Utilization of Automated Device Algorithms
Bibliography

- UMJ
- OF
- $FTDSJCFXIFOUIFGPMMPXJOHGFBUVSFTBSFNPTUBOE
- MFBTU IFMQGVM
- "EBQUJWF17"31
- TFBSDI
- .71"*TBGF3
- E JU IJ
- FTX
- D
- OH
- USJBMQBDJOHQSFGFSFODF
- $PODMVEF XJUI BO PWFSBMM QSPHSBNNJOH TUSBUFHZ
Dynamic PVARP

Maximum PVARP

Minimum PVARP

MTR interval

LRL interval
I am not sure if this is even readable.
Tracking of a fast atrial rate causes loss of CRT at 120 bpm - demonstrates importance of having a high UTR

DDD 60 ppm, 120 ppm, 130 ms
Brainwave patterns in the EEG provide insights into cognitive functions.

- EEG patterns can offer valuable information about brain activity.


- A high-risk strategy should be taken regarding the
  high blood pressure.

- Further tests must be taken if the results are uncertain.
in case of
the of cases
some of the
factors

The statue of David by Michelangelo is considered one of the greatest works of art.
These are some of the greatest statues
China has been at forefront against the
prevention and control of the COVID-19
coronavirus.
Manolis AS. PACE 2006; 29:298-315
- In certain circumstances of patients with congenital heart disease, the atrioventricular conduction system may show a delayed AV nodal conduction time.
## Table of Hysteresis Strategies

<table>
<thead>
<tr>
<th>Device Manufacturer</th>
<th>Strategy Description</th>
<th>Effect and Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotronik</td>
<td>AV Scan &amp; Repetitive Hysteresis I-Opt (combines both)</td>
<td>Extends AV Interval to Programmed Value &amp; allows for occasional block</td>
</tr>
<tr>
<td>Boston Scientific</td>
<td>AV Search Hysteresis</td>
<td>Extends AV Interval to Programmed Value</td>
</tr>
<tr>
<td>Ela/Sorin</td>
<td>DDD/AMC</td>
<td>Monitors intrinsic conduction and adds 50 ms to AV to a max of 300 ms</td>
</tr>
<tr>
<td>Medtronic</td>
<td>Search AV</td>
<td>Extends AV Interval Incrementally Until VS to a max of 320 ms at out-of-the-box settings</td>
</tr>
<tr>
<td></td>
<td>Search AV+ Adaptive</td>
<td><strong>Adapta/EnPulse®</strong> a max of 600 ms</td>
</tr>
<tr>
<td>SJM</td>
<td>Auto Intrinsic Conduction Search Ventricular Intrinsic Preference</td>
<td>Extends AV Interval to the Programmed Delta to a max of 350 ms</td>
</tr>
</tbody>
</table>
ошибка при передаче данных и ошибок

- ошибки при передаче данных и ошибок
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- ошибки при передаче данных и ошибок
- ошибки при передаче данных и ошибок
Programmed PVI = 150 ms
Programmed AVI = 175 ms
Programmed Hysteresis Delta = -30 ms
MVP Mode is clinically proven to reduce unnecessary right ventricular pacing to 0.5%† in patients with sinus node dysfunction and to 1.6%† in all pacing indicated patients studied.

† Median number
**DDD(R) Switch***
Ventricular support if loss of AV conduction is persistent

**Switch from DDD(R) to AAI(R)**
Continual checks for restoration of AV conduction occur to allow AAI(R) to be resumed promptly
2 consecutive blocked P waves
1. Do not have the upper rate behavior issues
   Long AV of 300 ms, PVARP of 300 ms
   TARP = 600 ms   2:1 Rate = 100 ppm MTR

2. Have DDD back-up should AV block develop compared to using a standard AAI mode

3. Takes the guess work out of how long to program the AV to allow intrinsic conduction
   - on the other hand how long is too long
Section 1

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Additional content of the section or subsection of the document is here
Olshansky et al. Results of Intrinsic RV Study. HRS May 17-20, 2006; Boston
[Image of an ECG waveform with annotations]

- A discussion on interpreting and understanding ECG waves and their implications for clinical diagnosis. The annotations highlight key features and markers for identifying various cardiac conditions.
Farfield sensing resulting in inappropriate M/S
2. Geroux L. Arch Mal Coeur 1998; 91:229
5. De Simone et al. PACE 2005; 28:S47-S49
The ECG interval patterns of normality can be used to determine whether certain ECG intervals are normal or indicate a pathological state.
• 长篇大论 长篇大论
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ソーシャルメディアの重要性

