

## CLINICAL VIGNETTE

# UCLA Anticoagulation Management Service: A Continuous Quality Improvement Endeavor

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Anticoagulation with Vitamin K antagonists, such as warfarin, has been shown to be effective reducing risk of clot or stroke in many studies over the years. However, the risks of anticoagulation are also significant and anticoagulation management requires significant patient education as well as close monitoring and follow up. Over the past decade, there has been much published regarding how best to administer anticoagulation management<sup>1-6</sup>. The hallmarks of a good anticoagulation management service focus on appropriateness of care, anticoagulation dosing management, systematic monitoring and patient evaluation, ongoing education, and communication with other providers involved in the patient's care<sup>3,4,7</sup>.

UCLA physicians have been managing patients' anticoagulation needs for many years. In the Department of Medicine (DOM), additional staff has been provided to assist in managing anticoagulation patients since the 1990's. The initial program enrolled chronic anticoagulation patients and captured INR results. Clinic staff would follow up on results and would notify the responsible physicians of the results and communicate changes to the patients. The patients were tracked in a modified commercial database. In the early 2000s, the DOM system had outgrown the internally developed software and a commercial computer program called DAWN AC was implemented. This program provided dose adjustment recommendations to supplement clinicians' judgment and had been demonstrated to improve anticoagulation control by 20-30%<sup>8</sup>. Control has been measured in several ways. Percent of the time within range is the most accepted current metric.

At the start of the new program, there were about 400 patients enrolled; by the end of the academic year, a total of 1400 patients had been enrolled. Additionally, for the first time, the AMS was now able to identify actual benchmark aggregate results, such as how well the AMS does in terms of maintaining patients in the appropriate anticoagulation range.

While the initial AMS was based in the Internal Medicine Suite for General Internal Medicine and Geriatrics patients, the program expanded to Cardiology patients, almost doubling the number of patients and physicians involved.

In addition to increased enrollment, the AMS has greatly expanded communication with physicians and patients. Over the course of 2008-09, the AMS documented significant improvement in percent time INR in range.

Further enhancements to the program include greater and more systematic patient education. A new informed consent process and patient education was designed using UCLA's online patient education and informed consent tutorial. A simple 15-question survey was also added to each visit (see appendix A). The survey elicits critical health information relevant to the patient's anticoagulation, questions behaviors that may affect anticoagulation and provides reminders. The next step in the program involves implementing point of service INR testing with immediate results and dosing instructions for patients. This will eliminate many of difficulties in contacting patients after they have obtained their testing. It should also enhance communication, by providing written instructions for dosage changes.

The point of service testing has been piloted in Santa Monica with an additional 300 patients. The point of service program has performed well, with results well above the recognized standard, placing the Santa Monica AMS among the top institutions participating in the national benchmarking program.

Overall, anticoagulation management has grown and evolved to increase opportunities to meld quality improvement, community based participatory research, and health services research techniques with clinical medicine. Additionally, in the spirit of an academic institution with a training program, the AMS has

made significant efforts to provide opportunities for students and house staff to learn about these techniques, learning to apply them to clinical medicine. Lastly, the AMS believes that its greatest partnership is with its patients. Much effort has been generated in developing a system that maximizes patient education and safety while minimizing patient discomfort. Future goals include expansion towards developing an Institutional AMS supporting all healthcare departments and bringing us one step closer towards the national patient safety goal of developing a single institutional anticoagulation management service.

## REFERENCES

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Anticoagulation Management Service

Patient name
Medical record number

**Abnormal INR Intake Form**

Current Warfarin/Coumadin dose: \_\_\_\_\_

Since the patient's last INR, has the patient:

(Circle Yes or No)

- |  |     |    |
|--|-----|----|
| 1. Missed any doses of Coumadin / Warfarin?  | Yes | No |
| 2. Changed from brand Coumadin to generic Warfarin?  | Yes | No |
| 3. Started, stopped, or made changes to <b>Vitamins or Herbal/Nutritional Supplements?</b> (Examples: coenzyme Q10, ginseng, ginkgo biloba, St. John's Wort, or other)<br>If YES, please describe: _____ | Yes | No |
| 4. Started, stopped or made changes to <b>Prescription or Over-the-Counter Medication?</b> (Examples: Antibiotics? Aspirin?)<br>If YES, please describe: _____   | Yes | No |
| 5. Changed diet?   | Yes | No |
| 6. Increased or decreased the amount of alcohol used?  | Yes | No |
| 7. Had bleeding (including nosebleeds, blood in urine, stool or vomit) or easy bruising?<br>If YES, please describe _____  | Yes | No |
| 8. Been in the hospital?<br>If YES, reason and duration of hospitalization<br>_____  | Yes | No |
| 9. Noticed numbness or tingling in arms or legs?   | Yes | No |
| 10. Noticed any visual changes or loss of vision in either eye?  | Yes | No |
| 11. Noticed dizziness or fainting?   | Yes | No |
| 12. Had chest pain, difficulty breathing or coughing up blood?   | Yes | No |
| 13. Had a fall or injury?  | Yes | No |
| 14. Been scheduled for any upcoming medical, surgical, or dental procedures?   | Yes | No |
| 15. Made plans to travel in the near future?   | Yes | No |

Does the patient have any other concerns? Yes No  
Please describe: \_\_\_\_\_