

Mouth-to-mouth ventilation reduces interruptions in chest compressions during lifeguard CPR: A randomized manikin study

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WORLD CONFERENCE ON
DROWNING PREVENTION 2011

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Research - Rescue - Disaster - Treatment - Prevention - Collaboration

Conflict of interest

None to disclose

Main finding

Mouth-to-mouth ventilation reduces interruptions in chest compressions and produces a higher number of effective ventilations when compared to mouth-to-mask and bag-mask ventilation during lifeguard CPR

Introduction

Ventilation is an essential part of CPR

Especially important for the drowning victim

Quality chest compressions: ↑ survival

↓ interruptions in chest compressions

Ventilations interrupt chest compressions

Introduction



**Mouth-to-mouth
ventilation
(MMV)**



**Mouth-to-pocket mask
ventilation
(MPV)**



**Bag-mask
ventilation
(BMV)**

Resuscitation of a drowning victim → MPV

No studies on ventilation >< interruptions

Aim

**To compare different ventilation techniques
on the quality of CPR**

Methods

Professional, surf lifeguards (> 18 years)

Recruited from two Lifeguard Services

Annual mandatory CPR re-training

Oral and written consent obtained

Performance not disclosed

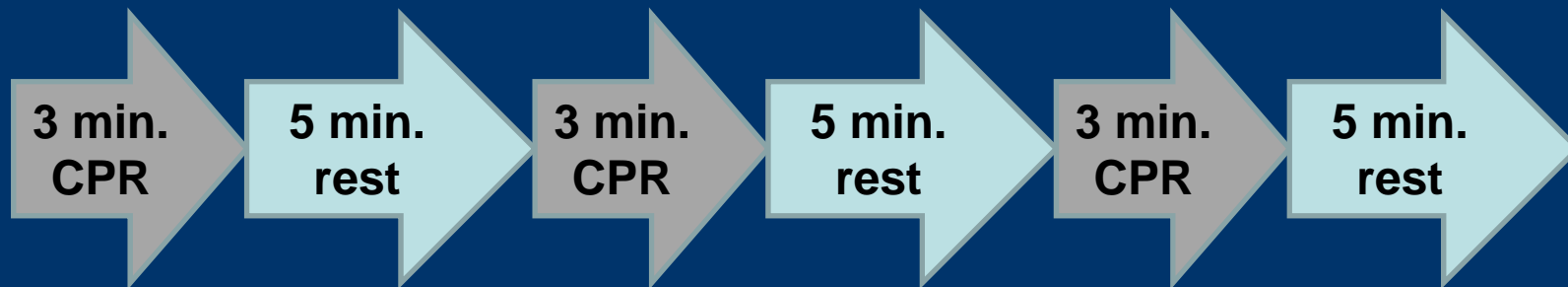
Questionnaire – demographics

Study design

Randomized – single rescuer CPR – manikin

MMV, MPV (PocketMask™), BMV (theBAG II™)

Allowed to familiarize with the equipment



Data collected on the beach (laptop/video)

