

Réanimateur: vers un nouveau métier

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Paris, France

Liens d'intérêt

- **Lecture: Fresenius et Mundipharma**
- **Lecture et advisory board: MSD et Roche**
- **Data safety et monitoring board: AM-Pharma**

“Prediction is very difficult, especially about the future”

(Niels Bohr)



Niels Bohr

Le Passé

— ” —

Lorsque tu ne sais pas où
tu vas, regarde d'où tu
viens !

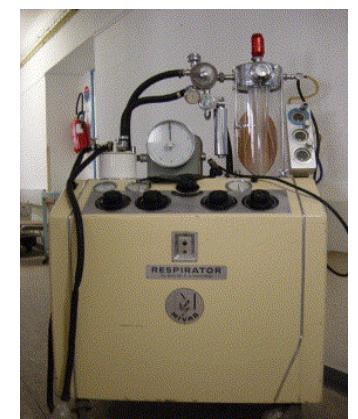
— ” —

Proverbe africain

Florence Nightingale (1820-1910)



Ventilation manuelle d'un enfant atteint de polio à Copenhagen en 1953 (Blegdams Hospital)



THE WORK IN AN ANAESTHESIOLOGIC OBSERVATION UNIT

By BJØRN IBSEN & TONE DAHL KVITTINGEN

A survey is given of the work in the recovery room, the intensive therapy unit for respiratory and circulatory insufficiency and of some emergency work on newly admitted patients in a department of anaesthesiology.

The different principles of the active treatment of respiratory insufficiency are outlined, and the importance of combining all possible therapeutic measures is stressed.

The treatment of shock and hyperthermia by use of chlorpromazine and surface cooling is described.

A report is given of the patients treated according to these principles over a 4 year period. The main interest is focused on the results of treatment of respiratory or circulatory insufficiency. The patients are grouped as follows:

I. Respiratory or circulatory insufficiency following surgery on non-traumatic indications. 121 patients.

II. Respiratory or circulatory insufficiency following trauma. 60 patients.

III. Respiratory or circulatory insufficiency due to primary disease of the lungs or the heart. 34 patients.

IV. Respiratory or circulatory disorders due to neurological disease. 19 patients.

V. Other conditions, mainly poisoning. 25 patients.

The patients come — very often for resuscitation — from several different departments from a hospital area with 1,700 beds. The total number of patients is 259, of whom 93 have died.

The importance of team work is mentioned, and a much more active approach in the treatment of respiratory and circulatory insufficiency plus hyperthermia is recommended.

(Anesthesiologisk afdeling, Kommunehospitalet, Copenhagen;
Head: B. IBSEN.)

31.VII.1958.



Première publication sur le métier de réanimation

Mortality 36%

Le présent

- Deux voies de formation (DES-MIR; DES-ARMPO)

Réanimation et soins critiques en général : un modèle à repenser après la crise

- Spécialité primaire

- Qua

Un modèle à repenser après la crise

- Reconnaissance lors de la crise COVID19

- Nouveaux décrets (2022)

- Augmentation du nombre d'internes

- Crise hospitalière

PRÉSENTATION

Depuis le début de la crise sanitaire, en France comme à l'étranger, les capacités hospitalières en réanimation ont conditionné le fonctionnement des systèmes de santé, mais aussi la société dans leur ensemble, et même les soins de santé. Cela a été mis en évidence par l'apparition d'un phénomène inédit : la réanimation palliative très spécifique, peu connue du grand public, mais importante pour la survie des patients. Elle est réalisée par des professionnels, avec des techniques et une disponibilité effective sont étroitement liées au fonctionnement des systèmes de santé. En effet, il n'existe pas d'alternative à une hospitalisation en urgence dans une unité de réanimation. Les îlots de ces unités sont en permanence occupés à 88 % en moyenne⁴², avec des pics d'activité récurrents en hiver.

⁴² La Cour n'a recensé aucun rapport analysant de façon globale la question des soins critiques en France antérieur à la crise sanitaire. Depuis, le sujet a été abordé, notamment, dans les rapports sur la crise sanitaire de la mission d'information de l'Assemblée nationale (XV^e législature, n° 3053, 3 juin 2020 et n° 3633, 2 décembre 2020) et de la commission d'enquête du Sénat (n° 199, 2020-2021, 8 décembre 2020).

⁴³ Les sociétés savantes de réanimation recommandent de ne pas dépasser un taux d'occupation de 80 % afin de pouvoir garantir en permanence l'accueil de patients en urgence absolue.

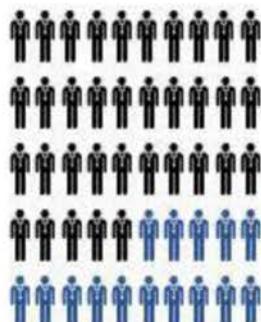
Le présent

Enquête 2021



Ressources humaines médicales

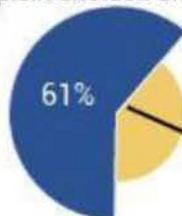
2350 médecins
exercent en réanimation



1/3 de femmes

50% des réanimateurs de
moins de 40 ans sont des réanimatrices

Temps plein exclusif en réanimation



6 ETP / service (IQR 5-8) + 1 ETP vacant

(2 dans les services extra-
universitaire publics)



329 postes vacants

Postes financés mais non pourvus en France



57% des services ont un poste vacant

Ensemble des services en France



76% des services des hôpitaux publics extra-
universitaires ont un poste vacant

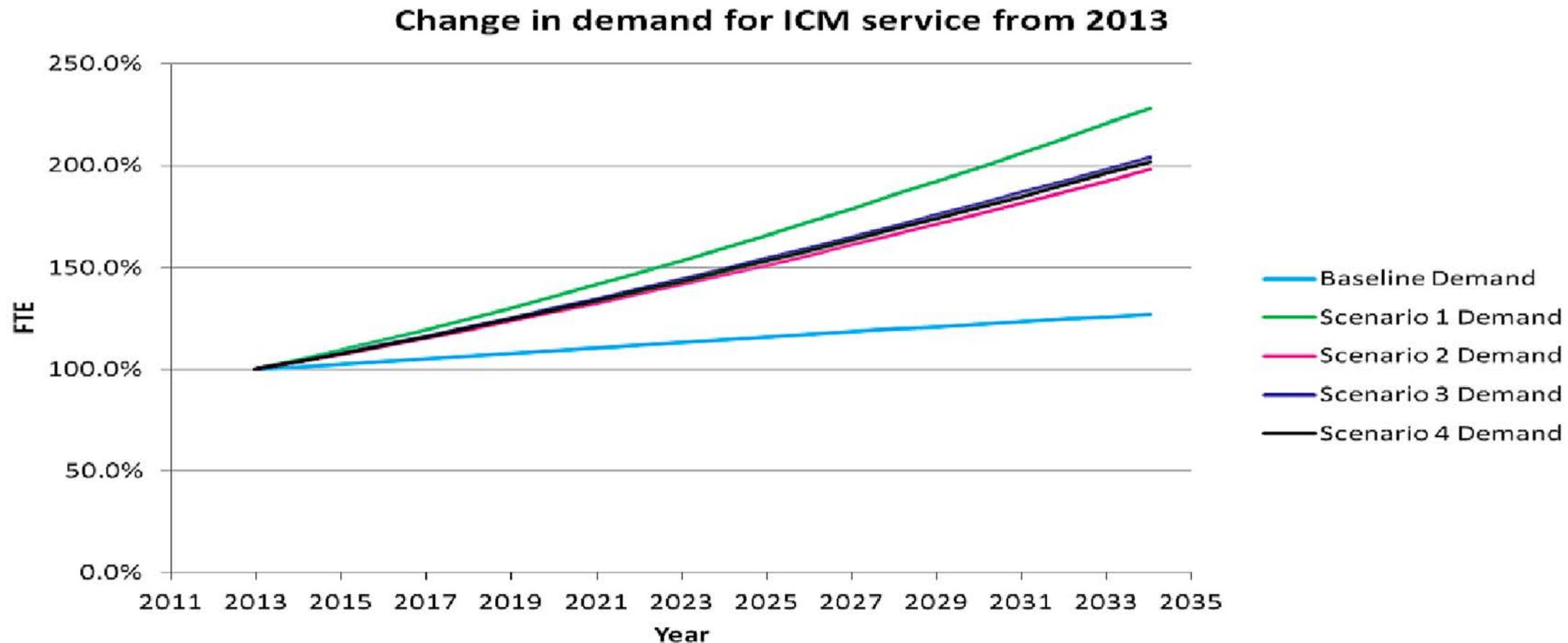
327 réanimateurs > 60 ans

Départs à la retraite dans les 5 ans



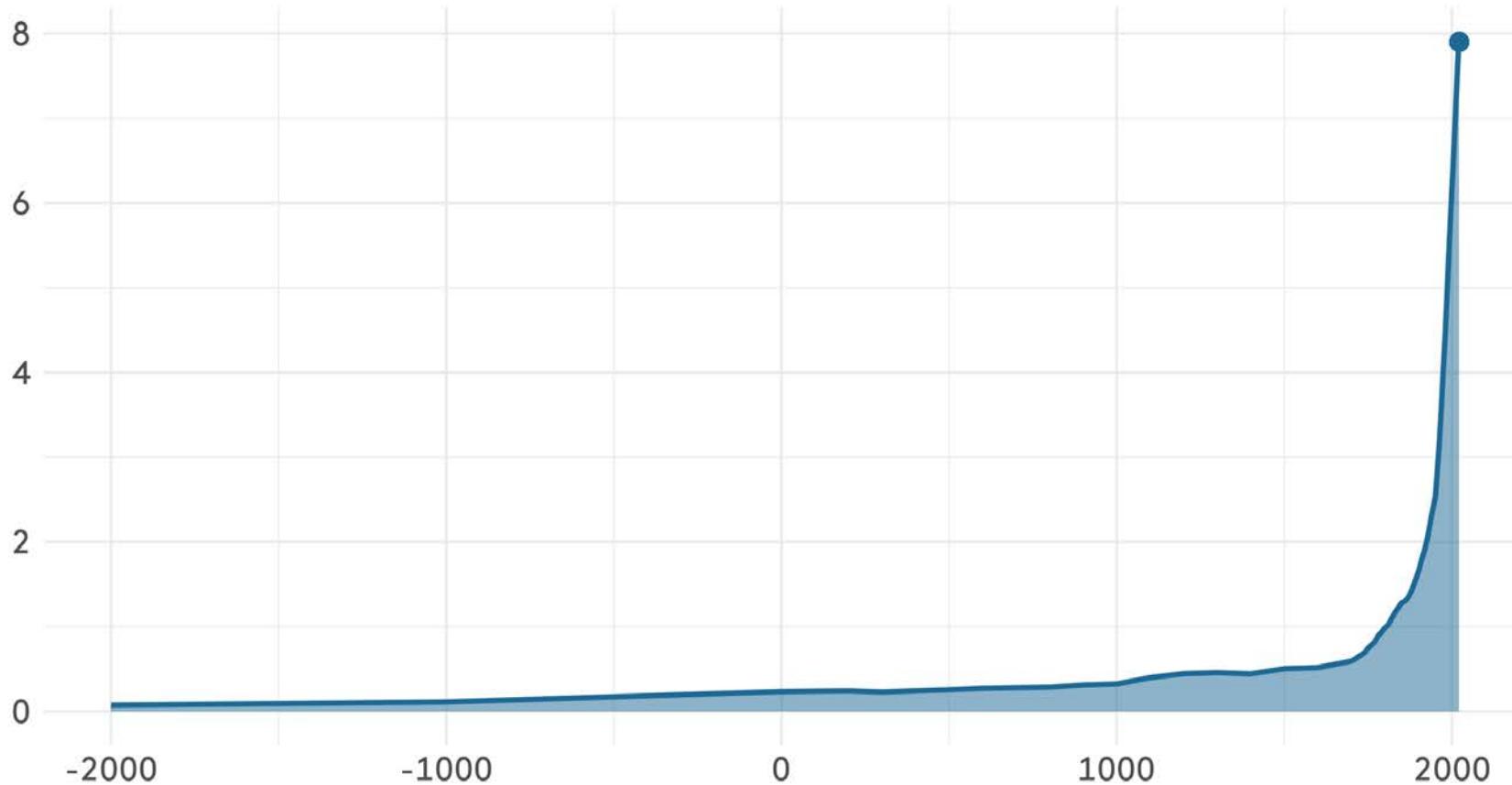
36% des services font appel à l'intérim médical
47% en secteur public extra-universitaire

Position paper of the Workforce Advisory Group January 2015



La population mondiale atteint 8 milliards de personnes sur Terre

Estimation de la population de 2 000 avant J.-C. à aujourd'hui
(en milliards d'habitants)



Source: Gapminder, Hyde, Nations Unies. Données compilées par Our World in Data

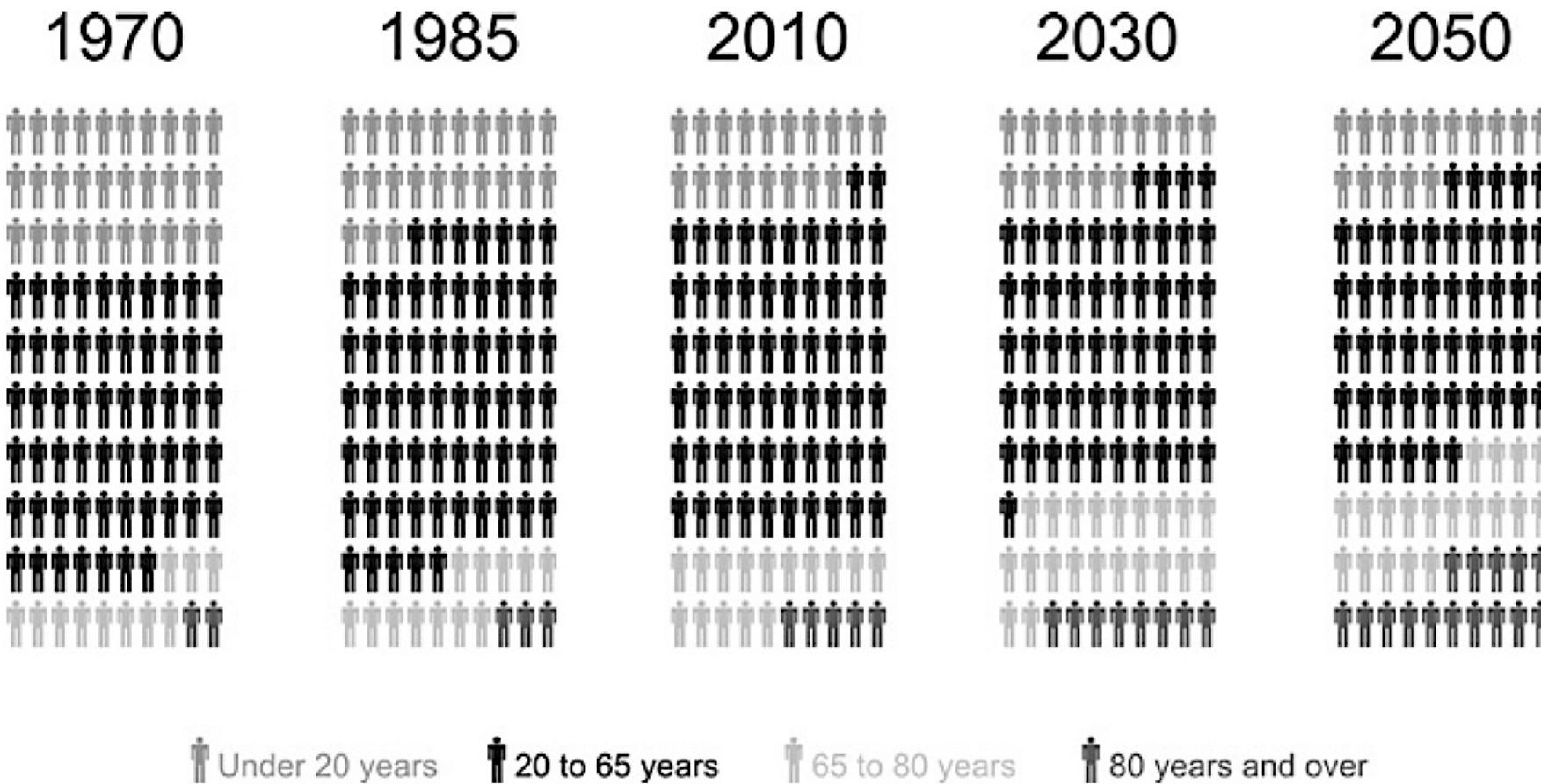
TAUX DE NATALITÉ PAR ÉTAT ET TERRITOIRE EN 2010



