

# TAVI without STANDBY?

Hans Rickli, St.Gallen

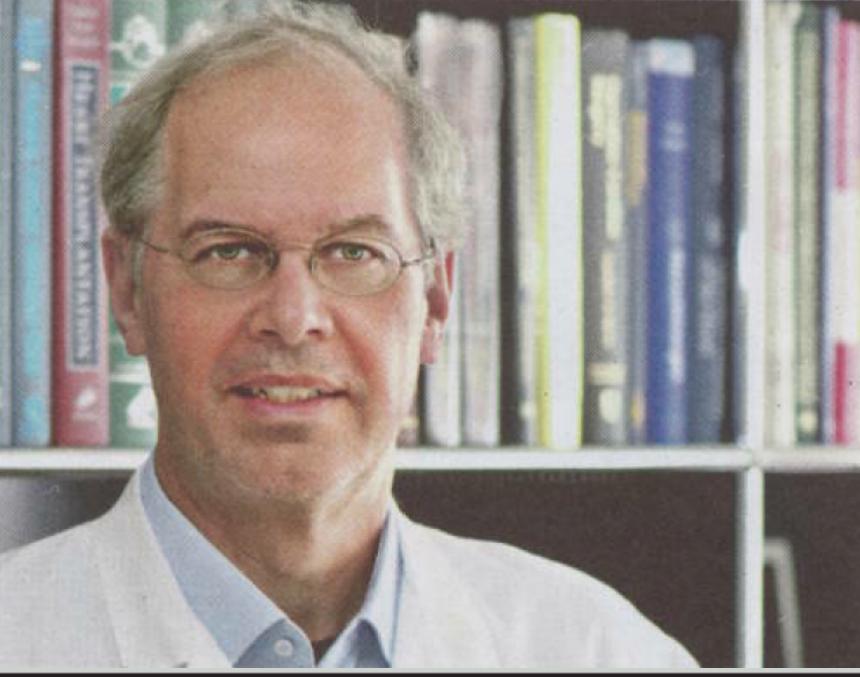


Conflict of Interest to declare: No cardiac surgery

# TAVI without STANDBY?

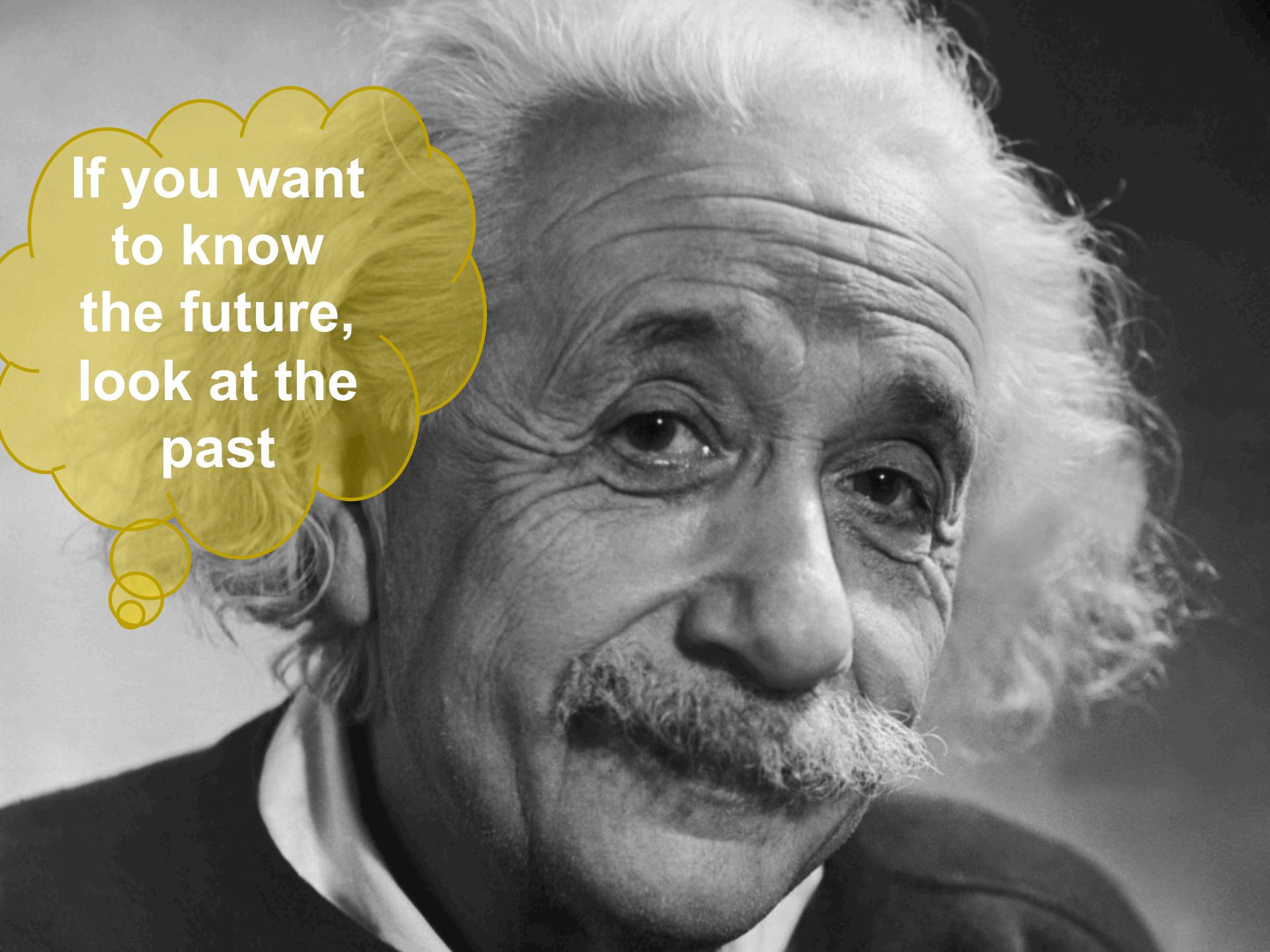


# Guidelines on the management of valvular heart disease (version 2016? )

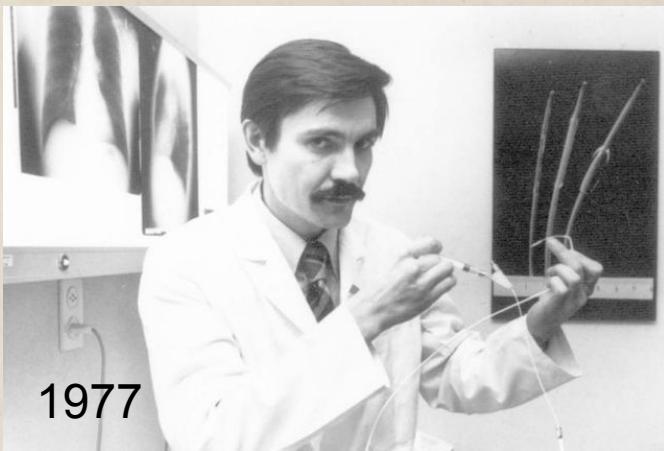
	<b>Class<sup>a</sup></b>	<b>Level<sup>b</sup></b>
	I	C
TAVI should only be performed in hospitals with cardiac surgery on-site.	I	<b>Carrel</b>



I think it's better  
to stay at  
home?



If you want  
to know  
the future,  
look at the  
past



**On-site cardiac surgery for PCI?**

**PENTIUM - 100**

TEL. 073 / 51 01 05  
FAX 073 / 51 01 06

8 MB RAM + 865 MB Festplatte + miro PCI  
Grafikkarte 1 MB + WIN 95 +  
