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The influence of balloon inflation time in femoro-popliteal and BTK angioplasty: a systematic review

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The logo for Franciscus Gasthuis & Vlietland features the word 'Franciscus' in a red, cursive font, with 'Gasthuis & Vlietland' in a smaller, blue, sans-serif font below it.

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The logo for UMC Utrecht features a blue, stylized sunburst or gear-like symbol above the text 'UMC Utrecht' in a blue, sans-serif font.

UMC Utrecht

The logo for Universitätsklinikum Leipzig features a blue, stylized 'U' symbol above the text 'Universitätsklinikum Leipzig' in a blue, sans-serif font, with 'Anstalt öffentlichen Rechts' in a smaller font below it.

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Disclosure

Speaker name:

Olaf J Bakker.....

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

X I do not have any potential conflict of interest

Introduction

- Numerous studies have investigated the effect of DCB, BMS or DES in fempop and BTK angioplasty
- Only 3 studies have investigated the effect of prolonged balloon inflation¹⁻³
- Current guidelines lack a recommendation on balloon inflation time

¹Manninen '97; ²Soder 2002; ³Zorger 2002

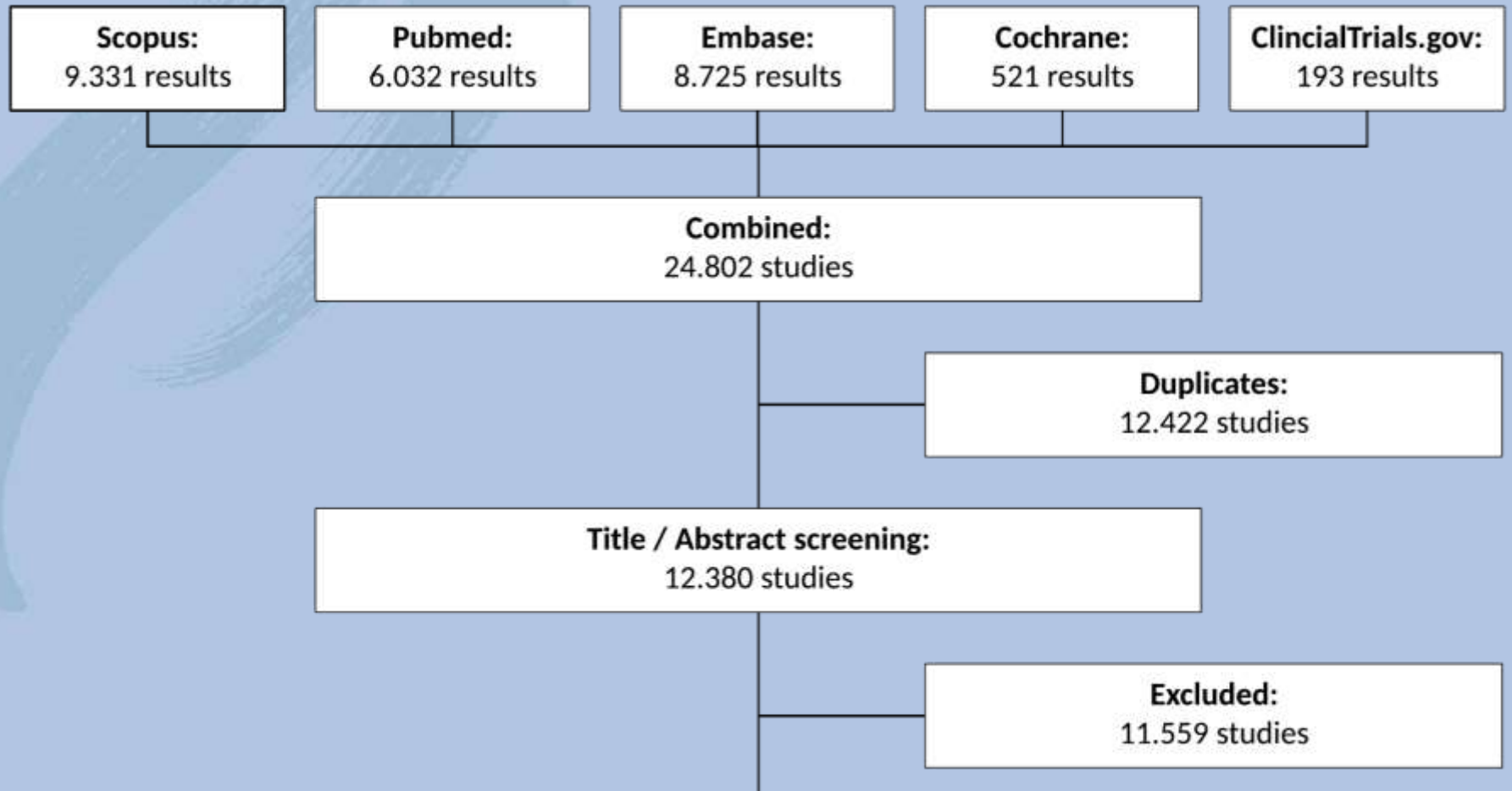
Study Question

- *What is the effect of balloon inflation time on outcomes in fem-pop and BTK angioplasty?*

