumstances would never change —only I could.

Planning ahead We learned to preplan our meals so that we could prepare for dining out or parties. We also learned the helpfulness of leaving something on your plate, no matter how small. It is necessary to detract from the overeater's need to clean the plate, and that wee bit of food staring up at me makes me feel noble and virtuous.

As the program progressed, greater stress was placed on individual circumstances. Since the objective is to change those behavior habits that revolve around food, all participants were encouraged to discuss their own patterns that contributed to overeating.

One of our group, Arlene, who lived alone, found it difficult not to start gobbling food the moment she arrived home from her office. The use of a timer placed behind her front door (which was upset when she opened it each evening) acted as a conditioned response to delay eating by progressively timed postponements. Eventually she was able to wait fifteen minutes and then prepare a reasonable dinner rather than dash for the refrigerator the moment her door was opened.

Helen was saved the temptation of stopping at a neighborhood fast-food place on her way home from work merely by rerouting her travel so that she never passed the drive-in.

Sally had difficulty refusing dinner invitations, which came in great profusion during her husband's frequent traveling times when she was left alone. She was able to circumvent this by firmly utilizing another of our techniques—creating alternate behavior. We were all encouraged to introduce into our behavior some-

thing we could do that would act as a substitute for times when we might find ourselves drawn irresistibly toward the refrigerator. It had to be something that could not be done while eating.

Sally was an able decorator and craftswoman. She put these talents to work, and it became easy to refuse a dinner invitation with the truthful statement, "I can't leave the house tonight. I'm in the middle of papering the bedroom." By the end of our six months she had reupholstered a sofa, wallpapered a room, painted her kitchen, and started in business with a friend. As a side benefit she found she was less lonely when her husband was away, because there were so many projects in which she was involved.

Keeping away from the goodies Joyce faced the problem of a skinny son returning for vacations from college and requesting a host of goodies unavailable to him there. She knew that preparing them for him would be anathema for her, so the group suggested a small refrigerator for his room so that his special foods could be available to him but away from the family.

I found that my own biggest problem revolved around entertaining or being entertained. I was able to follow the program perfectly during the week, but weekends created very special hazards for me. I learned to discard food after a party, either into the freezer, by giving it away, or as a final alternative, shoving it down the garbage disposal. While this temporarily distressed the thrifty part of my nature, I was able to rationalize that the sewage system needed it more than my daily calorie count.

Another technique dealt with shopping for food, and it became quite easy for all the members of our group to eliminate impulse buying. I solved it by abolishing all trips

I started doing all my shopping by telephone, and therefore I ordered only family essentials.

to the supermarket—I did all my shopping by telephone at a store that delivered, and therefore I ordered only family essentials.

Another member of our group planned for weekend parties and restaurant dining by calculating ahead of time how many calories she would allow herself at the outing, and by distributing the remainder for the day between her breakfast and lunch. This fit very well into the preplanning aspect of the program. One might think it necessary to carry a calorie book around, but it is surprising how quickly one learns the approximate value of each food.

Assertiveness Learning to be assertive in restaurants and at dinner parties was something we discussed frequently. Listen at dinner parties—all the diminutives are saying No to dessert. Whether or not the hostess is offended is not important, as she'll be saying No to dessert at your home the following week.

A gain or a no-loss week represented only one challenge—to reinstate the program. One thing was clear from the beginning—following the tenets of the program would result in a weight loss. Systems for getting back on the program ranged from reintroducing techniques one by one to spending the day after a binge doing something nice for yourself. We all found it easier to resume the program after respecting ourselves rather than hating what we had done.

Our six months were over. We had been privileged to share something private in our lives and emerged with greater compassion for ourselves and one another. Most of us had lost between twenty and thirty pounds; one much more. I had lost about half of what I hoped eventually to lose. So we began follow-up and are about a month into it at this writing.

Have things changed for us? Will we be able to maintain this weight loss, go on to lose the rest of what we should, and join the anonymous "normals" of the world?

I don't know for sure, and neither does the staff at the university. I do know that it will always be impossible for me to put something in my mouth without evaluating the calories. That doesn't mean it may not go in, but I do have the awareness that the options are mine. I eat what I do by choice and not by circumstance. Control is in my hands and no one else's.

Janice L. Booker is a free-lance writer who has been published in *Family Circle, Parents Magazine,* and *Newsday,* among others. She also works as a reporter for a suburban newspaper.

THE LIVING BODY By Irving Jones, M.D.

The kidneys: keepers of the internal environment

The liquid part of the blood, the plasma, is laundered through the kidneys about 60 times a day. A million tiny filters in each kidney handle the passage of the body's total blood volume every five minutes, and a total of 180 quarts of fluid is actually filtered every 24 hours. Ninety-nine per cent of this fluid is absorbed back into the blood stream, leaving about 1 1/2 quarts of water and dissolved waste, the urine, to be passed each day.

The kidneys dispose of the waste products of body metabolism. Furthermore, the mineral and water composition of the body's *internal environment* is kept remarkably constant by the sophisticated workings of the kidneys.

Claude Bernard, the brilliant French experimental physiologist, was the first to call attention to the "internal environment" in 1865. Microscopists, by 1840, had established the fact that the body is composed of millions of cells. In the years that followed, Bernard, by careful observation and experimentation, became aware of the great importance of the fluid environment in which the cells carry out their vital activities. Without this fluid bathing the cells, whereby oxygen and nutrients can come into contact with the cells and into which wastes can be disposed, the cells would die.

