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Preoperative Therapy to Improve Outcomes in Total Joint Arthroplasty Patients

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College of Nursing and Professional Disciplines, University of North Dakota

NURS 997: Independent Study

Elizabeth Jahn, DNP, FNP-BC

March 29th, 2020

PERMISSION

Title

Department Nursing

Degree Master of Science

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Abstract

The implementation of prehabilitation prior to total joint arthroplasty through therapy and education has been recognized in recent literature to potentially decrease pain, reduce length of hospital stay, increase patient satisfaction, and decrease overall costs. Currently, there are no standards of care regarding prehabilitation, and it is not a standard practice in all facilities. Improvement in patient outcomes was identified in the facilities that implemented educating patients on postoperative treatment preoperatively, as well as those implementing preoperative physical therapy. These methods were found to be an effective way of lessening patient anxiety, postoperative visits, length of stay, and cost, while maintaining strength. It was determined that water rehabilitation had the best results. The outcomes of preoperative therapy to decrease pain after surgery were inconclusive. It was noted that primary providers play a crucial role in the support of patients receiving prehabilitation. The literature analyzed proposed further research on the effects of prehabilitation in a variety of areas including but not limited to standardized methodology of prehabilitation. A literature search was performed through the use of CINAHL Complete, Wiley Online Library, and PubMed. The search was limited to the last five years. The total number of relevant articles used for this paper was thirteen.

Keywords: prehabilitation, preoperative therapy, total joint arthroplasty, pain, physical therapy, decreased hospital stay, water rehabilitation

Preoperative Therapy to Improve Outcomes in Total Joint Arthroplasty Patients

Background

With one million procedures performed each year, hip and knee replacements are a commonly performed operation in the United States. Joint replacements are becoming the most common elective surgical procedure performed (Kremers, et al., 2015). With the ageing population, there are higher rates of treatment and diagnosis of advanced osteoarthritis. Increased rates of osteoarthritis in the elderly population has led to a demand to improve the patient's mobility, which would lead to an increased quality of life. This treatment often involves joint replacements or joint arthroscopy. In 2015, it was estimated that the number of Americans living with a hip or knee replacement was seven million people (Kremers, et al., 2015).

Considerable amounts of research have been designed to look at the cost and outcomes of total joint replacements while focusing on the perioperative period. The majority of patients that have a total joint replacement have a relatively long lifespan post-surgery. With patients living longer, years of follow-up care will be required including but not limited to therapy, radiographic assessments, and specialty appointments. This can all lead to an increase in patient care costs. No recommendations have been presented in relation to using preoperative physical therapy to improve patient outcomes. Prehabilitation programs have positive health effects for patients needing total joint arthroplasty and may lead to improved patient outcomes. Improving outcomes can lead to a shorter recovery for the patient, decreased time spent in the hospital and lower care costs (Kremers, et al., 2015).

This literature review will be incorporating a case report based on a woman in her forties who had an injury to her knee that is requiring surgical repair. During the preoperative

examination it was discussed with the patient the types of therapy that she had been participating in. Preoperative therapy had not been recommended for her and she was not told what her postoperative therapy plan was. Since her injury, she had not been participating in any therapy for the injury. In the clinical scenario, the patient was seen with a meniscus injury needing arthroscopy. Due to limitations of literature for preoperative treatment with arthroscopy, this literature search is based on prehabilitation in patient with total joint arthroplasty. The literature review will also emphasize and discuss the potential benefits of preoperative physical therapy/prehabilitation therapies for patients that are undergoing total joint arthroplasties, while looking into the possible barriers to preoperative care for patients.

Case Report

T.S. is a pleasant 46-year-old female with a history of hypertension, hypothyroidism, obesity, squamous cell carcinoma and diabetes type 2, presented to the clinic on February 27th, 2020 for a pre-op examination. She reported that she would be having right knee surgery in about one month. The exact date and time had not been scheduled. The initial injury to the right knee happened about 6 months ago when she fell. At that time, she did not seek immediate care for the injury. She did not lose consciousness, and she reported that she did not hit her head during the fall. Since that time, she has had a constant aching pain in that knee, mainly at the joint line. The pain is increased with walking and stairs. She has tried taking Tylenol and ibuprofen with minimal relief. She was seen by orthopedic, and it was recommended to have a right knee arthroscopy performed. Today she rates the pain as moderate. She is unsure what the post-operative rehabilitation plan is at this time, and she has not been doing any therapy prior to her procedure. She has not had any other injury to that knee in the past.

