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Comparative Analysis of Clinical Decision Support Systems for Eye Fundus Images

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In ophthalmology there is a crucial need for early and accurate identification of eye diseases, particularly in areas with limited resources or in rural locations. With the evolution of handheld fundus cameras in recent years, remote and small clinics can now capture high-quality retinal images, allowing them access to advanced eye care. These fundus cameras are being enhanced with the capabilities of artificial intelligence through clinical decision support systems, enabling timely detection of eye diseases. In this study, we conducted a comparative analysis of 6 clinical decision support systems for eye fundus images, aiming to gauge their versatility, accuracy, and integration across different operational settings by gathering and reviewing information available from the pages of each CDSS. Our aim was to gauge their versatility, accuracy, and integration across different operational settings. Our analysis encompassed several metrics: diagnostic accuracy, interoperability with different imaging systems and diseases, architecture, and openness as claimed by the providers. The results revealed that most systems do not provide diagnostic accuracy metrics on their pages, leaving a significant gap in understanding their performance. In addition, the analysis revealed that most systems focused on the detection of a narrow range of diseases, most commonly diabetic retinopathy, significantly limiting their utility for a wider range of eye conditions. Furthermore, several systems only supported a limited set of imaging systems, further limiting their applicability, particularly in diverse operational settings that employ a variety of imaging devices.