

# Nitroglycerin Improves Microcirculation During and After Cardiopulmonary Resuscitation in a Porcine Model of Cardiac Arrest

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## Introduction

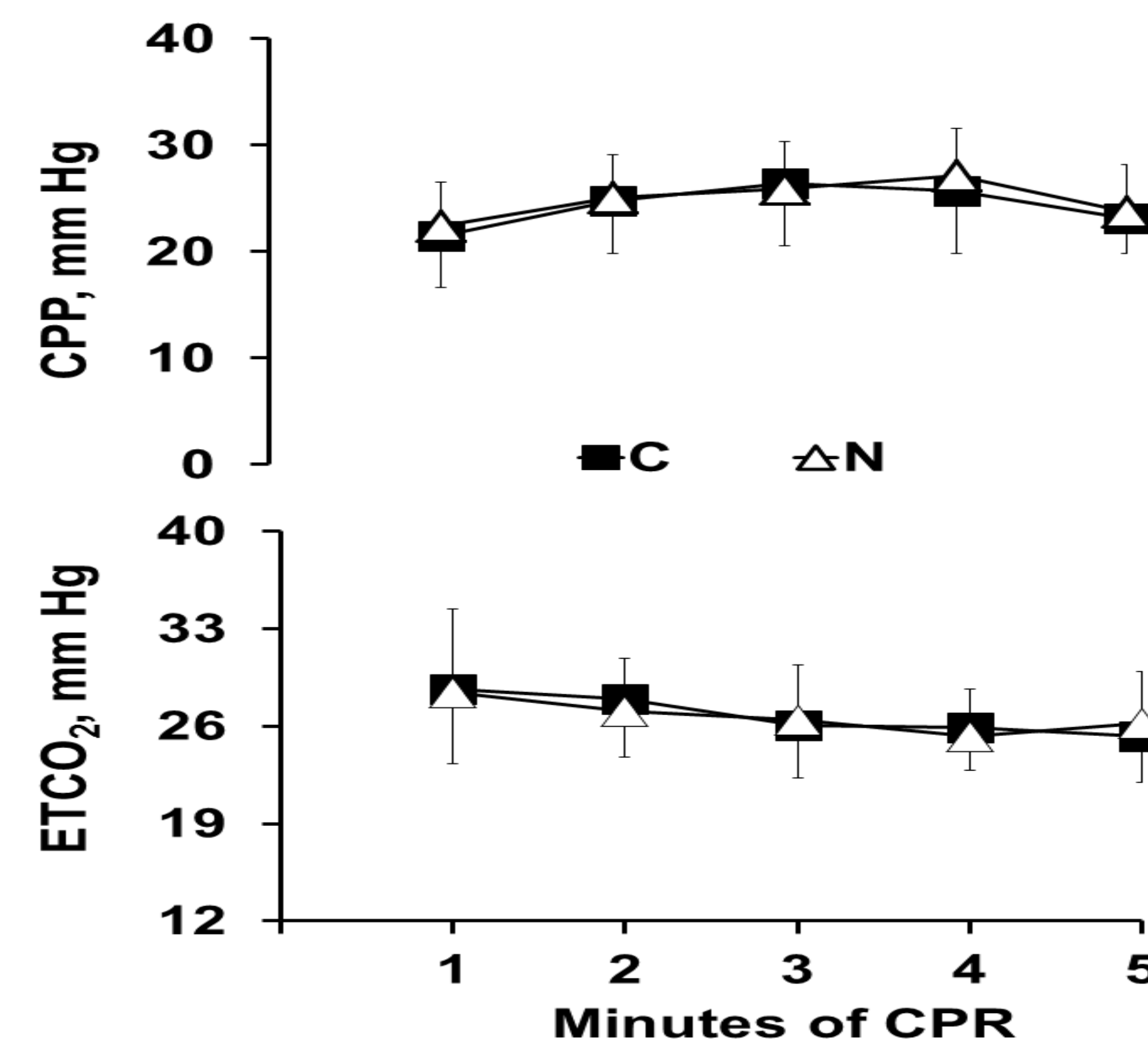
We have previously demonstrated that vasopressors administered during cardiopulmonary resuscitation (CPR) decrease microcirculatory flow. The beneficial effects of nitroglycerin have been evaluated in multiple studies observing effects in conjunction with epinephrine. In the present study, we investigated the effects of nitroglycerin on the macro and microcirculation during and after CPR in a porcine model of cardiac arrest (CA). We hypothesized nitroglycerin improves microcirculation without undesirable effects on the macrocirculation during and after cardiopulmonary resuscitation.

