

# IMPEC

IMPROVING EMERGENCY CARE

**The IMPEC FHU**

Pr Yonathan Freund - Sorbonne University, APHP.SU

# Emergency Medicine:

**Cornerstone of most acute conditions and critical illness**

---

**Facing several issues to deliver best care to patient:**



**Specificity of emergency physician's work**  
(multiple patients, incomplete information, rapid decision)



**Shortcomings** from a specific system  
(hospitals' bed restriction, access blocks, manpower shortage)



**Difficult environment**  
(comorbid and fragile population, geopolitical evolution)

# Research in **emergency medicine**

---

**Late comer compared to others specialties**

**Worldwide (Leading societies and leading journal at lower grade)**

---

**Emergency Medicine @APHP in the last 10 years**

**Despite few & disseminated researchers, achieved:**

- **Several national grants funded (> 6 Million €) and European RCTs**
- **Landmark publications in major journals (1 NEJM, 4 JAMA, 1 Lancet, 1 BMJ)**

# **IMPEC FHU: Aim of the project**



**The creation of IMPEC FHU will allow to:**

- **Federate all Emergency Med, Researcher in Paris Metro area**
- **Encourage collaborations between hospitals and EDs**
- **Enhance attractiveness of research in a difficult environment**
- **Improve international visibility of French EM research**

# IMPEC FHU: General structure



- 
- Core group: **ED researchers APHP.SU, APHP.P13, APHP.Univ Paris**
  - Support group: **All academic APHP EDs (17) + 2 non APHP EDs**
  - Linked with **Regional ED observatory (120 EDs)**
  - **First research consortium in EM in France**



# Aim of the structure:

## Improving emergency care through 5 workpackages

---



**WP1:** Early therapy in the critically ill *Pr F Adnet*



**WP2:** Healthcare access and suboptimal care for fragile population *Dr AL Feral*



**WP3:** Resource allocation and precision medicine *Pr Y Freund*



**WP4:** Paramedical research *J Leblanc*



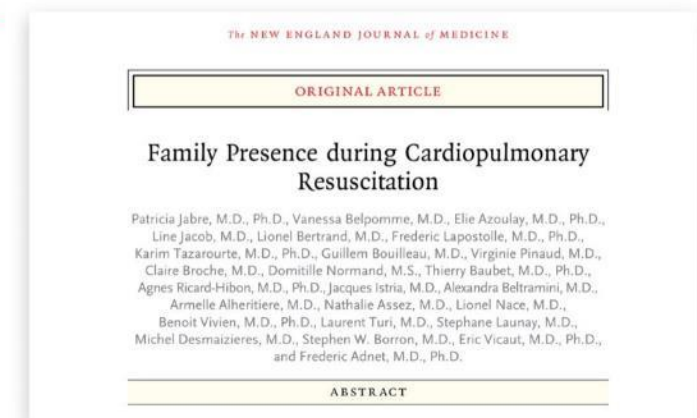
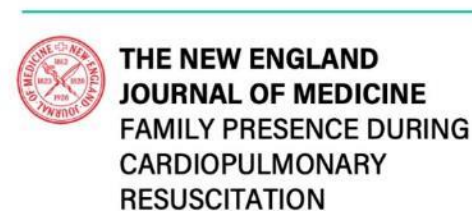
**WP5:** Medical education, medical errors and human factors *Dr AL Philippon*

# WP1: Early therapy in the critically ill

**Aim :**  
to improve  
prognosis in  
acute emergency  
condition



**JAMA** THE JOURNAL OF THE  
AMERICAN MEDICAL  
ASSOCIATION  
PROGNOSTIC ACCURACY  
OF SEPSIS-3 CRITERIA



# **WP1: Early therapy in the critically ill**

**Aim : to improve prognosis in acute emergency condition**

---

**Cardiac arrest:** leading cause of death

Ongoing research on early management – optimisation of early care (drug's efficacy)

