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Capacity for Colorectal Cancer Screening by Colonoscopy, Montana, 2008

Carol Ballew, PhD, Barbara G. Lloyd, MD, FACS, Sue H. Miller, RN

Background: Colorectal cancer is largely preventable by screening, but screening participation is low in Montana. Colonoscopy is often considered the most accurate screening test and has the potential to prevent colon cancer by pre-emptive removal of polyps. However, colonoscopy may not be equally available to all residents of rural states. The Montana Department of Public Health and Human Services (DPHHS) has assigned high priority to colorectal cancer prevention, but before beginning a campaign to increase screening, DPHHS conducted a survey to determine existing colonoscopy screening capacity.

Methods: An eight-question survey was sent by DPHHS to all hospitals and ambulatory surgical centers that perform colonoscopy in Montana, assessing their current and projected capacity to perform screening colonoscopies. Data were collected from March to May 2008, and analysis was performed in June 2008.

Results: Responses were received from 43 of 44 hospitals and ambulatory surgical centers performing colonoscopies in Montana. The number of screening colonoscopies performed was estimated to be 19,444 per year. Unused colonoscopy screening capacity was estimated to be 23,096 procedures per year. Although similar total capacity existed in urban and rural areas, more unused capacity existed in rural areas.

Conclusions: Montana has statewide capacity to meet moderately increased demand for screening colonoscopy but would be able to meet only 17% of demand in 2009 if all eligible adults chose colonoscopy as their primary form of screening. It is feasible to develop campaigns to increase screening colonoscopy participation now, but a systematic combination of colonoscopy and other screening modalities may be better able to meet Montana's long-term needs.

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Background

Colorectal cancer (CRC) is the third most common incident cancer in Montana and the U.S., and it is the third most common cause of cancer mortality.^{1,2} A substantial proportion of CRC can be prevented by screening colonoscopy,^{3–6} but participation in CRC screening of any kind is low in Montana. In the 2006 Montana Behavioral Risk Factor Surveillance System Survey,⁷ 53% of respondents aged 50 years and older had ever had an endoscopy for any indication, and only 28% had had a fecal occult blood test within the past 2 years.

The Montana Department of Public Health and Human Services (DPHHS) considers CRC screening a high public health priority. Recent national and individual state surveys^{8–11} document substantial shortfall of screening capacity if all individuals aged 50 years and

older at average risk choose colonoscopy as their primary form of screening, but they document adequate capacity if most adults have annual fecal tests in combination with flexible sigmoidoscopy, followed by colonoscopy for positive screening results. These surveys may not accurately reflect the situation in Montana, which is largely rural or frontier with regard to access to health care.^{12,13} Frontier areas, such as 50 of Montana's 56 counties, are defined as having very low population density (fewer than 12 people per square mile) with residents living more than 90 miles or more than a 90-minute drive from essential services, including health care.¹³

The screening tests that can be recommended in a public health campaign depend on the availability of screening capacity. Although two recent national expert panels have expressed a preference for endoscopic procedures that prevent CRC, as opposed to the fecal tests that are more likely to detect extant cancer,^{3,4} it is not appropriate to recommend exclusively screening procedures that are not widely available. Therefore, DPHHS wanted to assess colonoscopy capacity in Mon-

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tana before embarking on a campaign to increase colorectal screening participation statewide.

Methods

All hospitals and ambulatory surgical centers were identified by DPHHS from the Montana Hospital Association directory. Each hospital was contacted by telephone, and those that performed colonoscopy were asked to identify an individual authorized to give permission for participation in the survey. All agreed to participate and designated a respondent, who was then asked to consult billing or other records to answer an eight-question survey about current and projected screening capacity. Hospitals were asked how many colonoscopies they performed each year, what proportion were for screening purposes, and how many more colonoscopies they could perform. They were also asked questions about staffing and facilities. Data collection occurred from March to May 2008. Analysis was conducted in June 2008.

