University of Milan

I.R.C.C.S.
POLICLINICO SAN DONATO

Thoracic Aortic
Research Center

IRAD latest results and future trends

Santi Trimarchi, MD, PhD

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Thoracic Aortic Research Center, Director
IRCCS Policlinico San Donato
University of Milan

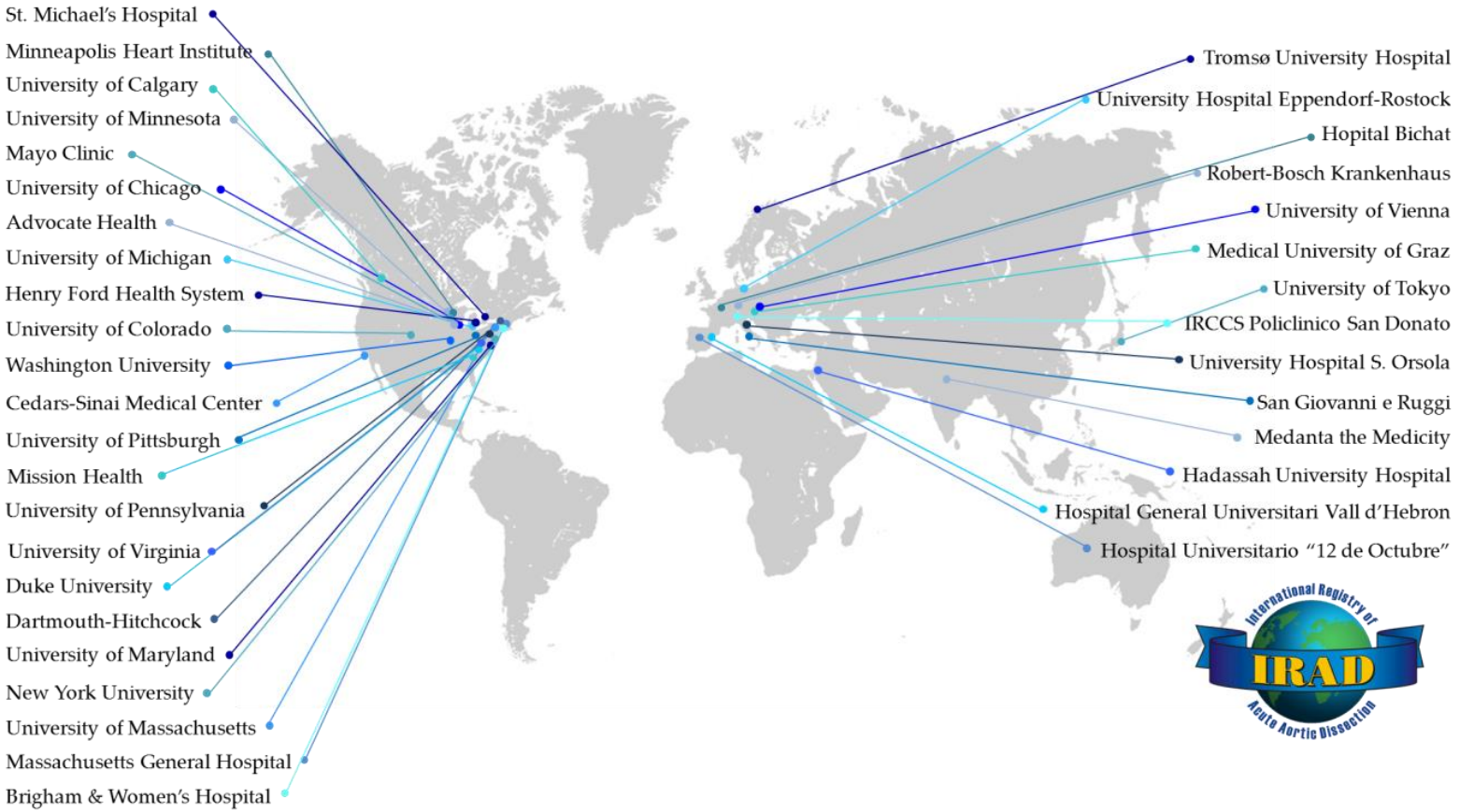
Disclosures

Grants: Italian National Research Council (CNR), CARIPLO Foundation, San Donato Foundation, Gore WL.

Consultant: Gore WL, Medtronic inc.

IRAD

International Registry of Acute Aortic Dissection



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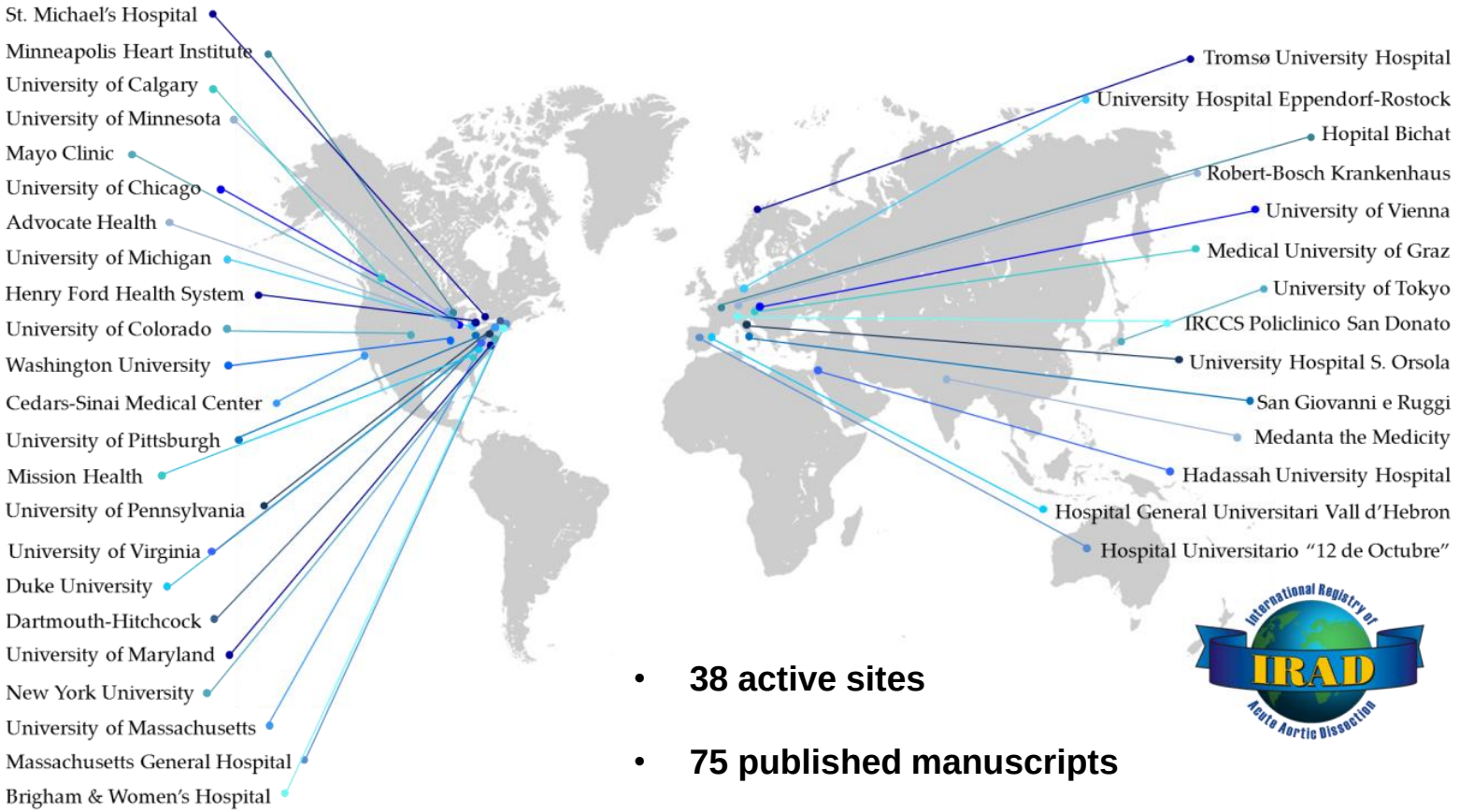

- **38 active sites**
- **75 published manuscripts**
- **69 active projects**

IRAD

- **Latest results from IRAD. 1**

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The IRAD Classification System for Characterizing Survival after Aortic Dissection

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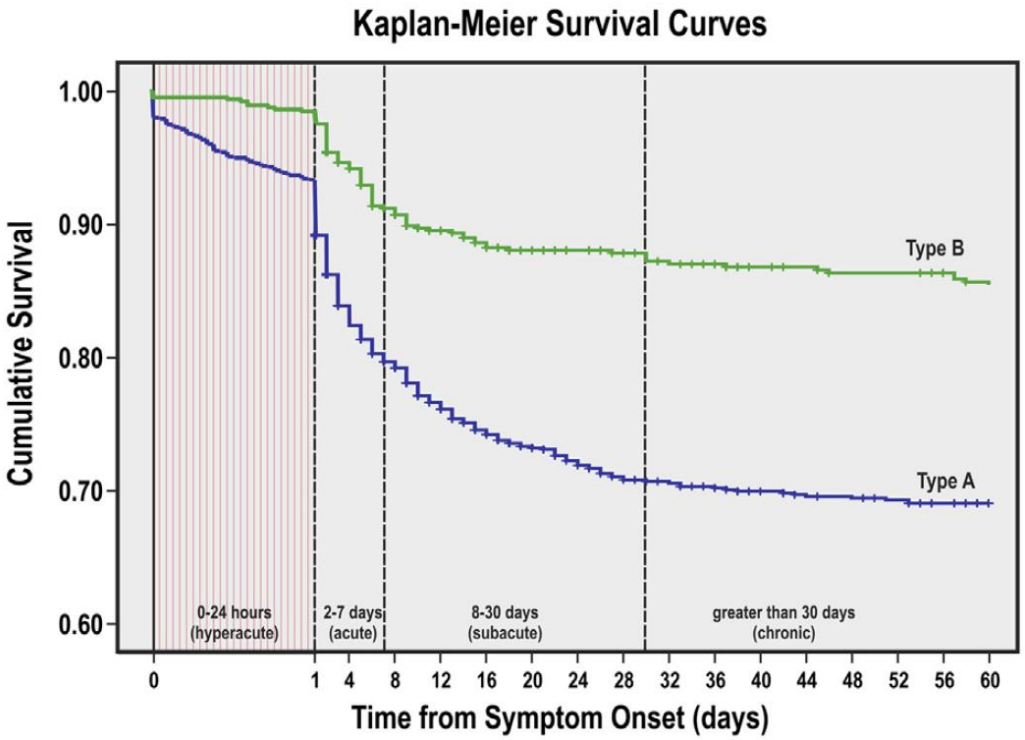
The American Journal of Medicine (2013) 126,



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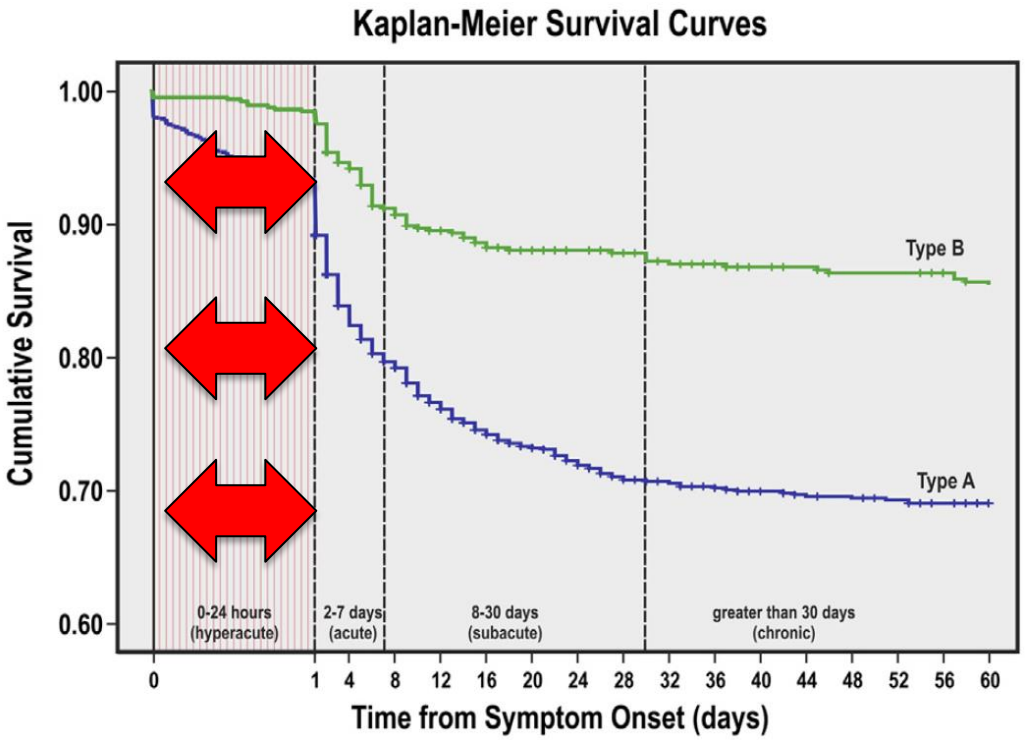

