

## Ciclo de cuidado ao AVC: Experiência Joinvasc – Stroke Program

Carla Heloisa Cabral Moro













Joinvasc Stroke Program covers the entire population of Joinville, but is not limited to it.

Objective: Improve stroke care throughout the line of care, from prevention to health outcomes that make sense to the patient.







Norberto Cabral 1963-2019



Carla Moro



Alexandre Longo

## Main strategies

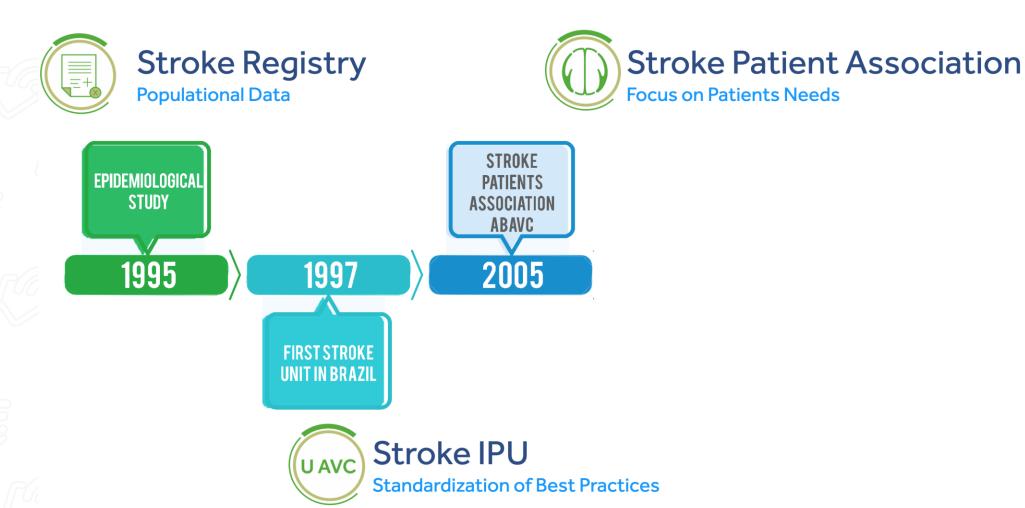
- Best Medical Practices
- Outcome and cost metrics
- Learning cycles
- Stroke Support Association



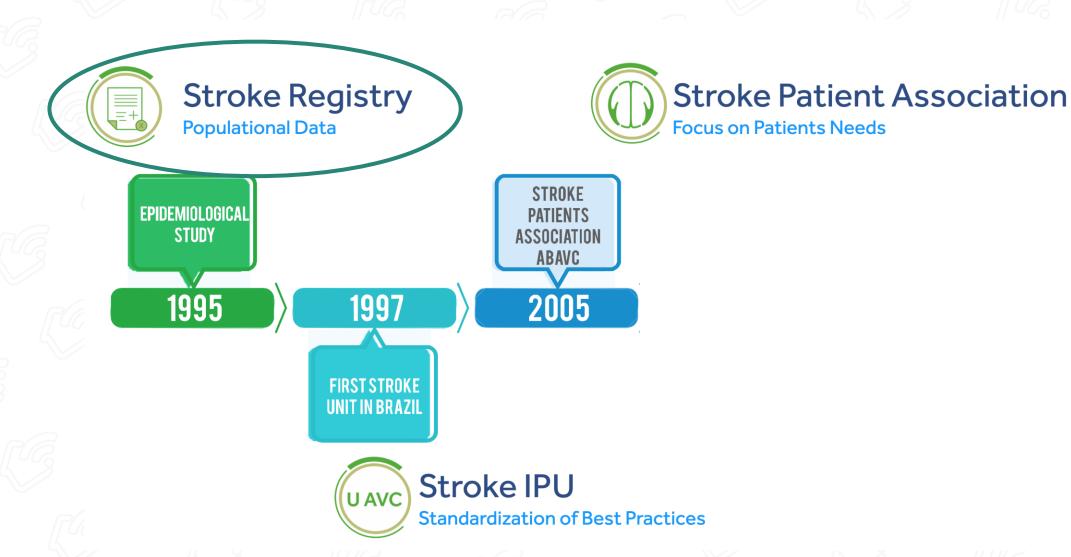


















## Stroke Registry Populational Data







## EPIDEMIOLOGIA DOS ACIDENTES CEREBROVASCULARES EM JOINVILLE, BRASIL

ESTUDO INSTITUCIONAL.

NORBERTO L. CABRAL\*, ALEXANDRE L. LONGO\*, CARLA H.C. MORO\*, CLAUDIO H. AMARAL\*, HAYDEE C. KISS\*



## Populational Stroke Registry and Outcome Data



Started in 1995

WHO STEPS Methodology

All subtypes of stroke (TIAs, AIS, ICH, and SAH)

5 Years Follow-up

2013 became a municipality law



01 Neurologist Coordinator

**05 Dedicated Nurses** 

01 Administrative assistants

05 Volunteer stroke neurologists

#### Stakeholders:

Region of Joinville University – UNIVILLE

The municipality (health secretariat)

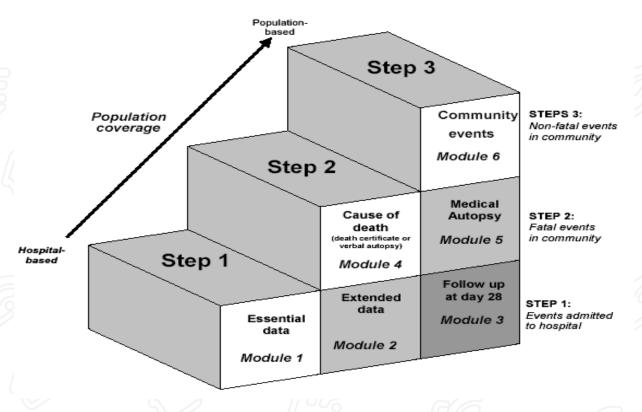
Public Comprehensive Stroke Center

Stroke Support Association ABAVC



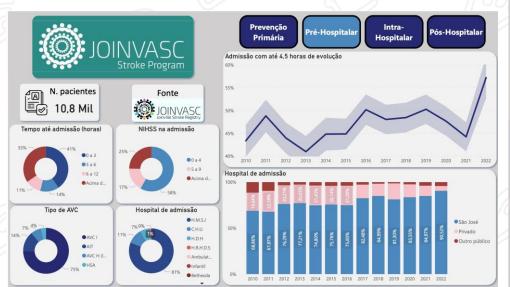
STEPwise Approach to NCD Risk Factor Surveillance (STEPS)