TAUX DE NATALITÉ PAR ÉTAT ET TERRITOIRE EN 2021

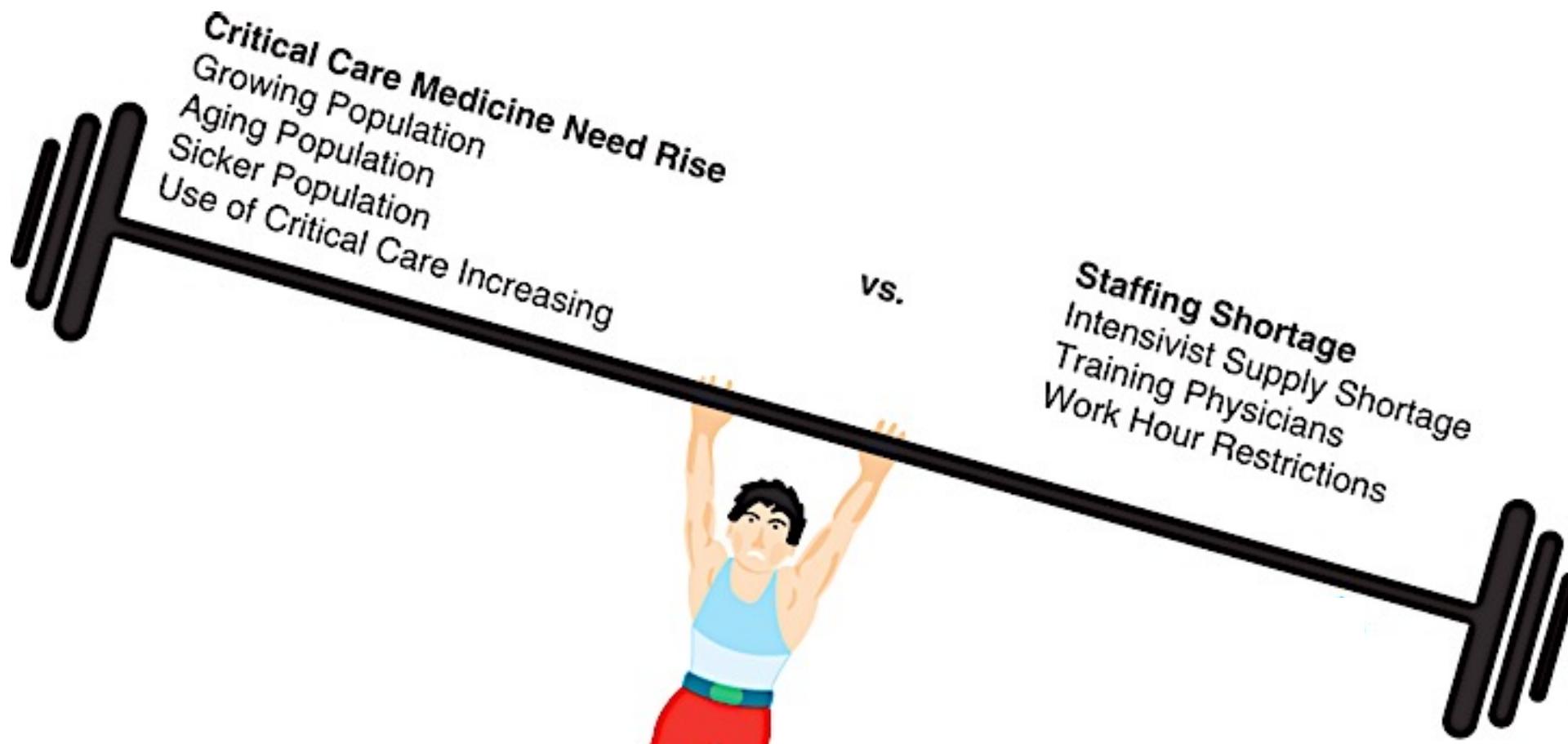


Distribution des classes d'âge dans la population allemande



Prévalence des diagnostics en Allemagne 2007, 2030 et 2050

Diagnosis	Relative numbers (per 100,000)		
	2007	2030	2050
Age-dependent macula degeneration [10] ^c	1,065	1,660 (+56%)	2,574 (+142%)
Osteoporosis [11] ^c	10,068	13,209 (+31%)	15,131 (+50%)
Arthritis [12] ^c	16,554	20,191 (+22%)	21,606 (+31%)
Diabetes mellitus [13, 14] ^c	4,993–7,730	6,497– 10,056 (+30%)	7,185– 11,287 (+44–46%)
Hypertension [15] ^c	42,367	49,035 (+16%)	51,591 (+22%)
Chronic obstructive lung disease [16] ^c	7,829	10,259 (+31%)	11,533 (+47%)
Dialysis [17] ^c	88	110 (+25%)	124 (+41%)
Dementia [18] ^c	1,300	2,092 (+61%)	3,175 (+144%)



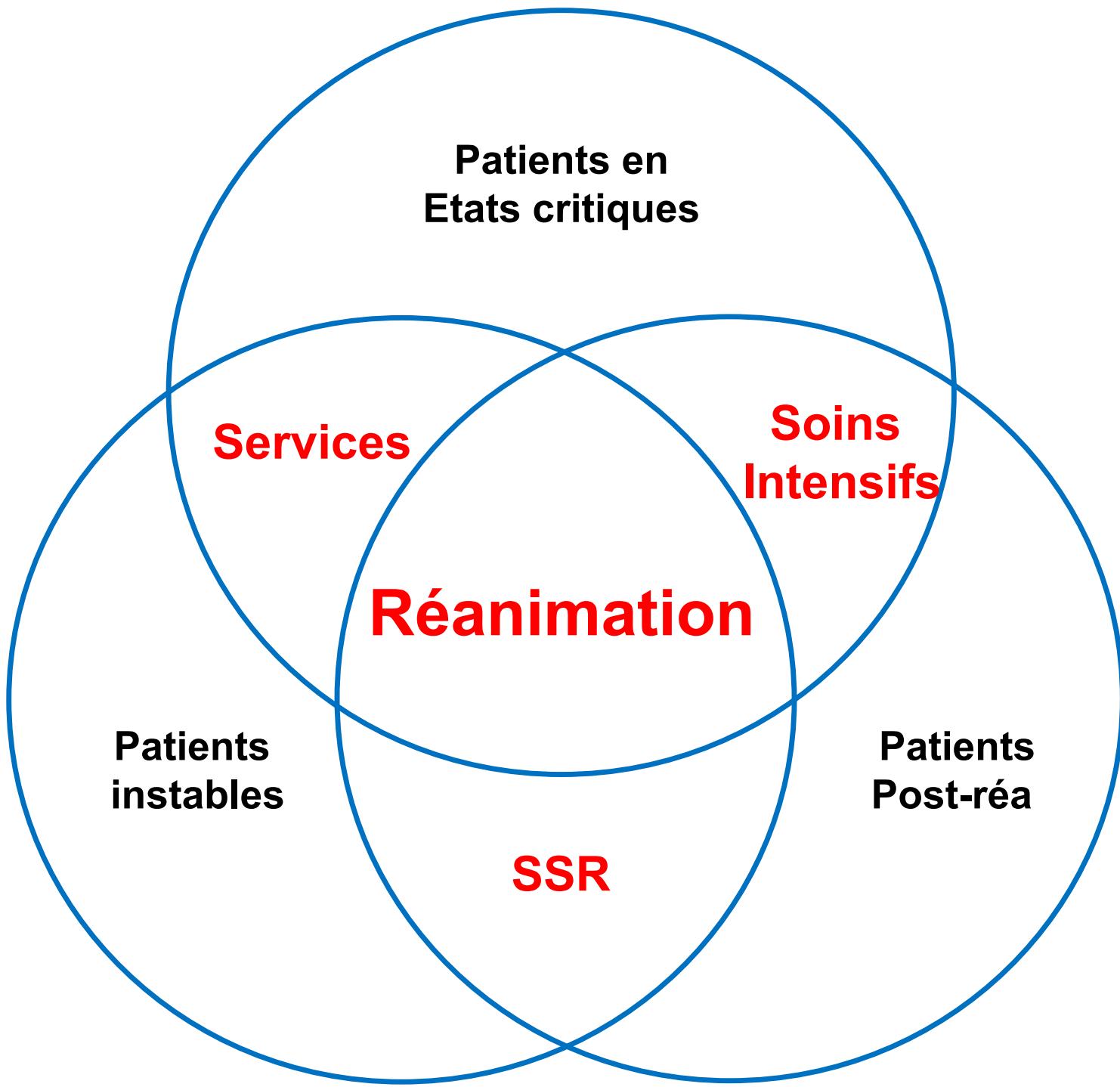
Future place de la réanimation dans l'hôpital



2022



2050





Interprofessional Practice in Critical Care: Looking Back and Forging Ahead

Effective communication

Mutual respect

Collaboration

Consultation

Cooperation

Cohesion

Adaptability

Coaching

Strategic decision-making

Defining expectations

Resolving challenges

Team identity

Psychologic safety

Enhancing Implementation of Complex Critical Care Interventions through Interprofessional Education

L'éducation interprofessionnelle est une nouvelle stratégie qui facilite l'acceptabilité, l'appropriation et la faisabilité de l'implantation de nouvelles pratiques et recommandations.

Pratiques interprofessionnelles en réanimation

Equipe:

- Médecins
- Internes
- IDE
- AS
- Cadres
- Kinés
- Psychologue
- Assistante sociale

Interprofessional Practice in US Critical Care

- ICU team:**
- **Physicians**
 - **Nurse practitioners (NPs)**
 - **Physician assistants**
 - **Clinical pharmacists**
 - **Clinicians-in-training**
 - **Respiratory therapists (RTs)**
 - **Bedside nurses**
 - **Physical/occupational therapists**
 - **Case management and social work**
 - **Dietician/nutritionists**
 - **Spiritual support**

Interprofessional Practice in US Critical Care

- ICU team:
- Physicians
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 - Clinicians-in-training
 - Bedside nurses
 - Physical/occupational therapists
 - Case management and social work
 - Dietician/nutritionists
 - Spiritual support
 - Nurse practitioners (NPs)
 - Clinical pharmacists
 - Respiratory therapists (RTs)



Acute Care Nurse Practitioner (ACNP)

JUMP TO SECTION

[What Is an Acute Care Nurse Practitioner?](#)

[Becoming an Acute Care Nurse Practitioner](#)

[Career and Outlook](#)

[Acute Care Nurse Practitioner Salary & Employment](#)

[Helpful Organizations, Societies, & Agencies](#)



What Is an Acute Care Nurse Practitioner?

An acute care nurse practitioner (ACNP) is an advanced-practice registered nurse who specializes in the care of acutely ill or injured patients. They work primarily in hospitals and urgent care centers. They diagnose medical problems and order treatments and medications to help patients recover from sudden illness/injury or exacerbated chronic conditions.

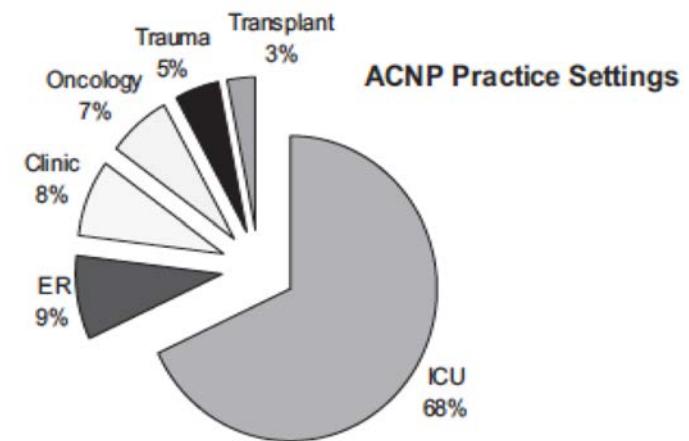
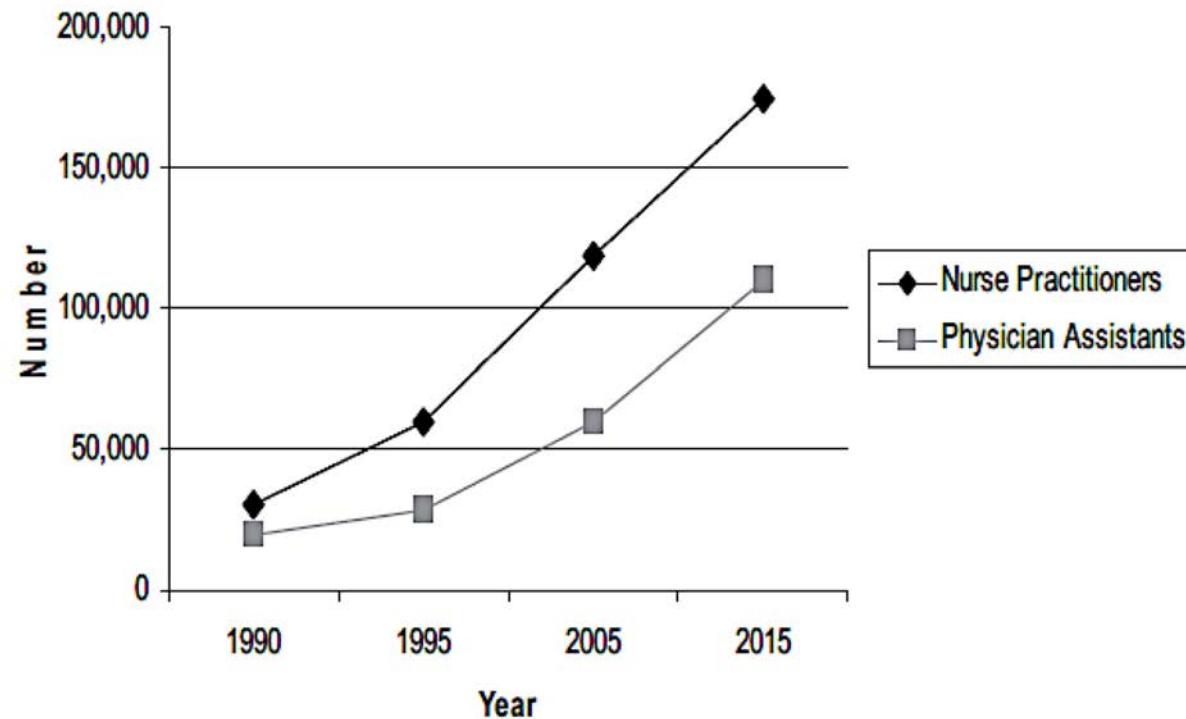


① Why Are Acute Care Nurse Practitioners So Important?

