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PART 2 IN A SERIES

Tracking the Impact of COVID-19 on the Retina Community

In the Annual Meeting *Retina Times*, Retinomics presented an article by Vestrum Health Co-founder David Williams, MD, MBA, outlining the effects of COVID-19 on retina practices.¹

Now, we have invited Vestrum Health Co-founders John S. Pollack, MD, and David Williams, MD, MBA, to provide an updated, retina-specific data analysis to help gain a deeper perspective on the pandemic’s effect on retina practices.

Panelists



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The Vestrum Health database has closely tracked and documented the impact of COVID-19 on the retina community throughout the pandemic. Vestrum Health maintains a robust, continuously updated, aggregated database of deidentified Health Insurance Portability and Accountability Act (HIPAA)-compliant data, automatically captured directly from the electronic health records of several hundred geographically and demographically representative retina specialists throughout the United States.

As autumn sets in, the COVID-19 pandemic continues its relentless ebb and flow of activity around the globe, with no clear end in sight. Retina practices worldwide have overcome major barriers—and leaned into an environment of confusion, fear, and scarcity of key personal protection resources—to ensure that patients with vision-threatening retinal diseases continue to have access to their retina care providers.

As of September, it has been 6 months since the onset of major COVID-19 effects on retina practices that began in the third week of March.¹ Retina practices continue to implement strategies to protect patients, staff, and doctors through enhanced sanitation and office decongestion, in addition to more recent restrictions that require all patients and employees to cover their noses and mouths with appropriately fitting masks.

Although far from being considered “routine,” these changes are now widely embraced by the retina community and patients who acknowledge—some more reluctantly than others—the need for this new normal.

Tracking patient volume trends

Figure 1 illustrates the relative percentage change in total patient volume seen by Vestrum Health retina specialists from the week ending January 11 to the week ending

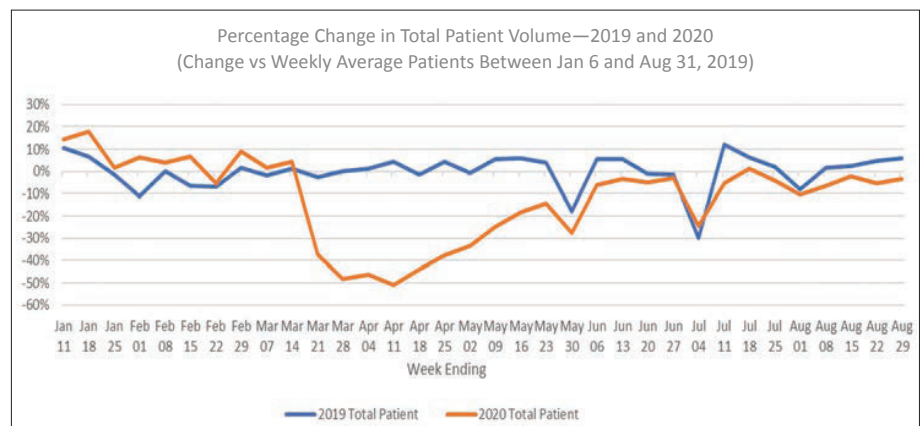


Figure 1. Source: Vestrum Health, LLC. Used with permission.

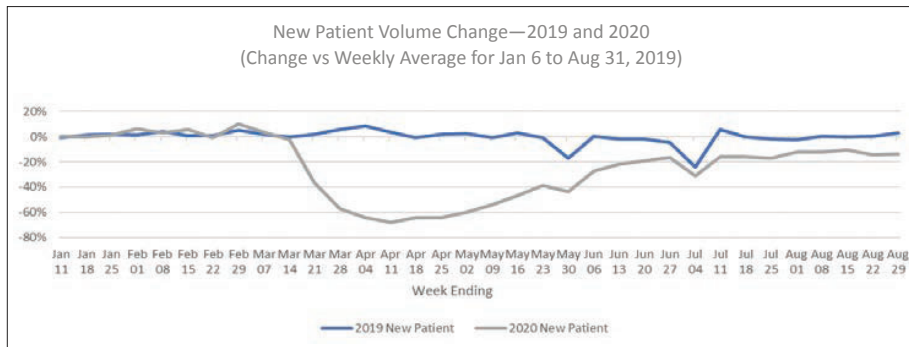


Figure 2A. Source: Vestrum Health, LLC. Used with permission.