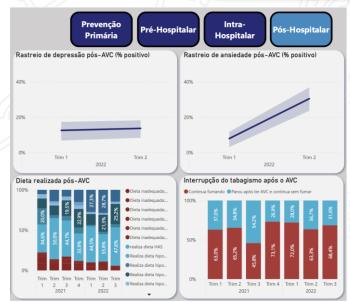


## Populational Stroke Registry and Outcome Data









## Data-driven Improvements:

- Dashboards are available for all stakeholders: outcomes (mRS, QoL, anxiety, depression), costs, quality, care gaps, and outpatient care.
- Data flow enables learning loops with a comprehensive view of factors affecting patients' value;
- Creates the team's accountability for outcomes;
- Relationship of trust and mutual responsibility among stakeholders.



## Populational Stroke Registry and Cost Data

## Standardized processes to collect real-world costs for the full cycle of stroke care (up to 5y)

Cost analysis led to **data-driven discussions**, allowing the full adoption of state-of-theart therapies which were **not yet incorporated in the SUS**:

| Joinvasc                               | Brasil – National Policy |
|--|--------------------------|
| 1997 - The first Stroke Unit in Brazil | 2012                     |
| 1998 - IV Thrombolysis                 | 2012                     |
| 2012 - Mechanical thrombectomy         | 2023                     |



# Managed and monitored discharge and póst hospital needs



JOINVASC Epidemiologic Register



Digital health

Monitors post-hospital needs GAD-7 Depression /PHQ-9 Anxiety

## Main scientific publications



#### Trends of Stroke Incidence from 1995 to 2013 in Joinville

Incidence and functional outcome of atrial fibrillation

Increase of Stroke Incidence in Young Adults in a Middle-Income Country

Trends in stroke incidence, mortality and case fatality rates in Joinville

High five-year mortality rates of ischemic stroke subtypes

Fibrilação atrial crônica, AVC e anticoagulação: Sub-uso de varfarina:

Trombólise endovenosa com alteplase em AVC isquêmicoexperiência em 27 casos-Joinville

The Brazilian Family Health Program and Secondary Stroke and Myocardial Infarction Prevention: A 6-Year Cohort Study

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Stroke recurrence in the different subtypes of ischemic stroke.

The importance of the intracranial disease

Decrease in Hospital Admissions for Stroke in the COVID-19 Era

Education Level Explains Differences in Stroke Incidence among City Districts in Joinville

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Education Level Explains Differences in Stroke Incidence among City Districts in Joinville





#### **Original Paper**

Neuro epidemiology

Neuroepidemiology 328865 DOI: 10.1159/000328865 Received: February 21, 2011 Accepted: April 20, 2011 Published online: ■■■

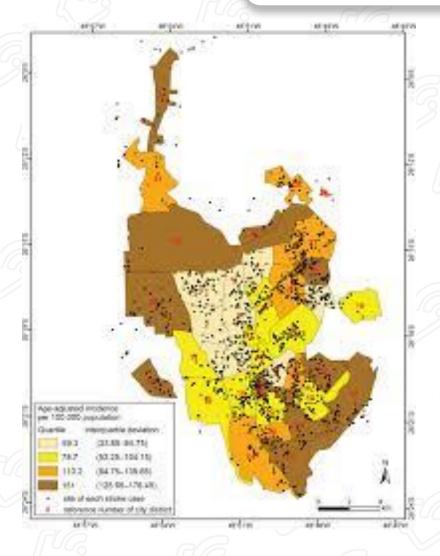
## Education Level Explains Differences in Stroke Incidence among City Districts in Joinville, Brazil: A Three-Year Population-Based Study

Norberto L. Cabral<sup>a</sup> Alexandre Longo<sup>a</sup> Carla Moro<sup>a</sup> Priscila Ferst<sup>a</sup>
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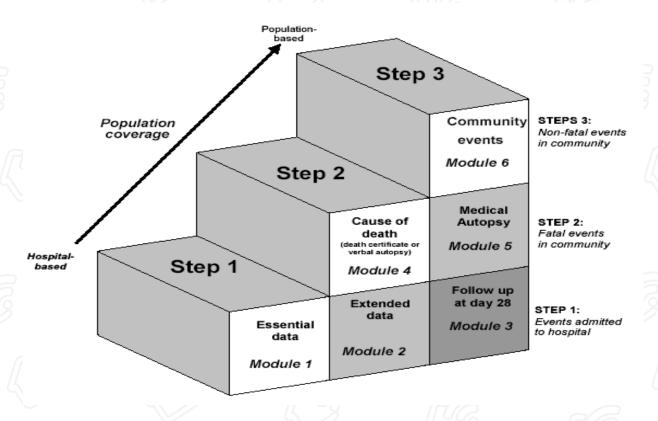
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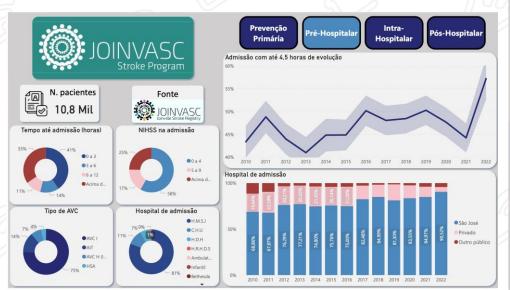
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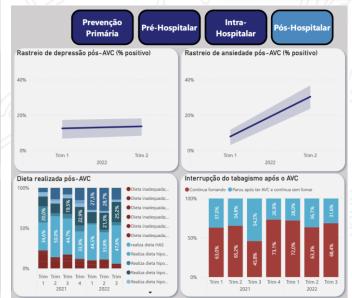