A full review of her family, medical and social history was completed, and a full 12-point review of systems was completed, as well as a head to toe physical assessment. An EKG, basic metabolic panel, TSH and CBC (Appendix B) were also completed at this visit and were unremarkable. With all of this information, it was determined that the patient was at low risk for the planned procedure. There are no contraindications for her to proceed with her surgery as planned. Instructions on what medications to hold prior to surgery was discussed with the patient. Her postoperative plan and therapy regimen will be determined by the surgical team. As for her hypertension she is stable on her current lisinopril dosing, her diabetes is well controlled on metformin, and her hypothyroidism is stable with her levothyroxine dosing. Plan to continue to work on weight reduction through diet and exercise as previously discussed. Appropriate diet counseling given at the appointment today. (Please see Appendix A for full clinic note)

Literature Review

With the increasing rate of elective joint replacement surgeries, it is important to look at ways to decrease rehabilitation time, care costs, pain and patient strength. Health care costs following a hospitalization for a total joint replacement are a major contributor to Medicare spending (Snow, et al., 2014). In 2009, it is estimated that United States hospital expenditures of total hip and knee arthroplasty were 13.7 billion dollars and 28.5 billion dollars (Masaracchio, Hanney, Liu, Kobler & Kirker, 2017). Research is suggestive that performing physical therapy exercises prior to the surgical intervention can decrease the amount of time that it takes to recover reducing the need for postoperative medical care. A majority of the prehabilitation research has been completed for patients that are undergoing elective cardiac surgery, hepatobiliary cancer surgery, and major gastrointestinal surgery (Joyce & Azocar, 2019). The research of prehabilitation for patients undergoing total joint arthroplasty is less extensive.

With advancements in surgical techniques, the length of the hospital stay following a total joint arthroplasty continues to decrease. This leads to an increased amount of patient teaching and preparation that needs to be completed prior to surgery or within the short hospital stay. The most efficient way to accomplish this preparation is still unknown. A randomized trial “one-time, one-on-one preoperative physical therapy education coupled with a web-based microsite (preopPTed) on patients’ readiness to discharge from physical therapy, length of hospital stays, and patient-reported functional outcomes” (Soeters, et al., 2018, para 3) was evaluated. This study concluded that this approach to prehabilitation was effective at reducing the number of postoperative physical therapy visits. Prehabilitation also reduced the time for readiness to discharge from physical therapy, but it did not reduce the length of hospital stay or have an effect on outcomes four to six weeks after surgery. Patients reported that they liked this process for education, and they would recommend it for other patients undergoing total joint arthroplasty. This study was limited in that it was completed at a specialty hospital that was well funded. These recommendations would need to be further studied in a smaller, nonspecialized hospital that may have limited resources prior to being implemented into that facility (Soeters, et al., 2018).

The effects of prehabilitation on postoperative total joint arthroplasty patients are encouraging. In a study completed to investigate prehabilitation on postoperative outcomes in patients that were diagnosed with gonarthrosis, needing a total knee arthroplasty two different scoring systems were used to determine results. The first was the knee score which assists in assessing the patient’s pain and disability due to the knee deficit. The second score was the function score which helps to determine the function of the joint. In this study, all of the surgeries were performed by the same surgeon. Although the function score was not

significantly different in those who completed prehabilitation the knee score improved greatly in those who received prehabilitation (Jahic, Omerovic, Tanovic, Dzankovic & Campara, 2018).

Water Rehabilitation Programs

A cross-sectional study looked at water rehabilitation programs before and after surgery for patients that underwent total joint arthroplasty. This study looked at patients range of motion, as well as the forces that were generated by the pelvic stabilizer muscles (Typ, et al., 2016). The patient's pain was also assessed regularly assessed throughout this study. Results of this study are encouraging for the recommendation of using water rehabilitation preoperatively. It was noted that the patients in the study expressed a significant reduction of pain and a decrease in the need to use pain medications postoperatively. Those who used the water rehabilitation prior to surgery also had increased range of motion and greater muscle strength. Although there is not much relevant data about water rehabilitation, water exercises seem to be an effective and valuable component of a rehabilitation program especially when they are used for prehabilitation (Typ, et al., 2016).

