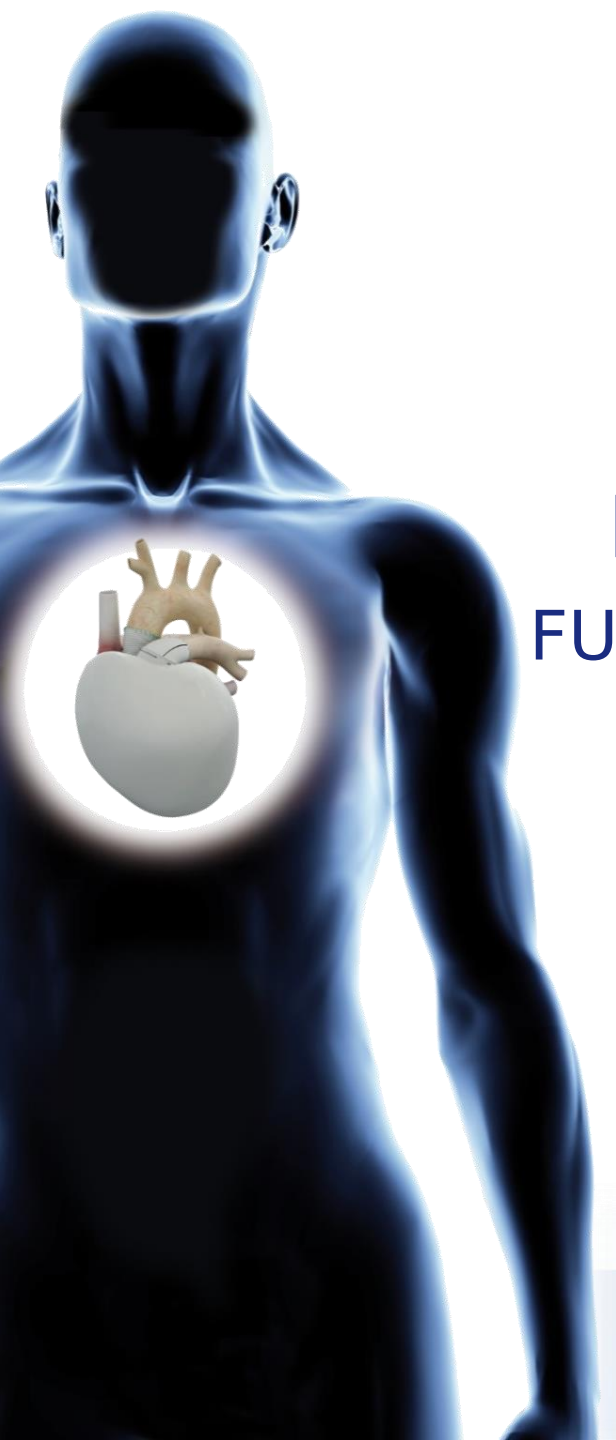

CARMAT

BECAUSE WE DON'T BELIEVE THE FUTURE CAN WAIT FOR THE FUTURE

Plenary meeting

January 15, 2019

Safe Harbor

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Contents

Speakers

Stéphane Piat
Chief Executive Officer of CARMAT

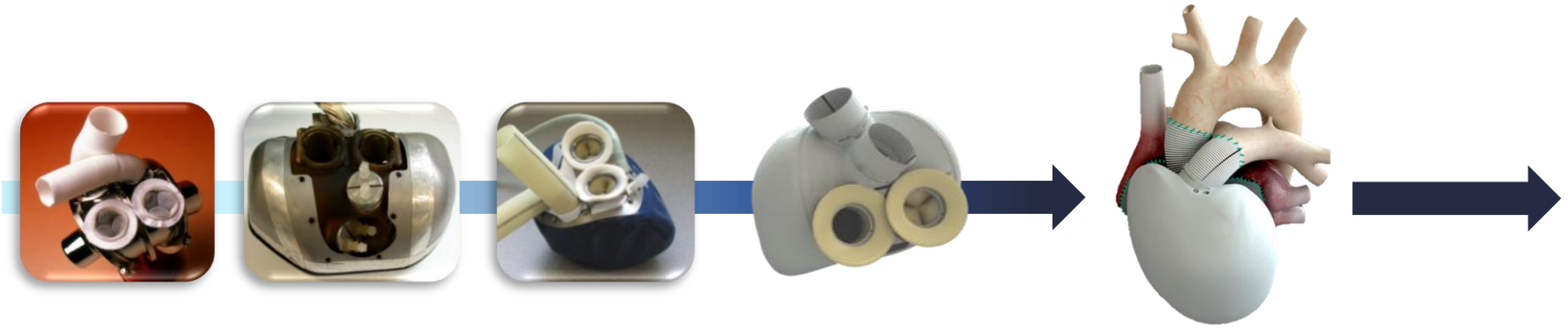
- Over 20-year experience in the medical device business
- Previously Divisional Vice President Global Market Development at Abbott
- Johnson & Johnson Cordis (2002-2007)

Pr. Christian Latrémouille
Cardiac surgeon at the Georges Pompidou European Hospital

- Principal investigator of the CARMAT bioprosthetic heart feasibility study

Key milestones

- **15 years of R&D** (Airbus Group, Prof. Alain Carpentier)
- **2008:** foundation of CARMAT
- **2010:** IPO on Euronext Growth (previously known as Alternext)
- **2013:** first successful human implantation
- **2014 – 2016:** proof-of-concept in the feasibility study
- **2016:** start of the PIVOTAL study
- **2017:** international expansion of the PIVOTAL study
- **2018:** opening of the **Bois-d'Arcy** facility and **approximately 180** employees



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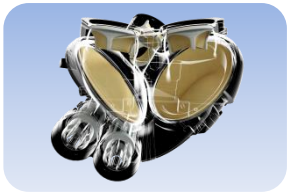
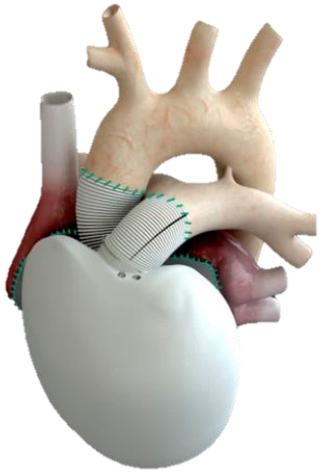


