

AUTOMATED PICTOGRAPH ENHANCEMENT OF DISCHARGE INSTRUCTIONS:
IMPACT ON RECALL AND SATISFACTION

by

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ABSTRACT

Hospital discharge instructions are critical for a patient's posthospitalization recovery. When patients are discharged to home they frequently have to manage wound/incision care, change dressings, take medications, modify activities, follow specialized diets and recognize signs or symptoms that require medical attention. Unfortunately, conditions of hospitalization, effects of illness on cognition, and low health literacy impact a patient's ability to understand discharge instructions.

Two studies were completed for this dissertation research. The first was conducted to understand how discharge instructions are created and used by healthcare professionals and by patients. Semistructured interviews were conducted with 5 nurses and 5 doctors who work at the University of Utah Hospital Cardiovascular Medical Unit and 5 patients recently hospitalized on this unit. Coded interview segments were analyzed to reveal themes, which converged with discharge instruction literature, that were then developed as strategies to improve discharge instructions. Strategies included the modification of content through text simplification to improve patient comprehension, the enhancement of readability with logical formatting, the use of discharge instructions to provide consistent information to the patient and the inclusion of pictures or illustrations.

The second study was a randomized controlled trial with aims to evaluate the effect of standard versus pictograph-enhanced discharge instructions on immediate and delayed patient recall of the content of and patient satisfaction with their discharge

instructions. Participants were randomly assigned to receive standard ($n = 71$) or pictograph-enhanced ($n = 73$) discharge instructions and were asked to recall the content of their instructions at discharge and 1 week post discharge. Patients who received pictograph-enhanced discharge instructions recalled more of their instructions at discharge than those who received standard discharge instructions, ($t(142) = -3.1, p < .01$), and were also more satisfied with the ease of understanding discharge instructions one week after hospital discharge than those who received standard discharge instructions ($z(142) = -2.4, p = .016$).

A multifaceted, comprehensive approach is essential to assist patients through the transition from hospital to self-care. The results of these studies, to improve discharge instruction creation and enhance their understandability, provide interventions that can serve an important role in such an approach.

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CHAPTER 1

INTRODUCTION

The responsibility for the majority of care after hospital discharge is relegated to the patient and their family. Therefore it is essential for them to understand the critical information that is presented during the hospital discharge process in order to be able to negotiate the risky period of recovery and potentially prevent adverse events and readmission (Chugh, Williams, Grigsby, & Coleman, 2009). In order to improve the recovery process, patients and their caregivers need to understand activity restrictions, dietary guidelines, medication management, wound care, follow-up instructions, signs and symptoms of potential problems, and emergency contact information (Jacott, 2007). Several factors are barriers to a patient's ability to comprehend and perform activities included in hospital instructions such as a large quantity of information exchanged in a short period of time, the influence of acute and/or chronic illness on a patient's ability to listen and comprehend, side effects of medications and poor sleep quality while hospitalized that effects cognition and memory, low health literacy and unrecognized cognitive impairment (Chugh et al., 2009). Additionally, the training that healthcare professionals obtain in the creation and communication of discharge instructions is typically quite limited (Chugh et al., 2009).

Hospital discharge is a vulnerable time for patients as increased clinical acuity of patients and shorter inpatient hospitalization stays create more complicated postdischarge self-care activities which results in an associated increase of the complexity of postdischarge instructions (Chugh et al., 2009; DeFrances & Hall, 2007). The Agency for Healthcare Research and Quality (AHRQ) reports statistics that describe the scope of this problem. According to the AHRQ, within 3 weeks of hospital discharge, 20% of patients experience adverse events and 20% of Medicare patients are readmitted to the hospital within 30 days of their discharge (Agency for Healthcare Research Quality, 2012). Preventable adverse events accounted for 17% of readmissions (Agency for Healthcare Research Quality, 2012). CMS has defined readmission as a return to the hospital within 30 days, and per the Patient Protection and Affordable Care Act, has instituted the Readmission Reduction Program that financially penalizes hospitals with high rates of readmission for congestive heart failure, heart attack and pneumonia ("Preventing Hospital Readmissions: The First Test Case for Continuity of Care," 2012; "Readmissions Reduction Program," 2013). A recent report funded by the Robert Wood Johnson Foundation revealed that an important factor in avoidable readmissions is that patients do not understand their discharge instructions and are therefore unable to follow them ("The Revolving Door: A report on U.S. hospital readmissions," 2013). One strategy to improve attention, comprehension, recall and adherence to discharge instructions is to add pictures (Houts, Doak, Doak, & Loscalzo, 2006).

Literature on illustrations for health education materials includes cartoon, stick figure and shaded drawings, and black and white as well as color photographs (Houts et al., 2006). Authors of these studies suggest that simple cartoon drawings are most

effective in facilitating comprehension (Houts et al., 2006). According The Free Dictionary (n.d.), a pictograph is, “In all senses a pictogram. 1. A picture representing a word or idea; a hieroglyph.” Pictures increase the effectiveness of health communication, particularly in people with low literacy skills by increasing the recall and understanding of and adherence to health information (Houts et al., 2006). Additionally, pictures can improve patient satisfaction with hospital discharge instructions (Mohan, Riley, Boyington, & Kripalani, 2012). There is currently no standard pictograph language for patient communication or automated systems to enhance text with pictographs and limited research on strategies to systematically develop and evaluate pictographs for health communication (Zeng-Treitler, 2009b).

Two studies were conducted for this dissertation research. The research goal of the first study was to understand the experience of doctors, nurses and patients with hospital discharge instructions. The research goals of the second study were to 1) improve patient recall rates of discharge instructions through inclusion of automated pictographs in discharge instructions and 2) improve patient satisfaction with the understandability and content of discharge instructions by automated enhancement of discharge instructions with pictographs.

Objectives and Specific Aims

This research seeks to further our understanding of hospital discharge instructions. The specific aim of the first study was to conduct thematic and content analysis of semistructured interviews of doctors, nurses and patients to reveal strategies to improve hospital discharge instructions. Data for the study were collected during

semistructured interviews of five doctors, five nurses and five patients who worked or were patients of the University of Utah Hospital CVMU.

The second study had two aims. Aim 1 was to compare standard versus pictograph-enhanced discharge instructions on immediate and delayed patient recall. The hypothesis was that patients who receive pictograph-enhanced discharge instructions would recall more of their discharge instructions than patients who receive standard discharge instructions. Immediate and delayed free recall of discharge instructions were examined. The second aim was to compare standard versus pictograph-enhanced discharge instructions on patient satisfaction with discharge instructions. The hypothesis was that patients who receive pictograph-enhanced discharge instructions will report higher satisfaction with their discharge instructions than those who receive standard discharge instructions. Immediate and delayed satisfaction scores were examined. The data for this study were collected from patients in the CVMU of the University of Utah hospital.

Theoretical Framework

Dual Coding Theory (DCT), developed by Allan Paivio at the University of Western Ontario in 1971, postulates that the mind operates by processing two forms of mental representation, verbal representations (logogen for word generator) and ‘imaginal’ representations (imagen for image generator), and that learning is aided when mental images are formed (Paivio, 1971, 1991a; Thomas, 2013). These two mental representations function in memory as distinct and functionally independent, though interacting, systems called verbal memory and image memory (Thomas, 2013). The additive effects of the brain’s use of two independent systems to both process and store

information facilitates information retrieval and improves recall for image memory (Paivio & Csapo, 1973; Thompson & Paivio, 1994). The DCT has been considered to be one of the most influential theories on cognition in the 20th century and is credited for inspiring both a resurgence in interest as well as controversy and research on imagery (Thomas, 2013). The DCT has also persevered over both conceptual criticism and experimental refutations (Thomas, 2013). The theory has since been expanded to include various cognitive processes to include reading, comprehension and response (Sadoski & Paivio, 2000).

The DCT has been used to explain a phenomenon called the Picture Superiority Effect (PSE) in which memories for pictures are superior to corresponding words as visual images are stored in two functionally different locations in the brain, but text is stored in only one location (Paivio, 1991a, 1991b; Paivio & Csapo, 1973; Paivio, Rogers, & Smythe, 1968; Stenberg, 2006). Paivio proposes that the mechanism for this effect is twofold: a) that pictures are processed and stored both verbally and 'imaginally' but text is stored only verbally; and b) images are an inherently superior memory code (Paivio & Csapo, 1973; Paivio et al., 1968). The specific locations in the brain are not identified, but neurological EEG research in the 1980s identified the left hemisphere as dominant in sequential processing, such as speech, and the posterior regions of both hemispheres are associated with synchronous processing, such as images, which Paivio cited as evidence for the DCT (Paivio, 1986). One example of the PSE is when you recognize an acquaintance's face, but cannot remember their name (Stenberg, 2006) or the use of flashcards to learn new information (Khan et al., n.d.). The PSE was demonstrated in a study in which Paivio's study participants examined pictures, and both concrete and

abstract words. On a free recall test, pictures were better recalled than either word type (Paivio & Csapo, 1973)

Paivio explained the PSE through the *additivity hypothesis*, which posits that there is a potentiating effect on recall when imagery supplements a verbal processing baseline (Paivio, 1991a; Paivio et al., 1968). In further research, Paivio found that the contribution of the image (or pictorial) code surpassed the verbal code by a 2:1 ratio (Paivio, 1991a). The verbal and ‘imaginal’ memory systems are independent and additive in their effects on free recall meaning that text paired with images is additive and results in superior recall rates than text alone (Madigan, 1983; Paivio, 1991a, 1991b; Stenberg, 2006).

The DCT and PSE are utilized in this study in two ways. The DCT and the PSE theoretical framework posit that incorporating visual images or pictographs paired with text in discharge instructions will increase patient’s memory of discharge instructions. The second way the DCT and the PSE will be utilized will be the use of free recall as a measure for memory of patient discharge instructions as the DCT posits that there is an additive effect on recall when imagery supplements verbal processing. The first category of the Cognitive domain of Bloom’s Taxonomy, Remembering, dovetails with the use of recall its behavioral component is *the learner is able to recall, restate and remember learned information* (Anderson, 2000).

Previous Pictograph-enhanced Discharge Instruction Research

Qing Zeng’s lab at the University of Utah Department of Biomedical Informatics has been conducting research to support this proposed study. Relevant studies that are currently in data analysis include testing recall of pictograph-enhanced versus text only discharge instructions; testing our pictographic lexicon for study participant recognition

and comprehension; and an interview study in which 5 each of nurses, doctors and recently discharged patients were interviewed about their experience with discharge instructions. The team has also developed a system, Glyph, that contains the pictograph library and each pictographs associated terminology, for medical concepts and medications, in a database (Bui, Nakamura, Bray, & Zeng-Treitler, 2012). The Glyph system preprocesses free text, annotates a set of concept extraction modules that locate and annotate text strings, composes images from grammar patterns, and then renders images, generated by the rule engine, for the corresponding text (Bui et al., 2012). Studies and projects that have contributed to the development of this proposal are summarized as follows.

Glyph System

The Glyph system is an automated illustration system that can be used by healthcare providers to supplement text with illustrations. It entails five processing stages: preprocessing, annotation, postprocessing, image composition and image rendering. Pictographs were created by study team graphic designers and from information downloaded from the DailyMed that provides images based on the description of the medication brand name, generic name, ingredients, strength, routes, forms, shapes, colors, sizes and imprints. Iterative testing was conducted on a sample of 49 instructions that Glyph illustrated. The study team rated 66% of the instructions as illustrated correctly (Bui et al., 2012). The study team continues to refine Glyph rules and conduct more in-depth testing.

Improving Discharge Instructions Through Automated
Pictograph Enhancement: Recall and Comprehension

The hypothesis of this study is that recall/comprehension rates of discharge instructions will be higher for pictograph-enhanced instructions versus instructions without pictograph enhancement. The goals were to 1) improve the recall and subsequent adherence rates to discharge instructions through inclusion of automated pictographs in discharge instructions and 2) improve the comprehension of discharge instructions through use of a proxy measure, recognition, by automated enhancement of discharge instructions with pictographs.

Recall study participants were recruited outside the University of Utah Hospital Cafeteria. People who work in a clinical position involving discharge instructions were excluded from study participation. Eighty-four subjects completed the study. Study participants were given 10 cardiology discharge instructions that were divided equally between pictograph-enhanced instructions and text only discharge instructions. Pictograph-enhanced instructions were randomly selected from a band of 70 instructions; each instruction and the order of instructions were randomized as well. Participants were given up to 10 minutes to review the instructions. They were then asked to complete a demographic survey as a distraction technique. They were then asked to take up to 10 minutes and write down the instructions they had read and examined. Glyph illustrated discharge instructions improved recall over text based discharge instructions.

Improving Discharge Instructions Through Automated
Pictograph Enhancement: Recognition

The research question of this study was how well do people recognize the concept behind pictographs designed to enhance discharge instructions? The objective was to evaluate how well a diverse sample of study participants recognizes pictographs designed to enhance discharge instructions.

Recognition study participants were recruited outside the University of Utah Hospital Cafeteria and from the hospital housekeeping staff. People who work in a clinical position involving discharge instructions were excluded from the study. One hundred-fifty subjects completed the study. Discharge instructions were collected from the University of Utah Cardiovascular Medical Unit (CVMU), 2000, and from the Internet, 662, each containing 50-100 distinct instructions. Eight hundred and fifty distinct instructions were extracted for illustration. Four hundred and eighty-eight pictographs out of our bank of 800, developed by graphic designers on the study team, were used to illustrate the instructions.

Questionnaires contained the illustrated discharge instructions with a blank for the concept that was illustrated. Appendix A provides examples of high and low scoring questions. Thirty-one percent, or 153 of the 488 pictographs, were rated as low identification accuracy. Of those, 84 were determined eligible for redesign after analyzing participant responses and the instruction with which it was paired. Redesign was accomplished by examining participant responses and analyzing high identification accuracy pictographs for elements that could be incorporated into low identification accuracy pictographs.

Improving Discharge Instructions

This research seeks to reveal strategies and field-test a system designed to illustrate discharge instructions in order to improve discharge instructions. There are other strategies, while not the focus of this research, that should be considered in order to improve discharge instructions. One important strategy is the use of Federal Plain Language Guidelines which state that readers should be able to, “find what they need, understand what they find; and use what they find to meet their needs (National Cancer Institute, 2010).” The National Institutes of Health, The Agency for Healthcare Research Quality, and the Centers for Disease Control advocate for the use of plain language in communication (National Institutes of Health, 2013; National Cancer Institute, 2010). Additionally, the manner in which discharge instructions are provided to patients is evolving with increasing utilization of personal health records and technology. This transition period in healthcare that is fueled in part by healthcare informatics provides an opportunity to explore and examine new ways in which to improve the delivery and receipt of healthcare. This research seeks to contribute to that effort.

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CHAPTER 2

LITERATURE REVIEW

Effectiveness of Discharge Instructions

The Centers for Medicare & Medicaid Services and the Joint Commission provide standards for the hospital discharge process which state that patients, and as appropriate their family, must be provided with discharge instructions that are complete and understandable (International, 2012). Additionally, provision of discharge instructions is a mandatory requirement as part of the accreditation process of hospitals (International, 2012). Discharge instructions are usually divided into sections that provide important information regarding the patients care after discharge and typically include activity restrictions and recommendations, diet, medications, plans for physician follow-up, wound care if applicable, signs and symptoms to be vigilant for, and the name and telephone number of a physician to contact should the patient require clarification or additional information following hospital discharge (Jacott, 2007). Discharge instructions and discharge teaching are typically conducted by a nurse who collects discharge information from doctors, pharmacists, dieticians and other pertinent resources and compiles it into a written or printed format. The nurse reviews the information for accuracy, and then explains written instructions to the patient or their family/caregiver. However, research has demonstrated that it is not unusual, and indeed common, for patients to experience problems comprehending or recalling the information that has been

prepared for and explained to them in their discharge instructions (Engel et al., 2012; "The Revolving Door: A report on U.S. hospital readmissions," 2013). This lack of patient comprehension of discharge instructions reduces patient satisfaction, compliance and post hospitalization health outcome quality (Clarke et al., 2005; Ginde, Weiner, Pallin, & Camargo, 2008; Watt, Wertzler, & Brannan, 2005).

A patient's comprehension of discharge instructions is crucial in order for the patient to implement postdischarge care regimens that are critical for recovery (Chugh et al., 2009). Unfortunately, the scope of the problem of the lack of understanding discharge instructions is daunting as exemplified by a recent study in which 80% of patients discharged from an emergency department showed deficits in understanding home care instructions and 79% of patients showed deficits in understanding return/follow-up instructions (Engel et al., 2012). There is a business case for the improvement of a patient's comprehension of discharge instructions; the cost of poor patient comprehension of discharge instructions is expensive hospital readmissions (Chugh et al., 2009; "The Revolving Door: A report on U.S. hospital readmissions," 2013).

When seeking to understand the causes of poor patient comprehension of discharge instructions it is important to examine the experience of the hospitalized patient. Many barriers to the hospitalized patients' ability to understand discharge instructions are difficult to ameliorate, such as effects of medications, poor sleep quality while in the hospital, and the effects of the patient's illness (Chugh et al., 2009). However, barriers associated with patient education such as increased complexity of discharge instructions and low health literacy of the patient (Chugh et al., 2009) can be addressed in the creation or modification of discharge instructions. An intervention

proposed to simplify content of discharge instructions and make them more comprehensible, especially to people with low health literacy, is to include pictures (Boodman, 2011; Chugh et al., 2009; Houts et al., 2006).

Health Literacy and Comprehension of Discharge Instructions

Health literacy and readability are the two major factors in understanding discharge instructions that consequently impact adherence (Chugh et al., 2009; McCray, 2005; Rudd, Kaphingst, Colton, Gregoire, & Hyde, 2004; Williams, Davis, Parker, & Weiss, 2002). There is often a mismatch between a patient's health literacy level and the readability of health texts, such as discharge instructions, that are provided to patients who are expected to comprehend and then adhere to instructions and concepts in the health material (McCray, 2005). The U.S. Department of Health and Human Services (DHHS) defines health literacy as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions." (United States Department of Health and Human Services, 2000). A patient's health literacy level, and the readability of health information, impacts the person's ability to understand drug labels, healthcare providers verbal instructions and to read and interpret discharge instructions (Chugh et al., 2009; Kadakia et al., 2013).

The Institute of Medicine (IOM) reports that inadequate or poor health literacy is a threat to health outcomes because those who have difficulty comprehending or following health information have higher rates of costly and unnecessary complications, readmission, hospitalization, use of emergency services and death (Boodman, 2011; Institute of Medicine, 2004). It is estimated that up to half of all Americans have poor health literacy. This pervasive lack of comprehension of important health information is

estimated to result in avoidable health costs of approximately \$238 billion annually (Boodman, 2011; Institute of Medicine, 2004). Older adults with low health literacy have a particularly difficult time accurately following discharge instructions when they return home (Choi, 2013a). Even well educated individuals with higher level literacy skills encounter health information they cannot understand such as medical procedure instructions, especially if they are experiencing stress or are sick (Institute of Medicine, 2004). Two strategies that have been shown to improve the readability of discharge instructions for individuals with low health literacy are the addition of pictographs and text simplification (Delp & Jones, 1996; Jolly, Scott, & Sanford, 1995).

Readability is the ease of the reader's ability to read and understand text (Zakaluk, 1988). Two practices have been proposed that seek to assist those with low health literacy receive health texts that they can understand: 1) matching the health literacy level of readers to the readability level of content; (Zakaluk, 1988) or 2) providing easy to read content to all readers (Chugh et al., 2009; McCray, 2005), both of which require the development or modification of existing discharge instructions. Matching health literacy levels to the level of patients requires that patient's health literacy level be determined through the use of a screening instrument. However, the use of screening instruments for health literacy are rare, except when used in research, as patients often experience shame and alienation when their low health literacy is revealed (Chugh et al., 2009). A patient who feels shame for their low health literacy is less likely to ask additional questions about their discharge instructions and care requirements (Katz, Kripalani, & Weiss, 2006).

Low-literacy patients read by focusing on understanding words rather than concepts, which limits their understanding of easy-to-read instructions (Choi, 2011). Text

simplification as a strategy to create easy-to-read instructions improves understanding for those who already read well, but only improves understanding marginally for poor readers (Houts et al., 2006). Adding to the burden of low health literacy is the language healthcare workers use when communicating with patients about their diagnosis, treatment, medications and home care (Boodman, 2011). The high literacy environment of healthcare delivery can be challenging for patients regardless of their health literacy (Lerner, Jehle, Janicke, & Moscati, 2000; The Joint Commission, 2007). Even when healthcare text is simplified for readability, patients may not be familiar with concepts that are necessary to understand information (McCray, 2005). For example, when a patient is told they need to be on a cardiac diet, meaning avoiding foods bad for the heart and eating foods good for the heart, they often understand the word diet as meaning to lose weight, or exercise as being solely gym-based instead of including activities such as walking or gardening (Boodman, 2011). When patients receive health information that they do not understand, they may feel intimidated, and often, patients with low health literacy have developed strategies that conceal the fact they don't understand the materials that have been provided to them (McCray, 2005; The Joint Commission, 2007). An intervention that has been found to improve readability and comprehension of health information is to include illustrations and pictures (Boodman, 2011; Choi, 2012; Chugh et al., 2009; Houts et al., 2006; Jeungok, 2011).

The Use of Pictographs in Healthcare Communication

Improving discharge instructions to be more understandable to the patient at discharge and when they refer back to them for care instructions has the potential to significantly improve adherence and patient satisfaction with the information they receive

to care for themselves when they return home (Chugh et al., 2009; Clarke et al., 2005). A pictograph is the graphical representation of a word, idea, relationship or numerical data and can include images, icons, graphs and symbols (Zeng-Treitler, 2009a). Pictographs are commonly used for signs and instructions as they can transcend language and cultural differences. An example is a defined set of pictographs, by the International Organization for Standardization, for public information such as, “no smoking, first aid, and hospital” (“Graphical Symbols -- Public Information Symbols,” 2007). Pictographs are used widely to represent concepts and make complicated information more effectively presented (Larkin & Simon, 1987).

Pictographs have been successfully used to illustrate health concepts. One example is the Wong-Baker Faces of Pain Scale (“Wong-Baker Faces Foundation,” 1983). Donna Wong, RN PhD, developed the scale in response to her observation that visual aids help patients express their experience who would otherwise have trouble when using numbers, when ranking, or when confronted with unfamiliar words (Mayer & Villaire, 2007). Patients understand risks and benefits of medical interventions better when the statistics are accompanied by a pictograph (Fagerlin, Wang, & Ubel, 2005). The use of pictures with written or spoken text impacts health communication in four ways: 1) by focusing attention to the materials which increases the likelihood that it will be read; 2) by assisting patients in comprehending presented information; 3) by improving recall of the materials; and 4) by increasing adherence to the message of the materials (Houts et al., 2006). A research review of the use of pictures in health education materials found that these benefits were large and that the effectiveness is particularly pronounced for patients with low literacy skills (Houts et al., 2006).

Pictures in medical instructions have also been found to impact behavior. A study that compared picture-enhanced versus text-only asthma inhaler instructions found that those who used picture enhanced instructions correctly performed more procedural steps, were faster and expressed fewer doubts than those with text-only instructions when they performed inhaler chamber instructions that they read (Kools, van de Wiel, Ruiter, & Kok, 2006). A research review on the use of pictures in medication instructions concluded that pictorial aids, when used to enhance either written or oral instructions, improved understanding of how to take medications (Katz et al., 2006).

Research on the use of pictures in medical device, medication instructions and health education materials has established the usefulness of adding pictures to text, but there have been few studies about the inclusion of pictures in discharge instructions (Choi, 2011). The first study to test the use of illustrations in discharge instructions found that patients who received illustrated discharge instructions scored better on comprehension questions about their discharge instructions than patients who received discharge instructions without illustrations (Austin, Matlack, Dunn, Kesler, & Brown, 1995). Another study from the same time period examined the use of cartoon illustrations in emergency department discharge instructions and found that the group that received illustrated instructions were more likely to read them and answer recall questions correctly (Delp & Jones, 1996). A more recent study found that older adults, after hip replacement surgery, perceived that pictograph-enhanced discharge instructions helped them to more fully understand the intended healthcare messages (Choi, 2013b). The body of literature on using pictures in health communication, device and medication instructions and discharge instructions is limited but promising. Houts et al. (2006)

reports that the areas where research about the role of pictures to enhance health communication holds promise include understanding health information, recalling and adhering to health instructions. Additionally, pictographs have been found to be an effective tool to improve written communication with groups that have significant communication difficulties with healthcare providers, such as those with low health literacy in acute healthcare settings and for patients that do not speak English (Choi, 2012; Jeungok, 2011).

One critical limitation is that pictures, illustrations and pictographs in the current body of research were not empirically designed or quantitatively evaluated which can potentially limit their impact and usefulness (Zeng-Treitler, 2009a). To date, one of the main limitations to the widespread implementation of illustrated health information is that there are no experiential studies that compare pictograph-enhanced and text-only instructions conducted in a clinical setting (Choi, 2011; Houts et al., 2006). The goal of this study, in part, is to address these gaps.

The Effect of Pictograph-enhanced Instructions on Recall

In order to adhere to hospital discharge instructions, it is important for a patient to understand and use the information that was explained and provided for their use after they leave the hospital. Because of the critical nature of the information in discharge instructions, patients typically receive a combination of oral and written discharge instructions. Unfortunately, patients only remember between 29-73% of doctors' oral instructions, and as the amounts of information increases, recall rates drop (Houts et al., 2006). In most instances, patients read the written instructions once and then rely on memory to take health actions (Houts et al., 2006). Should a patient have questions about

their home care or other components of their discharge plan, they need to remember what information is in the written document and where it is located within the written document (Houts et al., 2006). Assessing patient recall of their discharge instructions is therefore a first step in measuring their usefulness.

In order to create a structure for the measurement of the effectiveness of discharge instructions for patients, it is important to understand how learning has traditionally been assessed. The hallmark of the categorization and evaluation of learning is Bloom's *Taxonomy of Educational Objectives* (Bloom, 1956). Bloom's *Taxonomy* is divided into six main categories that lie along a continuum that is ordered from simple to complex and concrete to abstract (Armstrong, 2013) in the cognitive domain (Clark, 2013). Taxonomy categories were revised in the mid-nineteen nineties by one of Bloom's former students, Lorin Anderson, to reflect a more accurate and active form of thinking (Anderson, 2000; Clark, 2013). The revised categories of the cognitive domain are arranged hierarchically and are as follows (Anderson, 2000):

1. Remembering (Recalling information): The learner is able to recall, restate and remember learned information
2. Understanding (Explaining ideas or concepts): The learner grasps the meaning of information by interpreting and translating what has been learned.
3. Applying (Using information in another familiar situation): The learner makes use of information in a new situation from the one in which it was learned.

4. Analyzing (Critical thinking- Breaking information into parts to explore understandings and relationships): The learner breaks learned information into its parts to best understand that information in an attempt to identify evidence for a conclusion.
5. Evaluating (Critical thinking- Justifying a decision or course of action): The learner makes decisions based on in-depth reflection, criticism and assessment.
6. Creating (Critical thinking- Generating new ideas, products, or ways of viewing things).

Given that this is the first experimentally designed, clinical study to evaluate the effect of pictures in discharge instructions it is logical to start at the beginning of the hierarchical structure of the revised Bloom's *Taxonomy* as a first step to assess how these instructions are processed cognitively. The second reason is that this study will be conducted on the Cardiovascular Medical Unit with 10 different discharge instruction sets (Appendix B) that also include personalized information: Ablation, Atrial Fibrillation Ablation, Angiogram, ASD_PFO, CAD Stent MI, EP Device, Heart Failure, Minimally Invasive Surgery, Heart Surgery, and TAVR. Given the diversity of discharge instructions that also contain personalized information, it is necessary to be able to assess a common metric.

Recall is generally assessed by using one of two methods: "free recall" or "cued recall" (Houts et al., 2006). To measure free recall, subjects repeat what they have read without the use of any cues or prompts (Houts et al., 2006). To measure cued recall, subjects are presented information with a paired stimulus, such as a picture, that is later

used to prompt the recall of information (Houts et al., 2006). Free recall will be used in this study because the theoretical framework, Dual Coding Theory, posits that images are remembered better than text, which was tested by the theory developers (Paivio & Csapo, 1973; Thompson, & Paivio, 1994).

A recent study that examined patients' recall of discharge instructions after having an acute myocardial infarction found that over 50% of study participants could not name their diagnosis, and few were able to independently name a specific risk factor for their condition or associate it as a contributing cause of their condition (Sanderson, Thompson, Brown, Tucker, & Bittner, 2009). One solution to improve comprehension and recall of patient discharge instructions is to include illustrations of medical concepts and instructions to complement written instructions as illustrations have been shown to improve comprehension and recall of health communications (Delp & Jones, 1996; Houts et al., 1998, 2006; Houts, Witmer, Egeth, Loscalzo, & Zabora, 2001; Jolly et al., 1995; Mayer & Villaire, 2007). Recall of asthma inhaler educational materials enhanced with pictures has been found to be superior to text only instructions (Kools et al., 2006). A pilot study conducted by Qing Zeng, PhD, found that both immediate and delayed recall were higher for pictograph-enhanced verses text only discharge instructions (Zeng-Treitler, Kim, & Hunter, 2008).

Illustrating discharge instructions has also improved instruction recall in several populations. In a population of Haitians with limited health literacy illustrating medication instructions significantly improved recall after cataract surgery (Hickman, White, & White, 2010). Another study evaluated the effect of pictographs in conjunction with oral instructions and found that patients with low literacy skills, some of whom were

experiencing problems as a result of their low literacy, remembered most pictograph meanings for at least 4 weeks (Houts et al., 2001). Pictorial illustrations have been shown to improve recall of sentence content in both younger and older adults (Cherry, Dokey, Reese, & Brigman, 2003).

Patient Satisfaction with Hospital Discharge Instructions

Patient satisfaction scores are often used to identify gaps in care that can compromise patient safety and quality of care (Rodak, 2012). Patient satisfaction with discharge instructions is strongly correlated to satisfaction with their hospital care (Clark et al., 2005; Perez-Carceles, Girona, Osuna, Falcon, & Luna, 2010; Topacoglu et al., 2004). Hospital Care Quality Information from the Consumer Perspective survey reveals that discharge preparation was rated lowest in all aspects of hospital care (Chugh et al., 2009). Patients frequently report that their discharge instructions are of lower quality than their overall hospital care (Jha, Orav, Zheng, & Epstein, 2008). Dissatisfaction with discharge instructions can lower patient perceptions of the hospital care they received (Clark et al., 2005; Jha et al., 2008; Topacoglu et al., 2004). Therefore, it is essential to improve discharge instructions in order to increase satisfaction with overall hospital care consequent to improvement in satisfaction with discharge instructions (Huang et al., 2004). Patients who receive inadequate discharge information become dissatisfied about their care and are uncertain about their postdischarge care management (Huang et al., 2004). Among patients who reported that they were insufficiently prepared for postdischarge self-care activities there is a significant likelihood of admission to the emergency department or readmission to the hospital (Chugh et al., 2009; Coleman, Mahoney, & Parry, 2005; Parry, Mahoney, Chalmers, & Coleman, 2008). The use of

clear, diagnosis specific discharge instructions improves communication between patients and their clinicians, which has been shown to increase patient satisfaction with their hospital care (Huang et al., 2004; Perez-Carceles et al., 2010; Topacoglu et al., 2004).

Qualitative research that examined the hospitalized patient's experience provides guidelines for exploration of the phenomenon of satisfaction (Chenail, 2011). Insight into the patient's experience assists healthcare providers to assess the efficacy of interventions, explain how patients impact interventions, and how patients engage with the intervention (Chenail, 2011). Patient experience research on satisfaction is described by Chenail (2011):

In these investigations, researchers envision participants as customers or consumers and seek to learn how satisfied or dissatisfied they are with their healthcare experiences. A subset of this research involves how patients value the services they receive and how this information helps healthcare systems determine "Return on Investment" (ROI). Learning this information can help professionals evaluate their programs and services and produce improvements and enhancements. (p. 1175)

Patient satisfaction can measure service quality and is a direct outcome of the quality of care received (Clark et al., 2005). Use of the Likert scale allows for the patient to evaluate quality from the perspective of his own needs rather than an externally imposed standard (Clark et al., 2005).

In order to measure patient satisfaction, it is important to examine how it is assessed in the clinical environment. Publications that describe the use of proprietary tools designed to measure satisfaction provide scant information about their tools. However, they do describe their results and what scale was used to collect satisfaction data. The first study reported that patient's satisfaction scores increased when they received diagnosis specific discharge instructions in their care plans (Lo, Stuenkel, &

Rodriguez, 2009). Lo et al. (2009) implemented the proprietary Krames On-Demand electronic diagnosis instructions sheets and did not report specifics about the survey, only that a Likert scale of 1-5 was used, as it was administered by an independent contractor. Another study reported that overall patient satisfaction showed a strong positive relationship to patient's ratings of 'instructions given about how to care for yourself at home' (Clark et al., 2005). Clark et al. (2005) analyzed data from the Press Ganey Inpatient Survey, a research firm that specializes in measurement of healthcare satisfaction, which used a 1-5 Likert scale that covered the patient experience from admission to discharge.

There is a paucity of information about interventions to increase patient satisfaction with discharge instructions. Most research examines factors that contribute to patient satisfaction with their overall emergency department or hospital care. However, one study reported about an intervention that can increase patient satisfaction as well as behavioral aspects of their post hospitalization care. A system to enhance prescription medication instructions using illustrations found that illustrations improved patient satisfaction and understanding of instructions as well as increased self-efficacy to take and self-reported adherence to their prescribed medication regimen (Mohan et al., 2012).

The use of illustrations in discharge instructions is an intervention that can address many facets of the complex process of hospital discharge and the resulting management of posthospitalization care. Illustrations improve comprehension and understandability of discharge instructions in those with low health literacy. They have also been found to increase recall of information included in discharge instructions, which may facilitate adherence to posthospitalization care regimens. Additionally,

illustrations have been found to foster communication between healthcare professionals and patients, which can improve patient satisfaction with their hospital care. Exploration of how discharge instructions are created, taught by healthcare professionals and received and utilized by patients informs how illustrations can be used to improve their usefulness for patients.

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CHAPTER 3

DISCHARGE INSTRUCTION ANALYSIS: SEMISTRUCTURED INTERVIEWS WITH NURSES, DOCTORS, AND PATIENTS

Abstract

Effective discharge instruction is necessary for a patient's posthospitalization care. Five doctors, five nurses and five patients who had recently been discharged from an inpatient stay participated in a recorded, semistructured interview. Interview themes and coded interview segments provided access to a rich source of experience in which strategies to improve discharge instructions emerge. Strategies for improving discharge instructions from interviews converged with strategies identified in the literature to provide a basis for interventions to improve discharge instructions. Some of the most salient common recommendations included improve readability and formatting, provide consistent information and link symptoms and desired behaviors to the patient's diagnosis. Specific recommendations to improve discharge instructions are provided from the process of thematic and explicit analysis of semistructured interviews of those who work with and receive discharge instructions.

Introduction

Discharge instructions are an important and complex form of health communication. They are provided to patients when they leave the hospital as a reference

for posthospitalization instructions to follow when they return home. Discharge instructions have become more complex as patient acuity and a reduction in the length of hospital stays have contributed to a corresponding increase in the complexity of postdischarge self-care activities (Chugh, Williams, Grigsby, & Coleman, 2009; Coleman, Mahoney, & Parry, 2005; DeFrances & Hall, 2007; Erdem, 2014). They are usually divided into sections that provide information important for a patient's care after discharge and typically include activity, diet, medications, plans for physician follow-up, wound care if applicable, signs and symptoms to be vigilant for, and the name and telephone number of a physician to contact should the patient require clarification or additional information following hospital discharge (Jacott, 2007b). Prior research has demonstrated that it is not unusual, and indeed common, for patients to experience problems comprehending or recalling their discharge instructions (Engel et al., 2012; "The Revolving Door: A report on U.S. hospital readmissions," 2013; Sawyer, McBroom, Granger, Bride, & Harper, 2011). Additionally, patients and caregivers can receive discordant recommendations and unclear instructions about the patient's after-care and may even be left out of the discharge planning process (Clark, Duco, Lattimer, & Cheri, 2012). A recent report funded by the Robert Wood Johnson Foundation revealed that an important factor in avoidable readmissions is that patients do not understand their discharge instructions and are therefore unable to follow them ("The Revolving Door: A report on U.S. hospital readmissions," 2013). Therefore, it is imperative for healthcare professionals to improve discharge instructions (Boodman, 2011; Chugh et al., 2009; Engel et al., 2012; Ginde, Weiner, Pallin, & Camargo, 2008;

Institute of Medicine, 2004; "The Revolving Door: A report on U.S. hospital readmissions," 2013).

There have been many efforts to improve health communication, and communication in general. Implementation of electronic discharge instructions was found to improve their completeness, especially in the documentation of major procedures and tests performed (Bell, Takhar, Beloff, Schuur, & Landman, 2013). Several studies have examined the use of illustrations, cartoon figures and pictographs to improve discharge instructions (Austin, Matlack, Dunn, Kesler, & Brown, 1995; Choi, 2013; Chugh et al., 2009; P. A. Clark et al., 2005; Clarke et al., 2005; Delp & Jones, 1996). Another example is the use of plain language in health communication that is advocated by the National Institutes on Health, the Agency for Healthcare Research Quality (AHRQ), and the Centers for Disease Control (National Cancer Institute, 2010; National Institutes of Health, 2013). Plain language guidelines, according the NIH (2013) include, "Organizing information so that most important points come first; breaking complex information into understandable chunks; using simple language and defining technical terms; and, using the active voice (National Cancer Institute, 2010; National Institutes of Health, 2013)." While the general health communication guidelines apply to discharge instructions, in order to identify and select interventions to improve discharge instructions it is important to understand how discharge instructions are created and used by physicians, nurses and patients. The focus of this study is to understand the experience of doctors, nurses and patients conveyed through semistructured interviews to reveal strengths and weaknesses of hospital discharge instructions.

Methods

Sample and Setting

Study participants were recruited from the University of Utah Healthcare System (UUHSC) in Salt Lake City, Utah, an academic healthcare system. University of Utah IRB approval for the study was sought and received. A convenience sample of 5 doctors and 5 nurses who work in the Cardiovascular Medical Unit (CVMU), and 5 patients who had a recent inpatient stay within the past 6 months, were recruited at a follow-up appointment in the UUHSC cardiology outpatient clinic, participated in the study. Informed consent was obtained from each study participant. Patients were required to read, speak and write in English. Study sample characteristics are outlined in Table 3.1.

Data Collection Procedures

All interviews were conducted by 1 interviewer (BDH), by asking a set of predetermined, open-ended questions for the healthcare providers, and a different set of predetermined, open-ended questions for patients, with follow-up questions. Interviews were conducted in one of two conference rooms in the hospital and lasted between 20 and 90 minutes. One nurse interview was excluded and an additional nurse interview was conducted as the study team felt that the interviewer asked some leading follow-up questions.

Table 3.1. Study Participant Demographics (N=15)

Characteristic	Nurses N (%)	Doctors N (%)	Patients N (%)	Total N (%)
Gender				
Male	0 (0)	5 (100)	2 (40)	7 (47)
Female	5 (100)	0 (0)	3 (60)	8 (53)
Age				
21-29	1 (20)	2 (40)	0 (0)	3 (20)
30-39	3 (60)	3 (60)	0 (0)	6 (40)
40-49	0 (0)	0 (0)	1 (20)	1 (7)
50-59	0 (0)	0 (0)	2 (40)	2 (13)
60-69	1 (20)	0 (0)	1 (20)	2 (13)
70-79	0 (0)	0 (0)	1 (20)	1 (7)
Race				
White	5 (100)	2 (40)	5 (100)	12 (80)
Asian	0 (0)	1 (20)	0 (0)	1 (7)
Other	0 (0)	2 (40)	0 (0)	2 (13)
Ethnicity				
Hispanic	1 (7)	2 (40)	0 (0)	3 (20)
Non-	4 (27)	3 (60)	5 (100)	12 (80)
Hispanic Education				
>12th Grade	5 (100)	5 (100)	5 (100)	15 (100)
First Language				
English	5 (100)	2 (40)	5 (100)	12 (80)
Non-English	0 (0)	3 (60)	0 (0)	3 (20)

Semistructured Interview Questions

A team that included a cardiologist, nurses, and informaticians reviewed literature about discharge instructions and created semistructured interview questions through an iterative process until consensus was achieved.

Healthcare Providers Questions

- What are your three top problems with creating or personalizing discharge instructions?
- What has been your experience with explaining discharge instructions to patients?
- What do patients find confusing or difficult to understand about discharge instructions?
 - The participant is given a copy of deidentified discharge instructions:
- What do you think works well with discharge instructions?
- What do you think can be improved with discharge instructions?
- What would you like to tell us about your experience with discharge instructions?
- Is there anything else you would like to share with us about discharge instructions?

Patient Questions

- After you were recently discharged from the hospital, did you or someone involved in your care read and review your discharge instructions when you got home?
 - If no, why not?
 - If yes, did you find anything confusing or difficult to understand?

