Custom automated software tools increase genetic counseling follow-up task efficiency

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Introduction

Time tracking analyses show that almost half of a clinical genetic counselor's time is spent on labor-intensive follow-up patient care activities including writing and sending patient or provider notes.[1-3] For example, Sukenik-Halevy et al. (2016) cited a mean of 30 minutes per oncogenic patient note.[2] Custom software tools have been developed to aid genetic counselor efficiency in areas such as pedigree creation, scheduling, and templated notes with smart phrases, however, the use of software for automated note generation has been limited.

In June 2019, Color built and implemented an innovative patient note-creation and integration software for patients with positive genetic test results. This automated software integrates up-to-date patient and provider order and demographic information, personal and family health history, genetic test results, and standard genetic counseling note language, all while allowing genetic counselors to easily personalize and edit each note in an in-browser text editor. Should a patient's personal or family health history or variant classification change between genetic counseling consultations, the software also allows for the new information to be integrated into new notes. Additional in-house software tools allow notes to be automatically sent to the patient and provider once finalized.

Color's automated note-creation software was designed to supplement a patient's Color report(s), which include clearly illustrated disease risk and screening guidelines in an easy-to-read and interactive format.[4] Genetic counseling notes are integrated into a patient's and provider's online Color portal so that they can easily toggle between the genetic test report and the note. Therefore, Color's genetic counseling notes highlight what was discussed in the genetic counseling session, provide resources, and list the most poignant next steps without repeating much of the information already included in the report.

To understand how the use of this software impacted genetic counseling follow-up task efficiency and patient care, we analyzed genetic counselors' time spent using these automated software applications compared to using more standard genetic counseling note templates that were manually edited. Through the integration of automated note-creation software applications, genetic counselors at Color saw a significant decrease in time spent preparing and sending follow-up patient notes.

Methods

Genetic counselors tracked time spent writing and sending patient notes as part of standard follow-up for over 3,900 post-test telemedicine genetic counseling sessions for patients with positive Color Hereditary Cancer Test or Color Hereditary Heart Health Test results between January 1, 2019, and March 31, 2020. The time-efficiency of using automated software tools when finalizing and sending patient follow-up notes between the launch of automated note software in June 2019 through March 2020 (n = 2,376) was calculated and compared to the same activities performed without using automated software tools between January 2019 and May 2019 (n = 1,535). When not using the automated software tools, genetic counselors provided several manual inputs to note templates, such as patient and provider order and demographic information, personal and family health history, genetic test results, and other information discussed during the genetic counseling consultation.

Conclusions

- Color built innovative, integrated software solutions that allowed genetic counselors to decrease the overall time spent on case follow-up tasks (10.6 minutes on average) while increasing efficiency and time spent on direct patient interaction.
- Similar automated integration tools as described here are important to help genetics providers scale their services and efficiency.
- Though this study primarily assessed Color genetic counselors' efficiency, we have successfully integrated our automated notes into the electronic medical records for several large health systems that partner with Color. Therefore, similar integration technology may be scalable for other providers and health systems.
- Saving time, increasing direct patient interaction, and reducing administrative workload placed on genetic counselors by utilizing technology may aid in reducing occupational stress, which has been positively correlated with burnout and professional dissatisfaction.[5]

Results

Figure 1. Color's clinical genetic counseling appointment and follow-up task workflow

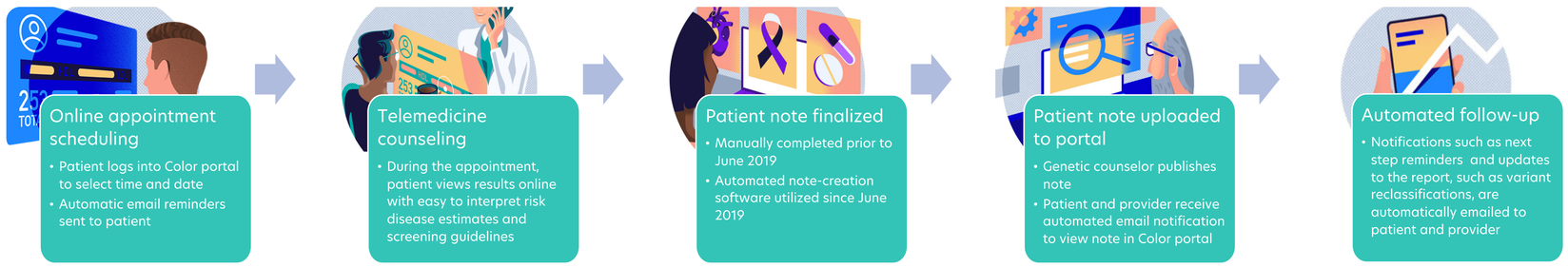


Figure 2. Example of Color's automated note-creation software tool flow

(A) After completing a telemedicine genetic counseling consultation, genetic counselors can choose or fill in optional fields relevant to the case and discussion. Other fields, such as special considerations for patients referred from certain clinics or health systems, appear when relevant to the case.

(B) Genetic counselors then review the automatically integrated information, such as up-to-date patient order and demographic information, personal and family health history, genetic test results, standard genetic counseling note language, and any additional recipients of the note such as ordering or shared providers, while easily personalizing and editing each note in an in-browser text editor.

(C) Once the genetic counselor finalizes a patient's note, additional software tools allow notes to be automatically and securely sent to the patient and the patient's designated provider(s). These notes are integrated into Color's online portal so patients and providers can easily click between and view results and notes.

