

Software solutions increase efficiency of genetic counseling for hereditary cancer

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Introduction

Analyses of time-use efficiency have determined that clinical genetic counseling services are time-consuming and labor-intensive, with as little as 25%-41% of a genetic counselor's time spent on direct patient care and up to 3.5 to 7 total hours spent per patient.¹⁻⁵ Survey results between studies conducted by Bernhardt et al. and McPherson et al. have indicated that there has been little improvement in the time-use efficiency for this field over a 20 year span. Additionally, one study of failed appointment rates (no-shows and cancellations) at genetics clinics found the average failed appointment rate to be 12%.⁶ Through the integration of software applications that aid in patient scheduling, patient health history collection, pedigree generation, clinical documentation, and a telemedicine-only service delivery model, the clinical genetic counselors at Color Genomics saw a dramatic decrease in time spent conducting non-direct patient care activities. Color Genomics saw a 8-25% time-use efficiency increase compared to industry average in the proportion of time spent on direct patient care without compromising patient satisfaction. Additionally, the failed appointment rate was significantly lower than industry average.

Materials & Methods

Genetic counselors at Color Genomics tracked time spent providing direct patient care (speaking directly with patients by phone) and conducting non-direct patient care activities (reviewing health history, making notes in chart, writing patient letters, etc.) using supportive software when providing over 400 post-test telemedicine genetic counseling sessions for clients who received a 19-gene hereditary breast and ovarian cancer panel (*ATM*, *BARD1*, *BRCA1*, *BRCA2*, *BRIP1*, *CDH1*, *CHEK2*, *EPCAM*, *MLH1*, *MSH2*, *MSH6*, *NBN*, *PALB2*, *PMS2*, *PTEN*, *RAD51C*, *RAD51D*, *STK11*, *TP53*). Short surveys were conducted after each genetic counseling session to assess perceived comprehension and satisfaction with genetic counseling and the overall testing process. The time-efficiency of using supportive software was calculated and compared to the same activity performed in the traditional way.

Conclusion

- Genetic counselors are essential to the communication of results obtained from genetic testing. However, as the uptake of genetic testing increases, genetic counseling efficiency also needs to improve.
- Color Genomics found that software solutions allowed for genetic counselors to decrease the overall time spent per case (40 mins on average) while increasing the overall percentage of the time spent on direct patient interaction (50% on average).
- Even with less time spent per patient there was still a high degree of satisfaction and comprehension reported by the patients.
- Broader implementation of additional software tools for tasks such as: scheduling and rescheduling appointments, collecting family history, pedigree drawing, and note writing for all genetic counselors providing clinical care may improve efficiency and time available for genetic counselors to spend on both direct and non-direct patient care which may help to decrease risk for burnout.

References

- Bernhardt BA, Weiner J, Foster EC, et al. The economics of clinical genetics services. II. A time analysis of a medical genetics clinic. *Am J Hum Genet* 1987;41:559-565.
- Cooksey JA, Forte G, Flanagan PA, et al. The medical genetics workforce: an analysis of clinical geneticist subgroups. *Genet Med* 2006;8:603-614.
- Mahon S. Allocation of work activities in a comprehensive cancer genetics program. *Clin J Oncol Nurs* 2013;17:397-404.
- Heald B, Gustafson S, Mester J, et al. A time study of cancer genetic counselors using a genetic counselor-only patient care model versus a traditional combined genetic counselor plus medical geneticist care model. *J Natl Compr Canc Netw* 2013;11:1076-1081.
- McPherson E, Zaleski C, Benishek K, et al. Clinical genetics provider real-time workflow study. *Genet Med* 2008;10:699-706.
- Humphreys L, Hunter AGW, et al. Letters to the editor: Why patients do not attend for their appointments at a genetics clinic. *J Med Genet* 2000;37:10 810-815.
- Widmer C, DeShazo JP, Bodurtha J, Quillin J, Creswick H. Genetic Counselors' Current Use of Personal Health Records-Based Family Histories in Genetic Clinics and Considerations for Their Future Adoption. *Journal of genetic counseling*. 2013;22(3):384-392.
- Bernhardt BA, Rushton CH, Carrese J, Peyeritz RE, Kolodner K, Geller G. Distress and Burnout among Genetic Service Providers. *Genetics in medicine : official journal of the American College of Medical Genetics*. 2009;11(7):527-535.
- Buchanan AH, Rahm AK, Williams JL. Alternate Service Delivery Models in Cancer Genetic Counseling: A Mini-Review. *Frontiers in Oncology*. 2016;6:120.

