

Cardiac Rhythm Management

Features

IRS^{plus}

**Intrinsic Intrinsic Rhythm
Support – IRS^{plus}.**
**Balance between AV Delay and
Haemodynamics.**



Agenda

Products offering the feature

-  Clinical background and literature
-  Function description – Pacemakers
-  Function description – ICDs
-  Feature advantages
-  Clinical results

IRS^{plus}

Implants with IRS^{plus}

- Cylos DR-T
- Philos II DR-T, DR, SLR
- Talos DR, D, SLR
- Belos DR, DR-T, A+, A+/T
- Lexos DR, DR-T, A+, A+/T
- Xelos DR-T
- Lumos-DR, DR-T





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Clinical background

Promote intrinsic conduction but not at the expense of haemodynamics

Many studies have shown that unnecessary chronic right ventricular apical pacing can cause a variety of adverse effects, such as:

- Congestive heart failure
- Atrial fibrillation
- Stroke



Literature

1. Sweeny et al., Circulation. (23),2003
2. Nielsen et al., JACC 42 (4),2003
3. Sweeny et al., Circulation (23), 2003

Clinical Rationale

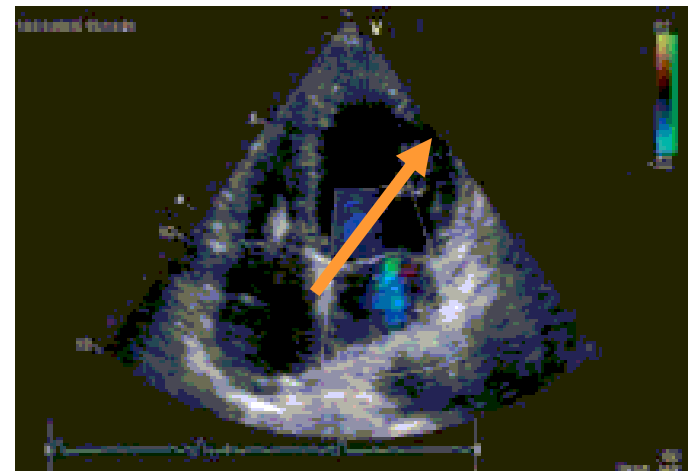
**Long non-physiological
AV-delays lead to:**



