

# Ambulancezorg app with national guidelines leading Dutch EMS professionals (1/2)



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## Introduction

In 2023 the Dutch national guidelines committee implemented a major change in the national protocols for ambulance care. Beside the necessary content update both layout and technical features of the mobile application were improved. In the app SPART is introduced as a model for ambulance care process, containing clinical reasoning tools and illness scripts.

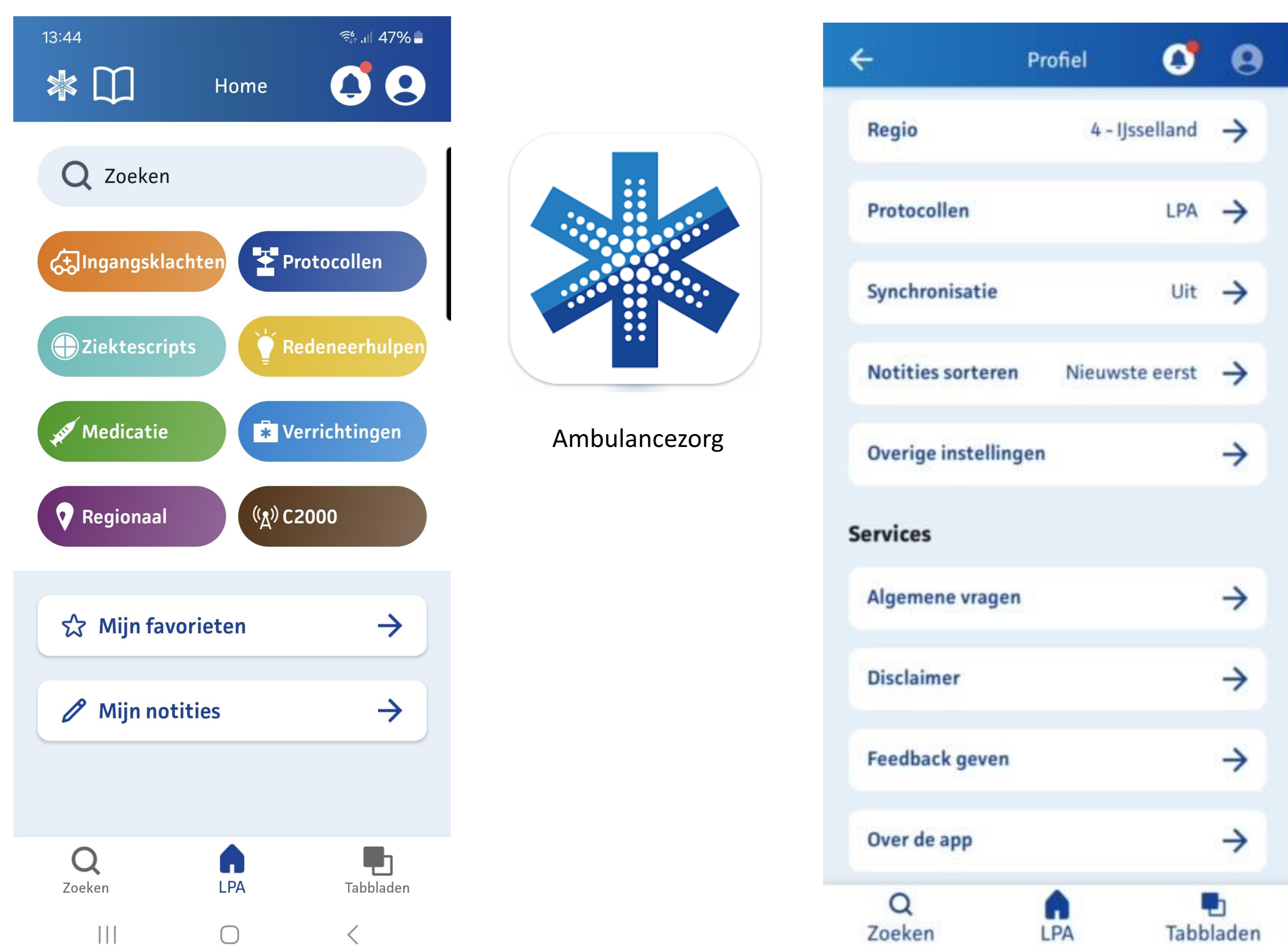
Dutch ambulance care protocols are used nationwide and approved by the national association of directors of Regional Ambulance Services (Ambulancezorg Nederland). The guidelines committee is composed of ambulance care professionals: specialized nurses and doctors representing their department of associations. The committee is appointed and supported by Ambulancezorg Nederland<sup>1</sup> for more than 30 years!