## Methods

Ten male domestic pigs weighing  $40 \pm 2$  kg were utilized. Ventricular fibrillation was electrically induced and untreated for 5 min. The animals were then randomized to receive NTG (N group) or saline (C group). Coincident with the start of CPR, NTG (5  $\mu$ g/kg) or saline was administered into the right atrium. Defibrillation was attempted by a single 150 J shock after 5 min of CPR. Hemodynamics were recorded continuously and sublingual microcirculation was assessed with the orthogonal polarisation spectral (OPS) at baseline (BL), 1, 5 min of CPR and 1, 5 min after resuscitation.

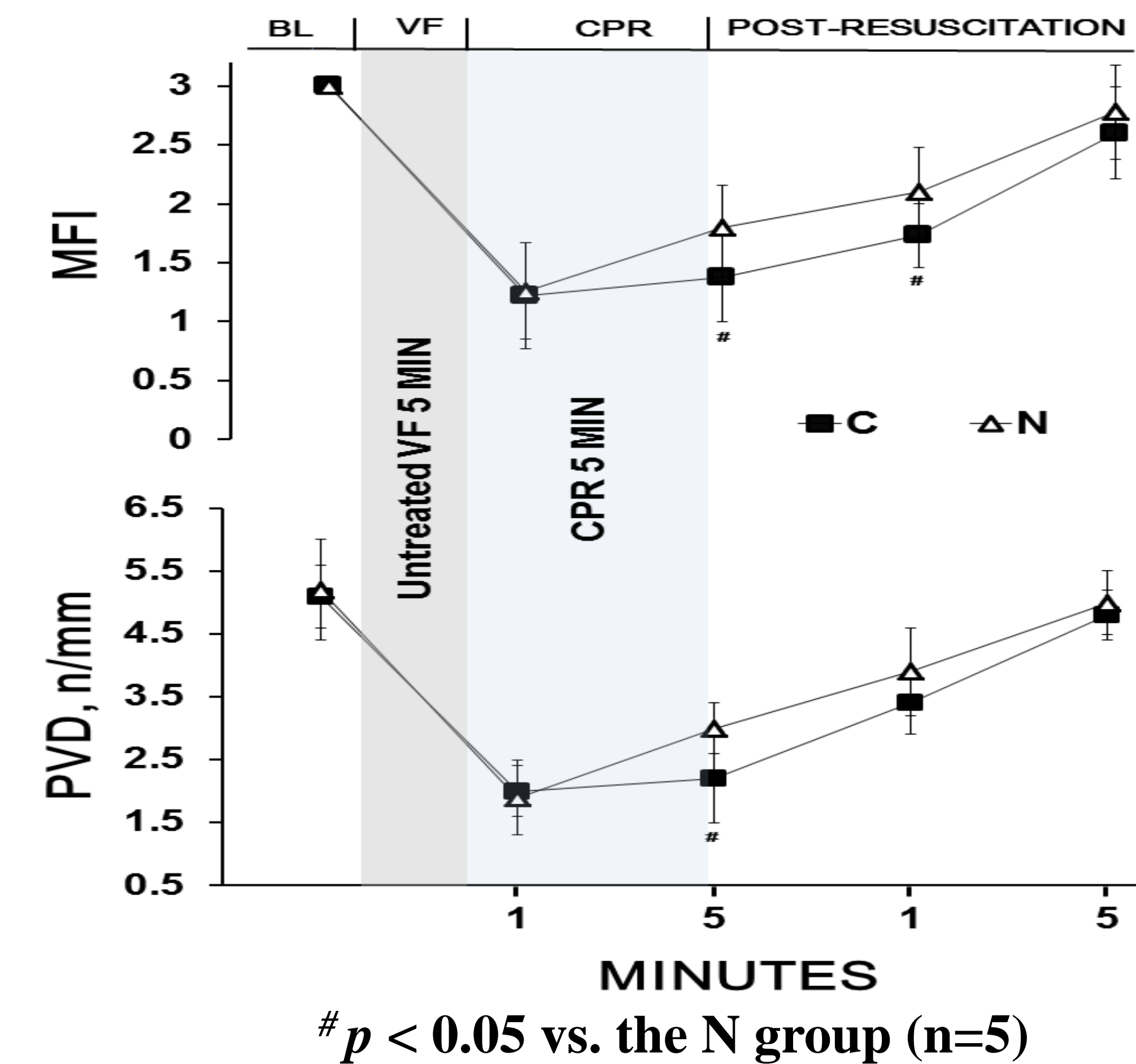
## Results

Figure 1. Hemodynamic changes during CPR.



