Colorado Department of Public Health and Environment

Guidance for Alterations in the Healthcare System During an Influenza Pandemic

Draft as of September 2008

Participants Involved/Acknowledgements

The following persons contributed to the development and/or approval of the guidance issued in this document:

Anderson, Marsha, MD; Associate Professor of Pediatrics, Section of Infectious Diseases, The Children's Hospital
Blue, Geoffrey, JD; Deputy Attorney General, Legal Policy and Governmental Affairs, Office of the Attorney General
Bogdan, Greg, PhD; Research Director & Medical Toxicology Coordinator, Rocky Mountain Poison and Drug Center – Denver Health and Hospital Authority
Calonge, Ned, MD; Chief Medical Officer, Colorado Department of Public Health and Environment (CDPHE)
Cantrill, Stephen V., MD; Emergency Physician, Denver Health and Hospital Authority
Cowden, Jessica, MD; The Children's Hospital/University of Colorado Hospital
Drennen, Curt; Psy.D., R.N.; Disaster Mental Health Coordinator, Colorado Division of Behavioral Health
Herrero, Diana, MS; Pandemic Preparedness Manager, CDPHE
Hause, Ann, JD; Office of Legal and Regulatory Affairs Director, CDPHE
Havice-Cover, P.J., CAC III, LPC, MA; Disaster Mental Health Program Specialist, Colorado Division of Behavioral Health
Huffman, Margaret, ND, RN; Immunization Projects Manager, CDPHE
Kanowitz, Arthur, MD, FACEP; State EMTS Medical Director, CDPHE
Kenney, David W., MA, BCC; Consultant in Clinical Ethics, Health Policy and Clinical Pastoral Care
Koons, Robin, PhD; Emergency Response Manager, CDPHE
Lindley, Chris, PhD; Emergency Preparedness and Response Division Director; CDPHE
Little, Charles; D.O., FACEP; Pandemic Influenza Coordinator, University of Colorado Hospital
Miller, Lisa, MD; Disease Control and Environmental Epidemiology Division Director, CDPHE
Moore, Jr., Lyle, MPH; Hospital Preparedness Manager; CDPHE
Nedrow, Ann; Emergency Planning Assistant, CDPHE
Nyquist, Ann-Christine, MD; Medical Director of Infection Control, The Children's Hospital
Polemi, Rosemarie, RN; MSN; Regional Nursing Practice Leader, Kaiser Permanente
Schmitt, Barton, MD; Medical Director, TCH Call Center, The Children's Hospital
Ward, Don, DO, FAAFP; Panflu Family Practice Physician Lead, Kaiser Permanente
Wathen, Joseph, MD; Medical Director Disaster Preparedness, Emergency Department, The Children's Hospital

September 2008

Table of Contents

Executive Summary

An influenza or "flu" pandemic is a worldwide outbreak caused by a novel strain of influenza A virus for which there is little or no immunity in the human population, which would allow the virus to spread easily from person-to-person worldwide. History suggests that influenza pandemics have probably occurred during at least the last four centuries. Since 1900, three pandemics and several "pandemic threats" have occurred at unpredictable intervals and with widely varying severity. The most catastrophic pandemic, the so-called "Spanish" influenza pandemic, occurred between September 1918 and April 1919 and claimed the lives of approximately 675,000 people in the U.S. and approximately 50 million people worldwide. With the Spanish flu, mortality rates were high among healthy adults as well as the usual high-risk groups. The attack rate and mortality was highest among adults 20 to 50 years old; the reasons for this remain uncertain. The severity of that virus has not been seen again. The Spanish flu pandemic is the catastrophe against which all modern pandemics are measured and the scenario used to develop the decisions made in this document.

A pandemic will dramatically strain medical resources and possibly require a shift in medical resources from a standard of care focused on the individual patient to an altered standard that does the most good for the most patients. With that in mind, this guidance document seeks to present a basis for allocating health and medical resources in Colorado during an influenza pandemic. The goal of this process is to provide ethical, reasonable, transparent and flexible guidance to achieve the following:

- Provide clearly understood and widely accepted guidance that is fair and clinically sound to the Colorado healthcare providers, systems and facilities for consistent and equitable triaging during a pandemic so that all persons seeking guidance or care are addressed in the same manner.
- Maximize appropriate care for the largest number of patients presenting to an overwhelmed critical care system.
- Minimize serious illness and death by administering a finite pool of resources to those who have the greatest opportunity to benefit from them.
- Maximize self-triage and self-care by the general public using a variety of media to deliver public health messages.
- Delineate which healthcare facilities should provide what type of care based on the capacities and capabilities of the facility.
- Provide a legal framework for developing triage decisions and utilizing nonstandard health care facilities in an emergency.

The ethical and emotional issues arising in an influenza pandemic stem from the need to promote the public health of the community over the level of care provided to individuals. Healthcare professionals will be faced with trying to balance their basic standards of practice; code of ethics to provide care and protect the public from harm; competencies and values with competing obligations to protecting their own health, family and friends and working in an extremely stressful environment where there are too many ill and too few resources. It is in the best interest of the community to address the ethical considerations of such a disaster now in order to establish standards that can be universally applied.

Coordination of any response during a public health emergency is contingent upon having sufficient legal authority to adequately address the varying needs of the affected community. Pursuant to Colorado Revised Statute (C.R.S.) §25-1.5-102(1)(b), the Colorado General Assembly has tasked

CDPHE with the duty "to investigate and monitor the spread of disease that is considered part of an emergency epidemic as defined in section C.R.S. §24-32-2103(1.7), to determine the extent of environmental contamination resulting from the emergency epidemic, and to rapidly provide epidemiological and environmental information to the Governor's Expert Emergency Epidemic Response Committee (GEEERC), created in section C.R.S. §24-32-2104(8), C.R.S." Additionally, the governor has the authority pursuant to the Colorado Disaster Act ("Disaster Act"), C.R.S. § 24-32-2101 et seq, to declare a disaster emergency when he determines that a disaster has occurred or that such a disaster or the threat thereof is imminent. C.R.S. §24-32-3104(4). Through these statutes, the governor and CDPHE have sufficient legal authority to respond to disasters and temporarily modify statues, rules and orders that may hinder this response.

In order to provide a more well rounded set of guidelines for altering standards of care, this document is broken into two major sections: Supporting Information and Triage Guidance. The Supporting Information section is provided to give the reader a broader frame of reference in understanding the rationale of the guidance being proposed, including Assumptions, Communication, Legal Issues and Authority, 'Triggers' for Considering Plan Activation, Colorado Medical Resources, and Emergency Medical Services. The Triage Guidance section details recommendations for each of the following instances: case detection and clinical management, mass emergency screening, community acquired pneumonia, phone triage, and use of hospital critical care beds and ventilators. Recovery and Other Things to Consider complete the document.

Background

Introduction

An influenza or “flu” pandemic is a worldwide outbreak caused by a novel strain of influenza A virus for which there is little or no immunity in the human population, which would allow the virus to spread easily from person-to-person worldwide. History suggests that influenza pandemics have probably occurred during at least the last four centuries. Since 1900, three pandemics and several "pandemic threats" have occurred at unpredictable intervals and with widely varying severity. The most catastrophic pandemic, the so-called “Spanish” influenza pandemic, occurred between September 1918 and April 1919 and claimed the lives of approximately 675,000 people in the U.S. and approximately 50 million people worldwide. With the Spanish flu, mortality rates were high among healthy adults as well as the usual high-risk groups. The attack rate and mortality was highest among adults 20 to 50 years old; the reasons for this remain uncertain. The severity of that virus has not been seen again. The Spanish flu pandemic is the catastrophe against which all modern pandemics are measured and the scenario used to develop the decisions made in this document. While the Spanish influenza pandemic was the most severe there have been many other pandemics occurring generally about every twenty years.

A pandemic will dramatically strain medical resources and possibly require a shift in medical resources from a standard of care focused on the individual patient to an altered standard that does the most good for the most patients. With that in mind, this guidance document seeks to present a basis for allocating health and medical resources in Colorado during an influenza pandemic. The goal of this process is to provide ethical, reasonable, transparent and flexible guidance to achieve the following:

- Provide clearly understood and widely accepted guidance that is fair and clinically sound to the Colorado healthcare providers, systems and facilities for consistent and equitable triaging during a pandemic so that all persons seeking guidance or care are addressed in the same manner.
- Maximize appropriate care for the largest number of patients presenting to an overwhelmed critical care system.
- Minimize serious illness and death by administering a finite pool of resources to those who have the greatest opportunity to benefit from them.
- Maximize self-triage and self-care by the general public using a variety of media to deliver public health messages.
- Delineate which healthcare facilities should provide what type of care based on the capacities and capabilities of the facility.
- Provide a legal framework for developing triage decisions and utilizing nonstandard health care facilities in an emergency.

Limitations of this Document

A number of vulnerabilities are inherent in planning for a scenario such as an influenza pandemic with so many unknowns. This section identifies the known vulnerabilities at the time of development.

- This guidance document is meant to serve as a starting point for considering some of the most difficult decisions during a pandemic.
- It is not all encompassing of every scenario that a community may face during a pandemic and is based on information currently available.
- The guidance put forth in this document isn't final. It is meant to be fluid, flexible and will be revised as new information becomes available.
- A future pandemic may have a markedly different course from previous pandemics where this guidance may provide little or no value.
- The guidance in this document places an increased role on call centers and nurse lines as a means to provide information and medical advice remotely. Inherent in this increased role, is the assumption that telephone lines will remain open during a pandemic despite the likelihood that this sector may see increased absenteeism.
- This document currently does not address guidance for pediatric triaging for mechanical ventilation. Currently, no guidance is available; however, this working group will either address this issue in the future or follow published guidance.
- The Colorado Attorney General's Office has worked to ensure that state laws, statutes, orders and regulations that may impede response to a pandemic can be modified or waived. However, there are some federal law, statutes and regulations that states have no control over that may hinder response activities (e.g. Health Insurance Portability and Accountability Act of 1996). The Colorado Attorney General's Office is identifying these laws, statutes and regulations now so that the time of the emergency, an official emergency waiver can be requested from the President of the United States.

Public Engagement

In April 2007, the Colorado Department of Public Health and Environment (CDPHE) assembled a working group of professionals in public health and hospital preparedness, immunization, epidemiology, ethics, pediatrics, emergency medical services, infectious disease, emergency medicine, internal medicine, family practice, ambulatory clinical care, behavioral health and law to begin development of a guidance document for defining the provision of healthcare services, equipment and pharmaceuticals during a pandemic. Once completed, this guidance document will be distributed for peer review among partners in healthcare, public health, emergency management, ethics, emergency medical services and others to seek comments and suggestions. CDPHE is seeking input and support from the majority of the Colorado emergency preparedness and healthcare community. By the end of 2008, this document will be placed on the CDPHE website for public comment and review. CDPHE hopes to engage the public in this process and build trust in the community by being inclusive, transparent, open and honest about the guidance put forth.

Scope of Audience and Content

This document provides guidance to Colorado healthcare providers for triaging adult patients over 18 years of age or older (except where noted) and altering the provision of care during a pandemic in order to provide the greatest level of care to the greatest number of people. These guidelines apply to all healthcare professionals, clinics, hospitals and facilities in Colorado. To that end, this document

was written with the healthcare professional audience in mind. Triage in the sense of this document means allocating healthcare resources (personnel, hospital beds, supplies, medications, treatments, etc.) in a healthcare emergency. This document is broken into two major sections: Supporting Information and Triage Guidance. The Supporting Information section is provided to give the reader a broader frame of reference in understanding the rationale of the guidance being proposed, including Assumptions, Communication, Legal Issues and Authority, 'Triggers' for Considering Plan Activation, Colorado Medical Resources, and Emergency Medical Services. The Triage Guidance section details recommendations for each of the following instances: case detection and clinical management, mass emergency screening, community acquired pneumonia, phone triage, and use of hospital critical care beds and ventilators. Recovery and Other Things to Consider complete the document.

Supporting Information

Ethical Guidelines and Values

CDPHE is committed to helping secure the health and well being of the community, and to responsible stewardship of limited resources. This extends to our duty to provide and adhere to a defined ethical framework in preparing for and responding to disasters. In consideration of appropriate response to any public health emergency, which may overwhelm available resources, the needs of the greater community will tend to rise above the needs of individuals. Healthcare professionals will be faced with trying to balance several normally well-integrated elements: their accustomed, well-established standards of practice; professional codes of ethics; the primacy of principles such as beneficence and non-malfeasance; concern for one's own personal and family safety; and the demands of working in an extremely stressful environment where there are too many ill and too few resources. It is in the best interest of the people of Colorado to address, early on and forthrightly, the complex ethical concerns surrounding planning and response to such a disaster, and to establish ethically acceptable standards that can be universally applied. The guidance in this document follows an ethical framework, which values the classical principles of medical ethics including the human person's right to self-determination and the physician's obligations to beneficence, non-malfeasance and justice. With respect to the principle of justice, our guidance recognizes the inevitable reckoning, in the midst of a pandemic emergency, with the dilemma of a very limited availability of scarce resources in the face of unprecedented human need. Ultimately, allocation of these resources must support the greatest measurable benefit for the greatest possible number of persons. In approaching our recommendations, we have relied upon documents produced by the University of Toronto Joint Centre for Bioethics (2005)[1], World Health Organization[2] and the American Nurses Association (2008)[3].

Assumptions

The following assumptions about a future influenza pandemic were made to assist in development of this guidance document:

- Susceptibility to the pandemic influenza virus strain will be universal.

- Changes in the usual standards of health and medical care in the affected locality or region will be required to achieve the goal of saving the most lives in a mass casualty event. Rather than doing everything possible to try to save every life, it will be necessary to allocate scarce resources in a different manner to save as many lives as possible.

- The clinical disease attack rate will be about 30% in the overall population. Illness rates will likely be highest among school-age children and the elderly (about 40%). Among working adults, an average of 20% will become ill during a community outbreak.

[1] University of Toronto Joint Centre for Bioethics Pandemic Influenza Working Group (2005). *Stand on guard for thee: Ethical considerations in preparedness planning for pandemic influenza*. Toronto, Ontario: University of Toronto Joint Centre for Bioethics

[2] World Health Organization (2007), *Ethical considerations in developing a public health response to pandemic influenza*. Geneva, Switzerland: Department of Ethics, Trade, Human Rights and Health Law and the Department of Epidemic and Pandemic Alert and Response, World

[3] American Nurses Association (2008). *Adapting Standards of Care Under Extreme Conditions Guidance for Professionals During Disasters, Pandemics, and Other Extreme Emergencies*. Center for Health Policy, Columbia University School of Nursing

- Of those who become ill with the new strain of influenza, approximately 50% will seek outpatient medical care.

- In an infected community, a pandemic outbreak will last about six to eight weeks. At least two pandemic disease waves are likely. Neither the seasonality of a pandemic nor the interval between disease waves can be predicted with certainty.

- Estimates are based on extrapolation from past influenza pandemics in the United States using Colorado-specific census data in the Centers for Disease Control and Prevention's (CDC) FluAid 2.0 software.

Table 1 – Colorado Illness, Healthcare Utilization, and Death Estimates

Estimated number of Illness, Healthcare Utilization, and Death associated with Moderate and Severe Pandemic Influenza Scenarios in Colorado			
2007 Estimated U.S. Population[4] = 301,621,157 **2007 Estimated Colorado Population[4] =** 4,861,515 **Colorado Percentage of U.S. Population =** 1.61%			
Characteristic	**Moderate (1958/68)**	**Severe (1918)**	**Assumptions**
Illness	1,458,455	1,458,455	30% of Colorado population becomes ill
Outpatient Medical Care	729,227	729,227	50% of ill persons seek outpatient care
Hospitalization	14,584	160,430	1-11% of ill persons require hospitalization
ICU Care	1,458	23,335	0.1-1.6% of ill persons require ICU care
Mechanical Ventilation	1,021	11,668	0.07-0.8% of ill persons require ventilation
Deaths	2,917	30,628	0.2-2.1% of ill persons die

**Estimates based on extrapolation from past pandemics in the United States. Note that these estimates do not include the potential impact of interventions not available during the 20th century pandemics.

- Risk groups for severe and fatal infections cannot be predicted with certainty. During annual fall and winter influenza season, infants and the elderly, persons with chronic illnesses and pregnant women are usually at higher risk of complications from influenza infections. In contrast, in the 1918 pandemic, most deaths occurred among young, previously healthy adults.

- Pandemic influenza or, as Severe Acute Respiratory Syndrome (SARS) demonstrated, any catastrophic outbreak of infectious disease, will have profound effects on the availability and delivery of health care services and the functioning of health care institutions.

- Financially challenged and minority cultural groups that may have difficulty accessing healthcare may be at increased risk.

- Based on the above extrapolation for a severe pandemic, Colorado deaths are estimated to be approximately 30,000. It is assumed that a pandemic will occur in 2 waves lasting 6 – 8 weeks each. If the number of Colorado deaths is spread out over 2 waves of 8 weeks each, Colorado

[4] U.S. Census Bureau American FactFinder: http://factfinder.census.gov

can expect to see approximately 347 deaths per day. This estimate includes 80 deaths per day that Colorado typically experiences. As a direct calculation, this estimate does not take into account traditional epidemiologic bell curves seen in disease outbreaks. Therefore, this number will likely be smaller at the onset of the wave, rise steeply at the peak and decrease at the end of the wave. This cycle will likely repeat with the second wave.

- The typical incubation period (interval between infection and onset of symptoms) for influenza is two days. It is assumed that this would be the same for a novel strain that is transmitted between people by respiratory secretions. Patients may be infectious before the onset of symptoms.

- Outbreaks can be expected to occur simultaneously throughout much of the U.S., likely preventing shifts in human and material resources that are usually available in response to other disasters.

- Healthcare workers, public health workers, and other traditional first responders (e.g., law enforcement and firefighters) will be at higher risk of exposure and illness than the general population, further straining the pandemic response.

- Laboratory confirmation for pandemic influenza will occur only at the beginning of a pandemic until it is determined that pandemic influenza has entered a community. After this, syndromic surveillance (collecting and analyzing statistical health-related data to signal disease trends) will be employed.

- It is expected that telephone systems will be operable during a pandemic and that the healthcare delivery system will become overwhelmed from increased patient demands and staffing shortages. Medical call centers using telephone triage guidelines will be able to support many of those with illness by employing home management and self-care strategies whenever appropriate.