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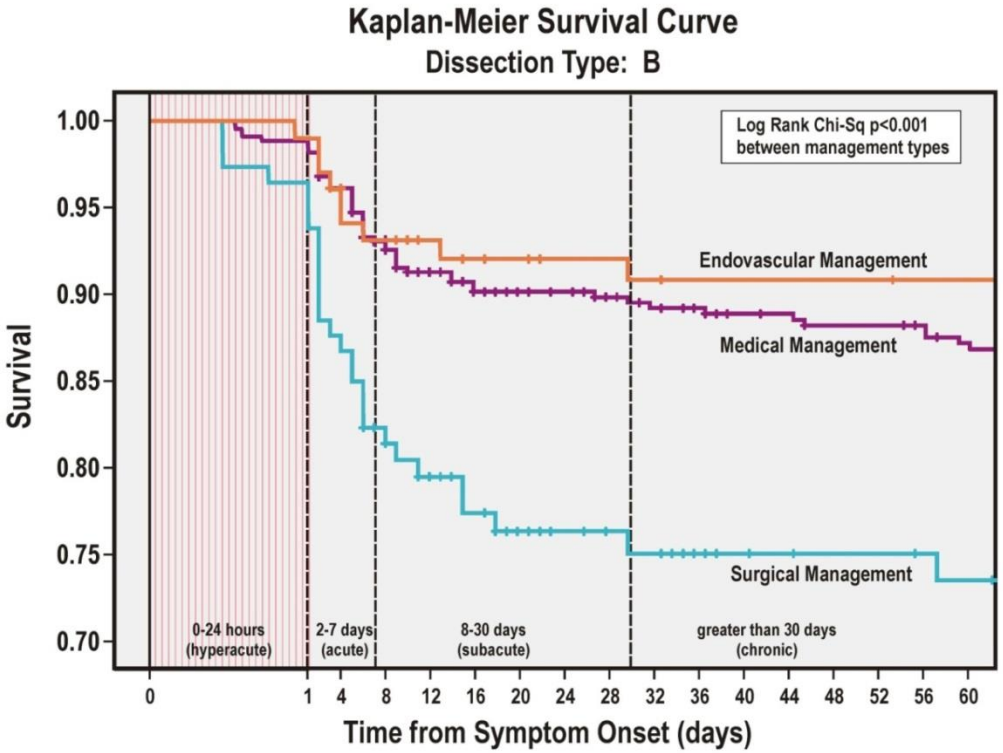

IRAD

- **Latest results from IRAD. 2**

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Survival After Endovascular Therapy in Patients With Type B Aortic Dissection

A Report From the International Registry of Acute Aortic Dissection (IRAD)

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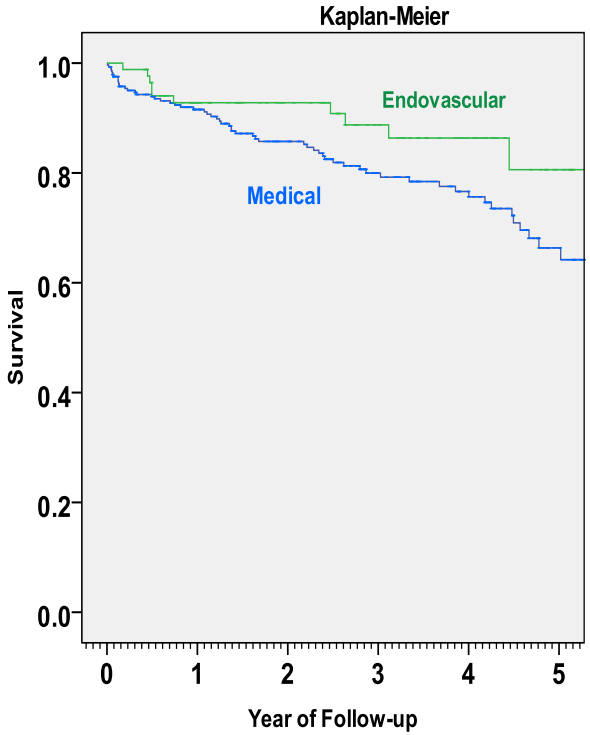

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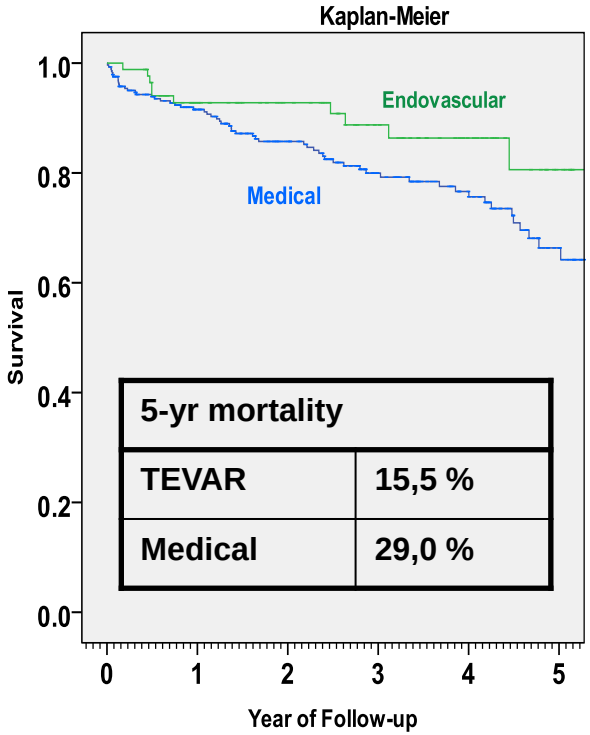

5-yr mortality	
TEVAR	15,5 %
Medical	29,0 %

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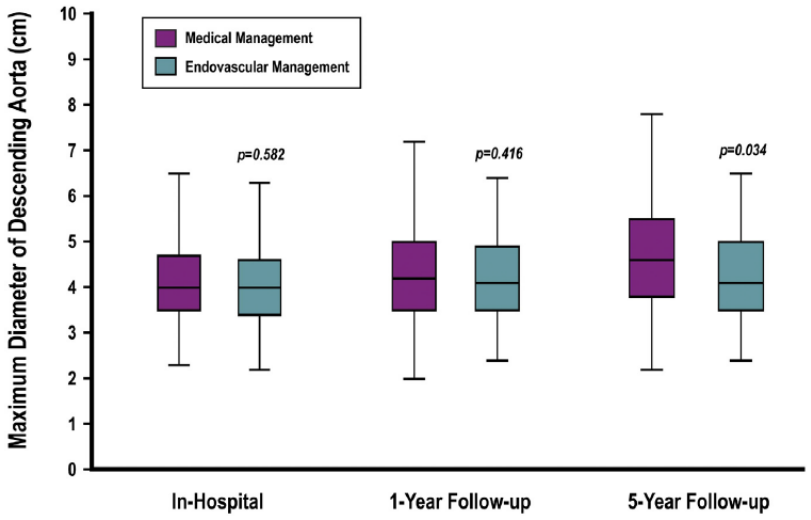
- Long-term outcomes of Type B: **Medical Therapy vs TEVAR**



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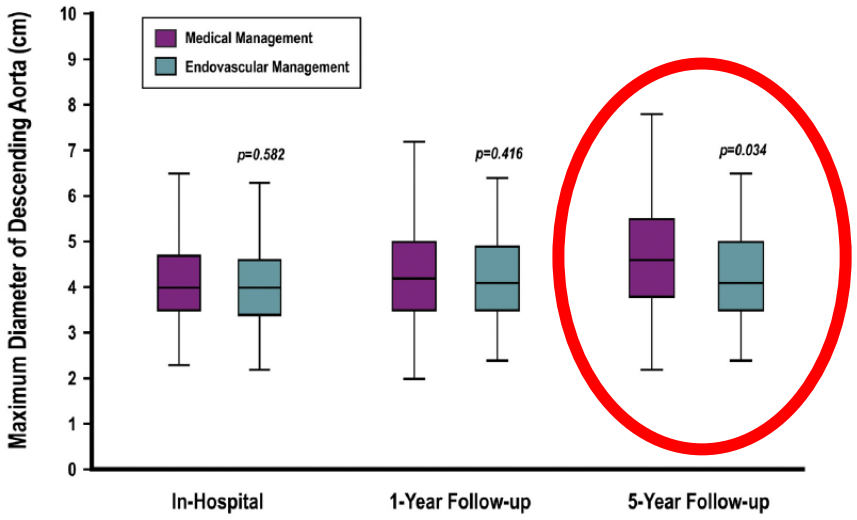

IRAD

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Surgery for Aortic Disease

Acute Aortic Intramural Hematoma

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Kevin M. Harris, MD; Alan C. Braverman, MD; Kim A. Eagle, MD; Elise M. Woznicki, BS; Reed E. Pyeritz, MD; Truls Myrmel, MD; Mark D. Peterson, MD; Matthias Voehringer, MD; Rossella Fattori, MD; James L. Januzzi, MD; Dan Gilon, MD; Daniel G. Montgomery, BS; Christoph A. Nienaber, MD; Santi Trimarchi, MD; Eric M. Isselbacher, MD; Arturo Evangelista, MD

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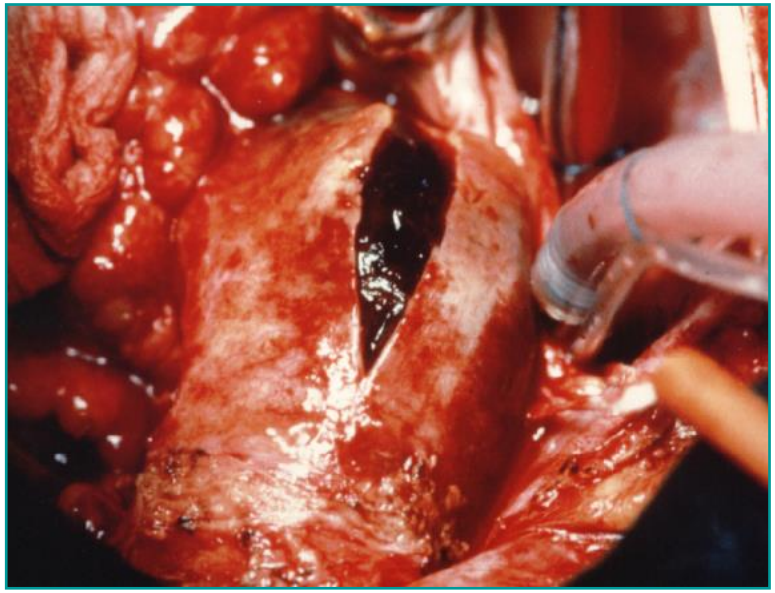

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2652 Type A and B

IMH 178 cases (6.3%).
Type A IMH 64 (3.5%)
Type B IMH 90 (12.1%)
Arch IMH 24 (8.5%)

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Pts with IMH tended:

- to be **older** (68.7 versus 61.7 years; p<0.001)
- to have **distal aortic involvement** (60.3% versus 35.3%; p<0.0001).

