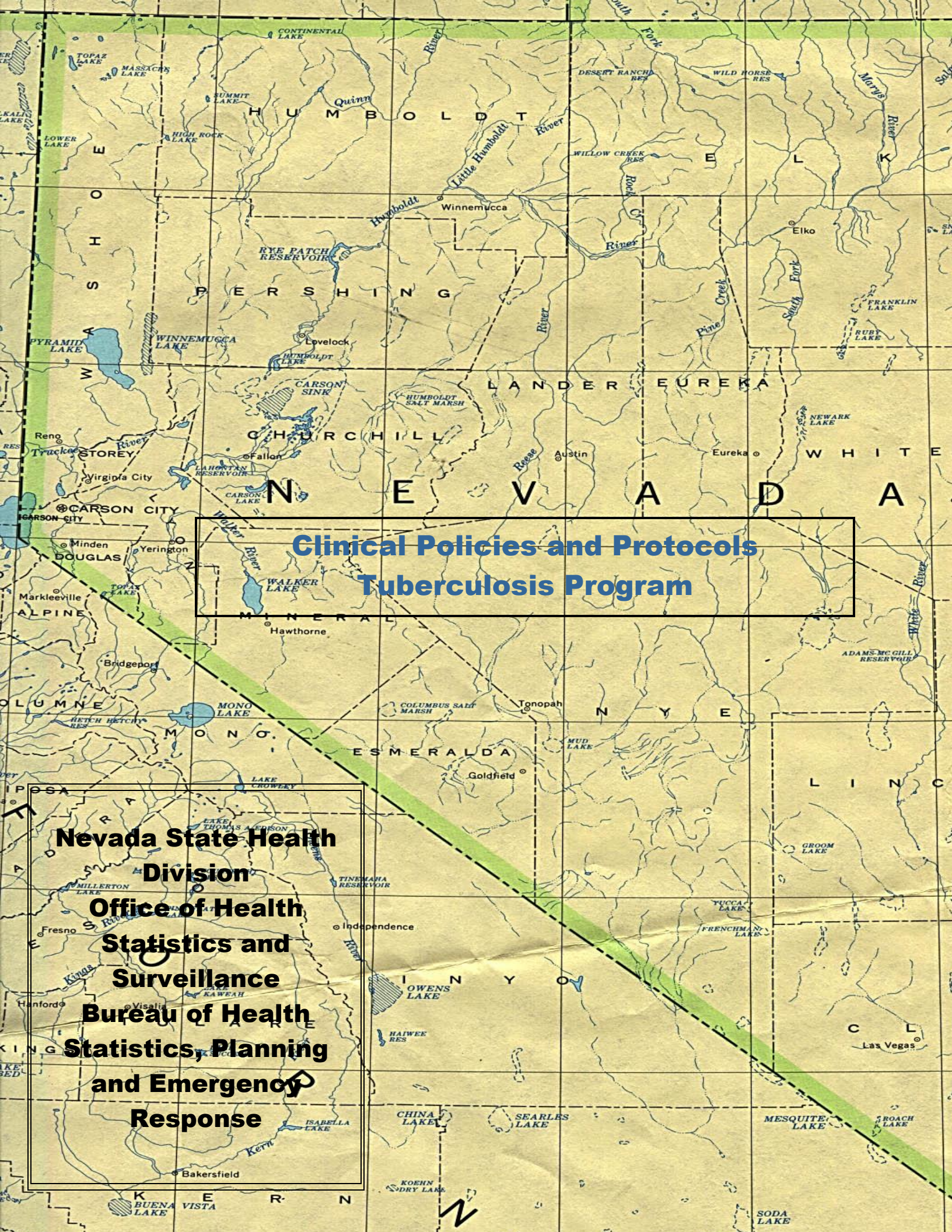

Clinical Policies and Protocols
Tuberculosis Program
Nevada State Health Division
Office of Health Statistics and Surveillance
Bureau of Health Statistics, Planning and Emergency Response
N E V A D A
HUMBOLDT
PERSHING
LANDER
EUREKA
CHURCHILL
WHITE PINE
ELKO
LYON
STOREY
WASHOE
CARSON CITY
DOUGLAS
MINERAL
ESMERALDA
NYE
LINCOLN
MONO
INYO
Winnemucca
Lovelock
Fallon
Reno
Virginia City
Carson City
Minden
Yerington
Markleeville
Hawthorne
Bridgeport
Tonopah
Goldfield
Elko
Eureka
Austin
Las Vegas
Independence
Fresno
Hanford
Visalia
Bakersfield
Truckee River
Humboldt River
Walker River
Reese River
Owens Lake
Mono Lake
Walker Lake
Carson Sink
Pyramid Lake
Winnemucca Lake
Rye Patch Reservoir
Humboldt Salt Marsh
Columbus Salt Marsh
Mud Lake
China Lake
Searles Lake
Mesquite Lake
Soda Lake
Owens River
Kern River
Kings River

Clinical Policies and Protocols

Tuberculosis Control

Nevada Department of Health and Human Services

2nd Edition July 2009

Acknowledgments

The Nevada State Health Division Tuberculosis Program is in the process of adapting a manual which will provide information and guidelines for the effective prevention and control of TB, and would like to thank all those who have assisted with the revision. Chapters will be made available as they are finished until the revised TB manual is complete. Please be patient when reading these chapters as they reference other chapters that have yet to be written.

It is based on a template created by an advisory group convened during CDC Task Order #6. The advisory group developed the template's format and created its content by reviewing other TB control manuals, current CDC guidelines, and the needs in the four states of Idaho, Montana, Utah, and Wyoming.

Funding for Nevada's TB programs and services are provided in part by an ongoing Cooperative Agreement from the CDC.