**Project: tailor the decision about when to stop resuscitation efforts**

---

**Sepsis:** tightening definition and early detection – biomarkers / clinical scores

**Project: test sepsis bundles and validate the SSC guidelines**

---

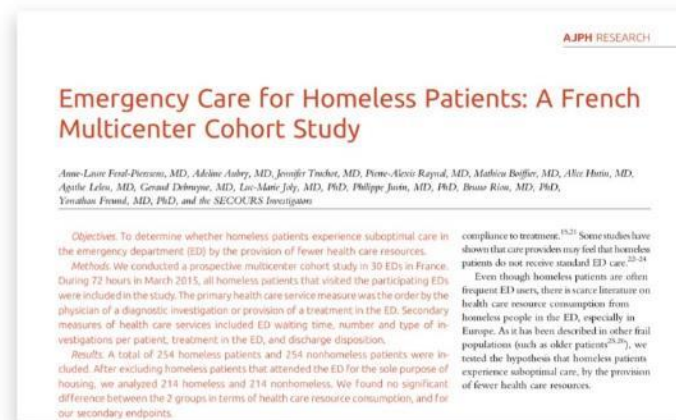
**Trauma:** leading cause of death and global burden

**Project: improve pre-hospital management by testing risk and benefit of hyperoxia**



# WP2: Healthcare access

## Suboptimal care to specific population Inequal access to healthcare



# WP2: Healthcare access

Suboptimal care to specific population - Inequal access to healthcare

---

**Transdisciplinary research from epidemiology to randomized clinical trials**

---

Identify pitfalls and needs – Collaboration with INSERM 1153

---

Root cause analysis

---

Build and conduct clinical trials

---



**WP1**

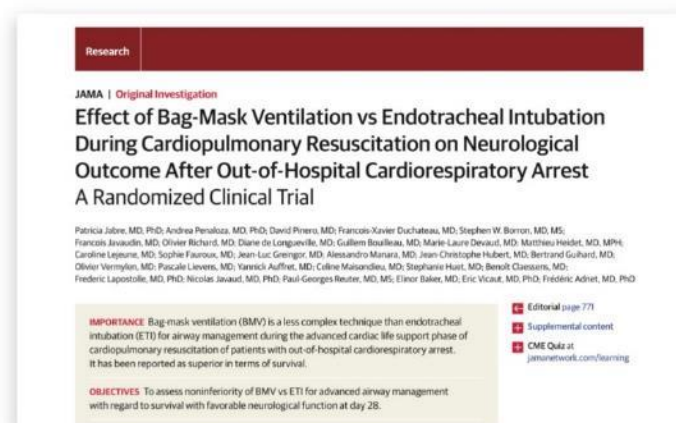


**WP4**

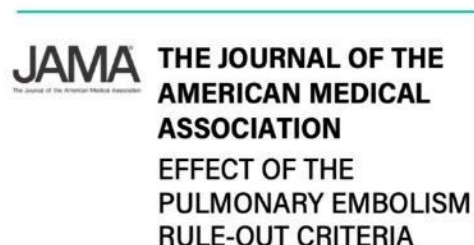
Perspective : migrant patients, uninsured, foregoing medical care...

# WP3: Resource allocation / precision medicine

**Rationalising  
diagnostic tests  
and treatment  
without impairing  
safety and  
efficacy of care**



**JAMA** THE JOURNAL OF THE  
THE JOURNAL OF THE  
AMERICAN MEDICAL  
ASSOCIATION  
EFFECT OF BAG-MASK  
VENTILATION VS  
ENDOTRACHEAL INTUBATION



# WP3: Resource allocation / precision medicine

Rationalising diagnostic tests and treatment - Without impairing safety and efficacy of care

---

## Reducing imaging studies use and need for invasive treatment



International RCT on clinical decision rule for PE

International RCT on coma patients (NICO) With medico-eco evaluation (URC-eco)

