

Available online at www.sciencedirect.com

Resuscitation Plus

journal homepage: www.elsevier.com/locate/resuscitation-plus

Clinical paper

A multidisciplinary guideline-based approach to improving the sudden cardiac arrest care pathway: The Copenhagen framework



Mette Kirstine Wagner^{a,*}, Jan Christensen^b, Kate Allen Christensen^b, Camilla Dichman^a, Rikke Gottlieb^b, Ida Kolster^a, Carolina Malta Hansen^{a,c,d,e}, Helle Hoff^c, Christian Hassager^a, Fredrik Folke^{c,d,e}, Bo Gregers Winkel^a

Abstract

Although recommended in the European Resuscitation Council (ERC) and European Society of Intensive Care Medicine (ESICM) Guidelines, a framework for delivering post-cardiac arrest care in a systematic manner in dedicated high-volume cardiac arrest centers is lacking in the existing literature.

To our knowledge, the Copenhagen Framework is the only established framework of its kind. The framework comprises management of out-of-hospital cardiac arrest (OHCA) survivors, and follow-up, and rehabilitation. The framework also incorporates research projects on cardiac arrest survivors and their close family members. The overall aim of this paper is to describe a framework made in order to bridge the gaps between international recommendations and delivering high-quality post-resuscitation clinical care, improving the continuity of care for OHCA survivors, access to post-CA rehabilitation, a seamless transition to everyday life, and ultimately patient outcomes in the future.

Keywords: Cardiac arrest, Sudden cardiac arrest, Post-resuscitation care

Introduction

Due to several national initiatives in Denmark,¹ the number of individuals who survived cardiac arrests outside hospitals (OHCA) in 2022 was more than four times higher than that in 2002² (referred to as cardiac arrest (CA) in the following). The current survival rate of 13% amounts to approximately 700 persons yearly or 12 persons per 100,000 persons in the population.² Although, the European Resuscitation Council (ERC) and European Society of Intensive Care Medicine (ESICM) Guidelines for post-resuscitation care suggest that care after CA should be delivered in a systematic manner in dedicated high volume CA centers,^{3,4} current evidence still has extensive knowledge gaps, when it comes to evidence-based post-CA care including diagnostics, provision of information, screening for cognitive impairments and emotional problems, physical assessments, follow-up, and rehabilitation.⁵ In fact, post-CA care often fragments after survivors leave the hospital.^{6–10} This means that

considerable variations in care plans and outcome following resuscitation exist.^{11–13} In particular, the effectiveness of rehabilitation interventions in general, and specifically rehabilitations interventions aimed to improve return-to work (RTW), mental health outcomes and quality of life (QoL) may be vital for optimized coherent care.^{14–16}

The Danish public health care system is an up-front tax-paid system where all costs for treatment are covered based on the principle of free and equal access for all citizens. Denmark has approximately 6 million residents and five specialised CA centers with access to Cath lab, Intensive Care Unit (ICU), advanced imaging and electrophysiology/device implantation.¹⁷ Two CA centers (Copenhagen University Hospitals Gentofte and Rigshospitalet) cover all OHCA of suspected cardiac cause in the Capital Region (1.9 mio. inhabitants), with Rigshospitalet also covering the neighboring region of Zealand (0.8 mio. inhabitants). Rigshospitalet discharges approximately 150 CA survivors, and Gentofte discharges approximately 50 CA survivors each year. In the Department of Cardiology at

* Corresponding author at: Department of Cardiology, Copenhagen University Hospital – Rigshospitalet, Blegdamsvej 9, DK-2100 Copenhagen, Denmark.

E-mail address: mette.kirstine.wagner@regionh.dk (M.K. Wagner).

<https://doi.org/10.1016/j.resplu.2023.100546>

2666-5204/© 2023 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Rigshospitalet, a multidisciplinary guideline-based framework¹⁸ has been developed based on clinical statements from survivors and close family members, as well as qualitative studies^{19–21} and cross-sectional quantitative investigations of Activities of daily Living (ADL) performance ability,²² unmet rehabilitation needs and RTW⁶ in CA survivorship. The framework has been implemented into clinical practice during an ongoing process starting from December 15, 2017, and has been continuously refined adapting new methods when it comes to diagnostics, cognitive and psychopathological screening tools used, timepoints of screening, better awareness of the care needs and elements of follow-up for survivors and families of CA.^{23–26} This process has been further qualified involving national colleagues, researchers, and patient representatives from the Danish Cardiac Arrest Survivorship (DANCAS) network.²⁷ Gentofte Hospital applied the same system in October 2023. The multidisciplinary framework is centered around cardiac wards dedicated to CA survivors.