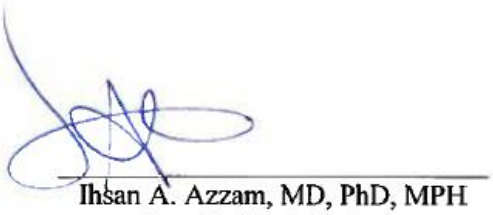
Nevada State Health Division

Bureau of Health Statistics, Planning, Epidemiology and Response (HSPER)

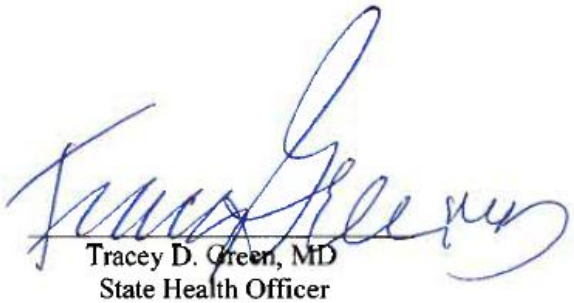
Tuberculosis Program
Clinical Policies and Protocols

Susanne Paulson,
State Tuberculosis Controller

Luana J. Ritch, Ph.D.
Bureau Chief



Ihsan A. Azzam, MD, PhD, MPH
State Epidemiologist



Tracey D. Green, MD
State Health Officer

Table of Contents

Introduction

Introduction to the NV TB Program

CONTENTS

About the Nevada Tuberculosis Program Manual

Purpose

This manual is designed to present the key steps and crucial information needed to perform tuberculosis (TB) prevention and control tasks in Nevada.

Audience

The audience for this manual includes city/county/regional public health nurses, outreach workers, physicians, and public health officers; Indian Health Services (IHS) staff; physician consultants; private sector physicians; infection control nurses in hospitals and other facilities; disease investigation and intervention specialists; state and county epidemiologists; and Nevada State Health Division TB program staff.

How to Use This Manual

Portable Document Format

This manual is available electronically as a portable document format (PDF) file. To view the PDF file, you will need the free Adobe Reader, available at http://www.adobe.com/products/acrobat/readstep2.html .

Hyperlinks

When viewing this manual online with an Internet connection, you can go directly to underlined Web addresses by double clicking on them.

Forms

Required and recommended forms are available in the forms section

Icons

Throughout the manual, these icons quickly cue you about important information and other resources:

This warns about high-consequence information you must understand when performing the task.

This signals when you should call to report or to consult on the task.

This highlights special considerations for pediatric patients.

This suggests another relevant area in the manual or another resource that you may want to review.

This alerts you that a form is available for the task.

Abbreviations

Refer to the list below for abbreviations used in the manual.

ACET	Advisory Council for the Elimination of Tuberculosis
ACH	air changes per hour
AFB	acid-fast bacilli
AIDS	Acquired Immunodeficiency Syndrome
AII	airborne infection isolation
ALT	alanine aminotransferase
ARPE	*Aggregate Report for Program Evaluation*
ART	antiretroviral therapy
AST	aspartate aminotransferase
ATS	American Thoracic Society
BAMT	blood assay for *Mycobacterium tuberculosis*
BCG	Bacille Calmette-Guérin
CDC	Centers for Disease Control and Prevention
CT	computed tomography
CXR	chest radiograph
DNA	deoxyribonucleic acid
DOT	directly observed therapy
DTBE	Division of Tuberculosis Elimination
DTH	delayed-type hypersensitivity
ED	emergency department
EMB	ethambutol
EMS	emergency medical service
ESRD	end-stage renal disease
FDA	U.S. Food and Drug Administration
HAART	highly active antiretroviral therapy

HCW	healthcare worker
HEPA	high-efficiency particulate air
HIPAA	Health Insurance Portability and Accountability Act
HIV	Human Immunodeficiency Virus
IDSA	Infectious Diseases Society of America
IGRA	interferon gamma release assay
INH	isoniazid
LTBI	latent tuberculosis infection
M. tuberculosis	*Mycobacterium tuberculosis*
MDR-TB	multidrug-resistant tuberculosis
MIRU	mycobacterial interspersed repetitive units
MOTT	mycobacterium other than tuberculosis
NAA	nucleic acid amplification
NIOSH	National Institute for Occupational Safety and Health
NNRTI	nonnucleoside reverse transcriptase inhibitors
NTCA	National Tuberculosis Controllers Association
NTNC	National Tuberculosis Nurse Coalition
NTM	nontuberculous mycobacteria
OSHA	Occupational Safety and Health Administration
PAPR	powered air-purifying respirator
PCR	polymerase chain reaction
PI	protease inhibitor
PPD	purified protein derivative
PZA	pyrazinamide
QA	quality assurance
QFT	QuantiFERON®-TB test
QFT-G	QuantiFERON®-TB Gold test
RFB	rifabutin

RFLP	restriction fragment length polymorphism
RIF	rifampin
RNA	ribonucleic acid
RPT	rifapentine
RVCT	*Report of Verified Case of Tuberculosis*
RZ	rifampin and pyrazinamide
TB	tuberculosis
TIMS	Tuberculosis Information Management System
TNF-α	tumor necrosis factor-alpha
TST	tuberculin skin test
TU	tuberculin units
USCIS	U.S. Citizenship and Immigration Services
UVGI	ultraviolet germicidal irradiation

Purpose of Tuberculosis Control

Tuberculosis (TB) is caused by a bacterial organism named *Mycobacterium tuberculosis* (MTB). Mycobacteria can cause a variety of diseases and can affect any part of the body but is most often found in the lungs. Some mycobacteria are called tuberculous mycobacteria because they cause TB or diseases similar to TB. These mycobacteria are *M. tuberculosis, M. bovis, M. africanum, M. canetti* and *M. microti;* together these species of mycobacteria make up the MTB Complex. Other mycobacteria are called nontuberculous mycobacteria (NTM) because they do not cause TB. One common type of nontuberculous mycobacteria is *M. avium intracellular* complex (MAIC). Tuberculosis mycobacteria readily spread from person to person; nontuberculous mycobacteria do not usually spread from person to person.

