











# Journey of an Interventional Cardiology

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Associate Professor of Medicine  
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Clinical Associate Professor of Medicine  
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# Personal Journey of an Interventional Cardiologist

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# Timeline



“Grandma were you around when the dinosaurs died?”

Mevsim Denktas Age 4, 2006

“Ali, would you be able to present the journey of interventional cardiology?”

Ahmed Magdi, 2018



## Outline

- Historical perspective of the field
- What happened in my lifetime
- How does the future look?



## Once Upon a Time

- 3000 BC Egyptians performed bladder catheterization using metal tubes.
- 1844 Bernard coins the term "cardiac catheterization" and uses catheters to record intracardiac pressures in animals
- 1929 Frossmann first documented human cardiac catheterization

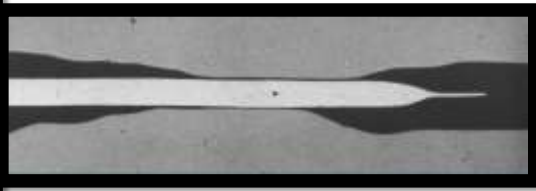
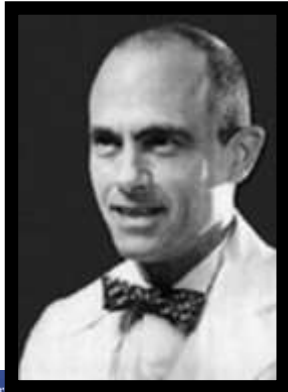


- 1956 Forssmann, Cournand and Richards share the Nobel Prize. Cournand states in his acceptance speech "the cardiac catheter was...the key in the lock."
- 1958 The diagnostic coronary angiogram selective imaging of the heart is discovered by Dr. Mason Sones



## 1964

- Transluminal Angioplasty is introduced by Dr. Charles T. Dotter.

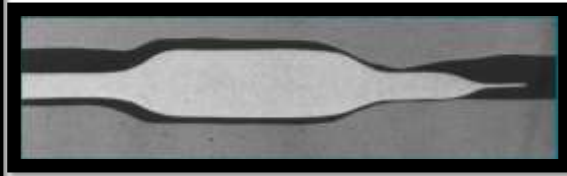
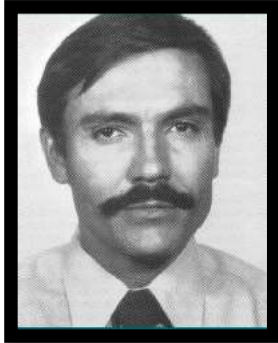


## 1966

- 1967 — Introduction of the Judkins Technique of coronary angiography

## 1974

- First peripheral human balloon angioplasty
- Andreas Gruentzig



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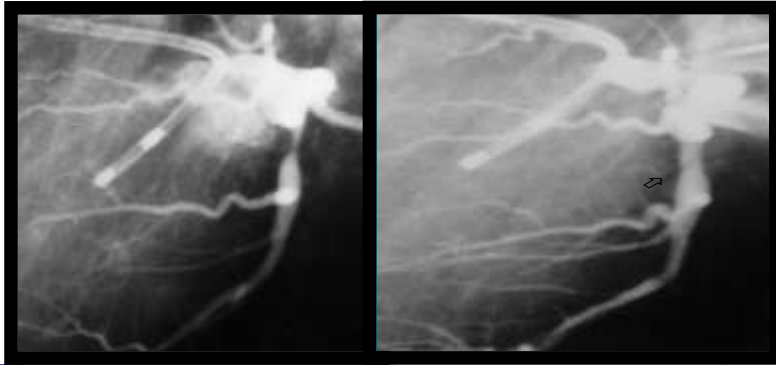
- 1975 — First ASD closure percutaneously at Ochsner Clinic in New Orleans

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1977

## Andreas Gruentzig performs first cath lab PTCA on awake patient in Zurich



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Medicine



## The New England Journal of Medicine

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Volume 301

JULY 12, 1979

Number 2

### NONOPERATIVE DILATATION OF CORONARY-ARTERY STENOSIS

#### Percutaneous Transluminal Coronary Angioplasty

ANDREAS R. GRÜNTZIG, M.D., ÅKE SENNING, M.D., AND WALTER E. SIEGENTHALER, M.D.



