

# Quality of life improvement with rehabilitation according to constitution of the World Health Organization for coronary artery bypass graft surgery patients: A descriptive review

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## Abstract

This is a descriptive review focusing on trends of treatments required for postoperative coronary artery bypass graft surgery (CABG) patients to improve the quality of life (QOL). **Methodology:** The sources of literary research to understand the concepts of coronary artery disease according to Indian scriptures are Ayurveda texts, *Bhagavad Gita*, *Patanjali Yoga Sutra*. The data was typed in Sanskrit using *Devanagari* script and explanation in English was given. As per new research techniques, surgery, physiotherapy rehabilitation and *Yoga* are serving CABG patient's medical and psychological health better. The World Health Organization (WHO) defines health as physical, mental and social well-being later redefined with additional terms like environmental and spiritual health. This definition is similar to the *Panchakosha* concept in *Yoga* and *Pancha Mahabhutas* in Ayurveda. In cases of emergency or passive treatment, medication serves as a better option for physical health. In circumstances where the person is able to move in daily activities (just after discharge), rehabilitation serves as a better option for physical, mental and social health. Travel and reactions to climatic change serve environmental health. Last strategy, belief, cultural and traditional methods with scientific background serves as the spiritual health. These step-wise treatments are required for CABG patients to get the overall health or QOL. However, surgery and physiotherapy rehabilitation are advanced as per modern era which serves physical, mental, and social health also, but environmental health and spiritual health have yet to be addressed. As an ancient system of medicine, *Yoga* combines physical, mental, social, environmental and spiritual practices and it should be added as treatment along with surgery and physiotherapy rehabilitation. If all of these therapies were in the treatment protocol for CABG surgery patients, we would observe the changes of QOL and fulfill the requirements of constitution of the WHO. Integrating concepts of *Yoga*, Ayurveda, modern rehabilitation, surgery and patient cooperation with lifestyle change are the key to QOL improvements after CABG.

**Keywords:** Coronary artery bypass graft, quality of life, rehabilitation, World Health Organization, *Yoga*

## Introduction

Coronary artery bypass graft (CABG) surgery and stent can help to restore blood flow to an area of the heart but do not stop the progression of atherosclerosis.<sup>[1]</sup> Combination of surgery that is CABG with medical therapy can improve the quality of life (QOL) better than medical therapy alone for coronary artery disease (CAD).<sup>[2]</sup> Even though CABG and coronary artery stenting reduces symptoms, recurrence of events of disease and requirement of procedures, mortality will be the same in the long term.<sup>[3,4]</sup> Hence, personality which is the conduct of life or daily living, especially type-D personality can affect the QOL of the cardiac diseased person.<sup>[5]</sup> As the sense of coherence reduces, health-related QOL also

reduces after 6 months of either CABG or percutaneous transluminal coronary angioplasty.<sup>[6]</sup> Mortality rate increases by thrice from 1<sup>st</sup> to 3<sup>rd</sup> year<sup>[4]</sup> and twice from 1<sup>st</sup> to 5<sup>th</sup> year with definitive requirement of reoperation.<sup>[7]</sup> CABG alone can improve QOL much after 12 months, but there is still the necessity of multidisciplinary rehabilitation which focuses

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on emotional support, information about progression, patient education and peer education.<sup>[8]</sup> Secondary preventions such as risk factor management and initiation of rehabilitation are essential components for postoperative CABG patients to optimize graft patency and to achieve the highest level of physical health and QOL.<sup>[9]</sup> There is a lot of importance for cardiac rehabilitation at the national and international level to reduce rehospitalization.<sup>[10]</sup> A well structured, multicomponent cardiac rehabilitation is associated with reduced mortality after CABG and in order to achieve high quality evidence, minimum standards for planning, performing and presenting of controlled cohort studies are warranted.<sup>[11]</sup>