To our knowledge, the Copenhagen Framework is the only established framework of its kind. The overall aim of this paper is to describe a framework made in order to bridge the gaps between international recommendations and delivering high-quality post-resuscitation clinical care, improving the continuity of care for OHCA survivors, access to post-CA rehabilitation, a seamless transition to everyday life and ultimately patient outcomes in the future. In addition, there is a strong focus on delivering high-quality research. The framework design comprises the following components (Fig. 1).

Management of CA survivors in-hospital

Diagnostic evaluation

Establishing the cause of CA is important to facilitate the right treatment, and to secure a proper diagnostic work-up of close family members in case of suspected inherited cardiac disease. For this, a protocolized staged diagnostic evaluation of the CA survivor has been used clinically since 2017.²³ The staged evaluation includes clinical examinations, imaging, and provocations tests, and secures

that e.g. coronary artery disease (the most frequent cause of CA) as well as rare diseases like Brugada Syndrome, are not overlooked. The staged approach to examine CA survivors are in line with current guidelines, highlighting the importance of securing the right cause of CA.²³ Correct treatment is initiated, and if needed, the survivor will be referred to their local hospitals out-patient clinic for further adjustment of medication. In diseases where an inherited cardiac disease is suspected, the patient and their family are referred to the dedicated clinic for inherited cardiac diseases. In some instances, the diagnosis might not be clear at the time of discharge, either because not all examinations have been made, or because all examinations are normal. In these cases, a clinical follow-up of the survivor is scheduled, making sure any outstanding examinations are carried out. All survivors with an implantable cardioverter defibrillator (ICD) are followed remotely through a pacemaker/ICD clinic. ICDs are implanted according to ESCs guidelines or as part of randomized trials.²³

Screening of survivors and close family members

In-hospital assessment of cognitive impairment and psychological problems as symptoms of anxiety, depression, and trauma reactions in survivors is internationally recommended in guidelines⁴ but is unfortunately not performed routinely in the early phase after CA in clinical practice.²⁸ In the absence of a recommended early post-arrest screening method for assessing cognitive impairment and symptoms of psychopathology, these challenges often go unrecognised during hospital admission.^{29,30} This is also the case when it comes to psychological reactions in close family members.^{20,25,31} Between 2018 and 2022 the multicenter REcovery after cardiac arrest surVIVAL (REVIVAL) cohort study was conducted across three highly specialised CA centers covering urban and rural areas of Denmark and the Neurobiology Research Unit at Rigshospitalet.²⁴ The overall aim of this study was to investigate early cognitive impairment and symptoms of psychopathology using a screening model and to evaluate the evolution of these problems at three-month follow-up in a population of OHCA survivors. As we found associations between the early screening procedure during hospitalisation