### Drug Treatment

The patient is given aspirin (1.0 g per day) for three days, starting the day before the procedure. Heparin and low-molecular-weight dextran are administered during dilatation; warfarin is started after the procedure and is continued until the follow-up study six to nine months later. To prevent coronary spasms, nitroglycerin and nifedipine are given before and during the procedure. The patient is discharged two days after angioplasty.



## 1985

- 1985 — A year of loss in the history of interventional medicine: Dotter, Sones, Judkins and Gruentzig all pass away

## 1994: the PALMAZ-SCHATZ® Balloon-Expandable Stent approved by the FDA





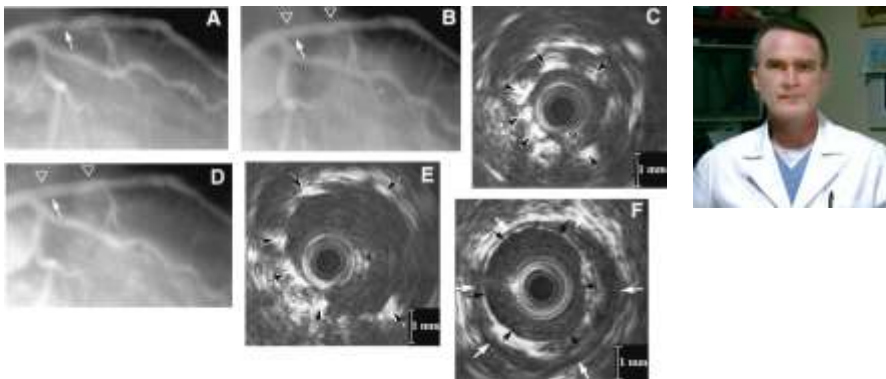
## 1994-2003

- Stent thrombosis
  - 1997 Colombo et al. High pressure and Ticlopidine+ASA
  - 1998 ASA+Ticlopidine better than ASA alone or ASA+Coumadin
- Restenosis



### Intracoronary Stenting Without Anticoagulation Accomplished With Intravascular Ultrasound Guidance

Antonio Colombo, Patrick Hall, Shigeru Nakamura, Yaron Almogor, Luigi Maiello, Giovanni Martini, Antonio Gaglione, Steven L. Goldberg, Jonathan M. Tobis



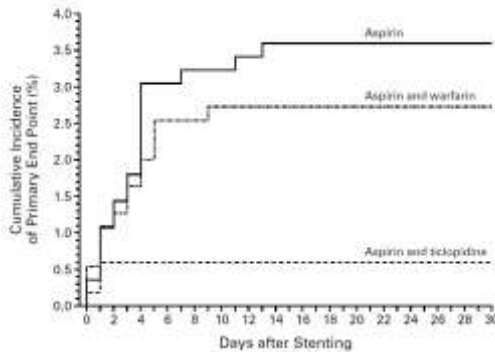
Colombo A, et al. Circulation 1995 Mar 15;91(6):1676-88



## Dual Antiplatelet vs ASA Monotherapy vs Anticoagulant Therapy

### A CLINICAL TRIAL COMPARING THREE ANTITHROMBOTIC-DRUG REGIMENS AFTER CORONARY-ARTERY STENTING

MARTIN B. LEON, M.D., DONALD S. BAIM, M.D., JEFFREY J. POPMA, M.D., PAUL C. GORDON, M.D., DONALD E. CUTLIP, M.D., KALON K.L. HO, M.D., ALEX GIAMBARTOLOMEI, M.D., DANIEL J. DIVER, M.D., DAVID M. LASORDA, D.O., DAVID O. WILLIAMS, M.D., STUART J. POOCK, Ph.D., AND RICHARD E. KUNTZ, M.D., FOR THE STENT ANTICOAGULATION RESTENOSIS STUDY INVESTIGATORS\*



