

HOME REMEDIES

HYDROTHERAPY, MASSAGE,
CHARCOAL AND OTHER
SIMPLE TREATMENTS

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CHAPTER FIFTEEN

Charcoal Therapy

Introduction

Many old-fashioned remedies are going out of fashion, not because they are ineffective, but because an art is required for their management, and a sufficient degree of labor required that most people are unwilling to provide. Every private home should have charcoal on hand as a ready antidote for poisoning, and as a cleansing agent in infections and various metabolic disturbances. Orally administered charcoal is effective in preventing many intestinal infections. All studies show that charcoal is harmless when ingested, when inhaled and when it comes in contact with the skin.

Charcoal is without a rival as an agent for cleansing and assisting the healing of the body. The grains of charcoal have many crevices and corners for the adsorption of materials, gases, foreign proteins, body wastes, chemicals and drugs of various kinds making it a powerful assistant to the cleansing apparatus of the body. The total surface area of the sum of the particles in a small cube of charcoal only $\frac{2}{5}$ th of an inch on each side is one thousand square meters, a field more than thirty-three yards square! The uses of charcoal are almost as universal as those of water, both commercially and medically—and like water it can be freely used as a healing agent. Because charcoal can pack molecules of ammonia gas into its crevices, it can attract 80 quarts of ammonia gas per 1 quart of pulverized charcoal! It may be used internally or externally, and for a range of disorders from bee stings and other venomous bites, to metabolic problems such as jaundice of the newborn, or an allergic reaction to poison ivy.

In 1773, Scheele made an experiment with charcoal in which a gas was trapped in an inverted tube with charcoal, the lower end of the tube submerged in a container of mercury. Most of the gas disappeared as evidenced by a rise of mercury into the tube. As the gas was adsorbed by the charcoal, a vacuum appeared in the tube and sucked the mercury up into the tube. As a demonstration

of the effectiveness of charcoal, Bertrand in 1913 survived after swallowing 5 grams of arsenic trioxide mixed with charcoal, and Touery in 1831 survived after swallowing 15 grams of strychnine (ten times the lethal dose) and an equal amount of charcoal before the French Academy of Medicine.¹⁸¹

Materials for Making Charcoal

Charcoal can be produced from a number of different materials. Charcoal made from burnt toast is apparently entirely worthless, and the so-called "universal antidote" with glycerin, tea and charcoal is decidedly inferior to plain charcoal, the tannic acid in the tea decreasing the effectiveness of charcoal. Tannic acid as found in many herbs precipitates alkaloids, certain glycosides, and many metals. It interferes with the usefulness of charcoal as an antidote. Willow charcoal, (or any commercial charcoal) is quite effective against bad breath, gas and intestinal disorders.

Charcoals made from vegetable material such as wood and coal, contain about 90% carbon, whereas bone charcoal contains about 11% carbon, 9% calcium carbonate, and 78% calcium phosphate. Bone charcoal is quite effective in decolorizing solutions, and is used widely in the sugar industry for this purpose. Charred coconut or black walnut shells make very good adsorptive material. Such materials as blood, cereals, fruit pits, kelp, corn cobs, rice hulls, distillery wastes and paper mill wastes have all been used to make charcoal. The most common present day charcoals are made from petroleum coke, coals, peat, sawdust, wood char, paper mill wastes, bone and coconut shells.

Activated charcoal is produced from the controlled burning of wood or bone, and is then subjected to the action of an oxidizing gas, such as steam or air, at elevated temperatures. This process enhances the adsorptive power of charcoal by developing an extensive internal

network of fine pores in the material. The activation process was invented somewhat after the turn of the 20th century, but charcoal was already recognized as a very useful healing agent, illustrating the efficacy of ordinary charcoal. Nobody has really understood the mechanism by which charcoal works, either from a physical or chemical standpoint.

Charcoal made in the kitchen from such items as bread or burned food is definitely inferior or poor, and may be harmful if used on a regular basis. Wood charcoal is preferred since it does not develop the harmful chemicals (such as methylcholanthrene and benzopyrene) sometimes formed from burned fats.

When making your own charcoal, pieces of charred wood from the fireplace or grill can be used. The ultimate in making your own charcoal begins with a wood fire out-of-doors. After the wood is burning brightly, it should be covered with a large piece of tin, and dirt piled over the tin to make a dome to exclude air. As the heat continues to burn the wood without oxygen, the soft parts of the wood are burned out and the hard parts remain, making a good charcoal. The charred parts of wood should then be pounded to coarse granules in a cloth bag. After it is reduced to chunks ranging in size from small peanuts to rice grains, put the charcoal in a blender and pulverize it to a fine powder, the finest that can be obtained.

The commercial tablets as compared to finely powdered charcoals have been found less effective by about half. In one study¹⁸² humans who took pulverized charcoal were able to prevent absorption of a drug by 73%, whereas those taking the tablets prevented only 48%. A tablet containing 0.44 gm. total material has only 0.33 gm. of charcoal, the remainder of the material representing starch and other substances used to hold the tablets together. Chewing the tablets well before swallowing will increase their effectiveness.

Briquettes used for charbroiling are not safe sources for charcoal for either external or internal use, as various undesirable fillers are used, and chemicals are often applied to the products to insure rapid igniting.

General Features

Charcoal has been used to combat odors in air and water, to remove carbon dioxide from air in submarines, to filter poisons in gas masks, in making medicines, and coloring candy jellybeans and licorice. Charcoal may be powdered and placed in a jar lid on a shelf, in the refrigerator, oven, or a drawer and it will adsorb a variety of odors, including rancid odors. It is useful in removing odors from casts, skin ulcers, and gastrointestinal gas, and as a cigarette filter. Herbicides applied too liberally, or having an inordinately long residual effect, may be

efficiently counteracted by a charcoal spray. It has been used to remove toxins from the blood in kidney and hepatic diseases, taking the charcoal internally, or applying it as a poultice or bath, and for use in an exchange column to perfuse blood.

Except for the occasional finding of irritation of bowel in certain inflammatory states in very sensitive persons, and the prolongation of the transit time sometimes seen, there are no known contraindications to the use of charcoal. Allergies have not been reported. It is inexpensive, harmless and easily applied. It is available readily through commercial channels, or can be made at home.

Care should be used in applying charcoal poultices to freshly broken skin. It is possible to get a tattooing effect if the lesions extend through the skin into the dermis. For such wounds, it is wiser to use comfrey poultices to avoid the possibility of tattooing an area not usually covered by the clothing.

Dosage of Charcoal

One can buy charcoal powder, tablets and capsules. The activated capsules are roughly twice as potent as the tablets. Drug stores or health food stores often carry charcoal. The oral dosage is 1 tablespoon of powder stirred into a glass of water, 4 capsules of activated charcoal, or 8 regular tablets taken in the mid-morning and repeated in the mid-afternoon. Food interferes with its effectiveness. Charcoal probably should not be taken regularly over long periods—years—as some nutrients may be adsorbed. We have seen no problems with its intermittent use for long periods, or with regular use for up to twelve weeks.

Charcoal may be ordered from Yuchi Pines Institute, Rt. 1, Box 273, Seale, Al. 36875.