## Dutch national guidelines for ambulance care

The national guidelines for high complex ambulance care (LPA) were last published in pocket book and app in 2016. Additional guidelines for low- and medium complex ambulance care (LPLMA) were published in 2021.

Meanwhile, the guideline committee developed a new concept for the Ambulancezorg app (iOS and Android). The app amongst other includes both these guidelines for all ambulance care professionals. Expert groups of ambulance professionals provided updates for the evidence-based protocols. When evidence was limited, expert opinion of the expert groups and committee was utilized. This new mobile application was successfully launched spring 2023!

## Ambulancezorg app



The app supports all ambulance care professionals in the Netherlands. It includes the 9<sup>th</sup> version of the national ambulance care protocol for high complex ambulance care and the 1<sup>st</sup> version of the national ambulance care protocol for low- and medium complex ambulance care. Short cut buttons at the home screen of the app provide quick access to information needed in the line of duty, like medical interventions, medication description, etcetera. Even without internet the protocols can be consulted! Regional protocols can be included in the content.

Each protocol contains pages with explanation about the flowchart, used references and frequently asked questions. Personal notes can be added in every single of the more than 80 protocols. These notes can be saved in the cloud for future reference.

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## Protocol 'Convulsion' and medication 'Midazolam'

(persistent) convulsion

↓

**midazolam** →  
 repeat once according to the effect after 5 minutes

intranasal of i.m. if i.v. is not available	0,2 mg / kg
i.v.	0,1 mg / kg
intranasal of i.m. if i.v. is not available	10 mg
i.v.	5 mg

↓

- atypical febrile convulsion
  - convulsion with focal aspects
  - recurrent convulsion in the same febrile period
  - no complete recovery < 60 minutes
  - in children < 6 months or ≥ 6 years
  - duration > 15 minutes
  - history of neurological disorder
  - postictal neurological deficits
- signs of meningitis:
  - meningeal irritation symptoms
  - petechiae
  - decreased level of consciousness

atypical febrile convulsion or signs of meningitis

transfer hospital

no atypical febrile convulsion and no signs of meningitis

transfer

**midazolam**

**effect**

- sedative
- anxiolytic
- anticonvulsant

**contraindication**

- severe respiratory insufficiency

**side effects**

- respiratory depression up to apnea; opiates enhance this effect
- especially in elderly and children: paradoxical reactions

**precautions**

- reduce dose in elderly and hemodynamic instability
- administer only if the patient's head can be approached easily due to possible apnea

for further information:  
[www.farmacotherapie.kompas.nl](http://www.farmacotherapie.kompas.nl)

**Protocollen:**

- agitation / fidgety →
- bradycardia child →
- bradycardia adult →
- convulsion →
- exited delirium syndrome →
- resuscitation adult →
- consent patient care →

## Management of protocols

The ambulance protocols will be assessed every six months for one or more medical specialties. Is there new evidence or insight of such importance for ambulance care that an adjustment or a new protocol is needed? This could be, for example, the cardiac or trauma protocols. In this way each specialty will be discussed once every four years with expert groups and guidelines committee. At the same time, scientific associations are also consulted.

Further developments for 2025 are adding presenting complaints and illness scripts. Entering the protocol through presenting complaints supports ambulance care professionals extra in their clinical reasoning.

## Ambulance care: low-, middle and high complex

Each of the 25 Dutch Regional Ambulance Services (RAV) can provide low, medium and high complex ambulance care.

Low or medium complex care is never emergency ambulance care. A patient is provided with low or medium complex ambulance care in predictable non-life-threatening situations. **Low complex care** is provided by an ambulance team consisting of a driver and a care giver. **Medium complex care** may involve a higher complex care demand, which is appropriate to the level that a nurse can provide. Urgent ambulance care is **highly complex care** and is used when a patient is in immediate danger of death or needs care very quickly because there may be serious damage to their health. Emergency ambulance care is provided by an ambulance nurse or ambulance care medical officer in close cooperation with the ambulance driver. Nurse practitioners and physician assistants provide a new level of high complex ambulance care.



Each of the 25 Dutch Regional Ambulance Services (RAV) is independent and not affiliated with a hospital or another care organization.



## Introduction SPART

The demand for care is becoming increasingly complex. This requires more structured and conscious collecting of information, checking assumptions and hypotheses, reasoning and making decisions. That is why the SPART model was developed<sup>2</sup>. It describes the daily practice and supports more complete clinical reasoning. With SPART you can oversee an ambulance care process in ten distinguished steps. It's not always about the exact order. Sometimes you skip a certain step, some steps you go through several times. SPART makes you more aware of every step, also in your evaluation and reporting of the ambulance care process. It fits well with Kahnemans<sup>3</sup> two-system theory, in which intuition has an important place alongside the hypothetical deductive mode of clinical reasoning. The SPART model is endorsed by the National Inspectorate of Health and Youth Health and even noted as stimulating the likelihood of making the best clinical decision.