The goal of TB control in the United States is to reduce TB morbidity and mortality by

- preventing transmission of *M. tuberculosis* from persons with contagious forms of the disease to uninfected persons, and
- Preventing progression from latent TB infection (LTBI) to active TB disease among persons who have become infected with the *M. tuberculosis* Bacterium.[1]

For information on the transmission of *M. tuberculosis* and on how LTBI progresses to TB disease, see the Centers for Disease Control and Prevention's (CDC's) online course *Interactive Core Curriculum on Tuberculosis* (2004) at http://www.cdc.gov/tb/webcourses/CoreCurr/

The four fundamental strategies to reduce TB morbidity and mortality are

1. Early and accurate detection, diagnosis, and reporting of TB cases, leading to initiation and completion of treatment;
2. Identification of contacts of patients with infectious TB and treatment of those at risk with an effective drug regimen;
3. Identification of other persons with latent TB infection at risk for progression to TB disease, and treatment of those persons with an effective drug regimen; and
4. Identification of settings in which a high risk exists for transmission of *M. tuberculosis* and application of effective infection control measures.[2]

For more information on these strategies see "Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America" (*MMWR* 2005; 54[No. RR-12]) at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5412a1.htm

Nevada Laws and Regulations for Tuberculosis Control

Nevada laws and regulations regarding tuberculosis (TB) are available online:

State Laws and Regulations

Nevada Legislature/Nevada Law Library
http://www.leg.state.nv.us/law1.cfm
Title 40: Public Health and Safety
Chapter 441A: Communicable Diseases
Tuberculosis (NRS§ 441.A.340 through §441A.400)

GENERAL PROVISIONS

NRS 441A.010	Definitions.
NRS 441A.020	"Board" defined.
NRS 441A.030	"Child care facility" defined.
NRS 441A.040	"Communicable disease" defined.
NRS 441A.050	"Health authority" defined.
NRS 441A.060	"Health Division" defined.
NRS 441A.065	"Isolation" defined.
NRS 441A.070	"Laboratory director" defined.
NRS 441A.080	"Medical facility" defined.
NRS 441A.090	"Medical laboratory" defined.
NRS 441A.100	"Physician" defined.
NRS 441A.110	"Provider of health care" defined. [Effective through December 31, 2007.]
NRS 441A.110	"Provider of health care" defined. [Effective January 1, 2008.]
NRS 441A.115	"Quarantine" defined.
NRS 441A.120	Regulations of State Board of Health.
NRS 441A.125	Use of syndromic reporting and active surveillance to monitor public health; regulations.
NRS 441A.130	State Health Officer to inform local health officers of regulations and procedures.
NRS 441A.140	Authority of Health Division to receive and use financial aid.
NRS 441A.150	Reporting occurrences of communicable diseases to health authority.
NRS 441A.160	Powers and duties of health authority.
NRS 441A.170	Weekly reports to State Health Officer.
NRS 441A.180	Contagious person to prevent exposure to others; warning by health authority; penalty.
NRS 441A.190	Control of disease within schools, child care facilities, medical facilities and correctional facilities.
NRS 441A.195	Testing of person or decedent who may have exposed law enforcement officer, correctional officer, emergency medical attendant, firefighter, county coroner or medical examiner, person employed by agency of criminal justice or certain other public employees to contagious disease.
NRS 441A.200	Right to receive treatment from physician or clinic of choice; Board may prescribe method of treatment.

	NRS 441A.210 Rights and duties of person who depends exclusively on prayer for healing. **NRS 441A.220** Confidentiality of information; permissible disclosure. **NRS 441A.230** Disclosure of personal information prohibited without consent. **TUBERCULOSIS** **NRS 441A.340** Duties of Health Division. **NRS 441A.350** Establishment and support of clinics. **NRS 441A.360** Provision of medical supplies and financial aid for treatment of indigent patients. **NRS 441A.370** Contracts with hospitals, clinics and other institutions for examination and care of patients. **NRS 441A.380** Treatment of patient for condition related to or as necessary for control of tuberculosis. **NRS 441A.390** Contracts with private physicians to provide outpatient care in rural areas. **NRS 441A.400** Inspection of records of facility where patients are treated. Contact the Nevada State Health Division's Bureau of Health Care Quality and Compliance at 775-687-4475 or the TB Program at 775-684-5982 for assistance with interpreting laws and regulations regarding TB control.
	Nevada Administrative Code/Nevada Law Library **http://www.leg.state.nv.us/NAC/CHAPTERS.HTML** ➢ **Chapter NAC- 441A: Communicable Diseases 5-08** ➢ **General Provisions** 441A.010 **through** 441A.200 ➢ **Reporting Requirements** 441A.225**through** 441A.260 ➢ **Duties and Powers Relating to the Presence of Communicable Diseases** 441A.275 **through** 441A.310 ➢ **Investigating, Reporting, Preventing, Suppressing and Controlling Particular Communicable Disease General Provisions** 441A.325 Tuberculosis NAC 441A.350 Health care provider to report certain cases and suspected cases within 24 hours of discovery. NAC 441A.355 Active tuberculosis: Duties and powers of health authority. NAC 441A.360 Cases and suspected cases: Prohibited acts; duties; discharge from medical supervision. NAC 441A.365 Contacts: Compliance with regulations; medical evaluation; prohibited acts. NAC 441A.370 Correctional facilities: Testing and surveillance of employees and inmates; investigation for contacts; course of preventive treatment for person with tuberculosis infection; documentation. NAC 441A.375 Medical facilities, facilities for the dependent and homes for individual residential care: Management of cases and suspected cases; surveillance and testing of employees; counseling and preventive treatment. NAC 441A.380 Admission of persons to certain medical facilities, facilities for the dependent or homes for individual residential care: Testing; respiratory isolation; medical treatment; counseling and preventive treatment; documentation. NAC 441A.385 Care of medically indigent patient in State Tuberculosis Control Program; payment of cost. NAC 441A.390 Treatment of case or suspect case by health care provider.