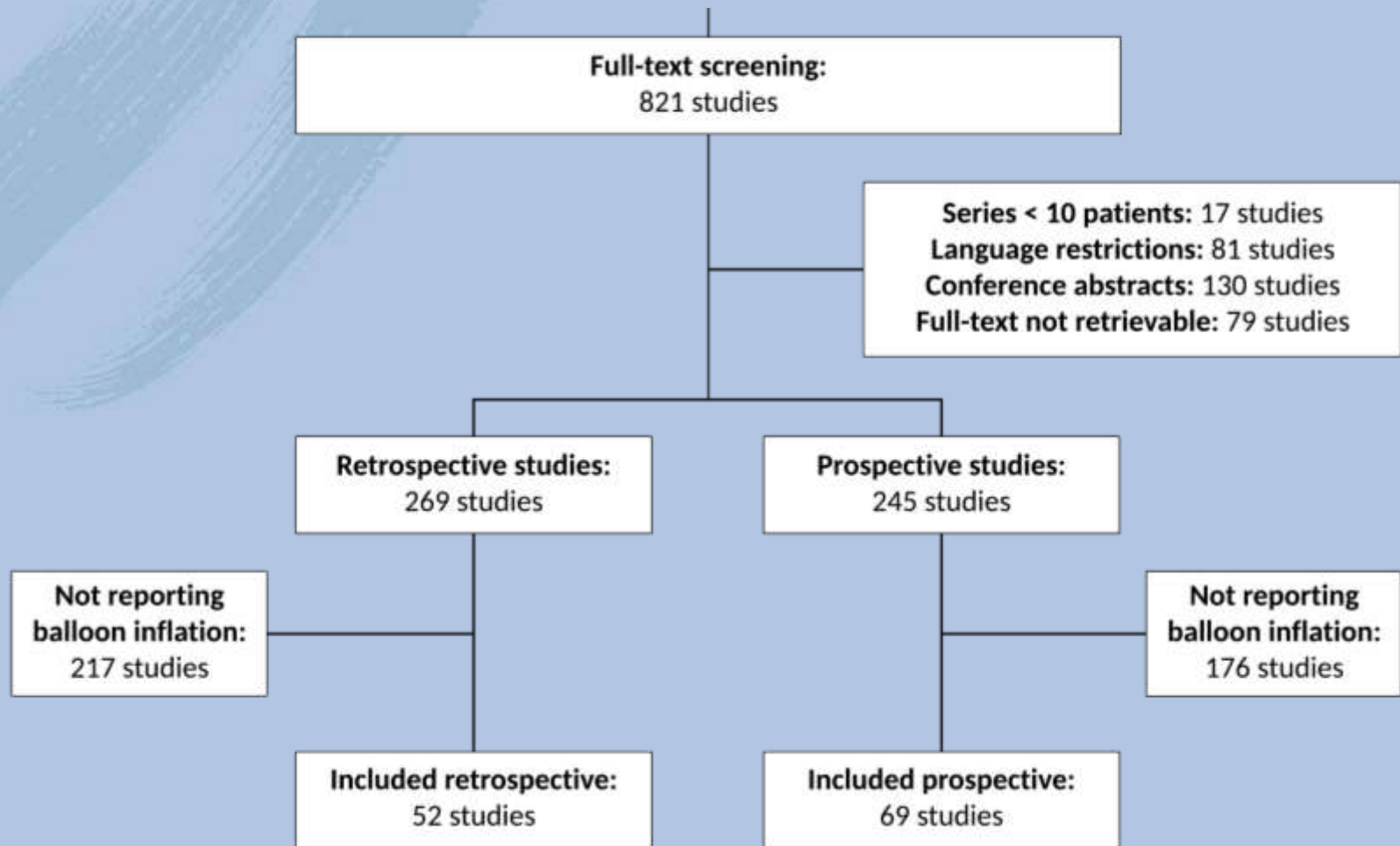
Methods

- Systematic review of the literature & meta-analysis
- Scopus, Pubmed, Embase, Cochrane, ClinicalTrial.gov
- Inclusion: - fempop / BTK angioplasty (POBA or DCB)
- inflation time
- Exclusion: - studies not written in English, German
or Dutch
- < 10 patients