- What do you think works well with discharge instructions?
- What do you think can be improved with discharge instructions?
 - The participant is given a copy of deidentified discharge instructions:
- What do you think is positive about the discharge instructions?
- What, if anything, do you think should be improved?
- What would you like to tell us about your experience with discharge instructions?
- Is there anything else you would like to share with us about discharge instructions?

Data Coding and Analysis

Study participant interviews were transcribed verbatim and uploaded into Dedoose, a content analysis tool ("Dedoose Version 4.5," 2013). Three study team members created and refined codes by reading all of the interviews and presenting code suggestions to the group in an iterative process to reach agreement. When the codes were agreed upon by the coding team, each of the three team members coded the same nurse and patient interview independently and continued to refine the codes and coding strategy until a Kappa of .86 and .91 interrater reliability between the study lead and the two team members was achieved. Eight themes emerged from this process and are as follows: communicating discharge instructions to patients, healthcare team communication, content, formatting, institutional barriers, pharmaceutical content, template and utility (Table 3.2). The remaining interviews were divided among study team members.

Upon completion of the thematic analysis, excerpts from the top three themes for each group were analyzed by the lead author at an explicit level, which focused on what participants said. These coded segments of the interviews were examined in order to

Table 3.2. Codes and Themes for Interviews

Themes	Communicating Discharge Instructions to Patients	Communication Healthcare Team	Content	Formatting
Codes	Content difficult to explain	Conflicting information	Incomplete information in d/c instructions	Formatting – columns, spacing
	Drawing/illustrating d/c instructions	Health care team breakdown in communication	Incorrect information	Formatting - Font size
	Communicating so patients can understand	Insufficient information exchange	Insufficient content	Formatting arrangement
	Apply context	Accountability/responsibility	Readability	Professional appearance
	Explain with examples	Having correct information from MDs	Using clinical terms	Unclear that papers are d/c instructions
	Extra clarification for difficult or important topics		Redundant information	
	Cross-cultural barriers – language		Need WHY information	
	D/C instructions were sufficiently explained by provider		Seeking more information	
	Received fragmentary information		Pt. request more information	
	Received conflicting information		Nothing confusing per pt.	
	Patient understanding unknown		Lack of content standards	
	Patient disinterest		Too much information	
	Way to aid learning			
	Patient not assimilating information			

Table 3.2: Continued

Themes	Institutional Barriers	Pharmaceutical Content	Template	Utility
Codes	Time constraints	Difficulty understanding how to take meds	Lack of customization	Referred back to instructions at home seeking information
	Resources	Conflicting medication information	Lack of flexibility	Other person helped with d/c instructions
	Materials		Rigid formatting	Good reference
	Training		Checklist format	DC instructions unused
	Lack of access		Consistency of template	
	Unclear process		Placement of information	
	IT - Memory			

draw implications from the interviews that can be used as a basis to improve discharge instructions.

Results

Quantification of the themes for each group interviewed (Table 3.3), nurses, doctors and patients, revealed the three most frequently occurring themes for each group that were discussed most. The most frequently occurring themes for nurses were: 1. Communicating Discharge Instructions to Patients, and a tie, 2. Content, and 2. Template. The most frequently occurring themes for doctors were: 1. Content, 2. Pharmaceutical Content, and 3. Communicating Discharge Instructions to Patients. The most frequently occurring themes for patients were: 1. Content, 2. Utility, and 3. Formatting.

Table 3.3. Code Application and Count for Nurses, Doctors and Patients

	Communicating Discharge Instructions to Patients	Communication Healthcare Team	Content	Formatting	Institutional Barriers	Pharmaceutical Content	Template	Utility
RN	61	42	57	16	42	40	57	25
MD	27	5	30	3	12	28	11	9
Patient	14	3	60	37	2	25	20	49

Nurses

Communicating Discharge Instructions to Patients

Nurses reported that they often had problems communicating discharge instructions to patients (Table 3.4). They stated that it is often difficult to assess a patient's level of understanding and predict what the patient will retain. Nurses reported that they frequently modify discharge instructions by bolding, highlighting, crossing out, drawing or handwriting information on the standardized discharge instruction paperwork in order to clarify instructions or address patient questions about the instructions. They also stated that when the delivered instructions match information provided by the healthcare team during the patient's hospitalization, the reinforcement of information helps the patient retain and understand information. When information given to patients is not consistent, it can create confusion and uncertainty.

Content

Nurses reported that patients frequently had a difficult time trying to incorporate the content of discharge instructions into their daily lives and requested additional information such as recipes that would match their dietary restrictions and recommendations. Conversely, nurses stated that the content of discharge instructions has improved and is also easier to personalize with electronic charting versus paper charting. Additionally, nurses reported that it is difficult to get information for discharge instructions from other providers, such as physicians and pharmacists, during evening hours or weekends. Another issue reported was that when creating new templates or updating existing content it is difficult to get consensus from multiple providers about what information to include in discharge instructions. Finally, a limiting factor for

providing content is that it is only written in English, which curtails their usefulness as a resource for non-English speaking patients.

Template

Nurses reported frustration with a restrictive computerized Patient Care Summary template, which does not allow modification or elimination of content that is unnecessary or outdated. Examples of problems created by the computerized template include the inability to delete sections that do not apply to a specific patient which appear as large blank spaces in the printed discharge instructions, and the inability to increase font size for people with visual impairment. Additionally, the title, ‘Patient Care Summary’ doesn’t inform the patient that the information in the document is important for their aftercare. However, nurses reported that they liked the flow and organization of the diagnosis/procedure specific template that can be modified for the patient.

Table 3.4. Top Three Codes from Nurse Interviews with an Example for Each

Codes	Examples
Communicating Discharge Instructions to Patients	“And then I just kind of star or emphasize certain things, if they need to be reiterated where if the family is forgetful about something, specifically when it’s about the medication, if it’s a new medication they’re going home on, I want to make sure they understand what it’s for, and the side effects, and things to monitor and tell the physician when they have their follow up appointment, so I’ll put a star and a note, and they’ll say, you know, will you write that next to that medication what it does again”
Content	“It (CABGx3) should be typed out, coronary artery bypass graft times three vessels, (DM) diabetes mellitus, type II controlled, and typically that indicates if it’s controlled with insulin or medication... I would just write out the entire diagnosis right below.”
Template	“I just think the layout is terrible. I think this whole front section is just kind of, I don’t know, not necessarily information that we need to tell the patient. Like, when they came, when they’re leaving. I still kind of go over that stuff, it’s just...hospital centered.”

Doctors

Content

Doctors reported that the diagnosis/procedure specific template provides valuable aftercare information for patients but should provide more information about what procedure(s) the patient received during their hospitalization (Table 3.5). Doctors agreed that language on discharge instructions could sometimes be technical and confusing to patients. One doctor suggested the instructions could start with an explanation of the diagnosis, written and explained in lay terms, and then link the other sections of the instructions back to the diagnosis so a patient gets a better understanding of why they should adhere to the instructions. For example, a diagnosis of heart failure could be followed by “Causes” and then “Symptoms” of heart failure, then linked to strategies for symptom management such as low sodium diet, daily weights, fluid restrictions and medications.

Pharmaceutical Content

Doctors reported that the Patient Care Summary computerized template is too rigid for pharmaceutical content so modifications cannot be made to taper drugs or temporarily put a hold on a medication as the template requires a stop date even for drugs that are taken as needed. Additionally, the doctors concurred that adherence might be improved if each medication included the purpose for which it is taken and what could happen to the patient if it is not taken as prescribed. Doctors also reported that information about symptoms of adverse reactions to medications should also be included in the pharmaceutical content section of discharge instructions.

Table 3.5. Top Three Codes from Doctor Interviews with an Example for Each

Codes	Examples
Content	<p>“Sometimes I get patients who, I mean they’ve been seen at the University and were recently discharged and I see them for follow up, it’s a brand new patient, from their, in my regular continuity clinic, and they still don’t know what the hell is going on, they don’t know what happened. They just know they were seen for follow up and we had to re-address what exactly happened during their admission. That is, I can sense that there’s some frustration. I feel that, maybe most of the time you get some sense of understanding what happened in that admission from the patient’s point of view and that doesn’t always happen. And part of that’s our fault, but I think the other part is there is not a good document saying what exactly transpired in a way that the patient can understand, in an easy format.”</p>
Pharmaceutical Content	<p>“So, I think, sometimes it might be the language that’s used. Like we’re, a lot of times we don’t really translate the discharge instructions to what a lay man could read, and I know I was doing that as an intern and I’ve been trying to make sure it’s more understandable and they’re...I have been adding onto the discharge instructions the new medications that the patient is on, and hopefully that’s reinforcing what is being done with the discharge pharmacist but I’m not entirely sure if that’s actually the case.”</p>
Communicating Discharge Instructions to Patients	<p>“I think they can, they, I think they grasp some of them, like if you put them in sort of like situations they can remember, it seems like they, they remember them more, like, for, for patients who have just had a cath I’ll tell them not to lift anything heavier than a gallon of milk, don’t, you know, don’t drive for that day, don’t go running up and down the stairs, but then it’s kind of harder to describe you know, the signs and symptoms of infections for like patients who’ve had some sort of pacemaker implant, or ICD implanted, you know, you tell them, try to describe to them you know, what’s irritation versus what’s an infection, and it’s, I think it’s pretty difficult sometimes to really describe it in words.”</p>

Communicating Discharge Instructions to Patients

Doctors, like nurses, reported that they sometimes write and draw on discharge instructions to clarify information for patients. One specific area of concern doctors reported is that, while activity restrictions are listed in discharge instructions and explained to patients, it is easy for patients to forget when they get home. For example, a patient who had pacemaker implanted is not supposed to lift the arm on the side of the implant above the shoulder. Providing alternatives for typical activities that need to be restricted or modified contextualized to the patient's life may provide cues that assist the patient to remember. Additional recommendations for improvement were beyond the scope of paper based discharge instructions. The first was that doctors reported that it is easier to communicate discharge instructions when a family member or friend of the patient is present. The final recommendation was that patients should receive a follow-up phone call after discharge to make sure they understand their instructions and have the opportunity to ask questions when they are home implementing them.

Patients

Content

Patients reported that they found the content of discharge instructions to be useful, and for the most part, understandable (Table 3.6). They also stated that when healthcare providers write on their discharge instructions, they were, at times, unable to read their handwriting. Additionally, patients stated that while they found the content useful, technical language and formatting issues made instructions difficult to read or understand.

Table 3.6. Top Three Codes from Patient Interviews with an Example for Each

Codes	Examples
Content	“it.. y'know.. I was kinda confused for a little while till I really thought it through. And I had to think through what they were trying to say. Cause I didn't know the lingo.”
Utility	“The instructions, they’re pretty much to keep me going. Mine, I could die if I didn’t look at the instructions. I could die easily by the medications being wrong. By thinking, ‘Oh, the doctor told me this...’ and I go home and start taking something at a dose, when I should have looked at the paper and it says, ‘Two times a day,’ instead of three times a day, or whatever. It could result in me getting real sick or possibly death if I didn’t (get it) quick enough, because we can go into rejection quick.”
Formatting	“If I throw this on the table it looks just like any other piece of paper. And so, it could maybe be colored, like the color of the hospital, whatever. A certain color of the hospital would be good, so you know if you’re looking at the table and you go, ‘Where’s that piece of paper?’ You can look down and automatically find that piece of paper. Cause I’ve done that, you’re looking through them all because they all look the same. And I do, when I leave here I have a whole bunch of...I got a whole bunch in the closet right now that are just building up.”

Utility

Patients reported that follow-up appointments, emergency contact information, and aftercare instructions was pertinent and useful information in their discharge instructions. However, patients stated that they would like to receive a follow-up phone call. As one patient clarified, he felt uncomfortable calling because he did not have enough information to know what was normal and what wasn’t. Patients also reported that they used information in discharge instructions as a source to research their condition online and therefore would prefer both technical and lay language included in their instructions.

Formatting

Suggestions for improvement included remove the first page of demographic information that seems to be for hospital use and break up the text into more discernable and understandable chunks of information to improve 'flow'. Additionally, patients suggested formatting changes such as: the print should be darker, the font size should be larger, and the pages should be numbered. Patients stated that the Patient Care Summary had sections that were not filled in so they were unsure if information was accidentally omitted or if the section just did not apply to them. When information was not included in some sections, large blank spaces appeared in the discharge instructions, which patients suggested should be eliminated.

Discussion and Conclusion

Themes and explicated summaries of the experience of nurses, doctors and patients in creating, teaching or receiving discharge instructions mirror published studies on how to improve discharge instructions. Content of discharge instructions was one of the top three themes for patients, nurses and doctors. The use of plain language, which is included in the theme of content, is achieved by the creation of easy to read content or by simplification of existing content (Alberti & Nannini, 2013; Chugh et al., 2009; Institute of Medicine, 2004; Jolly, Scott, & Sanford, 1995; McCray, 2005; National Institutes of Health, 2013). This is consistent with doctors' and patients' critiques that technical language included in discharge instructions can be a barrier to comprehension. However, text simplification may not be sufficient to improve comprehension of discharge instructions. Patients' problems with comprehension of their discharge instructions are not only due to low health literacy, but are also related to impaired cognitive functioning

(Chugh et al., 2009). One potential method to improve comprehension of written health communication, proposed by Federal Plain Language Guidelines and tested with patients, is to include illustrations that clarify text (Houts, Doak, Doak, & Loscalzo, 2006; National Cancer Institute, 2010; "Wong-Baker Faces Foundation," 1983). While simplification of the language of discharge instructions and inclusion of illustrations can increase comprehension of discharge instructions it is not sufficient by itself to make the instructions useful to patients.

Doctors and nurses both reported that they struggle to make the content of discharge instructions relevant to the patient and sought to provide context for the patient. For example, one nurse stated that patients often ask for specific recipes or menus that follow dietary recommendations. A patient-centered approach to discharge instructions that includes language simplification is the use content tailoring of information for the patient, both written content and verbal instruction, in order for a patient to incorporate discharge instructions into his daily routine (Chugh et al., 2009; National Cancer Institute, 2010). While content tailoring can increase understanding of discharge instructions and can provide context, knowledge does not always predict behavior (Connolly, Aitken, & Tower, 2014). A strategy that has been proposed to increase the self-efficacy of patients to perform post-hospitalization activities is to ask the patient to demonstrate the desired self-care behaviors to clinical staff prior to hospital discharge (Coleman et al., 2005). While healthcare workers often cite a lack of time and resources to implement health literacy interventions (Chugh et al., 2009), there are opportunities to practice behaviors in the hospital. For example, a dietician could review meal choices

that a patient makes when ordering meals in the hospital or even discuss food items that have been brought to the patient's room by friends and family.

Formatting of discharge instructions was one of the top three themes for patients. Patients reported that changes to formatting could improve the readability of discharge instructions which is also reflected in Federal Plain Language Guidelines and in a study by Aetna that stated that relevant organization of content improves comprehension of discharge instructions (Chugh et al., 2009; National Cancer Institute, 2010). Patients had a difficult time distinguishing their discharge instructions from other discharge paperwork as a majority of the first page of the patient care summary is demographic information that includes items such as a financial identification number that did not mean anything to the patient. There is a statement that the information is important for follow-up care on the patient care summary. However, it is located at the bottom fourth of the first page. Patients also reported that the font should be darker, that the information should be separated into discrete sections and that important information should be highlighted or underlined. While these recommendations seem obvious, the fact that the patient care summary is not organized very well highlights a problem in which a template was created for the patient care summary that is inflexible, and healthcare providers do not have a way to suggest or implement even rudimentary changes that could improve discharge documents as many of the same formatting critiques were also identified by healthcare providers.

Formatting was also an issue for nurses and doctors who identified the main problem: a restrictive computerized template that could not be modified to accommodate patient needs and created large blank spaces in discharge documents. Both doctors and

nurses felt that this was an institutional problem that was not given priority. Patients and healthcare providers identified that discharge instructions are difficult to discern from the morass of paperwork a patient receives at discharge. Strategies to make them more identifiable include addition of a more descriptive title in large print, eliminate most of the demographic information that comprises the first page of the instruction set so they do not look like other documents, and use different colored paper for discharge instructions. While these strategies will not necessarily improve comprehension and adherence to discharge instructions, they can assist the patient to identify discharge instructions as one study found that up to 54 % of recently discharged patients did not even remember receiving discharge instructions (Chugh et al., 2009).

Communicating discharge instructions was a theme identified by both doctors and nurses. Both groups stated that they sometimes write or draw information on discharge instructions to clarify or provide more information for patients. However, the strategy to write or draw on discharge instructions can be ineffective when the patient cannot read the writing or understand the drawing as reported by one of the patients who was interviewed. A patient's need for additional information and healthcare providers efforts to make discharge instructions understandable to patients is undermined by the fact that knowledge alone is insufficient to lead to desired behaviors (Connolly et al., 2014; Lorig, Laurent, Plant, Krishnan, & Ritter, 2014). This requires a fundamental change in the way discharge instructions are communicated to patients in that understanding discharge instructions should be paired with supervised practice of the desired behaviors. An example of practicing desired behavior would be to ask a patient to demonstrate a dressing change or to evaluate his or her own incision or wound site and discuss how it

would look when healing or becoming infected. New behaviors typically take several repetitions in order to gain sufficient self-efficacy to continue the behavior. Therefore it is essential, as identified by both nurses and doctors in this study, that communication continue beyond discharge in order to support a patient as they seek to emulate desired behaviors taught to them while they were hospitalized. Use of an electronic personal health record (PHR) could facilitate ongoing communication between healthcare providers and patients.

Strategies to improve discharge instructions should be informed by Federal Plain Language Guidelines (FPLG). Guidelines state that readers should be able to “find what they need, understand what they find; and use what they find to meet their needs” (National Cancer Institute, 2010). The findings in this study revealed issues with content, formatting, and communicating discharge instructions, which can be improved by redesigning and rewriting discharge instructions that adhere to FPLG. The guidelines provide direction on how to create user friendly content from the words that are used to sentence structure and construction of paragraphs (National Cancer Institute, 2010). The guidelines provide principles for the structure of discharge instruction formatting through the use of organization that meets the readers needs, specific to a person and not a group, with the use of lots of headings and short sections (National Cancer Institute, 2010). They also provide guidance about ways to improve clarity of content through the use of examples, lists, tables, illustrations and emphasis to highlight important concepts (National Cancer Institute, 2010). It is apparent that discharge instructions are not meeting the needs of providers to communicate information to patients and are not assisting patients in the comprehension of their postdischarge needs.

Conclusion

Discharge instructions seek to provide critical information for a patient's recovery following hospital discharge. Explication of strategies to improve discharge instructions from nurse, doctor and patient interviews can be used to improve discharge instructions. While there are aspects of discharge instructions that healthcare providers find beneficial, such as individualized content relevant to the patient, the presentation of content can be improved through logical formatting and text simplification in order to help the patient understand and adhere to discharge instructions. Strategies to improve discharge instructions should involve doctors, nurses and patients supported by hospital administration so that changes to discharge instructions and the discharge process can be instituted. Additionally, it is important to have clear communication channels for patient information including consistency among healthcare providers the patient encounters through their hospitalization, and outreach to patients following their hospitalization.

This study also revealed that use of technology in the creation of discharge instructions could both help and hinder their utility. The Patient Care Summary portion of discharge instructions utilized an old electronic template that was difficult for physicians to use, limited customization, and printed content in a format that was difficult to read and confusing to patients. The diagnosis/procedure specific template was a Word document on a shared drive that allowed for personalization and a simple process to request changes to information when new content was necessary or old content was not needed. The use of technology in the creation of discharge instructions can improve their efficacy as long as efforts to update and improve computerized systems are given institutional priority. Lessons learned from creating discharge instructions with electronic

technology will be essential when healthcare organizations begin providing electronic discharge instructions to person health records in the near future. Additionally, FPLG should also be employed as electronic content is created, as it is evident that the guidelines have been largely ignored as evidenced by the critiques of discharge instructions in both the literature and this study that show ongoing issues with discharge instructions that do not adhere to FPLG.

Practice Implications

Information explicated from interviews and discharge instruction literature reveals strategies to improve discharge instructions:

- Content
 - Utilize text simplification methods to increase comprehension.
 - Include a section for technical terms with lay definitions.
 - Provide access to a library of medical illustrations or pictographs that can be automatically inserted into discharge instructions as a substitute for hand drawn illustrations clinicians sometimes provide.
 - Provide information about what can happen to the patient if they do not follow the instructions or take medication as prescribed.
 - Organize content in a logical flow so that the impact of restricted activities and desired behaviors is articulated for the patient.
 - Provide the patient with alternatives for restricted activities or behaviors.
 - Provide instructions in several languages.

- Formatting
 - Title discharge instructions, or print them on paper that is a different color than other paperwork, to make sure they are easily identifiable as important information for aftercare instructions.
 - Eliminate blank spaces and organization to improve ease of readability.
 - Utilize flexible templates so that patient specific modifications, such as an increased font size, can be made.
 - Elevate discharge instructions as an institutional priority to ensure that technical issues, like problematic formatting due to restrictive templates, have a clear and direct process for resolution.
- Communicating Discharge Instructions
 - Provide consistent information to the patient from check-in to discharge by using the content of discharge instructions as the focus of education for the patient from all healthcare providers in order to provide consistent information.
 - Drawing or writing on discharge instructions should be discouraged, as patients may not be able to read or understand the information when they return home.
 - Provide opportunities for a patient to practice desired behaviors while they are in the hospital.
 - Include the patient's family or friends when the healthcare provider is educating the patient about posthospitalization care.

- Patients should receive a follow-up phone call from a healthcare provider who was involved in their care and discharge to provide an opportunity for the patient to ask additional questions or receive clarification.

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CHAPTER 4

AUTOMATED PICTOGRAPHIC ILLUSTRATION OF DISCHARGE INSTRUCTIONS WITH GLYPH: IMPACT ON PATIENT RECALL AND SATISFACTION

Abstract

To evaluate standard versus pictograph-enhanced discharge instructions on immediate and delayed patient recall and to field test the Glyph system. Glyph, an automated healthcare informatics system, was used to automatically enhance discharge instructions with pictographs for patients. Patients in a cardiovascular medical unit were randomized to receive pictograph-enhanced or standard discharge instructions. Study participants who received pictograph-enhanced discharge instructions recalled a greater proportion and were more satisfied with the understandability of their instructions one week post discharge than those that received standard discharge instructions. Overall recall of discharge instructions was very poor. However, pictograph-enhanced discharge instructions have the potential to increase patient understanding and compliance with discharge instructions. The Glyph system is an effective tool to illustrate patient education materials in the clinical environment

Background and Significance

The responsibility for the majority of care for a patient after hospital discharge is relegated to the patient and patient's family (Chugh et al., 2009). For this reason, it is essential that patients and their caregivers understand critical elements of their discharge instructions such as activity restrictions, dietary guidelines, medication management, wound care, follow-up instructions, signs and symptoms of potential problems, and emergency contact information in order to successfully negotiate the recovery process (Jacott, 2007a). Approximately one out of two adult Americans have a difficult time comprehending and taking action on drug labels, healthcare providers verbal instructions and reading and interpreting discharge instructions due to low health literacy (Chugh et al., 2009; Institute of Medicine, 2004). An intervention that has the potential to improve comprehension of discharge instructions for those with low health literacy is the use of illustrations and pictures to depict important health and self-care information (Boodman, 2011; Choi, 2012; Chugh et al., 2009; Houts et al., 2006; Jeungok, 2011).

A pictograph is a graphical representation of a word, idea, relationship or numerical data and can include images, icons, graphs and symbols (Zeng-Treitler, 2009). Pictographs, such as the Wong-Baker Faces of Pain Scale, have been found to help patients with low health literacy express their experience better than numbers, ranking or unfamiliar words (Mayer & Villaire, 2007; "Wong-Baker Faces Foundation," 1983). The use of pictographs has improved written and verbal communication in acute healthcare settings for patients with low health literacy and for patients who don't speak English (Choi, 2012). Pictures paired with written or spoken text impacts health communication by: 1) focusing attention to the materials which increases the likelihood that they will be

read; 2) assisting patients in comprehending presented information; 3) improving recall of the materials; and 4) increasing adherence to the message of the materials (Houts et al., 2006).

Illustrations for health education materials include cartoon, stick figure and shaded drawings, and black and white as well as color photographs (Houts et al., 2006). Research suggests that simple cartoon drawings are most effective in facilitating comprehension (Houts et al., 2006). A pictograph is a pictorial representation of a concept as part of a graphic system (Merriam-Webster, 2014). There is currently no standard pictograph language for patient communication to enhance text with pictographs and limited research on strategies to systematically develop and evaluate pictographs for health communication (Zeng-Treitler, 2009).

Hospital discharge is a process that seeks to bridge care continuity between the patient's hospital stay and recovery period, which often occurs at home without home healthcare services (Pfundner, 2012). This transition of care, in order to be successful, requires that the patient, and caregiver(s) if present, possess the knowledge and skills to adhere to discharge instructions (Clark, Doyle, Duco, & Lattimer, 2012). Patients who can't understand and therefore can't follow health information have higher rates of hospitalization, readmission, costly and unnecessary complications, use of emergency services and death (Boodman, 2011; Institute of Medicine, 2004). Should patients leave the hospital with an inadequate discernment of their medical condition and plan of care, they may not recognize the importance of aftercare instruction adherence (Clark et al., 2012).

The discharge process typically is comprised of verbal and written discharge instructions prepared and explained to patients by a nurse. Unfortunately, prior studies have revealed that patients, regardless of health literacy and education level, commonly have problems understanding and recalling their discharge instructions (Engel et al., 2012; Institute of Medicine, 2004; Sawyer et al., 2011). Many barriers to a patient's ability to understand discharge instructions are inherent to the hospital environment and are difficult to ameliorate. Examples include side effects of medications, poor sleep quality while hospitalized, and effects associated with the patient's morbidity (Chugh et al., 2009). In order to address patients' inability to understand and follow discharge instructions, it is essential to reevaluate the efficacy of discharge instructions and employ strategies that increase comprehensibility of discharge instruction for patients ("The Revolving Door: A report on U.S. hospital readmissions," 2013). Enhancing discharge instructions with pictographs holds promise to transform discharge instructions from a format that is incomprehensible to many patients to one in which patients can more readily understand and adhere to their discharge instructions.

Objectives

The aims of the study were twofold. The first was to evaluate standard versus pictograph-enhanced discharge instructions on immediate and delayed recall. The second was to evaluate standard versus pictograph-enhanced discharge instructions on patient satisfaction with discharge instructions. A between group experimental design was used with pre-discharge and post-discharge measures of free recall and patient satisfaction with patients on a cardiovascular medical unit.

Materials and Methods

Discharge Instructions

Two documents, created independently, comprise discharge instructions at the University of Utah Cardiovascular Medical Unit (CVMU). The diagnosis/procedure specific template (Table 4.1) is a modifiable Word document that is given to the patient, by preventive cardiology nurses, in conjunction with discharge teaching during the patient's hospitalization. Templates cover diagnosis or procedures and include atrial fibrillation ablation, ablation, cardio-thoracic heart surgery, heart failure, minimally invasive chest surgery, EP device, and postcatheter angiogram. The diagnosis/procedure specific template is sometimes modified by a preventive cardiology nurse. For example, the nurse would remove information about a defibrillator in the EP device template if the patient had a pacemaker implant. The Patient Care Summary (Table 4.1) is completed by the patient's physician from a computerized template and is provided to the patient by his nurse at discharge in conjunction with discharge teaching. The patient's doctor who creates the patient care summary can also include personalized instructions in the diet and activity, and activity restriction sections.

Pictographs

Pictographs were created by a graphic designer based on illustratable concepts in discharge instructions from the University of Utah CVMU and discharge instructions found on the Internet from healthcare organizations that publish them for the public. Our team, consisting of clinicians and informaticists, provided feedback to revise and refined the pictographs to more fully represent medical concepts. The pictographs were also tested, to determine if they accurately represented medical concepts, with study

Table 4.1. Components of CVMU Discharge Instructions


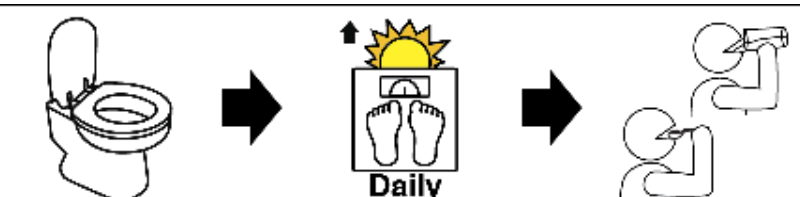
Patient Care Summary	Diagnosis/Procedure Specific Template
Demographic Information	Signs and Symptoms to Call MD or 911
Provider Information	Activity Restrictions
Scheduled Appointments	Wound Care Instructions
Medications	Diet Recommendations
Diet and Activity Recommendations	Diet Recommendations & Restrictions
Activity Restrictions	Activity Recommendations
Diagnosis or Procedure	Smoking Quit Line
Signature Block	Preventive Cardiology Contact Info

participants. They were presented along with actual discharge instructions, with concept text removed, and the representative pictograph at the end of the instruction. Participants in this usability study were asked to write what they thought the pictograph represented. The results were rated for accuracy against the original intent of the pictograph. Pictographs were modified based on the results of this study, which is pending publication (Perri et al., 2013). Table 4.2 provides examples of discharge instructions and their associated pictographs that were used in the current study.

Glyph System

The Glyph system preprocesses free text, annotates a set of concept extraction modules that locate and annotate text strings, composes images from grammar patterns, and then renders images, generated by the rule engine, for the corresponding text. It entails five processing stages: preprocessing, annotation, postprocessing, image composition and image rendering. Glyph rule engines were refined as the result of a study in which 49 sets of discharge instructions were illustrated and then assessed by the study team for the accuracy of inserted pictographs and their placement (Bui, Nakamura, Bray, & Zeng-Treitler, 2012). The Glyph system was further refined through an iterative process of illustrating CVMU discharge instructions and rating their accuracy until the team was satisfied with illustrated templates and Glyph's ability to illustrate personalized information that varied from the template. Glyph is the first informatics intervention designed to automatically enhance discharge instructions in a clinical environment.

Table 4.2. Discharge Instructions and Their Associated Illustrations

Instruction	Illustration
Do not drive for 4 weeks or while you are taking narcotics.	
Weigh yourself each morning after going to the bathroom but before eating or drinking.	

Sample and Setting

Study participants were recruited from the University of Utah Healthcare System (UUHCS) CVMU in Salt Lake City, Utah, an academic healthcare system. Participants who met all inclusion and no exclusion criteria (Table 4.3) were approached by study nurses in their hospital room for consent to participate in the study. While diagnosis or procedure were not considered for study inclusion, the following study/procedure specific templates were received by study participants: ablation, atrial fibrillation ablation, angiogram, atrial septal defect/patent foramen ovale, coronary artery disease/stent/heart attack, electrophysiology device, heart failure, heart surgery, and minimally invasive heart surgery.

Table 4.3. Study Inclusion/Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Ability to speak, read, and write in English.	Cognitive or physical impairments that prevent participation in the study.
Discharged to home.	Works as a nurse, doctor or pharmacist and discharge instructions are a component of their job.
≥ 21 years old	Heart transplant or LVAD on a waiting list or a recipient.
Receive both Patient Care Summary and diagnosis/procedure specific discharge instructions.	

Participants were approached for study participation until 144 patients consented and completed all study procedures. The sample size calculation was conducted using G*Power. Baseline immediate recall rate estimates of .44 % for standard discharge instructions and .54 for pictograph-enhanced discharge instructions were based on the preliminary research of Dr. Zeng-Treitler (2009) who also estimated the standard deviation to be 0.20. Using the means for each group, .44 and .54, and a *SD* of .20 yields a Cohen's *d* effect size of 0.5. with a two-tailed test, an alpha = 0.05 and power = 0.80, a sample size of 128 would be sufficient to detect the large effect between groups with 64 randomized to control and 64 randomized to intervention. The study overenrolled as a strategy to increase power.

Instruments and Measures

The measure of free recall for this study consisted of questions developed by the study investigators. The questions were based on sections of typical discharge instructions (Jacott, 2007a). A question about patient's medications was initially included in this instrument but was excluded as the CVMU protocol for medications was in transition to become a separate discharge task conducted by a clinical pharmacist. The

study team also developed patient satisfaction questions with a Likert-type response from 1 (“completely dissatisfied”) to 7 (“completely satisfied”).

Recall Questions

1. Diagnosis: Based on the instructions you were given, what is your final diagnosis for this hospitalization?
2. General Care:
 - a. What signs and symptoms to watch for were listed in your discharge instructions?
 - b. What wound care instructions were listed on your discharge instructions?
3. Activity Level:
 - a. What activities or exercises were you asked to do in your instructions?
 - b. What activity restrictions were given in your instructions?
4. Diet:
 - a. What dietary restrictions were given to you in your instructions?
 - b. What dietary recommendations were given to you in your instructions?
5. Follow-up Plan: What follow-up doctor appointments or tests were listed on your discharge instructions?
6. Other: Are there any other instructions you can recall?

Satisfaction Questions

1. I am satisfied with how easy my discharge instructions are to understand.
 1. Completely Dissatisfied
 2. Mostly Dissatisfied
 3. Somewhat Dissatisfied
 4. Neither Satisfied nor Dissatisfied

5. Somewhat Satisfied
6. Mostly Satisfied
7. Completely Satisfied

2. I am satisfied that the discharge instructions gave me enough information to manage my condition after leaving the hospital.

1. Completely Dissatisfied
2. Mostly Dissatisfied
3. Somewhat Dissatisfied
4. Neither Satisfied nor Dissatisfied
5. Somewhat Satisfied
6. Mostly Satisfied
7. Completely Satisfied

Data Collection Procedures

Prospective study participants' names were provided to study nurses by preventive cardiology nurses after a daily CVMU discharge planning meeting. Additionally, preventive cardiology nurses updated study nurses on prospective study participants who received discharge orders throughout the day. Patients were screened and those who qualified based on the inclusion/exclusion criteria were approached for consent. Patients who consented to participate were randomized to receive standard versus pictograph-enhanced discharge instructions. Treatment group discharge instructions were prepared by study nurses who obtained an electronic copy of the patient's patient care summary from the CVMU electronic health record (EHR) and processed it with the Glyph system to illustrate diet, activity and activity restriction sections. Study nurses reviewed the newly illustrated material for accuracy, readability and patient safety and no issues related to the automated insertion of pictograph illustration were identified. The patient care summary was appended to include a diagnosis/procedure specific template that was illustrated with Glyph a priori and then

modified to include personalization alterations that were made to the templates by CVMU preventive cardiology nurses. Control group discharge instructions were prepared by study nurses who printed an electronic copy of the patient's patient care summary from the EHR and appended it with a copy of the diagnosis/procedure specific template that was modestly formatted to improve readability and include personalization alterations that were made to the templates by preventive cardiology nurses.

Study procedures for data collection did not begin until the patient received all standard hospital discharge teaching by the patient's nurse using standard discharge instructions. After completing the traditional final discharge teaching, study nurses were notified that the patient was ready to begin the study. The study nurse then went to the patient's room and presented the participant with the version of study discharge instructions that they were randomized to receive and advised the participant to review the document for up to 15 minutes. When the participant indicated that they were done reviewing their discharge instructions, they were asked a series of free recall questions to assess immediate recall. Study nurses used a nonillustrated copy of the patient's instructions and highlighted each word in the instructions that were verbalized by the patient. Partial points were given for partially remembered instructions such as remembering that they were instructed to weigh themselves each day, but not the time of day. Additionally, participants were asked two questions about satisfaction with their discharge instructions. In order to assess delayed recall, participants were called 1 week after discharge and asked the same free recall and satisfaction questions by a member of the study team who was blinded to participant group assignment. Study data were collected and managed using REDCap (Research Electronic Data Capture) electronic

data capture tools hosted at the University of Utah (Harris et al., 2009). REDCap is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. Center for Clinical and Translational Sciences grant support ("CTSA 5UL1RR025764-02,").

Data Analysis

Immediate and free recall rates were calculated by taking the number of words the patient recalled correctly divided by the number of words in the patient's discharge instructions to create a ratio that represented the amount of instructions the patient remembered of their discharge instruction set. The goal was to standardize the recall variable since discharge instructions varied in length depending on the diagnosis/procedure and amount of personalization (individual tailoring/customization) if included in the patient's discharge instructions. Recall rate was treated as a continuous variable. Data were assessed to determine normality of distribution of the study variables. An independent samples *T*-Test was conducted to determine if there were differences in group means at discharge (immediate recall) and 1 week post discharge (delayed recall).

A Mann-Whitney *U* test was conducted to evaluate whether the hypothesis that patients who received pictograph-enhanced discharge instructions are more satisfied with the understandability and inclusiveness of their discharge instructions than those who received standard discharge instructions. This test was conducted because the satisfaction responses were treated as interval scale data and were not normally distributed. Data

analyses were conducted using SPSS version 18 (SPSS Inc. Released 2009. PASW Statistics for Windows).

Results

The majority of study participants were White males. Mean age of the sample was 53 (*SD* 30.6), 70% were male and 95% spoke English as their first language. Mean age of patients on the CVMU during the course of the study was 61 (*SD* 16.5), 63% of patients were male and 93% spoke English as their first language. Study sample characteristics are outlined in Table 4.4.

The results indicate a significant recall effect for immediate recall, $t(142) = -3.1, p < .01$ and a nonsignificant recall effect at delayed recall, $t(142) = -0.26, p = .80$. At discharge, patients who received pictograph-enhanced discharge instructions remembered more of their discharge instructions (5.8% vs. 4.3%) than patients who received standard discharge instructions when only illustrated sections of discharge instructions were compared against the same sections in standard discharge instructions.

Raw percentages based on the total number of words a patient remembered divided by the total number of words in the patients discharge instruction set was calculated (Table 4.5).

The mean scores for the two satisfaction questions for both groups at discharge were 6.41 (understandability) and 6.57 (inclusiveness), and at 1 week 6.48 (understandability) and 6.64 (inclusiveness). There were no significant differences between the groups at discharge for either question, (understandability) $z = -.53, p = .6$ and (inclusiveness) $z = -.99, p = .32$, respectively. For 1 week postdischarge, significant

Table 4.4. Study Participant Demographics (N=144)

Characteristic	Pictograph N (%)	Standard N (%)	Total N (%)
Gender			
Male	49 (69)	52 (71)	101 (70)
Female	22 (31)	21 (29)	43 (30)
Age			
24-54	21 (30)	28 (38)	49 (34)
55-65	25 (35)	25 (34)	50 (35)
66-90	25 (35)	20 (27)	45 (31)
Race			
White	70 (99)	67 (92)	137 (95)
Black or African American	1 (1)	4 (5)	5 (4)
Native Hawaiian or Other Pacific Islander	0 (0)	2 (3)	2 (1)
Ethnicity			
Hispanic	1 (1)	1 (1)	2 (1)
Non-Hispanic	70 (99)	72 (99)	142 (99)
Education			
4th Grade	0 (0)	1 (1)	1 (1)
5 to 8th Grade	1 (1)	3 (4)	4 (3)
9 to 12th Grade	12 (17)	23 (32)	35 (24)
>12th Grade	58 (82)	46 (63)	104 (72)
First Language			
English	69 (97)	68 (93)	137 (95)
Non-English	2 (3)	5 (7)	7 (5)

Table 4.5. Percentage of Instructions Patients Recalled

	Immediate Recall	Delayed Recall
Standard		
Mean (<i>SD</i>)	0.05 (0.03)	0.04 (0.03)
Most	0.13	0.13
Least	0.01	<0.01
Pictograph-enhanced		
Mean (<i>SD</i>)	0.07 (0.03)	0.04 (0.02)
Most	0.15	0.12
Least	0.02	<0.01

effects were found in the pictograph-enhanced discharge instruction group for question 1 (understandability), $z = -2.4$, $p = .016$ but not for question 2 (inclusiveness).

Discussion

The results of this study demonstrate that an informatics intervention to improve recall and satisfaction through automatic illustration of discharge instructions shows promise. Specifically, pictographic enhancement improved the immediate recall of discharge instructions by 35% at discharge, which is clinically significant. However, the increase in recall of pictograph-enhanced over standard discharge instructions did not carry over to delayed recall 1 week post discharge. According to Houts (2006) most patients read written instructions once and then rely on memory to take health actions. Therefore, theoretically, the patients with pictograph-enhanced discharge instructions had more information to draw on when taking health actions. While it is not clear if patients who received pictograph-enhanced discharge instructions adhered more to their instructions or had fewer preventable adverse events, the results hold sufficient promise to continue with research to explore the impact of illustrated discharge instructions.

Patients were asked to recall the content of their discharge instructions verbatim to the best of their ability. However, overall recall rates were extremely low. The most that any patient remembered at discharge was approximately 15 % of their instructions and the least, 1 %. The most that any patient remembered of their discharge instructions after one week was approximately 13 % of their instructions and the least, less than 1 %. Comprehension is the translation of information into meaningful ideas; therefore verbatim recall in this study does not provide insight about what information is

meaningful to study participants in their discharge instructions. For example, patients may not remember the exact date of follow-up appointments, as they may not occur for 2 to 3 weeks after discharge, but may remember wound care instructions due to the immediacy of the need for that information.