Physiotherapy

Physiotherapy is similar to physical therapy but with physiotherapy there is more of a hands-on manual approach. This manual approach can include manipulation, myofascial release, and manipulation as well as complementary modalities. With physical therapy there is more of an exercised-based approach (Morgan & Coghlan, n.d.). Physiotherapy is an important treatment during the rehabilitation stage of an arthroplasty, but the impact of using it preoperatively is not well known. Although the impact has not been well studied, physiotherapy is also becoming a popular treatment for prehabilitation prior to total joint arthroplasty (Eil-Ismail, Sharifudin, Shokri, & Rahman, 2016). In a randomized control trial evaluating the effect of preoperative

physiotherapy on the short-term functional outcomes in patients having a total knee arthroplasty, it was determined that six-weeks of preoperative therapy showed no significant improvement on short term functional outcomes or range of motion (Eil-Ismail, Sharifudin, Shokri, & Rahman, 2016).

Post-Operative Physical Therapy Alone

The use of physical therapy postoperatively for total joint arthroplasty is seemingly routine with importance to reduce complications and hospital length of stay. Different approaches to postoperative rehabilitation are applicable, yet there is not one that is agreed upon to be the most effective. In a systematic review that looked at different post-operative therapy options it was found that cryotherapy or cold therapy along with the physical therapy was the most effective way to reduce pain and accelerate overall therapy. The quality of this evidence was considered low and further high-quality studies in the area are needed for future evaluation and recommendations. Cryotherapy preoperatively was not included in this study (Curry, Goehring, Bell, & Jette, 2018).

Conflicting evidence on when it is best time to start post-operative therapy is present throughout the literature. This conflict is seen in cases with and without the use of prehabilitation. It was found that therapy initiated within 24 hours postoperatively provided a greater proportion of participants with normal balance and gait compared to those who started therapy at 48 to 72 hours after total knee arthroplasty (Pua & Ong, 2014). It was also noted that ambulation within the third day of surgery from a total hip arthroplasty makes a difference in the patient's functional stability and improvement in quality of life (Sahu, Kumar, Krishna, & Madhavi, 2018). The effects of physical therapy alone can be beneficial postoperatively to get the patient to gain strength and balance, but the effects on pain were not looked at in this study.

Physical therapy postoperatively only also requires more visits than those patients that undergo prehabilitation in addition to physical therapy after surgery (Soeters, et al., 2018).

Duration of Prehabilitation

The duration of prehabilitation that is recommended for optimal recovery is not well documented. Literature reports that four to six weeks of prehabilitation physical therapy, water rehabilitation or physiotherapy is recommended to received optimal results including decreased pain, increased function and strength and shorter recovery times (Soeters, et al., 2018). Other literature reports that just one visit with a physical therapist for postoperative education on the use of assistive devices and exercises is enough to decrease recovery time (Burch & Ahn, 2015).

In a study looking at the reduction in postoperative care use for patients that have had preoperative physical therapy, it was noted that even as few as one or two sessions can reduce care by as much as 29%. This would be a savings of \$1,000 per patient or more. Researchers in Ohio reviewing nearly 5,000 Medicare cases noted that 79.7% of the patients had no preoperative physical therapy. These patients required increased post-hospital care services including but not limited to inpatient rehabilitation and homecare. This is in contrast to only 54.2% for those patients that received preoperative physical therapy needed post-hospital care services (Kunysz, 2014).

Overall Outcomes of Prehabilitation Through Literature Synthesis

A systematic review and meta-analysis of randomized control trials determined that existing evidence shows that prehabilitation may slightly improve early postoperative pain and function for those who are undergoing a total joint arthroplasty. This study notes that these effects remain too short-term and small to be considered of clinical importance. They also noted that it did not affect key outcomes of interest like length of stay and decreased costs (Wang, et

al., 2016). Another study found that a structured preoperative exercise program may be beneficial and is associated with a shorter hospital stay but well-designed randomized trials should be completed to confirm (Sharma, Ardebili & Abdulla, 2019).