Communication

In the event of a pandemic, CDPHE will work to gather information that provides decision makers with as complete a picture as possible of events occurring in the community. A Joint Information System made up of Public Information Officers from public health, emergency management, behavioral health and others will be established to ensure that messages to the public are timely, accurate and consistent across the state. Information messages to partners and the public will be tailored to the intended audience and provided quickly using a variety of communication methods. CDPHE will consult with behavior health professionals in crafting public information messages in an effort to reduce overreactions such as panic and to increase adherence to disease control measures through balanced messaging. It will be crucial to provide accurate and compelling advice to the public that will keep themselves and their family safe and healthy during a pandemic. This advice will focus on key actions the public can take: maintaining physical distance from others, staying home while sick, avoiding sick people, covering your cough, washing your hands often, staying away from hospitals unless absolutely necessary as the likelihood of exposure is increased, not stockpiling antivirals or requesting prescriptions unless very ill. A sample draft news release to help provide

timely information to all audiences in the event of an influenza pandemic can be found in Appendix 1. The following methods will be used to communicate with:

Health care providers, public health, emergency management, first responders and other partners:

- Colorado Health Alert Network messages
- Colorado Situational Awareness Tool (SATool) www.satool.org
- EMSystem web-based system
- HCStandard web-based system
- WebEOC web-based system

The general public:

- News releases to statewide media outlets
- CDPHE website and "E-Updates" at www.cdphe.state.co.us
- Press conferences and interviews as appropriate with public health officials
- Colorado Health Emergency Line for Public Information (COHELP): 1-877-462-2911
- United Way 2-1-1
- Colorado Department of Transportation electronic bulletin boards
- Public service announcements
- Emergency Broadcast System (via television)
- Reverse 9-1-1
- Blogs and social networking sites (e.g. MySpace, FaceBook, Twitter, etc.)

Legal Issues and Authority

Coordination of any response during a public health emergency is contingent upon having sufficient legal authority to adequately address the varying needs of the affected community. Pursuant to Colorado Revised Statute (C.R.S.) §25-1.5-102(1)(b), the Colorado General Assembly has tasked CDPHE with the duty "to investigate and monitor the spread of disease that is considered part of an emergency epidemic as defined in section C.R.S. §24-32-2103(1.7), to determine the extent of environmental contamination resulting from the emergency epidemic, and to rapidly provide epidemiological and environmental information to the Governor's Expert Emergency Epidemic Response Committee (GEEERC), created in section C.R.S. §24-32-2104(8), C.R.S." CDPHE exercises this power, in conjunction with the local public health agencies at the county level, to assess the public health risk created by the emergency event and determine the appropriate response. Coordination with the public health authorities will help ensure consistency with other response measures and prevent losing the public's confidence due to receipt of potentially conflicting information.

During a pandemic event, the medical community will likely be reacting to scenarios not contemplated by current licensing requirements and standards of care. Because there is no way to predict with absolute certainty what a pandemic will entail, healthcare practitioners responding to the emergency will need the flexibility to alter their practices to meet the demands created by the emergency. While medical standards of care in Colorado are community-specific and not set forth in any statute or rule, statutes pertaining to the various healthcare professions make it unlawful and/or grounds for discipline by the appropriate regulatory board for the licensee to fail to meet generally accepted standards of practice. Additionally, the liability associated with a breach of such standard is codified in the Health Care Availability Act, C.R.S. 13-64-101 et seq. While critical standards concerning worker and

patient safety, including appropriate infection control precautions, must be maintained to ensure that medical care is provided during an emergency event; it may be necessary to alter the standard regulatory framework in the areas of standards of care, civil and criminal liability, and confidentiality requirements for patient records. Furthermore, some elective procedures may need to be suspended in order to devote the necessary medical resources to meeting the needs of those impacted by the emergency event.

Authority

The governor has the authority pursuant to the Colorado Disaster Act ("Disaster Act"), C.R.S. § 24-32-2101 et seq, to declare a disaster emergency when he determines that a disaster has occurred or that such a disaster or the threat thereof is imminent. C.R.S. §24-32-3104(4). Declared disasters last for no more than thirty (30) days, unless renewed by the governor, or until the emergency condition no longer exists and the governor terminates the state of emergency by executive order or proclamation. Declaration of a disaster emergency activates the disaster response and recovery aspects of the state, local and inter-jurisdictional disaster emergency plans in the areas in question. The Disaster Act provides the governor with broad powers during the state of emergency, including the ability to "suspend the provisions of any regulatory statute prescribing the procedures for conduct of state business or the orders, rules, or regulations of any state agency, if strict compliance with the provisions of any statute, order, rule, or regulation would in any way prevent, hinder, or delay necessary action in coping with the emergency." C.R.S. § 24-32-2104(7). The Disaster Act also establishes the GEEERC, which advises the governor with respect to possible measures to implement during an emergency, including but not limited to "ordering physicians and hospitals to transfer or cease admission of patients or perform medical examinations of persons." C.R.S. § 24-32-2104(8)(e).

In recognition of its responsibilities should a disaster emergency be declared, the GEEERC has prepared several draft executive orders for the governor's potential use during a public health emergency. It must be noted that while the governor's powers pursuant to the Disaster Act are broad, the governor does not have the authority to modify or waive federal law; thus, any executive orders addressing altered standards concerning federal law do not provide an absolute shield from any federal tort claims. These executive orders contemplate altering standards in the following areas: compliance with federal requirements such as Emergency Medical Treatment and Active Labor Act (EMTALA); acquisition and dispensing of medications including antivirals; suspension of licensure standards; isolation, quarantine, and social distancing authority; transferring mentally ill patients and suspension of death certificates and burial practices. A complete list of the GEEERC Draft Executive Orders can be found in the CDPHE Pandemic Influenza Plan[5]. Other executive orders that could be drafted in anticipation of a pandemic event include:

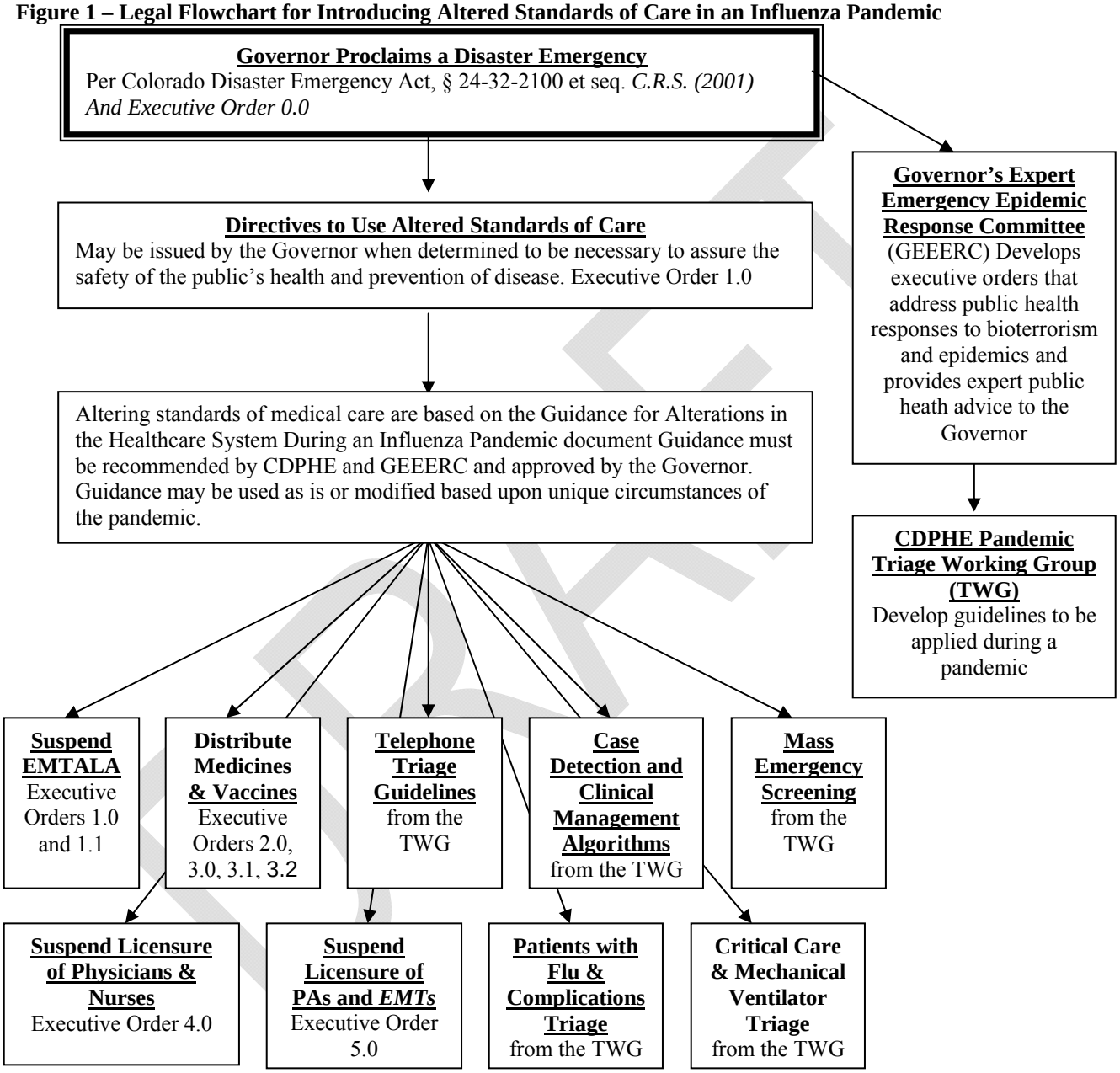
- Allowing for the operation of alternate care facilities
- Modifying patient/nurse ratios
- Altering childcare standards (e.g. caregiver/child ratios or emergency caregiver provisions)
- Allowing medical staff to prescribe medications to patients with whom they do not have a professional relationship

If it is determined that existing orders, rules or regulations are hindering response to the pandemic or if guidance issued in this document needs to be implemented, CDPHE will convene the Governor's Expert Emergency Epidemic Response Committee (GEEERC) to determine the most prudent course

[5] CDPHE Pandemic Influenza Plan, Attachment 3 – GEEERC Draft Executive Orders. http://www.cdphe.state.co.us/epr/Public/InternalResponsePlan/Attachment3.pdf

of action to take. An executive order detailing the current circumstances, the order, rule or regulation to be modified, who or what is affected and the duration the order is in effect will be drafted and sent to the Governor's Office for approval and signature. Once approved, CDPHE will make the information of the executive order available to healthcare workers, the media and the public.

Figure 1 – Legal Flowchart for Introducing Altered Standards of Care in an Influenza Pandemic



Additionally, the federal government may play a role in altering certain standards during an emergency event. The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 ("Bioterrorism Preparedness Act") allow federal authorities to waive or modify certain state and federal laws during a federally declared emergency event. For example, EMTALA requires hospitals to stabilize any patient who presents for treatment prior to transfer. The Centers for Medicare and Medicaid Services (CMS) within the U.S. Department of Health and Human Services (HHS) issued guidance in December 2007 concerning waivers of sanctions for EMTALA violations in hospitals located within areas covered by a public health emergency declaration. The declaration must be made by both the president, pursuant to the National Emergencies Act or the Stafford Disaster Relief and Emergency Assistance Act, and the Secretary of HHS pursuant to Section 319 of the Public Health Service Act. Thus, while the statute remains unchanged, HHS has expressed its intent to not enforce its requirements during a federally declared emergency. The governor may request a non-enforcement waiver of additional key federal regulations and rules. A draft letter will be prepared to speed its issuance when an emergency situation arises.

Liability

Responders to emergency events have expressed concerns with respect to liability issues. The legal concept of liability applies when a public health worker or a volunteer injures someone in the course of performing public health actions. Responders to public health emergency events may receive some form of immunity from state liability in three different ways. First, state law provides protection for a "Good Samaritan", meaning a person who in good faith renders emergency assistance without compensation at the place of an emergency or accident. C.R.S. § 13-21-108. Thus, those who spontaneously respond to an emergency event and render care at the scene should be protected from state liability, unless the acts or omissions of the responder were grossly negligent or willful and wanton.

Second, the Colorado Governmental Immunity Act (CGIA) provides liability protection for state and local government employees concerning claims based on state law. C.R.S. § 24-10-103(4)(a) includes in the definition of public employee "authorized volunteer", meaning "a person who performs an act for the benefit of a public entity at the request of and subject to the control of such public entity." Arguably, a volunteer registered in the state's volunteer registration system, operating under the direction and control of a public entity, could be considered a public employee. Public employees are not liable for injuries arising out of an act or omission occurring during the performance of the employee's duties and within the scope of employment, unless the act or omission is willful or wanton. C.R.S. 24-10-105. A public entity is immune from liability in all claims for injury that lies in tort, with certain exceptions specifically set forth in the CGIA. C.R.S. § 24-10-106. The exceptions to immunity which might apply to public health activity would be: (a) the operation of a motor vehicle, owned or leased by the public entity, by a public employee while in the course of employment (except emergency vehicles operated in certain circumstances) and (b) the operation of a public hospital. C.R.S. § 24-10-106(1)(a) and (b). In these situations, the public entity might be liable for the acts of the employee. In sum, state and local public health employees, which include authorized volunteers, are not personally liable for actions they take within the scope of their employment to meet a public health event, unless the act causing injury is willful and wanton.

A third possibility for liability protection is found in the Colorado Disaster Emergency Act of 1992 ("Disaster Act"). When the Governor issues executive orders directing measures to combat an emergency epidemic, the Disaster Act provides immunity from civil liability for "public health care workers" who completely comply in good faith with the executive orders. C.R.S. § 24-32-2111.5(2).

The Disaster Act also provides that a "hospital, physician, health insurer or managed health care organization, health care provider, public health care worker, or emergency medical services provider" who completely complies in good faith with executive orders issued to combat an emergency epidemic shall be immune from civil liability. C.R.S. § 24-32-2111.5(2). Thus, those practitioners acting at the direction of the state and in compliance with the executive order(s) should be immune from liability.

Workers Compensation

Workers compensation applies when the public health worker or volunteer is injured while performing public health duties. The Colorado Workers Compensation Act ("Compensation Act") defines "employee" to include, "Every person in the service of the state, or of any county, city, town, or … of any public institution or administrative board thereof under any appointment per contract for hire, express of implied…." C.R.S. § 8-40-202(1)(a)(I)(A). In general, the Compensation Act requires employers to provide coverage for injuries that occur within the scope of employment, which would include any injury suffered in the course of performing actions to meet a public health event. The Compensation Act does not explicitly require public employers to cover volunteers, although the Act does include volunteer disaster teams, volunteer ambulance teams and groups as "employees" under the Act. See C.R.S. § 8-40-202(1)(a)(I)(A) and (1)(b).

Workers compensation coverage is in effect for public employees who perform duties within the scope and course of their employment during the disaster. State statute provides healthcare volunteers with state workers compensation benefits, if appropriated, in disasters to a "physician, healthcare provider, public health worker, or emergency medical service provider who is ordered by the Governor or a member of the disaster emergency forces of this state to provide specific medical or public health services during or related to an emergency epidemic and who complies with such an order without pay or other consideration." C.R.S. § 24-32-2202(3).

Privacy & Individual Liberty

During an emergency event, altered standards may also be necessary concerning privacy requirements and individual liberties. With respect to privacy, for example, the Health Insurance Portability and Accountability Act of 1996 (HIPAA) Privacy Rule, 45 C.F.R. Part 164, protects confidential patient information by requiring strict adherence to rules concerning when release of patient information is appropriate. HIPAA allows for the release of protected health information in certain circumstances, generally related to treatment, payment, or health care operations. While CDPHE is not a covered entity, and is authorized to receive protected health information as a public health authority, those submitting information that are covered entities must comply with HIPAA's mandates. Acknowledging that during an emergency event, strict compliance with federal privacy requirements may not be possible prior to the necessity to share confidential patient information, the federal government demonstrated during Hurricane Katrina that it may exercise enforcement discretion if the HIPAA requirements were met "as soon as practicable," rather than prior to the disclosure. See Office of Civil Rights, Department of Health and Human Services, Hurricane Katrina Bulletin #2: HIPAA Privacy Compliance Guidance and Enforcement Statement for Activities in Response to Hurricane Katrina.

Traditional liberty interests may also be modified in deference to the need to abate harm during the emergency event. Any decisions to impede upon the community's liberties should be proportional to the need to protect the public's health and should not exceed what is necessary to address the actual level of risk to or critical needs of the community. A common example of restraint against one's liberty is the closing of public gathering places, i.e., social distancing, in an effort to stop the spread of

disease. The need to take this step must be measured against what other negative outcomes might occur solely based upon the closure.

Emergency Medical Technician Deviation from Scope of Practice[6]

Emergency Medical Services (EMS) Medical Directors and certified Emergency Medical Technicians (EMT) are governed by the Colorado Board of Medical Examiners Rule 500, which defines the duties and responsibilities of EMS Medical Directors and the Authorized Medical Acts (Acts Allowed) of EMTs. Currently, all levels of EMTs must work under the authorization and supervision of an EMS medical director and each level of EMT may only perform emergency medical acts within their scope of practice as defined by the Rule 500 Acts Allowed and administer medications as defined in the Rule 500 Medication Formulary.

During a pandemic event, EMS providers may need to legally deviate from their established, day-to-day treatment procedures and protocols. For example, EMS providers may need to administer vaccines or anti-viral medications. Currently, under Rule 500, only EMT-Is and EMT-Ps are allowed to administer public health related vaccines or medications. There are many communities throughout Colorado where EMS is provided solely by first responders and EMT-Basics. Therefore, there is likely to be the need in many communities throughout Colorado, for EMT-Basics to be allowed to give vaccinations or administer anti-viral medications.

There currently is a GEEERC draft Executive Order that the Governor could sign into effect at the time of a pandemic or other public health emergency that will allow any Colorado certified EMT or Nationally Registered EMT from another state to practice outside Rule 500 as long as directed by a licensed Colorado physician.

Colorado Medical Resources

CDPHE used existing information to estimate the number of healthcare workers and medical facilities as well as EMS personnel and transport agencies currently available in the state. In June 2003, Executive Order D013 03 was issued and mandated that all state agencies with the responsibility for the public's safety adopt the Governor's All-Hazards Emergency Management Regions for the purposes of emergency management and response. All sixty-four of Colorado's counties were divided into 9 regions: North Central, Northeast, Northwest, San Luis Valley, South, South Central, Southeast, Southwest and West. See Figure 1.0 below. The one exception to this is EMS personnel and transport agencies follow the Regional Emergency Medical and Trauma Advisory Council (RETAC) regions. See Figure 2 below. To keep in line with current planning regions, healthcare workers and medical facilities were organized per the Governor's All-Hazards Emergency Management Regions and EMS personnel and transport agencies are organized by RETAC regions.

