The DNA of Dispatch

The reasons for a unified medical dispatch protocol.

BY JEFF J. CLAWSON, MD

NINETEEN FIFTY-THREE WAS THE YEAR OF A REMARKABLE DISCOVERY. It was a red letter day in science with the discovery by Crick and Watson of the double helix structure of DNA within the human chromosome.1 We finally learned how one spiral chemical chain creates, or "replicates," itself and, thus, how life is perpetuated in a predetermined non-arbitrary way. Frogs give birth to frogs; snakes give birth to snakes. Unfortunately, if the order, or "code," of the genetic chemical units is defective, mutations can appear: two-eyed frogs become three-eyed frogs or frogs that cannot jump.

Nature, because of its simplicity and effectiveness, can provide a model to better understand apparently unrelated processes. Medical dispatch is one of them. For many years, the process of handling 9-1-1 requests was addressed by a dispatcher with no applicable training and no structured protocol.2,3 Often similar, if not exact, problems were handled differently by different dispatchers in the same center or differently by the same dispatcher from one call to the next.4

The absence of a formal plan means that no reliable reproduction of that "plan" can exist. Such call-taking anarchy observed in centers functioning in this "planless" mode has given a not-so-flattering name to this type of nonprocess: Dodge City dispatching.5 Like the lawless Dodge City of the Wild West—do what you want to do, to whomever you want to do it, whenever you want to do it to them. This certainly bears little resemblance to the orderly, effortless, near-perfect replication of living cells DNA provides in countless functioning plants and animals.

But, then, the cell has a "plan."

Priority dispatch protocols introduced into the public safety communications world in 1978 were designed for a specific purpose: to ensure that the right thing is sent to the right place, in the right way, at the right time. This is the most important reason these protocols exist.6 The prioritization of response and the orderliness of treatment is the true value of such protocol "plans." Now, more than ever, patient care is being impacted by the management of mobile medical resource response in the prehospital setting.7 Pre-planning of emergency responses is becoming a more essential science in a health care environment that stresses efficiency of care.

To keep with the analogy, just as DNA determines the replication of life, dispatch determinant codes, or "dispatch DRGs" (diagnosis related groups), form the replicative basis of priority dispatch protocols. DRGs are a universal type of medical coding system used by hospitals and clinics to medically classify and, ultimately, bill patients. Obviously, how a dispatcher arrives at the decision to select a given DRG is just as important as the resultant code itself because selection of the wrong code may result in sending either too many or too few resources. This can be more simply defined as risk vs. waste. A predesigned interrogation plan ensures reliable situation analysis by the EMD. It also links outcome with the evaluation process in a way that can then be studied, compared among different centers and, therefore, improved over time.

Like DNA replication, each plan must be followed to the letter (as much as possible) or unforeseen consequences occur—such as the three-eyed frog. Imagine the genetic chaos that would be created if each cell had to guess what proteins to make, where they were to form and in what order; we'd be lucky if any subse-
quent creatures looked remotely the same as their parents, much less survived.

In the same way, dispatch protocols must be followed in a given order; just using "chunks" of the plan doesn't work very well. Dispatch protocols are serial action plans, not arbitrary choices on a menu. Think of what would happen then if DNA was no more than this—in other words, only a guideline.


According to the laws of genetic replication, each species can transfer minor genetic improvements onto the next generation within that species. Orderly sharing of this genetic information then causes improvement within the species in relatively short periods of time—stronger frogs and faster snakes. In the same way, by maintaining the same core plan (protocol structure and content), the actual experience of one communication center's application of the plan can be formally transferred to other centers that use the same plan.

However, if the core plan of one dispatch center is, say, frog DNA and the core of another one close by is snake DNA, a new, improved jumping adaptation in the frog protocol won't, when mated with the snake, create a jumping snake. It doesn't even create a frog (or a snake either for that matter).

One of the most important features of the Advanced Medical Protocol Dispatch System (AMPDS) is what we call the unified protocol model. This means that all centers within each system use the same protocol and the same edition of that protocol.

Years ago, this was seen as restrictive to the protocol-developing enthusiasm and freedom of new medical dispatch centers, and by the mid-1980s various versions of priority dispatch protocols were in hundreds of places. Unfortunately no unified plan to ensure orderly protocol improvement existed and many were rewritten, modified or just tweaked in some minor way. Yet as each center randomly "improved" their protocol, what started out as the same protocol became increasingly different from center to center over time. Some groups eliminated questions based on the "too many questions" pressure found in many centers. Some added expansive prearrival instructions. Some asked esoteric medical questions of the caller that on the surface sounded interesting to a medical novice but which when examined in more depth lacked clear dispatch-related objectives. In essence, without order, the protocols mutated.

A personal experience in 1990 brought home the down side of such protocol "freedom." After giving the opening speech at the North Carolina State EMS Conference, a polite gentleman asked me if I would visit his communications center in town. He pointed out that this communications center was the first in his state to use medical priority dispatch protocols. After arriving at the center, he pointed to the three stations and said, "See, doc, there are your protocols—one, two, three."