Objectives and Standards

Quality of Care

For tuberculosis (TB) programs, quality of care is measured by means of objectives and standards. Such objectives and standards are used as guides to direct the program and yardsticks to measure its success.

Objectives reflect outcomes or results and program desires. Programs require objectives to define expected outcomes and results for case management activities.

Standards are an accepted set of conditions or behaviors that define what is expected and acceptable regarding job duties, performance, and provision of services. The TB control program works to achieve objectives through a series of standards.

In Nevada, TB program objectives and standards are established from the following:

State Laws and Regulations

See the above laws and regulations

TB Program Agreements, Plans, and Protocols

- Contracts between Nevada, TB Control and the local health agencies
- Centers for Disease Control and Prevention (CDC) Cooperative Agreement

National TB Guidelines

The national organizations and TB guidelines that help to establish the NSHD's TB program's goals, objectives, and standards of performance include:

- American Thoracic Society (ATS)
- Infectious Diseases Society of America (IDSA)
- CDC Division of Tuberculosis Elimination (DTBE) guidelines

• National TB Program Objectives

Below are the current national TB program objectives established by the CDC, updated February 2009.[3] Nevada TB programs review the following objectives and establish standards and goals that are specific, measurable, attainable and timely, (SMART) with the ultimate goal of performing at these target levels. The (n) values and percentages for Nevada are established based on past performance and in conjunction with the CDC Project Officer assigned to Nevada.

TABLE 1: **PROGRAM OBJECTIVES AND PERFORMANCE TARGETS**

Indicator		National Tuberculosis Program Objectives
1	**Completion of Treatment**	For patients with newly diagnosed TB for whom 12 months or less of treatment is indicated, increase the proportion of patients who complete treatment within 12 months to 93.0%.
2	**TB Case Rates** • U.S.-born Persons • Foreign-born Persons • U.S.-born non-Hispanic Blacks • Children Younger than 5 years of age	**Decline in TB rates** **a.** Decrease the TB case rate in U.S.- born persons to less than 0.7 cases per 100,000 **b.** Increase the average yearly decline in TB case rate in U.S.-born persons to at least 11.0%. **c.** Decrease the TB case rate for foreign-born persons to less than 14.0 cases per 100,000. **d.** Increase the average yearly decline in TB case rate in foreign-born persons to at least 4.0% **e.** Decrease the TB case rate in U.S.-born non-Hispanic blacks to less than 1.3 cases per 100,000. **f.** Decrease the TB case rate for children younger than 5 years of age to less than 0.4 cases per 100,000. **g.** National Objective: All sputum-AFB-smear-positive TB cases will have at least one contact listed (by 2015).

Indicator		National Tuberculosis Program Objectives
3	**Contact Investigation** • Contact Elicitation • Evaluation • Treatment Initiation • Treatment Completion	**Improve contact identification, evaluation, and treatment** **a.** Increase the proportion of TB patients with positive acid-fast bacillus (AFB) sputum-smear results who have contacts elicited to 100.0%. **b.** Increase the proportion of contacts to sputum AFB smear –positive TB patients who are evaluated for infection and disease to 93.0%. **c.** Increase the proportion of contacts to sputum AFB smear-positive TB patients with newly diagnosed latent TB infections (LTBI) who start treatment to 88.0%. **d.** For contacts to sputum AFB smear-positive TB patients who have started treatment for the newly diagnosed LTBI, increase the proportion who complete treatment to 79.0%.
4	**Laboratory Reporting** • Turnaround Time • Drug-susceptibility Result	**Ensure timely laboratory reporting** **a.** Increase the proportion of culture-positive or nucleic acid amplification (NAA) test-positive TB cases with a pleural or respiratory site of disease that have the identification of *M. tuberculosis* complex reported by laboratory with N days from the date the initial diagnostic pleural or respiratory specimen was collected to n %. **b.** Increase the proportion of culture-positive TB cases with initial drug-susceptibility results reported to 100.0%.
5	**Treatment Initiation**	Increase the proportion of TB patients with positive AFB sputum-smear results who initiate treatment within 7 days of specimen collection to n%.
6	**Sputum Culture Conversion**	Increase the proportion of TB patients with positive sputum culture results who have documented conversion to sputum culture-negative within 60 days of treatment initiation to 61.5%.

Indicator		National Tuberculosis Program Objectives
7	**Data Reporting** • RVCT • ARPEs • EDN	**Improve completeness of reported data** **a.** Increase the completeness of each core Report of Verified Case of Tuberculosis (RVCT) data item reported to CDC, as described in the TB Cooperative Agreement announcement, to 99.2%. **b.** Increase the completeness of each core Aggregated Reports of Program Evaluations (ARPEs) data items report to CDC, as described in the TB Cooperative Agreement announcement, to 100.0% **c.** Increase the completeness of each core Electronic Disease Notification (EDN) system data item reported to CDC, as described in the TB Cooperative Agreement announcement, to n%.
8	**Recommended Initial Therapy**	Increase the proportion of patients who are started on the recommended initial 4-drug regimen when suspected of having TB disease to 93.4%.
9	**Universal Genotyping**	Increase the proportion of culture-confirmed TB cases with a genotyping result reported to 94.0%.
10	**Known HIV Status**	Increase the proportion of TB cases with positive or negative HIV test result reported to 88.7%.
11	**Evaluation of Immigrants and Refugees** • Evaluation Initiation • Evaluation Completion • Treatment Initiation • Treatment Completion	**Increase the percentage of immigrants and refugees designated as Class A, B1, B2 or B3 who are appropriately evaluated and treated.** **a.** For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB, increase the proportion who initiate a medical evaluation within 30 days of arrival to n%. **b.** For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB, increase the proportion who complete a medical evaluation within 90 days of arrival to n%. **c.** For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB and who are diagnosed with latent TB infection (LTBI) during evaluation in the U.S., increase the proportion who start treatment to n%. **d.** For immigrants and refugees with abnormal chest x-rays read overseas as consistent with TB and who are diagnosed with latent TB infection (LTBI) during evaluation in the U.S. and started on treatment, increase the proportion who complete LTBI treatment to n%.

