



# Vasovagal reactions in blood donors

How to improve compliance of donors with strategies and improve retention

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# Disclaimer information

- No financial conflicts of interest or ties with commercial bodies
- Employed by Sanquin Blood Bank (non-profit, 100% non-remunerated donors)
- Also employed by TRIP (Transfusion and Transplantation Reactions in Patients) Dutch Hemovigilance and Biovigilance Office
- Views expressed are personal and not necessarily those of my employers

## Definition of vasovagal reactions (VVR)

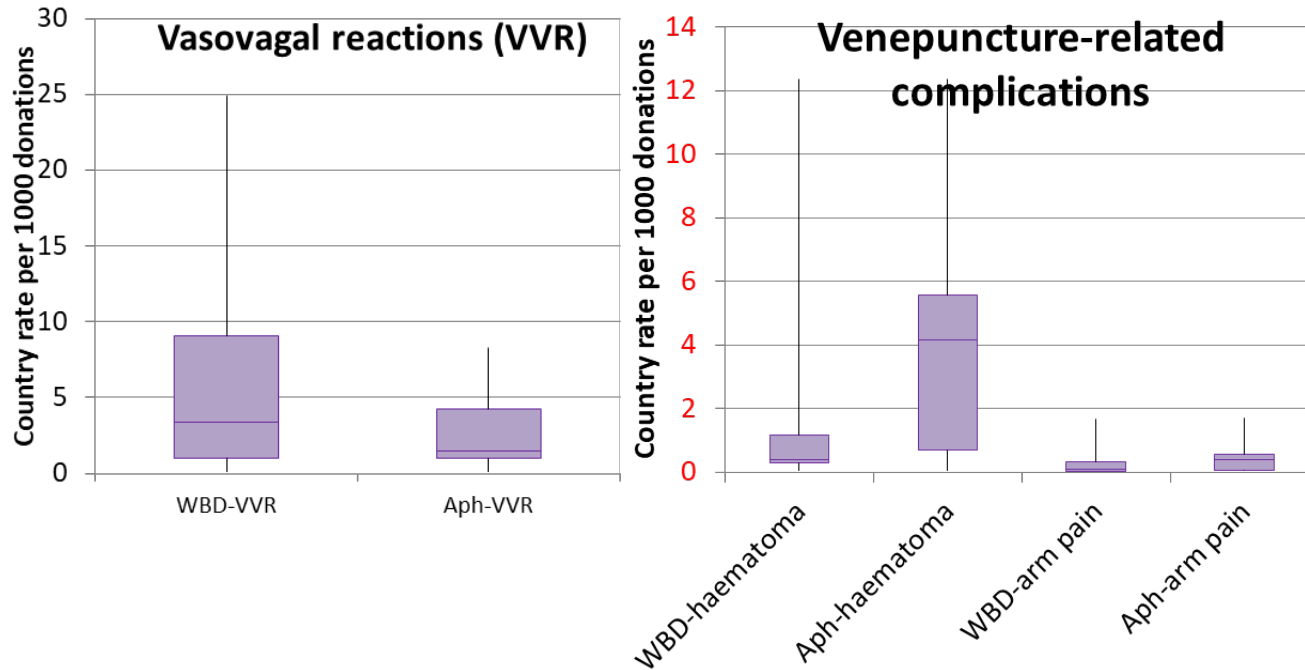
“A vasovagal reaction (VVR) is a general feeling of discomfort and weakness with anxiety, dizziness and nausea, which may progress to loss of consciousness (faint).

It is the most common acute complication related to blood donation.”

