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Why same-day discharge after PCI should be the norm
10 years Experience of a Public Hospital

Pr Emmanuel TEIGER

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DÉCLARATION DE LIENS D'INTÉRÊT AVEC LA PRÉSENTATION

Intervenant : Emmanuel Teiger, Créteil

☑ Je n'ai pas de lien d'intérêt à déclarer

Why same-day discharge after PCI should be the norm

1) Clinical equivalence
2) Economic benefit
3) Patient preference

A pilot study of coronary angioplasty in outpatients

Gerrit J Laarman, Ferdinand Kiemeneij, L Ron van der Wieken, Jan G P Tijssen, Jo S M Suwarganda, Ton Slagboom

***Conclusions*—Coronary angioplasty with miniature equipment passed through the brachial artery was a safe procedure with a high initial success rate. The results of this pilot trial suggest that with careful selection of patients before and after angioplasty PTCA can be performed safely in outpatients.**

(*Br Heart J* 1994;72:12–15)

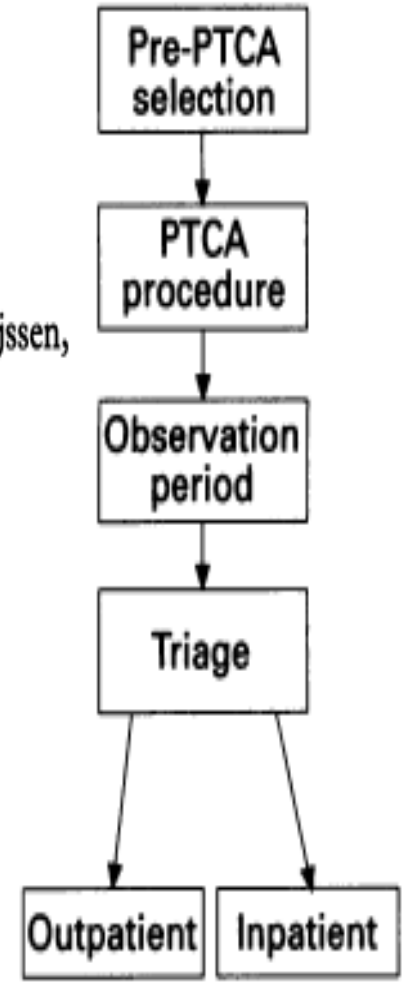

Figure Study protocol.

Same-day discharge after PCI

Catheterization and Cardiovascular Interventions 79:583–587 (2012

A Single Center Experience With Same-Day Transradial-PCI Patients: A Contrast With Published Guidelines

Ian C. Gilchrist,* MD, FACC, Denise A. Rhodes, RN, CRNP, and Hele

Catheterization and Cardiovascular Interventions 81:15–23 (2013)

Ambulatory Transradial Percutaneous Coronary Intervention: A Safe, Effective, and Cost-Saving Strategy

Philippe Le Corvoisier,[1,2,3*] MD, PhD, Barnabas Gellen,[4] MD, PhD, Pierre-François Lesault,[4] MD, Remy Cohen,[5] MD, Stéphane Champagne,[4] MD, Anne-Marie Duval,[6] MD, Gilles Montalescot,[7] MD, PhD, Simon Elhadad,[5] MD,

Catheterization and Cardiovascular Interventions 64:421–427 (2005)

Isabelle Durand-Zaleski,[8] MD, PhD, ID, PhD, and Emmanuel Teiger,[2,4] MD, PhD

CORONARY ARTERY

Outpatient Coronary Angioplasty: Feasible and Safe

An Audit of Outcomes

Coronary Syndrome ar

Ton Slagboom,* MD, Ferdinand Kiemeneij, MD, PhD, Gert Jan Laarman, MD, PhD, and Ron van der Wieken, MD

nal Article

Reported Outcomes and Preferences for Same-Day Discharge After Percutaneous Coronary Intervention

ed Trial

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el E. Farkouh, MD, MSc

CLINICAL RESEARCH — Interventional Cardiology

Same-Day Discharge After Percutaneous Coronary Intervention

A Meta-Analysis

Kimberly M. Brayton, MD, JD,* Vishal G. Patel, MD,† Christopher Stave, MLS,* James A. de Lemos, MD,† Dharam J. Kumbhani, MD, SM†

Stanford, California; and Dallas, Texas

Interven

A Randomized Study Discharge and Abcixi Hospitalization and Abc Transradial Cor

Olivier F. Bertrand, MD, PhD; Robert De Larochellière, MD; Josep Rodés-Cabau, MD; Guy Proulx, MD; Onil Gleeton, MD; Can Manh Nguyen, MD; Jean-Pierre Déry, MD, MSc; Gérald Barbeau, MD; Bernard Noël, MD; Éric Larose, DVM, MD; Paul Poirier, MD, PhD; Louis Roy, MD; for the Early Discharge After Transradial Stenting of Coronary Arteries (EASY) Study Investigators

American Heart Association.

ght Hospital Stay After I in Outpatient Study

(EPOS)

Gerlind S. Heyde, Karel T. Koch, Robbert J. de Winter, Marcel G.W. Dijkgraaf, Margriet I. Klees, Lea M. Dijksman, Jan J. Piek and Jan G.P. Tijssen

Recommandations américaines 2009 actualisées en avril 2018.

Catheterization and Cardiovascular Interventions 73:847–858 (2009)

CORONARY ARTERY DISEASE

Clinical Decision Making

Defining the Length of Stay Following Percutaneous Coronary Intervention: An Expert Consensus Document From the Society for Cardiovascular Angiography and Interventions

Endorsed by the American College of Cardiology Foundation

Charles E. Chambers,[1] MD, Gregory J. Dehmer,[2] MD, David A. Cox,[3] MD, Robert A. Harrington,[4] MD, Joseph D. Babb,[5] MD, Jeffrey J. Popma,[6] MD, Mark A. Turco,[7] MD, Bonnie H. Weiner,[8] MD, and Carl L. Tommaso,[9*] MD

Percutaneous coronary intervention (PCI) is the most common method of coronary revascularization. Over time, as operator skills and technical advances have improved procedural outcomes, the length of stay (LOS) has decreased. However, standardization in the definition of LOS following PCI has been challenging due to significant physician, procedural, and patient variables. Given the increased focus on both patient safety as well as the cost of medical care, system process issues are a concern and provide a driving force for standardization while simultaneously maintaining the quality of patient care. This document: (1) provides a summary of the existing published data on same-day patient discharge following PCI, (2) reviews studies that developed methods to predict risk following PCI, and (3) provides clarification of the terms used to define care settings following PCI. In addition, a decision matrix is proposed for the care of patients following PCI. It is intended to provide both the interventional cardiologist as well as the facilities, in which they are associated, a guide to allow for the appropriate LOS for the appropriate patient who could be considered for early discharge or outpatient intervention. © 2009 Wiley-Liss, Inc.