Results from a different systematic review and meta-analysis concluded that prehabilitation programs provide small-to-moderate improvements but that the improvement seen were based on the joint that was surgically repaired. For example, in patients that underwent a total hip arthroplasty, patients had significant improvements in their pain, had a decreased length of stay and an increase in the function of the hip when prehabilitation was completed. On the other hand, for the patient who was undergoing a total knee arthroplasty there was significant improvement for decreased length of stay, increased function, and quadriceps strength when prehabilitation had been utilized. No improvement in pain control was observed in this case (Moyer, Ikert, Long & Marsh, 2017). Studies also found that other benefits of prehabilitation in a total knee arthroplasty included improved knee range of motion and sit-to-stand test (Chen, Li, Ruan, Liu & Fang, 2017).

When looking at preoperative education for adults that are undergoing total joint arthroplasty, there is low quality evidence showing that no clinical meaningful difference in terms of postoperative pain, function, adverse events, or improvement in quality of life when patients were given education by an occupational therapist, physical therapist, physician, physiotherapist, etc. prior to surgery when compared to the usual care. In this study, the usual care consisted of a preoperative packet that was mailed to the patient which contained information about what to expect during the hospital stay, the procedure and routine information but nothing specific to preoperative physical therapy. It was noted that one-on-one, in-person education decreased the pre-operative anxiety for patients by five points on a 60-point scale.

This study did not look at the effects of prehabilitation with physical therapy or water rehabilitation prior to surgery (Burch & Ahn, 2015).

Throughout the literature, patients that had prehabilitation prior to surgery tend to have less pain, shorter time spent in postoperative physical therapy, and increased satisfaction. This was not limited to just exercises prior to procedure but also preoperative education as noted above. It seems that water rehabilitation prior to surgery had the best results when compared to physiotherapy and postoperative physical therapy alone (Wang, et al., 2016; Moyer, Ikert, Long & Marsh, 2017).

Future Research

Prehabilitation is a promising approach to post-operative pain reduction, reduced hospital length of stay and increased satisfaction. Further research is needed to help to determine the factors that contribute to effective exercise and educational programs that are set to improve the postoperative patients' expectations should be conducted. A standardized approach for reporting interventions in clinical trials is also warranted. This could result in clinically important changes and improvements to the current recommendations (Moyer, Ikert, Long & Marsh, 2017).

Other clinical trials could focus on the standardized regimen of outcomes. This would include standardized postoperative visits for data collection follow-up (Moyer, Ikert, Long & Marsh, 2017). Future research could also consider better reporting of patient compliance with prehabilitation, particularly in patients with osteoarthritis, pain, or other comorbidities that could present as primary barriers to prehabilitation participation. Patients with comorbidities who are unable to participate in rehabilitation activities could consequently limit the potential improvements in postoperative outcomes (Moyer, Ikert, Long & Marsh, 2017).

Further research into the optimal length, type, and frequency of prehabilitation is also warranted. Lastly, studying a prehabilitation exercise program that uses a patient centered approach versus generic programs set up for all patients could give insight as to how patients obtain the best results. Prehabilitation could be further studied as to whether these programs are supervised versus unsupervised, and if these prehabilitation programs result in a faster return to work or recreational activities that the patient enjoys would be important items to research (Moyer, Ikert, Long & Marsh, 2017). Throughout the literature, it is apparent that prehabilitation has the potential to improve patient experience and quality of life postoperatively. Prehabilitation use for total joint arthroplasty is an exciting topic that will continue to change the way that the preoperative period is conducted.

The research of prehabilitation in relation to other procedures is also evolving. Research continues to expand on prehabilitation patients prior to anesthesia, regardless of the procedure, to ensure that they are in the best health to undergo the procedure. Decreasing other patient risks like smoking cessation and weight reduction are also being researched as prehabilitation options that could decrease healing time, length of hospital stay, and pain (Joyce & Azocar, 2019).

