

# A Rural Healthcare System Expands Cancer Care with a “Hub and Spoke” Model

According to the American Society of Clinical Oncology (ASCO), the number of practicing oncologists has not kept pace with the growing demand for cancer treatment as baby boomers continue to age, resulting in a shortage of qualified oncology providers in many parts of the country.<sup>1</sup> This physician shortage—and other obstacles to care—is especially prevalent in rural settings.

The seven Munson Healthcare hospitals in northern Michigan are designated by the Centers for Medicare & Medicaid Services as either sole community hospitals or critical access hospitals. Among other factors, these designations indicate a degree of inaccessibility to local hospitals due to regional topography (there are many large lakes in this region, some with drawbridges) or the presence of prolonged, severe weather conditions (Grand Traverse County in Michigan averages 118 inches of snow per year). Munson Healthcare hospitals are located an average of 35 miles apart, and driving conditions make travel time between them at least 45 minutes.

In rural communities such as ours, geographic distances and economic factors often have a negative effect on patient access to specialized providers and timely treatment. Munson Healthcare’s oncology service line serves patients in 27 counties located in the lower northern region of Michigan and in the eastern upper peninsula. Many of our patients travel more than 50 miles to receive oncology care.

---

When an area is medically under-resourced, it can have a negative effect on care coordination, leading to delays in advanced imaging, diagnostic procedures, and surgical interventions. Advanced practice providers (APPs)—which our system defines as both nurse practitioners and physician assistants—can help improve access to quality care in the rural setting.

---

In many rural areas, a lack of primary care and regular screening result in cancer being detected in emergency departments at advanced stages. Such cases require intense intervention and result in lower success rates than cancers discovered earlier through primary care management and regular screening.

Recruiting providers into rural areas is challenging. Providers in sparsely developed regions earn less than their urban counterparts and must treat populations strewn over hundreds of miles. There are other impediments as well. Spouses may be unable to find work in rural regions, and compensation is comparatively low. Employers in Traverse City, Mich., are said to advise potential employees that they will earn “a view of the bay, for half the pay.” Subsequently, physicians and physician specialists in urban areas far outnumber those in rural communities (Table 1, below).

When an area is medically under-resourced, it can have a negative effect on care coordination, leading to delays in advanced imaging, diagnostic procedures, and surgical interventions. Advanced practice providers (APPs)—which our system defines as both nurse practitioners and physician assistants—can help improve access to quality care in the rural setting. To better leverage APPs, improve APP/physician partnerships, and ease transportation challenges for our rural patients, Munson Healthcare’s oncology service line implemented a physician/APP “Hub and Spoke Model of Care” (see Figure 1, right).

### Hub and Spoke Model

Munson Healthcare’s hub and spoke model of its oncology service line was developed over a period of four years from 2016 to 2020 (Figure 2, page 42). The “hub” is Cowell Family Cancer Center, located in Traverse City on the campus of the Munson Medical Center (MMC). It is a 400-bed tertiary care hospital that houses most of the health system’s major oncology services, including radiation oncology, gynecologic oncology, cardiothoracic surgery, neurosurgery, and urologic and colorectal surgery, as well as advanced diagnostic services, a compounding pharmacy, and inpatient care. The “spokes” consist of five sole community and/or critical access hospitals that offer medical oncology clinics and infusion services and two outpatient health centers that host therapeutic infusion services. These regional cancer clinics provide medical oncology consultation and follow-up, chemotherapy, therapeutic infusion services, and survivorship care.

We implemented a physician/APP model at each of our regional clinics. Under this model, Munson’s eight medical oncologists practice at the Cowell Family Cancer Center and travel to the regional clinics to conduct weekly clinics. They work in tandem with APPs who provide daily oversight of the operations, management, and provision of care at these regional clinics.