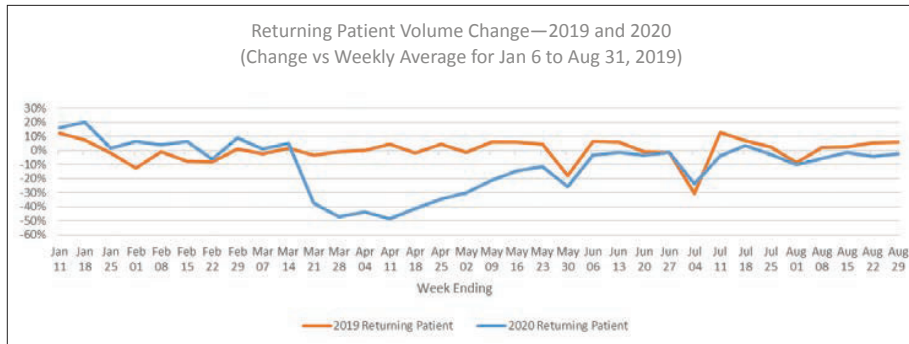


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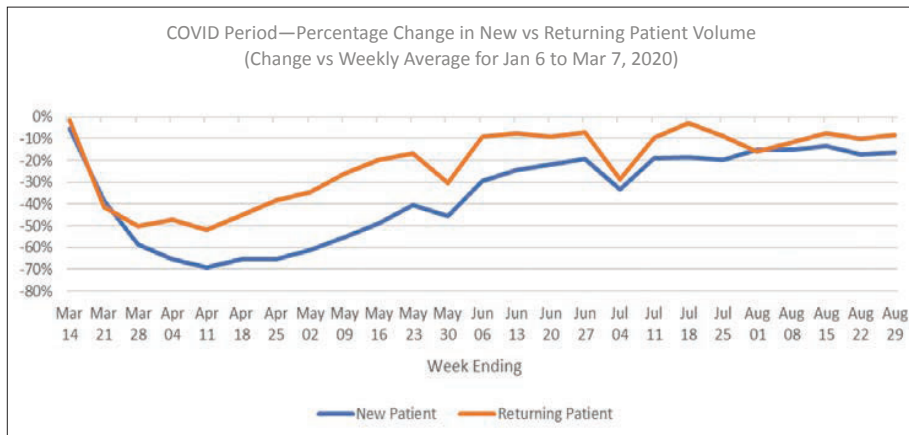


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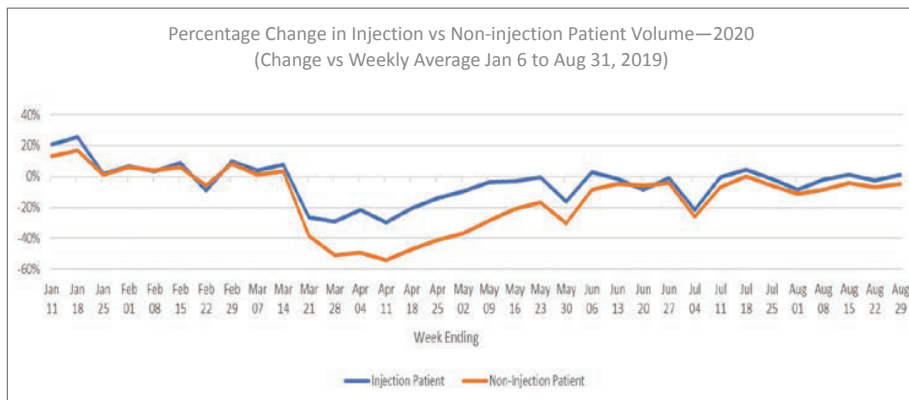


Figure 2D. Source: Vestrum Health, LLC. Used with permission.