(ISBT-IHN Revised Standard for surveillance of Complications related to Blood Donation, December 2014)

Symptom-based definition

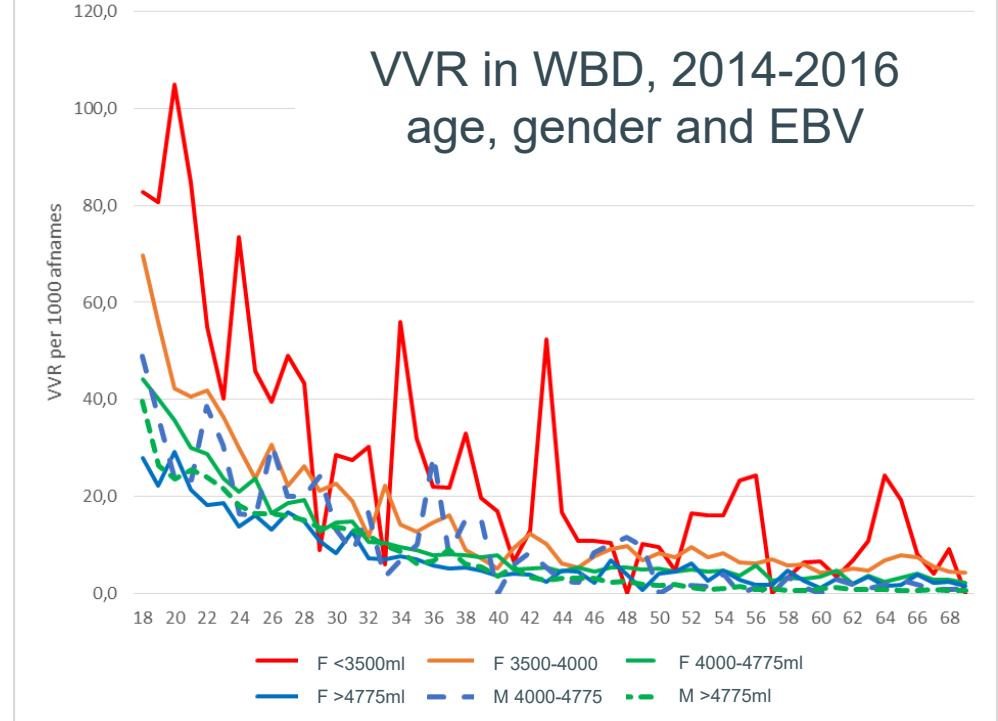
## Whole blood donation vs apheresis (country rate\* per type of complication)



\*Median of country rates, IQR and range  
18 countries, 89 CY, 128 million donations

## Risk factors for VVR

- First time vs repeat donors
- Female vs male, younger age
- (Low) estimated blood volume (EBV)
- (Higher) Hb
- Fear (France 2019: half of variation)



## Reactions discourage donors

- Yet the majority of those who return experience an uncomplicated donation
- Growing literature but many questions remain (e.g. Thijsen et al 2019)
- Less evidence on the effect of witnessing reactions

## Minimising vasovagal reactions (VVR)

- EPISoDe study (“Experience Success in Donation”)
- Measures
  - Reviewed by
    - Fisher et al, 2016
    - ABO White Paper, Dr Mindy Goldman et al, 2014
- Compliance and effect on donor return

# Study of interventions to optimise success of WBD ("EPISoDe")

**Participants:** Young (< 30 years old)

- New (1st donation) and "novice" (2nd, 3rd and 4th donations), whole blood
- Inclusion December 2014-August 2016
- Intervention determined by collection centre cluster

**Study groups:**

500 ml water drink	) After health
330 ml water drink	) screening
Ball squeezing with donation arm (placebo)	)
Routine care (control)	