In CABG research, QOL is an important outcome to be measured, which should at least have components such as, physical status, mental function, social interaction and disease-specific measure.<sup>[12]</sup> It is important to assess physical, psychological and social variables as well to adjust life after CABG.<sup>[13]</sup> A review study proved CABG is better than percutaneous coronary intervention (PCI) after 1 year of surgery in terms of QOL checked with many instruments.<sup>[14]</sup> QOL instrument selection is an important factor to be considered in rehabilitation programs to draw conclusions. Furthermore, randomized control trial (RCT) and pre-post designs are very much required to support researched techniques for CABG.<sup>[15]</sup> This suggests the necessity of providing mobile tele-monitoring guided cardiac rehabilitation because of the comfort zone and cost-effectiveness.<sup>[16]</sup> Home-based intervention programs improve health related QOL after CABG nonsignificantly compared with normal participants.<sup>[17]</sup> According to the “Constitution of WHO,” health is “a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.”<sup>[18]</sup> The integrative approach of *Yoga* has similarities with the constitution of the World Health Organization (WHO) regarding health. *Yoga* has proven to be beneficial for hypertension, diabetes mellitus, dyslipidemia, high cholesterol levels, which are risk factors of cardiac diseases.<sup>[19]</sup> *Yoga* is a mind–body practice that reduces anxiety, depression and blood pressure and also improves physical fitness as part of QOL.<sup>[20]</sup> Hence, as there is a chance to develop the disease with these risk factors in the future, so there is need to prove the effect of *Yoga* on CABG patients.

## Methodology

The literary research was done in three steps;

- Step 1: Sources of Literary Research for understanding the concepts of CAD according to Indian scriptures
  1. *Charaka Samhita*: Written approximately 3000 BC, by *Acharya Charaka*, is the first and among the most famous texts of Ayurveda classics.
  2. *Madhava Nidana*: Diagnostic part of diseases in Ayurveda.
  3. *Sushruta Samhita*: This is another famous Ayurvedic text that deals with the surgical procedures and its complications.
  4. *Yoga Vashishtha*: *Yogic* concept of manifestation of disease.

5. *Bhagavad Gita*: Concept of manifestation of disease and the role of mind in disease.
6. *Patanjali Yoga Sutra*: Concept of mind and conflicts of personality. It provides the basis for most of the *Yoga* techniques used in the study.

- Step-2: Literary research presentation
  1. Selected verses related to CAD from above mentioned texts one by one.
  2. Verses were written in *Devanagari* script first, transliteration and translation was done later on. Further explanation wherever necessary has been given.
  3. A summary of the same is presented with conclusions.
  4. An Ayurveda/*Yoga* model of the origin and progress of CAD is presented.
- Step-3: Key verses in classical texts.

As per Ayurveda in the cases of individuals with habitual intake of unwholesome food and with their mind covered with *Rajas* and *Tamas*, *Dosha* gets vitiated jointly or severely and then they obstruct or vitiates different channels resulting in the manifestation of diseases such as intoxication, fainting and syncope. As per *Yoga Vashishtha*, diseases arise from the deep seated thoughts in the mind that is called as *Adi* and also mentioned in *Bhagavad Gita* (*Shloka* 2.62, 2.63) when a human being dwells on the objects of sense, it creates an attraction for them. Attraction develops into desire and desire breeds anger. Anger induces delusion. Delusion leads to loss of memory; through loss of memory, reason is shattered; and loss of reason leads to destruction.

## Physical Health

Exercise-based cardiac rehabilitation improves the cardiac parameters after PCI<sup>[21]</sup> and other similar changes can be expected after CABG. Strength training increases left ventricular (LV) size and early diastolic function, whereas endurance training increases the thickness and segmentation of late LV diastolic function in male athletics.<sup>[22]</sup> Low-intensity exercises involve large muscles and allow cardiovascular adaptation and myocardial perfusion.<sup>[23]</sup> Rehabilitation with exercise and education classes improves walking distance, gait speed and attendance preoperatively and 3 months after CABG according to a pilot randomized control trial (RCT).<sup>[24]</sup>