Currently, the United States is amid a physician shortage. The American Association of Medical Colleges (AAMC) projects a shortage of 40,800 to 104,900 physicians by the end of the next decade. Additionally, more patients are seeking health care services primarily due to an aging population and recent health care legislation. As more patients utilize health care services, the number of physicians available to address their needs is not sufficient. Nurse practitioners are a valuable member of the health care team to fill the gap between patient care needs and the physician shortage.

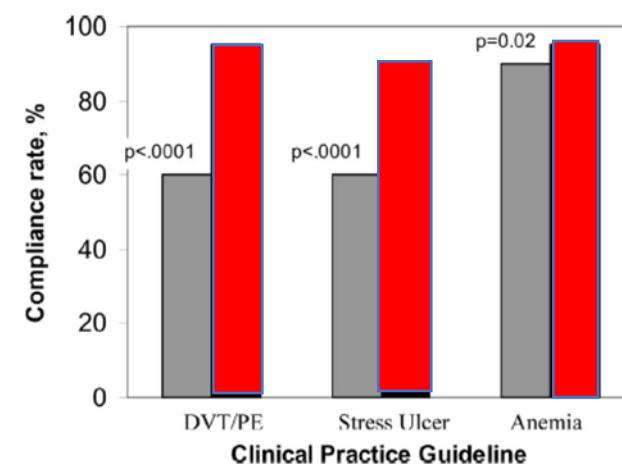
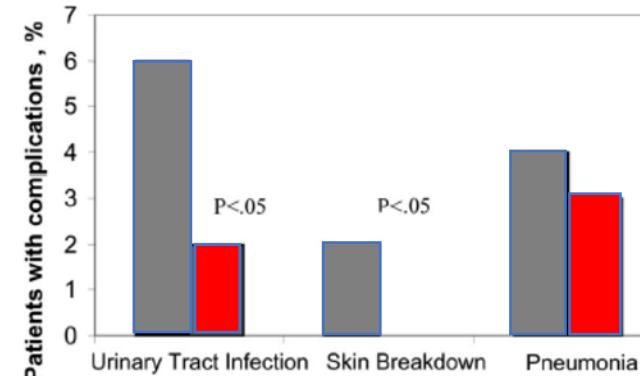
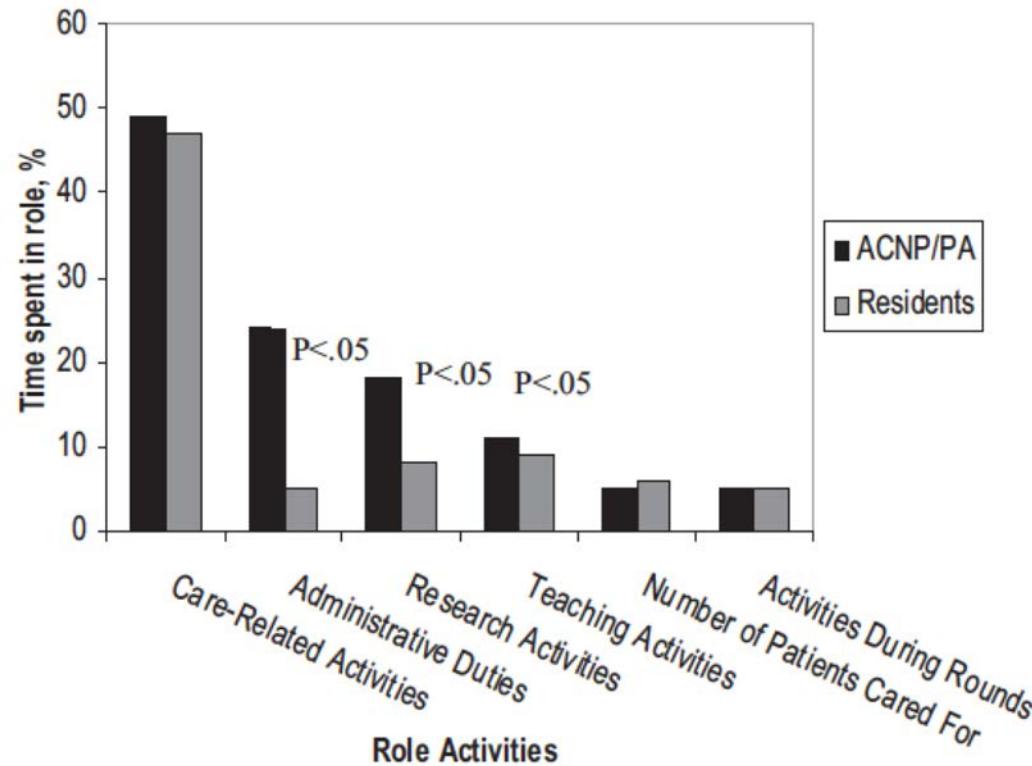
Additionally, nurse practitioners start off as nurses—which means they are highly skilled in educating patients. This valuable trait leads to higher patient satisfaction and improved patient care outcomes. It also helps to reduce health care costs, as nurse practitioners provide comprehensive care at the first point of service.

Nurse Practitioners and Physician Assistants in Acute and Critical Care



Survey 2015: combined total of 10,000 NPs and PAs list the ICU as their primary site of practice.

Nurse Practitioners and Physician Assistants in Acute and Critical Care





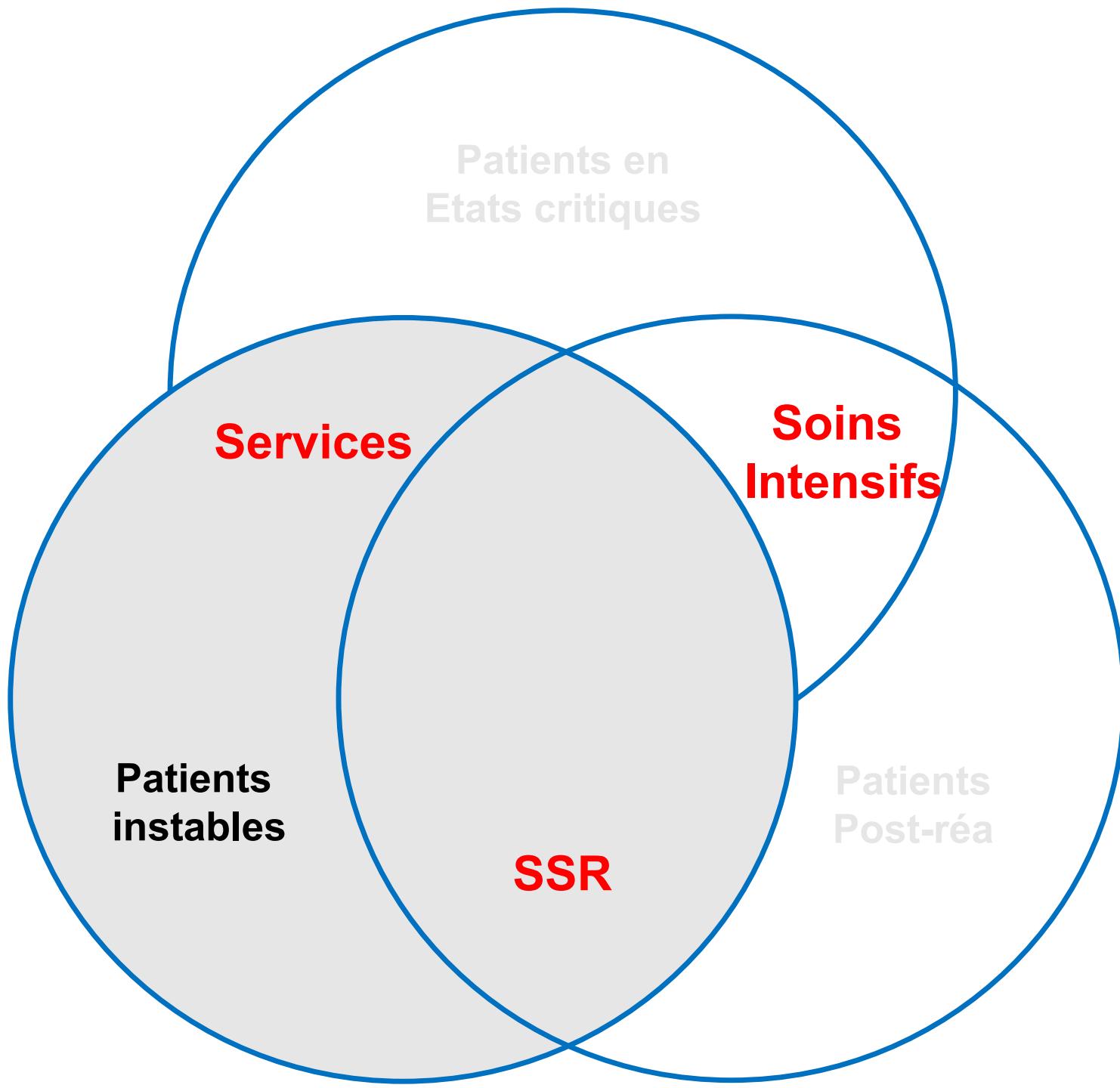
CHEST

Topics in Practice Management

Integrating Infirmières en Pratique Avancée Into Medical Critical Care Teams

*Christine McCarthy, MBA; Nancy C. O'Rourke, MSN, ACNP;
and J. Mark Madison, MD, FCCP*

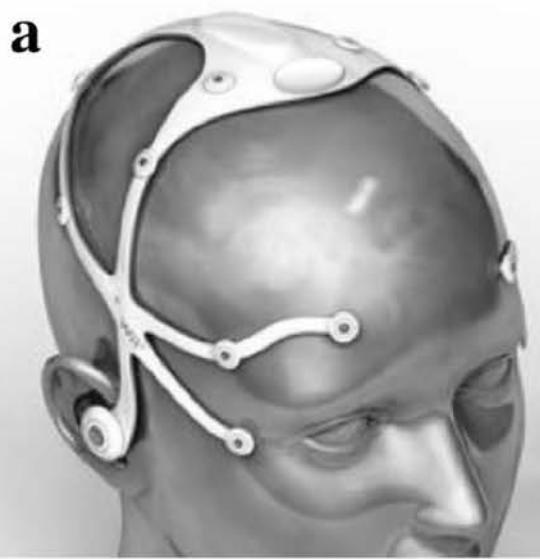
- Prévention
- Détection
- Décision



Rapid response teams

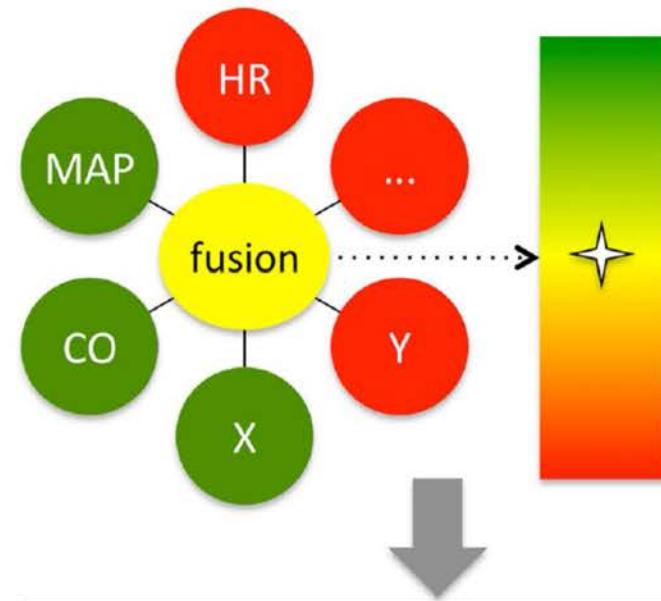
Rapid Response Team	Code Blue Team
<p>Responds to <i>Urgent</i> Situations</p> <ul style="list-style-type: none">• Urgent Changes in Clinical Status, i.e.• Respiratory rate• Heart rate• Blood pressure• Mental status• Oxygen saturation• Concerned staff and/or family	<p>Responds to <i>Emergent</i> Situations</p> <ul style="list-style-type: none">• Cardiopulmonary Arrest

Non-invasive, **E**rgonomic, **W**ireless & wearable sensors + **S**mart software & algorithms



→

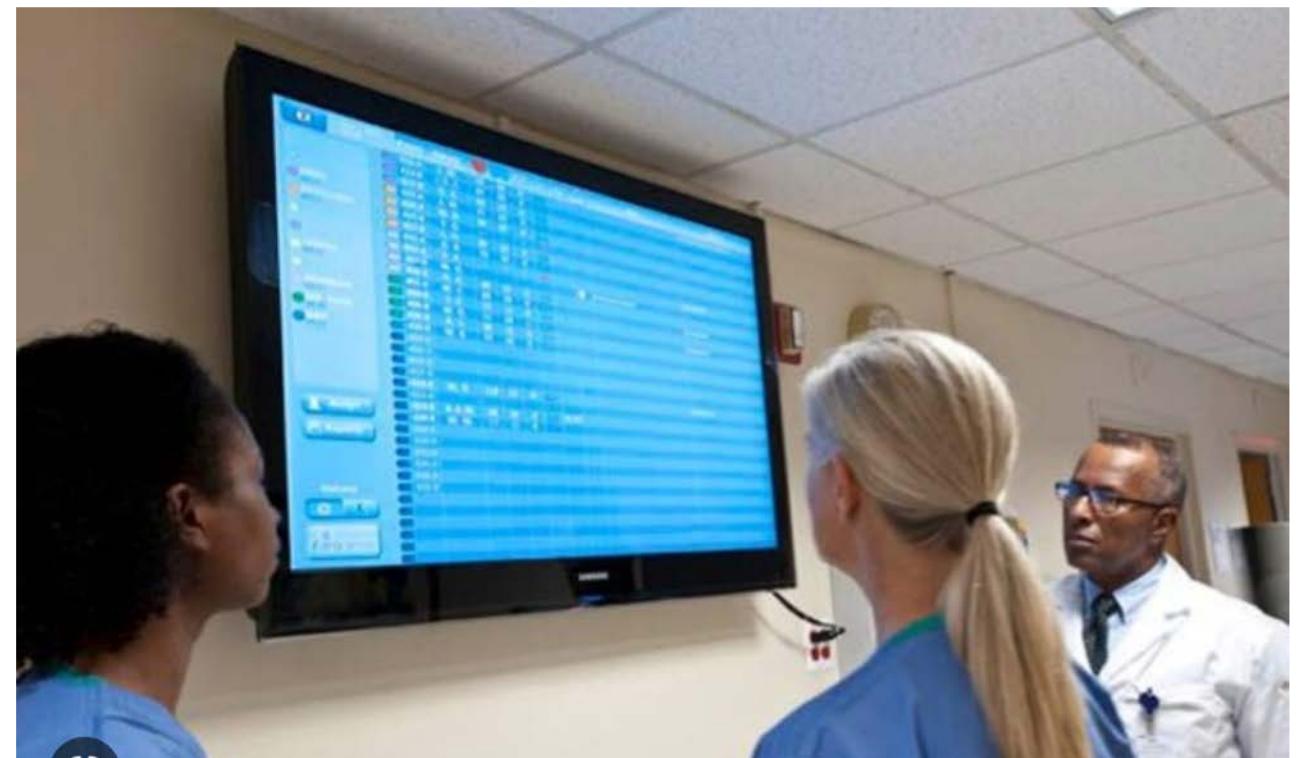
Data integration, data fusion
Graphical displays
Predictive analytics



