

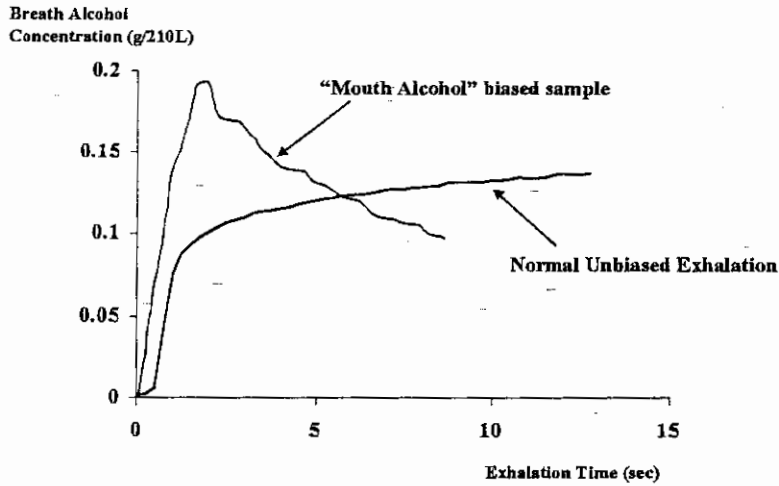
*The Inadequacy of Instrumental  
"Mouth Alcohol" Detection Systems  
in Forensic Breath Alcohol Measurement*

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Washington State Patrol  
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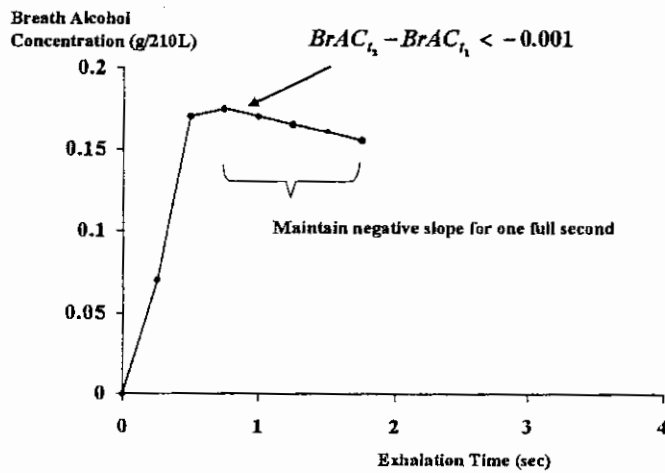
*"Mouth Alcohol"*

**Alcohol within the Oropharyngeal cavity due to  
recent consumption of an alcoholic beverage or  
due to regurgitation which can bias an  
end-expiratory breath alcohol measurement.**

Instrumental Use of Breath Alcohol Expirograms to Detect  
The Presence of "Mouth Alcohol"



"Mouth Alcohol" Detection Algorithm Within BAC Datamaster  
Employing Four Hertz Sampling Frequency