Key words: percutaneous coronary angioplasty; outpatient; cost containment; quality improvement

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Conflict of interest: Nothing to report.

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CLINICAL DECISION MAKING

WILEY

Length of stay following percutaneous coronary intervention: An expert consensus document update from the society for cardiovascular angiography and interventions

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Abstract

Since the publication of the 2009 SCAI Expert Consensus Document on Length of Stay Following percutaneous coronary intervention (PCI), advances in vascular access techniques, stent technology, and antiplatelet pharmacology have facilitated changes in discharge patterns following PCI. Additional clinical studies have demonstrated the safety of early and same day discharge in selected patients with uncomplicated PCI, while reimbursement policies have discouraged unnecessary hospitalization. This consensus update: (1) clarifies clinical and reimbursement definitions of discharge strategies, (2) reviews the technological advances and literature supporting reduced hospitalization duration and risk assessment, and (3) describes changes to the consensus recommendations on length of stay following PCI (Supporting Information Table S1). These recommendations are intended to support reasonable clinical decision making regarding postprocedure length of stay for a broad spectrum of patients undergoing PCI, rather than prescribing a specific period of observation for individual patients.

KEYWORDS
outpatient, percutaneous coronary intervention, quality improvement, same-day discharge

Ambulatory Transradial Percutaneous Coronary Intervention: A Safe, Effective, and Cost-Saving Strategy

Philippe Le Corvoisier,[1,2,3*] MD, PhD, Barnabas Gellen,[4] MD, PhD, Pierre-François Lesault,[4] MD, Remy Cohen,[5] MD, Stéphane Champagne,[4] MD, Anne-Marie Duval,[6] MD, Gilles Montalescot,[7] MD, PhD, Simon Elhadad,[5] MD, Olivier Montagne,[1,2,3] MD, Isabelle Durand-Zaleski,[8] MD, PhD, Jean-Luc Dubois-Randé,[2,6] MD, PhD, and Emmanuel Teiger,[2,4] MD, PhD

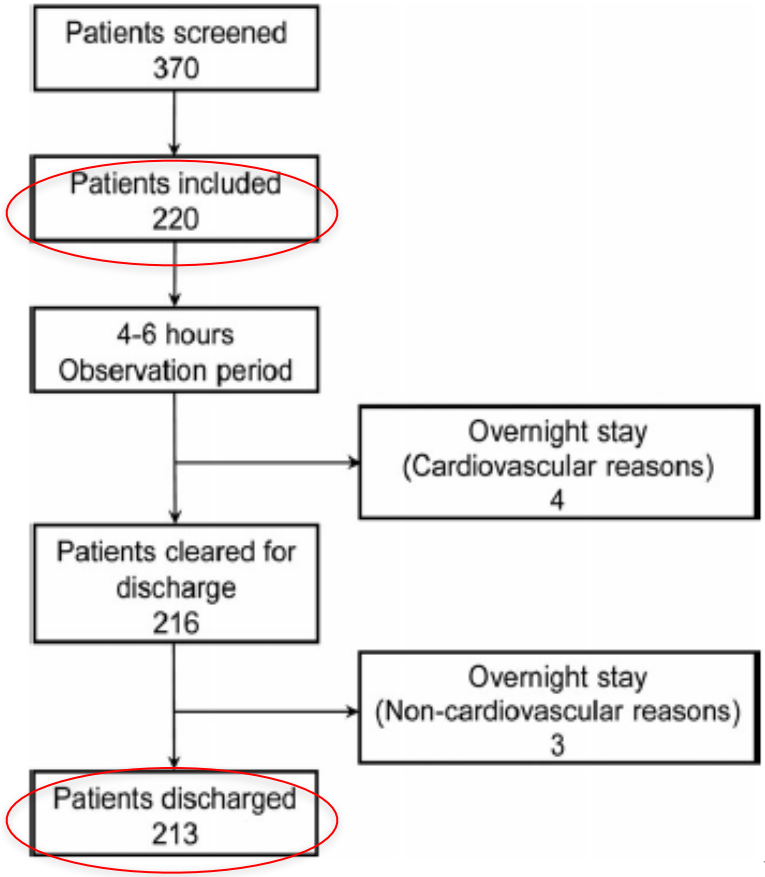
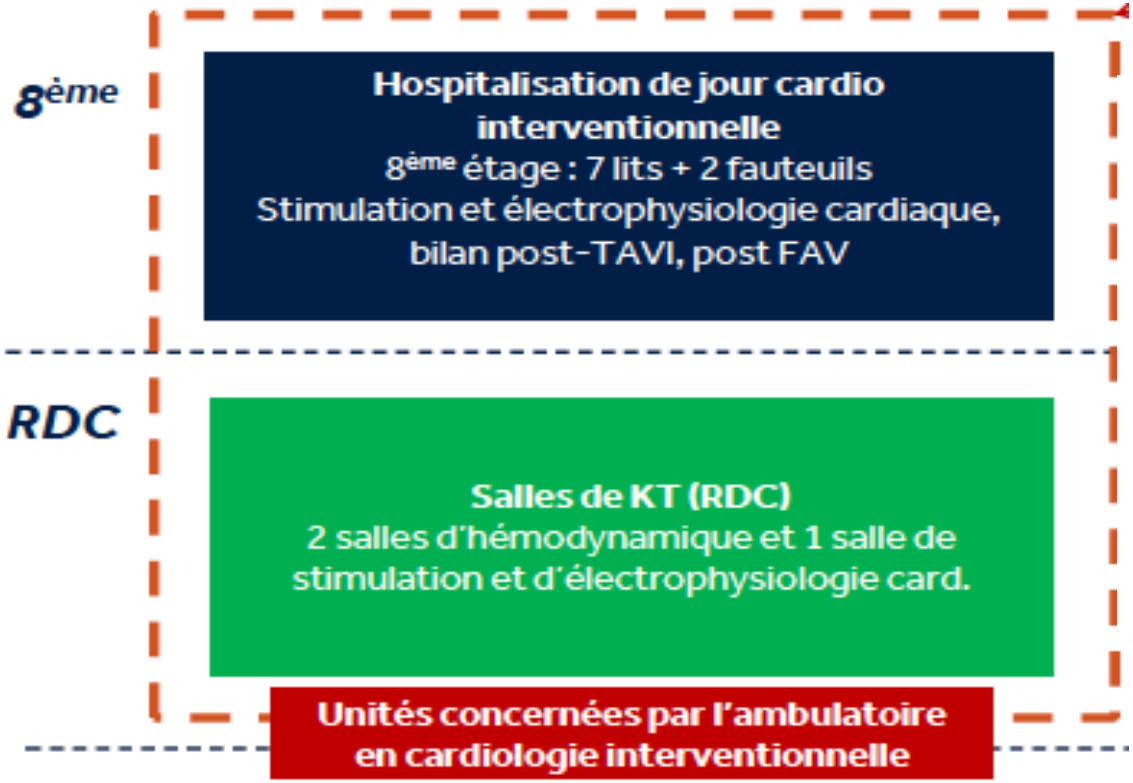