This finding leads to a cascade of implications for both the hospital discharge process as well as the metric used for this study. It is likely that clinical providers overestimate the amount of information that patients remember from their discharge instructions. The discharge instruction sets in this study contained both instructions for patient aftercare as well as patient health education information. It may be beneficial to limit discharge instructions to aftercare needs such as symptom identification and wound care and address health education information, such as dietary recommendations, in an outpatient setting. Another implication is that should a patient not be able to identify or lose his discharge instructions, he may not have sufficient retained knowledge of his instructions to adequately care for himself posthospitalization. Providing an electronic copy through email or a personal health record should be utilized to ensure that a patient has a resource for aftercare instructions. Finally, verbatim recall may not be the best metric to assess patient comprehension of discharge instructions. Reading for comprehension is a different process than reading for memorization. Therefore, exploration of different methods to measure a patient's comprehension of the activities and concepts in discharge instructions is incumbent for future research in this area. Secondary analysis of the study data to determine the type of information that patients are more likely to remember is planned for the purpose of identifying if recall identifies more

immediate needs like wound care instructions rather than long term behavioral and lifestyle health education information.

Patient satisfaction with ease of use of their discharge instructions was similar at discharge for both groups, but after 1 week during which study participants had the opportunity to review their instructions at home, those who received pictograph-enhanced instructions reported greater levels of satisfaction with the ease of use of their instructions than those that received standard instructions. When discharge instructions were illustrated in this study, they were considerably longer than standard instructions due to the amount of space pictographs take up on the page with 13 pages as the average length of pictograph-enhanced discharge instructions and 4.3 pages as the average length of standard discharge instructions. That patients found instruction sets with illustrations that were approximately three times longer easier to use than standard instructions is intriguing. Previous research on use of pictographs in healthcare communication can provide insight into how pictographs increase satisfaction with ease of use. Pictures paired with text assists readers to visualize relations in the text that can increase comprehension of the material, which may translate to increased satisfaction with ease of use as text instructions alone requires more cognitive resources to make a mental model of the information (Houts et al., 2006; Kools, van de Wiel, Ruiters, & Kok, 2006). For example, the aforementioned study on asthma inhaler instructions found that patients who received picture enhanced instructions were faster and correctly performed more instruction steps while expressing fewer doubts than those with text-only instructions when they performed inhaler chamber instructions they read (Kools et al., 2006). Participant satisfaction with the amount of information provided was similar at discharge

and 1 week later. Since both sets of instructions contained the same content it is understandable that these satisfaction scores were similar.

The primary limitation of this study was that the sample was mostly White and the vast majority had completed high school education and beyond. This lack of diversity limits the generalizability of the results to other populations. Additional research with diverse patient populations would reveal more about the utility of pictograph-enhanced discharge instructions for those with less education and lower health literacy, as well as individuals from racial and ethnic minority groups who may interpret pictographs in dramatically different ways.

Conclusion

This study demonstrated the feasibility of the Glyph system that can be used in a busy clinical environment to automatically enhance patient education materials. Diagnosis/procedure specific templates were illustrated in advance, but the Patient Care Summary sections of diet, activities, and activity restrictions, which are completed by the patient's physician, were successfully illustrated at discharge in a timely manner. Study nurses were able to obtain an electronic copy of the PCS when it was complete in the EHR and process it through Glyph, to automatically add illustrations, in a very short period of time: a couple of minutes. This process was completed on a very busy cardiovascular medical unit and did not interrupt the busy flow of patient treatment and care. The addition of pictographs to discharge instructions has the potential to increase the efficiency of patient education as pictographs in health communication focuses attention to the materials and aids in comprehension and performance of instructions, is

not time consuming and does not interfere with the work of the clinical environment (Houts et al., 2006; Kools et al., 2006).

The inclusion of pictographs is one method to improve recall and satisfaction with discharge instructions, but it is not a solution unto itself. Discharge instructions for patients hospitalized with cardiac and cardiovascular disease are complex and extensive, and when enhanced by pictographs, become considerably longer. Exploration of other methods to provide information to patients should be explored, as it is unlikely that one intervention, however efficacious, is sufficient to address the multifactorial issues that impact a patient's ability to understand and follow their hospital discharge instructions.

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CHAPTER 5

CONCLUSION

The goal of this dissertation research was to improve discharge instructions for those who provide patient teaching and for the patients who use them to guide their posthospital care. Two consecutive studies were conducted in order to achieve this goal. The objective of the first study was to identify issues in the discharge process and aspects of discharge instructions that can be improved through the use of pictographs and other structural and process enhancements. The objectives of the second study were to 1) improve patient recall rates of discharge instructions through inclusion of automated pictographs in discharge instructions and 2) improve patient satisfaction with the content and understandability of discharge instructions through automated enhancement of discharge instructions with pictographs. Both studies provided insight into strategies to improve discharge teaching and patient comprehension and understanding of discharge instructions.

Strategies for Creating and Communicating

More Effective Discharge Instructions

The analysis of qualitative data from interviews in the first study provided insight into strategies to improve discharge instructions such as text simplification, content formatting and organization, and provision of consistent information to improve patient

understanding and comprehension. Both healthcare providers and patients identified technical language in discharge instructions as a barrier to patient understanding of their disease/procedure and subsequent aftercare instructions. Efforts to address this issue have been partially successful. Preventive Cardiology nurses, with input from Dr. Zeng's team, worked to simplify disease/procedure specific templates before the initiation of the second study. The rigid template that is used to create the Patient Care Summary (PCS) was not modified prior to this study. While it is sometimes difficult to simplify some disease/procedure specific technical language, it is possible that pictographs can often provide a concise representation of the concepts of technical language, which can facilitate patient familiarity with disease/procedure specific terminology. Additionally, pairing pictographs with technical language may help patients better understand the context of their disease and/or procedure in terms of subsequent instructions about posthospitalization care and interventions for disease amelioration in their future interactions with healthcare providers.

Content organization and formatting can be improved to enhance the efficacy of discharge instructions. A physician interviewed in the first study suggested that the organization of content of discharge instructions should demonstrate to the patient how treatments and medications address the disease process. Additionally, he suggested that content organization should demonstrate how nonadherence to treatment regimens could impact the disease/procedure and the likely resulting symptoms and outcomes. It may be technically difficult to arrange the content of discharge instructions in a manner that provides such a comprehensive overview as symptoms and outcomes that are complex and not linear and may be difficult to map in a two-dimensional paper format.

Additionally, patients with low health literacy may not be able to understand the intent and meaning of this content organization strategy as the mapping of the disease/procedure and associated signs and outcomes are too numerous and nonlinear to demonstrate on paper. Healthcare technology may be able to accommodate the organization strategy of linkages to signs, symptoms, outcomes and nonadherence consequences in an electronic health record (EHR) in which links, videos and animations could enhance the associations of these interconnected relationships.

Communicating discharge instruction information to patients was also a problem identified by healthcare providers. Both doctors and nurses stated that they do not have sufficient time to assess a patients' health literacy and don't have capability or resources to adjust the materials to match the health literacy of a patient. Therefore it is essential to provide materials that can be understood by patients of varying health literacy levels. However, a confounding practice that is a barrier to communication of discharge instructions is the consistency of information provided to patients in the healthcare setting. Both patients and healthcare providers reported that sometimes patients receive inconsistent information from healthcare providers that they encounter throughout the course of their hospitalization.

One strategy that has promise to improve the complexity match and consistency of communicated information is the inclusion of pictographs. Illustrations can increase the readability and comprehension of health related concepts regardless of the patient's health literacy level. While the addition of pictographs is not the ultimate solution to all problems identified in interviews, information technology can be employed to improve both the selection of literacy matched health information and discharge instructions as

well as improve the consistency of information communicated to the patient by healthcare providers.

Another vital strategy is to leverage the EHR and personal health record (PHR) in the creation and distribution of individualized discharge instructions. The EHR is a gatekeeper for health information; therefore discharge instructions that emanate from the EHR could be tailored to the patient and used as the patient information resource by the patient's healthcare team. Health education materials and discharge instructions could be delivered to the patient via the PHR. A literacy test could be administered to patients via their PHR and the results could then determine the complexity of health information in any patient education materials and discharge instructions that the patient receives. The patient's use of a PHR as a resource for their information needs would improve the consistency of information they receive. Healthcare providers routinely rely on an EHR in order to gather information to provide to patients. The use of an EHR as a required gatekeeper and direct links to the patient PHR could improve consistency and accountability for the information a patient receives from healthcare providers.

Limitations

Health Literacy

Health literacy is a key factor in patient comprehension of discharge instructions. Literacy performance levels, of patients enrolled in this research, were not assessed. Several factors are barriers to a patient's ability to comprehend and perform activities included in hospital instructions, regardless of health literacy level. These factors include the large quantity of information exchanged in a short period of time, the influence of acute and/or chronic illness on a patient's ability to listen and comprehend, side effects of

medications and poor sleep quality while hospitalized, which affects cognition and memory, and can result in unrecognized cognitive impairment (Chugh et al., 2009). Additionally, even well educated individuals with higher level literacy skills encounter health information they cannot understand such as diagnostic and medical procedure instructions, especially if they are experiencing stress or are sick (Institute of Medicine, 2004).

Federal Plain Language Guidelines (FPLG), designed to improve reader comprehension and readability of written text were not fully addressed in this research. Aspects of FPLG were addressed, such as text simplification and content organization, in the results section of Chapter 3. FPLG are important to consider in the creation of communication materials. However, this research was about improving existing materials with pictographs and not creating new content or rewriting existing content. Therefore, discussion of FPLG as a strategy to improve discharge instructions is relevant and appropriate whereas inclusion of FPLG in this research is beyond the scope of both studies.

Recall as an Outcome Measure

The extremely low recall rates of both groups in the second study highlight the need for improved assessment of the impact of discharge instructions and the provision of understandable and utilizable discharge instruction reference materials. Early readmission to the hospital due to preventable adverse events is a costly problem both in terms of significant patient burden and substantial financial expenditures (Chugh, Williams, Grigsby, & Coleman, 2009). Preventable adverse events are often associated with a patient's inability to follow discharge instructions, typically because they did not

understand their instructions or the importance of following those instructions ("The Revolving Door: A report on U.S. hospital readmissions," 2013). This is reflected in the results of the second study in that patients recall a very small percentage of their discharge instructions at discharge and even less 1 week later. Dual Coding Theory (the theoretical framework of the study) can explain why patients who received pictograph-enhanced discharge instructions remember more of their instructions at discharge. It does not account for the result that higher rates of recall of the content of pictograph-enhanced discharge instructions did not carry through to 1 week posthospitalization. The fundamental issue may be that knowledge does not necessarily lead to behavior so that the knowledge gained through discharge instruction education is not reinforced behaviorally when the patient returns home and the information is forgotten (Glanz et al., 2008).

The metric of recall may also be a limiting factor in the accurate assessment of the impact of illustrated discharge instructions as evidenced by the fact that patients did not remember most of the content of their discharge instructions. Patients were given up to 15 minutes to review their instructions. It would be almost impossible to memorize that volume of information in the limited period of time, especially with the deficits of cognition and memory many patients experience when hospitalized. It is likely that patients read for understanding and not memorization. Therefore, the measure of recall may not fully assess a patient's knowledge of their discharge instructions. In order to better evaluate and measure the impact of discharge instruction education and materials, assessment of patient concept retention, adherence and documentation of any adverse

events or early readmissions that follow discharge could provide a more comprehensive examination.

The creation of new patient education materials was beyond the scope of this project. However, lessons learned from the study reported in Chapter 3 were incorporated into the creation of study documents for the study reported in Chapter 4. Both the illustrated and nonillustrated disease specific templates in the second study (Appendix B & C) were reorganized to increase the readability of content by 1) bulleting information that was in paragraph form, 2) changed the font from Times New Roman to Helvetica and font size from 12 to 13, 3) and standardized the colors with blue for headings and black for the text. This may have resulted in minimizing the recall difference between pictograph-enhanced and standard discharge instructions. The study team debated the changes made to the standard documents and a nonunanimous decision was made to keep the formatting changes in the standard disease/procedure specific template even though it had been reformatted for readability.

Satisfaction as an Outcome Measure

Although patient satisfaction with standard and pictograph-enhanced instructions was very high, given the specific critique of discharge instructions from patients in the first study, there is obvious room for improvement. One explanation for the high satisfaction ratings could be that patients had nothing to compare their discharge instructions with. Additionally, since patients often don't recognize their own knowledge deficits they may not be aware that their instructions aren't sufficient to provide the information that they need (Engel et al., 2009, Samuels-Kalow et al., 2012). While it is encouraging that patients in the second study had higher satisfaction with the

understandability of their instructions 1 week after discharge, patient satisfaction may not yield sufficient information to be a useful research measure to assess the effectiveness of discharge instructions.

Future Research

While this study demonstrated that the addition of illustrations to discharge instructions can improve immediate recall of instructions as well as satisfaction with the understandability of discharge instructions one week after discharge, more research is necessary to not only improve the impact of illustrations for patients but to also explore additional interventions to improve the discharge process. Discharge instructions are long and may have too much information that results in patient information overload. Dr. Zeng's team has initiated secondary analysis of the data from the second study in order to determine if there are patterns associated with the content of discharge instructions. For example, is there content of discharge information that is remembered by a majority of patients and content that most patients forget? Additional exploration of the content of discharge instructions to determine if content can be separated into instructions relevant for aftercare versus health education is underway. Separating information that is important to provide in an inpatient setting versus information more suited for other venues has the potential to improve integration and mastery of necessary health promoting behaviors and reduce or eliminate negative health behaviors in order to ameliorate acute or chronic health problems.

Health Promotion and Education

Another component of the discharge process that could potentially be improved through the application of health education and promotion theory is patient adherence to discharge instructions. A foundational theory of the field of health promotion and education is the Health Belief Model (HBM). One component of the HBM is self-efficacy defined as a subjective appraisal of one's ability to perform recommended health action (Glanz et al., 2008). A patient's level of self-efficacy to perform necessary behaviors to successfully perform their discharge instructions is instrumental in whether the patient will or will not adhere to discharge instructions. If a patient has low self-efficacy for performing discharge instruction activities they will likely become frustrated and won't persevere. However, if a patient has high self-efficacy for performing discharge instruction activities, it is far more likely that they will adhere to their discharge instructions. The most important aspect of attainment of self-efficacy is experience or mastery of the desired behavior(s) (Glanz et al., 2008). For example, a patient may observe or have a dressing change explained, but unless patients have the opportunity to practice the dressing change until they are comfortable that they can successfully complete the dressing change, they are far less likely to be able to do it when at home without professional assistance. It has been my experience that there is a lot of time in which a patient is not engaged in clinical care while inpatient that could be used as opportunities to practice desired aftercare behaviors with the assistance of a health educator or nurse educator. Unfortunately, in my review of literature about preventable early readmission to the hospital due to adverse events, the application of health education and promotion theory to the discharge process has not been addressed.

Patients, regardless of group assignment, retained more information at discharge than at 1 week post discharge. The amount of information that patients remember follows a similar pattern as other posthospitalization services. The percentage of patients who are referred to cardiac rehab at the University of Utah Hospital and the drop out rate of those patients have only recently been tracked. For May of 2014, 24 patients were referred to cardiac rehab and 20 patients followed up on the referral. Drop out rates for cardiac rehab were estimated by the program manager at 35-40% who do not complete the entire program from beginning evaluation to ending evaluation (T. Brannon, personal communication, May 20, 2014). This is consistent with the concept of cue to action in the Health Belief Model theory in which patients are more motivated to make positive changes immediately after a health scare but motivation to make positive changes declines with the amount of time elapsed from the health scare event (Glanz et al., 2008). Application of theories of behavior change are lacking in the creation and teaching of discharge instructions which is likely one of the root causes for poor adherence to rehab as well as poor recall of discharge instructions after 1 week. Components of the HBM that should be incorporated in discharge instructions and teaching that could increase performance and adherence to discharge activities include: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cue to action and self-efficacy (Glanz et al., 2008).

Leveraging Informatics for the Development of Patient

Health Information

Health information graphics, or health infographics, according to the CDC (2014), are “are visual representations of data, information or knowledge that tell a story through

visual communication.” These can be created and placed in conspicuous places to act as cues to remind and prompt individuals to engage in a desired behavior. For example, diet infographics could be placed on a refrigerator; medication infographics on a medicine cabinet mirror or above a kitchen sink. Another innovation includes wearable health devices, from a simple pedometer to a new iWatch, which may be the wave of the future to provide health reminders and personal health data. The immediate feedback and health data that change as a result of behavior change that these devices provide holds promise for populations that will utilize these new innovations. However, comfort and use of technology varies based on exposure and experience with technology. While neither of these can replace discharge instructions, they can be useful adjuncts that can improve the efficacy of adherence to discharge instructions.

Looking to the future, it will be imperative to create discharge instruction and health education materials that are integrated in a patient’s Internet-based PHR. As more patients become accustomed to using a PHR, the delivery of discharge instructions and health education to patients through the PHR is anticipated. The PHR web platform can accommodate animations and video, which, through social modeling, can help patients practice the desired behaviors included in discharge instructions. Additionally, access to real or realistic pictures can help a patient identify adverse events such as infected incisions, decubitus ulcers or other signs and symptoms that should be reported to a healthcare provider. Wearable health devices could also relay data to a PHR for patient health tracking and feedback that could also be shared with clinicians. The future of patient education within the context of discharge instructions is about to change radically as more patients adopt PHRs and other health technologies. It is essential that those

involved in the creation, distribution and use of healthcare instructions and education materials are prepared to exploit the opportunities of technological advances that can help a patient negotiate posthospitalization care requirements.

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APPENDIX A

PICTOGRAPH TESTING

Table A1: Sample Questions with High and Low Scores





Image	Sample Question	Sum of Rating	Correct Answer	Answers
	<p>_____</p> <p>will make you feel weak and dizzy.</p>	<p>25 Low</p>	<p>Low blood sugar</p>	<p>donating blood low blood pressure less than 60 blood test low BP low blood pressure narcotics giving blood, blood transfusion low blood sugar ? driving low blood pelse (pulse) test blood blood sueco (sugar)</p>
	<p>Tell your doctor if you have</p> <p>_____</p>	<p>37 Low</p>	<p>Kidney disease</p>	<p>lung disease sad lungs kidney ploms (problems) renal failure lung problems kidney problems ? kidney problems kidney disease lung problem kidney problems kidney problem kidney pain</p>

Table A1: Continued

Image	Sample Question	Sum of Rating	Correct Answer	Answers
	<p>Call your doctor immediately if you have an abnormally _____</p>	<p>51 Medium</p>	<p>Fast Heartbeat</p>	<p>Afib rapid heart beat fast heart beat too fast heart beat (rate) fast heart rate in your heart fast heart rate fast heart rate fast pulse heart is bad bite fast hart (heart) bead (beat) fast heart beat fast heart beat faster</p>
	<p>Call your doctor right away if you have _____</p>	<p>57 High</p>	<p>Blood in your urine</p>	<p>blood in urine blood in urine blood in your pee blood in urine blood in urine blood in your urine bloody urine blood in urine blood in urine bloody urine blood in urine blood in uren (urine) Orin (urine) bleeding pee red orine (urine)</p>

APPENDIX B

STANDARD DISCHARGE INSTRUCTION TEMPLATES



Ablation Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting. Your next PT/INR blood check is on_____.

Call Your Cardiologist if You Have any of the Following:

- Fainting, dizziness, racing heart rate
- Fever more than 100.5 (F)
- Nausea or vomiting
- Extreme fatigue
- Shortness of breath or difficulty breathing
- Swelling in your legs, hands, or stomach
- Bleeding, swelling or infection at incision site(s)
- Unusual changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the “EP Fellow on call.”

Restrictions:

- You may drive in 2 days.
- Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.
- No strenuous activity for 1 week.

Wound Care:

- Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.

- Consider sites healed after 5 days.
- Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.
- Do not use lotions, ointments or powders at the site until it is healed.
- Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.
- Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.
- If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Other Information:

Daily Weights:

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.

- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508. Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Atrial Fibrillation Ablation Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

Blood Test:

You must have a blood test if your doctor prescribes 7 days of a diuretic and potassium. Have the BMP (Basic Metabolic Panel) one week after your discharge. Please have the results faxed to 801-587-5872.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting. Your next PT/INR blood check is on _____.

Call Your Cardiologist if You Have Any of the Following:

- Chest discomfort or burning that lasts more than 2-3 days after the procedure.
- Difficulty swallowing
- Fainting, dizziness, racing heart rate
- Fever over 100.5
- Nausea, vomiting or persistent cough
- Extreme fatigue
- Shortness of breath or difficulty breathing
- Swelling in your legs, hands or stomach
- Bleeding, swelling, or infection at incision site(s)
- Unusual changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the “EP Fellow on call.”

Call 911 Or Go to the Emergency Room if You:

- Cough up or vomit blood
- Have sudden or severe chest pain
- Have signs of a stroke including weakness or numbness in your face or limbs-especially on one side of the body-confusion, loss of

balance, trouble speaking or seeing

Restrictions:

- You may drive in 2 days.
- Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.
- No strenuous activity for 1 week.

Wound Care:

- Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.
- Consider sites healed after 5 days.
- Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.
- Do not use lotions, ointments or powders at the site until it is healed.
- Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.
- Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.
- If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Event Monitor:

Your doctor has ordered an event monitor to record your heart rhythm. You must wear the monitor every day for 60 days.

Other Information:**Daily Weights:**

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.

- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.
- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508. Talk to your doctor about

Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Angiogram Patient Instructions

Medications:

Bring your current medication list to all your doctor appointments.

Call Your Cardiologist if you Have any of the Following:

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Extreme fatigue
- Nausea or vomiting
- Shortness of breath or difficulty breathing
- Swelling in your legs, hands, or stomach
- Bleeding, swelling or infection at incision site(s)
- Changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Cardiology Fellow on call."

If You Have Chest Pain:

- Stop all activity and sit down.
- If the chest pain does not go away after 5 minutes of rest, call 911.

Do NOT drive yourself to the emergency room!

Restrictions:

- You may drive in 2 days.
- No strenuous activity for 1 week.

Wound Care (Leg/Groin):

- Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.
- Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.
- Consider sites healed after 5 days.
- Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.
- Do not use lotions, ointments or powders at the site until it is healed.
- Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.
- Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.
- If you start bleeding from your leg/groin incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Wound Care (Arm/Wrist):

- Do not lift more than 5 pounds with affected wrist for 7 days. A half gallon of milk is 4 pounds.
- Remove the clear dressing 24 hours after it was placed.
- Leave puncture site open to air after 24 hours. If there is minor oozing from the puncture site, apply a Band-Aid and remove it in 12 hours.
- Do not flex or extend your wrist more than 30 degrees for the next 24 hours.
- Do not soak your wrist for 3 days.
- If you start bleeding from your arm/wrist incision, apply pressure for 15 minutes with your thumb on one side of your wrist and your fingers on the other (pinching your wrist). Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Fluids:

Increase your fluid intake by about 1 liter (about a quart) of water today and tomorrow. This will help prevent dehydration as well as help remove the contrast dye from your body

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508. Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Nutrition:**Heart Healthy Diet:**

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.

- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



ASD/PFO Closure Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

Call your cardiologist if you have any of the following:

- Heavy bleeding
- Abdominal (stomach) pain
- Fever more than 100.5
- Bleeding, swelling or infection at incision site(s)

Call your Doctor and go to the nearest ER if you have these symptoms:

- Severe chest pain or very fast heart rate
- If you suddenly can't see, move, speak, swallow, or smile
- Severe headache (the worst you've ever had)

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital

operator to speak to the "Interventional Cardiology Fellow on call."

Restrictions:

- You may drive in 2 days.

You may resume normal activity in 3-4 days EXCEPT:

- Do not lift, push or pull more than 10 pounds for 1 month. A gallon of milk is 8 pounds.
- No strenuous activity, strenuous exercise, or contact sports for 1 month.
- Activity restrictions may vary. Talk to your Cardiologist about your restrictions.

Wound Care:

- Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.
- Consider sites healed after 5 days.
- Dressings should be removed after 24 hours. You may use a Band-Aid for a day or two.
- Do not use lotions, ointments or powders at the site until it is healed.
- Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is swelling or hurting more.
- If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Device Card:

Carry your device card with you at all times.

Dental Care:

Avoid dental care for 6 months (including cleanings). If you require emergency dental care, your dentist must prescribe an antibiotic for you to take at least 1 hour before any dental procedure.

Surgery:

Avoid surgery for 6 months. Surgery requires that you stop taking blood thinner medication. If you stop taking Plavix or aspirin in the first six

months following your heart procedure, your risk of stroke after any surgery increases. If you have to have surgery, talk with your cardiologist first.

What to expect:

Awareness of your heart beat-fluttering, skipping, feeling of short of breath, mild chest discomfort or feeling a lump in the throat are all common symptoms after this procedure. Call your cardiologist if symptoms last for more than 2 hours.

Bruising/bleeding-are more common because of the Plavix and Aspirin use. Do not stop taking these medications unless your cardiologist tells you to do so. Women who have periods may experience some heavy bleeding in the first month after starting these medications.

Migraines and Headaches-are common after the procedure. This does not mean there is anything wrong with the device. Your headaches may actually be more severe or frequent during the first month after your surgery. Continue to treat them as you normally would. They will become less frequent and less severe with time.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Coronary Artery Disease / Stent / Heart Attack Patient Instructions

What is a Stent?

A stent is a very small wire tube that is placed in the blood vessel to help keep the artery open. The stent will stay in your artery always, and you will need to take a medication every day to avoid a blockage forming inside the stent. Your doctor will have you take a blood thinning medication for a minimum of one year, in most cases. Never stop taking or miss a dose of your blood thinner unless your Cardiologist tells you to.

Medications:

Bring your current medication list to all your doctor appointments.

Call Your Cardiologist if you Have any of the Following:

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Extreme fatigue
- Nausea or vomiting
- Shortness of breath
- Swelling in your legs, hands, or stomach
- Bleeding or swelling at your leg site
- Changes in blood pressure or heart rate

Phone Numbers:

During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.

After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Cardiology Fellow on call."

If You Have Chest Pain:

- Stop all activity and sit down.
- If the chest pain does not go away after 5 minutes of rest, call 911.

Do NOT drive yourself to the emergency room!

Restrictions:

- If you had stents only, do not lift more than 10 pounds for 3 days. A gallon of milk is 8 pounds.
- If you had a heart attack, do not lift more than 10 pounds until your cardiologist tells you it is OK.
- Do not drive for 2 days.
- No strenuous activity for one week.

Wound Care (Leg/Groin):

- Do not lift more than 10 pounds for 3 days. A gallon of milk is 8 pounds.
- Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.
- Consider sites healed after 5 days.
- Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.
- Do not use lotions, ointments or powders at the site until it is healed.
- Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.

- Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.
- If you start bleeding from your leg/groin incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Wound Care (Arm/Wrist):

- Do not lift more than 10 pounds with affected wrist for 3 days. A gallon of milk is 8 pounds.
- Remove the clear dressing 24 hours after it was placed.
- Leave puncture site open to air after 24 hours. If there is minor oozing from the puncture site, apply a Band-Aid and remove it in 12 hours.
- Do not flex or extend your wrist more than 30 degrees for the next 24 hours.
- Do not soak your wrist for 3 days.
- If you start bleeding from your arm/wrist incision, apply pressure for 15 minutes with your thumb on one side of your wrist and your fingers on the other (pinching your wrist). Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Fluids:

Increase your fluid intake by about 1 liter (about a quart) of water today and tomorrow. This will help prevent dehydration as well as facilitate the removal of contrast dye from your body.

Activity:

Moderate exercise is very important for heart health. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 3-5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase your difficulty so you are still working with medium effort. Always cool down for 3-5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes or more most days of the week. Cardiac Rehab is recommended for best recovery.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a

week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508.

Nutrition:

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.
- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting call the Quit Line for your state, or talk to your doctor about medications that may help.

Other Instructions:**Daily Weights:**

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Write it down in a journal.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Cholesterol Test:

Have a fasting blood draw in 6-8 weeks to make sure you are at goal (if you just started a statin or changed your dose).

- Your total cholesterol should be around 130.
- HDL (good) levels should be more than 40 for men, 50 for women.
- LDL (bad) levels should be less than 70.
- Triglyceride levels less than 150.

Diabetes Control:

- Your Hemoglobin A1c should be less than 7.0.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

**Pacemaker or Defibrillator Patient Instructions**

Medication:

Bring your current medication list to all your doctor appointments.

Call Your Cardiologist if You Have any of the Following:

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Nausea or vomiting
- Shortness of breath or difficulty breathing

- Bleeding, swelling or infection at incision site(s)
- You get shocked by your defibrillator
- You notice anything unusual or unexpected that concerns you

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the “EP Fellow on call.”

Restrictions:

For the Next 3 Weeks:

- You may move your arm freely, but do not raise it above your shoulder.
- Do not lift more than 10 pounds with the arm on the same side as your new device. A gallon of milk is 8 pounds.

After 3 Weeks:

- You may return to normal activity unless your doctor gives you other instructions.

Other:

- You may drive when you feel well (unless you have a groin incision, then you must wait two days before driving).
- You may resume sexual activity when you feel ready.

Device Wound Care:

- Keep the dressing dry and in place until your follow-up appointment in 7-10 days.
- Do not shower while the dressing is on.
- If the dressing gets wet or dirty, replace it with a clean dry gauze and tape it in place.
- After the dressing comes off you can shower with mild soap and water.
- Do not take a tub bath, go swimming or soak in a hot tub for 6 weeks or until the incision is completely healed.
- Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.

Additional Instructions (if a catheter/tube was placed through your groin for electrophysiology studies):

Restrictions:

- You may drive in 2 days.
- Do not lift more than 10 pounds with either arm for 1 week. A gallon of milk is 8 pounds.

Wound Care (Leg/Groin):

- Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.
- Shower and clean the sites with mild soap and water daily. Do not take a bath, go swimming or use a hot tub for 5 days.
- Consider sites healed after 5 days.
- Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.
- If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Device Guidelines:

Carry your device card with you at all times. At first, you will have a temporary card. In 4-6 weeks you will receive a permanent card.

- Avoid strong magnetic or electrical currents, large running motors and arc welding. CT scans and x-rays are safe. You cannot have an MRI unless you received an MRI-safe device (check your device booklet, with the manufacturer, or with your cardiologist).
- Use cell phones on the side opposite your device. Do not carry cellphones in a shirt pocket right over your device.
- Most household appliances are safe to use including microwave ovens.
- Let your arrhythmia doctor know if you are going to have any surgery.
- Read your device booklet carefully. Call the company if you have any questions about your device.

Defibrillator Guidelines:

- Call 911 if you get a shock from your defibrillator that makes you feel dizzy, lightheaded or causes your heart to race.
- Call 911 if you get multiple shocks from your defibrillator.

- If you get a shock from your defibrillator but feel OK afterwards, call your arrhythmia doctor to let them know.

Follow-Up:

You should follow up with your arrhythmia doctor in about three months. Most patients need regular checks of their device about every three months. Checks can be done in the doctor's office or over the phone with a special transmitter.

Other Information for Patients with Heart Failure:

Daily Weights:

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.
- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.

- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508. Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Heart Failure Patient Instructions

Follow-Up:

Go to all your follow-up appointments. It is very important. Appropriate follow-up will make you feel better faster, reduce the risk of a hospital stay and prolong your life.

Medication:

- Take all of your medications as prescribed.
- Bring your current medication list to all your doctor appointments.
- Do not stop taking any medication without your doctor's approval.

Call Your Cardiologist if You Have any of the Following:

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Increased shortness of breath
- Having to sleep on more pillows or sitting up
- Swelling in your legs, hands, or stomach
- Nausea or loss of appetite
- Weight gain of 3 pounds or more in 48 hours or 5 pounds or more in 7 days
- Changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 9-5) 801-585-5122 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Heart Transplant Fellow on call."

If You Have Chest Pain:

- Stop all activity and sit down.
- If the chest pain does not go away after 5 minutes, call 911.

Do NOT drive yourself to the emergency room!

Daily Weights:

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Activity:

Moderate exercise is very important for heart health. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 3-5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase your

difficulty so you are still working with medium effort. Always cool down for 3-5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes or more most days of the week.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508. Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Straining:

Do not lift more than 20 pounds when exercising or working in your home. Avoid straining or bearing down when working or going to the bathroom.

Nutrition:

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.
- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.

- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Other:

Avoid caffeine and alcohol.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Blood pressure

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 85.
- The medications used in treating heart failure keep your blood pressure lower than what you may be used to. If the top number is less than 80 OR you feel dizzy or lightheaded, call your doctor.

What to bring to your doctor's appointments:

- A record including daily weight, blood pressure and heart rate.
- Complete list of your medications or all your medication bottles.
- A record of daily blood sugars if you are diabetic.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

**Minimally Invasive Chest Surgery Patient Instructions**

Medication:

Bring your current medication list to all your doctor appointments.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the

legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting. Your next PT/INR blood check is on_____.

Call Your Surgeon if You Have any of the Following:

- Fainting, dizziness, racing heart
- Fever more than 100.5
- Nausea or vomiting
- Shortness of breath or difficulty breathing
- Swelling in your legs
- Bleeding, swelling or infection at incision site(s)
- Your incision seems to be opening up
- Rapid weight gain

Phone Numbers:

- During office hours (M-F, 8-4) 801-581-2121 or 800-824-2073. Ask for your surgeon's office.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "CT Surgeon on call."

If you are having an emergency:

- Call 911 or go to the emergency room.
- Ask the emergency room doctor to call your surgeon.

Restrictions:

- Do not drive while you are taking narcotics.
- Do not lift over 5 pounds for 2 weeks. A half gallon of milk is 4 pounds.
- You may start having sex again when you feel ready.
- Do not bear down or push hard to have a bowel movement. Pain medicine may cause constipation. Take stool softeners while you are on narcotics. Eating high fiber foods and drinking water also helps prevent constipation.
- Talk with your surgeon about when you can return to work.

Wound Care:

- If you leave with a dressing on your incision(s), remove it after 48 hours.

- Look at your wounds every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.
- You may shower after that if your incision has no open areas. Clean with mild soap and water, pat dry. Do not use lotions or powders.
- Gently remove any strips of tape in the shower after 48 hours.
- If you have stitches, they will be removed by your surgeon.
- No tub baths, swimming pool or hot tubs until the surgeon says OK (usually in 6 weeks).

Big Breaths:

Use your Incentive Spirometer every few hours while awake for the first two weeks. Do 10 slow, smooth, deep breaths each time. Don't rush the breaths. Keep trying to increase volume.

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week. Cardiac Rehab is recommended for best recovery from heart surgery.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508. Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Nutrition:

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.

- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.
- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Other Instructions:

Daily Weights:

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Keep a record and bring it to your appointment with the surgeon.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Cholesterol Levels:

This is an important part of your heart health. Talk to your doctor about when to check your fasting lipid panel.

- Your total cholesterol should be under 200.
- HDL (good) levels should be more than 40 for men, 50 for women.
- LDL (bad) levels should be less than 100.
- Triglyceride levels less than 150.

Diabetes Control:

- Your Hemoglobin A1c should be less than 7.0.

For Valve Surgery Only:

- No routine dental procedures for 3 months.
- Tell your dentist about your valve surgery.
- Follow the surgeon's advice about taking antibiotics before any dental procedure or surgery.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Transcatheter Aortic Valve Replacement Instructions

Medications:

Bring a current medication list to all your doctor appointments.

Call Your Cardiologist if you Have any of the Following:

- Fainting, dizziness, racing heart rate
- Fever more than 100.5 (F)
- Nausea, vomiting or persistent cough
- Extreme fatigue
- Shortness of breath
- Swelling in your legs, hands, or stomach
- Bleeding, swelling, or infection at incision site(s)
- Unusual changes in blood pressure or heart rate

Phone Numbers:

During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.

After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the “Cardiology Fellow on call”.

If You Have Chest Pain:

- Stop all activity and sit down.
- If the chest pain does not go away after 5 minutes of rest, call 911.

Do NOT drive yourself to the emergency room!

Restrictions:

- No driving after your surgery. Your doctor will tell you when you are allowed to drive again.
- Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.
- No sex or strenuous exercise for two weeks.

Wound Care:

- You may shower 2 days after your procedure as long as all your drains have been removed. Use only your hands, water and a mild antibacterial soap. Gently clean the incision sites then pat them dry. Do not scrub or use a washcloth.
- No tub baths, hot tub soaking or swimming for 8 weeks after procedure.
- Gently remove any strips of tape in the shower after 48 hours.
- Some bruising, drainage, or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.
- If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Daily Weights:

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week. Cardiac Rehab is recommended for best recovery from heart surgery.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508.

Nutrition:**Heart Healthy Diet:**

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.
- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.

- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Write it down in a journal.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Heart Surgery Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting.

Your next PT/INR blood check is on_____.

Call Your Surgeon if You Have any of the Following:

- Fainting, dizziness, racing heart
- Fever more than 100.5
- Nausea or vomiting
- Shortness of breath or difficulty breathing
- Swelling in your legs
- Bleeding, swelling or infection at incision site(s)
- Your incision seems to be opening up
- Rapid weight gain
- Unusual changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-581-2121 or 800-824-2073. Ask for your surgeon's office.
- After office hours 801-581-2121 or 800-824-2037. Ask the hospital operator to speak to the "CT Surgeon on call."

If you are having an emergency:

- Call 911 or go to the emergency room.
- Ask the emergency room doctor to call your surgeon.

Restrictions (also called "Sternal Precautions"):

- Do not drive for 4 weeks or while you are taking narcotics.
- Do not lift over 5 pounds for 6 weeks. A half gallon of milk is 4 pounds. Also avoid pushing, pulling, or carrying things for 6 weeks.
- You may start having sex again when you feel ready. Do not put pressure on your chest or hold yourself up with your arms for 6 weeks.
- Do not bear down or push hard to have a bowel movement. Pain medicine may cause constipation. Take stool softeners while you are on narcotics. Eating high fiber foods and drinking water also helps prevent constipation.
- Talk with your surgeon about when you can return to work.

Wound Care:

- If you leave with a dressing on your incision(s), remove it after 48 hours.
- Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.
- You may shower 5 days after your surgery if your incision has no open areas. Clean with mild soap and water, pat dry. Do not use lotions or powders.

- Gently remove any strips of tape in the shower after 48 hours.
- If you have stitches, they will be removed by your surgeon.
- No tub baths, swimming pool or hot tubs until the surgeon says OK (usually in 6 weeks).

Big Breaths:

Use your Incentive Spirometer every few hours while awake for the first two weeks. Do 10 slow, smooth, deep breaths each time. Don't rush the breaths. Keep trying to increase volume.

Activity:

Regular moderate exercise can reduce symptoms of tiredness and shortness of breath. It will help your daily activities become easier and you to feel better. The best heart exercises are walking or cycling at a medium pace that raises your pulse. Warm up for 5 minutes. Start out easy and slowly add time until you can exercise for 20-30 minutes. As you get stronger, increase the pace so you are still working with medium effort. Always cool down for 5 minutes and stretch after exercising. The American Heart Association suggests exercising 30 minutes most days of the week. Cardiac Rehab is recommended for best recovery from heart surgery.

Maintain Strength:

Lifting weights can help maintain strength and daily function. Check with your doctor to make sure it's OK, then start lifting light weights twice a week. Make sure you use proper technique. If you have questions, call our Exercise Specialists at 801-585-3508.

Nutrition:

You may not have much of an appetite for up to 4 weeks after your surgery. When you eat, choose protein and nutrient-rich foods to help you heal. When your appetite returns, your surgeon recommends the following:

Heart Healthy Diet:

- Eat lots of fruits and vegetables.
- Choose whole grains over white bread and white rice.
- Eat lean meats, fish, beans and non-fat dairy.
- Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.

- Cut back on high-calorie snack foods, desserts, and juices/sodas.
- Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.
- Limit yourself to 1800 to 2000 calories per day—try smaller portions.
- If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

The goal is to eat less than 2000mg of salt daily (about a teaspoon). Give yourself time to get used to eating less salt. It may take a little while. Here are some tips to help:

- Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.
- When you eat out, ask that your food be cooked without added salt. Fast food and restaurant food is prepared with large amounts of salt.
- Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.
- Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!

If you smoke, please stop to help prevent further health problems. If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Other Instructions:

Daily Weights:

Weigh yourself each morning after going to the bathroom but before eating or drinking. Keep a record of your weight every day. Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week. This is a sign of fluid overload, which strains the heart.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Write it down in a journal and bring it to your appointment with the surgeon.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Cholesterol Levels:

This is an important part of your heart health. Talk to your doctor about when to check your cholesterol panel to make sure you are at goal (if you just started a “statin” drug or changed the dose).

- Your total cholesterol should be around 130.
- HDL (good) levels should be more than 40 for men, 50 for women.
- LDL (bad) levels should be less than 70.
- Triglyceride levels should be less than 150.

Diabetes Control:

- Your Hemoglobin A1c should be less than 7.0.

For Valve Surgery only:

- No routine dental procedures for 3 months.
- Tell your dentist about your valve surgery.
- Follow your surgeon's advice about taking antibiotics before any dental procedure or surgery.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

APPENDIX C

ILLUSTRATED DISCHARGE INSTRUCTION TEMPLATES

Ablation Patient Instructions

Medication:

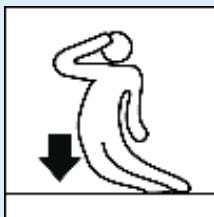
Bring your current medication list to all your doctor appointments.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting. Your next PT/INR blood check is on _____.

