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# How to Explain Cancer to a Child and the Effects of Coloring Therapy in Children with Cancer

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**Applicant:** Alexandra Mauer

**Thesis title:** How to Explain Cancer to a Child and the Effects of Coloring Therapy in Children with Cancer

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Read, approved, and signed by:

Thesis adviser(s) Alison Walton 3/14/17  
Alison Walton, PharmD Date

Reader(s) Jane Gerasim 4-4-17  
Date

Certified by \_\_\_\_\_  
Director, Honors Program Date

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# **How to Explain Cancer to a Child and the Effects of Coloring Therapy in Children with Cancer**

**By: Alexandra Mauer, PharmD Candidate at Butler University**

## **INTRODUCTION**

Did you know that doodling or coloring in a book can have significant therapeutic effects? It has been studied and proven that art therapy can help with anxiety, depression, and even some diseases such as cancer.<sup>1</sup> Although coloring may not be able to cure cancer, it can make coping with it more manageable.<sup>1</sup> When a child who has cancer is waiting to be seen in a doctor's office or at the hospital, a coloring book can keep his or her mind off of the diagnosis, provide entertainment, and elicit a relaxing mindset. This coloring book could also have a storyline incorporated that explains cancer to children in a way that is easy to understand and gentle. Furthermore, there is an entire field of art therapy and professional associations dedicated to research around benefits in art therapy for patients. Games can be used to take children's minds off of cancer as well. There are some cancer art therapy and children's books already available, but through this research project, I studied specifically what resources are currently available (books, coloring books, and games), and ultimately created a new resource to fill the gaps for children around cancer.

## **THESIS OBJECTIVE**

For my thesis, I researched the effects of art therapy, as well as gaming therapy, in cancer, what children's books are available about cancer, and ultimately co-wrote a children's book in which I personally focused on how to incorporate art therapy through coloring in a storyline about cancer, an area of unmet need. In the children's book, we incorporated a character with cancer in order to explain what cancer is to children. I also made this children's book a coloring book to provide entertainment, relaxation, and therapy to those who choose to heal through art. My primary research question was: can we, as an inter-professional team after studying the current body of literature, create a children's

book to address an unmet need in cancer for children while at the same time incorporating art or gaming therapy?

## **SIGNIFICANCE**

The idea to write a children's book on cancer while also incorporating art therapy and/or gaming is both unique and exciting for me because I am passionate about oncology and hope to find a career in this therapeutic area someday. My mother was diagnosed with breast cancer about a year ago. Since then, I have become extremely interested in oncology and have done a lot of research on the subject. I am also very passionate about writing. I worked in the writers' studio and am a founder of the student run journal *BU Well*; I have experience writing and helping others brainstorm ideas. These passions and experiences that I have had at Butler University ultimately pushed me in the direction of this thesis project which incorporates everything I love into one book!

Not only is this children's coloring book important to me, but it is an important aspect of children's healthcare that should be utilized for every child that has cancer in order to put them at ease and hopefully explain some questions that they may have about cancer. Art therapy should be utilized to calm cancer patients and provide them with a distraction, while simultaneously offering children dealing with serious illnesses a chance to express their feelings. At the same time, a coloring book with a storyline could help explain unanswered questions about cancer that a child might have or that a parent doesn't know how to explain. This type of book could be utilized in children's hospital waiting rooms or even in patient rooms, or could be sold simply as a coloring book with an educational storyline.

