

# An Acuity Rating System for Infusion Center Nurse Staffing

## The Cleveland Clinic Cancer Center at Hillcrest Hospital experience

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**H**illcrest Hospital, a Cleveland Clinic regional hospital, is a 424-bed facility located in Mayfield Heights, Ohio, serving Cuyahoga County, and residents of nearby Lake, Geauga, and Summit counties. In 2006 the Cancer Center at Hillcrest Hospital moved into the new four-story West Tower. The new tower also houses two new operating rooms and an endovascular suite for minimally invasive vascular procedures.

Cleveland Clinic Cancer Center at Hillcrest Hospital is a regional location of Cleveland Clinic Taussig Cancer Institute, offering a full range of oncology services in one location. Inpatient and outpatient medical oncology, radiation oncology, and gynecological oncology services are offered at the Cancer Center, which is staffed by Cleveland Clinic physicians. On the lower level of the West Tower are radiation oncology and gyn oncology. Medical oncology, exam clinic, triage, the cancer resource library, and the infusion clinic are located on the second floor, and inpatient oncology is on the third floor.

The Cancer Center has support staff for education and supportive care, including a certified genetic counselor and a dedicated social worker, who assists with psychosocial and resource needs of patients. The Cancer Center has an active research program, participating in cooperative group and industry-sponsored trials. The research team consists of a research coordinator, research nurse, and a data manager. Year-to-date in 2009, the cancer program is accruing approximately 10 percent of new patients to clinical trials.

The Cancer Center's registry captures 1,500 cases each year. In 2008 the Cancer Center had 11,000 patient visits and delivered about 8,800 chemotherapy/biotherapy and/or therapeutic administrations. The Cancer Center has been accredited by the American College of Surgeons Commission on Cancer since 1971.

### Infusion Center Services

The Cancer Center's spacious infusion area is configured in three pods with eight chairs per pod. In addition, there are three private bay rooms with stretchers. One bay room, designated as the neutropenic fever bay, is equipped to care for neutropenic patients. In 2008 the Cancer Center initiated a dedicated neutropenic throughput team, modeled on similar programs at Dartmouth-Hitchcock Cancer Center and a New York emergency department. Any patient that presents with febrile neutropenia during the Cancer Center's operating hours will be fast-tracked to the neutropenic fever bay. The goal of the team and the process is to bring

patients from the door to antibiotic in less than one hour from any point of entry into the hospital. In 2008 the neutropenic throughput program received system-wide recognition with the Silver Safety Award at the annual Cleveland Clinic Patient Safety Forum.

The Cancer Center's infusion area is staffed by:

- 4 physicians (equivalent to 2.0 FTE medical oncologists/hematologists)
- 11.3 FTE oncology nurses (all OCN certified as required within 1 year of hire)
- Secretaries and medical assistants equal to 5.2 FTEs
- Dedicated social worker, certified genetic counselor, and research nursing support equal to 3 FTEs.

The Cancer Center also employs a supportive care/palliative medicine nurse practitioner who supports the program with symptom management and collaborates with the social worker for transition to home care and hospice. Located within the infusion center is a dedicated oncology pharmacy that is staffed by a full-time pharmacist, a full-time pharmacy technician, and a full-time PharmD.

### Implementing an Acuity System

In 2006, in response to anecdotal feedback about throughput time in the infusion center, the Cancer Center conducted a throughput time study. For two weeks, staff logged all infusion center patients' movements—sign in, when the nurse brought the patient back to the infusion chair, when the labs were sent—every step in the care process was timed and logged in. These data were then entered in a database, which allowed program staff to run queries.

Next, a throughput practice council was established, similar to an ad hoc committee, comprised of front-line staff members including secretaries, a medical assistant, and RNs. This group first looked at the throughput data to determine where bottlenecks were occurring. In the short term, they found some simple solutions, such as staff working with the lab to identify cancer patients as STAT CBC/Diffs and to improve turnaround times of results needed to begin chemotherapy infusions.

At this point, the Cancer Center experienced a change in program administration. The new program manager championed the need for an acuity system in order to both enhance the patient experience in the infusion center and to create a balanced workload for the Cancer Center's infusion nurses.

The manager, in collaboration with a clinical nurse spe-

*continued on page 36*



Nursing staff at the Cleveland Clinic Cancer Center at Hillcrest Hospital.

