CARTOSMARTTOUCH™ Technology for every patient, every physician every arrhythmia

Can we reproduce the ablation strategy to standardize a successful paroxysmal AF treatment?

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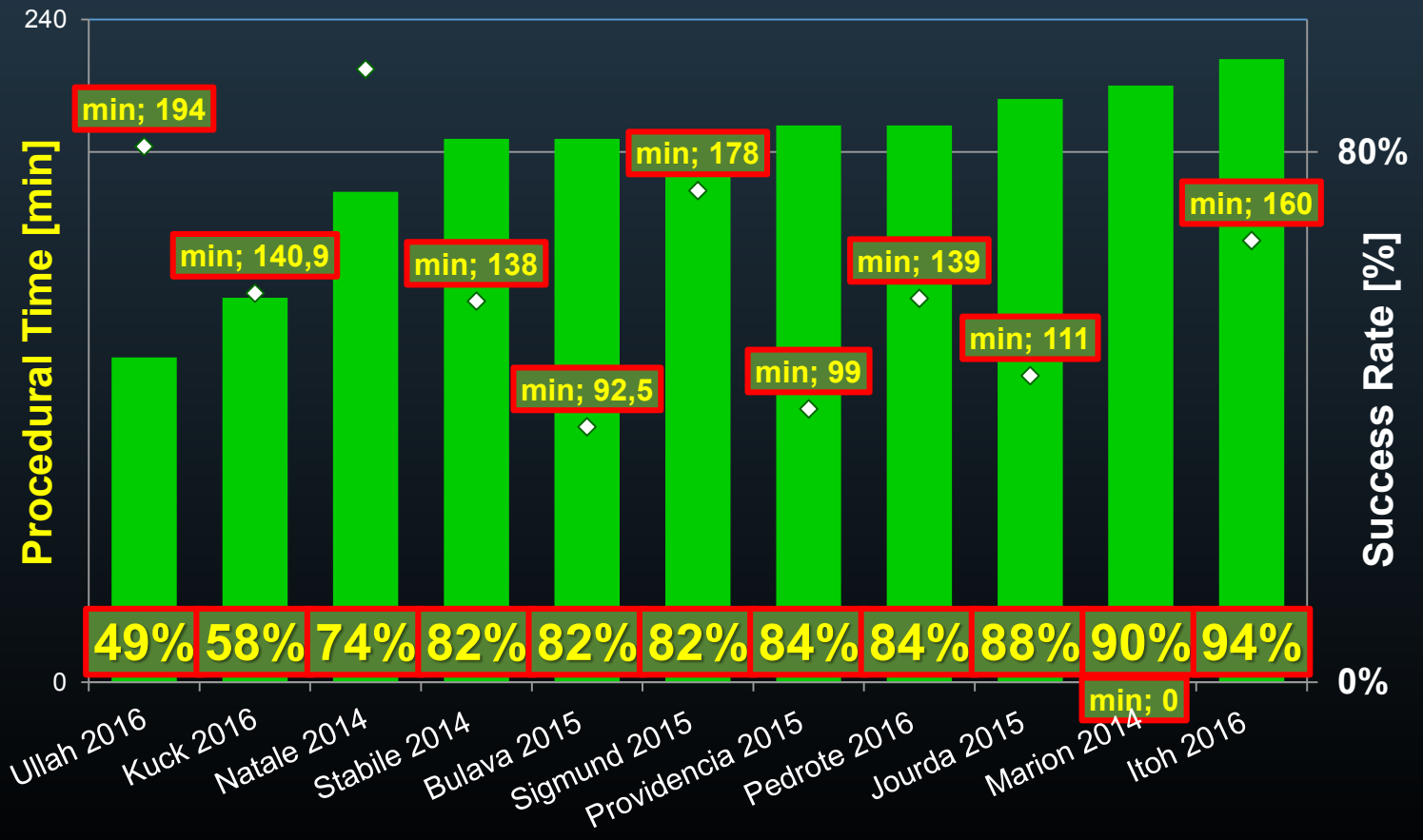
State of the art