## TIMELINE USED

Form a group of 2 pharmacy (COPHS) students, 2 business (LSB) students, 2 education (COE) students, and an illustrator: Kelsey Lindsay -COPHS Kevin Rhinesmith-LSB Savannah Caudillo-LSB Megan Fitzgerald- COE Erica Gauger- COE Camille Bates-Illustrator	By February 2016
Submit Thesis Proposal to Butler University Honor's Program	March 4, 2016
Meet with team to go over details and make a timeline that works for everyone	March 14, 2016 (12-1pm)
Hear back from Honor's Board	By April 2016
Divide into 2 teams (1 student from each college per team) to develop the storyline	By May 2016
The 2 teams come together to decide on a final storyline	By June 2016
Have outline of story complete with rough sketches	By Mid-June 2016
Writing takes place with constant feedback	Mid-June through July 2016
Editing and artist work	July-August 2016
Develop a marketing strategy	By September 1, 2016
Put illustrations and story together and ask for opinions from faculty and students	By September 1, 2016
Begin fundraising (pre-sales, reach out to Riley Hospital, etc.)	September 2016 (and all fall semester)
Present at Poster Day	October 21, 2016
Finalize contract with publisher	By December 1, 2016
Make any necessary edits and changes to the book	December 2016
Send to be published	January-February 2017
Books being printed; continue sales and marketing; publicity opportunities	January 2017-March 2017
Start writing thesis	January-March 2017
Books are here!! (Book signing, continued selling, publicity opportunities)	April-May 2017
Submit final thesis	April 2017
Ideally, be ready to have book at URC to present	By April 2017

## RESEARCH

In the United States, more than 1,000 children die from cancer yearly, and although pediatric cancer death rates have declined by 70% over the past four decades, cancer remains the leading cause of death from disease among children.<sup>2</sup> According to the National Cancer Institute (NCI), acute lymphocytic leukemia (ALL) is one of the most common types of cancer diagnosed in children.<sup>2</sup> ALL comprises approximately 30 percent of all childhood malignancies and each year, in the United States, approximately 2,500 to 3,500 new cases of ALL are diagnosed in children.<sup>3</sup> Survival rates for ALL have improved dramatically since the 1980s, with a current five-year overall survival rate estimated at greater than 85 percent, however, the incidence of childhood leukemia is rising.<sup>2</sup> The peak age of diagnosis is between two and five years old, and it occurs more commonly among boys than girls. Children with certain genetic and immunodeficiency syndromes are at increased risk, including those diagnosed with Down syndrome, Neurofibromatosis type 1, Bloom syndrome, or ataxia telangiectasia.<sup>3</sup>

The most common signs and symptoms of ALL are nonspecific. They include: fever, bleeding, bone pain, lymphadenopathy, headache, and peripheral blood abnormalities (anemia and/or thrombocytopenia).<sup>3</sup> Unexplained persistence of any of these common signs or symptoms should prompt consideration of malignancy as a possible cause. Historically, childhood ALL has been classified morphologically using the French-American-British (FAB) system. This system incorporates information regarding the size, amount of cytoplasm, and prominence of tumor cells from the bone marrow. Most children with ALL are classified as having FAB L1.<sup>3</sup> Leukemia cells in ALL are classified according to immuno-phenotype using an extensive panel of monoclonal antibodies to cell surface "cluster of differentiation" (CD) markers.<sup>3</sup> Approximately 75 percent of childhood ALL cases are of B-precursor lineage (CD10+, CD19+, and sometimes CD20+).<sup>3</sup> Chromosomal abnormalities are also common in childhood ALL and, although not specifically used for diagnosis, cytogenetic findings are an essential part of the risk group stratification used to help to guide therapy.

The diagnosis and classification of leukemia are based upon specialized tests that are performed on cells derived from bone marrow or tissue biopsy specimens. If unable to obtain these, the diagnosis can be made from cells obtained from the peripheral blood or pleural effusions. The diagnosis of leukemia requires one of the following: cytologic confirmation of leukemic cells, clinical signs of leukemia (facial nerve palsy, brain/eye involvement, or hypothalamic syndrome), or a tumor mass determined by imaging studies.<sup>3</sup>

At the time of diagnosis, patients with ALL commonly require transfusion support, treatment of suspected or proven infections with broad-spectrum antibiotics, and, for patients with a high tumor burden, correction of any metabolic imbalances. This commonly involves the administration of a multidrug regimen. Treatment is divided into several phases (induction, consolidation, and maintenance), includes therapy directed to the central nervous system (CNS), and takes two to three years to complete. More than 90 percent of children with ALL enter complete remission at the end of induction therapy regardless of their initial risk grouping.<sup>3</sup>