A groundbreaking innovation: the physiological artificial heart

Technological breakthrough for the treatment of terminal heart failure

Vision

- A **physiological** artificial heart:
  a genuine alternative to transplantation
- Make the implantation of this heart
  a **common surgical procedure**
- Gain a **global market**



CARMAT, the world's most advanced artificial heart

CARMAT

The total physiological artificial heart: the next opportunity in cardiology

CARMAT

MAJOR PLAYERS

Medtronic

Johnson & Johnson

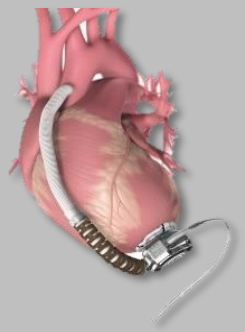
Boston Scientific

Abbott

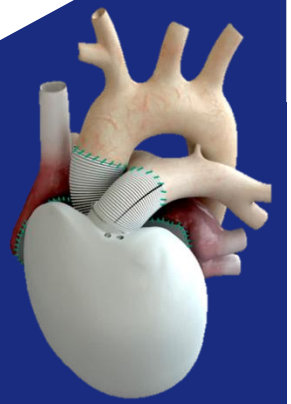
Edwards

AFIB / CRT-D

Structural Heart



VAD



SynCardia

BIVAD*

NYHA evolution

* BIVAD: *Biventricular Assist Device*

Clinical development

Advanced Heart Failure

5,000 heart transplants per year

Covering only **3%** of the total need

Between **60** and **94%** death rate within a year

CARMAT

CARMAT program

Available technology	LVAD/BIVAD/TAH* displaying numerous limitations
Need for a reliable new-generation solution	Adapts to the patient physiology through an autoregulation system and improved hemocompatibility to provide a better quality of life
The objective of the clinical program	Validate these hypotheses