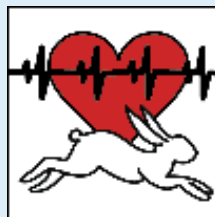
Call Your Cardiologist if You Have any of the Following:



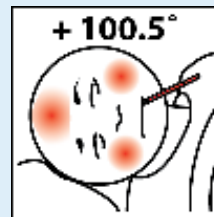
fainting



dizziness



racing heart
rate



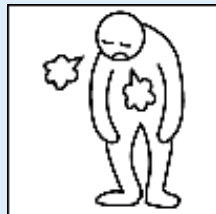
fever



nausea



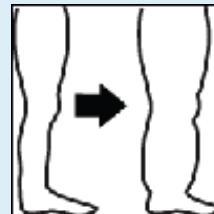
vomiting



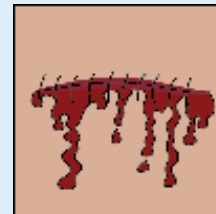
fatigue



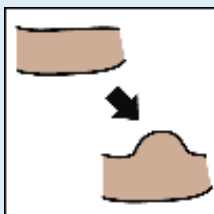
shortness of
breath



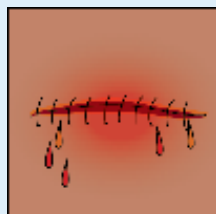
swelling in
legs



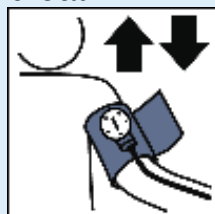
bleeding



swelling



infection at
incision sites



changes in
blood
pressure

- Fainting, dizziness, racing heart rate

- Fever more than 100.5 (F)
- Nausea or vomiting
- Extreme fatigue
- Shortness of breath or difficulty breathing
- Swelling in your legs, hands, or stomach
- Bleeding, swelling or infection at incision site(s)
- Unusual changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the “EP Fellow on call.”

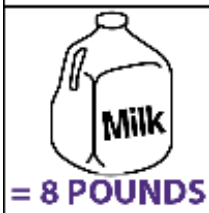
Restrictions:



You may drive in 2 days.

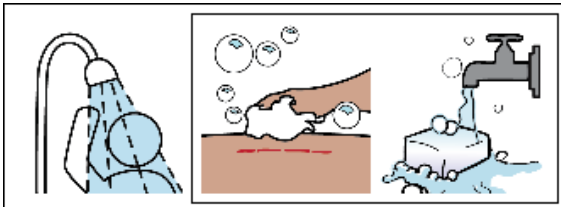


Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.

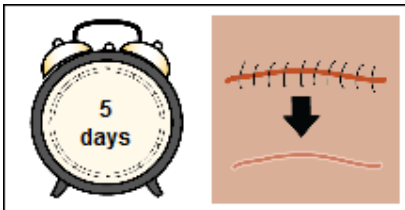


No strenuous activity for 1 week.

Wound Care:



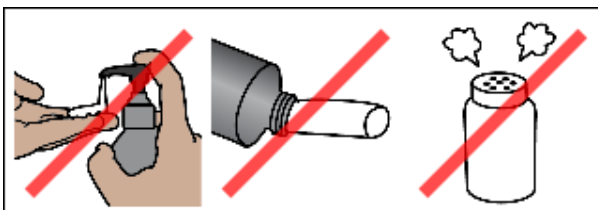
Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.



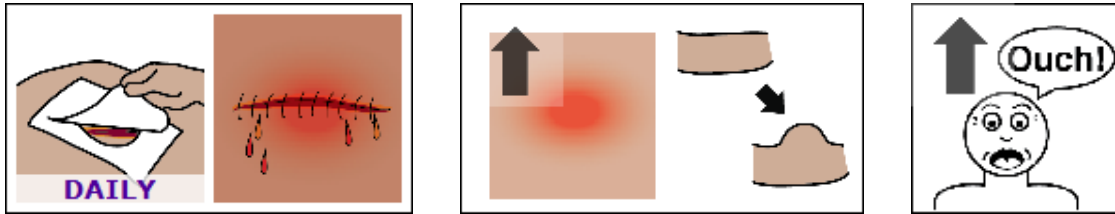
Consider sites healed after 5 days.



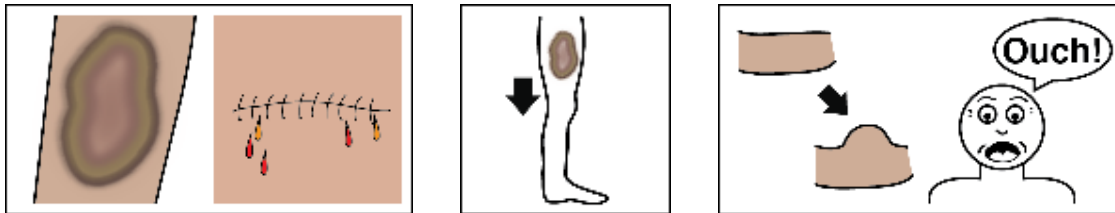
Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.



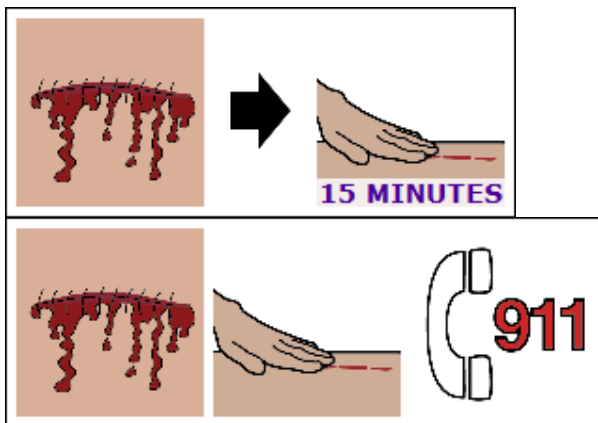
Do not use lotions, ointments or powders at the site until it is healed.



Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.

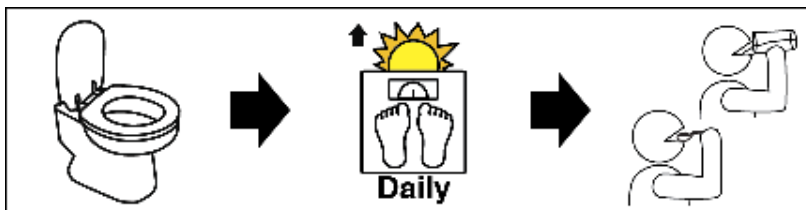


Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.



If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Other Information: Daily Weights:



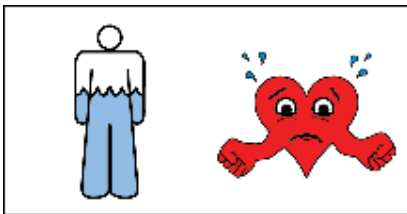
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.

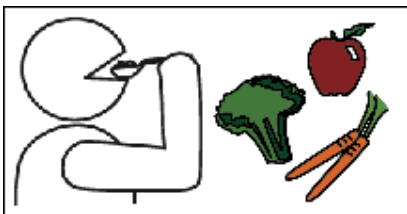


Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.

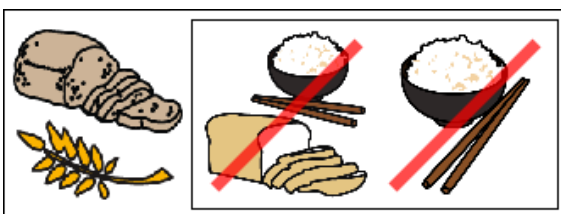


This is a sign of fluid overload, which strains the heart.

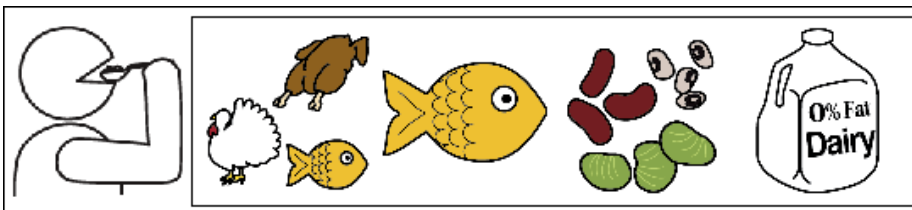
Heart Healthy Diet:



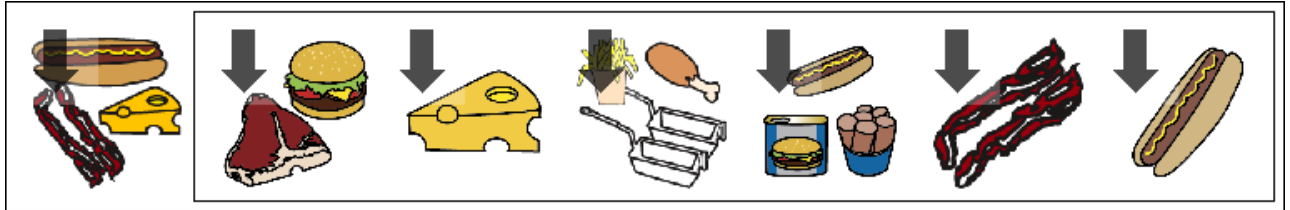
Eat lots of fruits and vegetables.



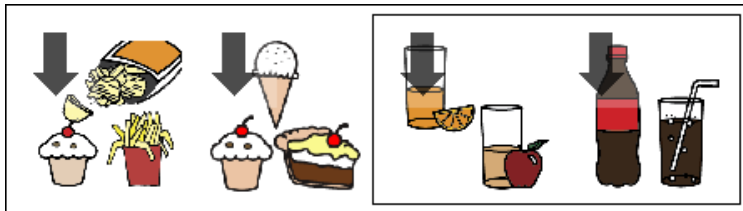
Choose whole grains over white bread and white rice.



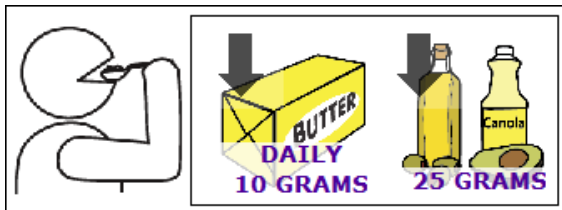
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



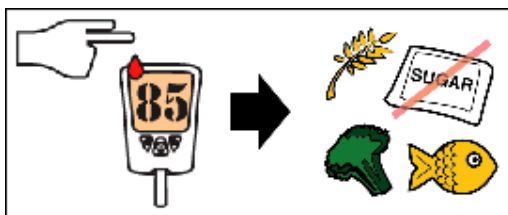
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

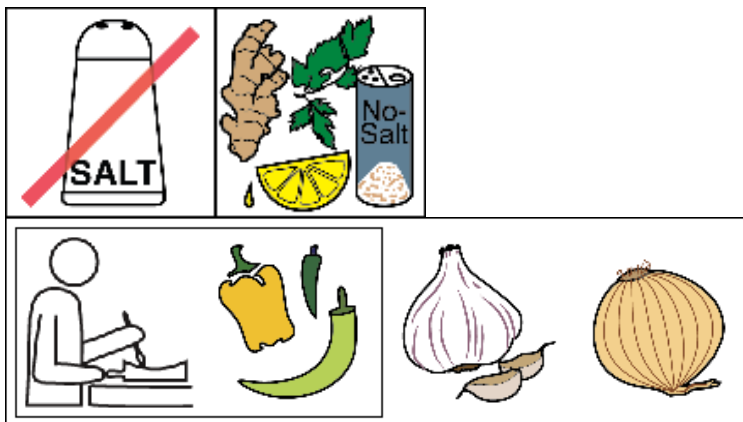


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

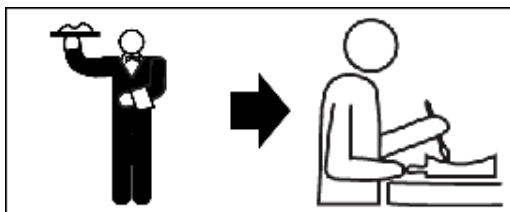


Give yourself time to get used to eating less salt. It may take a little while.

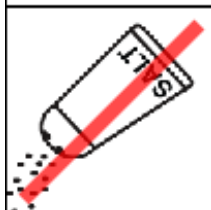
Here are some tips to help:

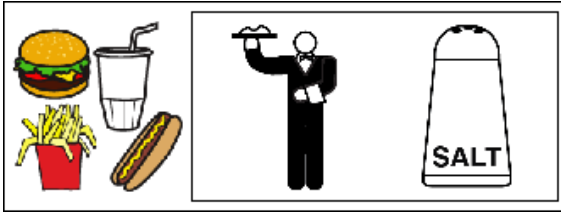


Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.

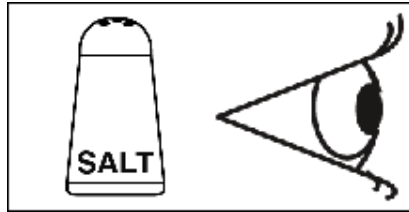


When you eat out, ask that your food be cooked without added salt.



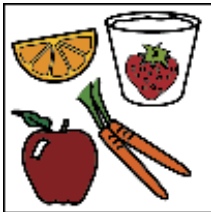


Fast food and restaurant food is prepared with large amounts of salt.



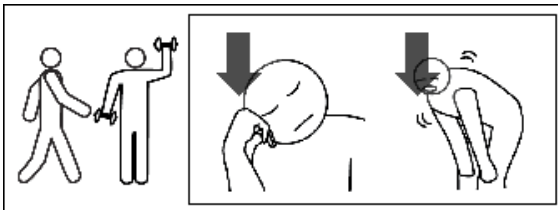
Nutrition Facts	
Amount Per Serving	
Calories 95	
Total Fat 1g	2%
Saturated Fat 0g	0%
Total Fat 1g	2%
Sodium 0mg	0%
Total amount of Sodium	
Sodium	

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.

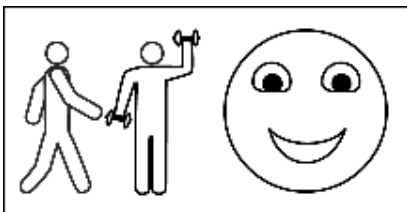


Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

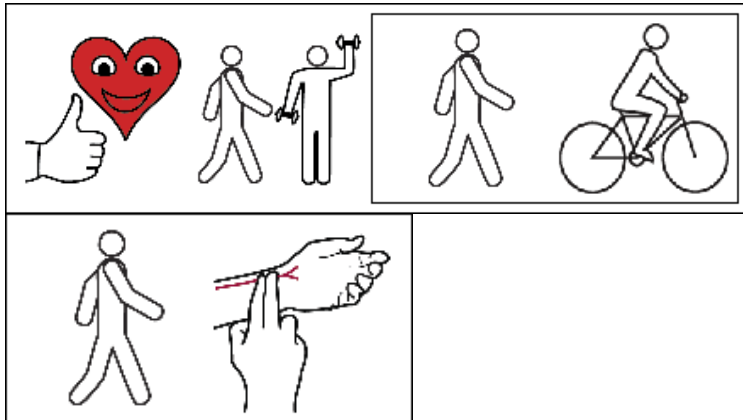
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



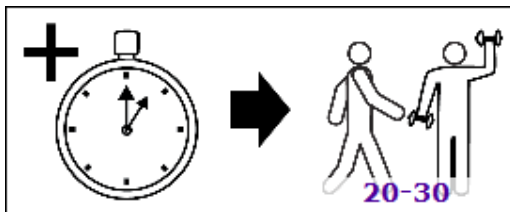
It will help your daily activities become easier and you to feel better.



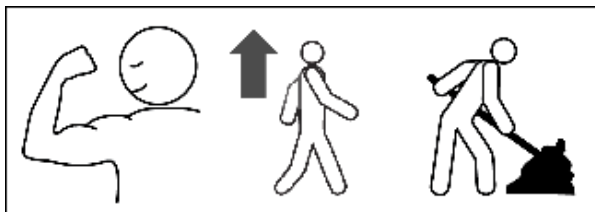
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



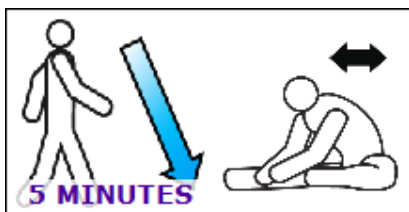
Warm up for 5 minutes.



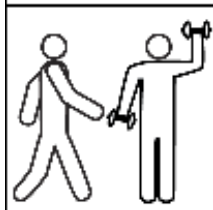
Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.



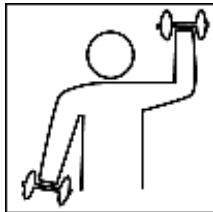
Always cool down for 5 minutes and stretch after exercising.





The American Heart Association suggests exercising 30 minutes most days of the week.

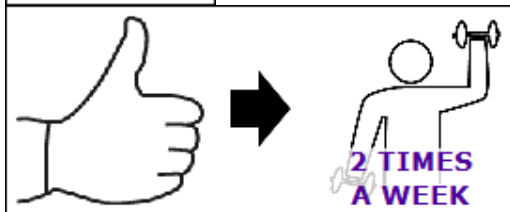
Maintain Strength:



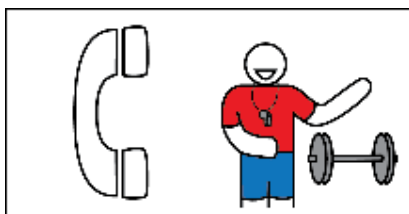
Lifting weights can help maintain strength and daily function.



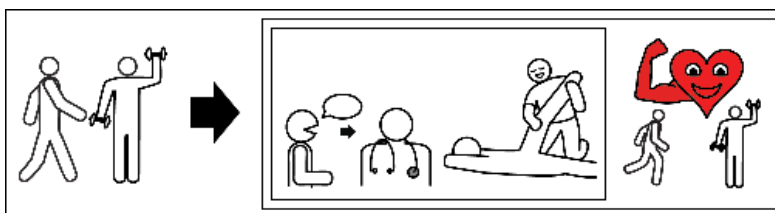
Check with your doctor to make sure it's OK, then start lifting light weights twice a week.



Make sure you use proper technique.

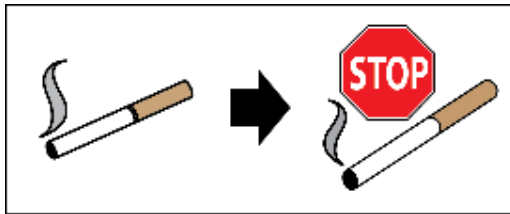


If you have questions, call our Exercise Specialists at 801-585-3508.



Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Do Not Smoke!



If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



UNIVERSITY OF UTAH
HEALTH CARE

Atrial Fibrillation Ablation Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

Blood Test:

You must have a blood test if your doctor prescribes 7 days of a diuretic and potassium. Have the BMP (Basic Metabolic Panel) one week after your discharge. Please have the results faxed to 801-587-5872.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

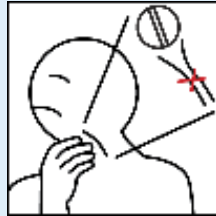
A test called the PT/INR is used to find out how your blood is clotting.

Your next PT/INR blood check is on _____.

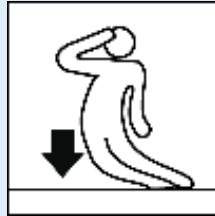
Call Your Cardiologist if You Have Any of the Following:



chest
discomfort or
burning



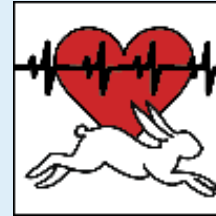
difficulty
swallowing



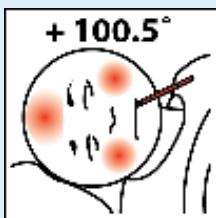
fainting



dizziness



racing heart
rate



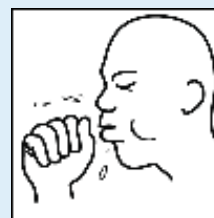
fever



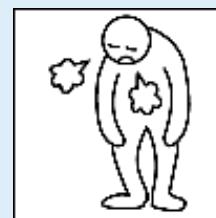
nausea



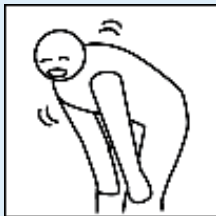
vomiting



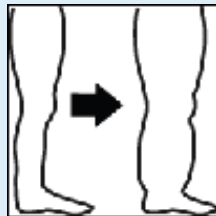
cough



fatigue



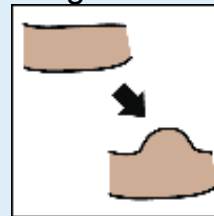
shortness of
breath



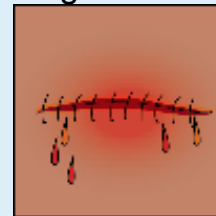
swelling in
legs



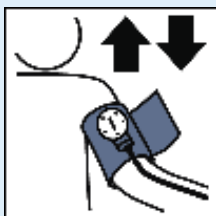
bleeding



swelling



infection at
incision sites



changes in
blood
pressure

- Chest discomfort or burning that lasts more than 2-3 days after the procedure.
- Difficulty swallowing
- Fainting, dizziness, racing heart rate
- Fever over 100.5
- Nausea, vomiting or persistent cough
- Extreme fatigue
- Shortness of breath or difficulty breathing
- Swelling in your legs, hands or stomach
- Bleeding, swelling, or infection at incision site(s)
- Unusual changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.

- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the “EP Fellow on call.”

Call 911 Or Go to the Emergency Room if You:



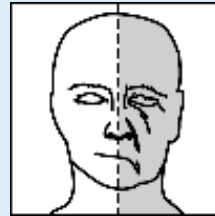
cough



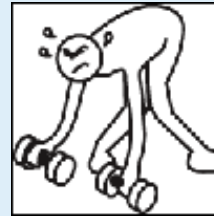
vomit blood



chest pain



stroke



weakness



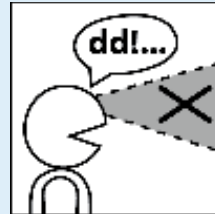
numbness



confusion



loss of
balance



trouble
speaking or
seeing

- Cough up or vomit blood
- Have sudden or severe chest pain
- Have signs of a stroke including weakness or numbness in your face or limbs-especially on one side of the body-confusion, loss of balance, trouble speaking or seeing

Restrictions:



You may drive in 2 days.

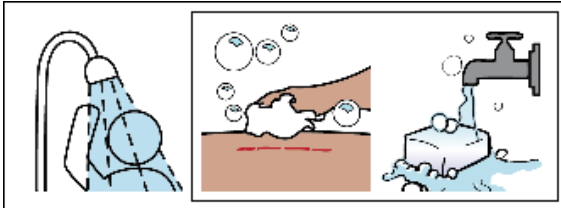


Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.

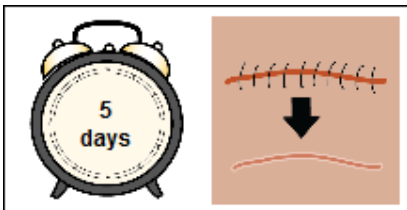


No strenuous activity for 1 week.

Wound Care:



Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.

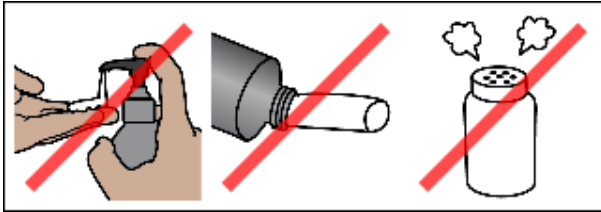


Consider sites healed after 5 days.

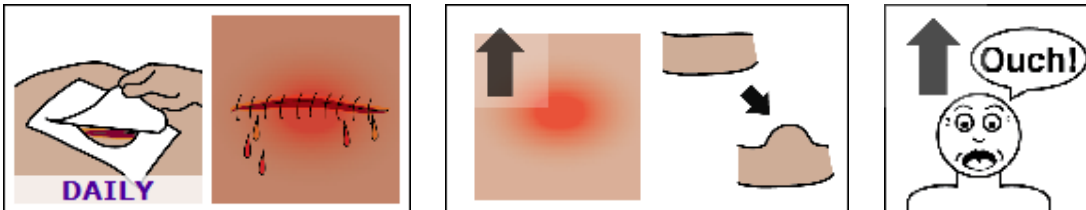


Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.

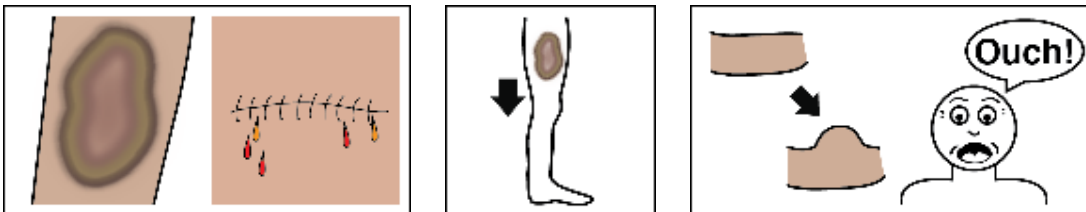




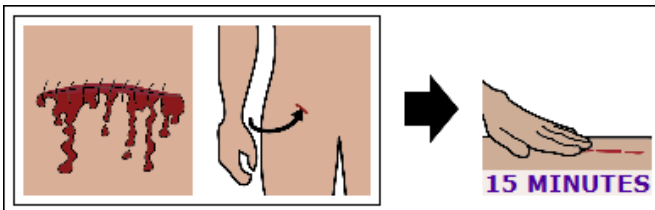
Do not use lotions, ointments or powders at the site until it is healed.



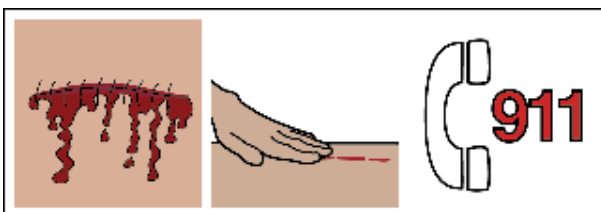
Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.



Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.



If you start bleeding from your leg/groin incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes.



If you are still bleeding, re-apply pressure and call 911.

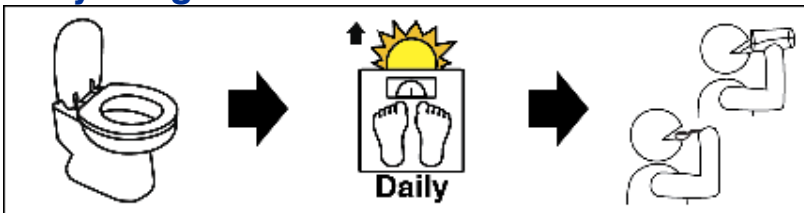
Event Monitor:



Your doctor has ordered an event monitor to record your heart rhythm. You must wear the monitor every day for 60 days.

Other Information:

Daily Weights:



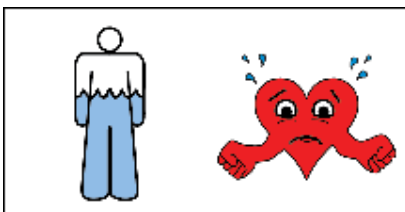
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.



Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.

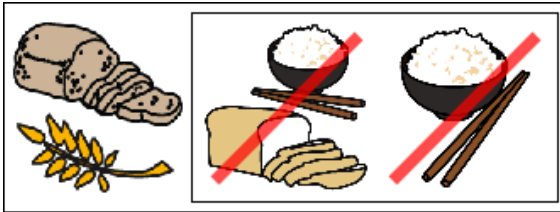


This is a sign of fluid overload, which strains the heart.

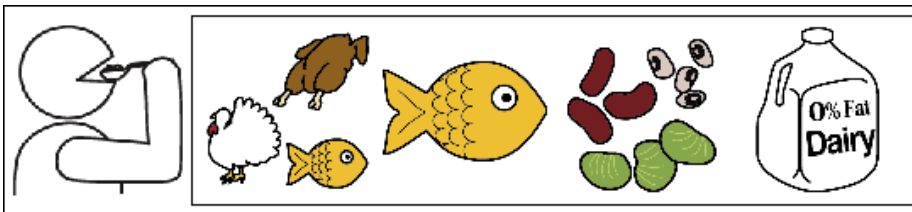
Heart Healthy Diet:



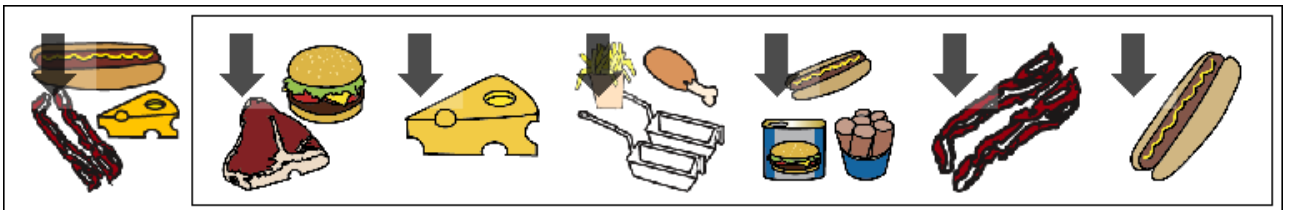
Eat lots of fruits and vegetables.



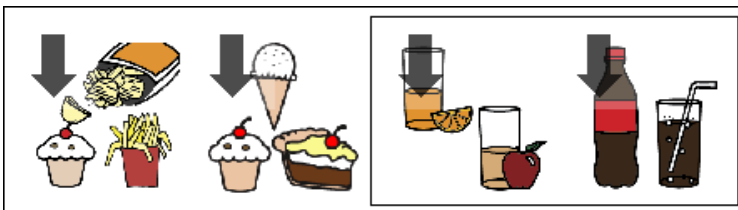
Choose whole grains over white bread and white rice.



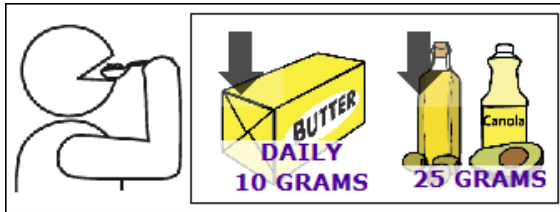
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



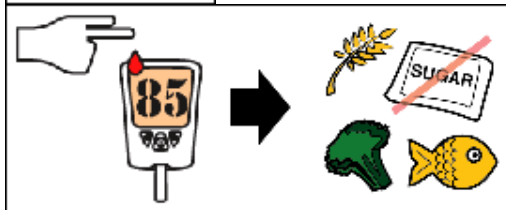
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

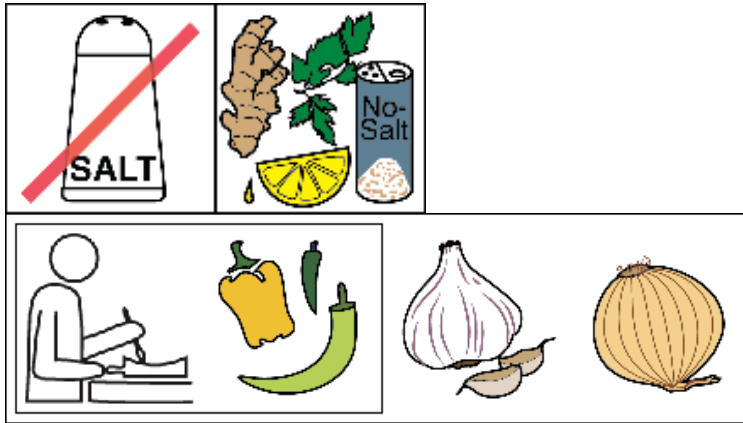


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

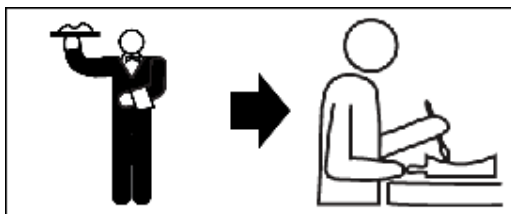


Give yourself time to get used to eating less salt. It may take a little while.

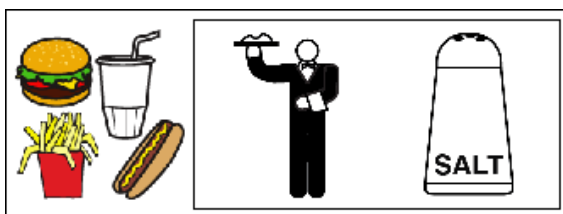
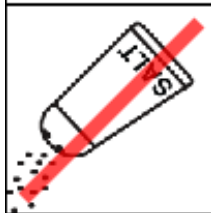
Here are some tips to help:



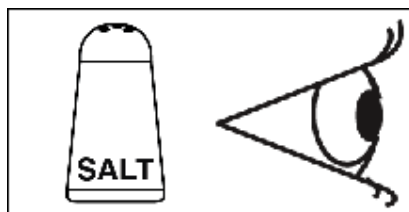
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



When you eat out, ask that your food be cooked without added salt.

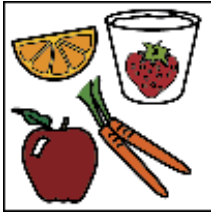


Fast food and restaurant food is prepared with large amounts of salt.



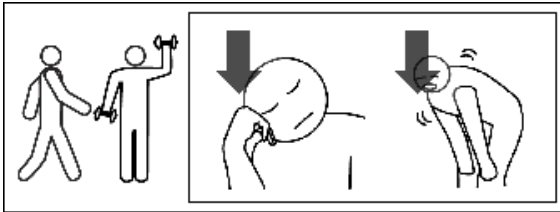
Nutrition Facts	
Serving Size: 1 cup Servings: 4	
Amount Per Serving	
Calories 85	Calories from Fat 45
Total Fat 17g	34%
Saturated Fat 2g	12%
Total Cholesterol 35mg	70%
Sodium 20mg	40%
Total Carbohydrate 14g	28%
*Percent Daily Values are based on a diet of other people's secrets.	
Sodium	

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.

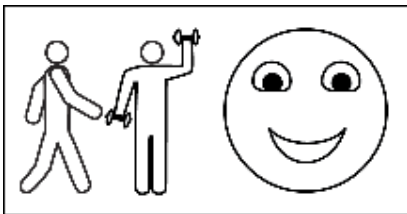


Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

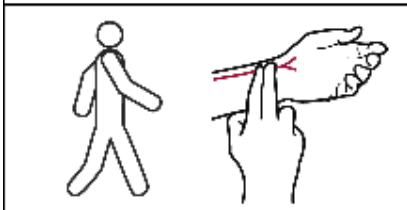
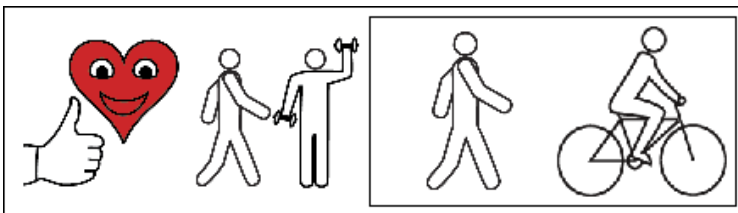
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



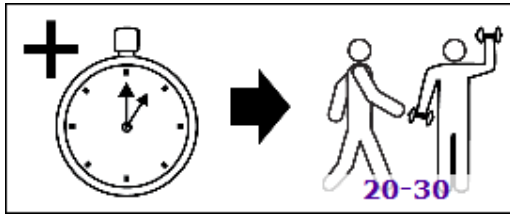
It will help your daily activities become easier and you to feel better.



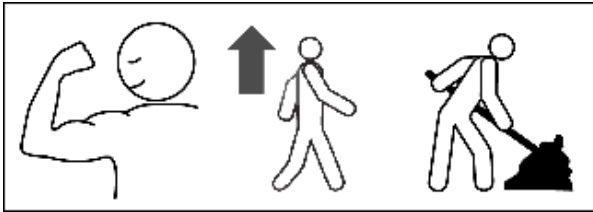
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



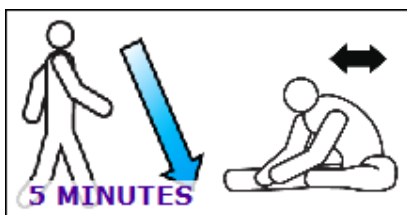
Warm up for 5 minutes.



Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.



Always cool down for 5 minutes and stretch after exercising.



The American Heart Association suggests exercising 30 minutes most days of the week.

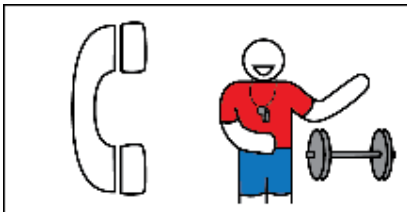
Maintain Strength:



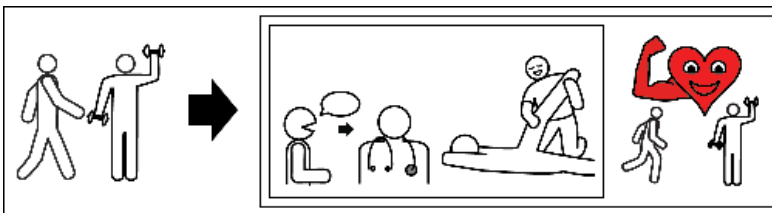
Lifting weights can help maintain strength and daily function.



Check with your doctor to make sure it's OK, then start lifting light weights twice a week.
 Make sure you use proper technique.

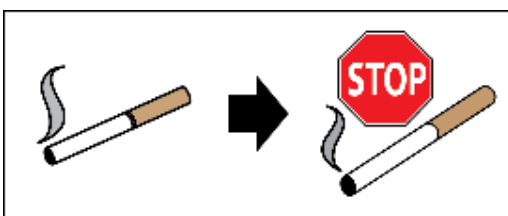


If you have questions, call our Exercise Specialists at 801-585-3508.



Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Do Not Smoke!



If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

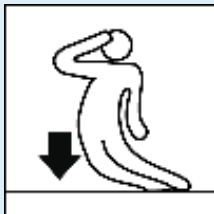


Angiogram Patient Instructions

Medications:

Bring your current medication list to all your doctor appointments.

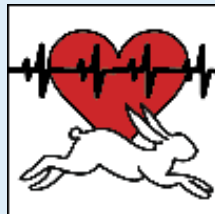
Call Your Cardiologist if you Have any of the Following:



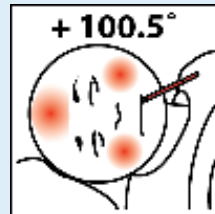
fainting



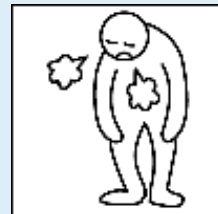
dizziness



racing heart
rate



fever



fatigue



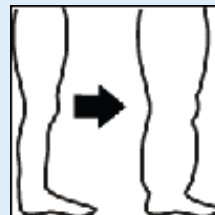
nausea



vomiting



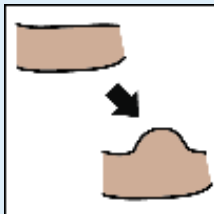
shortness of
breath



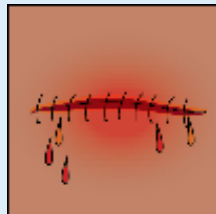
swelling in
legs



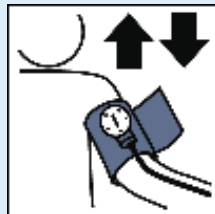
bleeding



swelling



infection at
incision sites



changes in
blood
pressure

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Shortness of breath or difficulty breathing
- Swelling in your legs, hands, or stomach

- Extreme fatigue
- Nausea or vomiting
- Bleeding, swelling or infection at incision site(s)
- Changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Cardiology Fellow on call."



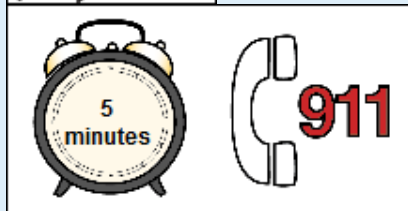
If You Have Chest Pain:



Stop all activity and sit down.



If the chest pain does not go away after 5 minutes, call 911.



Do NOT drive yourself to the emergency room!

Restrictions:



You may drive in 2 days.



No strenuous activity for 1 week.

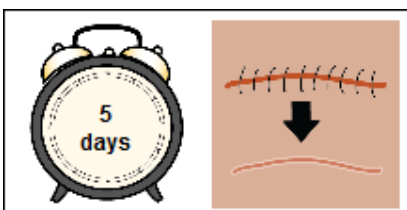
Wound Care (Leg/Groin):



Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.



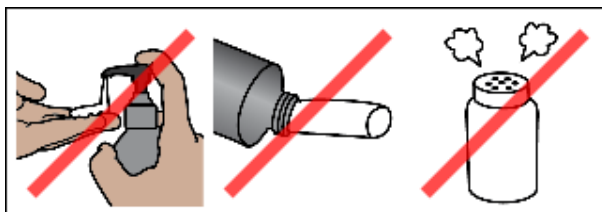
Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.



