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Kaiser Permanente Spreads Antibiotic Stewardship Program for Patient Safety

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Kaiser Permanente Southern California's Regional Infectious Disease (ID) Chief Dr. Kalvin Yu and tertiary medical center ID lead Dr. Jim Nomura implemented a two-site pilot in late 2010 that resulted in over 1,500 hospital patients having expert review of their antimicrobial regimen and up to a quarter of these patients having an improvement made in the dosing, medication or duration of their treatment. For these patients, interventions involved both a change to a more efficacious medication and also took into account protection against developing resistance–so called "super bugs"–that have become endemic in all hospitals. The region is now in the process of adding processes from the pilot to existing antibiotic stewardship efforts across its 11 medical centers.

Antibiotic Stewardship is not a new concept; it is promoted by the Center for Disease Control (CDC) and is also now a requirement by the state of California. It can be done in many ways. The CDC and California recommend a team approach with a physician champion and a pharmacist. Kaiser Permanente's pilot programs, including most of Northern California under the ID leadership of Dr. Stephen Parodi, is based on the concept of pairing of an ID physician and a two-site pharmacist with advanced training in ID. It also relies on one-to-one communication with ordering physicians. The program can be implemented without extensive information technology and these elements can be adopted by any hospital.

A full-time ID pharmacist prescreening of key clinical data saves the time of the ID physician, who spends about one-to-two hours per day on this program in a typical hospital with 200 to 300 beds. The pharmacist reviews a list of patients who are receiving antibiotics, identifies new cases, and presents about a quarter of these to the physician. With ID training, the pharmacist develops the expertise to provide consults to other pharmacists, as well as document changes, tracks the status of patients whose regimen has changed and alerts the physicians to any untoward effects.

The CDC noted that up to 50 percent of antibiotic usage is inappropriate. The shared knowledge of the physician and pharmacist helps identify when treatment can be improved to not only benefit the patient, but reduce some of this waste. Recommendations are made by the pharmacist to the physician after a systematic review of the medical record, including history, laboratory results, imaging and vital signs. The physician then contacts the ordering physician to discuss a change. Almost 90 percent of the recom-

mendations are accepted. Changes resulted in marked decrease in purchasing costs for the most expensive medications and a shift from broader spectrum medications to those that are less likely to result in the patients building resistance. Patients may also be switched from an intravenous to oral form of the medications, allowing them to be discharged earlier.

The pilot's data capture and reporting will be moved to more automated processes, leveraging Kaiser Permanente HealthConnect® (Kaiser Permanente's electronic medical record) and related information systems. The successful implementation of infection surveillance software in Kaiser Permanente Southern California, Kaiser Permanente Northwest and Kaiser Permanente Hawaii Regions will allow for the development of benchmarks and sharing of best practices.

Next steps also include sharing a "playbook" for the program and setting up simulation training to provide opportunities for staff to practice presenting interventions suggestions to ordering physicians.

In the long run, Kaiser Permanente expects that with widespread and consistent promotion of more appropriate antibiotics usage, there will be improved results in better safety and outcomes for our members. The literature on the CDC Website reports that after three-to-five years, hospitals with robust antibiotic stewardship programs may record decreases in their multidrug resistant infection rates. Kaiser Permanente expects that the efforts currently underway in its hospital system will combine to contribute to its ongoing improvements to continue to reduce hospital acquired infections, such as C. *difficile*.

Maureen Hanlon is Senior Director, Resource Stewardship in the Department of Care and Service Quality at Kaiser Permanente. Her role is to support care delivery teams and leadership in finding opportunities and spreading practices where the right thing for the patient is also the best way to use our resources.

She graduated from UC Berkeley with a degree in Communication and Public Policy and she is a Registered Health Information Administrator and Certified Professional in Health Care Quality and in Utilization Management.

Before coming to Kaiser Permanente in September 2004, she was Director Quality Improvement at the Alameda Alliance for Health, a county-based HMO for low income families. She has also worked at Children's Hospital Oakland, the Medical Center at the University of California at San Francisco, City College of San Francisco's Medical Record Technology Program, and InterStudy, a Minnesota-based health policy and research organization.

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