Blood flow to the kidneys The main artery to each kidney (the renal artery) divides into five branches, each of which supplies blood to a part of the kidney. These branches further subdivide into arcuate (like an arch) branches, which send up straight, interlobar branches into the substance of the functioning part of the kidney, the cortex. Here the arteries further divide and send tufts of capillaries into the filter units, the *nephrons*. (See Figure 1.)

The first step in the complex process that cleanses the blood of its waste products is the passage of the plasma through the membrane of the capillary tuft. Only the blood cells and the larger protein molecules and some water re-

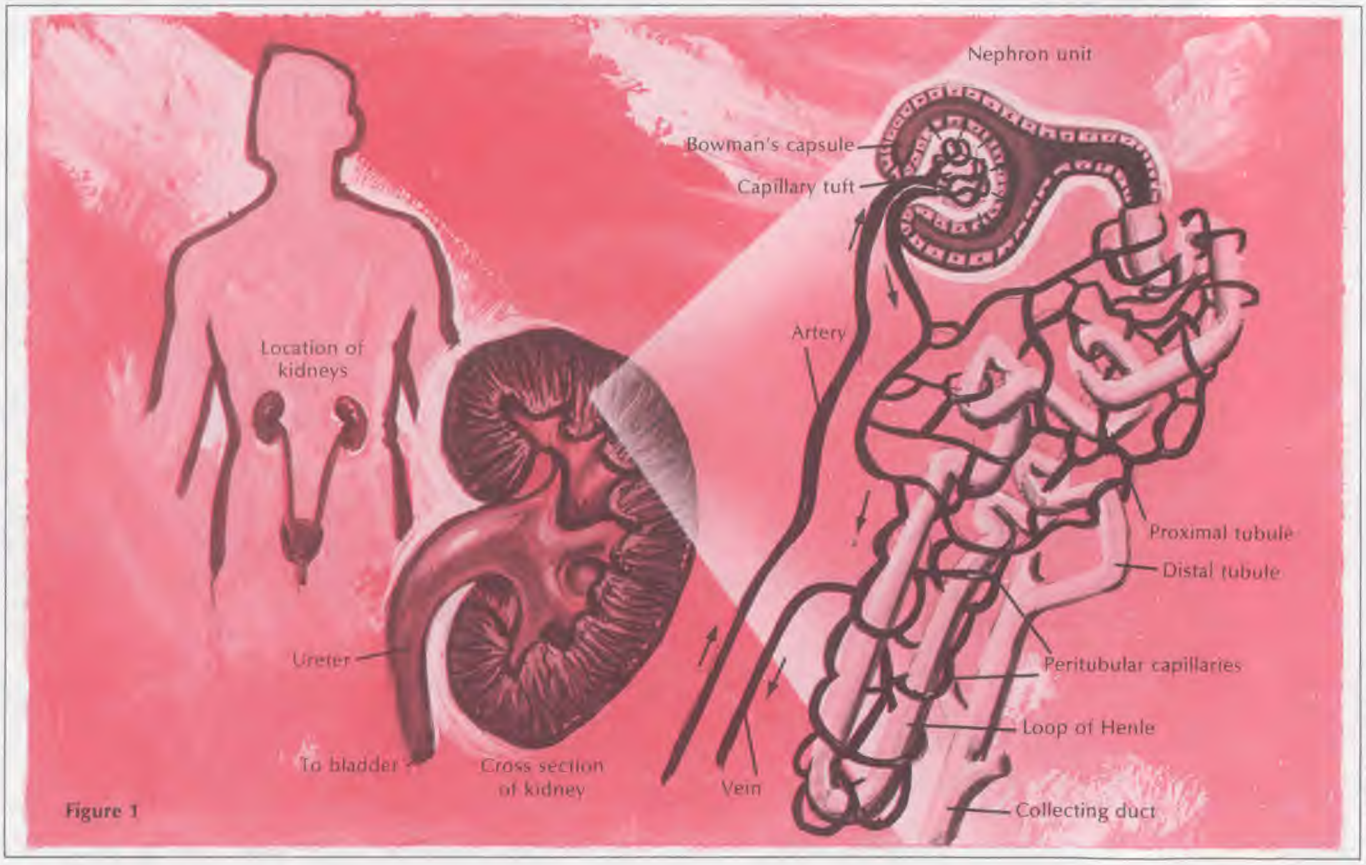


Figure 1

ILLUSTRATED BY TOM DUNBEBIN

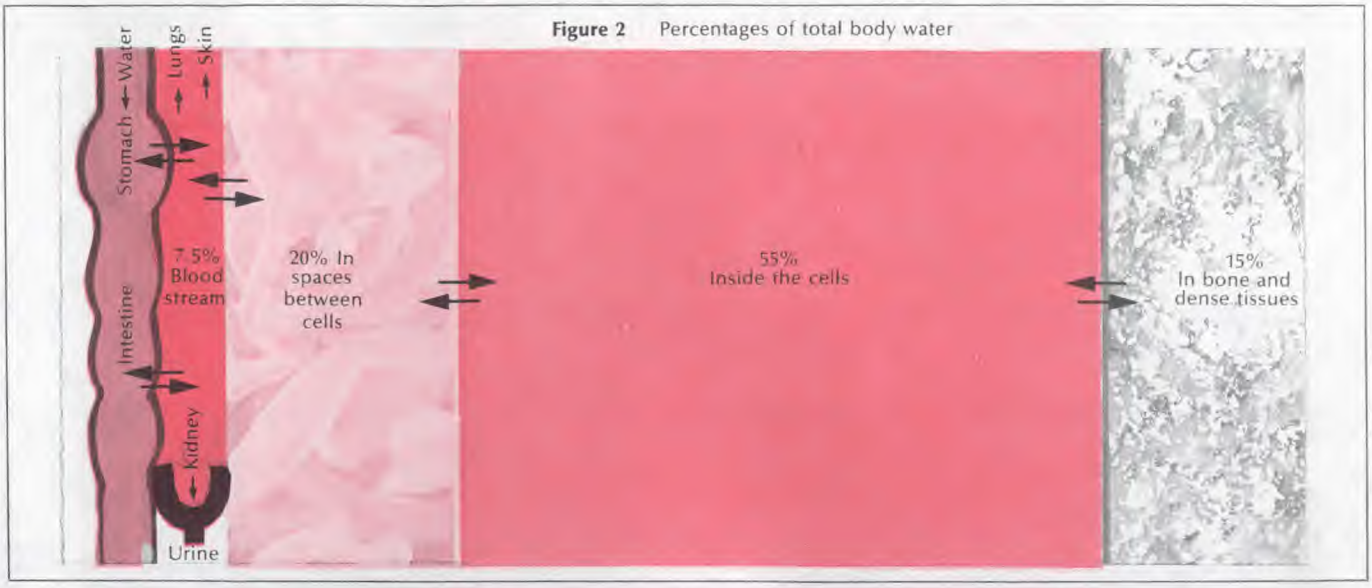


Figure 2 Percentages of total body water

main in the capillaries. All the rest passes through special pores in the capillaries, which are fifty times more permeable than the capillaries found, for example, in skeletal muscle. Furthermore, the pressure in the kidney capillaries is greater than capillary pressure in other organs of the body —75 mm. Hg. as compared to 20 mm. Hg. in other tissues. The pressure in the tuft is carefully regulated by biological pressure valves on either side of the tuft.

Now, what happens after we've run the entire contents of the blood, except for cells and protein, through the capillary tuft?

Within seconds the precious liquid is absorbed back into the capillary system that surrounds the nephron unit (see Figure 1). The usable substances such as glucose and amino acids and most of the water are returned quickly to the bloodstream to pass on into the veins and back into general circulation. Waste products such as urea, creatinine, and uric acid are only partly reabsorbed. These substances end up in the 1 1/2 quarts of urine that eventually drains into the bladder, where it is temporarily stored until it can be conveniently passed.

Urine, formed in the kidneys, is carried downward through the ureters by muscular contraction and then injected by spurts into the bladder. Gradually the bladder fills, its muscular walls accommodating to the increasing volume. The first urge to void is felt when the bladder contains about 5 ounces (150 cc.). The need to void can usually be disregarded until 12 to 14 ounces accumulate (400 cc.). At this point the urge becomes intense and there is nothing to do but call out, "Stop the car at the next gas station!"