Because of interference with effective adsorption of toxic materials in the gastrointestinal tract, it is estimated that 10 grams (about 1 tablespoon) of charcoal can adsorb only about three to seven grams of materials, making it necessary to give at least twice the amount of charcoal as the suspected weight of the poison taken.¹⁸³

There has been some discussion as to whether food and partially split derivatives of food, digestive enzymes, and various secretions usually found in the gastrointestinal tract would inhibit adsorption of drugs or poisons by charcoal. It has been found that there is approximately 50% reduction in effectiveness of adsorption with charcoal due to stomach contents, 30% reduction due to bile, and very minor reduction due to duodenal juice. Therefore, when a poison has been ingested, to be on the safe side use approximately eight to ten times the estimated weight of the poison as the dosage of charcoal.

Finely powdered charcoal can get to the surface of toxins better than coarsely powdered charcoal and should be used for the best results.

Charcoal adsorbs poorly mineral acids, alkalis and salts such as NaCl (table salt) and FeSO₄ (iron). There is some advantage in recognizing this particular characteristic of charcoal, since in the area of nutrients, charcoal is a poor adsorbent. Every year children die from poisoning from table salt and iron. Extra large doses of charcoal should be used when these substances have been swallowed.

In combating poisons, the speed with which the charcoal is administered will determine to a certain degree the success. Additionally, the quantity of charcoal is a determinant of success. For venomous bites or poison ivy, immediately wash the area well with soap and water, or flood with a solution of charcoal. After this brief preparation the poultice can be applied.

In cholera, give 2 heaping teaspoons of pulverized charcoal four times daily, and supplement with 1-2½ liters of normal saline intravenously if the patient is unable to drink adequate fluids to prevent the severe dehydration that characterizes cholera.¹⁸⁴

Charcoal Reactions in the Intestinal Tract

Charcoal reaches its maximal rate of adsorption extremely rapidly, within one minute. In thick or viscid fluids such as the intestinal or stomach juices, adsorption might be delayed somewhat, but can still be expected to be very rapid.¹⁸⁵

In the past some have questioned the effects of the pH in the gastrointestinal tract on charcoal and its adsorbed materials, as to whether poisons might dissociate farther down and be absorbed into the blood. It has been found that charcoal forms a stable complex with toxic materials, and does not dissociate the toxins further down the gastrointestinal tract for later absorption into the blood stream.¹⁸⁶

It has also been found that charcoal does not significantly adsorb nutrients. Two groups of rats were tested to determine if one group fed an identical diet with another group could be made to have deficiency disease by feeding charcoal. It was discovered that the two groups of rats were identical with or without charcoal.¹⁸⁷

Charcoal added to the diet of sheep for 6 months did not cause a loss of nutrients, as compared with sheep not receiving charcoal. Blood tests showed no significant difference between the two groups of animals, and there were no visible signs of any nutritional deficiency. At

autopsy no differences either grossly or microscopically could be detected. A level of 5% of the total diet was given as charcoal. It did not affect the blood or urinary levels of calcium, copper, iron, magnesium, inorganic phosphorus, potassium, sodium, zinc, creatinine, uric acid, urea nitrogen, alkaline phosphatase, total protein or urine pH. It is of interest that although the animals inhaled some of the powdered charcoal, no ill effects could be demonstrated in the microscopic sections of the lungs and other structures of the chest.¹⁸⁸ Workers in charcoal manufacturing plants have been studied to determine the effect of breathing the dust of charcoal. It was found that the incidence of any respiratory symptoms was extremely low, suggesting that breathing the dust was quite innocuous.¹⁸⁹

Ideally both vomiting and inactivation of the poison should be combined in the early treatment of acute poisonings. Syrup of Ipecac and apomorphine both bring up only about 30% of the poison in the stomach, meaning that they are inefficient in preventing poisoning by inducing vomiting, as 70% of the poison is retained in the stomach.

Lavage of the stomach is another method for treating poisoning, but the use of charcoal is far more effective and easy. It is non-toxic, and maintains its potency indefinitely in a closed container and can be conveniently and safely administered in the home. Activated charcoal is very well tolerated, even in amounts up to 100 grams (about ¾ of a cupful of pulverized dry powder!) and there is no known contraindication to its use in acute poisonings. It is immediately effective and can be safely used by nonprofessionals. Charcoal is the most valuable single agent currently available for treating poisonings.¹⁹⁰ Babies and children accept slurries made of powdered activated charcoal. If enough charcoal is used there is almost no likelihood of dislodging the adsorbed material from the charcoal grains further down the digestive tract.

Charcoal adsorbs well at body temperature, but not so well at elevated temperatures. Heating in the oven causes substances that have been adsorbed to be released. Charcoal can be reused once or twice by washing, allowing to settle, pouring off the fluid and drying the charcoal in the oven at a high temperature (about 350°) but not high enough for the charcoal to ash.

Substances can be adsorbed from a water solution better than from an organic solvent. Salts such as sodium chloride and potassium nitrate are not readily adsorbed by activated charcoal. Iodine and mercuric chloride are well adsorbed. Simple acids and bases are easily adsorbed. Caustic materials are probably not readily adsorbed. In the swallowing of caustic agents such as lye, the offending agent may be poorly adsorbed unless large quantities of charcoal are used. While charcoal does no

harm, it may not do much good, and more definitive treatment should be sought, such as drinking dilute vinegar solution. The same may be true of the alcohols, methanol, and ethanol, as there is experimental evidence in rats that charcoal is not effective in alcohol intoxication.¹⁸³

On the skin, charcoal has been found to have no observable harmful effects. It will adsorb cancer-producing agents which, when free on the skin, are capable of producing skin cancer. It will effectively adsorb such known cancer-producing agents as methylcholanthrene and benzopyrene.¹⁹²

