



An introduction



The challenge

■ EDITORIAL

Anesth Analg (2013) 117:5 ; 1033-36

Perioperative Cognitive Aids in Anesthesia: What, Who, How, and Why Bother?

David M. Gaba, MD

„With several decades passing since the introduction of these kinds of aids, is it surprising that no national body in the United States and many other countries, and no international body, has attempted to create a more comprehensive set of perioperative cognitive aids through formal consensus approaches? One can only conjecture that the task is daunting logistically, politically, and financially“.

Accepting the challenge





- Initiative of the Professional Association of German Anaesthetists (BDA) and the German Society of Anesthesiology and Intensive Care (DGAI)
- Small research grant: 360.000€
- Project period: 7/2017 – 7/2020
- Project members
 - **German Cognitive Aid Working Group:** University hospitals with affiliated simulation centres: Augsburg, Berlin, Dresden, Erlangen, Hannover, Heidelberg, HELIOS München, Würzburg
 - Institute for Medical Informatics, FAU Erlangen
 - Commercial IT-company
- Aim:
 - Nationwide implementation
 - Free software, free registration, free educational material
 - Accompanying research: obstacles, enablers, success stories

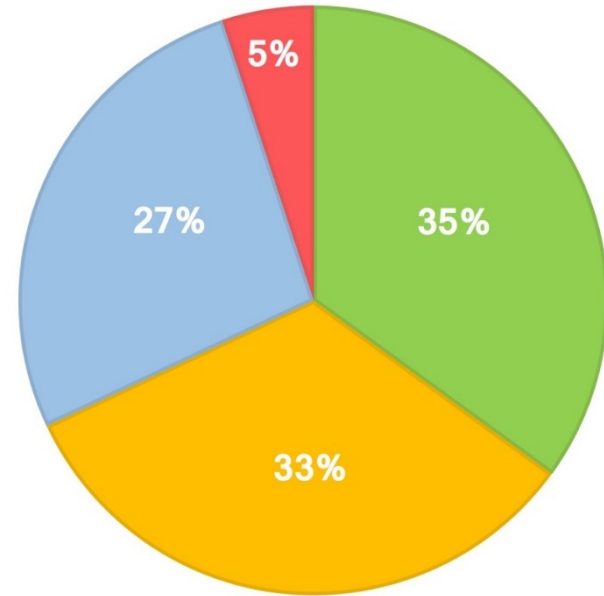
User Centered Design Process

„Wish list“ of the expert group (2017)

- Intuitive handling of the app: UCD-process
- Offline availability (should work in any OR)
- Medical content in accordance with guidelines (if available)
- Registered users are able to edit locally relevant information
- ~~Automatic dose calculation~~ (medical device law)
- Support for both, experts and novices
- Display supports teamwork (tablet & PC-screen)
- „CRM-/TRM-impulses“
- Educational material to support local teams in their implementation efforts

Medical content – Levels of Evidence

-  **Spezific recommendation** or guideline for intra-/perioperative emergency available (e.g. MH, LAST)
-  **General recommendation** or guideline available, adapted to intra-/perioperative emergency (e.g. MI, PE)
-  No recommendation or guideline available; **content of other cognitive aids** (expert level recommendation)
-  No recommendation or guideline available; only review articles or consensus statements (e.g. intraarterial injection)



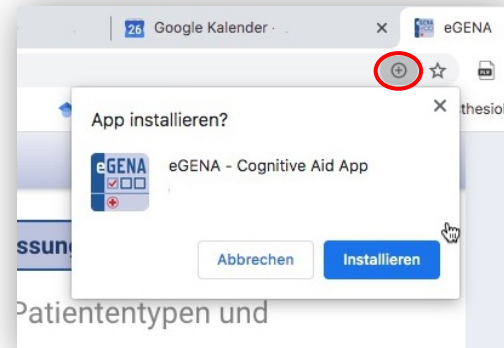
(n=98 eGENA-pages; 4/2023)

Download and installation



Google Play

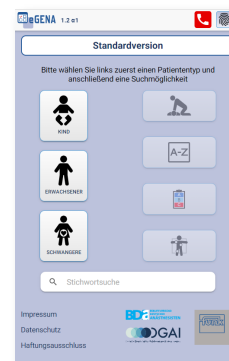
- eGENA is a Progressive Web Application (PWA); a functionality supported by all modern browsers
- German full version: <https://egena-app.de>
- Englisch test version <https://ca-app.eu> with only a few exemplary pages
- Offline-availability (download) by using
 - „add to your homescreen“ (smartphone) or
 - „install“ (PC)



Supporting the user

eGENA takes into account ...