Conserving body water Keeping the total body water content at optimum levels is no less important a function of the kidneys than the excretion of wastes and excess minerals.

If you were to remove all the water from an average adult body it would fill two five-gallon cans. Water makes up 50-55 per cent of the total body weight, and because it performs so many vital functions in the body, the quantity of water in the blood, in the intercellular spaces, and within the cells, must be maintained at quite precise levels. Most of the water is found inside the body cells (55 per cent). About 7.5 per cent of it circulates in the blood stream, and about 20 per cent is found in the spaces between the cells. The remainder is located in more dense tissues, such as bone, connective tissues, and cartilage (15 per cent). A small amount is found free in such places as inside the intestinal tract, inside the respiratory tract, and in the bladder (2.5 per cent). (See Figure 2.)

Thirst signals the need for water Since there is an absolute need to get rid of wastes from the body through the kidneys and since this is done by dissolving the wastes in water, there is an urgent need to replace the water lost via the kidneys. Water is also lost from the skin as the body cools itself (sweat). Water is lost in the air exhaled from the lungs, and a small amount of water is found in the stool.

All the water lost through these routes (urine, sweat, breath, feces) must be replaced. Otherwise a gradual dehydration takes place, triggering intense thirst.

Ordinarily we drink sufficient liquid, 4-5 cupfuls (1,200 cc.), and obtain enough water from solid foods (1,000 cc.) to take care of our *minimum* needs. But this is far from ideal. Such a minimum water intake requires the kidneys to work harder to reduce water excretion to a minimum. This results in concentrated, often irritating, urine and paves the way for stone formation.

Low water intake also requires maximum reabsorption of water from the digestive tract. The stools become hard and often constipation develops. With less water in the respira-

tory tract, mucus becomes thick and is harder to raise. Sweat becomes more concentrated and body odor more obvious. The old suggestion of six to eight glassfuls of fluid a day is still a good health rule. Why not stop right now and get yourself a glass of cool water and sip it while you read the rest of this article. M-m-m, good!

