Dr. Larkin

Good afternoon. First, I would like to announce that I am not Dr. Martin McHenry, and when my turn comes to discuss the things that Dr. McHenry could discuss, please be very, very kind to me.

Everything I am going to say today will be immoral to some, controversial to others, and I am sure, illegal to another group, because when you discuss the role of infection in colonic and rectal surgery, you have opened Pandora’s box. Let us, this afternoon, try to un-muddle the cause, the prevention, and the treatment. We can agree about the first, but when we get to the second and the third, I don’t think we’ll ever have complete agreement (slide). Here’s our enemy. When infection attacks the intestinal tract it is attacking an organ that is full of bacteria, and is unlike other organs; the chest has bacteria, and the mouth has bacteria, but when you start here, you’re asking for trouble. We have to know who our enemy is when we start. This is a rundown of the small intestinal flora right on down to the rectum, and I am not going to take your time by reading them, except to point out the beta and the gamma streptococci; the reason for that is that this work was done in the GI department of the University of Miami, and the only thing we got out of it was that in people with tourist diarrhea we did find an increase in these bacteria when we recovered them from an intestinal tube in the jejunum. We never did find a virus but, for what it’s worth, that’s that.

Going down to the ileum, we begin to recognize some old friends. The reason Bacteroides is so seldom seen in the small intestine is that—well, I’ll talk a little bit more about that in a minute. Rather than read all those down, we are already seeing E. coli and Aerobacter aerogenes; now the colonic flora, that’s next. Here’s our big group of trouble-makers. You notice there is a space between Lactobacillus and Bacteroides—well, that doesn’t mean that we left one out. That’s deliberate. In the past, we talked about normal bacterial flora and abnormal bacterial flora—I think when we were talking about normal bacterial flora ten years ago, we would have listed the last five microorganisms. This, of course, is not really true any more. The first two are probably the normal bacterial flora because they are found in constant numbers most of the time in everybody. The reason that we haven’t found them, or paid much attention to them, is that they are anaerobes and, of course, it is very easy to culture stool aerobically, and we just haven’t bothered to do the other.

Now the others live in the colon, but they are probably incidental invaders early in the game and their numbers change, up and
down, with disease and even in health. So we no longer talk about them as the normal flora. These are really a little abnormal because they don’t stay the same, and they are our trouble-makers.

In addition to the bacteria sitting there waiting to spring when we open Pandora’s box, we have to remember that we can cause some problems ourselves. I am not going to spend any time with a distinguished group of surgeons telling you that you should take time to clean skin and wash your hands, but every once in a while you have to remind a lot of people about that, because we depend a great deal upon the drugs I am going to talk about now.

As early as 1939, Dr. Garlock indicated he could reduce some of the mortality in colonic surgery by the simple use of a chemotherapeutic agent—sulfanilamide. Not much came of that, and World War II began, but late in the course of the war, and in the 40’s, we began to rearrange the chemotherapeutic molecule, which is a simple benzene ring with a sulfonamide on one end and an amine on the other. We found that we could get one that would not be absorbed, and we thought our problems were over; two drugs—succinylsulfathiazole (Sulfasuxidine) and phthalylsulfathiazole (Sulfathalidine)—came out of this for general use. For a while, that was the standard treatment.

Around this time, also, the first of the penicillins became available to everybody else (slide). This slide illustrates the great number of drugs that are off the simple benzene ring of the penicillin family. The first has been here for a long time—penicillin G. The second is not in use any more. Ampicillin is next. The last two are recent additions in which we have penicillin drugs that resist penicillinase. But, as you can see, these are broad-spectrum antibiotics and are rather simple in structure (slide).

This is a complicated looking formula, and I want to illustrate—as we get specific in producing an antibiotic for a specific group of organisms, so do we complicate the molecule we use, and as we complicate the molecule we use, to be more specific, we cause the first of the toxic reactions to the specific antibiotics (slide).

This is simply a slide indicating our friend, tetracycline. You will notice there is an “R” here and an “R” here; well, by replacing these two “R’s”—one with a chloride up here and another with an OH down here, we change this to Terramycin, aureomycin, and Declomycin, but basically this is the same structure, and there really isn't much difference. When this drug became available, we had the first fairly safe broad-spectrum antibiotic that we could use (slide).

Finally, to show you a simple antibiotic, this is chloramphenicol. This is a rather simple formula: the broader the spectrum, the simpler the formula; the more distinct the spectrum, the more complex the formula. We put this up there because even though it is considered a dangerous drug by many people, later I will explain why I still think it is a pretty good drug for us to use.

With this as a background, from these drugs and others (for example, that large streptomycin molecule that we put up), came other drugs that we now use—kanamycin is a derivative; neomycin is a derivative. There are the enemies, and here are the weapons. Now you would think, if you had that proposition, that the solution would be easy, but it isn't, because we have never really agreed about how to take this group of drugs and put them together and treat this group of enemies. If we just start with a discussion of the preparation of people for this type of surgery, we have already opened Pandora’s box. For a long time, from 1950 on through 1960 or 1962, I think most of us agreed that if we put sulfathalididine with neomycin, after Dr. Poth’s first suggestion, and used it for five days—approximately one