

# Assessing Agreement Between Salivary Alpha Amylase Levels Collected by Passive Drool and Eluted Filter Paper in Adolescents With Cancer

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**A** cancer diagnosis poses many challenges for adolescents, and the psychological stress associated with some of these challenges may have detrimental effects. Stressors that have been identified by children and adolescents with cancer include painful procedures (Hedstrom, Ljungman, & von Essen, 2005; McCaffery, 2006; Woodgate, Degner, & Yanofsky, 2003), frequent and extended hospital stays (McCaffery, 2006), alopecia, difficult symptoms (Hedstrom et al., 2005; McCaffery, 2006; Woodgate, 2005), and uncertainty (Stewart, Lynn, & Mishel, 2010; Woodgate et al., 2003). The few studies on psychological stress in children and adolescents with cancer have noted both short- and long-term effects. In the short-term, psychological stress has been linked to greater symptom severity (Docherty, Sandelowski, & Preisser, 2006; McCaffery, 2006) and higher levels of anxiety (Hedstrom et al., 2005; Hockenberry-Eaton, Dilorio, & Kemp, 1995). In the long-term, psychological stress in survivors of cancer in childhood and adolescence has been associated with post-traumatic stress disorder (PTSD) (Rourke, Hobbie, Schwartz, & Kazak, 2007; Schrag, McKeown, Jackson, Cuffe, & Neuberg, 2008). Psychological stress in adolescents with cancer may be a targeted area for oncology nurse intervention, but the prevalence and degree have not been studied extensively. A biobehavioral approach to investigating psychosocial functioning, including psychological stress, is highly recommended for adolescents with cancer (Moore, 2004). However, validated biologic measures of psychological stress are limited. The purpose of this study was to examine the validity of a method for collecting one biologic marker of psychological stress: salivary alpha amylase (sAA). Efficient,

**Purpose/Objectives:** To assess the validity of filter paper (FP) against the gold standard of passive drool (PD) for collecting salivary alpha amylase as a surrogate biomarker of psychological stress in adolescents with cancer.

**Design:** Part of a longitudinal, descriptive study of symptoms in adolescents with cancer during chemotherapy.

**Setting:** A pediatric hematology/oncology treatment center.

**Sample:** 33 saliva sample pairs from nine adolescents with cancer, aged 13–18 years.

**Methods:** Salivary alpha amylase was collected by PD and FP at four time points during a cycle of chemotherapy: days 1 (time 1) and 2 (time 2) of chemotherapy, day 7–10 (time 3), and day 1 of the next cycle (time 4). A random effects regression was used to assess the correlation between PD and FP values, and a Bland Altman analysis was conducted to assess agreement between the values.

**Main Research Variables:** Salivary alpha amylase.

**Findings:** The estimated correlation between PD and FP values was  $r = 0.91$ ,  $p < 0.001$ . Regression results were also used to rescale FP values to the levels of the PD values because the FP values were on a different scale than the PD values. The Bland Altman analysis revealed that the agreement between the rescaled FP values and PD values was not satisfactory.

**Conclusions:** Eluted FP may not be a valid method for collecting salivary alpha amylase in adolescents with cancer.

**Implications for Nursing:** Psychological stress in adolescents with cancer may be linked to negative outcomes, such as greater symptom severity and post-traumatic stress disorder. Nurses need valid, efficient, biobehavioral measures to assess psychological stress in the clinical setting.

easy-to-obtain biologic markers of stress may enhance development of clinical research and lead to future use in clinical settings by oncology nurses.