Results

The average total time spent per patient was 40 minutes compared to the industry average of 3.5-7 hours. Over 50% of the time spent per patient was towards providing direct patient care. There was a high degree of perceived comprehension and satisfaction with both genetic counseling and the overall testing process among respondents. Failed appointment rates were below industry average at 3.1%.

Percent of genetic counseling time spent on direct patient care

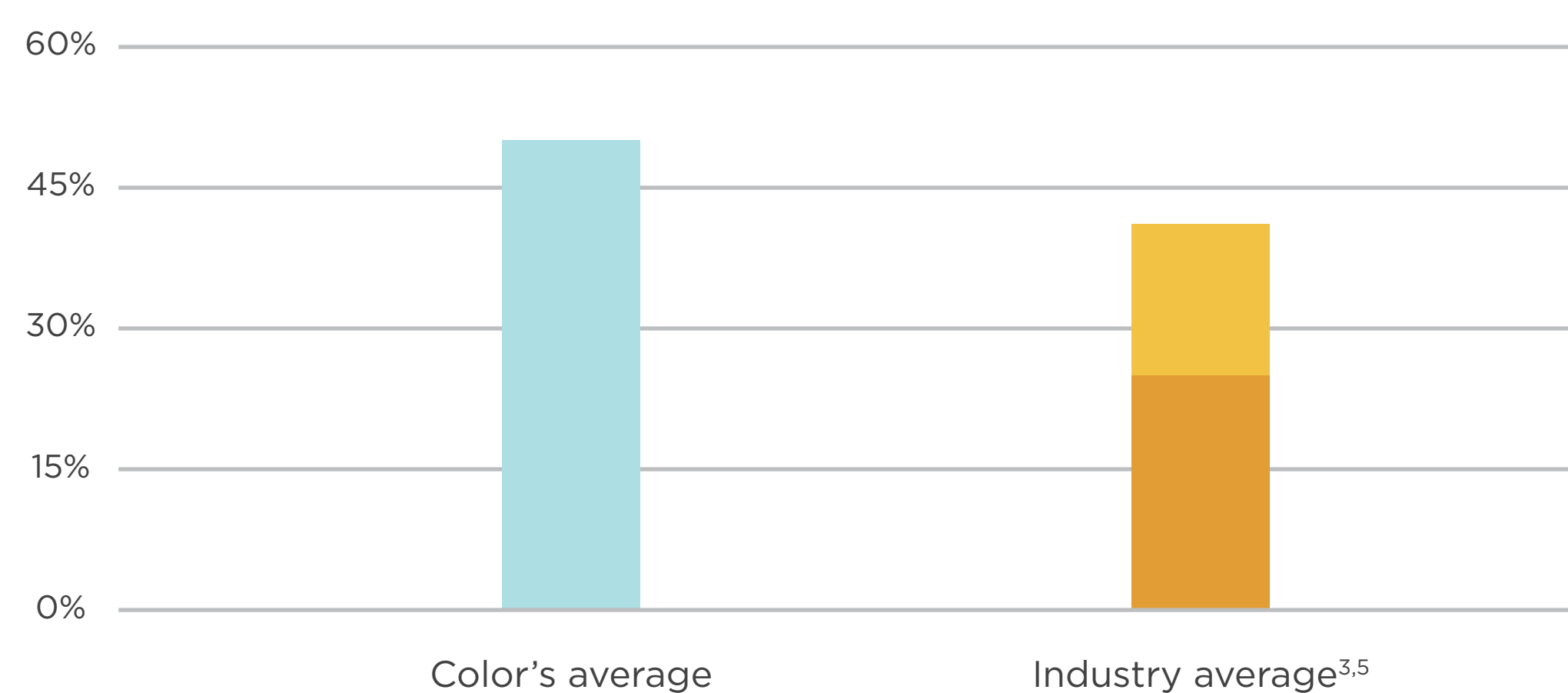


Figure 1: On average, the genetic counselors at Color spent 50% of their time per patient providing direct patient care (non-admin).