August 29. (The Vestrum Health database is refreshed each Tuesday.) The weekly average from January 11 through August 29, 2019 was used as the index to calculate change in each week.

The 2020 data indicates that total patient volume was level for the weeks ending January 11 to March 14—the pre-COVID period. However, the third week of March—the beginning of what we’ll call the *COVID period*—was characterized by an abrupt drop in total patient volume to a nadir of approximately 50%. Although total patient volumes have gradually increased, the numbers remain consistently below average patient volumes in 2019, with a 9% difference during the most recently measured week ending August 29.

Analysis of returning- vs new-patient volume (Figures 2A-2C) shows a dichotomy. While returning-patient visits dropped to a nadir of approximately 50% of pre-COVID volume, new-patient visits dropped to a nadir of approximately 70%.

The trajectory of recovery has also been different for returning vs new patients. Returning-patient volume recovered to 80% of the pre-COVID level by May 16, while new-patient volume has remained lower for longer, recovering to only 50% of pre-COVID levels by May 16 and still trailing 2019 new-patient volume by 17% at the latest data check on August 29.

This dichotomy between returning- and new-patient volume during the COVID period may be explained by the high volume of patients on chronic anti-VEGF therapy for preservation of vision in patients with wet age-related macular degeneration (AMD) and diabetic macular edema (DME) who are highly motivated to continue follow-up visits. This is illustrated in Figure 2D, which shows a smaller drop in injection patient volume compared to non-injection patient volume. Though the amount of difference has diminished over time, a difference persists.

Figures 3A and 3B demonstrate the changes in new and returning intermediate dry-AMD volume. New intermediate dry-AMD volume dropped by nearly 80% in the early days of the pandemic and has slowly increased, though that volume has still failed to return to and maintain 2019 levels. Returning intermediate dry-AMD patient volume, on the other hand, recovered to 2019 volume levels the week of May 30 and has since remained comparable to those volumes.

COVID's impact on presenting visual acuity

When the COVID-19 pandemic hit, many ophthalmology practices had to temporarily close their doors or reduce hours. In addition, many patients became hesitant to visit doctors' offices. There was a suspected delay in referrals of some wet-AMD patients due to these factors, potentially leading to a decrease in presenting vision compared to pre-pandemic times.

Comparing the mean presenting vision of newly diagnosed wet-AMD patients during the COVID-19 pandemic to the 2020 pre-COVID average reveals a small, but statistically significant, difference of 1.7 letters (Figure 4).

If, at the beginning of the pandemic in the third week of March, some new-onset wet-AMD patient evaluations were delayed by 4 to 6 weeks, the week ending May 2 may be a reasonable period from which to begin assessing the visual impact of delayed wet-AMD diagnosis and management. Figure 5 compares mean visual acuity (VA) in newly diagnosed wet-AMD patients prior to the week ending May 2 (pre-COVID-delayed presentation) to VA in patients seen between week ending May 2 through the week of August 29 (COVID-delayed presentation).

Mean VA prior to and after this time point demonstrates a statistically significant difference of 2.3 letters ($P < .0001$). While small from a clinical perspective, it may signal a more significant visual impact that might require a more detailed analysis for greater elucidation.

Interestingly, presenting VAs during the referral lag time frame are very similar to those during the same period in 2019, as shown in Figure 6. The reason for this discrepancy with the data in Figure 5 is unclear.

What is clear, however, is that patients who have frequent retinal evaluations present with approximately 2 lines better VA at time of diagnosis than patients newly referred to retina practices. Figures 7A and 7B compare mean presenting VA of newly diagnosed wet AMD for new patients ("New diagnosis") to that of established patients already being followed by a retina specialist ("New with wet-AMD history").