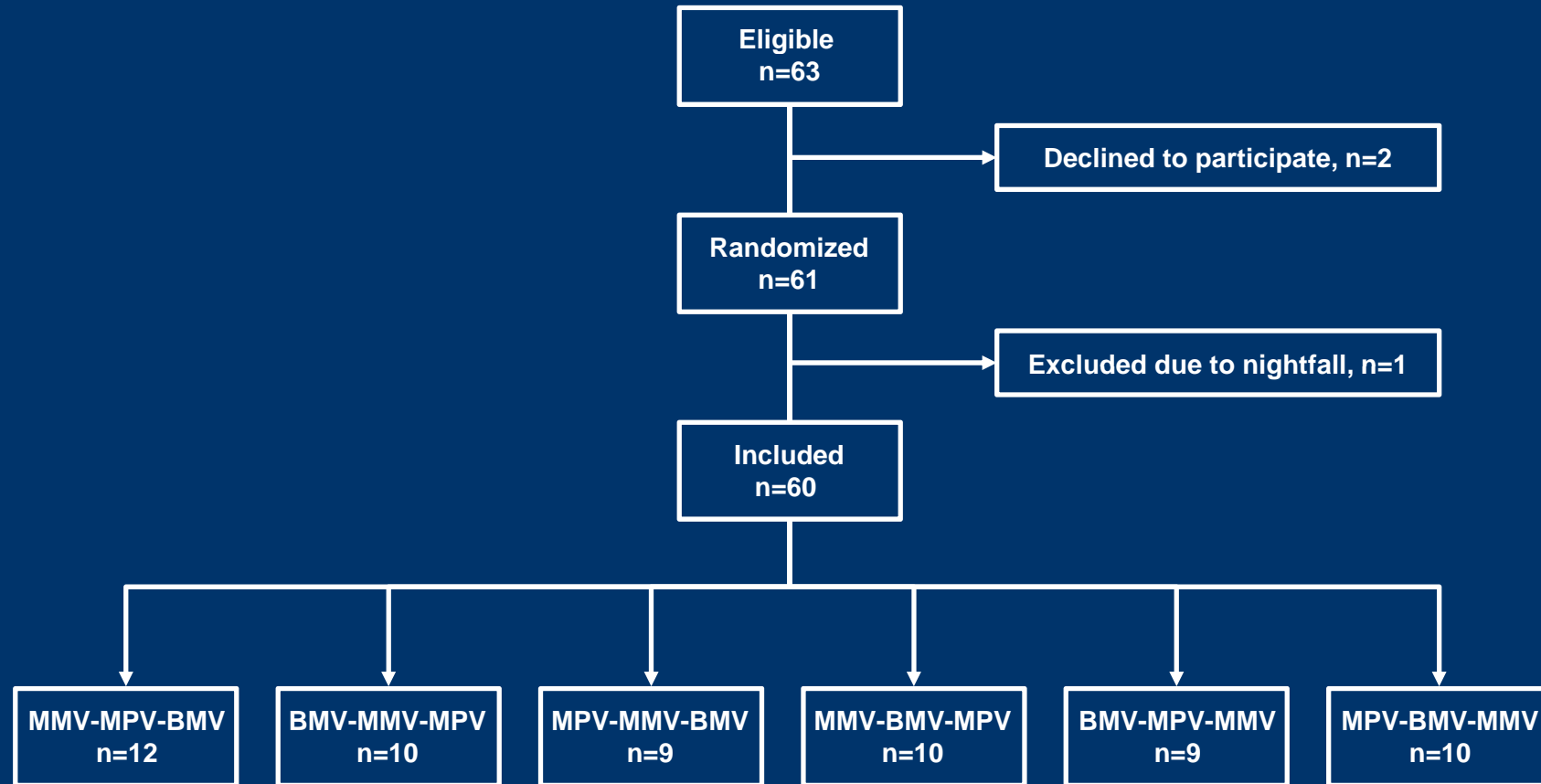
Data analysis

The first four cycles of each CPR session

Cycle excluded if participants stopped CPR

Effective breaths – visible chest rise

Results



MMV: Mouth-to-mouth ventilation | MPV: Mouth-to-pocket mask ventilation | BMV: Bag-mask ventilation

Demographics

Mean age \pm SD (years)	25.4 \pm 5.9
Sex (n, %)	
Female	20 (33%)
Male	40 (67%)
Certification year (mean \pm SD)	2006 \pm 4.4
Years of experience (mean \pm SD)	4.4 \pm 4.4
Health care professional (n, %)	7 (13 %)

