**PHYT 822 ADVANCED PATIENT MANAGEMENT**

**UNIT I – Oncology Assignment**

**Alan E. Levinson, 1/30/2018**

**Acute Myelogenous Leukemia, Case II**

**I - Cancer Diagnosis**

According to the National Cancer Institute, Leukemia is a cancer of the blood, most often affecting white blood cells that are responsible to fight infections in the body. There are childhood manifestations (the most common form of childhood cancer) and adult onset. For adults, it is most common after age 55.1 Our patient, Ms. F, is unusual in that she has Acute Myelogenous Leukemia (AML), also known as Acute Myeloid or Myeloblastic Leukemia, among other names.2 AML is an aggressive, quick growing cancer characterized by an overabundance of white blood cells in the blood and bone marrow. In 2017, over 21,300 new cases were reported, and just shy of 10,600 dealths.2

When treated appropriately, AML patients may expect good survival rates and many reach remission and be considered cured. Survival is inversely related to age, with 65% of patients younger than 60 experiencing remission after treatment. Ms. F, at age 22, should be a good candidate for these benefits, and has already experienced a 3.5-year remission from her first round of chemo in 2006.

**II - Past Medical History**

In addition to her prior AML and treatment, Ms. F had an aspergilloma (fungal ball growth) in her left lower lung within 6 months of completing her first bout of chemotherapy. In late 2006, she underwent a left lower lung lobectomy to remove the aspergilloma. Ms. F may have formed the aspergilloma resulting from neutropenia associated with her first episode of AML. According to Mohapatra et al., this is one of the 3 major origin classifications. In that study, the authors conclude that if surgery is successful and without acute complications, most undergoing lobectomy will experience a symptom free survival.3

In addition to AML and lung lobectomy, Ms. F has experienced medication induced adrenal insufficiency (AI). Adrenal insufficiency was treated with steroids to boost cortisol levels, vital to many functions like how the body responds to threats. AI patients may experience weakness and fatigue among other symptoms.4

**III - Cancer Treatment**

Following her initial diagnosis and chemotherapy treatment in 2005, Ms. F had experienced a 3.5-year remission. However, she recently relapsed and underwent a second round of chemo with an inpatient hospital stay. The medicines used for this round of her chemo (idarubicin, bortezomib, and cytarabine) are all antineoplastics and commonly prescribed for AML.5 It is interesting to note that each of these agents have significant pulmonary side-effects and PT implications given her prior medical history and asperigilloma.

**IV - PT Evaluation**

 The PT Evaluation will include a thorough chart review, with some of the information already summarized above. Then, a complete Evaluation includes subjective (patient interview) and objective (tests and measures) data gathering, and an assessment of impairments. Finally, a plan of care (POC) will be developed to help Ms. F improve her conditioning and optimize her potential for her upcoming bone marrow transplant. The hypothesized goals are improved endurance and strengthening to counteract feelings of fatigue and weakness experienced following recent chemotherapy.

 In my patient interview, I hope to gather an understanding of Ms. F and her preferences and goals. Chart review has provided some social history and functional status, and this along with getting to know her will help guide the development of the plan.

 My objective evaluation will include the Cardiopulmonary Exercise Test (CPET) for baseline heart and lung functioning. While Neary et al. (cited above) concluded that post- lobectomy patients often return to symptom-free survival, Ms. F should have baseline parameters documented and used to inform goals and expectations for endurance and exercise capacity.

The CPET provides information on oxygen consumption, peak tidal volume. This can also be used to document improvements in aerobic capacity over time.6

 Other objective measures will include manual muscle testing, the 6-minute walk test (6MWT) for functional performance. The European Organization for Research and Treatment of Cancer-Quality of Life (EORTC-QOL) and Functional Assessment of Cancer Therapy-Fatigue (FACT-F) assessments for quality of life and fatigue respectively. These measures have appeared in numerous studies and related to a variety of cancer diagnoses, and are considered standard of care assessments. Based on chemo and other medications listed for Ms. F, it is advised to pay particular attention to any signs of breathing difficulty, sore throat, change in mental status and confusion. Additionally, since infection and excessive bleeding are known possible complications with those chemo agents, observe for bruising and keep all treatment activities “low impact” and take precautions for falls.

Gilchrist et al. outline an assessment program based on the WHO-ICF Model.7 Building on the principles suggested in this article, Ms. F has AML as the central health condition over-arching her life situation. Utilizing subjective and objective measures, we can determine the priority body structure and function limitations that are present. Fatigue, weakness, nausea, vomiting and other symptoms of cancer and cancer treatment have been documented for Ms. F. These are affecting cardiopulmonary, and musculoskeletal systems. Her prior AI episode impacts her endocrine system, and cannot be ignored. Medical treatment plan includes increased steroids in preparation for her upcoming bone marrow transplant to account for that.

Chart review shows some of her activity and participation limits, such as fatigue after ¼ mile walking, difficulty with heavy housework, and reduced ability to carry her child while walking. Subjective interview will uncover additional areas of concern for Ms. F, and the POC will attempt to address activity and participation goals. Impacting all these areas are environmental, social, and personal factors. While she appears to have family support, there is no mention of the baby’s father, and internal factors such as anxiety and depression must be factored into any plan as well.