Percent appointments missed

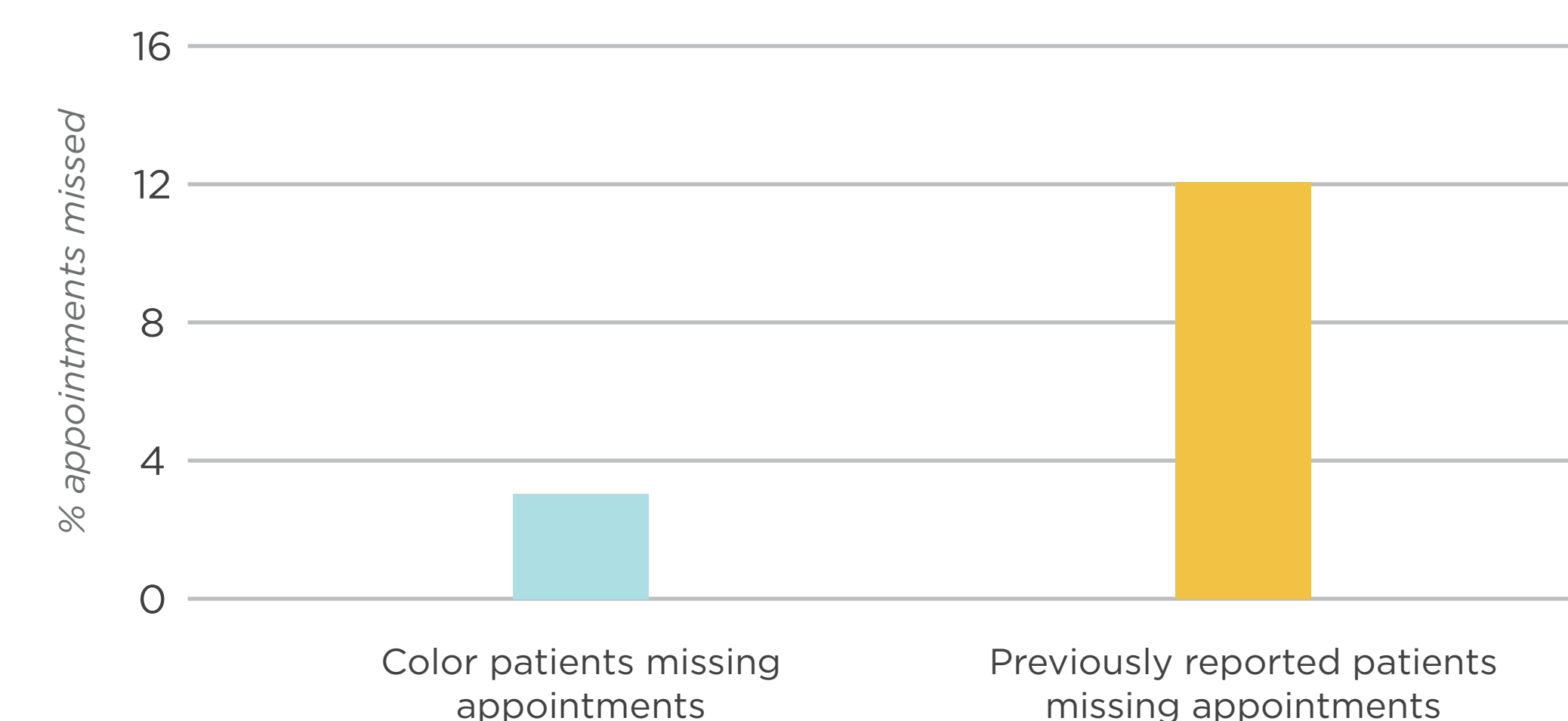


Figure 2: Color Genomics experienced a lower than industry average no-show appointment rate (3.1% vs. 12%)⁶

Overall, how satisfied are you with your Color experience?

Overall satisfaction average between 11/15 - 08/16
1 = Very dissatisfied; 5 = Very satisfied