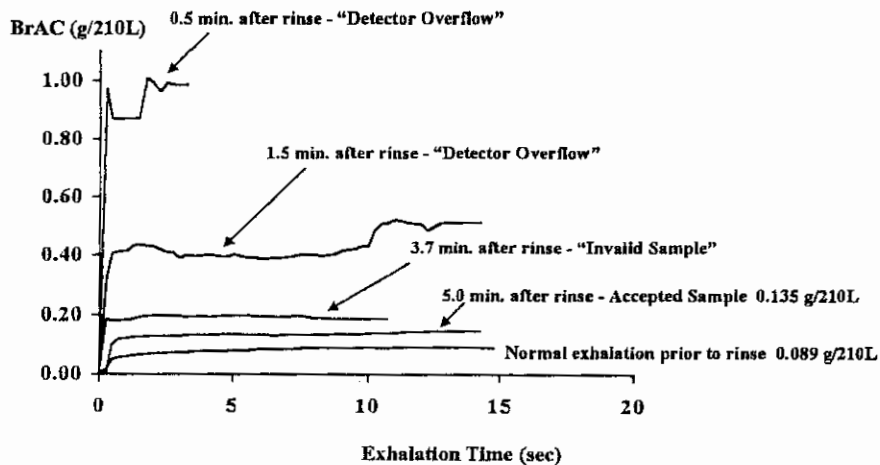


## Experimental Design For Evaluating Sufficiency of "Mouth Alcohol" Detection Algorithm

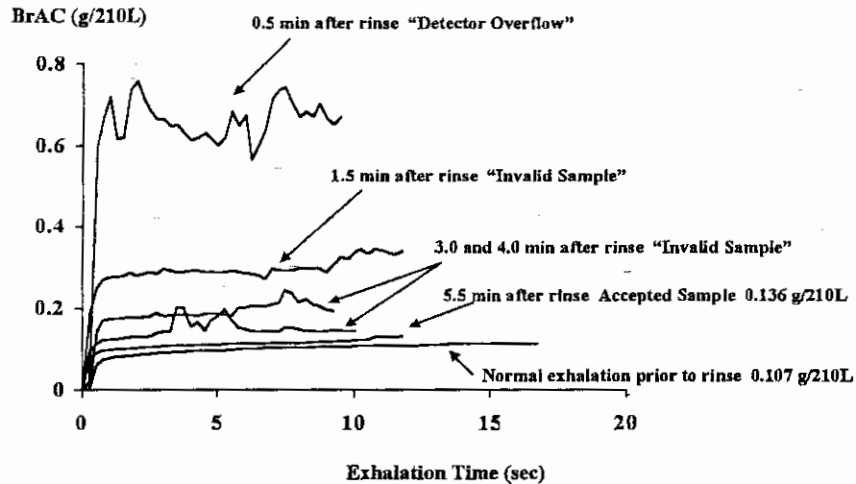
**Subjects:** Two male subjects (ages 27 and 34)

**Protocol:** Administered "mouth alcohol" (mouth rinse) before drinking  
Collected replicate breath samples and expirograms  
Administered alcohol for consumption (0.95 and 1.1 g/Kg)  
Measured breath alcohol and expirogram  
Administered "mouth alcohol" (mouth rinse)  
Collected replicate breath samples and expirograms  
Determined time when instrument accepted sample  
Determined if measurement was biased  
Used BAC Datamaster instrument with data acquisition

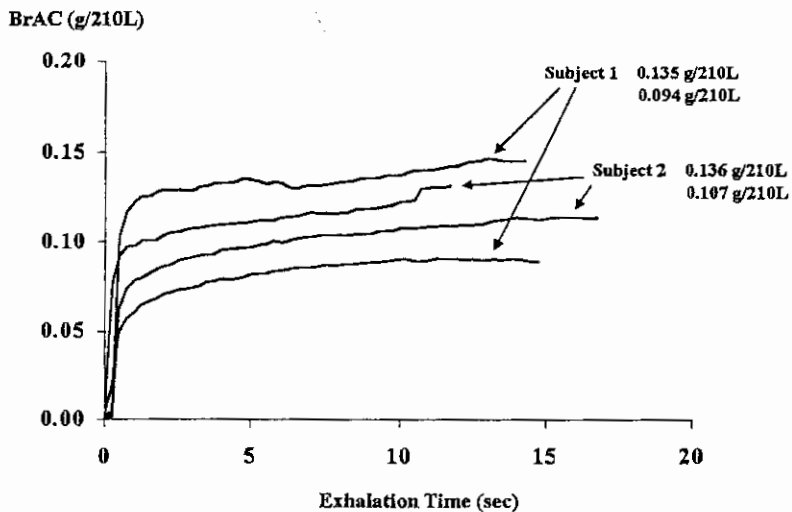
### Breath Alcohol Expirograms For Subject 1 Following Alcohol Consumption And "Mouth Alcohol" Rinse



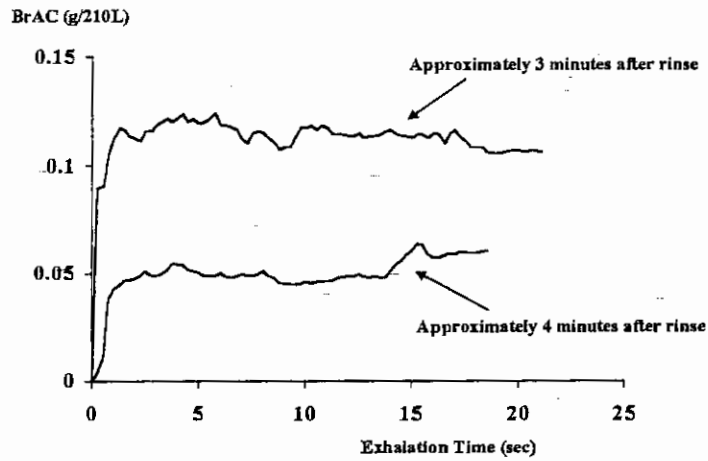
**Breath Alcohol Expirograms For Subject 2 Following Alcohol Consumption  
And "Mouth Alcohol" Rinse**