* LVAD: Left Ventricular Assist Device; BIVAD: Bi-ventricular Assist Device; TAH: Total Artificial Heart

Clinical development

	FIM Study (completed)	**PIVOTAL Study** (enrolling)
Number of patients	4	~ 20
Selection criteria	INTERMACS 1-2	▪ Inotrope dependent or ▪ Cardiac index <2,0 L/min/m²
Primary endpoints	Survival at 30 days	▪ Survival at 180 days or transplanted <180days
Secondary endpoints		▪ Quality of life, functional recovery ▪ 2 years follow up post-implantation

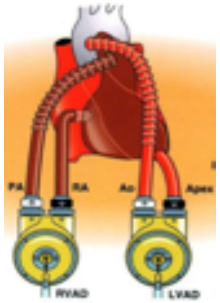
CARMAT

Ongoing PIVOTAL study

- Enrollment completed for the first part of the study
- First patient of the second part of the study enrolled
- Enrollment objective: **20 patients**
- Primary endpoint of the study: **6 months** survival

Results from the first cohort of the PIVOTAL study

- 6-month survival rate among the first 10 patients: 70%
- Improvement expected with the second patient cohort as a result of the experience gained



	6-month survival rate
CARMAT FIM	50%
CARMAT PIVOTAL (part 1)	**70%**
SynCardia*	54% - 62%
BIVAD**	46% - 68%
LVAD***	90% - 92%

* Kirklin JK *et al.*, J Heart Lung Transplant 2018;37:685-691. Arabia F *et al.*, J Heart Lung Transplant, 2018;37:1304–1312
** Lavee J *et al.*, J Heart Lung Transplant 2018;37:1399−1402. Arabia F *et al.*, Ann Thorac Surg 2018;105:548–56
*** Strueber M *et al.* J Am Coll Cardiol 2011;57:1375–82. Netuka I *et al.*, J Am Coll Cardiol 2015;66:2579–89

Confirmation of the FIM study results

- Positive 6-month safety profile in 10 patients compared to other therapies

Adverse events	Stroke	Bleeding – surgical repair	Gastrointestinal bleeding	Percutaneous cable infection
CARMAT FIM	0%	75%	0%	0%
CARMAT PIVOTAL (part 1)	**0%**	**40%**	**0%**	**0%**
SynCardia*	23%	41%	20%	22%
BIVAD**	7%	n/a	7%	7%
LVAD***	8%	14%	8%	10%