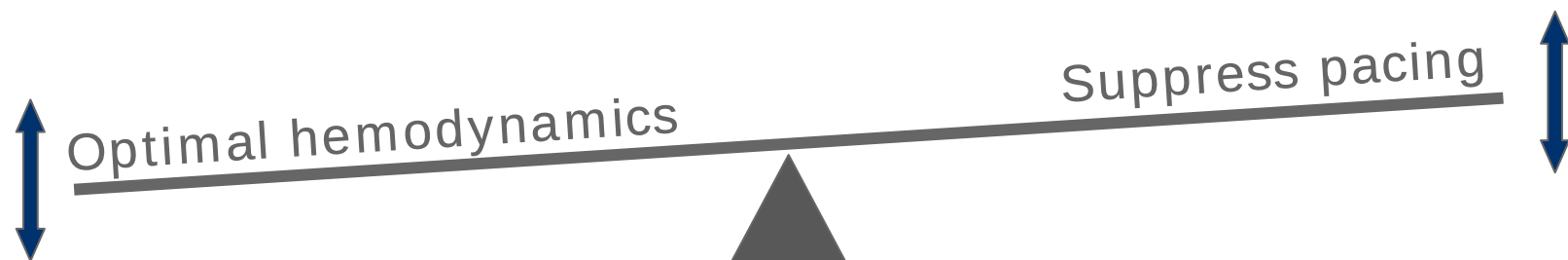
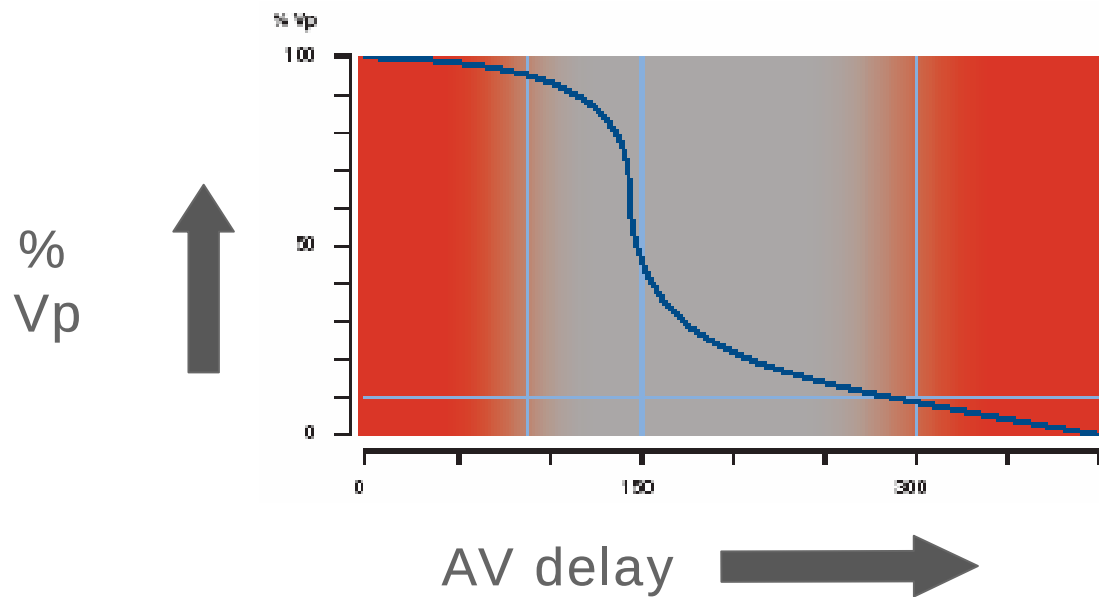
- Mitral valve regurgitation
- Decreased LV filling times
- Loss of 1:1 AV conduction under load



Reduced cardiac output



Clinical proposal: Find the perfect balance with IRS^{plus}





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Programming of AV Hysteresis