---

## Biomarkers and diagnostic tests

ED triage and early rule-out With INSERM U942



WP1



WP4

## Big data analysis on ED visit data

Forecasting ED flow – improving patients' pathway With Harv Med School & EDS



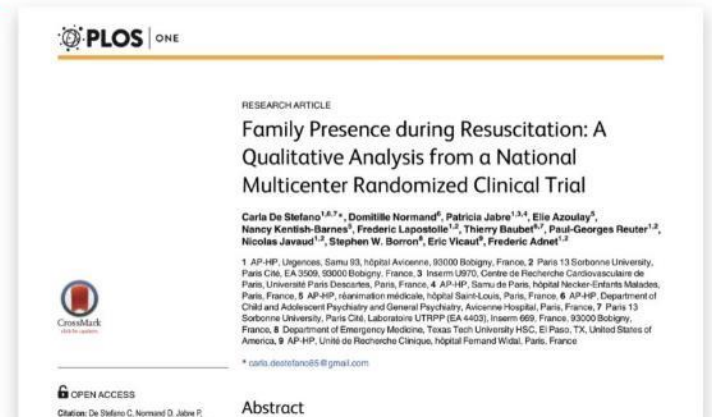
# WP4: Paramedical research

**Nurses and other  
Paramedical  
providers are  
pivot for ED care**



*Annals of*  
**Emergency Medicine**  
*An International Journal*

**ANNALS OF EMERGENCY MEDICINE  
TARGETED HIV SCREENING IN  
EIGHT EMERGENCY  
DEPARTMENTS**





# **WP4: Paramedical research**

**Nurses and other paramedical providers are pivot for ED care**

---

**Targeted screening for HIV in the ED**

---

**Advanced practice nursing (Ministry of health and ARS)**

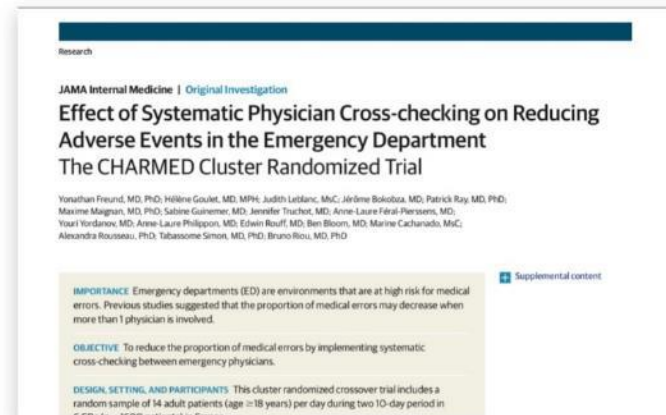
Cooperation protocol for Xray order and therapy administration

---

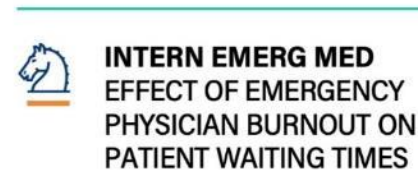
**Reducing risk of psychotrauma after cardiac arrest for family**

# WP5: Medical errors - medical education

**Study humans factors → system based changes and improved patient's safety**



**JAMA** THE JOURNAL OF THE  
THE JOURNAL OF THE  
AMERICAN MEDICAL  
ASSOCIATION  
EFFECT OF SYSTEMATIC  
PHYSICIAN CROSS-CHECKING