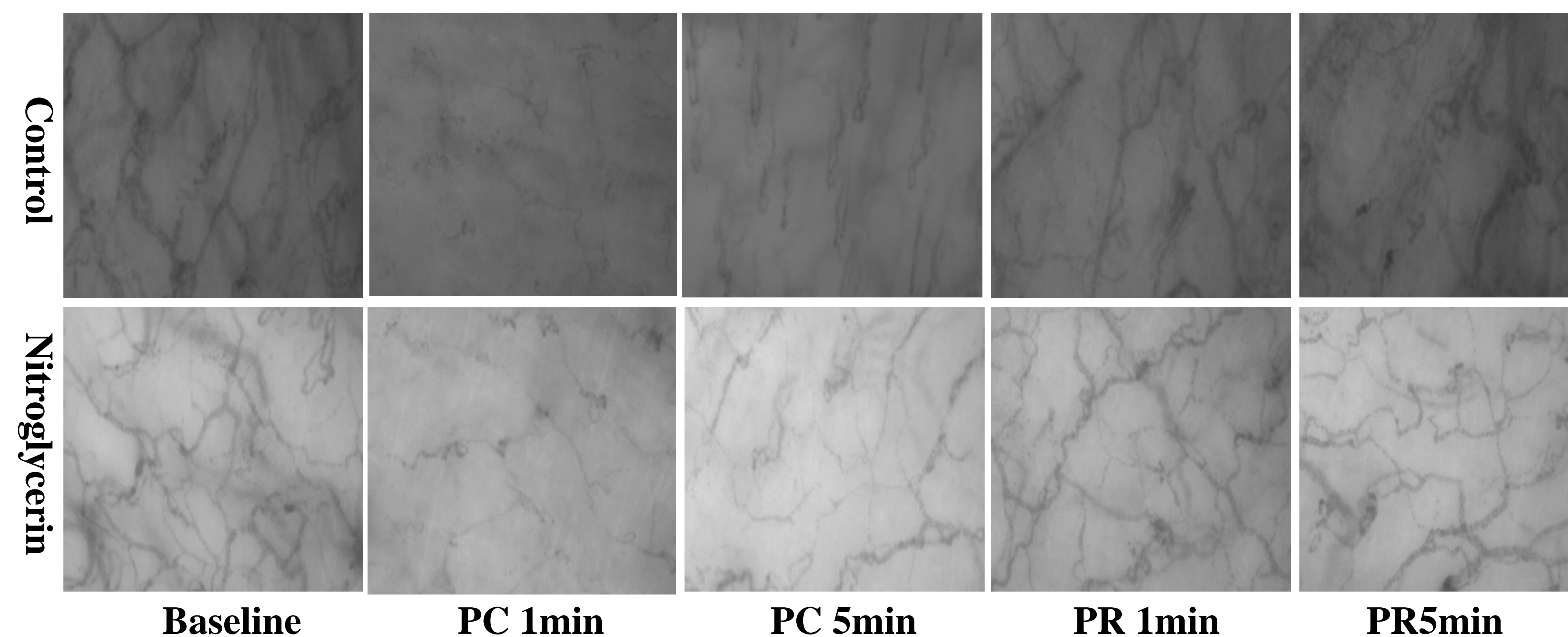
CPP, coronary perfusion pressure; ETCO<sub>2</sub>, end-tidal carbon dioxide; C group, control group; N group, administration of nitroglycerin at the onset of CPR

Figure 2. Sublingual microcirculation changes during CPR.