IRAD

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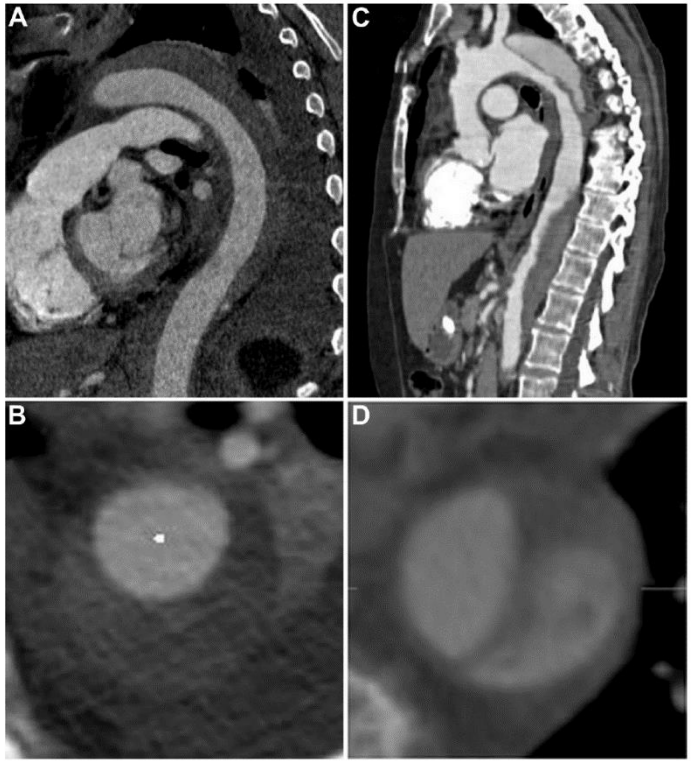
The differences and similarities between intramural hematoma of the descending aorta and acute type B dissection

Jip L. Tolenaar, MD,[a] Kevin M. Harris, MD,[b] Gilbert R. Upchurch Jr, MD,[c] Arturo Evangelista, MD, PhD,[d] Frans L. Moll, MD, PhD,[e] Marco di Eusanio, MD, PhD,[f] Kim Eagle, MD,[g] and Santi Trimarchi, MD, PhD,[a] on behalf of IRAD investigators, *Milan, Italy; Minneapolis, Minn; Charlottesville, Va; Barcelona, Spain; Utrecht, The Netherlands; Bologna, Italy; and Ann Arbor, Mich*

(J Vasc Surg 2013;58:1498-504.)



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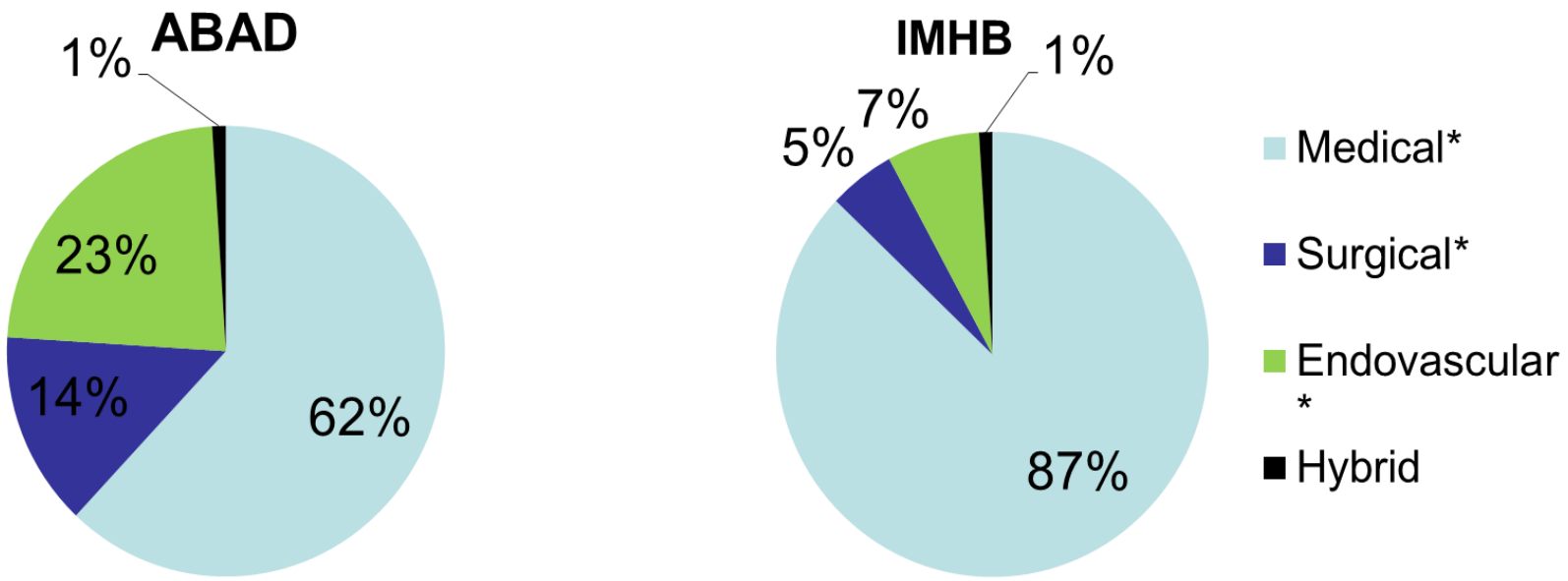
MANAGEMENT



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Category	Type B		
	True IMH	Classic AoD	p-value
In-hospital mortality	7 (6.5%)	84 (10.6%)	0.188
Medical management	6 (6.4%)	44 (9.0%)	0.413
Endovascular	0 (0.0%)	17 (11.9%)	0.313
1-year follow-up			
Follow-up available (% of total)	45 (42%)	274 (34.7%)	
Descending Aortic enlargement diameter	10 (38.5%)	90 (60.8%)	0.034
Mortality	4 (8.9%)	19 (6.9%)	0.547

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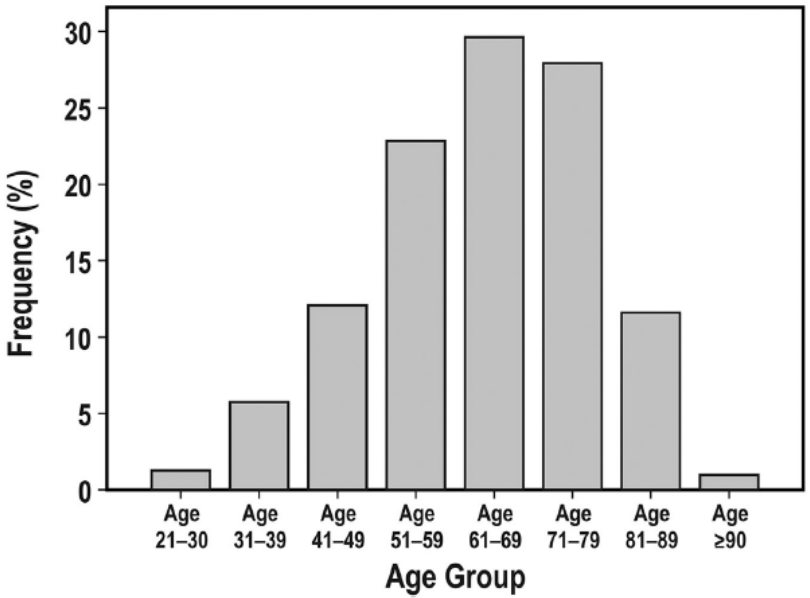
(Ann Thorac Surg 2013;96:2129–34)



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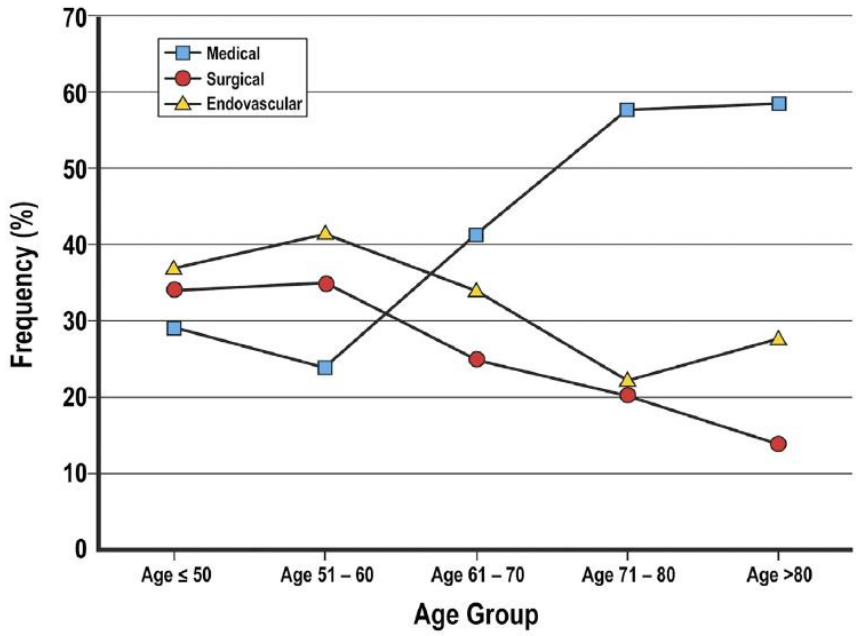

Management

IRAD

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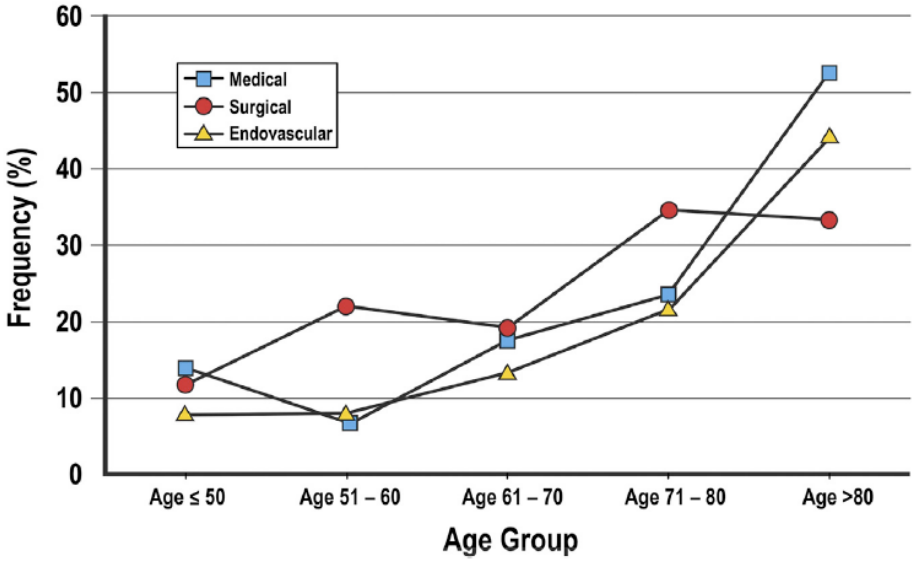

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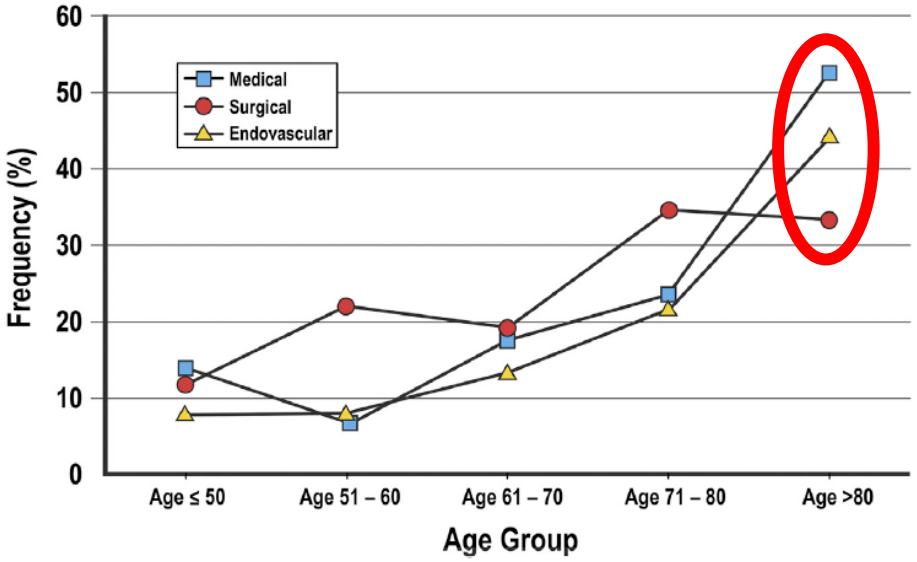

Mortality

IRAD

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Predicting In-Hospital Mortality in Acute Type B Aortic Dissection

Evidence From International Registry of Acute Aortic Dissection

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Circulation. 2014;130[suppl 1]:S45-S50.

