On a recent Saturday morning, Bob Pfohl raced up six flights of stairs, hauled a fully charged hose 75 feet and dragged a 175-pound body another 100 feet. The 54-year-old firefighter from San Diego wasn't responding to a call, but competing in the Firefighter Combat Challenge, a nationwide competition that tests the physical fitness and stamina of thousands of firefighters every year.

Often called "the Olympics of firefighting," the Combat Challenge, which has 20 events a year featuring about 4,000 firefighters, is the brainchild of exercise physiologist Paul Davis. In the early 1970s, Dr. Davis was a firefighter in Montgomery County, Md., and fire departments across the country were starting to get sued by minority and feminist groups for what many saw as the discriminatory physical requirements to become a firefighter.

"In some places you had to be six feet tall, odd stuff like that," he said in a recent interview. "It was very arbitrary and differed from place to place."

With a grant from what would become the Federal Emergency Management Agency, Dr. Davis was asked to develop a standardized test for fire departments. "We basically asked ourselves, 'What's an essential function, and how do we create a surrogate for that?'" he said.

What they came up with are the events that make up the Combat Challenge. Each firefighter—wearing 50 pounds of gear, including an air pack—starts with an additional 45-pound hose pack (sometimes called an "apartment pack" or "hotel pack"). A set of preconnected hoses used to fight fires in multistory hotels and apartments (on his shoulder and has to run up 63 steps to the top of a five-story tower.

"The physical demands of stair climbing are extraordinary, and very much a part of the job," Dr. Davis said. "You're not only propelling yourself forward, but also lifting. It exacts a severe physiological toll."

By Dr. Davis's measurement, during the stair climb the firefighters are moving themselves and their gear about 41 feet in 12 seconds at 1.5 horsepower. "That's not sustainable," he said.

Once at the top of the stairs, contestants reach over a railing and use a rope to haul up another hose pack, this one weighing 42 pounds. This, he said, shifts the work load from the lower extremities to the upper body. "In firefighting, your grip could be your life."

Next, contestants run back down the stairs—touching each one—and pick up a sledgehammer to use on what's called a "kaiser sled," a metal track with a 160-pound block on it. The firefighters have to use the sledgehammer to drive the block at least five feet. The preferred method seems to be to straddle the kaiser sled, swing the sledgehammer in short, choppy swings, and hit the end of the block. It's a true test of real-world firefighter's skills, Dr. Davis said, because sometimes buildings are so smoky and deprived of oxygen that firefighters can't use a gas-powered saw, so they have to use axes and sledgehammers to break through doors and walls.

Contestants then run 140 feet and grab a fully charged hose, drag it 75 feet and shoot the spray at a small target. "It's another essential function and a test of legs and core strength," Dr. Davis said.

Finally, firefighters must drag a 175-pound mannequin 106 feet. It's one of the toughest parts of the competition, and not just because it comes at the end, when these guys are spent. "It's the human tractor pull," Dr. Davis said. "And if you look at our demographics, we're not getting any lighter."

Dr. Davis said the test is important because firefighting is one of the last truly physical jobs in urban America. "Most of the work done in cities has been replaced by machines," he said. "But firefighters still make a living using their bodies. They're still hugely dependent on their physical prowess."

Today, the Combat Challenge and the Candidate Physical Ability Test are the two standardized tests used by most fire departments to screen applicants. But some fire departments are also using it to make sure that their firefighters remain physically fit for the job. For instance, the Montgomery, Ala., department, which had a rookie team here, uses the Combat Challenge course to test its firefighters every year, from chiefs to its newest members. They have nine minutes and 30 seconds to complete the course, compared with the Combat Challenge where the world individual record is one minute, 19 seconds. If a Montgomery firefighter fails the test, he must participate in a remedial physical-fitness program "until he does pass."

"These guys are professional athletes," Dr. Davis said of the Challenge participants. "If you put them in an exercise physiology lab, they'd test right up there with Olympians."

At Tyler, there were about 130 firefighters competing in team and individual competitions. The events are usually held in mall and school parking lots—anywhere with enough room to set up the course. About 500 fans—mostly family members and other local firefighters—showed up to cheer on the competitors. Rex Nimrod, whom Dr. Davis calls "a perennial teenager," worked the crowd and introduced the competitors.

The best individual time at Tyler came from MacKenzie Briggs of Palm Beach County, Fla. Expected to do well at the world championships in Myrtle Beach, S.C., in November, he completed the course in one minute, 31.74 seconds.

The team competition, in which four members of a team divide up the six tasks, was won by Team Wired Zip Lines, a group of firefighters from McKinney, Texas, with a time of one minute, 14.84 seconds. The world record is one minute, eight seconds.

And then there was Mr. Pfohl, the San Diego firefighter, who works on the Viejas Indian Reservation. He completed the individual course in two minutes, 30.78 seconds—good enough to win the Over 50 category and place 97th overall among the mostly 20-something competitors.

"Bob Pfohl is what the Combat Challenge is all about," Dr. Davis said. "He's the kind of 54-year-old firefighter you want getting out of the truck in front of your house."

Mr. Yost is a writer in Chicago.