High variability in paroxysmal AFIB ablation outcome due also to the absence of a standardized workflow



State of the art

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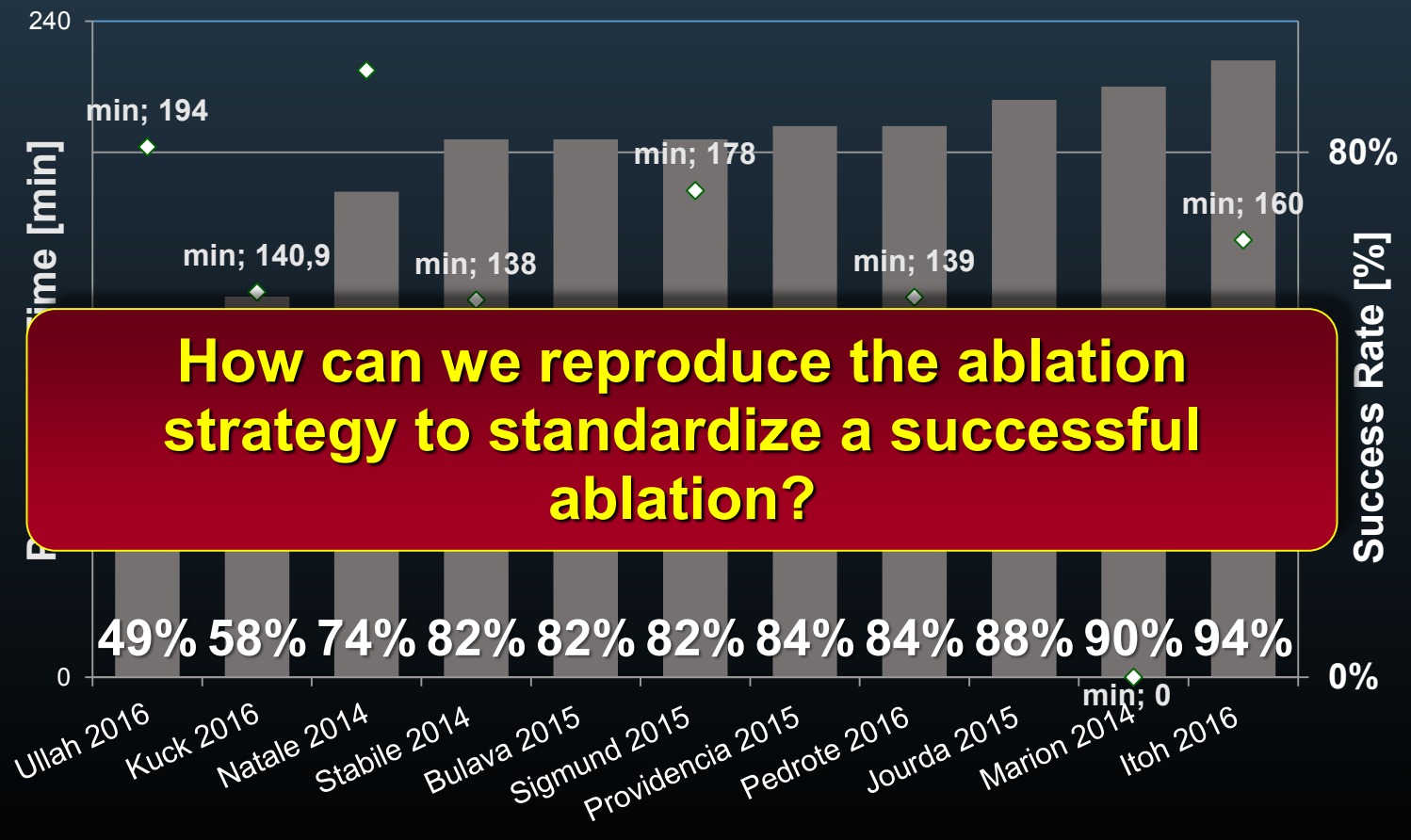

How can we reproduce the ablation strategy to standardize a successful ablation?

