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Acute Care Physical Therapy Status Post Laparoscopic Loop Sigmoid Colostomy for a Patient with Colorectal Cancer: A Case Report

Elizabeth Race

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The patient signed an informed consent allowing the use of medical information for this report and received information on the institution’s policies regarding the Health Insurance Portability and Accountability Act.

The author acknowledges Amy Litterini, PT, DPT, for guidance and support for case report conceptualization and Elissa Parker, MPT, for her supervision and assistance with treatment as well as the patient for participating in this case report.
ABSTRACT

Background and Purpose: Colorectal cancer (CRC) is the third most commonly diagnosed cancer, with an increasing prevalence in the United States. Surgical treatment is common and the American Society of Enhanced Recovery (ASER) established fast track protocols to reduce recovery time and length of stay in the hospital. Early mobilization is a key component of these protocols. The purpose of this case report is to describe the acute physical therapy (PT) for a patient who received a laparoscopic loop sigmoid colostomy.

Case Description: The patient was a 73-year-old male admitted to the hospital to receive surgery for a permanent colostomy due to his diagnosis of stage II adenocarcinoma of the rectum. PT evaluation and treatment began post-operative day (POD) one. He presented below his baseline level of function, as he was previously independent in mobility and activities of daily living (ADLs). At the time of evaluation, he had limitations in bed mobility, transfers, and tolerance to activity. Treatment focused on a task oriented approach addressing limitations in functional mobility.

Outcomes: The patient was assessed on his required level of assistance at initial evaluation and discharge. He demonstrated improvements in all functional mobility; bed mobility (moderate assistance to independence), transfers (minimal assist to independence), ambulation (contact guard assist for 150 feet to supervision for 350 feet), and stair negotiation (unable to perform to close guarding with ascending/descending nine stairs).

Discussion: This patient had the benefit of following the multidisciplinary ASER protocol and received early mobilization guided by a skilled physical therapist. He was discharged to inpatient rehab after eight days in the hospital. Further research should look at pre-habilitation to determine how that affects outcomes. Manuscript word count 3069
BACKGROUND and PURPOSE

CRC is defined as any malignant uncontrolled cell division that commences in the large intestine. Ninety-six percent of all cases of CRC are classified as an adenocarcinoma, which arises from glandular cells within the inner lining of the large intestine.\(^1\) The large intestine is made up of the colon and the rectum. The colon is the more proximal portion of the large intestine, which connects distally to the rectum (refer to Figure 1). The primary function of the large intestine is to absorb water and transport stool to the rectum, where the stool is stored until elimination.

CRC is an extremely prevalent problem in the United States, as it is the third most commonly diagnosed cancer, aside from skin cancers.\(^2\) As of January, 2016, the American Cancer Society (ACS) estimated there are 724,690 men and 727,350 women living with a history of CRC, and has a projected ten year increase to 910,190 and 885,940 respectively.\(^3\) CRC screening has helped reduce incidence rates for individuals aged 65 and older; however, this population is still at the greatest risk with the median age of CRC diagnosis being 66 for males and 70 for females.\(^1,3\)

Treatment for CRC is dependent upon the location and stage of the cancer. Colon cancer is typically treated with surgery first, followed by adjuvant chemotherapy (chemo) and/or radiation. In comparison, rectal cancer is usually treated first with chemo-radiation neoadjuvantly.\(^3\) Chemo-radiation therapy combines the use of localized high energy particles from radiation with the systemic effects of chemo. Side effects vary amongst individuals, but fatigue, nausea, and diarrhea are commonly reported.

Surgery is aimed at the removal of the tumor which, depending on location, may result in a colostomy. A colostomy is a surgical procedure that resects part of the large intestine, creating
a stoma to allow a new pathway for the removal of gas and stool into a disposable bag attached
to the abdomen (refer to appendix 2 and 3). The placement of the stoma is dependent on the
location of the cancer. The operation for a colostomy can either be open or laparoscopic. A
laparoscopic approach is minimally invasive, and has been shown to reduce the risk of infection,
recovery time, and length of stay at the hospital when compared to an open surgery.\textsuperscript{4,5}

Post-surgical recovery requires a multi-disciplinary approach, which includes physicians,
nurses, physical and occupational therapy, as well as social work. ASER has established fast
track protocols for colorectal surgery, which encourage safe early mobilization. These fast track
protocols have an emphasis on ambulation post-operative day one, with the goal of improving
patient outcomes and reducing length of stay and overall health care costs.\textsuperscript{6} With consideration to
the older population, they have been shown to be safe with patients older than 70 years of age.\textsuperscript{7}
Although clinical practice guidelines support early mobilization, there is a lack of literature that
describes the acute physical therapy management for patients post colostomy.