Tastatur + Mouse =

**FR. 2'199.-**

9249 OBERBÜRN, GEWERBEHAUS SANDÄCKERSTR. 30  
MO-FR 08.30-18.00, FR 13.30-21.00, SA 10.30-18.00

**Gratis Tel:  
155 2772**

**Donnerstag, 9. November 1995**  
**Redaktion/Inserate 071/22 66 31**

**H  
L  
T  
St.Gallen  
ung**

**rukka**

**3. Jahrgang, Woche 45, Auflage 68'365, WEMF beglaubigt  
Unabhängige redaktionelle Wochenzeitung**

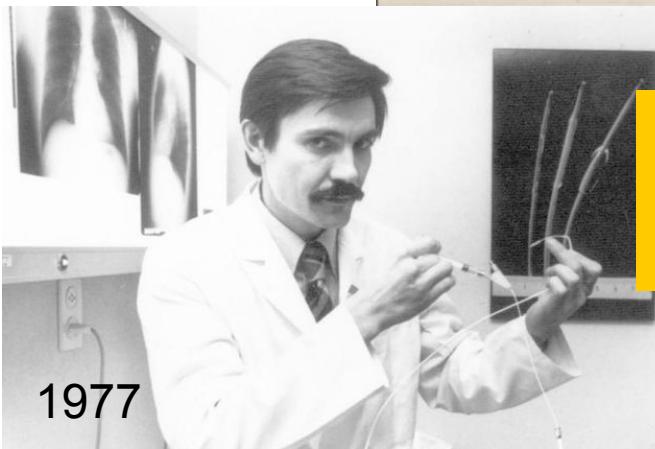


**No PCI without on-site  
surgery.....**

**Donnerstag, 9. November 1995**

**«....No cardiac surgery  
needed: PCI can be done  
without on-site surgery.....»**

**Notwendig  
oder Prestigeprojekt?**



## CH: First-Stent – PCI without on-site cardiac surgery: 11 years



## First TAVI 3/2002

Cribier et al. Circulation 2002;106:3006–3008.