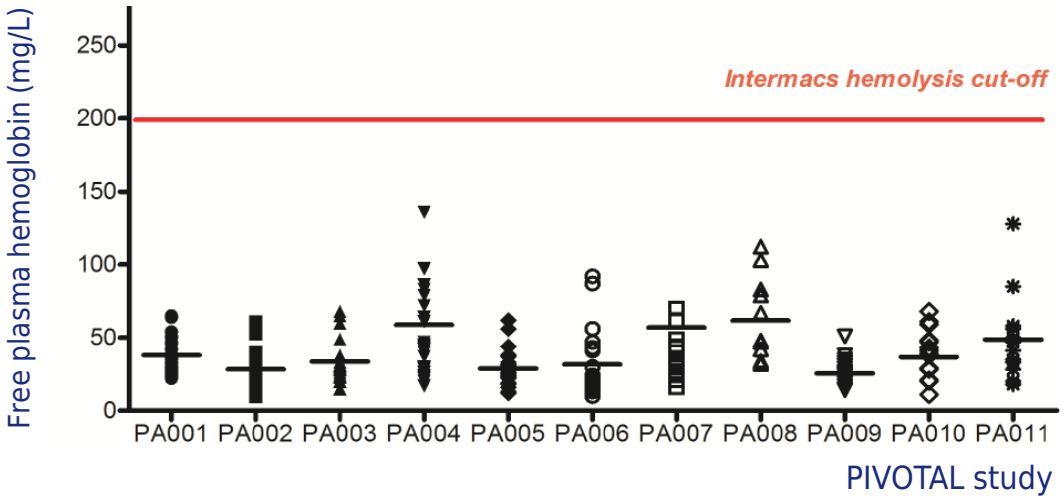
* Arabia F *et al.*, J Heart Lung Transplant, 2018;37:1304–1312. Demondion P *et al.*, Eur J Cardiothorac Surg. 2013 Nov;44(5):843-8.
** Lavee J *et al.*, J Heart Lung Transplant 2018;37:1399−1402.
*** Netuka I *et al.*, J Am Coll Cardiol 2015;66:2579–89

CARMAT

No hemolysis

- Factors causing hemolysis (red blood cell rupture) negligible for CARMAT
- Hemolysis markers (free plasma hemoglobin) ↓↓ in all patients

Factor causing hemolysis is present	LVAD	SynCardia	CARMAT
Shear stress	++	+++	-
Synthetic material	+++	+++	+



No strokes

- CARMAT: hemocompatible by design (materials, operation)
- Modest anticoagulation regime
- Major impact on quality of life and survival

	Anticoagulation recommendation	Strokes after 6 months
CARMAT*	**Heparin IV → Heparin SC** **75-100 mg aspirin**	**0%**
SynCardia**	Heparin IV → warfarin INR 2.5–3.5 325mg aspirin, dipyridamole	23%
BIVAD***	Heparin IV → warfarin INR 2.0–3.0 75-100 mg aspirin	7%
LVAD****	Heparin IV → warfarin INR 2.0–3.0 75-100 mg aspirin	8%

*First cohort of 10 patients

** Arabia F *et al.*, J Heart Lung Transplant, 2018;37:1304–1312. Demondion P *et al.*, Eur J Cardiothorac Surg. 2013 Nov;44(5):843-8.

*** Lavee J *et al.*, J Heart Lung Transplant 2018;37:1399−1402

**** Netuka I *et al.*, J Am Coll Cardiol 2015;66:2579–89

CARMAT

No gastrointestinal bleeding

No gastrointestinal bleeding in (first cohort) CARMAT patients thanks to:

- Pulsating flows
- Hemocompatibility
- No shear stress
- No “von Willebrand” failure
- No venous congestion
- Low-dose anti-coagulant

	Gastrointestinal bleeding after 6 months
CARMAT*	**0%**
SynCardia**	20%
BIVAD/LVAD***	7%
LVAD****	8%

*First cohort of 10 patients
** Arabia F *et al.*, J Heart Lung Transplant, 2018;37:1304–1312. Demondion P *et al.*, Eur J Cardiothorac Surg. 2013 Nov;44(5):843-8.
*** Lavee J *et al.*, J Heart Lung Transplant 2018;37:1399−1402
**** Netuka I *et al.*, J Am Coll Cardiol 2015;66:2579–89