[6] See *Pandemic Influenza Planning Guidelines for Colorado EMS*, a document of the Emergency Medical and Trauma Services Section of the Colorado Department of Public Health and Environment

Figure 2 – Colorado All Hazards Emergency Management Regions

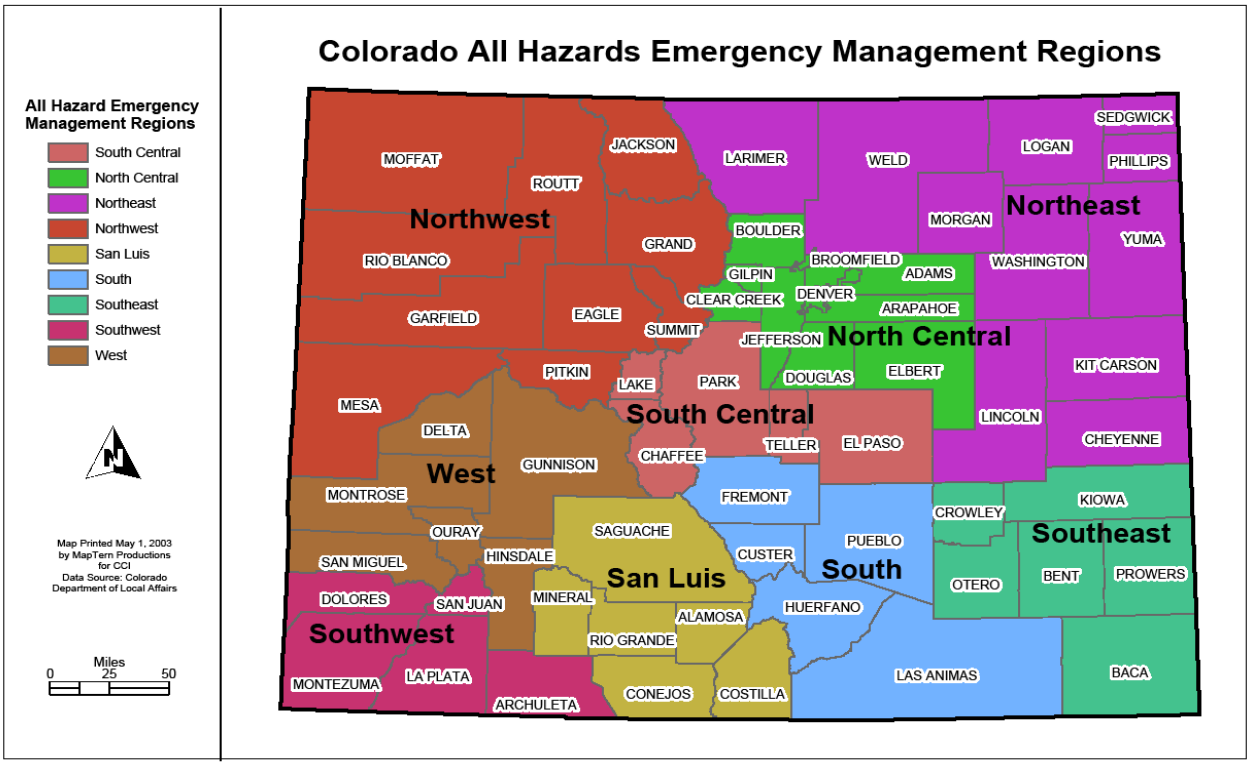
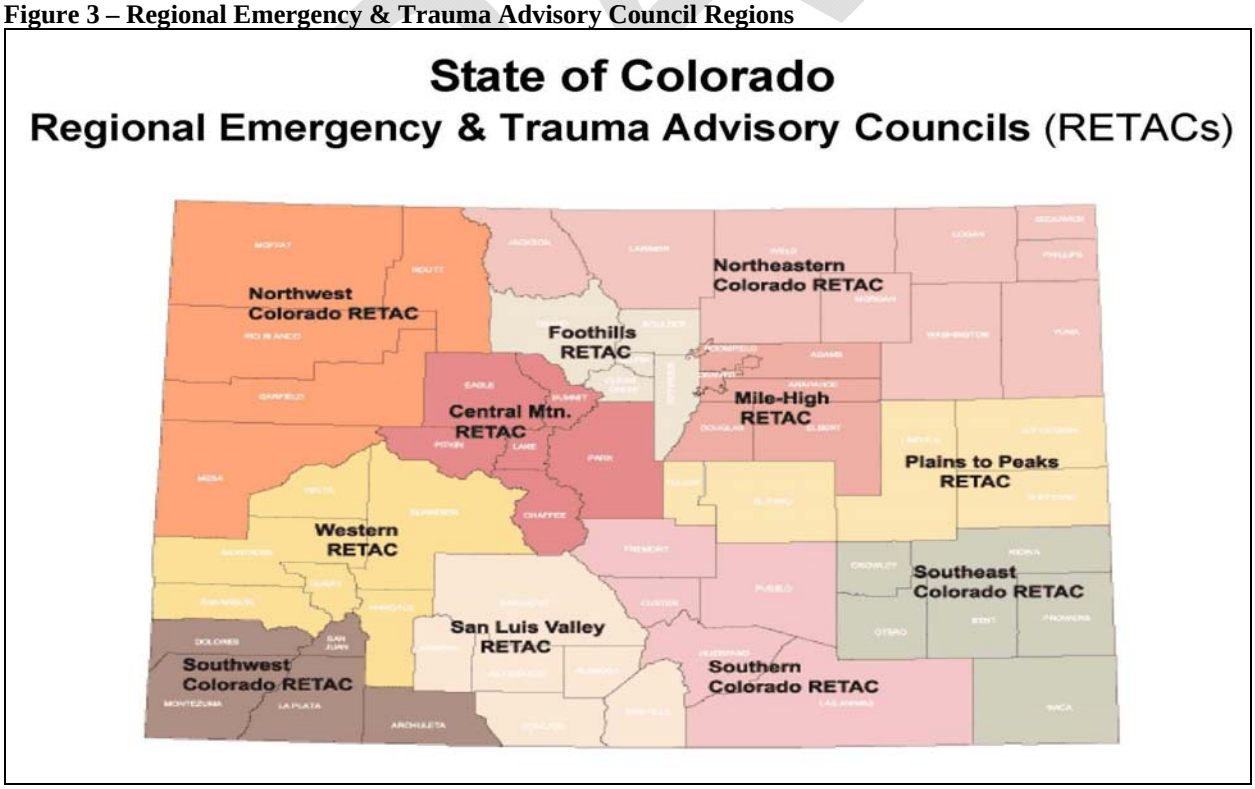


Figure 3 – Regional Emergency & Trauma Advisory Council Regions



Medical Personnel

CDPHE estimated the numbers of healthcare workers using available databases maintained by the Colorado Department of Regulatory Affairs (DORA) for various healthcare licenses. The DORA Division of Registrations is responsible for the licensing boards and programs that have been created by the Colorado Legislature to ensure a minimal level of competence of licensees and to protect the public. As of June 2008, there are approximately 130,000 active licensed healthcare workers in Colorado. The complete tables of active licensed and retired healthcare workers can be found in Appendix 2.

- Medical Practitioner: Physician, Foreign Teaching Physician, Physician in Training, Dentist, Veterinarian
- Mid-level Provider[7]: Physician Assistant, Advanced Practice Nurse with prescriptive authority (including nurse practitioner; clinical nurse specialist; certified nurse midwife; certified registered nurse anesthetist)
- Nursing: Registered Nurse, Licensed Practical Nurse and Certified Nurse Aide
- Pharmacy: Pharmacist and Pharmacist Intern
- Psychological Practitioners: Psychologist, Licensed Professional Counselor, Provisional Licensed Professional Counselor, Licensed Social Worker, Provisional Social Worker, and Marriage Family Therapist
- Respiratory Care Therapists
- Other: Chiropractor, Physical Therapist, and Psychiatric Technologist – Developmental Disabilities

Emergency Medical Service Transport

As of July 2008, there are over 15,000 emergency medical technicians based on information from the CDPHE's Colorado Emergency Medical Services Information System. Data collected includes all EMS Medical Directors currently registered with the Emergency Medical and Trauma Services (EMTS) Section of the CDPHE, all registered EMS ground transport agencies, and all Emergency Medical Technicians (EMT) currently certified by the state which include the following levels: Emergency Medical Technician-Basic (EMT-B), Emergency Medical Technician-Intermediate (EMT-I), Emergency Medical Technician-Paramedic (EMT-P). Number of EMS personnel and transport agencies by RETAC region is provided in Appendix 3.

Volunteers

The use of volunteers (both medical and lay) may be required in all settings of patient care. CDPHE would coordinate public health and medical volunteers at the state but this role could also be filled at the local level by local public health or local emergency management for their jurisdiction. CDPHE's Colorado Volunteer Mobilizer (CVM) for Medical and Public Health will be activated to recruit public health and medical volunteers: *https://covolunteers.state.co.us/*. These volunteers will receive notifications through the CVM that their assistance is needed, where and what time to show up, required identification and any items they need to bring with them. Expedient credentialing of spontaneous volunteers may be required based on circumstances. Guidance for how to manage spontaneous volunteers will be provided at the state level but would have to be implemented locally. The Colorado Volunteer Mobilizer will also include lay volunteers for deployment upon request locally, regionally and statewide as needed either by local jurisdictions or by request through the state office of emergency management.

[7] Mid-level providers require supervision or a physician collaborating agreement in order to practice medicine: one physician can supervise two physician assistants and/or one physician collaborative agreement can cover five advanced practice nurses.

Medical Facilities and Services

The total numbers of licensed medical facilities were calculated based on information from the Health Facilities Division at the Colorado Department of Public Health and Environment. Licensed facilities were categorized by similar capabilities and capacity. Numbers of hospital beds by trauma level, maximum numbers of licensed beds in extended care facilities (assisted living residences, nursing homes, community residential homes, and intermediate care facilities for developmentally and mentally disabled) as well as the numbers of beds in mental health hospitals and residential treatment centers were also tabulated. The complete table for all licensed healthcare facilities and beds can be found in Appendix 4. Medical facilities and services were categorized by type and include the following subcategories:

- Hospitals: All trauma levels
- Extended Care Facilities: Assisted Living Residences, Nursing Homes, Hospices, Assisted Living Residences for Mentally Ill, Community Residential Homes for Developmental Disabilities and Intermediate Care Facilities for the Mentally Disabled
- Physician Offices/Outpatient Clinics: Physicians' Offices, Community Clinics and Emergency Centers, Colorado Rural Health Center clinics, Kaiser Permanente Clinics, and Rehabilitation and Physical Therapy Outpatient Centers.
- Ambulatory Surgical Centers: Elective Surgical Centers or Orthopedic Surgical Centers
- Behavioral Health Facilities: Mental Health Centers, Community Mental Health Specialty Clinics, Mental Health Hospitals, and Residential Treatment Centers.
- End Stage Renal Disease Clinics: Treatment and Dialysis Centers
- Medical Services: Home Health Agencies and Personal Service Agencies

Transferring Inpatient Psychiatric Clients

In 2003, the Colorado Inpatient Psychiatric Incident Command Center (IPICC) was created at Ft. Logan in order to facilitate the transfer of hospital psychiatric clients to other hospitals during times of emergency. The activation of the IPICC requires a Governor's Executive Order. During a pandemic flu, the IPICC could be activated to transfer medically cleared psychiatric clients to the Colorado Mental Health Institutes (Ft. Logan or Pueblo) or any other psychiatric hospital or facility within Colorado. This is a facilitation role only. The IPICC does not assume responsibility for client safety, transportation or associated costs.

Standardized Hospital Bed Definitions

Bed definitions currently in use vary among systems and even among hospitals. This poses a challenge for organizations needing to track bed availability during a public health emergency. Standardized hospital bed definitions provide uniform terminology so hospital systems and emergency responders seeking beds are speaking the same language. To address this, federally mandated, standardized definitions have been developed by the Agency for Healthcare Research and Quality (AHRQ)[8] for the U.S. Department of Health and Human Services – Health Resources and Services Administration. A complete list of bed definitions is provided in Appendix 5.

[8] *AHRQ Releases Standardized Hospital Bed Definitions to Aid Katrina Responders*. September 2005. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/research/havbed/definitions.htm

Triage Guidance

This section details the overall process of altering standards of care during an influenza pandemic. In a global sense, this means shifting from individual care to population-based care to save the most lives, utilizing non-traditional facilities to provide medical care, prioritizing usage of scarce resources, utilizing non-medical staff to perform limited medical functions or utilizing medical staff outside of their scope of practice in order to respond to the pandemic. The following guidance is not all encompassing and may need to be modified as more information becomes available. In general, the WHO Phases and HHS Stages will be used to facilitate decision-making.

Table 2 - Decision-making based on Phase/Stage and Severity of the Pandemic

WHO Pandemic Phase	HHS Pandemic Stage	Geographic Area Involved	Moderate Pandemic	Severe Pandemic
3 Rare human-to-human spread	**0** New animal outbreak overseas	Overseas	Routine/ On Alert	Routine/ On Alert
	1 Suspected human outbreak overseas	Overseas	Routine/ On Alert	Routine/ On Alert
4 Limited human-to-human spread	**2** Confirmed human outbreak overseas	Overseas	Routine/ On Alert	Routine/ On Alert
5 Larger clusters human-to-human spread				
6 Pandemic	**3** Widespread human outbreaks overseas	Overseas	Routine/ On Alert	Plan/ Readiness
	4 First human case in North America	North America	Plan/ Readiness	Implement
	5 Spread throughout United States	United States, Colorado	Implement	Sustain
	6 Recovery and Preparation for subsequent waves	United States, Colorado	Recover	Recover

**While the WHO Phases and HHS Stages appear linked in this table, they are independent rating systems. For example, if a pandemic began here in the United States, the HHS Stage would be 5, whereas the WHO Phase may only be a 4 or a 5.

- **Routine**: Normal operating processes
- **Alert**: Situational awareness and education
- **Plan Readiness**: Place all resources on stand-by for plan implementation
- **Implement**: Initiate plan
- **Sustain**: Keep operations going
- **Recovery**: Resume routine operations and replenish resources

Overview of the Routine Triage Process

For the purposes of this document, "Routine Influenza Triage" means normal day-to-day seasonal influenza patient triaging protocols and procedures as defined by a healthcare organization or practice. Modifications of the routine triage process may be necessary when available resources are inadequate for high volumes of patients. The basics of triaging involve a combination of assessment of a patient's prognosis with knowledge of the medical resources presently available for treatment. The triaging process sorts patients according to type and seriousness of injury or illness and likelihood of survival, and establishes treatment priorities to assure medical care of the greatest benefit to the largest number. Emergency departments routinely use this process in determining which patients are treated first and who has to wait.

In standard triage, patients are divided into four groups based on probability of outcome: 1) those who will not survive even with treatment or requiring care that outstrips the resources available; 2) those whose survival depends upon available treatment; 3) those who do not need immediate treatment but could benefit from treatment and 4) those who will survive without treatment. The available limited resources are generally concentrated on groups 2 and 3, with less intense care being given to groups 1 and 4. Those receiving limited care include people so severely ill or injured that the currently available resources are inadequate to help them, and people who will survive without receiving the scarce resources that are being allocated. The purpose of triage is to concentrate the use of scarce materials or staff on these middle groups so as to gain the most benefit out of the resources available for the most people.

Overview of the Pandemic Triage Process

For the purposes of this document, "Pandemic Triage" is defined as triage focused on maximizing the number of lives saved with limited medical resources and personnel during a pandemic. This process may be used when available resources are inadequate to meet the needs of all patients. As decisions on how to triage patients will be difficult in the traditional sense, a modified version of triaging will likely have to be employed in order to ration personnel and resources. The goal of altering the standard triage process is to evaluate patients and direct them to the most appropriate level of medical care when resources are limited. Social distancing, staying away from hospitals unless inpatient care is needed, personal protection and remaining home while ill will be encouraged and the provision of healthcare advice via phone will help limit disease spread. The CDPHE Chief Medical Officer would lead the coordination of altering the triage process overall with concurrence from the GEEERC and final approval falling to the Governor. A short pullout guide of the most critical information from the Triage Guidance is provided in Appendix 6.

- For the majority of influenza patients, supportive home care is adequate. Limiting the influx of these patients into health care facilities allows resources to be focused on seriously ill patients. This improves social distancing and potential infection of patients and health care workers.
- Chronically ill patients without acute exacerbations or illness may be cared for entirely by phone thus limiting their exposure to influenza.
- More ill patients will require medical assessment of complications from influenza that require treatment (such as dehydration or pneumonia). These situations can often be cared for at a non-hospital medical facility.
- Hospitals will be required to focus on the critically ill while maintaining their core functions (trauma or burn centers, cardiac care, pediatrics, etc.).

- Family members may be required to care for patients at home, in hospitals or alternate care facilities depending on staff shortages.
- Separate triage centers away from the normal hospital emergency department will be considered. These facilities would augment the phone triage systems to sort patients to the appropriate level of care. See Medical Facility Classification.

'Triggers' for Considering Activation of Pandemic Triage

The circumstances that may prompt altering routine influenza triage and medical standards of care will occur based on an assessment of several conditions and/or sources of information. Any decision made should be reasonable, reciprocal, appropriate and based on evidence, principles, and values that stakeholders can agree are relevant to meeting health needs during an influenza pandemic. Some possible reasons to activate pandemic triaging are:

- Formal declaration of emergency by institutional, local, regional, state or national authority;
- Loss of essential services, including electricity, water or the supply chain;
- Loss of infrastructure, including facilities, or electronic information;
- Numbers of patients in excess of planned healthcare facility capacity, or an exceptional surge in number and severity over a short period of time;
- Care provision in alternate care facilities;
- Marked increase in proportion of patients, who are critically ill, injured patients unlikely to survive (using Sequential Organ Failure Assessment scores or similar standard assessments) or other extreme patient conditions;
- Abnormally high percentage of hospitals reporting "On Divert" status on EMSystem over an extended period of time;
- Shortage of ventilators available as reported on HCStandard;
- Increase in influenza hospitalizations and deaths reported in the Colorado Electronic Disease Reporting System;
- Marked increase in school absenteeism reporting to local public health agencies or CDPHE; and/or
- Marked increase in business closure reporting through the Colorado Health Emergency Line for Public Information via phone and/or web.

Medical Facility Classification

In order to maximize medical facilities and personnel, the following classification system was developed to assist with triaging patients to facilities that are most suited to take care of the patients' medical needs. This is a non-certification, non-binding classification system for planning purposes only. Facilities were categorized by similar capabilities and capacity and include both licensed medical facilities as well as non-medical facilities. The complete table for all licensed healthcare facilities can be found in Appendix 4.

- **Level A –** Acute care hospitals: Inpatient services, emergency medical and surgical care, continuous nursing services, necessary ancillary services and must be available for the diagnosis and/or treatment of injury, illness, pregnancy or disability, clinical assessment, bed capacity, intravenous hydration, pharmacy, respiratory support – ventilator, cardiac monitoring, advanced cardiac life support.