From a distance of about 20 feet, however, something didn't look quite right. I asked him how many cards were in each dispatch set. A dispatcher on duty, overhearing us, started counting them. The moment he said "29," I realized what was wrong. They had the 1981 version with 29 cards, which was the first version widely distributed. The version in use in 1990, however, was the 10th edition with 32 cards. The protocol they were using was hopelessly out-of-date; it contained no treatment sequence cards (as the CPR, choking and childbirth scripts were called back then) and was truly a potentially dangerous device. And no one knew that better than I, because I had written the thing practically 10 years before.

What went wrong? This center had actually copied the protocol from a neighboring county that had originally obtained them. They had made some changes to the protocol initially but lost enthusiasm for any "updating" within the year. There were no attempts to secure updates. It was quite a mental shock for me to realize that such obsolescent protocols were still being used—and used proudly.

After relating this experience on my return, my colleagues in the logic division at the office gave this disturbing lack of forward evolution a tongue-in-cheek nickname—the "evolution of fish." As in an evolutionary tree, if a certain edition of the protocol was introduced into a region without any process to maintain it, evolutionary stagnation sets it. That initial edition they irreverently called the "fish" version. Each place originally using that same protocol makes their own modifications to their "fish." One center's fish quickly becomes a blue fish; another's, more slowly, a spotted fish; and yet another's a three-headed fish (after which they quit using the protocols stating that they don't work very well). But all in all, each version was still a fish. None of the local efforts to modify ever went further than a year or so of "touching up" and never deeper than "scales" or "fins." And none of the modifications to these protocols ever "genetically" crossed over to those used by other adjacent centers. Even sadder, none of these "fish" protocol varieties ever made any significant evolutionary version "jumps" to become frogs, birds, horses or pri-

Imagine that a dispatch center in East Eaglejew, Manitoba, is using the same protocol you use. They experience a strange case that tests a rarely used logic path of the protocol containing a previously undetected weakness. The resulting problem wipes out a whole school district of kids. I can guarantee that this center will attempt to fix their protocol—and quickly. But will they get on the phone and call your center to warn you? Would they even know who you were? It would be even more unlikely that they would call the other 18,126 dispatch centers in North America either. much less the myriad of centers throughout the United Kingdom, Germany, Italy, Australia, South America, Africa, and so on.

Without a systematic method of sharing information, each center has to wait until it encounters the same or similar problem and a tragedy occurs. This is the same reason there are not four, 14, or 4,000 CPR, BLS or ACLS protocols being used and locally modified at will. But before these core protocols were defined in the early 1970s there were about a dozen different variations of CPR alone being used, and worse, the number of ACLS-like "protocols" in use back then roughly equaled the number of hospital base stations in North America. Hardly scientific or even remotely controllable. A disturbing thought to say the least. But a unified system of a single core protocol, modified through a scientific method process and routinely distributed to everyone ensures that every protocol benefits from the experience and research of
the other users. In the same way the heart and resuscitation coun-
cils maintain a core protocol for CPR, within the College of Fel-
lows the National Academy of Emergency Medical Dispatch pro-
vides stability and reliability to dispatch.

There are more than 88 million question-and-answer combina-
tions in the computerized version of the medical priority dis-
patch protocol. This means that it would require 88 million dif-
ferent 9-1-1 calls to test every one of these decision pathways in
the protocol once. Obviously, some pathways get tested every day
and some almost never in a given center. What does this all boil
down to? Frankly, most people don’t have the time to build a
complex protocol much less worry about maintaining it at cur-
rent levels themselves. That’s why the College of Fellows of the
National/International Academy of Emergency Medical Dispatch
was initiated.

The College of Fellows is the standard-setting body of the
NAEMD. The College of Fellows’ purpose and mission statement
is: “To conduct an ongoing review of the current standards of
care and practice in Emergency Medical Dispatch and evaluate
the tools and mechanisms used to meet or exceed those stan-
dards.” The College of Fellows is a unified international scientific
body of experts that maintains the integrity and credibility of the
Advanced MPDS protocols. This is done through a pre-estab-
lished process of reviewing and, where appropriate, approving
proposed modifications and improvements to the protocols.

The Academy now has approximately 20,000 certified mem-
bers and 2,000 centers are licensed users of the AMPDS. The
potential of such a large “user group” is being realized by a grow-
ing participation in the College of Fellows’ controlled process for
protocol evolution. If you obtained an MPDS protocol set (ver-
sion 10.0) in 1990, you have received updates at no charge for
six years, all for the original cost of the protocols. Version 10.2
was issued about a year ago. And the process is perpetual.

You know, another nice thing about controlled, unified evolu-
tion and DNA’s role in it, is that the average person out there,
busily running his (or her) dispatch center or EMS agency,
doesn’t have to worry much about it. It just happens. And the
vast majority of the time, it happens remarkably well. Crick and
Watson would be proud.

References

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