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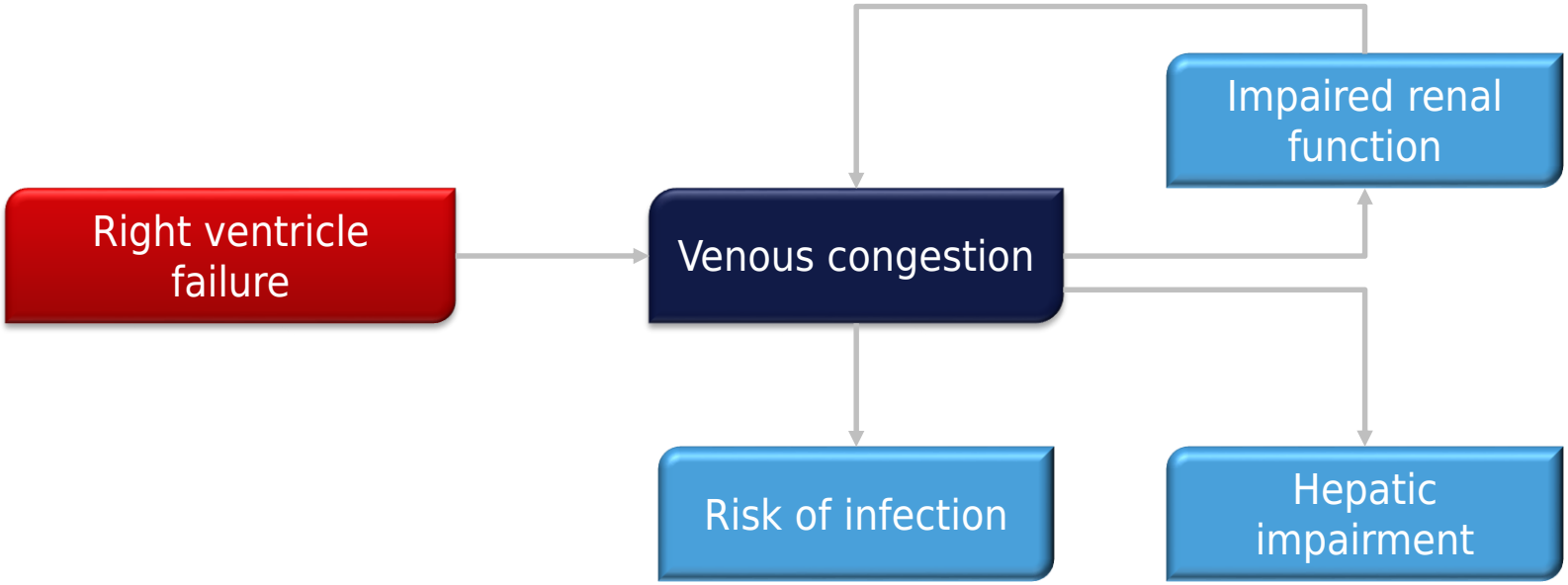
LVAD: recurring issue of failure in the unassisted right ventricle

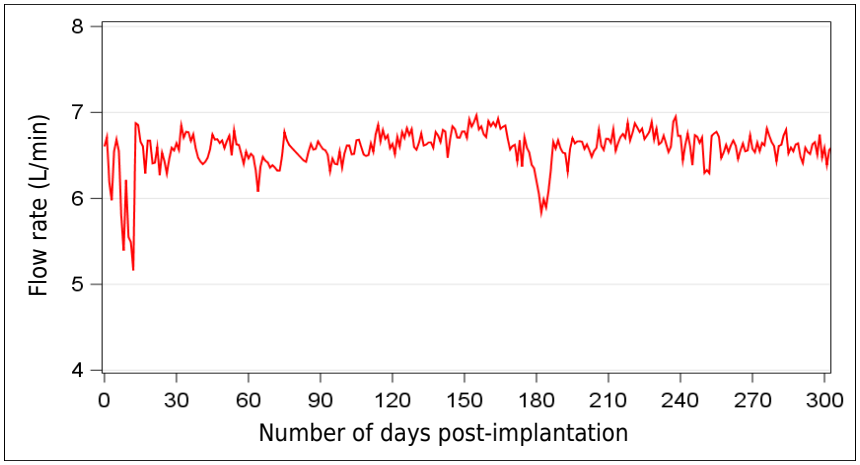
- Failure of the right ventricle in patients treated with LVAD:
  - 6-month incidence: 10%*
  - 24-month incidence: 32%**
- Associated with other undesirable events:
  congestion, impaired renal function, hepatic impairment, infection



* Netuka I *et al.*, J Am Coll Cardiol 2015;66:2579–89
** Mehra MR *et al.*; N Engl J Med. 2018;378:1386-95.

