

The Carbon Dioxide Footprint: Differences in EtCO₂ & PaCO₂

Jeffrey M. Goodloe, MD, NRP, FACEP, FAEMS

Chief Medical Officer

EMS System for Metropolitan Oklahoma City and Tulsa

Professor & EMS Section Chief

University of Oklahoma School of Community Medicine

Medical Director - Oklahoma Highway Patrol



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However, this CME activity has been designed and reviewed by an independent committee with no relevant financial ties to ensure that the content is free of commercial bias and evidence-based. Accordingly, all of the relevant financial relationships listed for **Dr. Goodloe** have been mitigated.

Seems Simple Enough...

- End-tidal CO₂ detection is valuable in:
- Invasive Airway Confirming & Monitoring
- Respiratory Failure “Early” Alerting
- COPD v CHF Differentiating
- Field Resuscitation Terminating
- Diabetic Ketoacidosis Alerting
- Sepsis Alerting



It *may* be surprising how it can differ from PCO_2 ...




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FOCUS ON RESEARCH



Correlation Between EtCO_2 and PCO_2 in Patients Undergoing Critical Care Transport

Christian Martin-Gill^a , Bradley J. Wheeler^b, Francis X. Guyette^a , and Sarah E. Wheeler^c 

^aDepartment of Emergency Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania; ^bSchool of Computing and Information, University of Pittsburgh, Pittsburgh, Pennsylvania; ^cDepartment of Pathology, University of Pittsburgh, Pittsburgh, Pennsylvania



Who were the patients?

- n= 6,459
- Critical Care Transport
- Advanced Airway (NOT NIPPV)
- EtCO₂ and PCO₂ analysis within 5 mins
 - 551 patients had multiple analysis points

Martin-Gill C, Wheeler BJ, Guyette FX, Wheeler SE. Correlation Between EtCO₂ and PCO₂ in Patients Undergoing Critical Care Transport. Prehosp Emerg Care. 2025;29(7):953-961. doi: 10.1080/10903127.2024.2430394. Epub 2024 Nov 25. PMID: 39546437.



What were the differences in PCO_2 v $EtCO_2$?

- Median initial difference **12.9 mmHg**
- 3,967 (61.4%)...

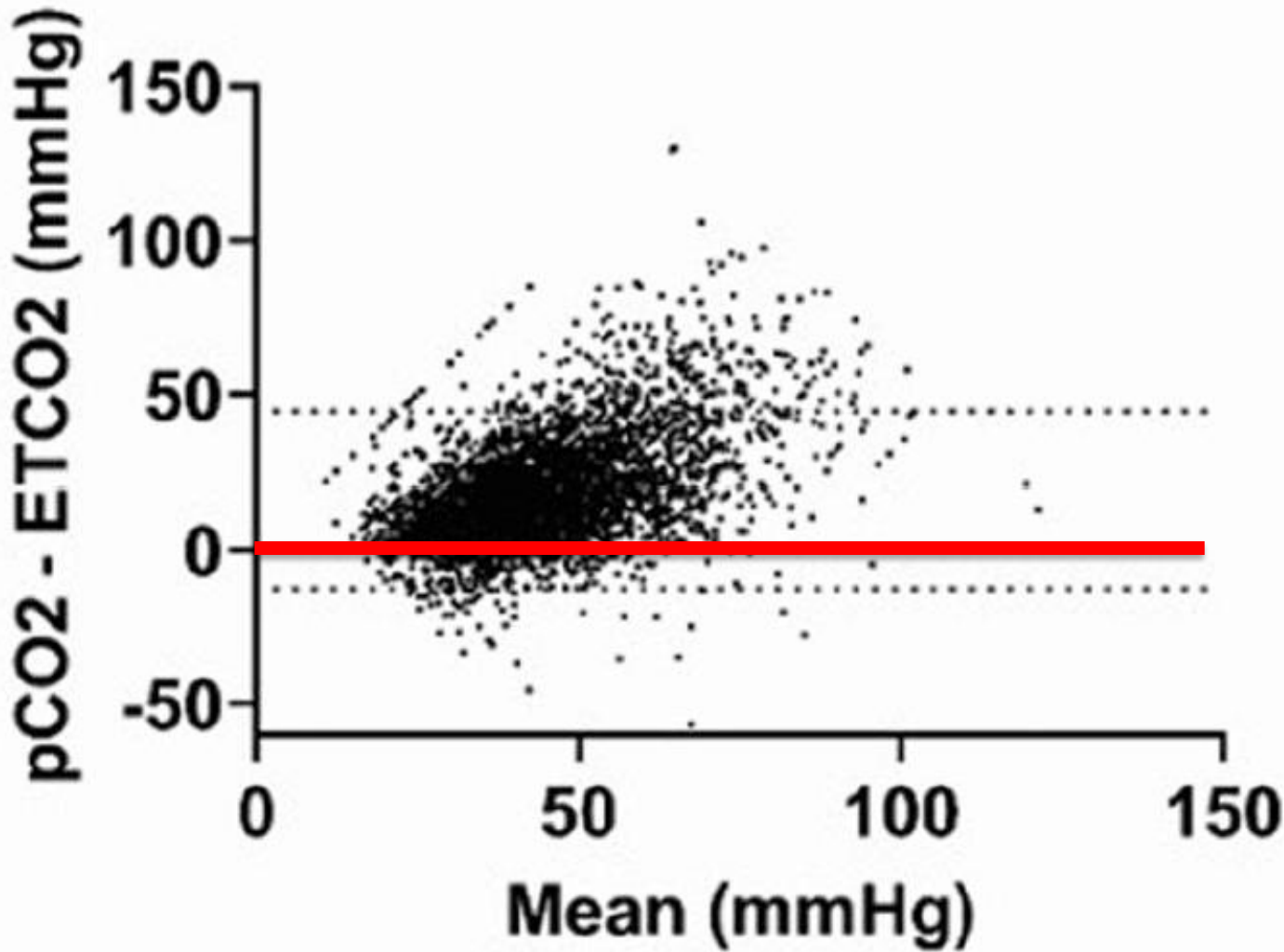
≥ 10 mmHg

- 1,843 (28.5%)

≥ 20 mmHg

Martin-Gill C, Wheeler BJ, Guyette FX, Wheeler SE. Correlation Between $EtCO_2$ and PCO_2 in Patients Undergoing Critical Care Transport. Prehosp Emerg Care. 2025;29(7):953-961. doi: 10.1080/10903127.2024.2430394. Epub 2024 Nov 25. PMID: 39546437.





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Risk Factors for Higher Differences in PCO_2 v $EtCO_2$?

- Hypoxia
- Hypotension
- Thoracostomy
- Older Age
- Male gender
- Scene (not interfacility)

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Perspective in 2026

- **Waveform capnography is valuable in EMS**
 - Invasive airway confirmation & monitoring
 - Patient assessment
 - Pathology differential diagnosis
 - Early alerting for serious illness
 - Ventilatory Failure; DKA; Sepsis
- **Avoid taking any one EtCO₂ number as unquestionable “truth”**
- **Treat the patient more than the number**
- **Stay tuned for more....**



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 **EMERGENCY MEDICINE**
UNIVERSITY OF OKLAHOMA

 **EMS SECTION**

Contact Info:

jeffrey-goodloe@ou.edu

Office of the Medical Director

www.okctulomd.com

918-596-3147

 [@drjeffgoodloe](https://twitter.com/drjeffgoodloe)



OKLAHOMA CITY