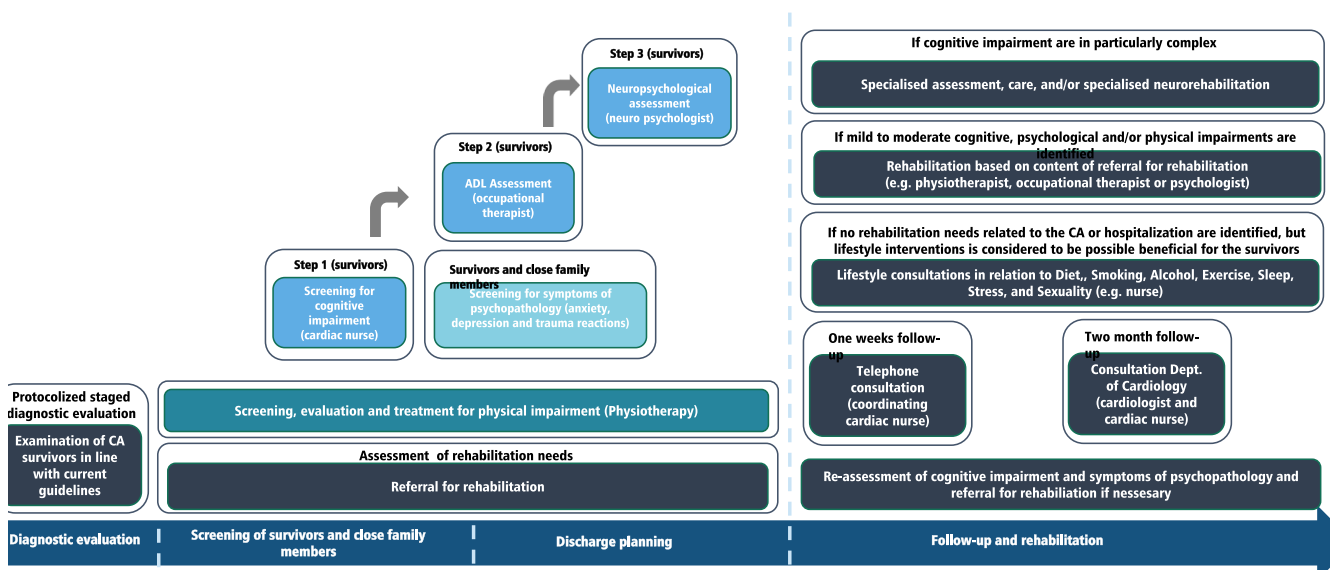


Fig. 1 – The Copenhagen Framework components

and mental health outcomes at three month follow-up,²⁴ CA survivors are now systematically screened with the Montreal Cognitive Assessment (MoCA),³² the Hospital Anxiety and Depression Scale (HADS),³³ and the Impact of Event Scale – Revised (IES-R).³⁴ During hospitalisation, a care team of certified coordinating CA nurses with the skills to screen and care for survivors conducts the assessments. Moreover, we are currently using the IES-R at hospital discharge to explore the setup for measuring traumatic distress in close family members of OHCA survivors,³⁵ to assess the needs of the family separately. In addition, to nuance the screenings, the perspectives of the survivors and close family members on these problems, critical points to consider in decision-making, their motivation, specific role, and needs for support are taken into consideration and involved to inform further needs. The overall aim of early assessment of rehabilitation needs, including individual family perspectives, is to provide the individual survivor and close family members with continuity of care, facilitating appropriate in- and out-of-hospital interventions in the transition to survivorship.³⁶ Without this, the survivors may consequently be discharged from the cardiology ward without appropriate rehabilitation needs assessment to manage the subsequent secondary CA challenges associated with daily activities.

Discharge planning

We have developed a multidisciplinary stepwise clinical safety net when it comes to cognitive impairment, ADL and rehabilitation needs (Fig. 1). If the survivor scores < 26 on the MoCA screening (step 1, Fig. 1), and/or the survivor and/or close family members report subjective cognitive problems, the survivor is prescribed to step 2, which is an in-hospital assessment of global functional level during ADL. An occupational therapist assesses the ability to carry out ADL in terms of safety, independence, effort, and efficiency, paying specific attention to cognitive motor and process skills and fatigue. In this context, the terminology of the International Classification of Functioning, Disability, and Health (ICF) of the World Health Organisation (WHO)³⁷ is used to describe the survivor's individual rehabilitation needs in terms of cognition, ADL and rehabilitation potential. The ICF terminology specifies common constructs and facilitate communication with individuals during their clinical care and rehabilitation, and has previously been used in research on outcomes in post-resuscitation care.^{29,38} The involved interdisciplinary core specialist team organised within this conceptual basis is cardiac nursing, occupational therapy, physiotherapy, neuropsychology, and medicine (cardiology) with knowledge, skills and experience in managing CA are collaborating to co-create a rehabilitation plan.³⁹

Once the interdisciplinary team has reached the conclusion that a thorough neurocognitive examination is necessary, they proceed to initiate a referral to a neuropsychologist dedicated to the secondary neuropsychological consequences of surviving CA (step 3, Fig. 1). The initial assessment is performed and/ or contact established before hospital discharge, as it is complicated for CA survivors in a Danish setting to get the appropriate access to rehabilitation otherwise. If the cognitive needs are particularly complex, survivors are referred for specialised assessment, care, and/or specialised neurorehabilitation.

Demographics and clinical data of survivors

The main clinical cognitive stepwise safety net (Fig. 1) used so far is step 1, which includes MoCA screening. A total of 654 survivors (84% men) have been assessed from December 15, 2017 to October 10, 2023. Participants' median age is 59 (IQR 50–67) years. As the

clinical framework was implemented, we know from the REVIVAL cohort,³² that the majority of the survivors are identical to those enrolled in the clinic. In the REVIVAL study, we found that ischemic heart disease was the main cause of CA (68%), the median time to ROSC was 10 minutes (IQR: 7–16), 63% had been treated at the ICU, and the median length of stay at the hospital was 12 days (IQR: 8–17).³² Approximately every fourth survivor has been referred for an in-hospital assessment of global functional level during ADL (step 2, Fig. 1). Of these survivors, only a small subset (n = 15) have undergone a comprehensive neuropsychological assessment (step 3, Fig. 1) initiated at the hospital.