The purpose of this case report is to describe the acute physical therapy management for
a patient who received a laparoscopic loop sigmoid colostomy due to a diagnosis of stage II
rectal cancer.

\textbf{CASE DESCRIPTION}

\textbf{Patient History and Systems Review}

The patient was a retired 73-year-old Polish-American male who was treated in an acute
care hospital. The patient gave consent for this case report to be written by a student physical
therapist (SPT) who evaluated and treated the patient during his hospital admission. He was
admitted with an ongoing diagnosis of stage II adenocarcinoma of the rectum. Prior to his
admission, he had been receiving neoadjuvant chemo-radiation to ease the effects of his cancer
and to prolong his life. However, he had difficulty tolerating the chemo-radiation and had issues with nausea, fecal incontinence, and diarrhea. Secondary to his nausea and diarrhea, the patient became malnourished and dehydrated. Therefore, to improve his quality of life, he opted for an irreversible loop sigmoid colostomy.

Prior to his cancer diagnosis, the patient had had a diagnosis of pre-hypertension. His hospital course entailed an eight-day inpatient admission on the medical-surgical unit. While at the hospital, he received nutritional counseling to improve his diet, intravenous fluids to improve his hydration, wound care, as well as physical and occupational therapy to address his limitations with mobility and activities of daily living (ADLs).

The patient was a retired corrections officer and was well respected in the community. He had a supportive wife who was working fulltime and an adult daughter who lived five hours away. Prior to admission, the patient lived in a split-level, three story home with his wife. He was independent in ADL’s and mobility with use of a rolling walker for ambulation. He had complaints of weakness and fatigue since he began chemo-radiation, which limited his ability to complete instrumental activities of daily living (IADLs). Therefore, his wife managed the cooking, cleaning, shopping and driving. His chief complaints upon the physical therapy evaluation were pain at his surgical site and fatigue. The patient’s goal was to return home upon discharge from the hospital. However, he understood the necessity of independent ambulation prior to a home discharge. Therefore, his goals in therapy were to safely ambulate with his rolling walking and to complete a flight of stairs. A systems review can be found in Table 1.

Clinical Impression 1

The primary problem for the patient was his decreased tolerance to activity, which limited his independence with mobility and ADLs. This decreased tolerance needed to be
differentiated from his pre and post-operative level of function. As the patient was seen on POD-one, it was expected he may present with pain, fatigue, and decreased activity tolerance. Due to his reports of fatigue from chemo-radiation prior to surgery, the SPT believed the patient was deconditioned prior to his surgery, which may negatively impact his prognosis.

Physical therapy in the hospital setting has typically focused on basic mobility to maintain function, return to baseline mobility, and to assure a safe discharge. The ASER protocol from Dartmouth College recommends ambulation POD one as well as a PT consultation if the patient is over age 70. After reviewing literature for acute care physical therapy, it was considered appropriate to focus on functional activity within the hospital setting. Therefore, the plan for examination included an assessment of basic functional mobility POD one with a focus on bed mobility, transfers, ambulation and stairs.

The patient was chosen for this case report because in addition to being diagnosed with a serious disease that required a life-changing procedure, he presented with a prior decline in function due to his treatment. Furthermore, he was motivated to return home, was compliant with PT treatment, and had a good support system to encourage his participation with his exercises outside of PT.

Examination – Tests and Measures

Due to ASER protocols and the goals of physical therapy in a hospital setting, an assessment of functional mobility was completed POD one. Functional mobility as defined by Spears is an individual’s ability to move around in his or her environment, and consists of three key areas of bed mobility, transfers, and ambulation. There were no standardized tests or outcome measures used in this case. Results were qualitatively documented in terms of cueing...
and level of assistance required by the patient to complete tasks. Terminology for his required level of assistance was based on Scalzitti’s definitions and can be found in Appendix 1. The mobility assessment took place in his hospital room, using an ADVANTA-2 med-surg bed (Hill-Rom, Skaneateles Falls, NY) for bed mobility. A wall saver recliner (Art of Care, Skaneateles Falls, NY) was used for transfers and his personal two-wheeled rolling walker for ambulation.