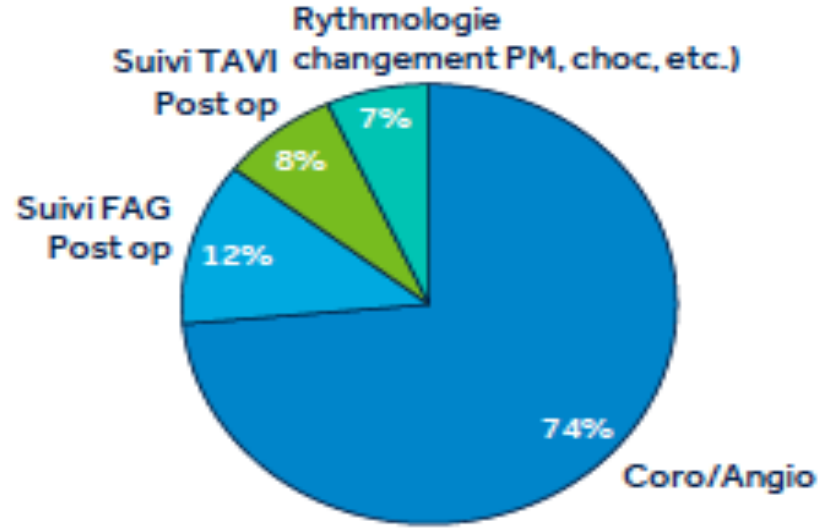
TABLE IV. Follow Up Data 24 hr and 1 Month After Ambulatory Percutaneous Coronary Intervention

	24 hr ($n = 213$)	1 month ($n = 213$)
Any MACCE	0 (0)	1 (0.5)
Death, *n* (%)	0 (0)	0 (0)
Myocardial infarction, *n* (%)	0 (0)	1 (0.5)
Cardiac surgery, *n* (%)	0 (0)	0 (0)
Repeat PCI, *n* (%)	0 (0)	0 (0)
Stroke, *n* (%)	0 (0)	0 (0)
Readmission, *n* (%)	0 (0)	4 (1.9)
Seek medical care without readmission, *n* (%)	0 (0)	7 (3.3)
Markers of myocardial injury		
CPK > 2 times the upper limit, *n* (%)	1 (0.5)	na
Troponin I > upper limit, *n* (%)	69 (33.5)	na
Troponin I > 3 times the upper limit, *n* (%)	43 (20.9)	na
Troponin I >1 μg/L, *n* (%)	11 (5.3)	na

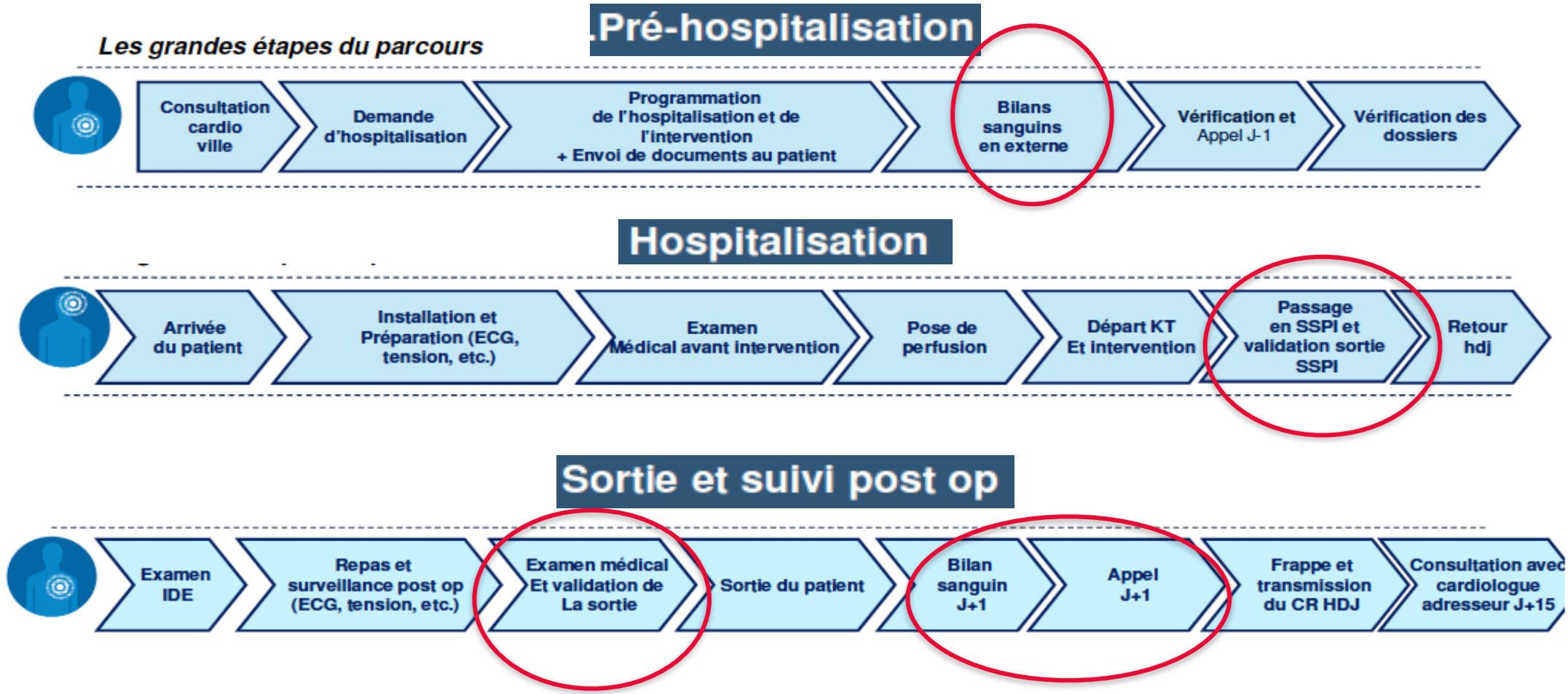
Catheterization and Cardiovascular Interventions 2013