Induction therapy involves weekly administration of vincristine for three to four weeks, daily corticosteroids, and asparaginase. Bone marrow examinations are used to assess the response to therapy during this time. Severe adverse effects that can occur with this treatment regimen include: toxicity, tumor lysis syndrome, thrombosis, neuropathy, bleeding, infection (fever), mucositis, pancreatitis, and hyperglycemia.<sup>3</sup> Post-remission therapy is the second phase of ALL treatment after complete remission is achieved. Ongoing treatment is required because some lymphoblasts will remain in the bone marrow. Consolidation therapy lasts from four to eight months and uses several different drug combinations such as cytarabine, methotrexate, anthracyclines, alkylating agents, or epipodophyllotoxins.<sup>3</sup> A more intensive delayed treatment regimen can be used which involves the administration of a five-to eight week “pulse” of chemotherapy similar to the induction and consolidation regimens. The overall treatment of children with ALL is 30 to 42 months. After completing

consolidation therapy, children receive a less intense continuation regimen consisting of mercaptopurine, weekly methotrexate with periodic vincristine, prednisone, and intrathecal therapy.<sup>3</sup>

During chemotherapy, the oncologist usually coordinates physical examinations, procedures, and imaging studies while the primary care provider (PCP) encourages patients to return for scheduled follow-up studies and provides routine medical care.<sup>3</sup> During these visits, patients will also be monitored for signs and symptoms of relapse. Communication between the PCP and oncologist is critical after the diagnosis and throughout the treatment and remission periods.

When a child is diagnosed with cancer, there are several ways to approach coping with it and explaining what is happening to your child. Honesty builds trust. The NCI suggests telling your child about the illness and what to expect.<sup>2</sup> This builds trust between you and your child and ultimately trust between your child and the healthcare team. This is important because no one wants children to be confused or to be scared. There are also other resources such as social workers or child life specialists, who should be incorporated into the healthcare team. Every child will react differently, and some parents will need tips to calm their child.

Gaming and art therapy have been used to combat fear, pain, and stress in pediatric oncology patients. Children diagnosed with cancer often experience fatigue and physical and mental deconditioning after chemotherapy treatments.<sup>4</sup> This can contribute to a diminished quality of life. Clinical and technological advancements in therapeutic videogames may enhance patients' coping skills, and self-management of symptoms related to disease and therapy. A study involving how computer games can impact hospitalized children with cancer who suffered from depressive symptoms was conducted. They found that patients in the study group, which included those playing videogames, had significantly fewer depressive symptom than those in the control group, who did not play videogames. They also reported that playing videogames helped reduce anxiety and pain.<sup>4</sup>



Existing commercially available videogames, such as Dance Dance Revolution, Wii™ Bowling, and Wii Boxing, can also be used to promote physical exercise and weight loss. These games can additionally improve neurologic function in children diagnosed with cancer by acting on the reward system which is central for preserving optimism and hope.<sup>4</sup> In addition, these games can provide a distraction for children with cancer who suffer from chemotherapy induced nausea and vomiting.<sup>5</sup>

Not only can games improve pain, anxiety, and depression associated with cancer treatment, they can also improve treatment adherence and improve knowledge of cancer therapy. In a randomized trial conducted from 2004 to 2005, patients who were undergoing cancer treatment were randomly assigned to an intervention group or a control group. The intervention group consisted of patients who played a video game that addressed issues of cancer treatment and adherence. Outcome measures studied during this trial were adherence, self-efficacy, knowledge, control, stress, and quality of life. They found that adherence, self-efficacy, and knowledge improved in the intervention group compared with the control group, supporting the use of videogames as therapy for children with cancer.<sup>6</sup>

