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Perimetric resilience in the retina: spatial distribution of preserved peripheral visual field loci in retinitis pigmentosa

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ABSTRACT IMPACT: We developed a novel semi-automated computational platform to quantify spatial characteristics of preserved peripheral visual field loci in retinitis pigmentosa. This work may inform future research on therapies to prevent visual field loss in retinitis pigmentosa and related diseases. OBJECTIVES/GOALS: Retinitis pigmentosa (RP) causes progressive and severe peripheral visual field (pVF) loss in some but not all patients. The characteristics of pVF in RP are incompletely understood. We developed a novel semi-automated computational platform to quantify the spatial characteristics of pVF. METHODS/STUDY POPULATION: We analyzed preserved pVF size and location in both eyes of RP patients using the Goldmann V4e isopter. We developed a custom algorithm in MATLAB to align and average the binary V4e isopter segmentations, and generated a two-dimensional probability map of the spatial distribution of preserved pVF loci along the radial and circumferential dimensions. To adjust for disease duration, cases were categorized by the time from self-reported symptom onset. Probability maps of pVF preservation were generated for categories of disease duration using unsupervised K-means clustering. Analyzing cases with longitudinal data, we identified loci of stable pVF over time. RESULTS/ANTICIPATED RESULTS: A total of 152 patients were included (N=304 eyes). The mean age was 46.7 years and 49.3% were male. Disease duration was categorized as <20 years (N=72, 47.4%), 20-40 years (N=60, 39.5%), or >40 years (N=20, 13.2%). Longitudinal data (3.2 -5.7 years of follow-up) were available in 65 patients (42.8%). Probability plots of preserved pVF loci in the cross-sectional dataset showed that the median percentage of preserved pVF loci were located between 50 °and 80 °eccentricity and between the 30 °to 50 °meridians, with highly concordant inter-ocular symmetry. Probability plots in the longitudinal dataset showed that inferotemporal pVF loci were most likely to be preserved over time. DISCUSSION/SIGNIFICANCE OF FINDINGS: Semi-automated quantification of pVF loci is a useful platform to analyze spatial characteristics of the visual field in RP. Certain portions of the pVF may be relatively resistant to functional decline. Understanding the molecular basis of pVF resilience will inform further research on RP therapy.

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Modeling COVID-19 infection dynamics and program interventions for K-12 school re-opening

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ABSTRACT IMPACT: This study provides public health and K-12 school districts with a pragmatic, flexible, adaptable model showing COVID-19 transmission dynamics, using local data and program elements that are modifiable and with an online model for easy use, to enable safe and equitable re-opening and maintenance of in-person learning. OBJECTIVES/GOALS: School closures resulting from the COVID-19 pandemic disrupt student education and health and exacerbate inequities. Public health agencies and school districts currently lack pragmatic models to assess the effects of potential strategies for resuming and maintaining in-person learning on outcomes such as transmission and attendance. METHODS/STUDY POPULATION: This study explored how various combinations of transmission-mitigating interventions affect health and learning outcomes in a range of underlying epidemiological conditions. The CTSA science team developed a conceptual framework and an agent-based simulation model with parameters including prevalence, transmission, testing, preventive and responsive actions, infection control, population behavior and awareness, and the potential impact of vaccine adoption and exemption policies. The team partnered with a large school district to ensure relevance of the program components to decision-making. RESULTS/ANTICIPATED RESULTS: The model shows that no single program element or condition ensures safety. Combining interventions can result in synergy in the mitigation efforts. Even without testing, an efficient health screening process with forthcoming risk reporting, combined with on-campus infection control, can reduce on-campus transmission. The resulting model is accessible online to enable exploration of likely scenarios. It is adaptable as COVID-19 science evolves, including for testing and vaccines. DISCUSSION/SIGNIFICANCE OF FINDINGS: This research provides public health agencies and school districts with a model that couples local conditions with programmatic elements to help inform the local COVID-19 response, recognizing that decisions about the school community are often complex politically, technically, and operationally when it comes to addressing a health crisis.

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Screening for Obesity related renal damage in adolescent women - Body Surface area matters

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ABSTRACT IMPACT: This change will improve primary care physicians and pediatrics ability to identify, intervene and prevent obesity related renal damage in the vulnerable population of young adults OBJECTIVES/GOALS: Obesity related glomerulopathy has a reversible stage manifested as hyperfiltration. Early intervention depends on the ability to identify hyperfiltration. Hyperfiltration prevalence is underestimated using the currently recommended formula We investigated whether calculating BSA-adjusted GFR will more readily identify hyperfiltration. METHODS/STUDY POPULATION: We extracted data from a large urban, multi-institutional Electronic Health Records (EHR) clinical data research network to construct an EHR data base of 60,549 women and girls ages 12-21 years from the New York metropolitan area. EGFR was calculated in two ways, 1) according to age appropriate formula, and 2) according to age appropriate formula and adjusted to body