- Hospitals: Categorized by trauma levels with number of licensed beds. The primary function will be to provide respiratory/ventilator and critical care for influenza patients. They will still need to take care of their regular serious non-influenza patients. The hospitals will increase their internal surge capacity by adding nonstandard beds and units.

- **Level B** – Existing medical facilities constructed and equipped for medical care. Examples are orthopedic or elective/ambulatory surgical centers. These *may* provide: nursing services, clinical assessment, overnight bed capacity, laboratory services, radiological services, intravenous hydration, limited pharmacy capability and oxygen capacity.
  - Extended Care Facilities/Skilled Nursing Facilities: These facilities generally have in-house healthcare personnel who will provide limited medical care. Residents will be treated and remain at the facility.
  - Community Clinics and Community Clinics with Emergency Centers: Comprehensive, community-based medical facilities which ordinarily provide preventive health services, primary care services, diagnostic and/or therapeutic outpatient services, and limited inpatient care.
  - Ambulatory Surgical Centers: These facilities perform outpatient surgical procedures that do not result in extensive blood loss, are life threatening, or involve major or prolonged invasion of body cavities. They may be used as birthing centers for low-risk deliveries, trauma patients with non-influenza illnesses and injuries or other special populations who need specific care away from patients with known influenza illness.

- **Level C –** Facilities such as primary care physicians' offices, rural/community health clinics and alternate care facilities that *may* provide: Basic nursing services, clinical assessment, bed capacity, intravenous hydration and limited pharmacy capability. Behavioral health facilities may have these capabilities but will focus on providing psychological services.

  - Physician Offices/Outpatient Clinics/Rural and Community Health Clinics: Patients assessed, provided with outpatient care, if appropriate, and sent home. Patients needing further care can be triaged to the above locations. Larger clinic systems may be capable of short-term treatment of non-critical patients.
  - Behavioral Health Facilities: Non-influenza patients requiring mental health care and/or acute substance abuse treatment will be referred here.
  - Alternate Care Facilities[9]: Improvised facilities that *may* provide: bed capacity, intravenous fluids, oral medications or analgesics. Few ACFs may be able to provide supplemental oxygen.
  - College/University Health Centers: College/university campus health centers serving the student population that *may* provide: Outpatient care, basic nursing services, clinical assessment, lab services, counseling, limited bed capacity, intravenous hydration, limited pharmacy capability. Students will be directed to stay on campus, go home or seek medical care elsewhere depending on their condition.

- **Level D** – Shelters with assisted self-care; non-medical facilities such as gymnasiums, schools, churches that *may* provide: basic first aid skills, food/water, hygiene facilities and/or analgesics.

[9] ACFs are defined as organized medical care in a non-hospital setting. ACFs are also called a number of other names including: Alternate Treatment Sites (ATS), Alternate Care Sites (ACS), Alternate Treatment Facility (ATF), Alternate Medical Treatment Sites (AMTS), Alternate Treatment Centers (ATC), Alternate Care Centers (ACC) and Temporary Alternative Healthcare Facilities (TAHCF).

- **Level E** – Pharmacies or Public Health Points of Dispensing; no medical services provided.
  - Public Health Point of Dispensing: Well persons will be referred here to receive influenza vaccinations, if available. Limited triaging will occur.
  - Pharmacies: Prescriptions called in for ill persons advised to remain at home.

- **Specialty –** Registered facilities and services that will continue their usual function.
  - End Stage Renal Disease (ESRD) Treatment Clinics: Will maintain their normal functions of providing dialysis or transplantation services. Attempts should be made to treat influenza and non-influenza patients separately.
  - Home Health Care: Will continue with their normal function but may become increasingly needed as more people become sick and either cannot or do not want to leave their homes or can not get access to medical care.
  - Birthing Centers: Will continue to provide care during delivery and immediately after delivery. Centers will continue emergency transfer of patients to hospitals as necessary.

Table 3 - Potential Care Sites and Facility Classification

Potential Care Sites	Facility Classification[10]
Home (phone)	N/A
Hospitals	A
Extended Care Facilities/Skilled Nursing Facilities	B
Ambulatory Surgical Centers	B
Community Clinics and Community Clinics with Emergency Centers	B
Outpatient Clinics/Physicians' Offices/ Rural and Community Health Clinics	C
Behavioral Health Clinics	C
Alternate Care Facilities	C
College/University Health Centers	C
Shelters	D
Public Health Points of Dispensing	E
Pharmacies	E

Antiviral Prioritization

Colorado will receive 677,699 10-day courses of Tamiflu and Relenza (80%/20% split) from the federal Strategic National Stockpile program in the event of a pandemic. This allotment is intended to treat all hospitalized flu patients; all healthcare worker, first responder and essential service workers with the flu who seek care; all high-risk patients with the flu who seek care; and provide at least eight weeks of continuous prophylaxis for all health-care workers taking care of influenza patients in Colorado. If it is determined that antivirals are effective against the pandemic strain, a more detailed prioritization scheme developed by CDPHE, with concurrence of the GEEERC, and approved by the

[10] 'Facilities by level' concept adapted from William Lockwood, MD, St. Mary's Hospital, Grand Junction, Colorado and the Mesa County ESF 8 Planning Committee's pandemic influenza triage protocols.

Governor will be utilized. The most current antiviral prioritization list is located in the CDPHE Pandemic Influenza Plan[11].

Case Detection and Clinical Management Triage (Adults and Pediatrics)

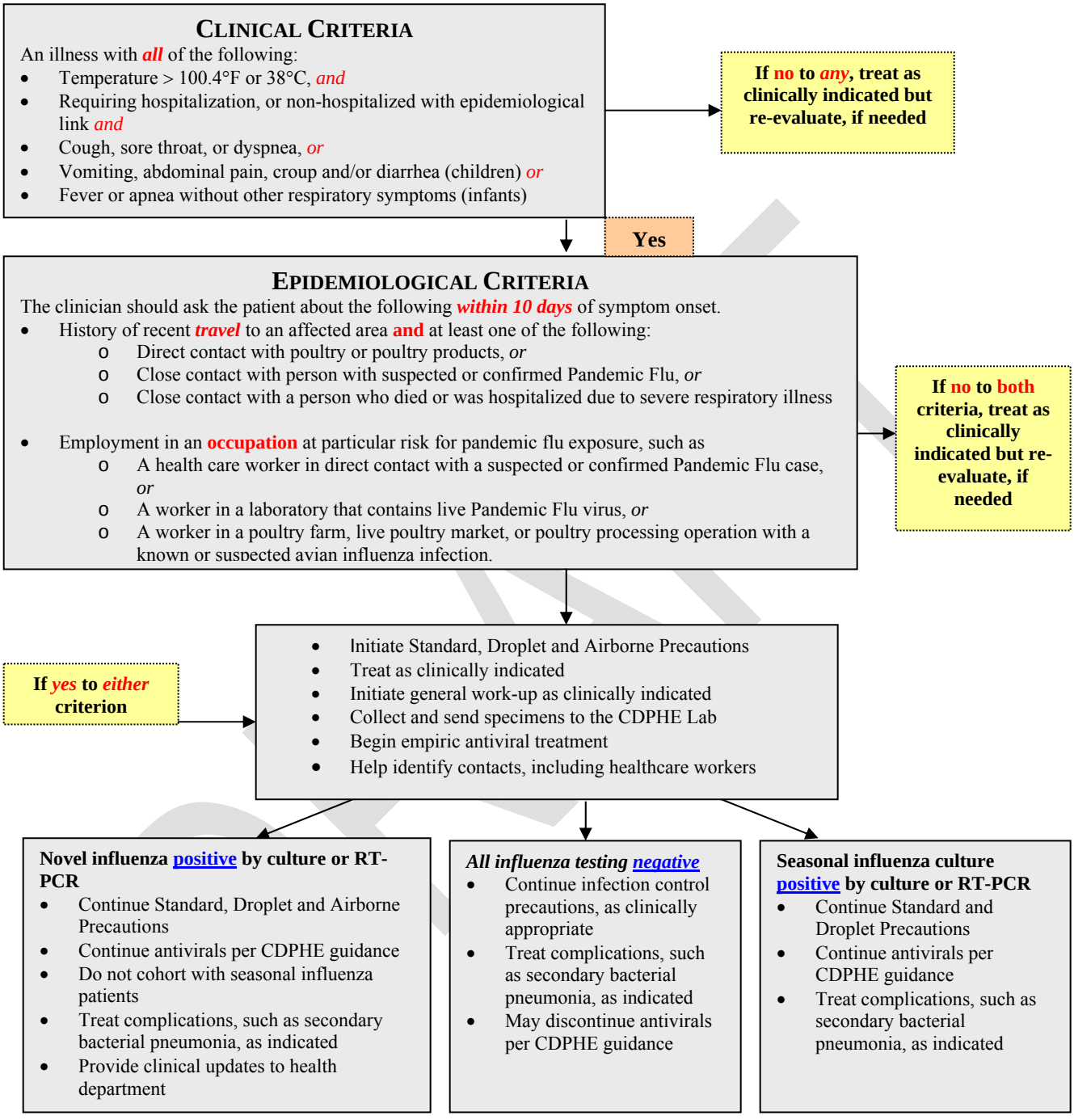
This section provides clinical procedures for the initial screening, assessment, and management of patients with suspected novel influenza during the Interpandemic and Pandemic Alert Periods and for patients with suspected pandemic influenza during the Pandemic Period. These algorithms were adapted from the U.S. Department of Health and Human Services (HHS) Pandemic Influenza Plan[12] and will be modified based on epidemiology, if needed.

- During the Interpandemic (Phases 1 and 2) and Pandemic Alert (Phase 3, 4 and 5) Periods, the likelihood of novel influenza A virus infection is low; therefore, early recognition of illness will rely on a combination of clinical and epidemiologic features. See Figure 3.
- During the Pandemic Period (Phase 6), diagnosis maybe more clinically oriented because the likelihood will be high that any severe febrile respiratory illness is pandemic influenza. See Figure 4.

This supplement is designed to serve as a guide for clinicians, with the understanding that the management of influenza is based primarily on sound clinical judgment regarding the individual patient as well as an assessment of locally available resources, such as rapid diagnostics, antiviral drugs, and hospital beds.

[11] CDPHE Pandemic Influenza Plan – Version 2, Attachment 5b: http://www.cdphe.state.co.us/epr/attachments.html
[12] Adapted from HHS Pandemic Influenza Plan, Supplement 5: Clinical Guidelines, November 2005.

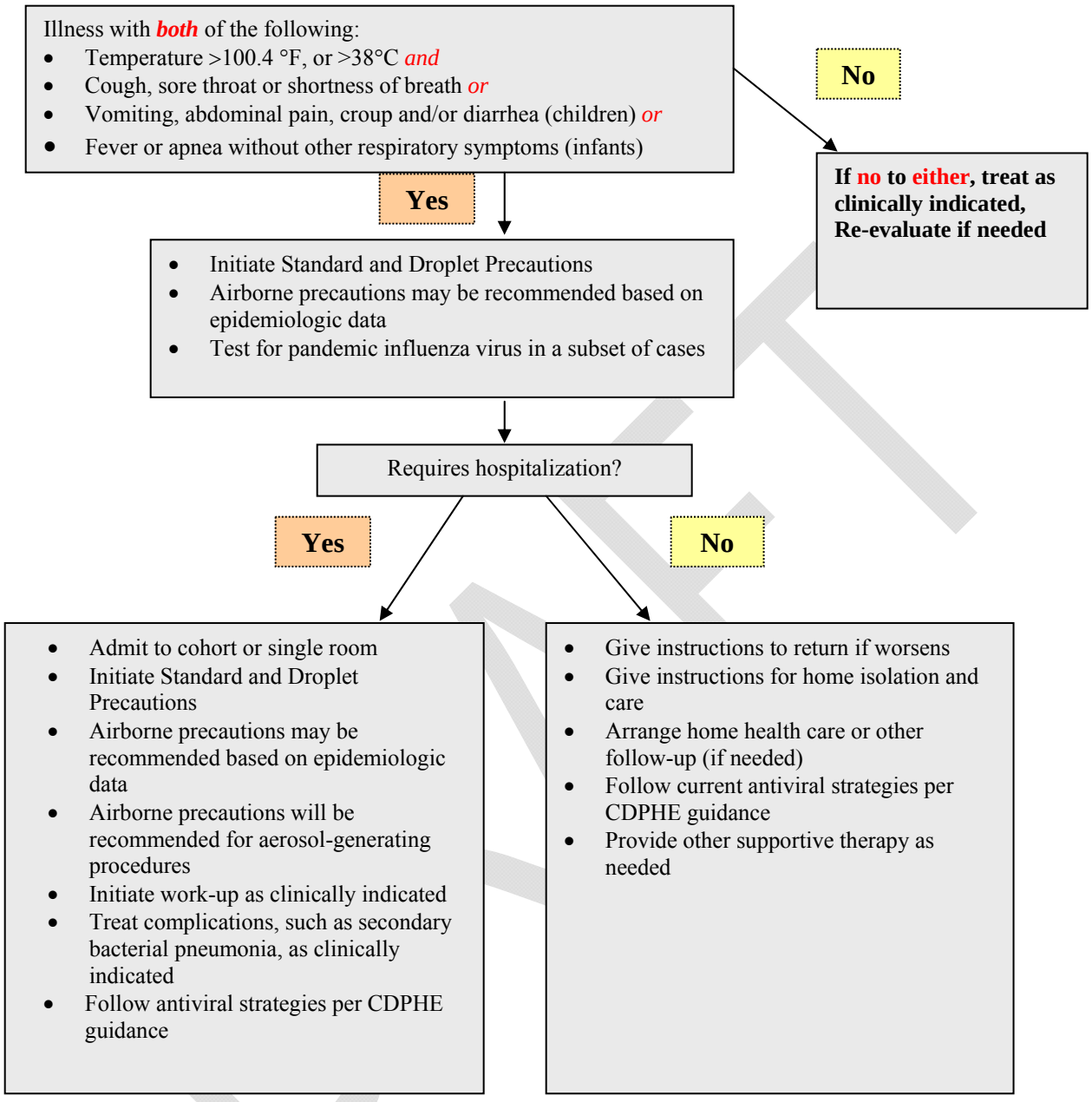
Figure 4: Case Detection & Clinical Management Algorithm for Pre-pandemic & Pandemic Alert Phases[13, 14]



[13] Adapted from HHS Pandemic Plan, Supplement 5: Clinical Guidelines, Figure 1 for footnotes. www.hhs.gov/pandemicflu/plan/sup5.html

[14] High-risk groups with atypical symptoms - Young children, elderly patients, patients in long-term care facilities, and persons with underlying chronic illnesses might not have typical influenza-like symptoms, such as fever. When such patients have a strong epidemiologic risk factor, novel influenza should be considered with almost any change in health status, even in the absence of typical clinical features. Conjunctivitis has been reported in patients with influenza A (H7N7) and (H7N3) infections. In young children, gastrointestinal manifestations such as vomiting and diarrhea might be present. Infants may present with fever or apnea alone, without other respiratory symptoms, and should be evaluated if there is an otherwise increased suspicion of novel influenza.

Figure 5: Case Detection & Clinical Management Algorithm for Pandemic Phase[15, 16]



[15] Adapted from HHS Pandemic Plan, Supplement 5: Clinical Guidelines, Figure 2 for footnotes. www.hhs.gov/pandemicflu/plan/sup5.html

[16] High-risk groups with atypical symptoms - Young children, elderly patients, patients in long-term care facilities, and persons with underlying chronic illnesses might not have typical influenza-like symptoms, such as fever. When such patients have a strong epidemiologic risk factor, novel influenza should be considered with almost any change in health status, even in the absence of typical clinical features. Conjunctivitis has been reported in patients with influenza A (H7N7) and (H7N3) infections. In young children, gastrointestinal manifestations such as vomiting and diarrhea might be present. Infants may present with fever or apnea alone, without other respiratory symptoms, and should be evaluated if there is an otherwise increased suspicion of novel influenza.

Telephone Triage (Adults and Pediatrics)

Health care delivery systems and health care providers need to consider how they would handle increased volumes of influenza patients, many of whom will not necessarily benefit from direct evaluations, in the face of increased demands on limited health care resources. The goal would be to reduce unnecessary hospital, clinic and physician office visits and to shift patients to home-management and self-care where deemed appropriate.

Due to the increased reliance on phone triage for providing medical advice during a pandemic, it may also be necessary to augment phone triage workforce with trained volunteers (under the direction of a lead medical staff member). Answers to Frequently Asked Questions will be provided by CDPHE and updated as often as necessary. Behavioral health staff or volunteers can also assist with the "worried well" and with those who are caring for patients with advanced symptoms "too sick" for hospital care.

Assumptions:

- During a pandemic, everyone with a cough or fever has pandemic influenza until proven otherwise
- Pandemic flu vaccine, when available, will be urged for most people
- More prescriptions will be called in to pharmacies.
- Wellness visits will be suspended
- No return visits for the same complaint unless complications occur (e.g., respiratory distress or dehydration).
- Once someone within a family unit is diagnosed with pandemic influenza, other members of the family will not need to be seen for pandemic influenza unless they develop complications.
- Facility will need separate entrances and waiting areas for those with/without influenza

This protocol is for pandemic triage via telephone only and applies to patients who call seeking medical advice or how to care for sick family members. In-person triage protocols can be found in the Guidelines for Mass Emergency Screening (Adults).

Call EMS (911) NOW for transport to a Level A Facility

- Severe respiratory distress (struggling for each breath, unable to speak or cry, severe retractions, cyanosis)
- Slow shallow, weak breathing (R/O respiratory depression)
- Stopped breathing (apneic episode)
- Bluish lips, tongue or face now (R/O cyanosis)
- Shock suspected (very weak, limp, not moving, too weak to stand, pale cool skin)
- Sounds like a life-threatening emergency to the triaging personnel (other than normal flu symptoms)

Refer to Level A or Level B Facility NOW

- **Hospital**:
  - Respiratory distress – mild or moderate (any wheezing, stridor or tachypnea)
  - Suspected pandemic influenza patients with chronic lung disease or heart disease

- **Community Clinics/Community Clinics with Emergency Centers:**
  - Dehydration suspected (no urine>12 hours, dry mouth, no tears)

- Needs emergent care based upon triaging personnel's clinical judgment
- **Ambulatory Surgical Center:**
  - In labor and low-risk pregnancy
  - Non-flu trauma
  - Other special populations who need specific care away from known influenza patients

Refer to Level C Facility NOW

- **Behavioral Health Clinic:**
  - Psych emergencies: potentially harmful to self or others, gravely disabled, panic reactions, hopelessness or depression, etc.