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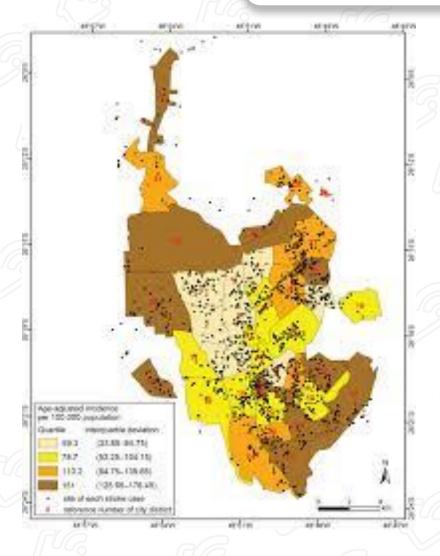
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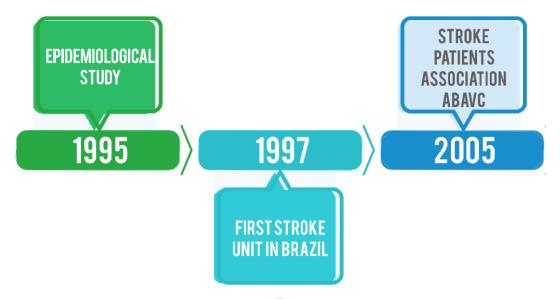
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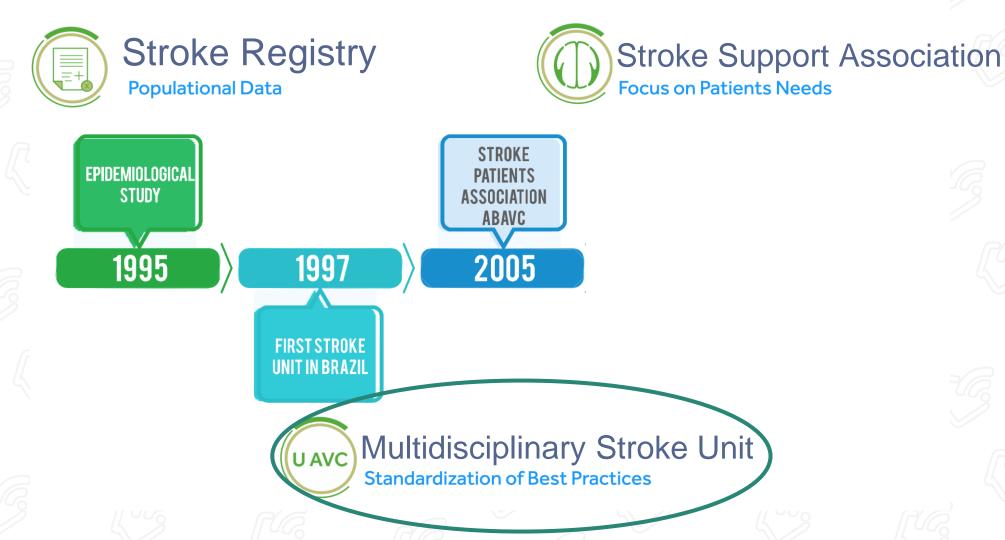


















Stroke Registry
Populational Data



**Multidisciplinary Stroke Unit** 

**Standardization of Best Practices** 



Stroke Support Association
Focus on Patients Needs





Stroke Registry Populational

Multidisciplinary Stroke Unit

**Standardization of Best Practices** 

Stroke Support Association Focus on Patients Needs



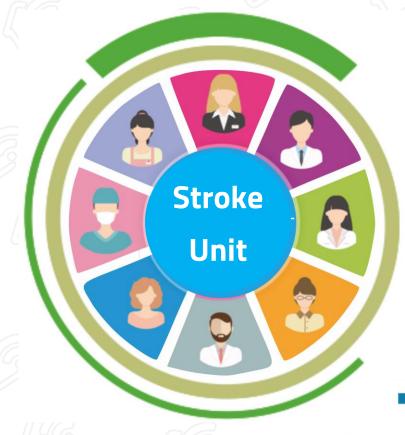


## **The Stroke Unit**

## Organized, multidisciplinary stroke care:

- Volume/scale;
- Care centered around the patient's needs and preferences
- Reduce mortality and improve recovery and independence;
- Data collection and care coordination;
- Continuum of care that extends from acute treatment to rehabilitation and beyond;
- Caring for patients in specialized units reduces costs





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Safanelli J et al. The cost of stroke in a public hospital in Braz

https://doi.org/10.1590/0004-282X20190059

The cost of stroke in a public hospital in Brazil: a one-year prospective study

| 77                          |                |                    |
|-----------------------------|----------------|--------------------|
| Table S4 Unit costs and ave | erage composit | costsby stroke typ |
| Cost item                   | Unit costs     | OITH               |
|                             |                | _1                 |
| Hospital daily              |                |                    |
| Emergency department        |                | 45,857.68          |
| Intensive care days         | 7.02           |                    |
| Stroke unit                 | 153.51         | 37 35.52 21,532.32 |

Hospital daily
Emergency department
Intensive care days
Stroke unit

304.62 153.51





de pacientes

## Multidisciplinary Stroke Unit Standardization of Best Practices

## Educação Fase Aguda Prevenção Primária **Populacional** U-AVC Pré-hospitalar Sala de emergência Hospital de Associação Prevenção secundária

Reabilitação

retaquarda













## Multidisciplinary Stroke Unit Standardization of Best Practices

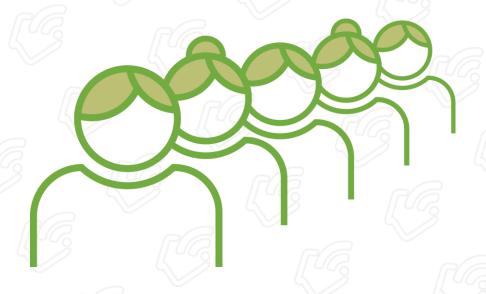






## Multidisciplinary Stroke Unit Standardization of Best Practices

Organized for the patient's needs
TIA and Stroke
Specialized multidisciplinary team
Responsibility for the hospital care cycle





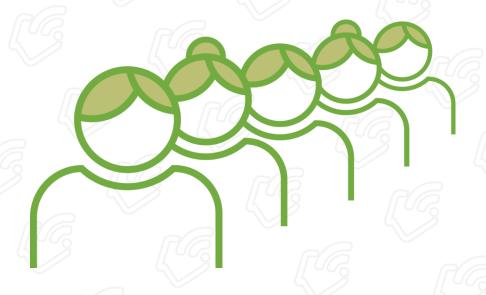


## Multidisciplinary Stroke Unit Standardization of Best Practices

Bedside visits

Monthly presentation of indicators.