↓

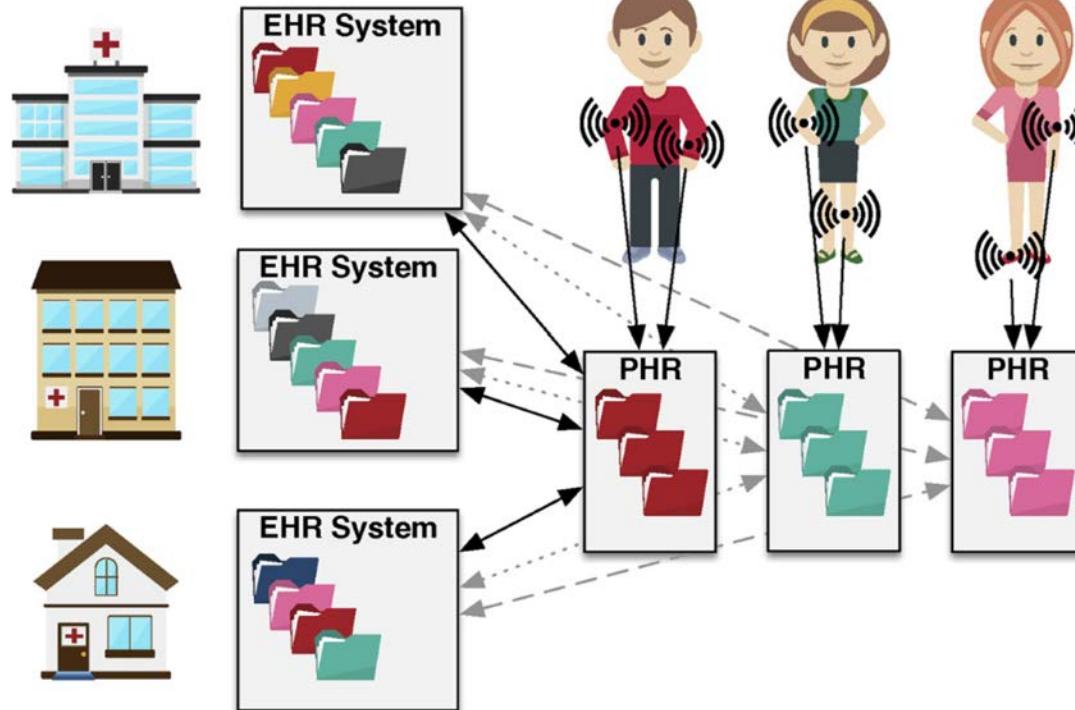
Diagnosis & therapeutic suggestions
Early & visual detection of deterioration
Prediction of adverse events

Monitoring généralisé

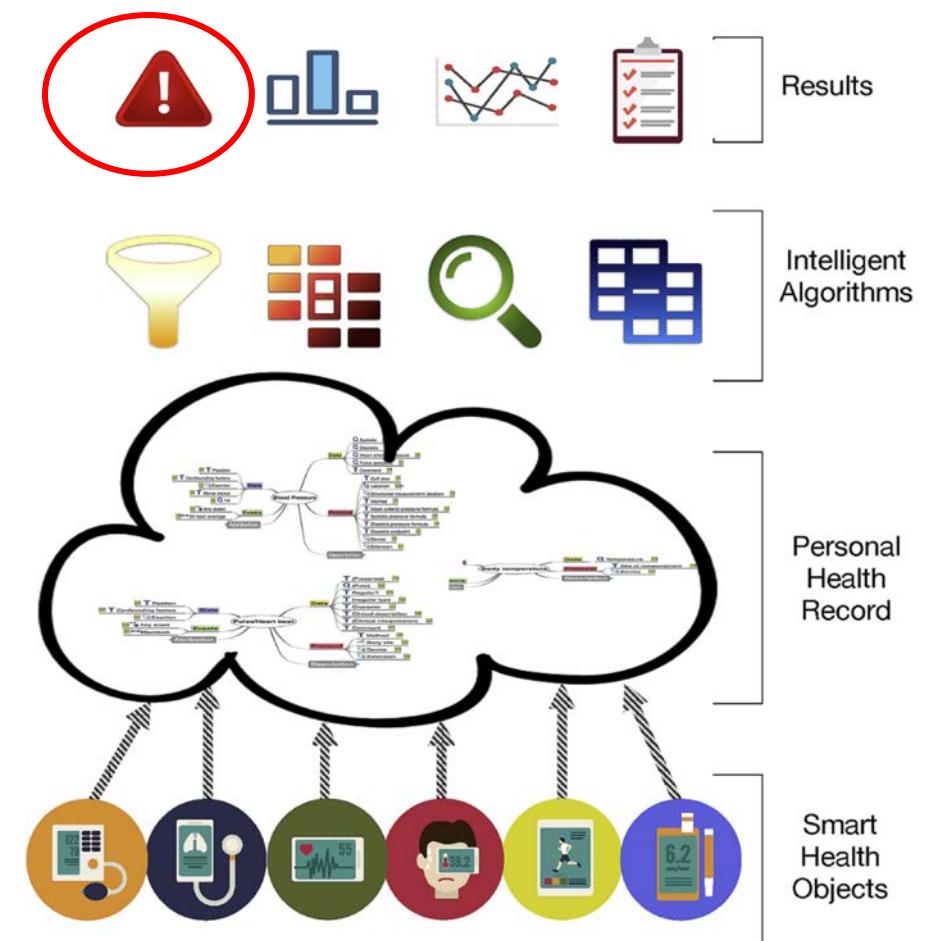


Rapid Response Team

Health Provider



Patient



Prédiction/prévention



ORIGINAL RESEARCH
published: 08 March 2022
doi: 10.3389/fdgth.2022.848599

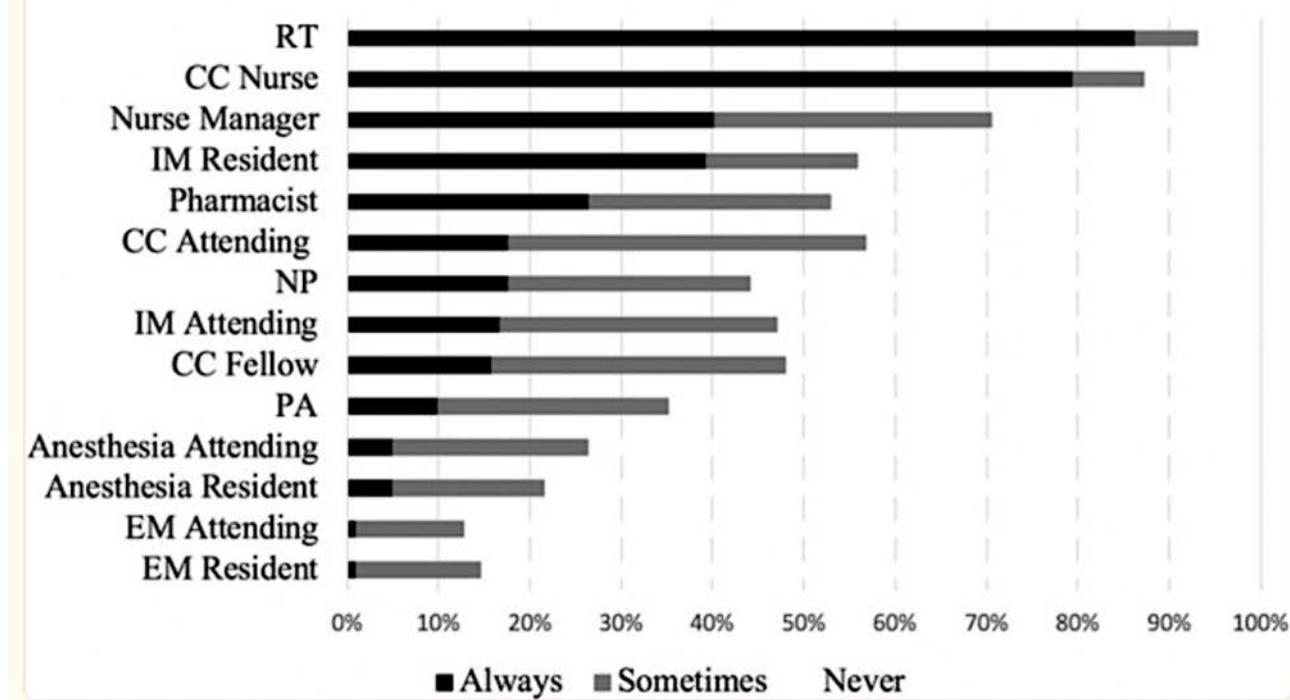


Sepsis Prediction for the General Ward Setting

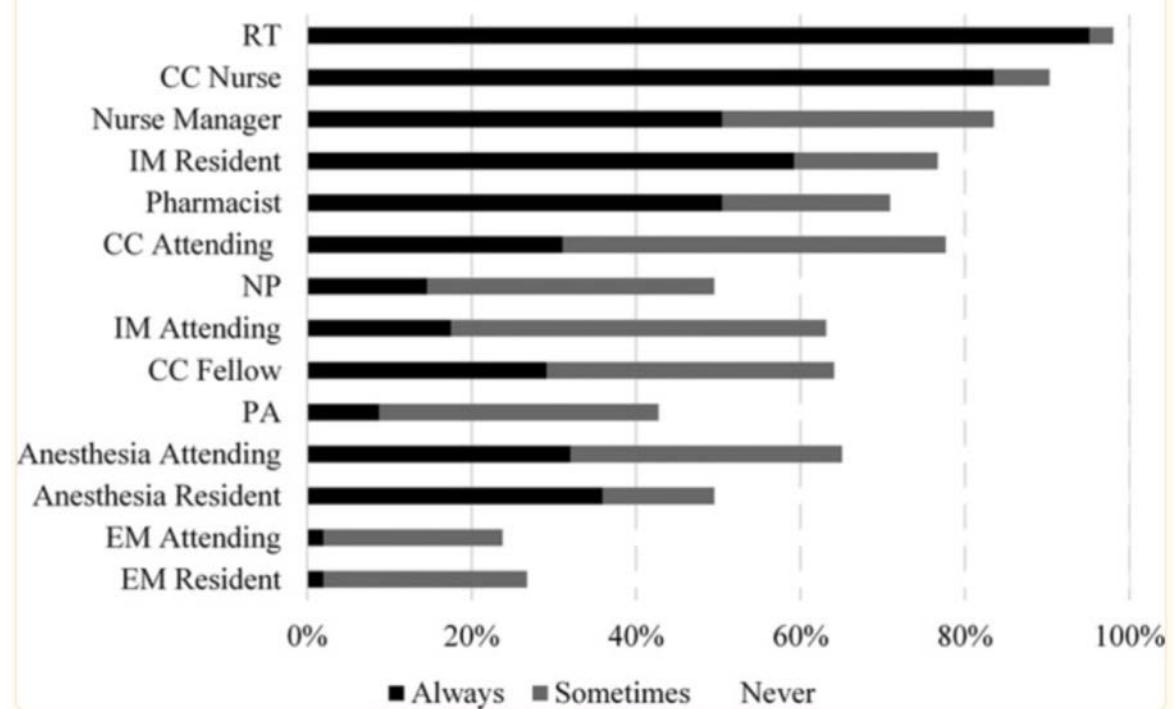
Sean C. Yu^{1,2*}, Aditi Gupta¹, Kevin D. Betthauser³, Patrick G. Lyons^{4,5}, Albert M. Lai¹, Marin H. Kollef⁴, Philip R. O. Payne¹ and Andrew P. Michelson^{1,4}

Rapid Response Team

Composition of Rapid Response Team



Composition of Cardiac Arrest Team

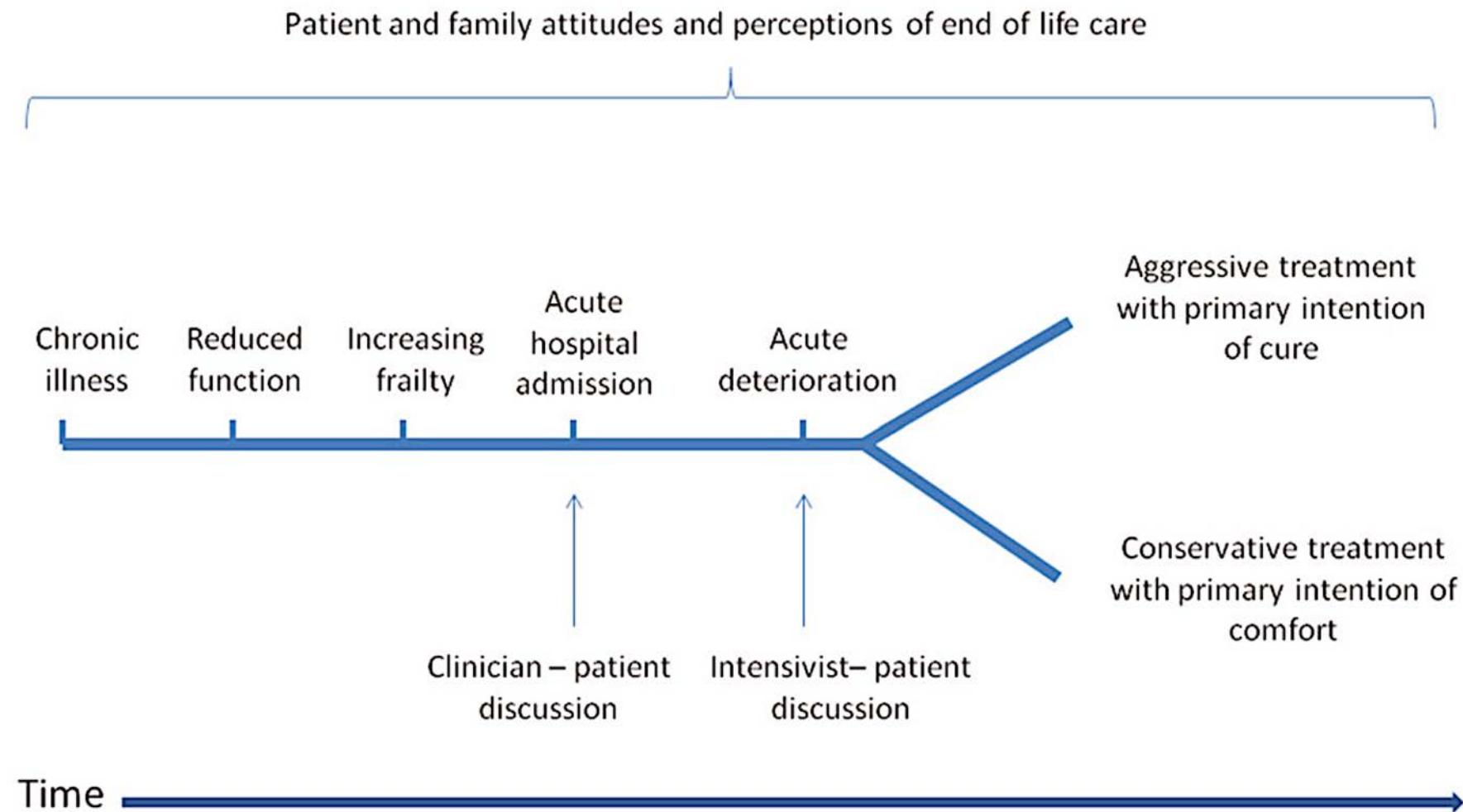


Comparison of Site of Death, Health Care Utilization, and Hospital Expenditures for Patients Dying With Cancer in 7 Developed Countries

Patients > 65 ans



The role of the intensivist and the rapid response team in nosocomial end-of-life care