Demographics

Education

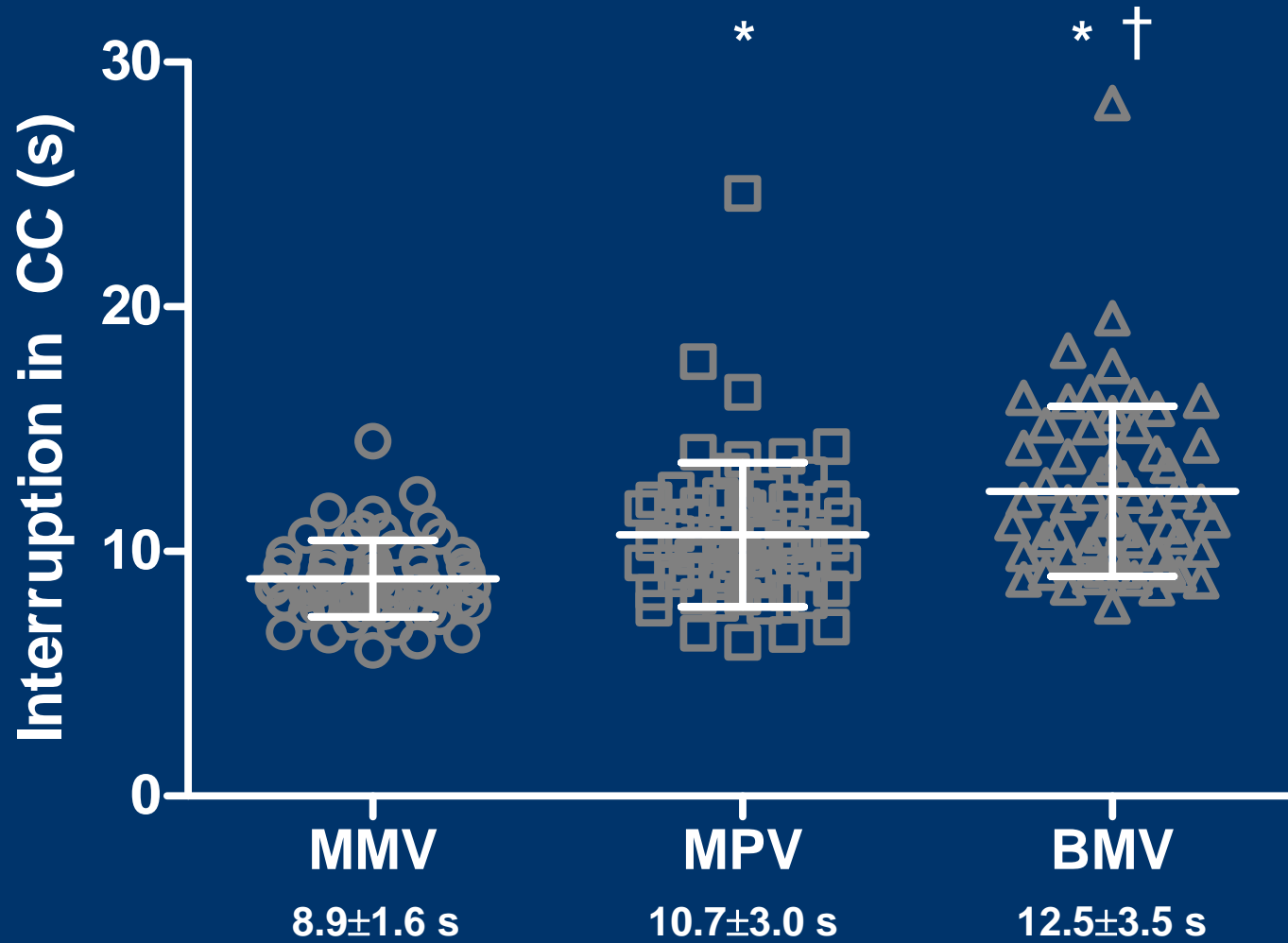
None	1 (2%)
Primary/lower secondary school	2 (3%)
College or preuniversity	41 (68 %)
Higher education (<2 years)	1 (2%)
Higher education (2 – 4.5 years)	7 (12%)
Higher education (> 5 years)	8 (13 %)