Formal / informal meetings = Process
Improvements (listening to the team)





# **U AVC**







# U AVC













## **The Stroke Unit**

## Multidisciplinary Team Training



## Shoulder care for hemiplegics



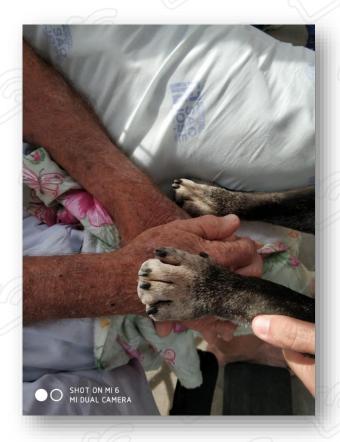


## **Palliative care**











#### **The Stroke Unit**





Certification
Stroke Centers
in Latin America







# Centro Avançado de AVC Hospital São José









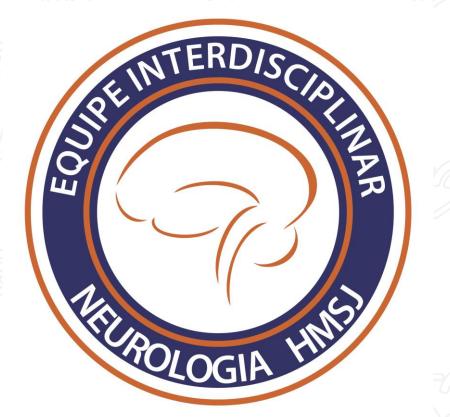


# Medical Residency Program in Neurology



Since 2006

#### Multidisciplinary Residency Program in Neurology



Nursing, Physiotherapy, Nutrition Pharmacy / Psychology Since 2014



#### Neurovascular Fellowship

Since 2009 Partnership Neurológica / HMSJ / ABAVC



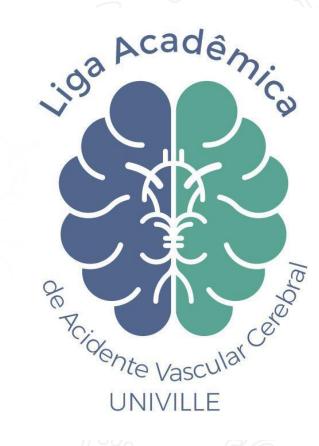








### **University – Medicine course**





Assistance: Stroke Unit Research: NeuroCovid

Community: Interactive Exhibition







# Partnership Neurológica / Stroke Unit



|     | ProFess   | Fase III | Prev. Secundária     | 2006-08 | 21 |
|-----|-----------|----------|----------------------|---------|----|
| 200 | Perform   | Fase III | Prev. Secundária     | 2006-10 | 83 |
|     | Conciouns | Fase III | HSA                  | 2010    | 3  |
| 4   | Clear III | Fase III | Hemorragia Intravent | 2011-14 | 0  |
|     | Masci     | Fase III | AVC Ag               | 2011-12 | 5  |
|     | Enchanted | Fase III | AVC Ag               | 2014-17 | 29 |
|     | Respect   | Fase III | Prev. Secundária     | 2015-18 | 8  |
|     | Navigate  | Fase III | Prev. Secundária     | 2016-18 | 11 |
|     | Restore   | Fase II  | AVC Ag               | 2017-18 | 8  |
|     | Thales    | Fase III | AVC Ag               | 2018-19 | 32 |
|     |           |          |                      |         |    |



#### Partnership Neurológica Stroke Unit



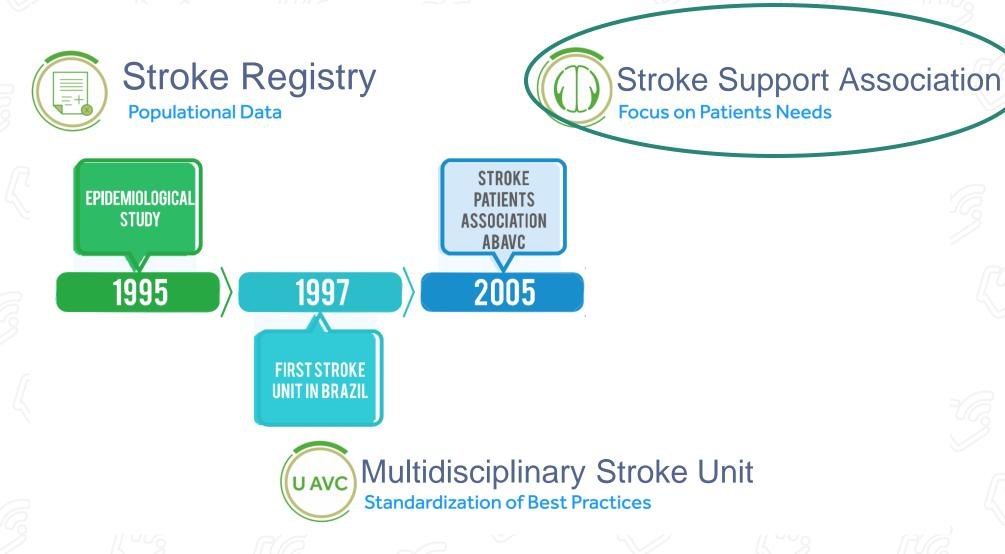
| Charm            | Fase III  | AVC Ag              | 2019    | 0   |
|------------------|-----------|---------------------|---------|-----|
| Optimal          | Fase III  | Prev. Secundária    | 2019    | 302 |
| Axiomatic        | Fase III  | AVC Ag              | 2019    | 2   |
| Trident          | Fase III  | AVCH                | 2020    | 11  |
| Interact -2      | Observac. | AVCH                | 2011-12 | 5   |
| Area             | Observac. | AVCI - Reabilitação | 2014-17 | 29  |
| Oceanic          | Fase III  | Prev. Secundária    | Ongoing |     |
| Librexia         | Fase III  | Prev. Secundária    | Ongoing |     |
| Resilent TNK     | Fase III  | AVC Ag              | Ongoing |     |
| Resilent Ext. IV | Fase III  | AVC Ag              | Ongoing |     |
| Avert Dose       | Fase III  | AVCI - Reabilitação | Ongoing |     |
|                  |           |                     |         |     |



#### Partnership Neurológica Stroke Unit



#### The Three Essential Components of Joinvasc





#### The Three Essential Components of Joinvasc





Stroke Registry Populational



Multidisciplinary Stroke Unit Standardization of Best Practices



Stroke Support Association Focus on Patients Needs



#### Stroke support organization



Desde 2005

abavc.org.br



Stroke organization that advocate priorities that matters to patients;