**Patients en
Etats critiques**

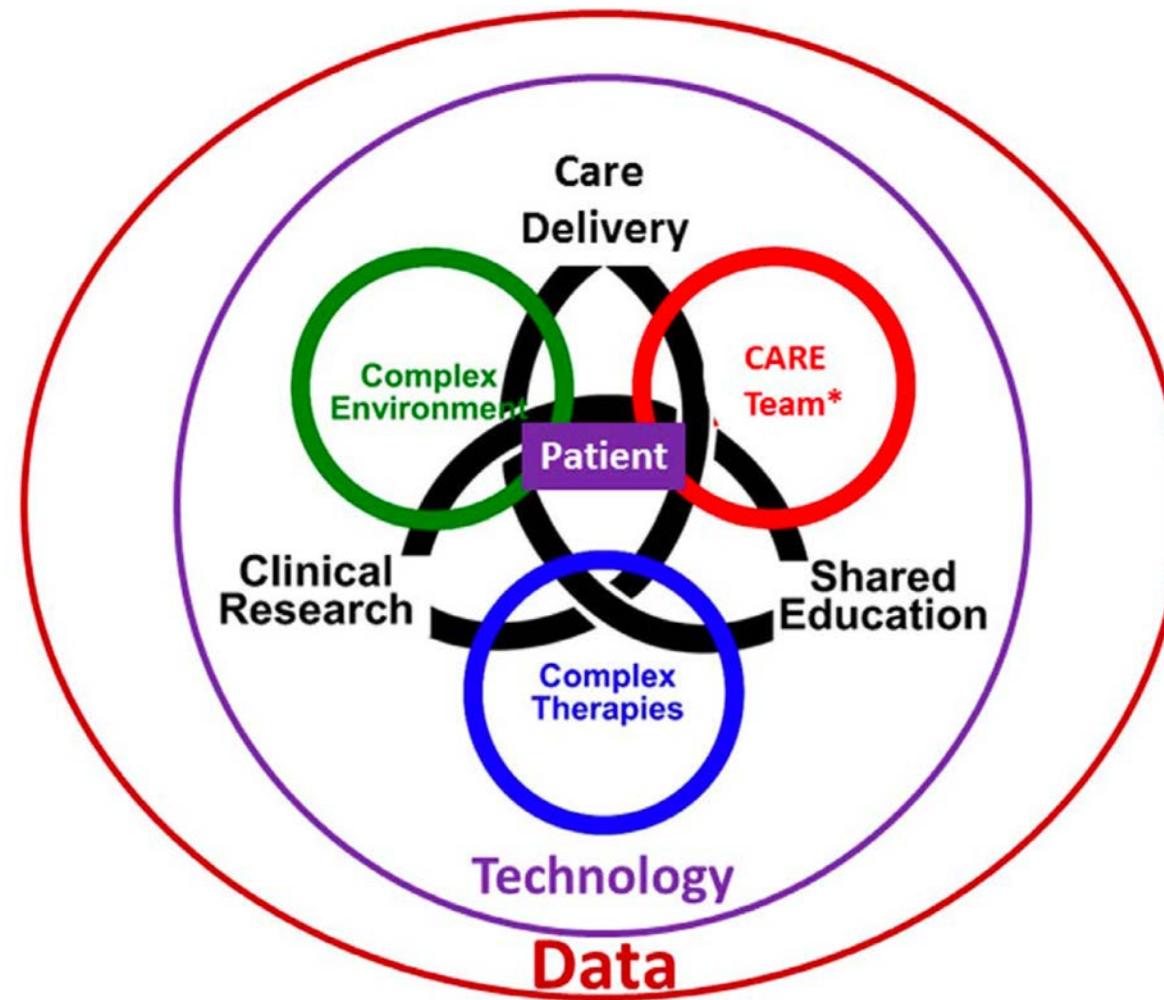
Réa

Patients
instables

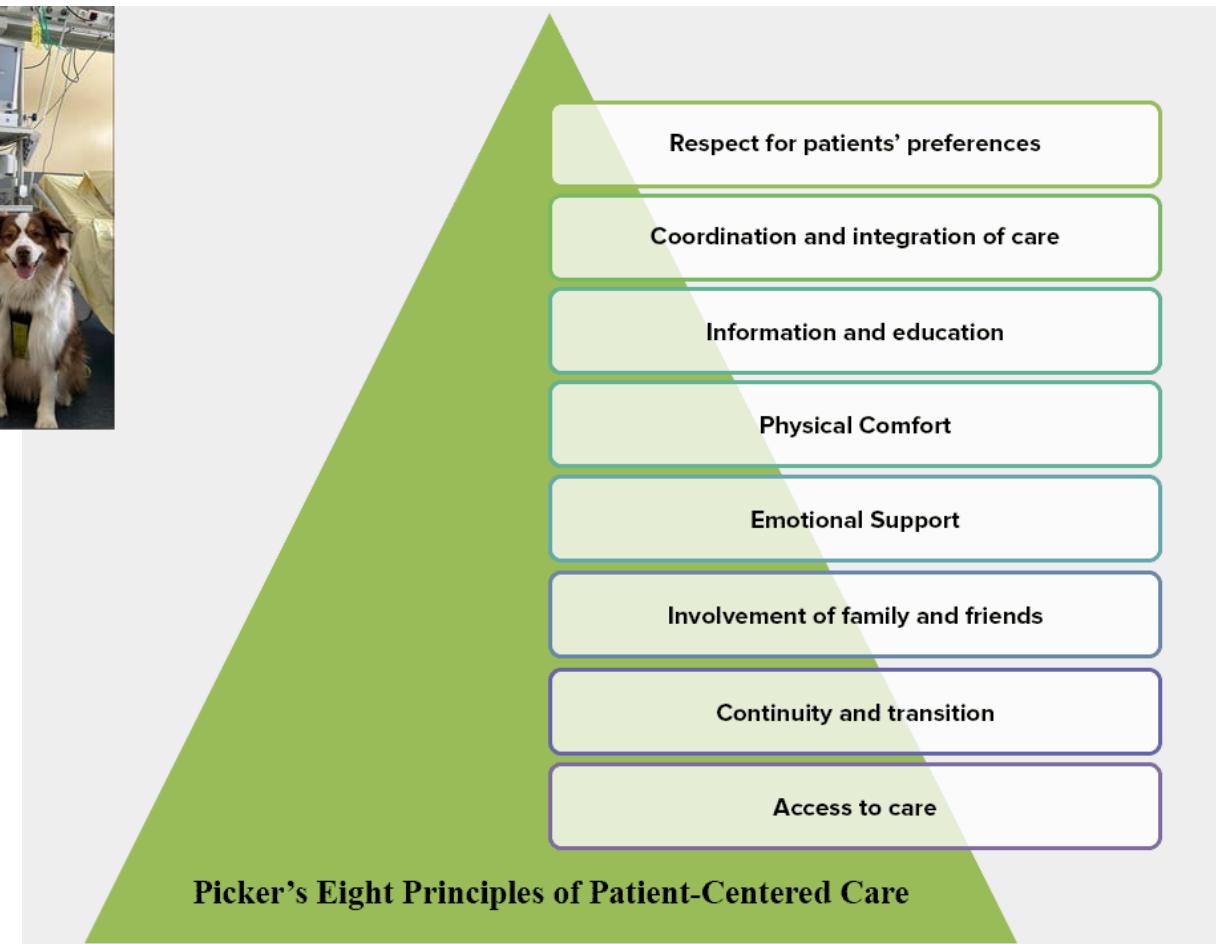
Patients
Post-réa

SSR

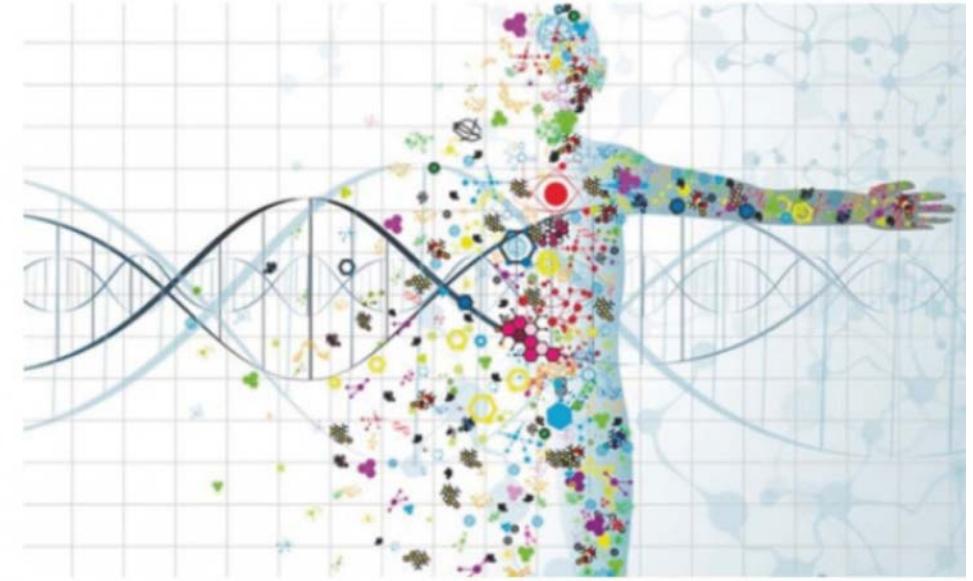
Réanimation 202.



Patient and family-centered care



Transformer ou rupture



Arrêté du 10 novembre 2022 relatif à la formation socle au numérique en santé des étudiants en santé

NOR : SPRH2220195A

ELI : <https://www.legifrance.gouv.fr/eli/arrete/2022/11/10/SPRH2220195A/jo/texte>

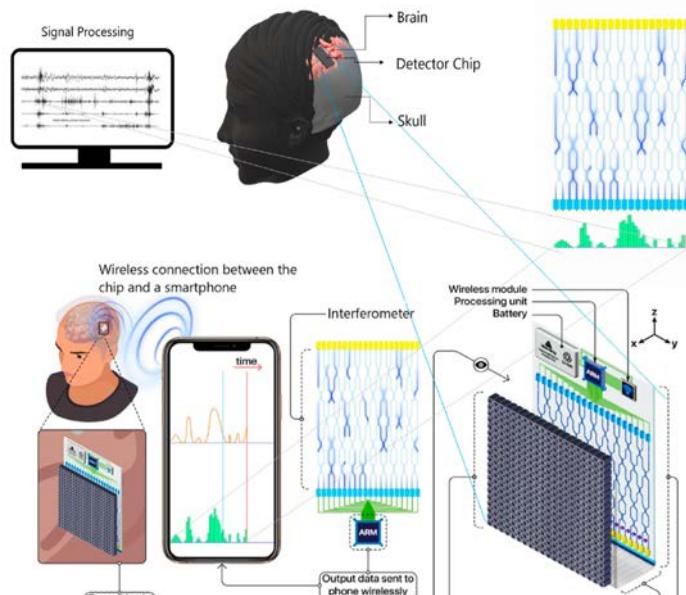
JORF n°0262 du 11 novembre 2022

Texte n° 38

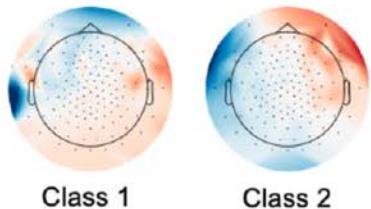


Extrait du Journal officiel
électronique authentifié
PDF - 1,9 Mo

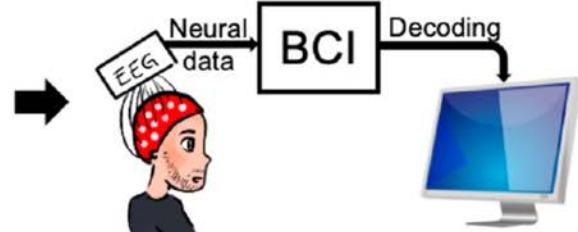
Brain-computer interfaces



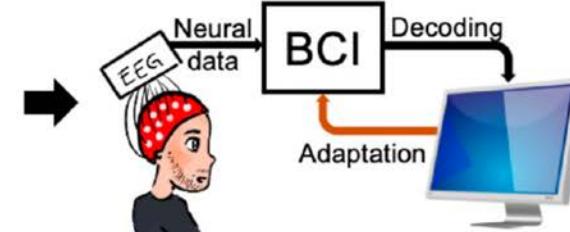
1. Find neural patterns



2. Open-loop BCIs



3. Closed-loop BCIs

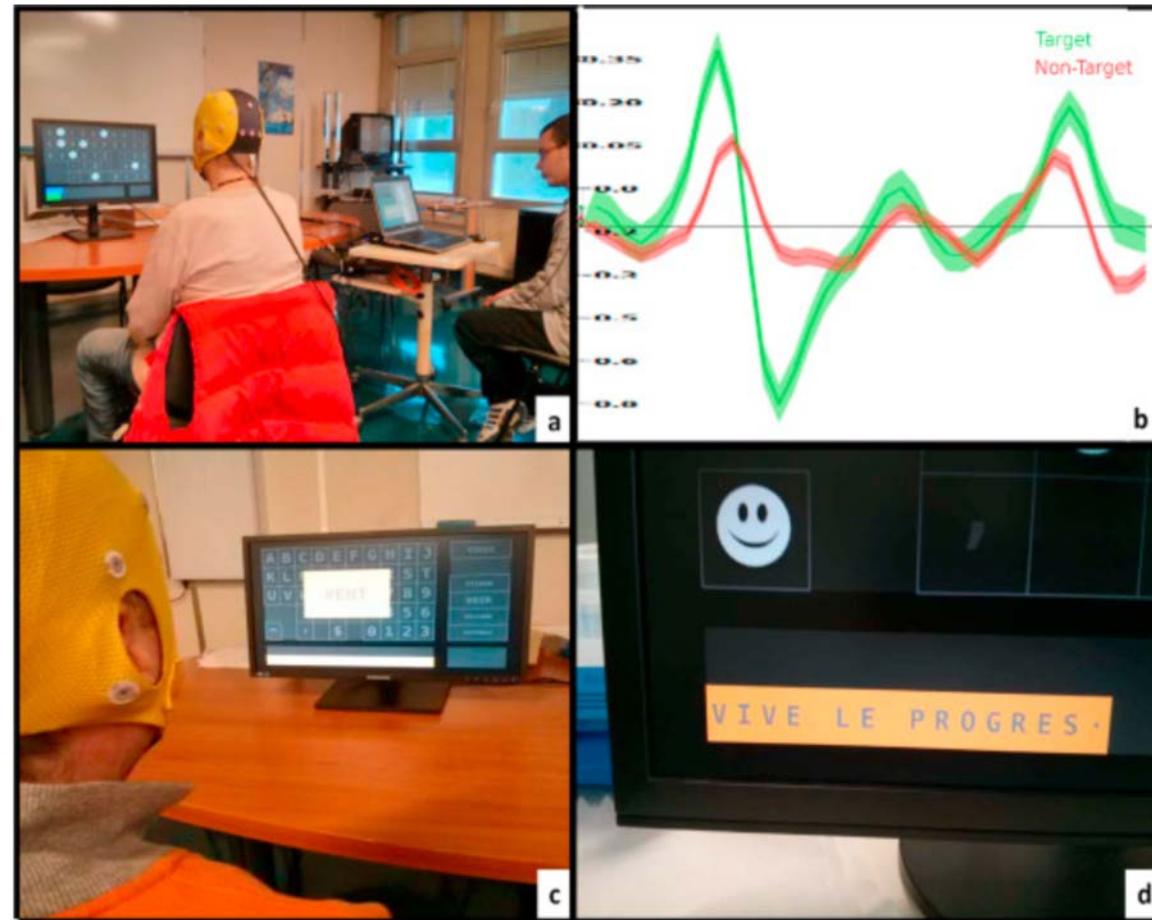


Amélioration performances

Rehabilitation

Considering Augmentative and Alternative Communication Research for Brain-Computer Interface Practice

P300 speller



Télé-médecine

Expertise

Consultation

Permanence





NATIONAL EMERGENCY TELE-CRITICAL CARE NETWORK
NETCCN
VIRTUAL CRITICAL CARE ANYWHERE



ASPR
ASSISTANT SECRETARY FOR
PREPAREDNESS AND RESPONSE



Society of
Critical Care Medicine
The Intensive Care Professionals



NETCCN

LEARN MORE

GET HELP

VOLUNTEERS

MEDIA

RESOURCES

CONTACT US

BACK TO TATRC



NATIONAL EMERGENCY TELE-CRITICAL CARE NETWORK (*NETCCN*)