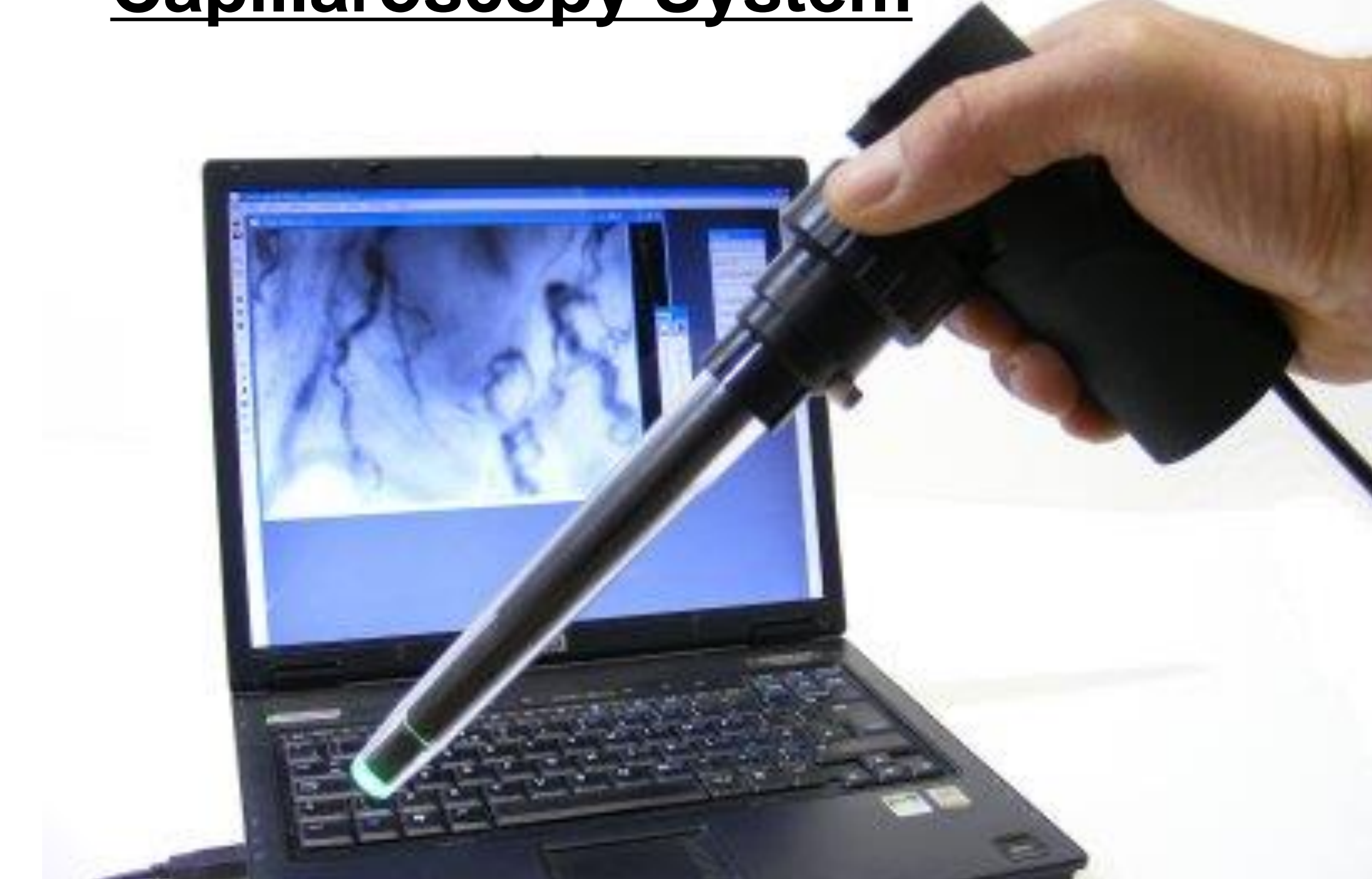
BL, baseline; VF, ventricular fibrillation; CPR, cardiopulmonary resuscitation; MFI, microcirculatory flow index; PVD, perfused vessel density; C group, control group; N group, administration of nitroglycerin at the onset of CPR

Figure 3. Digital photomicrographs of sublingual microcirculation



PC, precordial compression; PR, post-resuscitation

## CapiScope HVCS Handheld Video Capillaroscopy System



## Conclusion

Administration of nitroglycerin at the onset of CPR improves microcirculation without undesirable effects on macrocirculation during and after cardiopulmonary resuscitation.

## References

1. Ristagno, G. et al. Critical care medicine 2009;37:1408-1415.
2. Uil, C. A. et al. Eur J Heart Fail 2009; 11: 386-390.

## Disclosure

None