Learning Points

- Prehabilitation does not take the place of postoperative care but aids in decreasing patient recovery time (Pua & Ong, 2014).
- Prehabilitation using water rehabilitation had the greatest effect on decreasing pain, increasing range of motion, and muscle strength post operatively when compared to patient having postoperative therapy alone (Typ, et al., 2016).

- Improvement in pain, strength, gait, balance, and decreased postoperative appointments were some of the benefits seen from prehabilitation (Wang, et al., 2016; Moyer, Ikert, Long & Marsh, 2017; Chen, Li, Ruan, Liu & Fang, 2017).
- Primary providers play an important role in preoperative education, this role is important for increasing patient satisfaction and decreasing preprocedural anxiety (Burch & Ahn, 2015).
- Areas of prehabilitation that need to be researched including but not limited to: the optimal length and type of prehabilitation, most effective delivery of education, and patient tailored programs versus generalized programing (Moyer, Ikert, Long & Marsh, 2017; Sharma, Ardebili & Abdulla, 2019).

References:

- Burch, J., & Ahn, J. (2015). Is preoperative education beneficial for adults undergoing hip or knee replacement? *Cochrane Clinical Answers*. Doi: 10.1002/cca.681
- Chen, H., Li, S., Ruan, T., Liu, L., & Fang, L. (2017). Is it necessary to perform prehabilitation exercise for patients undergoing total knee arthroplasty: meta-analysis of randomized controlled trials. *The Physician and Sportsmedicine*, 46(1), 36–43. doi: 10.1080/00913847.2018.1403274
- Curry, A., Goehring, M., Bell, J., & Jette, D. (2018). Effect of Physical Therapy Interventions in the Acute Care Setting on Function, Activity, and Participation After Total Knee Arthroplasty. *Journal of Acute Care Physical Therapy*, 1. Doi: 10.1097/jat.0000000000000079
- Eil-Ismail, M., Sharifudin, M., Shokri, A., & Rahman, S. (2016). Preoperative physiotherapy and short-term functional outcomes of primary total knee arthroplasty. *Singapore Medical Journal*, 57(03), 138–143. Doi: 10.11622/smedj.2016055
- Jahic, D., Omerovic, D., Tanovic, A. T., Dzankovic, F., & Campara, M. T. (2018, December). The Effect of Prehabilitation on Postoperative Outcome in Patients Following Primary Total Knee Arthroplasty. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6340623/>
- Joyce, M., & Azocar, E. (2019). Prehabilitation for anesthesia and surgery. Retrieved from <https://www.uptodate.com/contents/120301/print>

- Kremers, M., Larson, D., Crowson, C., Kremers, W., Washington, R., Steiner, C., Jiranek, W., & Berry, D. (2015). Prevalence of Total Hip and Knee Replacement in the United States. *The Journal of bone and joint surgery. American volume*, 97(17), 1386–1397. doi:10.2106/JBJS.N.01141
- Kunysz, T. (2014). Preoperative Physical Therapy Results in ‘Significant’ Reduction in Postoperative Care Use for Patients Undergoing Hip or Knee Replacement. Retrieved from <https://www.apta.org/PtinMotion/News/2014/10/2/PreOperativePT/>
- Morgan, P., & Coghlan, S. (n.d.). The difference between a Physiotherapist & Physical Therapist. Retrieved from <https://www.mmphysiotherapy.com/difference-between-physio-physical-therapist.html>
- Masaracchio, M., Hanney, W., Liu, X., Kolber, M., & Kirker, K. (2017). Timing of rehabilitation on length of stay and cost in patients with hip or knee joint arthroplasty: A systematic review with meta-analysis. *PloS one*, 12(6), e0178295. <https://doi.org/10.1371/journal.pone.0178295>
- Moyer, R., Ikert, K., Long, K., & Marsh, J. (2017). The Value of Preoperative Exercise and Education for Patients Undergoing Total Hip and Knee Arthroplasty. *JBJS Reviews*, 5(12). doi: 10.2106/jbjs.rvw.17.00015
- Pua, Y., & Ong, P. (2014). Association of Early Ambulation With Length of Stay and Costs in Total Knee Arthroplasty. *American Journal of Physical Medicine & Rehabilitation*, 93(11), 962–970. Doi: 10.1097/phm.0000000000000116
- Sahu, A., Kumar, K., Krishna, S., & Madhavi, K. (2018). Influence of Early Physiotherapy Intervention on Pain, Joint Range of Motion and Quality of Life in Unilateral Hip Joint

