



## BOND STRENGTH OF CARIES-AFFECTED TEETH TREATED WITH SILVER COMPOUNDS

Hanthao Phan (Lilliam Marie Pinzon)  
School of Dentistry

### Background

Dental caries is currently a prevalent public health problem across the world. Silver diamine fluoride (SDF) is an anti-caries agent that is used in dentistry to arrest or slow down the rate of dental caries progression. Similar to SDF, application of silver nitrate followed by fluoride varnish has been used in American dentistry to arrest dental carries since 1800s. SDF or silver nitrate treatment of sound dentin helps preventing bacterial growth under resin restoration, thus preventing recurrent caries. However, any agent applied on dentin or enamel prior to restoration could potentially compromise the mechanical properties of adhesives and resins. The purpose of this study is to evaluate the effects of 38% SDF, 48% silver nitrate, and the combination of each agent with 5% fluoride varnish on bond strength of resin composite to the dentin on permanent molars.

### Methods

Twenty human caries-affected permanent molars were randomly selected and sectioned into halves. The tooth specimens were randomly distributed into 5 groups: (1) no treatment – control group, (2) 38% silver diamine fluoride – SDF, (3) 48% silver nitrate – SDN, (4) 38% SDF followed by 5% fluoride varnish, (5) 48% silver nitrate followed by 5% fluoride varnish. After applying universal adhesive Parkell, composite stubs were built up on the surface (n=40). They were then de-bonded in tension to measure bond strength. Bond strength values were calculated. Failure modes were determined at 100X magnification. Means and standard deviations were calculated. Means were compared using analysis of variance. Fisher's PLSD intervals were calculated at the 0.05 level of significance.

### Results:

Means and standard deviations are listed in table 1. Fisher's PLSD interval for comparisons of means among groups was 4.1 MPa, respectively. Means with the same superscripted letters are not statistically different at the 0.05 level of significance.

Table 1: Bond Strengths

CG	SDF	SDN	SDF+F	SDN+F
38.4(3.5)	23.5(3.4) <sup>a</sup>	22.6(4.1) <sup>a</sup>	23.6(4.3) <sup>a</sup>	22.9(4.8) <sup>a</sup>

### Conclusions:

The SDF, SDN, SDF+F, and SDN+F treatments resulted in bond strengths above 20 MPa. These results show that pretreating caries-affected dentin with 38% SDF and 48% SDN with or without fluoride does not affect the bond strength of composite resin to caries-affected dentin.