**TAVI without on-site cardiac surgery: extension to all teaching centers.....?**



Working Group Interventional Cardiology  
and Acute Coronary Syndromes

Home  
Board  
Center  
Report  
Next S  
Guidel  
Links  
Histori

1997: PCI without on-site cardiac surgery allowed



ment für den Standort St.Gallen. Für die Bewohner des St.Galler Oberlandes und des Raumes Gaster-See, ist der Weg nach St.Gallen weiter. Die Verbindungen mit den öf-

tionen elf neue Stellen eingesetzt werden. Die Pflege und die Betreuung der postoperativen Herzpatientinnen und -patienten ist Neuland für den Pflegedienst im Kantonsspital.

ge medizinische Routine-Institution. Bis vor einigen Jahren war es tatsächlich begreiflich, die chirurgische Korrektur schwerer Ductusblutungsstörungen des Herzmus-

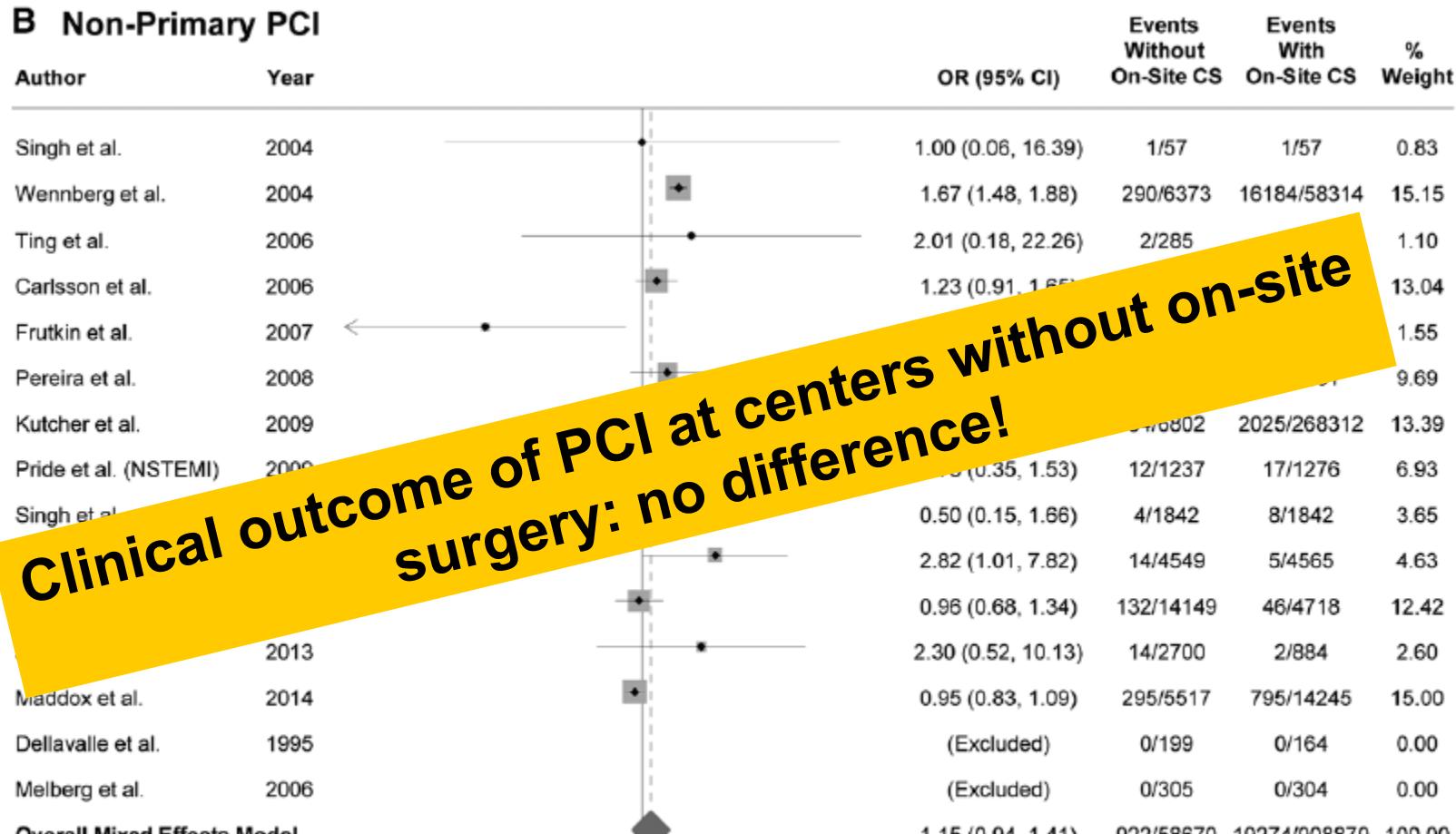
stik, welche übrigens an der kardiologischen Abteilung des Kantonsspitals hervorragend durchgeführt wird, gleichzeitig mit der notwendigen Therapie vorzunehmen. Es ist si-