When illness occurs in which water is lost, such as with vomiting, diarrhea, or with high fever through perspiration, dehydration may become acute. If water can't be retained because of vomiting, a medical emergency develops and intravenous fluids must be administered. This is particularly true in small children, who become dehydrated rapidly.

The conservation of body water is largely dependent on the healthy functioning of the kidneys. These master chemists even now are sorting out and disposing of the wastes and excess minerals, guarding carefully the water and mineral content of your internal environment. And, incidentally, there is no extra charge for this service. If you had to have this done by a mechanical device known as an *artificial kidney*, it would cost you from $5,000 to $15,000 a year. &

THE LIVING CELL By Irving Jones, M.D.

How the kidneys handle salt

Ordinary table salt brings out the flavor of corn on the cob or a slice of tomato. Salt, otherwise known as sodium chloride, also plays a vital role in a great variety of body functions: the strength of the heartbeat, the transmission of nerve impulses, and the secretion of hormones. The kidneys are responsible for keeping the right amount of salt in the body while getting rid of the excess.

Most of us eat too much salt, because we like the way it accentuates the flavor of food. (Salt is one of the four taste sensations detected by the tongue, along with sweet, sour, and bitter.) Most of this excess salt is excreted by the kidneys. Small amounts are lost through sweat and from the digestive tract.

If a sample of blood were to be taken from a healthy person each day for a week and analyzed for its salt content, the quantity would be found to be remarkably constant. Most of the sodium chloride is filtered through the capillary tuft of the nephron and passed into the tubules. But the tubules are rigged up with a very efficient "sodium pump," which extracts just the needed amount of salt to maintain its proper concentration in the plasma and the intercellular spaces.

How do the kidneys know how much to send back and how much to let go?

Several hormones are involved in this vital process, notably *aldosterone* from the adrenal cortex. The chief function of this hormone is to stimulate the kidney tubules to reabsorb sodium. So potent is this hormone that tumors of the adrenals, which secrete aldosterone, can cause serious salt retention and high blood pressure.

The kidneys themselves influence the process of sodium reabsorption by secreting a hormone *renin*, which activates another hormone, *angiotension*, which stimulates the production of *aldosterone*. (See Figure 3.)

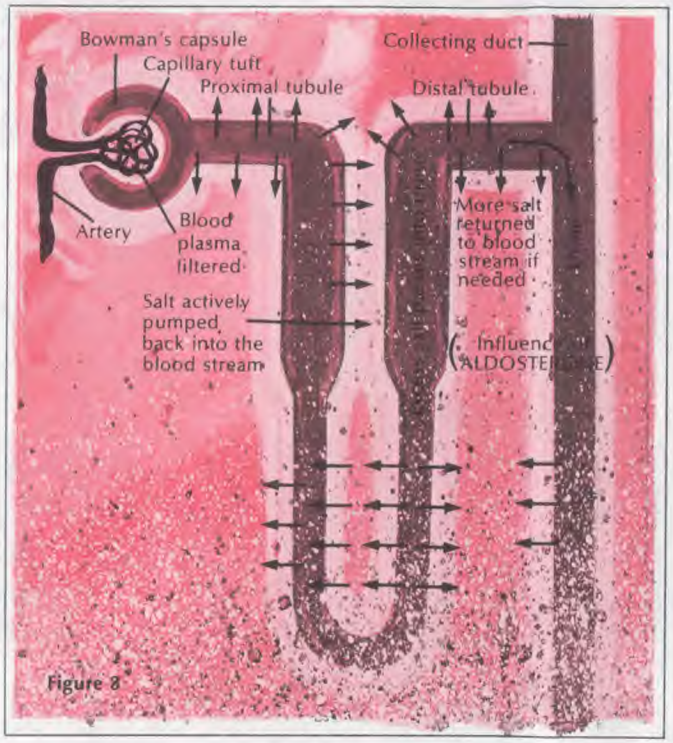


Figure 8

A bit complicated? Yes.

Many unsolved problems challenge research scientists who study these mechanisms, especially those which have to do with the very common and very serious health problem *hypertension* (high blood pressure).

The wise person is reasonably cautious about the amount of salt he uses. Furthermore, he chooses a wide variety of fruits and vegetables, nuts and grains, foods that assure him a sufficient amount of other mineral elements needed in the body's internal environment. A wise person also drinks plenty of water, so that his kidneys can function most efficiently.

These remarkable organs will last us a lifetime if we adjust our life-style to harmonize with the laws that govern their vital functions. &

Turning the biggest corner of all

By Vivian Buchan

Although every birthday is turning a corner of sorts, turning the one at 65 is undoubtedly the most dangerous corner of all. It's apt to plunge one off the road, as it did my cousin, for instance, who said, "The day I signed up for Social Security and Medicare, I became one hundred years old."

Up until that time, he'd celebrated each birthday with gusto, declaring a man was only as old as he felt. He'd been filled with the zest for living and fired up with new ideas. But, suddenly, he became an old man. Why?

Dr. Hans Selye, of the University of Montreal, said, "When we get the idea fixed in our heads that after 65 we're too old for exercise or learning new things, we create a negative self-image. We begin doing the very things that make us old when we see ourselves as old. We cut down on physical activity and lose interest in new things. We curtail social activities, become set in our ways, bored, and give up our great expectations."

