Virtual body surface mapping

The next step in guidance for physiological pacing?

Alexander Langanke, MD

Department of Cardiology - Electrophysiology - Varisano Hospital Bad Soden

Academic teaching hospital for the Goethe University Frankfurt am Main - Germany

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Conflicts of interest

- **Consultant**
  - Personal MedSystems

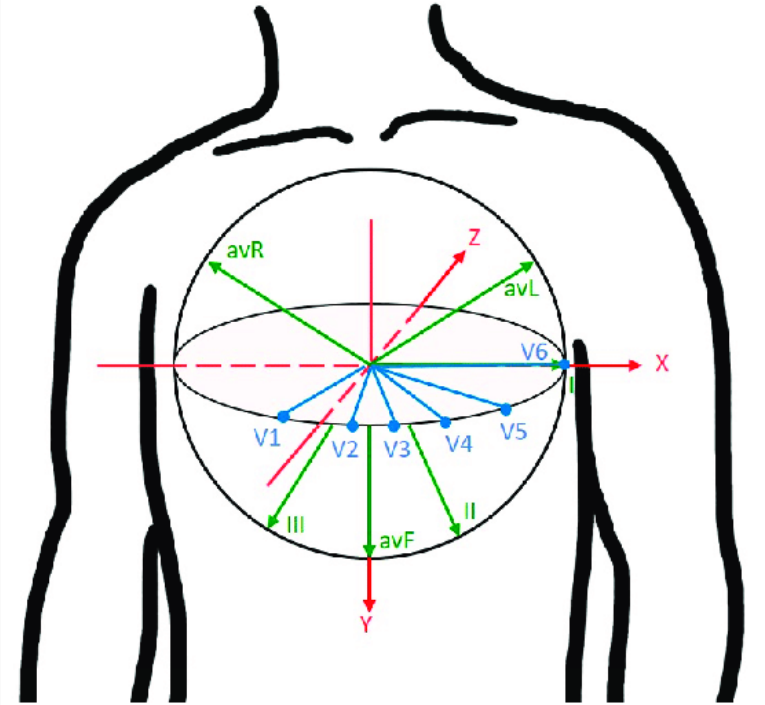
- **Travel- and training grants**
  - Medtronic
  - Biotronic

Virtual Body Surface Map – What is the vision?

Dyssynchrony

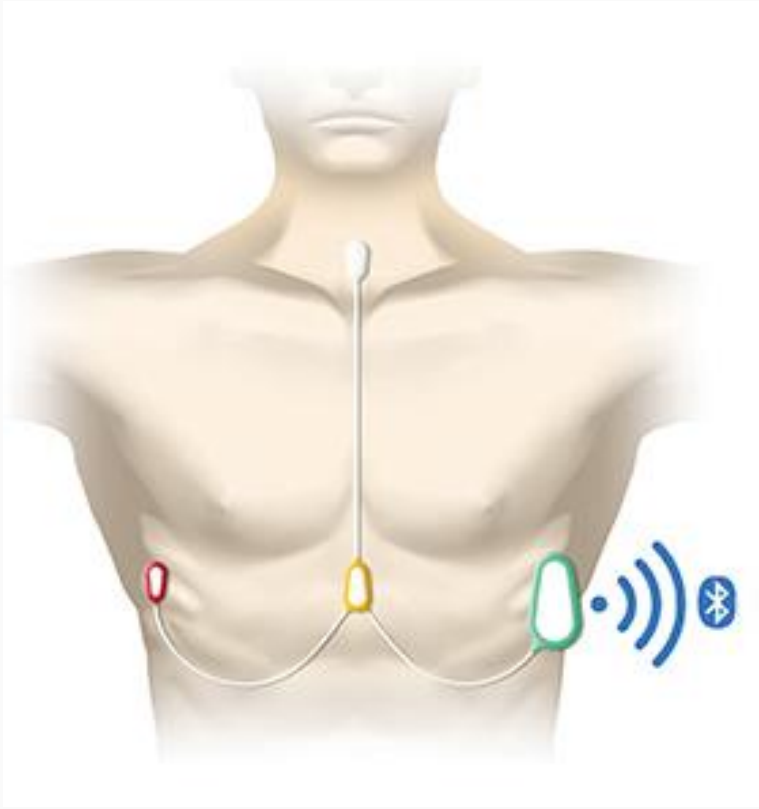
Implantation

Basics of vectorcardiography



Chuang, Yu-Hung & Huang, Chia-Ling & Chang, Wen-Whei & Chien, Jen-Tzung. (2020). Automatic Classification of Myocardial Infarction Using Spline Representation of Single-Lead Derived Vectorcardiography. Sensors. 20. 7246. 10.3390/s20247246.

