

Hemoglobin A1C Testing according to Laboratory Services Guidelines

Compliance with new utilization criteria in 2016

The Hemoglobin A1C test is a blood test providing information about a person's average blood glucose level, and is the primary test used for diabetes management. A normal blood glucose level is below 5.7 per cent. In September 2015, Alberta Health Services issued a bulletin¹ to Edmonton Zone and Calgary Laboratory Services with new criteria for A1C laboratory testing. The criteria limit test utilization to one test within a 90 day period, with the exception of pregnant women with gestational diabetes.

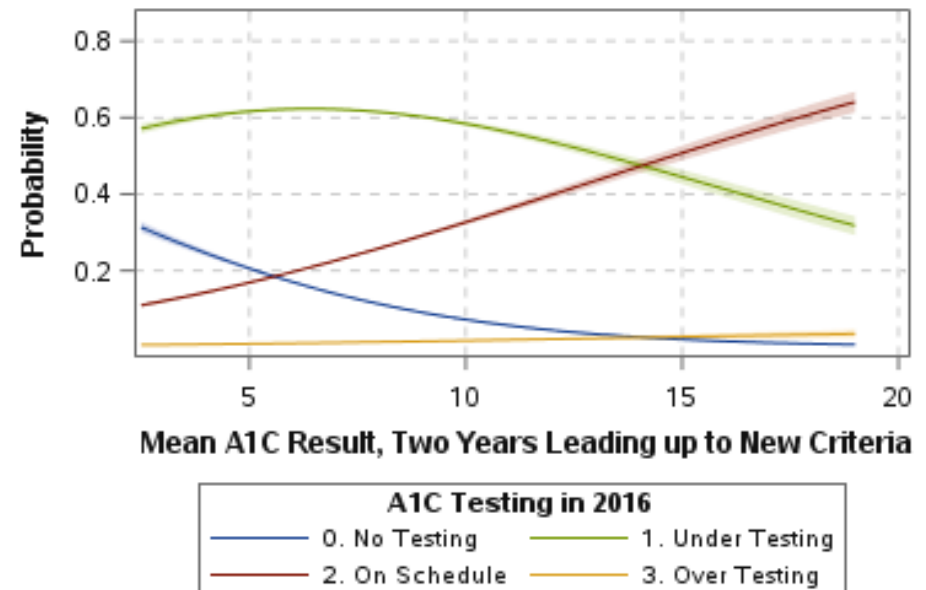
Today's edition of *Health Trends Alberta* uses a multinomial logistic regression model to assess how patient and physician characteristics influence testing according to provincial guidelines. A cohort of patients 40 years of age or older, diagnosed with diabetes between 2005 and 2014 who had at least one A1C test in the two years prior to the bulletin was identified. Testing outcomes were grouped as follows: (i) no testing, (ii) under testing, (iii) testing according to criteria, and (iv) over testing.

Estimated probability of testing according to guidelines increases with prior A1C result value

The effect plot displayed to the right compares the predicted probability for each of the four testing outcomes across a range of mean A1C test results, holding other variables at their mean values. Confidence intervals are given by the shaded areas around each curve. Patients with a low prior A1C result were more likely to be under tested or not to be tested, while those with prior A1C levels greater than 15 were most likely to be tested according to the guidelines.

The multinomial logistic regression also identified the following relationships:

- Patients with at least one inpatient visit in 2016 were more likely (Odds Ratio 3.54) to be over tested than to be tested according to guidelines.
- Patients of female physicians were less likely to not to test or to under test (OR 0.62 and 0.82 respectively), and more likely to over test (OR 1.27) relative to patients tested according to guidelines.
- Patients whose tests were submitted to a laboratory network receiving the bulletin were much less likely to over test (OR 0.62) relative to patients tested according to guidelines.
- Variables for patient gender, travel time and distance between patient and physician addresses, and country of physician education were not found to be statistically significant.



¹ <http://www.albertahealthservices.ca/assets/wf/lab/wf-lab-bulletin-new-hemoglobin-a1c-test-utilization-criteria.pdf>