- ソーシャルメディアは、現代の社会においてますます重要な役割を果たしています。
- 情報の共有、コミュニケーションの場を提供し、新たなビジネス機会を創出する場ともなります。
- 企業や個人が、効果的にマーケティングやパーソナライズされたサービスを提供するのに役立っています。
- また、ソーシャルメディアは、情報の迅速な伝播と意見の交換の場でもあります。

ソーシャルメディアの活用

- ソーシャルメディアを活用することで、企業は魅力的なパーソナリティを醸成し、顧客との信頼関係を築くことができます。
- 特定のターゲットを目的とした広告を効果的に配信し、ブランドの知名度を高めることができます。
- 顧客からのフィードバックを迅速に収集し、製品開発やサービス改善に活用することができます。
- オンラインで話題となるコンテンツを作成し、リアルタイムで情報発信することで、顧客との関わりを強化することができます。
2. Hermida et. al. PACE 2003;26:26-35
3. Chirifeet. al. PACE 2003;26:2103-2110
Gillis. Heart Rhythm, November 2006: 1367-72
Preference pacing for a programmable number of beats.

Programmable interval decrement (e.g., 30 ms) from previous pacing interval.

20 ms search interval increment.
<table>
<thead>
<tr>
<th>PACING ALGORITHMS TO PREVENT AF ONSET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dynamic atrial overdrive pacing</strong></td>
</tr>
<tr>
<td><strong>PAC suppression</strong></td>
</tr>
<tr>
<td><strong>Post PAC response</strong></td>
</tr>
<tr>
<td><strong>Prevent sudden rate decreases</strong></td>
</tr>
</tbody>
</table>
Purpose of the study was to identify pts with specific onset patterns of PAF.

METHODS DDD pacemakers were implanted in 112 standard brady pts with a hx of PAF. Diagnostic data were analyzed after 97.5 ± 40.9 days. According to the frequency of (PACs) during the 5 min before AF onset, pts were assigned to 1 of 3 groups: group A (high PAC activity), group B (moderate PAC activity), or group C (low PAC activity).

RESULTS AF burden was lower in group A (4.6% ± 2.4%) than group B (15.8% ± 3.0%, P = .003) and group C (15.5% ± 3.1%, P = .003). Fewer AF episodes occurred in group A than group B P= .006.

CONCLUSION The coincidence of low PAC activity before AF onset, high AF burden, and extended arrhythmia episode duration appears to be the consequence of a high atrial substrate factor. In these "substrate fibrillators," the efficacy of pacing algorithms for maintenance of sinus rhythm may be limited. In contrast, "trigger fibrillators" exhibiting low AF burden despite high PAC incidence may represent the target population for specific PAC-suppressing pacing algorithms.
The text on the page is not legible. It appears to be a large amount of foreign characters and symbols that do not form coherent sentences or paragraphs. There are no visible headings or titles to indicate the topic or context of the text.
The graph shows the sensor rate over time, with two important events marked: the start of the search interval and the beginning of sinus tracking. The chart also includes data points for atrial paced events and atrial sensed events, indicating the progression through the search episode.
Onset of A-pace to onset of A-wave
The text on the page is not legible due to the quality of the image. It appears to be a page with text, but the text cannot be accurately transcribed.
Just because its there
A sail boat sails on the sea
and' a man that
that the sea
together the sea
the man the sea
together the sea'.
the" that 'man
Goal: Restore the abnormal cardiac rhythm as close to normal as possible!
Adapta Pacing System

Appendix A: Additional Features (continued)

NCAP (Non-Competitive Atrial Pacing)
NCAP may minimize atrial competition. Atrial backfiring can be triggered by an atrial pace falling within the atrium's relative refractory period. NCAP is intended to avoid these occurrences.

- When programmed ON, NCAP operation prevents an atrial pace from occurring within the programmed NCAP interval following a refractory atrial sensed event. The delay causes the AV interval to shorten in order to maintain a stable ventricular rate.
- This feature may be programmed ON or OFF only in MVP, DDDR, and DDD modes.
- Nominal setting is ON, 300 ms.

NCAP Details

Atrial Timing
- When NCAP is programmed ON, a refractory sensed atrial event falling in the PVARP starts a programmable NCAP period during which no atrial pacing is allowed to occur.

If a sensor-driven or lower rate pace is scheduled to occur during the NCAP period, the VA interval is extended until the NCAP period expires. If no pace is scheduled to occur during the NCAP period, timing is unaffected. Pacing occurs at the end of the VA interval, unless inhibited.

Atrial refractory sensed event occurring during the NCAP period starts a new NCAP period.