Ventilation technique

Preferred ventilation technique

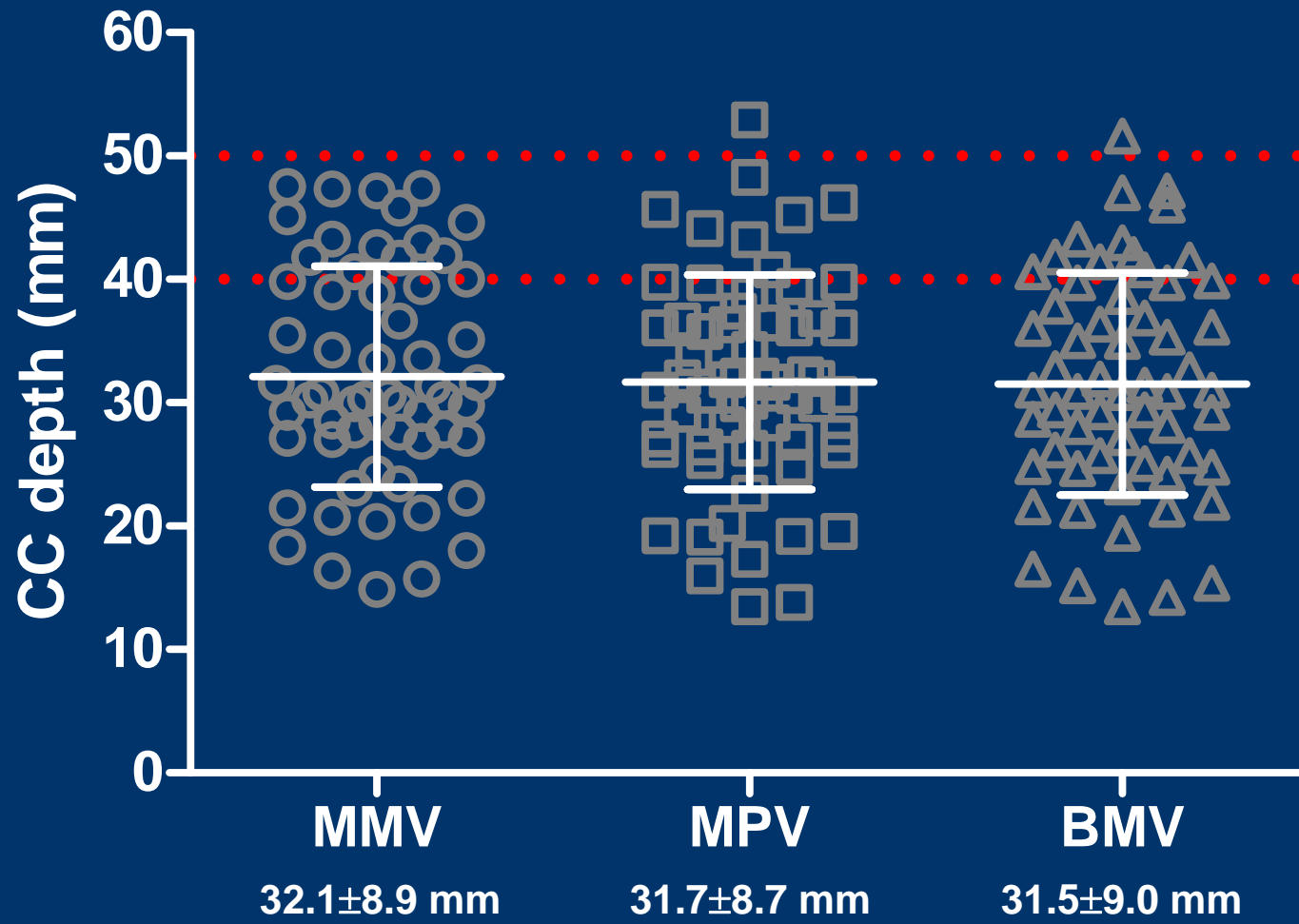
Mouth-to-mouth ventilation	11 (18%)
Mouth-to-pocket mask ventilation	42 (70%)
Bag-mask ventilation	6 (10 %)
No reply	1 (2%)