Bed mobility was assessed at a zero degree incline and included rolling from supine to side-lying on both sides, scooting vertically and horizontally, as well as supine to and from sit. Transfer tasks entailed sit to stand from bed to recliner with a step-pivot using his rolling walker. The ambulation assessment looked at distance measured in feet, gait pattern, and safety with assistive device use. Stair use was not assessed on the initial evaluation due to the SPT’s clinical judgment based on the patient’s presentation of weakness and fatigue. Strength had been grossly assessed during the systems review, which revealed global weakness in all extremities.

Outcomes from the assessment of functional mobility on the initial evaluation can be found in Table 2.

Clinical Impression 2

The patient presentation during the initial examination was consistent with the initial clinical impression. He had pain and fatigue, consistent with his surgical operation. His reports of weakness and fatigue prior to surgery were consistent with chemo-radiation side effects. Due to the patient’s functional limitations with bed mobility, transfers and ambulation, as well as his weakness and decreased tolerance to activity, he was still deemed appropriate for this case report.
The patient was admitted to the hospital for a laparoscopic loop sigmoid colostomy surgery with a diagnosis of stage II adenocarcinoma of the rectum. POD-one, he was examined by the SPT and was further diagnosed with a gait disorder due to weakness (ICD10 code R26.89), as well as generalized muscle weakness (ICD10 code M62.81).

The patient had a fair but guarded prognosis for several reasons. He had received a laparoscopic surgery which has shown to reduce recovery time compared to open surgeries. He was independent with mobility prior to admission, so it was expected that the patient would show progress with his strength and mobility as long as there were no medical complications while in the acute setting. He also had a healthy, supportive wife who would visit daily to learn his exercises and walk with him outside of his therapy sessions. Due to the minimally invasive surgery, prior level of independence, support system and early mobility, it was the SPT’s clinical opinion that the patient would regain his functional mobility. Conversely, due to his prior decline in function and his oral chemotherapy, he may have ongoing fatigue and limited activity tolerance, which may prolong his recovery. Therefore, the patient would benefit from continued physical therapy services after being discharged from the hospital. If he was able to manage his colostomy independently and mobilize safely, a home discharge with home PT could be considered. However, Balentine et al, have shown that the prognosis for a home discharge decreases with age regardless of functional status. Because of his previous decline in function, ongoing treatment, and his wife’s lack of 24 hour per day availability, a sub-acute inpatient rehabilitation (SAR) seemed most appropriate.

The plan for additional testing included an assessment of his safety using stairs. This would take place when the patient could ambulate 200 feet with CGA. His tolerance to activity would be observed during all PT treatments. There was no acute plan for additional referrals or
consultation as he was already being seen by a multidisciplinary team. His long term plan would include a referral to a SAR.

The PT plan of care consisted of a frequency and duration of daily treatments, five days a week for two weeks. Interventions were to address bed mobility, endurance, strengthening, gait, energy conservation, patient/family education, functional transfer training, and stair training. His mobility was assessed during each therapy session and was planned to assess his safety using stairs when the patient felt ready and the therapist deemed it appropriate. Goals for physical therapy were based on his limitations during the initial evaluation and can be found in Table 3. Because the discharge plan was for the patient to go to a SAR, goals were aimed at progress and safe mobility, but not complete independence.

**Intervention**

The initial patient presentation, plan of care, and progress were discussed with his physician, nurses, and discharge planners. Social work was consulted to address his adjustment to illness. His PT was coordinated with occupational therapy in order to avoid excessive fatigue. His presentation during each visit was communicated with his nurse and PT discharge recommendation was communicated with the discharge planner. The initial evaluation and all treatment sessions were documented electronically in SOAP note format and included a discharge recommendation.

The patient was instructed to be out of bed for all meals, and to walk with nursing after lunch and dinner. He was educated on his results during the initial evaluation and the expectations during recovery which included the necessity of his participation during all PT sessions. His wife was also educated on the exercises that were done, the plan for progression and the ASER protocol to ambulate at least four times a day. The patient was educated on safety
and energy efficient techniques during mobility tasks as well as the importance of changing positions to maintain skin integrity and to reduce the risk of progression of his stage 1 pressure ulcers on his sacrum and on the lower cervical spinous processes.