Before detailing the particular physical exercise program, a discussion of patient education and red flag conditions is presented: Regarding patient education, Ms. F will be provided with information about the benefits of exercise in relation to fatigue and weakness. With many research studies demonstrating the benefits of physical exercise and documenting the positive outcomes, this would hopefully serve as a motivating factor for her. Not only are benefits seen in physical performance and decreasing fatigue, positive psychological benefits are documented as well, and may benefit Ms. F who has experienced depression and anxiety. In a 2014 Cochrane Systematic Review, Bergenthal et al. found all these beneficial outcomes, including overall quality of life improvements stemming from physical exercise in patients with hematological malignancies.8

Nonetheless, Ms. F may face a number of barriers to physical exercise. If the physical affects of improved energy and strength are not enough to motivate her participation with the exercise program, one consideration to suggest would be to try and build on the social support or engage other important people in her life with exercise. Felbel et al. completed a Cochrane Systematic Review of Yoga as an add on to cancer treatment. Ultimately, there were not enough data to support Yoga as an intervention for improved quality of life and reduced fatigue, but provided significant findings on improved sleep quality.9 Yoga is also readily available in that there are multiple offerings through private organizations as are listed on the CarolinaParent website.10 This would be recommended for the group interactions and social community that often develop in Yoga classes, especially ones involving parent and child.

Blaney et al. discuss barriers to exercise commonly experienced by patients with Cancer- Related Fatigue (CRF).11 More information would be needed and obtained during the patient interview, but Ms. F may present with reduced immunological functioning as a result of her cancer or treatment. Or, depending on her insurance coverage, she may not have coverage for ongoing PT services, or financial ability to join a gym for the limited variety of equipment required of the recommended program listed below. If medically unable to attend group exercise sessions due to immunological dysfunction, the exercise program below could be adapted as a HEP with specific instructions on each exercise, and by providing therabands or free weights through a community agency or social service program. If no immunological barriers, access to PT services through insurance or a gym membership could be sought by helping her apply for Medicaid if her financial situation meets those qualifications. Utilizing a caseworker to help navigate that system would be beneficial. Finally, while living with her parents may seem to be a social support, it is not known to the extent they help with childcare and whether or not they help with transportation or other basic necessities. These variables must be included for review during the patient interview to adequately set Ms. F up for success.

**V - Exercise Prescription**

Knols et al. found in their 2005 systematic review that physical activity generates significant improvement in physiologic, physical performance, and quality of life measures for individuals diagnosed with hematologic malignancies. Like most systematic reviews, there was no singular exercise prescription identified as being outright superior to the other programs. Therefore, the recommended program for Ms. F is one that falls within the ranges included in the Knols report.12 Ms. F has approximately 10 weeks before her bone marrow transplant. In that time she will complete 2-5 days/ week of stretching and endurance exercises, and 1-2 days/ week of resistance training. Her program will increase gradually as tolerated. **Please see Appendix A** for details of program.

Positive indicators for Ms. F include her young age, the fact that she is living with her parents and the presumed support that this offers. Ms. F has a young daughter to care for, so is motivated to continue her education and advance her career in order to provide for her. While physical activity is difficult, she is able to walk ¼ mile, and has good strength in her major muscle groups. It is important to take into account Ms. F’s plans and goals in order to build a successful program. It is also important to share with her what is seen as positive indicators. Sometimes individuals do not see the sunshine through the rain.

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**APPENDIX A:**

Exercise Prescription

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **STRETCHING** | **Prior to each exercise session** |  |  |  |
| Dynamic warm up | Standing with feet shoulder width apart, reach straight up, then, touch shoulders, hips, knees, and toes, with legs straight, 10x;Trunk rotations; 10x; Neck rotations 10x |  |  |  |
| **ENDURANCE** | **Weeks 1-2** | **Weeks 3-6** | **Weeks 7-10** | **NOTES** |
| Pt. select: [cycle, TM, recumbent bike, etc.] | Warm up 2min Borg RPE 6-9Endurance 5-10min RPE 9-11(Target 40-50% HRmax)Cool down 2minRPE 6-92-3d/ week | Warm up 2-4minRPE 6-9Endurance 10-20min RPE 11-14 (Target 50-60% HRmax)Cool down 2-4min RPE 6-93-4d/ week | Warm up 2-4minRPE 6-9Endurance 20-35min RPE 11-14 (Target 50-70% HRmax)Cool down 2-4min RPE 6-93-5d/ wk | Progress gradually.Discontinue immediately with fatigue, SOB, pain . |
| **RESISTANCE** | **Weeks 1-2** | **Weeks 3-6** | **Weeks 7-10** | **NOTES** |
| 3 levels resistance band OR3, 5, 8 lb. hand/ ankle weights | Band 1 or 3lbs.6-8 reps;Shoulder, arm, hip, knee flex/ ext’s.Squats, heel raises.Supine core crunches, straight leg lifts.Prone back ext’s.Increase to 2x2d/ week | Gradual increase to- Band 2 or 5lbs.;8-12 reps;Shoulder, arm, hip, knee flex/ ext’s.Squats, heel raises.Supine core crunches, straight leg lifts.Prone back ext’s. Begin at 1x, increase to 2x2d/ week | Gradual increase to-Band 2 or 8lbs. 10-15 reps; Shoulder, arm, hip, knee flex/ ext’s.Squats, heel raises.Supine core crunches, straight leg lifts.Prone back ext’s. Begin at 1x, increase to 2x2d/ week | Discontinue if pain, fatigue. Keep exercise journal or use exercise apps to track progress. |

All exercises above fall within ranges of programs outlined by Knols et al. in their 2005 systematic review.12

**RESOURCES**

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2. National Cancer Institute. Adult Acute Myeloid Leukemia Treatment (PDQ®)—Health Professional Version. *NIH - National Cancer Institute* 2017. Available at: https://www.cancer.gov/types/leukemia/hp/adult-aml-treatment-pdq#section/\_1. Accessed January 27, 2018.

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12. Knols R, Aaronson NK, Uebelhart D, Fransen J, Aufdemkampe G. Physical exercise in cancer patients during and after medical treatment: a systematic review of randomized and controlled clinical trials. *J Clin Oncol* 2005;23(16):3830-3842. doi:10.1200/JCO.2005.02.148.