The number of Montanans needing screening colonoscopies (assuming all adults aged 50 years and older at average risk should have a screening colonoscopy every 10 years) was calculated from the 2006 intercensal population estimate for Montana,¹⁴ aging the population annually through 2020 and applying 2006 age-specific mortality rates and the estimated Montana endoscopy adherence rate of 53% each year.^{7,15} Estimates were adjusted downward by applying national prevalence estimates for factors conferring increased risk.⁹ Projections about the time needed to achieve full screening by colonoscopy are based on the simplifying assumption that capacity remains constant.⁹

Results

There are currently 62 hospitals (excluding children's hospitals) and nine ambulatory surgical centers (excluding orthopedic and eye practices) in Montana. A total of 41 hospitals and three ambulatory surgical centers with colonoscopy facilities were

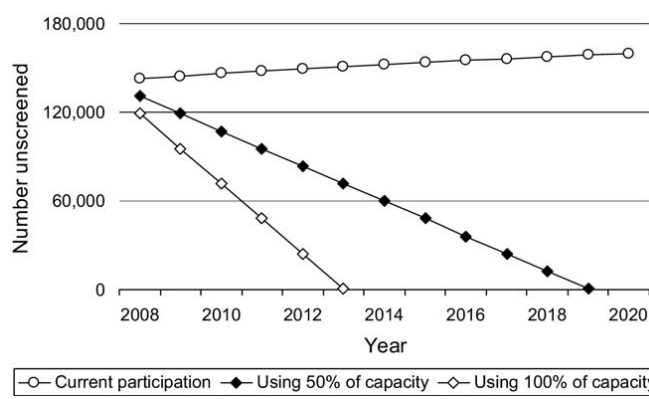


Figure 1. Time to achieve full colonoscopy screening for colorectal cancer in Montana

identified by DPHHS, which received responses from 43. The ambulatory centers performing colonoscopy were outpatient surgical units of large hospitals. Thirteen hospitals were located in seven cities, and 30 were rural hospitals. The nonresponding hospital was a small rural hospital; its capacity was inferred from information provided by the only physician performing colonoscopies there.

In the aggregate, hospitals performed 36,636 colonoscopies per year, including 19,444 screening procedures (54% of total procedures, range 11% to 100%; Table 1). Hospitals estimated that they could perform 23,096 more screening colonoscopies per year.

The number of Montana adults who need screening colonoscopy was estimated to be 142,627 in 2008, increasing to 159,863 in 2020. Assuming that all unscreened individuals demanded colonoscopy every 10 years, and utilizing 100% of hospitals' estimated screening capacity, full screening coverage by colonoscopy could be achieved by 2013 (Figure 1). If the demand for colonoscopy were lower, such that half the estimated capacity were utilized, full screening coverage could be achieved by 2019. If patterns of endoscopy adherence continue as they are now, the number of adults who need screening will increase by more than 10% by 2020.

Colonoscopy resources are unevenly distributed in Montana, a large and primarily rural and frontier state (Figure 2). Resources tend to be concentrated in urban centers, although 31 of 48 rural hospitals in Montana have colonoscopy facilities. Montana has seven urban areas where 35% of the population lives.¹⁴ The remaining 65% lives in small towns or rural or frontier areas. Urban hospitals had more physical and personnel resources to conduct colonoscopy than rural hospitals, but they also had longer waiting times for appointments and less unused screening capacity than rural hospitals (Table 1). As a result of this unequal distribution, 35% of the population lived in urban areas where 49% of the total capacity was located but where only 24% of the unused capacity was located. Conversely, 65% of the population lived in rural areas where 51%

Table 1. Montana urban and rural hospital estimates of colonoscopy screening capacity

	Urban hospitals n=13	Rural hospitals n=30	Total N=43
Screening colonoscopies performed in past 12 months (n)	15,240	4,204	19,444
Estimated total screening capacity per year (n)	20,697	21,843	42,540
Estimated unused screening capacity per year (n)	5,457	17,639	23,096
Estimated unused screening capacity per year (% of total)	26	81	54
Range (% of total)	12–86	11–100	11–110
Mean waiting time for screening (weeks)	6.8	2.1	3.4
Range (weeks)	1–48	1–6	1–48