- Replacement surgery. *Indian Journal of Physiotherapy and Occupational Therapy – An International Journal*, 12(1), 30. Doi: 10.5958/0973-5674.2018.00006.0
- Sharma, R., Ardebili, M. A., & Abdulla, I. N. (2019). Does Rehabilitation before Total Knee Arthroplasty Benefit Postoperative Recovery? A Systematic Review. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6394179/>
- Snow, R., Granata, J., Ruhil, A., Vogel, K., Mcshane, M., & Wasielewski, R. (2014). Associations Between Preoperative Physical Therapy and Post-Acute Care Utilization Patterns and Cost in Total Joint Replacement. *The Journal of Bone and Joint Surgery*, 96(19). doi: 10.2106/jbjs.m.01285
- Soeters, R., White, P. B., Murray-Weir, M., Koltsov, J., Alexiades, M., Ranawat, A. (2018). Preoperative Physical Therapy Education Reduces Time to Meet Functional Milestones After Total Joint Arthroplasty. *Clinical orthopaedics and related research*, 476(1), 40–48. <https://doi.org/10.1007/s11999-0000000000000010>
- Typ, M., Kaczor, R., Cabak, A., Tederko, P., Wlostowska, E., Stanistawska, I., Szyputa, J., & Tomaszewski, W. (2016). A Water Rehabilitation Program in Patients with Hip Osteoarthritis Before and After Total Hip Replacement. *Medical Science Monitor*, 22, 2635–2642. doi: 10.12659/msm.896203
- Wang, L., Lee, M., Zhang, Z., Moodie, J., Cheng, D., & Martin, J. (2016). Does preoperative rehabilitation for patients planning to undergo joint replacement surgery improve outcomes? A systematic review and meta-analysis of randomised controlled trials. *BMJ Open*, 6(2). Doi: 10.1136/bmjopen-2015-009857

Appendix A

Patient Profile:

Name: T.S.

Date of Visit: 2/27/2020

Examiner: Student: Cassandra Ackerman

Gender: Female

Race: Caucasian, Non-Hispanic

Language: English

Historian: Patient

Chief Complaint: Pre-op exam

History of Present Illness:

T.S. is a pleasant 46-year-old female who presents to the clinic today for a pre-op examination. She is here alone. She reports that she will be having right knee surgery in about 1 month. The exact date and time have not been scheduled. The initial injury happened about 6 months ago she fell and injured her right knee. At that time, she did not seek immediate care of the injury. She did not lose consciousness and she did not hit her head. She reports that since that time she has had a constant aching pain in that knee along the joint line. It is worse with stairs and ambulation. She has tried taking Tylenol and ibuprofen with little relief. She was seen by orthopedics and recommended to have a right knee arthroscopy performed. Today she rates the pain as moderate. She has not had to use any assisted devices around the home, and she has no

open areas on her skin. She is unsure what the post-operative rehabilitation plan is at this time. She has not had any injury to that knee in the past.

Is patient on anticoagulant/antiplatelet therapy? Including, but not limited to, Apixaban, Aspirin, Clopidogrel, Dabigatran, Edoxaban, Fondaparinux, LMWH, Prasugrel, Rivaroxaban, Ticagrelor, Ticlopidine, Warfarin. Yes

PreOp Questionnaire

Do you ever have any pain or discomfort in your chest? No

Have you ever had a severe pain across the front of your chest lasting for half an hour or more? No

Do you have swelling in your feet or ankles at times? No

Are you troubled by shortness of breath when:

Walking on the level? No

Walking up a slight hill? No

Sleeping at night? No

Do you sometimes get pains in the calves of your legs when you walk? No

Does your chest ever sound wheezy or whistling? No

Do you currently have a cold, bronchitis or other respiratory infection? No

Have you had a cold, bronchitis, or other respiratory infection within the last 2 weeks? No

Do you usually have a cough? No

Do you or does anyone in your family have serious bleeding problems such as prolonged bleeding following surgeries or cuts? No