Gaming is not the only resource used in hospitals to combat fear, pain, and stress. Art therapy has also become a popular therapy choice for children who are suffering from an illness.<sup>7</sup> Today, art therapy is widely practiced in a variety of settings including hospitals and in patients who have adverse physical health conditions such as cancer.<sup>8</sup> Art therapists trust that being creative helps to heal and, although scientific evidence is lacking, many health professionals believe that art therapy can be a way for people to cope with illness.<sup>9</sup> Art can encourage emotional expression, improve relationships, encourage self-confidence, help to control anxiety or depression, and help to take your mind off pain or discomfort.<sup>9</sup> The NCI suggests art therapy as a way to improve communication skills and social interactions, as well as an integrative way to lower pain, stress, and fear.<sup>2</sup>

Tracy Councill, an art therapist, founded Tracy's Kids at Georgetown Hospital 20 years ago. She believes, and has seen, that engaging in the art process can be very grounding and relaxing when children are placed in a really scary place.<sup>10</sup> She designed her clinic so that art would be the first thing patients see when they enter. Most of the art is bright and cheerful, but she also included some darker works because she believes monsters are symbolic of the anger young cancer patients experience. Tracy believes that art can be a way cancer patients use their imagination to take them outside of the hospital and put them in another place while receiving treatment.<sup>10</sup> Art therapy is a way to improve patients' quality of life and help them cope with their disease and treatment.

The creative arts, specifically art therapy, help to enhance and improve emotional, physical, and mental well-being of individuals of all ages.<sup>11</sup> Art therapy is commonly used to facilitate symbolic and non-verbal communication. This is helpful when a feeling or event is too overwhelming, confusing, difficult, or painful to speak of. Art therapy can be used independently or in collaboration with treatment, assessment, and research. Several art therapists, treatment teams, and clients have discovered that there are a vast variety of potential benefits of art therapy. These include relaxation and reduction of stress, reduction in anxiety and negative mood, assistance with communicating and expressing difficult feelings or experiences, an increase in self-esteem and self-awareness, resolution of conflicts, grief, and problems, improvement in quality of life, development of interpersonal skills, personal empowerment, and an increase of creativity, imagination, and visual thinking skills.<sup>11</sup>

Art therapy is not specific in its' practices which makes it customizable to the ever-changing life of a patient. It is one of the earliest forms of communication, and has been increasingly recognized as beneficial and effective in the treatment of various types of both mental and physical conditions. This has been described and studied since Adrian Hill's published work in 1942, but has been vastly underutilized. Art therapy has proven to be important with adolescents and children facing chronic illness because it can enhance the young patient's emotional, physical, and cognitive development.

Within the field of pediatric oncology, art therapy is used to restore self-image which is crucial for the patient because it helps them battle their illness.<sup>12</sup>

Art therapy is not only useful to the patient undergoing cancer treatment, but also can help parents and other family members cope with the diagnosis and pain that the patient is experiencing. Parents play a crucial role in the rehabilitation process of a child experiencing pain and art therapy can help everyone involved. The pain associated with cancer can cause stress, emotional and physical distress, and cancer treatment can lead to financial hardships. Such difficulties for parents of children diagnosed with cancer can also influence the child's pain and inflict a sense of guilt. By using art therapy to calm the parents or siblings of a child diagnosed with cancer, the patient will experience less pain and stress as well. Group art therapy can be helpful as well because the group atmosphere can help increase universality of the condition, decrease feelings of isolation, and offer space for people with similar needs to provide mutual support for each other.<sup>11</sup>

Although studied and suggested in many situations, art therapy is not considered a regular form of therapy in most medical fields, according to Dr. Martin Fischer. Dr. Fischer is the founder and executive director of the Toronto Art Therapy Institute. He has been using art therapy since 1949 and is depressed by what he sees as "considerable disinterest" in art therapy. He believes that art therapy fosters good communication and relationships between people and leads to verbalization of emotions and sharing of experiences. Art therapy is also unique because the discussion that follows the actual art activity is extremely important. By discussing what was created, the therapist can talk to the patient about what the creation might mean. That conversation can open up unexplored territory.<sup>13</sup>