Results



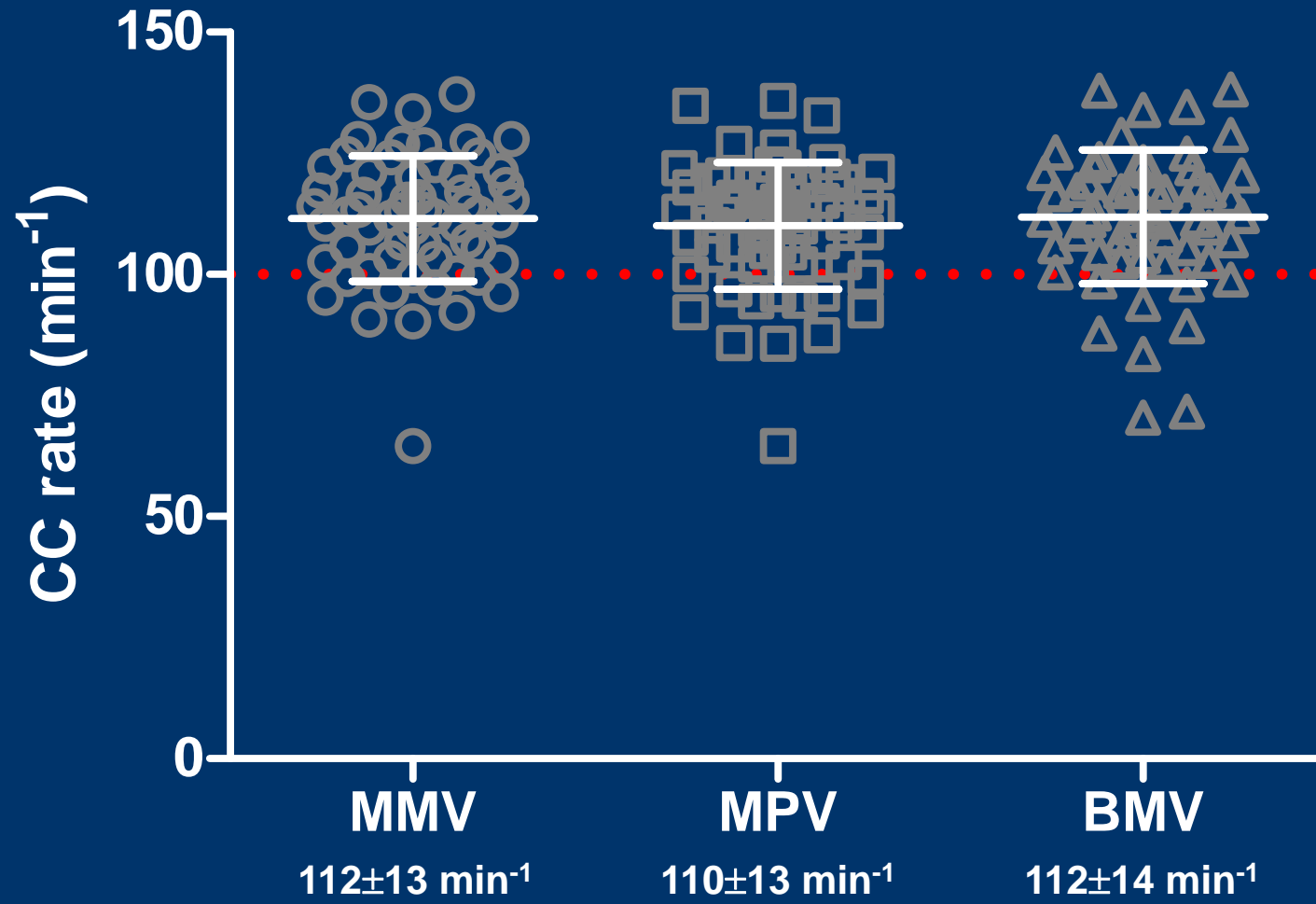
Data are mean±SD. *P<0.001 compared to MMV. †P<0.001 compared to MPV.