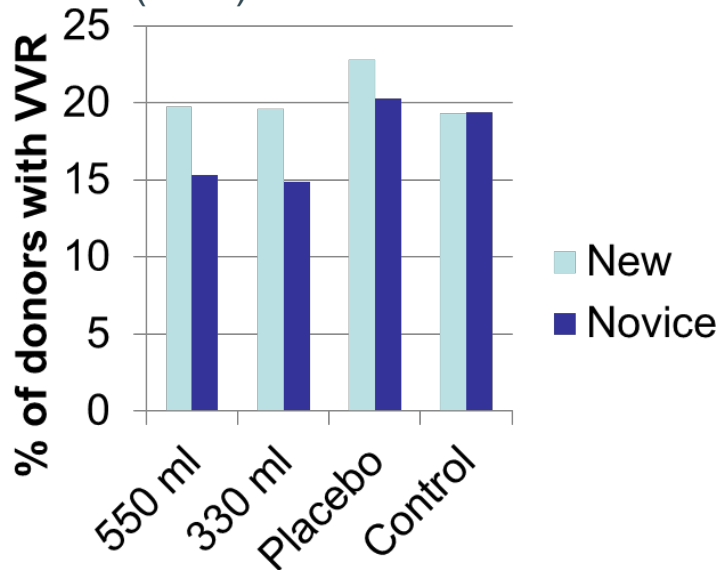
- Electronic questionnaire based on Blood Donor Reactions Inventory
- Use of routinely recorded data (computer system eProgesa)

NNT 23 novice  
donors to avoid  
a self-reported  
VVR

## Results of EPISoDe: primary outcome

- 8300 participants (73% female, 41% first donation)
- 6921 (83%) responded to questionnaire
- **23% reduction of self-reported vasovagal reactions (VVR)**  
(OR 0.77; 0.63-0.94) in **novice donors**
- **No difference between 330 and 500 ml water**
- **No effect in new donors**

(Transfusion 2018; doi:10.1111/trf.15065)