Not only can art therapy allow patients suffering from a disease or experience to express themselves, it can also improve the moods of the staff members who treat the patients by viewing artwork. Art, in general, can ensure that the hospital provides a high-quality environment that supports

a positive and healing experience for both the patients and providers.<sup>14</sup> It is believed that the different colors included in art pieces can have an effect on emotion. The different hues, brightness, and saturation of the pieces stimulates an emotional response that is pleasurable or non-pleasurable. Colors that elicit high levels of pleasure can induce a state of calm, while those that cause displeasure can provoke anxiety. The short wavelength blues and greens elicit more pleasure than the long wavelength reds and yellows. Brighter and more saturated colors are also found to be more pleasant for patients.<sup>14</sup>

Within the realm of art therapy is music therapy. Music therapy can be utilized to promote wellness, manage stress, alleviate pain, express feelings, enhance memory, improve communication, and promote physical rehabilitation. It is extensively studied in the oncology setting and is becoming an increasingly popular adjunctive intervention for supporting the psychosocial needs of cancer survivors. In a survey examining the extent to which cancer patients use certain coping strategies, music was the most commonly utilized coping mechanism next to prayer. While waiting for the doctor or while receiving a chemotherapy treatment, patients can listen to music to relax them, reduce anxiety and pain, and decrease respiratory and heart rates.<sup>15</sup>

The NCI also suggests filling waiting time at the doctor or during chemotherapy treatments by reading a book.<sup>2</sup> On their website, they provide several books for children or adolescents to explain cancer.<sup>2</sup> In my preliminary research on children's cancer books, I discovered books that portrayed the child with cancer, a sibling with cancer, or a parent with cancer. I researched coloring books for children with cancer and found many available for purchase that help them cope with a parent's illness<sup>16</sup>, but not many also contained a story about a child with cancer in order to provide explanations. One coloring book I admired was called *Sammie's New Mask* and was about a friend of a child with cancer which caught my attention.<sup>17</sup> These coloring books were highly suggested because they are a way for a child with cancer to express thoughts and feelings. Art therapy is not only a way for children diagnosed with

cancer to express themselves, but it can also be used as therapy for siblings or friends who do not know how to express their feelings.

When a child finds out they have cancer, art therapy or gaming can be used to help express feelings. Parents can also use these resources as a way to express their fear. When a parent finds out their child has cancer, they will be frightened and confused as well. Yet, they have to help their child understand his or her cancer. Many parents think they can protect their child by not telling him or her about the cancer.<sup>18</sup> However, a huge part of their diagnosis is explaining what cancer is to them.

This should be done in a calm, reassuring way to help the child see that you are coping with the diagnosis and they can too.<sup>19</sup> Parents or guardians of children diagnosed with cancer should practice their explanation beforehand to feel more comfortable with what they are saying. They should also not be afraid to use the word “cancer”. Even calling it by the type of cancer, such as leukemia, can be used to further describe and explain it.<sup>18</sup> Naming a child’s illness helps build trust and helps them feel included. It also prevents your child from learning that he or she has cancer by hearing it from someone else. Your child is also more likely to cooperate with tests and treatments if they understand more of the diagnosis.<sup>18</sup>

If the child doesn’t understand what is happening, they may invent their own explanations which could be more frightening for them than the actual facts.<sup>19</sup> They could also experience anxiety, stress, and fear if they do not understand what is happening.<sup>18</sup> To keep them involved in their diagnosis and treatment, part of the conversation should include what the treatment plan is and how it may affect their lives. Things to include could be potential hair loss, tiredness, or weight loss associated with the chemotherapy treatments.<sup>19</sup> It is also important to talk to the child about how they got cancer. Reassure them that it was not because of the way they have been behaving or what they have been thinking or

doing. Let them know that they cannot “catch” cancer like they can catch a cold. Assure them that they will be cared for and loved and that it is alright to be curious and ask questions.<sup>19</sup>

