

**Noninvasive Monitoring for Methemoglobinemia after Topical Application of Benzocaine during Upper Endoscopy and Trans-esophageal Echocardiography.**  
Schembre D., Ayub K., Gibbons E., Simmons S., Hampson N. *Gastroenterol* 126(4)  
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**Background**

Methemoglobinemia is a potentially life-threatening condition in which hemoglobin is oxidized (Fe<sup>3+</sup>), thereby limiting arterial blood oxygen carrying capacity. Topical anesthetic agents used prior to upper endoscopy, such as benzocaine, have been reported to cause symptomatic methemoglobinemia(1). The incidence of subclinical methemoglobinemia associated with topical oropharyngeal anesthesia is unknown.

**Methods**

A new, FDA-approved, hand-held, multi-wavelength Pulse CO-Oximeter (Rad-57, Masimo Corp, Irvine, CA), was used to measure methemoglobin (MetHb) levels before and approximately 45 minutes after upper endoscopy (EGD) in 38 consecutive patients and trans-esophageal echocardiography (TEE) in 29 patients. Patients were administered oropharyngeal anesthesia with 20% benzocaine spray immediately before their procedures for approximately 0.5 seconds.

**Results**

Pre and post procedure MetHb levels were easily obtained in all patients in less than 1 minute using Pulse CO-Oximetry on a finger. Among 67 patients, MetHb levels rose in 29 following benzocaine administration, dropped in 20 and remained the same in 18 patients. One patient (1.5%) developed a significant increase in MetHb to 8% following TEE. The patient was asymptomatic and monitored with the Rad-57m until MetHb returned to normal.

**Conclusions**

1. Significant methemoglobinemia, while uncommon after topical anesthetic with oral benzocaine spray at normal doses, does occur and may be more common than previously suspected. 2. Monitoring with this hand-held pulse CO-oximeter provides a simple, noninvasive method for detecting elevated methemoglobin levels.

1. Byrne MF et al., *J Clin Gastroenterol*. 2004; 38(3): 225-229.

Methemoglobin levels (mean + SD; range)

Procedure	EGD (n=38)	TEE (n=29)
Baseline MetHb	0.47 + 0.14% (0.2-0.9%)	0.46 + 0.19% (0.1-1.1%)
Post-procedure MetHb	0.48 + 0.16% (0.2-1.0%)	0.78 + 1.41% (0.1-8.0%)
Paired t-test	P=0.77	P=0.2093