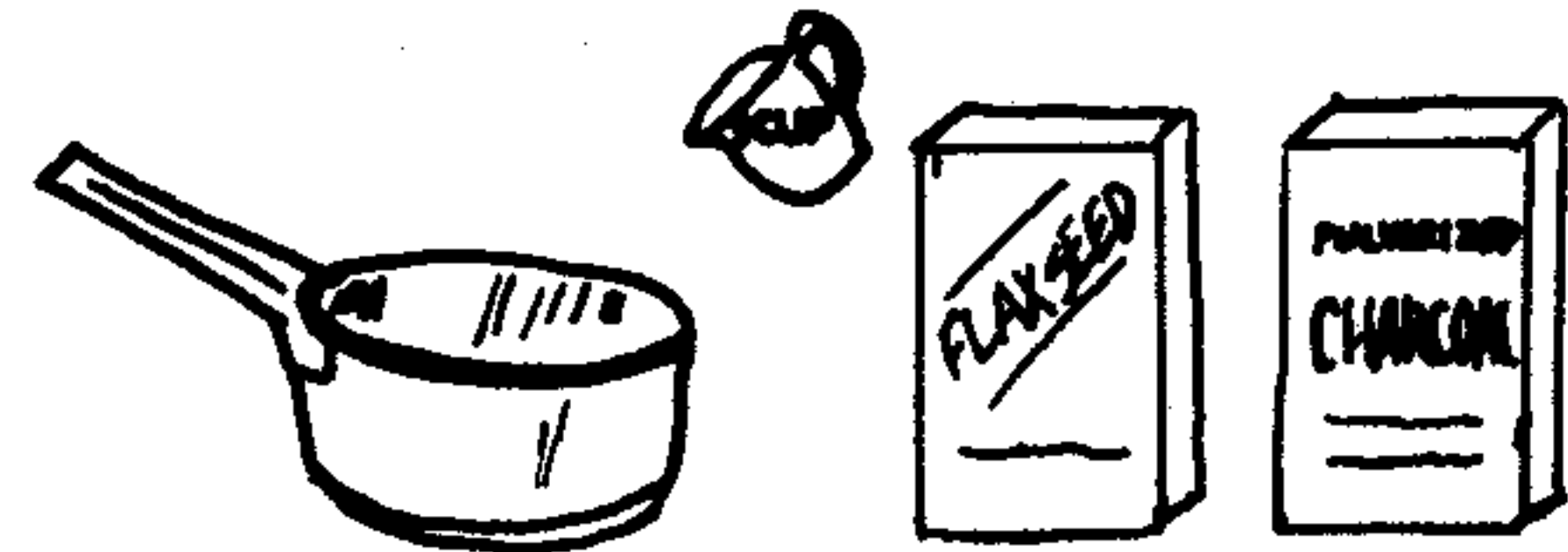
Once a substance is adsorbed onto charcoal, washing with blood plasma or gastric juice will not cause the adsorbed material to desorb, the toxic material having been bound so firmly that it will not be removed by ordinary means.¹⁹³

Substances Adsorbed by Charcoal²⁷³

Acetaminophen	Meprobamate
Aconitine	Mercuric chloride
Alcohol	Methylene blue
Amphetamine	Methyl salicylate
Antimony	Morphine
Antipyrine	Muscarin
Arsenic	Narcotics
Aspirin	Neguvon
Atropine	Nicotine
Barbital	Nortriptyline
Barbiturates	Opium
Cantharides	Parathion
Camphor	Penicillin
Chlordane	Pentobarbital
Chloroquine	Pesticides
Chlorpheniramine	Phenobarbital
Chlorpromazine	Phenolphthalein
Cocaine	Phenol
Colchicine	Phenylpropanolamine
Cyanide	Potassium cyanide
Delphinium	Potassium permanganate
2,4-Dichlorophenoxyacetic acid	Primaquine
Digitalis	Propantheline
Diphenylhydantoin	Propoxyphene
Diphenoxylates	Quinacrine
Elaterin	Quinidine
Ergotamine	Quinine
Ethchlorvynol	Radioactive substances
Gasoline	Salicylamide
Glutethimide	Salicylates
Hemlock	Secobarbital
Hexachlorophene	Selenium
Imipramine	Silver
Iodine	Stramonium
Ipecac	Strychnine
Isoniazid	Sulfonamides
Kerosene	Veratrine
Lead acetate	Some silver and
Malathion	antimony salts
Mefenamic acid	

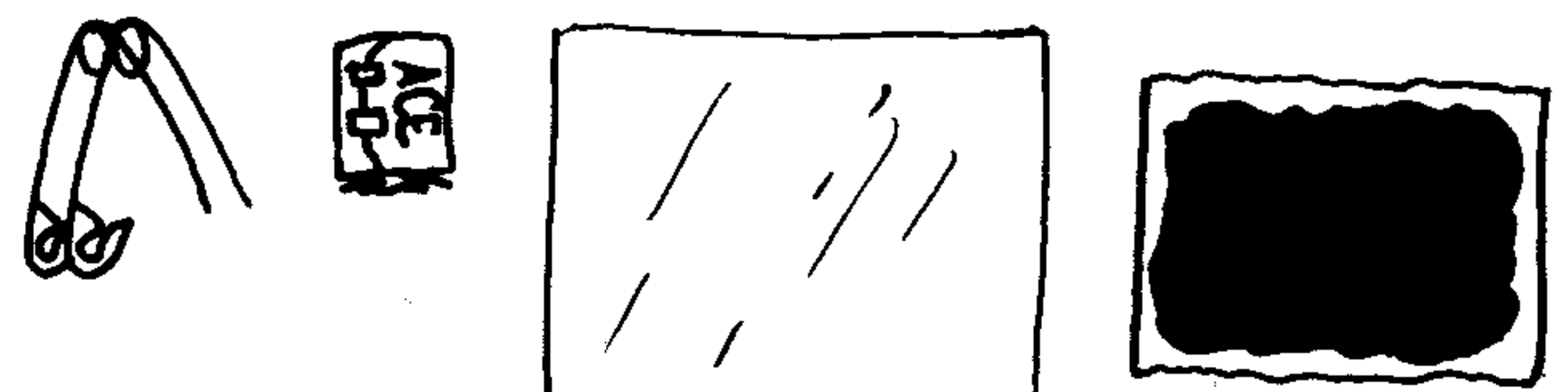
The Charcoal Poultice

A charcoal poultice for a large area such as the abdomen or a knee joint, can be made as follows: 3 tablespoons flaxseed ground in a blender or seed mill, and mixed with 1-3 tablespoons of pulverized charcoal. Stir this mixture into one cup of water. Let it set for 10-20 minutes, or heat slightly to thicken.



Put 3 tablespoons of charcoal and 3 tablespoons of flaxseed (congeals faster if it is first ground in a blender) in a pot with 1 cup of water. Bring to a boil while stirring. It becomes a gelatinous mixture.

Spread over a square of paper toweling of the proper size, using enough to make the paste 1/4 inch deep on the paper towel. Cover with another square of toweling. The edge of the poultice should not have paste spread on it for about 1/2 to 1 inch all around to minimize leakage. Place the poultice on the skin, cover with a piece of plastic that extends 1 inch over all edges and cover the entire plastic with an old towel to catch leaks that may develop. Use a binder or roller bandage to hold in place, pinning securely. Leave it on for 6-10 hours. Rub the area briskly with a cold washcloth after removing the compress.



Kitchen plastic

Spread the thickened charcoal-flaxseed material over a piece of cotton cloth or double thickness paper towel. Cover with a single thickness cloth or paper towel. Lay the poultice over the affected area. Cover with plastic wrap, and hold in place by roller bandage such as strips of bed sheeting, an old towel, or an ace bandage. Pin securely with safety pins.

In order to make a poultice for a bee sting, spider bite or other venomous bite, simply dissolve a spoonful or more (determined by the size of the area to be treated and the seriousness of the affliction) of charcoal powder, or crush up several charcoal tablets in plain water, spread the paste over a folded piece of facial tissue or paper toweling, making the poultice fit the area to be treated, and molding the poultice over the area. The tissue or

towel should be thoroughly moistened with the paste. The poultice can be molded around body parts, such as the ear when treating an earache, making the poultice fit the side of the jaw, the upper neck, as well as enclosing the ear lobe and skin behind the ear to the hairline.

Cover the poultice with a plastic piece cut from an ordinary bread bag, large enough to lap over all sides by at least one inch. Fix the poultice in place by a roller bandage, an ace bandage, or adhesive tape. A snug-fitting garment, such as a knitted cap, can be used over a charcoal compress to hold it on the eye or over the sinuses. A sweat shirt can help hold a charcoal compress snugly against the chest.