Refer to Level C Facility within 24 hours

- **Alternate Care Facility:** (will depend on the type of care provided)
  - Suspected influenza patients with severe coughs or suspected complications
- **Physicians' Office, Outpatient Clinic and Community/Rural Health Clinic:**
  - Patients normally seen here
  - Chronic disease patients with complications but without influenza
  - Acute illness visits (however, many will be handled by phone)

Refer to Level E facility within 24 hours

- **Public Health Point of Dispensing:**
  - Well patients who want an influenza vaccine, when available

Call in Prescription within 24 hours

- Suspected pandemic influenza patients in high-risk group[11]
- Chronic disease refills (e.g., asthma meds)
- Suspected ear infections
- Suspected sinus infections
- Eye infections with purulent (containing pus) eye discharge

Home Care with Telephone Triage and Advice

- Suspected influenza patients without complications and NOT in high-risk group[17]
- Most mild illnesses, acute phase
- Most acute minor injuries (trauma)
- Chronic disease management
- Mild dehydration

[17] Persons traditionally at high-risk for complications from influenza are those persons <2 years, >65 years, pregnant women, patients in long-term care facilities, persons (> 6 months to <18 years) who are receiving long-term aspirin therapy or persons with underlying chronic illnesses persons who required regular medical follow-up or hospitalization during the previous year because of chronic metabolic diseases, renal dysfunction, hemoglobinopathies, or immunosuppression. This definition will be assumed unless susceptibility to the pandemic strain proves otherwise.

EMS Resource-based Dispatch, Response, Transport and Destination Guidelines (Adult and Pediatrics)

During a pandemic, the caseload will not only be significantly increased but EMS resources (especially personnel) can become depleted, thus the amount of resources available can become significantly decreased. When the level of resource availability becomes significantly decreased, dispatch, response, transport and destination guidelines may need to be altered based on resources available.

Generally, when a patient contacts 9-1-1, they expect an ambulance to respond and to be transported to a hospital. However, during a pandemic, community containment strategies designed to limit the spread of the influenza virus may require no ambulance response and patients be referred to an appropriate center or an ambulance response with the patient being treated and released without transport. Both referral and "treat and release" alternatives are vital to maintain community mitigation strategies, such as social distancing and voluntary quarantine. Additionally, when healthcare facilities become overwhelmed with patients, it may be necessary to consider alternative options for patients who can be safely transported to an alternate care facility. Public information announcements may become necessary to educate the public regarding the necessity of EMS alternate destination and non-transport concepts. The following EMS Dispatch Guidelines consider three (3) levels of resource availability during a pandemic flu outbreak.

Figure 6 - EMS Resources Adequate during the Pandemic Phase

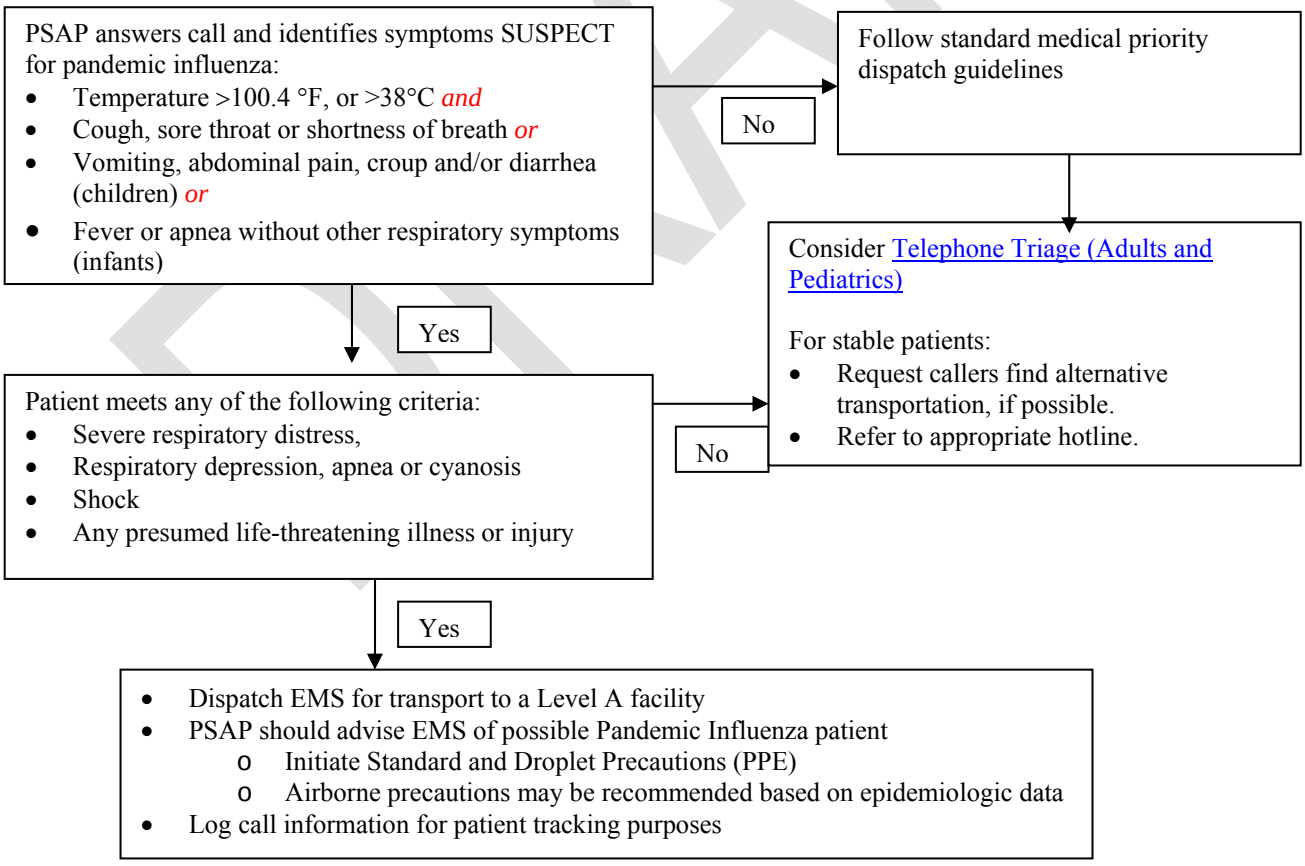


Figure 7 - Resources Inadequate during the Pandemic Phase - (Over capacity but not overwhelmed)

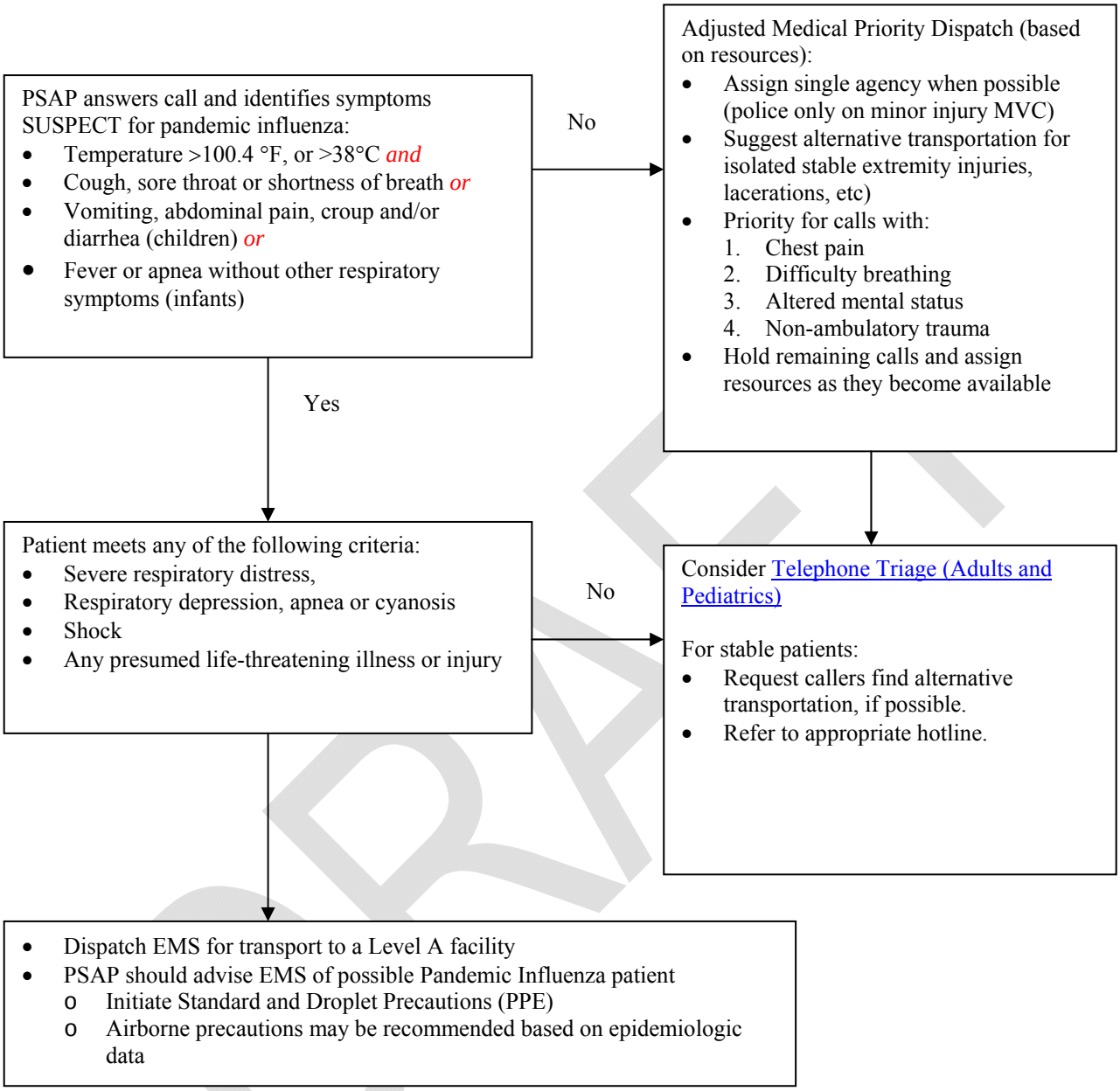
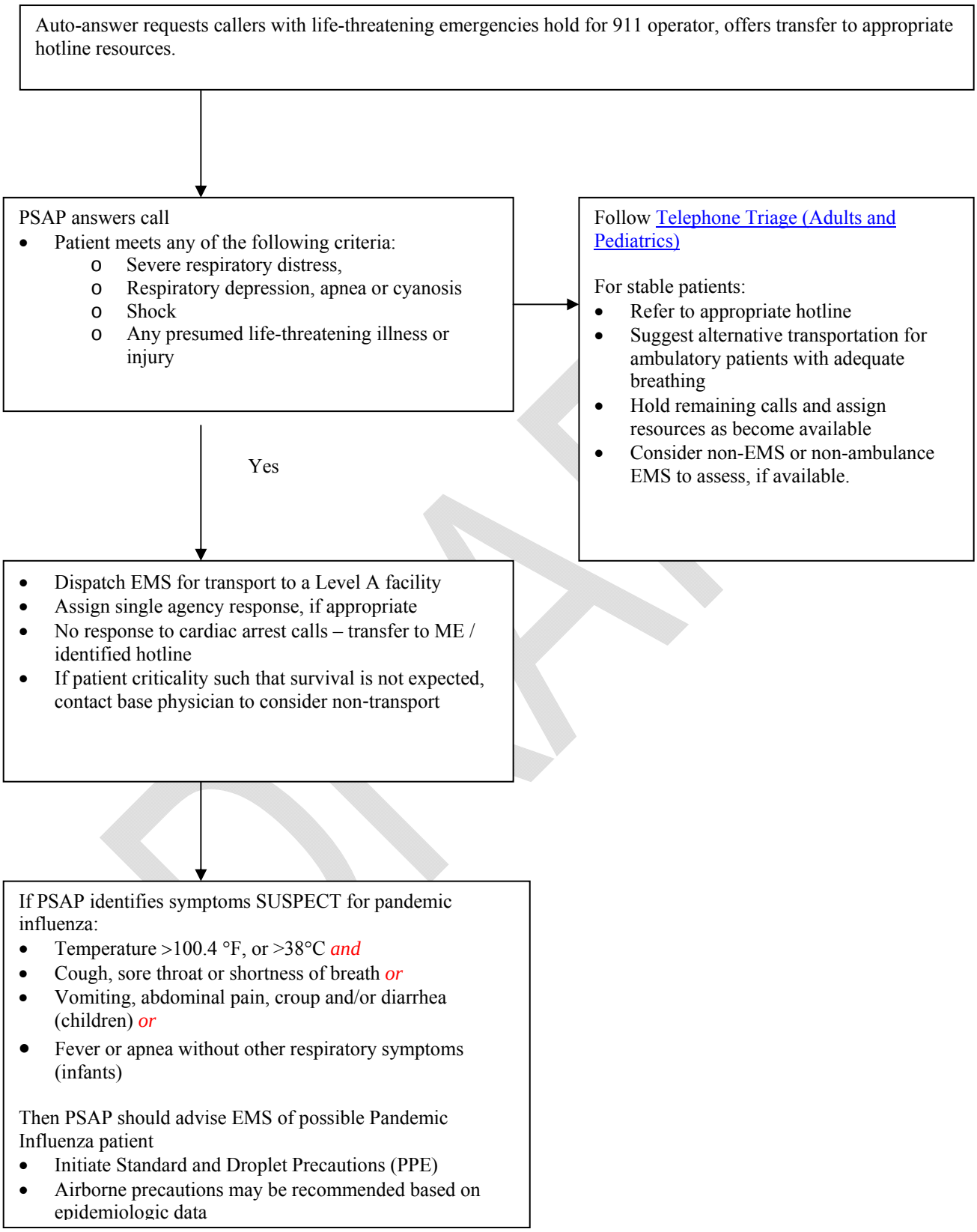


Figure 8 - Resources Overwhelmed during the Pandemic Phase



Guidelines for Mass Emergency Screening (Adults and Pediatrics)

These guidelines are to supplement clinical decision making for the mass emergency screening and triage of adult and pediatric influenza patients when clinical resources are limited and apply to patients who present for care in physicians offices, clinics or triage centers.

Adults

The adult triage guidelines were adapted from the HHS Pandemic Influenza Plan[18] and Talmor's 'Simple Triage Scoring System' article[19]. Adults are defined as persons 18 years of age or older.

1. Evaluate and score using presentation vital signs (see below)
2. If moderate or severe dehydration:
   - Try oral rehydration therapy (ORT)[20]; see Appendix 7 for formula.
   - Consider normal saline bolus 20ml/kg, repeat if necessary
   - Assess response and ability for home care
3. If bronchospasm, give a trial of beta-agonist metered dose inhaler (MDI)

Table 4 - Triage Scoring System for Adult Infectious Disease Presentations

Evaluate clinical criteria and score one point for each positive finding below:	
• Respiratory rate (RR) > 30 • Shock index >1 (Heart rate/Systolic BP) • O_2 Saturation < 90% (hypoxic) • Altered mental status (e.g., confusion) • Age ≥ 65	
Compute score:	
Score (Points)	***Estimated Mortality (%)***
0	<2
1	3-6
2	8-12
≥3	25-32
Determine disposition:	
Score (Points)	***Disposition (Care Site)***
0	
Tolerates Oral Rehydration Therapy (ORT) Dehydrated, not tolerating ORT	Home Level C with IV hydration

[18] Adapted from HHS Pandemic Influenza Plan, November 2005. http://www.hhs.gov/pandemicflu/plan

[19] Talmor, D., et al., *Simple triage scoring system predicting death and the need for critical care resources for use during epidemics*. Critical Care Medicine, 2007. 35(5): p. 1251-6.

[20] The WHO and UNICEF recommend a revised formula for Oral Rehydration Salts (ORS) that has a reduced sodium chloride and glucose content providing a solution with a reduced osmolarity of 245 mOsm/l. The International Pharmacopoeia, 4th edition and *13th Model List of Essential Medicines* (WHO Technical Report Series, No. 920, 2003).

1	
Age alone **or** Shock Index >1 due to dehydration (resolved with treatment) o Tolerates ORT o Not tolerating ORT Shock Index > 1 not resolved with hydration Hypoxic or RR > 30 Altered mental status (e.g. confusion)	 Home or Level D Level C with IV hydration Level A or B Level B or C with oxygen Level A or B
2	
For patients < age 65: o Hypoxia **and** RR > 30 alone For patients ≥ age 65: o Hypoxia **or** RR > 30 alone o Shock Index >1 due to dehydration (resolved with treatment) All other patients with score = 2	 Level B with oxygen Level B with oxygen Level B with IV hydration Level A
≥ 3	Level A
• Evaluate all patients for secondary bacterial Community Acquired Pneumonia (CAP) or other bacterial complications of influenza. • If appropriate, institute antibiotics by oral route if possible. If unable to tolerate, consider transfer to facility capable of IV antibiotics. • Screen for appropriateness of antiviral therapy as available per CDPHE recommendations[21].	

Pediatrics

To date, no mass emergency pediatric triaging guidance exists; therefore, final disposition is determined based on severity of symptoms rather than expected mortality. The pediatric triage guidelines were developed using professional judgment and expertise and concepts adapted from the HHS Pandemic Influenza Plan[18]. Pediatric patients are defined as persons less than 18 years of age.

Table 5 – Triage System for Pediatric Infectious Disease Presentations

Evaluate clinical criteria[22]:
• Abnormal breath sounds, Stridor • Tachypnea for age (Table 1) • Increase work of breathing (retractions, nasal flaring, head bobbing) or apnea • O_2 Saturation < 90% at 5,280 feet (hypoxic) or equivalent local values, cyanosis • Shock signs: delayed end organ perfusion (such as delayed capillary refill) plus tachycardia for age (Table 2) • Altered Mental Status • Age < 2 months

[21] CDPHE Pandemic Influenza Plan, Attachment 5b www.cdphe.state.co.us/pandemic

[22] Eitel DR, et al. The Emergency Severity Index Triage Algorithm Version 2 Is Reliable and Valid. *Acad Emerg Med*. 2003 Oct: 10 (10).