- ... different devices and operational systems
- ... individual preferences
- ... the clinical context
- ... different levels of expertise (expert - novice)
- ... possibility of local adaptations
- ... support of teamwork / resource management



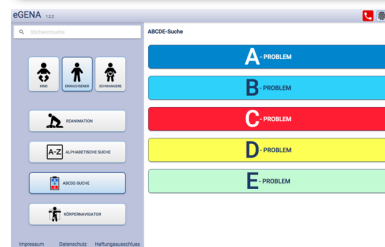
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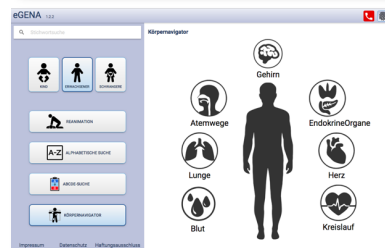
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Alphabetical search



ABCDE problem

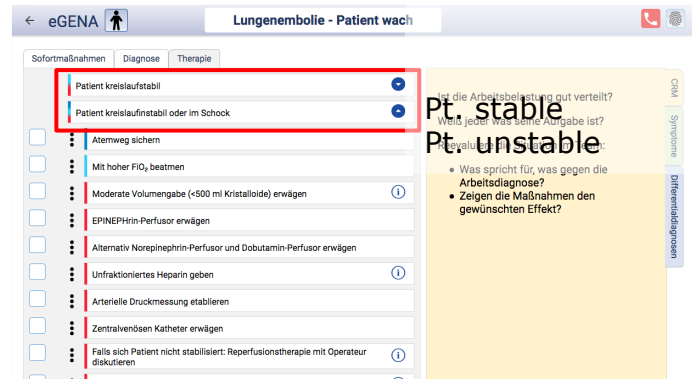
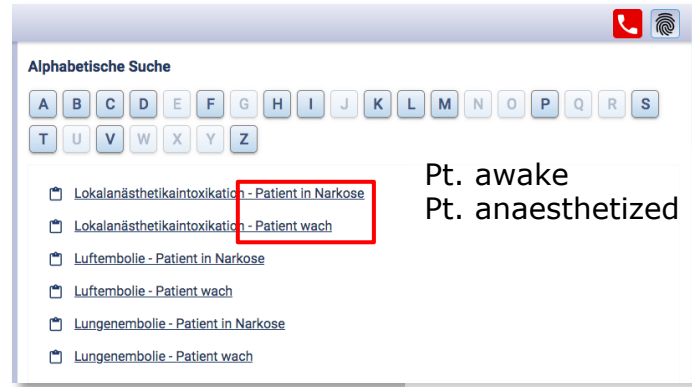


Body navigator

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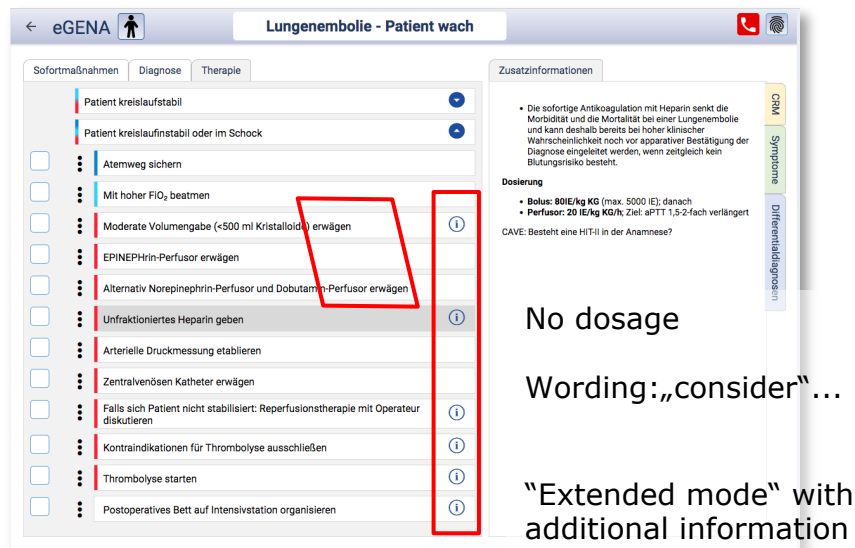
The screenshot displays the eGENA interface for the condition 'VF / Pulsless VT - Adults'. It features a navigation bar with a back arrow, the text 'eGENA', a user icon, and the condition name. Below the navigation bar are two tabs: 'Diagnosis' and 'Therapy'. The 'Therapy' tab is active, showing a list of tasks. Each task has a checkbox on the left and a colored bar (blue or red) on the right. Two tasks are highlighted with red boxes and arrows pointing to external links:

- Increase pressure limit of respirator to 50 mbar
- Avoid hyperventilation [i](#)
- Review potential reversible causes: 4Hs und 4Ts [i](#)
- After 3 shocks: Give EPINEPHrin 1 mg (i.v./i.o.)
- After 3 shocks: Give Amiodarone 300 mg (i.v./i.o.) [i](#)
- After 5 .shocks: Give EPINEPHrin 1 mg (i.v./i.o.)
- After 5 shocks: Give Amiodarone 150 mg (i.v./i.o.) [i](#)
- Consider mechanical chest compression device [i](#)
- If not already done: inform surgeon
- If patient has non-shockable rhythm #6 [Asystole and PEA - Adults](#) →
- In case of ROSC: check central pulses
- Plan for post-resuscitation care #8 [Post-resuscitation care - Adults](#) →

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eGENA Lungenembolie - Patient wach

Sofortmaßnahmen Diagnose Therapie

Patient kreislaufstabil

Patient kreislaufstabil oder im Schock

Atemweg sichern

Mit hoher FiO_2 beatmen

Moderate Volumengabe (± 500 ml Kristalloide) erwägen ⓘ

EPINEPHrin-Perfusor erwägen

Alternativ Norepinephrin-Perfusor und Dobutamin-Perfusor erwägen

Unfraktioniertes Heparin geben ⓘ

Arterielle Druckmessung etablieren

Zentralvenösen Katheter erwägen

Falls sich Patient nicht stabilisiert: Reperfusionstherapie mit Operateur diskutieren ⓘ

Kontraindikationen für Thrombolyse ausschließen ⓘ

Thrombolyse starten ⓘ

Postoperatives Bett auf Intensivstation organisieren ⓘ

Zusatzinformationen

• Die sofortige Antikoagulation mit Heparin senkt die Morbidität und die Mortalität bei einer Lungenembolie und kann deshalb bereits bei hoher klinischer Wahrscheinlichkeit noch vor apparativer Bestätigung der Diagnose eingeleitet werden, wenn zeitgleich kein Blutungsrisiko besteht.

Dosierung

• Bolus: 80 IE/kg KG (max. 5000 IE); danach

• Perfusor: 20 IE/kg KG/h; Ziel: aPTT 1,5-2-fach verlängert

CAVE: Besteht eine HIFI in der Anamnese?

CRN
Symptome
Differentialdiagnosen

No dosage

Wording: „consider“...

“Extended mode” with additional information

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The screenshot shows the eGENA interface for a patient with a myocardial infarction in anesthesia. The main content area is divided into two panels: 'Sofortmaßnahmen' (Immediate Measures) and 'Zusatzinformationen' (Additional Information).

Sofortmaßnahmen:

- ☐ Patient kreislaufstabil
- ☐ Adäquate Analgesie mit Opioiden sicherstellen
- ☐ Thrombozytenaggregation hemmen
- ☐ Antikoagulation durchführen
- ☐ Hb-Wert von mindestens 7-9 g/dl (4 - 6 mmol/l) anstreben
- ☐ Rasche Reperfusion (PCI) anstreben
- ☐ Patient kreislaufstabil oder im Schock

Zusatzinformationen:

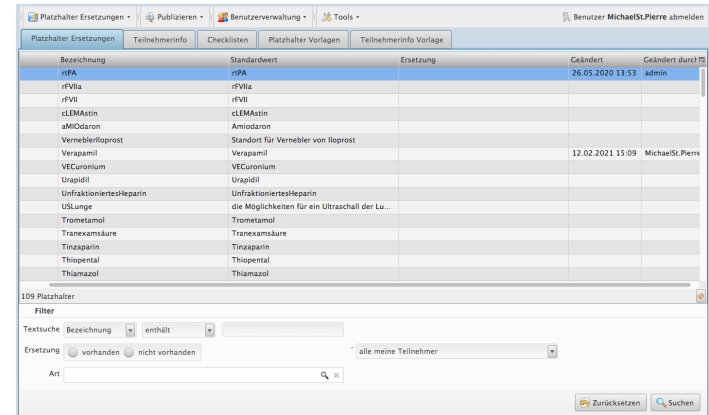
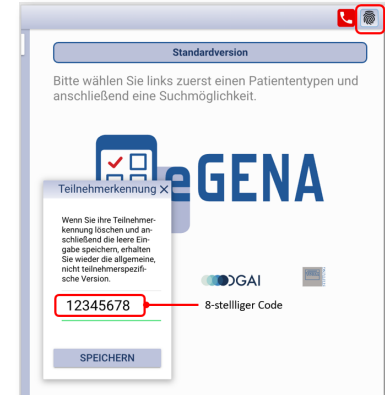
- Die oberste Priorität hat der rasche Transport zum nächsten freien Katheterplatz. Die PCI-Strategie mit der Kardiologie abstimmen.
- Die Telefonnummer des Herzkatheterlabors: 35375 / 45302

The interface includes a top navigation bar with 'eGENA', a user icon, and the patient title 'Myokardinfarkt - Patient in Narkose'. On the right side, there is a vertical sidebar with 'CRM', 'Symptome', and 'Differentialdiagnosen'.

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- ... support of teamwork / resource management
 - Immediate measures
 - Diagnosis
 - Therapy

