DRAFT

EUROPEAN RESUSCITATION COUNCIL

DRAFT GUIDELINES FOR PUBLIC COMMENT

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OPEN FOR COMMENT

UNTIL

5TH NOVEMBER 2020

HIBI – Hypoxic Ischemic Brain Injury
OHCA – Out of Hospital Cardiac Arrest
RCT – Randomised Controlled Trial
ROSC – Return of Spontaneous Circulation
WLST – Withdrawal of Life Sustaining Therapies

[h2]Long-term outcome after cardiac arrest

[h3] Long-term outcome

In countries where WLST is uncommon, poor outcome because of HIBI is common.[376,416] The prognosis of patients who are still comatose or in an unresponsive wakefulness state one month after the cardiac arrest is poor and they rarely recover.[416,417] In contrast, in countries practising WLST, the majority of survivors are defined as having a 'good' neurological outcome based on global outcome measures such as Cerebral Performance Categories (CPC), modified Rankin Scale (mRS) or the Glasgow Outcome Scale/Extended (GOS/E). [279,398,418-420] However, these measures are not sufficiently sensitive to capture the problems that many of the survivors experience, including cognitive, emotional and physical problems and fatigue.[421-423] In fact, approximately 40-50% of the survivors have long-term cognitive impairments.[219,424,425] Impairments are mostly mild to moderate and, although all cognitive domains can be affected, most problems are seen in memory, attention, processing speed and executive functioning (e.g. planning, organisation, initiation, flexibility).[219,421,424-426] In general, most cognitive recovery occurs during the first three months after the cardiac arrest.[427-429]

Emotional problems are also common. Three to six months after the cardiac arrest anxiety is present in 15-30% of the survivors and remains in 15-23% at 12 months.[430-432] Depressive symptoms range from 13-32% at 3-6 months and decrease to 5-15% at 12 months.[430-433] Symptoms of post-traumatic stress remain in about a quarter of the survivors.[422,430,433,434] Furthermore, some survivors show behavioural problems, such as aggressive/uninhibited behaviour or emotional lability.[425]

Fatigue is also frequently reported and is present in approximately 70% of the survivors at six months and remains in half of the survivors one year after the event.[430,435,436] Physical problems, including rib fractures, muscle weakness and ambulation difficulties, have also been reported. [423,430,437,438] However, the impact of survival on physical function has received little attention; when compared with age and gender-matched populations, reduced physical functioning has been reported in survivors at 3-months,[439] 6-months,[438] 12-months[420] and three years.[437] Almost half of survivors report limitations because of physical difficulties at 6-months,[438] with up to 40% describing mobility problems[420,425,430,440] and limitations in usual activities at 12-months.[420,430,440]

After discharge, most survivors are able to return home and only a small percentage (1–10%) need to be admitted to a long-term care facility.[430,440,441] The large majority (82–91%) are independent in their basic activities of daily living (ADL).[218,424,437,440] Although most survivors are able to resume their pre-arrest activities, they experience more restrictions in societal participation compared with myocardial infarction patients.[430,436] Cognitive impairments, depression, fatigue and restricted mobility are negative predictors for future participation.[436]

Of those who were previously working, 63-85% are able to return to work, although some need to adapt their working hours or activities.[420,430,436,437,440,442-444] Decreased likelihood of return to work is associated with cognitive problems and fatigue, unwitnessed OHCA, absence of bystander CPR, female gender, higher age and lower socio-economic status.[436,439,442-444]

General health-related quality of life is, on average, good and overall scores approach normal population values, as was shown in two systematic reviews and confirmed in several more recent studies.[218,420,440,445,446] Cognitive impairments, emotional problems and female gender are associated with a lower quality of life.[420,428,438,439,447-452] However, general health related quality of life is, on average, reported as good with overall scores approaching normal population values, as was shown in two systematic reviews and confirmed in several more recent studies.[218,420,440,445,446] However, such generic assessments lack sufficient granularity to comprehensively capture the breadth of problems

experienced by survivors, with the result that the impact of cardiac arrest survival may be incompletely captured.[279] Supplementing such generic assessment with condition or problem-specific assessment is recommended.[279]

More detailed information on recovery and long-term outcome after cardiac arrest, as well as a description of the current rehabilitation practices in Europe can be found in the epidemiology section of the European Resuscitation Council Guidelines.[453]

