Purpose: To determine the time and risk factors for developing proliferative diabetic retinopathy (PDR) and vitreous hemorrhage (VH). Methods: Anonymized data were extracted from 19 hospitals in the United Kingdom at the initial and follow-up visits for diabetic eyes until 2014. Time to development of PDR stratified by baseline diabetic retinopathy (DR) severity was calculated with Cox regression after adjusting for age, gender, race, and starting visual acuity. Results: A total of 50,254 patient eyes were included. The percentages of progression to PDR in 5 years differed by baseline DR severity: No DR (2.2%), mild (13.0%), moderate (27.2%), and severe NPDR (45.5%). Compared to no DR, the hazard of progressing to PDR in patient eyes that presented with mild, moderate, and severe NPDR were 6.71 (95%CI 5.46 to 8.24, p=2x10^{-16}), 14.80 (95%CI 12.10 to 18.09, p=2x10^{-16}), 28.19 (95%CI 22.92 to 34.67, p=2x10^{-16}), respectively. In comparison to no DR, the eyes with mild, moderate, and severe were 2.56 (95%CI 1.91 to 3.42, p=2.36x10^{-10}), 5.60 (95%CI 4.26 to 7.36, p=2x10^{-16}), 5.60 (95%CI 4.26 to 7.36, p=2x10^{-16}) times more likely to develop VH, respectively. In the subanalyses that only included eyes with severe NPDR, the eyes with IRMA had a significantly increased hazard of developing PDR (Hazard Ratio (HR) 1.77, 95% CI 1.25-2.49, p=0.0013), while those with 4 quadrant dot blot hemorrhages (4Q DBHs) had an increased hazard of developing VH (HR 3.84, 95% CI 1.39-10.62, p=0.0095), compared to those with venous beading. Conclusions: Baseline severities and features are key prognostic factors for PDR. IRMA increases risk of PDR while 4Q DBHs increases risk of VH. Clinical features of DR may help guide screening intervals and future clinical studies on DR progression.