Basics of vectorcardiography



vs.

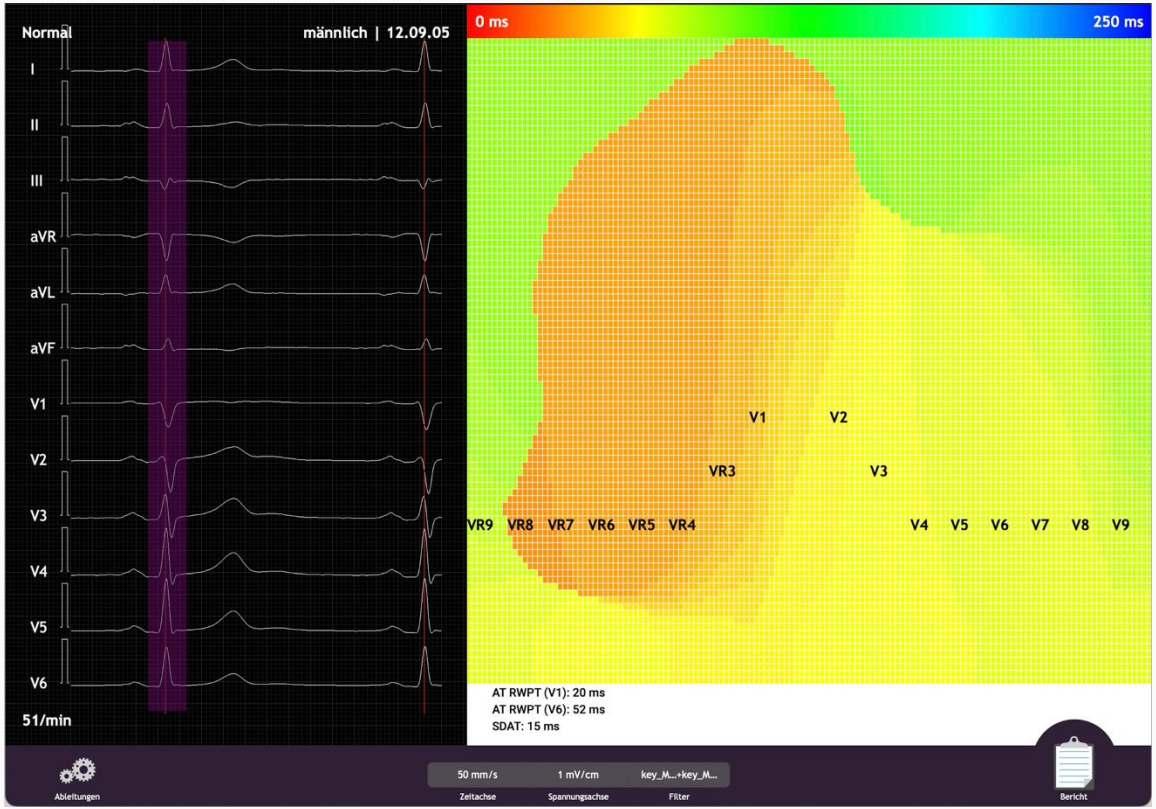
Virtual Body Surface Map – What is the vision?

