

# Advancing nursing in patients with percutaneous aortic valve implantation

## Experience in Bern



**10. Spring Meeting on Cardiovascular Nursing  
12-13 March 2010 Geneva**

## University Clinic of Cardiology, Swiss Cardiovascular Center, Bern

- 4'798 coronary angiographies with 2'330 percutaneous coronary interventions
- 75 retrograde implantations of aortic valve by the femoral artery
- 20 transapical aortic valve implantations
- 48 beds, 5'763 hospitalised patients
- Average length of stay: 2.9 days

# Transcatheter Aortic Valve Implantation (TAVI)

## Target Population:

- Very elderly patients (> 80 years)
- Increased risk of conventional surgery

## History:

- 2004: first Transcatheter Aortic Valve Implantation (TAVI)
- 2007 (August) in Bern: first percutaneous aortic valve implantation in Switzerland
- Technique in Bern: retrograde transfemoral, transapical and transsubclavian implantation

## Examinations prior to intervention

### 1st Hospitalisation for 2 Days:

- Exams: coronary angiography, transoesophageal echography, angio-CT
- Euroscore ( $> 6$  = exclusion criteria)
- Anamnesis: future perspective, meaning of life
- Multidimensional geriatric assessment: questions of mobility, diet, activities of daily living including mini mental status
- Patient-information (with their family):
  - choice between these different possibilities: transfemoral, transapical, conventional surgery

## Multidimensional Geriatric Assessment Results

- 20 patients with TAVI, 84.2 years old
- 70% of patients with malnutrition
- 25% symptoms of depression
- 50% probable cognitive limitation (20% with a high probability)
- 41% restriction in mobility
- 12% very strong restrictions in mobility

No 6 month follow-up results available

## Second Hospitalisation for the Intervention

- Only 2 or 3 weeks after the previous examinations
- Patients need reflexion time and very often also discussions with their family doctor
- Important for patients to cope with the process of their illness and for their decision making

## Activities before Intervention I

- **Day of admission**: status, examinations, venous catheter
- Information about the intervention by the interdisciplinary team
- Nurse-support (physically and psychologically)
- **Day of intervention**: artery blood pressure, pulmonal vein, external pacemaker, urinary catheter, sedation
- Preparation of 3 sterile tables in the cathlab like in the operating room

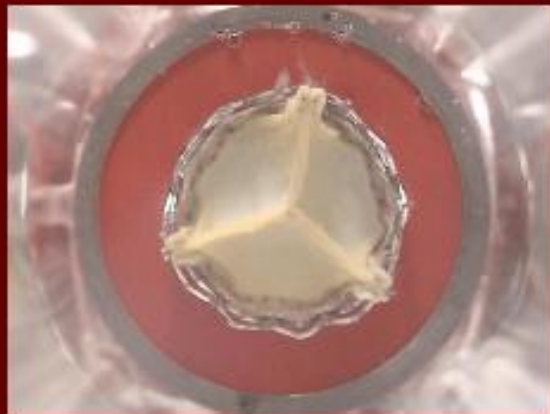
# Aortic Valve Implantation

## Cathlab:

- Transfemoral approach
- Balloon catheter presses the calcified valve against the wall
- Introduction system is loaded with the new valve, after a bath in ice water
- Implantation of the new valve

# Transcatheter Aortic Valve Prostheses

**Edwards SAPIEN Valve**



**Medtronic CoreValve  
Revalving System**



# Pleatet Edwards Sapien Valve before Implantation



## Intermediate Care after intervention

- 48 hours of monitoring (arrhythmias, haemodynamic, neurology, blood flow of the extremities)
- Pulmonary introduction catheter and external pacemaker needs monitoring
- 30 % have an AV-bloc III in the first time,
- 15-20% need a definitive pacemaker after 48 hours
- Inguinal puncture site: elderly patients have a calcified, fragile femoral artery!

## Intermediate Care after intervention

- Arterial blood pressure: during the first hours patients are haemodynamically instable
- Catecholamines during the first 6 hours
- Central-venous catheter for 48 hours
- 3 doses of antibiotics
- First mobilisation after 24 hours
- Physiotherapy
- Controls: laboratory-controls, ECG, echocardiography

## Stay in the ward: 4-7 days

- Rhythmology monitoring (telemetry)
- Mobilisation
- Daily weight
- Preparation of discharge:
  - Homecare needed?
  - Rehabilitation? (outpatient / hospital)
  - Medication by patient or health care professionals?
  - Endocarditis prophylaxis
  - Next appointment at the family doctor

## Nurse Competences needed

- **Cathlab:**

- Experience in the Cathlab
- Experience in emergency care
- Good knowledge with special materials
- Dexterity in preparation of the valve for the introduction system