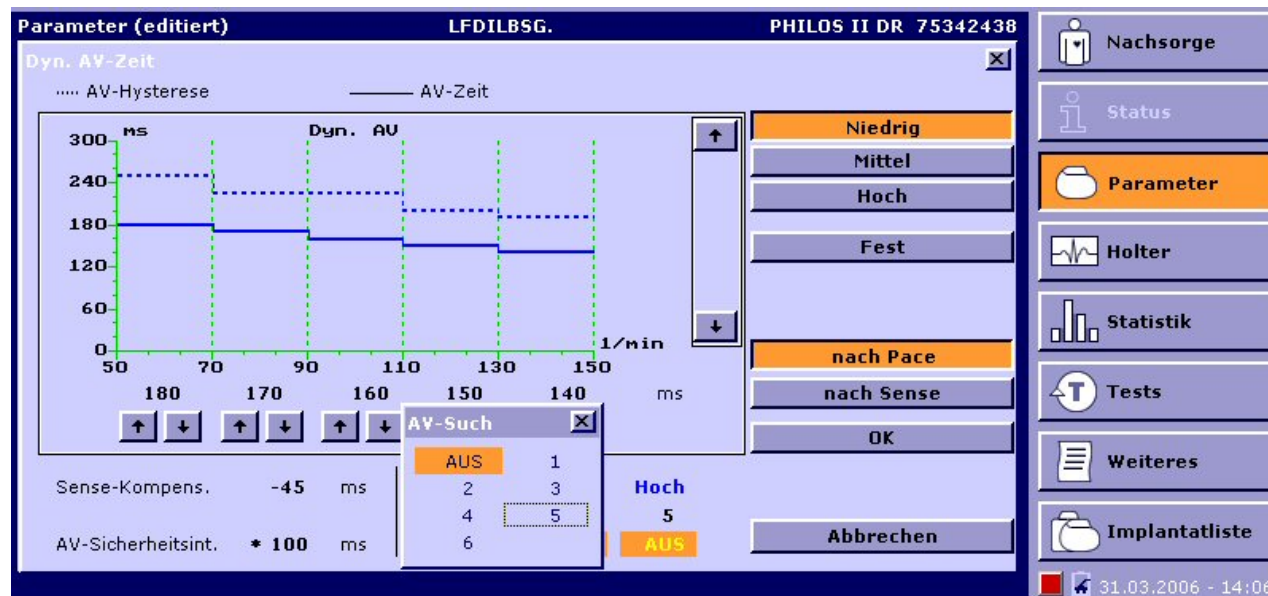
Conventional programming

Parameters (permanent)			PHILOS DR 75100001		
Mode	DDD		Atr.	Ven.	
Basic/Night Rate...	60/60	ppm	Pulse Amplitude	3.6	3.6 V
Rate Hysteresis...	OFF	ppm	Pulse Width	0.40	0.40 ms
Dynamic AV Delay...	180/140	ms	ACC ...	On	
Magnet Effect	SYNC		ACC Status	*	Disabled
			Sensitivity	1.0	2.5 mV
Upper Rate	130	ppm	Refract. Period	425	250 ms
WRL at	* 130/141	ppm	PVARP min.	235	ms
Mode Switching...	DDIR/140	ppm	ARP Extension	0	ms
VES Lock-in Protection	OFF		Cross Channel Bl.	56	32 ms
PMT Protection...	ON		Far Field Blanking	56	ms
Overdrive...	-----	ppm	Polarity Pace	BIPL	BIPL
Sensor/Rate Fading...	105/OFF	ppm	Polarity Sense	BIPL	BIPL
			Lead Check	OFF	OFF
Calculated ERI	*4 Y. 11 Mo.		Patient...		
Print			Program sets	Temporary	Program Interrogate

Turning on the AV Hysteresis package:
In the sub screen of the Dynamic AV Delay

Subscreen Dynamic AV Delay

Conventional programming



6 clicks to activate the complete Hysteresis package!

Activation of the Hysteresis with one click

IRS^{plus} comes with the following AV hysteresis package

- AV hysteresis
- AV scan hysteresis
- AV repetitive hysteresis

Parameters (edited) XXXXXXXXXXXXXXXX PHILOS II DR-T 75341815

Mode	DDD	Atr.	Ven.
Basic/Night Rate...	60/60 ppm	2.4	* 3.6 V
Rate Hysteresis...	OFF ppm	0.40	0.40 ms
IRSplus	OFF		On
Dynamic AV Delay...	180/140 ms		OK
Magnet Effect	AUTO		2.5 mV
Upper Rate	130 ppm		
WRL at	* 130/141 ppm	425	250 ms
Mode Switching...	DDIR/160 ppm	235	ms
VES Lock-in Protection	OFF	56	32 ms
PMT Protection...	ON	56	ms
Overdrive...	----- ppm	BIPL	BIPL
Sensor/Rate Fading...	120/OFF ppm	BIPL	BIPL
Home Monitoring...	ON	OFF	OFF
Calculated ERI	*6 Y. 3 Mo.		