Results



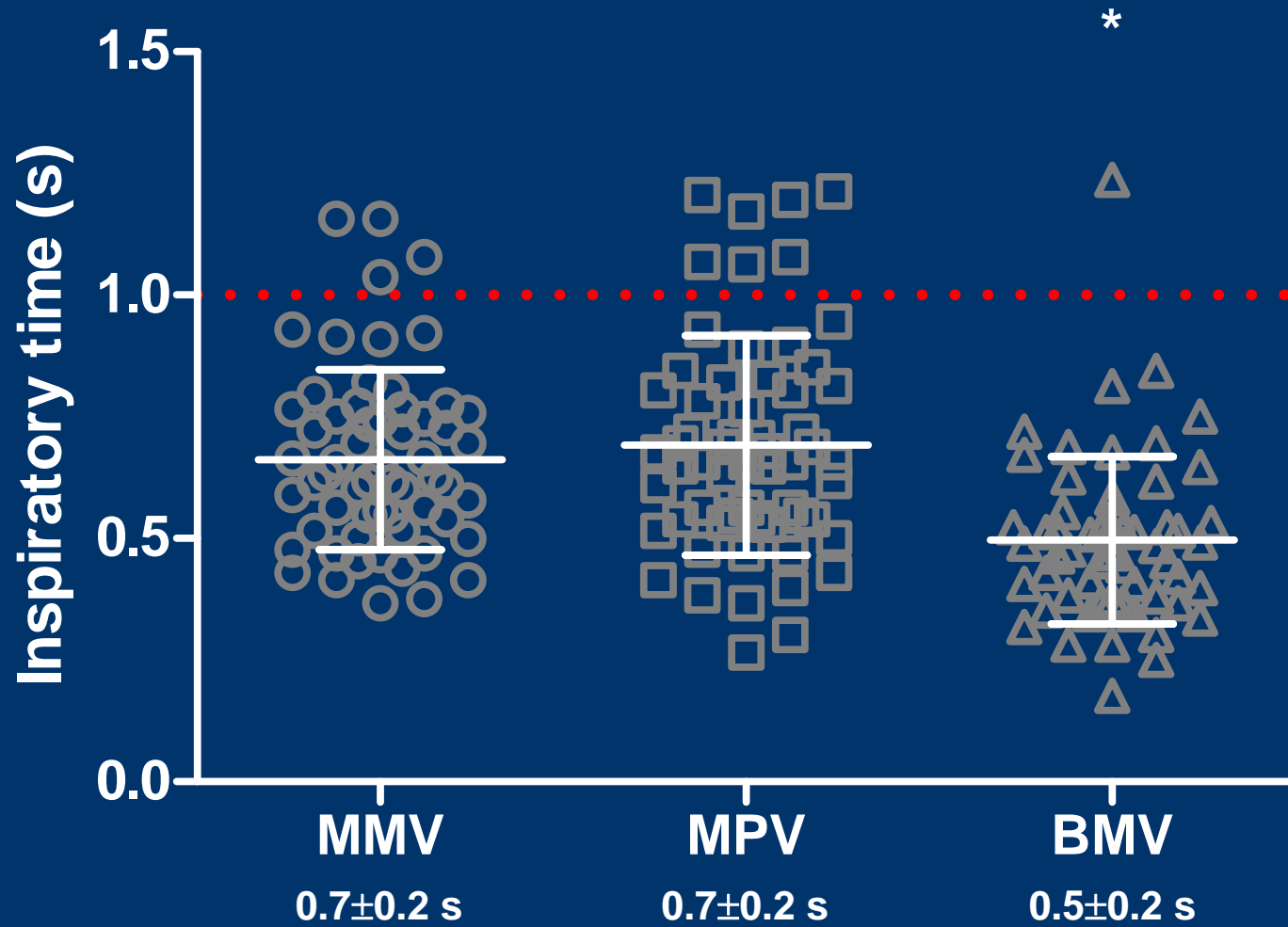
Data are mean±SD.