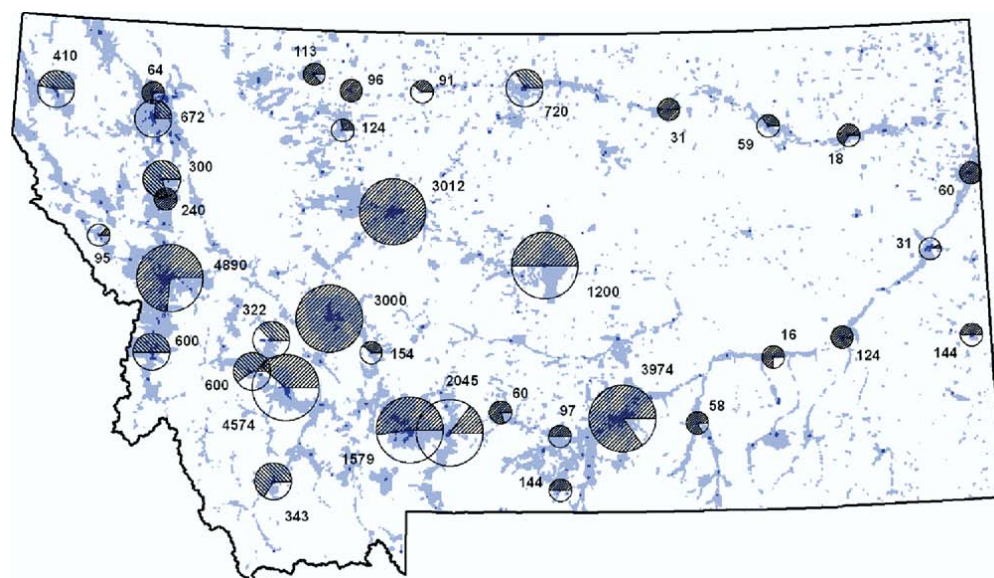


Figure 2. Map of colonoscopy screening capacity and population distribution in Montana. Dark blue areas represent a population density of >200 people per square mile; light blue areas represent a population density of 2–199 people per square mile. Large, medium, and small circles represent communities with total colonoscopy screening capacity of ≥ 1000 /year, 250–999/year, and <250/year, respectively. The unshaded area of each circle indicates unused capacity. Numbers indicate total annual screening capacity. Montana State Library Map # 08hhs003, November 25, 2008.

of the total capacity was located but where 76% of the unused capacity was located.

Conclusion

Forty-four hospitals performing colonoscopy in Montana were identified by DPHHS. Similar total screening capacity existed in urban and rural areas, but rural facilities were less heavily utilized than urban facilities. Several urban facilities reported being at full capacity with long waiting times for routine screening colonoscopies. These hospitals may experience pressure to increase screening capacity if demand increases. Rural hospitals reported more unused screening capacity and shorter waiting times for appointments. In many situations, it is assumed that rural residents have less access to specialized healthcare and diagnostic services than urban residents,^{12,13} but 31 of Montana's 48 rural hospitals have colonoscopy facilities. Several respondents in rural hospitals commented that more screening colonoscopies could be performed if there were more referrals or more patients willing to travel to their hospitals for screening.

In Montana, universal CRC screening by colonoscopy could be achieved within 5 years, in the unlikely event that all eligible adults demanded colonoscopy as their primary form of screening, and if all estimated screening capacity were fully utilized. This is consistent with national and other state estimates.^{8–11} On a statewide basis, Montana has unused screening colonoscopy capacity and can meet moderately increased demand, but it could meet only

17% of demand in 2009 if all eligible adults chose colonoscopy for screening.

It is feasible to develop campaigns to increase screening colonoscopy participation now, but a combination of colonoscopy and other screening modalities may be better able to meet Montana's long-term needs. Universal or nearly universal CRC screening by colonoscopy may not be realistic for Montana, a conclusion consistent with national and other state studies.^{8–11,16–18} From a public health perspective, a systematic screening program involving several primary screening options, with colonoscopy used to evaluate positive results from other screening modalities, has the most promise to achieve high levels of screening coverage. This type

of mixed-modality screening is consistent with recently published clinical guidelines.^{3,4}

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