RF lesion size and depth

- Current density tip catheter
- Tip size
- Power
- Cooling
- Irrigation
- Contact stabililty
- Time

Zipes, From cell to bedside, 2014

RF lesion size and depth

Current density tip catheter

Tip size

Power

Cooling

Irrigation

Contact stabililty

Time

Zipes, From cell to bedside, 2014

RF lesion size and depth

Current density tip catheter

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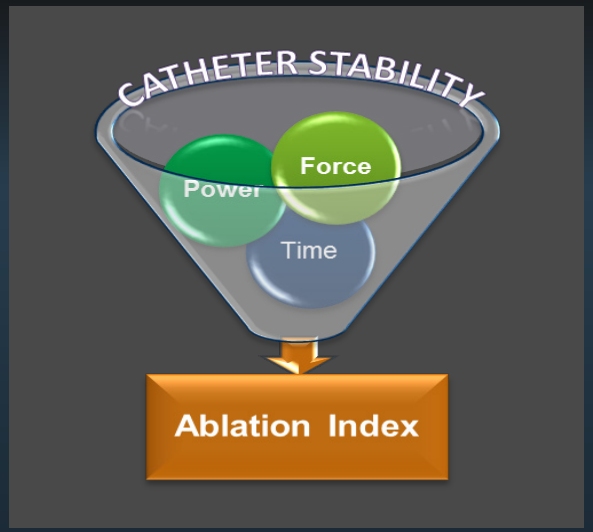
Zipes, From cell to bedside, 2014

Ablation Index



Animal

Retrospective Study

Prospective Study

Formula

Identification

Animal study: formula identification

Retrospective animal study (dog ventricle)