Organization of the ambulatory angiography and PCI





Organization of the ambulatory angiography and PCI



Purpose of the study and methods

Evaluate the early outcome (24h) of the SDD patients with SIHD (all-comer population) in 10 years of activity in our Ambulatory Cardiac Care Unit

1635 patients undergone a PCI (1/4/2007 -> 31/4/2017)

- 60 patients (3,7%) with adverse events during PCI
- 52 patients (3,2%) with adverse events 4-6h after PCI
- 450 patients (27,5%) for monitoring (without adverse events)
  - Physician preference: long PCI procedures, renal function monitoring / end of PCI after 3pm…
  - Social reasons: leaving >1h from the hospital / alone at home / doubts on compliance…)

1073 patients (65,6%) – SDD patients

Results – Baseline and PCI characteristics *(1035 SDD patients)*

Age (mean ± SD)	62 ± 40
Sex M (%)	88
BMI	27,2 ± 4,4
Hypertension (%)	56
Diabetes (%)	30
Tobacco use (%)	50
PCI for SIHD/ACS (%)	96,3/ 3,7

Ad-hoc PCI (%)	91
Radial artery use (%)	97
2-vessel / 3-vessel disease (%)	36 / 15
LAD PCI (%)	44
LCx PCI (%)	31
Stents / patient *(mean ± SD)*	1,5±0,8
DES (%)	83,5

Primary outcome, MACCE (n)	**0**
Death	0
Myocardial infarction	0
Stroke	0
Repeat PCI	0
Urgent cardiac surgery	0
Major vascular complications	0

Secondary outcome, n (%)	**2 (0,19)**
Readmission n (%)	2 (0,19)

Why same-day discharge after PCI should be the norm

1) Clinical equivalence ✔

2) Economic benefit 

3) Patient preference 

Economic Impact of Same-Day Home Discharge After Uncomplicated Transradial Percutaneous Coronary Intervention and Bolus-Only Abciximab Regimen

Stéphane Rinfret, MD, SM,* Wendy Ann Kennedy, PHD,† Jean Lachaine, PHD,‡ Anne Lemay, PHD,§ Josep Rodés-Cabau, MD,* David J. Cohen, MD, MSC,‖ Olivier Costerousse, PHD,* Olivier F. Bertrand, MD, PHD*

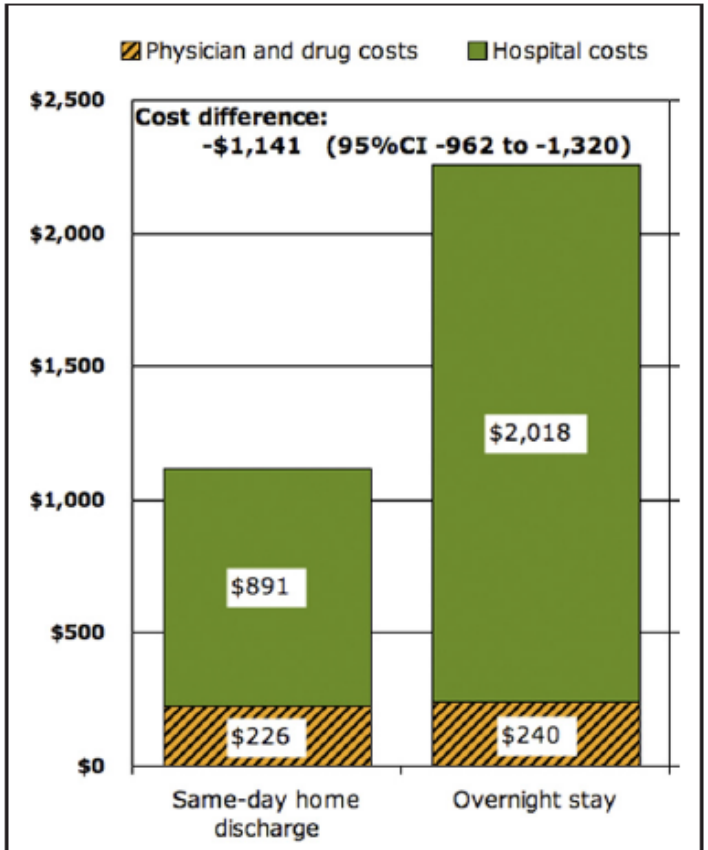


Figure 2. Cumulative Health Care Costs Within 30 Days Post-Percutaneous Coronary Intervention

CI = confidence interval.