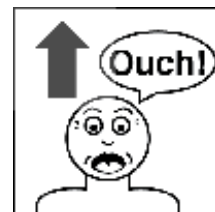
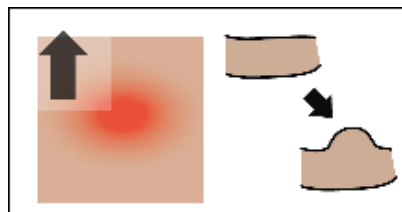
Consider sites healed after 5 days.



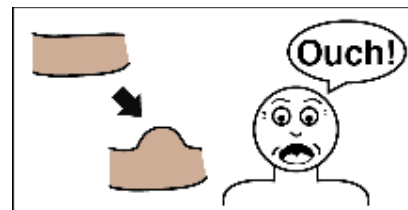
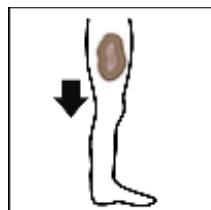
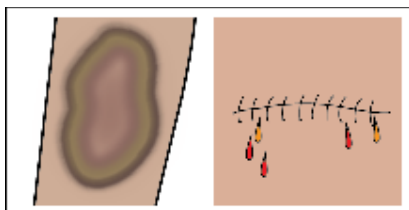
Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.



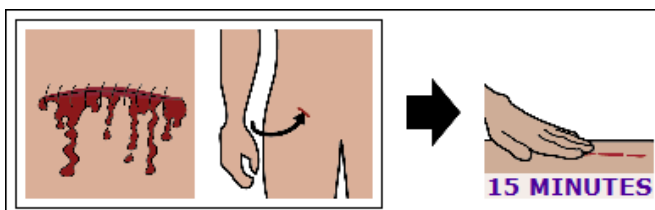
Do not use lotions, ointments or powders at the site until it is healed.



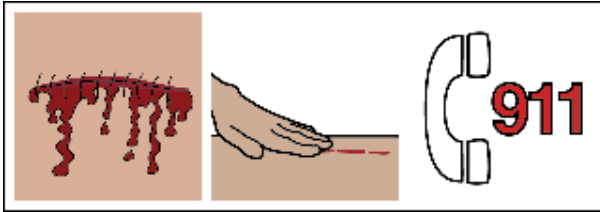
Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.



Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.



If you start bleeding from your leg/groin incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes.

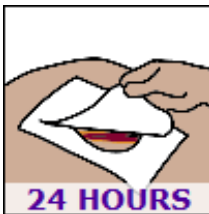


If you are still bleeding, re-apply pressure and call 911.

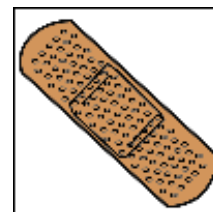
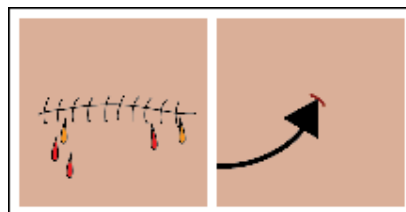
Wound Care (Arm/Wrist):



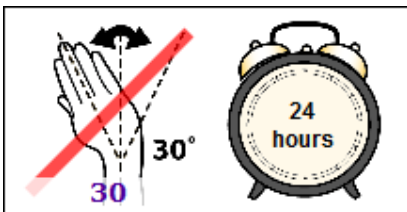
Do not lift more than 5 pounds with affected wrist for 7 days. A half gallon of milk is 4 pounds.



Remove the clear dressing 24 hours after it was placed.

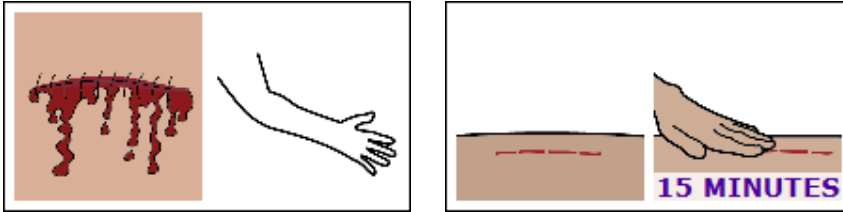


Leave puncture site open to air after 24 hours. If there is minor oozing from the puncture site, apply a Band-Aid and remove it in 12 hours.

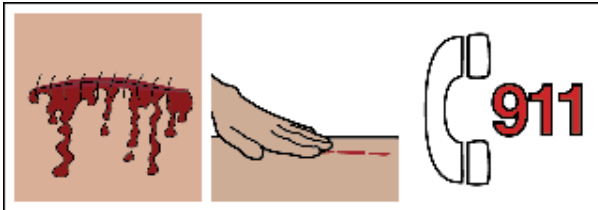


Do not flex or extend your wrist more than 30 degrees for the next 24 hours.

Do not soak your wrist for 3 days.

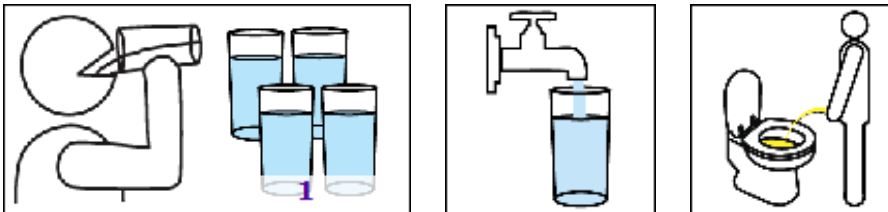


If you start bleeding from your arm/wrist incision, apply pressure for 15 minutes with your thumb on one side of your wrist and your fingers on the other (pinching your wrist). Do not let go. Check after 15 minutes.



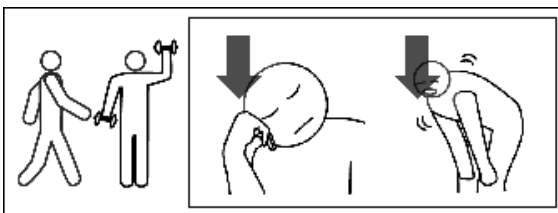
If you are still bleeding, re-apply pressure and call 911.

Fluids:

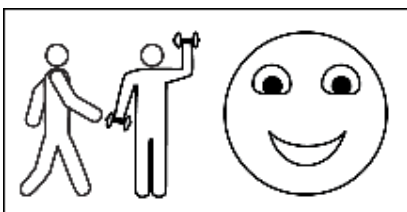


Increase your fluid intake by about 1 liter (about a quart) of water today and tomorrow. This will help prevent dehydration as well as help remove the contrast dye from your body

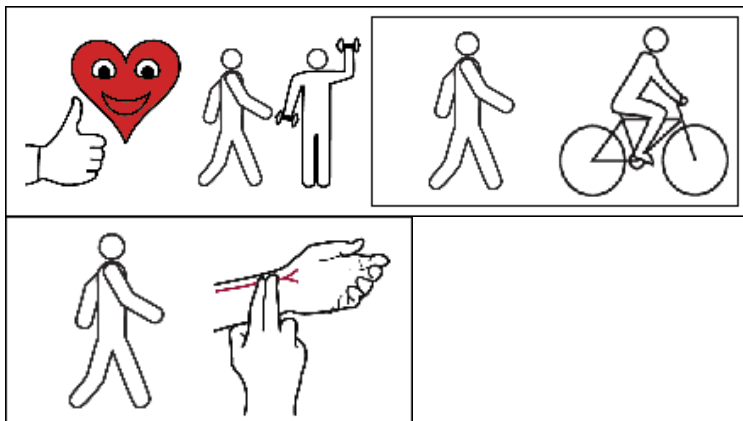
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



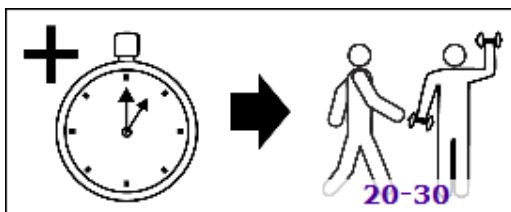
It will help your daily activities become easier and you to feel better.



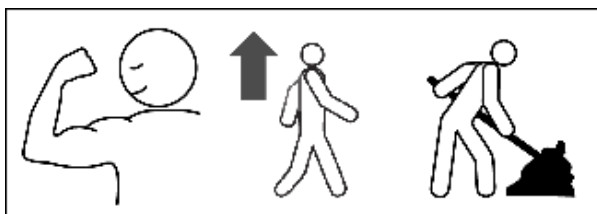
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



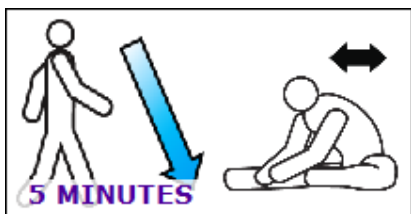
Warm up for 5 minutes.



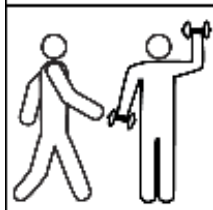
Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.



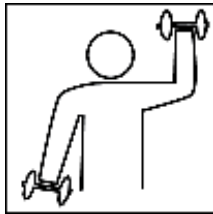
Always cool down for 5 minutes and stretch after exercising.



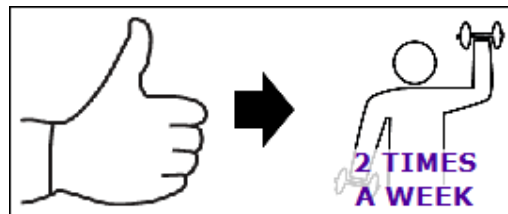


The American Heart Association suggests exercising 30 minutes most days of the week.

Maintain Strength:

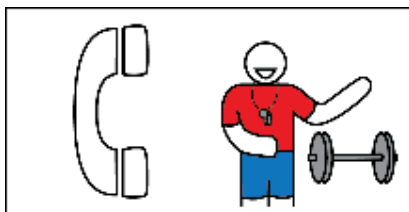


Lifting weights can help maintain strength and daily function.

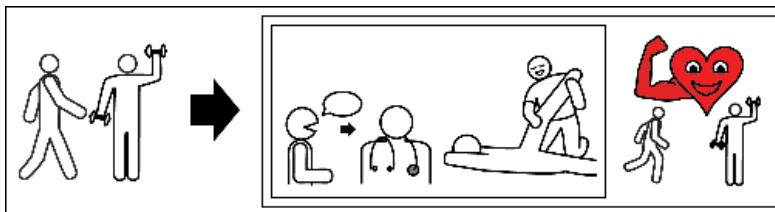


Check with your doctor to make sure it's OK, then start lifting light weights twice a week.

Make sure you use proper technique.

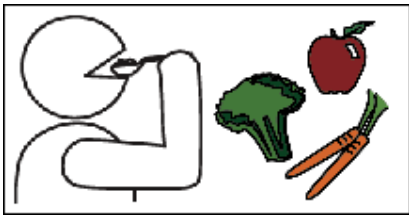


If you have questions, call our Exercise Specialists at 801-585-3508.

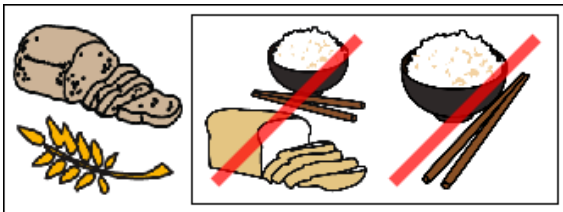


Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

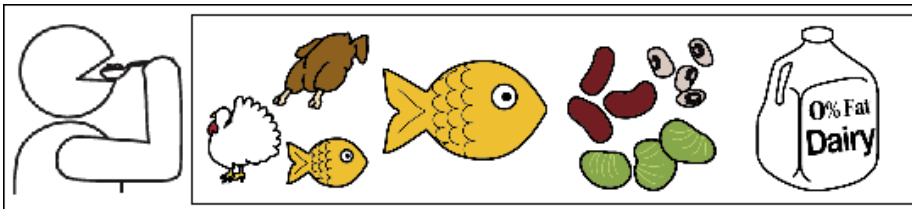
Nutrition:
Heart Healthy Diet:



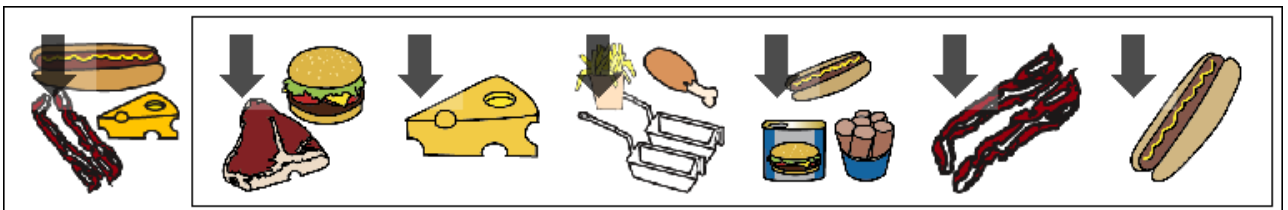
Eat lots of fruits and vegetables.



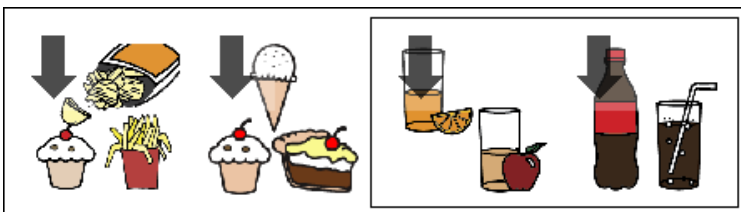
Choose whole grains over white bread and white rice.



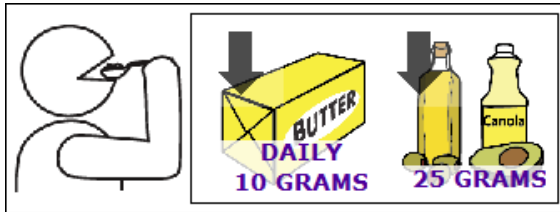
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



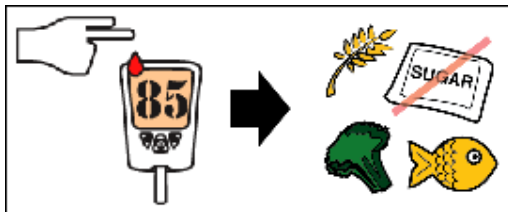
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

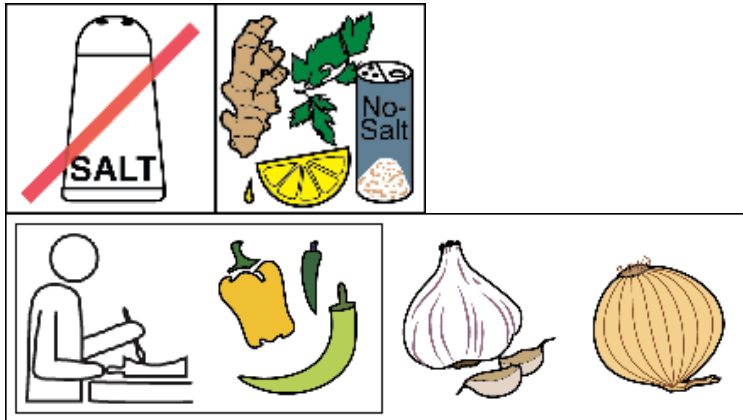


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

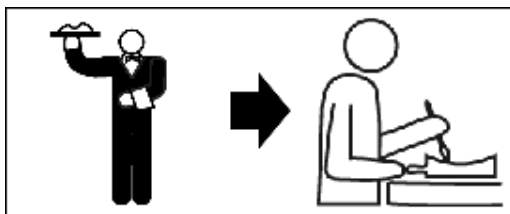


Give yourself time to get used to eating less salt. It may take a little while.

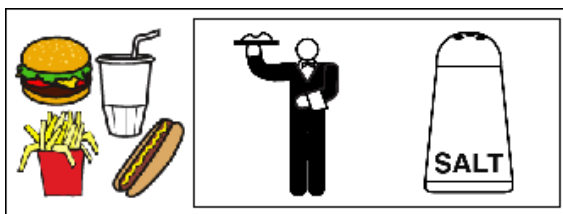
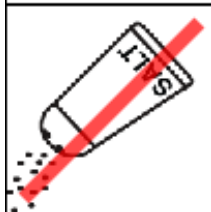
Here are some tips to help:



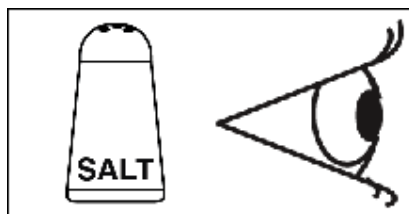
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



When you eat out, ask that your food be cooked without added salt.

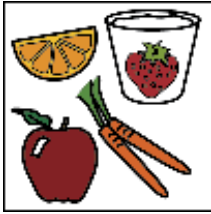


Fast food and restaurant food is prepared with large amounts of salt.



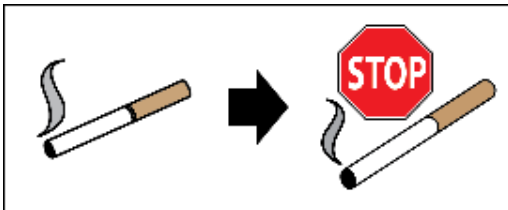
Nutrition Facts	
Serving Size: 1 oz. Servings per container: 4	
% Daily Value*	
Amount Per Serving	
Total Fat 10g	20%
Sodium 100mg	20%
Total Protein 10g	20%
*Percent Daily Values are based on a diet of other people's secrets.	
Sodium	

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.



Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!



If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



ASD/PFO Closure Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

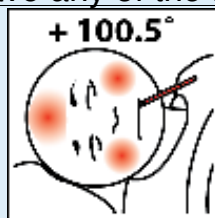
Call your cardiologist if you have any of the following



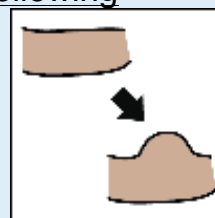
bleeding



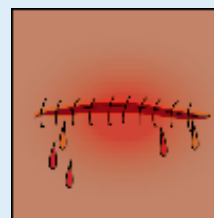
stomach pain



fever



swelling



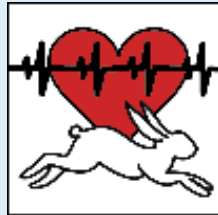
infection at incision sites

- Heavy bleeding
- Abdominal (stomach) pain
- Fever more than 100.5
- Bleeding, swelling or infection at incision site(s)

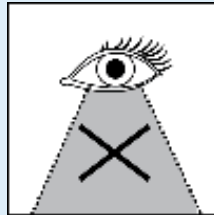
Call your Doctor and go to the nearest ER if you have these symptoms:



chest pain



fast heart rate



ca n't see



headache

- Severe chest pain or very fast heart rate
- If you suddenly can't see, move, speak, swallow, or smile
- Severe headache (the worst you've ever had)

Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Interventional Cardiology Fellow on call."

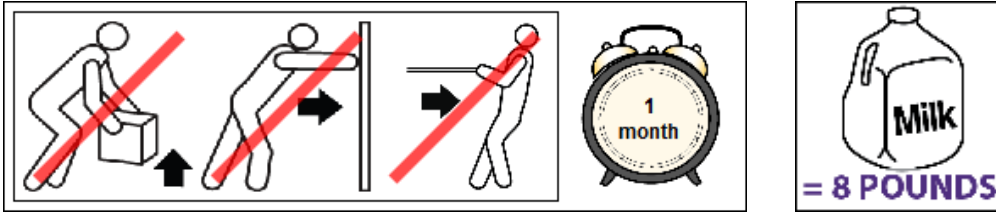
Restrictions:



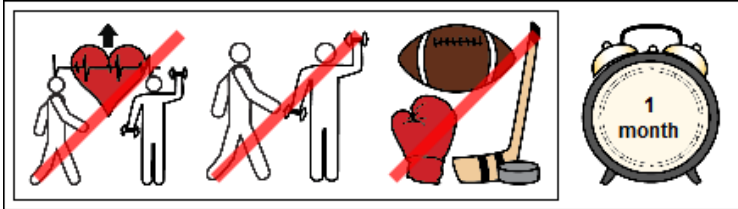
You may drive in 2 days.



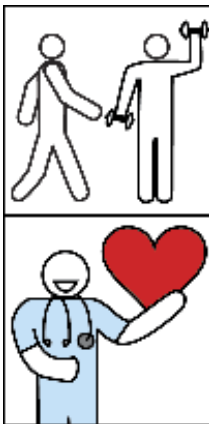
You may resume normal activity in 3-4 days EXCEPT:



Do not lift, push or pull more than 10 pounds for 1 month. A gallon of milk is 8 pounds.



No strenuous activity, strenuous exercise, or contact sports for 1 month.

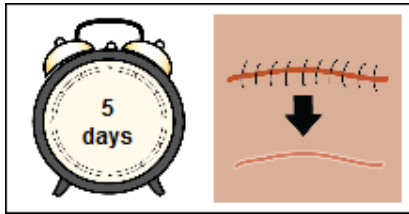


Activity restrictions may vary. Talk to your Cardiologist about your restrictions.

Wound Care:



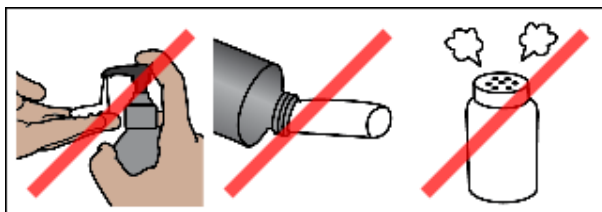
Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.



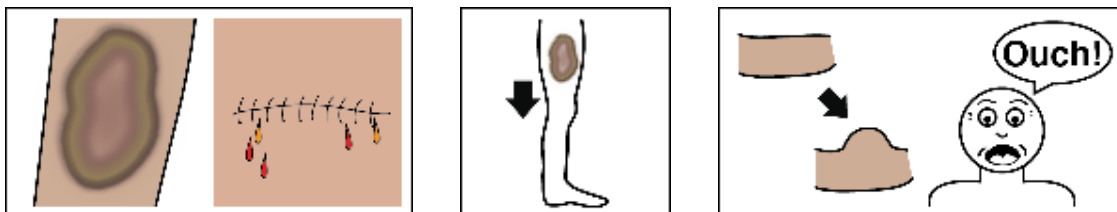
Consider sites healed after 5 days.



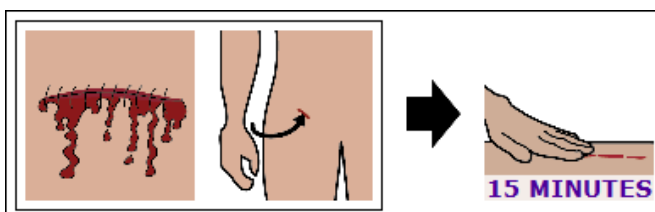
Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.



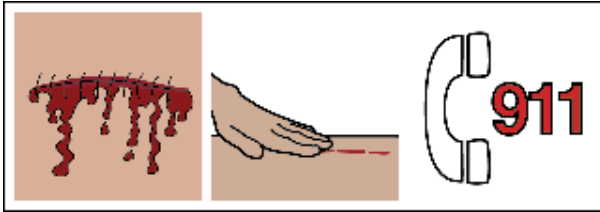
Do not use lotions, ointments or powders at the site until it is healed.



Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is swelling or hurting more.



If you start bleeding from your leg/groin incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes.



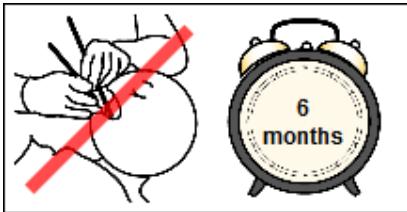
If you are still bleeding, re-apply pressure and call 911.

Device Card:

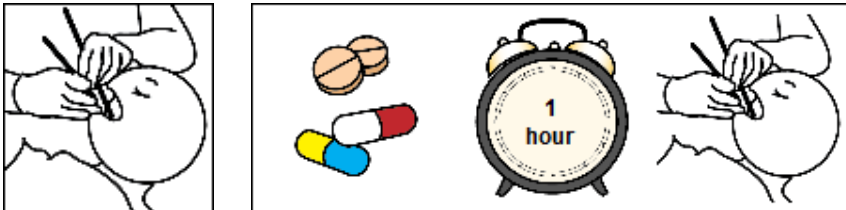


Carry your device card with you at all times.

Dental Care:



Avoid dental care for 6 months (including cleanings).

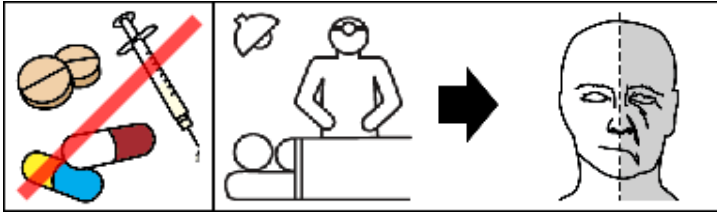


If you require emergency dental care, your dentist must prescribe an antibiotic for you to take at least 1 hour before any dental procedure.

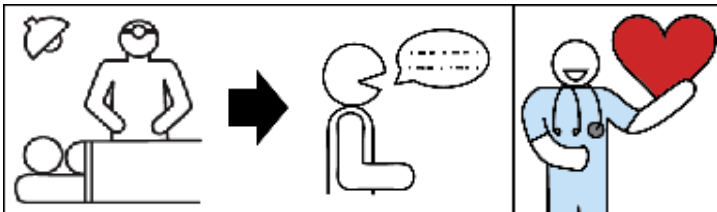
Surgery:



Avoid surgery for 6 months.



Surgery requires that you stop taking blood thinner medication. If you stop taking Plavix or aspirin in the first six months following your heart procedure, your risk of stroke after any surgery increases.



If you have to have surgery, talk with your cardiologist first.

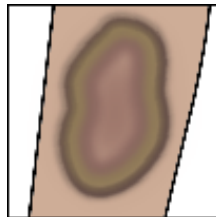
What to expect:



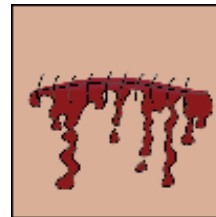
short of
breath



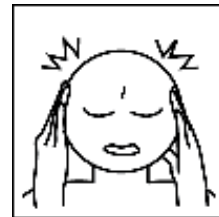
chest
discomfort



bruising



bleeding



headaches

Awareness of your heart beat-fluttering, skipping, feeling of short of breath, mild chest discomfort or feeling a lump in the throat are all common symptoms after this procedure. Call your cardiologist if symptoms last for more than 2 hours.

Bruising/bleeding-are more common because of the Plavix and Aspirin use. Do not stop taking these medications unless your cardiologist tells you to do so. Women who have periods may experience some heavy bleeding in the first month after starting these medications.

Migraines and Headaches-are common after the procedure. This does not mean there is anything wrong with the device. Your headaches may actually be more severe or frequent during the first month after your surgery. Continue to treat them as you normally would. They will become less frequent and less severe with time.

Preventive Cardiology:

Call or e-mail us if you have any other questions

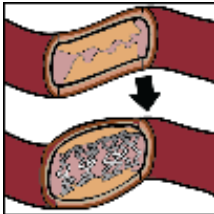
Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

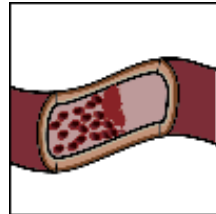


Coronary Artery Disease / Stent / Heart Attack Patient Instructions

What is a Stent?



stent



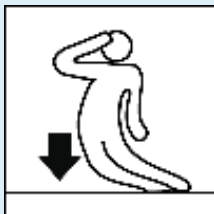
blockage

A stent is a very small wire tube that is placed in the blood vessel to help keep the artery open. The stent will stay in your artery always, and you will need to take a medication every day to avoid a blockage forming inside the stent. Your doctor will have you take a blood thinning medication for a minimum of one year, in most cases. Never stop taking or miss a dose of your blood thinner unless your Cardiologist tells you to.

Medications:

Bring your current medication list to all your doctor appointments.

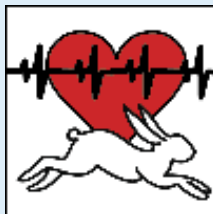
Call Your Cardiologist if you Have any of the Following:



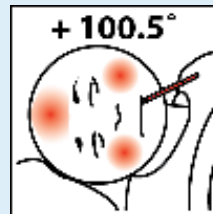
fainting



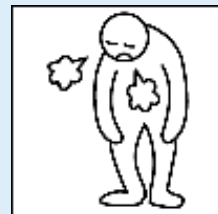
dizziness



racing heart
rate



fever



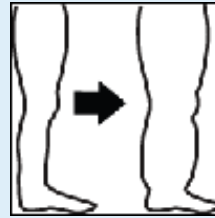
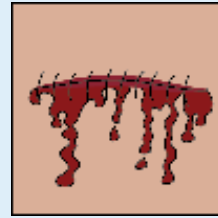
fatigue



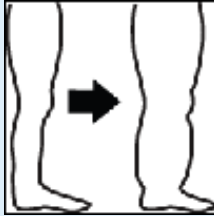
nausea



vomiting

shortness of
breathswelling in
leg

bleeding

swelling at
leg sitechanges in
blood
pressure

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Extreme fatigue
- Nausea or vomiting
- Shortness of breath
- Swelling in your legs, hands, or stomach
- Bleeding or swelling at your leg site
- Changes in blood pressure or heart rate

Phone Numbers:

During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.

After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Cardiology Fellow on call."



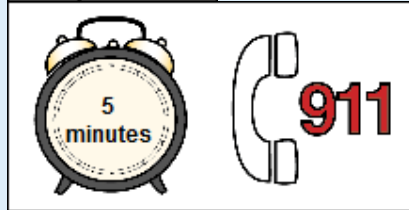
If You Have Chest Pain:



Stop all activity and sit down.

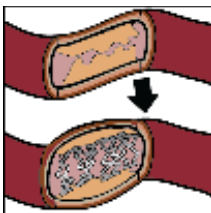


If the chest pain does not go away after 5 minutes, call 911.

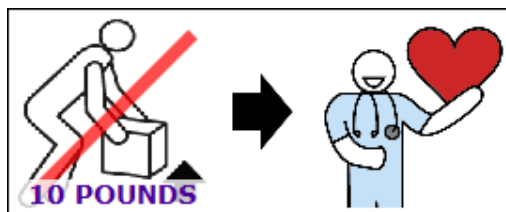


Do NOT drive yourself to the emergency room!

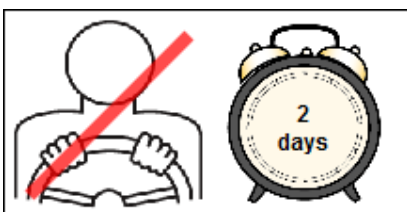
Restrictions:



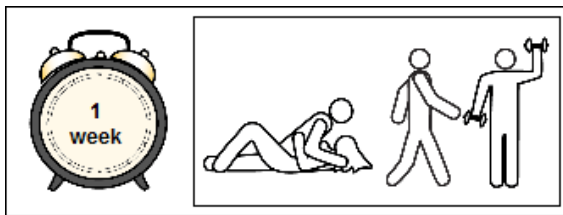
- If you had stents only, do not lift more than 10 pounds for 3 days. A gallon of milk is 8 pounds.



If you had a heart attack, do not lift more than 10 pounds until your cardiologist tells you it is OK.

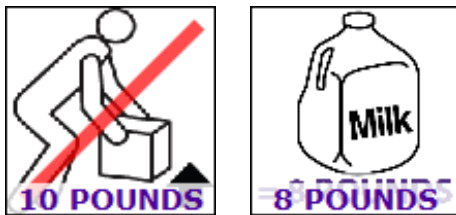


Do not drive for 2 days.

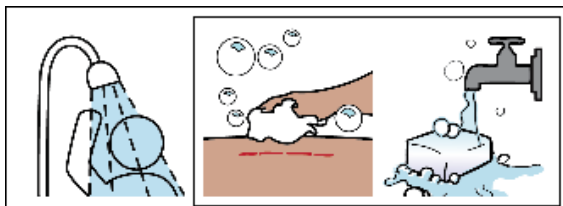


No strenuous activity for one week.

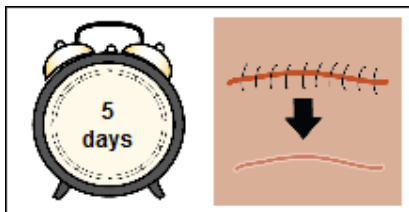
Wound Care (Leg/Groin):



- Do not lift more than 10 pounds for 3 days. A gallon of milk is 8 pounds.



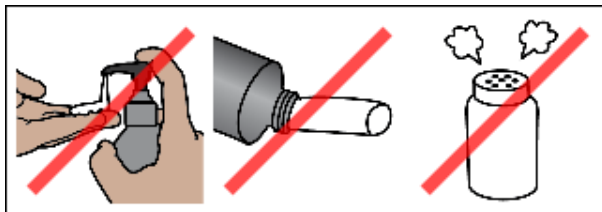
Shower and clean the sites with mild soap and water daily, but don't take a bath, go swimming or use a hot tub for 5 days.



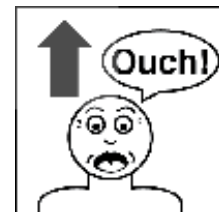
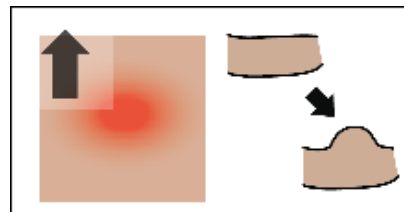
Consider sites healed after 5 days.



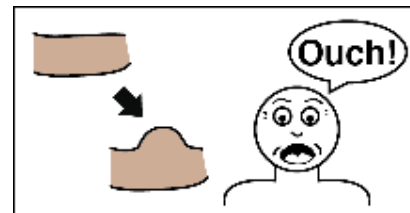
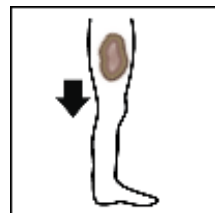
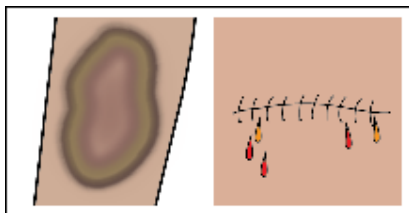
Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.



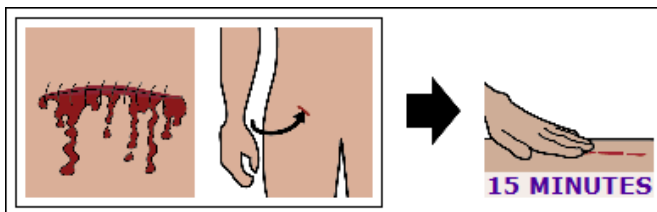
Do not use lotions, ointments or powders at the site until it is healed.



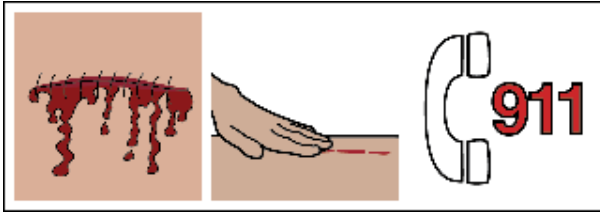
Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.



Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.

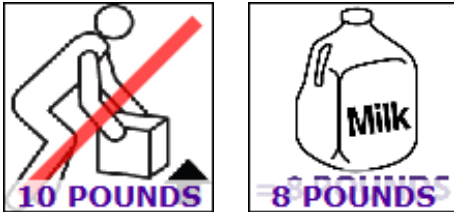


If you start bleeding from your leg/groin incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes.

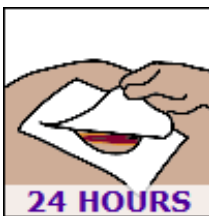


If you are still bleeding, re-apply pressure and call 911.

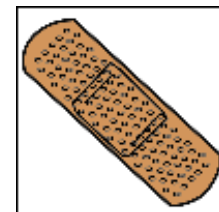
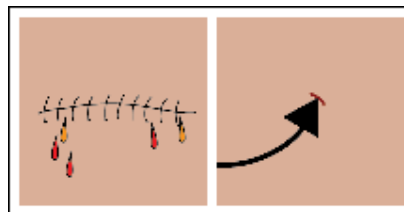
Wound Care (Arm/Wrist):



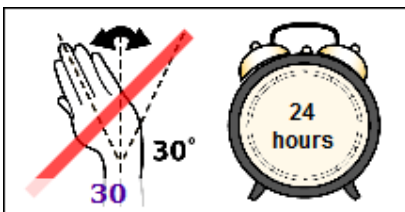
- Do not lift more than 10 pounds with affected wrist for 3 days. A gallon of milk is 8 pounds.



Remove the clear dressing 24 hours after it was placed.

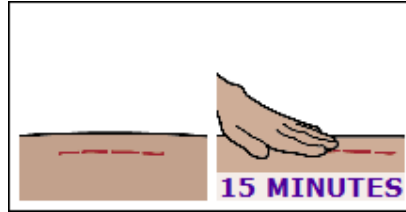
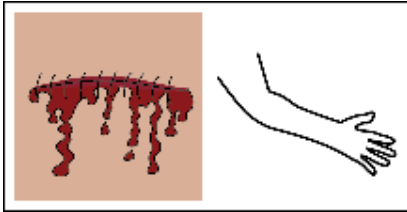


Leave puncture site open to air after 24 hours. If there is minor oozing from the puncture site, apply a Band-Aid and remove it in 12 hours.

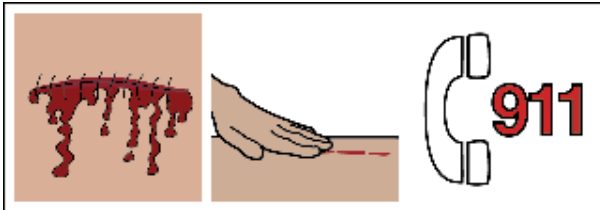


Do not flex or extend your wrist more than 30 degrees for the next 24 hours.

Do not soak your wrist for 3 days.

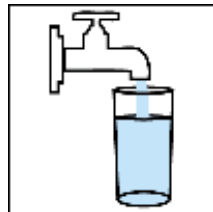
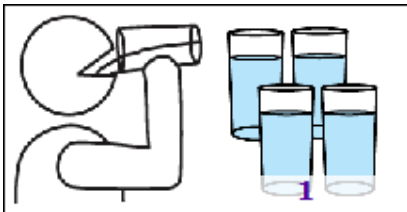


If you start bleeding from your arm/wrist incision, apply pressure for 15 minutes with your thumb on one side of your wrist and your fingers on the other (pinching your wrist). Do not let go. Check after 15 minutes.



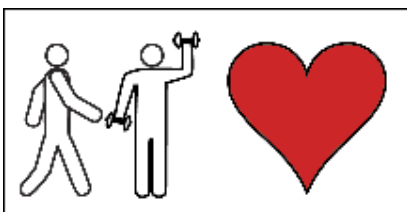
If you are still bleeding, re-apply pressure and call 911.

Fluids:

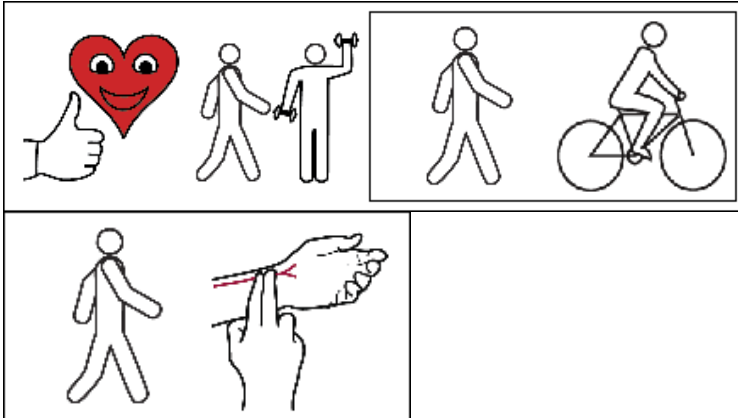


Increase your fluid intake by about 1 liter (about a quart) of water today and tomorrow. This will help prevent dehydration as well as facilitate the removal of contrast dye from your body.

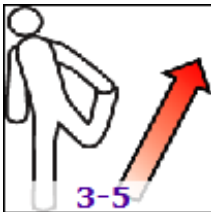
Activity:



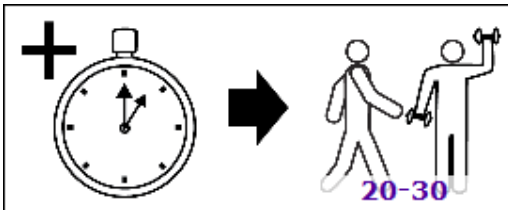
Moderate exercise is very important for heart health.