# WP5: Medical errors – medical education

Study humans factors → system based changes and improved patient's safety

---

## Improving simulation based teaching

Internal and external international validation of student's assessment

---

## Develop cross checking procedures, beyond emergency care

Intervention trial for shifted resident's work hours

---



WP4

## Introduce and assess benefit of checklist in emergent situation

Acute heart failure, sepsis, cardiac arrest



WP1

# Governance of IMPEC



## **Executive committee** / Monthly meeting

Pr Y Freund, Pr T Simon, Pr F Adnet, Dr AL Feral, J Leblanc,  
Dr AL Philippon



## **Research committee** / Quarterly meeting

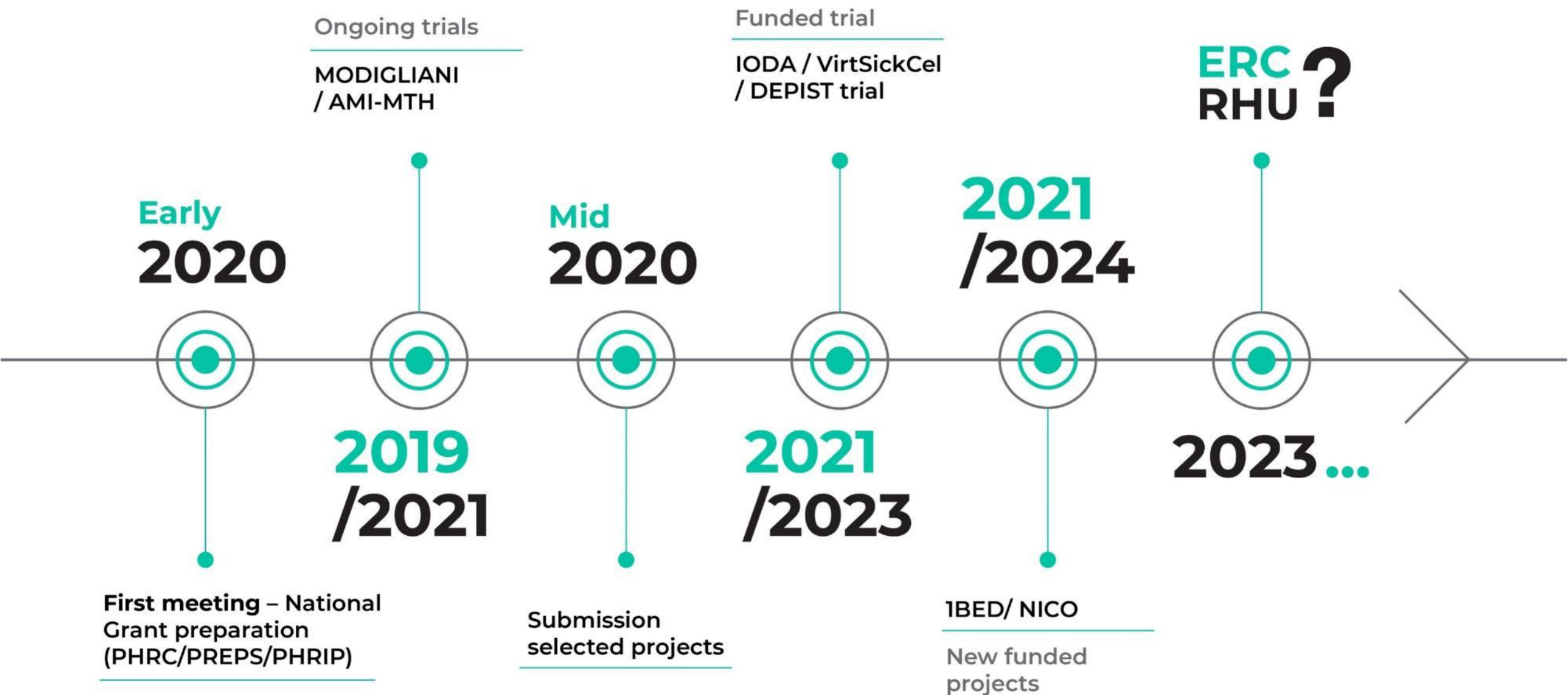
One researcher from involved hospitals and  
research structures (N=19) + Inserm U942 + URCEST + ORUIdF



