Educational Material for the Surgical Hospital at Southwoods

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MASTER OF FINE ARTS

In Medical Illustration

**Educational Material for the Surgical Hospital at Southwoods**

by

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Abstract:

The Surgical Hospital at Southwoods was established in 1996 with the purpose of creating a healthcare facility that places importance on providing excellent medical treatments. Since the individual patient is the main priority at Southwoods, the facility needed to give the patient information about his/her surgery in a way that the viewer understands regardless of that person’s health literacy level. To meet this prerequisite, the hospital was in need of new outpatient education material. The purpose of this project is to clearly inform patients what to expect before, during, and after surgery. This educational material will be given to every person going for three specific surgeries: total hip arthroplasty, total knee arthroplasty, spinal surgeries. Each booklet describes in detail what the patient should do before, what will happen during, and what to do during the recovery phase of their surgery. Common causes for these surgeries and corrective measures have been illustrated. After the surgery, the patient will be required to perform certain exercises to help with recovery in gaining full range of motion as well as learning how to use walkers. The booklets illustrate how to do activities of daily living after surgery, exercises to help in the recovery process and how to use different walking aids. The patients will have insight into their surgery and what is expected afterwards to reach full recovery.
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Introduction:

The Surgical Hospital at Southwoods was established in 1996 (Youngstown Ohio) with the purpose of creating a healthcare facility that places importance on providing excellent medical treatments. Southwoods has introduced the most technologically advanced and comprehensive imaging center in the region. Since the individual patient is the main priority at Southwoods, the facility needed to give the patient information about his/her surgery in a way that the viewer understands regardless of that person’s health literacy level. To meet this prerequisite, the hospital was in need of new outpatient education material.

The Purpose of this project is to clearly inform patients what to expect before, during, and after surgery. This educational material will be given to every person going in for three specific surgeries. I have redesigned three main surgery booklets that cover: total hip arthroplasty, total knee arthroplasty, and a variety of spinal surgeries. Each booklet describes in detail what the patient should do before surgery, what will happen during the surgery, and what to do during the recovery phase after surgery. I have illustrated common causes for these surgeries and corrective measures the surgery will provide. Afterwards, the patient will be required to perform certain exercises to help with recovery in gaining full range of motion as well as learning how to use walkers. I illustrated how to do activities of daily living after surgery, exercises to help in the recovery, and how to use different walking aids. Besides the educational purpose I have redesign the look of the booklet to give it a more modern look that will entice and engage the audience. The patients will have insight into their surgery and what is expected afterwards to reach full recovery.
Section I. Scientific Background:

There were three kinds of surgeries that were illustrated in the pamphlets: surgical procedures done on the spine, total knee replacement, and total hip replacement. Afterward, exercises for rehab treatment were illustrated to help in the healing process.

The spine book was the most detailed because of the different pathologies that require spinal surgery. Back pain can be caused by a number of factors such as injuries, arthritis and the effects of aging (arthritis, osteoporosis, disc degeneration and fractures). Aging and inherited factors can cause degenerative changes in the discs (called degenerative disc disease) as well as arthritic changes in the small joints. Osteoporosis causes bones to lose strength over time. This could lead to a fractured or compressed vertebra from a fall or even from everyday activities. There are multiple pictures that I illustrated describing instability, herniated discs, spinal stenosis, etc. These are some common problems Southwood Hospital treats. Using the descriptions given in their booklet I was able to recreate small pictures demonstrating herniated discs, spinal stenosis, etc. After this there is a section that describes some other different surgical procedures that are done to the spine. These procedures include Kyphoplasty, Laminectomy, and Fusion.