Determine age-based respiratory rate (RR)[23]:			
Age Group	***Normal RR (breaths/min.)***	***Mild-Moderate Tachypnea (breaths/min.)***	***Severe Tachypnea (breaths/min.)***
Infant (<1year)	30-60	60-70	>70
Toddler (1-3 years)	24-40	40-50	>50
Preschooler (4-5 years)	22-34	35-45	>45
School age (6-12 years)	18-30	25-35	>35
Adolescent (13-18 years)	12-20	20-30	>30
Determine age-based heart rate (HR)[24]:			
Age Group	***Normal HR (beats/min.)***	***Mild-Moderate Tachycardia (beats/min.)***	***Severe Tachycardia (beats/min.)***
Infant (<1 year)	110-180	180-200	>200
Toddler (1-3 years)	100-150	150-170	>170
Preschooler (4-5 years)	60-140	140-160	>160
School age (6-12 years)	60-120	120-140	>140
Adolescent (13-18 years)	60-100	100-120	>120

Determine disposition:	
Severity of Symptoms	***Disposition (Care Site)***
Mildly Ill	
• Alert, active • No stridor • Minimal to no retractions • RR normal to mild-moderate tachypnea • No hypoxia or cyanosis • No signs of shock • Feeding well, minimal to no signs of dehydration	Home or Level D with instructions
Moderately Ill	
• Alert, consoles • Stridor with agitation, not at rest (comfortable) • Minimal to moderate retractions • Mild-moderate tachypnea • Hypoxia- not severe (pulse-oximetry 80-90% room air at 5,280 feet), no cyanosis • Mild tachycardia without signs of shock • Decrease feeding or mild dehydration	Level C with ORT or IV hydration *or* Level B with oxygen or IV hydration *or* Level A
Severely Ill	

[23] Roback MG, Teach SJ. Pediatric Resuscitation: A Practical Approach. *American College of Emergency Physicians.* 2005 Oct.
[24] Pediatric Advanced Life Support- Provider Manual. American Academy of Pediatrics and the American Heart Association. 2006.

• Fussy, difficult to console, altered mentation • Stridor at rest • Moderate to severe retractions, nasal flaring, head bobbing • Severe tachypnea • Cyanosis or hypoxia (pulse-oximetry <80% room air at 5,280 feet) • Episodes apnea • Moderate to severe tachycardia and/or clinical signs of shock • Poor feeding, moderate to severe signs of dehydration • Symptoms and age < 2 months	Level A
• Evaluate all patients for secondary bacterial CAP or other bacterial complications of influenza. • Children as opposed to adults can present with upper airway or croup like symptoms • All patients should have pulse-oximetry • Attempt nasal suction on all infants and young children with respiratory distress or decrease feeding • Attempt rehydration and initial antibiotics by oral method in the mildly or moderately ill child. Those that are severely ill or unable to tolerate oral antibiotics should be transferred to a facility capable of IV fluids and antibiotics • Screen for appropriateness of antiviral therapy as available per CDPHE recommendations[21].	

Patient Triage for Influenza and Complications (Adults)

Many influenza patients with complications such as otitis media, sinusitis or simple dehydration can be cared for at home after they have been evaluated. More serious complications such as community-acquired pneumonia (CAP) may require inpatient care in a medical facility. This section provides background information and methodology to allow a systematic evaluation and referral of patients when hospital and other health care resources are overloaded.

The assumption is made that a pandemic influenza virus will infect about 30% of the Colorado population. If about 10% of people with pandemic influenza develop a post-influenza bacterial pneumonia, there would be approximately 150,000 cases of post-influenza bacterial CAP. CAP can generally be treated with some antibiotics such as fluroquinolones, macolides, doxycycline and extended spectrum beta-lactams. Staphylococcal pneumonia is relatively more common following influenza and requires different antibiotic coverage. There have been recent cases of Methicillin-resistant *Staphylococcus aureus* (MRSA) influenza-associated CAP. World experience with avian influenza currently has not shown a significant incidence of staphylococcal infections. Recommendations from the WHO and CDC should also be consulted for empiric antibiotic coverage during a pandemic. Limited medical resources will require clinicians to treat pneumonia empirically. It is recognized that many of the diagnostic tests routinely used for CAP will not be available due to an overburdened health care system. The antibiotic guidance is for persons 18 years of age and older and derived from the 2007 Infectious Disease Society Recommendations[25]. Antibiotic guidance for pediatrics is forthcoming in the final draft of this document.

Adult Guidelines for Treatment of Influenza Associated CAP

Use the Simple Triage Scoring System to assess the severity of illness and triage to appropriate level care site. CAP is clinically assessed or by chest x-ray.

[25] Mandell LA, Wunderink RG, Anzueto A, Bartlett JG, Campbell GD, Dean NC, Dowell SF, File TM Jr, Musher DM, Niederman MS, Torres A, Whitney CG. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis 2007 Mar 1;44 Suppl 2:S27-72

Assumptions:

- Clinicians will apply clinical decision making in the selection of individual therapy based on standard clinical care modified by the clinical setting of the pandemic. Judicious choices of antibiotics will be needed due to shortages.
- For patients not critically ill and able to take oral antibiotics, oral therapy is preferred.
- Intravenous and intramuscular antibiotics and personnel to administer them will be scarce.
- The World Health Organization (WHO) and CDC will issue updated antibiotic guidelines based on the clinical data available at the time of pandemic disease spread.

Table 6 – Diagnostics and Likely Bacterial Pathogens in Adults

Disposition (Care Site)	CAP-Specific Diagnostic Measures	Likely Bacterial Pathogens Causing Pneumonia	
Home	None	*S. pneumoniae* *H. influenzae*	*M. pneumoniae* *C. pneumoniae*
Level C	None	*S. pneumoniae* *H. influenzae* *Legionella sp.*	*M. pneumoniae* *C. pneumoniae*
Level B	None Consider ancillary testing of co-morbid conditions (e.g. blood sugar, chemistries)	*S. pneumoniae* *H. influenzae* *Legionella sp.*	*M. pneumoniae* *C. pneumoniae* *S. Aureus- MSSA or MRSA*
Level A – ward level care	Multi-system evaluation as indicated and available Sputum culture, blood cultures and urinary antigens if clinical resources available	*S. pneumoniae* *H. influenzae* *Legionella sp* *Gram neg sp*	*M. pneumoniae* *C. pneumoniae* *S. Aureus- MSSA or MRSA*
Level A – ICU level care	Multi-system evaluation as indicated and available Sputum culture, blood cultures and urinary antigens if clinical resources available	*S. pneumoniae* *H. influenzae* *Legionella sp.* *Gram neg sp.*	*M. pneumoniae* *C. pneumoniae* *S. Aureus- MSSA or MRSA*

Table 7 - Recommended Empirical Antibiotics for Community Acquired Pneumonia in Adults[26]

Home treatment
1. Previously healthy and no use of antimicrobials within the previous 3 months o A macrolide o Doxycyline 2. Presence of comorbidities such as chronic heart, lung, liver or renal disease; diabetes mellitus; alcoholism; malignancies; asplenia; immunosuppressing conditions or use of immunosuppressing drugs; or use of antimicrobials within the previous 3 months (an alternative from a different class should be selected) o A respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin [750 mg]) o A β-lactam **plus** a macrolide, doxycycline may substitute for macrolide 3. In regions with a high rate (>25%) of infection with high level (MIC ≥ 16 μg/mL) macrolide resistant *Streptococcus pneumoniae,* consider use of alternative agents listed above in for patients without comorbidities
Non-ICU treatment in Level B or C care site
o A respiratory fluoroquinolone o A β-lactam **plus** a macrolide, doxycycline may substitute for macrolide o Use oral therapy if feasible in non-ICU patients and do not treat patients with negative x-rays for CAP
Non-ICU treatment in a Level A care site
o A respiratory fluoroquinolone o A β-lactam **plus** a macrolide, doxycycline may substitute for macrolide o If MSSA or MRSA a consideration add vancomycin or linezolid o Use oral therapy if feasible in non-ICU patients and do not treat patients with negative x-rays for CAP
ICU treatment
o A β-lactam (cefotaxime, ceftriaxone, or ampicillin-sulbactam) plus either azithromycin or a respiratory fluoroquinolone (for penicillin-allergic patients, a respiratory fluoroquinolone and aztreonam are recommended)
Special concerns
If *Pseudomonas* is a consideration: o An antipneumococcal, antipseudomonal β-lactam (piperacillin-tazobactam, cefepime, imipenem, or meropenem) plus either ciprofloxacin or levofloxacin (750 mg) **OR** o The above β-lactam plus an aminoglycoside and azithromycin **OR** o The above β-lactam plus an aminoglycoside and an antipneumococcal fluoroquinolone (for penicillin allergic patients, substitute aztreonam for above β-lactam) o The above β-lactam plus an aminoglycoside and an antipneumococcal fluoroquinolone (for penicillin allergic patients, substitute aztreonam for above β-lactam) o If MSSA or MRSA is a consideration, add vancomycin or linezolid, modify based on sensitivities

[26] Mandell, L.A., et al., *Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults.* Clinical Infectious Disease, 2007. 44 Suppl 2: p. S27-72.

Critical Care Triage and Allocation of Ventilators (Adults)

The advent of pandemic influenza may overwhelm the availability of hospitals to care for critically ill patients. For example, calculations of a 1918-like pandemic predict the need for critical care beds and ventilators in Colorado to be vastly more than the number available[27]. Application of CDC's FluSurge 2.0 was used to model the potential impact of a pandemic on Colorado with a 35% attack rate over an eight-week period. Colorado has approximately 9,000 licensed non-ICU beds, 2,500 ICU beds and approximately 600 ventilators. The model predicted that hospital admissions would peak at approximately 4,200/week or 650/day indicating that influenza patients would occupy 36% of non-ICU, 37% ICU beds and 80% of ventilators. It is important to note that at any given moment 90 – 100% of these resources are currently in use for day-to-day needs.

This protocol is intended to provide guidance for making triage decisions during the initial days to weeks of an influenza pandemic if the healthcare system becomes overwhelmed. Since all patients will share in the same pool of scare resources, *the triage protocol would apply to patients both with and without influenza.* The guidance applies to patients already in a hospital.

Generally agreed upon principals for such situations include:

- A state-level developed plan with community acceptance,
- Region-wide implementation to ensure conformity between institutions and
- A transparent and objective system of allocating such care.

As complicated influenza is primarily a respiratory illness, it is expected that ventilators will be the critical care treatment in shortest supply. Colorado will therefore implement a triage system focusing first on ventilators. In a more severe pandemic, triage allocation of other critical care resources may be needed and this will be applied in a sequential fashion. These triage processes will be implemented under the direction of the CDPHE to ensure statewide conformity with allocation of scarce resources.

Mechanical Ventilator Triage (Adults)

Patients with non-influenza illnesses and injuries that need mechanical ventilation will continue as normal but without the usual available resources. Usually, hospitals maintain a sufficient number of ventilators to meet current health care demands. At times of peak demand (e.g., respiratory/ influenza season), hospitals will supplement their inventory by renting additional ventilators and potentially by accessing the Strategic National Stockpile. During a pandemic influenza event, ventilators will become a scarce resource. The increased number of patients during a pandemic will likely exceed the number of ventilators even after being supplemented with rentals.

Colorado will follow a stepwise application of a system to allocate ventilator resources during a pandemic. This will allow for the calibration of the triage criteria as the pandemic evolves. Usage of adult ventilators is based on weight; thus, the typical definition of an "adult" (persons 18 years of age or older) doesn't apply here. These guidelines apply to adult ventilators for persons weighing more than 88 lbs or 40 kg and generally above 12 years in age; therefore, infants and young children are exempt from ventilator triage.

The following guidance is an adapted approach for rationing critical care beds and the use of ventilators during a pandemic[28]. When critical care beds and ventilators are at risk of becoming

[27] HHS Pandemic Influenza Plan, Appendix B: Pandemic Influenza Background, http://www.hhs.gov/pandemicflu/plan/pdf/AppB.pdf

[28] Hick, JL and O'Laughlin, DT; Concept *of Operations for Triage of Mechanical Ventilation in an Epidemic.* Acad Emerg Med. 2006 Feb;13(2):195-8.

depleted, Tier 1 criteria will be employed in order to maximize resources for those most in need. If Tier 1 isn't sufficient to aid in allocation Tier 2 criteria will be employed in addition to the criteria in Tier 1. Finally, if criteria in Tiers 1 and 2 aren't sufficient then Tier 3 criteria can either be added or Tier 3 criteria can be employed alone. The GEEERC and ultimately the governor must approve every modification or addition of these triage criteria.

Tier 1: Do not offer and if started, withdraw ventilatory support for patients with any one of the following:

1. Respiratory failure requiring intubation with persistent hypotension (systolic blood pressure <90 mm Hg for adults) unresponsive to adequate fluid resuscitation after 6–12 hours of therapy and signs of additional end-organ dysfunction (e.g., oliguria (very small amount of urine), mental status changes, cardiac ischemia (lack of oxygen in the heart muscle)
2. Failure to respond to mechanical ventilation (no improvement in oxygenation or lung compliance) and antibiotics after 72 hours of treatment for a bacterial pathogen (timeline may be modified based on organism-specific data)
3. Laboratory or clinical evidence of greater than or equal to four organ systems failing
    a. Pulmonary – Arteries (adult respiratory distress syndrome, ventilatory failure, refractory hypoxemia or severe chronic lung disease with FEV in 1 second of < 25%)
    b. Cardiovascular – Heart (left ventricular dysfunction, hypotension, new ischemia)
    c. Renal – Kidneys (hyperkalemia, diminished urine output despite adequate fluid resuscitation, increasing creatinine level, dialysis dependant)
    d. Hepatic – Liver (transaminase greater than two times upper limit of normal, increasing bilirubin or ammonia levels or Model of End-stage Liver Disease score > 20)
    e. Neurologic – Nervous System (altered mental status not related to volume status, metabolic, or hypoxic source, stroke or severe, irreversible neurologic event/condition with high expected mortality)
    f. Hematologic – Blood (clinical or laboratory evidence of disseminated intravascular coagulation)

Tier 2: Do not offer and if started withdraw ventilatory support for patients with respiratory failure requiring intubation with the following conditions (in addition to those in Tier 1):

Patients with pre-existing system compromise or failure including:

1. Known congestive heart failure with ejection fraction <25% (or persistent ischemia unresponsive to therapy and pulmonary edema)
2. Acute renal failure requiring hemodialysis (related to illness)
3. Severe chronic lung disease including pulmonary fibrosis, cystic fibrosis, obstructive or restrictive diseases requiring continuous home oxygen use before onset of acute illness
4. Acquired immunodeficiency syndrome (AIDS), other immunodeficiency syndromes at stage of disease susceptible to opportunistic pathogens (e.g., CD4 <200 for AIDS) with respiratory failure requiring intubation
5. Active malignancy (cancer) with poor potential for survival (e.g., metastatic malignancy, pancreatic cancer)
6. Cirrhosis with ascites, history of variceal bleeding, fixed coagulopathy, or encephalopathy
7. Acute hepatic failure with hyperammonemia
8. Irreversible neurologic impairment that makes patient dependent for personal care (e.g., severe stroke, congenital syndrome, persistent vegetative state)
9. Severe burn: body surface area >40%, severe inhalation injury

Tier 3: Apply specific protocols developed by the GEEERC and/or utilize SOFA scores.

1. Restriction of treatment based on disease-specific epidemiology and survival data for patient subgroups (may include age-based criteria) per GEEERC recommendations.
2. Expansion of pre-existing disease classes that will not be offered ventilatory support per GEEERC recommendations and governor approval.
3. Applying Modified Sequential Organ Failure Assessment[26] scoring to the triage process and establishing a cutoff score above which mechanical ventilation will not be offered.

Hospital Pandemic Critical Care Triage by Modified SOFA Score (Adults and Pediatrics)

The Sequential Organ Failure Assessment (SOFA)[29], a physiologically based scoring system that predicts critical care outcomes will be utilized to triage critical care beds. SOFA was developed in 1994 to quantify the severity of patients' illness, based on the degree of organ dysfunction. The SOFA scoring system takes into account the time course of a patient's condition during the entire ICU stay and allows for reassessment at given points in time. This enables physicians to follow the evolving disease process and recommend/make decisions on the most current patient information.

Grissom and colleagues[30] develop a modified SOFA scoring system that focused on limiting the number of laboratory tests needed to perform risk stratification by replacing the arterial blood gas with an oxygen saturation measurement, deleting coagulation testing, and replacing the bilirubin measurement with a crude evaluation of the presence or absence of jaundice. Grissom and coworkers determined that the traditional SOFA and modified SOFA tools performed equally well at predicting mortality; therefore, this is the scoring system Colorado will use.

Instructions for the application of the triage protocol to determine a patient's need for critical care during an influenza pandemic[31]

1. Assess whether the patient meets the inclusion criteria (Patients who may benefit from admission to critical care and primarily focuses on respiratory failure, since the provision of ventilatory support is what fundamentally differentiates the ICU from other acute care areas.
   - If yes, proceed to step 2
   - If no, reassess patient later to determine whether clinical status has deteriorated
2. Assess whether the patient meets the exclusion criteria (Patients who have a poor prognosis despite care in an ICU, patients who require resources that simply cannot be provided during a pandemic and patients with advanced medical illnesses whose underlying illness has a poor prognosis with a high likelihood of death, even without their current concomitant critical illness.)
   - If no, proceed to step 3
   - If yes, assign a "blue" triage code; *do not* transfer the patient to critical care; continue current level of care or provide palliative care as needed

[29] Vincent JL et al. The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction / failure. *Intensive Care Med.* 1996;22:707-710

[30] Grissom CK, Orme JF, Jensen RL, et al. A modified sequential organ failure assessment score to predict mortality in critically ill patients. Program and abstracts of the Society of Critical Care Medicine (SCCM) 37th Critical Care Congress; February 2-6, 2008; Honolulu, Hawaii. Abstract 36.

[31] Adapted from Christian MD, Hawryluck L, Wax RS, et al. *Development of a triage protocol for critical care during an influenza pandemic*. *Canadian Medical Association Journal* 2006; 175(11): 1377-81

3. Proceed to triage tool – Table 9. *The triage protocol applies to all patients undergoing assessment for possible critical care and not only those with influenza-like symptoms.*

Detailed inclusion and exclusion criteria used in the triage protocol for critical care during an influenza pandemic

Inclusion criteria[32]

The patient is allowed admission or transfer to critical care if A or B is present:

A. Requirement for invasive ventilatory support (one or more of the following)
- Refractory hypoxemia (SpO_2 < 90% on non-rebreather mask)
- Respiratory acidosis (pH < 7.2)
- Clinical evidence of impending respiratory failure
- Inability to protect or maintain airway

B. Hypotension (systolic blood pressure < 90 mm Hg or relative hypotension) with clinical evidence of shock (altered level of consciousness, decreased urine output or other evidence of end-organ failure) refractory to aggressive volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting

Exclusion criteria

The patient is excluded from admission or transfer to critical care if any of the following is present:

A. Severe trauma with a revised trauma score of <2[33]
B. Severe burns of patient with any two of the following:
- Age > 60 yr
- > 40% of total body surface area affected
- Inhalation injury
- Anticipated survival rate of <50% (Patients identified as "Low" or worse on Triage Decision Table for Burn Victims

C. Cardiac arrest
- Unwitnessed cardiac arrest
- Witnessed cardiac arrest, not responsive to electrical therapy (defibrillation or pacing)
- Recurrent cardiac arrest

D. Known severe dementia, medically treated and requiring assistance with activities of daily living
E. Do Not Resuscitate/Do Not Intubate (DNR/DNI)
F. Advanced untreatable neuromuscular disease (e.g., amyotrophic lateral sclerosis, end stage multiple sclerosis, etc.) requiring assistance with activities of daily living or requiring chronic ventilatory support
G. Metastatic malignant disease
H. Advanced and irreversible immuno-compromise
I. Severe and irreversible neurologic event or condition with persistent coma and Glascow Coma Score of <6
J. End-stage organ failure meeting the following criteria[34]:

[32] This is not an exhaustive list and may change based upon the severity of the pandemic.