Table 1. Demographics and Patient History of All Patients With Type B Aortic Dissection

		In-Hospital			
		Survived	Died		
	Number	n (%)	n (%)	Odds Ratio	*P* Value
History	1034 (100)	924 (89.4)	110 (10.6)		

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Mean age, y	63.5±14.0	63.0±13.9	67.8±14.6	1.42 (1.22–1.82)	0.001
Age ≥70 y	371 (35.9)	315 (34.1)	56 (50.9)	2.00 (1.35–2.98)	0.001

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Table 2. In-Hospital Management of All Patients With Type B Aortic Dissection

		In-Hospital			
		Survived	Died		
	Number	n (%)	n (%)	Odds Ratio	*P* Value
Management					
Medical	676 (65.4)	618 (91.4)	58 (8.6)	Reference	...
Surgery	106 (10.3)	82 (77.4)	24 (22.6)	3.12 (1.84–5.28)	<0.001
Endovascular	241 (23.3)	214 (88.8)	27 (11.2)	1.34 (0.83–2.17)	0.230

IRAD

- **Latest results from IRAD. 5**

Predicting In-Hospital Mortality in Acute Type B Aortic Dissection

Evidence From International Registry of Acute Aortic Dissection

Jip L. Tolenaar, MD, PhD; Whit Froehlich; Frederik H.W. Jonker, MD, PhD; Gilbert R. Upchurch Jr, MD; Vincenzo Rampoldi, MD; Thomas T. Tsai, MD, MSc; Eduardo Bossone, MD, PhD; Arturo Evangelista, MD; Patrick O'Gara, MD; Linda Pape, MD; Dan Montgomery; Eric M. Isselbacher, MD; Christoph A. Nienaber, MD; Kim A. Eagle, MD; Santi Trimarchi, MD, PhD

Circulation. 2014;130[suppl 1]:S45-S50.

Table 5. Complications at Presentation of All Patients With Type B Aortic Dissection

		In-Hospital			
		Survived	Died		
	Number	n (%)	n (%)	Odds Ratio	*P* Value
Complications					
Spinal ischemia	23 (2.5)	17 (2.0)	6 (6.5)	3.34 (1.28–8.68)	0.009
Mesenteric ischemia/infarction	71 (7.4)	45 (5.2)	26 (26.8)	6.69 (3.90–11.48)	<0.001
Acute renal failure	174 (17.9)	134 (15.4)	40 (40.0)	3.67 (2.36–5.70)	<0.001
Hypotension	94 (9.7)	37 (4.3)	57 (54.8)	27.21 (16.4–45.2)	<0.001
Limb ischemia	91 (9.5)	69 (8.0)	22 (22.4)	3.34 (1.95–5.69)	<0.001

IRAD

- **Latest results from IRAD. 5**

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Evidence From International Registry of Acute Aortic Dissection

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Circulation. 2014;130[suppl 1]:S45-S50.

Table 6. Independent Predictors of In-Hospital Mortality in Type B Aortic Dissection

Variables at Presentation	Mortality Odds Ratio (95% CI)	Parameter Coefficient	Model Score Assigned	*P* Value
Female	1.37 (0.67–2.81)	0.316	0.3	0.387
Age (per decade)	1.33 (1.00–1.75)	0. 28	0.3	0.044
Hypotension/shock	6.43 (2.18–18.98)	1.861	1.9	0.001
Periaortic hematoma	3.06 (1.38–6.78)	1.119	1.1	0.006
Diameter ≥5.5 cm	6.04 (2.87–12.73)	1.798	1.8	<0.001
Mesenteric ischemia	9.03 (3.49–23.38)	2.201	2.2	<0.001
Acute renal failure	3.61 (1.68–7.75)	1.284	1.3	0.001
Limb ischemia	3.02 (1.05–8.68)	1.105	1.1	0.040

IRAD

- **Latest results from IRAD. 5**

Predicting In-Hospital Mortality in Acute Type B Aortic Dissection

Evidence From International Registry of Acute Aortic Dissection

Jip L. Tolenaar, MD, PhD; Whit Froehlich; Frederik H.W. Jonker, MD, PhD; Gilbert R. Upchurch Jr, MD; Vincenzo Rampoldi, MD; Thomas T. Tsai, MD, MSc; Eduardo Bossone, MD, PhD; Arturo Evangelista, MD; Patrick O'Gara, MD; Linda Pape, MD; Dan Montgomery; Eric M. Isselbacher, MD; Christoph A. Nienaber, MD; Kim A. Eagle, MD; Santi Trimarchi, MD, PhD

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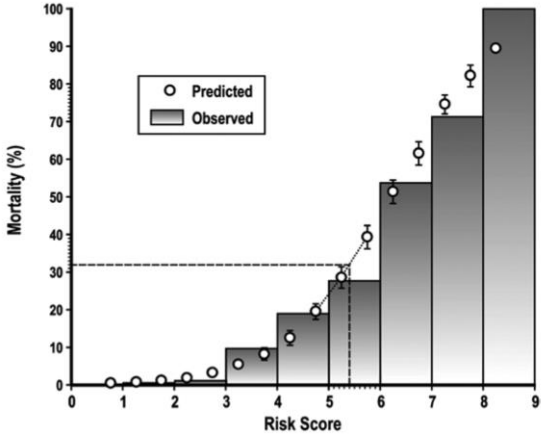

Figure. Model observed versus predicted death by score. The bars of the predicted scores represent the SD of the predicted mortality associated with each interval of risk score. Example: Computed tomographic scan of a 74-year-old female patient presenting with shock in the emergency room showed type B dissection with periaortic hematoma. Her model score is 0.3×(female)+0.3×(age in decades)+1.9×(hypotension/shock)+1.1×(periaortic hematoma). Total score is 5.4, which is associated with a mortality of 32%, not adjusting for management.

IRAD

- **Latest results from IRAD. 6**

IRAD

- **Latest results from IRAD. 6**

Acute type B aortic dissection complicated by visceral ischemia

Frederik H. W. Jonker, MD, PhD,[a,b] Himanshu J. Patel, MD,[c] Gilbert R. Upchurch, MD,[d] David M. Williams, MD,[e] Daniel G. Montgomery, BS,[f] Thomas G. Gleason, MD, MS,[g] Alan C. Braverman, MD,[h] Udo Sechtem, MD,[i] Rossella Fattori, MD,[j] Marco Di Eusanio, MD, PhD,[k] Arturo Evangelista, MD,[l] Christoph A. Nienaber, MD,[m] Eric M. Isselbacher, MD,[n] Kim A. Eagle, MD,[f] and Santi Trimarchi, MD, PhD[a]

(J Thorac Cardiovasc Surg 2014; ■:1-6)

IRAD

- **Latest results from IRAD. 6**

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(J Thorac Cardiovasc Surg 2014;■:1-6)

TABLE 1. Baseline characteristics

Characteristic	Visceral ischemia, n (%)	No visceral ischemia, n (%)	*P* value
Total patients	104 (7.1)	1352 (92.9)	
Demographics			
Mean age ± standard	59.1 ± 13.7	64.0 ± 14.1	.001

IRAD

- **Latest results from IRAD. 6**

Acute type B aortic dissection complicated by visceral ischemia

Frederik H. W. Jonker, MD, PhD,[a,b] Himanshu J. Patel, MD,[c] Gilbert R. Upchurch, MD,[d] David M. Williams, MD,[e] Daniel G. Montgomery, BS,[f] Thomas G. Gleason, MD, MS,[g] Alan C. Braverman, MD,[h] Udo Sechtem, MD,[i] Rossella Fattori, MD,[j] Marco Di Eusanio, MD, PhD,[k] Arturo Evangelista, MD,[l] Christoph A. Nienaber, MD,[m] Eric M. Isselbacher, MD,[n] Kim A. Eagle, MD,[f] and Santi Trimarchi, MD, PhD[a]

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Total patients	104 (7.1)	1352 (92.9)	
Demographics			
Mean age ± standard	59.1 ± 13.7	64.0 ± 14.1	.001
Femoral pulse deficits	28 (32.2)	134 (13.4)	<.001
Complications (preoperative)			
Limb ischemia	28 (28.3)	87 (7.1)	<.001
Acute renal failure	41 (41.0)	166 (13.5)	<.001
Spinal cord ischemia	5 (5.2)	23 (1.9)	.054

IRAD

- **Latest results from IRAD. 6**

Acute type B aortic dissection complicated by visceral ischemia

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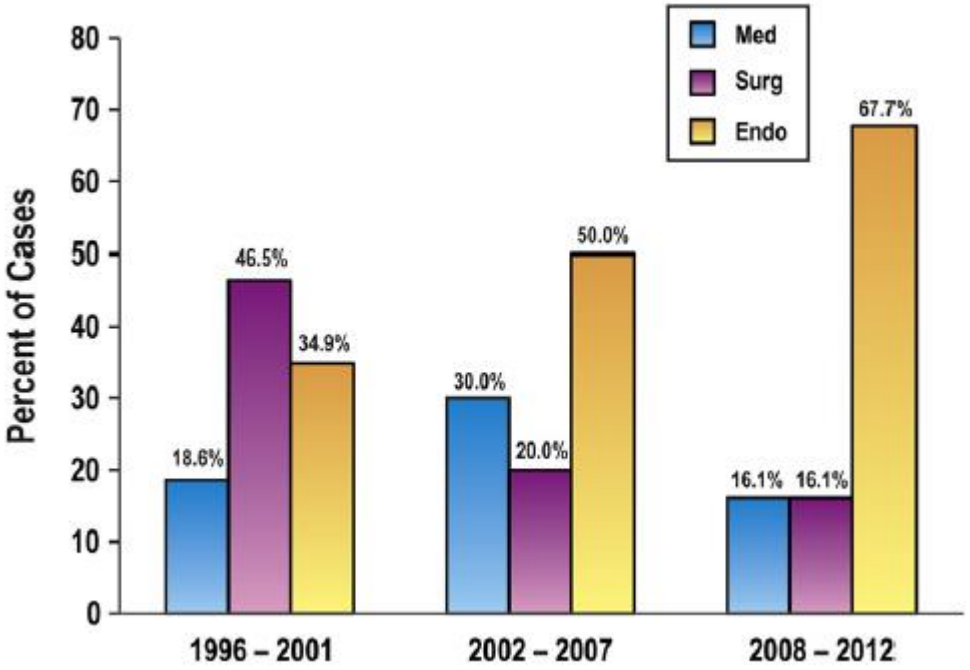
(J Thorac Cardiovasc Surg 2014; ■:1-6)



Management

IRAD

- **Latest results from IRAD. 6**

Acute type B aortic dissection complicated by visceral ischemia

Frederik H. W. Jonker, MD, PhD,[a,b] Himanshu J. Patel, MD,[c] Gilbert R. Upchurch, MD,[d] David M. Williams, MD,[e] Daniel G. Montgomery, BS,[f] Thomas G. Gleason, MD, MS,[g] Alan C. Braverman, MD,[h] Udo Sechtem, MD,[i] Rossella Fattori, MD,[j] Marco Di Eusanio, MD, PhD,[k] Arturo Evangelista, MD,[l] Christoph A. Nienaber, MD,[m] Eric M. Isselbacher, MD,[n] Kim A. Eagle, MD,[f] and Santi Trimarchi, MD, PhD[a]

(J Thorac Cardiovasc Surg 2014;■:1-6)

TABLE 4. In-hospital mortality of patients with and without visceral ischemia

Mortality	Visceral ischemia, n (%)	No visceral ischemia, n (%)	*P* value
Total patients	104 (7.1)	1352 (92.9)	
Overall	32 (30.8)	123 (9.1)	<.001
Medical	11 (50.0)	69 (7.7)	<.001
Surgical	8 (25.8)	25 (15.5)	.131
Endovascular	13 (25.5)	29 (10.0)	.004

IRAD – Future Trends

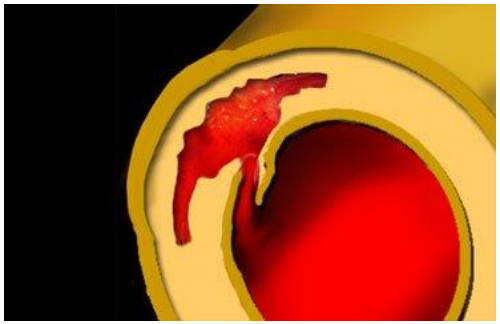
IRAD

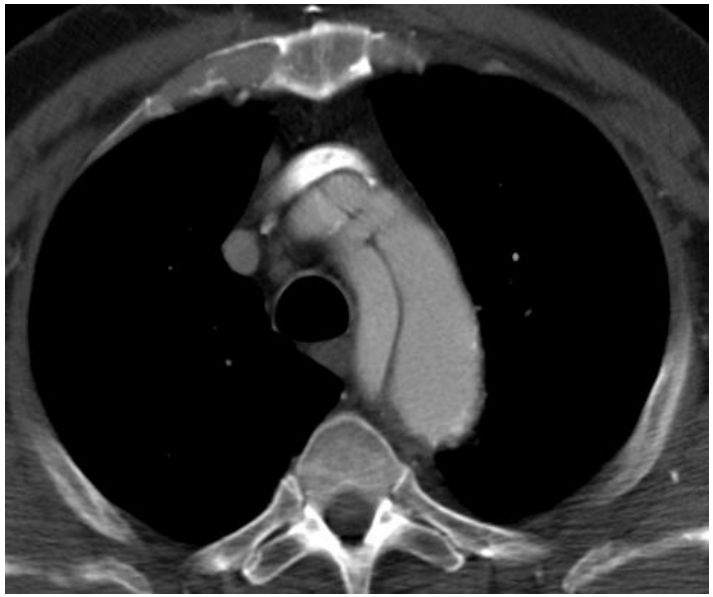
- **Future Trends. Open issues on Arch Dissection**