Link between patients, managers, and

healthcare teams;

**ABAVC** has a representative in Joinvasc's management committee;

**ABAVC** has a permanent chair in the city's health council;



## Stroke support organization



Desde 2005

abavc.org.br

#### **Develop Educational Material:**

- Population
- Schools
- Multidisciplinary team
- Patients and caregivers



# Stroke support organization

Patient and and Caregivers informatives

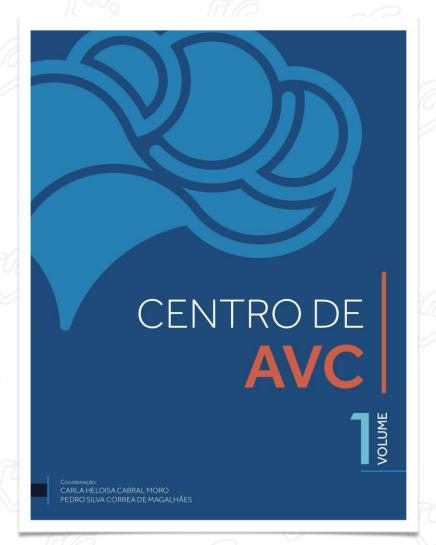


Disponível em: www.abavc.org.br



# **Stroke Support Association**

Online course



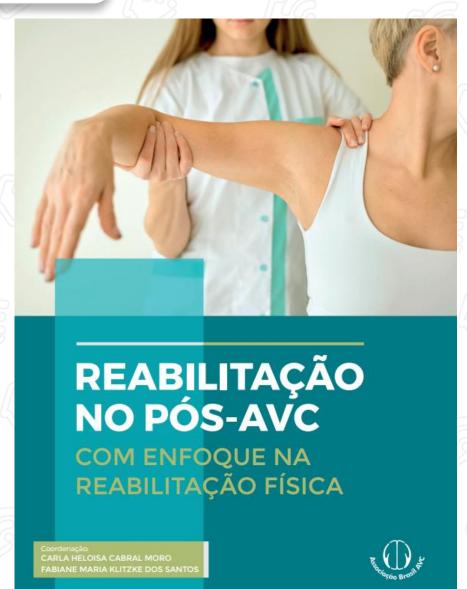


## **Stroke Support Association**

**Online course** 







#### Get to know the course:

Post stroke rehabilitation focusing on physical rehabilitation





### Educational Program - Annual Stroke Campaing











# **Educational Program – Annual Stroke Campaing**

#### Campanha de AVC do SAMU 192

# Aprenda sinais de AVC, eles iniciam repentinamente







#### **Stroke Support Association**





#### **Annual Stroke Forum**

#### Brings together all stakeholders:

- Patients, caregivers, and family members
- Community representatives
- Health care professionals
- Hospital leaders
- Managers















#### **Annual Stroke Forum**

Fórum Regional do AVC 2017













#### **Annual Stroke Forum**















#### Stroke support association



Desde 2005

abavc.org.br

#### **Sponsored:**

Database upgrade and maintenance

QUER NO AVC project – PUC Pr's partnership (Patient follow -up app).



#### **Innovation**





#### **Quer NO AVC?**

Health care monitoring app

#### **Benefits**

- Increase patient engagement.
- Stimulate self -care.
- Optimization the work of health professionals.















#### **Educational Program - community**









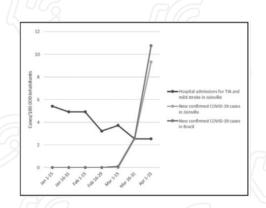


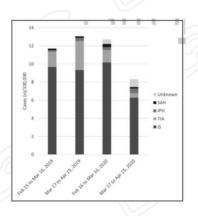
#### Joinvasc Stroke Registry x Stroke Support Association

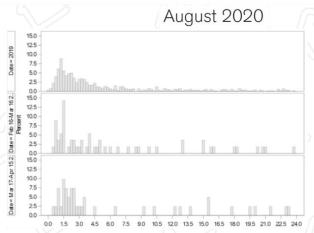
# <u>Stroke</u>

# Decrease in Hospital Admissions for Transient Ischemic Attack, Mild, and Moderate Stroke During the COVID-19 Era

Henrique Diegoli, MD; Pedro S.C. Magalhães, MD; Sheila C.O. Martins, PhD; Carla H.C. Moro, MD; Paulo H.C. França, PhD; Juliana Safanelli, RN, MSc; Vivian Nagel, RN, PhD; Vanessa G. Venancio, RN; Rafaela B. Liberato, MSc; Alexandre L. Longo, MD









#### Joinvasc Stroke Registry x Stroke Support Association





#### Joinvasc Stroke Registry x Stroke Support Association











Stroke + mathematics = learned in double dose

Elementary school





#### Stroke + mathematics = learned in double dose













■ Mail 💵 4G 😝

10:00

Stroke + mathematics = learned in double dose





# Stroke + Mathematics = learned in double dose!

14 Jun 2022 | Stroke awareness | Stroke prevention

Associação Brasil AVC finds innovative ways to reach young people with the stroke prevention message.

ΔΑ

world-stroke.org













# EDUCANDO PARA A CIDADANIA

#### EDUCANDO

#### PARA A CIDADANIA

Atividades Contextualizadas para o Ensino de Estatística no Ensino Fundamental

EDUCANDO PARA A CIDADANIA

#### Apresentação

03

 Educação não transforma o mundo. Educação muda as pessoas. Pessoas transformam o mundo.

Paulo Freire

#### Capítulo 1

04

- Introdução
- Acidente vascular cerebral
- Estatística no ensino fundamental
- Educação matemática crítica
- Cenários de investigação
   Ensino de estatística

#### Referências

17

Referências bibliográficas

#### Capítulo 2

18

- Cenário 1
  Cenário 2
- Cenario 2
   Cenário 3
- Cenário 4

#### Sugestões

36

- · Filme : O Escafandro e a Borboleta
- Filme : Sem Palavras

#### Considerações

38

Considerações finais



EDUCANDO PARA A CIDADANIA









www.abavc.org.br

- 2. Uma associação beneficente irá sortear uma cadeira de rodas para 7 pessoas (4 homens e 3 mulheres) que precisam de cadeira de rodas.
- a) Qual a probabilidade de uma pessoa ser sorteada?
- b) Qual a probabilidade de um homem ser sorteado?
- c) Qual a probabilidade de uma mulher ser sorteada?