## Herzchirurgie in St.Gallen?

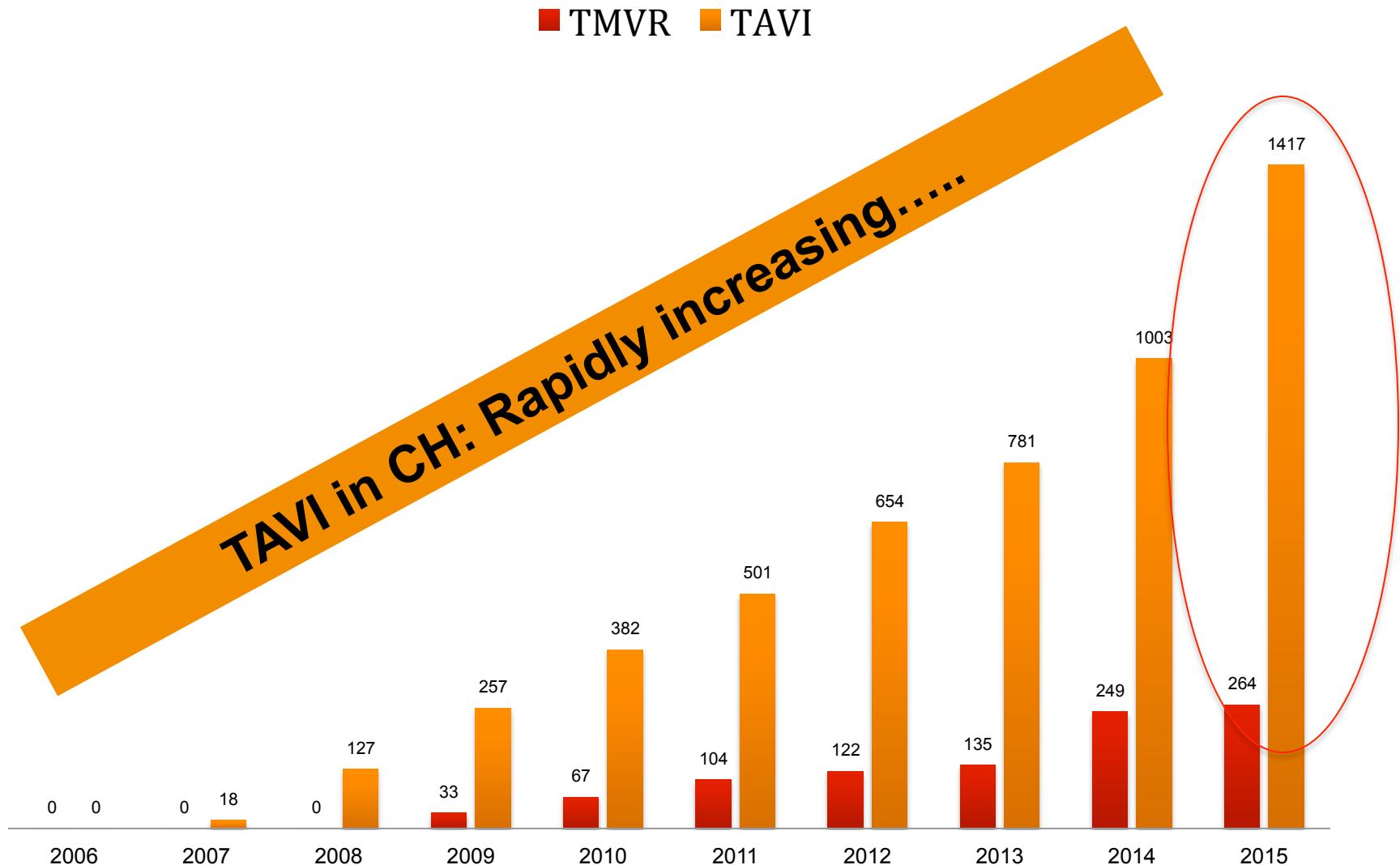
# Percutaneous Coronary Intervention at Centers With and Without On-Site Surgical Backup