He would probably have said that my cousin's self-image had always been that of a young and vigorous man. But when it changed to one of an old man he became old.

Self-image is how we see ourselves, not how others see us. It is what makes one person a success, another a failure. Dr. Raphael Ginzbert stated twenty-five years ago, at the International Gerontological Congress at St. Louis, "The traditional idea that we grow old and useless after 65 is responsible in large measure for becoming old at that age. In a more-enlightened future we may come to regard 70 as simply middle age. Age is in the mind, not calendar years."

We think ourselves into old age, we don't grow into it. When society slaps the "You're Old" label on the lapel of a 65-year-old person (and he leaves it pinned on), he becomes old.

Dr. Selye, who has studied for forty years the effects of stress on people, believes there is a basic life force (that he calls "adaptation energy") we use every day to adapt to stress conditions. "All of life is adaptive," he wrote. "It is not an end in itself; it is simply a means to the end. We're all goal-strivers until we reach the point where we think we're too old to set new goals. Our self-image becomes so negative we fail before we begin, even if some motivation is strong enough to tempt us to start something new. Without goals the supply of life force weakens, and as the life force weakens we weaken and grow old."

Creative people live longer and produce longer than noncreative workers. Michelangelo did some of his best paintings after 80; Edison was still inventing at 90; Picasso dominated the art world when he was past 75; Shaw was still writing plays at 90. The list goes on and on. Was it because they developed a nostalgia for the future instead of the past that kept them looking forward instead of backward?

Dr. Arnold A. Hutschnecker wrote in his book *The Will to Live*, "We age, not by years, but by events and our emotional reactions to them. Why do some widows wither away and others bloom? It's a matter of attitude. The widow who feels her life has come to an end and believes there's nothing more to live for actually begins to look old. Another widow, older in years, may begin to blossom as she enters the competition for a new husband, embarks on a new career, or involves herself in activities she never had time to pursue before."

Futility, pessimism, frustration, and living in the past are not only characteristics of old people but they are the characteristics that have made them old. It's the loss of self-esteem that leads to the negative self-image that makes a retired man begin to go downhill or die shortly after retirement. It's not the retiring from a job that ages a person or even kills him, it's the retiring from life.

Now, researchers indicate that all of us reach a mental peak somewhere around the age of 35 and *maintain that same level well past the age of 70.* So an old dog can learn new tricks if he doesn't know he's an old dog.

After we turn that big corner on the sixty-fifth birthday we can either run into the ditch because of fear or just keep driving straight ahead. Since you may face another decade or two after 65, don't let anyone fasten any "You're Old" labels on *your* coat.

MODERN MEDICINE MAN

By Fred Edwardy

"What in the world did you tell her?" the nurse asked the Navajo interpreter sitting beside her.

"Just what you said. But not so many words. I told her doctor would cut her throat," the old Indian said.

It had been obvious that the patient had a tumor in her thyroid gland and surgery was necessary. But when the nurse explained through the interpreter, as simply as she could, how the doctor at the hospital would remove the growth, the Navajo Indian woman's eyes widened and her stare was accentuated more than was symptomatic of her disease. Jumping to her feet she gathered her voluminous skirts and swept out of the little clinic office, leaving a cloud of dust swirling in the shaft of sunlight on the floor.

They needed help As a young physician, Dr. George E. Bock, touring Navajo land in 1950, could never forget the stories he had been told about the Indians of Arizona, New Mexico, and Utah. He was fascinated by their intelligence, physical beauty and strength, and the artistry of their crafts in weaving and jewelry designing. But as remarkable as these people were, they needed help badly—medically, nutritionally, politically.