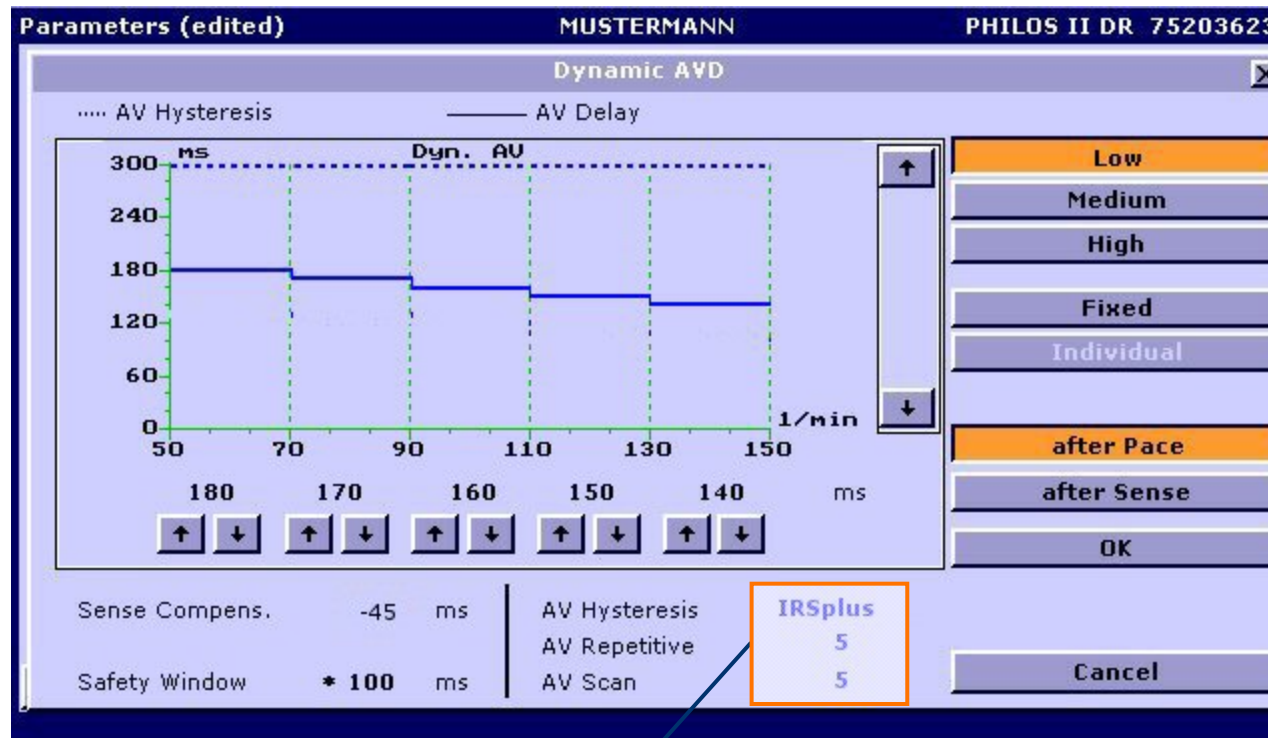
IRSplus ON

Promotion of Intrinsic Conduction

OK Cancel

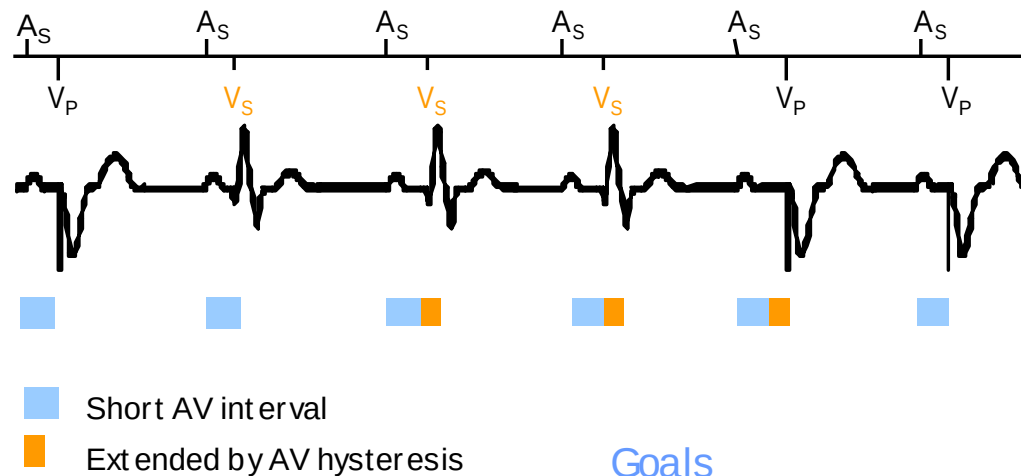
Print Help Program sets Temporary Program Interrogate

'One click' programming to support intrinsic conduction



IRS^{plus} activates the whole AV Hysteresis package.
The AV Hysteresis is set to 300 ms.