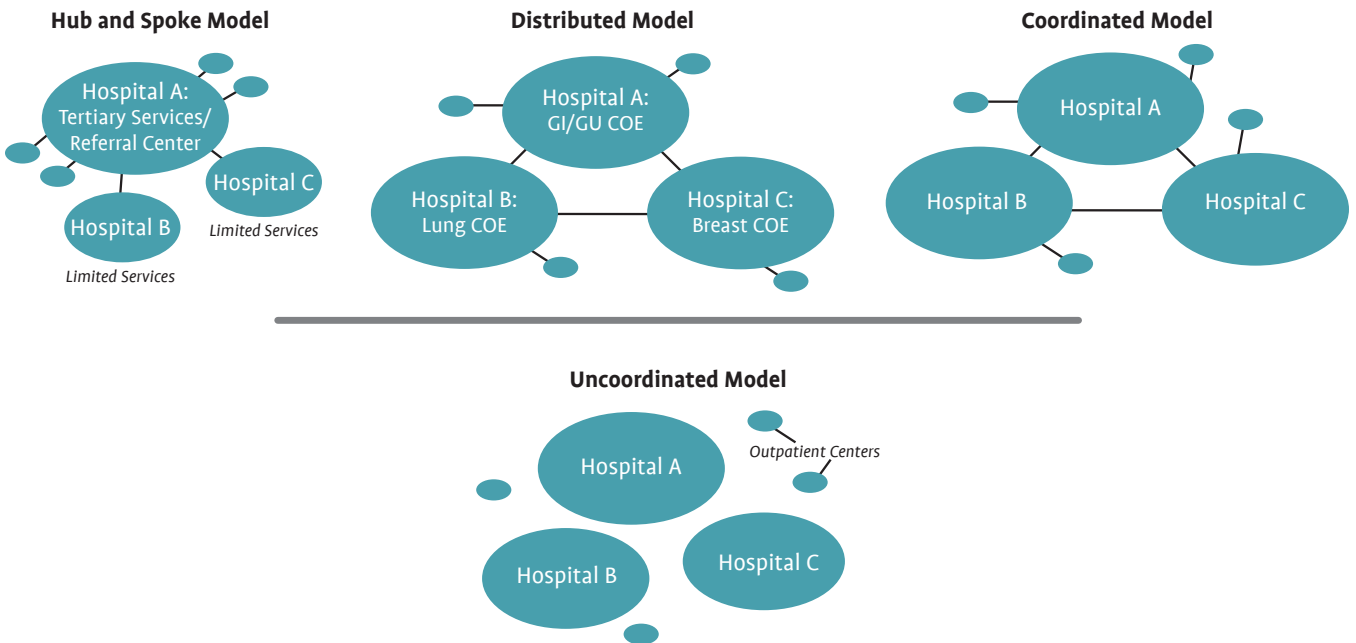
In an effort to treat patients in the communities where they live, new patients can access our service line via an initial consult

**Table 1. National Rural Health Snapshot**

	Rural Setting	Urban Setting
Percentage of population	19.3%	80.7%
Number of physicians per 10,000 people	13.1	31.2
Number of specialists per 100,000 people	30	263
Population aged 65 and older	18%	12%
Average per capita income	\$45,482	\$53,657
Non-Hispanic white population	69-82%	45%
Adults who describe health status as fair/poor	19.5%	15.6%
Adolescents who smoke	11%	5%
Male life expectancy (in years)	76.2	74.1
Female life expectancy (in years)	81.3	79.7
Percentage of dual-eligible Medicare beneficiaries	30%	70%
Medicare beneficiaries without drug coverage	43%	27%
Percentage covered by Medicaid	16%	13%

Source: Reproduced with permission from the National Rural Health Association<sup>2</sup>