## Secondary outcome: donor return “within a year”

**Included:** Donors invited for donation up to 400 days\* after index donation

➤ **n = 8199 donors**

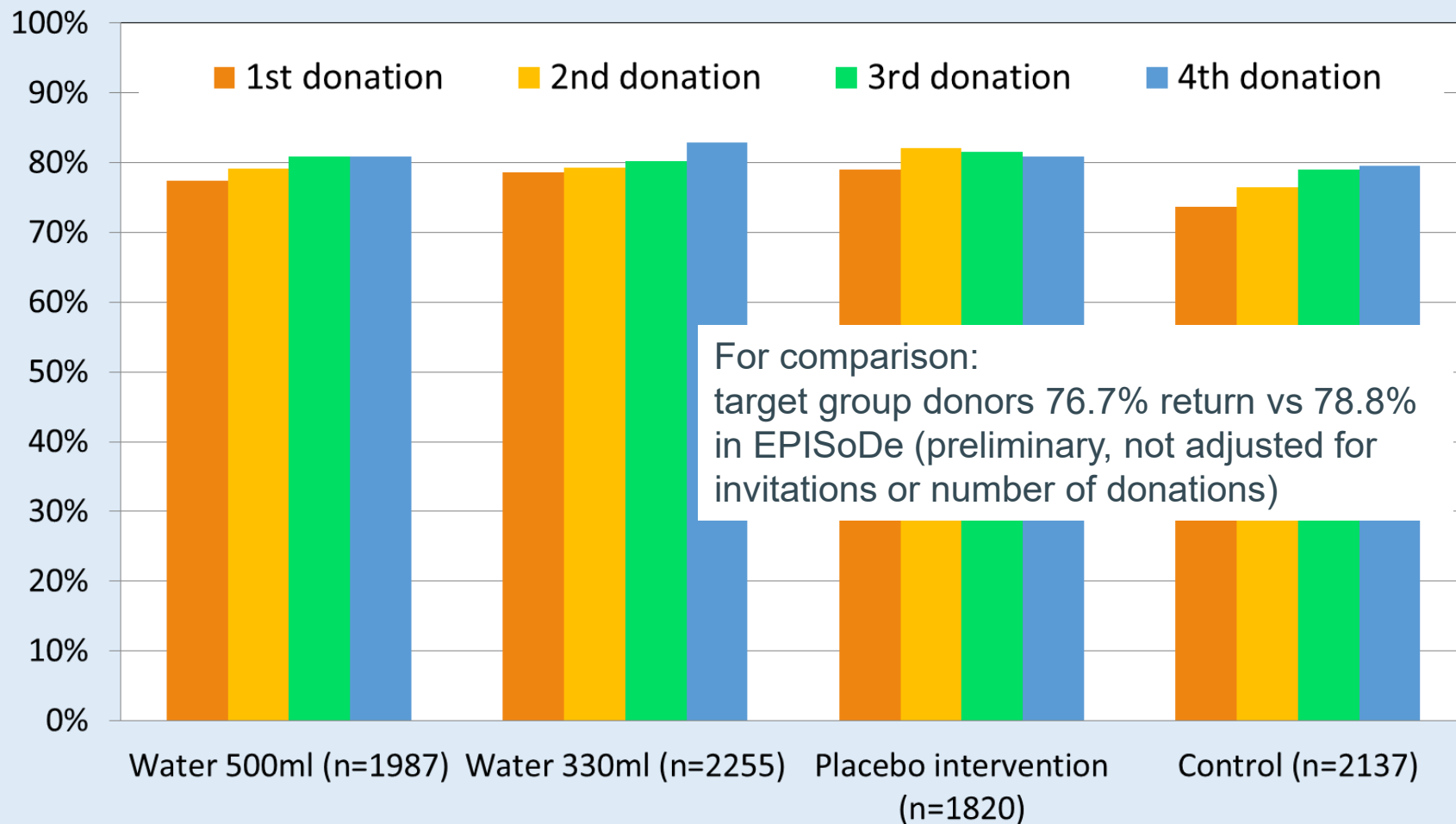
- Attendance for donation (any type) within 421 days after index donation
- Association between % return and intervention
- For comparison: % return of target group donors who met inclusion criteria but did not participate (not approached / other collection centre)
- Extra parameters: donation history, gender, reported symptoms at index donation
- Binomial logistic regression (SPSS version 23)