O que é Placebo?

Placebo é qualquer substância ou tratamento inerte (ou seja, que não apresenta interação com o organismo) empregado como se fosse ativo. Na medicina, injeções de soro fisiciógico e comprimidos de açucar são dos placebos mais usados.



- Em uma pesquisa para tratamento do AVC, há 50 pessoas, dessas 20 pessoas irão receber placebo\* e 30 pessoas irão receber o novo medicamento.
- a) Qual a probabilidade de receber placebo?
- b) Qual a probabilidade de receber a medicação?



Since 2024 – Implementation in the Learning Progression Map

- all municipal schools (54)
- seventh year of elementary school
- in the curricular components of mathematics, natural sciences physical education



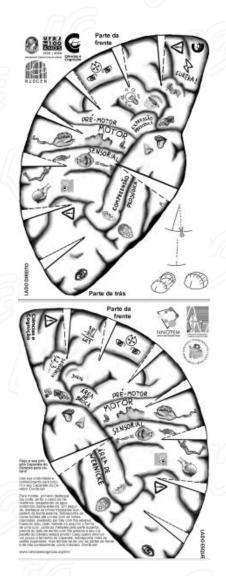
Teacher's training







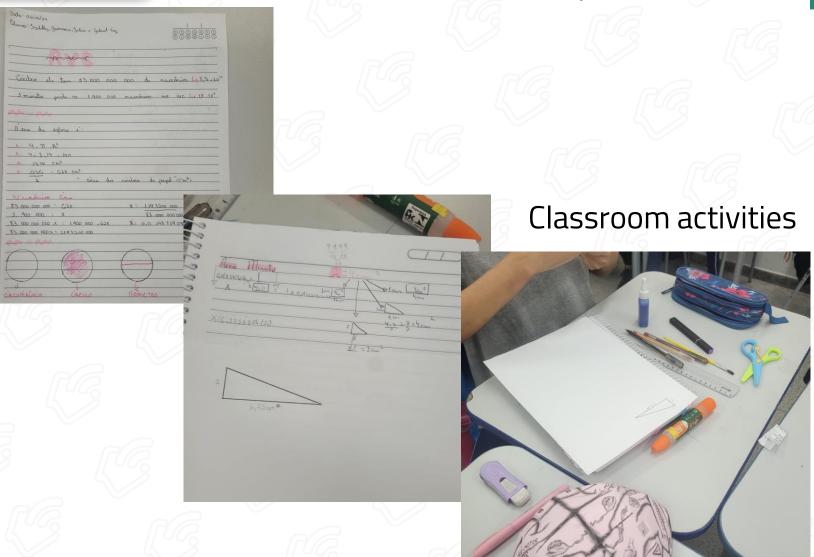






**Brain helmet** 





**Brain helmet** 



Presentation of acquired knowledge to other students









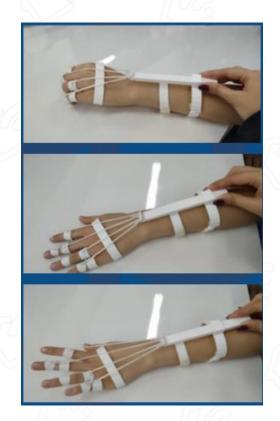
Robotic project / entrepreneurship / design thinking High School





Robotic project / entrepreneurship / design thinking High School







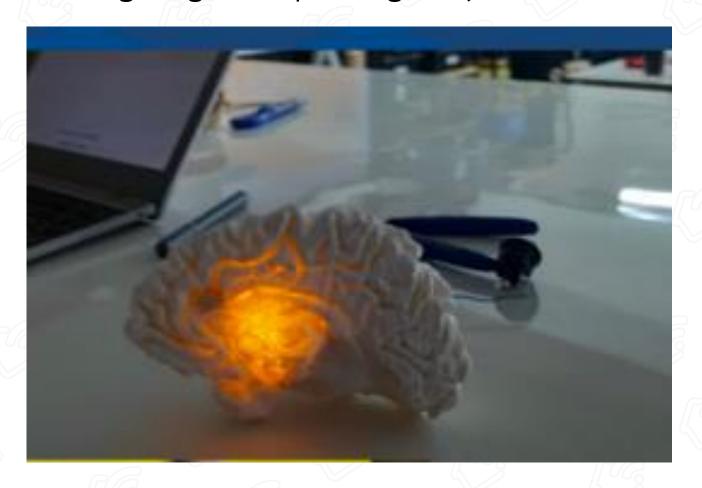
Robotic project / entrepreneurship / design thinking High School





## **3D Brain**

## Lighting corresponding to injured area









## For a healthy and tobacco free life

#### Game development

High School – Escola S –
 Mecânica, dinâmica e estática







University - UniSenai Programação

**Enemies** 



# For a healthy and tobacco free life

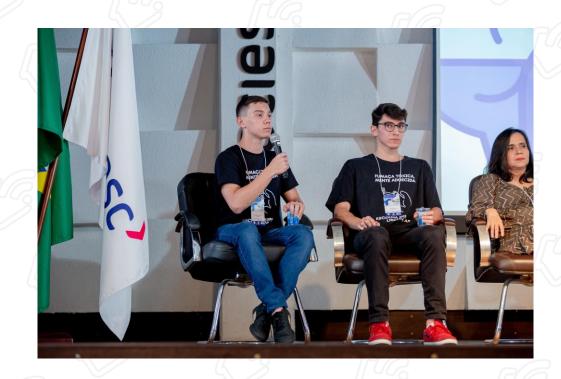






## For a healthy and tobacco free life







Active participation in the round table with managers Coordination's of Primary Care Tabagism Program, School Director, Professor, Pneumologist and Neurologist



## Patient Navegation - Stroke Support Association

### Service: In -person - Online - WhatsApp - Home



**Mary** Physiotherapist



**Hanna** Nurse



**Claudinéia** Social worker



**Isabel**High school student

Support for patients and caregivers in Stroke Care Navigation



# Patient Navegation - Stroke Support Association

Service: In -person - Online - WhatsApp - Home



Support for patients and caregivers in Stroke Care Navigation





www.abavc.org.br

Desde 2005





# **Partnerships**

Secretaria da Saúde



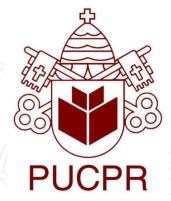




















## Laws



LEI Nº 5526, de 17 de julho de 2006.