[h3] In-hospital assessment and follow-up after hospital discharge

[h4] Early rehabilitation and assessment during hospital phase

There are no studies of early rehabilitation interventions for cardiac arrest survivors specifically but there is substantial overlap with the post-intensive care syndrome (PICS). For other ICU patients, interventions of early mobilisation and prevention of delirium are described, and similar interventions are thought to be useful for cardiac arrest patients as well.[423,454-456] Recommendations in the UK National Institute for Health and Care Excellence (NICE) guidelines for rehabilitation after critical illness suggest that individualised rehabilitation plans and information should be provided before discharge from the ICU and the hospital, based on functional assessments of physical and non-physical (e.g. cognitive and emotional) impairments.[457] However, a recent AHA Scientific Statement focusing on survivorship highlights that discharge planning and organisation of further rehabilitation needs after cardiac arrest is often lacking.[423]

We therefore recommend providing information and performing functional assessments of physical and non-physical impairments before discharge from the hospital to identify potential rehabilitation needs and arrange referral for rehabilitation if indicated (Figure X.5).

[h4] Follow-up and screening after hospital discharge

Although cognitive impairments, emotional problems and fatigue are common after cardiac arrest, these 'invisible problems' are not always recognised by healthcare professionals.[428,436,439,443,452] Since these problems have a significant impact on long-term outcome and quality of life, follow-up should be organised in such a way that these problems are detected early enabling appropriate care or rehabilitation to be arranged.[458-460]

Evidence on this subject is scarce but results from one RCT showed that an early intervention service for cardiac arrest survivors and their caregivers improved emotional well-being and quality of life,

resulted in a faster return to work and was cost-effective.[461,462] This individualised programme is provided by a specialised nurse, starts soon after discharge from the hospital and comprises one to six consultations during the first three months. The intervention consists of screening for cognitive and emotional problems, provision of information and support, and referral to further specialised care if indicated. [463,464] There are several other examples of how follow-up after cardiac arrest can be organised.[460,465,466] UK NICE guidelines for rehabilitation after critical illness likewise recommend a follow-up and reassessment for physical and non-physical problems 2-3 months after discharge to enable identification of remaining problems and to provide further support as needed.[457] For cardiac arrest survivors, reassessments have also been suggested at 3, 6 and 12 months.[423]

We therefore suggest the systematic follow-up of all cardiac arrest survivors within three months following hospital discharge which should, at least, include cognitive screening, screening for emotional problems and fatigue, and the provision of information and support for patients and their family (Figure X.5).

[h4] Screening for cognitive problems

To screen for cognition, the patient can be asked about common cognitive complaints, such as memory problems, attention difficulties, distractibility, slowness in thinking, irritability and problems in initiation, planning, multi-tasking or flexibility. Family members can also provide useful insight into changes in cognition and behaviour. A structured questionnaire, such as the Informant Questionnaire of Cognitive decline in the Elderly - Cardiac Arrest version (IQCODE-CA) or the Checklist Cognition and Emotion (CLCE-24), may be used.[467,468] Formal cognitive screening is recommended because patients are not always aware of their cognitive impairments.[429,458,469] We suggest use of the Montreal Cognitive Assessment (MoCA), which takes approximately 10 minutes to administer, is easy to use and freely available in many languages (see www.mocatest.org).[466,469-471] If there are signs of cognitive impairment, consider referral to a neuropsychologist for more extensive neuropsychological assessment or another specialist in cognitive rehabilitation, such as an occupational therapist, should be considered.[472]

[h4] Screening for emotional problems and fatigue

To screen for emotional problems, the presence of emotional symptoms, including symptoms of anxiety, depression and posttraumatic stress, can be explored. Questionnaires, such as the Hospital Anxiety and Depression Scale (HADS), may be useful.[423,459,466,473] If severe emotional problems are detected we suggest referral to a psychologist or psychiatrist for further evaluation and treatment.

We also suggest assessing the presence of fatigue; however, assessment guidance in this population is currently lacking. In case of severe fatigue consider referral to a specialist in rehabilitation medicine for advice on appropriate care.