Indicator		National Tuberculosis Program Objectives
12	**Sputum-Culture Reported**	Increase the proportion of TB cases with a pleural or respiratory site of disease in patients ages 12 years or older that have a sputum-culture result reported to 95.7%.
13	**Program Evaluation** • Evaluation Focal Point	**Improve the Evaluation of TB Programs** **a.** Increase program evaluation activities by monitoring program progress and tracking evaluation status of cooperative agreement recipients. **b.** Increase the percent of cooperative agreement recipients that have an evaluation focal point.
14	**Human Resource Development Plan**	**Improve the Evaluation of TB Programs** **a.** Increase program evaluation activities by monitoring program progress and tracking evaluation status of cooperative agreement recipients. **b.** Increase the percent of cooperative agreement recipients that have an evaluation focal point.
15	**Training Focal Point**	Increase the percent of cooperative agreement recipients that have a TB training focal point.

Source: National TB Program Objectives and Performance Targets for 2015. CDC Division of Tuberculosis Elimination; February 4, 2009, http://www.cdc.gov/tb/Program_Evaluation/Indicators/ProgramObjectives.pdf and http://www.cdc.gov/tb/Program_Evaluation/Indicators/default.htm

Notes:

1. Performance targets for completion of treatment, case rates, and contact investigation are established based on 2002 data.
2. Performance targets for Sputum Culture Conversion, Recommended Initial Therapy, Known HIV Status, and Sputum Culture Reported objectives are established based on 2006 data.
3. Performance target for Universal Genotyping is based on 2007 data.
4. Performance targets will not be established for Laboratory Turnaround Time and Treatment Initiation objectives until data becomes available from the implementation of revised RVCT in 2009.
5. Performance targets will not be established for EDN Data Reporting and Evaluation of Immigrants and Refugees objectives until the data collection in EDN has been enhanced.
6. The average change in the case rates for U.S.-born and foreign-born populations will be monitored at the national level only.

Standards

Program standards are what the stakeholders of the TB programs would consider to be "reasonable expectations" for the program. For TB, standards have been established by nationally accepted authorities, such as ATS, IDSA and CDC, and generally recognized TB control experts, such as the National Tuberculosis Nurse Coalition (NTNC) and National Tuberculosis Controllers Association (NTCA). Many state programs, and some local TB control programs, have established their own standards and objectives for case management. The NTNC has revised its Tuberculosis Nursing manual, which will contain the most current program, structural and patient care standards that the NTNC recommends. Check for updates at http://www.ntca-tb.org.

The standards of care for the medical treatment and control of TB are published jointly by the American Thoracic Society (ATS), the Infectious Diseases Society of America (IDSA), and the CDC. These standards should be available for reference by each TB staff member. The standards are included in the following guidelines:

- ATS, CDC, IDSA. "Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America" (*MMWR* 2005; 54[No. RR-12]). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5412a1.htm
- ATS, CDC, IDSA. "Diagnostic Standards and Classification of Tuberculosis in Adults and Children" (*Am J Respir Crit Care Med* 2000; 161[4 Pt 1]). Available at: http://www.cdc.gov/tb/pubs/PDF/1376.pdf
- ATS, CDC, IDSA. "Treatment of Tuberculosis" (*MMWR* 2003; 52[No. RR-11]). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5211a1.htm
- CDC, NTCA. "Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC" (*MMWR* 2005; 54 [No. RR-15]). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5415a1.htm
- CDC. "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-care Settings, 2005" (*MMWR* 2005; 54[No. RR-17]). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr5417a1_e
- CDC. "Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection" (*MMWR* 2000; 49[No. RR-6]). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.htm
- CDC "Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC" (MMWR 2006/55(RR09); 1-44). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5509a1.htm

For additional guidelines, see the Division of Tuberculosis Elimination's "TB Guidelines" Web page (Division of Tuberculosis Elimination Web site; accessed March, 2009). Available at: http://www.cdc.gov/tb/pubs/mmwr/Maj_guide/default.htm

Roles, Responsibilities & Contact Information

Roles and Responsibilities of the Nevada State Health Division Tuberculosis Elimination Program