Have you ever had problems with anemia or been told to take iron pills? No

Have you had any abnormal blood loss such as black, tarry or bloody stools, (for women) abnormal vaginal bleeding, etc.? No

Have you or any of your relatives ever had problems with anesthesia? No

For Women:

Is there any chance that you may be pregnant? No

Current Medications:

Medication	Sig
• Metformin (Glucophage) 1000 mg	Take 1 tablet by mouth once daily.
• Rybelsus (semaglutide) 7 mg	Take 1 tablet by mouth once daily.
• Levothyroxine (Synthroid) 125 mcg	Take 1 tablet by mouth once daily.
• Aspirin 81 mg	Take 1 tablet once daily.
• Lisinopril 10 mg	Take 1 tablet daily
• Tylenol 500 mg	Take 2 tablets every 6 hours as needed for pain
• Ibuprofen	Take 3 tablets every 6 hours as needed for pain.

Allergies:

Amoxicillin-reaction unknown

Morphine-Nausea, vomiting

Past Medical History:

Type 2 Diabetes

Obesity

Hypothyroidism

Right knee injury

Hypertension

Squamous cell Carcinoma on neck

Past Surgical History:

- HYSTERECTOMY
- SKIN BIOPSY-*squamous cell carcinoma*
- LAPAROSCOPIC CHOLECYSTECTOMY
- C-Section x2

Family History:

Father is living and has a history of 3 stents at age 55, prostate cancer, hypertension and hyperlipidemia. Mother is living and has a history of breast cancer at age 60, Hypertension and obesity. Paternal grandfather is living and has a history of hypertension and melanoma. Paternal grandmother has a history of a CVA at age 80 and is deceased. Maternal grandfather is not living, and his history is unknown. Maternal grandmother has a history of hypertension and breast cancer.

Social History:

T.S. is married and has 2 children. She works in education, she has never smoked or used tobacco, she drinks rarely (1 glass of wine per month). She has never used illicit substances. She lives a sedentary lifestyle.

Review of Systems:

Constitutional: Denies fatigue, Denies fever, chills, syncope, dizziness and light headedness

Eye: Denies changes in vision

ENT: No changes in hearing or smell

Cardiovascular: Denies palpitations, chest pain, activity intolerance and edema.

Respiratory: Denies shortness of breath, no wheezing. No exposure to secondary smoke.

Gastrointestinal- Normal appetite, Denies reflux, nausea, vomiting, diarrhea, constipation, hematemesis, abdominal or epigastric pain, and food intolerances.

Genitourinary-Denies urgency, frequency, suprapubic pain, dysuria, nocturia, incontinence

Musculoskeletal: Denies back pain, muscle pain and cramps, stiffness, back swelling. Denies neck pain or stiffness. Complaints of right knee pain.

Integumentary-Denies itching, urticaria, nail deformities, moles, hair loss, open sores, bruising or lesions of concern.

Neurological-Denies weakness, numbness, tingling, memory loss, tremors, stroke, seizures, and paresthesias.

Psychiatric-Denies sleep disturbances, suicidal ideation

Endocrine-Denies heat/cold intolerance, no polyphasic, polydipsia, polyuria. Denies changes in skin, hair and nail texture.

Hematologic/Lymphatic-denies any abnormal bruising or bleeding. Denies any lymph node enlargement.

Initial diagnostic hypotheses (Differential diagnoses):

Pre-op exam

Physical Examination:

BP 136/88 | Pulse 78 | Temp 98.5 °F | Ht 5 ft 6 in | Wt 211 lbs | BMI 34 kg/m²

GENERAL: vital signs reviewed, well developed and nourished, in no distress

SKIN: warm and dry, color normal

HEAD: normal

EYES: lids and conjunctivae normal, PERRLA, normal EOM's

EARS: hearing, external canals and TM's normal

NOSE: no congestion

OROPHARYNX: oral mucosa and pharynx normal

NECK: carotid pulses, thyroid and lymph nodes normal, trachea midline

CHEST: normal respiratory effort, breath sounds clear

CARDIOVASCULAR: normal rate and rhythm, no murmurs or gallops, no edema, peripheral pulses normal

ABDOMEN: no tenderness, masses or hepatosplenomegaly, bowel sounds normal

MUSCULOSKELETAL: gait normal, **medial joint line tenderness/pain and click with movement of right knee.** No erythema or warmth.