The patient was scheduled daily for five days per week for up to two weeks. However, the patient was discharged from the hospital on POD seven. He required encouragement and motivation to complete exercises but was compliant with all PT sessions. The interventions were used to address limitations found during the initial evaluation. They focused on functional mobility which included bed mobility, transfers, gait, and stair training, as well as therapeutic exercises for endurance, and strengthening to improve his activity tolerance. Because the intervention tasks were low in complexity and high in organization, a whole task approach was used.

ADVANTA-2 med-surg bed (Hill-Rom, Skaneateles Falls, NY) was used for bed mobility. This bed had adjustable rails which the patient could use initially and progress to not using in order to simulate his home environment. Interventions to address bed mobility included transitions of supine to and from sit. The patient initially received verbal cues with minimal assistance from the therapist. After he demonstrated his ability to do this task without therapist assistance he was progressed to no verbal cues and was further progressed to no use of the rail.

Transfer activities focused on sit to and from stand. Initially the patient used his hospital bed which allowed the height to be adjusted for ease. He was also using a wall saver recliner (Art of Care, Skaneateles Falls, NY) in order to promote being out of bed. After he no longer needed physical assistance from the therapist, he was progressed to a Day Bed Sleeper sofa (Art of Care, Skaneateles Falls, NY) which was lower the ground and only had one arm rest. He was further
progressed to a standard folding chair which did not have arm rests. The different seating options added variability which helped simulate real world situations.

All ambulation activities were on a flat, hard floor with the use of the patient’s personal Rolling walker. With no complaints of dyspnea, dizziness or lightheadedness the ambulation distance was increased daily. After the patient gained some strength and endurance back, stairs were introduced and remained a part of each PT session.

His weakness and decreased activity tolerance were addressed through endurance and strengthening exercises. Because he was also being treated by occupational therapy, which focused on his upper extremities, PT exercises targeted his lower extremities. These were initially seated exercises which were progressed to standing when the patient reported little to no difficulty with initial exercises. Please see table 4 a detailed report of interventions.

**OUTCOME**

The patient demonstrated improvement with all functional mobility. He was initially evaluated on POD one and was discharged from the hospital after five PT treatments on POD seven. Throughout treatments, he was able to progress his therapeutic exercises, decrease his required level of assistance and progressively work towards independence. Bed mobility improved from requiring moderate assistance to being independent. Transfer tasks improved from requiring minimal assistance to being independent. Ambulation improved from requiring contact guard assist to supervision. Ambulation distance also improved from 150 feet to 350 feet. Stair negotiation was unable to be assessed during the initial evaluation due to the patient’s weakness and fatigue. By discharge, he was able to complete nine consecutive stairs with close guarding. Please see table 2 for the results of outcome measures.

At the time of hospital discharge, the patient had met all but one goal. The goal he needed
to continue to work on was negotiating stairs, he was discharged at a level of close guarding and the goal was to be at supervision level. Due to his unmet goal, ongoing fatigue, prior decline in function as well as his wife’s request for the patient to get stronger prior to returning home, he was discharged to SAR.

DISCUSSION

This case report describes the acute PT management for a patient who received a laparoscopic loop sigmoid colostomy. Through examining the patient POD one, the PT followed the ASER protocol for early mobility and focused interventions to address limitations in functional mobility. The patient demonstrated progress in all aspects of functional mobility. Although this case report outlines the PT management, ASER protocols recommend that post-surgical recovery use a multidisciplinary team. In this case, the team included nurses, physicians, discharge planners, a dietician, occupational and physical therapy. The patient was seen for only five PT treatments and demonstrated progress in all areas of functional mobility. Although PT focused on his functional mobility, many factors helped this patient recover. He had good support from his wife and was motivated to return to his prior level of function. He also had the support and supervision of nurses to monitor his medical status and to assist with tasks. This provided safety and helped to prevent falls or other complications. Physicians were also available to adjust medications and monitor medical status. His nutritional status may have also played a role in his recovery by improving his hydration through intravenous fluids and reintroducing to solid foods to his diet.

In addition to being a post-surgical patient, he also had an ongoing diagnosis of stage II adenocarcinoma of the rectum. His cancer related fatigue had begun prior to his surgery which caused him to be admitted in a deconditioned state. This patient had the benefit of following the
multidisciplinary ASER protocol and received early mobilization guided by a skilled physical therapist. However, due to his cancer diagnosis, age, and prior decline in function, a pre-operative therapy program may have been beneficial for him. Clinicians should continue to follow the ASER protocol and promote the need for skilled PT during early mobilization. Further research should examine pre-habilitation to determine how that affects patient outcomes.