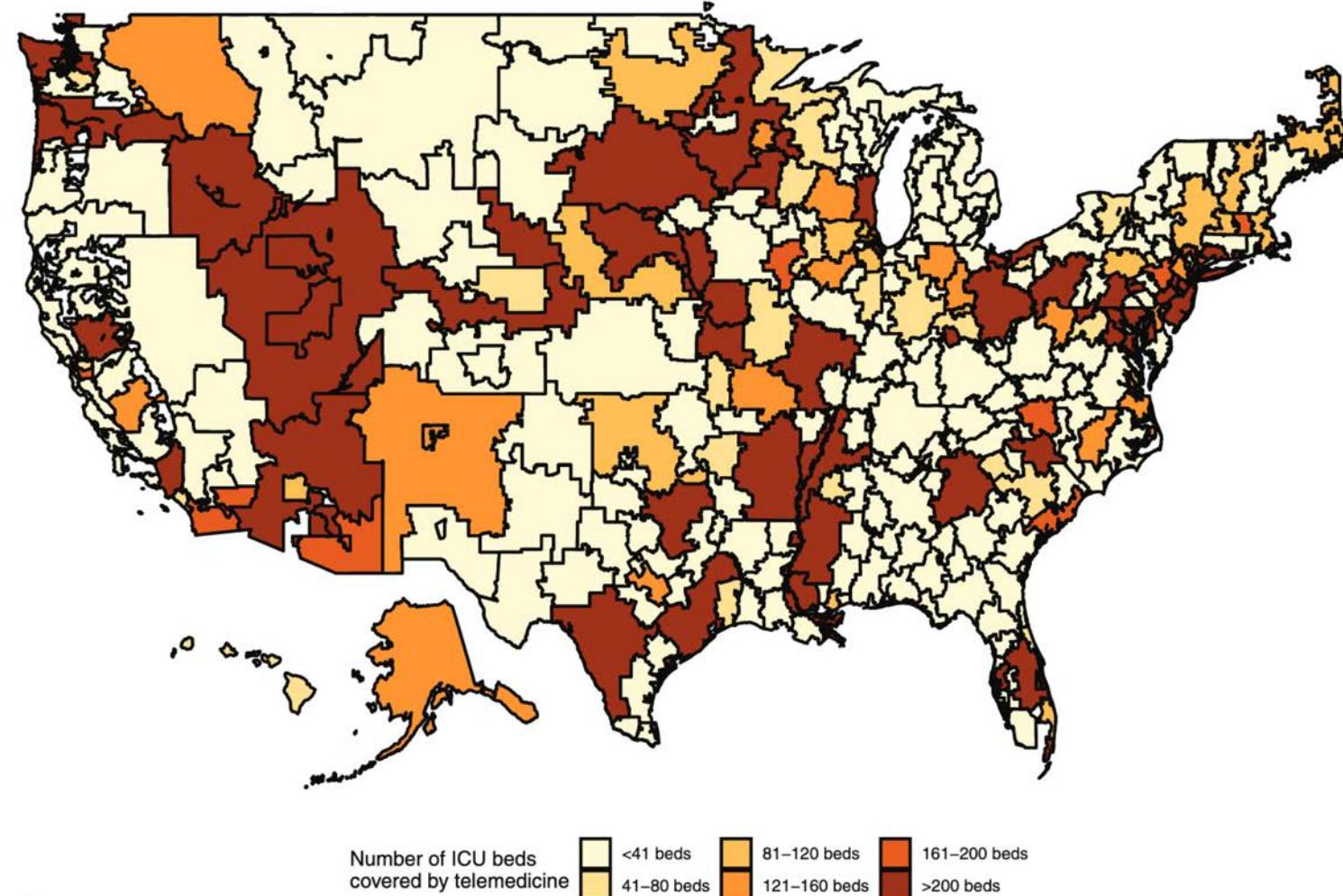
IS DESIGNED TO BRING HIGH QUALITY EMERGENCY AND CRITICAL CARE SUPPORT TO
ANY BEDSIDE AT ANY TIME.

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[GET HELP](#)

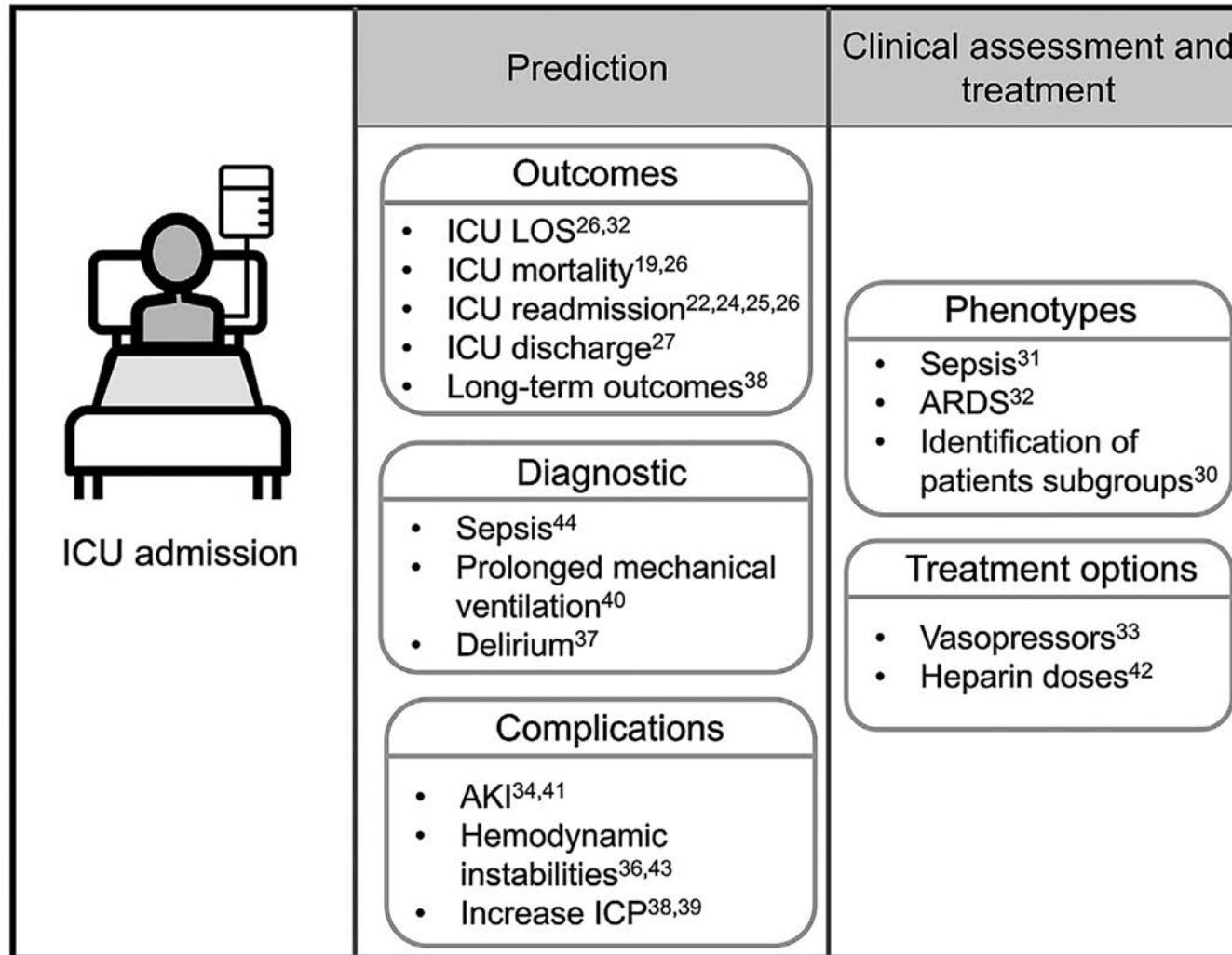
[VOLUNTEERS](#)

Characteristics of U.S. Acute Care Hospitals That Have Implemented Telemedicine Critical Care