Kyphoplasty is a minimally invasive spinal surgical procedure used to treat painful progressive vertebral compression fractures. This type of fracture is in the body of the vertebra which causes it to collapse and form an abnormal forward curve in the spinal column. The surgical process inserts a balloon between collapsed vertebrae. I was able to illustrate a portion of a spinal column showing a balloon being inserted with a slightly forward curved spine and then a blown-up balloon with a healthy curve to the spine.
Laminectomy removes the damaged portion of the lamina. Removal of the lamina helps release the pressure when the disc bulges. If stenosis is present the surgeon may enlarge the foramen to allow space for the nerve to exit. Two superior view illustrations are used to demonstrate this. One shows the nerve being pinched and the other shows a section of lamina removed and a nerve in its position.

Fusion is for people with instability and need the vertebrae joined together. Small pieces of bone, wires, rods, screws, and plates may be used. I used one drawing showing two examples on each side. On one side bone is used and the other side a rod is being used.

Using the old booklet as a reference I was able to get a good understanding of what they wanted their patients to know and understand for their surgeries. I used the examples they described to illustrate the different complications that can occur to the spine. After such surgeries there are many guidelines on how to sit, sleep, and walk. I recreated the old black and white photos into clean understandable vector line art. Many of the guidelines are for the patient’s safety. For one of the guidelines I had to watch and sketch people going up and down the stairs with a walker. This helped me to understand how they folded the walker and used it for balance.

Secondly, using the reference paper and video included in the *Surgical Technique of Total Knee Arthroplasty without Soft Tissue Balance* (Hong tao Xu et al 1016) and visiting the operating room for a total knee replacement in the Fall of 2015, I was able to get a good idea of the procedure the hospital preformed for their patients. Realizing each patient scenario might vary I did a broad generalization for the procedure. For example, one patient might not need a total knee replacement but only require a partial knee replacement.

The rehab exercises that Southwoods wanted were already demonstrated in the book. I had to recreate those images into vector line art. These rehab exercises help the patient to regain
their mobility. The purpose of many of these exercises is to help the ligaments to achieve their ideal length and flexibility. A lot of the exercises dealt with trying to flex the knee and straighten it from laying, sitting, and standing positions. The patient should work in doing knee slides and foot slides to help gain a range of motion with their new knee. These kinds of exercises were drawn out in a step-by-step approach for the audience to clearly comprehend how to perform them. For example, knee slides should be performed by sitting on a chair or the edge of a bed and stabilizing their foot against some type of support such as the wall. Pressing down with their arms and gently sliding forward toward their feet and then back would be the proper way to gain a range of motion with the patient’s knee.

There is also a part that helps the patients understand how to do common household duties with their new replacement so that there is no damage done. Examples of some household activities included getting into and out of bed safely and how to put dishes in the dishwasher. One has to be careful with how they bend the knee in everyday use. These illustrations will help the viewer see the correct way to do these activities. By watching and studying people preform these duties in real life I was able to recreate images showing the proper technique they should be using to achieve their goals.

Thirdly, using the reference paper *The Direct Anterior Approach for Complex Primary Total Hip Arthroplasty: The Extensile Acetabular Approach on a Regular Operating Room Table* (Molenaers, et al 2016) and visiting the operating room in the Fall of 2015, I was able to gain insight on the procedure for a total hip replacement. Again, each patient procedure will vary but I did a broad generalization on what will occur during their surgery, including the cup for the acetabulum, and ball and stem for the femur.

The therapeutic exercises demonstrated in the old booklet are used in the hospital. Using
the old illustrations, I was able to recreate many of the different techniques used for the healing process. These includes hip abductions, hip extensions and hip flexion. These are performed by standing stationary and abducting the hip for a certain amount of repetitions moving on to extension and flexion. All the exercises demonstrated will help the patient gain strength and flexibility in their joint for everyday life. Activities of life would include getting into and out of a car and even walking with a cane or walker.

Section II. The Body of Work:

The goals of the project are: 1) to provide an engaging, and enlightening material for the general public; 2) to visually elements for explaining surgical procedures, rehabilitation exercises, and how to perform activities of daily living; and 3) to ensure the patient has the materials needed to make informed decisions before and after the surgery.