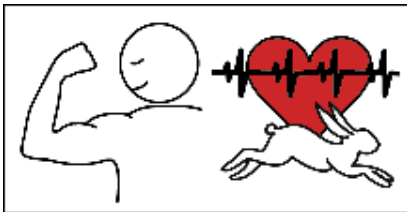
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



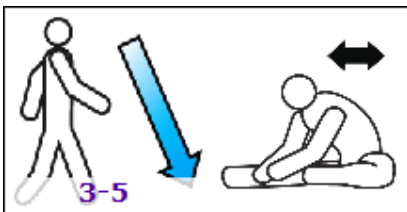
Warm up for 3-5 minutes.



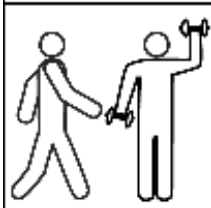
Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase your difficulty so you are still working with medium effort.



Always cool down for 3-5 minutes and stretch after exercising.



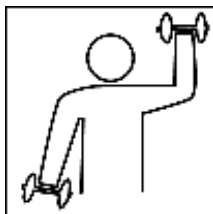


The American Heart Association suggests exercising 30 minutes or more most days of the week.

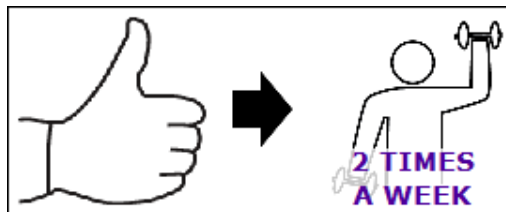


Cardiac Rehab is recommended for best recovery.

Maintain Strength:

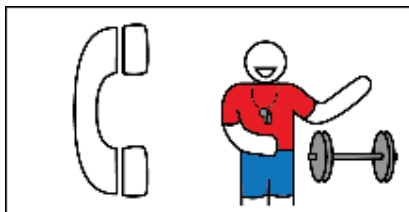


Lifting weights can help maintain strength and daily function.



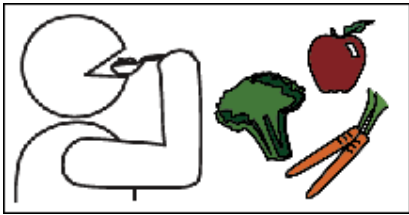
Check with your doctor to make sure it's OK, then start lifting light weights twice a week.

Make sure you use proper technique.



If you have questions, call our Exercise Specialists at 801-585-3508.

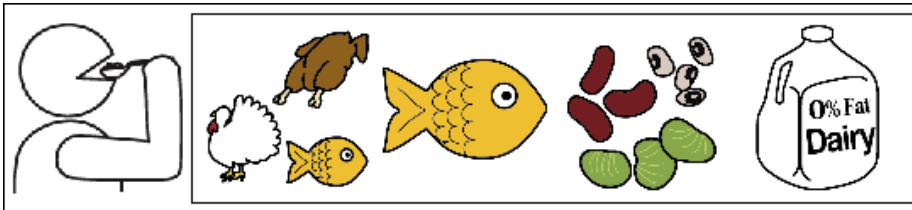
Nutrition:
Heart Healthy Diet:



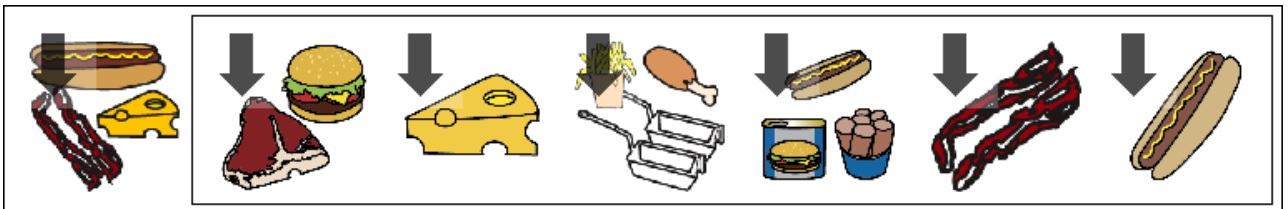
Eat lots of fruits and vegetables.



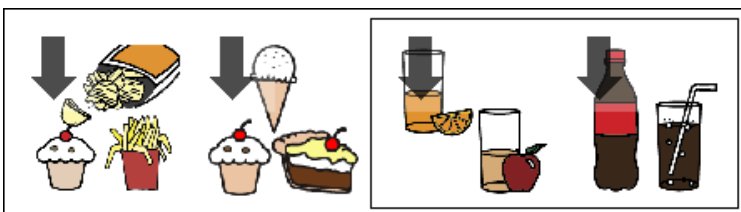
Choose whole grains over white bread and white rice.



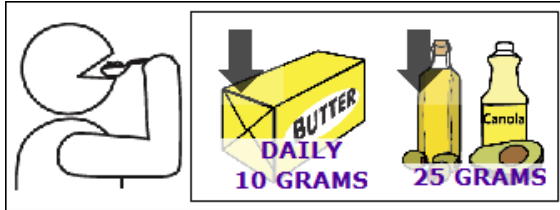
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



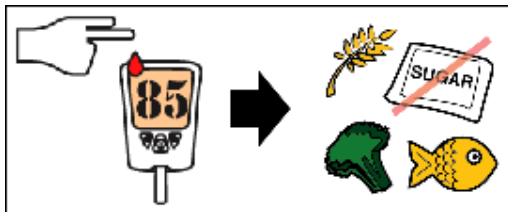
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

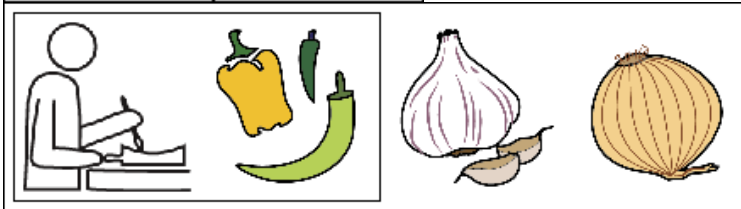


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

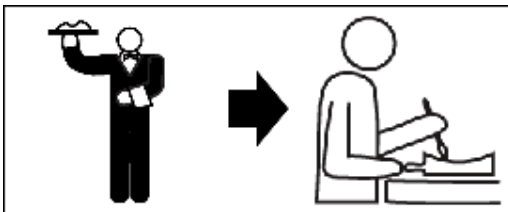


Give yourself time to get used to eating less salt. It may take a little while.

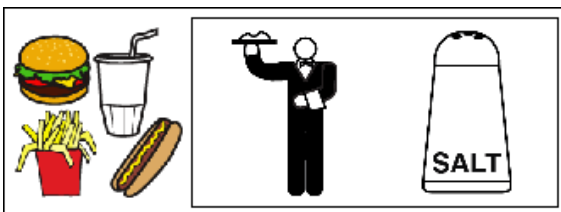
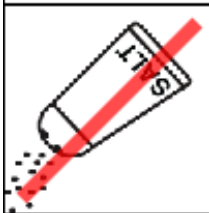
Here are some tips to help:



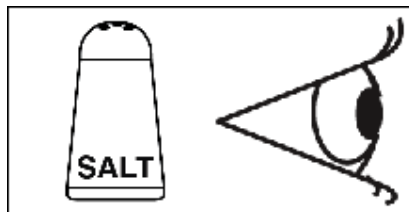
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



When you eat out, ask that your food be cooked without added salt.

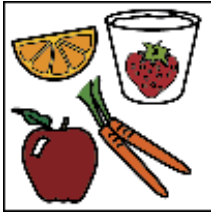


Fast food and restaurant food is prepared with large amounts of salt.



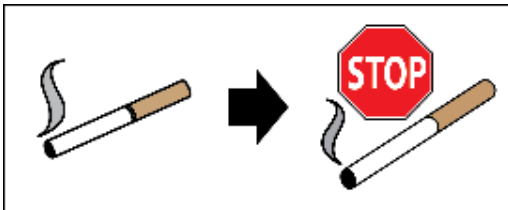
Nutrition Facts	
Serving Size: 1/2 cup (125g)	
Amount Per Serving	
% Daily Value*	Amount Per Serving
Total Fat 11g	22%
Saturated Fat 2g	4%
Total Cholesterol 100mg	20%
Sodium 100mg	20%
*Percent Daily Values are based on a diet of other people's secrets.	

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.



Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!



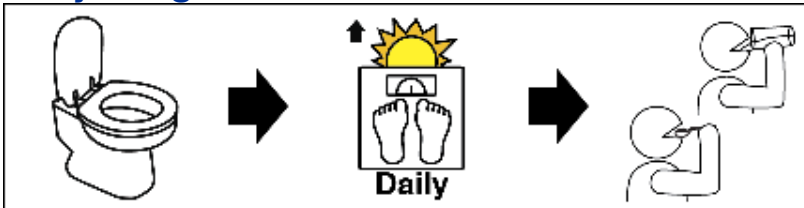
If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Other Instructions:

Daily Weights:



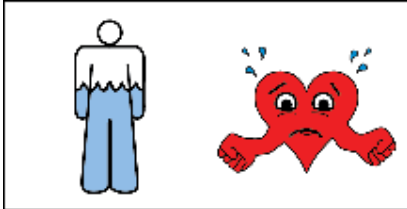
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.



Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.



This is a sign of fluid overload, which strains the heart.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Write it down in a journal.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Cholesterol Test:

Have a fasting blood draw in 6-8 weeks to make sure you are at goal (if you just started a statin or changed your dose).

- Your total cholesterol should be around 130.
- HDL (good) levels should be more than 40 for men, 50 for women.
- LDL (bad) levels should be less than 70.
- Triglyceride levels less than 150.

Diabetes Control:

- Your Hemoglobin A1c should be less than 7.0.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

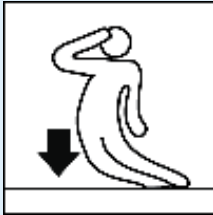


Pacemaker or Defibrillator Patient Instructions

Medication:

Bring your current medication list to all your doctor appointments.

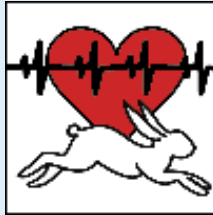
Call Your Cardiologist if You Have any of the Following:



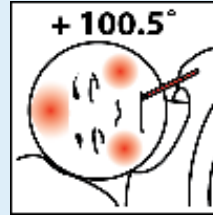
fainting



dizziness



racing heart
rate



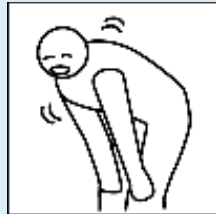
fever



nausea



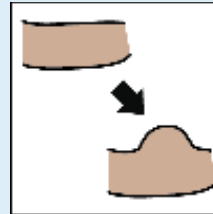
vomiting



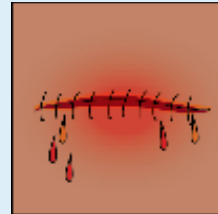
shortness of
breath



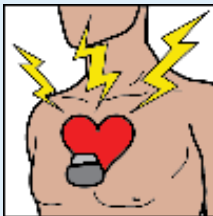
bleeding



swelling



infection at
incision sites



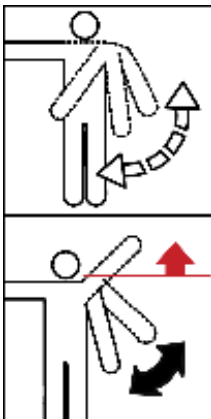
shocked by
defibrillator

- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Nausea or vomiting
- Shortness of breath or difficulty breathing
- Bleeding, swelling or infection at incision site(s)
- You get shocked by your defibrillator
- You notice anything unusual or unexpected that concerns you

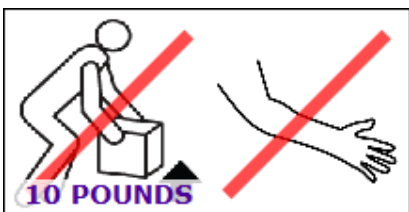
Phone Numbers:

- During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "EP Fellow on call."

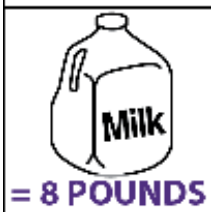
**Restrictions:
For the Next 3 Weeks:**



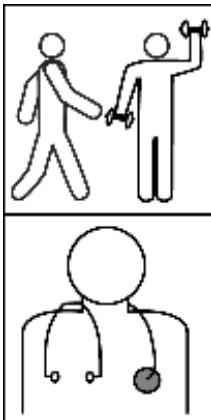
You may move your arm freely, but do not raise it above your shoulder.



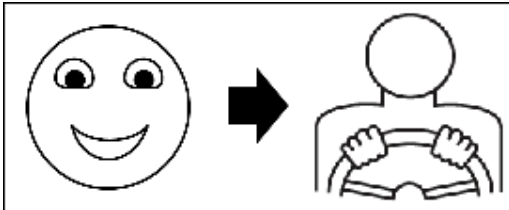
Do not lift more than 10 pounds with the arm on the same side as your new device. A gallon of milk is 8 pounds.



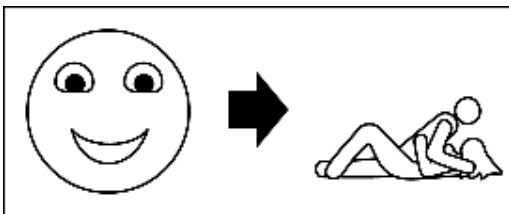
After 3 Weeks:



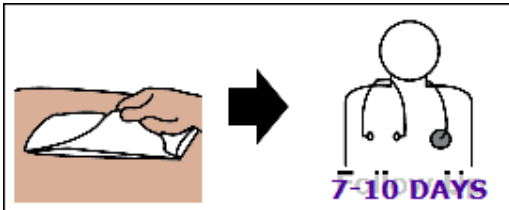
You may return to normal activity unless your doctor gives you other instructions.

Other:

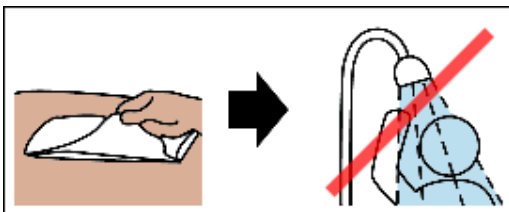
You may drive when you feel well (unless you have a groin incision, then you must wait two days before driving).



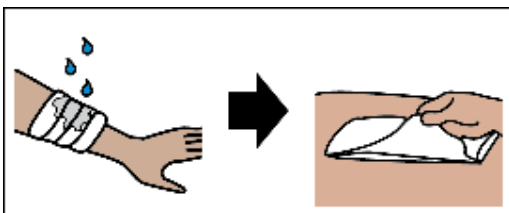
You may resume sexual activity when you feel ready.

Device Wound Care:

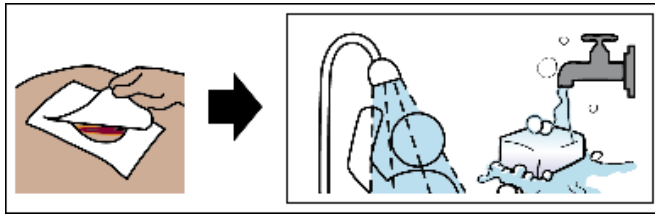
Keep the dressing dry and in place until your follow-up appointment in 7-10 days.



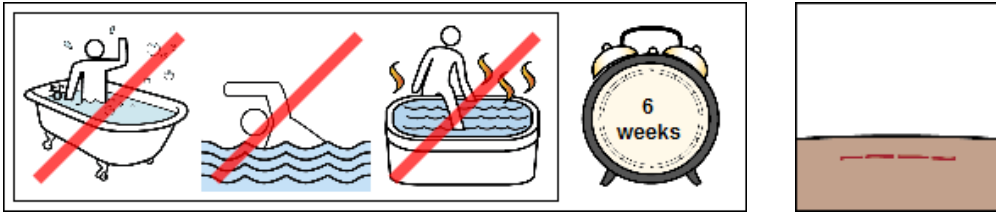
Do not shower while the dressing is on.



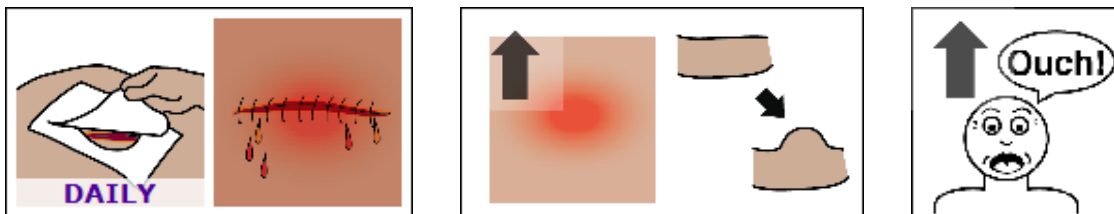
If the dressing gets wet or dirty, replace it with a clean dry gauze and tape it in place.



After the dressing comes off you can shower with mild soap and water.



Do not take a tub bath, go swimming or soak in a hot tub for 6 weeks or until the incision is completely healed.



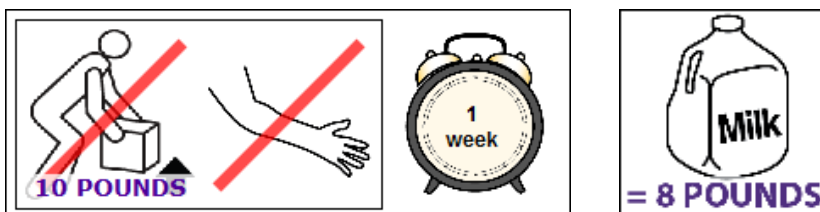
Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.

Additional Instructions (if a catheter/tube was placed through your groin for electrophysiology studies):

Restrictions:

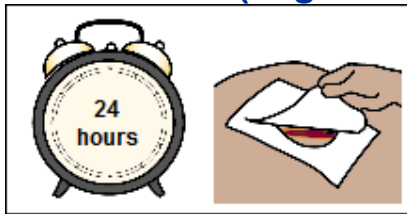


You may drive in 2 days.

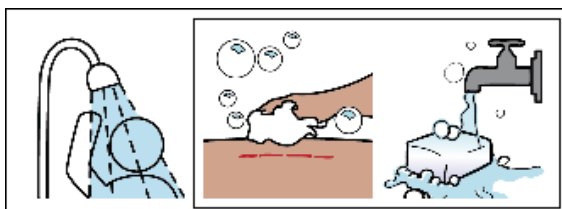


Do not lift more than 10 pounds with either arm for 1 week. A gallon of milk is 8 pounds.

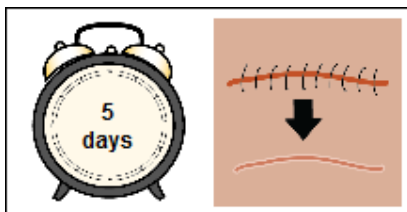
Wound Care (Leg/Groin):



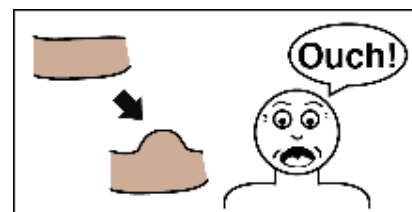
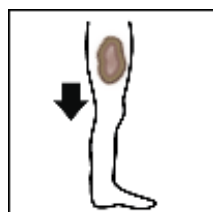
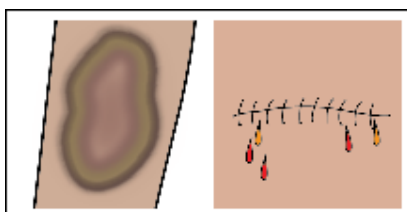
Dressings should be removed after 24 hours. You can use a Band-Aid for a day or two.



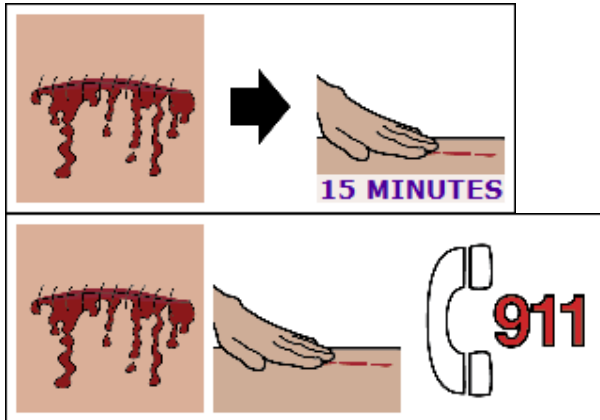
Shower and clean the sites with mild soap and water daily. Do not take a bath, go swimming or use a hot tub for 5 days.



Consider sites healed after 5 days.



Some bruising, drainage or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.

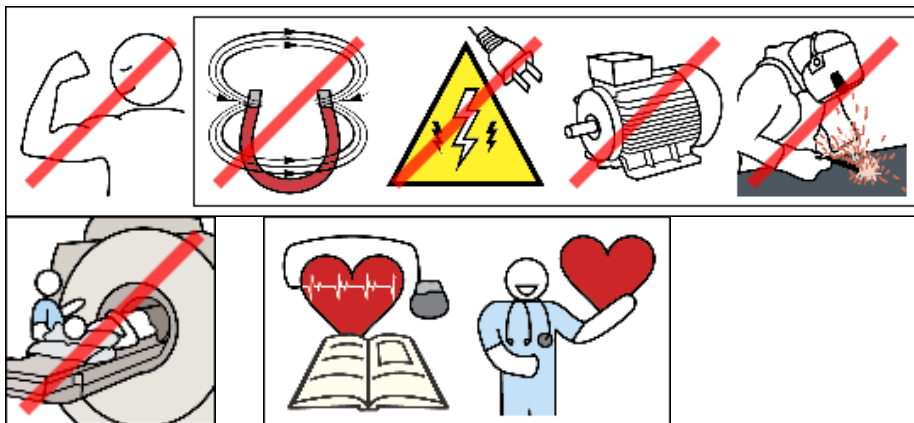


If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

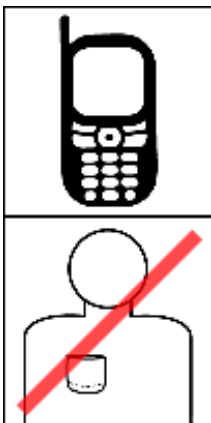
Device Guidelines:



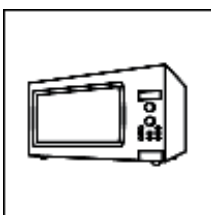
Carry your device card with you at all times. At first, you will have a temporary card. In 4-6 weeks you will receive a permanent card.



Avoid strong magnetic or electrical currents, large running motors and arc welding. CT scans and x-rays are safe. You cannot have an MRI unless you received an MRI-safe device (check your device booklet, with the manufacturer, or with your cardiologist).



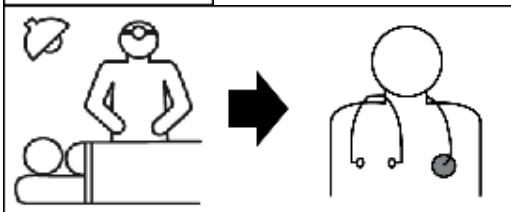
Use cell phones on the side opposite your device. Do not carry cellphones in a shirt pocket right over your device.



Most household appliances are safe to use including microwave ovens.

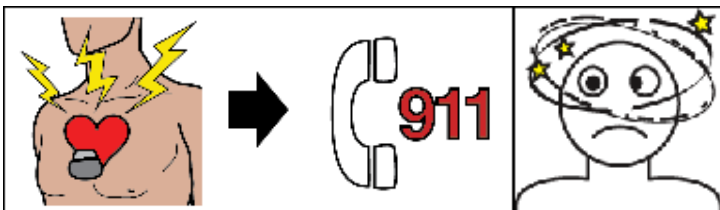


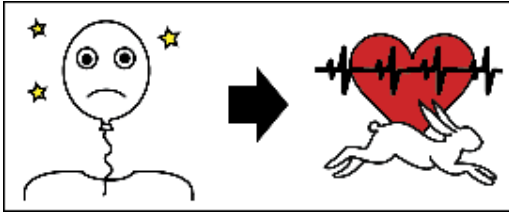
Let your arrhythmia doctor know if you are going to have any surgery.



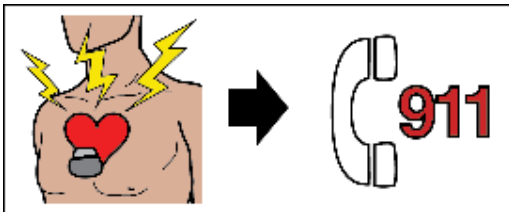
Read your device booklet carefully. Call the company if you have any questions about your device.

Defibrillator Guidelines:

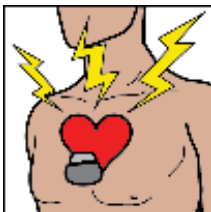




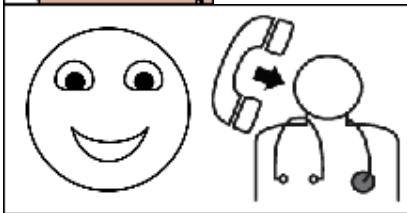
Call 911 if you get a shock from your defibrillator that makes you feel dizzy, lightheaded or causes your heart to race.



Call 911 if you get multiple shocks from your defibrillator.



If you get a shock from your defibrillator but feel OK afterwards, call your arrhythmia doctor to let them know.

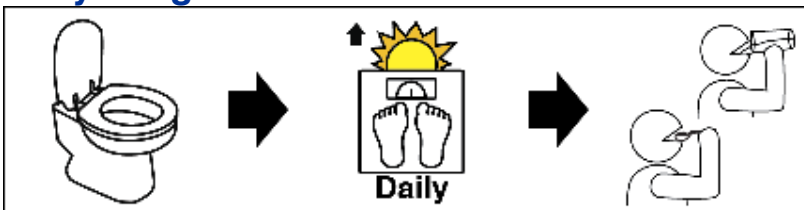


Follow-Up:

You should follow up with your arrhythmia doctor in about three months. Most patients need regular checks of their device about every three months. Checks can be done in the doctor's office or over the phone with a special transmitter.

Other Information for Patients with Heart Failure:

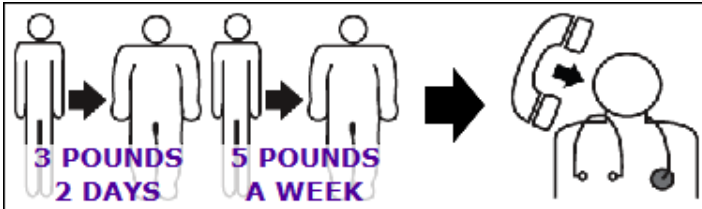
Daily Weights:



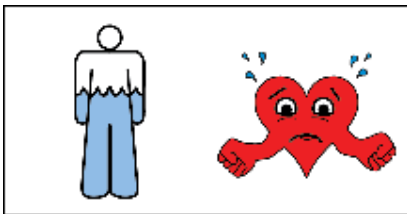
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.



Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.

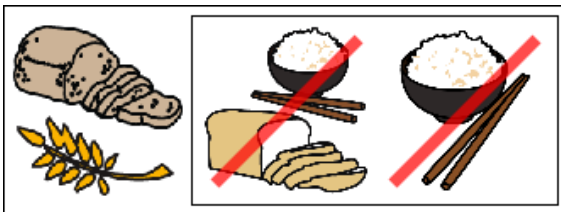


This is a sign of fluid overload, which strains the heart.

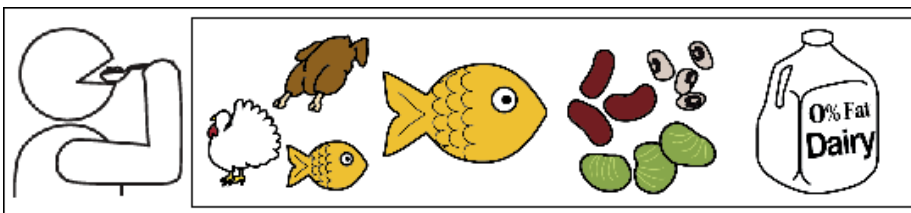
Heart Healthy Diet:



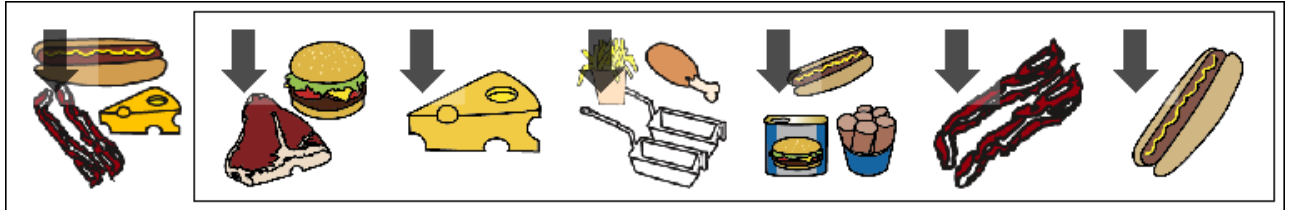
Eat lots of fruits and vegetables.



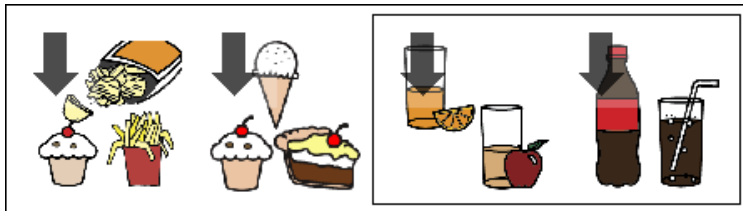
Choose whole grains over white bread and white rice.



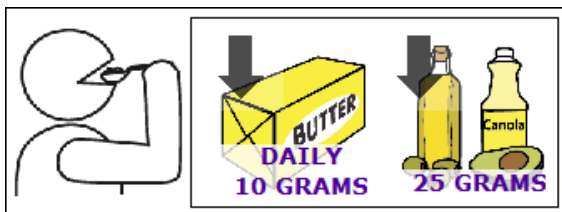
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



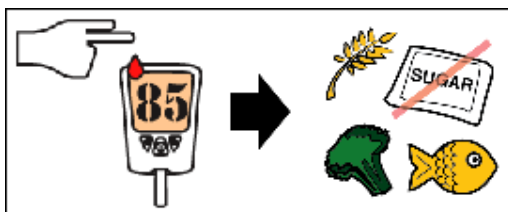
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

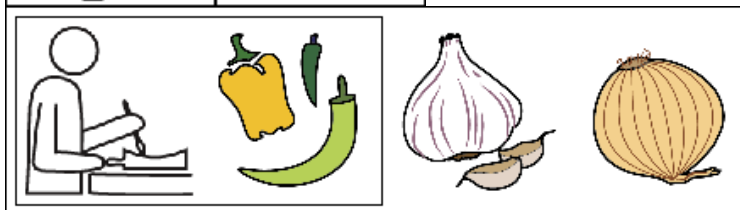


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

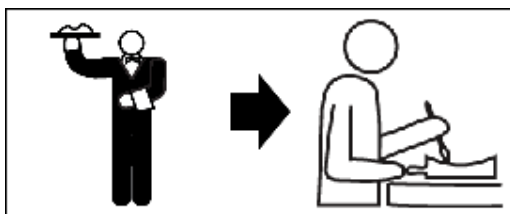


Give yourself time to get used to eating less salt. It may take a little while.

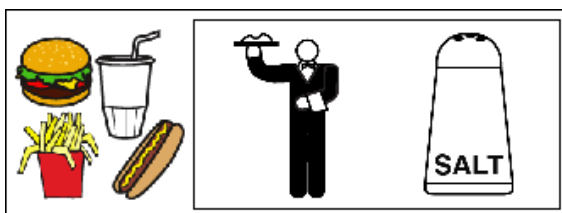
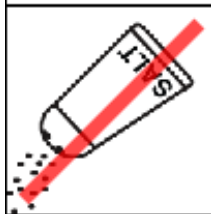
Here are some tips to help:



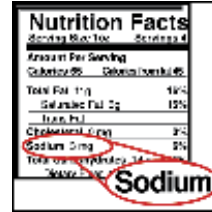
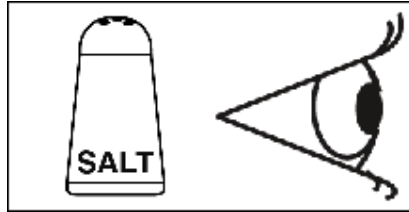
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



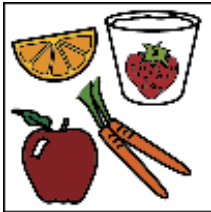
When you eat out, ask that your food be cooked without added salt.



Fast food and restaurant food is prepared with large amounts of salt.

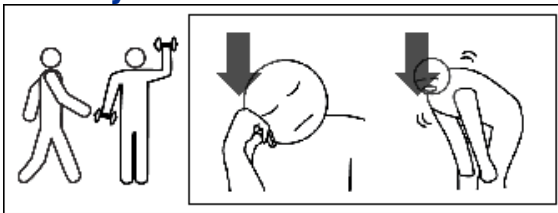


Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.

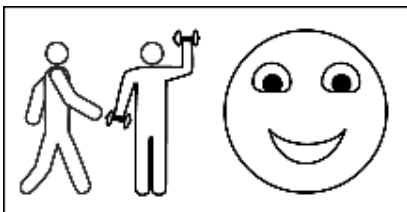


Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

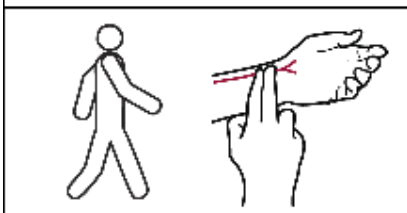
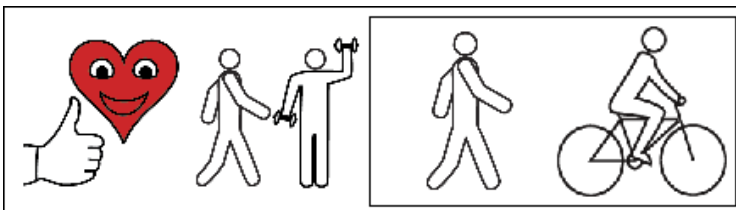
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



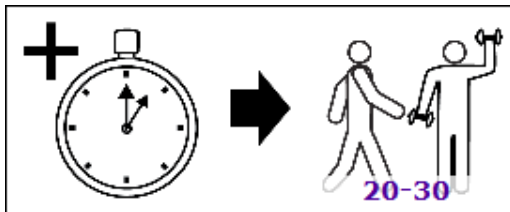
It will help your daily activities become easier and you to feel better.



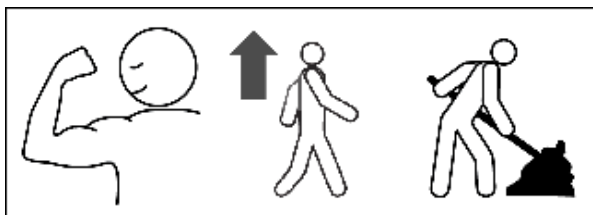
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



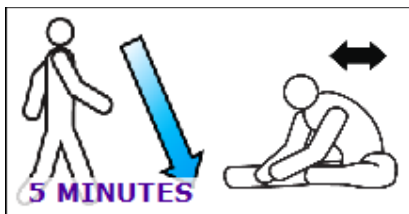
Warm up for 5 minutes.



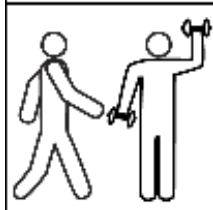
Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.

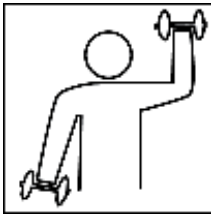


Always cool down for 5 minutes and stretch after exercising.



The American Heart Association suggests exercising 30 minutes most days of the week.

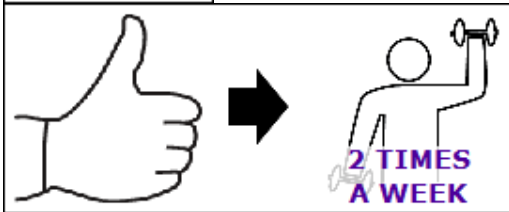
Maintain Strength:



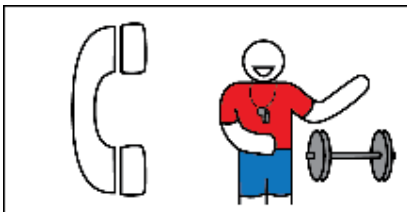
Lifting weights can help maintain strength and daily function.



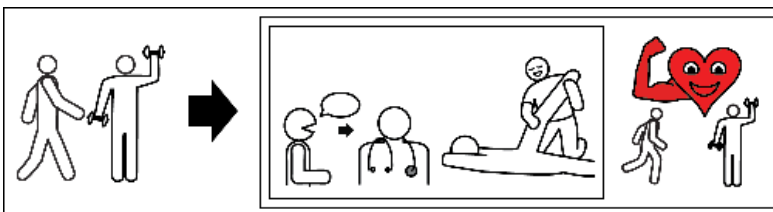
Check with your doctor to make sure it's OK, then start lifting light weights twice a week.



Make sure you use proper technique.

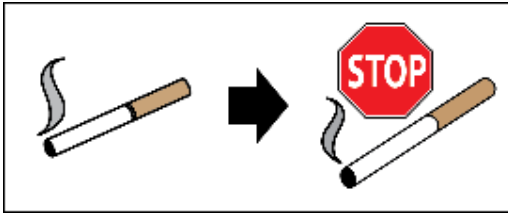


If you have questions, call our Exercise Specialists at 801-585-3508.



Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Do Not Smoke!



If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Heart Failure Patient Instructions

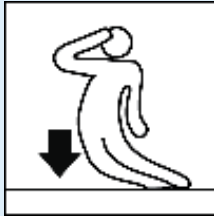
Follow-Up:

Go to all your follow-up appointments. It is very important. Appropriate follow-up will make you feel better faster, reduce the risk of a hospital stay and prolong your life.

Medication:

- Take all of your medications as prescribed.
- Bring your current medication list to all your doctor appointments.
- Do not stop taking any medication without your doctor's approval.

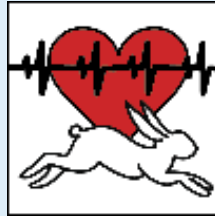
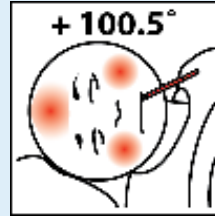
Call Your Cardiologist if You Have any of the Following:



fainting



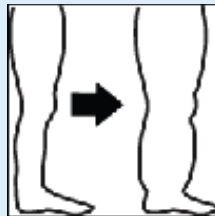
dizziness

racing heart
rate

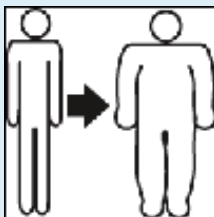
fever

shortness of
breathsleep on
more pillows

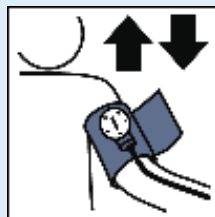
sitting up

swelling in
legs

nausea

loss of
appetite

gain weight

changes in
blood
pressure

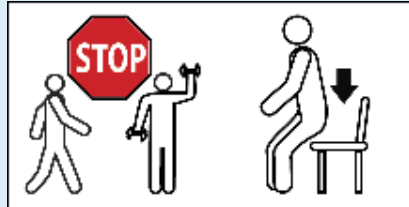
- Fainting, dizziness, racing heart rate
- Fever more than 100.5
- Increased shortness of breath
- Having to sleep on more pillows or sitting up
- Swelling in your legs, hands, or stomach
- Nausea or loss of appetite
- Weight gain of 3 pounds or more in 48 hours or 5 pounds or more in 7 days
- Changes in blood pressure or heart rate

Phone Numbers:

- During office hours (M-F, 9-5) 801-585-5122 or 800-824-2073. Ask for your cardiologist or surgeon.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Heart Transplant Fellow on call."



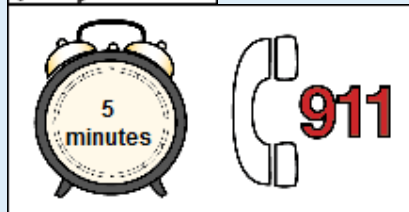
If You Have Chest Pain:



Stop all activity and sit down.

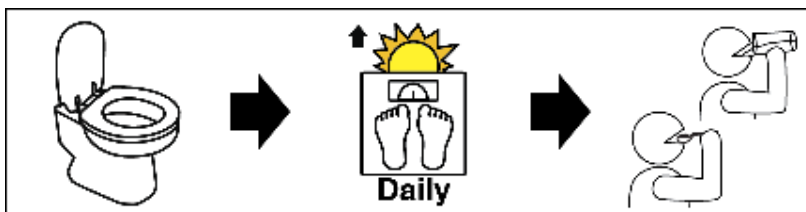


If the chest pain does not go away after 5 minutes, call 911.



Do NOT drive yourself to the emergency room!