**Table 1. Medical Oncology Acuity of Care Rating System, Cleveland Clinic Cancer Center at Hillcrest Hospital<sup>1,2</sup>**

**Level 1 (30 – 60 minutes)**

- Short treatments (Zometa®, Velcade®, Vidaza®, Ferrlecit®)
- IVP chemotherapy
- Short biotherapy (Herceptin®)
- Troubleshooting ports

**Level 4 (3 – 4 hours)**

- Chemotherapy lasting 3–4 hours maximum, includes vesicants, i.e., Adriamycin®
- PRBC transfusions (blood ready)
- Patient education followed by long chemotherapy
- Gamma infusion
- Rituxan® (weekly or monthly)
- Patient needing fever/neutropenia work-up (with fluids, antibiotics, possible admission)

**Level 2 (1 – 2 hours)**

- Chemotherapy lasting 1–2 hours maximum, includes Gemzar®, VP-16, single agents
- Bone marrow aspiration and biopsy
- Patient education (schedule in afternoon)
- Platelet transfusion
- Patient for treatment with labs not completed
- Phlebotomy
- Patient needing bathroom with assistance/fall risk

**Level 5 (More than 4 hours)**

- Complex chemotherapy administration lasting more than 4 hours
- PRBC transfusions with type and cross needed
- Patient for treatment needing complex symptom management and possible admission
- Includes FOLFOX, Taxol®/Carboplatin®, Cisplatin®

**Level 3 (2 – 3 hours)**

- Chemotherapy lasting 2–3 hours maximum, includes Aredia®
- Patient education followed by short chemotherapy
- Patient for treatment needing symptom management or with multiple needs

<sup>1</sup>Infusion times for chemotherapy dictate level of acuity, not the drugs given as examples.  
<sup>2</sup>Levels of acuity determined by total time of treatment, with consideration of extra time with patient and/or family, blood draws (complicated or uncomplicated), or any additional nursing needs assessed by nursing caregiver at time of treatment.



**Table 2. Treatment Length Scheduling Template, Cleveland Clinic Cancer**

**Questions to ask prior to scheduling treatment:**

1. Is this the person's first treatment?
2. What is the length of treatment?
3. Is teaching needed?
4. Is assistance needed (i.e., help to go to the bathroom)?
5. Does patient need to be seen by a physician prior to treatment?

cialist, conducted a literature review. By adapting and modifying information from the articles of Cusack and colleagues<sup>1</sup> and Moore and Hastings<sup>2</sup> and then individualizing the tool to meet the specific needs of the infusion center, the Cancer Center's Medical Oncology Acuity of Care Rating System was developed (see Table 1 on page 35). The rating system uses five acuity levels that are based on the time needed for "ideal" care delivery. Levels of acuity are determined by total time of treatment, with consideration of extra time with patient and/or family members, blood draws (complicated or uncomplicated), or any additional nursing needs assessed by the nursing caregiver at time of treatment. Initially patients are assigned a level based on the "ideal," but once a nurse has treated the patient, the nurse can—based on his or her experience that day—change the level for the patient's next visit. For example, if a patient has a difficult venous access requiring extra time or experienced a reaction to the infusion requiring increased observation and supportive meds, then the nurse would go from a level 3 to a level 4 for the next scheduled visit.

The Acuity of Care Rating System was implemented in the fall of 2006. After several months, it became clear that assigning acuity levels remained a challenge for some staff. So we created the "Treatment Length Scheduling Template" (see Table 2 above) to simplify the process. This template is designed as a communication tool for team members. It provides "questions to ask prior to scheduling treatment" as a guide to help staff assess the individual patient's needs. The template includes daily clinic hours, and guidelines on where the various levels will fit during each day's schedule. The template also lists common examples of drugs and treatments and allows secretaries to participate in accurate scheduling.

**Using the Acuity Tool**

Each day, the infusion center's charge nurse prepares the assignment schedule for the following day. Every day the

infusion nurses check a sheet on the charge nurse's desk that lists that day's patient assignments along with the patients' acuity levels. Typically the levels total 18 to 24 per day; the average is about 21 to 22 per day. This number translates to 6 to 8 patients per infusion nurse per day (for example, a nursing assignment may include: 8 am level 5, 8:30 am level 5, 9 am level 4, 11 am level 1, 12:30 pm level 2, and 1:30 pm level 1 to total 18). When the acuity level goes higher than 22, ideally another nurse is needed. To fill this need, the program