Survivors discharged from the hospital with an implanted ICD are provided with written ICD information, and all survivors and close family members are provided with a contact information card for the CA team, an appointment for the one week telephone consultation with the coordinating CA nurse, and two booklets translated from Dutch to Danish on 'Surviving cardiac arrest' and 'A cardiac arrest also affects partners and loved ones'.⁴⁰

Follow-up and rehabilitation

By law, the municipalities in Denmark are obliged to offer rehabilitation to patients with identified decreased health functioning and medical issues related to the CA and/or hospitalisation.⁴¹ In this context, rehabilitation is a person-centered health strategy, with a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment. Rehabilitation services are relevant along the continuum of care, from prevention of impairment and deterioration in the acute phase to optimization and maintenance of functioning in the post-acute and long-term phases of care.⁴² However, in cardiac rehabilitation, there is generally little attention paid to cognitive issues.^{14,29} This is due to the fact that 1) the primary CA diagnosis may still determine the rehabilitation offered,¹³ 2) the body of evidence on CA rehabilitation is very low,¹⁴ and that 3) there is often confusion on which provider or specialty (cardiology or neurology) will ensure follow-up and targeted cognitive rehabilitation,²⁹ including fatigue management^{43,44} and psychosocial interventions^{45,46} Existing clinical guidelines on rehabilitation provision after CA⁴ should as a minimum be followed to meet the high burden of secondary consequences suffered by CA survivors, with the overall target of improving continuity of care, reducing individual suffering, family burdens, and health care costs.

One week follow-up

As shown in Fig. 1, all survivors and close family members receive a planned follow-up telephone consultation 1 to 2 weeks after discharge. This follow-up consultation program plan is built on a holistic survivor perspective on what potential problems CA survivors and their relatives may experience, requiring differing levels of support to bridge the gap between treating the heart and brain together.^{15,19,20,24,40,47} The consultation follows a written manual inspired by the NEMPRO,⁴⁸ a patient-reported instrument developed to assess challenges in everyday life in stroke patients. Underpinned by the literature and interdisciplinary knowledge across the Department of Cardiology (coordinating CA nurse and cardiologist), the Department of Occupational Therapy and Physiotherapy (occupational therapist and physiotherapist) and the Department of Neurology (neuro physiotherapist and neuropsychologist) at Righospitalet, a few questions on potential problems CA survivors face were adjusted from the original NEMPRO (see [Supplementary Material S1](#)). The overall aim of this survivorship appointment is to check in on

the survivors and their families to understand their current individual and separate needs (in particular cognitive and psychological challenges) and, if possible, address them by involving community rehabilitation teams to prevent prolonged complications, e.g. brain injury coordinators, which are available in all municipalities in Denmark.

Two-months follow-up

At two-months follow-up, the survivors and close family members are invited to the Department of Cardiology for a comprehensive collaborative survivorship 1-hour specialist visit with a cardiologist and a coordinating CA nurse (Fig. 1). This clinical appointment is needed and is arranged in parallel with, rather than built on, already established cardiological and/or neurological rehabilitation. The aims of this visit are to follow-up on information about the CA diagnosis, on medical issues, to discuss patient-centered recovery, rehabilitation progress, including unmet needs and preferences, reassess how the individual family manages everyday life, including RTW, the individual need for further information and support, and to re-assess the need for psychological support, e.g., should be offered targeted cognitive behavioral therapy (CBT).^{49,50} As for the telephone consultation, the written manual guides the follow-up consultation (Supplementary Material S1).

Post-resuscitation rehabilitation evidence continues to evolve.¹⁴ However, the effectiveness of rehabilitation studies targeted RTW in CA survivors and mental health outcomes in the whole family are desperately needed.

