Pathogens of a Dental Nature:

A Qualitative Method for the Rapid Detection of the Risk

of Dental Caries on Snyder Test Agar

Introduction

Dental caries is a major problem in this country even with health insurance being available to many in our society. Many people do not take advantage of the care they could receive in retaining their own teeth for their lifetime. Since some people do not receive proper dental care, they develop dental caries, among many dental diseases.

Dental caries is a deterioration of the teeth from the outer surface in to the inner aspect of the tooth. The outer surface of the tooth is called enamel. This layer is entirely mineralized and contains no cells. The destruction of the enamel (the hardest surface in or on man) has been attributed to the presence of acidic metabolic end-products.

The initial step in the destruction of the enamel is plaque formation. This plaque consists of a sticky poly-peptide/polysaccharide complex. This complex forms the network upon which acid-producing bacteria will reside. Once the plaque is in place and the bacteria are in place, the scenario is set. The bacteria will make a great deal of acids which will leach mineral from the enamel -- much like the effects of nitric acid on bone about which you learned in your first semester of Human Anatomy and Physiology.

The primary bacterium involved in the production of these acids is *Streptococcus mutans*. *Streptococcus mutans* embeds itself in the plaque matrix and ferments sucrose. The main end-products of this fermentative process are acids. These acids lower the pH in this confined area to <5. When this happen, the patient is well on his or her way to getting a cavity or worse.

It would be helpful if there were a method in which to take advantage of the decrease in pH following *S. mutans* activity in the plaque on the tooth. It turns out that there is a rapid method for the detection of a patient's risk for developing dental caries. This method utilizes Snyder Test Agar. Snyder Test Agar contains an acid-base indicator called bromocresol green. At acidic pH's, bromocresol green is

yellow. At alkaline pH's, bromocresol green turns blue-green. This medium also contains glucose. Glucose is another substrate that *S. mutans* will ferment to acidic end products.

In theory, then, the more *S. mutans* in a person's mouth, the more glucose that ought to be fermented and the more acidic end products that ought to be produced and the sooner that the pH will drop. This is the case and the basis for this qualitative screening method.

Materials and Methods

Materials

Snyder test agar deep (melted)	Water fountain	Vortex and Bunsen burner	Test tube rack and incubator

Method

Obtain a Snyder test agar deep that has been melted for you. Rinse out your mouth with water. Think of your favorite food for a few seconds while collecting some saliva in your mouth. Remove the plug from the agar deep, flame the neck of the agar deep and release the saliva from your mouth into the agar deep. Immediately flame the neck of the agar deep, then replace the plug. Put the tube in the test tube rack in the incubator. Every 24 hours examine the tubes for a change in their color from blue green to yellow. Using the following table, determine your risk of developing dental caries:

Color of Medium at Time (hours)	Risk of Developing Dental Caries
Yellow at 24 hours	High
Green at 24 hours and Yellow at 48 hours	Moderate
Green at 48 hours and Yellow at 72 hours	Low

Write your risk level in the box below:

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