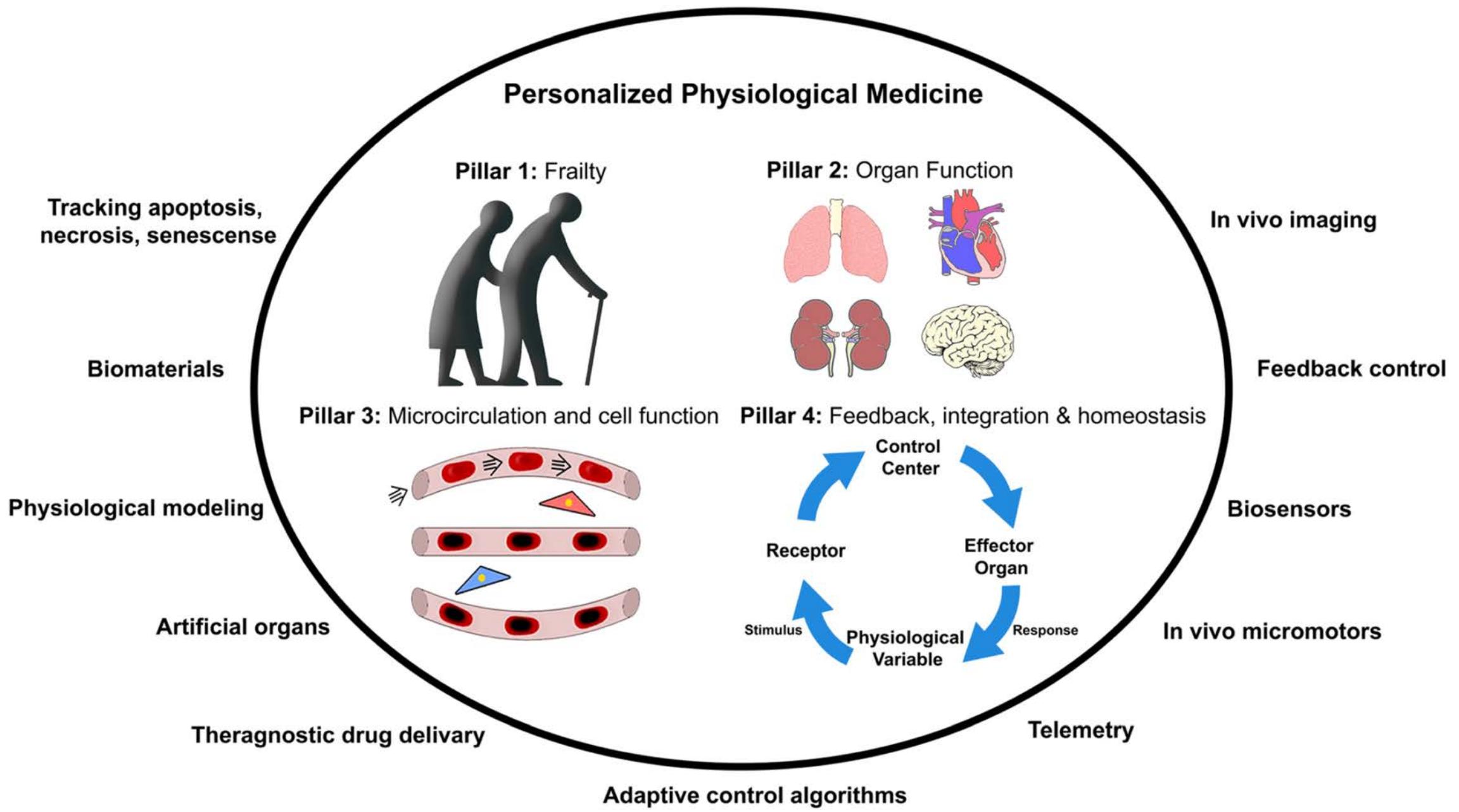
B

Big Data analysis in the ICU setting



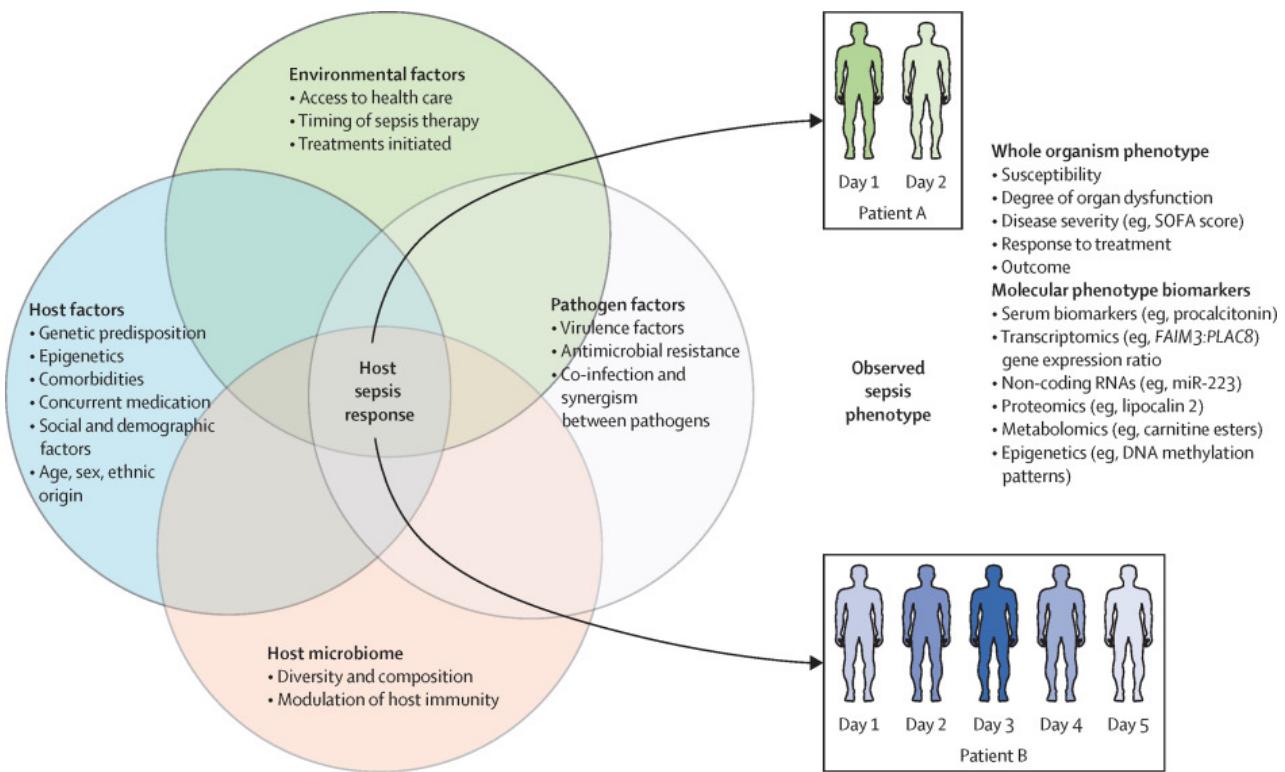
Personalized Medicine

Personalized Physiological Medicine

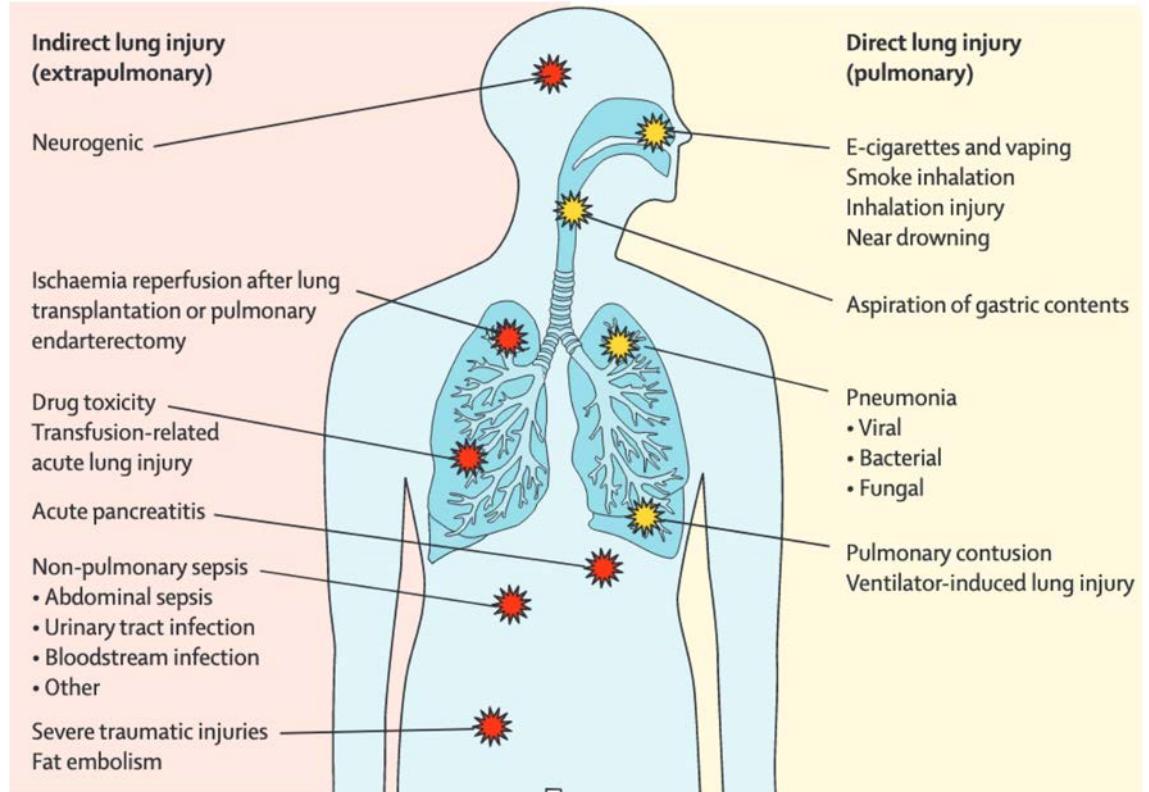


Critical illness syndromes

Sepsis



ARDS



Bos LDJ. Lancet 2022; 400: 1145

Renal failure, Delirium, PIKS,..





Genomics

- Susceptibility
- Severity
- Response to therapy



Transcriptomics

- Diagnosis
- Severity
- Damage
- Response to therapy



Proteomics

- Diagnosis
- Severity
- Damage
- Response to therapy



Cytomics

- Diagnosis
- Severity
- Damage
- Response to therapy



Metabolomics

- Diagnosis
- Severity
- Damage
- Response to therapy

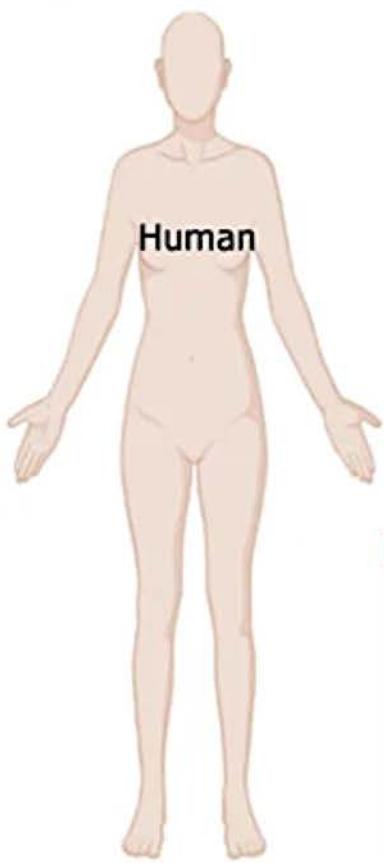
Multidimensional understanding of the disease biology



Disease etiology/pathology

Unbiased clinical outcome

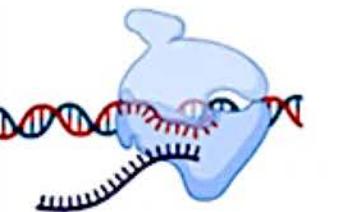
Sample source



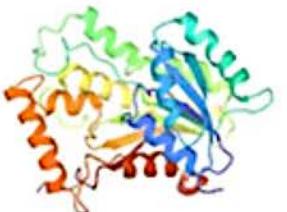
Measurements



Genomics



Transcriptomics



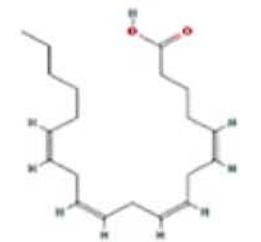
Proteomics



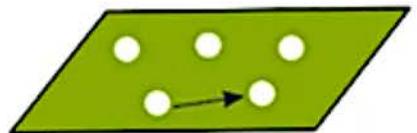
whole blood,
plasma, serum

urine

Metabolomics

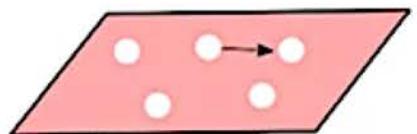


Single omics

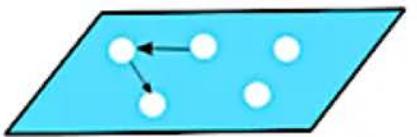


WGS
NGS

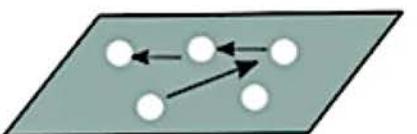
RNA-Seq
Microarray



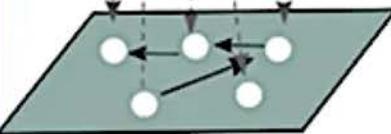
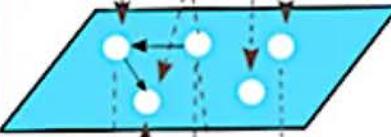
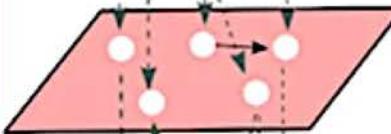
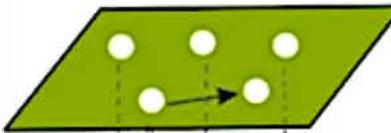
Mass
spectrometry



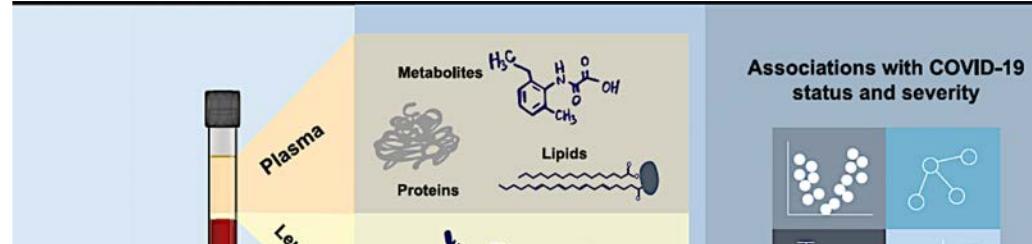
Mass
spectrometry
NMR



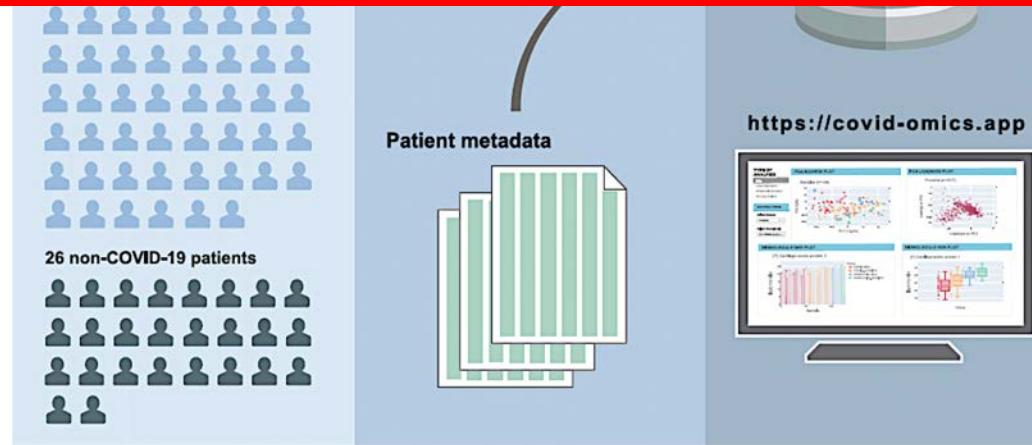
Integromics



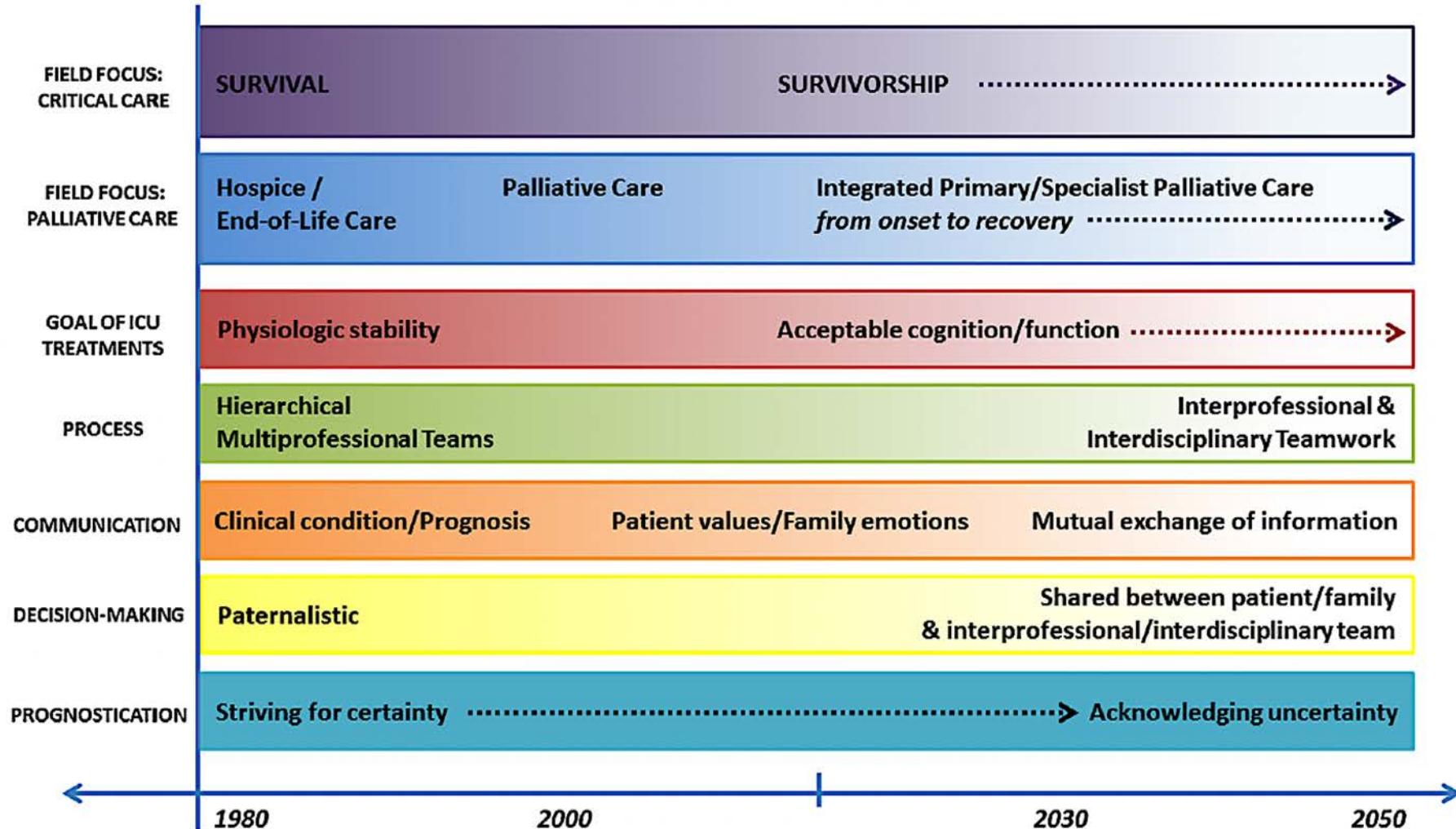
Large-Scale Multi-omic Analysis of COVID-19 Severity



219 biomolecules strongly associated with COVID-19 status and severity:
dysregulation of processes related to lipid transport, blood coagulation, acute phase response, endotheliopathy, and neutrophil degranulation.

