Appendix 2: Modelling strategy for study of information exchange among physicians treating the same patient in the community

The visits included in our analysis were not independent. Therefore, we used a hierarchical mixed-effects multivariable logistic regression model to determine the independent association of between patient, physician and visit factors and information availability.

The model had 3 levels of clustering. Level 1 represented the physician for the previous visit. Its classification as the primary level acknowledged that characteristics of previous physicians were probably prime determinants of the availability of information at current visits and that characteristics were correlated with availability of information over time. Level 2 (clustered within level 1) represented the patient and accounted for the influence of patient characteristics on information availability, as well as for additional correlation within the same patient. Level 3 (clustered within level 2) represented the physician for the current visit and accounted for the additional correlation likely to arise when the information about a particular patient was to be passed on to the same physician at a subsequent visit. Level 1 and level 3 variables included both visit and physician characteristics. We subdivided the level 2 variables into patient demographic characteristics, medical history and characteristics of the index hospital admission. We used PROC GLIMMIX software (SAS version 9.1, SAS Institute, Cary, North Carolina) for all analyses.

We built the model in a stepwise fashion. We first reduced the number of candidate variables to be offered to the final multilevel model using five *separate* mixed-effects regression models that included only the variables of each level (with level 2 variables subdivided into their 3 components). We obtained statistical significance levels for individual variables from *t* tests, with degrees of freedom calculated using the Kenward–Roger procedure.[1] We selected variables with *p* values less than 0.10 for inclusion in the final model.

To assess the fit of the final mode, we calculated the *C* statistic using the predicted and actual probabilities of information availability for all possible *pairs* of visits for which information was available for only one visit. The *C* statistic measures the proportion of times the model assigned a higher probability to the visit at which information was available. Given the large variability in the number of visits within each cluster and the sparse distribution of some explanatory variables, we did not test for any interaction effects across or within clusters, to avoid potential problems with model convergence.

REFERENCE

1. Littell R, Milliken GA, Stroup WW, et al. *SAS for mixed models*. 2nd ed. Cary (NC): SAS Institute; 2006.

Appendix to: van Walraven C, Taljaard M, Bell CM, et al. Information exchange among physicians caring for the same patient in the community. *CMAJ* 2008;179:1013-8.