Charcoal Poultice with Hops or Smartweed

Make the poultice essentially the same as the plain charcoal poultice described above, but add to the paste fresh or dry commercial hops by simply crushing the leaves and adding them to the charcoal paste. Fresh leaves may be whirled in a blender a few seconds with a small amount of water before adding to the charcoal. To convert this poultice to a stupe, which may give a greater reaction, simply apply a moderately hot fomentation over the poultice and leave in place for about 20 minutes. Remove the fomentation, dry off any moisture and cover well with a sweater or snug fitting shirt for the night.

Charcoal and Flaxseed Poultice

Mix one tablespoon of charcoal powder in a cup with one tablespoon of flaxseed which has been ground in a blender. Add 1/3 cup of water and mix thoroughly. Bring to a boil, and use the thick material to spread on a linen piece or folded paper towel, as in the plain charcoal poultice.

Charcoal as an Antidote for Bites and Stings

Externally, venomous bites can be readily treated with charcoal. *Fire ants* leave a sterile abscess under the stings from the venom which kills a tiny area of tissue. An ordinary band-aid, wet slightly and rubbed with a charcoal tablet until it is entirely black, and applied as a mini-poultice combats ant stings. The same treatment is effective for mosquito bites, chigger bites, and poison ivy.

The perfect treatment for bee stings is a charcoal poultice. Many years ago we had a young co-worker who was stung on the finger by a yellow jacket. He spent one sleepless night due to pain, and was about to go into his second when he decided that he would apply a charcoal

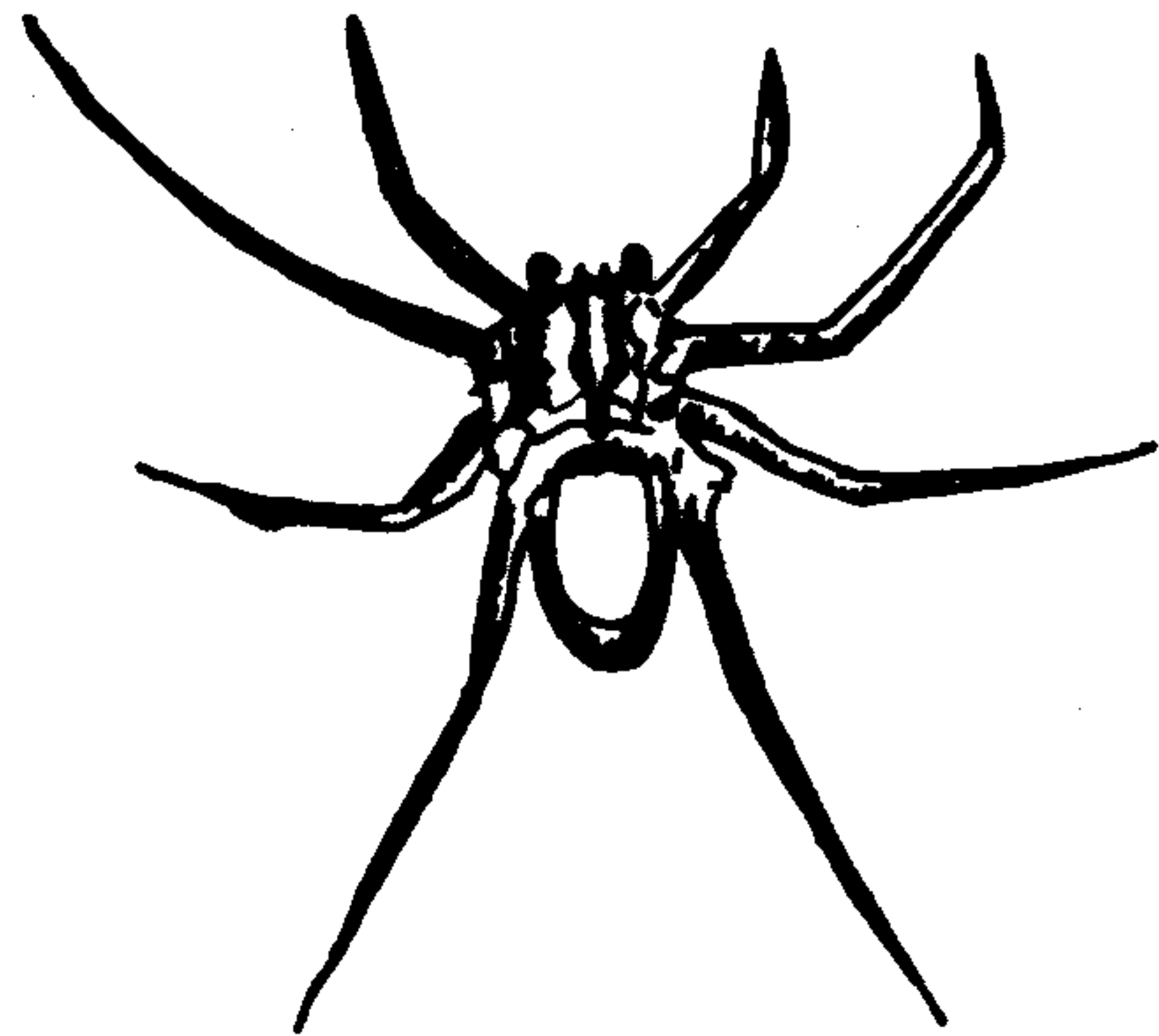
poultice. At that time none of us had used charcoal poultices for yellow jacket stings and didn't know what to expect. Within five minutes the pain was gone and he slept all night. Since that time whenever anyone is stung by a bee, wasp, or yellow jacket, we promptly apply a poultice which will prevent either swelling or pain.

A few years later a lady who had been told that she would probably die if she were ever stung again by a honey bee, received a bee sting on the thumb while walking near the home of a friend. Within two minutes she had begun to sweat all over, had developed a headache, and had severe pain in the thumb. A charcoal poultice was quickly applied and the general reaction entirely subsided within 5 minutes. Although she usually experienced massive swelling after bee stings, this time she had no trace of swelling. It is apparent that an anaphylactoid reaction was prevented in this lady by the charcoal poultice.

We have not had experience in treating snakebites with charcoal, but physicians who have successfully used it find it a good treatment. In isolated areas where antivenin is unavailable, and for snakebites for which there is no antivenin, we would immediately apply a very large charcoal poultice covering almost an entire extremity, centering over the bite, using large quantities of powdered charcoal wet with water, replacing the charcoal poultice about every 10 or 15 minutes.

The sooner the charcoal is applied, the more effective the treatment should be, as swelling in a snakebite begins within 10 minutes. We recommend that charcoal be carried in the pocket for first aid when individuals are hiking in snake-infested woods, so that the charcoal can be applied to any venomous bites promptly. Once swelling begins, the venom may not be able to transfer into the charcoal as easily. Ten charcoal tablets should be taken by mouth immediately. As long as the pain and swelling are being controlled by the poultices we would continue with this treatment alone. If pain and swelling should progress we would add ice packs to the extremity. Large quantities of charcoal should be taken periodically by mouth, as many poisons can be secreted into the gastrointestinal tract. Injections equivalent to 100 fatal doses of cobra venom had no venomous effect when activated charcoal was added to a solution of the venom and agitated before injection into experimental animals.