This data suggests that frequent retina specialist monitoring of intermediate dry-AMD is associated with better VA on conversion to wet AMD compared to newly referred patients, possibly due to more-

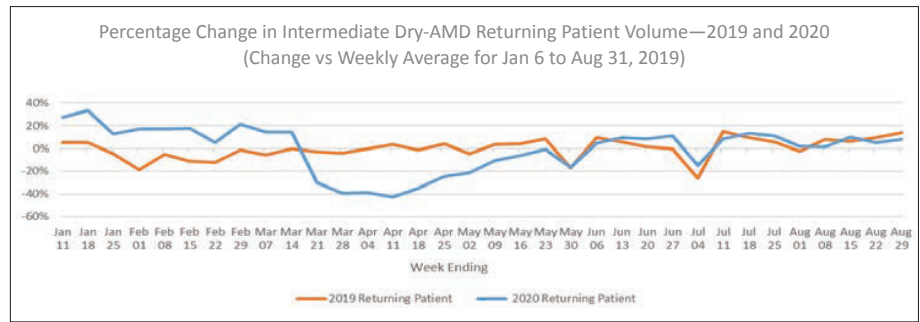


Figure 3A. Source: Vestrum Health, LLC. Used with permission.

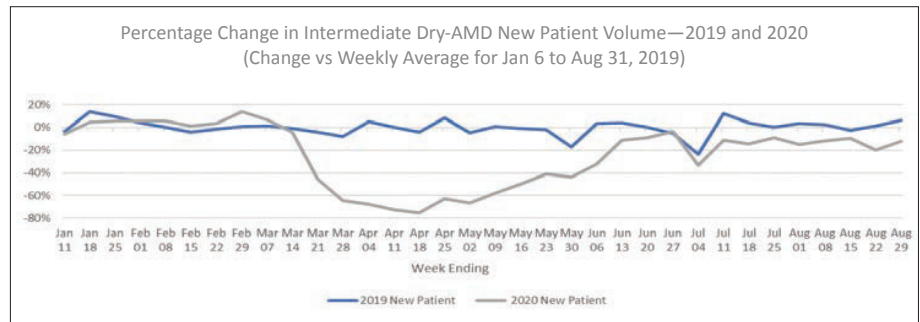


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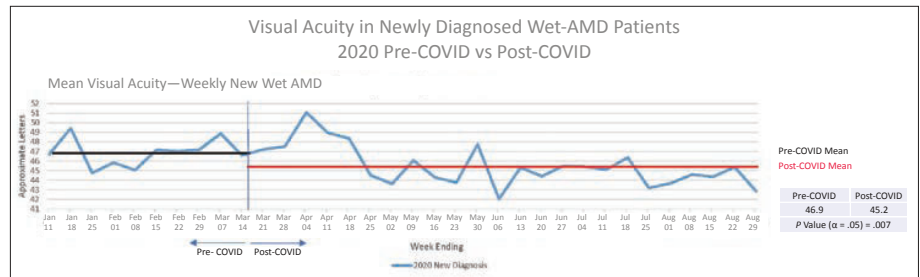


Figure 4. Source: Vestrum Health, LLC. Used with permission.

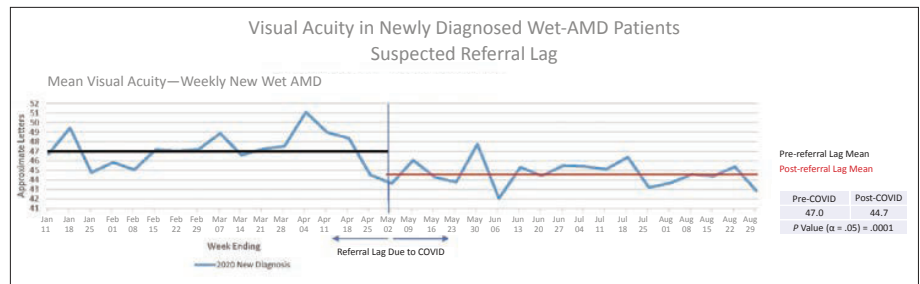


Figure 5. Source: Vestrum Health, LLC. Used with permission.