$$Index = \left(k * \int_0^t CF^a(\tau) P^b(\tau) d\tau \right)^c$$

Force

Power

Time

HRS 2012, Hiroshi Nakagawa, MD, PhD et al

Greater impact of **Power** over contact force

$$\int Force\ Time$$

Animal

Retrospective Study

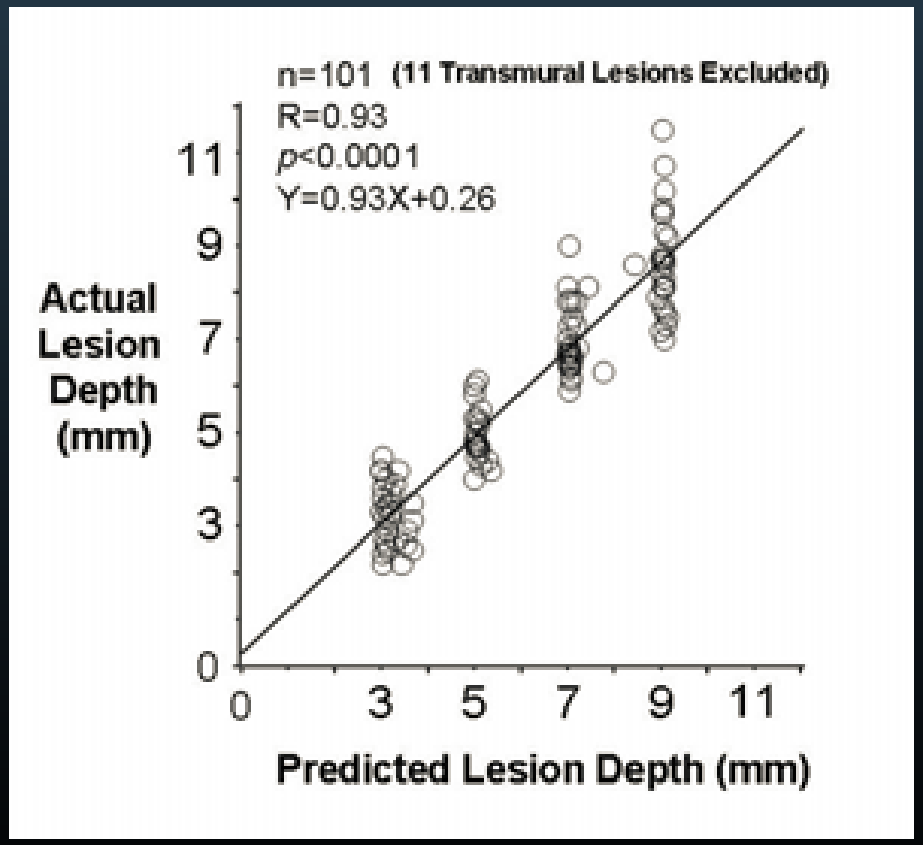
Formula Identification

Prospective Study

Formula Validation

Animal study: formula validation

Lesion dimension prediction via formula



Lesion depth prediction +/- 1 mm

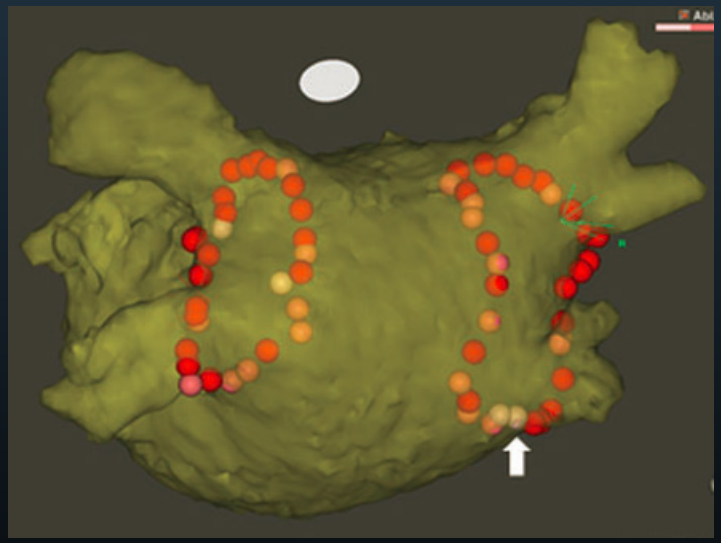
HRS 2013, Hiroshi Nakagawa, MD

	Animal	Human
Retrospective Study	Formula Identification	Ablation index Thresholds Identification
Prospective Study	Formula Validation	

Human study: retrospective validation

Can formula predict acute reconnection?

159 pts



Low ablation index is correlated to reconnection (adenosine after 20 minutes)

There is a **minumum value** under which there is *constantly acute reconnection*

Regional difference

Posterior/inferior walls
AI = 380

Anterior/superior walls
AI = 550

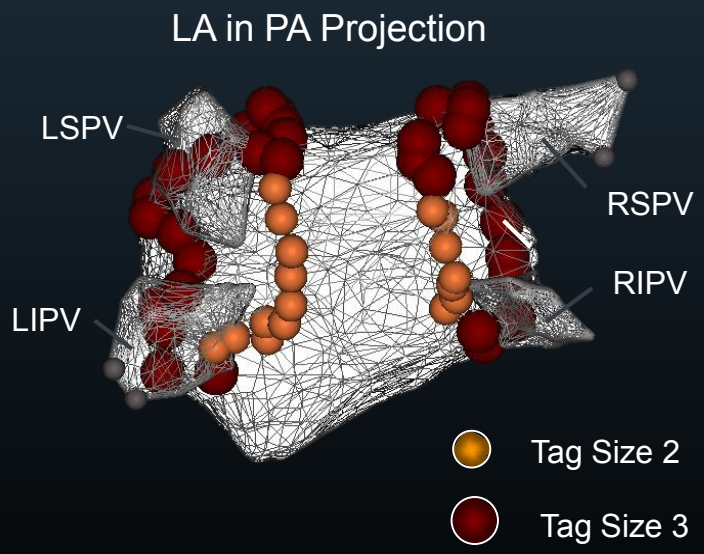
HRS 2013, Hiroshi Nakagawa, MD

	Animal	Human
Retrospective Study	Formula Identification	Ablation index Thresholds Identification
Prospective Study	Formula Validation	Ablation Index Clinical outcomes