REFERENCES


5. Rosen MJ, Cobb WS, Kercher KW, Heniford BT. Laparoscopic versus Open Colostomy

   doi.org/10.1016/j.ijsu.2014.08.389.


**TABLES and FIGURES**

**Figure 1. Anatomy of the Large Intestine**


Table 1. Systems Review

<table>
<thead>
<tr>
<th>Systems Review</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiovascular/Pulmonary</strong></td>
<td>Pre-hypertension, decreased tolerance to activity</td>
</tr>
<tr>
<td><strong>Musculoskeletal</strong></td>
<td>Global weakness</td>
</tr>
<tr>
<td><strong>Neuromuscular</strong></td>
<td>Intact</td>
</tr>
<tr>
<td><strong>Integumentary</strong></td>
<td>Stoma in Left Lower Quadrant, stage 1 pressure ulcer at C6/7 and sacrum.</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>Intact</td>
</tr>
<tr>
<td><strong>Affect, Cognition, Language, Learning Style</strong></td>
<td>Alert and oriented, cooperative, good problem solving, good safety awareness, good attention span, preferred demonstration.</td>
</tr>
</tbody>
</table>
Table 2. Outcomes

<table>
<thead>
<tr>
<th>Task</th>
<th>Results at Initial Evaluation (POD 1)</th>
<th>Results at Discharge (POD 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supine to side lying</td>
<td>I, with use of bed rail</td>
<td>I</td>
</tr>
<tr>
<td>Scooting</td>
<td>Min A, VC to bend knees and lift torso</td>
<td>I</td>
</tr>
<tr>
<td>Supine to sit</td>
<td>Mod A, able to move legs off bed but required assistance with lifting his torso</td>
<td>I</td>
</tr>
<tr>
<td>Sit to supine</td>
<td>Mod A, assistance with leg placement</td>
<td>I</td>
</tr>
<tr>
<td>Sit to stand</td>
<td>Min A, VC to push from the bed</td>
<td>I</td>
</tr>
<tr>
<td>Step Pivot</td>
<td>CGA, with RW</td>
<td>I, RW</td>
</tr>
<tr>
<td>Stand to sit</td>
<td>CGA, VC to reach for chair</td>
<td>I</td>
</tr>
<tr>
<td>Ambulation</td>
<td>CGA, 150 ft, RW step through pattern, on flat level hard surface</td>
<td>S, 350 ft, RW step through pattern, on flat level hard surface</td>
</tr>
<tr>
<td>Stairs</td>
<td>Patient unable to perform</td>
<td>CG, 9 consecutive stairs up and down with bil hand rails.</td>
</tr>
</tbody>
</table>

Verbal cueing= VC; Moderate assistance= Mod A; Minimal assistance= Min A; Contact guard assist= CGA; Close guarding= CG; Supervision= S; Independent= I; Bilateral= bil; Feet= ft; Rolling walker=RW

Table 3. Goals

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short term goals to be met by day three</td>
<td>1. Independent with supine to side lying without the use of the bed rail</td>
</tr>
<tr>
<td></td>
<td>2. Supervision for scooting, sit to supine and supine to sit with verbal cueing and use of bed rail.</td>
</tr>
<tr>
<td></td>
<td>3. Close guarding for sit to stand, step-pivot, and stand to sit.</td>
</tr>
<tr>
<td></td>
<td>4. Ambulate 200 feet four times per day with rolling walker and contact guard assist.</td>
</tr>
</tbody>
</table>

1. Met
2. Met
3. Met
4. Met
Long term goals to be met by day five

1. Ambulate 350 feet four times a day with rolling walker and supervision.
2. Negotiate nine stairs with supervision and use of bilateral handrails.