## An Updated Meta-Analysis of 23 Studies

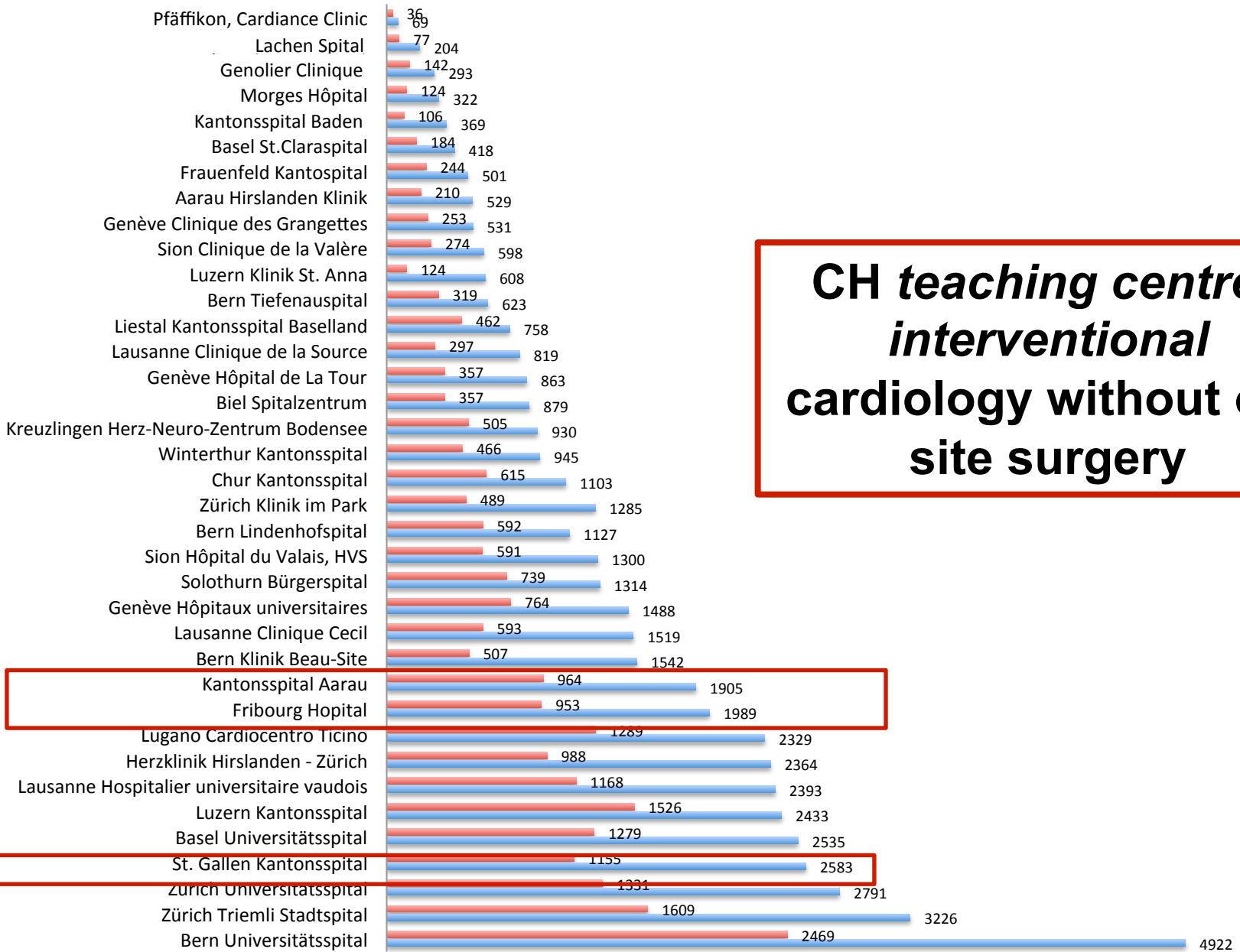
### B Non-Primary PCI



# transcatheter aortic valve implantation (TAVI) and transcatheter mitral valve repair (TMVR) from 2006 to 2015 in Switzerland



# Coronary angiographies (CA) and percutaneous coronary interventions (PCI) in all centres during the year 2015 in Switzerland



**CH teaching centres  
interventional  
cardiology without on-  
site surgery**



# Outcomes of transfemoral transcatheter aortic valve implantation at hospitals with and without on-site cardiac surgery department: insights from the prospective German aortic valve replacement quality assurance registry (AQUA) in 17 919 patients

**Holger Eggebrecht<sup>1\*</sup>, Maike Bestehorn<sup>2</sup>, Michael Haude<sup>3</sup>, Axel Schmermund<sup>1</sup>, Kurt Bestehorn<sup>4</sup>, Thomas Voigtlander<sup>1</sup>, Karl-Heinz Kuck<sup>5</sup>, and Rajendra H. Mehta<sup>6</sup>**

<sup>1</sup>Cardioangiological Center Bethanien (CCB) and AGAPLESION Bethanien Hospital, Frankfurt, Germany; <sup>2</sup>ProMedCon GmbH, Ebenhausen, Germany; <sup>3</sup>Medical Clinic I, Städtische Kliniken Neuss, Lukaskrankenhaus GmbH, Neuss, Germany; <sup>4</sup>Technical University of Dresden, Dresden, Germany; <sup>5</sup>Department of Cardiology, Asklepios Hospital St Georg, Hamburg, Germany; and <sup>6</sup>Duke Clinical Research Institute and Duke University Medical Center, Durham, NC, USA