The Nevada State Health Division's TB Program has the overall responsibility for surveillance, containment, management and assessment of TB activities in the state. Specific duties include the formulation and distribution of guidelines for TB control and prevention in Nevada, utilizing established recommendations from the CDC and ATS. The responsibilities of TBCP include:

a) Providing epidemiological, technical, medical, nursing, and programmatic consultative services regarding TB prevention and control to public and private health care providers, including local and Native American public health departments, public and private physicians' nurses, and public and private health care facilities
b) Providing training upon request or identified need for individuals and groups with responsibility for diagnosing/evaluation and treating persons with Tb disease and LTBI
c) Providing technical assistance as necessary
d) Providing notification to the local health departments of any information received by the CDC's Division of Global Migration and Quarantine (DGMQ)
e) Providing reports as necessary to the CDC
f) Working with Nevada State Health Laboratory to ensure quality TB laboratory services are provided in the state
g) Ensuring that reporting regulations are met and assists local health departments in enforcing commitment laws when necessary
h) Verification and accurate count of all new and recurrent cases of TB disease within the state
i) Aggregating non-patient specific information and transmitting this information to CDC for inclusion in national statistics on the incidences of TB, as well as data on the utilization of recommended control and prevention measures
j) Maintaining a registry of TB cases with drug resistant organisms, and provides drug resistance incidence data
k) Providing case management consultation to local and district health departments and other health care providers upon request
l) Developing and distributing epidemiological data on the incidence and location of TB disease in Nevada
m) Providing/assisting local health departments' TB programs with program evaluations as needed
n) Initiating, developing, approving and monitoring contracts with local and district health departments to provide TB services
o) Providing on-site evaluations of TB control programs in each local health department
p) Evaluating the TB control program and providing that information to the CDC semiannually

Roles and Responsibilities of the Local Health Departments

The basic role of the Local Tuberculosis Control Programs is to assure the provision of comprehensive TB prevention and control services to persons with known or suspected TB disease or latent TB infection, with as little disruption in their daily lives as possible. Each program is expected to ensure their practices are current based on the CDC guidelines. Local TB clinics have a major responsibility to prevent unnecessary hospitalization by performing, when possible, necessary screening and diagnostic testing along with providing appropriate treatment on an outpatient basis. The local health departments' responsibilities include:

a) Physician evaluation, including medical history
b) Tuberculin skin test (Mantoux only) administration, reading and interpretation or collection and processing of a blood assay screening test for TB.
c) Chest x-rays (on-site or at a reasonable convenient location for the patient)
d) Chest x-rays reading and interpretation by a radiologist
e) Collection of sputum specimens – natural and/or induced (on-site or at a reasonable convenient location for the patient and TB staff)
f) Ensuring, to the best of their ability, that persons on therapeutic or preventive regimens take their medication to completion, including directly observed therapy (DOT)
g) Monitoring persons on therapeutic or preventive regimens
h) Contact identification, notification, and examination, with appropriate follow-up
i) Consultation to other health care providers regarding TB control and prevention methods
j) TB educational services for patients and their families, other health care providers, and the general public, as requested or required
k) Referral to appropriate agencies for assistance with identified problems/needs

Roles and Responsibilities of TB Nurses/Coordinators and Disease Investigators in the Local Health Department

The TB nurse/coordinators and disease investigators at the local health department have a major responsibility for a successful TB control program. They are the prime link in effective TB prevention and control for all persons in the community, whether hospitalized or treated on an outpatient basis. The responsibilities include:

a) Instructing the patient on the importance of continuous and uninterrupted drug therapy and precautions to take to prevent the transmission of infection
b) Case management to ensure the patient successfully completes anti-TB chemotherapy and treatment of LTBI
c) Monitoring of the patient's clinical status and obtaining liver function studies monthly
d) Ensuring, to the best of their ability, compliance with treatment
e) Collecting specimens as necessary
f) Ensuring other testing is completed as necessary
g) Referring patient to other appropriate agencies as necessary
h) Working with the physician to maintain standards of care for each patient
i) Contacting any health care provider (i.e. outpatient departments, infirmaries of

state and local correctional and mental health institutions, federal facilities, and private physicians) to monitor the current status of the TB patient
j) Maintaining surveillance for TB within the community
k) Serving as a liaison between local health care providers and facilities and the TBCP

Specific responsibilities include:

a) Initial patient visit – This visit is often the key to eventual successful completion of adequate treatment for the patient
b) Assessment of the patient (See Case Management Section)
c) Development of the Nursing Care Plan (See Case Management Section)
d) Observation for infectiousness, i.e. coughing, general hygiene (if patient covers their cough, disposes of tissues), and collection of specimens
e) Current and prior medical history, i.e., contacts with other TB cases or a previous history of TB of LTBI, length of illness, other chronic conditions, current medications (including over the counter and herbal), HIV status (or risk factors if not known)
f) Coping skills i.e., reaction of the patient and family regarding present condition. Identification of barriers to care in order to develop a plan of care
g) Assessment of the patient's environment i.e. home, school work to determine shared environments with others. Also note the climate, central heating and air conditions, confined spaces, air movement within a home, office, classroom, etc., all may be factors to be taken into consideration
h) Contact identification, ensuring all contacts are examined and appropriately managed. Identification of contacts to a smear positive TB case/suspect is a high priority activity
i) Initial contact evaluation: examination of close contacts of current infectious cases of pulmonary or laryngeal TB is the most productive method of case finding and initial evaluations should be completed within 10 working days of the initial report of the TB case.

Patient and family education, focusing on achieving an understanding of:

- The disease process
- The reason for chemotherapy for the patient and preventive treatment for contacts
- The importance of continuous and uninterrupted therapy
- The importance of maintaining regular medical supervision
- The signs and symptoms of potential side effects of the prescribed medications and what course of action to follow should these occur
- Transmission of TB and methods of prevention
- The importance of covering the nose and mouth with tissue every time when coughing or sneezing whether alone or with others, and proper disposal of tissue
- The probable duration of the infectious period
- The need for adequate ventilation
- The fact that dishes, linens, and other fomites require no special precaution
- The potential benefit of sleeping apart from the rest of the family during the infectious period
- The reason for contact identification and examination.

j) Maintain medication orders for anti-tuberculosis chemotherapy from the primary health care provider and/or the TB clinician for the local health department. Directly observed therapy (DOT) is the standard of care. Rarely, there may be

times when self administered therapy (SAT) is an acceptable option. For patients who are on SAT, only a one (1) month supply of medication may be given to the patient at any time. Monitoring for potential side effects of the medication is provided at each dose for patients on DOT, and at least monthly for patients on SAT. If any prescription calls for a dose or method of administration which is different from what the CDC and or the ATS recommends, the TB nurse/coordinator should consult with TBCP, the TB clinician for the local health department and/or the local health officer.