The treatment of choice for the *brown recluse spider* is charcoal. There is no other recognized treatment except wide surgical excision. There is no known antidote. The brown recluse spider produces a bite that gives little or no pain at first. In 24 hours a purplish red zone develops around the bite, and extensive tissue death occurs. It may produce a very deep and angry ulceration extending down to the bone, which lasts for weeks or months. We



The Brown Recluse Spider. The spider is identified by the fiddle-shaped mark on the thorax.

have had three brown recluse spider bites successfully treated with charcoal, which produced no ulcerations and only the faintest purple discoloration after one week. The sooner treatment is begun the better. The spider is brown and has a fiddle-shaped mark on the back.

Specific Uses for Charcoal

1. Tylenol (Acetaminophen)

Acetaminophen poisoning can be treated with charcoal,¹⁹⁴ as can cobra venom, diphtherial toxin¹⁹⁵ and numerous ingested poisons.¹⁹⁶

2. Aspirin

Activated charcoal used for aspirin poisoning is quite effective. In 1967, 17,995 cases of aspirin poisoning were reported, mostly involving children under five. Dozens of deaths result from such poisoning. Activated charcoal should be given promptly. In one study, when no activated charcoal was taken with a dose of aspirin, approximately 99.6% of the aspirin was absorbed from the gastrointestinal tract. The figure dropped to 58.9% in subjects given 10 grams (about 1 tablespoon) of activated charcoal immediately after taking aspirin. If the administration of activated charcoal was delayed one hour, the percentage absorbed rose sharply to 78.5%. When large amounts of aspirin are taken, activated charcoal is somewhat useful even up to 6 hours, but progressively less so.¹⁹⁷

3. Bad Breath

Charcoal can be used for bad breath, cleansing both the mouth and the gastrointestinal tract. Even odor-pro-

ducing substances that are secreted into the gastrointestinal tract high up will be adsorbed and their excretion through the lungs prevented. Odors produced in the mouth can be counteracted by proper cleansing of the teeth, tongue and gums by a soft bristle brush, and then holding a charcoal tablet in the mouth for 20-30 minutes.

4. Cancer

The anemia experienced in cancer can be treated with charcoal since this anemia is usually due to the toxins produced by cancer. The toxins are hemolytic and can be adsorbed onto the charcoal administered by mouth.¹⁹⁸ The pain produced by cancer can often be controlled by charcoal poultices. Pain in bone, abdomen, and elsewhere will often respond readily to charcoal poultices.

Charcoal poultices have been reported to completely check round cell sarcomas in dogs. Mouse cancer has not responded so well.¹⁹⁹

5. Colostomy and Ileostomy Odor

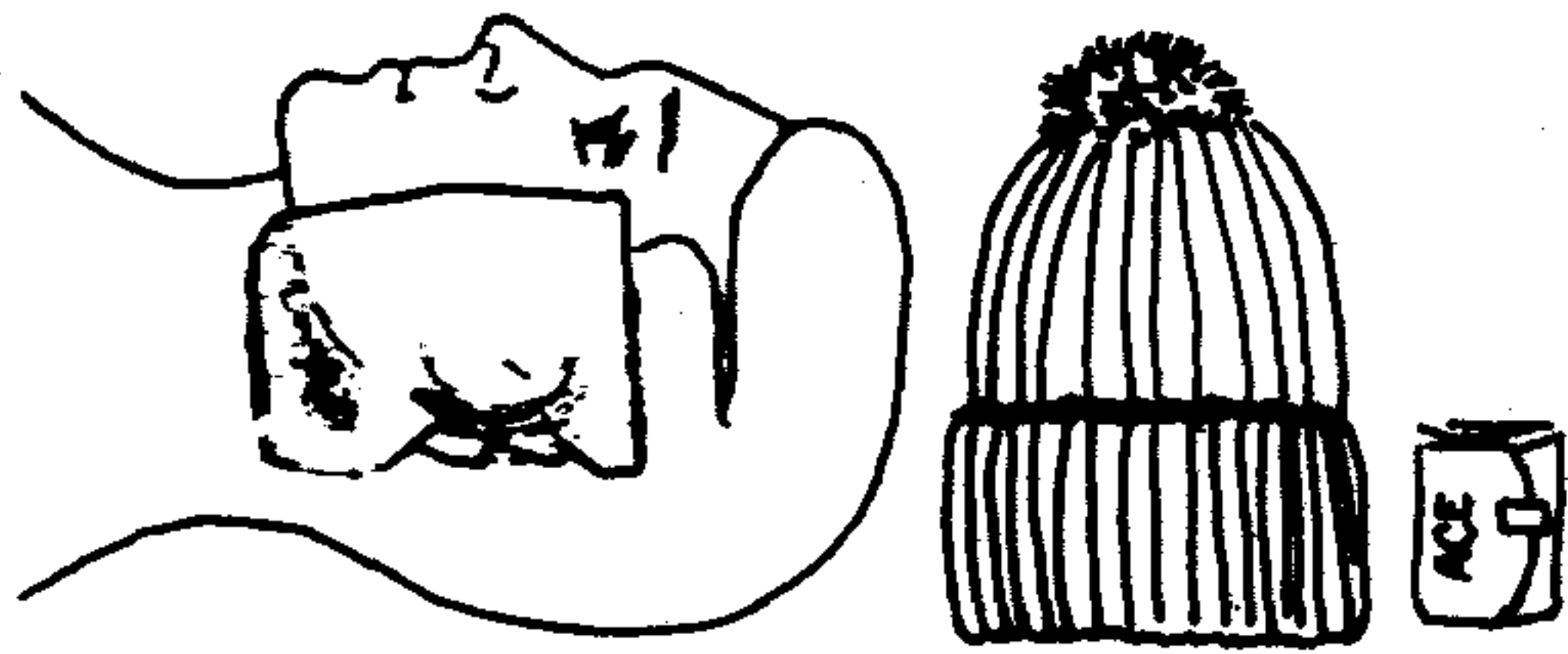
As a fecal deodorant for patients who have ileostomies or colostomies, doctors have used activated charcoal routinely three times daily to reduce odors with good effect. Interestingly, only one-third of the patients continue this practice after five years, although initially they eagerly accept the treatment. It may be that they learn to handle the equipment better or become more skillful in avoiding certain foods that are more likely to cause odors. No apparent ill-effects from long term use have been described, even for these nutritionally marginal patients.²⁰⁰

6. Eye and Ear Conditions

The eyes are really another lobe of the brain. A treatment to the eyes can result also in a treatment to the brain, and it is well to remember that such afflictions of the brain as meningitis and encephalitis may respond somewhat to charcoal poultices and other treatments applied to the eyes.

Since inflamed tissue behind the eyes can become congested, if one level of temperature does not feel good to the eyes, change to another; if heat applied to the eyes does not feel good, change to cold, or the other way around. Often that which feels most agreeable will be the most effective treatment.