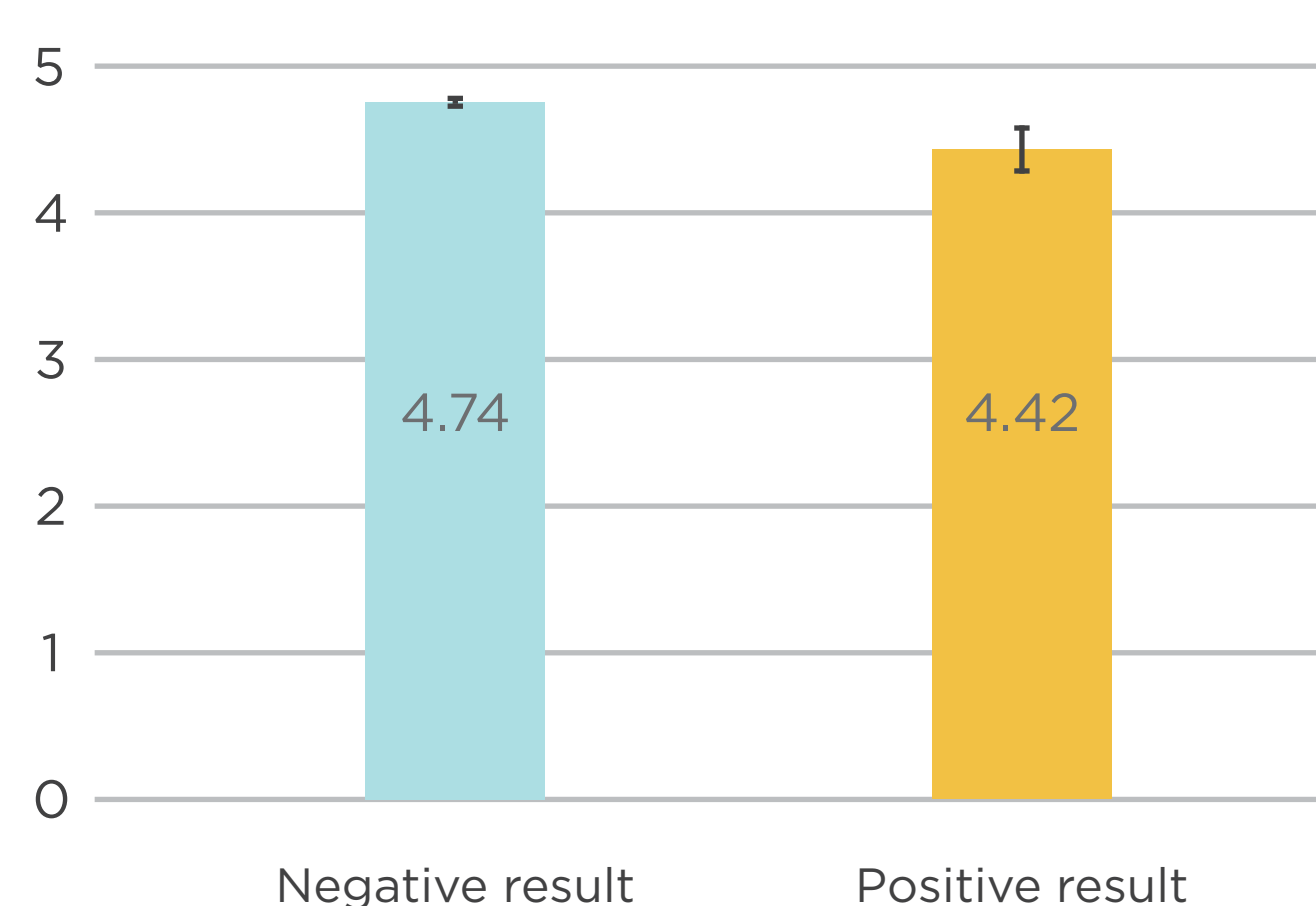


Figure 3: Overall, Color Genomics clients were satisfied with their genetic testing experience.

How satisfied were you with your genetic counseling appointment?

Satisfaction with genetic counseling average between 11/15- 08/16
1 = Very dissatisfied; 5 = Very satisfied