Figure 1. Regionalization Framework: Regional Service Line Models



Source: Strum.<sup>3</sup>

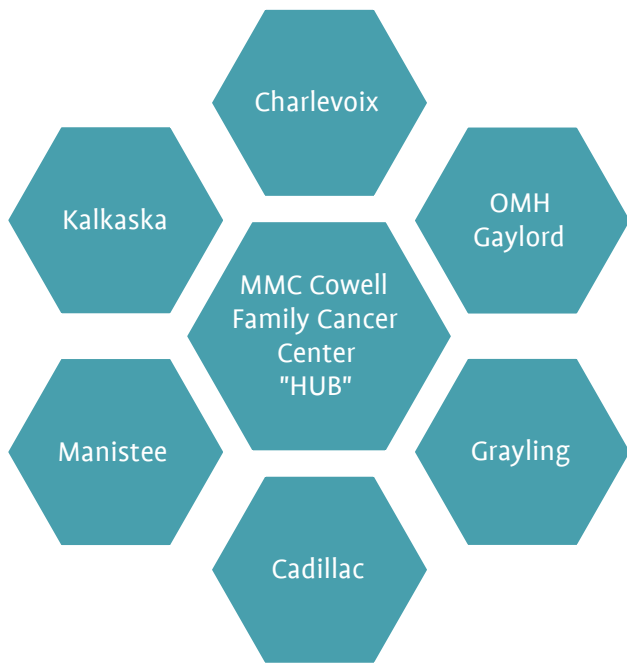
at Cowell Family Cancer Center or at any of these regional clinic locations, where APPs initiate care coordination with patients' primary care physicians, specialists, and necessary diagnosticians. Advanced diagnostics and surgical interventions are typically performed at Cowell Family Cancer Center, with follow-up care and chemotherapy delivered at the regional clinics. For patients who must travel to Cowell Family Cancer Center to receive care, Munson Medical Center provides housing at a nominal cost at its 30-bed manor, in addition to two RV hook ups for those with mobile housing.

Four outpatient APPs and three inpatient APPs located at Cowell Family Cancer Center collaborate closely with and support our medical and gynecologic oncologists. Cowell Family Cancer Center's medical oncology outpatient APP team is responsible for:

- Triaging symptoms
- Administering same-day visits for acute symptom management
- Providing guidance to infusion suite nurses
- Conducting patient survivorship visits and chemotherapy education
- Making appropriate outbound referrals
- Performing bone marrow biopsies
- Seeing patients for on-site treatment office visits and routine follow-up care.

We now offer same-day appointments with APPs, which has increased the number of patients evaluated and managed in outpatient settings, thereby decreasing emergency department visits and maintaining continuity with known providers.

Figure 2. Munson Healthcare’s Hub and Spoke Model of Care Delivery



A gynecologic oncology APP offers both inpatient and outpatient care. This provider is responsible for admitting patients, monitoring patients during a hospital stay, and discharging patients from the hospital. This APP also sees patients in the outpatient setting, coordinating chemotherapy care at the regional clinics, overseeing patient care during chemotherapy treatment, managing patient side effects, and providing survivorship visits.

Most patients alternate their visits between an APP and a physician throughout the course of treatment. Munson’s hub and spoke model has streamlined our clinic schedules, allowing our physicians to see more new patients sooner after their referrals. Adding APPs to the provider mix has also allowed patients to be seen on schedule and at appropriate intervals throughout the course of their treatment. We now offer same-day appointments with APPs, which has increased the number of patients evaluated and managed in outpatient settings, thereby decreasing emergency department visits and maintaining continuity with known providers.

This collaborative approach to cancer care has significantly increased provider availability at Cowell Family Cancer Center. The hub and spoke model of care has also improved patient satisfaction, increased the availability of physician providers at the regional clinics, and improved access to oncology care for northern Michigan’s rural populations.

### Inpatient Services

The provision of specialty care at a community hospital located in a rural healthcare system poses unique staffing challenges that an academic medical center or urban hospital may not experience. Though some consider it advantageous to have only attending physicians care for patients in this setting, a lack of medical students, residents, interns, and fellows creates a staffing shortage when the number of physicians is inadequate. By expanding our provider pool to include APPs in the inpatient setting, we have been able to close this physician gap and streamline the care of oncology patients in our hospitals.

Inpatient care is delivered at the Cowell Family Cancer Center via a coordinated transfer process. Having inpatient APPs provide this care allows patients to receive more timely consultations, procedures, admissions, and/or discharges. Inpatient APPs communicate directly with physicians who both direct inpatient care and conduct outpatient clinics at the Cowell Family Cancer Center or at one of the regional clinics. A physician does inpatient rounds either after clinic hours or prior to the start of the next day. This schedule improves care coordination in both the inpatient and outpatient settings, allowing treatment to continue without delay, and results in fewer physician interruptions during busy clinic days.