IRAD

- **Future Trends. Open issues on Arch Dissection**

15% of all AD



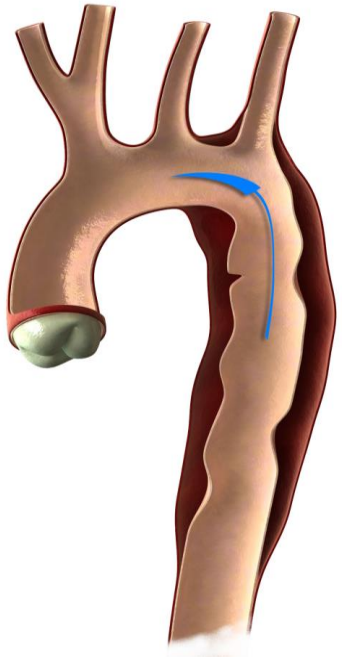


IRAD. Hagan PG, KA Eagle et al. JAMA 2000

IRAD

- **Future Trends. Open issues on Arch Dissection**

- **Which is the significance of retrograde arch involvement in B dissection ?**



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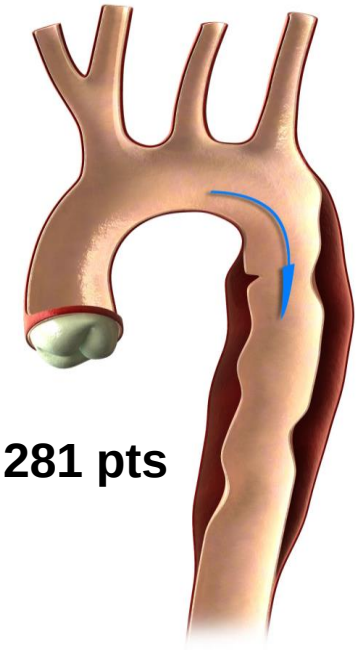
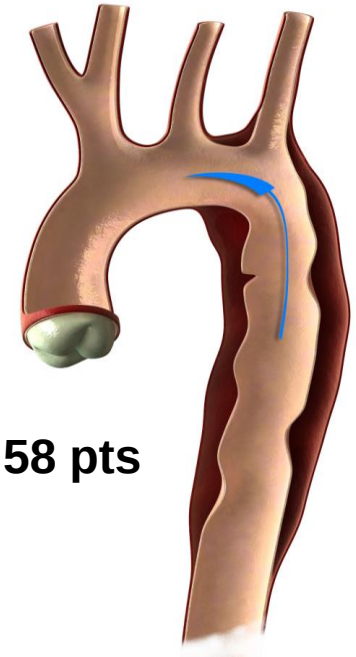


G 1: 281 pts



G 2: 58 pts

IRAD

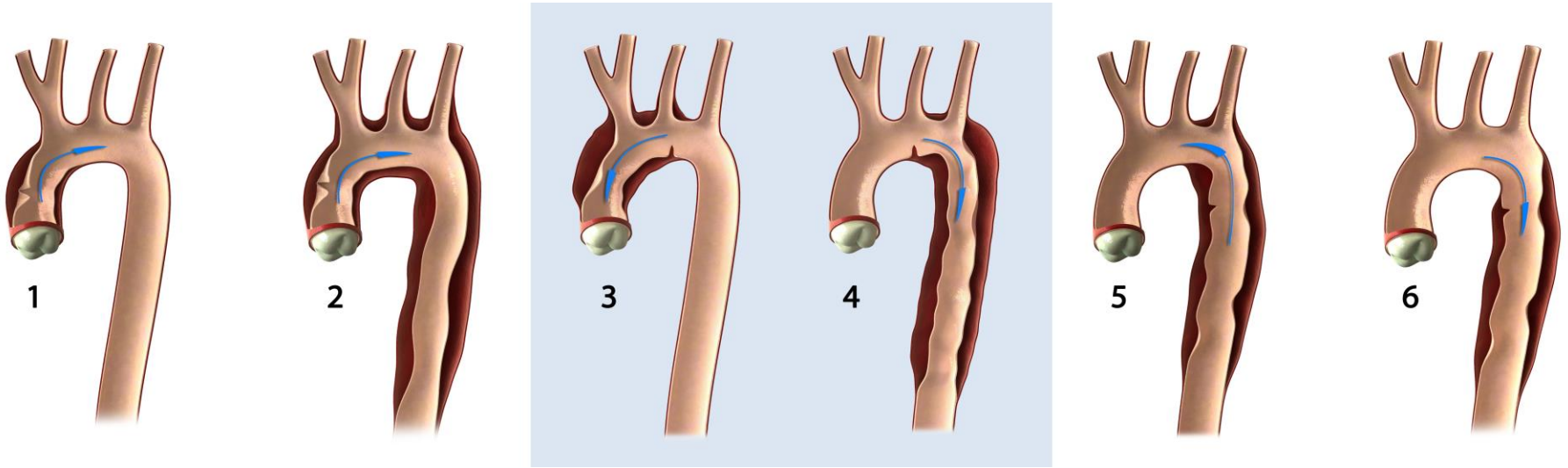
- **Future Trends. Open issues on Arch Dissection**

- What is the significance of retrograde arch involvement in B dissection ?

- **Do we need a new arch dissection classification ?**

IRAD

- **Future Trends. Open issues on Arch Dissection**
- What is the significance of retrograde arch involvement in B dissection ?
- **Do we need a new arch dissection classification ?**



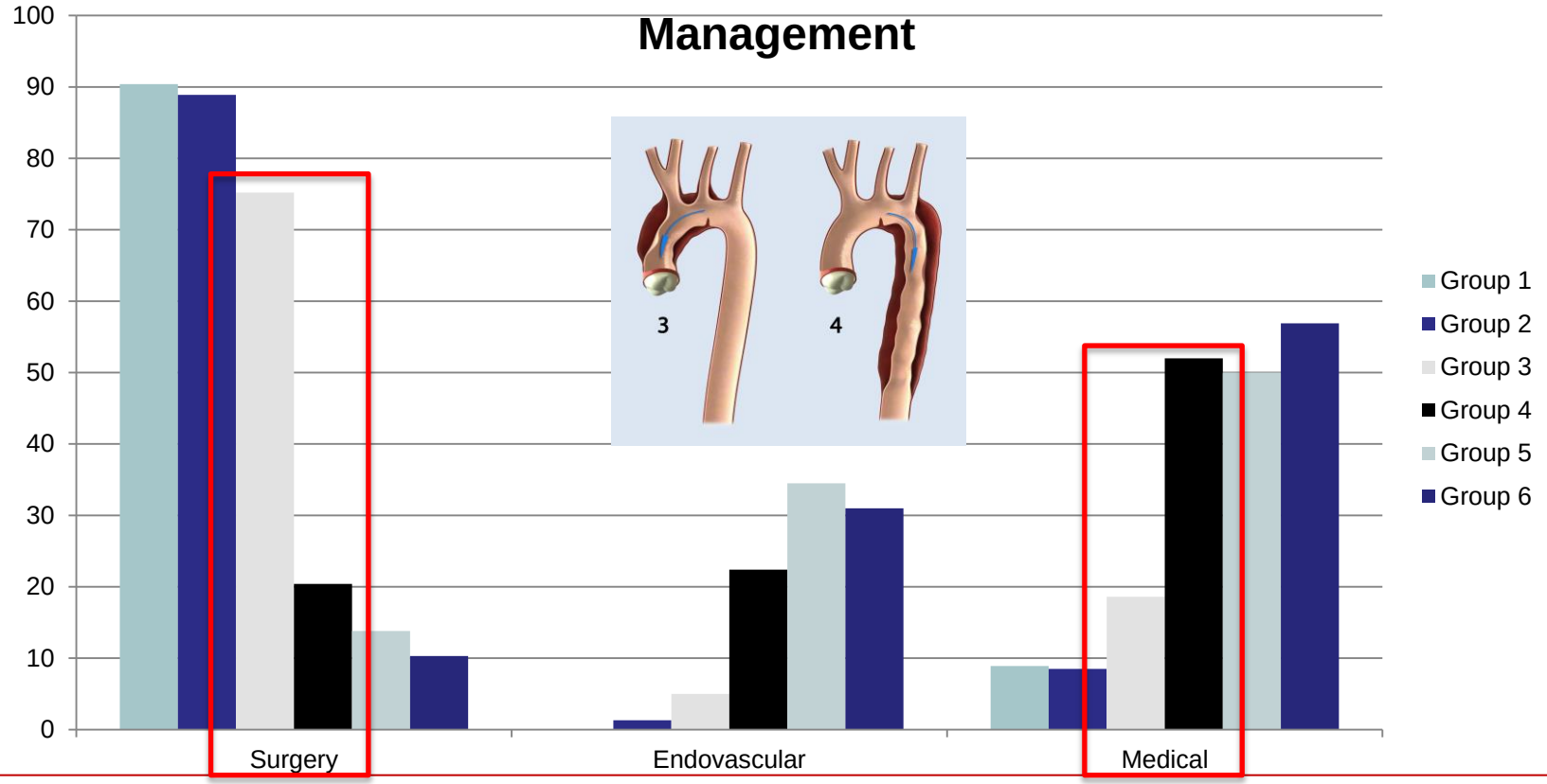
11%	47%	11%	7%	4%	20%
(n=157)	(n=673)	(n=161)	(n=98)	(n=58)	(n=280)

IRAD

- **Future Trends. Open issues on Arch Dissection**

- What is the significance of retrograde arch involvement in B dissection ?

- **Do we need a new arch dissection classification ?**

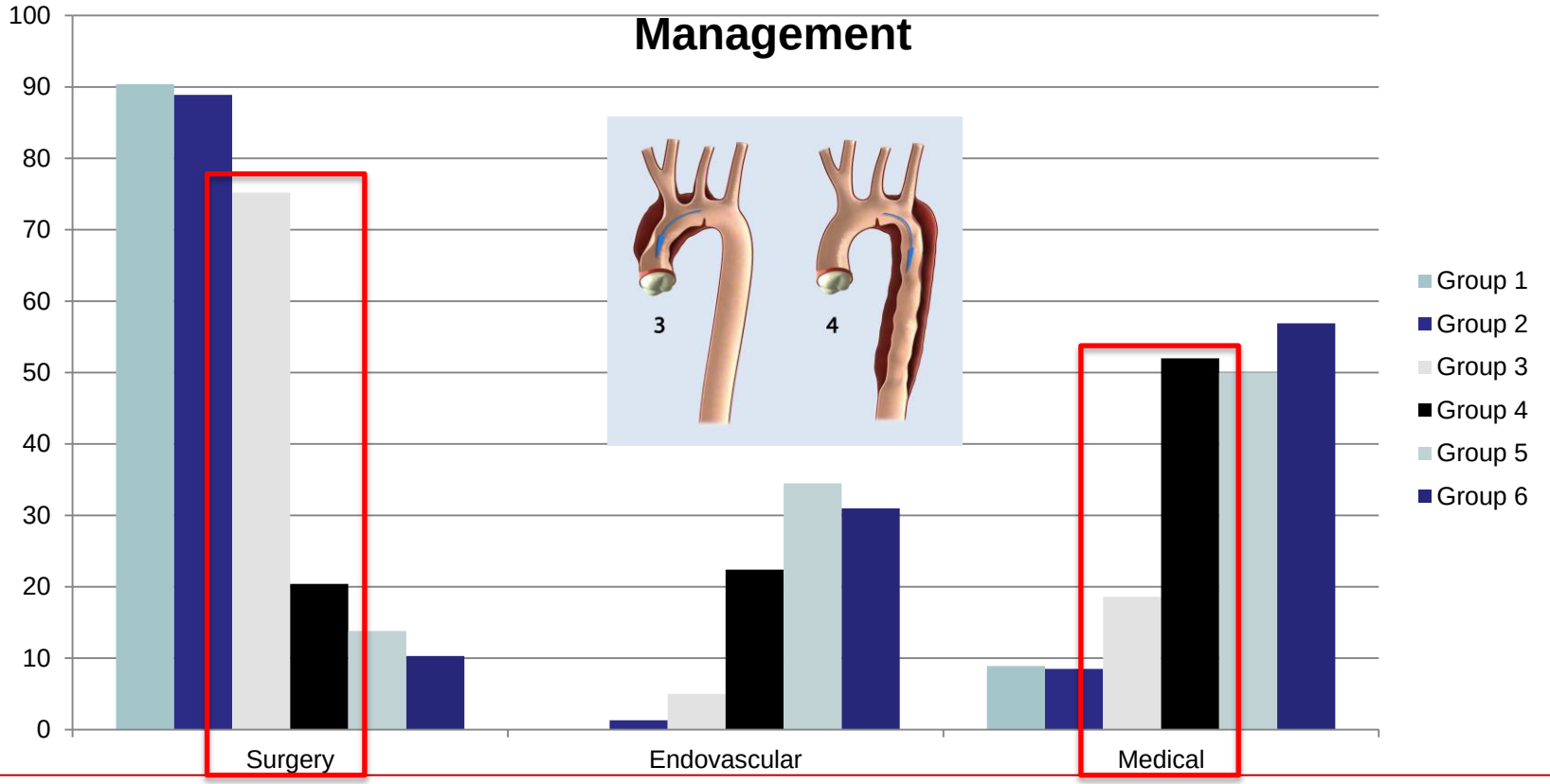


IRAD

- In patients with proximal ET located in the arch:

surgery and medical: 75.2% and 18.2% in Group 3 vs **<u>20.4 and 52.0% in Group 4</u>**,

p<0.001 for all

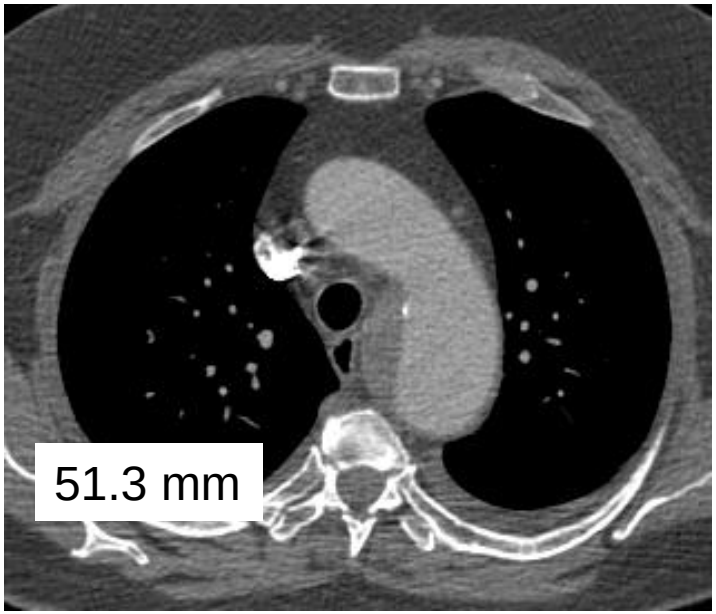


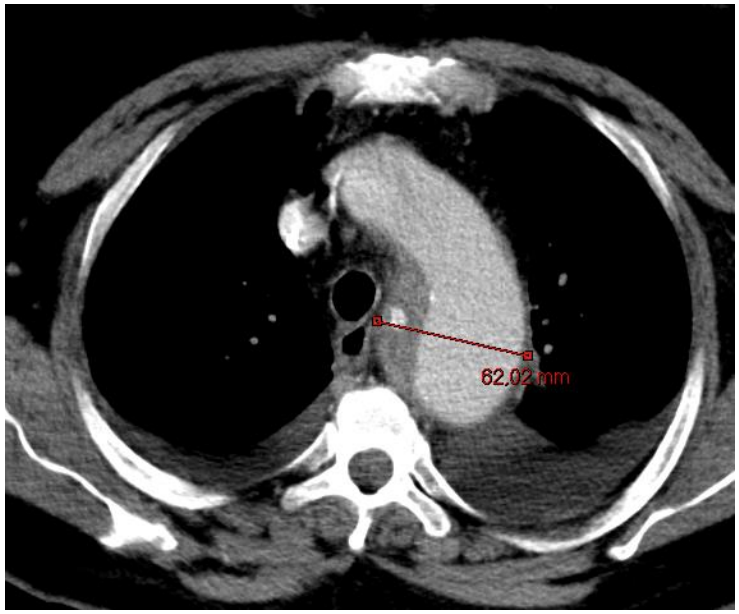
IRAD

- Future Trends. Open issues on Arch Dissection
- **In-hospital complications in initially uncomplicated B dissection**

IRAD

- Future Trends. Open issues on Arch Dissection
- **In-hospital complications in initially uncomplicated B dissection**

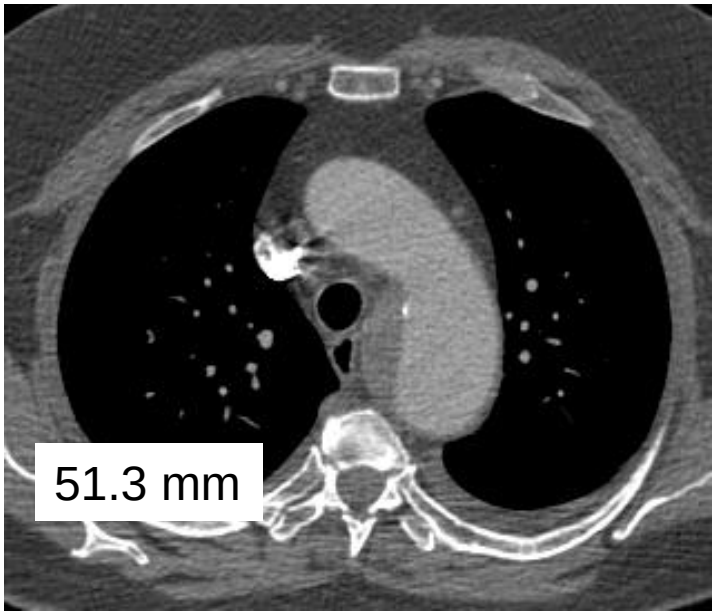


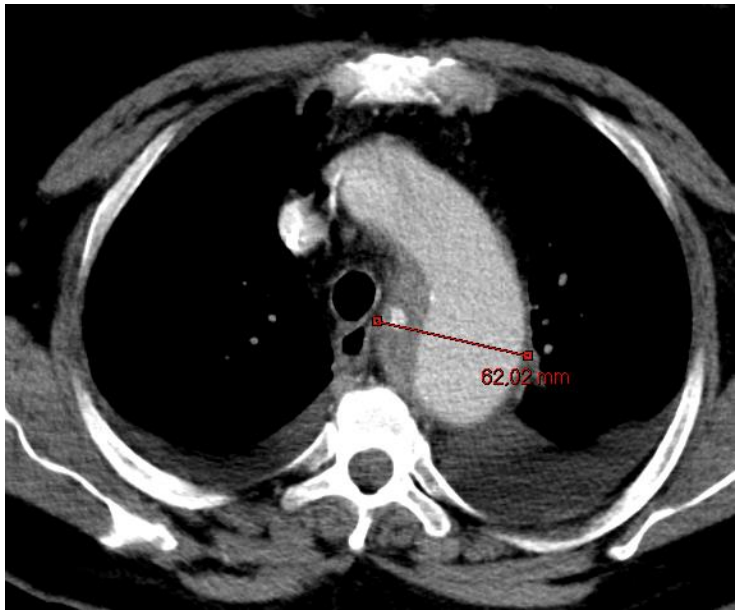


IRAD

- Future Trends. Open issues on Arch Dissection
- **In-hospital complications in initially uncomplicated B dissection**

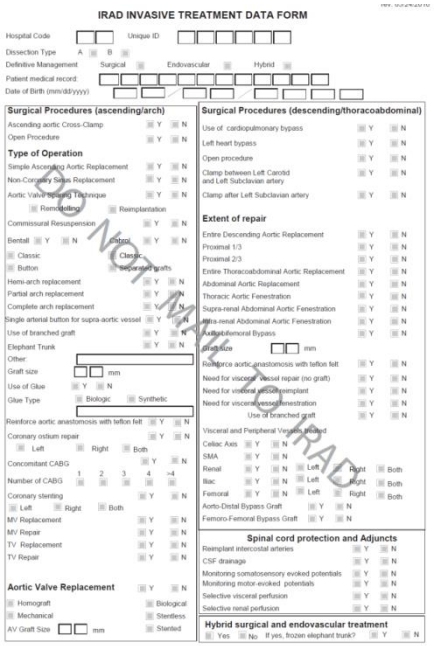
382 B uncomplicated at admission → 48 (12.6 %) became complicated





IRAD

- Future Trends. Open issues on Arch Dissection
- In-hospital complications in initially uncomplicated B dissection
- **Larger use of IRAD IVC**



IRAD INVASIVE TREATMENT DATA FORM

Hospital Code | Unique ID

Dissection Type: A | B

Definitive Management: Surgical | Endovascular | Hybrid

Patient medical record:

Date of Birth (mm/dd/yyyy)

Surgical Procedures (ascending/arch)

Ascending aortic Cross-Clamp Y N

Open Procedure Y N

Type of Operation

Simple Ascending Aortic Replacement Y N

Non-Coronary Sinus Replacement Y N

Aortic Valve Sparing Technique Y N

Remodeling | Reimplantation

Commissural Resuspension Y N

Bentall Y N | Bio | Y N

Classic | Button | Classic | Separated grafts

Hemi-arch replacement Y N

Partial arch replacement Y N

Complete arch replacement Y N

Single arterial button for supra-aortic vessel Y N

Use of branched graft Y N

Elephant Trunk Y N

Other

Graft size mm

Use of Glue Y N

Glue Type: Biologic | Synthetic

Reinforce aortic anastomosis with teflon felt Y N

Coronary ostium repair Y N

Left | Right | Both

Concomitant CABG Y N

Number of CABG 1 2 3 4 >4

Coronary stenting Y N

Left | Right | Both

MV Replacement Y N

MV Repair Y N

TV Replacement Y N

TV Repair Y N

Aortic Valve Replacement Y N

Homograft | Biological

Mechanical | Stentless

AV Graft Size mm | Stented

Surgical Procedures (descending/thoracoabdominal)