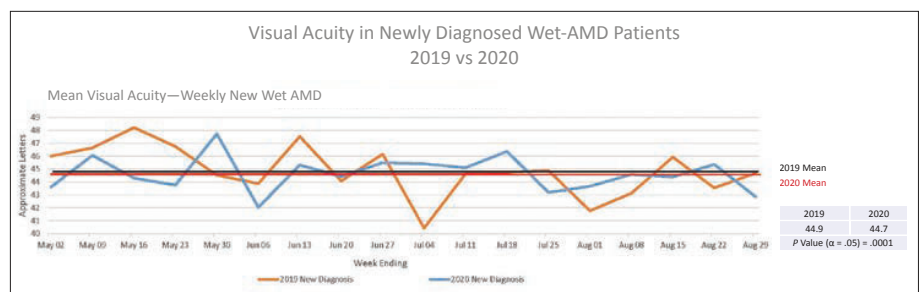


Figure 6. Source: Vestrum Health, LLC. Used with permission.

frequent OCT testing resulting in earlier detection of conversion to wet AMD.

Figures 8A and 8B (page 63) show that established retina patients who are newly diagnosed with DME demonstrated small but statistically significantly better presenting VA compared to patients newly referred for DME, in both 2019 (64.93 vs 63.84; $P = .002$) and 2020 (63.34 vs 65.02; $P < .001$).

AMD, diabetic retinopathy, retinal detachment, and vitreous hemorrhage account for a large proportion of patient volume in retina practices. Figure 9 (page 63) shows the trends in new patients for each of these conditions. While retina practices are recovering from the dramatic decrease in patient visits across all disease categories during the initial March-to-May COVID impact, most disease categories are still down 10% to 20% in new-patient enrollment. Returning, established-patient visits are down only about 5%.

There has been some concern that the risk of endophthalmitis after intravitreal anti-VEGF injections may be increased by patients' wearing of masks during the injection procedure. It has been suggested that oral droplets carrying bacteria may escape through the opening between top of the mask and the infraorbital region, perhaps resulting in deposition of bacteria on the injection needle as it is approaching the eye.

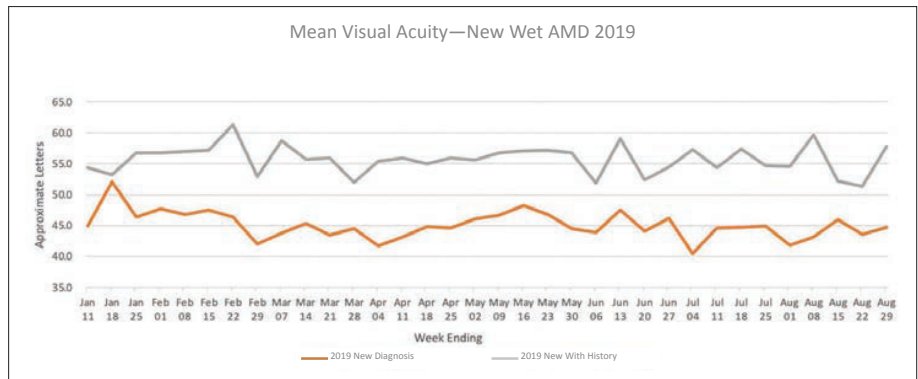


Figure 7A. Source: Vestrum Health, LLC. Used with permission.