RECONHECE DE UTILIDADE PÚBLICA MUNICIPAL A ASSOCIAÇÃO BRASIL AVC.



LEI Nº 7448, DE 12 DE JUNHO DE 2013.

INSTITUI O BANCO DE DADOS REGISTRO DE ACIDENTE VASCULAR CEREBRAL - AVC DE JOINVILLE E DÁ OUTRAS PROVIDÊNCIAS.

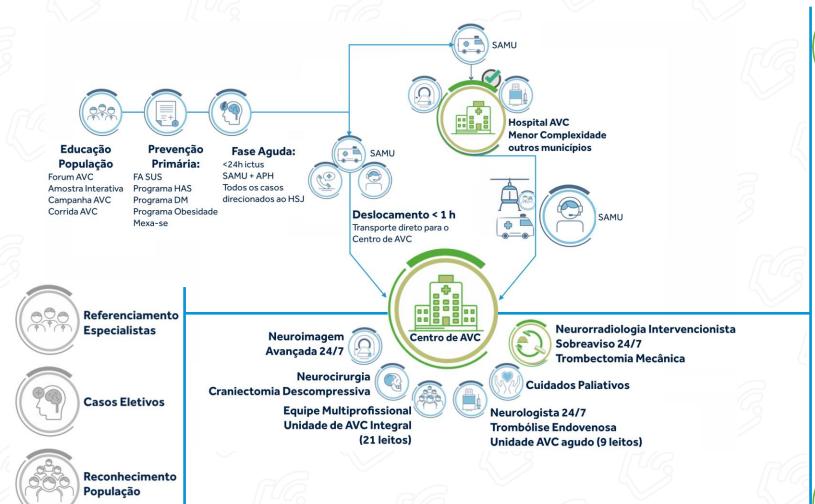


LEI N° 8266, DE 19 DE JULHO DE 2016.

Institui o "Dia de Combate ao Acidente Vascular Cerebral - AVC " no Município.