Daily Weights:



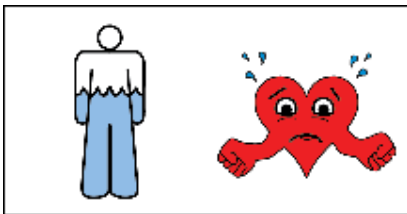
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.

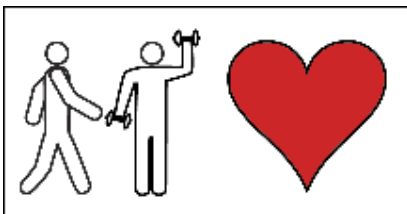


Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.

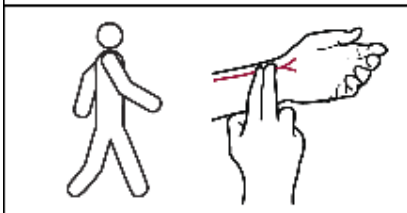
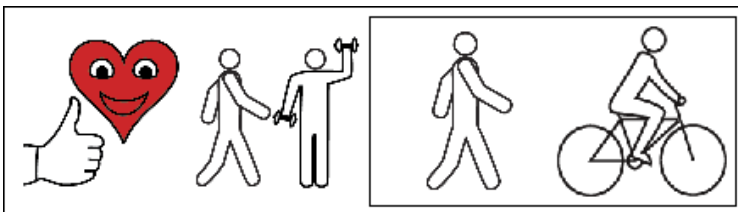


This is a sign of fluid overload, which strains the heart.

Activity:



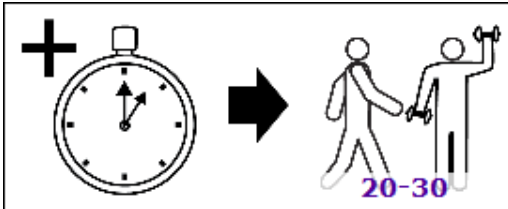
Moderate exercise is very important for heart health.



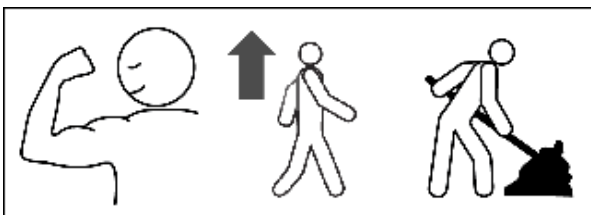
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



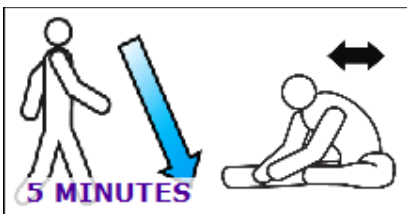
Warm up for 5 minutes.



Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.

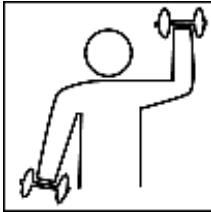


Always cool down for 5 minutes and stretch after exercising.



The American Heart Association suggests exercising 30 minutes most days of the week.

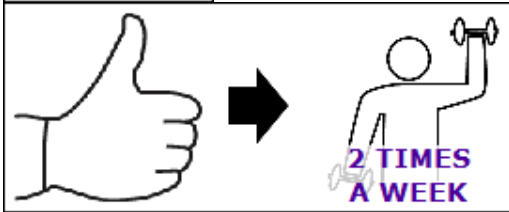
Maintain Strength:



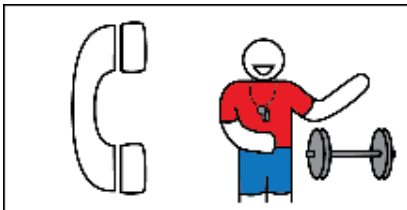
Lifting weights can help maintain strength and daily function.



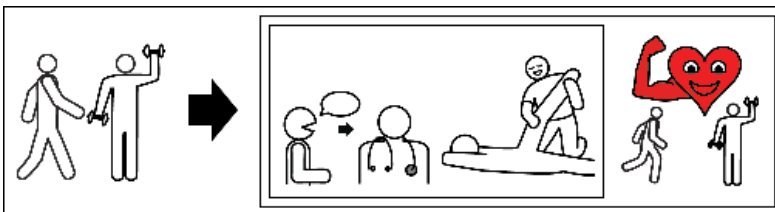
Check with your doctor to make sure it's OK, then start lifting light weights twice a week.



Make sure you use proper technique.

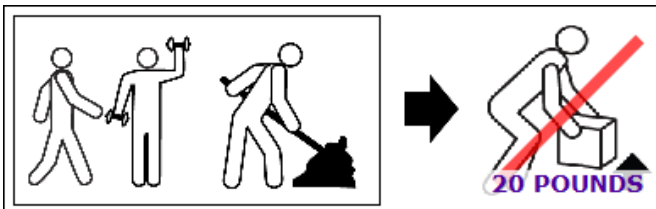


If you have questions, call our Exercise Specialists at 801-585-3508.

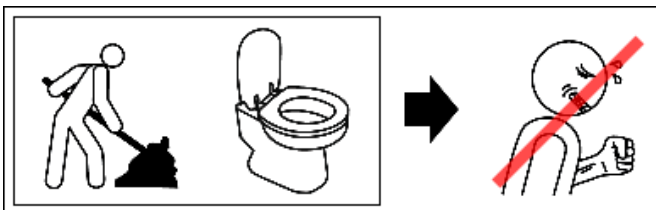


Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

Straining:



Do not lift more than 20 pounds when exercising or working in your home.



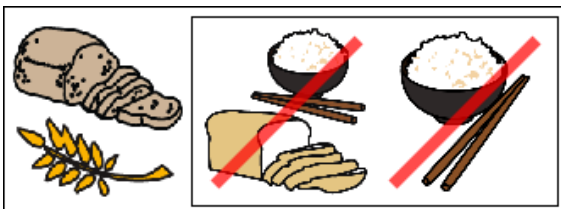
Avoid straining or bearing down when working or going to the bathroom.

Nutrition:

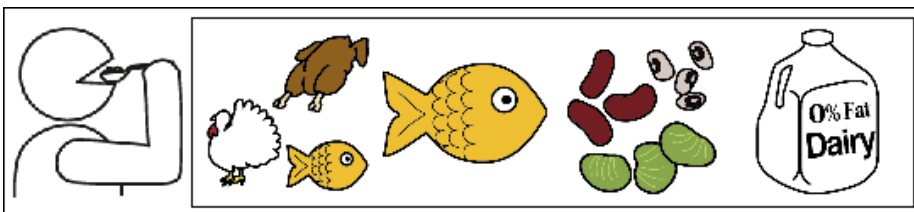
Heart Healthy Diet:



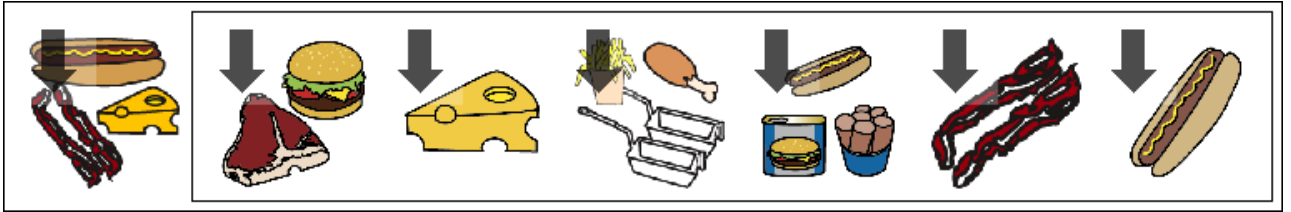
Eat lots of fruits and vegetables.



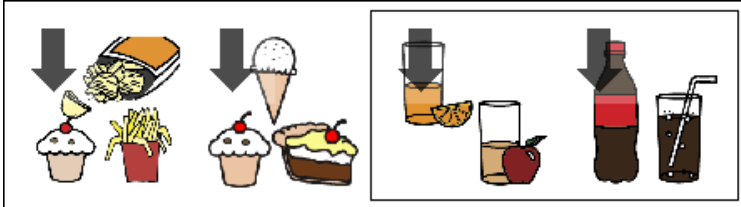
Choose whole grains over white bread and white rice.



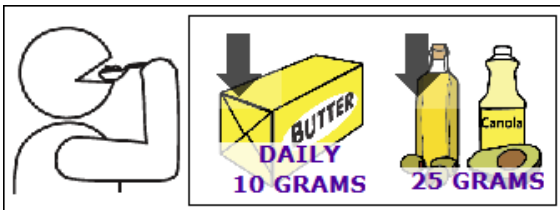
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



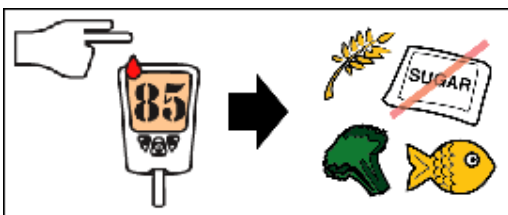
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

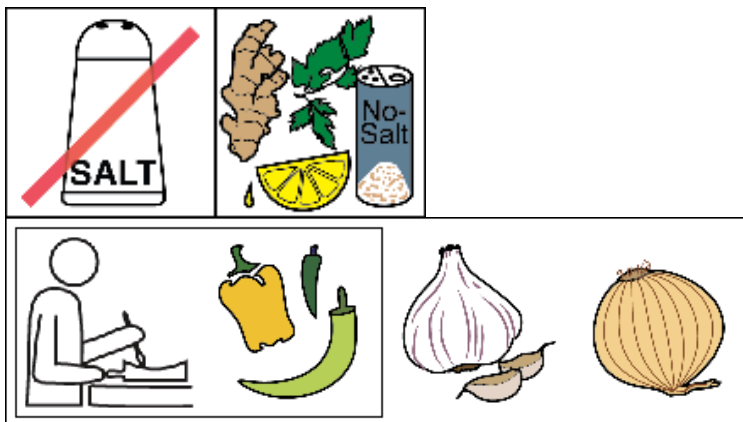


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

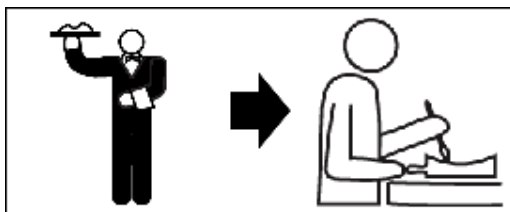


Give yourself time to get used to eating less salt. It may take a little while.

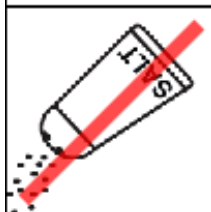
Here are some tips to help:

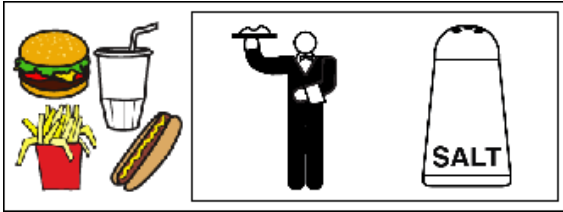


Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.

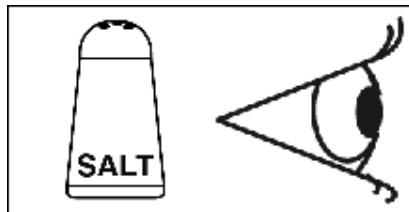


When you eat out, ask that your food be cooked without added salt.



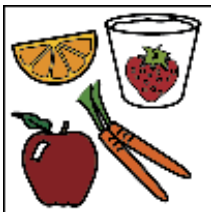


Fast food and restaurant food is prepared with large amounts of salt.



Nutrition Facts	
Amount Per Serving	
% Daily Value*	
Total Fat 1g	2%
Saturated Fat 2g	4%
Total Fat 1g	2%
Sodium 2mg	40%
*Percent Daily Values are based on a diet of other people's secrets.	

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.



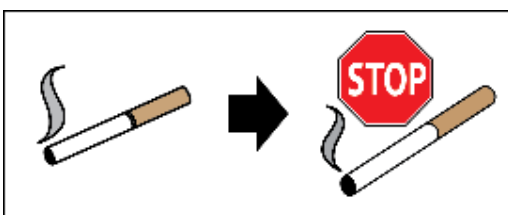
Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Other:



Avoid caffeine and alcohol.

Do Not Smoke!



If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Blood pressure

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 85.
- The medications used in treating heart failure keep your blood pressure lower than what you may be used to. If the top number is less than 80 OR you feel dizzy or lightheaded, call your doctor.

What to bring to your doctor's appointments:

- A record including daily weight, blood pressure and heart rate.
- Complete list of your medications or all your medication bottles.
- A record of daily blood sugars if you are diabetic.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Minimally Invasive Chest Surgery Patient Instructions

Medication:

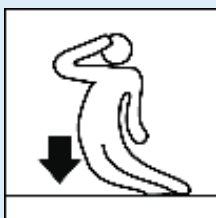
Bring your current medication list to all your doctor appointments.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting. Your next PT/INR blood check is on_____.

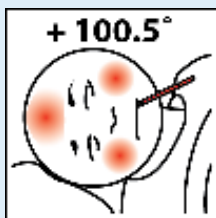
Call Your Surgeon if You Have any of the Following:



fainting



dizziness



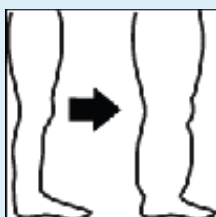
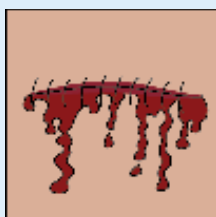
fever



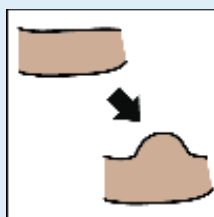
nausea



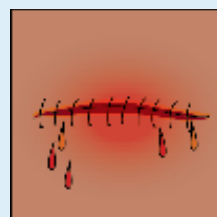
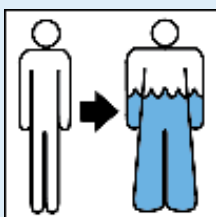
vomiting

shortness of
breathswelling in
legs

bleeding



swelling

infection at
incision sitesrapid weight
gain

- Fainting, dizziness, racing heart
- Fever more than 100.5
- Nausea or vomiting
- Shortness of breath or difficulty breathing
- Swelling in your legs
- Bleeding, swelling or infection at incision site(s)
- Your incision seems to be opening up
- Rapid weight gain

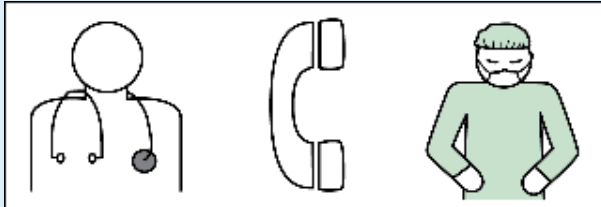
Phone Numbers:

- During office hours (M-F, 8-4) 801-581-2121 or 800-824-2073. Ask for your surgeon's office.
- After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "CT Surgeon on call."

If you are having an emergency:

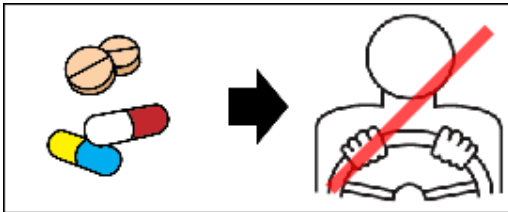


Call 911 or go to the emergency room.



Ask the emergency room doctor to call your surgeon.

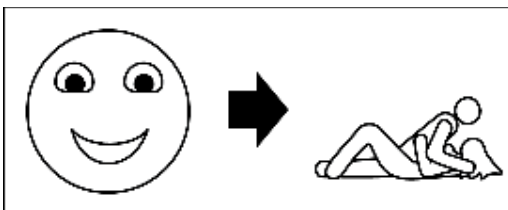
Restrictions:



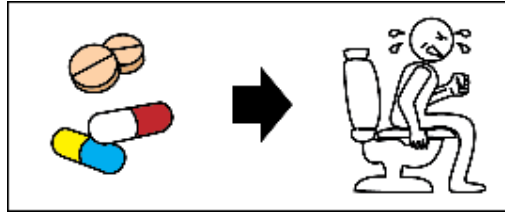
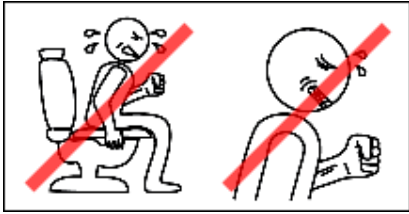
Do not drive while you are taking narcotics.



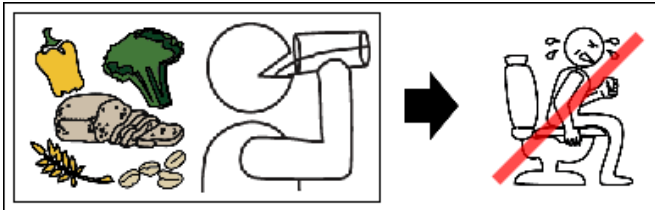
Do not lift over 5 pounds for 2 weeks. A half gallon of milk is 4 pounds.



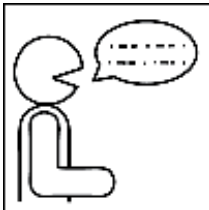
You may start having sex again when you feel ready.



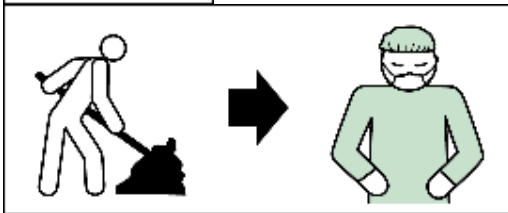
Do not bear down or push hard to have a bowel movement. Pain medicine may cause constipation, so take stool softeners while you are on narcotics.



Eating high fiber foods and drinking water also helps prevent constipation.



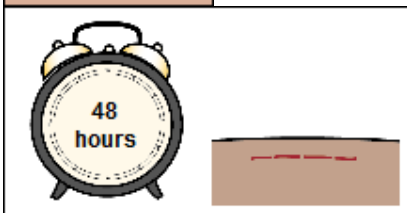
Talk with your surgeon about when you can go back to work.

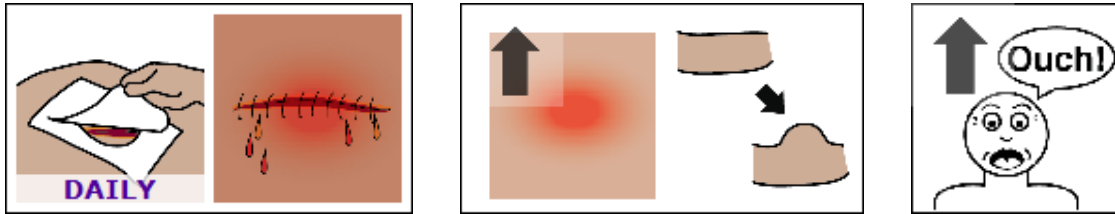


Wound Care:

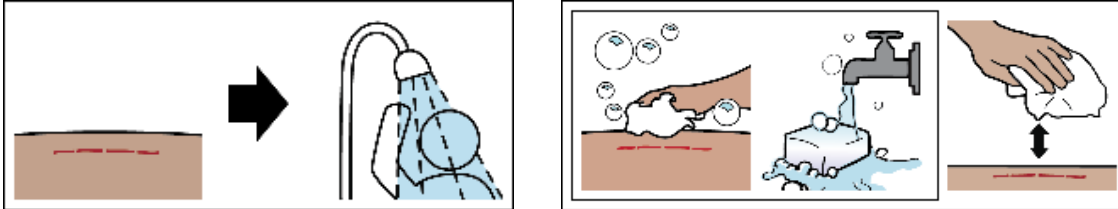


If you leave with a dressing on your incision(s), remove it after 48 hours.





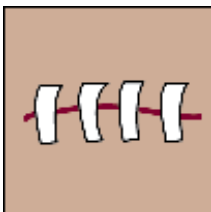
Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.



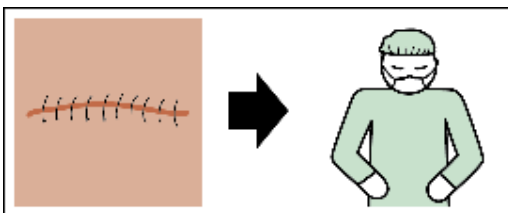
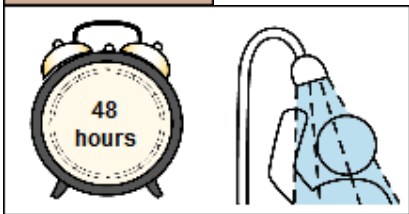
You may shower after that if your incision has no open areas. Clean with mild soap and water, pat dry.



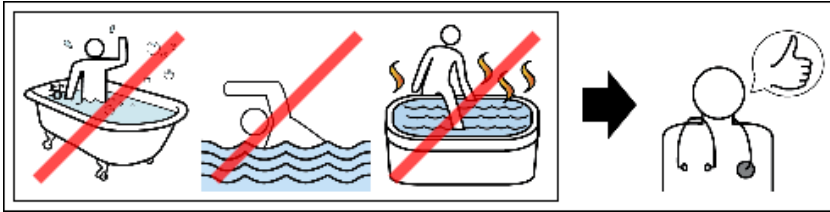
Do not use lotions or powders.



Gently remove any strips of tape in the shower after 48 hours.

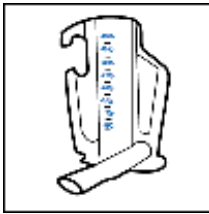


If you have stitches, they will be removed by your surgeon.

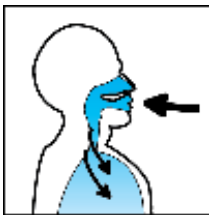


No tub baths, swimming pool or hot tubs until the surgeon says OK (usually in 6 weeks).

Big Breaths:

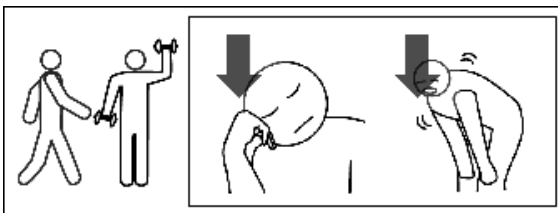


Use your Incentive Spirometer every few hours while awake for the first two weeks.

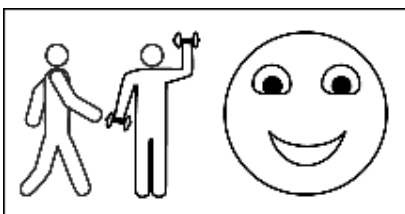


Do 10 slow, smooth, deep breaths each time.
Don't rush the breaths.
Keep trying to increase volume.

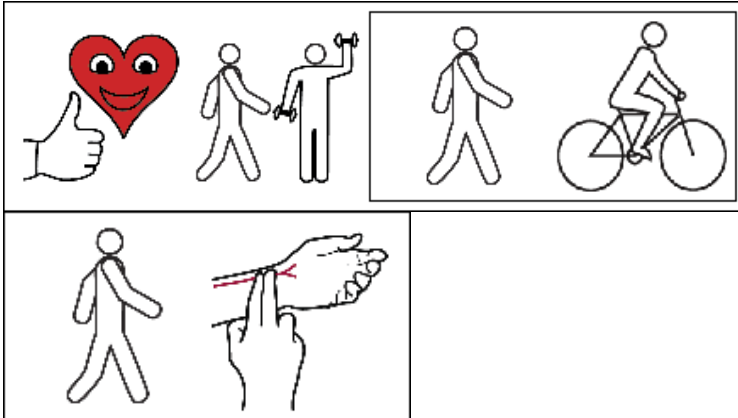
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



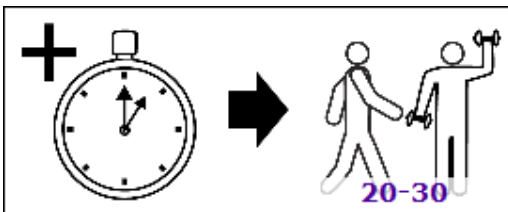
It will help your daily activities become easier and you to feel better.



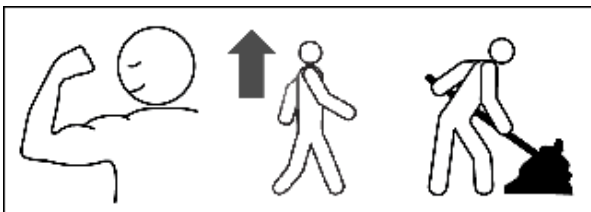
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



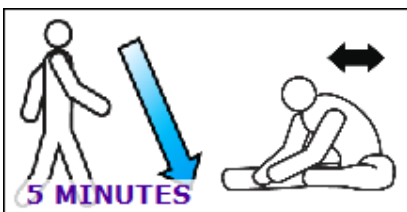
Warm up for 5 minutes.



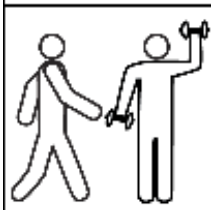
Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.



Always cool down for 5 minutes and stretch after exercising.





The American Heart Association suggests exercising 30 minutes most days of the week.



Cardiac Rehab is recommended for best recovery from heart surgery.

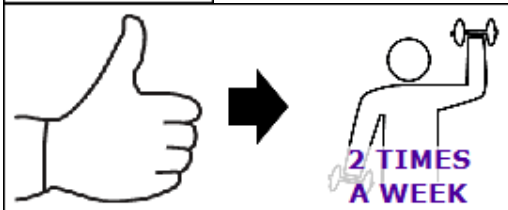
Maintain Strength:



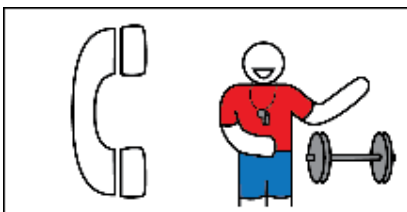
Lifting weights can help maintain strength and daily function.



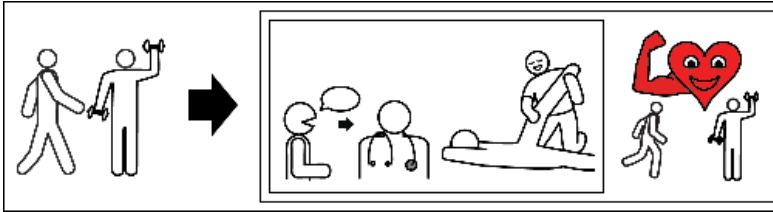
Check with your doctor to make sure it's OK, then start lifting light weights twice a week.



Make sure you use proper technique.



If you have questions, call our Exercise Specialists at 801-585-3508.



Talk to your doctor about Physical Therapy or Cardiac Rehab if you need help getting started with an exercise program.

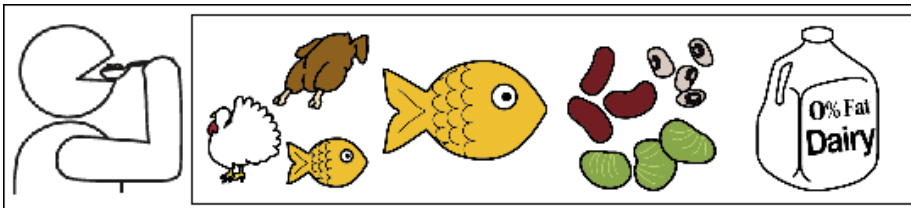
Nutrition: Heart Healthy Diet:



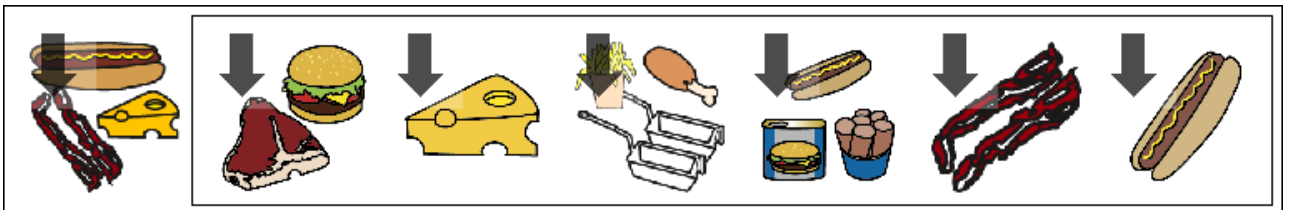
Eat lots of fruits and vegetables.



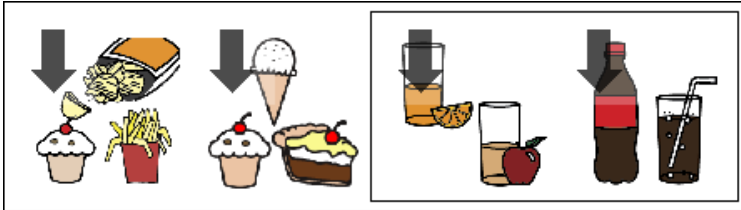
Choose whole grains over white bread and white rice.



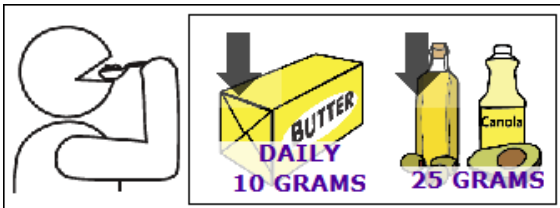
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



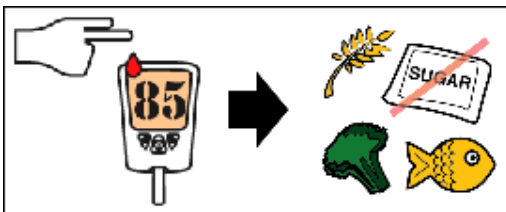
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

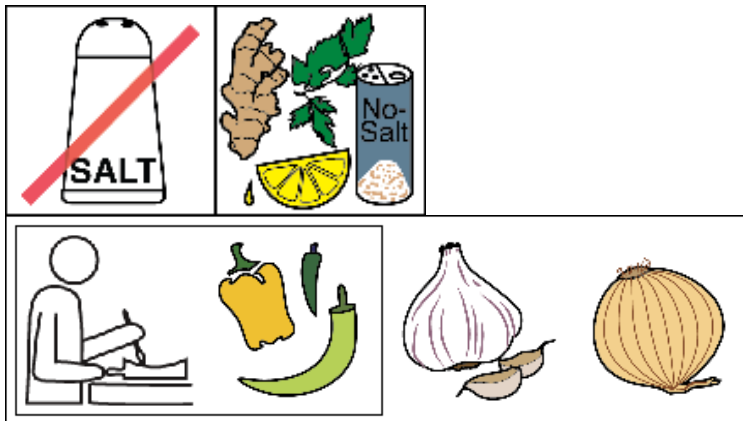


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

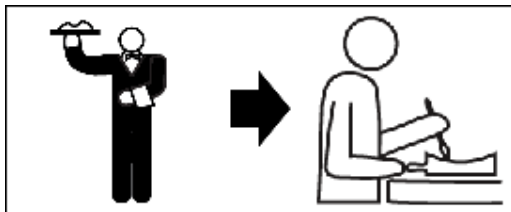


Give yourself time to get used to eating less salt. It may take a little while.

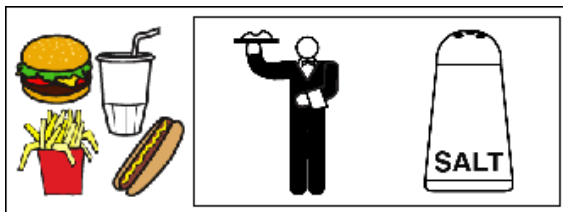
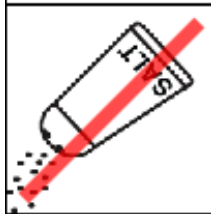
Here are some tips to help:



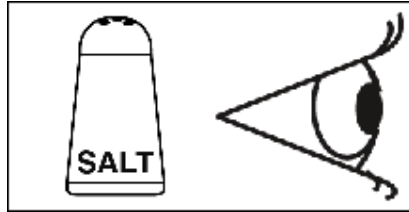
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



When you eat out, ask that your food be cooked without added salt.

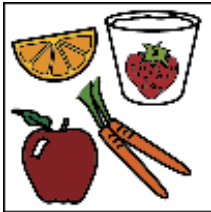


Fast food and restaurant food is prepared with large amounts of salt.



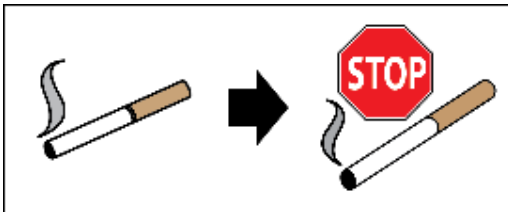
Nutrition Facts	
Serving Size: 1 oz (28g)	
Amount Per Serving	
% Daily Value*	
Total Fat	10g
Saturated Fat	12%
Trans Fat	
Cholesterol	2%
Sodium	25%
Total Crap	100%

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.



Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!



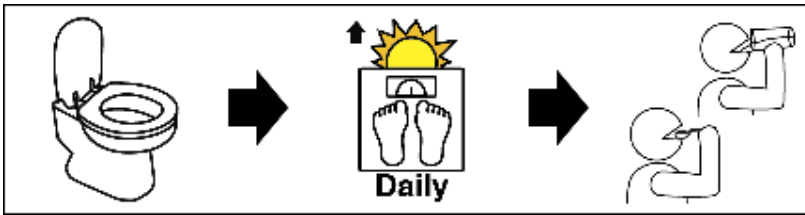
If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Other Instructions:

Daily Weights:



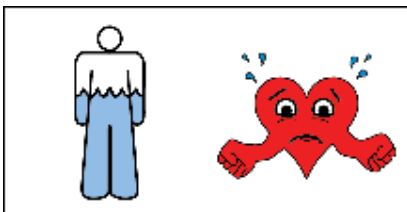
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.



Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.



This is a sign of fluid overload, which strains the heart.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Keep a record and bring it to your appointment with the surgeon.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Cholesterol Levels:

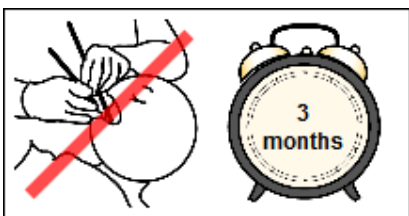
This is an important part of your heart health. Talk to your doctor about when to check your fasting lipid panel.

- Your total cholesterol should be under 200.
- HDL (good) levels should be more than 40 for men, 50 for women.
- LDL (bad) levels should be less than 100.
- Triglyceride levels less than 150.

Diabetes Control:

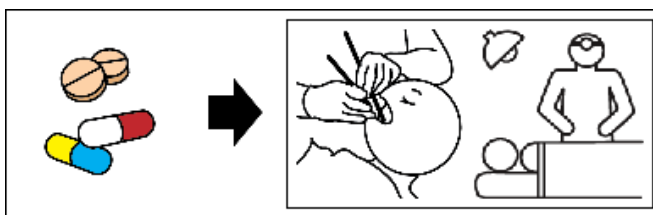
- Your Hemoglobin A1c should be less than 7.0.

For Valve Surgery only:



No routine dental procedures for 3 months.

Tell your dentist about your valve surgery.



Follow your surgeon's advice about taking antibiotics before any dental procedure or surgery.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu

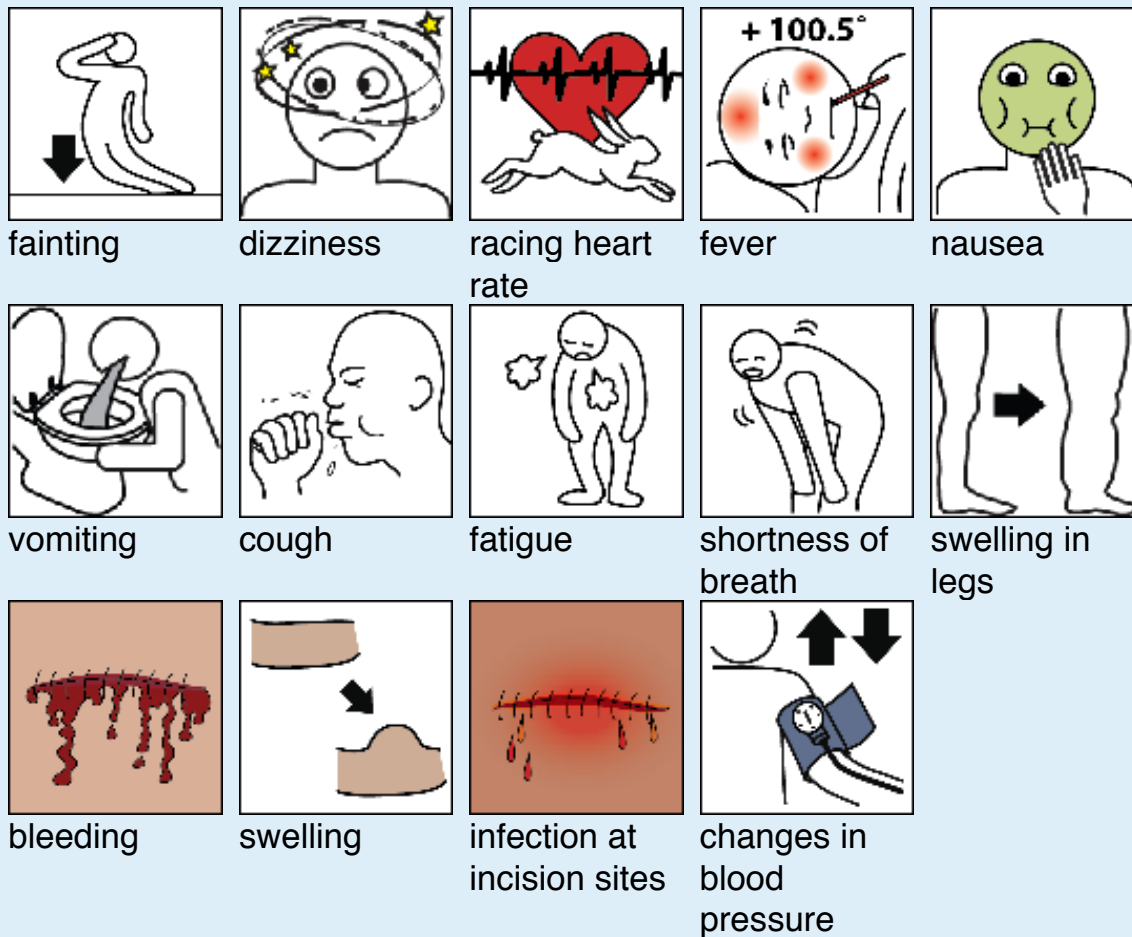


Transcatheter Aortic Valve Replacement Instructions

Medications:

Bring a current medication list to all your doctor appointments.

Call Your Cardiologist if you Have any of the Following:



- Fainting, dizziness, racing heart rate
- Fever more than 100.5 (F)
- Nausea, vomiting or persistent cough
- Extreme fatigue
- Shortness of breath
- Swelling in your legs, hands, or stomach
- Bleeding, swelling, or infection at incision site(s)
- Unusual changes in blood pressure or heart rate

Phone Numbers:

During office hours (M-F, 8-4) 801-585-7676 or 800-824-2073. Ask for your cardiologist or surgeon.

After office hours 801-581-2121 or 800-824-2073. Ask the hospital operator to speak to the "Cardiology Fellow on call".



If You Have Chest Pain:



Stop all activity and sit down.

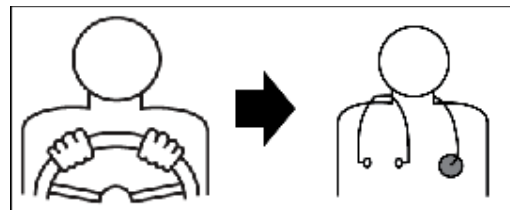
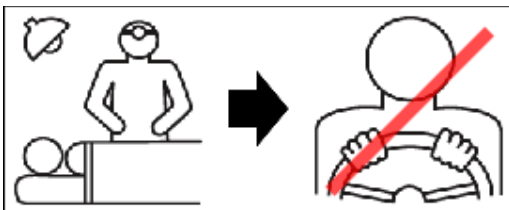


If the chest pain does not go away after 5 minutes, call 911.



Do NOT drive yourself to the emergency room!

Restrictions:



No driving after your surgery. Your doctor will tell you when you are allowed to drive again.

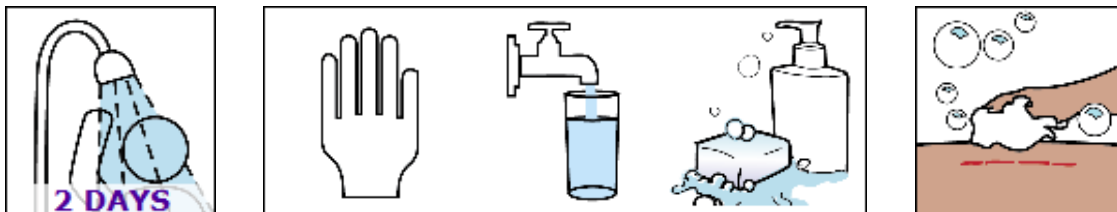


Do not lift more than 10 pounds for 1 week. A gallon of milk is 8 pounds.