Dyssynchrony

Implantation

Normal electrical conduction

12-lead ECG



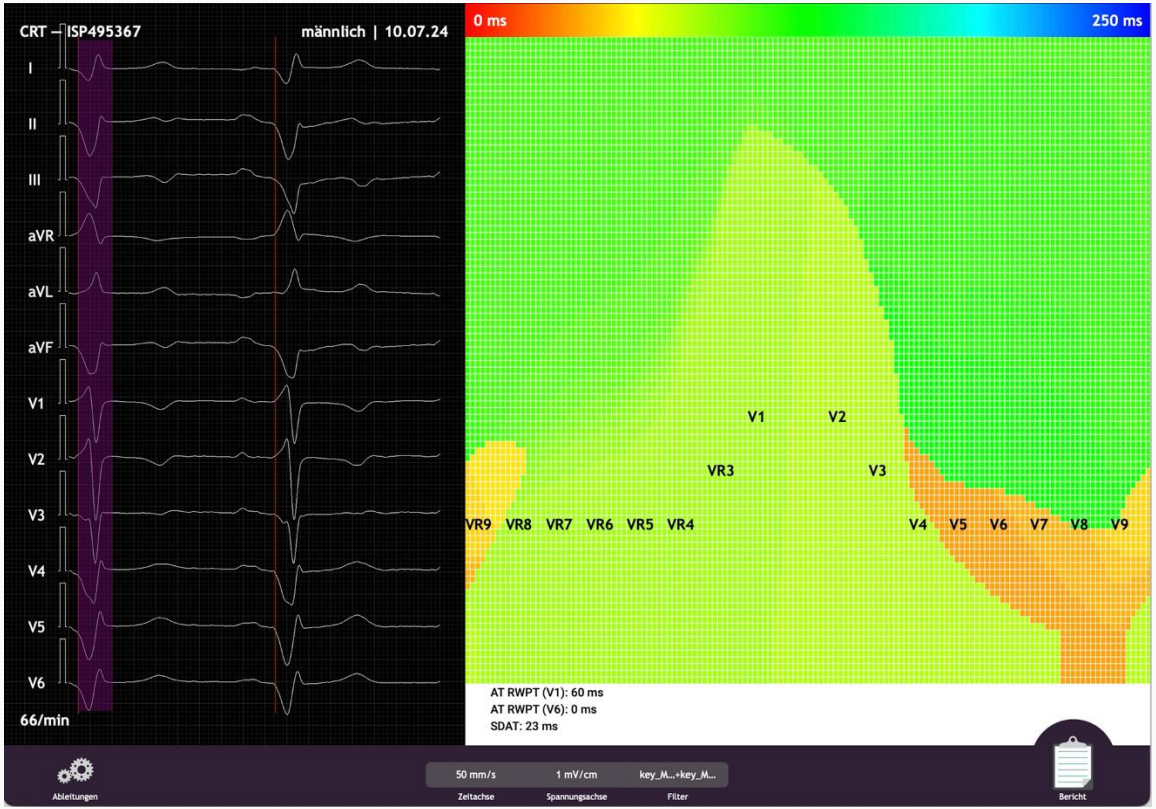
Head

14.000 derived body surface map leads

Feet

Left bundle branch block

Left bundle branch block – CRT on

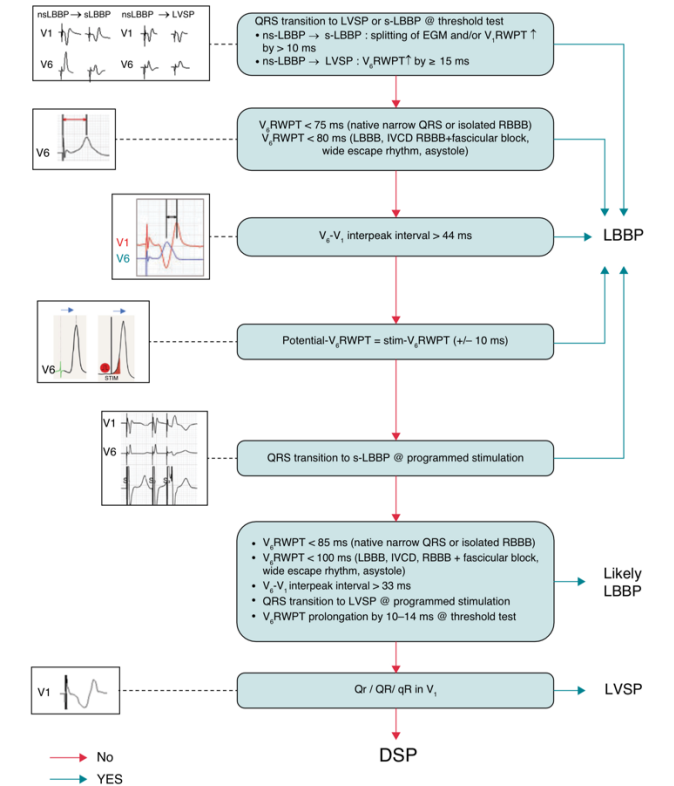


Virtual Body Surface Map – What is the vision?