# Methods

- Unmatched comparison:

	All patients	2013	2014	2013 vs. 2014
CS –	1332	735	597	- 19%
CS +	16587	6885	9702	+ 41%

# Results: Patient characteristics (unmatched)

	CS- (n=1,332)	CS+ (n=16,587)	p-value
Age	82.1±5.8 (55-97)	81.1±6.1 (33-100)	<0.001
Females (%)	722 (54.2%)	9125 (55.0%)	0.568
NYHA ≥ III	1204 (90.4%)	14079 (84.9%)	<0.001
Systolic PA pressure > 55 mmHg	257 (19.3%)	2204 (13.3%)	<0.001
Atrial fibrillation	392 (29.4%)	4925 (29.7%)	0.840
Presence of permanent pacemaker	177 (13.3%)	1868 (11.3%)	0.025
ASA ≥ 3	1242 (93.2%)	15221 (91.8%)	<0.001
Left ventricular ejection fraction ≤ 30%	148 (11.1%)	1687 (10.2%)	0.183
Coronary artery disease	804 (60.4%)	8995 (54.2%)	<0.001
Previous myocardial infarction	183 (13.7%)	2206 (13.3%)	0.650
Previous stroke	342 (25.4%)	466 (28.0%)	0.001
Previous open heart surgery	238 (17.9%)	2893 (17.4%)	0.693
Insulin-dependent diabetes mellitus	178 (13.4%)	2355 (14.2%)	0.400
Peripheral vascular disease	248 (18.6%)	2504 (15.1%)	0.012
COPD with medication	222 (16.7%)	2104 (12.7%)	0.001
Previous neurologic event	141 (10.6%)	191 (11.4%)	0.019
Chronic hemodialysis	36 (2.7%)	515 (3.1%)	0.413
LogEuroSCORE (%)	23.2±15.8 (3.1-88.8)	21.0±15.4 (1.5-98.3)	<0.001
- LogEuroSCORE <10%	213 (16.1%)	3945 (24.1%)	<0.001
- LogEuroSCORE 10-20%	520 (39.2%)	6036 (36.9%)	
- LogEuroSCORE 20-30%	259 (19.5%)	2969 (18.2%)	
- LogEuroSCORE > 30%	333 (25.1%)	3407 (20.8%)	
German Aortic Valve Score 2.0 (%)	6.1±5.5 (0.8-57)	5.5±5.9 (0.6-99.9)	<0.001

**Unmatched: Without on-site cardiac surgery (CS-):**

older, more comorbidities,

at higher predicted risks of death

# Results: In-hospital outcomes (unmatched)

	CS- (n=1,332)	CS+ (n=16,587)	p-value
Elective procedure	1109 (83.3%)	13907 (83.8%)	0.578
Procedure time (minutes)	110.3 ± 48.2	79.3± 44.8	<0.001
Fluoroscopy time (minutes)	18.9 ± 11.7	19.9 ± 33.1	0.273
Intraprocedural complications	112 (8.4%)	1817 (11.0%)	0.004
- Device malpositioning	19 (1.4%)	276 (1.7%)	0.512
- Device embolisation	6 (0.5%)	51 (0.3%)	0.373
- Coronary occlusion	4 (0.3%)	62 (0.4%)	0.671
- Aortic dissection	2 (0.2%)	38 (0.2%)	0.557
- Annular rupture	9 (0.7%)	55 (0.3%)	0.043
- Pericardial tamponade	6 (0.5%)	171 (1.0%)	0.039
- Acute cardiac decompensation	7 (0.5%)	118 (0.7%)	0.433
- Cerebral embolism	2 (0.2%)	30 (0.2%)	0.799
- Aortic regurgitation ≥ 2	28 (2.1%)	171 (1.0%)	<0.001
- Rhythm disturbances	25 (1.9%)	489 (2.9%)	0.024
- Vascular injury	33 (2.5%)	739 (4.5%)	<0.001
Conversion to open heart surgery	4 (0.3%)	115 (0.7%)	0.088