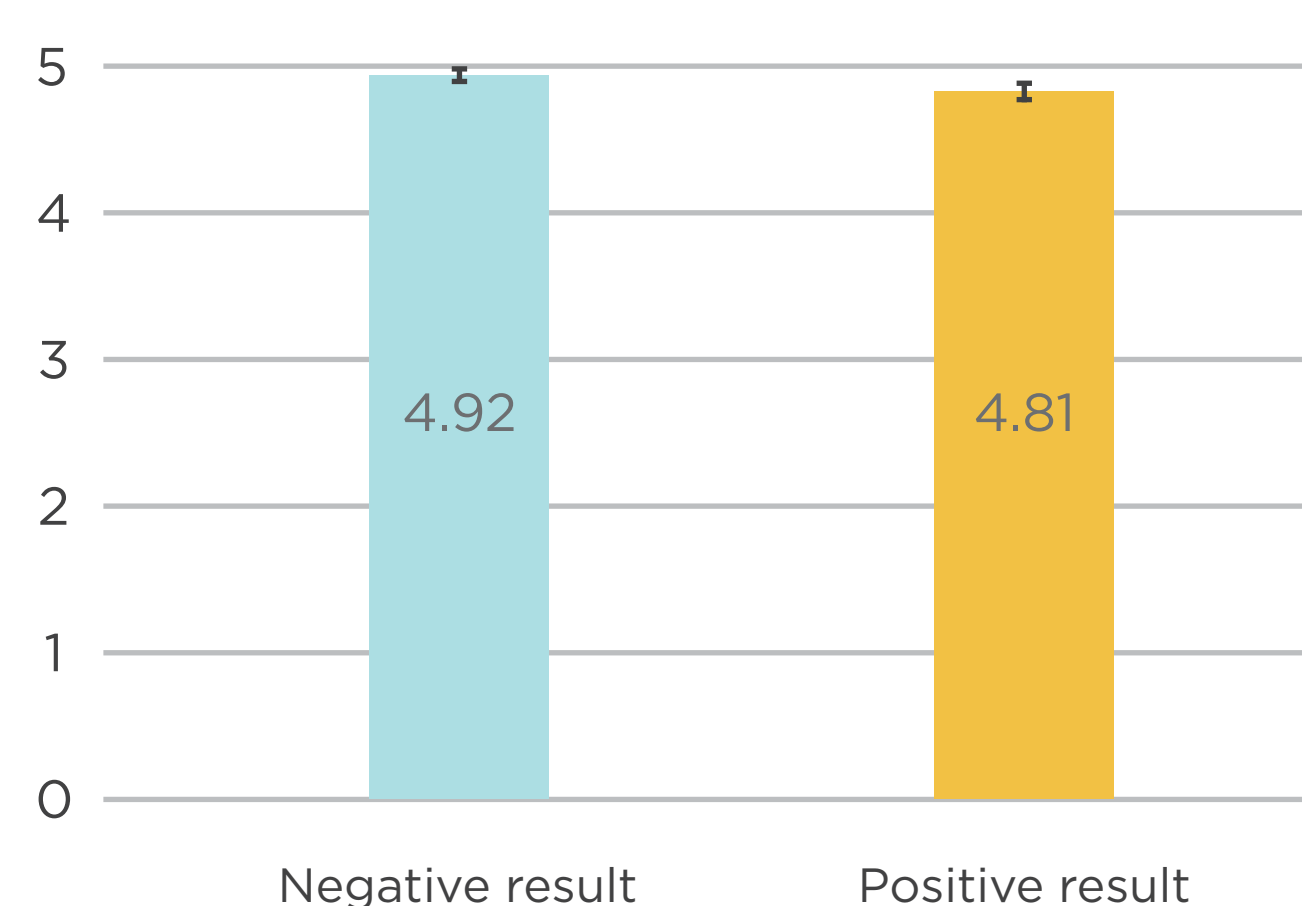


Figure 4: Even with only 40 minutes on average spent per patient, Color Genomics clients reported a high degree of satisfaction with their genetic counseling experience.

How clear were your results?