As per a systematic review, telemonitoring and telehealth recovery focused intervention play an important role in physical aspects of CABG patients.<sup>[25]</sup> The ischemic LV dysfunction and poor exercise capacity are risk factors of increased mortality rates 5 years after CABG.<sup>[26]</sup> Exercise training improves exercise capacity associated with restoration of peripheral oxygen utilization after CABG.<sup>[27]</sup> Cardiac rehabilitation initiated in a home environment may more likely sustain physical and psychosocial changes than institution based programs over 1 year after CABG.<sup>[28]</sup> Lifestyle intervention composed of low-cholesterol and low fat diet, moderate exercise and stress management could (1) increase the exercise capacity

from 9.59 Metabolic Equivalents (METS) to 11.03 METS and (2) reduced the weight from 187.3 pounds to 178 pounds (baseline to 3 years) to avoid revascularization.<sup>[29]</sup> Faulty lifestyle leads to heart disease called *Hridroga*.<sup>[30]</sup> *Yoga*-based cardiac rehabilitation improves ejection fraction and lipid profile after 1 year of CABG.<sup>[31]</sup> CABG surgery, physiotherapy rehabilitation after CABG and *Yoga* rehabilitation after CABG serve physical and mental health best at 1 year.<sup>[31]</sup> *Yoga* techniques meets the requirements of the constitution of WHO<sup>[32]</sup> because it has many benefits such as increasing muscular strength and flexibility; promoting improvements in respiratory and cardiovascular function; promoting recovery from addiction; reducing stress, anxiety, depression, and chronic pain; improving sleep patterns and enhancing overall well-being and QOL.<sup>[33]</sup>

## Psychological Health

Type-D personality of CAD patients gave evidence that the physiological hyper-reactivity and activation of pro-inflammatory cytokines may be responsible for detrimental effects on cardiac prognosis.<sup>[5]</sup> As per a systematic review with meta-analysis, variables like psychological (stressful life events, emotional distress and personality) factors should be examined to predict the progression of disease and QOL after CABG.<sup>[34]</sup> Depression and anxiety are cardiac risk factors are less but continue to be sustained even after 7 days,<sup>[35]</sup> 10 days<sup>[36]</sup> and after 5 years<sup>[37]</sup> of CABG. Psychosomatic symptoms, especially anxiety, may be associated with irregularity in circadian rhythm, which can be altered by basic lifestyle habits in healthy volunteers.<sup>[38]</sup> Hence, cognitive behavior therapy or supportive stress management therapy is effective in treating depression after 3 months of CABG.<sup>[39]</sup>

As per a systematic review, telemonitoring and telehealth recovery-focused intervention also play important role in psychological aspects of CABG patients.<sup>[25]</sup> *Yoga* based cardiac rehabilitation can improve the positive effect, skills of managing anxiety and depression than physiotherapy based rehabilitation alone after 1 year of CABG.<sup>[31]</sup> With all this research, surgery and rehabilitation are beneficial for CABG patients. But specific practices, like Iyengar *Yoga*, reduce cardiac reactivity with intentional stress, which is the risk factor for cardiac disease and improve QOL.<sup>[40]</sup>

Social-emotional, self-care, visualization and deep breathing can improve QOL by developing self healing insights into life-threatening diseases like cancer.<sup>[41]</sup> *Yoga*, as an ancient system of medicine, has specific techniques called meditation which increases the membrane potential of neurons and other body cells and reduce the activity of amygdala and cortical areas.<sup>[42]</sup>

As per a systematic review and meta-analysis, the mind-body techniques such as mindfulness based stress reduction, transcendental meditation, progressive muscle relaxation, and stress management will improve the different domains of QOL in cardiac diseases.<sup>[43]</sup> The aerobic and resistance physical

training effectively improve cardiac response to stressful situations of daily life and also preoperative cardiac disease.<sup>[20]</sup>

Even though there are positive results with meditation techniques for different diseases by modulating the cortisol levels before CABG,<sup>[44]</sup> the postoperative condition has yet to be addressed. Hence, psychological health is well served by surgery and rehabilitation treatments when combined with counseling sessions and meditation techniques of *Yoga*.<sup>[31]</sup> Nontraditional cardiac rehabilitation can be considered as a secondary preventive meditation where the involvement of meditation or mind during physical movements reduces depression of CAD patients.<sup>[45]</sup>

## Social Health

Socioeconomic factors such as age, education level and low income usually reduce QOL. Those who return early to work for compensating economic situation could improve QOL better than those who do not return to work.<sup>[46]</sup> If health-promoting programs start at the inpatient phase, then follow-up with the help of family members can reduce the risk factors of CAD after CABG.<sup>[47]</sup> Cardiac rehabilitation can improve social functioning through return to work after 1 year of CABG.<sup>[48]</sup> Team activities such as play, sports and quizzes are all part of the personal interaction which makes or changes behaviors and improves coping skills. Such programs are well developed in surgery teams and rehabilitation teams as an option, but not concerned to do it as a team.

