Group medical practice is the natural evolution of medicine

Eight core design principles that favor cooperation and the welfare of groups, applicable to the evolution of medical practice.

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The most famous quote about evolution has got to be Theodosius Dobzhansky's, "Nothing in biology makes sense except in the light of evolution." This applies to medical practice as well.

We have all been taught that Darwinian evolution is based on the principles of random mutation and natural selection. However, there are many people now questioning the completeness of these principles. There is a third principle, which is sometimes called group selection[1] and sometimes called cooperation.[2] Even Darwin had doubts about the completeness of his theory.[3]

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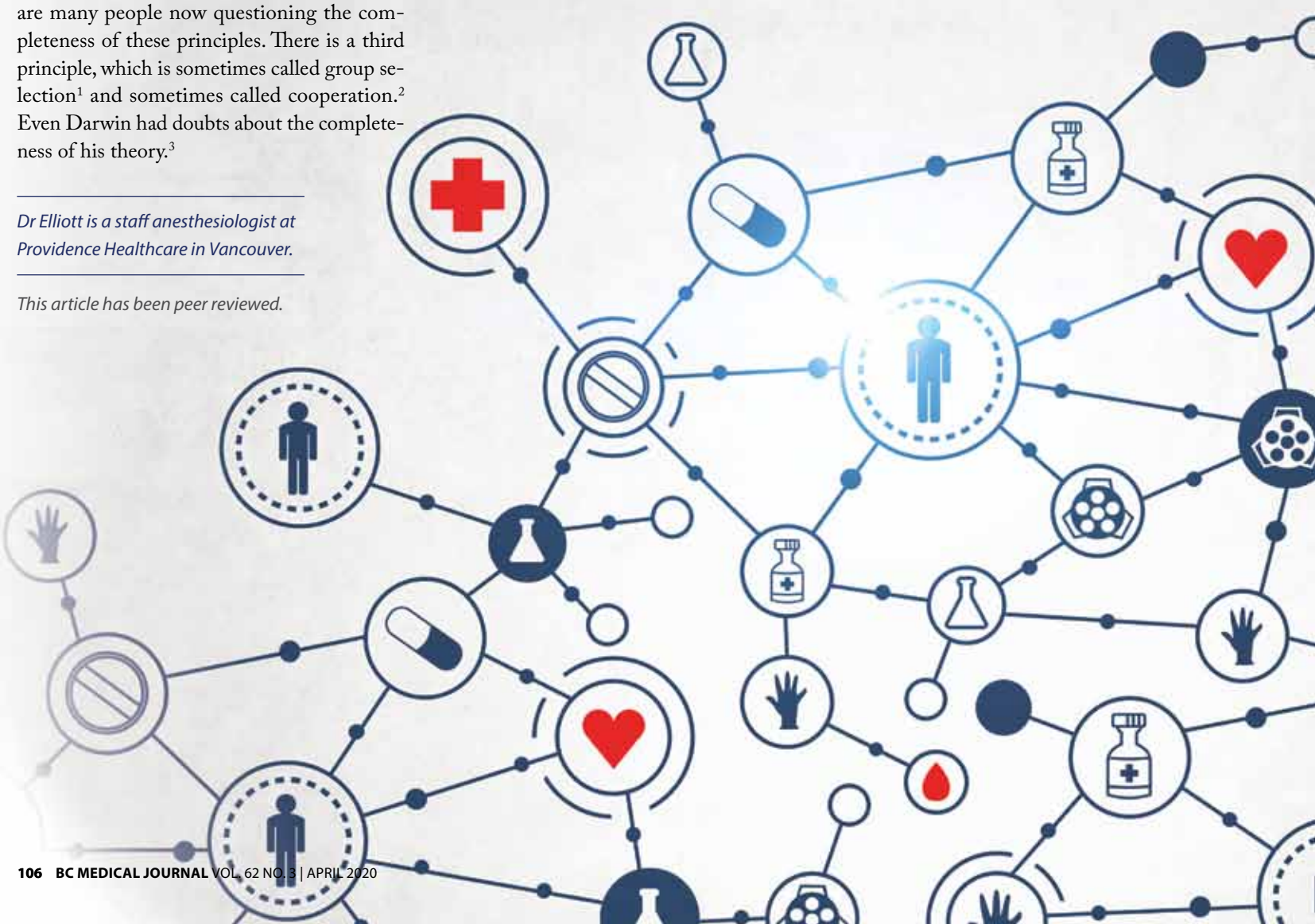
For at least 50 years, biological dictum has said that it is the individual who is subject to evolution. It is now believed that the small cooperative group is the fundamental unit of an organization that evolves. In fact, the evolution probably happens at many different levels. This has been termed "multilevel selection."

And evolution is not perfect. If an adaptation is selected at one level, this inevitably creates problems the next level up. So what is good for me may not be good for my family, what is good for my family may not be good for the community, what is good for the community may not be good for the province, what is good for the province may not be good for the country, and so forth.