Ventricular Timing
- When an atrial pace is delayed by the NCAP operation, the pacemaker attempts to maintain a stable ventricular rate by shortening the AV interval. that follows.

It will not, however, shorten the AV interval to less than 30 ms. When a relatively high lower rate and long PVARP are programmed, NCAP may result in ventricular pacing slightly below the Lower Rate.
Adapta Pacing System

Appendix A: Additional Features (continued)

Evaluating Sinus Preference

Use the Pacer Atrial Sensing on the Quick Link II screen to estimate Sinus Preference performance and/or consult the Atrial Base Histogram, automatically printed with initial interrogation. It is to see an increase in atrial sensed events with Sinus Preference ON.

Titrating Sinus Preference

If the atrial histogram and/or percent pacing indicates a low percentage of atrial sensed events, consider programming a larger Sinus Preference Zone or more frequent occlusion.

If the patient complains of fatigue, dizziness, consider decreasing the Sinus Preference Zone or increasing the search interval. Patients with significant symptomatic incapacity may require atrial rate responsive pacing support. Consider programming Sinus Preference OFF.

Breakthrough (Intrinsic) Episodic

If the intrinsic rate exceeds the sensed rate and remains the pacemaker will continue to use the intrinsic rate as long as it remains within the Sinus Preference Zone.

Programming Sinus Preference

- Track the parameters seen in access programming options
- Select the intrinsic activation field
- Select Sinus Preference ON (available only in the DDD mode)
- Choose the Sinus Preference Zone (minimal 20 bpm)
- Choose the Search Interval (normal every 10 minutes)
- Select OK and then Program to complete the steps
Gillis. Heart Rhythm, November 2006: 1367-72
PACE 2003;26:803
1. Bernheim. JACC 2005;45:1482
Gillis. Heart Rhythm, November 2006: 1367-72
آرئه ارائه شخصیت های مختلف

- در اولین قسمت، به آیین نوازی در جریان فنیکس و پیامدهای آن پرداخته می‌شود. این آیین به وسیله شخصیت‌های جدیدی از جمله پاپیروس و الیسون، بیان و نواخته می‌شود.

- در قسمت دوم، به ترسیم زندگی شخصیت‌های درون‌نشین و زناشویی پرداخته می‌شود. این قسمت به وسیله شخصیت‌هایی همانند رزالت و پولیس، بیان و درک می‌شود.

- در قسمت سوم، به آیین نوازی در جریان فنیکس و پیامدهای آن پرداخته می‌شود. این آیین به وسیله شخصیت‌های جدیدی از جمله پاپیروس و الیسون، بیان و نواخته می‌شود.

- در قسمت چهارم، به روند پیامدهای نتیجه‌گیری‌های اخیری از جمله همبستگی و مشارکت در آیین و پیامدهای آن پرداخته می‌شود. این قسمت به وسیله شخصیت‌های جدیدی از جمله پاپیروس و الیسون، بیان و نواخته می‌شود.

- در قسمت پنجم، به نحوی ساختار آیین نوازی و پیامدهای آن پرداخته می‌شود. این قسمت به وسیله شخصیت‌های جدیدی از جمله پاپیروس و الیسون، بیان و نواخته می‌شود.
1. SPHSBNNJOH1SBDUJDFT
2. y
3. *GJU㛣TJOUIFEFWJDF
4. "UVSOJUPONFOUBMJUZ㛤'
5. JF
6. SBVFNPEVMBUJPO
7. NPEFTXJUDIJOH
8. 17$
9. BMHPSJUINT
10. 1.5USFNJOBUJPO
11. TBGFUZQBDJOH
12. FUD
13. &RVJWBMFOUUPQSFTDSJCJOHNFETUPBQUXIP
14. DVSSFOUMZ
15. IBT
16. JOEJDBUJPOT
17. GPS
18. POMZ
19. UIFSFCZ
20. JODSFBTJOHUIFQPTTJCJMJUZPGQPUFOUJBMTJEFFGGFDUT
21. GSPN
22. VOOFDFTTBSZ
23. NFET
24. XJUIPVU
25. QSPWJEJOH
26. BOZ
27. GSPN
28. VOOFDFTTBSZ
29. NFET
30. XJUIPVU
31. QSPWJEJOH
32. BOZ
33. QPUFOUJBMCFOFGJU
Gehi AK et al. Evaluation & management of pts after ICD shock. JAMA 2006; 2839-47
CHAPTER something for example

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- something something something something something something something
- something something something something something something something
Adapta Pacing System

Clinical Situation

Atrial Fibrillation (AFib) may occur after spontaneous or therapeutic termination.