## **International advisory board** / Yearly meeting

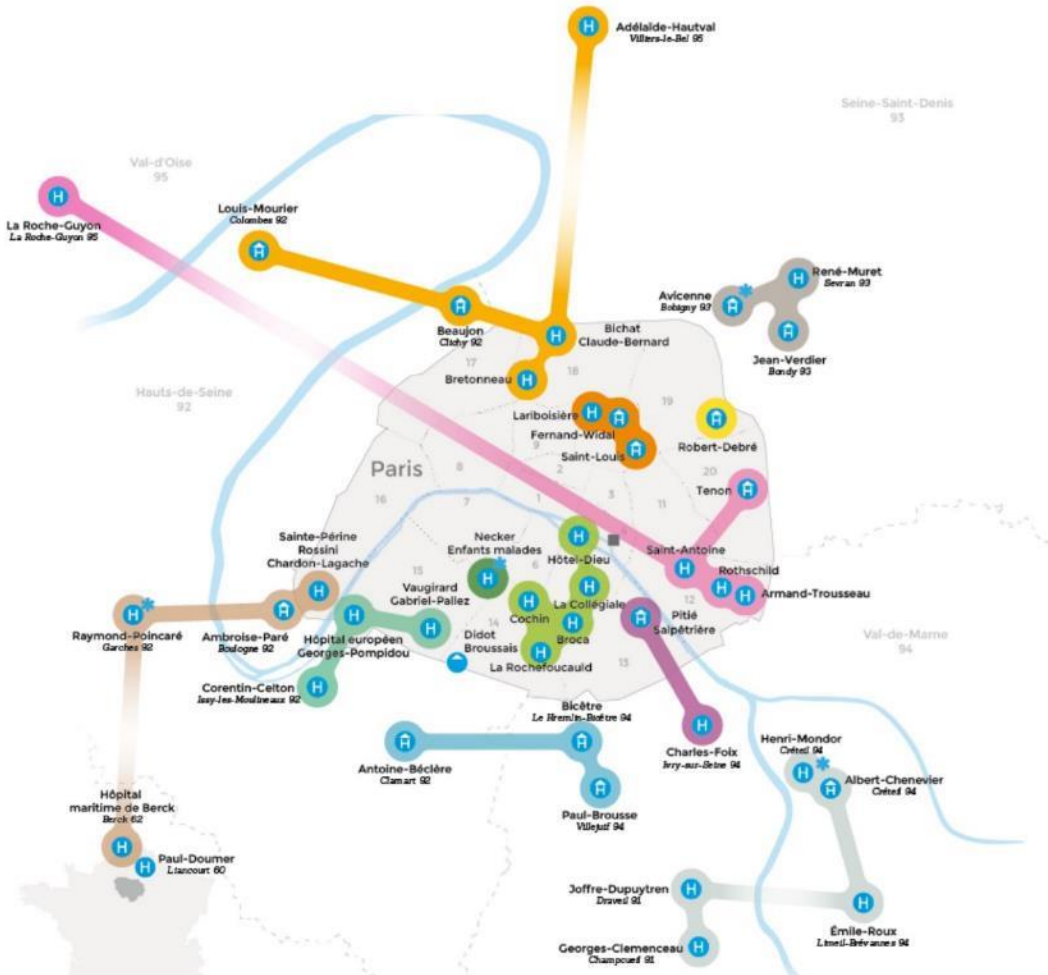
Pr Hugli (Switzerland), Dr Bloom (UK), Dr Penaloza (Belgium)  
& Dr Miro (Spain)







# Strengths of IMPEC



**First research consortium  
in emergency medicine  
in France (Already exist in  
UK, Spain, Belgium,  
Denmark...)**

# Strengths of IMPEC

Unsurpassed recruitment  
potential of **800K patients**  
per year (APHP)

And up to **4 million visits**  
per year (Regional  
observatory)





# Strengths of IMPEC



**Large diversity of recruiting center** Pre hosp / ED, semi rural / urban, underprivileged ...

**Strong support of INSERM**  
**3 universities and APHP**

Consolidate **European networks** for ERC application

Develop existing collaboration with **USA Canada and Chili**



Île-de-France

19 centres

France

33 centres

Europe

Espagne, Suisse,  
Belgique, UK

America

USA, Canada, Chili