Philos / AV Hysteresis

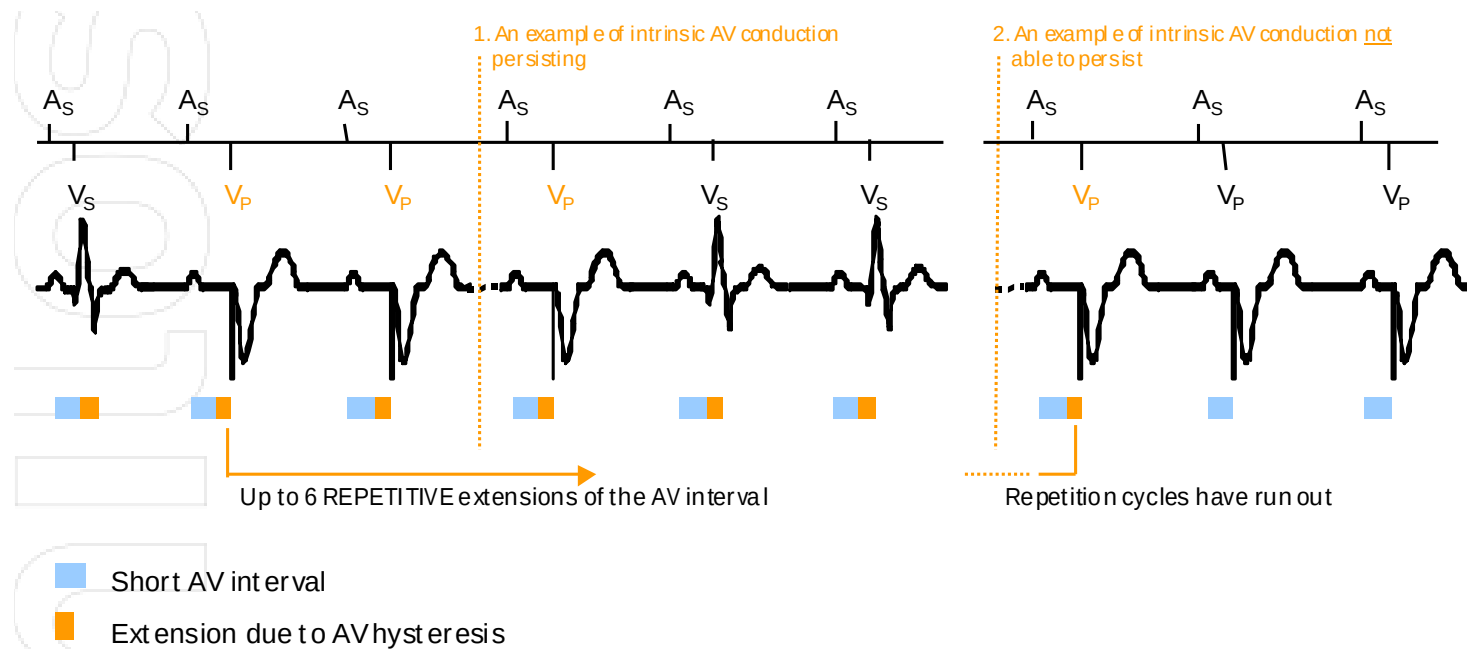


Goals

- Support the intrinsic AV conduction
- Program optimal AV intervals
- Reduce / avoid ventricular fusion systoles
- Conserve energy for pacing — extend the service time
- Optimize hemodynamics