Ongoing research

Return to work (RTW) is essential for many survivors who prior to the OHCA were active in the labour market.⁵¹ Despite registry studies have reported a high RTW rate,^{52,53} our group have explored survivor-reported received rehabilitation interventions, unmet rehabilitation need, RTW and job functioning 6 and 12 months after hospital discharge.⁶ Survivors reported extensive unmet rehabilitation needs and 6 and 12-months after discharge respectively 58% and 45% of survivors were on full time sick leave or working notably less (more than 10 h/week). Furthermore, of those who had returned to previous jobs, many had returned to modified job descriptions and/or modified job tasks. Based on the above, and while evidence of the effectiveness of rehabilitation after CA arrest is limited, our framework gives room and opportunities for research in post-CA rehabilitation, which we actively do. With the ongoing ROCK (Rehabilitation after Out-of-hospital Cardiac arrest survivors and return-to-work) trial, a two-arm parallel group multicentre pragmatic randomized controlled trial, we investigate the effectiveness of a comprehensive tailored rehabilitation intervention focusing on supporting RTW in addition to usual care or usual care after OHCA (NCT05173740). The trial is based on a multidisciplinary rehabilitation team approach with principles from the Individual Placement and Support and Stepped Care, Graded Exercise Therapy and CBT focusing on RTW.^{54–57} Moreover, an evaluation of the feasibility of a previous tested but modified flexible manual-based family intervention consisting of strategies from rehabilitation psychology, CBT, and marriage and family therapy is described.⁴⁹ The family-intervention is designed to prevent psychopathology, improve mental health and quality of life in CA survivors and close family members.

Discussion

This paper presents the Copenhagen CA survivor framework, a multidisciplinary guideline-based approach to improving the sudden CA care pathway consisting of management of OHCA survivors in-hospital, in-hospital screening of survivors and close family members, hospital discharge planning, and follow-up and rehabilitation. Other clinical CA follow-up programs have previously been described.¹⁶ Similar to our clinical work, the CARE group found the follow-up and rehabilitation care for CA survivors suboptimal in terms of a lack of systematic neuropsychological assessment within the first weeks of survival. In addition, the group highlighted that involving and supporting the families after OHCA within an expert multidisciplinary team approach is needed.¹⁶ Hence, a six-month follow-up appointment was recommended. This aligns with recent findings from the national DANCAS survey⁵⁸ which found high rates of long-term secondary post-arrest challenges in CA survivors. Considering these previous findings, the heterogeneous course of recovery after CA, and the duration of our follow-up framework, a limitation of the Copenhagen framework is perhaps the two-month follow-up timeframe. However, as in other rehabilitation settings (38.39), our setup is based on clinical needs and tailored to the survivor's goals and outcomes. With this in mind, all survivors and close family members are informed to contact the coordinating CA nurse or cardiologist at a later point than two-months post-arrest if needed.

This present framework is organised within two CA centers. Although the structural processes of CA-care have been questioned in recent years, it has previously been suggested that post-arrest care with access to early acute intervention might be better delivered in a designated high-volume center.⁵⁹ Considering the importance of CA survivorship, the organisation of post-resuscitation care in a coordinated integrated care path is vital.^{7,24} In particular, as cardiac rehabilitation and neuropsychological rehabilitation are most often located within different groups, departments, or institutions.¹⁵ With this in mind, to deliver high-quality CA care, the organisation of clinical in- and out-patient CA programs requires both the cardiac, neurocognitive, and physical knowledge, skills, and CA experience of health-care providers in a joint multidisciplinary team structure. Although no strong evidence exists, it is in our experience that leadership, culture, and a collaborative approach are key enablers and cornerstones for this multidisciplinary specialist service to succeed. To further develop and implement a successful CA rehabilitation framework within an interdisciplinary core specialist team, it is equally important to strengthen collaborative national and international data driven research. This has the potential to critically inform the fifth link in the chain of survival in the ERC ESICM guidelines. in the future.

Conclusion

The presented framework is suggested to bridge the gaps between international recommendations and delivering high-quality post-arrest clinical care. We will continue to evaluate this framework in terms of improving the coherent care of OHCA survivorship, access to post-resuscitation rehabilitation, a seamless transition to everyday life, and ultimately patient and family outcomes.

CRedit authorship contribution statement

Mette Kirstine Wagner: Conceptualization, Methodology, Writing – original draft. **Jan Christensen:** Methodology, Visualization, Writing – review & editing. **Kate Allen Christensen:** Writing – review & editing. **Camilla Dichman:** Writing – review & editing. **Rikke Gottlieb:** Writing – review & editing. **Ida Kolster:** Writing – review & editing. **Carolina Malta Hansen:** Writing – review & editing. **Helle Hoff:** Writing – review & editing. **Christian Hassager:** Writing – review & editing. **Fredrik Folke:** Writing – review & editing. **Bo Gregers Winkel:** Conceptualization, Methodology, Writing – original draft.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors thank Karin Spangsborg, project leader for the ‘Rehabilitation prescription plan’ [Den gode genoptræningsplan], for help with facilitating and developing the first version of the cognitive safety net, including the interview guide. Moreover, we thank the Danish Knowledge Centre for Rehabilitation and Palliative Care (REHPA) for planning the cardiac arrest rehabilitation courses, taking part in planning, and conducting the focus group interviews with CA survivors and close family members.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.resplu.2023.100546>.

