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**Temporal Characteristics of Sodium Fluorescein in the Tear Meniscus**By: Markoulli, M (Markoulli, Maria)<sup>[1]</sup>; Isa, NAMD (Isa, Nur Amalina M. D.)<sup>[1]</sup>; Papas, EB (Papas, Eric B.)<sup>[1]</sup>[View Web of Science ResearcherID and ORCID](#)**OPTOMETRY AND VISION SCIENCE**

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**Abstract**

Purpose. To observe the emission intensity profile of sodium fluorescein in the human tear film as a function of time and concentration.

Methods. Twenty-two participants with no dry eye signs or symptoms were randomly allocated to receive 1 KL of either a 2 or 10% concentration of fluorescein to one eye. Images of the inferior tear meniscus were captured at regular intervals over 30 minutes and the process repeated for the other eye with the alternate concentration. Fluorescence intensity was quantified on the basis of the grayscale pixel values in the tear meniscus images. The fluorescein-decay profile over time and between concentrations was determined.

Results. Peak fluorescence intensity was reached in 3.9 +/- 3.0 and 8.7 +/- 4.4 minutes after instillation for the 2 and 10% concentrations, respectively. The 10% concentration of fluorescein maintained its peak fluorescence intensity longer than the 2% concentration (about 9 and 2 minutes, respectively). The peak fluorescence intensity was not significantly different between the higher and lower concentrations (44 +/- 37 vs. 38 +/- 32 units,  $P = .22$ ). For both concentrations, the observed intensity did not return to baseline levels by the end of the 30-minute observation time.

Conclusions. The fluorescence intensity of fluorescein in a clinical setting varies with time such that both the onset and duration of maximum brightness are concentration dependent. At low concentration (2%), maximum brightness occurs almost immediately after instillation and lasts about 2 minutes. With a higher concentration (10%), the effective working window is delayed for about 7 to 8 minutes. Irrespective of initial concentration, observable fluorescence remains in the tear film beyond 30 minutes post-instillation.

**Keywords**

Author Keywords: fluorescein; tear meniscus; fluorescence; decay profile; quenching

KeyWords Plus: FILM FLUORESCENCE; EYE

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