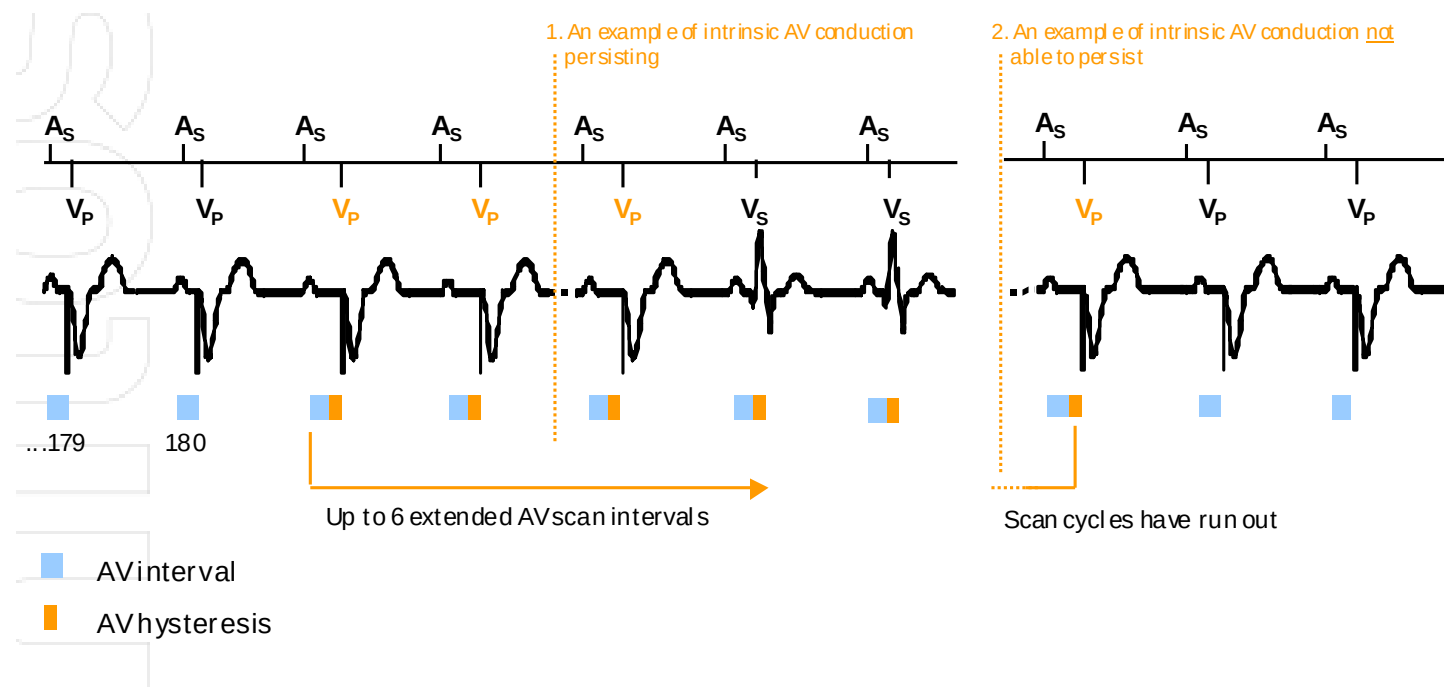
➔ AV hysteresis is advantageous for patients with intermittent AV block

Philos / AV Repetitive Hysteresis



→ AV repetitive hysteresis is another opportunity to maintain and support intrinsic AV conduction

Philos / AV Scan Hysteresis



→ Another possibility for finding intrinsic AV conduction



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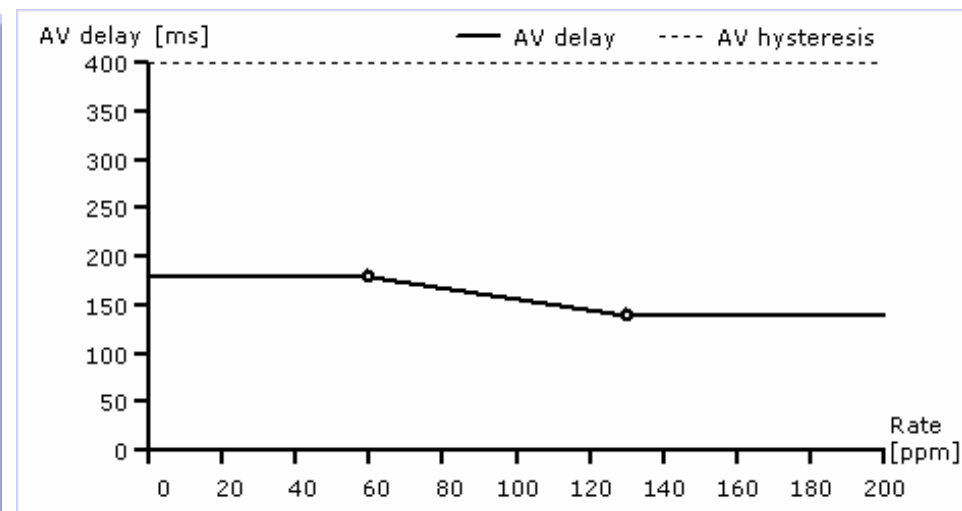
Activation of the Hysteresis with one click