### Multidisciplinary Care

In fall 2014, Munson’s oncology service line launched its first multidisciplinary clinic—the Multidisciplinary Thoracic Oncology Program—an APP-led clinic that cares for newly diagnosed thoracic oncology patients. Individuals with cancers of the mid/distal esophagus, lung, or thymus are referred to the clinic by their treating provider (often their primary care provider, pulmonologist, or gastroenterologist). An APP screens all referrals for appropriateness, triages patients based on clinical need, and orders any necessary diagnostic tests to ensure that patients are completely staged by the time of their first thoracic oncology clinic visit. As directed by the APP, thoracic oncology staff facilitate any necessary staging studies, which are coordinated by a nurse navigator.

Once patients are prepared for their first visit, thoracic oncology staff initiate contact with patients, provide an overview of the clinic’s services, and schedule patients for a day of coordinated multidisciplinary visits. On the day of their visit, patients are met by an APP, radiation oncologist, medical oncologist, and cardiothoracic surgeon. Patients are seen, examined, and interviewed by each of the providers during their program day, and their staging studies, diagnosis, prognosis, and potential treatment options are explained by the multidisciplinary team. This weekly clinic also includes a tumor board, in which a radiologist reviews all pertinent imaging, pathology presents tissue pictures and an overview of the pathological nature of the malignancy, and physicians present a treatment plan for each patient.

APPs summarize and present final recommendations to patients and then answer any questions. Patients also meet with other ancillary service providers during this visit, including a nurse navigator, palliative care provider, dietitian, social worker, financial navigator, and cancer researcher, as appropriate. Thoracic oncol-



Cowell Family Cancer Center - Munson Medical Center, Traverse City, Mich.

---

ogy patients leave their clinic day with a complete itinerary of the next steps in their treatment plan.

Throughout a patient's treatment journey, an APP acts as a liaison between the patient, referring provider, and all ancillary services. APPs and the thoracic oncology clinic team collaborate closely with medical oncology, radiation oncology, and cardiothoracic surgery providers to ensure good communication within the patient's team. The APP-led thoracic oncology clinic has expedited the workup of newly diagnosed patients, many of whom travel great distances for their care, improving the timeliness of initiating treatment after a new diagnosis.

Also part of an APP's responsibilities in the thoracic oncology clinic is oversight of our Lung Screening Program in collaboration with community primary care physicians. Smoking creates one of the top health disparities within northern Michigan's rural

regions, which led Munson to offer low-dose computed tomography screening. Within the Munson Healthcare system, 4,813 lung cancer screening tests were performed from September 2015 through September 2019. These screenings identified 54 lung cancer cases, of which 47 were non-small cell lung cancers. Coordination, counseling, and follow-up for these patients is a collaborative effort among oncology APPs, the radiology team, and community primary care physicians. Our oncology service line has also created the Tobacco-Free Coalition of Northern Michigan to develop smoking cessation strategies in concert with our community partners.

### **Practice Economics**

In 2018, an ASCO survey on the state of oncology practice in America found that the main sources of strain for oncologists are




payers, staffing, prior authorization pressure, and electronic health record burdens.<sup>4</sup> These pressures coupled with a volatile and uncertain reimbursement climate have resulted in many oncology practices consolidating or affiliating with larger health systems. The oncology specialists that are affiliated with Munson Healthcare have done so through professional services agreements (PSAs). Physician reimbursement in many PSAs is based on a dollar rate per worked relative value unit, which can discourage the use of APPs.

When physician reimbursement is based on specific, direct interactions with patients, there exists a monetary motivation for physicians to assume most patient care themselves rather than delegate aspects of care to APPs. Because physicians have only so much time in their schedules to see patients, patients must therefore wait for appointments, decreasing their access to care. To enable APPs to see patients directly and pick up that slack, Munson Healthcare has created a PSA compensation model that encourages the use of APPs within the outpatient setting. This model projects an expected full-time equivalent utilization model that defines compensation for physician supervision of APPs.