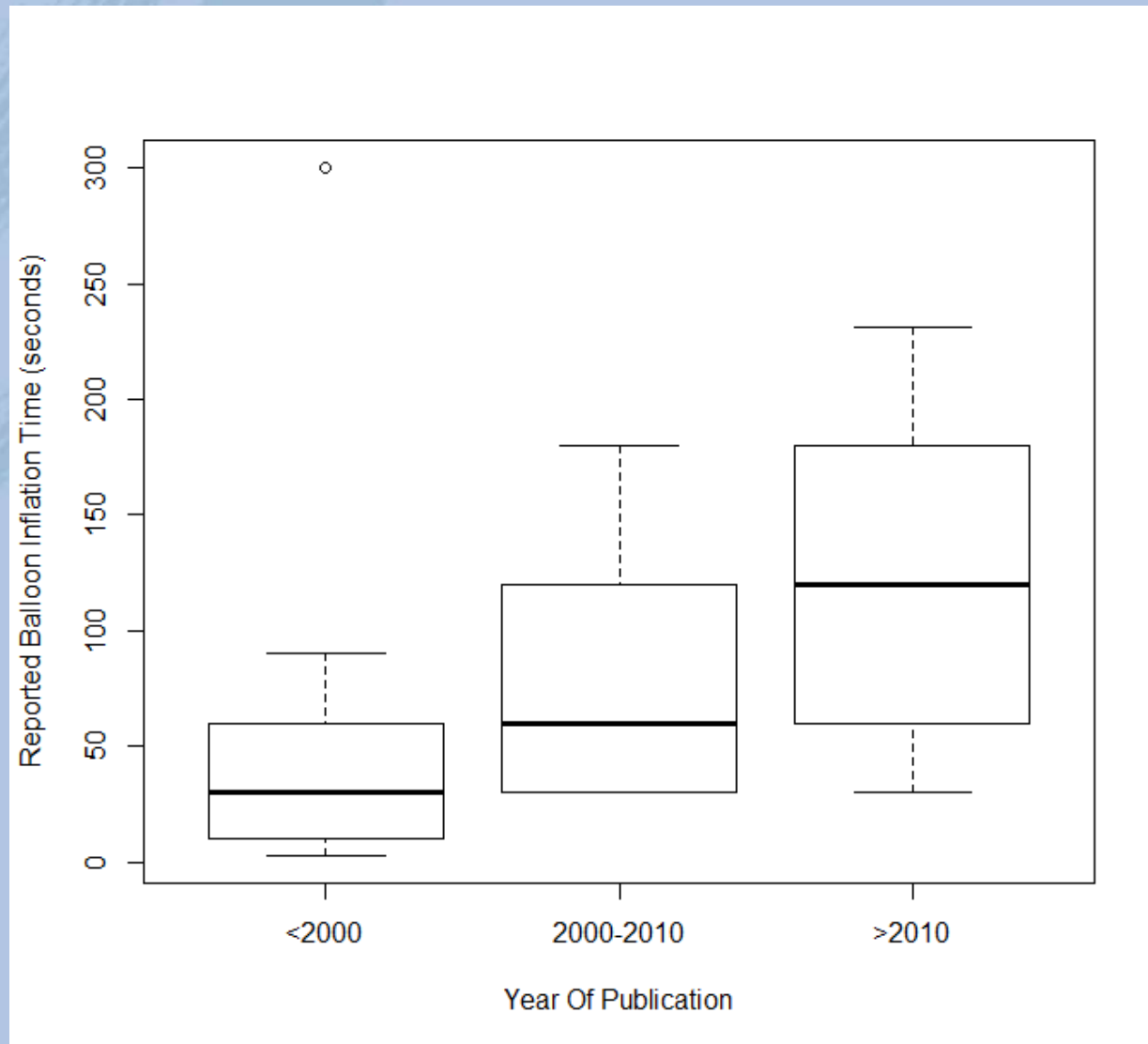
Inclusion Flowchart



Inclusion Flowchart (2)