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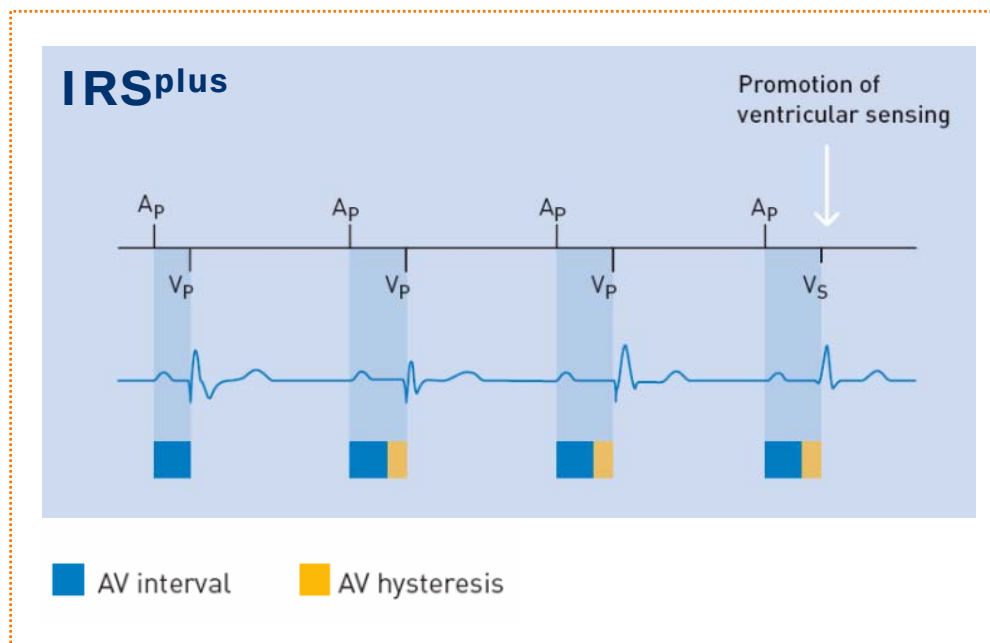
- AV hysteresis
- AV repetitive hysteresis
- AV scan hysteresis

AV hysteresis mode	IRS ^{plus}
AV hysteresis	400 ms
AV repetitive	5
AV scan	5

	Permanent	Post Shock
Mode	DDD	
Basic day/night rate...	60/OFF	ppm
Rate hysteresis...	OFF	ppm
IRS ^{plus}	ON	IRS ^{plus} ☒
AV delay...	180/140	☐ OFF ☒ ON
Upper rate...	130/WKB	
Mode switching...	DDI/160	ppm
PMT protection...	ON	
Sensor...		ppm
Post-shock duration		OFF mm:ss



Intrinsic Rhythm Support IRS^{plus}



AV repetitive hysteresis

- AVD extension after each Vs
- 1-10 cycles @400ms

AV scan hysteresis

- Auto AVD extension after 180 cycles of Vp
- 1-10 cycles @400ms

IRS^{plus} maintains an extended AV delay for several cycles allowing intrinsic rhythm to be established



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Intrinsic Rhythm Support

IRS^{plus} offers

- Effective reduction of unnecessary RV pacing
- Balanced approach to necessary RV pacing and optimal AV delay
- Optimized hemodynamics via avoidance of non-physiological AV delays
- Simple, easy to use "one touch" button programming
- Available across all PM-families and ICDs



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The INTACT Study

Programming an AV-hysteresis of 100ms to 245ms led to an 80 % reduction in Vpacing