DEW	**DRY EYE: DIAGNOSTIC TEST TEMPLATE**	
RAPPORTEUR	Michael A. Lemp	March 2006
TEST	**Tear osmolarity**	
TO DIAGNOSE	**Global test for dry eye**	
VERSION of TEST	Freezing point depression	
DESCRIPTION	A thermocouple is immersed in the collected sample, after which the sample is supercooled and mechanically stimulated until the heat of fusion is detected and the deflection from 0° is found.	
CONDUCT of TEST	1. Calibrate machine 2. Collect tears (upwards of many microliters required) 3. Dilute if tears are insufficient 4. Transfer fluid 5. Operate machine	
Web Video	Not available	
Materials:	• Osmometer • Microcapillaries • Accessories	
Standardization	Time of day [√] Temperature [√] Humidity [√] Air speed [√] Illumination [√] Other: Condensation within the chamber may compromise test, so humidity may be a factor in certain places. White et. al. Showed that use of a slit lamp has upwards of a 7 mOsm/kg effect on the value of osmolality due to the induction of reflex tearing. Overstimulation during collection is discouraged. Reflex tears have far lower osmolality (≈5%, Nelson, 1986) than basal tears.	Pensyl 1999 White et al. 1993 Nelson et al. 1986
Repeatability	Intra-observer agreement. [ ] Inter-observer agreement. [ ]	
Sensitivity	**(true positives)** [90%] [Is this for ≥ 312 mOsm/L?]	Farris 1994
Specificity	**(100 – false positives)** [95%]	Farris 1994
Test problems	Very high volume requirements for DES patients. Multiple collections requiring upwards of half an hour compromise the diagnostic value of this test.	
Test solutions	Freezing point depression very difficult to reduce sample volumes due to multiple transfers, and requirement for mechanical stimulation, etc.	
FORWARD LOOK	Unlikely that FPD will migrate to a clinical setting	
Glossary		

References

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White KM, Benjamin WJ, Hill RM. Human basic tear fluid osmolality. I. Importance of sample collection strategy. *Acta Ophthalmol (Copenh*) 1993;71(4):524-9.