**\*NOTE:** donors are actively invited for donation; Sanquin aims to invite at least 1x/y

## EPISoDe donor return: no significant difference between water and placebo interventions,

Subgroup of EPISoDe participants	Control group	Water 500 ml	Water 330 ml	Placebo intervention	EPISoDe total
Invited	2137	1987	2255	1820	8199
% return	<b>77.1%</b>	<b>79.7%</b>	<b>80.8%</b>	<b>81.5%</b>	<b>79.7%</b>
➤ Responded to questionnaire	1681	1708	1955	1497	6841
% return	80.1%	80.6%	81.7%	82.6%	81.3%
➤ Self-reported VVR	321	293	324	312	1250
% return	69.5%	68.9%	72.8%	77.9%	72.3%

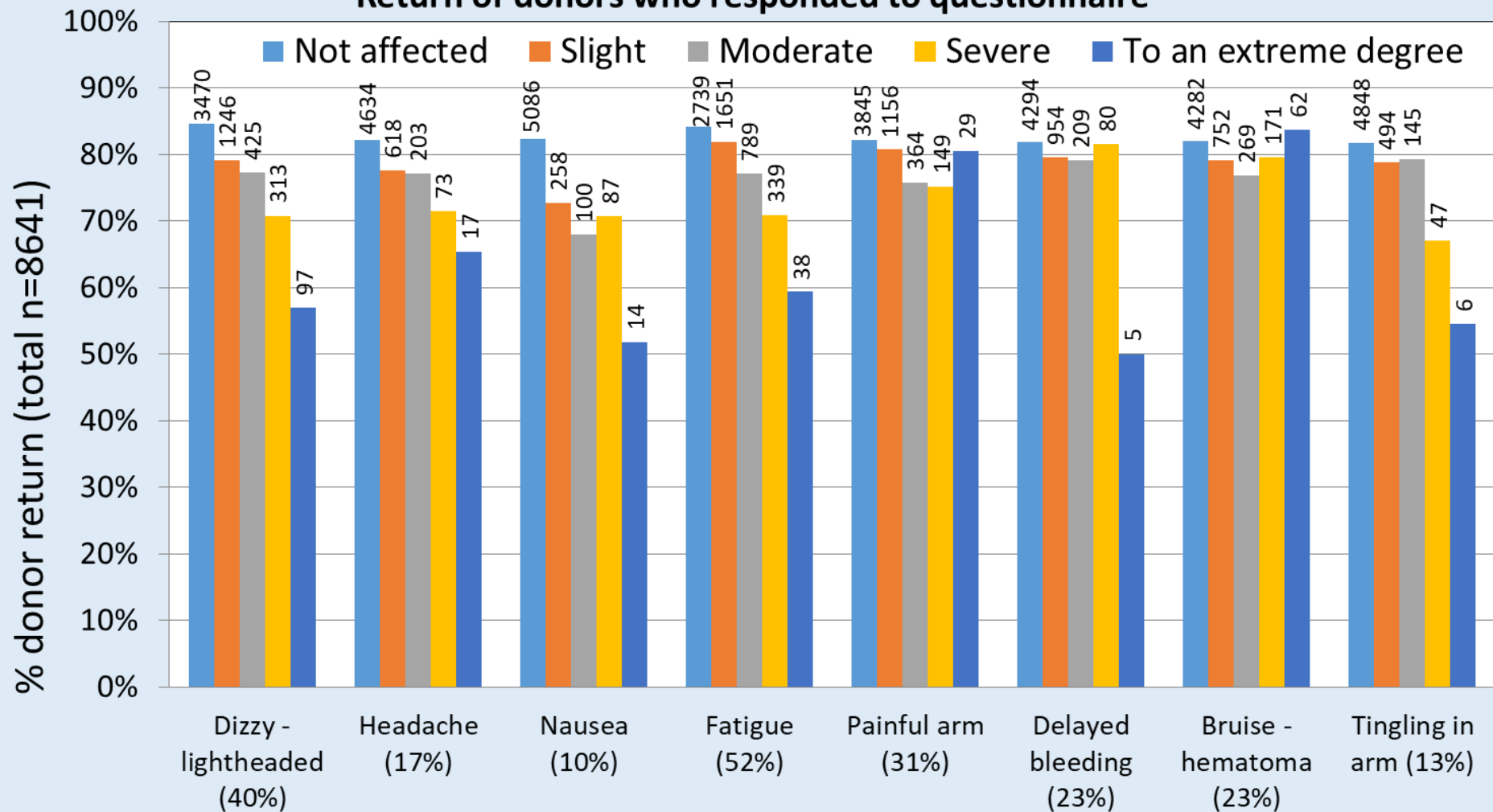
returned donors (%)



## Multivariable analysis: odds for donors' return

	Odds Ratio	95% Confidence interval	
		Lower	Upper
Gender (F vs M)	0.88	0.78	0.99
Water intervention	1.20	1.06	1.36
Placebo intervention	1.30	1.11	1.52
Donation history (new vs novice)	0.86	0.77	0.96
VVR (staff recorded)	0.48	0.38	0.61