k) Specimen collection containers should be provided along with mailing tubes and instructions to the patient for collecting routine laboratory specimens and referral to a local health care provider for sputum induction if necessary.
l) Contact follow-up: The TB nurse/coordinator assures that the contact investigation has begun, assists in the investigation if requested, administers TB screening test(s) to contacts identified outside the institution but within that county (if needed) and notifies TB Control Program (TBCP) of contacts requiring examination but residing in other jurisdictions. Contacts are to be evaluated and managed according to current recommendations as noted in this manual. Contacts on preventive therapy for LTBI must be followed and monitored at least monthly. Results of the contact investigation are sent to TBCP.
m) Documenting records and reports in the patient's folder including components of the home, hospital, or clinic visits, contact examination results and follow-up treatment regimen, collection of specimens, smear and culture results, chest x-ray reports, other laboratory reports, assessment of compliance, and any other information pertinent to the appropriate case management of the patient in a timely manner. Examples of some of the forms include Report of Verified Case of Tuberculosis (RVCT) and RVCT Follow-up 1 & 2 forms.
n) Isolation assistance should be requested from the local deputy TB control office and/or the local health office and enforced, when necessary.
o) Isolation enforcement should be used in compliance with the Nevada Revised Statues (NRS) and/or Nevada Administrative Code (NAC) to protect the health of the public. TBCP will assist the local TB nurse/coordinator with this responsibility as necessary and when requested (See pages 1.9 and 1.10 on Nevada TB laws)

Roles and Responsibilities of Health Care Providers

Health care providers, including general hospital, outpatient departments, infirmaries of state and local correctional and mental institutions, federal facilities, as well as local health departments and private providers in the community, carry out the roles of evaluation, diagnosing, prescribing, and monitoring the medical care of those persons with or suspected to have TB disease or LTBI.

Health care providers in Nevada who know of a person who has or is suspected of having tuberculosis, are required by Nevada Administrative Code (NAC 441A.230) to notify the state TB controller or the local health officer and to cooperate in any investigation conducted as a result of the notification. Notification shall include, if known, the name, address and physical location of the person who has or is suspected of having TB. If the person reporting is a licensed physician, the report shall also include the condition of the person and the status of the disease.

According to Nevada Administrative Code (NAC 441A.250), a physician or an administrator of a health care facility or any authorized representative, shall report within

twenty-four (24) hours to the local health agency by telephone or other equally expeditious means, any suspected or confirmed TB disease in any person, as well as any LTBI in a child less than six (6) years of age.

The reporting of each person with known or suspected new or recurrent TB disease and each child less than six (6) years of age with LTBI allows the resources of the local health department and TBCP to become available to assist the provider in the appropriate management of the patient. Epidemiological services are available to identify and examine source cases and contacts. The local health department may have chest x-ray availability on site, or will have arrangements made with other nearby health care facilities to provide x-ray services, including reading and interpretation. Some local health departments may have laboratory services and local medical consultation. All local health departments are able to link health care providers with the services provided by the Nevada State Health Division.

Close cooperation between health care providers and the local health department is imperative for the optimal outcome for the patient, contacts, and the community as a whole. Physicians and other providers described above are required to cooperate with the local health department when a report is requested on the follow-up care being given to a patient (NRS 441A.400). Periodic updates are required to monitor the patient's bacteriological, radiological, and chemotherapy status, or status of treatment for LTBI. Physicians and other health care providers are required to promptly report to the local health department if the patient ceases to or refuses to comply with medical recommendations for voluntary examination, isolation, monitoring or treatment for active TB (NRS 441A.180).

Roles and Responsibilities of Clinical Laboratories

A clinical laboratory director, or authorized representative**,** in accordance with Nevada Administrative Code (NRS 441A.170), shall submit to the Nevada Department of Health Services a written or electronic report of positive laboratory findings for *Mycobacterium tuberculosis* and its drug sensitivity patterns. NAC 441A.235 requires that the written or electronic laboratory report shall include the patient's name, address and telephone number (if available), date of birth, reference number, specimen type, date of collection, type of test, test results, and the ordering physician's name and telephone number. This required report includes the findings of any test that is suggestive of tuberculosis, most specifically positive smears for acid-fast bacilli (AFB) as well as positive cultures for *Mycobacterium tuberculosis.*

In addition, in order to provide epidemiological data and information regarding TB in Nevada including drug-resistance patterns and genotype, all clinical laboratories are strongly encouraged to provide an isolate of all cultures positive for *Mycobacterium tuberculosis* to the Nevada State Health Laboratory, 1660 N. Virginia St., Reno, Nevada, 89557-0385, telephone (775) 688-1335.

The following is from "Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health Care Settings Facilities, 2005/1994" published in Morbidity and Mortality Weekly Report, Vol. 5 434, No. RR 1713, December 30, 2005.

"Prompt laboratory results are crucial to the proper treatment of the TB patient and to early initiation of infection control measures. To ensure timely results, laboratories performing mycobacteriologic tests should be proficient at both the laboratory and administrative aspects of specimen processing. Laboratories should use the most rapid methods available (e.g., fluorescent microscopy for AFB smears; radiometric culture methods for isolation of mycobacteria, nucleic acid probes, or high-pressure liquid chromatography (HPLC) for species identification; and radiometric methods for drug susceptibility testing). As other more rapid or sensitive tests become available, practical, and affordable, such tests should be incorporated promptly into the mycobacteriology laboratory. Laboratories that rarely receive specimens for mycobacteriologic analysis should refer the specimens to a laboratory that more frequently performs these tests."

