By Jane E. Brody  
New York Times Service  

NEW YORK — The kinds of fats consumed, not the total amount of fat, determine a woman’s risk of suffering a heart attack, according to the first major study of the effects of all dietary fats in women.

The 14-year study, of more than 80,000 women, highlighted two types of fats as the main culprits in heart disease: saturated fats, found mainly in meat and dairy foods, and trans fats, found in most margarines, commercial baked goods and deep-fried foods prepared with hardened vegetable oils.

The research, which documented 939 heart attacks, fatal and nonfatal, among the participants, is the latest in a series of studies that have sought to define more carefully the effects of diet on heart disease. The earlier research focused mainly on saturated fat, cholesterol and total fat intake as the chief dietary factors. The new findings, in contrast, confirm and extend those from a report, published four years ago and also based on this study of nurses, about the risk of trans fats.

When the researchers took into account other influences on coronary risk like smoking, trans fats stood out as the most serious problem. Among the women who consumed the largest amounts of trans fats, the chance of suffering a heart attack was 58 percent higher than among those at the low end of trans fat consumption.

But women in the group with the largest consumption of total fat (46 percent of calories) had no greater risk of heart attack than those in the group with the lowest consumption of total fat (29 percent of calories).

The researchers, from the Harvard School of Public Health and Brigham and Women’s Hospital in Boston, said this suggested that limiting consumption of trans fats would be more effective in avoiding heart attacks than reducing overall fat intake.

The authors said they believed that their finding would apply to men as well as to women.

But some other experts pointed out that the study had not examined the effects of a diet lower in fat than 46 percent of calories, and said the time to recommend reducing total fat intake.

Currently, about 50 percent of the fat in American diets, which is produced with the help of bacteria that add hydrogen to liquid vegetable oils, are free of trans fats.

Like earlier research, the study found that people who are most likely to develop heart disease are greatest in their consumption of saturated fats — from beans, corn and sunflower oil. 

In this study, most prominent among the high saturated fat category were fish, nuts and olives, but overall, no particular food group emerged as a significant risk factor.

The study was published in the Thursday issue of the New England Journal of Medicine, but it is one of the most extensive commentaries.

By Gina Kolata  
New York Times Service  

NEW YORK — Gene therapy has prompted patients with hopelessly blocked blood vessels in their legs to grow their own bypasses, researchers said. Most patients in a small study saw a sharp reversal of the predicatably downhill course of that type of cardiovascular disease.

The results, reported at the scientific meeting of the American Heart Association in Orlando, Florida, by Dr. Jeffrey Paris of St. Elizabeth’s Hospital and the Tufts University School of Medicine near Boston, covered 10 patients. Although that is not a large number, some experts said the study was a rare demonstration of a clinical benefit from gene therapy and might be pivotal.

Dr. Lerner and his colleagues injected genes into legs, eliciting the growth of a web of hairlike blood vessels that rerouted blood around the blockages and could be seen with X-ray and magnetic resonance imaging.

As a result, he reported, three patients who had been scheduled for amputations avoided them entirely because blood flow improved so markedly. For six others, severe and relentlessly painful lesions; two of them, who had been scheduled to lose legs, each lost a toe to amputation. In some cases, gangrene cleared up. Only one of the 10 patients failed to respond.

A paper describing the results has been accepted for publication in the journal Circulation, Dr. Lerner said.

In addition to using a small number of patients, the study lacked a group that received a placebo for purposes of comparison. Medical experts urged that the work be repeated in a large study with such controls.

Until then, said Dr. R. Sanford Williams, chief of cardiology at the University of Texas Southwestern Medical School in Dallas, “we have to be extremely cautious and avoid giving false hope.”

Nonetheless, some experts said, the results were compelling. The patients, after all, were in the final stages of a devastating disease. There was essentially no chance that their conditions would improve on their own. And never before, some experts said, had gene therapy actually resulted in the clinical improvement of a disease.

“This could be a pivotal study,” said Dr. James Wilson, director of the Institute for Human Gene Therapy at the University of Pennsylvania.
Fat

29 percent of 
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cates of a low-fat diet to prevent heart disease 
and those who say a high-fat diet promotes 
obesity and some cancers.

Bypass Blockages in Legs

Stuart Orkin, a professor of pediatrics at the Harvard Medical School, said, "It is one of the first, if not 
first, times that gene therapy has 
ited in a clinical improvement.

Orkin at 2. The results were 
fortifying. When some of 
patients' histories are described, he 
said, "you have to say, 'Wow.'"

ach year 30,000 to 40,000 Amer- 
s develop such severe blockages in 
leg arteries that they have excruciat 
and ulcers on their legs that do 
heat. For those patients, unlike 
ple with blocked coronary arteries, 
no effective drug therapy. 
usual, they face eventual ampu-
as, as the lack of blood flow leads to 
tion and gangrene.

Dr. Lerner said that 20 percent of those 
ents died in the hospital and that 40 
percent died within a year of the surgery. 
s patients, Dr. Lerner said, had the 
t to gain and the least to lose from gene 
therapy.

The study demonstrated the remarkable 
properties of a gene known as the 
vascular endothelial growth factor, or 
F, that is thought to be the body's 
signal to grow new blood vessels.

The idea was to inject F genes 
directly into muscle cells near the 
blockage and allow the 
takes up the 
and use it to make F protein. 
About 5 percent of the billions of genes 
Dr. Lerner injected actually went into 
muscle cells and were used by them.

Upon taking up the genes, the muscle 
cells secreted the F protein, which 
made its way to nearby blood vessels.

Naturally, F would not avidly at- 
tach itself in cells that line the blood-
essel walls. But when a vessel is 
blocked, the cells just beyond the block-
age, which are starved for blood, become 
very sticky for F. And so the F proteins 
ly attached themselves to the 
sections of the blood vessels 
which were needed.

With F stuck to their surfaces, the 
cells started to sprout a network of 
threadlike blood vessels. When that happens, 
for reasons that are still mysterious 
researchers, the new vessels wind 
their way around the blockage and form 
an alternative pathway for blood.

Any F that did not attach to cells 
early was swept away by the 
stream and degraded. The muscle 
cells secreted F only for several 
weeks, just long enough for the body \n
grow its bypasses.

"When we began our study," Dr. 
said, "we had no idea what dose of 
gene therapy was going to work or if the 
way we were injecting the genes was 
appropriate or if the sites we were in- 
jecting were appropriate. I have to admit, 
we really lucked out."