Solutions Post Mode Switch Overdrive Pacing

Post Mode Switch Overdrive Pacing can be programmed to drive overdrive atrial pacing to manage AFib:

- Mode Switch to DDDR occurs in response to an atrial tachyarrhythmia
- Upon termination of the atrial tachyarrhythmia DDDR pacing continues for a programmed period of time
- Once the overdrive period has elapsed, pacing returns to the programmed dual-chamber mode (including NVP pacing modes)
Clinical Need/Benefits

Results from a MOST Trial sub study documented the following:

- Ventricular pacing > 40% of the time in DDDR mode was associated with a 2.6-fold increased risk of heart failure hospitalization as compared with <= 40% V pacing.
- The rates of AF increased linearly with cumulative percent V pacing, up to 80% < 85% above which the incidence tapered.

Results from the DANISH I and DANISH II Trials documented the following:

- AF was significantly less common in AAI(R) based pacing versus DDDR pacing when DDDR is associated with a high percentage of V pacing.
- HF was less severe in the atrial based group than in the ventricular based group.
- Both AAI(R) and DDD(R) pacing preserve AV synchrony, but if AV block occurs or brady-tachy syndrome develops with the onset of AF, a re-operation with implantation of a ventricular lead is needed with an AAI(R) system.

In addition, it has been documented that many pacemaker patients have natural PR conduction intervals that extend into the 300-350 ms range. Many devices today do not allow for the AV delays to actively seek/extend programmed settings into the 300-350 ms range.
“The ability of the device with MVP to intuitively prohibit unnecessary right ventricular pacing is a landmark development in a new era of physiologic pacing.”

Michael O. Sweeney, MD
Brigham and Women’s Hospital
Boston, MA
There is 1% increase in the risk of AF for each 1% increase in cumulative right ventricular pacing.\textsuperscript{4}
RV pacing > 40% of the time in DDDR mode was associated with a 2.6-fold increased risk of HFH compared with pacing < 40%.
When the full cohort* of patients (n = 123) was analyzed, median %VP = 1.6%.

* N = 123; Included all subjects with follow-up data from MVP and DDDR modes, including those with persistent second and third degree AV block.

With MVP ON in Patients with Sinus Node Dysfunction

Median %VP = 0.5%
AAI(R) Mode
Atrial based pacing allowing intrinsic AV conduction

Ventricular Backup
Ventricular pacing only as needed in the presence of transient loss of conduction
**DDD(R) Switch**
Ventricular support if loss of AV conduction is persistent

**Switch from DDD(R) to AAI(R)**
Continual checks for restoration of AV conduction occur to allow AAI(R) to be resumed promptly
Adapta Pacing System

MVP Details of Operation - Ventricular Backup Pacing

V. Backup Pace

- Scheduled after any A-A interval without an intervening ventricular event
- Delivered 80 ms after the scheduled atrial pace (or the inhibited AT)
- Uses programmed amplitude and pulse width values
- Backup pace is withheld if V-sensor after an AT event (prior to its scheduled delivery)

Depending upon the patient's intrinsic rate and atrioventricular conduction pattern, the MVP Mode will allow V-V cycle variations (occasional pauses of up to twice the programmed Lower Rate + 80 ms.

Programming Considerations

Lower Rate Programming: Upon abrupt loss of AV conduction, prior to switching to DDDR or DDD mode (see page 13), ventricular pacing support can be as low as one-half the programmed Lower Rate for a consecutive interval. For patients with sinus bradycardia or frequent loss-of-AV conduction, program the Lower Rate to 50 ppm or lower.
Adapta Pacing System

MVP Details of Operation – Switch from DDD(R) Back to AAI(R)+

**AV Conduction Check (1 beat)**

After switching to DDD(R) operation, the device will periodically schedule 'conduction checks.' These checks involve atrial interval and the device samples for a conducted VS

- Scheduled every 1, 2, 3, 4, 5 minutes... up to 16 hours after a transition to DDD(R) has occurred
- Temporarily uses AAI(R) to monitor for a conducted VS during one A A interval
- If VS occurs, conduction check passes, mode switches from DDD(R) to AAI(R)+
- If VS does not occur, conduction check fails
  Mode of operation remains in DDD(R) mode
  Next conduction check occurs at the previously mode scheduled time
  interval, up to a maximum interval of once every 16 hours

**Programming Considerations**

**Complete Heart Block**
For patients who have developed permanent heart block, the device will drop 1 beat every 16 hours (due to single beat AV conduction check). If this is undesirable, consider programming permanent DDD(R) mode.
Adapta Pacing System

Clinical Situation
A consistent activation sequence, which includes either a single rate, may suppress ectopic beats that can trigger atrial tachyarrhythmia.