Results clarity average between 11/15 - 08/16
1 = Very confusing; 5 = Very clear

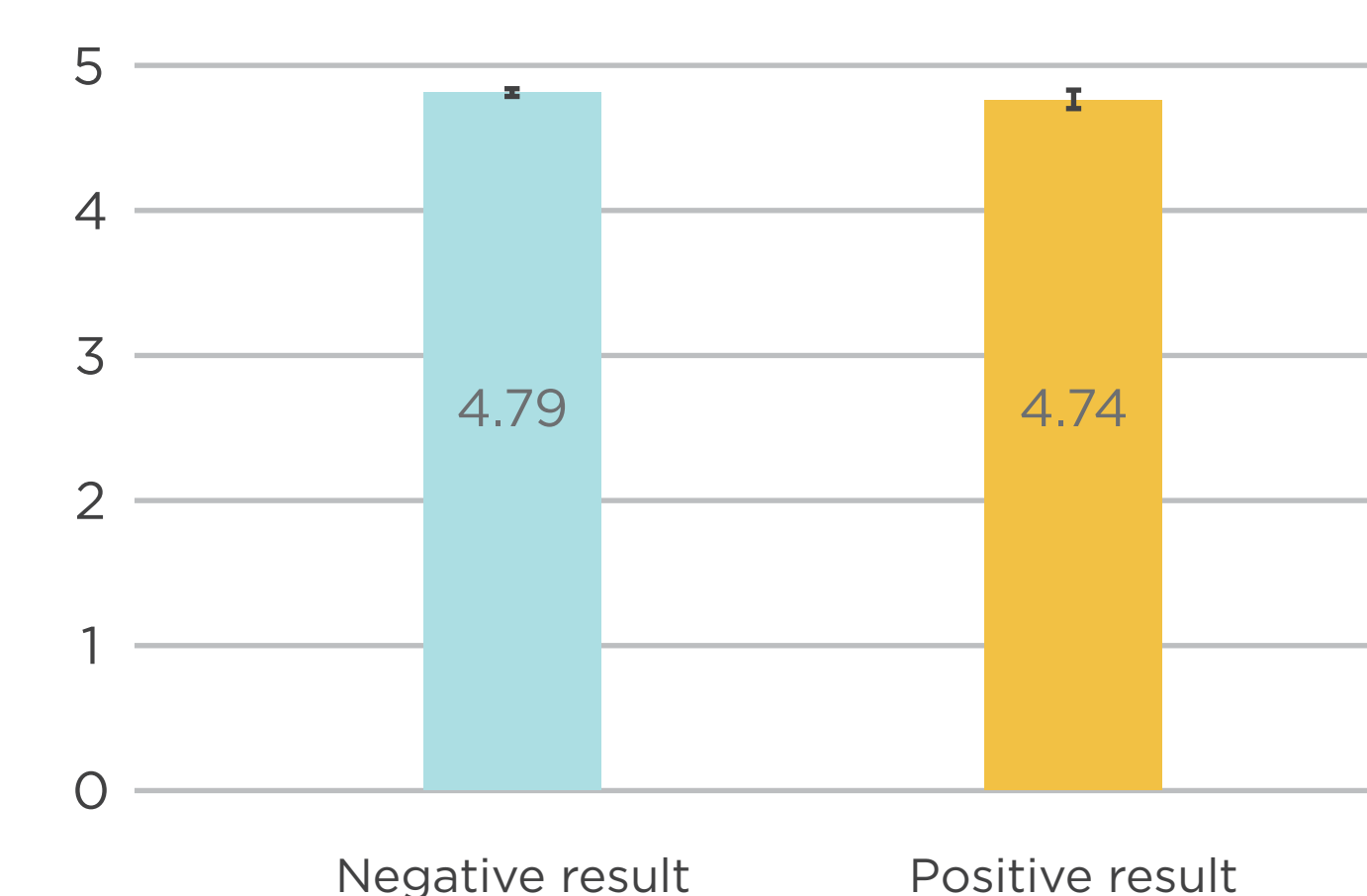


Figure 5: With significantly less genetic counselor time spent per patient, Color Genomics clients still reported that their results were clear.

Discussion

Custom software tools have been implemented to improve the efficiency of genetic counseling including: online health history collection and self-directed pedigree creation, online scheduling and rescheduling, and templated summary notes. Though many of the tools utilized by the genetic counselors at Color were built in-house by Color's engineering team, there are comparable tools available from distributors that assist with scheduling, health history and pedigree generation, and note writing. Color Genomics has been able to integrate these time-saving features into a seamless interface which further reduces task-switching. Use of software tools in genetics clinics varies, but there is wide agreement that simply having the personal and family history collected prior to the appointment may save time for the counselors and allow for increased focus on counseling.⁷ Saving time and reducing the administrative workload placed on genetic counselors may aid in reducing distress which has been positively correlated with burnout and professional dissatisfaction.⁸

Randomized trials comparing telephone with in-person cancer genetic counseling have shown that telephone counseling achieves equal short-term outcomes as in-person counseling. These trials have shown no difference by group on patients' knowledge, psychosocial outcomes (e.g., distress, decisional conflict, and cancer worry), satisfaction, or patient-centered communication.⁹ Color provides all genetic counseling by phone and provides all patients with online access to their results as well as written summaries of their genetic counseling sessions. There is a high level of satisfaction with the Color process as a whole, genetic counseling at Color, and comprehension of the results received. Genetic counselors at Color spent a larger percentage of their time providing direct patient care and spent 40 total minutes on average per patient, which allows for one counselor to see more patients per day or devote time to other activities. Additionally, counseling by phone may help to decrease failed appointment rates as patients do not need to travel or miss work to attend the appointment.