Results



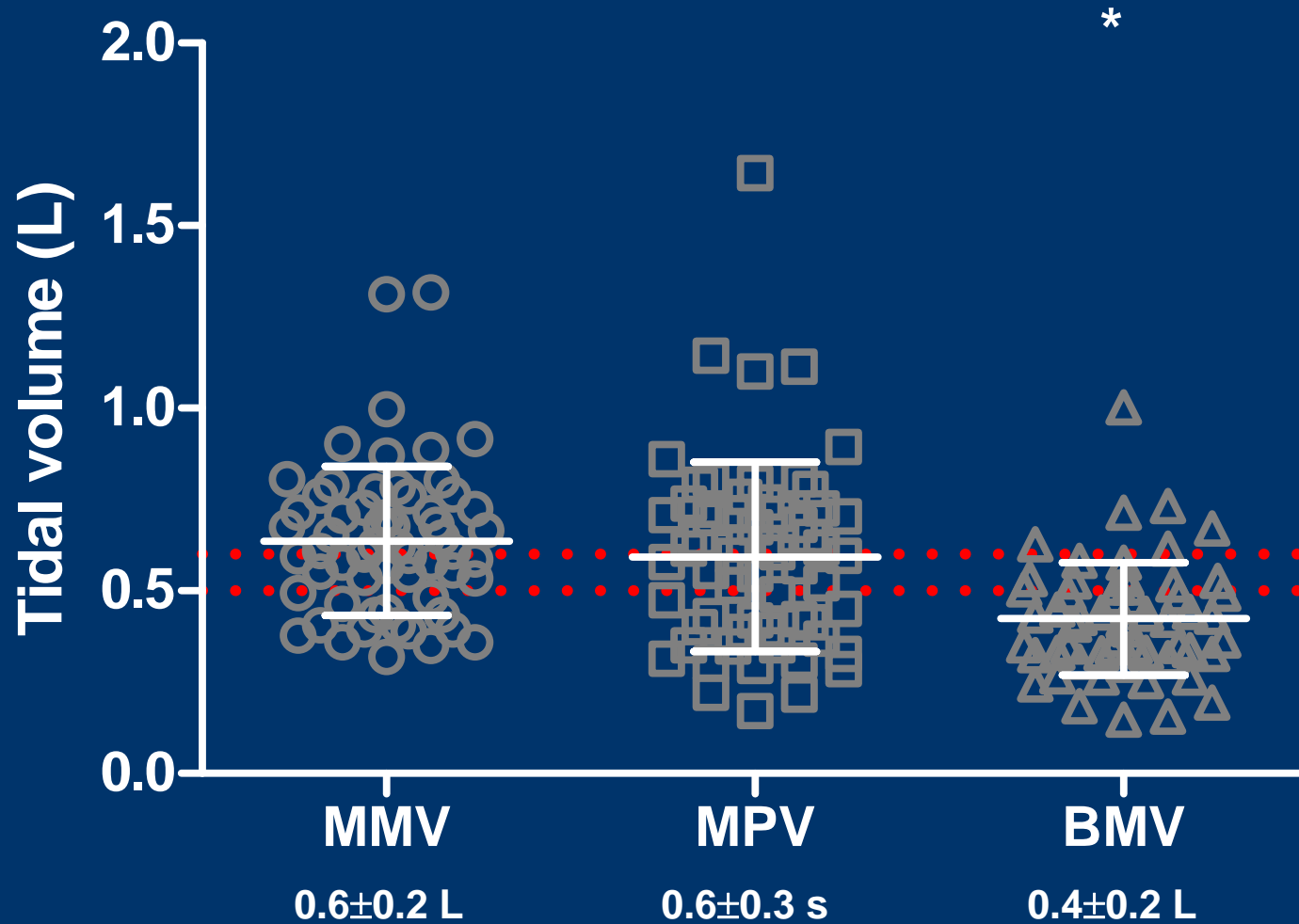
Data are mean \pm SD.

Results



Data are mean \pm SD. *P<0.001 compared to MMV and MPV respectively

Results



Data are mean±SD. *P<0.001 compared to MMV and MPV respectively

Results

Effective ventilations

MMV	MPV	BMV
91 % [*] (n=515)	79 % [*] (n = 518)	59 % [*] (n=557)

* $p < 0.001$, MMV vs MPV, MMV vs BMV and MPV vs BMV

Study limitations

Manikin study – e.g. no vomiting

Single rescuer scenario

BMV is not a part of the training curriculum

Conclusion

Mouth-to-mouth ventilation reduces interruptions in chest compressions and produces a higher number of effective ventilations when compared to mouth-to-mask and bag-mask ventilation during lifeguard CPR

Future directions?

More studies on ventilation techniques

Over the head-CPR

Multiple rescuers

Other barrier devices e.g. face shield

Laryngeal mask airway (LMA)

Acknowledgement

Collaborators

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Investigators

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