LYMPHATIC: no cervical adenopathy

NEUROLOGICAL: alert and oriented; cranial nerves intact

PSYCHIATRIC: normal mood, affect and insight

Laboratory/Diagnostic Tests:

See Appendix B

Diagnosis/diagnoses:

Preoperative examination

Essential hypertension with goal BP less than 140/90

Type 2 Diabetes

Obesity

Hypothyroidism

Right knee meniscus tear

Management plan (therapeutic decision making):

- Discussed with patient course of symptoms, and treatment plan at this time. T.S. came to the clinic today for her preop examination. She has no known cardiopulmonary disease. Lab work and EKG were completed and were unremarkable. The patient is at low risk for the planned procedure. There are no contraindications for her to proceed with the surgery as planned. Plan to hold the aspirin the week prior to procedure. Her metformin and Rybelsus she needs to hold the night prior to surgery. She should also discontinue the use of ibuprofen or other NSAIDS the week prior to surgery. She can continue to take Tylenol as needed as previously prescribed. She can take her Synthroid the morning of procedure with a few sips of water. Lisinopril hold the morning of procedure. Please follow these restrictions unless directed differently from surgical team. Do not start any new OTC medication or supplements prior to surgery. Work restrictions and postoperative care plan to be given by orthopedic team.
- Essential hypertension with goal BP less than 140/90-stable on Lisinopril 10 mg daily
- Type 2 diabetes-On Metformin, continue to work on diet and exercise
- Obesity-Continue to work on lifestyle modifications of diet and exercise.
- Hypothyroidism, currently stable on Levothyroxine 125 mcg

Appendix B

Labs:

TSH: 3.65 (0.4-4.3 miu/L)

Test	Result	Units	Reference interval
Albumin	3.9	g/dL	3.5-5.0
ALT (SGPT)	19	IU/L	6-31
AST (SGOT)	21	IU/L	11-36
Alkaline phosphatase	57	mg/dL	38-126
Total billirubin	0.8	mg/dL	0.2-1.3
BUN	11	mg/dL	7-17
Calcium	9.2	mg/dL	8.4-10.2
Chloride	101	mmol/L	98-107
Creatinine	0.8	mg/dL	0.7-1.2
Glucose	98	mg/dL	65-105
Lactate dehydrogenase (LDH)	149	IU/L	100-250
Magnesium	0.89	mmol/L	0.65-1.05
Potassium	4.0	mmol/L	3.6-5.0
Sodium	141	mmol/L	137-145
Total protein	7.0	g/dL	6.3-8.2
Uric Acid	301	mmol/L	227-367/467

Dr. Herbst

Component Results

CBC W/DIFF & PLT

Component	Your Value	Standard Range	Units
WBC	4.4	4.8 - 10.8	K/uL
RBC	4.49	4.70 - 6.10	M/uL
HEMOGLOBIN	14.6	12.6 - 17.4	g/dL
HEMATOCRIT	43.5	37.0 - 51.0	%
MCV	96.9	80.0 - 94.0	fl
MCH	32.5	27.0 - 31.0	pg
MCHC	33.5	33.0 - 37.0	g/dL
RDW	12.7	11.6 - 14.8	%
PLATELET COUNT	151	130 - 400	K/uL
SEGMENTED NEUTROPHILS #	1.60	2.40 - 7.60	K/uL
LYMPHOCYTE #	2.30	1.00 - 4.30	K/uL
MONOCYTES #	0.40	0.00 - 1.10	K/uL
EOSINOPHILS #	0.10	0.00 - 0.60	K/uL
BASOPHILS #	0.00	0.00 - 0.20	K/uL
SEGMENTED NEUTROPHIL %	36.6	50.0 - 70.0	%
LYMPHOCYTE %	52.0	20.0 - 40.0	%
MONOCYTES %	8.9	0.0 - 15.0	%
EOSINOPHILS %	1.9	0.0 - 6.0	%
BASOPHILS %	0.6	0.0 - 2.0	%