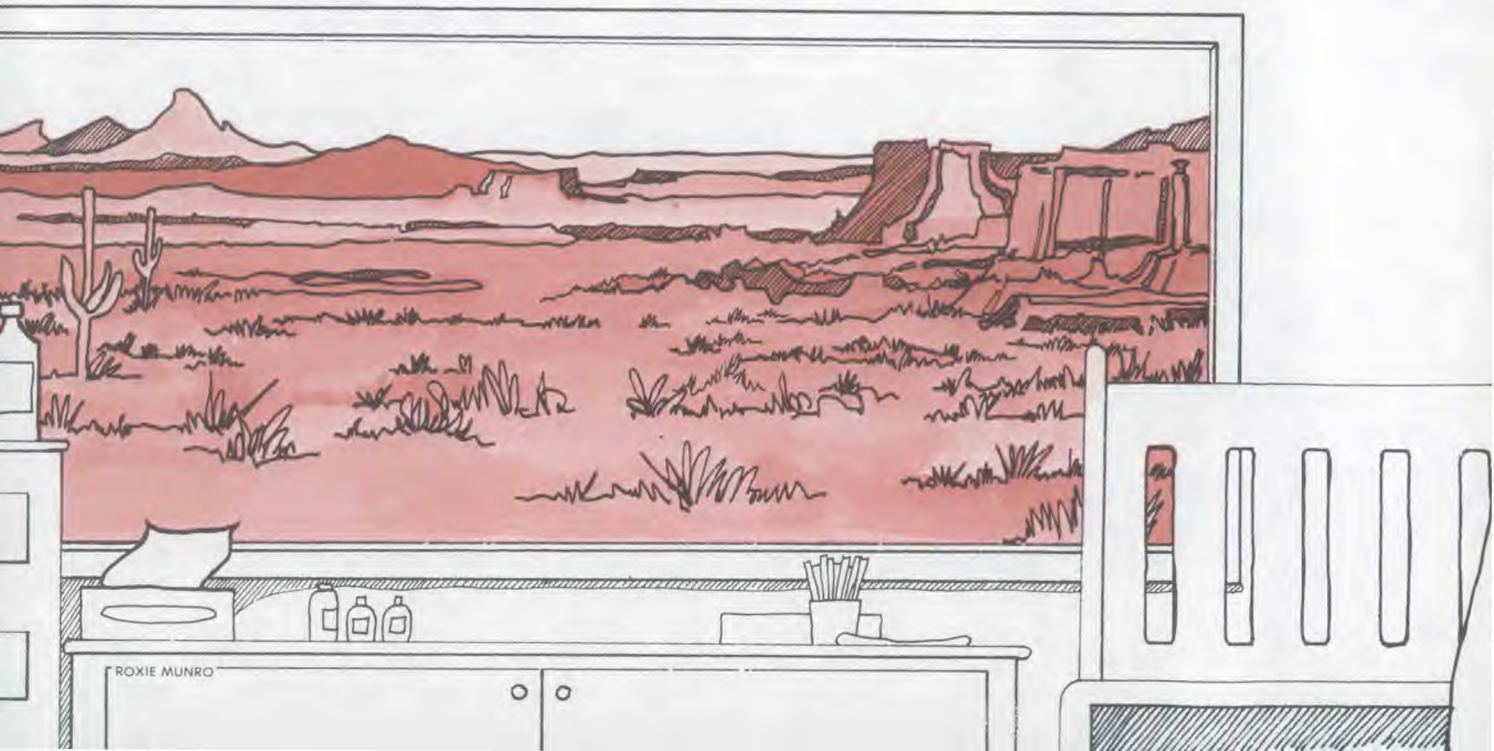
They had survived since finding their way across the Bering Strait into Alaska, and their tribes had settled in southwestern America between A.D. 1200 and 1400. Despite their misfortunes since the arrival of the Spaniards and the early settlers, the Navajos and other tribes still clung tenaciously to life—although greatly reduced in numbers.

Dr. Bock was appalled to learn that 90 per cent of the 25,000 Navajo Indian families lived in unsanitary, dilapidated dwellings, many in hogans with dirt floors, without running water or electricity. Their health level was among the lowest of any major population group in the United States, with their infant mortality rate 90.0 for 1,000 live births as contrasted with 21.8 for all other races in the U.S.

Tuberculosis among the Navajos is still ten times that of the average American. They have widespread strep throat, rheumatic fever, and heart disease, and forty times the general population's cases of persistent diarrhea. How could any humanitarian keep from talking and thinking about the conditions among these people, 50 per cent of whom have an annual family income between $1,500 and $2,000? Word got around that Dr. Bock was a champion of these forgotten native Americans, whose only crime had been that they had fought to protect their hunting grounds from the white man's invasion.

In 1963 the assistant surgeon general and the director of Indian Health in Washington, D.C., met Dr. Bock by chance during a medical meeting. They asked whether he would like to do something for the Navajos. Of course he would. He was appointed chief of hospital health services of the Navajo area Indian Health Service. Dr. Bock and his wife went to live in Window Rock, Arizona, on the Navajo Reservation.

Unemployment rate is nearly 60 per cent Although the Navajo Reservation has now been increased to



more than 15 million acres, only 50 per cent of the people speak English. Their unemployment rate is nearly 60 per cent, more than ten times the national average; and 42 per cent of Indian school children—almost double the national average—drop out before completing school.

Conditions are now improving, however, thanks to such men as Dr. Bock and the 115 other physicians and 42 dentists who are now serving the area in 6 hospitals, 10 health centers, and 22 health stations. Transportation is still a major difficulty for most of the Navajos, though, with the distance between hogans and health stations or clinics averaging 70 miles.

Only 22 per cent of the hogans have electricity—perhaps a single light bulb—and not many have refrigerators. And when a doctor tells one of his patients to go home and take sitz baths, most of the Indians can only shake their heads at the impossibility, because few hogans can keep on hand even an adequate supply of drinking water.

Unfortunately, there is still a problem with interpreters, even though more and more Navajos speak English. The Indians prefer to speak through an interpreter, and this causes problems. A physician may tell an Indian woman that the tests on her baby will not be completed until tomorrow, so she should come back then for the further treatment of her child. But the interpreter often condenses the information simply and tells the woman there is nothing wrong with her child and to go home. At times episodes like these have had tragic consequences.

Alcoholism One of the Indian population's greatest unsolved problems is alcoholism, just as it continues unsolved in the dominant culture that brought it to the Indian. Many neglect buying nutritious food for their families, and have a limited concept of the importance of good food in maintaining health.

But efforts to educate the Navajos on family planning—not to annihilate them as they first suspected, but to improve the health of both the mother and the child—are paying off. From their 1950 infant mortality of 90 per 1,000 babies, their death rate is now only 29 per 1,000. And mothers are encouraged to have their babies' health checked at least every six months until they reach 5 years of age.

Medical service is free to the Indians, and 63 per cent of the medical staff are now Navajos or other Indians. Thirty-eight Indians have graduated from U.S. medical colleges, but there is only one Indian dentist in the United States.