Dyssynchrony

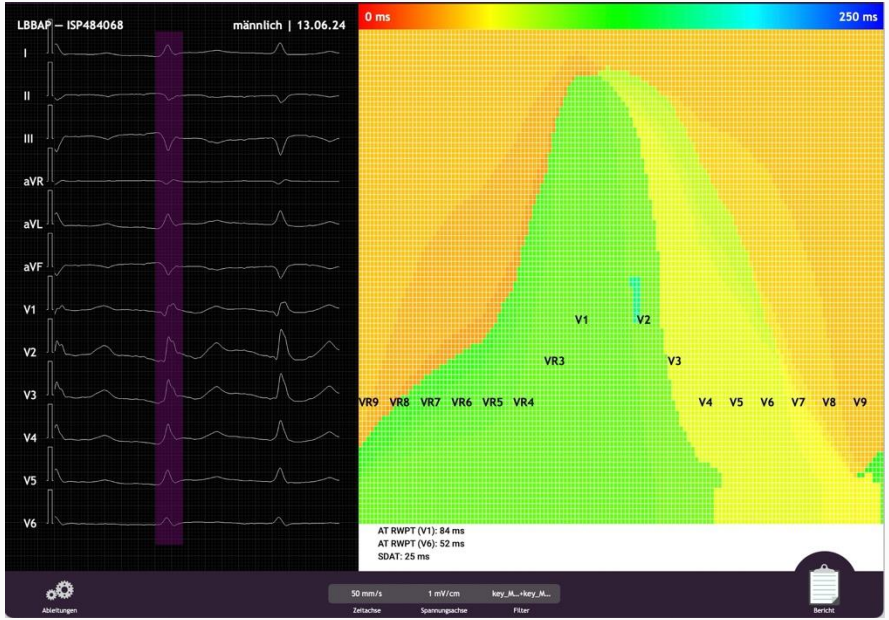
Implantation

LBBAP implantation criteria



Haran Burri et al. EHRA clinical consensus statement on conduction system pacing implantation: endorsed by the Asia Pacific Heart Rhythm Society (APHRS), Canadian Heart Rhythm Society (CHRS), and Latin American Heart Rhythm Society (LAHRS), *EP Europace*, Volume 25, Issue 4, April 2023, Pages 1208–1236 https://doi.org/10.1093/europace/euad043

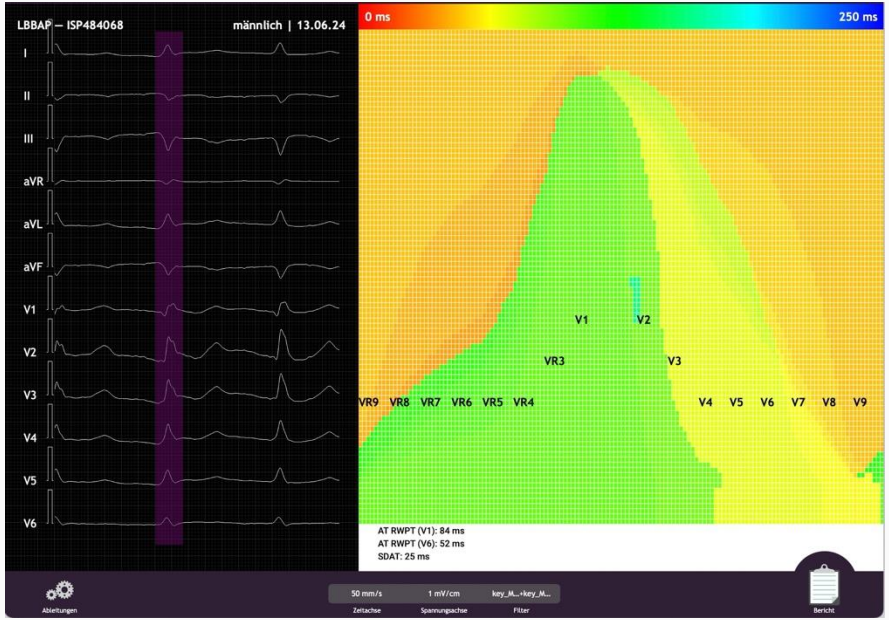
LBBAP vs. RV pacing



nsLBBAP

RV Pacing

LBBAP vs. RV pacing



nsLBBAP

RV Pacing

Research

Thank you

Body Surface mapping for CRT response prediction

FULL LENGTH ARTICLE · Volume 14, Issue 3, P392-399, March 2017

Changes in electrical dyssynchrony by body surface mapping predict left ventricular remodeling in patients with cardiac resynchronization therapy

Ryan M. Gage, MS [*] · Antonia E. Curtin, MS [†] · Kevin V. Burns, PhD [*] · Subham Ghosh, PhD [‡] · Jeffrey M. Gillberg, MS [‡] · Alan J. Bank, MD [*,†]

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Abstract

Background

Electrical activation is important in cardiac resynchronization therapy (CRT) response. Standard electrocardiographic analysis may not accurately reflect the heterogeneity of electrical activation.

Objective

We compared changes in left ventricular size and function after CRT to native electrical dyssynchrony and its change during pacing.

Methods

Body surface isochronal maps using 53 anterior and posterior electrodes as well as 12-lead electrocardiograms were acquired after CRT in 66 consecutive patients. Electrical dyssynchrony was quantified using standard deviation of activation times (SDAT). Ejection fraction (EF) and left ventricular end-systolic volume (LVESV) were measured before CRT and at 6 months. Multiple regression evaluated predictors of response.

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Thank you