Cellulitis of the face, eyelids and ears can be effectively treated with a poultice of charcoal. Otitis media or otitis externa can be treated by a charcoal poultice



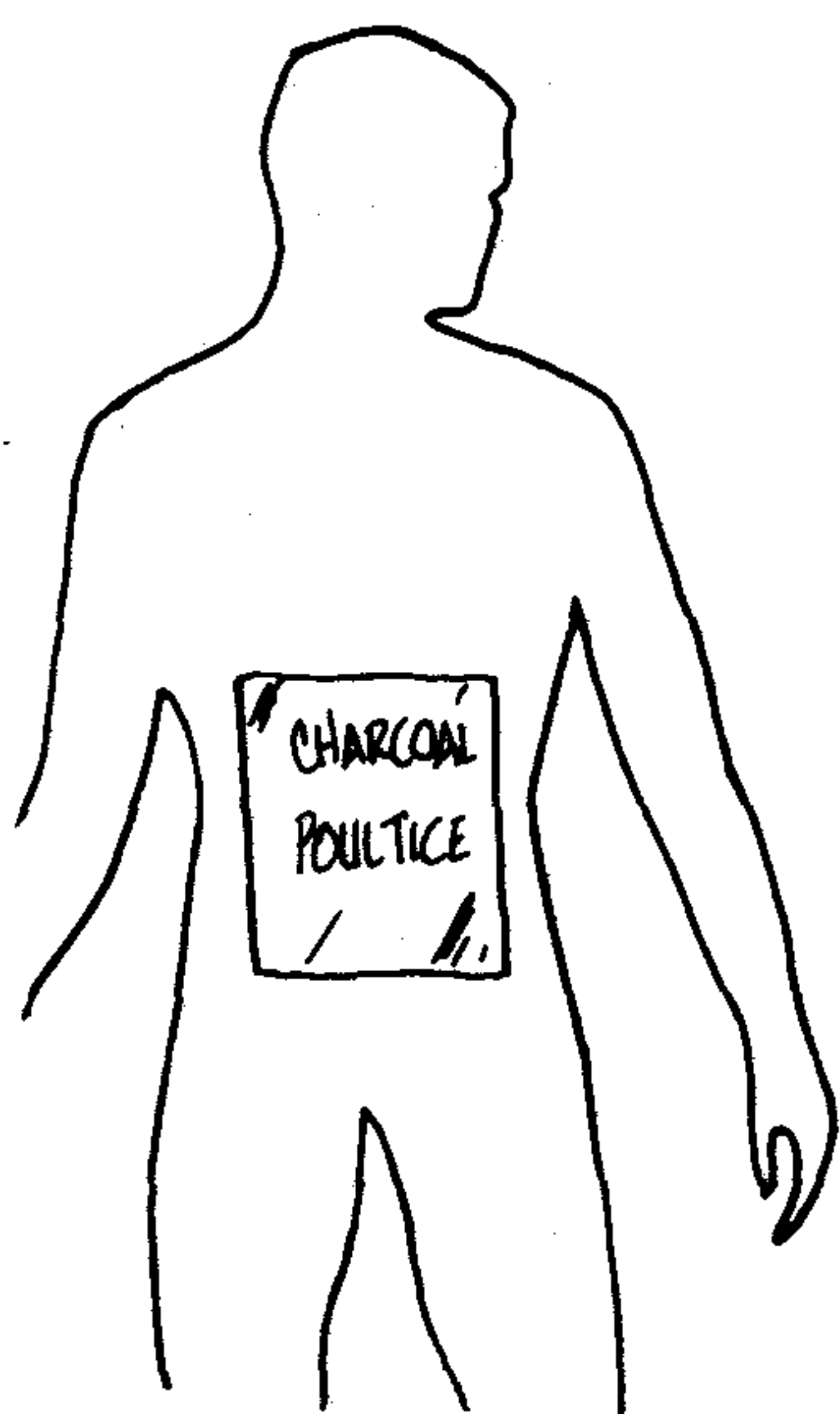
Charcoal poultice for earache. Mold the charcoal poultice over the ear and allow it to extend downward onto the neck, forward over the jaw, and upward to the hairline. Hold the poultice in place with an ace bandage and a knit cap pulled down well over the face and ears. Relief of earache often begins in 4-5 minutes.

molded over the exterior of the ear.²⁰¹ A heat lamp used over the poultice to keep it warm can increase its effectiveness. Keep moistening the poultice under the drying lamp.

7. Intestinal Gas, Diarrhea, Indigestion

Flatulence and abdominal distention can be readily treated with charcoal to good advantage. Use 4 capsules or 8 tablets as often as 3 or 4 times a day. Nervous diarrhea with irritable or spastic colon is greatly helped by taking charcoal. For bed patients who produce malodorous stools, charcoal can be a great assistance.²⁰² For indigestion, use powdered charcoal stirred into a little olive oil for cleansing and healing.

For indigestion, peptic ulcers, or other forms of gastrointestinal distress, the fluid resulting after charcoal has been stirred into water and allowed to settle may be



For abdominal pain lay a poultice of charcoal over the abdomen. In half an hour severe pain is often entirely relieved.

quite helpful. Stir about 1 tablespoon of charcoal into a large glass of water and allow the black part to settle to the bottom. The slurry water on top may be drunk with good results. Visible particles in suspension may be observed by shining a light obliquely through the water. Patients who are already taking a moderate amount of charcoal may benefit from taking their drinking water in this form. Patients with ulcerative colitis fall in this category, as well as some children who refuse to drink the black liquid. Persons with peptic ulcers and other very sensitive persons who get irritation from taking the whole charcoal may receive benefit from drinking slurry water.

8. Infections

Activated charcoal can adsorb bacteria, viruses, bacterial toxins, and hormones. Charcoal has been reported to disinfect wounds, and to act as a deodorizer in various bodily ills.²⁰³ Charcoal can be used for wound dressings.²⁰⁴

On the body surface, charcoal will adsorb wound secretions, bacteria, carcinogens, toxins, products of allergies, and will reduce swelling by taking up excess tissue fluid and products of inflammation. Charcoal works better in an acid than in an alkaline medium. Charcoal has been used internally in Asiatic cholera, dysentery, diarrhea, and dyspepsia.²⁰⁵

Foot and mouth disease virus in a 1% suspension can be entirely adsorbed on charcoal if used in the amount of 10 grams of charcoal per 100 milliliters of fluid. The virus is not destroyed, but its activity is much reduced. Wood and coconut charcoal are less effective than bone charcoal for adsorbing foot and mouth disease virus. Sheep-pox virus is adsorbed on bone charcoal effectively.²⁰⁶

Suspensions of colloidal charcoal have been used intravenously in 100 cases of septicemia, metritis, mastitis, lymphangitis, and pyogenic wounds. After the infusion of charcoal there was seen an increase in the number of neutrophils. Elevated body temperatures returned to normal within one hour. The charcoal reportedly is filtered out in spleen, lymph nodes, liver, and other reticuloendothelial areas. Since patients receiving intravenous charcoal have sometimes experienced shortness of breath, it seems proper to say that capillaries in the lungs were plugged by the charcoal, at least temporarily. These patients were treated with intravenous injections of 0.001 grams per kilogram of body weight.²⁰⁷ While we believe the intravenous use is contraindicated because of its obvious physiologic implications, it is interesting that it was at one time used successfully in this way to treat infections.