The National Institutes of Mental Health has made progress in working with the Indian medicine man in getting him to use the white man's medical knowledge as well as his own. He is most effective in areas of psychosomatic medicine.

Sixty per cent of the sickness treated in outpatient clinics can be cared for by Indian physician assistants, who are being trained by the Indian Health Service. Others trained as emergency medical technicians bring first aid in accident cases—three and one-half times more common among Navajos than among the general population. &

My life depends on a machine

By Earl R. Stresak

"I wanted to die because of the intense suffering I experienced on the first machine I was hooked up to," said John Englund. He was talking about his initial encounter with renal dialysis. He attributes the problem not to the kidney machine but to his declining physical condition and necessary psychological adjustments.

"If I could tell people one important thing, it would be not to wait in seeking medical help if they experience any type of urinary problem, especially after the age of 40," said John.

His problem began many years before its culmination in 1968, when he had been experiencing urinary retention. John said, "I could not completely expel all the urine in my bladder; some would always remain. This is an ideal situation for infection to get started, and over the years this infection spread upward, destroying my kidneys."

John finally learned that he had an infection of his prostate gland that was causing constricture—a narrowing in the passageway of his urinary system. This narrowing caused the retention of urine, and explained why for years he had difficulty in voiding, having to force when initiating that simple biological function.

In 1968 John Englund went onto hemodialysis. Now, three times a week John awakens early to begin a day of tedious medical treatment his very life depends upon.

One hundred miles a day From his Lancaster, California, home in the Mojave Desert north of Los Angeles, Englund travels 50 miles one way to Mid Valley Hospital in the San Fernando Valley for a 7:00 A.M. appointment. There he undergoes five hours of hemodialysis, a medical process that does the work his kidneys have been unable to do since 1968.

Simply explained, dialysis uses a machine to filter impurities from the blood stream, a job usually performed by healthy kidneys.

A tube called a cannula is surgically implanted into John's forearm. One end of the tubing extends from his arm and is attached to the hemodialysis machine. At the other end, the cannula is attached to a vein and an artery. The machine then siphons blood out of his body, and into the machine. John's blood flows into a coil inside the machine, and the coil strains all impurities from the blood, returning clean blood through the tubing back into the body.

The process is continuous, taking impure blood out of John's body, and returning clean blood back to him. It could be compared to the way an oil filter works in a car engine, or a water purifier works to produce distilled water.

Hemodialysis is done under sterile conditions, and John admits his greatest fear is having the tubing clog up, forcing air or impurities into his body, which could prove fatal.

John's body could poison itself Without the three-times-a-week treatments, John explains, his blood stream would keep accumulating impurities until it reached a point where his body would poison itself. If this happened, he would go into shock and die.

Despite these worries, Englund said the procedure today is relatively safe, having been improved since its early beginning.

Apart from his kidney problems, Englund has other medical problems, one being a complication from a fractured hip. The 66-year-old Englund gets around his antique and flower shop with the help of crutches

TARUS PHOTO

A kidney machine 50 miles from his home spells life or death to John Englund.

and his wife.

John Englund is a person who could rightfully indulge in self-pity, but when conversing with him you sense that he does not do so. Englund doesn't cry the blues while talking about his dependence on dialysis. He describes his medical condition as a family doctor would discuss a case of the measles.

Englund testifies that the hardest time was his initial contact with kidney machines. Once over the psychological shock of his new life-style, the machine became a part of his weekly routine.

Now he proudly explains that he is certified to teach newly registered and vocational nurses how to operate and care for the hemodialysis patient and machine. John gleaned this knowledge from a Federally sponsored training program.

Because of the training, John is able to care for himself while on the dialysis machine. He operates the machine, and keeps a constant check on his blood pressure and other vital signs, to assure all is going well.

Subsidized dialysis At one time, dialysis treatment almost meant the loss of John's livelihood. When he learned dialysis was necessary, he could not find a medical facility near his home, equipped with a hemodialysis unit. He finally found a hospital with the needed equipment in Anaheim, a city south of Los Angeles. There, three weekly sessions on the machine cost John $3,700. On the verge of giving up his business and declaring bankruptcy, Englund learned of the Los Angeles County subsidized program at Mid Valley Hospital.

This program charges a patient according to income. A recently passed Federal bill ensures that someone unable to pay for dialysis treatment would not have to voluntarily elect to die.

John's medical condition has meant restrictions on his life, his daily routine, his diet. His bone marrow has been destroyed because of extreme uremia, caused by the urine retention in earlier years. Bone marrow manufactures blood cells, and consequently Englund needs periodic blood transfusions. John must also restrict his potassium and fluid intake. He emphatically points out a mistake he believes he made in his younger years, "The best drink for everyone," says John, "is not coffee, not tea, not soft drinks, but water."

By his own admission, John's story contains a valuable lesson to persons scoffing at the idea of regular medical check-ups, and who are inclined to put things off.

Owns her own machine Marion Williams, government records librarian at Lancaster Public Library, greets you with a smile as she walks from her department. Marion is another Lancaster resident on hemodialysis. Her story, although similar to John's, bears some differences.

The 51-year-old woman has been on dialysis since 1971. She lost use of her kidneys because of a hereditary condition. For a while, she too traveled to Mid Valley for treatments, but in 1972 purchased her own kidney machine for home use.