Author details

^aDepartment of Cardiology, Copenhagen University Hospital, Rigshospitalet, Denmark ^bDepartment of Occupational Therapy and Physiotherapy, Copenhagen University Hospital, Rigshospitalet, Copenhagen, Denmark ^cDepartment of Cardiology, Herlev and Gentofte University Hospital, Hellerup, Denmark ^dCopenhagen Emergency Medical Services, Copenhagen University, Ballerup, Denmark ^eDepartment of Clinical Medicine, Copenhagen University, Copenhagen, Denmark

REFERENCES

1. Wissenberg M, Lippert FK, Folke F, et al. Association of national initiatives to improve cardiac arrest management with rates of bystander intervention and patient survival after out-of-hospital cardiac arrest. *JAMA - J Am Med Assoc.* 2013;310:1377–84.
2. Hjertestopregister D. Dansk Hjertestopregister Årsrapport for. 2022; Available from: <http://www.rkkp.dk>.
3. Gräsner JT, Herlitz J, Tjelmeland IBM, et al. European Resuscitation Council Guidelines 2021: epidemiology of cardiac arrest in Europe. *Resuscitation* 2021;161:61–79.
4. Nolan JP, Sandroni C, Böttiger BW, et al. European Resuscitation Council and European Society of Intensive Care Medicine Guidelines 2021: post-resuscitation care. *Resuscitation* 2021;161:220–69.
5. Marijon E, Narayanan K, Smith K, et al. The Lancet Commissions The Lancet Commission to reduce the global burden of sudden cardiac death: a call for multidisciplinary action.
6. Christensen J, Winkel BG, Eskildsen SJ, Gottlieb R, Hassager C, Wagner MK. Return-to-work and rehabilitation needs in cardiac arrest survivors: an exploratory cross-sectional study. *Eur J Cardiovasc Nurs* 2022;1–4.
7. Wagner MK, Berg SK, Hassager C, Joshi VL, Stenbæk DS, Missel M. Feeling understood for the first time: experiences of participation in rehabilitation after out-of-hospital sudden cardiac arrest. *Eur J Cardiovasc Nurs* 2021;20:767–74.
8. Dainty KN, Seaton MB, Richard VP. Moving from physical survival to psychologic recovery: a qualitative study of survivor perspectives on long-term outcome after sudden cardiac arrest. *Resusc Plus* 2021;5 100055.
9. Case R, Stub D, Mazzagatti E, et al. The second year of a second chance: Long-term psychosocial outcomes of cardiac arrest survivors and their family. *Resuscitation* 2021;167:274–81.
10. Mion M, Case R, Smith K, et al. “Lucky to be alive”? – Patients’ experience of care following an out-of-hospital cardiac arrest. *Resuscitation* 2020;155.
11. Israelsson J, Lilja G, Bremer A, Stevenson-ågren J, Årestedt K. Post cardiac arrest care and follow-up in Sweden – a national web-survey. *BMC Nurs* 2016;1–8.
12. Boyce LW, Goossens PH, Volker G, van Exel HJ, Vliet Vlieland TPM, van Bodegom-Vos L. Attention needed for cognitive problems in patients after out-of-hospital cardiac arrest: an inventory about daily rehabilitation care. *Netherlands Hear J* 2018;26:493–9.
13. Tang LH, Joshi V, Egholm CL, Zwisler AD. Are survivors of cardiac arrest provided with standard cardiac rehabilitation? - Results from a national survey of hospitals and municipalities in Denmark. *Eur J Cardiovasc Nurs* 2021;20:115–23.
14. Joshi VL, Christensen J, Lejsgaard E, Taylor RS, Zwisler AD, Tang LH. Effectiveness of rehabilitation interventions on the secondary consequences of surviving a cardiac arrest: a systematic review and meta-analysis. *BMJ Open* 2021;11:1–11.
15. Boyce LW, Goossens PH. Rehabilitation after cardiac arrest: integration of neurologic and cardiac rehabilitation. *Semin Neurol* 2017;37:94–102.
16. Mion M, Al-Janabi F, Islam S, et al. Care after REsuscitation: implementation of the United Kingdom’s first dedicated multidisciplinary follow-up program for survivors of out-of-hospital cardiac arrest. *Ther Hypothermia Temp Manage* 2020;10:53–9.
17. Sinning C, Ahrens I, Cariou A, et al. The cardiac arrest centre for the treatment of sudden cardiac arrest due to presumed cardiac cause – aims, function and structure: position paper of the Association for Acute CardioVascular Care of the European Society of Cardiology (AVCV). *European Assoc. Eur Hear J Acute Cardiovasc Care* 2020;9:S193–202.
18. Moolaert VR, van Heugten CM, Winkens B, et al. Early neurologically-focused follow-up after cardiac arrest improves quality of life at one year: a randomised controlled trial. *Int J Cardiol* 2015:193.
19. Wagner MK, Berg SK, Tang LH, Stenbæk DS, Hassager C, Missel M. Understanding the lived experiences of short- and long-term consequences on daily life after out-of-hospital cardiac arrest. A focus group study. *J Adv Nurs* 2021;77:1442–52.
20. Dichman C, Wagner MK, Joshi VL, Bernild C. Feeling responsible but unsupported: How relatives of out-of-hospital cardiac arrest survivors experience the transition from hospital to daily life – A focus group study. *Nurs Open* 2021;8:2520–7.
21. Rosenkilde S, Missel M, Wagner MK, et al. Caught between competing emotions and tensions while adjusting to a new everyday life: a focus group study with family caregivers of out-of-hospital cardiac arrest survivors. *Eur J Cardiovasc Nurs* 2023;22:320–7.