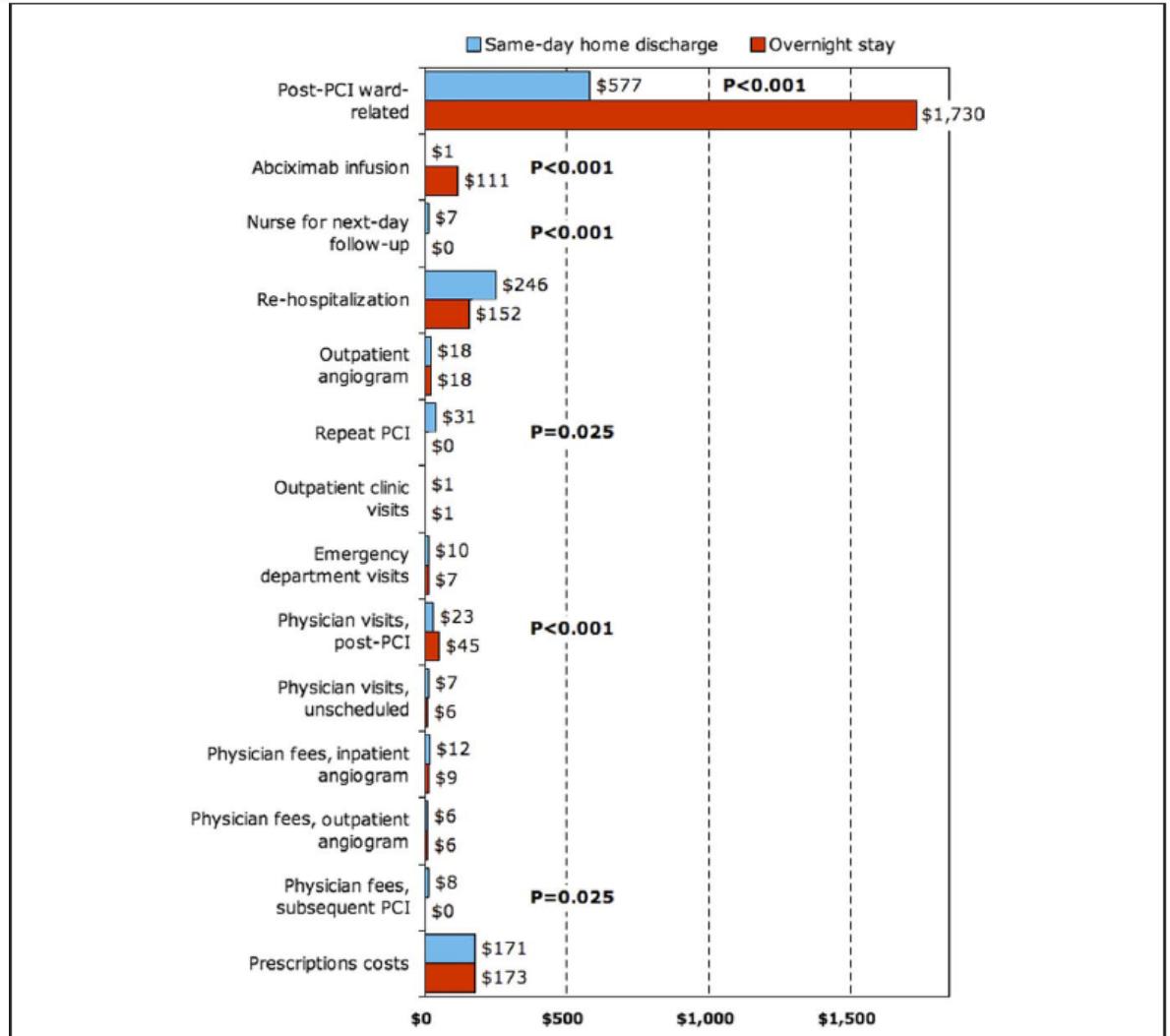


Figure 1. Average Per-Patient Cost Components of Health Services Use Within 30 Days Post-PCI

When no p value is indicated, p > 0.05. PCI = percutaneous coronary intervention.

Bertrand et al. Circulation 2006;114:2636-2643

Costs Associated With Access Site and Same-Day Discharge Among Medicare Beneficiaries Undergoing Percutaneous Coronary Intervention

An Evaluation of the Current Percutaneous Coronary Intervention Care Pathways in the United States

Amit P. Amin, MD, MSc,[a] Mark Patterson, PhD,[b] John A. House, MS,[c] Helmut Giersiefen, PhD,[d] John A. Spertus, MD, MPH,[c] Dmitri V. Baklanov, MD,[c] Adnan K. Chhatriwalla, MD,[c] David M. Safley, MD,[c] David J. Cohen, MD, MSc,[c] Sunil V. Rao, MD,[e] Steven P. Marso, MD[f]