Use of cardiopulmonary bypass Y N

Left heart bypass Y N

Open procedure Y N

Clamp between Left Carotid and Left Subclavian artery Y N

Clamp after Left Subclavian artery Y N

Extent of repair

Entire Descending Aortic Replacement Y N

Proximal 1/3 Y N

Proximal 2/3 Y N

Entire Thoracoabdominal Aortic Replacement Y N

Abdominal Aortic Replacement Y N

Thoracic Aortic Fenestration Y N

Supra-renal Abdominal Aortic Fenestration Y N

Infra-renal Abdominal Aortic Fenestration Y N

Aorto-bifemoral Bypass Y N

Graft Size mm

Reinforce aortic anastomosis with teflon felt Y N

Need for visceral vessel repair (no graft) Y N

Need for visceral vessel reimplant Y N

Need for visceral vessel fenestration Y N

Use of branched graft Y N

Visceral and Peripheral Vessels Bypass

Celiac Axis Y N

SMA Y N

Renal Y N Left Right Both

Iliac Y N Left Right Both

Femoral Y N Left Right Both

Aorto-Distal Bypass Graft Y N

Femoro-Femoral Bypass Graft Y N

Spinal cord protection and Adjuncts

Reimplant intercostal arteries Y N

CSF drainage Y N

Monitoring somatosensory evoked potentials Y N

Monitoring motor-evoked potentials Y N

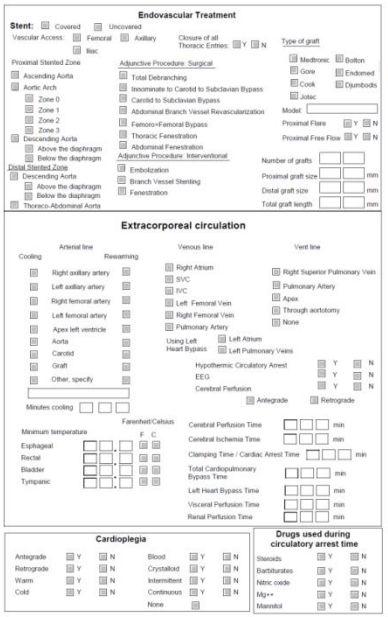
Selective visceral perfusion Y N

Selective renal perfusion Y N

Hybrid surgical and endovascular treatment

Yes | No If yes, frozen elephant trunk? Y N

DO NOT USE IRAD



Endovascular Treatment

Stent: Covered | Uncovered

Vascular Access: Femoral | Axillary | Iliac

Closure of all Thoracic Entries: Y N

Type of graft

Proximal Stented Zone

Ascending Aorta

Aortic Arch

Zone 0 | Zone 1 | Zone 2 | Zone 3

Descending Aorta

Above the diaphragm | Below the diaphragm

Distal Stented Zone

Descending Aorta

Above the diaphragm | Below the diaphragm

Thoraco-Abdominal Aorta

Adjunctive Procedure: Surgical

Total Debranching

Innominate to Carotid to Subclavian Bypass

Carotid to Subclavian Bypass

Abdominal Branch Vessel Revascularization

Femoro-Femoral Bypass

Thoracic Fenestration

Abdominal Fenestration

Adjunctive Procedure: Interventional

Embolization

Branch Vessel Stenting

Fenestration

Medtronic | Bolton | Gore | Endomed | Cook | Djumbods | Jotec

Model

Proximal Flare Y N

Proximal Free Flow Y N

Number of grafts

Proximal graft size mm

Distal graft size mm

Total graft length mm

Extracorporeal circulation

Arterial line | Venous line | Vent line

Cooling | Rewarming

Right axillary artery

Left axillary artery

Right femoral artery

Left femoral artery

Apex left ventricle

Aorta

Carotid

Graft

Other, specify

Minutes cooling

Right Atrium

SVC

IVC

Left Femoral Vein

Right Femoral Vein

Pulmonary Artery

Using Left Heart Bypass: Left Atrium | Left Pulmonary Veins

Right Superior Pulmonary Vein

Pulmonary Artery

Apex

Through aortotomy

None

Hypothermic Circulatory Arrest Y N

EEG Y N

Cerebral Perfusion Y N

Antegrade | Retrograde

Farenheit/Celsius

Minimum temperature

Esophageal | Rectal | Bladder | Tympanic

Cerebral Perfusion Time min

Cerebral Ischemia Time min

Clamping Time / Cardiac Arrest Time min

Total Cardiopulmonary Bypass Time min

Left Heart Bypass Time min

Visceral Perfusion Time min

Renal Perfusion Time min

Cardioplegia

Antegrade Y N | Blood Y N

Retrograde Y N | Crystalloid Y N

Warm Y N | Intermittent Y N

Cold Y N | Continuous Y N

None

Drugs used during circulatory arrest time

Steroids Y N

Barbiturates Y N

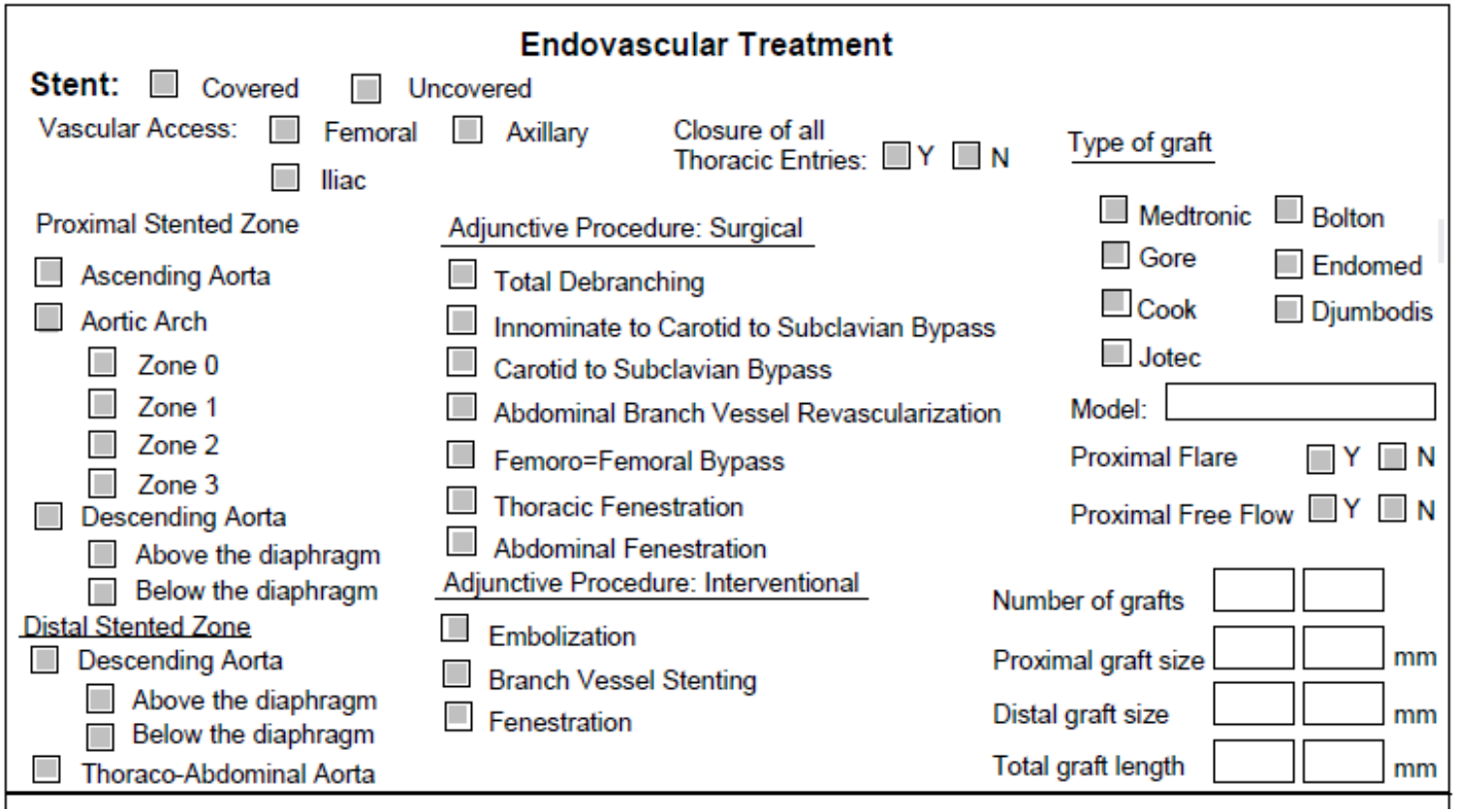
Nitric oxide Y N

Mg++ Y N

Mannitol Y N

IRAD

- Future Trends. Open issues on Arch Dissection
- **In-hospital complications in initially uncomplicated B dissection**
- **Larger use of IRAD IVC**



Endovascular Treatment

Stent: ☐ Covered ☐ Uncovered

Vascular Access: ☐ Femoral ☐ Axillary ☐ Iliac

Closure of all Thoracic Entries: ☐ Y ☐ N

Type of graft

☐ Medtronic ☐ Bolton
☐ Gore ☐ Endomed
☐ Cook ☐ Djumbodis
☐ Jotec

Model:

Proximal Flare ☐ Y ☐ N

Proximal Free Flow ☐ Y ☐ N

Proximal Stented Zone

☐ Ascending Aorta
☐ Aortic Arch
- ☐ Zone 0
- ☐ Zone 1
- ☐ Zone 2
- ☐ Zone 3

☐ Descending Aorta
- ☐ Above the diaphragm
- ☐ Below the diaphragm

Distal Stented Zone

☐ Descending Aorta
- ☐ Above the diaphragm
- ☐ Below the diaphragm

☐ Thoraco-Abdominal Aorta

Adjunctive Procedure: Surgical

☐ Total Debranching
☐ Innominate to Carotid to Subclavian Bypass
☐ Carotid to Subclavian Bypass
☐ Abdominal Branch Vessel Revascularization
☐ Femoro=Femoral Bypass
☐ Thoracic Fenestration
☐ Abdominal Fenestration

Adjunctive Procedure: Interventional

☐ Embolization
☐ Branch Vessel Stenting
☐ Fenestration

Number of grafts

Proximal graft size mm

Distal graft size mm

Total graft length mm

IRAD

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TEVAR in Acute Type B Aortic Dissection

Insights from the International Registry of Acute Aortic Dissection (IRAD), Interventional Cohort (IVC)

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Presented at AHA 2014

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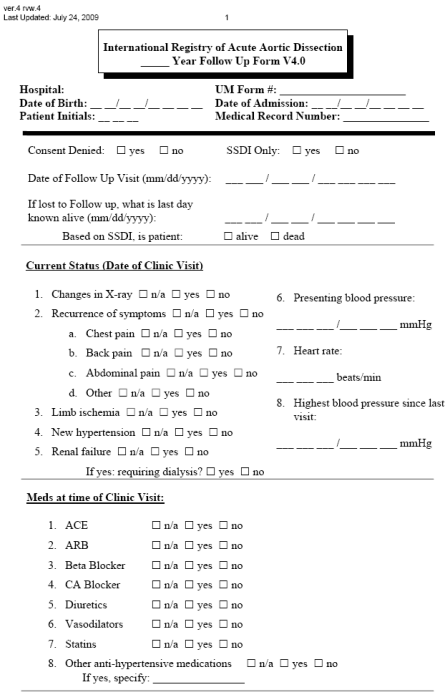
- **Larger use of new follow-up form**



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Last Updated: July 24, 2009 1

International Registry of Acute Aortic Dissection
____ Year Follow Up Form V4.0

Hospital: **UM Form #:** _____
Date of Birth: __ __/__ __/__ __ __ __ **Date of Admission:** __ __/__ __/__ __ __ __
Patient Initials: __ __ __ **Medical Record Number:** _____

Consent Denied: ☐ yes ☐ no SSDI Only: ☐ yes ☐ no

Date of Follow Up Visit (mm/dd/yyyy): ___ ___ / ___ ___ / ___ ___ ___ ___

If lost to Follow up, what is last day known alive (mm/dd/yyyy): ___ ___ / ___ ___ / ___ ___ ___ ___

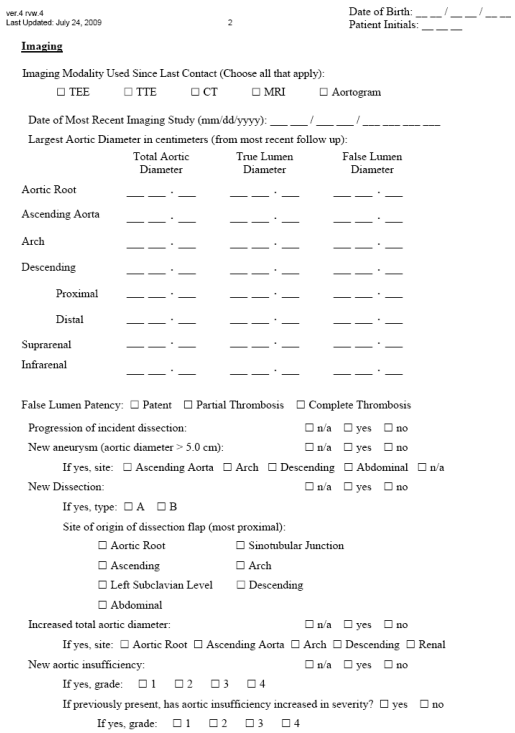
Based on SSDI, is patient: ☐ alive ☐ dead

Current Status (Date of Clinic Visit)

1. Changes in X-ray ☐ n/a ☐ yes ☐ no
2. Recurrence of symptoms ☐ n/a ☐ yes ☐ no
   a. Chest pain ☐ n/a ☐ yes ☐ no
   b. Back pain ☐ n/a ☐ yes ☐ no
   c. Abdominal pain ☐ n/a ☐ yes ☐ no
   d. Other ☐ n/a ☐ yes ☐ no
3. Limb ischemia ☐ n/a ☐ yes ☐ no
4. New hypertension ☐ n/a ☐ yes ☐ no
5. Renal failure ☐ n/a ☐ yes ☐ no
   If yes: requiring dialysis? ☐ yes ☐ no
6. Presenting blood pressure:
   ___ ___ ___ /___ ___ ___ mmHg
7. Heart rate:
   ___ ___ ___ beats/min
8. Highest blood pressure since last visit:
   ___ ___ ___ /___ ___ ___ mmHg

Meds at time of Clinic Visit:

1. ACE ☐ n/a ☐ yes ☐ no
2. ARB ☐ n/a ☐ yes ☐ no
3. Beta Blocker ☐ n/a ☐ yes ☐ no
4. CA Blocker ☐ n/a ☐ yes ☐ no
5. Diuretics ☐ n/a ☐ yes ☐ no
6. Vasodilators ☐ n/a ☐ yes ☐ no
7. Statins ☐ n/a ☐ yes ☐ no
8. Other anti-hypertensive medications ☐ n/a ☐ yes ☐ no
   If yes, specify: _____



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Date of Birth: __ __ / __ __ / __ __
Patient Initials: __ __ __

Imaging

Imaging Modality Used Since Last Contact (Choose all that apply):
☐ TEE ☐ TTE ☐ CT ☐ MRI ☐ Aortogram

Date of Most Recent Imaging Study (mm/dd/yyyy): ___ ___ / ___ ___ / ___ ___ ___ ___