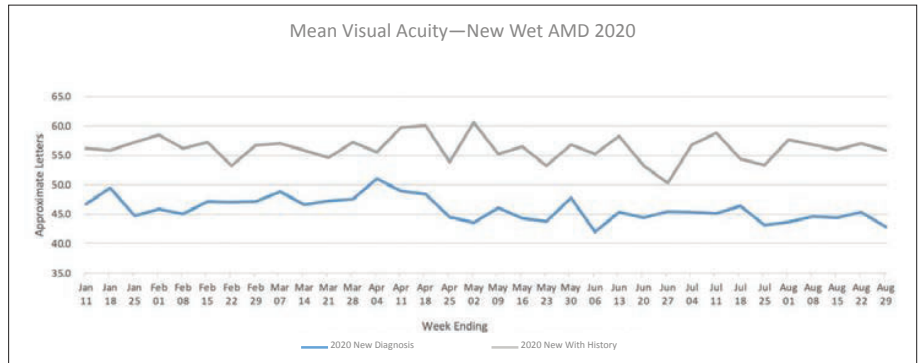
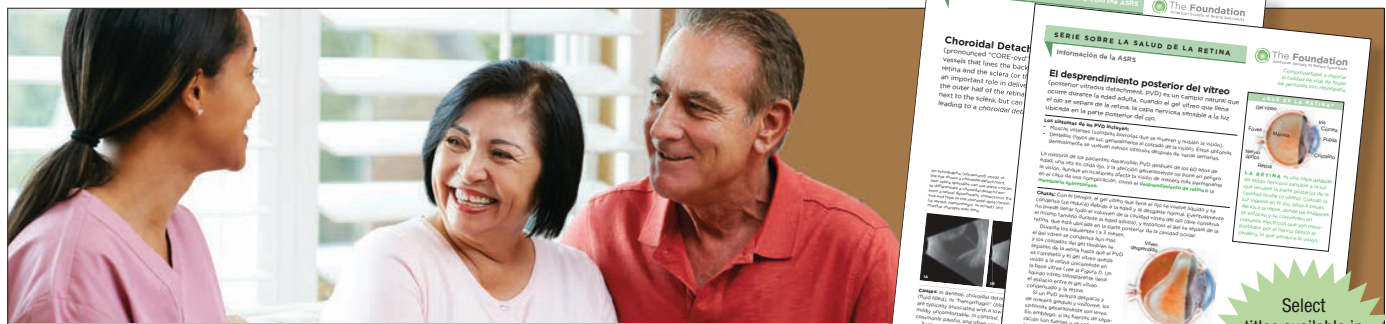


Figure 7B. Source: Vestrum Health, LLC. Used with permission.

Figure 10 (page 63) analyzes the incidence of endophthalmitis post anti-VEGF injections in 2020 compared to 2019, demonstrating no significant difference between the 2 years (0.0377% vs 0.0403%; $P = .5570$)

Continued on page 63



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Vestrum Health data confirms and documents that the COVID-19 pandemic has had a significant adverse impact on retina practices and their patients. Patient volume suffered a severe decline that began in the early weeks of the national shutdown, with a relatively greater decline in new-patient referrals than in return-patient visits.

The volume of returning patients, and particularly new patients, with the potentially blinding conditions of wet AMD, diabetic retinopathy, retinal detachment, and vitreous hemorrhage, declined precipitously but has returned nearly to historic averages from March to September, indicating that both practices and patients are gaining comfort in balancing exposure risk, personal protection, and the need to seek retinal care for potentially blinding disorders.

While the data raises the question of whether delayed referral of wet-AMD patients to retina specialists during the COVID-19 pandemic resulted in lower presenting VA, patients receiving regular evaluations by retina specialists clearly appear to have better presenting VA when they develop new-onset wet AMD or DME, irrespective of the pandemic.

These findings indicate there is likely value in frequent monitoring of patients with intermediate dry AMD and diabetic retinopathy to enable early detection of wet AMD and DME. Finally, it appears that mask wearing by patients receiving anti-VEGF injections does not increase the risk of developing post-injection endophthalmitis. 

Reference

- Williams DF, Brogan T, Boucher N, Aggarwal N, Halperin L, Garfinkel R. Tracking the impact of COVID-19 on the retina community. *Retina Times*. 2020;38(3): 52-55. Accessed September 20, 2020. www.asrs.org/retina-times-covid-impact-1

Financial Disclosures

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- Dr. Williams** - COVALENT MEDICAL, LLC: Board of Directors, Founder, Stockholder, Other Financial Benefit, Stock; VESTRUM HEALTH, LLC: Founder, Stockholder, Stock; WINNING PITCH CHALLENGE, LLC: Founder, Stockholder, No Compensation Received.

