

An Overview of the Planned Development and Operation of the Wyoming Telehealth Network

December 10, 2008

Driving Forces for Telehealth in Wyoming

Like other rural/frontier populations, Wyoming's citizens continually face problems in accessing quality health care and health education. Relative to urban populations, rural residents generally have higher rates of premature and infant mortality, as well as higher death rates from unintentional injuries, suicide, chronic obstructive pulmonary disease, cardiovascular disease and cancer. They are more likely to smoke, be obese, and be arrested for driving under the influence of alcohol.

Health care accessibility is particularly problematic in Wyoming, where distance, geography, inclement weather, and isolated communities all present challenges for the state's residents in gaining access to health care. Traveling long distances to access health care services is routine for many of Wyoming's residents, and they often seek needed care in neighboring states because it is unavailable within the state. Nine of the state's twenty-three counties qualify in their entirety as Health Professional Shortage Areas for primary care, while six other counties contain primary care shortage areas.

A related issue is on-site access to training and continuing education designed specifically for rural providers, the lack of which contributes to dissatisfaction among providers and reduced quality of care for rural populations. Burnout and compassion fatigue compound the shortage of healthcare providers, contributing to high turnover and increased error risk.

A primary issue in rural healthcare service delivery has been defined as how to "best to overcome geographic distance and spatial isolation"¹. One often-proposed solution to providing quality health care in rural areas is **telehealth**, which has tremendous potential for changing rural physician practice and increasing access to sophisticated medical care for rural residents.²

Telehealth Efforts

In response to the issues cited above, there has been a growing interest in telehealth in Wyoming, as evidenced by the increasing number of efforts to build telehealth capacity. These efforts have the potential to improve health care access, quality, and cost-effectiveness, and include both the public and private sectors.

Some efforts now underway include the following:

- The Cheyenne Regional Medical Center (CRMC) used federal funds to support deployment of equipment in seven hospitals and the development of the Southeast Wyoming Telehealth Network (SEWTN);
- CRMC connects hospitals statewide for CME and other applications;
- 24 of the 26 acute care hospitals now have equipment which meets current video standards, and have successfully participated in a statewide connectivity test;

¹ Cited in Ricketts, T.C., Johnson-Webb, K.D., & Taylor, P. (1998). Definitions of rural: A handbook for health policy makers and researchers. A technical issues paper prepared for the Federal Office of Rural Health Policy Health Resources and Services Administration, p. 11.

² Gantenbein, 2008, Revised Request for Funding to Wyoming Department of Health For the Wyoming Network for Telehealth (WyNETTE) Strategic Plan 2008-2010

- The Wyoming Medical Center (WMC) is implementing a tele-stroke program using internal funds and grants from the Department of Health;
- Wyoming received a Federal Communications Commission (FCC) grant to develop a telecommunications network; a draft RFP for network implementation has been submitted to the FCC for approval;
- An initial telehealth/telemedicine plan has been developed and a Statewide Steering Committee is directing statewide network development activities;
- The Wyoming Department of Health (WDH) has requested additional funds for network operations.

Financial support for telehealth activities has been a broad-based effort. In 2004, the University and WDH collaborated on a \$1.5 million federal grant for infrastructure and pilot programs. In 2006, the state provided funds to WDH and the University for telehealth support. Since 2005, hospitals have invested over \$450,000 of their own funds in telehealth. SEWTN members have demonstrated the value of telehealth, supporting programs of professional education, administration, clinical pilots, and healthcare professional recruiting. Additionally, participation in SEWTN activities has been steadily increasing since beginning operations in 2006.

Over the last two years, representatives from the WDH, the Wyoming Hospital Association (WHA), the Wyoming Health Information Organization (WyHIO), CRMC, WMC, the University of Wyoming Center for Rural Health Research and Education (UW-CRHRE), and the Wyoming Medical Society (WMS) have formed the Wyoming Telehealth Steering Committee. This group is addressing statewide telehealth network issues, and has adopted three major goals:

1. Complete the deployment of a statewide telehealth network.
2. Implement telehealth applications for the statewide telehealth network, focusing initially on Continuing Medical Education (CME), with later expansion to clinical applications.
3. Develop a plan for sustaining Wyoming's telehealth efforts.