Her machine cost $5,500, and part of the expense was defrayed by medical insurance. Marion spends six hours, three times a week, on her machine, aided by her husband.

Instead of an external cannula like John's, Marion's arm contains a "fistula," also surgically implanted. It is a bulb and valve type of arrangement. She does not connect tubing to the machine as John does. John's tubing extends from inside his arm, and is covered with tape when not in use.

Marion's fistula has been positioned under the skin of her forearm, and when it is time for dialysis, she inserts two small needles through her skin and into the fistula. The needles are then attached to tubes running to her machine.

Again, as in John's case, one tube is connected to a vein, the other to an artery, which allows exit and re-entrance of blood.

Marion does not consider her dialysis treatments a handicap, and leads an active life. She works full time at the library. "I am perfectly happy with my life," she said.

Marion, like John, takes her dependence on the kidney machine in stride. Perhaps the most difficult thing of all is public education on the subject. "I've educated everyone I work with about it," said Marion, motioning around the library.

"Feel that," she says, pointing to the spot on her forearm where blood can be felt rushing into the fistula. "Well, this part is connected . . . " and she continues explaining in the same knowledgeable, nonchalant way John Englund has done. What both seem to be saying is, "Look, this isn't any hocus-pocus mystery. It's all very explainable if you take time to understand it."

And maybe what really needs understanding is John Englund's very sincere warning, "If I could tell people reading this story one important thing, it would be not to wait in seeking medical help if they experience any type of urinary problem, especially after the age of 40." &

Earl Stresak is a writer and a photographer who received his first rejection slip at age 13. A graduate from California State University, Northridge, he received a B.A. in journalism. His interest in medical stories stems from his work as a medical technician in the U.S. Air Force. Stresak has a wife and a 4-year-old son.

Happiness is a clean mind

By Margaret R. Thiele

The English poet Sir Edward Dyer once said, "My mind to me a kingdom is . . ." and his poem goes on to show the treasures in his mind kingdom, including a clear conscience, inward happiness, and contentment.

Is your own mind kingdom stored with the memory of the spring day you climbed to the top of the hill with your friend, wading knee deep in wild flowers, smelling the fresh country air? Or the day you sat on a cliff overlooking the sea and watched the white sail on the horizon? Or the time you caught a fleeting glimpse of twin spotted fawns frisking through the woods after their mother?

Recent studies reveal some surprising effects the mind and emotions have on the body, and how physical problems may be better understood and treated when the mental health of the person is considered. That the well-being of the body is directly related to the well-being of the mind was recognized long ago by the Romans, who said, "Mens sana in corpore sano," meaning "a sound mind in a sound body."

Private kingdom The mind kingdom is personal and very private. You are the only one responsible for the things stored there or knowing what goes on in its secret chambers.

Although this kingdom is a very private one and may contain many

KATHERINE JANUS KAHN

When you learned to swim, your body learned certain muscular habits of breathing and of moving arms and legs. Your mind can do the same.

rooms that only you are aware of, thoughts result in actions, and the quality of your actions is closely related to the quality of your thoughts. Such works as those of Rembrandt, Raphael, and Corot show the quality of clean minds, while there are others whose minds promote the cult of the ugly, deformed, and destructive.

Poets with pure minds wrote exalted poems such as "Paradise Lost" and "The Vision of Sir Launfal." Composers, including Beethoven, Bach, and Handel, wrote uplifting music—*The Glory of God in Nature, The Messiah.* Others with good, creative minds have become inventors, designers, leaders.

A clean and pure mind, like a clean house, requires continual effort. You are aware of how one must be continually removing rubbish and garbage from the home. To have a clean mind takes the same effort and determination, with a constant repelling of unwanted thoughts—thoughts of envy, jealousy, humiliation, anger, disappointment, sadness, or impurity.

"But I cannot," you say, "control my thoughts. When something disturbing happens, my thoughts control me. I just go on thinking and thinking, and like a water faucet that runs and runs, my thoughts won't turn off."

What to do Here are some suggestions. Assert yourself. You know what you want—a mind filled with joy and happiness, peace and love. You also know that you do not wish to be filled with hate and anger, to be plagued with mental garbage.

Get rid of the negative elements at once and put something better in their place. Turn your mind to things you really like. Read a good book, think about someone whose life inspires you. If this doesn't work, try doing something so difficult you don't have time to think. Go swimming, play a fast game of tennis, climb a mountain. There is nothing like heavy physical activity to clear the mind.

Don't dwell on unwanted thoughts, mulling them over and over. Make it a habit to switch quickly to constructive, worthwhile ambitions and plans. Be creative, and work on some absorbing project. Design a fabric, invent a new mechanical toy, write a limerick, draw a cartoon, try a new recipe, build a doghouse.

Good habits of thinking are helpful allies. When you learned to swim, your body learned certain muscular habits of breathing and of moving arms and legs that did not need to be relearned every time you swam.

If you form the habit of rejecting negative thoughts immediately, clean thinking will become increasingly natural. &

Margaret Rossiter Thiele received her Master's degree from San Jose State College. The author of several books, she served for a number of years as assistant librarian in the medical library of Loma Linda University. She comes from a health-minded family, for her father, Dr. F. M. Rossiter, authored a health guide, which was translated into seven languages.

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