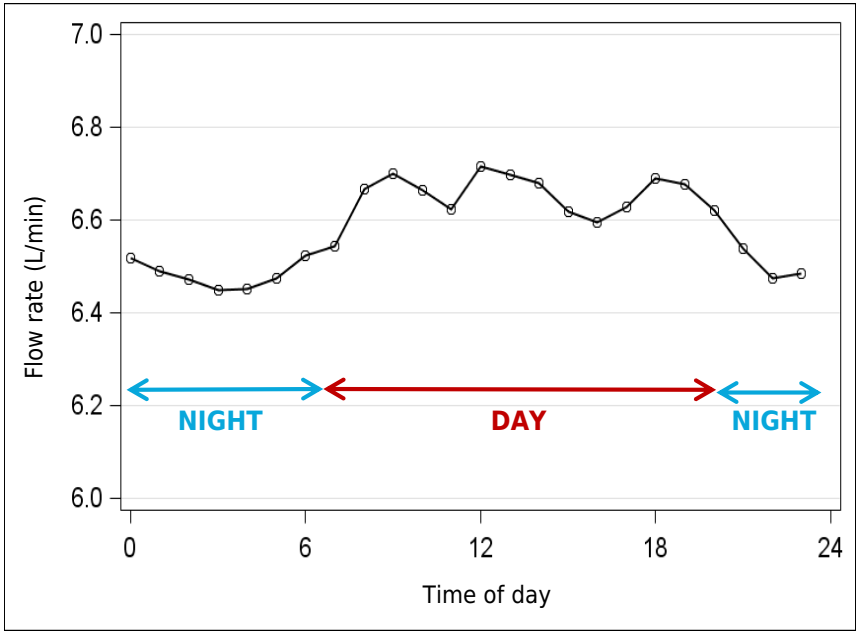
CARMAT

The prosthesis continues to work as a human heart



CARMAT flow rate
over 10 months of support

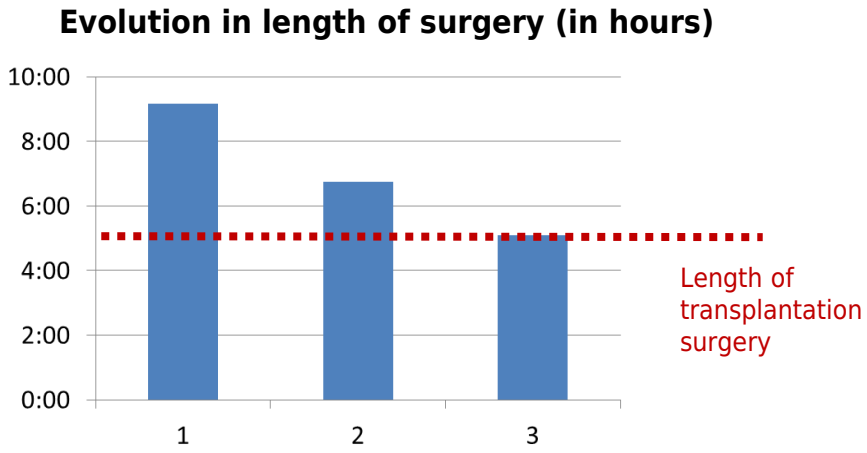
Circadian cycle
over 10 months of support



CARMAT

Optimization of the surgical experience

- 100% success rate for the procedure
- Length of surgery shortened with the benefit of experience



- Heart transplantation is possible following the CARMAT implantation: 3/3 successfully completed
- Pre-graft waiting times with CARMAT: between 109 and 243 days
- No tissue adhesion around the CARMAT prosthesis