Since charcoal increases the intestinal transit time in some individuals, it is properly used in diarrhea. Bauer reported in 1928 that the administration of charcoal to experimental animals doubles transit time.²⁰⁸

9. Inflammation

We have had cases of cellulitis that have been painful, feverish and throbbing. It is no exaggeration to say that within 5 minutes after putting on a charcoal poultice the patient feels relaxed and in complete comfort. It is a miraculous thing to witness this reaction.

E. G. White once said, "One of the most beneficial remedies is pulverized charcoal in a bag, and used in fomentations. This is a most successful remedy; if wet smartweed is boiled, it is better still. I have ordered this in cases where the sick were suffering great pain before the close of life. When I suggested charcoal, and the patient has slept, the turning point came, and recovery was the result. To students, when injured with bruised hands, and suffering with inflammation, I have prescribed this simple remedy with perfect success. The poison of the inflammation is overcome, the pain removed and the healing went on rapidly. The more severe inflammation of the eyes will be relieved by a poultice of charcoal, put in a bag, and dipped in hot or cold water as will best suit the case. This works like a charm. I expect you to laugh at this, but if I could give this remedy some outlandish name, that no one knew but myself, it would have greater influence."²⁰⁹

10. An Insecticide

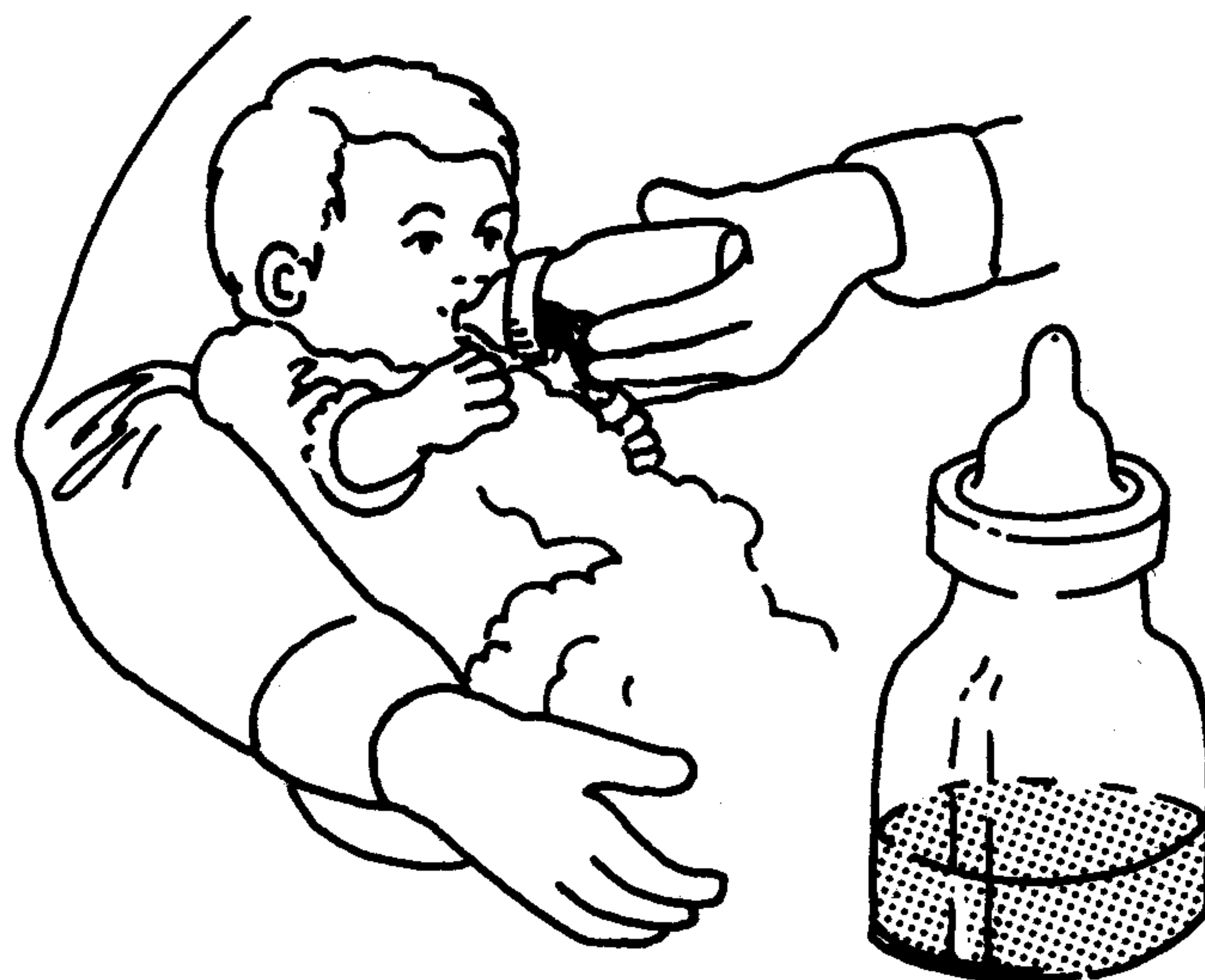
Activated charcoal and clay samples have shown insecticidal activity. Activated charcoal has high levels of insecticidal activity even at 95% relative humidity, and 30°C. The insecticidal effectiveness increases with the fineness of the particles and the hardness number.²¹⁰

11. Jaundice

The need for exchange transfusion in babies with erythroblastosis fetalis has been cut by more than 90% with the use of charcoal. All jaundiced newborn babies with a serum bilirubin over 10 milligrams may be given 0.5 grams (about 1/2 teaspoon) of charcoal in sufficient water to pass through a nipple every 2-3 hours. Since serum bilirubin usually reaches 20 milligrams percent before an exchange transfusion takes place, the charcoal regimen affords an earlier therapy, and will often stabilize the bilirubin at much less than 20 milligrams.²¹¹

Neonatal jaundice, caused by an excess of bilirubin in the blood, is relatively frequent in infants, particularly those that are premature or those that are breastfed. Normally, a large quantity of blood is broken down in the first few days of life, putting quite a load of work on the liver. At this time the liver is still immature and cannot process a great load of broken down blood cells. Breastfeeding enhances jaundice of the newborn, since a hormone in milk retards the processing of bilirubin by the liver. We believe that a small elevation of the serum bilirubin is actually stimulatory to the developing brain, but excessive levels—over 25—may be injurious, although recent studies seem to implicate low oxygen rather than high bilirubin as the cause of kernicterus. Charcoal adsorbs bilirubin well from the duodenal fluid. One gram per day causes only part of the bilirubin to be bound, but 4.5 grams (2-3 teaspoons) per day of charcoal prevents all but a small amount of bilirubin from being absorbed from the duodenum. If charcoal feeding is started at 12 hours of age it is less effective than when the charcoal is begun at 4 hours of age, as the enterohepatic circulation of bilirubin may play a critical role in determining the size of the bilirubin pool during the first few hours of life.