TABLE 2 Adjusted Cos
by Care Pathway Grou

Care Pathway Gr
SDD
NSDD
TRI
TFI
TRI SDD
TRI NSDD
TFI SDD
TFI NSDD

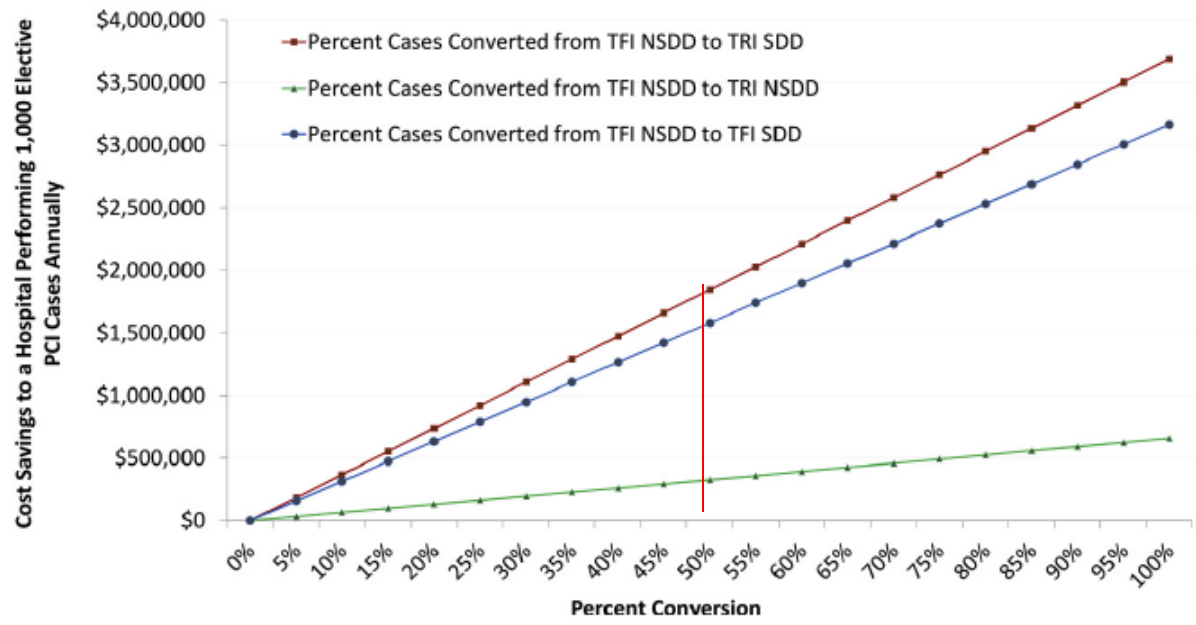
CI = confidence i

TABL

Ca
TRI vs.
SDD vs
TRI SD
TRI SD
TRI SD
TRI NS
TRI NS
TFI SD

Abbrevi

FIGURE 4 Cost Savings to a Hospital Performing 1,000 Elective PCIs Annually When Converting From TFI NSDD to Either TRI SDD, TFI SDD, or TRI NSDD



NSDD = non-same-day discharge; PCI = percutaneous coronary intervention; SDD = same-day discharge; TFI = transfemoral intervention; TRI = transradial intervention.

Amit et al. JACC cardiovascular interventions 2017 : vol. 10, no. 4

Ambulatory Transradial Percutaneous Coronary Intervention: A Safe, Effective, and Cost-Saving Strategy

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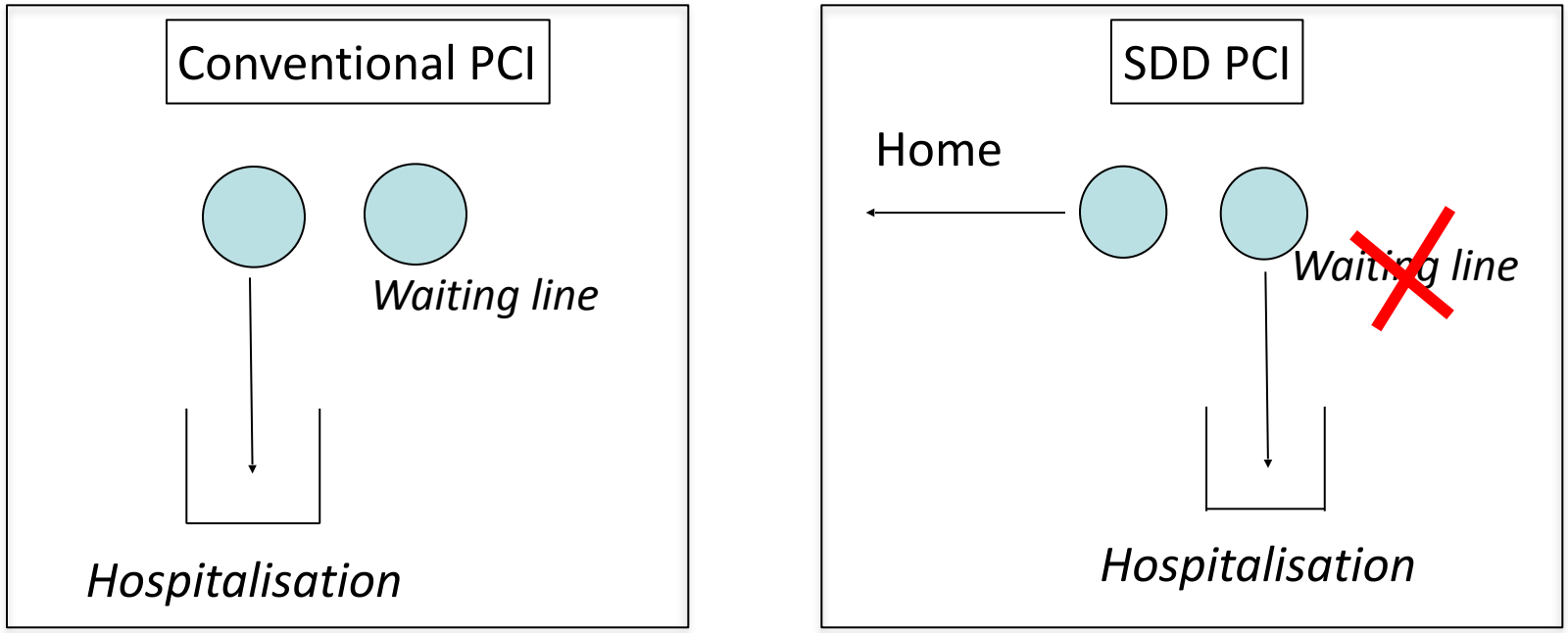
TABLE I. Unit Costs of Hospital Resources

Item	Cost/unit
Bare metal stent[17]	€390
Drug eluting stent[17]	€1,483
Procedural cost (excluding stents)[16]	€518
Personnel cost (day shift)[16]	€270
Overheads and bed charges per day[16]	€281