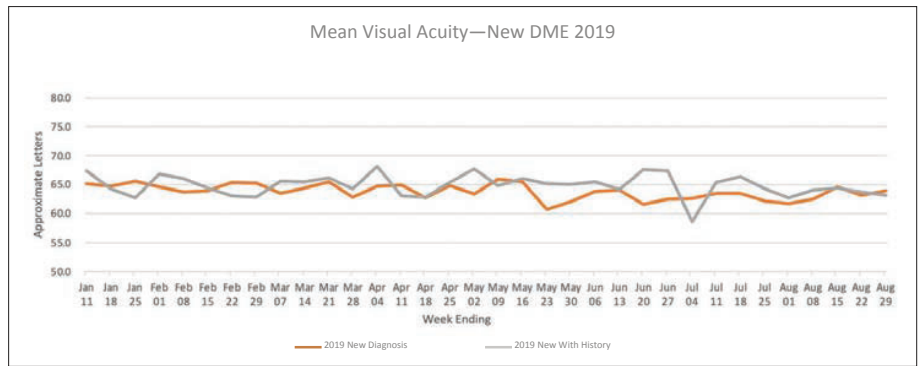


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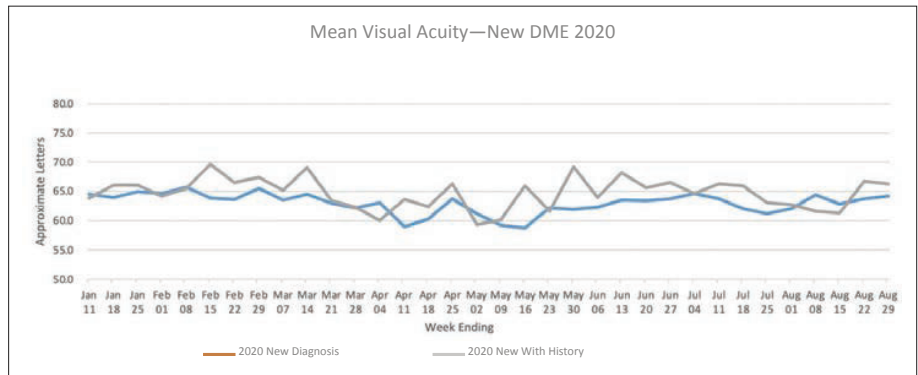


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Average Number of Patients Seen—New/Returning Patients

	Relative % Change		
	Jan-March (2019-2020)	March-Aug (2019-2020)	Jan-Aug 2019 vs Aug 2020
Total New Patients	1%	-33%	-14%
New wet AMD	0%	-22%	-14%
New dry AMD	-2%	-35%	-18%
New DME	2%	-29%	-10%
New DR without DME	5%	-31%	-5%
New intermediate dry AMD	2%	-33%	-12%
New PDR	-5%	-22%	-8%
New RD	-6%	-27%	-16%
New VH	2%	-18%	-6%

	Relative % Change		
	Jan-March (2019-2020)	March-Aug (2019-2020)	Jan-Aug 2019 vs Aug 2020
Total Patients	7%	-19%	-3%
Return wet AMD	5%	-13%	-4%
Return dry AMD	5%	-20%	-8%
Return DME	9%	-16%	-4%
Return DR without DME	13%	-18%	2%
Return intermediate dry AMD	25%	-9%	8%
Return PDR	13%	-14%	7%

Abbreviations: AMD = age-related macular degeneration; DME = diabetic macular edema; DR = diabetic retinopathy; PDR = proliferative diabetic retinopathy; RD = retinal detachment; VH = vitreous hemorrhage

Figure 9. Source: Vestrum Health, LLC. Used with permission.

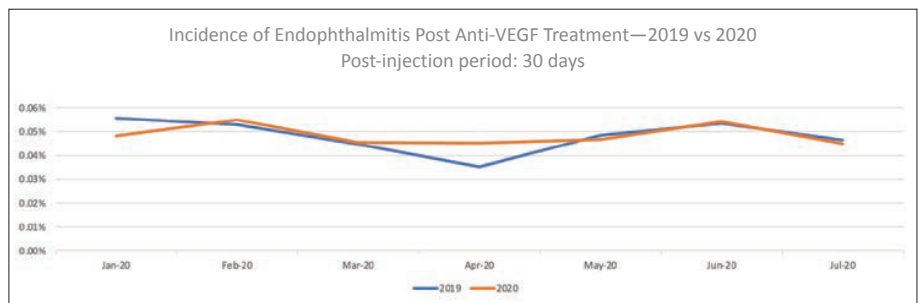


Figure 10. Source: Vestrum Health, LLC. Used with permission.