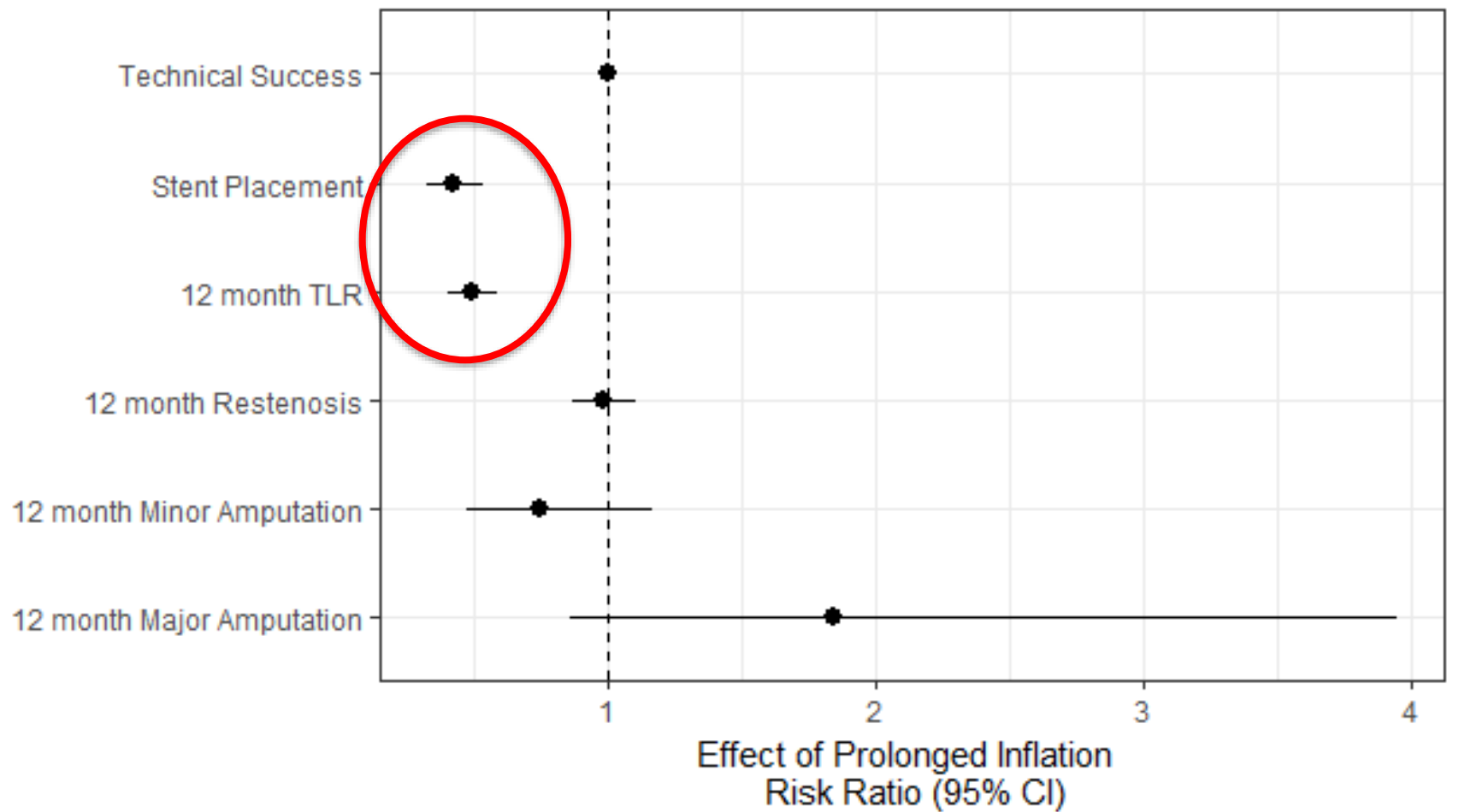


Balloon Inflation Time over the years

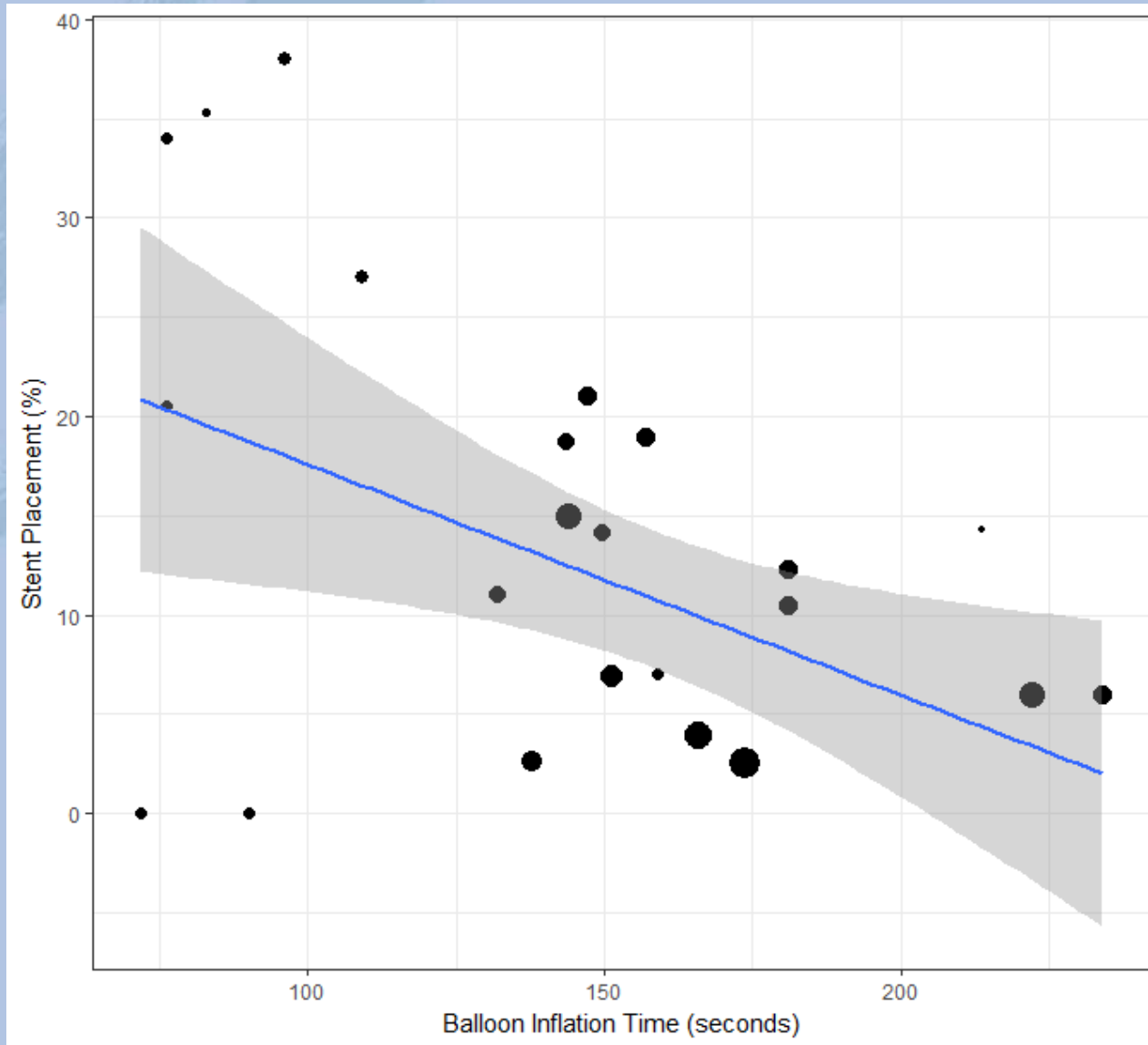


Baseline