The primary audience will be patients going in for spinal surgery for total hip arthroplasty and total knee arthroplasty. The content will be targeted to middle age and above because this is the typical age of patients requiring these surgical services. The secondary audience will include the patient’s family and friends who will be helping the patient during the recovery process. Clinicians and patient educators will also be able to use the material during the education process of the patient.

Existing illustrations on this topic have been done before. There were line art drawings compiled into the three booklets. Upon further examination these drawings were copied too many times, becoming illegible. In addition to the poor quality, the artwork that was used was found to be taken from the Internet. The images were not created by hospital personnel and are not suitable for print production.
Overall the artwork was not consistent among the three booklets. There were black and white photographs of people demonstrating different techniques. These photos were pixelated, grainy, and did not provide adequate information as a result of frequent replication.

Using the photos and illustrations they had in the booklets for references I was able to compile new modern artwork to help with educating the audience properly.

Above are two images that demonstrate the quality of pictures the books had. Both images demonstrate how to do daily activities following surgery. They are in black and white. Low quality makes them hard to understand.

After meeting the Southwoods Hospital’s graphic designer, hearing from the CEO, and listening to the patient education coordinator they decided there were three different surgeries that needed new patient education material. Their feedback helped shape the booklets being designed. The booklets will feature anatomical figures, demonstrate anatomy associated with the surgery, what will happen during the surgery, exercises to do afterwards, and guidelines for routine activities. These figures will be created with Adobe Photoshop, Illustrator, and InDesign.
A preliminary sample was sent to Southwoods to be analyzed by the patient education coordinator, graphic designer, and the CEO. After getting approval, the advancement of the rest of the material began. This includes finalization in layout, design, finalized drawings, and wording. This approach was innovative because the photographs in the old versions were very small, pixelated, and limited to black-and-white. The new version has clear colorful illustrations to help with the educational process.

I wanted the books to have the same feel of continuity. They all have the same color scheme and layout. First, the covers were designed in Photoshop (refer to Image 3, 4, and 5). These covers had to relate to the audience that was receiving the books. I chose middle age and older adults doing activities that would relate to their life. The colors chosen imply the feeling of happiness and relaxation. This would make it seem like it is possible to get back to daily life after the surgery.

Above are the covers for the three booklets that have been designed. Image 3 shows the cover for spine surgery. Image 4 shows the cover for hip surgery and image 3 shows the cover for knee surgery. The images on the cover reflect the audience that will be using the booklets at the time. The target audience is middle-age and older adults so the artwork is aligned toward that audience.
The second part of the book describes what to do before the day of surgery. It talks about different equipment the patient should have on hand and how to prepare the house for when they return from the surgery. For this part, I wanted to use little blue bubble clipart. They represented the different characters that are mentioned in this part. The overall feel is saying “it will be ok, you can recover from this”. This part of the book was very wordy with a lot of Do’s and Don’t’s. The blue figures make it more appealing for the audience to look at it.

Image 6
These demonstrates three different blue bubble body artwork used in the beginning of the booklets. Each one represents a topic that is covered in the beginning.

Sock aids

Image 7
One of the instruments needed to help carry out daily life after surgery. These should be acquired before the day of surgery to prepare.
In the old booklets, the surgery part is only in the spine book. It had a description of what was happening and why the patient was going into surgery. The others did not even mention surgeries or just had a small page at the end of the book discussing options. I decided to put the surgical part in all the books to help the audience understand their procedure. The artwork portrayed in this section is done with Adobe Photoshop. This helps to give a three-dimensional quality to the art using color and shading. The spine book was the most detailed because of the many different pathologies that require spinal surgery. There are multiple pictures describing bone spurs, herniated disks, etc. Going along with this there is also a section that describes the different surgical procedures that are done to the spine. Overall there are 4 pages in this book dedicated to educating the patient on their spine.