What to tell the child also depends on how old they are and what they are likely to understand. Ages 0-3 may be more concerned about being abandoned at the hospital or may feel like they have to live in the hospital forever. Parents should assure their child they will always be with them and to explain upcoming events clearly. Ages 3-7 need parents to assure them that they did not cause their cancer and may be afraid of pain. Parents should explain that the treatments are to help them feel better and that doctors can help to take the pain away. Ages 7-12 are more likely to understand they need medicine and treatments to get better, but they are still afraid of pain. They are also more likely to learn details about cancer from other sources, such as school, TV, and the Internet. It is important for parents to encourage discussions about the information instead of having the child worry alone.<sup>18</sup>

Children’s books can be used to help a child understand their diagnosis as well. Sometimes, when reading a book about cancer to a child, they may become confused. It is alright to take time then to explain things to them or to skip pages if they do not like them. It can also be helpful to add certain paragraphs or pages if needed. Reading these books to children should not be a one-time thing but should occur often in order for them to become familiar with the topic and even more comfortable with it. There are a lot of available books that can help explain cancer; finding the right one can be hard but it will become an important resource.

## **DETAILS ABOUT THE BOOK**

Writing a children’s book was a group effort that consisted of two college of pharmacy majors, two business majors, two college of education majors who have experience in children’s literature, and an illustrator (our illustrator is a double art & design and psychology major in JCA and LAS). The process of writing the book and illustrating it had to be concise and well-planned because the book was due to

the publisher in January 2017 for presentation at the 2017 spring Undergraduate Research Conference. The objective for writing this book was: to create a children's book that incorporates art therapy and educates children and their parents on cancer through age appropriate terminology. In addition, the book would spread awareness on the potential benefits of art therapy. Because this is my honor's thesis, I personally focused on researching the benefits of coloring and gaming therapy in children with cancer, understanding what is already available in the marketplace for children around cancer, as well as researching how best to explain cancer to a child to ultimately aid in publication of the final outcome, the children's book itself.

As previously stated, before we could determine a storyline for the book, we had to do research. We first had to understand and explore what is already available in the marketplace. We also had to understand the research around art therapy and coloring for children, particularly regarding cancer. Last, we had to identify gaps or unmet needs in the cancer space for children before we began our storyline. Once all of the research and existing data was collected, we began creating a storyline.

A few things we had to decide on about the storyline are: who in the story has cancer, who in the story is explaining what cancer is, what type of cancer the character has, what type of characters are we using (i.e. people vs animals or other creatures), what age range we want to target (coloring and activity books typically may begin for children ages 3-8<sup>20</sup>, for example), and what books are already published with a similar storyline, if any. Other things I needed to research and incorporate into the book were how to best explain cancer to a child, what terms to use, and how to incorporate coloring as therapy in this book.

I also planned to contact several people in order to make sure the information about cancer that I included in my children's book was accurate and thoughtful. Our script was distributed to various professionals on campus who annotated and helped mold our story. It was also sent to Jennifer Tobison,

a Pediatric Outpatient Clinical Pharmacist at Peyton Manning Children's Hospital at St. Vincent. She recommended several edits, including edits to our glossary. We included a glossary to help shape the final manuscript by explaining medical terminology in a child-friendly language.

Once we had the background information and research completed, we started to organize our thoughts and create a storyline. The first thing we discussed was what age group we would be targeting with our coloring book. The general consensus was for children 7-10 years of age. After that, we decided who in our story would have cancer. We decided on a child about the age of 7. From there, we determined that the child would be diagnosed with leukemia.