Challenges and Opportunities

The design, development, and operation of a sustainable Telehealth network for Wyoming presents a number of challenges and opportunities.

- Services offered must be responsive to statewide and community needs.
- The network must provide value to both patients and the healthcare community.
- The governance process must reflect statewide and local activities, partnerships, networks, and operational structures.
- Startup operations must be funded, and ongoing operations must be based on a sound business plan to manage the network infrastructure and services offered.
- The network infrastructure must provide capacity for growth as additional applications and services are identified.

It is expected that healthcare providers will offer telehealth services to meet the statewide and local community needs. The network will provide the infrastructure and a set of shared common services that allow network members to provide the needed telehealth services.

A needs assessment was conducted among hospitals to identify the most pressing unmet health care needs in their communities that could be addressed through telehealth. The results indicated Continuing Medical Education and tele-psychiatry as most pressing.

The Wyoming Telehealth Steering Committee is currently addressing network governance and sustainability.

Proposed Next Steps

Next steps are proposed as follows:

- Clarify the network's mission and objectives.
- Develop and implement a formal governance and organizational structure for the network.
- Seek financial and political support for the network.
- To build credibility and value, begin delivery of those priority services that can be quickly implemented with existing resources.
- Determine the longer term service needs and priorities of the healthcare community.
- Complete the network implementation, to include network infrastructure and needed common services.
- Develop the network business plan, with an emphasis on sustainability and measurement of value provided.

Network Components

The network components would consist of the equipment and telecommunications infrastructure needed to transmit information, and the common services to support the network operations and its members.

Network Governance

A governance model provides a formal process to address the direction, needs, architecture, funding, and standards of the statewide telehealth network. As such, the model must be adaptable and responsive to changing healthcare needs of Wyoming residents and the Wyoming healthcare community. Additionally, the model must ensure transparency and accountability of the network operations to the participants.

The Board of Directors will have the responsibility for implementing and operating the statewide network vision and policy, development of the statewide plan, and approval of expenditures for the network. The Board of Directors is also responsible for the effectiveness of the network, by encouraging participation in the network and telehealth/telemedicine services, and assisting all network members and participants in their efforts to provide high quality, cost effective services. Principals on the Board of Directors are anticipated to be

- The Wyoming Department of Health
- The Wyoming Medical Center
- Cheyenne Regional Medical Center
- The Wyoming Hospital Association
- The University of Wyoming, Center for Rural Health Research and Education
- The Wyoming Medical Society
- The Wyoming Health Information Organization

Additional entities in the governance model would include a statewide Advisory Committee, a statewide Technology Committee, and a statewide Applications Committee. These committees will provide advice and counsel to the Board of Directors in the setting of general direction and application of telehealth/telemedicine resources. While the Board of Directors has final responsibility for establishing policy, the advice and counsel of the committees will be given strong weight in any decision.