Image 8
These images are taken from the spine booklet designed to help the patient understand what will happen during their surgery. The images show a Kyphoplasty, Laminectomy and fusion of the vertebrae.
The other two books only show one kind of procedure that is done at the hospital for the knee and the hip. The Surgical Hospital at Southwoods mostly sees total hip and total knee replacement surgeries. That is what I focused on in these books. There is only one page dedicated to showing the problem and the replacement steps that are taken.

**Image 9**
Total hip replacement surgery.
A total knee replacement surgery.
The last section of the books describes what to do after the surgery. This section addresses how to do common household chores and strengthening exercises to help in the recovery process. All of the art in this section is created in Adobe Illustrator. The three books are a little bit different from one another in this part. They all show how to exercise the different parts of the body where the surgery was performed. In the spine book topics addressed include; how to get in and out of bed, how to sit in a chair, getting in and out of a car, doing the dishes, how to bathe, vacuum, do laundry, etc. These are all accompanied by line art that shows how to properly perform that activity.

Image 11
An Illustrator line art drawing showing how to properly walk with a cane.

Laundry
- Do not bend forward into the machines. For top loading machines, utilize a "golfer's lift" or straight leg lift as shown.
- Wash clothes in small loads. Large loads will be heavy and place too much strain on your back.
- When loading or unloading a front loading washing or dryer, lower yourself down onto one knee to avoid bending and twisting. Use support when returning to a standing position.

Image 12
Showing a person doing the laundry. This is the proper technique to use once surgery has been completed.
In the hip surgical booklet it also talks about daily living and how to perform daily activities. In addition to daily life there is a large section dedicated to how to strengthen the hip to achieve full motion. These are also done in the same style of line art using Adobe Illustrator. There is a sense of movement in some of the exercise pictures portrayed with a dashed line. This helps the viewer to understand the motion required without reading all of the text that describes the action.

**Image 13**
Line art describing how to properly get into a bed after surgery.
Image 14
After surgery strength exercises for the hip done in line art.
Image 15
Exercises that should be performed after surgery to strengthen the hip.
The knee exercises were also quite diverse in helping the patient develop full range of motion in their knee joint. Below shows a page from the knee exercise portion done in the same style of line art.

**Image 16**
A page from the knee booklet. This page is showing the many knee exercises needed to be performed after surgery.
In this section there is another part that the hospital deemed very important to the patient, the use of a walking aid. Southwoods Hospital stresses the importance of having the patient understand how to use walking aids properly. With the use of line art I developed a series of pictures to demonstrate the use of different walking aids in multiple scenarios.

**Image 17**
Showing how to use a walker to stand up from a chair.

**Image 18**
Showing how to use a walker going up the stairs with an assistant.
Conclusion:

The objective of the body of work was to help educate patients prepare for their anticipated surgery. The surgeries involved were spine surgery, hip arthroplasty, and knee arthroplasty. The patient will learn what to do before the surgery, what happens during the surgery, and how to recover from the surgery.

The body of work in all three patient education booklets demonstrate a strong understanding towards the audience and subject matter. All the artwork is clear and to the point. This helps the viewer interpret what is going on and how to perform different tasks.

The patient educator also plans on using them in her classes. This will provide feedback on ease of learning and understanding from each patient. In these classes the patient educator will be able to evaluate if the material has increased the understanding of each patient on their specific surgery. This development will help ensure the creation of an effective teaching tool that will fill a void in Southwoods Hospital’s patient education material.

Overall the three patient education materials have been redesigned with a new look. All the books received new artwork that will fit the Surgical Hospital at Southwoods needs.
References:


The Joint Academy of The Surgical Hospital at Southwoods, Ortho 101-Hip. Collection of Southwoods Hospital, Ohio

The Joint Academy of The Surgical Hospital at Southwoods, Ortho 101-Knee. Collection of Southwoods Hospital, Ohio

The Joint Academy of The Surgical Hospital at Southwoods, Ortho 101-Spine. Collection of Southwoods Hospital, Ohio