22. Christensen J, Eskildsen SJ, Winkel BG, Dichman CK, Wagner MK. Motor and process skills in activities of daily living in survivors of out-of-hospital cardiac arrest: a cross-sectional study at hospital discharge. *Eur J Cardiovasc Nurs* 2021;20:775–81.
23. Zeppenfeld K, Tfelt-Hansen J, De Riva M, et al. 2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death Developed by the task force for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death of. *Eur Heart J* 2022;43:3997–4126.
24. Wagner MK, Berg SK, Hassager C, Borregaard B, Rasmussen TB, Ekholm OSD. Cognitive impairment and psychopathology in sudden out-of-hospital cardiac arrest survivors: results from the REVIVAL cohort study. *Resuscitation* 2023;192:1–8.
25. Dainty KN, Seaton MB, Cowan K, et al. Partnering with survivors & families to determine research priorities for adult out-of-hospital cardiac arrest: a James Lind Alliance Priority Setting Partnership. *Resusc Plus* 2021;7:100148.
26. Wagner MK, Christensen AV, Hassager C, et al. Sex differences in patient-reported outcomes in the immediate recovery period after resuscitation: findings from the cross-sectional DenHeart survey. *J Cardiovasc Nurs* 2022;1–9.
27. <https://www.rehpa.dk/om-rehpa/in-english/#/>.
28. Lilja G, Blennow NE. What you ask for is what you get: a practical approach for early cognitive screening and the potential for individualized support after cardiac arrest. *Resuscitation* 2017;116.
29. Lilja G. Follow-up of cardiac arrest survivors: why, how, and when? A practical approach. *Semin Neurol* 2017;37:088–93.
30. Boyce LW, Goossens PH, Moolaert VR, Pound G, van Heugten CM. Out-of-hospital cardiac arrest survivors need both cardiological and neurological rehabilitation! *Curr Opin Crit Care* 2019;25:240–3.
31. Haywood K, Dainty KN. Life after cardiac arrest: the importance of engaging with the “forgotten patient”. *Resuscitation* 2018;128:A1–2.
32. Nasreddine ZS, Philips NA, Bedirian V, et al. The Montreal Cognitive Assessment, MoCA: A Brief Screening. *J Am Geriatr Soc* 2005:695–9.
33. Snaith RP. The hospital anxiety and depression scale. *Health Qual Life Outcomes* 1983;1:29.
34. Weiss DS, Marmar CR, TI of ESI. The Impact of Event Scale—Revised. In: Wilson JP, Keane TM, editors. *Assessing psychological trauma and PTSD*. Guilford Press; 1997. p. 399–411.
35. Wagner MK, Berg SK, Hassager C, et al. Cognitive impairment and psychopathology in out-of-hospital cardiac arrest survivors in Denmark: The REVIVAL cohort study protocol. *BMJ Open* 2020;10:1–9.
36. Wagner MK. Future of cardiac arrest care: the need for a coordinated transitional care strategy. *Eur J Cardiovasc Nurs* 2020.
37. <http://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health>.
38. Moolaert VRM, Van Heugten CM, Gorgels TPM, Wade DT, Verbunt JA. Long-term outcome after survival of a cardiac arrest: a prospective longitudinal cohort study. *Neurorehabil Neural Repair* 2017;31:530–9.
39. CHAPTER 2 National Clinical Guidelines for Stroke. Organisation of Stroke Services. 2007;5–28.
40. Moolaert V. Life after survival of a cardiac arrest: The brain is the heart of the matter; 2014.
41. <https://www.retsinformation.dk/eli/ta/2023/1011>.