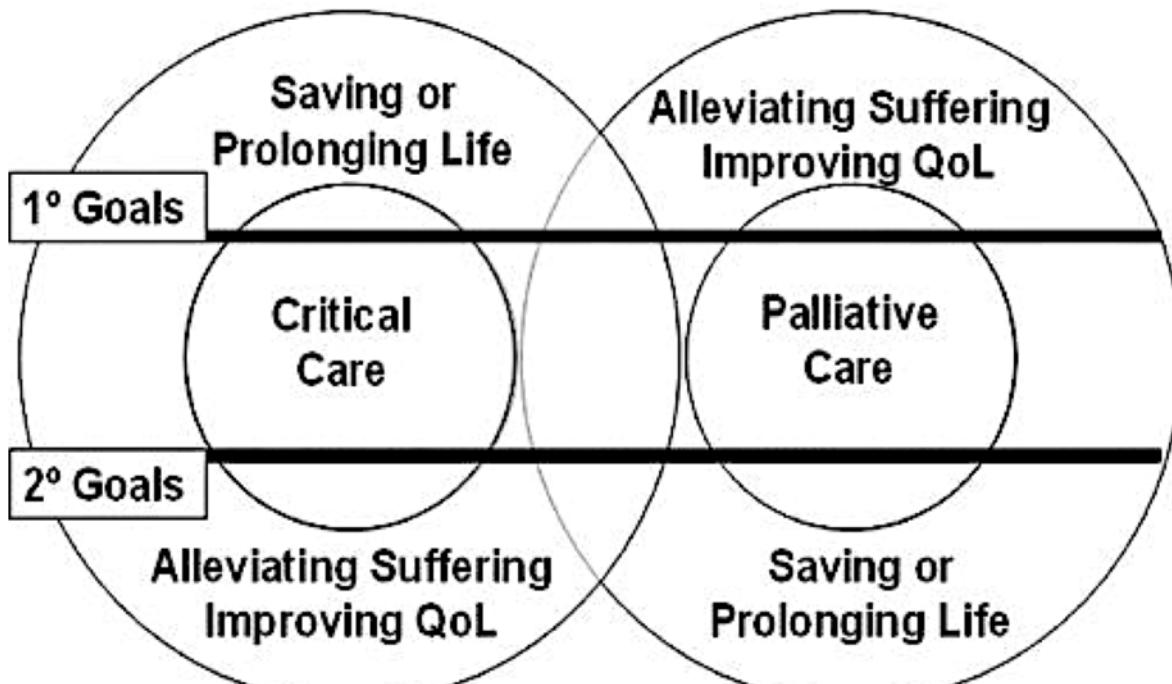


Soins palliatifs en soins critiques



Soins palliatifs en soins critiques

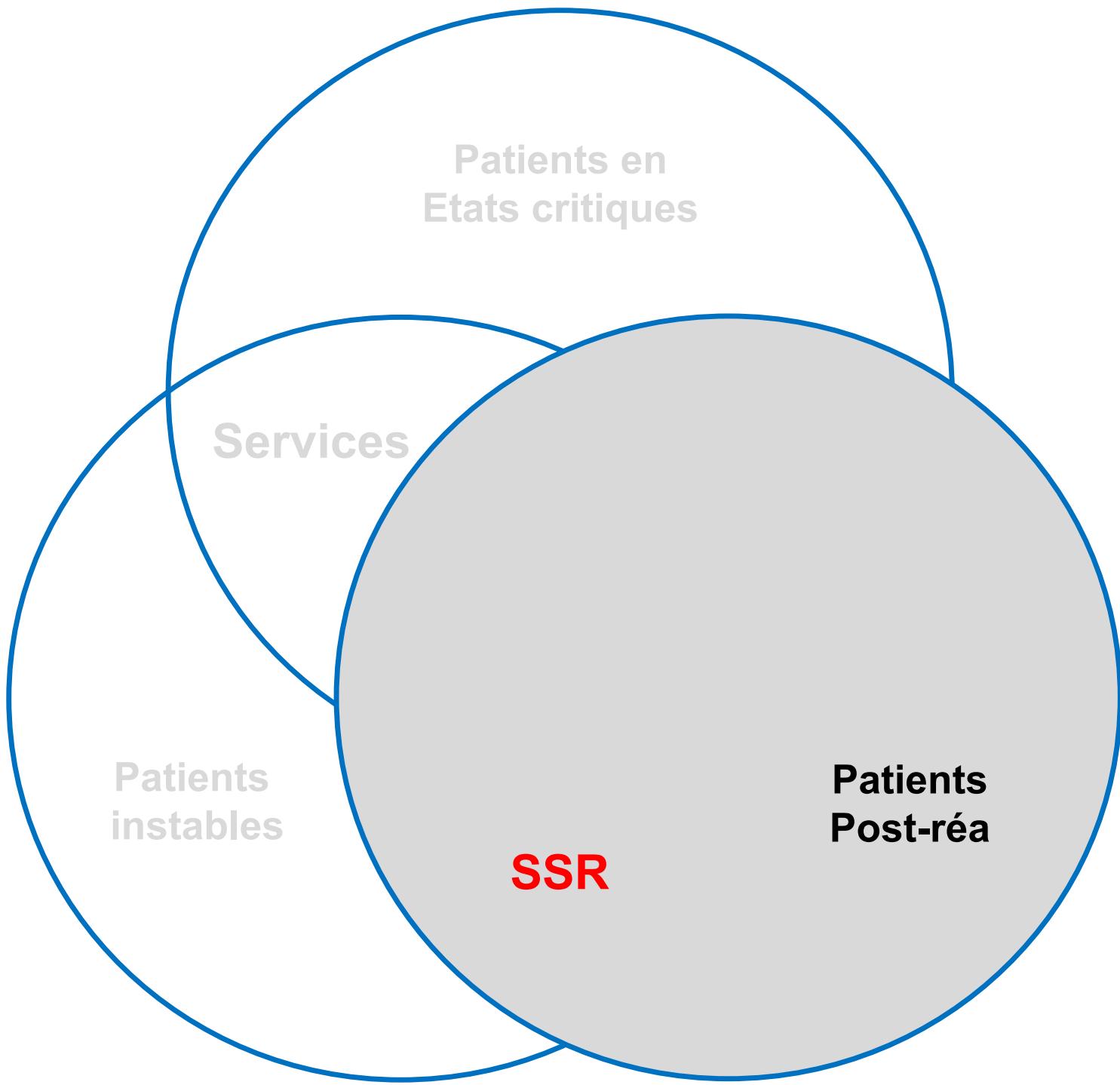
Concordance of Values and Goals



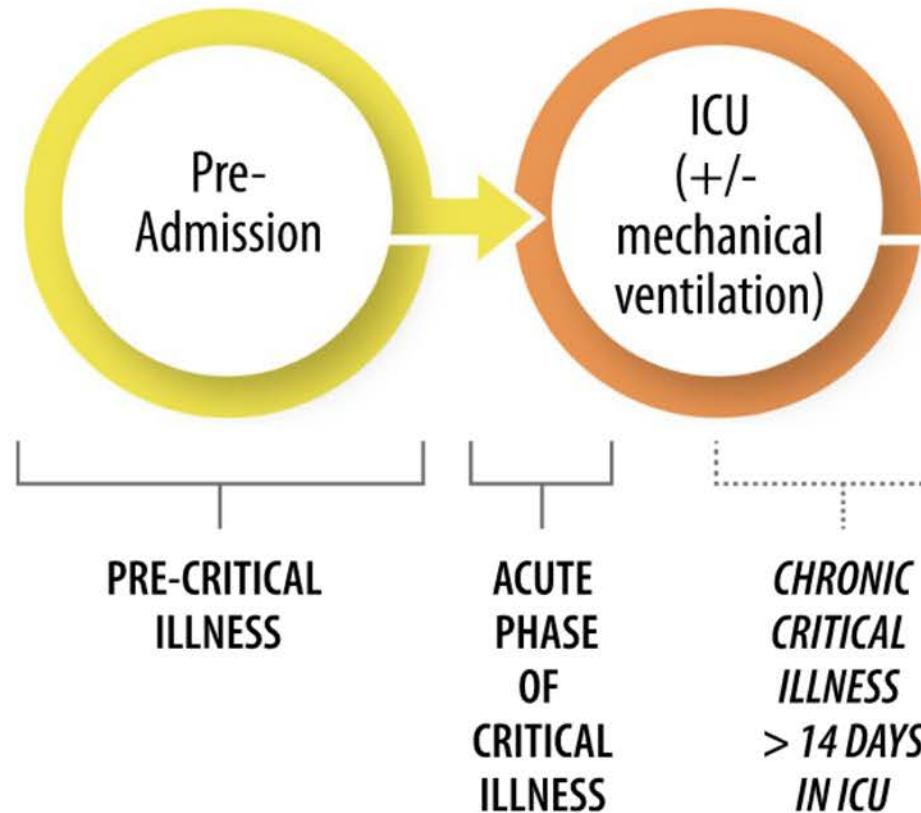
Ten Key Points About ICU Palliative Care

Edwards JD. Intensive Care Med. 2017 ; 43: 83





Trajectoire en soins critiques



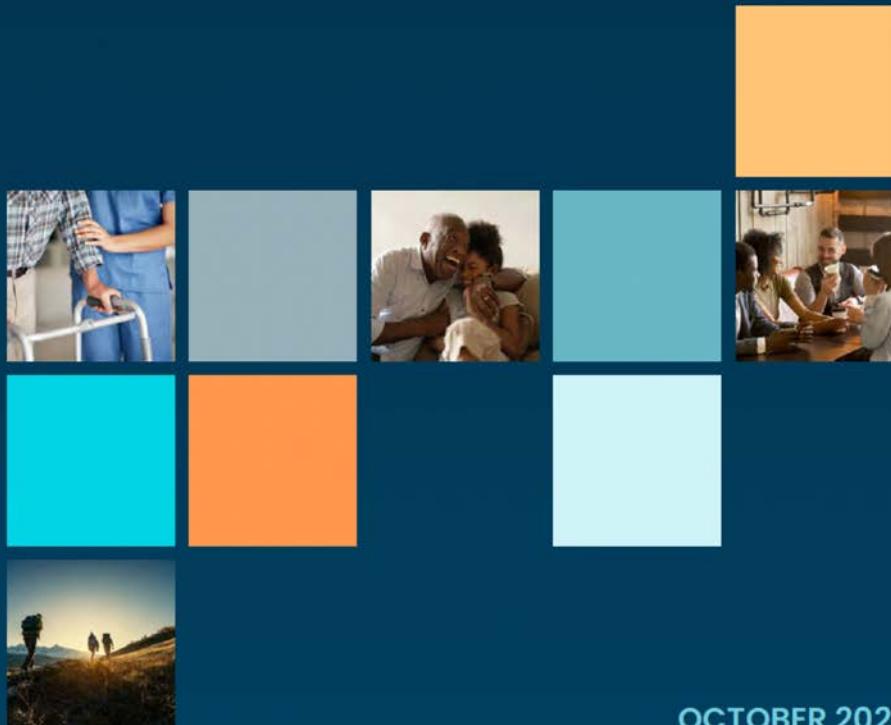


The Faculty of
**Intensive
Care Medicine**



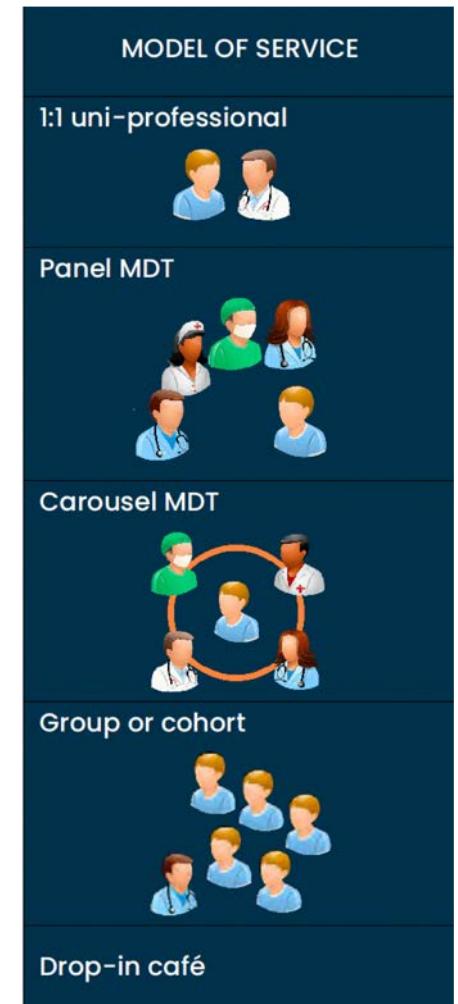
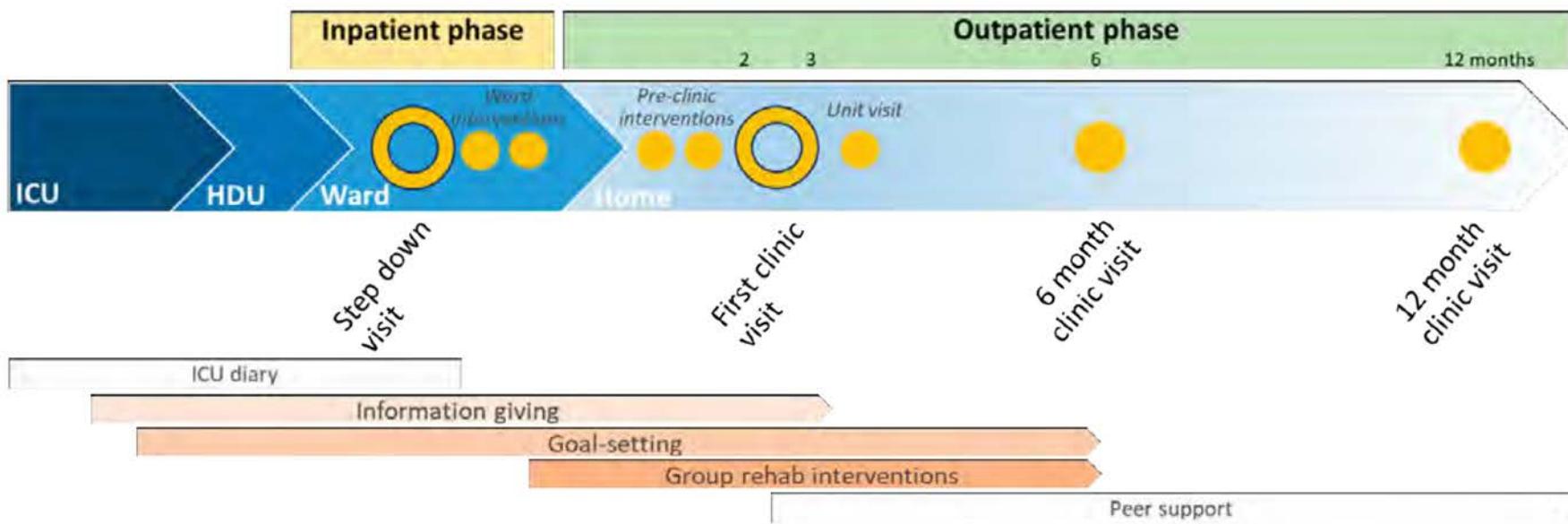
LIFE AFTER CRITICAL ILLNESS

A guide for developing and delivering
aftercare services for critically ill patients



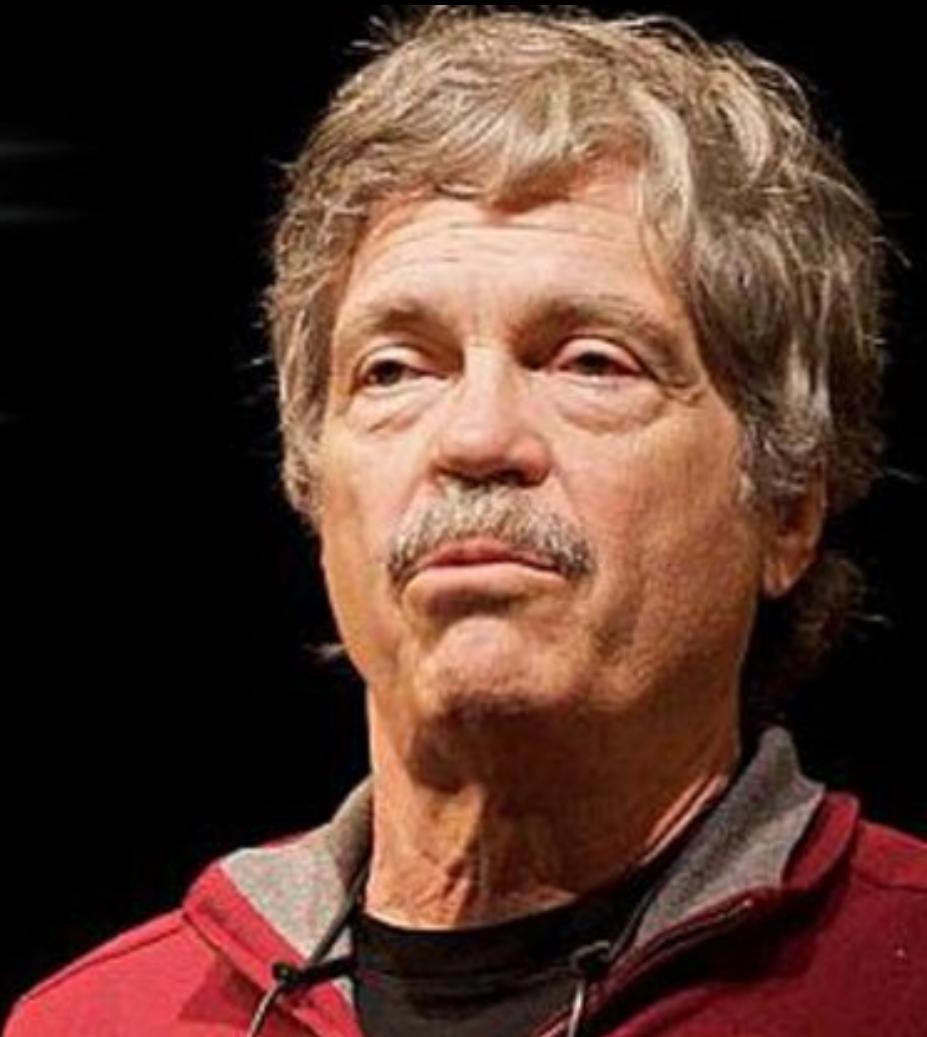
OCTOBER 2021

Consultations post-soins critiques



The best way to predict the future is
to invent it.

Alan Kay



Next Intensivist