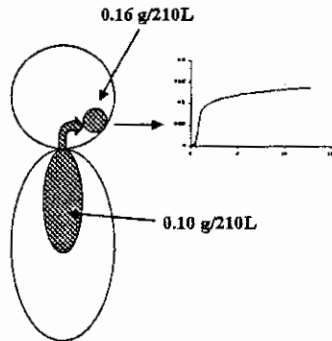
**Accepted Breath Alcohol Expirograms With Biased Results**



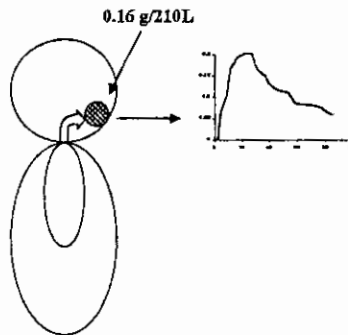
**"Invalid" Breath Alcohol Expirograms Following "Mouth Alcohol" Rinse  
and Prior to Alcohol Consumption**



**The Effect of Mixing End-Expiratory Alcohol With "Mouth Alcohol"**

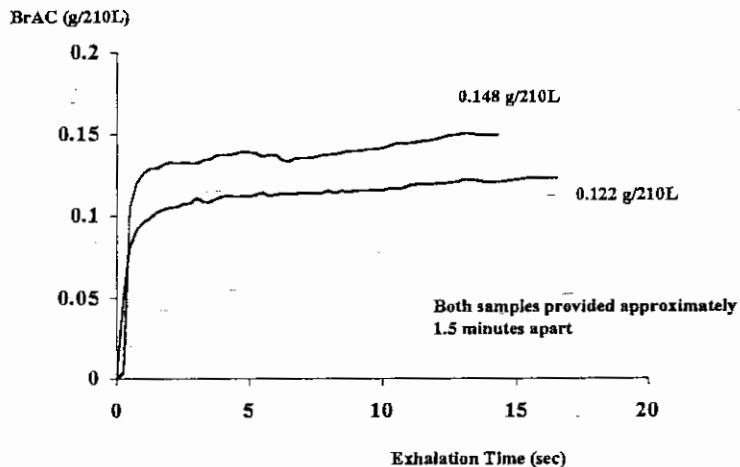


**Subject with end-expiratory breath alcohol and the effect of mixing with "mouth alcohol"**



**Subject without end-expiratory breath alcohol**

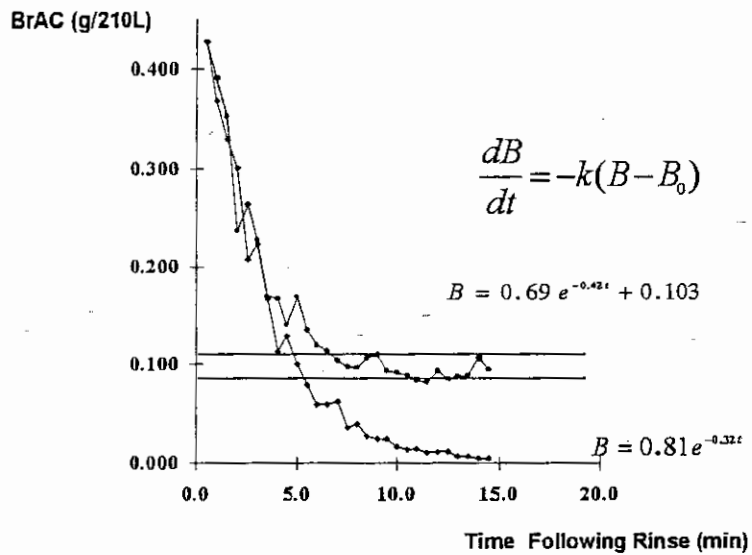
**Duplicate Breath Alcohol Expirograms Both Accepted By The Instrument and Yet Biased With "Mouth Alcohol"**



**How Long Is It Necessary To Wait For  
"Mouth Alcohol" To Be Eliminated?**

**In view of the exponential elimination pattern,  
15 minutes is more than sufficient time**

## Elimination of "Mouth Alcohol" With and Without Ingested Alcohol



### *A Preferred Breath Test Measurement Protocol To Minimize The Risk of "Mouth Alcohol" Bias*

- 15 Minute Observation Time
- Duplicate Breath Sample Analysis With Agreement Requirement Standards
- "Mouth Alcohol" Detection Algorithm

## *Conclusions*

- **“Mouth Alcohol” Bias is a concern in forensic breath alcohol analysis**
- **Modern instruments employ algorithms to try and detection the presence of “mouth alcohol” bias**
- **Experimental work demonstrates that these instrumental algorithms are generally not adequate**
- **The preferred protocol to minimize the risk of “mouth alcohol” bias is:**
  - **15 minute observation**
  - **Duplicate sample testing**
  - **Instrument detection algorithms**