## Decision-making: two system thinking

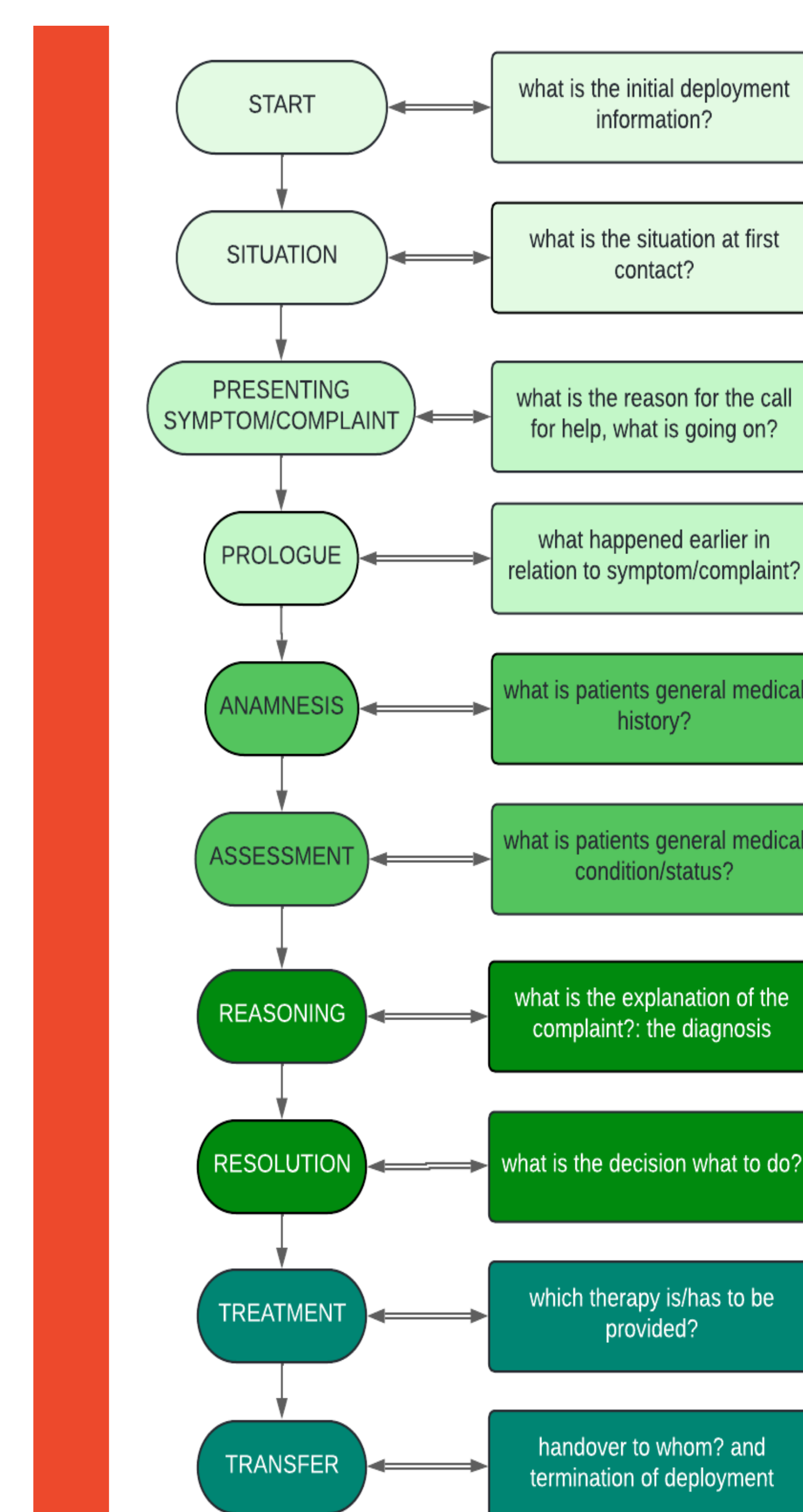
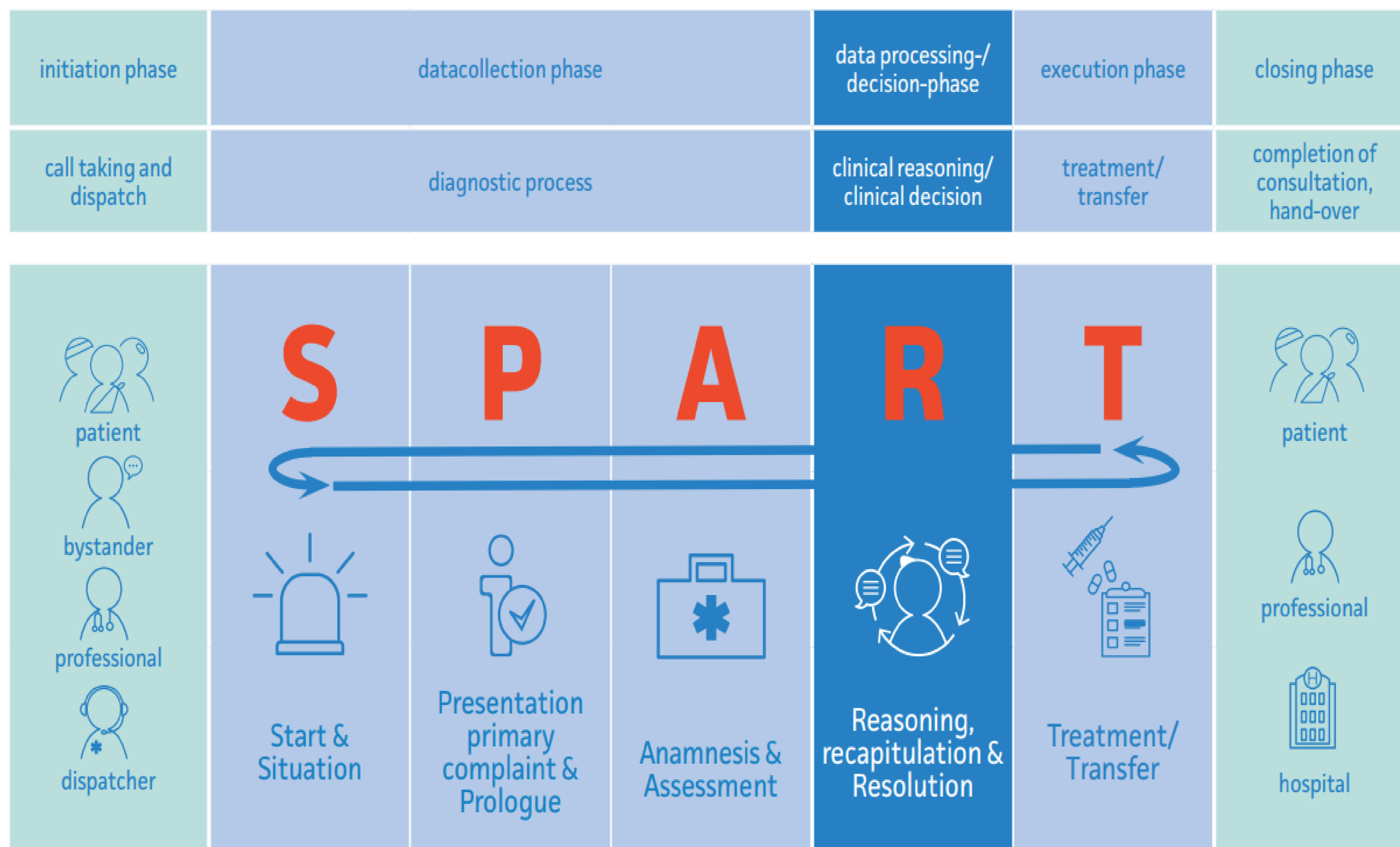
System 1	System 2
Fast	Slow
Subconscious	Conscious
Automatic	Effortful
Everyday decisions	Complex decisions
Intuitive, pattern recognition	Hypothetico-deductive
Variable reliability	Reliable
Less knowledge based	Knowledge based

## SPART-model

The acronym SPART describes ten different phases: Start, Situation, Presentation, Prologue, Assessment, Anamnesis, Reasoning, Resolution, Treatment and Transfer. The SPART model describes the EMS care process and helps to understand it. The model specifies all the steps that you already take consciously and subconsciously: collecting information, reasoning, deciding, and implementing.

When you provide emergency care at the scene, you process information and, like any human, make decisions in two different ways – using two systems, as it is also known. Your **first system** works quickly and intuitively and recognizes patterns, a kind of autopilot, very experienced and skilled. The **second system** is the analytical thinking. That means testing your intuition, seeking more information, and assessing objectively and thus more rationally, something that requires more time and attention. In clinical reasoning both systems complement each other, so that you both act quickly and substantiated.

# SPART - model



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## See more of us!



## Literature

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