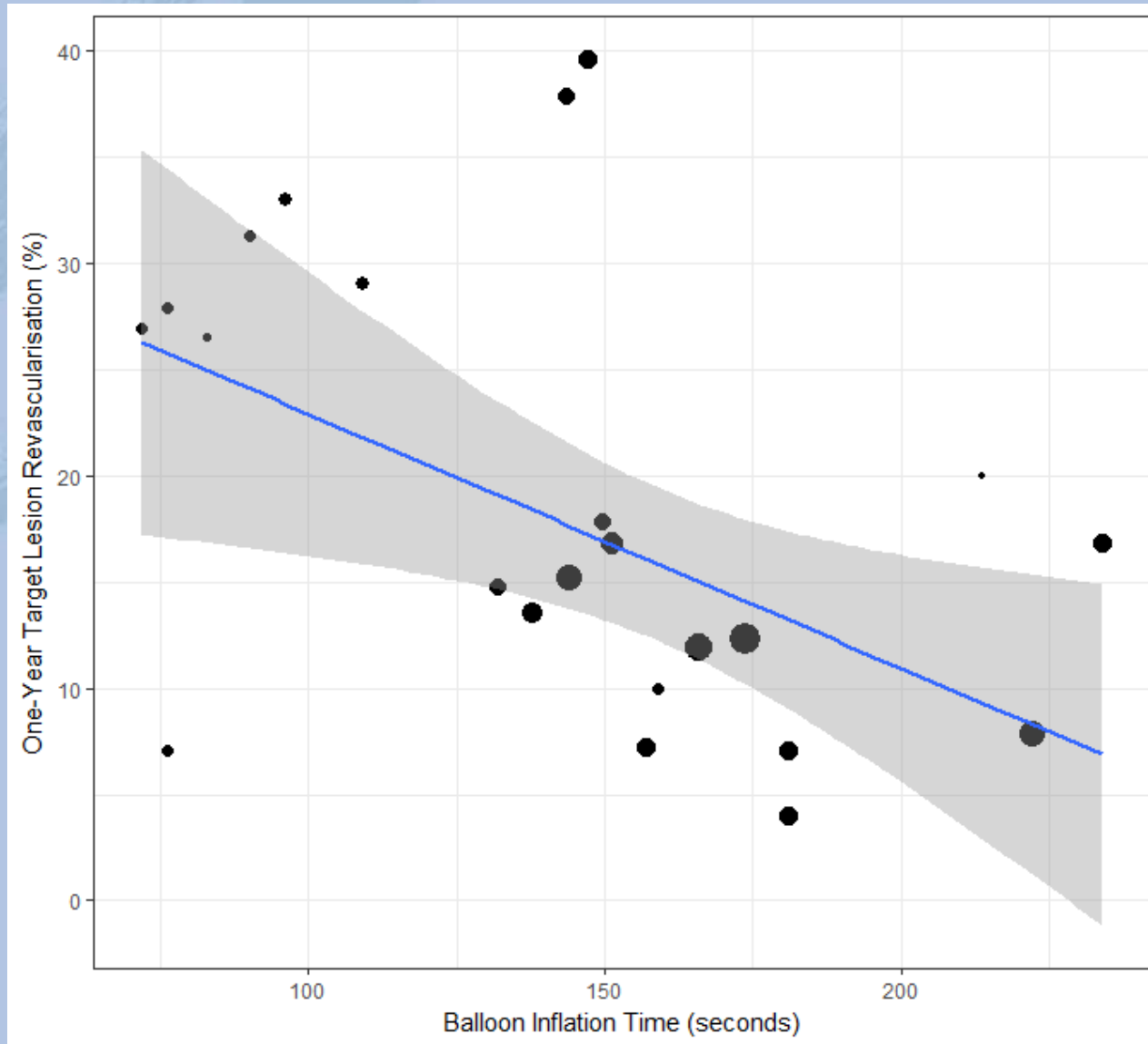
	< 150 sec	> 150 sec	p
No. of patients	957	1389	
Balloon inflation (mean, sec)	112.0	183.8	< 0.01
Follow-up (mean, months)	16.0	14.4	0.35
Lesion length (mean, mm)	98.7	97.5	0.95
Diabetes (%)	46.0	52.4	0.48
Rutherford 0-3 (%)	74.4	72.7	0.92
Rutherford 4-6 (%)	25.6	27.3	0.93