Table 4. Interventions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Rx Day 1 (POD1)</th>
<th>Rx Day 2 (POD2)</th>
<th>Rx Day 3 (POD5)</th>
<th>Rx Day 4 (POD6)</th>
<th>Rx Day 5 (POD7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supine to sit</td>
<td>Mod A VC Bed rail x 2</td>
<td>Min A VC Bed rail x 3</td>
<td>S Bed rail x 2</td>
<td>S VC x 3</td>
<td>I</td>
</tr>
<tr>
<td>Sit to supine</td>
<td>Mod A VC x 2</td>
<td>Min A VC x 2</td>
<td>S x 2</td>
<td>S x 2</td>
<td>I</td>
</tr>
<tr>
<td>Sit to stand</td>
<td>Min A VC Level 1 x 3</td>
<td>CGA VC Level 1 x 3 Level 2 x 2</td>
<td>CG Level 1 x 2 Level 2 x 2</td>
<td>S Level 1 x 2</td>
<td>S Level 1 x 1 CGA Level 3 x 2</td>
</tr>
<tr>
<td>Stand to sit</td>
<td>Min A VC Level 1 x 3 Level 2 x 2</td>
<td>CGA VC Level 1 x 3 Level 2 x 2</td>
<td>CG Level 1 x 2 Level 2 x 2</td>
<td>S Level 1 x 2</td>
<td>S Level 1 x 1 CGA Level 3 x 2</td>
</tr>
<tr>
<td>Gait</td>
<td>150 ft CGA</td>
<td>200 ft CGA</td>
<td>300 ft CG</td>
<td>350 ft S</td>
<td>350 ft S</td>
</tr>
<tr>
<td>Ankle pumps</td>
<td>x 10 bil</td>
<td>x 10 x 2 bil using light resistance theraband</td>
<td>x 10 x 2 bil using light resistance theraband</td>
<td>d/c</td>
<td>d/c</td>
</tr>
<tr>
<td>Seated knee extension and flexion</td>
<td>x 10 alt</td>
<td>x 10 x 2 using light resistance theraband</td>
<td>x 10 x 2 using light resistance theraband</td>
<td>d/c</td>
<td>d/c</td>
</tr>
<tr>
<td>Seated hip flexion</td>
<td>x 10 alt</td>
<td>x 10 x 2</td>
<td>d/c</td>
<td>d/c</td>
<td>d/c</td>
</tr>
<tr>
<td>I</td>
<td>C</td>
<td>Glute sets</td>
<td>5 sec hold</td>
<td>10 sec hold</td>
<td>10 sec hold</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>E</td>
<td>X</td>
<td>x 5</td>
<td>x 3</td>
<td>x 3</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>X</td>
<td>Mini squats</td>
<td>x 5 x 2 holding on to rolling walker</td>
<td>x 10 x 2 holding on to rolling walker</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td>5 sec hold x 5</td>
</tr>
<tr>
<td>C</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td>Side stepping</td>
</tr>
<tr>
<td>S</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Verbal cueing= VC; Moderate assistance= Mod A; Minimal assistance= Min A; Contact guard assist= CGA; Close guarding= CG; Supervision= S; Independent= I; Bilateral= bil; Alternating= alt; Feet= ft; Discontinued= d/c Level 1= ADVANTA-2 med-surg bed (Hill-Rom, Skaneateles Falls, NY) and/or wall saver recliner (Art of Care, Skaneateles Falls, NY) Level 2= Day Bed Sleeper sofa (Art of Care, Skaneateles Falls, NY) Level 3= folding chair x # = number of repetitions (ex: Level 1 x 3 = level 1 surface with 3 repetitions)

**APPENDICES**

**Appendix 1. Levels of assistance defined by Scalzitti**

<table>
<thead>
<tr>
<th>Level of assistance</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>Patient can consistently perform the skill safely.</td>
</tr>
<tr>
<td>Supervision</td>
<td>Someone is within an arm’s reach while the patient performs the task.</td>
</tr>
<tr>
<td>Close guarding</td>
<td>Someone is in a ready position to assist but is not touching patient.</td>
</tr>
<tr>
<td>Contact guard assist</td>
<td>Therapist is in ready position, touching the patient but not providing assistance.</td>
</tr>
<tr>
<td>Minimal assistance</td>
<td>Patient can complete majority of the task without assistance.</td>
</tr>
<tr>
<td>Moderate assistance</td>
<td>Patient can complete less than half of the task without assistance.</td>
</tr>
<tr>
<td>Maximal assistance</td>
<td>Patient is unable to perform any of the task.</td>
</tr>
</tbody>
</table>
Appendix 2. Colostomy Bag

Nucleus Medical Media. Colostomy Pouch. Smart Imagebase. April 3 2009 10:20 EDT.

Appendix 3. Stoma

Nucleus Medical Media. Colostomy Stoma. Smart Imagebase. April 30 2015 14:01 EDT.