<b>Nurse Visits/Triage</b>	<b>Less than 1 Hour</b>	<b>1.5 to 2 Hours</b>
Schedule between 7 am and 4:45 pm	Schedule after 1 pm and no later than 4 pm	Schedule after 1 pm and no later than 3 pm
Common Examples:	Common Examples:	Common Examples:
Neulasta Labs Aranesp Vitamin B12 injection	Vidaza injection Avastin 3rd dose or later Zolodex Reclast Phlebotomy Zometa Iron/Venofer Gemzar only Velcade 5FU/Leucovorin Topotecan only 5FU pump replacement	Cytoxan Taxotere Nitrogen mustard Adriamycin+Cytoxan Gemzar/Carboplatin Platelets Taxol, 1 hour only Carboplatin/Topotecan Avastin 1st dose only Avastin 2nd dose only

**Scheduling Guidelines**

**Infusions:**

- A. Please do not schedule more than...
1. 1 infusion at 7:00 am
  2. 2 infusions at 7:30 am
  3. 2 infusions at 8:00 am
  4. 2 infusions at 8:30 am
  5. 2 infusions at 9:00 am

From 7:30 am through the rest of the day—no more than 2 infusions every 30 minutes

- B. Follow template guidelines to determine what times are appropriate for a particular regimen.
- C. Write the name of the regimen, i.e., Taxol/Carboplatin, PRBC transfusion, and include acuity rating, i.e., L2 comments section on the DAR (daily activities report).

...implementation of the Acuity of Care Rating System has not resulted in the need to hire additional staff.

2.5 to 3 Hours	3.5 to 4 Hours	More than 4 Hours
Schedule between 10 am and 1 pm	Schedule between 9 am and 11 pm	Must schedule between 7 am and no later than 9 am
Common Examples:	Common Examples:	Common Examples:
IV potassium Rituxan, 2+ doses FOLFOX FOLFIRI 1st time 1 hour Taxol Taxol/Carboplatin 1st time Herceptin IV magnesium	Blood transfusion/ready Chemotherapy admission FOLFOX+Avastin FOLFIRI+Avastin IVIG/Gamma RCHOP	Blood transfusion, T/C needed Cisplatin with hydration Any chemotherapy w/2 hours hydration 3 hour Taxol Cisplatin/VP16 First time Rituxan Ifosfamide

**Nurse Visits**

A. Please write reason for visit in comments section, i.e., labs, Aranesp, port flush, etc.

**Exams**

A. New patient consults—if you cannot find a slot within 5 days of referral, please notify manager.

B. Try to schedule exams in time order—do not leave big breaks in the day.

C. If it is close to the day of the exam clinic and you notice gaps in the schedule, call new patients to come in earlier or move up established patients to make room for possible new patient referrals on future exam schedules.

**TREATMENT LENGTH:**

Labs + Pre-medications + Teach (if needed) + Chemotherapy infusion time  
 Labs = 20 to 30 minutes  
 Teach = 1 hour  
 IV pre-medications = 20 minutes per medicine  
 (PO medications DO NOT count towards treatment length)

team attends these meetings and can bring up any issues of concern. The nurse manager also spends time each week out on the floor. Twice a week in medical oncology and once a week in gyn oncology, the program has an “after-clinic” review. For this meeting, the charge nurse, the infusion nurses, and physician-coordinator nurses get together with pharmacy, social work, and supportive care to discuss the patients seen that week in clinic. This multidisciplinary group also looks at any referrals that need to occur, and the charge nurse brings up any issues related to the infusion center services.

At the Cancer Center, implementation of the Acuity of Care Rating System has not resulted in the need to hire additional staff. Instead, the system has enabled the Cancer Center to use existing staff more efficiently. As a result of the above process, patient satisfaction scores are currently at 98 percent overall, and employee engagement scores, recently communicated, increased 10 percent in the past year equal to the 75<sup>th</sup> percentile for Gallup healthcare. Another positive result of the process includes successfully meeting volume growth needs with current staffing. 📄

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**References**

<sup>1</sup>Cusack G, Jones-Wells A, Chisholm L. Patient intensity in an ambulatory oncology research center: a step forward for the field of ambulatory care. Part I, Part II, Part III. *Nursing Economics*. 2004;22(2,3,4). Available online at: <http://search.ebscohost.com/login.aspx?direct=true&db=nhh&jid=22R&site=echos>.  
<sup>2</sup>Moore M, Hastings C. The evolution of an ambulatory nursing intensity system: measuring nursing workload in a day hospital setting. *J Nurs Adm*. 2006;36(5):241-248.

may turn to the nurses scheduled for nurse visits, triage, and shots, re-assigning one of these nurses to the infusion center or asking the nurse to perform a throughput role for a few hours. (The throughput nurse is similar to a floating nurse who walks around to each of the nurses in the pod, looks at what needs to be done, and helps with various tasks to ease any potential bottlenecks.)

The infusion center staff has monthly meetings, 45 minutes of which are set aside for a practice council. The entire