Ambulatory PCI ($N = 220$)	€	P value*
Patients with same-day home discharge ($N = 213$)	**€1,214 ± 96**	
Personnel (medical and nursing)	€270	
Tests, drugs, supplies, imaging, transport	€663	
Overheads & bed charges	€281	
Patients with overnight or prolonged stay ($N = 7$)	**€1,634 ± 85**	
Personnel (medical and nursing)	€285	
Tests, drugs, supplies, imaging, transport	€918	
Overheads & bed charges	€431	
All patients ($N = 220$)	**€1,230 ± 98**	$<10^{-6}$
Conventional PCI ($N = 1,820$)		
All patients ($N = 1,820$)	**€2,304 ± 1,814**	
Personnel (medical and nursing)	€855	
Tests, drugs, supplies, imaging, transport	€918	
Overheads & bed charges	€531	

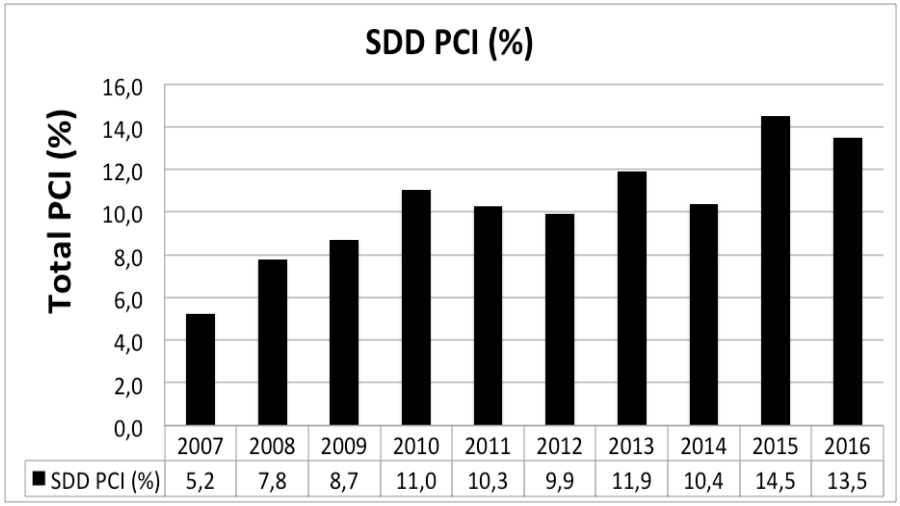
Le Corvoisier et al. Catheterization and Cardiovascular Interventions 2013

«Opportunity bed » concept

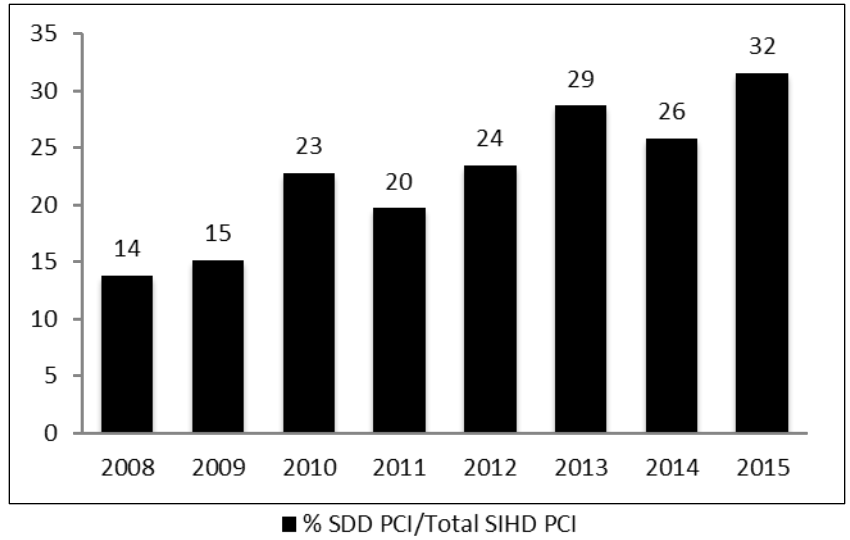


The differences in savings depends on the standard of care used (transradial vs transfemoral approach), healthcare prices (public/private/mixed) and type of reimbursement.

Impact of SDD PCI on total number of PCI performed in our hospital



Total PCI



PCI for stable angina

13,5% x 1200 PCI procedures (2016):
162 hospitalizations saved

Same-day discharge: 1523 €
Conventional PCI (2 nights): 2518 €

995 € saving/patient (995x 162= 161190 €)
+
2 bed-nights free/patient for hospitalization (2x162= 324 night-beds/year