Largest Aortic Diameter in centimeters (from most recent follow up):

	Total Aortic Diameter	True Lumen Diameter	False Lumen Diameter
Aortic Root	___ ___ . ___	___ ___ . ___	___ ___ . ___
Ascending Aorta	___ ___ . ___	___ ___ . ___	___ ___ . ___
Arch	___ ___ . ___	___ ___ . ___	___ ___ . ___
Descending	___ ___ . ___	___ ___ . ___	___ ___ . ___
Proximal	___ ___ . ___	___ ___ . ___	___ ___ . ___
Distal	___ ___ . ___	___ ___ . ___	___ ___ . ___
Suprarenal	___ ___ . ___	___ ___ . ___	___ ___ . ___
Infrarenal	___ ___ . ___	___ ___ . ___	___ ___ . ___

False Lumen Patency: ☐ Patent ☐ Partial Thrombosis ☐ Complete Thrombosis

Progression of incident dissection: ☐ n/a ☐ yes ☐ no
New aneurysm (aortic diameter > 5.0 cm): ☐ n/a ☐ yes ☐ no
If yes, site: ☐ Ascending Aorta ☐ Arch ☐ Descending ☐ Abdominal ☐ n/a
New Dissection: ☐ n/a ☐ yes ☐ no
If yes, type: ☐ A ☐ B
Site of origin of dissection flap (most proximal):
☐ Aortic Root ☐ Sinotubular Junction
☐ Ascending ☐ Arch
☐ Left Subclavian Level ☐ Descending
☐ Abdominal
Increased total aortic diameter: ☐ n/a ☐ yes ☐ no
If yes, site: ☐ Aortic Root ☐ Ascending Aorta ☐ Arch ☐ Descending ☐ Renal
New aortic insufficiency: ☐ n/a ☐ yes ☐ no
If yes, grade: ☐ 1 ☐ 2 ☐ 3 ☐ 4
If previously present, has aortic insufficiency increased in severity? ☐ yes ☐ no
If yes, grade: ☐ 1 ☐ 2 ☐ 3 ☐ 4

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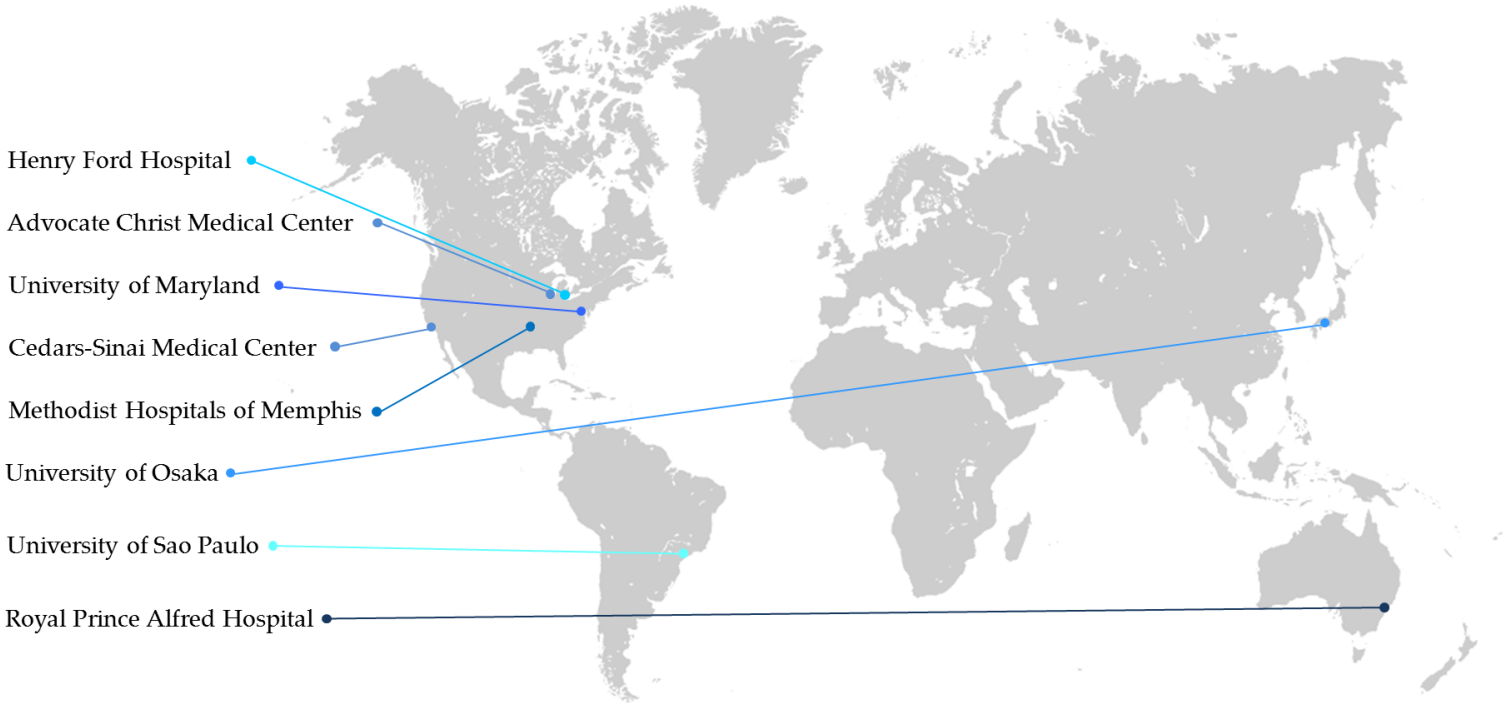
- **New sites**



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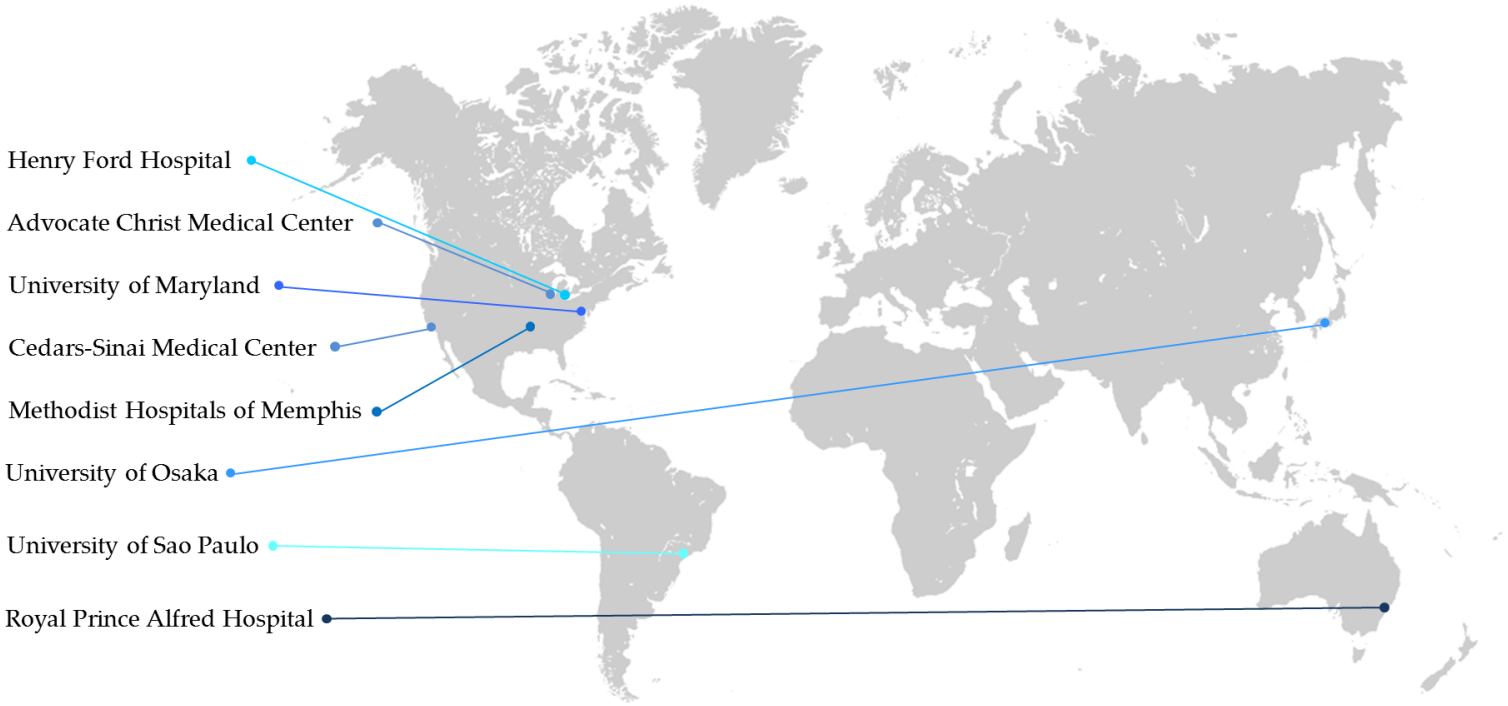

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- **New sites**

1. Royal Prince Alfred Hospital, Sydney, Australia
2. National Taiwan University, Taipei, Taiwan
3. Tokyo Medical University, Tokyo, Japan
4. University of Osaka, Osaka, Japan
5. Zhongshan Hospital, Shanghai, China
6. Emory University, Atlanta, Georgia
7. University of Sao Paulo, Sao Paulo, Brazil
8. Methodist Health System, Houston, Texas
9. Barnabas Health, West Orange, New Jersey
10. Monaldi Hospital, Naples, Italy
11. St. George Hospital, London, England
12. Technischen Universität München, Munich, Germany
13. St. Thomas Health, Nashville, United States
14. Toronto General Hospital, Toronto, Canada
15. The Prairie Heart Institute, Herrin, United States
16. European Pompidou Hospital, Paris, France
17. University of Alberta, Alberta, Canada
18. University of Perugia, Perugia, Italy
19. Virginia Commonwealth University, Richmond, USA
20. Kings College, London, England

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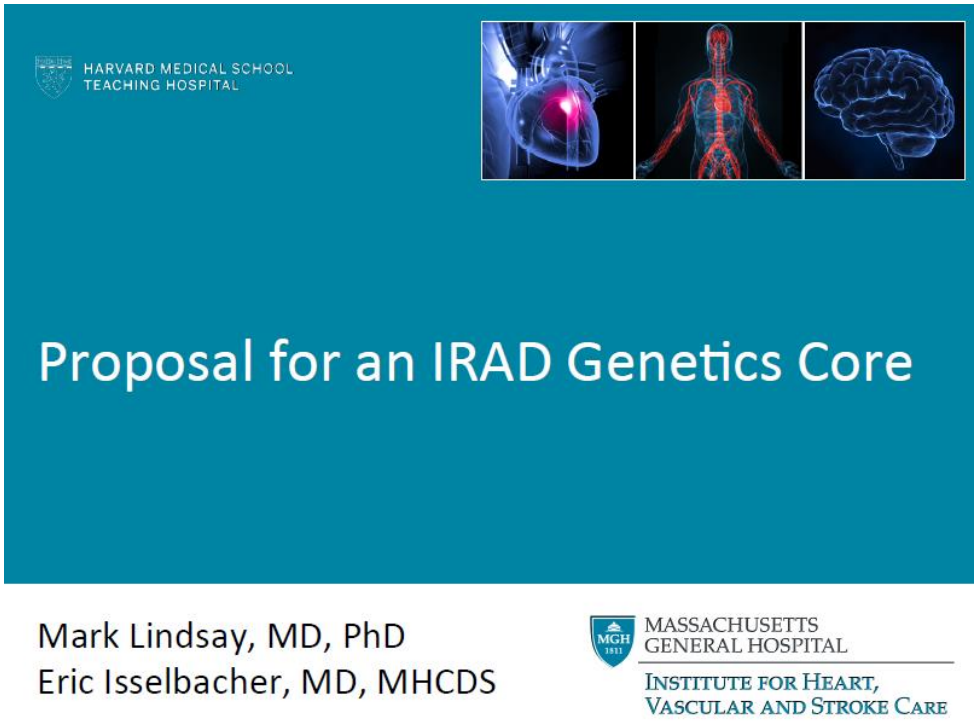
- **Genetics Core**



IRAD - Conclusions

- ……with contemporary information on acute aortic conditions, IRAD provides a valuable platform for modern strategic planning and teaching, and serves at the same time as a hypothesis generating source of new information on an old disease.

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- ……with contemporary information on acute aortic conditions, IRAD provides a valuable platform for modern strategic planning and teaching, and serves at the same time as a hypothesis generating source of new information on an old disease.

- Disease is very old and nothing about it has changed.

- It is we who change, as we learn to recognize what was formerly imperceptible

- Charcot