Network Specifics

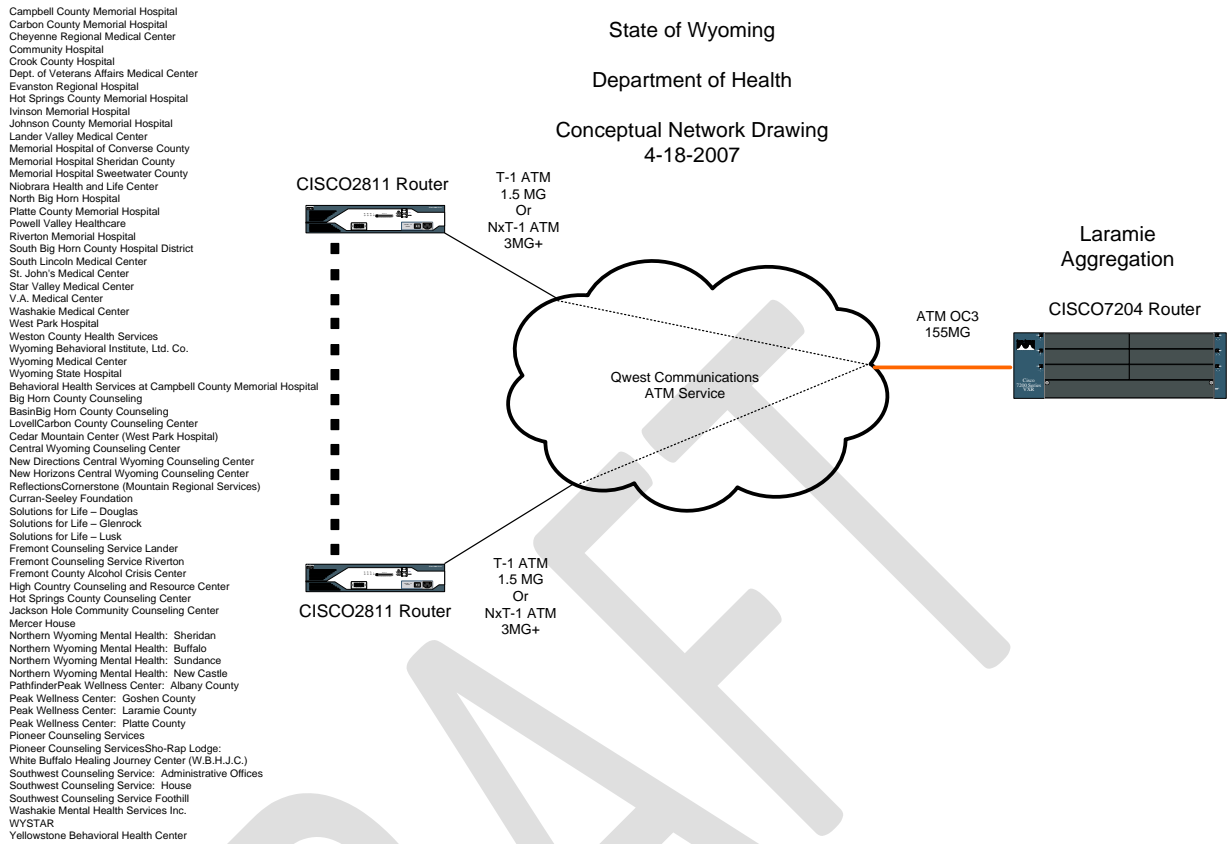
As originally conceived, the network would support dedicated, high-speed connectivity for the 26 acute care hospitals, the State Hospital, the Wyoming Behavioral Institute, two Veterans Administration hospitals, and forty-two community mental health centers/substance abuse clinics (MHSAs) in Wyoming. However, not all hospitals and mental health substance abuse center have joined the effort. The long term goal is to have all eligible hospitals and MHSAs join the network. See Appendix A for a list of all eligible hospitals and MHSAs.

The recently awarded FCC Rural Health Care Pilot program grant provides up to 85% of the costs of telecommunications equipment and line charges needed to construct and operate the network for approximately two years. Additionally, many of the hospitals already have sufficient bandwidth and connectivity equipment, and do not need the additional funds provided by the FCC grant to join the network.

A preliminary network design (Figure 1), developed in cooperation with Qwest Communications, would place a Cisco router at each remote site and provide connectivity through an ATM “cloud” to an aggregation point, which will be at the University of Wyoming in Laramie. In addition to simplifying the design, this approach will eliminate the interruption of service at multiple sites when one line becomes inoperative that occurs with “hub-and-spoke” networks.³

³ Wyoming Application for FCC Rural Healthcare Pilot Grant Program, <http://www.uwyo.edu/health/fcc/>