Why same-day discharge after PCI should be the norm

1) Clinical equivalence ✔

2) Economic benefit ✔

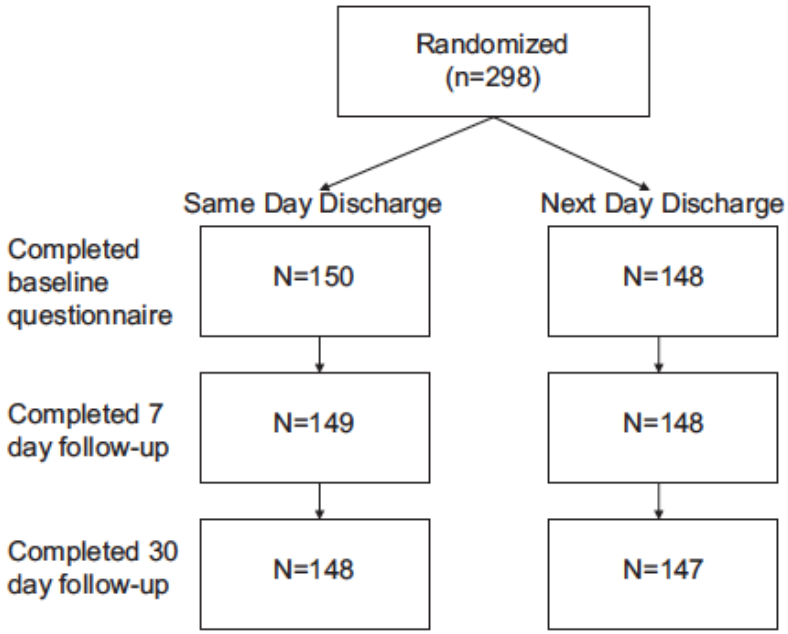
3) Patient preference 

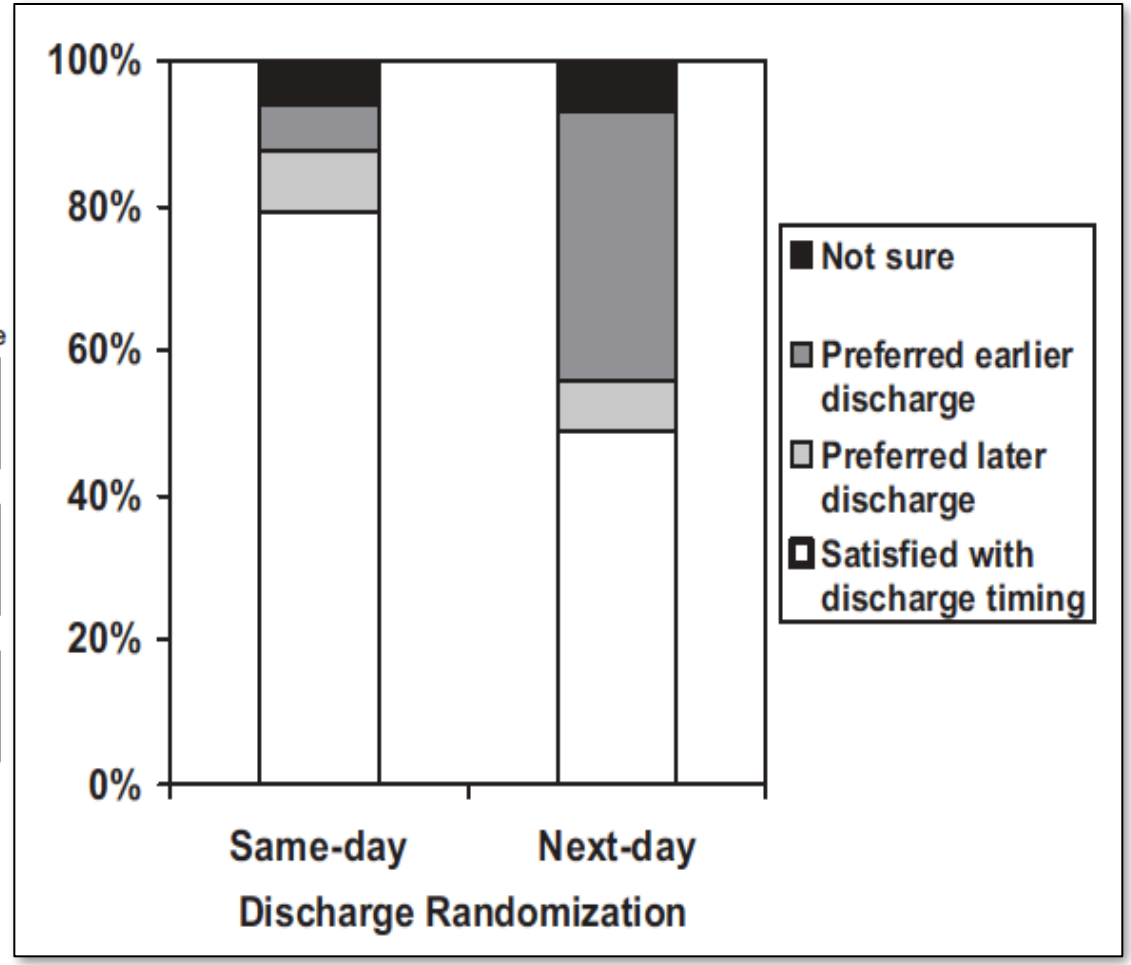
Original Article

Assessing Patient-Reported Outcomes and Preferences for Same-Day Discharge After Percutaneous Coronary Intervention

Results From a Pilot Randomized, Controlled Trial

Michael Kim, MD; Paul Muntner, PhD; Samin Sharma, MD; James W. Choi, MD; Robert C. Stoler MD; Mark Woodward, PhD; Devin M. Mann, MD; Michael E. Farkouh, MD, MSc





Kim et al. Circ Cardiovasc outcomes 2013

Randomized Trial Comparing Same-Day Discharge With Overnight Hospital Stay After Percutaneous Coronary Intervention

Results of the Elective PCI in Outpatient Study (EPOS)

Gerlind S. Heyde, MD; Karel T. Koch, MD, PhD; Robbert J. de Winter, MD, PhD; Marcel G.W. Dijkgraaf, PhD; Margriet I. Klees, RN; Lea M. Dijksman, MSc; Jan J. Piek, MD, PhD; Jan G.P. Tijssen, PhD

- 88% of the patients completed the patients satisfaction questionnaires: on a scale of 0 to 100, same-day discharge patients gave a 5.0 higher mean score for the discharge procedure (78.6) compared with overnight-stay patients (73.6; p=0.001)

- In case of repeat PCI, patients randomized to SDD would prefer SDD in 73% of the cases versus 27% of overnight-stay

Heyde et al. Circulation 2007;115:2299-2306

- In our study, 96% of the patients were willing to accept ambulatory PCI should they require another PCI procedure.

Le Corvoisier et al. Catheterization and Cardiovascular Interventions 2013

Take home messages 1

- Same-day discharge (SDD) after a successful PCI in SIHD, is actually a safe procedure thanks to better performing materials, systematic stenting and safer antithrombotic therapy.

- Several RCT and observational studies confirmed the safety of the SDD-PCI strategy in stable ischemic heart disease.

Take home messages 2

- SDD is associated with lower costs to the healthcare system. The impact of ambulatory PCI on hospital resource management depends on the characteristics of the cardiology intervention center:
  - In high-volume centers, the shorter hospital stay increases patient turn-over and the number of procedures.
  - In other centers, the increase in hospital bed availability might allow the development of other interventional cardiology activities.

- The development of ambulatory PCI in daily practice will depend on the level of hospital reimbursement assigned by national health authorities or private insurers and the incentives thus generated.

There is No Place Like Home After Successful Percutaneous Coronary Intervention

Ian C. Gilchrist,* MD, FSCAI

Conclusion

SDD strategy after a successful PCI offers

Safety, Savings, Satisfaction

and should be implemented more widely

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