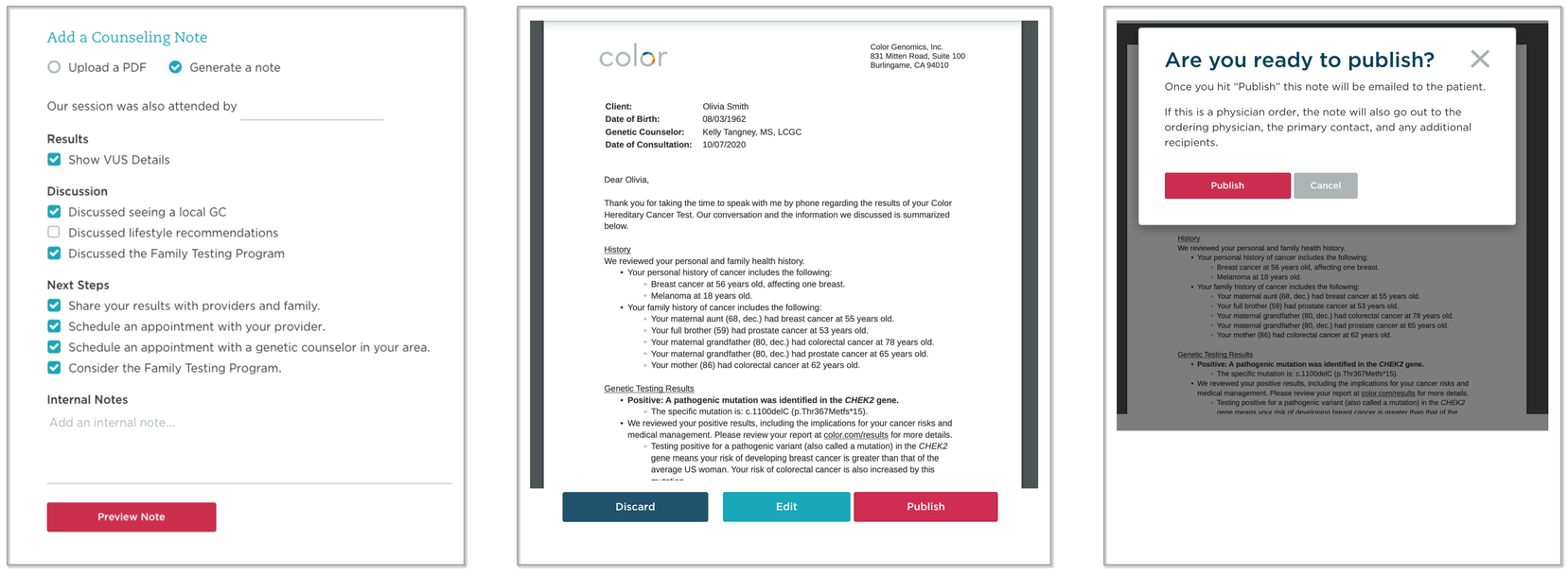


Figure 3. Overall time genetic counselors spent finalizing patient notes

The average time spent finalizing patient notes using automated software tools was 10.6 minutes compared to 16.1 minutes spent manually writing patient notes using standard genetic counseling note templates. This was a 51% improvement in Color's genetic counseling note-writing efficiency and a 183% improvement from that of the 30 minute published mean.[2]

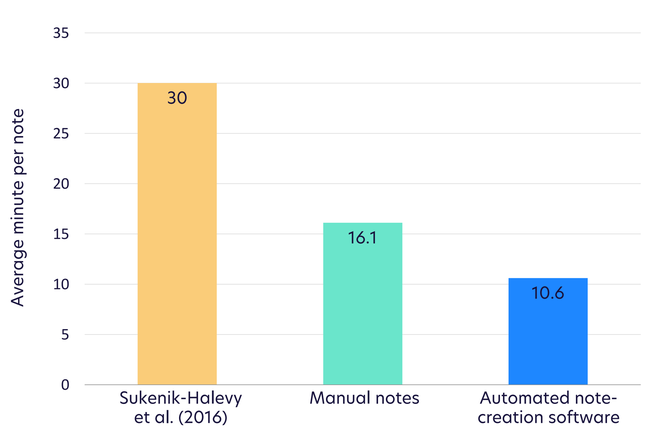
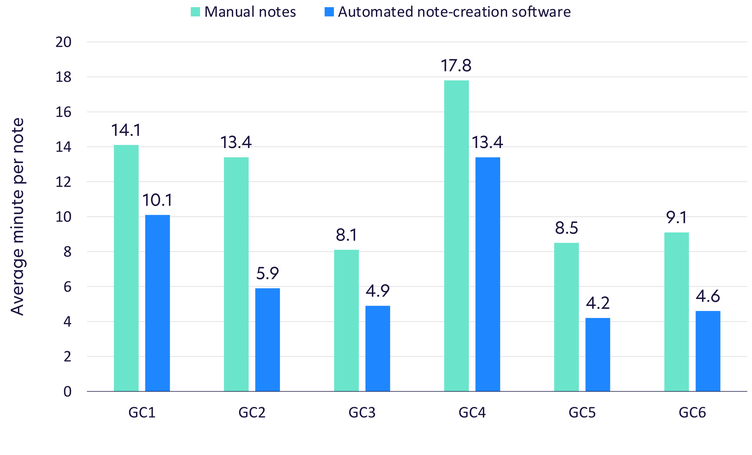


Figure 4. Time spent finalizing patient notes by individual genetic counselor

While the time spent finalizing notes varies depending on individual genetic counselor work style and preferences, all Color genetic counselors reduced their time spent on patient notes using automated note-creation technology (ranging from 4.2 to 13.4 average minutes per note) compared to time spent manually editing note templates (ranging from 8.1 to 17.8 average minutes per note). GC, genetic counselor.



References

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