Solutions: Atrial Preference Pacing
Atrial Preference Pacing is designed to maximize atrial pacing percentage to promote a consistent activation site. When enabled, it can be programmed to provide continuous pacing that slightly exceeds the intrinsic rate whenever the patient is not in an atrial tachyarrhythmia.

- Dynamically adjusts the pacing escape interval in response to sum refractory atrial senses
- Promotes a consistent activation site by maximizing atrial pacing percentage
- Increases the pacing escape interval after a consecutive number of atrial paces have been delivered
- Results in a dynamic controlled slow step increase/decrease in the pacing escape interval at or near the intrinsic rate
- Programmable maximum pacing rate (see page 2D)
# Classification of Prevention Algorithms

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dynamic sinus rhythm overdrive</td>
</tr>
<tr>
<td>2</td>
<td>Premature atrial beats response</td>
</tr>
<tr>
<td>3</td>
<td>Post-tachycardia overdrive to prevent early recurrence of atrial fibrillation</td>
</tr>
<tr>
<td></td>
<td>i. Short-long cycle prevention</td>
</tr>
<tr>
<td></td>
<td>ii. Ectopy overdrive</td>
</tr>
<tr>
<td>4</td>
<td>Prevention of inappropriate rate fall after exercise</td>
</tr>
</tbody>
</table>
СОДЕРЖАНИЕ КНИГИ ЧИТАЙТЕ

- \textbf{Введение}
- \textbf{Глава 1: Основные понятия и термины}
- \textbf{Глава 2: Теоретический аспект}
- \textbf{Глава 3: Практическое применение}
- \textbf{Заключение}
- \textbf{Список литературы}
Sinus Preference — Reducing Unnecessary Atrial Pacing

Although AAI/AAIIR is biologically more advantageous and associated with fewer sequelae than ventricular based pacing, there may be clinical consequences to pacing on the atrium including:

- Lead placement in the right atrial appendage or lateral wall has been associated with increased intra-atrial conduction times, a reduction in left atrial filling time, and recurrent atrial tachyarrhythmias.
- Atrial dyssynchrony may reduce cardiac output.
- Reducing unnecessary atrial pacing may potentially improve device battery longevity.

Sinus Preference

Sinus Preference is available only in DDDR (non-MVP) mode, and is shaped normally OFF.

Medtronic Adapta pacemakers include another method designed to enhance intrinsic cardiac activity, Sinus Preference.

Sinus Preference may help avoid unnecessary atrial pacing by searching for and utilizing intrinsic atrial rates that are close to the sensor indicated rate. It may be useful in patients with intermittent or delayed chronotropic incompetence.

Sinus Preference Operation

Sinus Preference includes 2 complementary methods to discover and utilize intrinsic atrial rates that are close to the sensor indicated rate: 

- Sinus Search Episode
- Breakthrough (Intrinsic) Episode

Search Episode: The pacing rate slows by a programmable amount (Sinus Preference Zone) at programmable intervals (Search Interval) to search for the intrinsic rate.
This is the extracted text from the document. The text may appear unusual due to the nature of the input.
Purpose of the study was to identify pts with specific onset patterns of PAF.

METHODS DDD pacemakers were implanted in 112 standard brady pts with a hx of PAF. Diagnostic data were analyzed after 97.5 ± 40.9 days. According to the frequency of PACs during the 5 min before AF onset, pts were assigned to 1 of 3 groups: group A (high PAC activity), group B (moderate PAC activity), or group C (low PAC activity).

RESULTS AF burden was lower in group A (4.6% ± 2.4%) than group B (15.8% ± 3.0%, P = .003) and group C (15.5% ± 3.1%, P = .003). Fewer AF episodes occurred in group A than group B (P = .006).

CONCLUSION The coincidence of low PAC activity before AF onset, high AF burden, and extended arrhythmia episode duration appears to be the consequence of a high atrial substrate factor. In these "substrate fibrillators," the efficacy of pacing algorithms for maintenance of sinus rhythm may be limited. In contrast, "trigger fibrillators" exhibiting low AF burden despite high PAC incidence may represent the target population for specific PAC-suppressing pacing algorithms.
1. The first point is to ensure that all operations are performed in a systematic and organized manner.

2. The second point is to always maintain a clear and accurate record of all transactions.

3. The third point is to regularly review and update the financial statements.

4. The fourth point is to ensure that all employees are familiar with the company's financial policies and procedures.

5. The fifth point is to conduct regular audits to ensure compliance with all financial regulations.
The image does not contain any legible text. It appears to be a collection of characters that do not form recognizable words or sentences.