After that, we talked about what types of characters we wanted to include and what types of settings we pictured for our story. We decided that the child's parents should be in the story, a few friends, a classroom of children and a teacher, as well as doctors or nurses treating the child. Next, we had to decide if we wanted to use animated human characters or animals as our characters. We decided on animals because we thought it would be patient friendly and we were excited to use a lion as our main character so we could incorporate hair-loss as a symptom. After that, we began thinking of names and other animals we could use as characters. We liked the idea of using names that started with the first letter of the name of the animal. For example: "Macalester the Monkey". As for the settings, we thought of three: the child's home, the doctor's office, and the school (and playground). Our illustrator brought up the interesting idea to take pictures of these places and then draw the characters into them as an idea, but we ended up drawing the backgrounds as well as the characters.

After we had thought of the general setting, character, and type of cancer we wanted to focus on, we began our first rough draft. This consisted of more brainstorming and lists. We began by talking about how long we wanted the book to be. Our illustrator, who has been through this process before, noted that children's books are usually 14 spreads. This means that there are 28 pages. We decided that



28 pages, or even a few more, would be ideal. Next, we had to discuss the coloring part of our coloring book. This was tricky because after most children color a picture in their coloring book, they tear it out and give it to someone or put it on their refrigerator. Because of this, we did not want to mix coloring pages in with the storyline. By putting all the coloring pages at the end of the story, children could still color and tear out their drawings without ruining the storyline. From there, we had to decide how many pages would be used for the story and how many pages would be used for coloring. We decided on 30 pages total, not including the cover page, title page(s), or reference/thank you page. Of these 30 pages, 23 would be storyline, 2 glossary, and 5 would be coloring.

Once we knew that we only had 23 pages for our story, we had to strategically map it out. I began by writing a rough draft in an old journal. The rough draft consisted of some storyline, but mostly notes that said “talk about \_\_\_\_\_ here” and “insert a picture of \_\_\_\_\_ here”. From there, I showed my ideas to the team and they liked them, so I typed up my rough draft onto our google doc. Together, we started to fill in the blanks. After several rough drafts, countless meetings, and numerous changes, we came up with a rough draft that we sent to several professionals on campus to edit. After receiving their edits, as well as the pediatric pharmacist’s edits from St. Vincent, we started to work on making sure the glossary was correct.

The glossary, or word bank, was a challenging part of this process because each of the terms we included in the glossary section were hard terms to describe to children who are 7-10 years old. After several drafts and input from several colleagues and professionals, we came up with a finalized glossary of 12 terms. After the majority of the writing was completed, we started making each group of words and ideas fit on pages that made sense with our illustrations. This was challenging because several of the paragraphs consisted of similar scenes making it difficult to split them up. After that was complete, we sent the finalized copy to each of the team members and the advisors for approval before sending it to

our publisher. From there, the illustrator had to upload several separate files on her own, which ended up taking longer than we had expected.

Throughout this process, we learned several lessons about interdisciplinary teamwork. As pharmacy students, we have little opportunity to work alongside students outside of the College of Pharmacy and Health Sciences. This project was a unique and invaluable experience working with students from other disciplines, points of view, and areas of expertise. Though the pharmacy majors were the head of the team in the beginning, it took delegation and trusting each team member to complete his or her responsibilities to develop the finished publication. While the pharmacy students brought medical insight on leukemia, treatment, art therapy and began the story line, the College of Education students were essential in writing a story our targeted age group could understand and enjoy. The College of Art student brought a plethora of artistic considerations such as the type of animal characters we could use, images that would be most important to depict in our illustrations and direction on how to best fit words to the page. The Lacy College of Business students were essential in choosing and communicating with a publisher, contacting potential business partners, developing a fundraising webpage and evaluating various marketing strategies for our book. Though the College of Pharmacy students had a vision, the project would not have been successful without the contribution of each individual on the team.

## **CONCLUSIONS**

*Lucas the Lion Fights Leukemia* is not a cure for cancer. However, with over 100 copies sold prior to publishing, Lucas' story has already spread awareness on the potential benefits of art therapy and encouraged parents to educate their children on cancer. In addition, several hundred copies are being donated and distributed to children affected by cancer. Pending feedback from recipients of the finished

project, it seems that the development of this children's story and coloring book is an effective tool for education and awareness on art therapy in cancer patients.

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