Figure 1: FCC Network Preliminary Design



This preliminary design proposes that the seven larger hospitals distributed throughout the state be connected to the aggregation point through dual T-1 ATM or higher capacity lines as shown in Figure 2. As indicated earlier, many hospitals have existing bandwidth in excess of the dual T-1 capacity, and do not need FCC funds to join the network. Additionally, the network will connect to Internet 2 to provide access to sites outside of Wyoming. This connection will be made through the aggregation point at the University of Wyoming, which is already a member of the Internet 2 Consortium and is connected to the Internet 2 backbone through the Front Range GIGAPop (FRGP) in Colorado. UW has developed the BISON ring, shown in Figure 3, which supports redundant, high-speed links to the FRGP and, with the additional router to be purchased through this proposal, will have the capacity to accommodate up to 100 additional T-1 circuits to the backbone.⁴

⁴ Wyoming Application for FCC Rural Healthcare Pilot Grant Program, <http://www.uwyo.edu/health/fcc/>

Figure 2: Dual ATM T-1 or Higher Capacity Lines

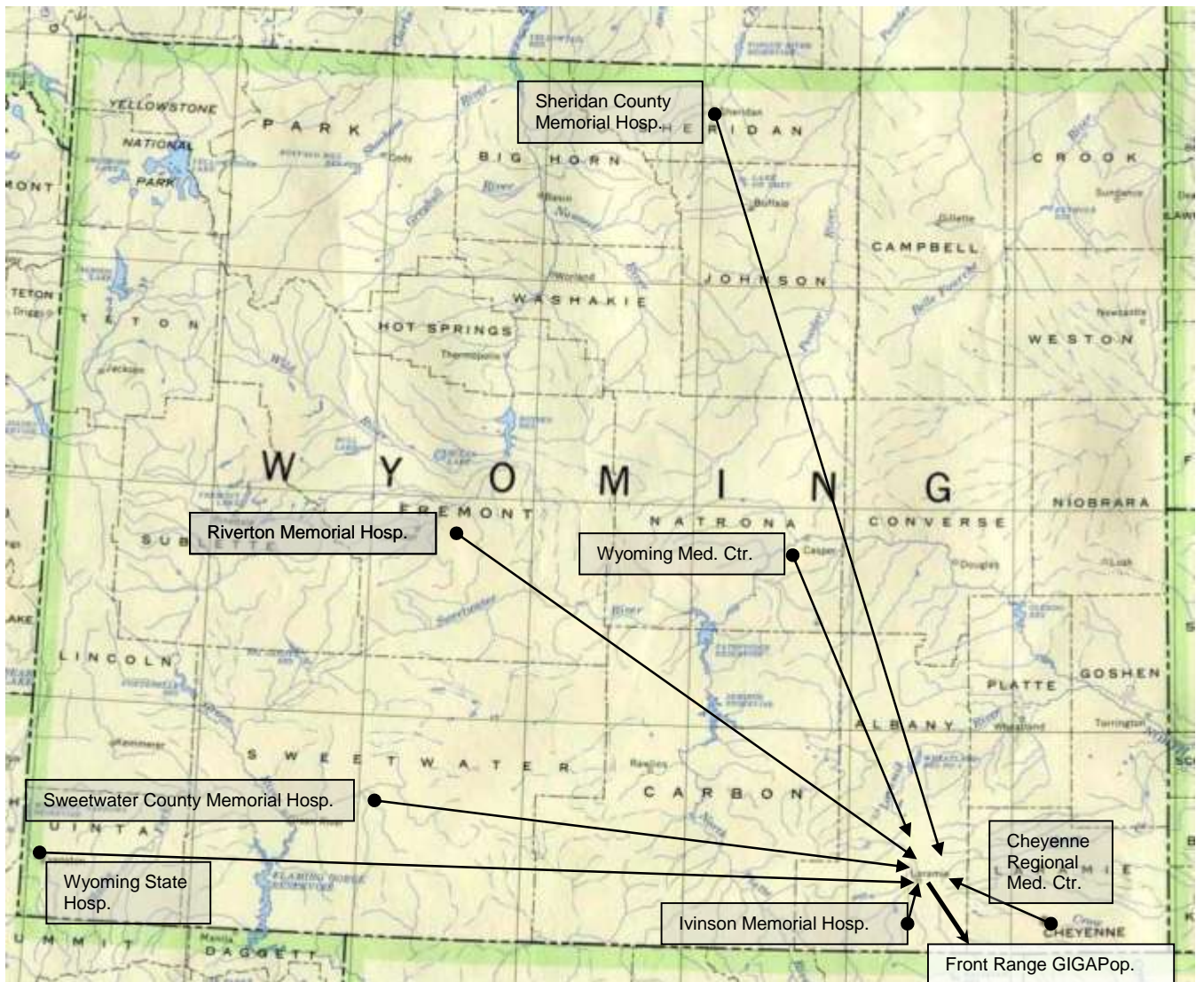
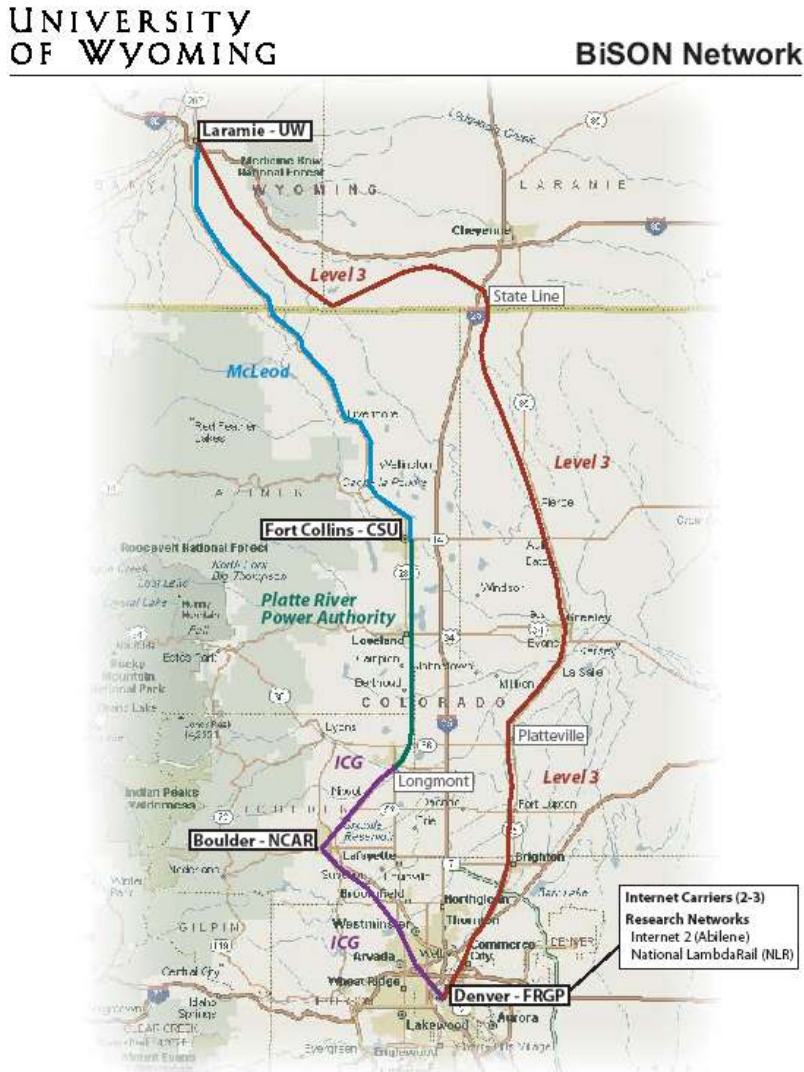


Figure 3: University of Wyoming, BiSON Network



Initial Network Membership

As indicated above, the Wyoming Telehealth Network will be able to support high-speed network connectivity for all hospitals, community mental health centers, and substance abuse clinics in the state of Wyoming. Initially, 24 of the 26 acute hospitals, the Wyoming Hospital Association, the State Hospital, the Wyoming Behavioral Institute, 5 rural health clinics, and 2 University of Wyoming sites will join the network. The map below (Figure 4) depicts the locations superimposed on a state map.