## Joinville's Stroke Care Line





















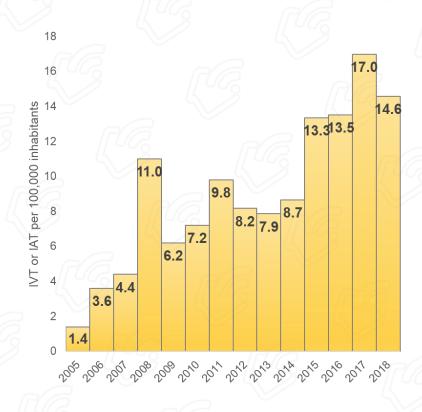


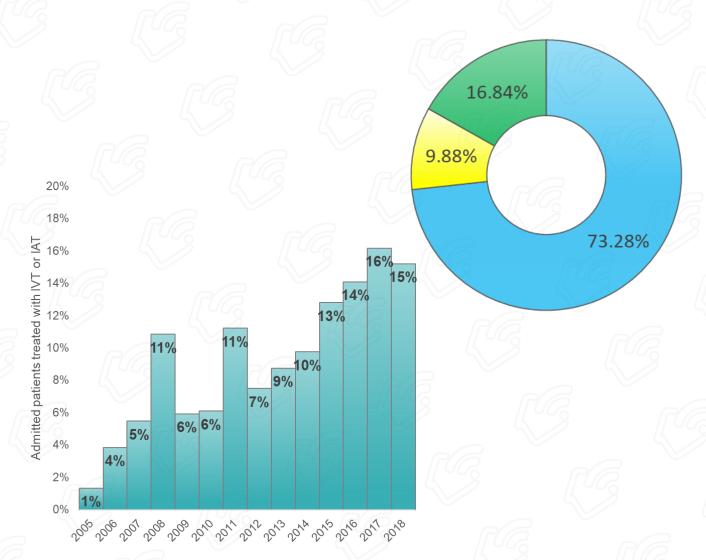
■ IVT alone

□ IVT + MT

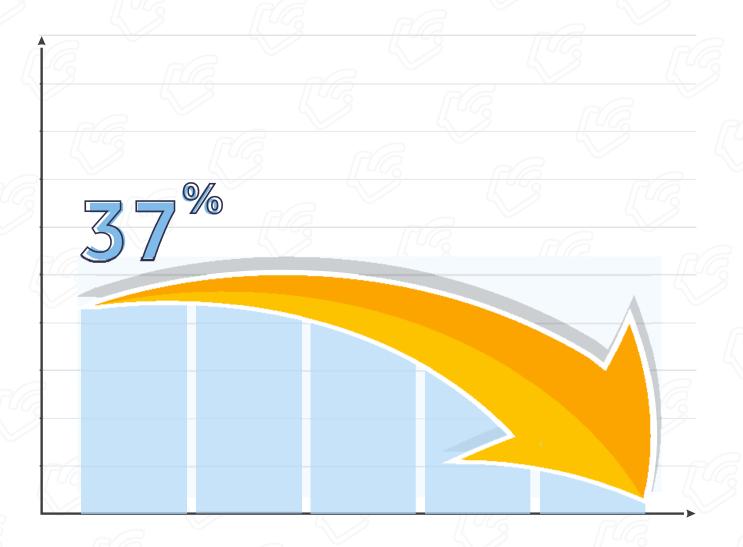
■ MT alone

### More than >10x thrombolysis



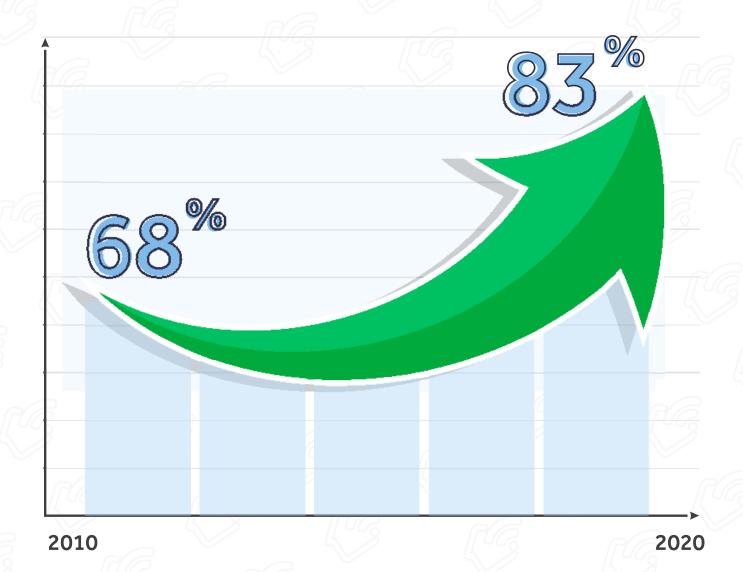






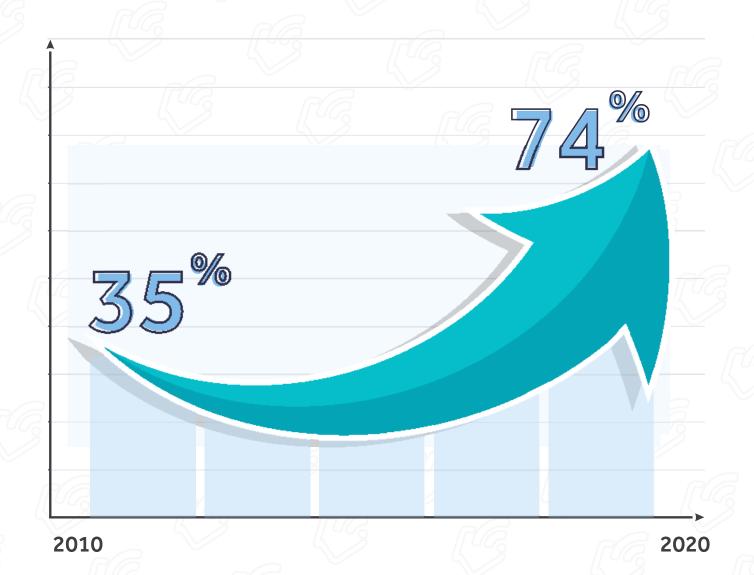
37% reduction in stroke incidence





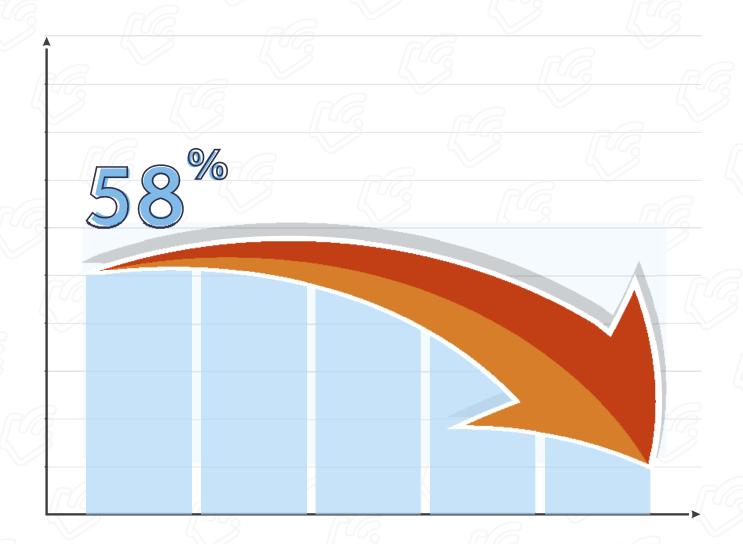
83% of stroke patients admitted to the IPU





Increased functional improvement after a severe stroke





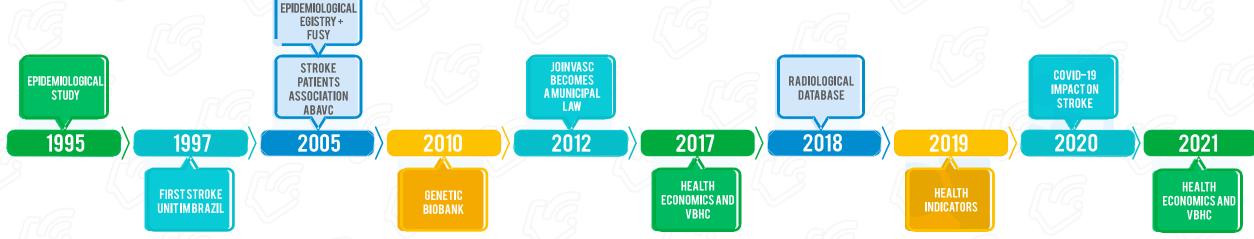
58% reduction in stroke lethality over the last 25 years



**CLINICAL AND** 

## Joinvasc Stroke Program Timeline





25 anos de melhorias contínuas baseadas nas necesssidades dos PACIENTES



## 2021 Winner of the VBHC Prize

The VBHC Prize **rewards and recognizes** inspiring initiatives that have adopted a fundamentally new line of thinking in creating excellent patient value in terms of real outcomes, real connections, and one common language. Each year, one excellent initiative is awarded the VBHC Prize, a prestigious prize awarded by a renowned international jury.

#### **Joinvasc Stroke Program**

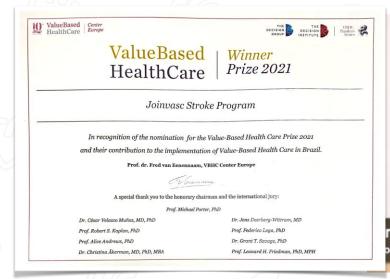


A VBHC Stroke Care Program

Value based health care



## 2021 Winner of the VBHC Prize





"This year's winner is a clear front-running in a very important field, measuring in a broad spectrum the outcomes in the whole cycle of care for stroke patients"



## Joinvasc Value-driven Stroke Program

2023 NEJM Catalyst publication: Case of Innovation in Care Delivery

NEJM Catalyst

Innovations in Care Delivery

**CASE STUDY** 

# Joinvasc: Organizing the Full Cycle of Stroke Care with Universal Coverage

Henrique Diegoli, MD, MSc, Pedro Magalhães, MD, MBA, Márcia Makdisse, MD, PhD, MBA, Carla Heloísa Cabral Moro, MD, Paulo França, PhD, Alexandre Longo, MD



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# Ciclo de cuidado ao AVC: Experiência Joinvasc – Stroke Program

Carla Heloisa Cabral Moro