[h4] Provision of information and support for survivor and family members

Exploring the need for and subsequent provision of appropriate information to patients and their family, preferably both in oral and written form, is recommended.[474] The active engagement of survivors and their family members to better understand their needs and how they would like to receive such information, is recommended as part of this process.[423] Information should cover not only medical subjects such as cardiac disease, risk factors, medication and ICD, but can also address other topics such as potential physical, cognitive and emotional changes and fatigue, resuming daily activities, driving and work, relationship and sexuality.[463,474-477]

It is also important to monitor the well-being of family members because the impact and burden can be substantial.[476,478] Partners often have emotional problems, including symptoms of anxiety and posttraumatic stress, especially in women and those who witnessed the resuscitation.[479,480] Consider referral to a social worker, psychologist or psychiatrist when indicated.

[h2] Rehabilitation after cardiac arrest

[h3] Neurological rehabilitation

In the presence of severe HIBI, patients may require inpatient neurological rehabilitation and, although the evidence is limited, several small retrospective studies have shown that functional improvements can be achieved, reducing the burden of care on the family and society.[481-483]

Although specific guidelines and evidence for neurological rehabilitation after cardiac arrest is lacking, there is more evidence and multiple clinical practice guidelines for other types of acquired brain injury such as traumatic brain injury and stroke which can guide the treatment of patients with HIBI due to cardiac arrest.[484-486] These guidelines provide practical recommendations on topics such as motor function, physical rehabilitation, cognition, communication, activities of daily living and psychosocial issues. Guidelines on rehabilitation after critical illness/ post-intensive care syndrome (PICS) can also be useful.[457,487-489]

[h3] Cardiac rehabilitation

Many cardiac arrest survivors are eligible to enrol in a cardiac rehabilitation programme.[490] There is evidence that cardiac rehabilitation reduces cardiovascular mortality and hospital admissions, improves quality of life, and is cost-effective.[490-493] Cardiac rehabilitation programmes are mostly generic programmes, in which patients with different cardiac diseases, e.g. post-acute coronary syndrome, heart failure or post cardiac surgery, can participate. It involves exercise training, risk factor management, lifestyle advice, education and psychological support.[491] Cardiac rehabilitation is frequently offered as a centre-based out-patient service, but can also be organised in a home-based setting in combination with telemonitoring.[494] In specific cases it can be provided as an inpatient programme.[491] Not all cardiac arrest survivors are eligible for or have access to cardiac rehabilitation, either because of the cause of the cardiac arrest or because of variation in national or insurance policies.[495]

Within cardiac rehabilitation programmes little attention is paid to potential cognitive problems. Among cardiac patients in general, cognitive and emotional problems have not been addressed well in cardiac rehabilitation programmes.[496-498] For cardiac arrest survivors, there are some examples in which cardiac and cognitive rehabilitation have been integrated, although evidence of effects is still lacking.[460,466]

[h3] Cognitive rehabilitation, fatigue management and psychosocial interventions

The goal of cognitive rehabilitation is to reduce the impact of cognitive impairments and to improve overall well-being and daily functioning.[499] It can include additional neuropsychological assessment to get more insight into the nature and severity of the cognitive impairments and other influencing factors. Extensive patient education is essential to give the patient and their family more insight into what has changed in their cognition and behaviour. Compensation strategies, such as memory strategy training and metacognitive strategy training (e.g. self-monitoring, self-regulation and planning ahead) and the use of external (memory) aids may be helpful.[472] Although there are no specific studies on the effects of cognitive rehabilitation in patients with brain injury caused by cardiac arrest, a recent evidence-based review on cognitive rehabilitation after stroke and traumatic brain injury, can serve as a guideline.[472]

Fatigue management can be included in cognitive rehabilitation or provided alone.[500] [Wylie 2018 CNC50] There is weak evidence that a 4-week telephone intervention, based on energy conservation and problem-solving therapy, can be of benefit for cardiac arrest survivors with moderate to severe fatigue.[501,502]

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2075 There is also evidence that psychosocial interventions specifically designed for cardiac arrest survivors
2076 can be valuable. Two RCTs showed benefit from nurse-led psychosocial interventions, either by
2077 telephone or face-to-face.[503,504] These interventions addressed self-management, coping strategies,
2078 relaxation, information and health education.[504,505]

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2080 There are currently no studies on the effectiveness of social support networks or virtual/online
2081 forums, but these may have additional value as a new and easily accessible form of psychosocial
2082 support and information after cardiac arrest.[423]

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