There is a well-known example involving hens to illustrate how group selection trumps individual selection.[4] Let's say you have groups of hens in cages (10 to a cage) on a modern agricultural egg farm. You might think that breeding the most productive individual hens would give you more eggs. But what happens after about five generations of this breeding is the hens peck each other's feathers out and egg production plummets. If, on the other hand,

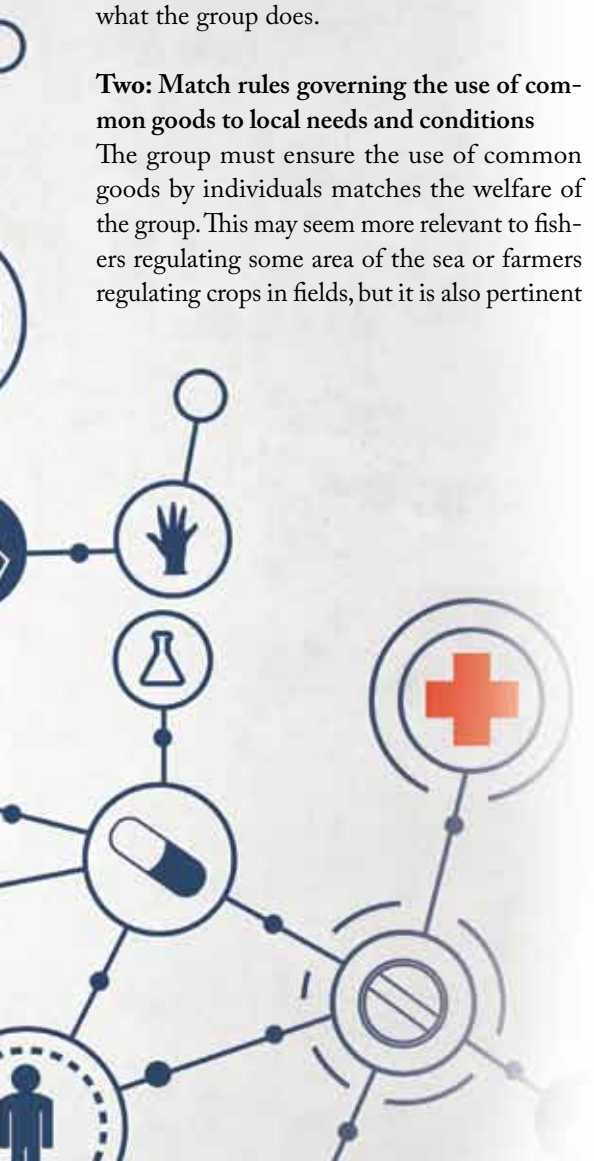


you select and breed the hens in the cages that have the most eggs, production goes way up after five generations. The rational usually given for the disastrous outcome in the first scenario is that you are breeding bullies who then do nothing but fight each other. Maybe one bully in a cage of 10 hens was okay, but 10 bullies in a cage is problematic, at least as far as egg production goes.

Elinor Ostrom won a Nobel prize in economics in 2009 for outlining eight core design principles that favor cooperation and the welfare of groups.[5] This work greatly influenced biologists developing the theory of evolution at the group level.[6] These principles are very applicable to medical practice. They are outlined here.

One: Define clear group boundaries
The group must have clear boundaries so its members know they are members and know what the group does.

Two: Match rules governing the use of common goods to local needs and conditions
The group must ensure the use of common goods by individuals matches the welfare of the group. This may seem more relevant to fishers regulating some area of the sea or farmers regulating crops in fields, but it is also pertinent to group medical practice. Basically it means you can't steal your money; you must earn it.



Three: Ensure those affected by the rules can participate in modifying the rules
The group must agree to things collectively so no one individual can be bossed around.

Four: Ensure the rule-making rights of community members are respected by outside authorities
In the case of doctors, the rules they enact must be respected by the larger collective system, whether that be a hospital administration, a regional health authority, or a provincial government. This is where it is good to have a group leader who is able to communicate well with the authorities and not simply be their hired hand.

Five: Develop a system, carried out by community members, for monitoring members' behavior
There must be a system to monitor the actions of a group's members. This is where a good leader shows their other side by being able to communicate well with group members, convincing them to change a practice if it is in the interest of the group.

Six: Use graduated sanctions for rule violators
If an individual doctor in a group breaks a rule, there must be a graduated, agreed-upon system of escalating sanctions against that member. The sanctions must start out benignly and should build up to a real sting after repeated transgressions.

Seven: Provide accessible, low-cost means for dispute resolution
Disputes must be settled with very little cost to the group. If they aren't, then medicolegal problems arise. Most lawsuits stem from longstanding grudges between doctors that result in a patient either overhearing one doctor complaining about how bad another doctor is or a doctor telling that directly to the patient. If a disastrous complication results from some situation, it is much easier for the individual doctor if everyone in the group does things similarly and/or jointly. Think about the difference between one surgeon struggling for hours versus two surgeons together struggling for hours with a bad outcome.

Eight: Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system
Interconnectedness is what defines a complex adaptive system. Health care is just one of many such systems. Johnny von Neumann said that the defining characteristic of a complex system is that it constitutes its own simplest behavioral description. If we try to reduce the system's behavior to any formal description it makes things more complicated, not less. This seems rather demoralizing in our health care system, but the responsibility that Ostrom's eighth principle suggests needs to be developed is better than anarchy.

Evolution is not top-down like the hierarchy of the military or hospital administration. Nor is it completely bottom-up, with evolution only working its wonders on genes that mutate and then get randomly selected (like laissez-faire capitalism with its inevitable booms and crushing busts). Evolution tinkers with things. It experiments, lets most things fail, and keeps the things that work until they, too, fail. Medical practice is no different. ■

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