As Munson Healthcare integrates its APPs into the PSA model, we are looking for opportunities to shift appropriate responsibilities to APPs, thus creating more efficiencies and greater patient access to care. Munson Healthcare APPs contribute significantly to the care and management of oncology patients within our vast catchment area. The primary responsibilities for APPs now include:

- Transition of care from primary care physicians (suspected or new cancer diagnosis)
- Chemotherapy education and management
- Symptom management
- Mentorship and onboarding of other APPs and continued competency through ongoing professional practice evaluation/focused professional practice evaluation
- Bone marrow biopsy procedures
- Inpatient care management
- Peer-to-peer prior authorization with payers
- Palliative care
- Survivorship care.

The aging population in northern Michigan is increasing at a greater rate than the state's overall population, resulting in an increase in new and recurring cancer rates in the area. At the same time, the number of oncology specialists in rural areas is declining or becoming stagnant. According to ASCO's 2018 report, *The State of Oncology Practice in America*, more than 90 percent of oncologists practice in non-rural areas.<sup>5</sup> A study commissioned by ASCO in 2014 predicted a shortage of oncologists in the United States by 2025 due to an aging workforce as well as increased numbers of cancer survivors.<sup>5</sup> Munson's hub and spoke physician/APP model looks to address both increased patient demand and challenges related to adequate provider staffing, retention, and compensation. Bottom line: Our concerted effort to recruit, implement, and utilize advanced practice providers allows us to deliver accessible, coordinated, and efficient care for all of our oncology patients. 

## Munson Healthcare Oncology Service Line at a Glance

### Oncology providers

- 8 hematology oncologists
- 5 radiation oncologists
- 1 gynecologic oncologist
- 15 APPs (13 nurse practitioners, 2 physician assistants)

### Locations

- 7 clinic locations
- 94 infusion chairs

### Patients

- 3,600 new patient visits annually
- 2,200 analytic cases annually
- 94,375 patient visits

### Patient experience

- Overall Press Ganey top box score improved 4 percentage points

*Kathleen LaRaia, MS, is executive director and Kendra G. Worden, MSN, FNP-C, AOCNP, is a nurse practitioner at Oncology Services, Multidisciplinary Thoracic Oncology Program and Patient Navigation, at Munson Medical Center in Traverse City, Mich.*

## References

1. Winkfield KM, Flowers CR, Mitchell EP. Making the case for improving oncology workforce diversity. *Am Soc Clin Oncol Educ Book*. 2017;37:18-22.
2. National Rural Health Association. About rural health care. Available online at: <https://www.ruralhealthweb.org/about-nrha/about-rural-health-care>. Last accessed August 12, 2020.
3. Strum M. Organizing and optimizing a regional cancer delivery system. Paper presented at: ACCC 44th Annual Meeting & Cancer Center Business Summit; March 14-16, 2018, Washington, D.C.
4. Kirkwood MK, Hanley A, Bruinooge SS, et al. The state of oncology practice in America, 2018: a report by the American Society of Clinical Oncology. *J Oncol Pract*. 2018;14(7):e412-e420.
5. American Society of Clinical Oncology. The state of cancer care in America. Available online at: [asco.org/research-guidelines/reports-studies/state-cancer-care](https://www.asco.org/research-guidelines/reports-studies/state-cancer-care). Last accessed July 14, 2020.

## Additional Resources

Bruinooge S, Pickard T, Vogel W, et al. Understanding the role of advanced practice providers in oncology in the United States. *J Oncol Pract*. 2018;14(9):e518-e532.

Cairo J, Munzi M, Ficke D, et al. Practice model for advanced practice providers in oncology. *Am Soc Clin Oncol Educ Book*. 2018;40-43. Available online at: [https://ascopubs.org/doi/abs/10.1200/EDBK\\_175577](https://ascopubs.org/doi/abs/10.1200/EDBK_175577). Last accessed August 11, 2020.

Elord JK, Fortenberry JL. The hub and spoke organization design revisited: a lifeline for rural hospitals. *BMC Health Serv Res*. 2017;17:23-35.