## Return of donors who responded to questionnaire



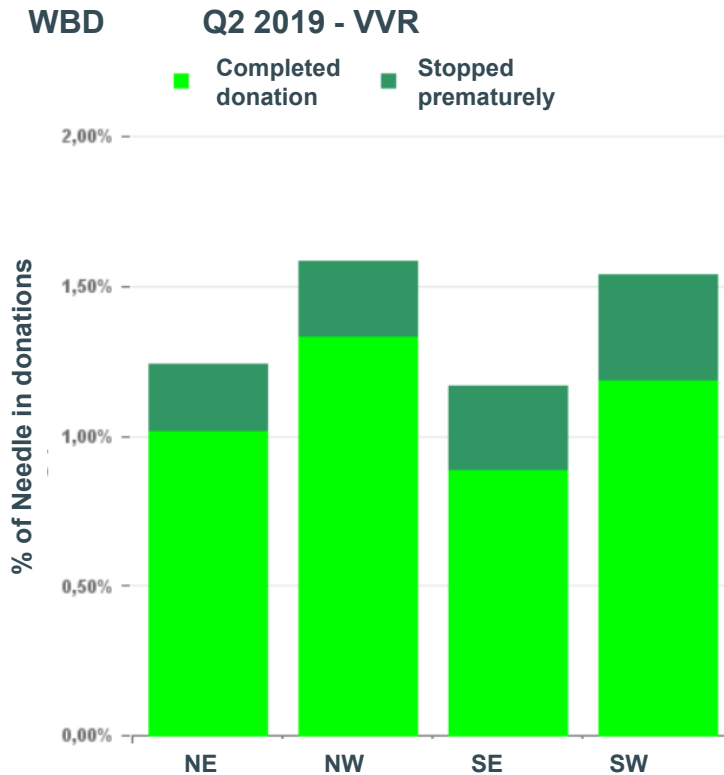
# Interventions

- Organisational: real time information
- Information/advice – prepare for your donation
- Distraction
- Water drink
- Isotonic drink/salt supplement
- Applied muscle tension
- Follow up e.g. phone call following reaction
  - Sms, social media??

Internal evaluation:  
donors appreciate call, no  
effect on return

## Real time monitoring

WBD Q2 2019 - VVR		Needle in donations	VVR total	Completed donation	Stopped prematurely
Northeast		27.360	1,24%	1,01%	0,23%
Northwest		19.354	1,58%	1,33%	0,25%
Southeast		32.514	1,17%	0,89%	0,28%
Southwest		20.655	1,54%	1,18%	0,36%
Totaal:		99.883	1,34%	1,07%	0,28%



## Information/advice to donors: “Prepare for your donation”

- Evidence for preventing reactions: “Common sense” (ABO white paper)
- Compliance: verbal question:  
how are they feeling today, when did they last eat/drink?
- Evidence for donor return ?
- France C, 2011: information on coping methods improved donation intention (high school donors and non donors)



## Water drink

- Compliance: 330 ml is enough
  - Actively offer beaker to young, inexperienced donors
  - NNT 23 novice donors (43 1st-4th donations)
- 
- Evidence for donor return – effect seems non-specific



## (Social) distraction



- Evidence for preventing reactions
  - Bonk 2001 (audiovisual distraction, 112 donors)
  - Hanson et al 2009 (supportive research assistant, 65 donors)
- Staff experience: “talk a donor through”
- Compliance: included in predonation advice
- Evidence for donor return ?

## Isotonic drink/salt supplement

- Loss of 2.5-3g of salt in a 500ml whole blood donation
- Physiology supports possible extra effect (Wieling et al 2011)
- May reduce delayed reactions (Morand et al 2016: OR, 0.62; 95% CI, 0.40-0.98)
- Acceptability - cost
- Evidence for donor return ?

## Applied muscle tension



### Muscle tensing exercises:

- Cross your legs
- Clench your legs and buttocks for 5 seconds
- Relax for 5 seconds
- Repeat

- Well established in syncope patients with autonomous dysregulation
- Improved cerebral oxygenation in 75 female experienced donors, no impact on presyncopal symptoms (Kowalsky et al 2011)
- Morand: reduction of reactions *during* donation (OR, 0.64; 95% CI, 0.42-0.98)
- Less well known by staff
- Possible role in treating donor reactions?
- Evidence for donor return – Ditto 2009 (women in mixed study of 1209)  
however no association between the actual reduction of symptoms in different applied tension conditions and higher levels of return

## Conclusions

- Steady increase in knowledge
- Reactions – and donors' return behaviour – are multifactorial
- Best evidence for water drink for VVR prevention
- Organisation-wide implementation
- Plenty more work to be done!



**Take your time  
Don't get up too quickly**

# Thank you for your attention

## Acknowledgements

### EPISoDe study

All participating donors

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