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Wound Infection Surveillance

To the Editor:

Postoperative wound infection is an infrequent adverse clinical outcome that properly concerns all surgeons, some epidemiologists, and now a number of the newest players in American healthcare, the "quality improvers." An antecedent requirement for using process variables as adverse outcome surrogates in quality improvement work is to prove their linkage to outcomes of interest. What are needed to demonstrate solidly that postoperative antibiotic orders mark surgical wound infection are aggressive global wound infection surveillance data rigidly obtained with prospective, parallel pharmacy data to rate the putative marker in a pure observational study without surgeons knowing that the probe is underway. To my knowledge, no such data ever have been produced and, even if they appear tomorrow morning in the finest peer-reviewed journals, I foresee lukewarm endorsement of the scheme wistfully suggested by Yokoe and Platt.[1]

I am not surprised that antibiotic use seems a marker for wound infection presence. In play here is a continuing pattern of well-intended, but often unnecessary, clinical practice by lots of colleagues. No competent surgeon would exclude empirical, adjunctive antibiotic use, for example, in a patient with a fresh vascular graft or heart valve and a rip-roaring staphylococcal wound infection! However, in general, antibiotic treatment in a patient with an infected surgical incision is necessary only for spreading infections attacking normal tissues lateral or deep to a wound space or for systemic sepsis. These are uncommon evolutions[2] with all sorts of definable special circumstances, fuzzy semantic areas, and catch-22s that cross every specialty boundary and many operation types. Even when antibiotics *are* indicated as adjuncts in treating wound infection, no scientific data exist to specify, for example, even the duration of the added therapy! *The generic, proper treatment of a surgical wound infection is to open the closed skin incision.*

That patients do well when incision opening is accompanied by antibiotic use unfortunately serves, by the *post hoc ergo propter hoc* fallacy, to reinforce the notion that the antibiotic "might help and can't hurt,"[3] and this reinforcement has been repeated for almost 50 years now -- about eight generations of surgical training. Nobody has ever shown that antibiotics can improve the treatment of the vast majority of opened, suppurated incisions, which are almost impossible to keep from healing by second intention, if only kept clean. Placing a caged canary in almost every such infected patient's hospital room is exactly as effective in an adjunctive sense as ordering antibiotics if the subcutaneous space has been opened for drainage and open wound care. If Yokoe and Platt have contradictory evidence on this point, we need to see it.

The monthly editorial[4] in the same issue as the Yokoe-Platt paper states very early in its second paragraph, that "... comprehensive evaluation of antibiotic use would include every aspect of the process, including *1) the decision to prescribe antibiotics to a patient"* (emphasis mine). Under managed care initiatives, efforts to trim resource waste currently are targeting inappropriate pharmacotherapy. Every dollar counts. Unnecessary antibiotic use, especially by surgeons, will be on every hit list, and the reasons are not concealed: about 25 million operations are performed in this country every year, we use lots of antibiotics, our daily workloads are perused easily in operating room logbooks, and we traditionally have not been exactly penurious in our stewardship of antibiotic dollars. As the reflexive use of antibiotics for "treating wound infections" is exposed and gradually rooted out, the surrogate marker scheme of Yokoe and Platt would ironically be progressively, *silently* disabled by this positive accomplishment, and thereby made completely unreliable.

Modern, computer-equipped hospital pharmacies that resemble air traffic control radar rooms notwithstanding, I remain unconvinced by Yokoe and Platt that the best way to track wound infections is not old-fashioned "shoe leather epidemiology."[5] As we have demonstrated in our continuing journey since 1978,[6] empowering all surgical ward and clinic nurses as primary case-finders for wound infections (with a single wound infection nurse acting as their consultant and our data manager) is an effective approach *because ward and clinic nurses see patients' incisions anyway as* part *of daily care agendas*. This approach meets the near-sacred CQI requirement of involving and bonding multiple team members interdisciplinarily; it generates enough monthly data to satisfy every administrative type who may be worried that we have an "infection problem"; it provides fodder for all sorts of discussions; it does not require chart review or lab work to case-find; and it removes surgeons from a required diagnostic role, thereby defusing bluntly any "fox-watching-the-henhouse" criticisms. The only extra resource outlay is one half the very modest annual salary and benefit costs for one wound infection nurse. That's not much money.

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The authors reply

We agree with many of the points raised in Dr. Lee's erudite Letter to the Editor but do not feel that these issues conflict with the use of postoperative antibiotic exposure to detect surgical site infections.

We agree that excessive use of postoperative antibiotics is common practice and that there are little data to support the additional usefulness of antibiotic administration for most surgical site infections beyond that obtained by opening and draining infected wounds. Our proposed surveillance method based on antibiotic exposure, however, does not depend on whether the decision to use antibiotics is right or wrong, but rather makes use of antibiotic exposure as a marker for identifying patients who receive antibiotics because their physicians believe that a postoperative infection is present.

Dr. Lee also observes that under managed care initiatives, efforts to reduce medical costs likely will include minimizing unnecessary antibiotic use, and he speculates that a surveillance system based on antibiotic exposure would be "silently disabled by this positive accomplishment." We agree that the practices governing antibiotic use vary over time. This variation will necessitate periodic reevaluation of the optimal antibiotic exposure thresholds used to distinguish patients most likely to have postoperative infections from those unlikely to be infected. Such reassessment will prevent antibiotic-based surveillance from becoming "completely unreliable," as predicted by Dr. Lee. In addition, limiting unnecessary antibiotic usage may, in fact, increase the predictive value of using antibiotic exposure to identify serious postoperative infections by eliminating misclassification of the extended use of perioperative antibiotic prophylaxis.

The largest potential limitation of antibiotic-based surveillance imposed by the manifestations of managed care will be the increasing percentage of surgical site infections diagnosed after discharge resulting from shortened hospital stays. Postdischarge infections, however, also are difficult to monitor using traditional "shoe leather epidemiology." In the case of managed care organizations where outpatient use of antibiotics is monitored closely, outpatient antibiotic use potentially could be used to identify infections diagnosed after discharge using outpatient pharmacy records.

Lastly, we agree with Dr. Lee that, as supported by his series of landmark studies, "shoe leather epidemiology" is likely to be the most complete surveillance method for tracking surgical site infections. This method, however, may be becoming increasingly less practical as a result of tightening hospital budgets and diminishing staff resources. Surgical ward and clinic nurses likely will have less time to allocate to the identification and documentation of surgical site infections. Antibiotic-based surveillance is labor- and personnel-efficient and, although perhaps less sensitive and specific than traditional surveillance methods, may be adequate to identify risk factors contributing to the endemic and epidemic occurrence of postoperative infections. An additional benefit of antibiotic-based surveillance is that it uses relatively objective data, reducing the potential for interobserver variability and variation in surveillance intensity over time.

In conclusion, although the concerns raised by Dr. Lee are valid, we are optimistic that a surveillance system based on postoperative antibiotic exposure can be engineered to surmount these potential problems. Rigorous testing of this hypothesis will let us know whether such surveillance is worthwhile.

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