On the map, hospitals are depicted by "H", mental health substance abuse centers by "MH", rural health clinics by "RC", and the University of Wyoming as "UW".⁵

⁵ Source: SEWTN network map modified for MHSAs and rural health clinics

Figure 4: Initial Network Sites



The following table shows the initial participating network sites, sorted by facility type and then by county.

Table 1: Initial Network Sites

Facility Name	Address	City		Zip	County	Facility Type
Iverson Memorial Hospital	255 North 30th St.	Laramie	WY	82070	Albany	Hospital
North Big Horn Hospital	1115 Lane 12	Lovell	WY	82431	Big Horn	Hospital
South Big Horn County Hospital District	88 South US Hwy. 20	Basin	WY	82410	Big Horn	Hospital
Campbell County Memorial Hospital	501 S. Burman Ave.	Gillette	WY	82717	Campbell	Hospital
Memorial Hospital of Carbon County	2221 West Elm Street	Rawlins	WY	82301	Carbon	Hospital
Memorial Hospital of Converse County	111 S. Fifth Street	Douglas	WY	82633	Converse	Hospital
Crook County Hospital	713 Oak Street	Sundance	WY	82729	Crook	Hospital
Riverton Memorial Hospital	2100 W. Sunset Drive	Riverton	WY	82501	Fremont	Hospital
Community Hospital	2000 Campbell Dr.	Torrington	WY	82240	Goshen	Hospital

Facility Name	Address	City		Zip	County	Facility Type
Hot Springs County Memorial Hospital	150 E. Arapahoe	Thermopolis	WY	82443	Hot Springs	Hospital
Johnson County Memorial Hospital	497 West Lott	Buffalo	WY	82834	Johnson	Hospital
Cheyenne Regional Medical Center	214 East 23rd St.	Cheyenne	WY	82001	Laramie	Hospital
Wyoming Hospital Association	2005 Warren Ave.	Cheyenne	WY	82001	Laramie	Hospital
South Lincoln Medical Center	711 Onyx Street	Kemmerer	WY	83101	Lincoln	Hospital
Star Valley Medical Center	910 Adams Street	Afton	WY	83110	Lincoln	Hospital
Wyoming Medical Center	1233 East 2nd St.	Casper	WY	82601	Natrona	Hospital
Wyoming Behavioral Institute	2521 East 15th St.	Casper	WY	82609	Natrona	Hospital
Niobrara Health & Life Center	921 S. Ballencee	Lusk	WY	82225	Niobrara	Hospital
Powell Valley Healthcare	777 Avenue H	Powell	WY	82435	Park	Hospital
West Park Hospital	707 Sheridan Avenue	Cody	WY	82414	Park	Hospital
Platte County Memorial Hospital	P.O. Box 848	Wheatland	WY	82201	Platte	Hospital
Sheridan Memorial Hospital	1401 West 5th St.	Sheridan	WY	82801	Sheridan	Hospital
Memorial Hospital of Sweetwater County	P.O. Box 1359	Rock Springs	WY	82901	Sweetwater	Hospital
Evanston Regional Hospital	190 Arrowhead Dr.	Evanston	WY	82930	Uinta	Hospital
Wyoming State Hospital	P.O. Box 177	Evanston	WY	82931	Uinta	Hospital
Washakie Medical Center	P.O. Box 700	Worland	WY	82401	Washakie	Hospital
Weston County Health Services	1124 Washington	Newcastle	WY	82701	Weston	Hospital
Peak Wellness Center: Albany County	1263 N. 15th St.	Laramie	WY	82072	Albany	Mental health clinic/ substance abuse center
Northern Wyoming Mental Health: Sundance	420-1/2 Main St.	Sundance	WY	82729	Crook	Mental health clinic/ substance abuse center
Fremont Counseling Service: Lander	748 Main Street	Lander	WY	82520	Fremont	Mental health clinic/ substance