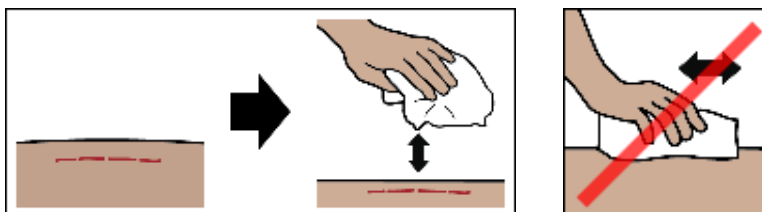


No sex or strenuous exercise for two weeks.

Wound Care:



You may shower 2 days after your procedure as long as all your drains have been removed. Use only your hands, water and a mild antibacterial soap.



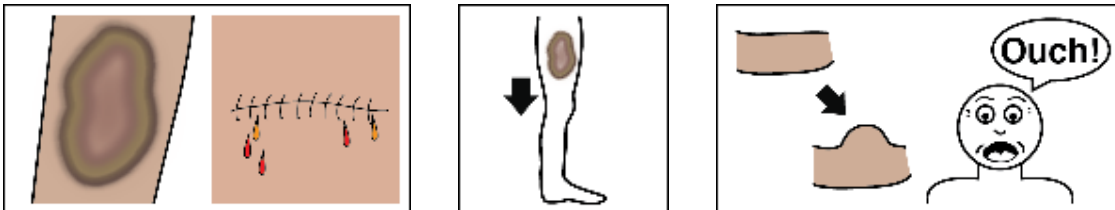
Gently clean the incision sites then pat them dry. Do not scrub or use a washcloth.



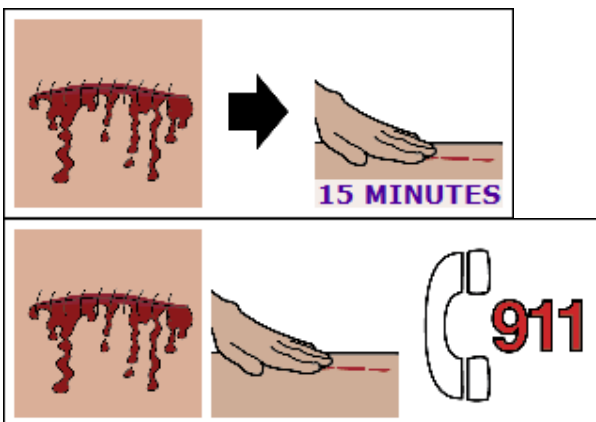
No tub baths, hot tub soaking or swimming for 8 weeks after procedure.



Gently remove any strips of tape in the shower after 48 hours.

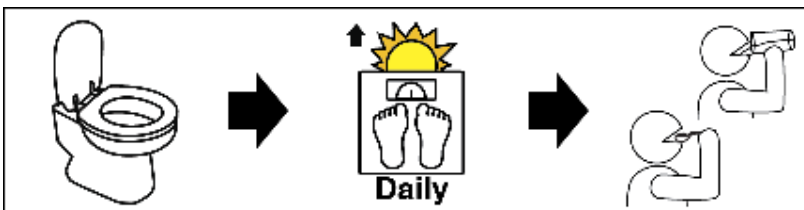


Some bruising, drainage, or oozing is normal. The bruise may even move down your leg. You may feel a small lump. Don't worry unless it is red, swelling or hurting more.



If you start bleeding from an incision, apply pressure for 15 minutes. Do not let go. Check after 15 minutes. If you are still bleeding, re-apply pressure and call 911.

Daily Weights:



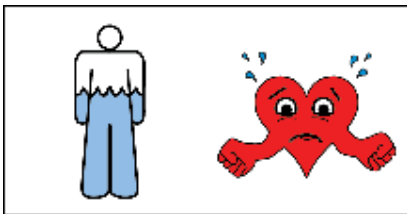
Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.

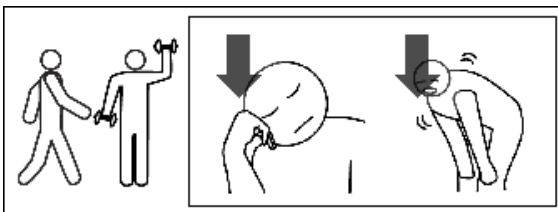


Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.

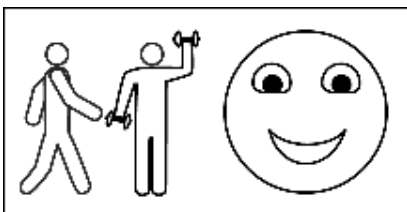


This is a sign of fluid overload, which strains the heart.

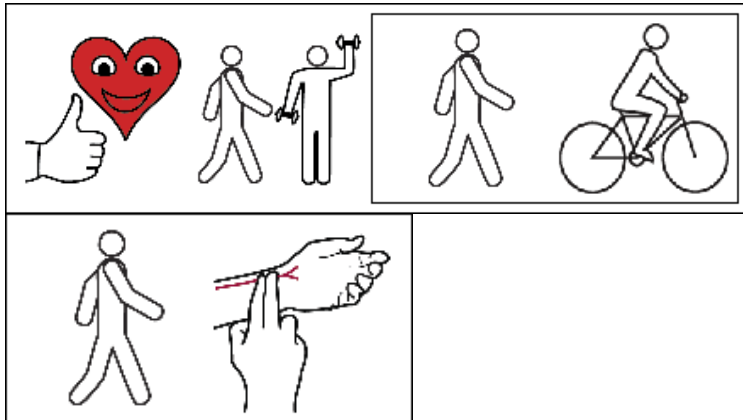
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



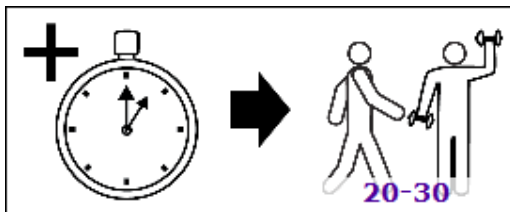
It will help your daily activities become easier and you to feel better.



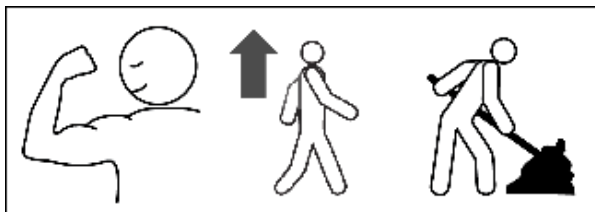
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



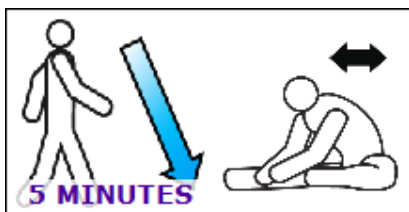
Warm up for 5 minutes.



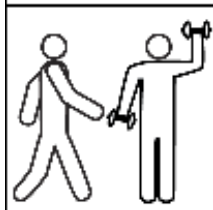
Start out easy and slowly add time until you can exercise for 20-30 minutes.



As you get stronger, increase the pace so you are still working with medium effort.

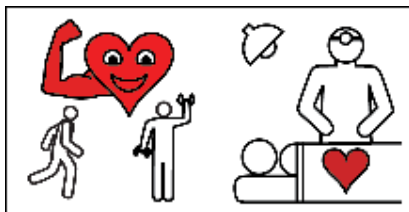


Always cool down for 5 minutes and stretch after exercising.



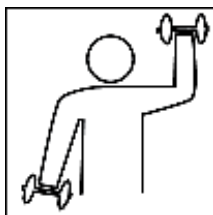


The American Heart Association suggests exercising 30 minutes most days of the week.



Cardiac Rehab is recommended for best recovery from heart surgery.

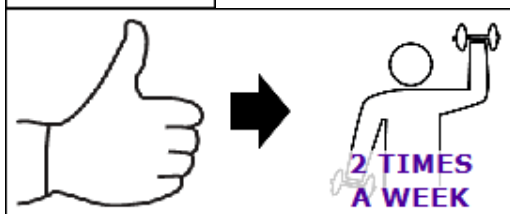
Maintain Strength:



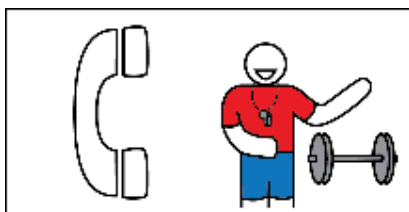
Lifting weights can help maintain strength and daily function.



Check with your doctor to make sure it's OK, then start lifting light weights twice a week.

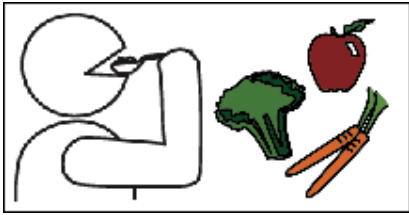


Make sure you use proper technique.

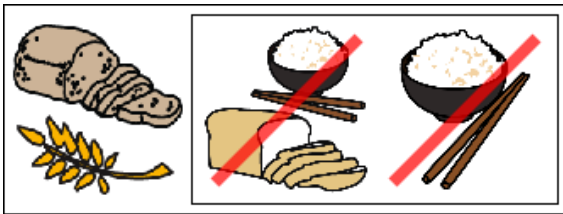


If you have questions, call our Exercise Specialists at 801-585-3508.

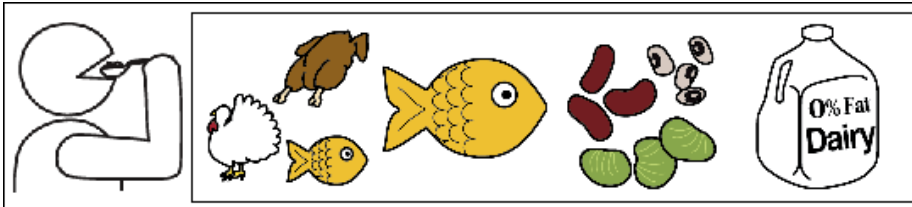
Nutrition:
Heart Healthy Diet:



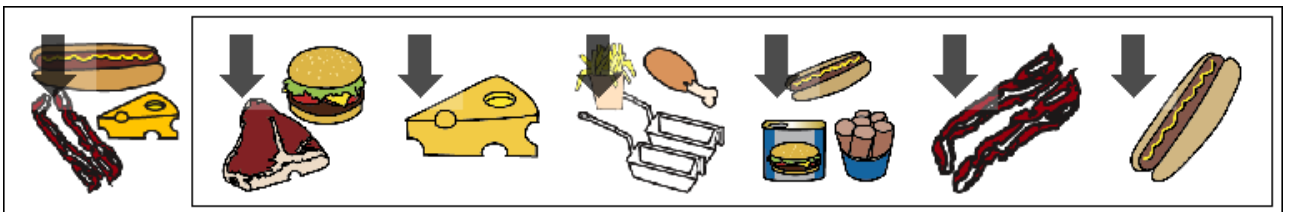
Eat lots of fruits and vegetables.



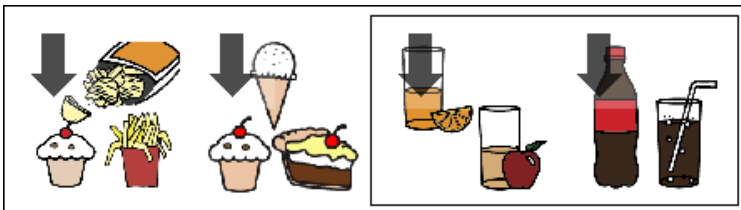
Choose whole grains over white bread and white rice.



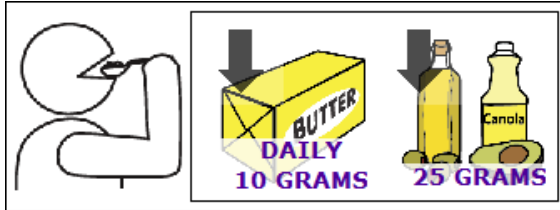
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



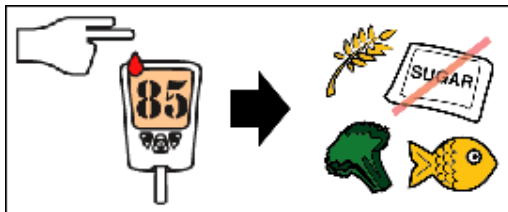
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

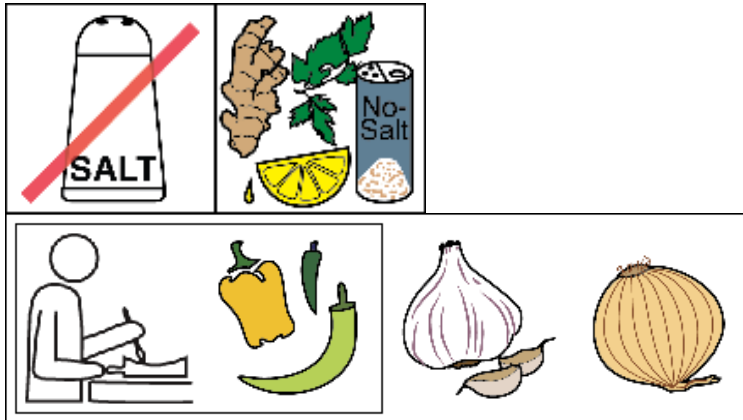


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

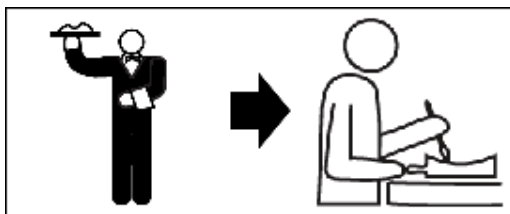


Give yourself time to get used to eating less salt. It may take a little while.

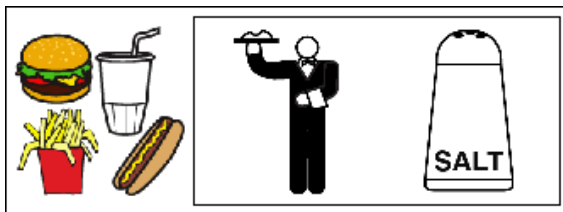
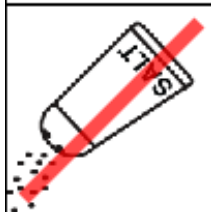
Here are some tips to help:



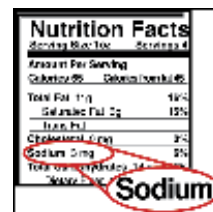
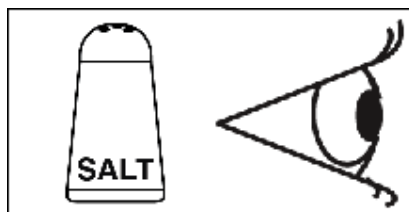
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



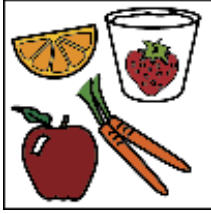
When you eat out, ask that your food be cooked without added salt.



Fast food and restaurant food is prepared with large amounts of salt.

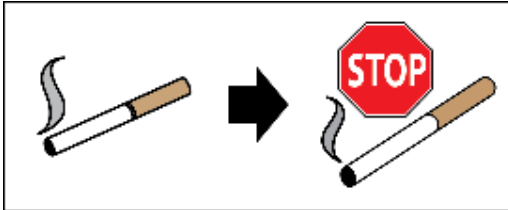


Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.



Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!



If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Write it down in a journal.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu



Heart Surgery Patient Instructions

Medication:

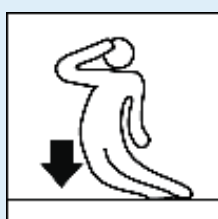
Bring your current medication list to all your doctor appointments.

Warfarin:

Warfarin (Coumadin®) is commonly known as a “blood thinner.” It makes your blood less likely to clot. It is used to prevent or treat blood clots in the legs, lungs, pelvis, and heart. Warfarin also increases your risk of bleeding. Because of this, it must be taken exactly as directed by your doctor.

A test called the PT/INR is used to find out how your blood is clotting. Your next PT/INR blood check is on December 12.

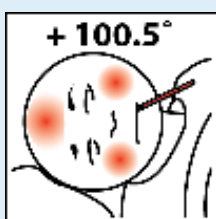
Call Your Surgeon if You Have any of the Following:



fainting



dizziness



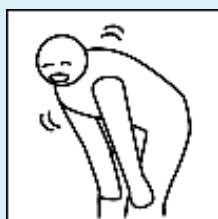
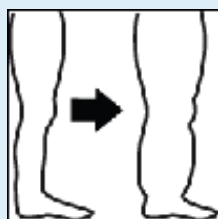
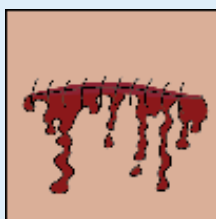
fever



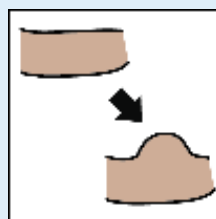
nausea



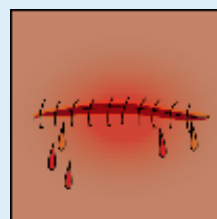
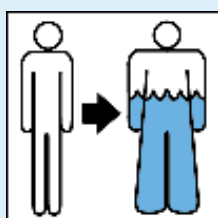
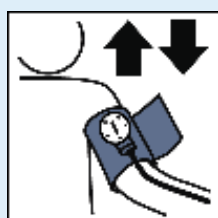
vomiting

shortness of
breathswelling in
legs

bleeding



swelling

infection at
incision sitesrapid weight
gainchanges in
blood
pressure

- Fainting, dizziness, racing heart
- Fever more than 100.5
- Nausea or vomiting
- Shortness of breath or difficulty breathing
- Swelling in your legs
- Bleeding, swelling or infection at incision site(s)
- Your incision seems to be opening up
- Rapid weight gain
- Unusual changes in blood pressure

or heart rate

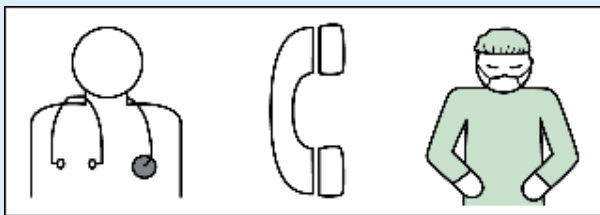
Phone Numbers:

- During office hours (M-F, 8-4) 801-581-2121 or 800-824-2073. Ask for your surgeon's office.
- After office hours 801-581-2121 or 800-824-2037. Ask the hospital operator to speak to the "CT Surgeon on call."

If you are having an emergency:

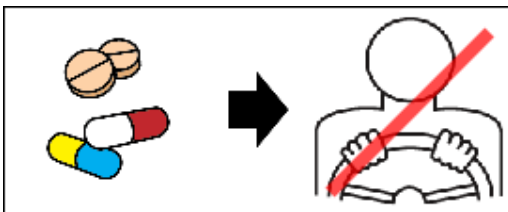


Call 911 or go to the emergency



Ask the emergency room doctor to call your surgeon.

Restrictions (also called "Sternal Precautions"):

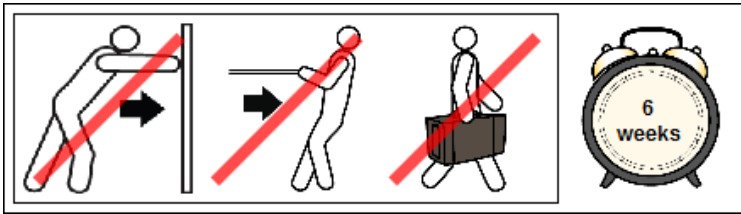


Do not drive for 4 weeks or while you are taking narcotics.

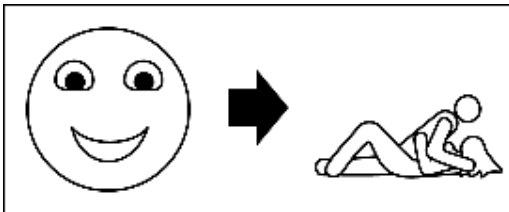


Do not lift over 5 pounds for 6 weeks. A half gallon of milk is 4 pounds.

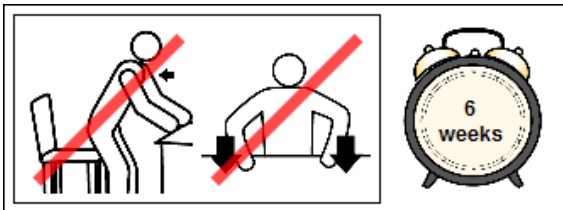




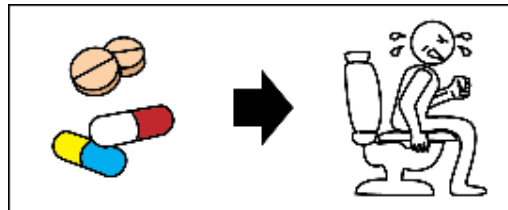
Also avoid pushing, pulling, or carrying things for 6 weeks.



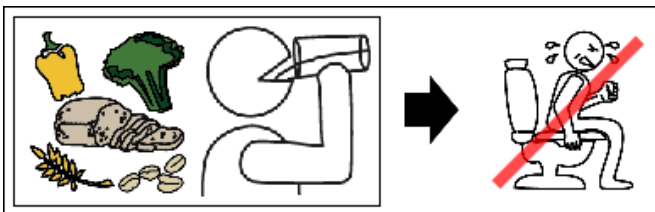
You may start having sex again when you feel ready.



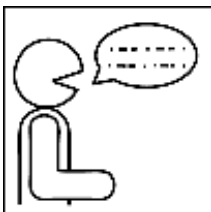
Do not put pressure on your chest or hold yourself up with your arms for 6 weeks.



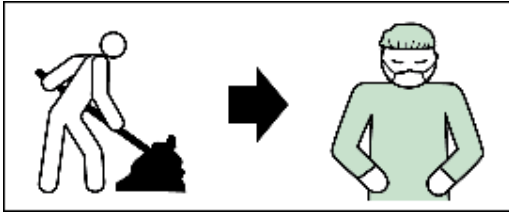
Do not bear down or push hard to have a bowel movement. Pain medicine may cause constipation, so take stool softeners while you are on narcotics.



Eating high fiber foods and drinking water also helps prevent constipation.



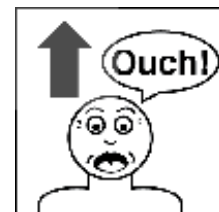
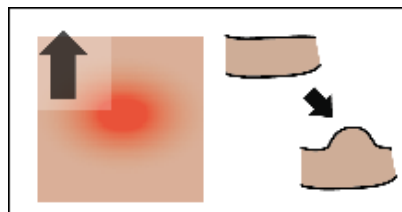
Talk with your surgeon about when you can go back to work.



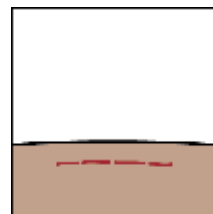
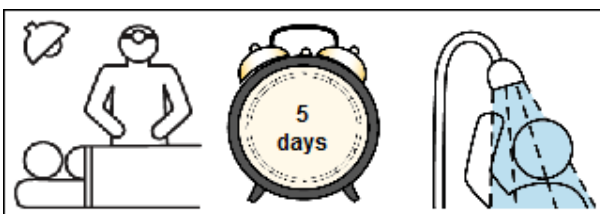
Wound Care:



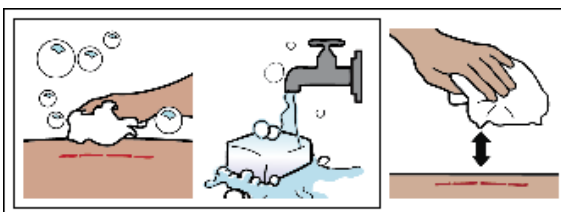
If you leave with a dressing on your incision(s), remove it after 48 hours.



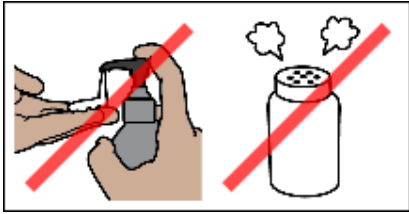
Look at your wound every day for signs of infection. This includes drainage, increased redness, swelling, or increased pain.



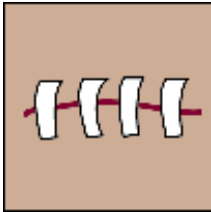
You may shower 5 days after your surgery if your incision has no open areas.



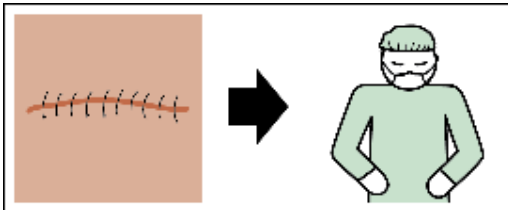
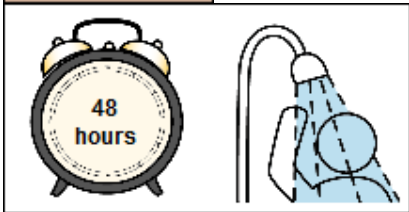
Clean with mild soap and water, pat dry.



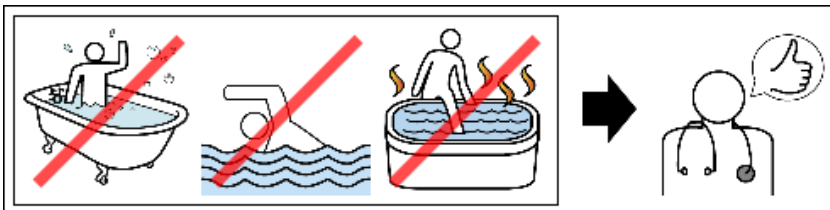
Do not use lotions or powders.



Gently remove any strips of tape in the shower after 48 hours.



If you have stitches, they will be removed by your surgeon.

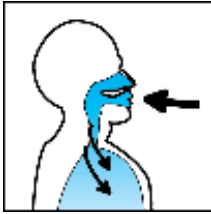


No tub baths, swimming pool or hot tubs until the surgeon says OK (usually in 6 weeks).

Big Breaths:



Use your Incentive Spirometer every few hours while awake for the first two weeks.

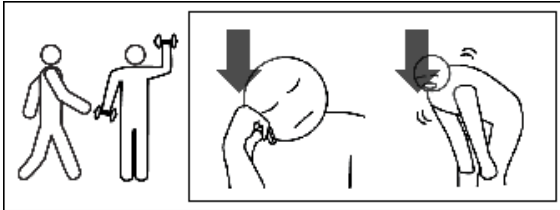


Do 10 slow, smooth, deep breaths each time.

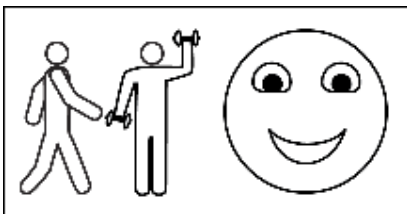
Don't rush the breaths.

Keep trying to increase volume.

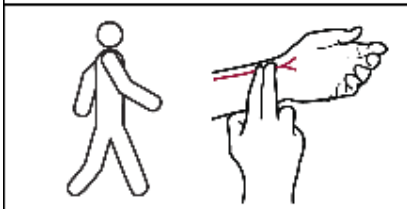
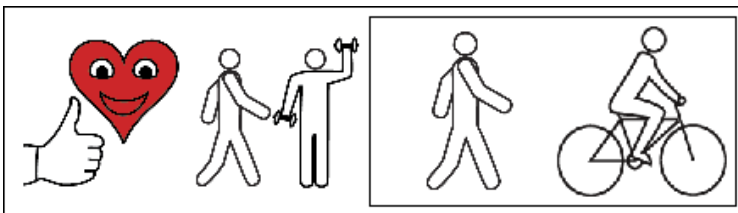
Activity:



Regular moderate exercise can reduce symptoms of tiredness and shortness of breath.



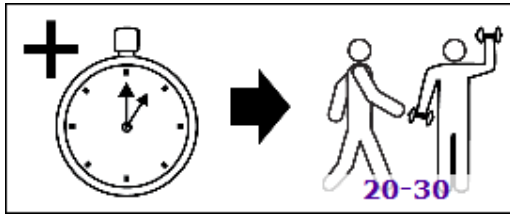
It will help your daily activities become easier and you to feel better.



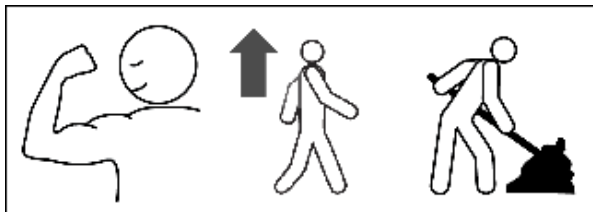
The best heart exercises are walking or cycling at a medium pace that raises your pulse.



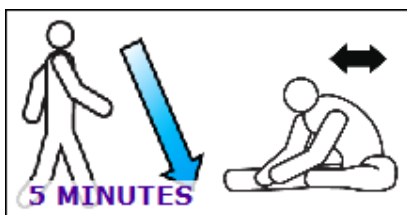
Warm up for 5 minutes.



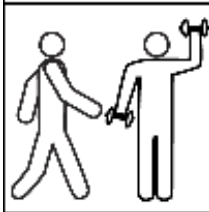
Start out easy and slowly add time until you can exercise for 20-30 minutes.



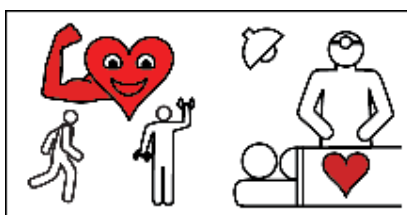
As you get stronger, increase the pace so you are still working with medium effort.



Always cool down for 5 minutes and stretch after exercising.

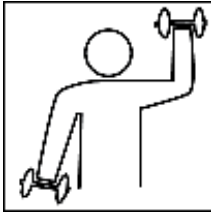


The American Heart Association suggests exercising 30 minutes most days of the week.



Cardiac Rehab is recommended for best recovery from heart surgery.

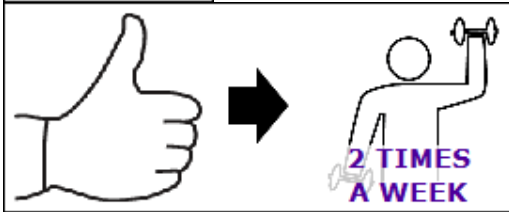
Maintain Strength:



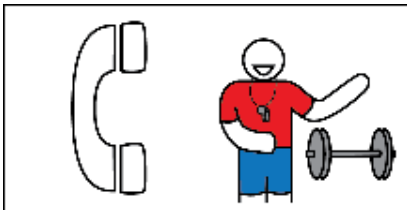
Lifting weights can help maintain strength and daily function.



Check with your doctor to make sure it's OK, then start lifting light weights twice a week.



Make sure you use proper technique.



If you have questions, call our Exercise Specialists at 801-585-3508.

Nutrition:



You may not have much of an appetite for up to 4 weeks after your surgery.



When you eat, choose protein and nutrient-rich foods to help you heal.

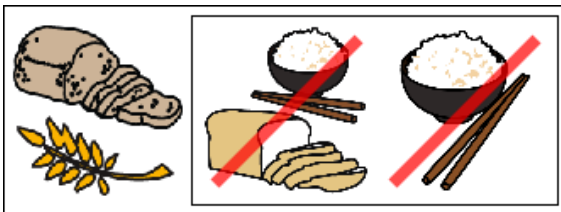


When your appetite returns, your surgeon recommends the following:

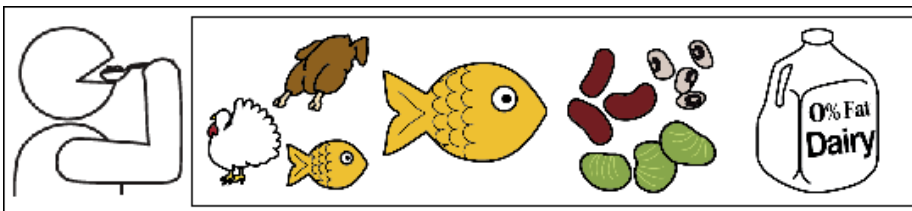
Heart Healthy Diet:



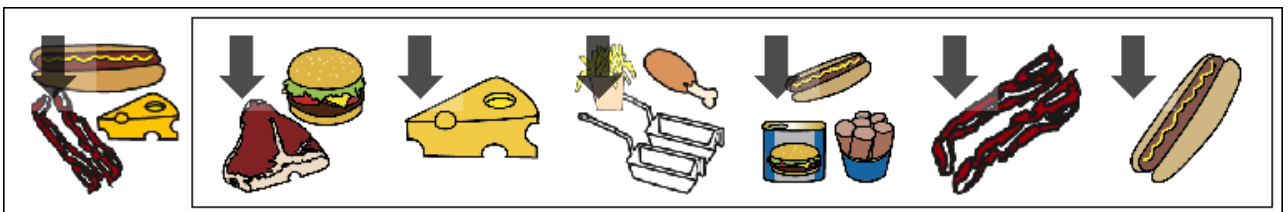
Eat lots of fruits and vegetables.



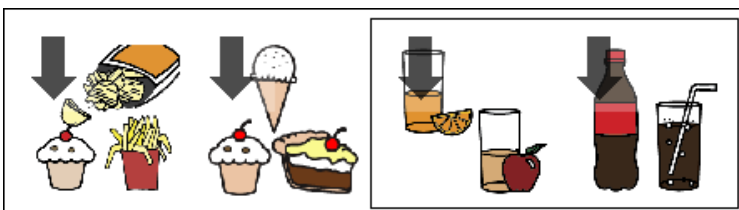
Choose whole grains over white bread and white rice.



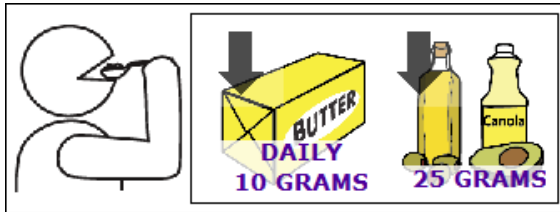
Eat lean meats, fish, beans and non-fat dairy.



Limit high-fat foods like red meat, cheese, fried foods, lunch meats, bacon, and hot dogs.



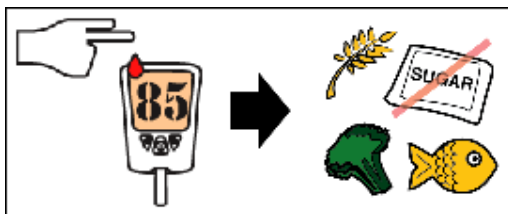
Cut back on high-calorie snack foods, desserts, and juices/sodas.



Eat less than 10 grams of saturated fat daily, and less than 25 grams total fat. Check labels for fat content per serving.



Limit yourself to 1800 to 2000 calories per day—try smaller portions.



If you are diabetic, stick to your diabetic diet.

Eat Less Salt (Sodium):

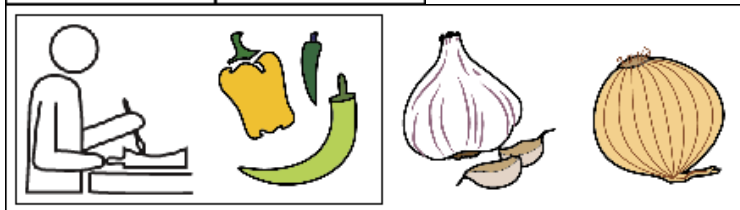


The goal is to eat less than 2000mg of salt daily (about a teaspoon).

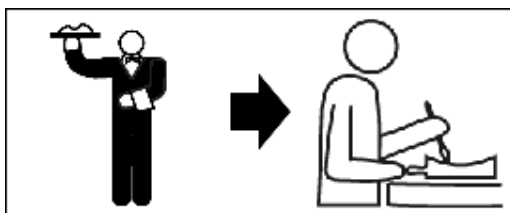


Give yourself time to get used to eating less salt. It may take a little while.

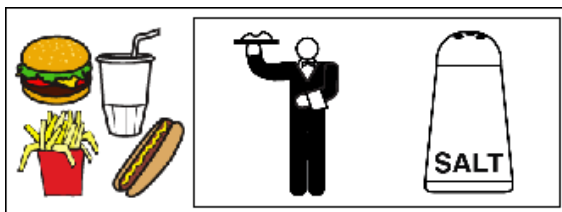
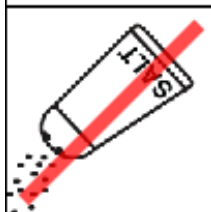
Here are some tips to help:



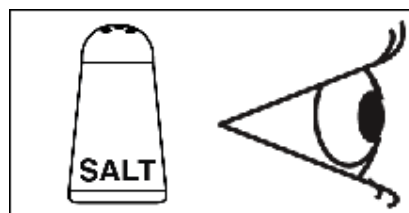
Take the salt shaker off the table. Replace it with salt-free herb mixes or a squeeze of lemon or lime juice. Cook with pepper, spices, garlic, and onion.



When you eat out, ask that your food be cooked without added salt.

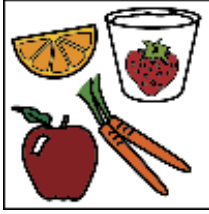


Fast food and restaurant food is prepared with large amounts of salt.



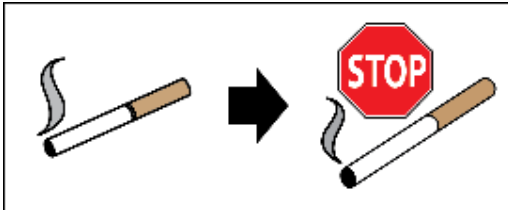
Nutrition Facts	
Amount Per Serving	
% Daily Value*	
Total Fat 11g	22%
Saturated Fat 2g	4%
Total Carb 28g	56%
Dietary Fiber 1g	2%
Sodium 2mg	40%
*Percent Daily Values are based on a diet of other people's secrets.	

Most packaged and canned foods have a lot of salt, so read labels carefully. Look for sodium amounts per serving. Make sure that a serving size matches what you actually eat.



Choose low-sodium snacks like sodium-free pretzels, crackers, or air-popped popcorn.

Do Not Smoke!



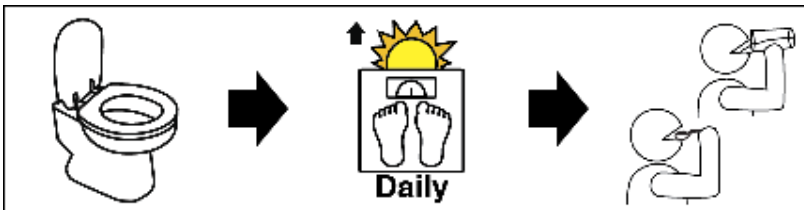
If you smoke, please stop to help prevent further health problems.



If you need help quitting, call the Quit Line for your state, or talk to your doctor about medications that may help.

Other Instructions:

Daily Weights:



Weigh yourself each morning after going to the bathroom but before eating or drinking.



Keep a record of your weight every day.



Call your doctor if you gain 3 or more pounds in 2 days, or if you gain 5 or more pounds in a week.



This is a sign of fluid overload, which strains the heart.

Blood Pressure:

Take your blood pressure twice a day (in the morning before your medications, and later in the day). Write it down in a journal and bring it to your appointment with the surgeon.

- The top number of your blood pressure should be less than 130.
- The bottom number of your blood pressure should be less than 80.

Cholesterol Levels:

This is an important part of your heart health. Talk to your doctor about when to check your cholesterol panel to make sure you are at goal (if you just started a “statin” drug or changed the dose).

- Your total cholesterol should be around 130.
- HDL (good) levels should be more than 40 for men, 50 for women.
- LDL (bad) levels should be less than 70.
- Triglyceride levels should be less than 150.

Diabetes Control:

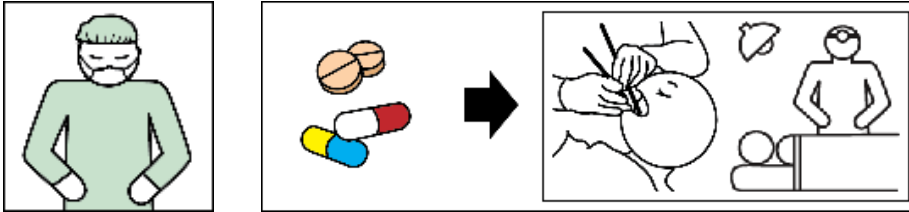
- Your Hemoglobin A1c should be less than 7.0.

For Valve Surgery only:



No routine dental procedures for 3 months.

Tell your dentist about your valve surgery.



Follow your surgeon's advice about taking antibiotics before any dental procedure or surgery.

Preventive Cardiology:

Call or e-mail us if you have any other questions

Phone: During office hours (M-F, 8-4) 801-581-3949

E-mail: prevcardnurse@hsc.utah.edu