Nevada State Health Laboratory

The Nevada State Laboratory processes sputum and other specimens for tuberculosis diagnostic and monitoring purposes as submitted by local health departments, private health care providers, health care facilities, and other laboratories. Acid-fast bacilli (AFB) smears, direct identification of mycobacteria from clinical specimens (rapid method), mycobacterial cultures, anti-tuberculosis drug sensitivity studies, and mycobacterial organism identification are included in the services provided. The laboratory serves as the tuberculosis reference laboratory for the entire state.

Specimen containers and mailing tubes may be obtained at no charge to patients or local health departments by calling (775) 688-1335.

Roles and Responsibilities of Regional and National Agencies

The Centers for Disease Control and Prevention (CDC), the American Thoracic Society (ATS**)**, formerly the medical Section of the American Lung Association (ALA), and the Francis J Curry Regional Training and Medical Consultation Center, provide official recommendations and guidelines for the control of tuberculosis, including standards of care for persons with known or suspected tuberculosis infection or disease, diagnostic methods, effective and appropriate anti-tuberculosis drug regimens, laboratory standards, contact identification, examination and follow-up, and methods for the prevention of transmission of tuberculosis within health care facilities and long-term care institutions. Both agencies also provide education, consultation and technical assistance as necessary to the Nevada State Health Division, Tuberculosis Control Section (TBCP), as well as public and private health care providers throughout the state upon request.

Regional Contact Information

Carson City Health and Human Services
900 East Long Street, Carson City, NV. 89706
(775) 887-2190

Churchill County Community Health Clinic
485 West B Street, Suite 101, Fallon, NV 89406
(775) 423-4434

Clark County (Southern Nevada) Health District
1820 East Lake Mead Blv. Suite H, Las Vegas, NV. 89030
(702) 759-1369

Douglas County Community Health Clinic
1133 Spruce Street, Gardnerville, NV 89410
(775) 782-9038

Douglas County Community Health Clinic
175 Hwy. 50, Stateline, Zephyr Cove, NV. 89448
(775) 586-7235

Elko County Community Health Clinic (contract nurse – limited hours)
764 14th Street, Elko, NV. 89801
(775) 778-0780

Humboldt County Community Health Clinic
102 E. Haskell Street, Winnemucca, NV. 89445
(775) 6223-6575

Lander County Community Health Clinic
150 Palmer Street, Battle Mountain, NV. 89445
(775) 635-2386 or (775) 635-1109

Lincoln County Community Health Clinic
360 Lincoln Street, Caliente, NV. 89008
(775) 726-3123

Lyon County (Fernley) Community Health Clinic
555 East Main Street, Fernley, NV. 89408
775) 351-1301 or (775) 575-3363

Lyon County (Dayton) Community Health Clinic
34 Lakes Blvd. Suite 101, Dayton, NV. 89403
(775) 246-6211

Lyon County (Silver Springs) Community Health Clinic
2475 Fort Churchill, Sliver Springs, NV. 89429
(775) 577-5016

Lyon County (Yerington) Community Health Clinic
26 Nevin Way, Yerington, NV. 89447
(775) 463-6539

Mineral County Community Health Clinic
331 1st Street, Hawthorne, NV. 89415
(775) 945-3657 or (775) 945-3658

Nye County (Pahrump) Community Health Clinic
250 N. Highway 160 Suite 6, Pahrump, NV 89048-0250
(775) 751-7070

Nye County (Tonopah) Community Health Clinic
#1 Frankie Avenue, Tonopah, NV. 89049
(775) 482-6659

Pershing County Community Health Clinic
535 Western Avenue, Lovelock, NV 89419
(775) 273-2041

Washoe County Health District
10 Kirman Avenue, Reno, NV. 89502
(775) 785-4785

White Pine County Community Health Clinic
995 Campton Street, Ely, NV. 89301
(775) 289-2107

Resources and References

Resources

- Division of Tuberculosis Elimination (DTBE) available at: http://www.cdc.gov/tb
- CDC. "Framework for Program Evaluation in Public Health" (*MMWR* 1999; 48[No. RR-11]). Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm
- Division of Tuberculosis Elimination. *A Guide to Developing a TB Program Evaluation Plan* (Division of Tuberculosis Elimination Web site; accessed November 1, 2006). Available at: http://www.cdc.gov/tb/Program_Evaluation/default.htm
- Division of Tuberculosis Elimination. *Understanding the TB Cohort Review Process: Instruction Guide* (Division of Tuberculosis Elimination Web site; accessed November 1, 2006). Available at: http://www.cdc.gov/tb/pubs/cohort/default.htm
- New Jersey Medical School National Tuberculosis Center. *Planning & Implementing the TB Case Management Conference: A Unique Opportunity for Networking, Peer Support and Ongoing Training* (Newark, NJ; 2004). Available at: http://www.nationaltbcenter.edu/research/docs/01intro0808.doc
- Instructions to Panel Physicians for Completing New U.S. Department of State Medical Examination For Immigrant or Refugee Applicant (DS-2053) and Associated Worksheets (DS-3024, DS-3025, and DS-3026) Available at: http://www.cdc.gov/Ncidod/dq/pdf/ds-forms-instructions.pdf
- National TB Indicators Project (NTIP) - Fact sheet. Available at: http://www.cdc.gov/tb/pubs/tbfactsheets/NTIPFAQs.htm

References

[1] ATS, CDC, IDSA. Controlling tuberculosis in the United States: recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR* 2005; 54(No. RR-12):14.
[2] ATS, CDC, IDSA. Controlling tuberculosis in the United States: recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR* 2005;54(No. RR-12):15.
[3] CDC Division of Tuberculosis Elimination. February 4, 2009. http://www.cdc.gov/tb/Program_Evaluation/Indicators/ProgramObjectives.pdf.