## Nurse Competences needed

- **Intermediate Care:**

- Experience in intensive and emergency care
- Knowledge in arrhythmias and external Pacemaker
- > 2 years experience in cardiology
- Experience with geriatric patients and cognitive limitations
- Experience with patients in transitory psychotic syndrome

## Experiences August 2007 – October 2009

**Referral for evaluation of TAVI**  
**Symptomatic, severe aortic stenosis**  
**(N = 270)**

**Medical  
Treatment**  
**(N = 63)**

**Surgical  
AVR**  
**(N = 60)**

**Transcatheter  
AVI**  
**(N= 147)**

# Transcatheter Aortic Valve Implantation (N=147)

**Transapical Edwards N=29**

**Jan 2008**

**October 2009**

**Transfemoral Edwards N=22**

**Dec 2007**

**October 2009**

**CoreValve N=96**

**Aug 2007**

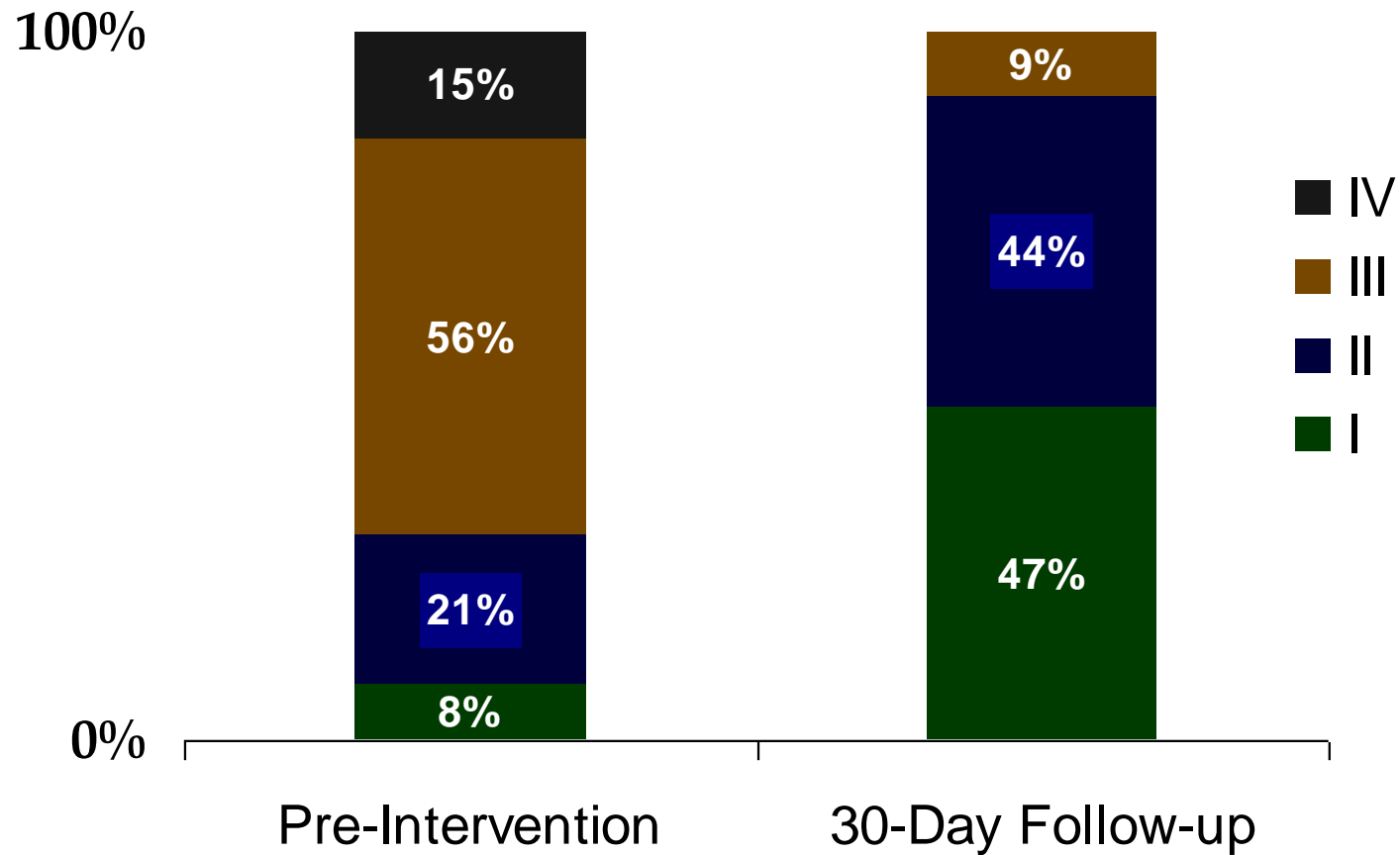
**October 2009**

# Transcatheter Aortic Valve Implantation

## Periprocedural complications (%)

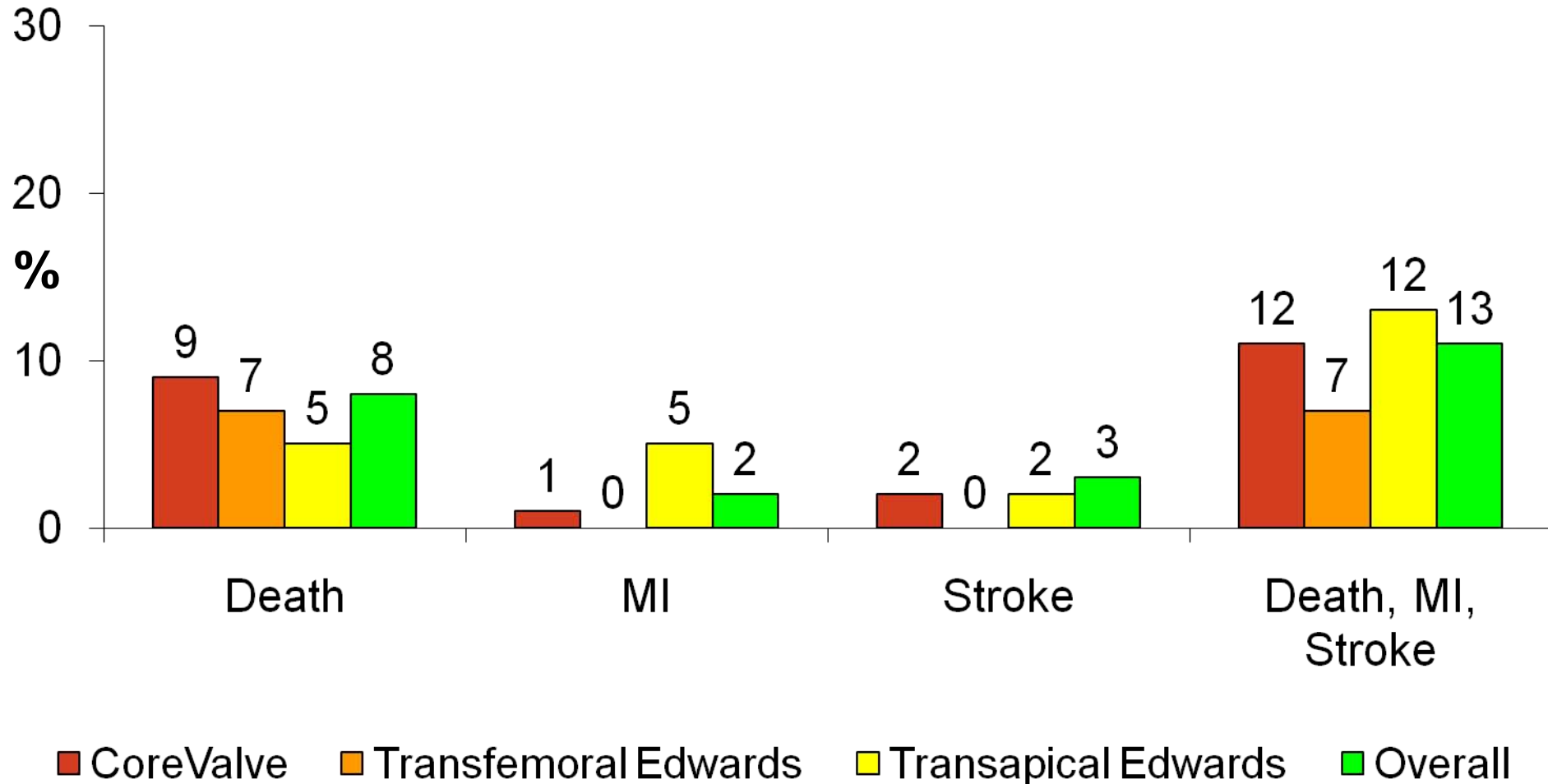
	<b>Overall</b>	<b>CoreValve</b>	<b>Edwards Transfemoral</b>	<b>Edwards Transapical</b>
patients	N=147	N=96	N=22	N=29
death	1	2	0	0
major stroke	2	2	0	3
myocardial infarction	2	1	0	5
complete AV-bloc	16	17	0	13
cardiac tamponade	1	1	0	0
major vascular complications	3	3	5	-