Human study: prospective validation 1

Applying target values: 380/550

43 pts



PVI deconnection with single encircling 90% (77/86)

Adensoine acute reconnection 5% (4/86)

Follow up 2-12 months: 2% recurrence (1/43)

HRS 2015, Hiroshi Nakagawa, MD

Human study: prospective validation 2

Applying target values: 380/550

Parameters	CF (n=50)	'CLOSE' (n=50)	
Procedure time, min	194±42	143±27	p<0.0001
Ispilateral encirclement			
RF time, min	27.7±7.4	17.8±3.8	p<0.0001
Isolation after 1st circle, n	55/100 (55%)	98/100 (98%)	p<0.0001
Isolation proof to adeno/waiting, n	76/100 (76%)	97/100 (97%)	p<0.01
FU at 6 months without blanking			
Free of Afib, n (%)	42/50 (84%)	48/50 (96%)	p<0.05
N of repeats, n (%)	7 (14%)	2 (4%)	p<0.05

138 pts

Follow up 2-14 months: 96%

Comparison with CF workflow

Shorter RF time
Shorter procedural time
Better outcome

Duytschaever Webinar Incathlab Nov. 2015,unpublished

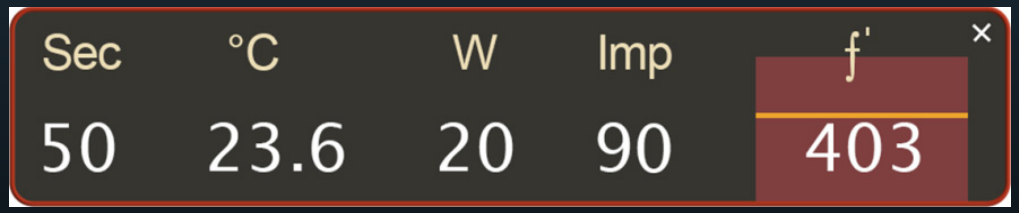
Our experience

Ablation index settings

Ablation index settings

During ablation, an Ablation Index progress bar is added to the ablation Energy Indication toolbar. (labeled ƒ')

Ablation Index Indication:
Below low threshold



Ablation Index Indication:
Above low threshold, below high threshold

Ablation Index Indication:
At or above high threshold


Study Map Point Catheter ECG Display Imaging Window Tools Help
Setup
HW Study Loc. Cath. Map
Replay
Real time
Verification
Routed channel CS 7-8
2-LA (1096, 0) Resp
0.43 mV Bi 1.40 mV
Abl.Idx
1.02 s T.Time 47.95 s
Ablation
Start
0.62
Acquire
CL LAT Imp
1153 N/A 007 152
AP PA LAO RAO LL RL INF SUP
None
CS 9-10
CS 7-8
CS 5-6
CS 3-4
CS 1-2
LASSO 1-2
LASSO 3-4
LASSO 5-6
LASSO 7-8
LASSO 9-10
MAP 1-2
MAP 3-4
V5
Timeline
200 mm/sec

Conclusions

PROs

Riproducibility:
not only force, power and time and **stability**

Lesion **contiguity**

Useful for **starters**

More value to **visitag**

CONs

Dragging technique vs **point by point**

All atria are created equal?

Local potential amplitude is not considered

Useful to decide **what to do,**
more useful to measure **what we have done**