42. World Health Organization. *Rehabilitation in health systems*. Geneva; 2017.
43. Zedlitz AMEE, Rietveld TCM, Geurts AC, Fasotti L. Cognitive and graded activity training can alleviate persistent fatigue after stroke: a randomized, controlled trial. *Stroke* 2012;43:1046–51.
44. Wylie GR, Flashman LA. Understanding the interplay between mild traumatic brain injury and cognitive fatigue: models and treatments. *Concussion* 2017;2:CNC50.
45. Dougherty CM, Thompson EA, Lewis FM. Long-term outcomes of a telephone intervention after an ICD. *PACE - Pacing Clin Electrophysiol* 2005;28:1157–67.
46. Cowan MJ, Pike KC, Budzynski HK. Psychosocial nursing therapy following sudden cardiac arrest: impact on two-year survival. *NursRes* 2001;50:68–76.
47. Whitehead L, Tierney S, Biggerstaff D, Perkins GD, Haywood KL. Trapped in a disrupted normality: survivors’ and partners’ experiences of life after a sudden cardiac arrest. *Resuscitation* 2020;1:81–7.
48. Forchhammer BH, Krogh C. <http://www.nempro.dk/>.
49. Soendergaard PL, Arango-Lasprilla JC, Wolffbrandt MM, Dornonville de la Cour FL, Biering-Sørensen F, Norup A. Investigating the effectiveness of a family intervention after acquired brain or spinal cord injury: a randomized controlled trial. *J Clin Med* 2023;12:1–17.
50. Holdgaard A, Eckhardt-Hansen C, Lassen CF, et al. Cognitive-behavioural therapy reduces psychological distress in younger patients with cardiac disease: a randomized trial. *Eur Heart J* 2023;44:986–96.
51. Lilja G, Ullén S, Dankiewicz J, et al. Effects of hypothermia vs normothermia on societal participation and cognitive function at 6 months in survivors after out-of-hospital cardiac arrest. *JAMA Neurol* 2023;80:1070–9.
52. Kragholm K, Wissenberg M, Mortensen RN, et al. Return to work in out-of-hospital cardiac arrest survivors: a nationwide register-based follow-up study. *Circulation* 2015;131:1682–90.
53. Descatha A, Dumas F, Bougouin W, Cariou A, Geri G. Work factors associated with return to work in out-of-hospital cardiac arrest survivors. *Resuscitation* 2018;2018:170–4.
54. Bond GR, Becker DR, Drake RE, et al. Implementing supported employment as an evidence-based practice. *Psychiatr Serv* 2001;52:313–22.
55. Wearden AJ, Morriss RK, Mullis R, et al. Randomised, double-blind, placebo-controlled treatment trial of fluoxetine and graded exercise for chronic fatigue syndrome. *Br J Psychiatry* 1998;172:485–90.
56. Powell P, Bental R, Nye FER. Randomised controlled trial of patient education to encourage graded exercise in chronic fatigue syndrome. *Br Med J* 2001;322:387–90.
57. Prins JB, Bleijenberg G, Bazelmans E, et al. Cognitive behaviour therapy for chronic fatigue syndrome: a multicentre randomised controlled trial. *Lancet* 2001;357:841–7.
58. Joshi VL, Tang LH, Mikkelsen TB, et al. Does time heal fatigue, psychological, cognitive and disability problems in people who experience an out-of-hospital cardiac arrest? Results from the DANCAS survey study. *Resuscitation* 2023;182.
59. Sunde K, Pytte M, Jacobsen D, et al. Implementation of a standardised treatment protocol for post resuscitation care after out-of-hospital cardiac arrest. *Resuscitation* 2007;73:29–39.