# NYHA class before and 30 days after TAVI

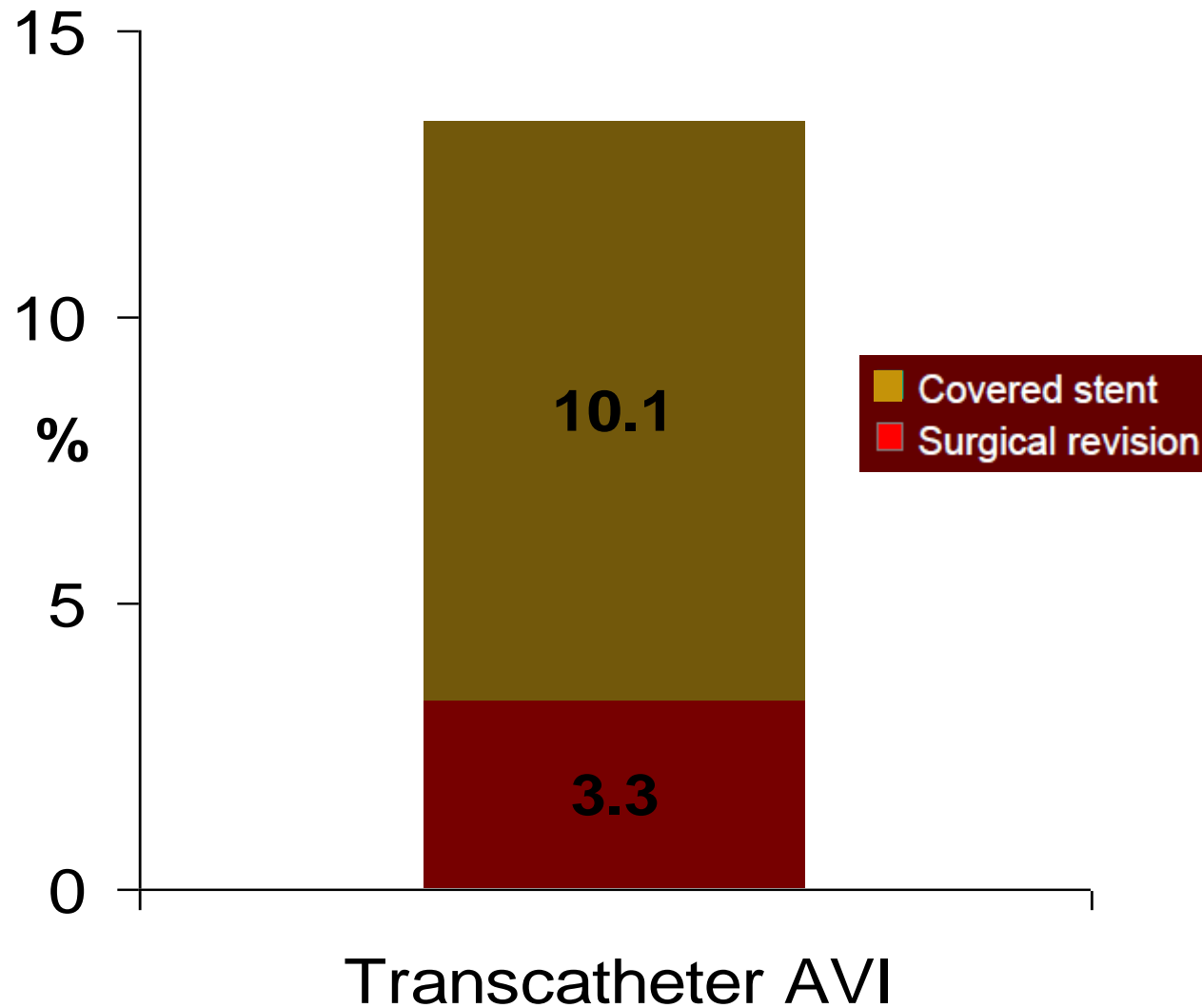


# Transcatheter Aortic Valve Implantation

## 30 day clinical outcome



## Vascular access-site complications



## TAVI Conclusions

- Transcatheter AVI is feasible
  - Excellent short-term hemodynamic clinical results
  - Encouraging mid-term clinical outcome
  - Improved results with increasing experience
- Areas of uncertainty
  - Long-term clinical follow-up
  - Late valve function (durability)
  - Vascular access and device positioning is challenging
- TAVI fulfils an unmet need in a large proportion of very elderly patients at increased risk of surgical AVR

## Take Home Messages

- Patients with TAVI need support in the processing of the treatment
- Most important for this elderly patients: they need information and a team approach
- A clinical pathway is necessary to control the process
- Nurses need new knowledge and new competences also in the Cathlab as in the Care-Team (IMC / Ward)
- **Careful patient selection and a team approach are the key factors for a successful TAVI procedure**



**Thank you !  
Do you have any  
questions ?**