Improvement in the quality of life

The device offers major improvements to the patient quality of life:

- Greater mobility
- Regained independence
- Autonomy comparable to LVAD

Effort with the CARMAT heart

Post-transplantation effort

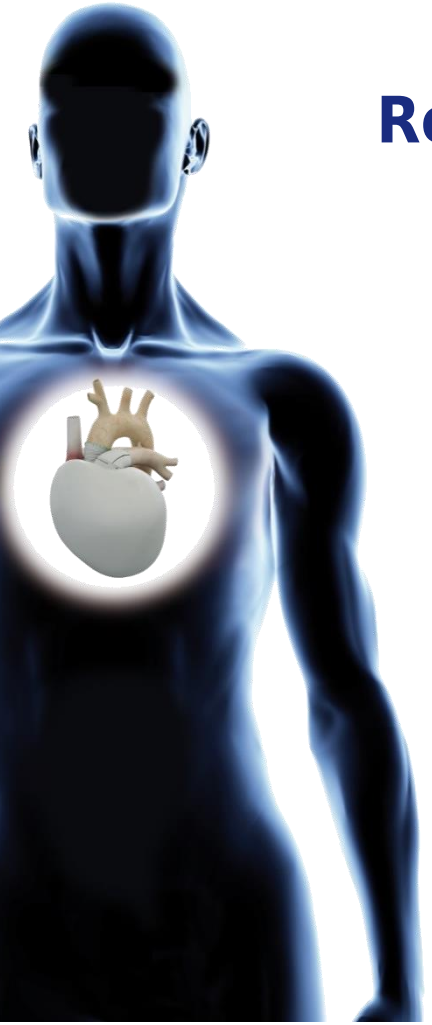
Post-transplantation consultation

Overview of the clinical experience to date

- **Operation**
  - Recovery times comparable to the norm for high-risk patients
  - Physiological autoregulation of the prosthesis, adapted to the activity of the patient
- **Favorable safety profile**
  - No hemolysis, no stroke, no digestive system bleeding in the first cohort
- **Follow-up**
  - 6-month survival rate in the first cohort: 70%
  - Bridge to heart transplant successfully performed

Discharge from ICU	11 ± 6 days
Return home	55 ± 11 days
Total length of support	5 years (11 patients)

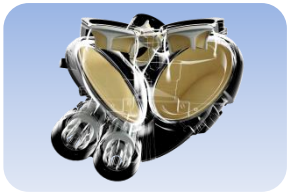
Conclusion



Results better than in the FIM feasibility study

Validation of study objectives

Clinical study in progress, encouraging results waiting for the completion of the second cohort



Strategy and outlook

Upcoming developments

- Ongoing industrial transformation: transfer from Vélizy to Bois-d'Arcy completed
- Completion of the PIVOTAL study
- Obtain FDA authorization to initiate implantation in the United States as part of an Early Feasibility Study (EFS)
- Setting up the sales and marketing strategy: prepare the company for commercialization

All the strategic projects are progressing well

Completion of the PIVOTAL study

- **Enrollment:** 11/20 patients
- **Production**: suspended during the fourth quarter of 2018 to factor in the lessons learned from the analysis of the data collected, representing over 20 years of total operation between clinical trials and reliability test benches
- The **analysis** highlighted **aspects that could be improved** in the manufacturing process, predominantly in the control on integrity and cleanliness of the technical compartment of the prosthesis
- These improvements were implemented in the fourth quarter of 2018, and production resumed in early 2019
- Validation underway for additional centers in two new European countries

The aim is to rapidly complete the enrollment in order to submit the CE marking application in early 2020

Development in the United States

- **Filing for the Early Feasibility Study (EFS) in August 2018**
  - FDA comments currently being addressed
  - consensus achieved regarding the protocol for the study
- **Selection of centers in progress**
  - highly ranked institutions in the field (> 100 cases per year)
- **Recruitment of scientific committee members in progress**
- **Logistical development in preparation**
- **The plan is still to treat the first patients in 2019**