# Results: In-hospital outcomes (unmatched)

	CS- (n=1,332)	CS+ (n=16,587)	p-value
In-hospital death	50 (3.8%)	703 (4.2%)	0.396
In-hospital death for the composite of intraprocedural complications likely to benefit from bail-out surgery	17/46 (37.0%)	220/653 (33.7%)	0.771
Cerebrovascular event	35 (2.6%)	378 (2.3%)	0.452
Delirium requiring treatment	47 (3.5%)	635 (3.8%)	0.582
Myocardial infarction	3 (0.2%)	60 (0.4%)	0.418
Low cardiac output	33 (2.5%)	431 (2.6%)	0.789
Resuscitation	39 (2.9%)	493 (3.0%)	0.927
Vascular complications	134 (10.1%)	1479 (8.9%)	0.161
Need for transient dialysis	15 (1.1%)	373 (2.2%)	0.007
Atrial fibrillation at discharge	315 (23.6%)	3811 (23.0%)	0.700
New pacemaker/ICD implantation	264 (19.8%)	2620 (15.8%)	<0.001
Days in hospital after TF-TAVI	11.0 ± 7.5 (0-93)	10.4 ± 7.5 (0-162)	0.005
Transfer to another hospital	142 (10.7%)	2501 (15.1%)	<0.001
Discharge to rehabilitation unit	186 (14.0%)	3074 (18.5%)	<0.001
Discharge to nursing facility	12 (0.9%)	77(0.5%)	0.029
In-hospital death	50 (3.8%)	703 (4.2%)	0.396



# Methods

- Unmatched comparison:

	All patients	2013	2014	2013 vs. 2014
CS -	1332	735	597	- 19%
CS +	16587	6885	9702	+ 41%

- Matched-pairs analysis:

- matching according to German Aortic Valve Score 2.0

(21 variables: age, female gender, body mass index < 22, BMI > 39, heart failure/NYHA IV, angina at rest/minor exertion, cardiogenic shock < 48 hrs, no pulmonary hypertension, sinus rhythm, ASA class 4, ASA class 5, CAD and left main stenosis, repeat cardiac/aortic surgery, infective endocarditis/septic intervention, diabetes, PVD, renal replacement therapy/crea > 2.3 mg/dl, LVEF < 30%, mechanical circulatory support)

550 pairs with identical GAV score 2.0 in each group (CS-/CS+)

# Matched pairs\*: Outcomes

	CS- (n=555)	CS+ (n=555)	p	OR	95% CI
Intraprocedural complications					
- Device malpositioning	4 (0.7%)	2 (0.4%)	0.413	2.007	0.366-1.004
- Device embolisation	1 (0.2%)	1 (0.2%)	1.00	1.00	0.062-1.6028
- Coronary occlusion	2 (0.4%)	1 (0.2%)	0.498	0.091-2.731	
- Aortic dissection	1 (0.2%)	1 (0.2%)	0.499	0.045-5.520	
- Annular rupture	0 (0%)	0 (0%)	1.00	0.249-4.019	
- Pericardial tamponade	3 (0.6%)	3 (0.6%)	0.568	0.165-1.9525	
- Acute cardiac decompensation	4 (0.7%)	2 (0.4%)	0.413	2.007	0.366-1.004
- Cerebral embolism	1 (0.2%)	1 (0.2%)	1.00	1.00	0.062-1.6028
- Aortic regurgitation ≥ 2	2 (0.4%)	1 (0.2%)	0.542	0.979-6.600	
- Rhythm disturbances	8 (1.4%)	2 (0.4%)	0.367	0.662	0.268-1.632
- Vascular injury	14 (2.5%)	22 (4.0%)	0.175	0.639	0.323-1.262
Conversion to open heart surgery	2 (0.4%)	5 (0.9%)	0.255	0.398	0.077-2.059
In-hospital death	10 (1.8%)	16 (2.9%)	0.234	0.618	0.278-1.374
Cerebrovascular event	18 (3.2%)	18 (3.2%)	1.00	1.00	0.515-1.943
New pacemaker/ICD implantation	114 (20.5%)	105 (18.9%)	0.497	1.108	0.824-1.489
Days in hospital after TF-TAVI	10.4 ± 7.1	9.8 ± 6.4	0.139	0.088	-0.029-0.207



**Matched pairs (CS-) vs. (CS+) no difference:  
Intraprocedural complications**

**In-hospital death**

**New Pacemaker/ICD-Implantation**

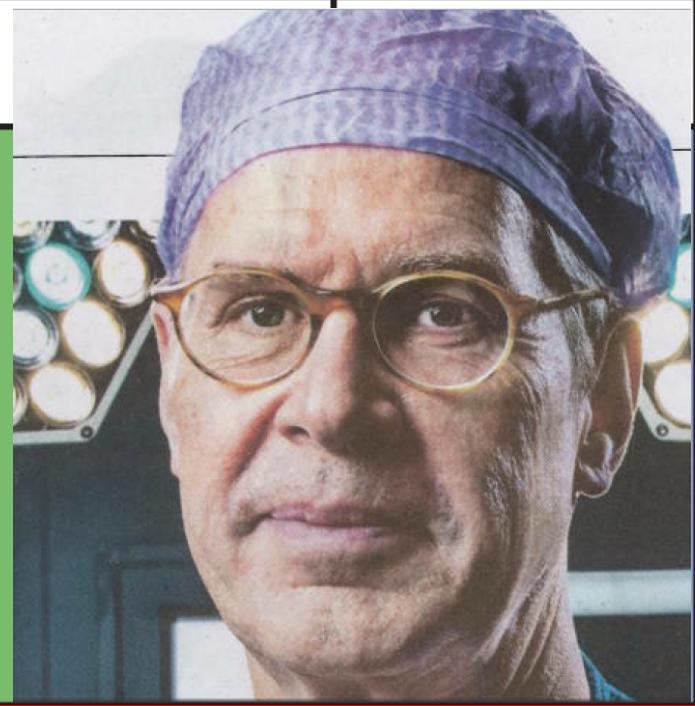
# Management of intraprocedural Complications