Facility Name	Address	City		Zip	County	Facility Type
						abuse center
Fremont Counseling Service: Riverton	1110 Major Ave	Riverton	WY	82501	Fremont	Mental health clinic/ substance abuse center
Peak Wellness Center: Goshen County	501 Albany Ave	Torrington	WY	82240	Goshen	Mental health clinic/ substance abuse center
Hot Springs County Counseling Services	121 South 4th Street	Thermopolis	WY	82443	Hot Springs	Mental health clinic/ substance abuse center
Northern Wyoming Mental Health: Buffalo	521 W. Lott St	Buffalo	WY	82834	Johnson	Mental health clinic/ substance abuse center
Peak Wellness Center	1609 East 19th Street	Cheyenne	WY	82001	Laramie	Mental health clinic/ substance abuse center
Peak Wellness Center: Laramie County	2526 Seymour Ave	Cheyenne	WY	82003	Laramie	Mental health clinic/ substance abuse center
Central Wyoming Counseling Center	1430 Wilkins Circle	Casper	WY	82601	Natrona	Mental health clinic/ substance abuse center
Cedar Mountain Center (West Park Hospital District)	707 Sheridan Avenue	Cody	WY	82414	Park	Mental health clinic/ substance abuse center
CMC Behavioral Health (West Park Hospital District)	1701 Stampede Avenue	Cody	WY	82414	Park	Mental health clinic/ substance abuse center
WPH Psychiatry (West Park Hospital District)	707 Sheridan Avenue	Cody	WY	82141	Park	Mental health clinic/ substance abuse center
Yellowstone Behavioral Health Center	2538 Big Horn Avenue	Cody	WY	82414	Park	Mental health clinic/ substance abuse center
Peak Wellness Center: Platte	1945 W. Mariposa Pkwy	Wheatland	WY	82201	Platte	Mental health clinic/

Facility Name	Address	City		Zip	County	Facility Type
County						substance abuse center
Northern Wyoming Mental Health: Sheridan	113 West Brundage	Sheridan	WY	82801	Sheridan	Mental health clinic/ substance abuse center
Northern Wyoming Mental Health: Supported Independence Program	101 West Brundage	Sheridan	WY	82801	Sheridan	Mental health clinic/ substance abuse center
Southwest Counseling Service Foothill	2706 Ankeny Way	Rock Springs	WY	82901	Sweetwater	Mental health clinic/ substance abuse center
Southwest Counseling Service: Administrative Offices	1124 College Road	Rock Springs	WY	82901	Sweetwater	Mental health clinic/ substance abuse center
Southwest Counseling Service	2300 Foothill	Rock Springs	WY	82901	Sweetwater	Mental health clinic/ substance abuse center
Jackson Hole Community Counseling Center	640 E. Broadway	Jackson	WY	83001	Teton	Mental health clinic/ substance abuse center
Pioneer Counseling Services	350 City View Dr., Ste 302	Evanston	WY	82930	Uinta	Mental health clinic/ substance abuse center
Pioneer Counseling Services	301 Main Street	Lyman	WY	82937	Uinta	Mental health clinic/ substance abuse center
Northern Wyoming Mental Health: Newcastle	420 Deanne Ave.	Newcastle	WY	82701	Weston	Mental health clinic/ substance abuse center
Big Horn Clinic	156 N 6th Street	Basin	WY	81410	Big Horn	Rural health clinic
Hulett Clinic (Crook County Memorial Hospital)	122 Main Street	Hulett	WY	82720	Crook	Rural health clinic
Moorcroft Clinic (Crook County Memorial Hospital)	101 West Crook	Moorcroft	WY	82721	Crook	Rural health clinic

Facility Name	Address	City		Zip	County	Facility Type
Bridger Valley Family Practice (Evanston Regional Hospital)	107 N. Main Street	Lyman	WY	82937	Uinta	Rural health clinic
Mountain View Clinic (Evanston Regional Hospital)	531 Parkway Drive	Mountain View	WY	82939	Uinta	Rural health clinic
Univ. of Wyoming Family Practice Center	820 East 17 th St.	Cheyenne	WY	82001	Laramie	University offering health care education
Univ. of Wyoming College of Health Sciences	236 Health Sciences Center	Laramie	WY	82071	Albany	University offering health care education

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