*Yoga* treatments have *Kriya Yoga* for any age by team in a particular way along with *Asana*, *Pranayama* and meditation techniques. Hence, social health may be better served by *Yoga* rehabilitation than other streams. Modification of rehabilitation as a cost-effective treatment for those who cannot really afford to go to the center must be developed to improve QOL of CAD<sup>[33]</sup> and CABG patients.<sup>[31]</sup>

The true knower realizes that they can never fully know infinity, whereas the ignorant thinks he knows everything.<sup>[19]</sup> Hence, proper lifestyle modifications by the patient and social support will improve QOL after CABG.<sup>[49]</sup>

## Environmental Health

As per a systematic review with meta-analysis, variables like environmental or behavioral (adherence to medication, management of diabetes, obesity and alcohol use) factors should be examined to predict the progression of disease and QOL after CABG.<sup>[34]</sup> The return to work duration is more after CABG make the person to think and may reduce QOL. Hence the rehabilitation program should reach the rural areas to prevent dropping of QOL after CABG.<sup>[50]</sup> The ability to work after CABG is little longer than other surgeries.<sup>[51]</sup> Elderly people could reduce the rate of fall with regular exercises mostly at home environments after 1 year of time shows the role of comfort zone for health status.<sup>[33]</sup> It was also proved with review that home-based cardiac rehabilitation

improves exercise capacity better than center-based cardiac rehabilitation.<sup>[52]</sup> A systematic review revealed that the alternative models of cardiac rehabilitation, like telephonic communication can reduce risk factors of CAD.<sup>[16]</sup>

The *Pranayama* practices of *Yoga* are meant to modulate breath capacity and increase the expected lifespan by increasing oxygen consumption<sup>[2]</sup> and help in reduction of stress through parasympathetic dominance.<sup>[53]</sup> If the individual is able to withstand such health challenges, then they are said to have good environmental health. Firm holding on sense organs is *Yoga* and it literally means to unite the lower self with the higher self; the worshiper with God.<sup>[19]</sup> Travelling or short migrations in routine life put the health into challenging situations to cope up with the environmental changes such as climate, temperature, food, water and different cultures.<sup>[54]</sup> Hence, this part of the WHO's requirement may be served by *Yoga* rehabilitation.

As the advancement in analysis of world wars, the scientists brought the concept of health as per cultural activities termed as spiritual health.<sup>[55]</sup> Hence, there is a need for techniques which can concentrate on spiritual health also. Cultural methods as intervention can reduce anxiety levels.<sup>[56]</sup> Faith is an independent and complex factor, influence the end life decision making ability which needs much medical attention for CABG patients.<sup>[57]</sup> Hence, if a treatment has practical applications in the form of cultural, devotional or spiritual programs, health can be maintained and uplifted from within. Such programs are not seen in surgery teams and rehabilitation teams, but it can be seen in *Yoga* teams in terms of *Bhajans* and sacred *Mantra* chanting. Hence, the WHO's requirement for spiritual health may be served by *Yoga* treatments. The individual decision and conduct of life is the main concern for preventing any disease progression. Cardiac disease processes can be reversed by lifestyle modifications<sup>[29,58]</sup> and combining *Yoga* into standard rehabilitation programs.<sup>[50,59,60]</sup> QOL is the measurement of the same lifestyle and can be changed if the person attempts to change.<sup>[61]</sup> This is the similarity between modern and ancient concepts of wisdom.<sup>[62]</sup> Similarities should be identified for integrating health systems and to serve society and the nation as per the requirements of the WHO constitution.

## Conclusion

QOL is comprised of different concepts of life. Treatment strategies are made as per this requirement, then disease progression can be reduced or stopped. More feasible, less economical and time-saving treatments can serve postoperative CABG patients better. Hence, integrating concepts of surgery, physiotherapy rehabilitation, *Yoga*, *Ayurveda* and knowledge of ancient texts can improve the QOL of CABG patients.

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## Conflicts of interest

There are no conflicts of interest.

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