Enhanced financial flexibility

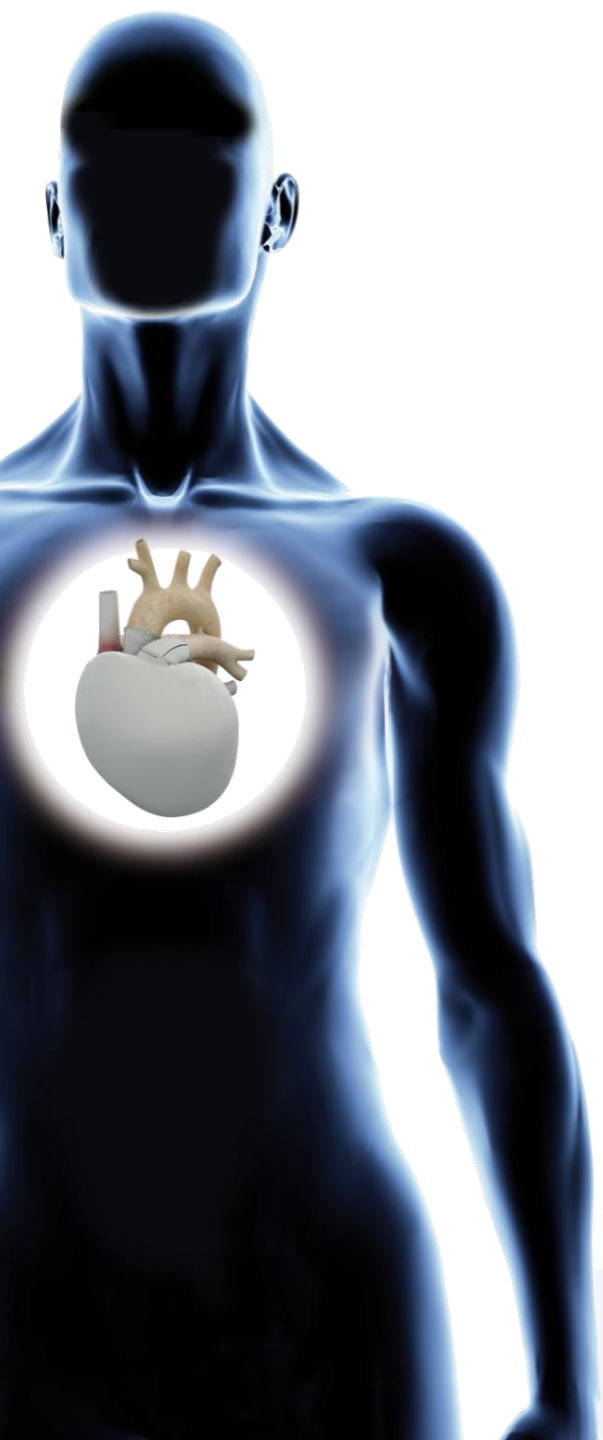
Financial structure at December 31, 2018

- Cash and cash equivalents: **€25.2 million**
- **€30 million** loan from the EIB
- Optional equity line: **€24.2 million** in flexible financing under a new agreement with Kepler Cheuvreux

Financial resources able to support the industrial and clinical developments and the preparations for commercialization

CARMAT, a company built to become a leader in its field

- **Technological breakthrough**, unprecedented worldwide: first bioprosthetic heart based on physiological functions
- Credible solution to the problems associated with **terminal biventricular heart failure**, a condition steadily becoming more and more prevalent
- **Significant** clinical and technical progress to submit the **CE marking application in early 2020**
- Support from first-class **industrial** and **financial partners**, as well as **leading players in cardiology**
- **Acceleration** in its **transformation** towards an industrial and commercial company, to become a **leader in its field**



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Thank you !