The very first case of neonatal jaundice on which we used charcoal was a breastfed baby who developed jaundice on the fourth day of life. The baby was sent to the



For erythroblastosis (jaundice in the newborn), put a tablespoon (about 4-8 grams) of pulverized charcoal in a nursing bottle with sufficient water to make a slurry barely capable of passing through the nipple. Shake well to blend. Start giving the charcoal water in suspected cases before the baby is 4 hours old. When combined with daily exposure to sunlight, bilirubin levels remain sufficiently low that most exchange transfusions can be avoided.

laboratory with his father, and the first total bilirubin level was 12 mg % on the 5th day, 14.5 mg. % twelve hours later, and 16 mg % 6 hours after that. A consultant agreed with our suspicion of an ABO incompatibility. At this point we began 6 hourly bilirubin determinations and appropriate associated laboratory tests. When the bilirubin rose to 18 mg % the consultant prepared for an exchange transfusion. That same hour the mother began administering as much charcoal as she could get the baby to accept and sat in the sunlight with the baby undressed in her lap, giving over an hour of exposure to both front and back (babies can tolerate more sunlight before getting a sunburn than can adults). At the next 6 hour bilirubin check the level was down to 16.5 mg % and we knew we had avoided the hazardous exchange transfusion. Continuing with this treatment the bilirubin began to clear and was down to 4 mg % by the 10th day.

12. Kerosene, Gasoline, Lighter Fluid Ingestion

Charcoal can adsorb some gasoline, kerosene, lighter fluids, and cleaning fluids that children may accidentally ingest, which may cause an involvement of the lungs and central nervous system. Since charcoal is not as efficient in adsorbing these substances, a much larger quantity of charcoal in relation to the offending fluid should be swallowed than for other poisons.

13. Liver Failure

Patients with hepatic failure can be treated even in the home, but especially by hemoperfusion through columns of charcoal which extract most amino acids, drugs, and toxins from plasma. Individuals who have acute liver failure should be given large quantities of charcoal by mouth in an attempt to prevent toxins from building up in the blood.²¹³

14. Metabolic Problems

Orally administered activated charcoal given for 4-8 weeks to six adults suffering from renal insufficiency showed that their serum triglycerides fell an average of 36% and serum cholesterol by an average of 67%. Urea, uric acid, and creatine were not significantly affected. It is felt that the direct binding of lipids and bile acids in the intestine by charcoal produces these results. Itching in patients on longterm dialysis can be relieved by charcoal by mouth.¹⁷¹

15. Mushroom Poisoning

Mushroom poisoning can be effectively treated with

charcoal, even 24 hours after eating *Amanita phalloides*.²¹⁵ Unconscious patients can be given activated charcoal by gastric tube.²¹⁶

16. Pain

For abdominal pain use pulverized charcoal on the abdomen as a poultice, laying it over the entire abdomen and sides. Often great pain can be relieved in a short while by the use of charcoal poultices on the abdomen.

The pain of sore throat, earache, sprains, arthritis, pleurisy, and all other pains should be given a trial of a charcoal poultice. The pain that may have gone unabated for hours is often relieved in ten minutes.

17. Theophyllin

Theophyllin, which is often given for respiratory tract problems in children, has a very narrow therapeutic index before toxic range is reached. Frequent acute overdoses can be expected, especially among children, since there is increased usage of this drug. Physicians and parents who prescribe and use drugs that can be dangerous to children should always have on hand activated charcoal ready for immediate administration.

18. Women's Diseases

In 1930 Nahmacher reported on his experience with charcoal. He stated that he had treated spontaneous abortions by watchful management, unless hemorrhage required surgical interference. Only in criminal abortions, produced by external interference, did he see fever. In numerous abortion cases having admission temperatures up to 100.4, he was able to prove that in almost all cases the temperature fell to normal in 24 hours at most, and convalescence was entirely free of fever when granulated charcoal was introduced into the uterus through the cervix by means of one or two charcoal pencils. He assumed that bacteria in the uterine cavity had been adsorbed into the charcoal. He reported convalescence free from fever, in contradistinction to cases not treated with charcoal, in which a low grade fever extended over several days, indicating endometritis. He reports almost immediate cessation of a malodorous discharge in infected abortions treated with charcoal.

He reported that fever after the birth of a baby was very favorably influenced by intrauterine charcoal therapy. As soon as a foul smelling discharge and low grade fever set in, the patients were treated five to six days with certain medicines, an ice bag, raising the head of the bed 25 cm. (about 8 inches) to aid escape of the discharge, and if no improvement occurred, charcoal was in-

roduced into the uterus on the seventh day under the strictest aseptic precautions. In all cases a reduction in temperature occurred the day following and was normal by the second day. The odor disappeared at once. In over 90% of cases it was unnecessary to insert charcoal pencils more than once.

The technique for insertion is as follows:

1. Cleanse the vaginal opening and the vagina. Insert a vaginal speculum.
2. Hook the anterior lip of the uterine cervix and cleanse the cervix of mucus and pus.
3. Grasp the charcoal pencil with a dressing forceps, dip two or three times in sterile water, and carefully insert it through the cervical canal to beyond the internal os. There is no need to dilate the os. Two or three pencils may be introduced if the uterine cavity is large enough, one toward the right, the second toward the left, and the third in the midline. A gauze is left against the os.²¹⁷

"Always study and teach the use of the simplest remedies, and the special blessing of the Lord may be expected to follow the use of these means which are within the reach of the common people."²¹⁸

The gastrointestinal tract is one of the most important systems for the removal of toxins, the lungs, skin, and urinary systems being the other routes of excretion of toxins. As materials are secreted from the blood into the gastrointestinal tract, the toxins may be either digested, or reabsorbed into the blood stream. If charcoal is present in the gastrointestinal tract, the toxic substances may adsorb into the charcoal. Since toxins may be actively secreted

into the gastrointestinal tract from the blood stream, charcoal makes a very efficient cleanser of the blood when taken orally. Undigested vegetable fiber from fruits, vegetables and whole grains also act as material to adsorb toxins and prevent their absorption into the blood stream. It is believed that many cancer-producing chemicals leave the body in this manner.

Kaolin, a white clay, is another material that adsorbs substances from the gastrointestinal tract, and has been used in various preparations for gastrointestinal disorders (Kaopectate is an example.) Ordinary clay from the hillside can be used either externally or internally in the same manner as charcoal. It has been in use for centuries in Europe and Central America, but has had only limited use in the United States, mainly for bee stings and other venomous bites. Clay poultices have been used for boils, corns, callouses, hemorrhoids, ringworm, pinkeye, acne, gangrene, and skin sores and ulcers.

Internally clay has been used for constipation, and conversely for diarrhea. Just mix some clay with water and drink it, or make a paste—1-4 tablespoons of clay with enough water to moisten. Clay has been used as an antidote for poisons and for anemia.

To obtain the clay, go to an uninhabited area or in your backyard, dig down under the topsoil with a hoe or shovel, and take up the underlying clay. Be certain no chemicals have been dumped in the area, and that pesticides and herbicides have not been used. Sterilize the clay and dry it out by baking in an oven at 350° for 15-30 minutes until completely dry. Pound with a hammer if necessary to make the clay fine. May be stored for years without losing potency.²¹⁹