- **Hall P, et al. Circulation 1996**
- **FANTASTIC.** Bertrand M, et al. Circulation 1996
- **ISAR.** Schmig A, et al. N Engl Med 1996
- **STARS.** Leon MB, et al. N Engl J Med 1998
- **MATTIS.** Urban P, et al. Circulation 1998



Study protocols generally used 4 weeks, 1 month, or 6 weeks of treatment

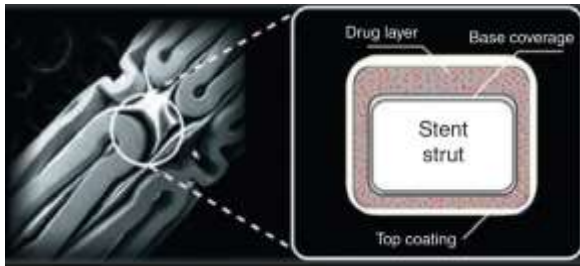
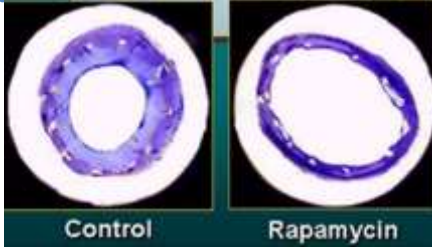


## 2002

- 2002 — the 25th anniversary of the first angioplasty performed in an awake patient
- 2002 — First TAVR
- 2003 — the first drug-eluting stent, the Cypher, manufactured by Johnson&Johnson /Cordis, is approved by the FDA
- 2004 — Boston Scientific gets its Taxus drug-eluting stent approved

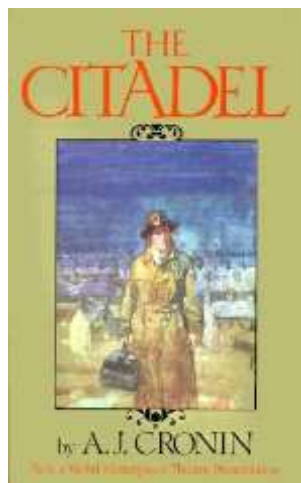


## 2002-2004: EME and FDA approval of Cypher and Taxus DES in Europe and USA

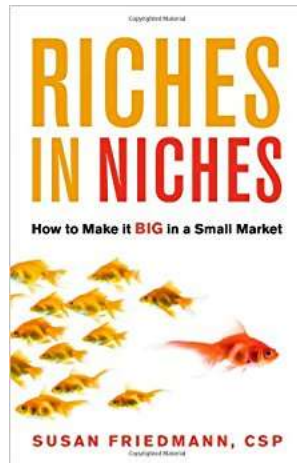


## Most Important

# patient



## The Niche



## Procedures

- Know what you're doing
- Write down the new procedures as you learn
- Use checklists



## Present Future

- Coronary
  - Robotics
  - More complex
  - CTO
  - Bifurcation
  - Coronary physiology
- Structural
  - Aortic, Mitral, L atrial space, Defects



## Future already here

- Alternative access
  - Radial (same day discharge)
  - Trans caval, Carotid, antegrade
  - Transseptal
- Other areas
  - LV and RV support devices
  - Peripheral
  - Veins



## The Goal of the Profession

- Should be to make us obsolete.



## Final Words

- The field of interventional cardiology have evolved within a lifespan of a human being
- We have lived through the most exciting era together
- However, we should never repeat the words attributed to Charles Holland Duell



- “Everything that can be invented has been invented.”
- However, he in fact said in 1902: “In my opinion, all previous advances in the various lines of invention will appear totally insignificant when compared with those which the present century will witness. I almost wish that I might live my life over again to see the wonders which are at the threshold.”

## Thank you