[33] Champion HR, Sacco WJ, Copes WS, Gann DS, Gennarelli TA, Flanagan ME. A revision of the Trauma Score. J Trauma.1989;29(5):623-629.

[34] *SpO_2 = oxygen saturation measured by pulse oximetry, FIO_2 = fraction of inspired oxygen, FEV1 = forced expiratory volume in 1 second, PaO_2 = partial pressure of arterial oxygen, VC = vital capacity, TLC = total lung capacity*

Heart –

- NYHA class III heart failure[35] (Moderate) – Marked limitation of physical activity. Comfortable at rest but less than ordinary activity causes fatigue, palpitations or dyspnea.
- NYHA Class IV heart failure[31] (Severe) – Unable to carry out physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

Lungs -

- Chronic Obstructed Pulmonary Disease (COPD) with forced expiratory volume in one second (FEV1) < 25% predicted, baseline
- Chronic PaO_2 < 55 mm Hg, or secondary pulmonary hypertension
- Cystic fibrosis with postbronchodilator FEV1 < 30% or baseline PaO_2 < 55 mm Hg
- Pulmonary fibrosis with VC or TLC < 60% predicted, baseline PaO_2 < 55 mm Hg, or secondary pulmonary hypertension
- Primary pulmonary hypertension (idiopathic pulmonary hypertension) with NYHA class III or IV heart failure, right atrial pressure > 10 mm Hg, or mean pulmonary arterial pressure > 50 mm Hg

Liver - Pugh score > 7, when available[36]

K. Age > 85 yr

L. Elective palliative surgery

M. Known chromosomal or untreatable disorders that is uniformly fatal within the first two years of life.

[35] New York Heart Association. The stages of heart failure – NYHA classification. Heart Failure Society of America Web site. http://www.abouthf.org/questions_stages.htm. Published 2002. Updated September 28, 2006. Accessed December 5, 2007.

[36] Pugh RNH, Murray-Lyon M, Dawson JL, Pietroni MC, Williams R. Transection of the oesophagus for bleeding oesophageal varices. Br. J. Surg. 1973; 60(8): 646-649

Table 8 - Scoring criteria for the Modified Sequential Organ-Failure Assessment (SOFA) score[37]

MSOFA Scoring Guidelines					
Variable	**Score***				
	0	**1**	**2**	**3**	**4**
SpO_2/FIO_2 ratio** or Nasal cannula or mask 0_2 required to keep $Sp0_2$ >90%	SpO_2/FIO_2 >400 or Room air SpO_2 >90%	SpO_2/FIO_2 316-400 or SpO_2 >90% at 1-3 L/min	SpO_2/FIO_2 231-315 or SpO_2 >90% at 4-6 L/min	SpO_2/FIO_2 151-230 or SpO_2 >90% at 7-10 L/min	SpO_2/FIO_2 <150 or SpO_2 >90% at >10 L/min
Bilirubin level, mg/dL (µmol/L)	< 1.2 (< 20)	1.2–1.9 (20–32)	2.0–5.9 (33–100)	6.0–11.9 (101–203)	> 12 (> 203)
Hypotension†	None	MABP < 70	Dop ≤ 5	Dop > 5 Epi ≤ 0.1 Norepi ≤ 0.1	Dop > 15 Epi > 0.1 Norepi > 0.1
Glasgow Coma score	15	13–14	10–12	6–9	< 6
Creatinine level, mg/dL	< 1.2	1.2–1.9	2.0–3.4	3.5–4.9 or urine output <500 mL in 24 hours	> 5 or urine output <200 mL in 24 hours

*Patients can receive a total score of 20 (5 categories with a total of 5 points for each category); any patient with a score of ≥ 11 is excluded from critical care or mechanical ventilation.
** SpO_2/FIO_2 ratio: SpO_2 = Percent saturation of hemoglobin with oxygen as measured by a pulse oximeter and expressed as % (e.g., 95%); FIO_2 = Fraction of inspired oxygen; e.g., ambient air is 0.21
†MABP = mean arterial blood pressure in mm Hg (diastolic + 1/3(systolic - diastolic))
Dop= dopamine in micrograms/kg/min
Epi = epinephrine in micrograms/kg/min
Norepi = norepinephrine in micrograms/kg/min

Table 9 - Initial Assessment

Triage code	Criteria	Action or Priority
Blue	Exclusion criteria met or SOFA score > 11*	• Manage medically • Provide palliative care as needed • Discharge from critical care
Red	SOFA score ≤ 7 or single-organ failure	Highest Priority
Yellow	SOFA score 8–11	Intermediate Priority
Green	No significant organ failure	• Defer or discharge • Reassess as needed

The "minimum qualifications for survival" form the third component of the triage protocol. These qualifications represent a ceiling on the amount of resources that can be expended on any one person. The minimum

[37] Adapted, with permission, from Ferreira FL, Bota DP, Bross A, et al. *Serial evaluation of the SOFA score to predict outcome in critically ill patients*. JAMA 2001; 286: 1754-8. Copyright © 2001, American Medical Association. All rights reserved.

qualifications for survival dictate reassessment at 48 and 120 hours, as well as an ongoing cut-off ceiling if a patient ever has a SOFA score greater than 11 or any other exclusion criteria. The key component of the minimum qualifications for survival is the attempt to identify at an early stage, patients who are not improving and who are likely to have a poor outcome. In day-to-day practice, it may take days or weeks of intensive care before this poor outcome occurs. During a pandemic, several other patients could have had their lives saved during this time.

Table 10 - 48-hour Assessment

Triage code	Criteria	Action or Priority
Blue	Exclusion criteria met or SOFA score > 11 or SOFA score stable at 8 – 11 with no change	• Provide palliative care • Discharge from critical care
Red	SOFA score < 11 and decreasing	Highest Priority
Yellow	SOFA score stable at < 8 with no change	Intermediate Priority
Green	No longer dependant on ventilator	Discharge from critical care

Table 11 - 120-hour Assessment

Triage code	Criteria	Action or Priority
Blue	Exclusion criteria met or SOFA score > 11 or SOFA score < 8 with no change	• Provide palliative care • Discharge from critical care
Red	SOFA score < 11 and decreasing progressively	Highest Priority
Yellow	SOFA < 8 with minimal decrease (< 3-point decrease in past 72h)	Intermediate Priority
Green	No longer dependant on ventilator	Discharge from critical care

Other Things to Consider

- How will this guidance be implemented at the local level? Local Emergency Support Function 8 lead/co-lead agencies must coordinate surge planning with Healthcare Coalition partners to develop protocols at the local level, and document these protocols within their plans.

- How would less important actions that could be delayed, eliminated for some period of time or in some cases assigned to family members, non-licensed assistants or volunteers be handled, such as:
  - Routine care activities (e.g., blood pressure checks in non-acute patients, assisted ambulation);
  - Extensive documentation of care;
  - Maintenance of complete privacy and confidentiality;
  - Elective procedures.

- Department/service/organizations goal(s) might need to be temporarily restated as minimizing loss of life and assuring emergency services for only priority needs, providing "the greatest good for the greatest number". How would this be communicated?

- How and where would non-flu or flu patients be co-horted, facilitating a lower staff-to-patient ratio than normal?

- Most patients with pandemic influenza will be able to remain at home during the course of their illness and can be cared for by family members or others who live in the household. Home care advice given should be consistent with HHS recommendations[38].

- Some low-risk births might be able to occur at home rather than in a hospital setting. How can legally recognized midwives be included in surge planning?

- Hospitals need to plan for mass fatalities and rapid processing of death certificates with the county coroner. Death certificates aren't "official" until processed at the state-level. Currently, one of four final dispositions – cremation, burial, refrigeration or embalming must be completed within 24 hours. During a pandemic, an executive order may be issued for 'direct-to-burial' procedures.

- Each hospital should establish a peer-based structure for the review of hospital admission, ICU admission, and termination of care. Consider a team of at least 3 individuals:
  - Intensivist and 2 or more of the following:
  - Hospital medical director,
  - Nursing supervisor,
  - Board member,
  - Ethicist,
  - Pastoral care representative, and
  - One or more independent physicians.

[38] HHS Pandemic Influenza Plan, Section 5: Clinical Guidelines - Home Care Infection Control Guidance for Pandemic Influenza Patients and Household Members: http://www.hhs.gov/pandemicflu/plan/sup5.html#box4

- Each hospital should institute an action team to provide counseling and care coordination and to work with the families of loved ones who have been denied care. Medical staff should establish a method of providing peer support and expert consultation to physicians making these decisions.

Recovery

Healthcare facilities and the healthcare system overall need to have a clear plan for re-evaluating the level and type of care being provided and deciding when it is appropriate to return to routine operations. The ongoing analysis of the existing case levels and hospital admission levels should be supplemented with the personal assessments of medical professionals throughout the state. Demobilization will be stepwise over time and based upon assessment of the following:

- Decrease in the number of cases being reported
- Deactivating alternate care facilities
- Number of calls decreasing to call center
- A decrease in the number of hospital admissions without alternate triaging related to influenza is occurring
- The number of ventilators in use without alternate triaging is manageable and is within the scope of the available supply
- Medication and other support therapies can be met through standard supply methods
- The routine standard of care practices can be met
- Numbers of patients in excess of planned healthcare facility capacity, or an exceptional surge in number and severity over a short period of time;
- Marked increase in proportion of patients who are critically ill, injured patients unlikely to survive (using Sequential Organ Failure Assessment scores or similar standard assessments) or other extreme patient conditions;
- Likelihood for subsequent waves

The recovery period may be different for individual communities and regions of the state based on their population density, supply routes and overall capacity for care. Therefore, the recovery period will occur in phases. Consideration must be given to the process of resuming normal activities, as there could be an indirect impact on surrounding communities as a result of an imbalance of services or supplies.

Lifting of draft executive orders will occur when communities can operate at a normal capacity for patient care and medical supplies are consistently received by medical facilities in most communities across the state.

Appendices

Appendix 1 – Draft News Release

Colorado Department of Public Health and Environment
JOINT INFORMATION CENTER
4300 Cherry Creek Drive South
Denver, CO 80246

Statewide News Release

Contact: Joint Information Center
Phone: 303-692-XXXX
Fax: 303-XXX-XX

FOR IMMEDIATE RELEASE

DATE/YEAR Time: XX: XX a.m./p.m.

Governor Declares State of Emergency to Respond to Pandemic Influenza

DENVER–Colorado Governor ____ _____, at XX a.m./p.m. today, declared a state of emergency in Colorado to help manage the state's response to pandemic influenza among the population. The Governor's Expert Emergency Epidemic Response Committee was consulted in making this declaration.

With reports from health care providers throughout the state that thousands of Coloradans are experiencing symptoms that could be associated with influenza, the state is implementing its triage guidelines that had been prepared in advance for just such an emergency.

These triage guidelines are intended to help manage and allocate health care resources to provide the greatest care to the greatest number of people. Healthcare resources include, but are not limited to, personnel, hospital beds, medications and treatment.

"If everyone experiencing symptoms shows up at their local doctor's office, emergency clinic or hospital, we will be unable to provide the medical care to those who most are in need of assistance," said Colorado Chief Medical Officer ____ _____. "I am asking all people in Colorado to consider and follow the advice contained in this communication."

The triage process is commonly used by health professionals in emergencies to diagnose and determine which individuals are most in need of care – as well as the type of care that is needed.

"Past pandemics in the U.S. have resulted tens of thousands of deaths nationwide and it can be anticipated this current pandemic may result in the death of thousands of our loved ones," said medical director _____. "To help reduce the number of deaths all Coloradans must work together to best manage our health care resources to provide the greatest care to the those who need it most."

The goal of the state's triage plan is to reduce unnecessary hospital, clinic and physician office visits and to shift symptomatic patients to 'home-management' and 'self-care' when deemed appropriate. By staying home, people can help prevent the spread of infection. Treating patients by phone is a primary goal of the state's triage plan. For detailed information about caring for the sick at home, people can visit this site for information from the Red Cross http://www.denver-redcross.org/site/DocServer/RC_PandemicFluBrochure.pdf?docID=1381.

If you experience flu symptoms, call your doctor. Common sighs of pandemic flu are like those of typical seasonal influenza and include fever, muscle pain, headaches and sore throats. Other symptoms of avian influenza in humans can include eye infections, pneumonia, severe respiratory diseases and other severe and life-threatening complications. Your doctor may prescribe medicine to reduce symptoms.

In the triage process being deployed, depending on their symptoms, will be divided by health care providers into four basic categories: those patients who will not survive even with treatment; those whose survival depends on treatment; those who do not need immediate treatment but could benefit from treatment; and those who will survive without treatment. This triage process is initiated with a phone call to a medical provider.

Physicians phone lines may be busy, if you can't connect, please follow these basic guidelines to help determine your medical need, said chief medical officer ____ _____. *[Here, insert a list of symptoms by severity, followed by the recommended course of action.]*

The Colorado state health department is urging people to be vigilant about practicing good hygiene. It always is important to limit the spread of germs by:

- Staying away from others as much as possible when sick;
- Washing hands frequently with soap and water; and
- Covering coughs and sneezes with tissues or the sleeve near the inside of your elbow (do not use your bare hand).

According to health department officials, there is not a vaccine available for H5N1 influenza at this time. There are antiviral medications that can be used to reduce the severity of human flu. These medicines also may be effective in treating the H5N1 avian flu. However, there are limited supplies of these antiviral medications – and, importantly, their effectiveness in fighting pandemic flu is uncertain.

For more information about pandemic flu and emergency preparedness visit the following Web sites:

http://www.cdphe.state.co.us/

http://www.pandemicflu.gov/

Appendix 2 – Colorado Medical Personnel

Region & County[1]	Physician	Physician Assistant	Physician in Training	Midwife	RN w/o Prescriptive Authority	RN Prescriptive Authority	Licensed Practical Nurse	Certified Nurse Aide	Pharmacist	Pharmacist Intern	Psychologist	Licensed Professional Counselor	Licensed Social Worker	Marriage Family Therapist	Dentist	Chiropractor	Veterinarian	Physical Therapist	Psych Tech – Mentally Ill	Psych Tech – Dev. Disabilities
	Medical Practitioners				Nursing				Pharmacy		Psychological Practitioners				Other					
Adams (TCHD)	560	85	333		2,709	77	589	2,255	185	51	50	129	137	12	148	84	79	165	4	70
Arapahoe (TCHD)	1,749	158	30	1	5,600	220	953	3,033	563	154	238	372	373	45	490	200	177	402	3	26
Boulder	1,064	125	1	12	2,839	129	347	824	286	23	260	442	394	61	241	212	175	406	1	1
Broomfield	79	19	2		612	28	66	148	65	5	17	27	21	10	47	25	22	71		4
Clear Creek	16	2			116	5	7	11	12		5	9	7	1	5	11	8	9		3
Denver	3,214	246	743	4	4,910	302	630	2,804	517	183	544	486	758	70	414	149	141	476	10	61
Douglas (TCHD)	478	105	3	1	3,540	116	232	501	423	30	63	132	125	26	211	106	133	297	3	5
Elbert	11	2		1	256	7	33	58	16	2	1	14	2		6	4	37	13		
Gilpin	8	1			63	2	7	10	3	1	2	10	2			3	3	5		1
Jefferson	1,102	201	6	4	6,337	249	771	2,001	595	70	184	424	415	52	406	208	268	555	5	145
North Central Region	**8,281**	**944**	**1,118**	**23**	**26,982**	**1,135**	**3,635**	**11,645**	**2,665**	**519**	**1,364**	**2,045**	**2,234**	**277**	**1,968**	**1,002**	**1,043**	**2,399**	**26**	**316**
Cheyenne	2	2			17	0	7	19	1			1				1		1		
Kit Carson	5	2			53	2	7	42	1			2		1	2	2	3	2		
Larimer	719	95	13	6	3,455	127	451	1,706	296	16	157	199	215	74	228	151	491	318	6	1
Lincoln	5	1			45	1	10	48	3			5	2		1	2	5	1		
Logan (NCHD)	25	6			158	6	77	154	13	2	3	10	5	1	9	5	7	9		
Morgan (NCHD)	31	6			208	4	59	242	11	1	2	12	5		10	4	18	12		1
Phillips (NCHD)	3				25		10	43	1			1			1	2	3	1		

Sedgwick (NCHD)		3	2				12		6	19		2									1		1	1		
Washington (NCHD)			1				30	2	9	35		1			1	2	1			1	1	1			
Weld		304	50	20	1		2068	75	334	1808		139	6		52	122	49	7		94	64	149	114		
Yuma (NCHD)		11	2				84	1	14	89		2			1	4	2	1		5	2	7	3		
Northeast Region		**1108**	**167**	**33**	**7**		**6155**	**218**	**984**	**4205**		**470**	**25**		**215**	**357**	**280**	**85**		**352**	**234**	**685**	**462**	**6**	**2**
Eagle		145	14		1		343	1	16	49		39			11	31	17	5		31	17	22	72		
Garfield		102	8		2		457	17	59	237		25			5	25	30	5		31	14	35	46	1	2
Grand		22	3				102	5	6	13		12			2	8	5	2		2	9	7	14		
Jackson		2					2			2								1				2			
Mesa		420	46	16			1,609	48	209	992		134	6		30	98	66	14		90	54	57	109	48	369
Moffat (NWVNA)		16	2				84	1	24	82		6	1			4	2			5	9	7	5		1
Pitkin		60	4	1			109	3	3	6		13	1		12	9	13	1		14	10	11	33		
Rio Blanco		7	1				48	2	9	50		1				3	2	1		4	3	2	3		
Routt (NWVNA)		76	15		1		278	10	23	96		25			9	14	13	2		21	10	14	52		
Summit		92	15				255	7	19	21		26	1		14	22	15			26	16	18	31		
Northwest Region		**942**	**108**	**17**	**4**		**3,287**	**94**	**368**	**1,548**		**281**	**9**		**83**	**214**	**163**	**31**		**224**	**142**	**175**	**365**	**49**	**372**
Alamosa		36	10				138	8	47	106		11			4	36	11			12	3	2	7		
Conejos		4	4				53	2	27	93		5				6	1			1		1	2		
Costilla		1					25	1	9	28							2						1		
Mineral		1	2				6		1	4						2				1	1	2			
Rio Grande		11	4				100	2	27	123		9			1	9		1		5	1	6	8		
Saguache		5					38	1		22		1				7	1	1		1	1	1			
San Luis Valley Region		**58**	**20**	**0**	**0**		**360**	**14**	**111**	**376**		**26**	**0**		**5**	**60**	**15**	**2**		**20**	**6**	**12**	**18**	**0**	**0**
Custer		3	2				53	5		7		1				1	2			1	3	3	2	1	
Fremont		44	16		1		437	13	141	444		30	1		18	39	24	3		16	14	18	21	4	
Huerfano (LA-HHD)		9					64	1	24	96		3				3	2	3		1	1	5	4	2	1
Las Animas (LA-HHD)		19					164	4	47	147		6				4	1	1		7	6	3	6		1
Pueblo		387	35	16			2011	59	427	1,336		137	13		47	117	127	7		90	36	36	59	216	204
South Region		**462**	**53**	**16**	**1**		**2729**	**82**	**639**	**2,030**		**177**	**14**		**65**	**164**	**156**	**14**		**115**	**60**	**65**	**92**	**223**	**206**