Need for stentplacement



Target Lesion Revascularization



Multivariable Linear Regression Analysis

- Adjusted for use of DCB
- Adjusted for vessel segment (fem-pop-BTK)

Stent placement

- Inflation time: OR = 0.59 ($p < 0.01$)

Multivariable Linear Regression Analysis

- Adjusted for use of DCB
- Adjusted for vessel segment (fem-pop-BTK)

12-month TLR

- Inflation time: OR = 0.67 (p = 0.04)
 - DCB use: OR = 0.63 (p < 0.01)
- >> non-significant difference DCB vs. Inflation Time

Summary

- Prolonged inflation is correlated with reduced need for stent placement and target lesion revascularization
- In reducing need for TLR, prolonged inflation is equally as effective as DCB use

Limitations

- Inflation time was not primary goal of included studies
- Overall, few studies report balloon inflation time (14 out of 514)
- Results mostly applicable to non-complex lesions

Conclusion

- Prolonged balloon inflation is associated with improved procedural and long-term outcomes in fem-pop and BTK angioplasty
- If recoil or dissection occurs after primary angioplasty, prolonged inflation should be the next step

Thank you



-Olaf Bakker

-Frans Moll

-Andrej Schmidt

-Rutger Welling

-Gert Jan de Borst

-Dierk Scheinert

Methods (2)

Outcome measures:

- Technical success
- Bail-out stent placement
- 12-month amputations
 - Minor
 - Major
- 12-month angiographic restenosis
- 12-month TLR

Baseline (2)

Patient characteristics		< 150 seconds	> 150 seconds	p
	No. of patients	957	1389	
	Male	69.8%	68.0%	0.75
	Mean age (years)	68.7	69.0	0.59
	Hypertension	80.5%	81.0%	0.63
	Hypercholesterolemia	57.8%	77.0%	0.03
	Diabetes	46.0%	52.4%	0.48
	Current or history of smoking	36.6%	62.5%	0.09
	Coronary Artery Disease	28.9%	44.2%	0.19
	Rutherford 0-3	74.4%	72.7%	0.92
	Rutherford 4-6	25.6%	27.3%	0.93

Results – Exact Time – Correlations (1)

- Sample Size weighted Pearsons' correlation.
- Non-significant correlations;
 - Technical success
 - Angiographic restenosis
 - Minor amputations
 - Major amputations

Limitations

- Inflation time was not primary goal of included studies
- Few studies report balloon inflation time
 - 23.5% in method section (121 out of 514)
 - 2.7% as outcome (14 out of 514)
- No comparison to primary stenting studies possible

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