	CS- (n=555)	CS+ (n=555)
Intraprocedural complications	51 (9.2%)	57 (10.3%)
- Device malpositioning		Repositioning /Valve in valve
- Device embolisation		Interventional /Case by case
- Coronary occlusion		Interventional /Case by case
- Aortic dissection	1/500 pts? Why not Cardiac surgery for other Aortic dissection???	
- Annular Rupture During Transcatheter Aortic Valve Replacement	4 (0.7%)	2 (0.4%)
Classification, Pathophysiology, Diagnostics, Treatment Approaches, and Prevention J Am Coll Cardiol Intv 2015;8:1–9	1 (0.2%)	1 (0.2%)
	15 (2.7%)	3 (0.1%)
	8 (1.4%)	12 (2.2%)
	14 (2.5%)	22 (4.0%)
		- Vascular surgeon...

# Guidelines on the management of valvular heart disease (2016)

## Recommendations

TAVI should only be undertaken with a multidisciplinary 'heart team' including cardiologists and cardiac surgeons and other specialists if necessary.



- Close cooperation in the Heart Team is key
- Lack of a CS department on-site should not be regarded as contraindication for TAVI

# TAVI without STANDBY?



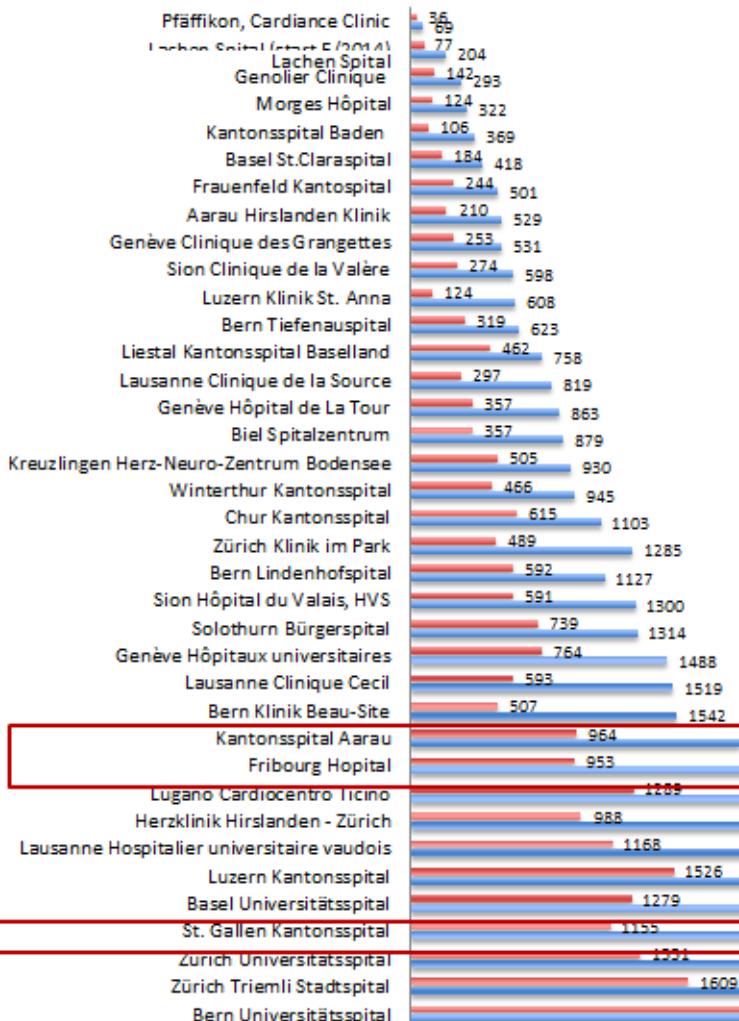
Elf von zehn  
Frauen haben  
immer recht.





# TAVI without on-site surgery? Yes, but.....

Coronary angiographies (CA) and percutaneous coronary interventions (PCI) in all centres during the year 2015 in Switzerland



Definition of the on-site conditions for TAVI:

- Heart Team on site
- Restriction to teaching centers?
- How to solve pre-defined complications

Thank you!  
[hans.rickli@kssg.ch](mailto:hans.rickli@kssg.ch)