Chaffee		41	5		2		219	4	29	99		20			5	21	6	4		12	11	13	19		1
El Paso		1,342	163	3	8		223	92	879	3,508		424	24		197	519	382	105		462	206	223	465	7	4
Lake		3	2				55	1	7	26		4			1	1	1			2	3	1	2		
Park		5	1				192	7	21	30		13			1	7	14			3	1	11	11		
Teller		33	11		1		335	12	36	115		25			5	27	18	4		13	10	11	24		
South Central Region		**1,424**	**182**	**3**	**11**		**1,024**	**116**	**972**	**3,778**		**486**	**24**		**209**	**575**	**421**	**113**		**492**	**231**	**259**	**521**	**7**	**5**
Baca		2	1				39	1	17	120		1								2	3	2	2		
Bent							47	3	17	61					1	2	2				1	2	1		
Crowley (Otero)		2	2				20	1	8	40		4				1	1					1		1	1
Kiowa		2	1				15	1	3	32		1	1												
Otero		26	2				151	10	45	180		8	1		5	10	5			4	7	13	7		1
Prowers		14	2				175	5	41	94		7				4	1			6	4	6	4		
Southeast Region		**46**	**8**	**0**	**0**		**447**	**21**	**131**	**527**		**21**	**2**		**6**	**17**	**9**	**0**		**12**	**15**	**24**	**14**	**1**	**2**
Archuleta (SJBHD)		17					87	2	15	32		9			4	10	6			7	9	13	12		
Dolores		3			1		11	1	3	5										1					
La Plata (SJBHD)		199	21		3		612	28	81	150		59	1		22	66	37	13		41	34	40	68		1
Montezuma		37	6				253	8	32	223		16	1		2	17	15	1		16	10	17	19		1
San Juan		1					8		1																
Southwest Region		**257**	**27**	**0**	**4**		**971**	**39**	**132**	**410**		**84**	**2**		**28**	**93**	**58**	**14**		**65**	**53**	**70**	**99**	**0**	**2**
Delta		39	3		1		259	4	87	286		19			5	14	12	2		11	17	18	20	1	4
Gunnison		26	10		1		121	2	12	62		7			1	17	4	1		8	6	8	18		
Hinsdale		2	1				7	1	1																
Montrose		92	9		1		340	10	86	287		29			4	22	18	2		27	18	23	39		1
Ouray		23			1		69	5	8	6		7			6	5	3	2		6	2	7	3		
San Miguel		17	5				30	2	2	2		1	1		5	7	1	1		5	4	5	13		
West Region		**199**	**28**	**0**	**4**		**826**	**17**	**196**	**643**		**63**	**1**		**21**	**65**	**38**	**8**		**57**	**47**	**61**	**93**	**1**	**5**
All Colorado		**12,777**	**1,537**	**1,187**	**54**		**42,781**	**1,736**	**7,168**	**25,162**		**4,273**	**596**		**1,996**	**3,590**	**3,374**	**544**		**3,305**	**1,790**	**2,394**	**4,063**	**313**	**910**

[1] TCHD = Tri-County Health Dept., NEHD = Northeast Colorado Health Dept., NWVNA = Northwest Colorado Visiting Nursing Association, SJBHD = San Juan Basin Health Dept., LAHHD = Las Animas-Huerfano Counties District Health Dept. Otero County Health Dept services Crowley County.

Appendix 3 - Colorado EMTs and Transport Agencies by RETAC Region

RETAC	# of EMTs by Level			Total # EMTs	# of EMS Medical Directors	# of EMS Transport Agencies
	EMT-Basics	EMT-Intermediates	EMT-Paramedics			
Central Mountains	820	42	169	1,031	10	
Foothills	1,793	23	433	2,249	13	
Mile-High	3,364	31	1,060	4,455	16	
Northeast Colorado	1,682	95	301	2,078	19	
Northwest	561	95	119	775	10	
Plains to Peaks	1,389	40	350	1,779	5	
San Luis Valley	130	55	15	200	9	
Southeast Colorado	159	24	10	193	6	
Southern Colorado	558	117	115	790	8	
Southwest	324	76	64	464	9	
Western	334	68	45	447	10	
Unknown	301	5	248	554		
Total all RETACS	11,415	671	2,929	15,015	115	194

Appendix 4 – Colorado Medical Facilities

Region & County[1]	Hospitals and Trauma Center Designations												Rural Health Centers	Other Community Clinics	Kaiser Clinics	ESRD[3] Clinic/Dialysis Treatment Clinics	Rehab/ Physical Therapy & Speech	Ambulatory Surgical Centers
	Hospitals (with licensed beds)												CCEC[2] Clinics			Outpatient Clinics					
	I	Beds	II	Beds	III	Beds	IV	Beds	NonD	Beds	Total #	Total Beds	Non D	IV	V						
Adams (TCHD)	1	270					3	692			4	962					10	1	4	7	5
Arapahoe (TCHD)	1	368	2	577							3	945	2				7	5	5	4	16
Boulder							1	25			1	25					4	3	2	5	11
Broomfield											0	0					0	0	0	0	0
Clear Creek											0	0					0	0	0	0	0
Denver	2	1,070							5	2,081	7	3,151					6	4	13	4	13
Douglas (TCHD)					2	250					2	250					0	1	0	3	7
Elbert											0	0					0	0	0	0	0
Gilpin											0	0					1	0	0	0	0
Jefferson					1	400					1	400					8	3	5	7	10
North Central Region	**4**	**1,708**	**2**	**577**	**3**	**650**	**4**	**717**	**5**	**2,081**	**18**	**5,733**	**2**	**0**	**0**	**0**	**36**	**17**	**29**	**30**	**62**
Cheyenne							1	17			1	17				2	0		0	0	0
Kit Carson							1	25			1	25				2	2		1	0	0
Larimer			2	136	2	396	1	23			5	555				1	4		2	4	11
Lincoln							1	15			1	15				0	3		0	0	0
Logan (NCHD)					1	36					1	36				1	3		1	1	0
Morgan (NCHD)							1	25			1	25				2	1		0	0	0
Phillips (NCHD)							2	40			2	40				1	0		0	0	0
Sedgwick (NCHD)							1	25			1	25				1	0		0	0	0
Washington (NCHD)											0	0				1	0		0	0	0

DRAFT

Weld			1	378							1	378				0	4		1	3	2
Yuma (NCHD)							2	37			2	37				1	0		0	0	0
Northeast Region	**0**	**0**	**3**	**514**	**3**	**432**	**10**	**207**	**0**	**0**	**16**	**1,153**	**0**	**0**	**0**	**12**	**17**	**0**	**5**	**8**	**13**
Eagle					1	58					1	58	1			0	1		0	1	2
Garfield					1	78	1	25			2	103				2	2		0	0	0
Grand							1	24			1	24		1	1	0	0		1	0	0
Jackson											0	0				1	0		0	0	0
Mesa			1	346			1	78	1	10	3	434				0	2		2	0	4
Moffat (NWVNA)							1	25			1	25				0	1		0	1	0
Pitkin					1	25					1	25				0	0		0	0	0
Rio Blanco		1	15				1	25			16	26				1	0		0	0	0
Routt (NWVNA)							1	29			1	29				0	0		0	1	0
Summit					1	25			1		2	25	1		2	0	1		0	1	1
Northwest Region	**0**	**1**	**16**	**346**	**4**	**186**	**6**	**206**	**2**	**10**	**28**	**749**	**2**	**1**	**3**	**4**	**7**	**0**	**3**	**4**	**7**
Alamosa							1	59			1	59				0	2		1	0	0
Conejos							1	17			1	17				1	1		0	0	0
Costilla											0	0				0	1		0	1	0
Mineral											0	0				1	0		0	0	0
Rio Grande							1	17			1	17				1	1		0	2	0
Saguache											0	0				0	2		0	0	0
San Luis Valley Region	**1**	**0**	**0**	**2**	**0**	**0**	**3**	**93**	**0**	**0**	**4**	**95**	**0**	**0**	**0**	**3**	**7**	**0**	**1**	**3**	**0**
Custer											0	0				1	1		0	1	0
Fremont							1	55			1	55				5	9		1	0	1
Huerfano (LA-HHD)							1	25			1	25				1	1		1	0	0
Las Animas (LA-HHD)							1	15			1	15				4	2		1	2	0
Pueblo			2	650							2	650				0	9		2	0	6
South Region	**0**	**0**	**2**	**650**	**0**	**0**	**3**	**95**	**0**	**0**	**5**	**745**	**0**	**0**	**0**	**11**	**22**	**0**	**5**	**3**	**7**
Chaffee							1	25			1	25				2	1		0	0	0
El Paso			3	1,236							3	1,236				1	15		4	8	15
Lake									1	25	1	25				0	0		0	0	0
Park											0	0				0	1		0	0	0
Teller									1	15	1	15				0	1		0	0	0

South Central Region	**1**	**0**	**3**	**2**	**0**	**0**	**3**	**25**	**2**	**40**	**9**	**67**	**0**	**0**	**0**	**3**	**18**	**0**	**4**	**8**	**15**
Baca									1	23	1	23				1	0		0	0	0
Bent											0	0				1	3		0	1	0
Crowley (Otero)											0	0				1	2		0	0	0
Kiowa							1	25			1	25				1	0		0	0	0
Otero							1	78			1	78				1	1		1	0	0
Prowers							1	25			1	25				1	1		1	0	0
Southeast Region	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**128**	**1**	**23**	**4**	**151**	**0**	**0**	**0**	**6**	**7**	**0**	**2**	**1**	**0**
Archuleta (SJBHD)									1	23	1	23				0	0		0	0	0
Dolores											0	0				0	1		0	0	0
La Plata (SJBHD)									1	25	1	25				0	1		1	0	2
Montezuma							1	25			1	25				2	1		1	0	1
San Juan											0	0				0	0		0	0	0
Southwest Region	**1**	**0**	**2**	**0**	**3**	**0**	**1**	**25**	**6**	**48**	**3**	**73**	**0**	**0**	**0**	**2**	**3**	**0**	**2**	**0**	**3**
Delta							1	49			1	49				1	1		0	0	0
Gunnison							1	25			1	25	1			0	0		0	0	1
Hinsdale											0	0				1	0		0	0	0
Montrose							1	75			1	75	1			2	1		1	0	1
Ouray											0	0				0	0		0	0	0
San Miguel									2		2	0	1			1	0		0	0	0
West Region	**1**	**0**	**0**	**2**	**0**	**0**	**3**	**149**	**2**	**0**	**5**	**151**	**3**	**0**	**0**	**5**	**2**	**0**	**1**	**0**	**2**
All Colorado	**8**	**1,709**	**28**	**2,093**	**13**	**1,268**	**36**	**1,645**	**18**	**2,202**	**92**	**8,917**	**7**	**1**	**3**	**46**	**119**	**17**	**52**	**57**	**109**

[1]TCHD = Tri-County Health Dept., NCHD = Northeast Colorado Health Dept., NWVNA = Northwest Colorado Visiting Nursing Association, SJBHD = San Juan Basin Health Dept., LA-HHD = Animas-Huerfano Health Dept. Otero County Health Dept services Crowley County. [2]CECC = Community Clinic and Emergency Center. [3]ESRD = End Stage Renal Disease Clinic.

Appendix 4 – Colorado Medical Facilities (cont.)

Region & County[1]	Assisted Living Residences		Nursing Homes		Hospices		Assisted Living Residences for Mentally Ill		Residential Care Facilities - Developmental Disabilities		Intermediate Care Facilities - Mental Disabilities		Home Health Agencies
	Extended Care Facilities												Services
	#	Beds	#	Beds	#	Beds	#	Beds	#	Beds	#	Beds	#
Adams (TCHD)	30	854	15	1,883			4	54	8	46			4
Arapahoe (TCHD)	68	1,957	21	2,165	9	40	4	62	18	109	1	23	20
Boulder	23	885	9	1,066	5	10	4	37	5	40			8
Broomfield	1	5	1	180									
Clear Creek													
Denver	51	2,300	21	2,248	7	0	18	166	8	56			14
Douglas (TCHD)	15	211	2	206					2	13			2
Elbert	1	8	1	30									
Gilpin													
Jefferson	75	2,077	26	2,542	4	24	2	23	35	235	1	30	5
North Central Region	**264**	**8,297**	**96**	**10,320**	**25**	**74**	**32**	**342**	**76**	**499**	**2**	**53**	**53**
Cheyenne			1	38									
Kit Carson	4	64	1	37	1	0			2	15			1
Larimer	29	1055	14	1,270	3	12	1	8	14	77			5
Lincoln	2	46	1	35	1	0							1
Logan (NCHD)	5	96	2	187	1	0			5	33			2
Morgan (NCHD)	5	140	3	337	1	0			2	14			1
Phillips (NCHD)	1	32	1	51									
Sedgwick (NCHD)	1	26	1	32					1	8			
Washington (NCHD)			1	34									

Weld		17	426	7	814	4	22	2	28	6	26				7
Yuma (NCHD)		2	50	3	149	1	0								1
Northeast Region		**66**	**1935**	**35**	**2,984**	**12**	**34**	**3**	**36**	**30**	**173**	**0**	**0**		**18**
Eagle						1	0			1	5				1
Garfield		7	145	4	301	1	0			7	46				1
Grand		1	28			1	0								1
Jackson															
Mesa		26	1004	8	656	1	0			23	163	1	46		7
Moffat (NWVNA)				1	58	1	0			3	17				1
Pitkin		1	15												
Rio Blanco		1	20	1	33										2
Routt (NWVNA)		1	20	1	59	1	0			2	10				1
Summit						1	0								1
Northwest Region		**37**	**1,232**	**15**	**1,107**	**7**	**0**	**0**	**0**	**36**	**241**	**1**	**46**		**15**
Alamosa		2	101	2	130	1	0			6	39				2
Conejos				1	31										
Costilla				0											
Mineral				0											
Rio Grande		1	36	3	160					2	8				
Saguache				0											
San Luis Valley Region		**3**	**137**	**6**	**321**	**1**	**0**	**0**	**0**	**8**	**47**	**0**	**0**		**2**
Custer		1	19												
Fremont		4	82	6	513	3	2			2	6				1
Huerfano (LA-HHD)				2	162	1	0			1	4				1
Las Animas (LA-HHD)		1	12	1	119					4	24				
Pueblo		23	634	11	1,036	3	10	3	40	17	124				9
South Region		**29**	**747**	**20**	**1,830**	**7**	**12**	**3**	**40**	**24**	**158**	**0**	**0**		**11**
Chaffee		1	6	1	112	1	0			1	5				2
El Paso		50	1494	21	1,961	5	54			8	44				14
Lake															1
Park															

Teller				1	60	1	0							1
South Central Region		**51**	**1500**	**23**	**2,133**	**7**	**54**	**0**	**0**	**9**	**49**	**0**	**0**	**18**
Baca		1	20	2	86	1	0							1
Bent		3	41	1	60					2	11			1
Crowley (Otero)				1	37									
Kiowa		1	20	1	34									1
Otero		2	87	4	268	1	0			4	21			1
Prowers		1	24	2	109	1	0			2	8			1
Southeast Region		**8**	**192**	**11**	**594**	**3**	**0**	**0**	**0**	**8**	**40**	**0**		**5**
Archuleta (SHBHD)		1	10	1	60	1	0							
Dolores														
La Plata (SJBHD)		2	34	1	158	1	0							3
Montezuma		6	143	2	186	1	0							2
San Juan														
Southwest Region		**9**	**187**	**4**	**404**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Delta		5	97	3	219	1	0			1	5			2
Gunnison		1	15	1	59	1	0							1
Hinsdale														
Montrose		6	206	3	273	2	0			6	44			2
Ouray														
San Miguel														
West Region		**12**	**318**	**7**	**551**	**4**	**0**	**0**	**0**	**7**	**49**	**0**	**0**	**5**
All Colorado		**479**	**14,545**	**217**	**20,244**	**69**	**174**	**38**	**418**	**198**	**1,256**	**3**	**99**	**132**

[1]TCHD = Tri-County Health Dept., NCHD = Northeast Colorado Health Dept., NWVNA = Northwest Colorado Visiting Nursing Association, SJBHD = San Juan Basin Health Dept., LA-HHD = Animas-Huerfano Health Dept. Otero County Health Dept services Crowley County.

Appendix 4 – Colorado Medical Facilities (cont.)

Region & County[1]	Fixed Wing Ambulances	Rotor Ambulances	Ground Ambulance Agencies	Mental Health Centers	Community Mental Health Clinics	Mental Health Hospitals[2]		Residential Treatment Centers	
	Ambulances			Mental Health					
	#			#	#	Beds	#	Beds	#	Beds
Adams (TCHD)		1	11	1	1		1		3	112
Arapahoe (TCHD)	14	1	12	11	1	368	1	577	4	263
Boulder			8	1	1		3		2	20
Broomfield			1							
Clear Creek			1						1	24
Denver			3	1	1	1,293	1	417	15	572
Douglas (TCHD)		1	5	2	1				1	80
Elbert			6							
Gilpin			2							
Jefferson			9	1	1		1		12	335
North Central Region	**14**	**3**	**58**	**17**	**6**	**1,661**	**7**	**994**	**38**	**1,406**
Cheyenne			1							
Kit Carson			2						4	83
Larimer			4	1	1		1			
Lincoln			4							
Logan (NCHD)			2	1	1				1	40
Morgan (NCHD)			1							
Phillips (NCHD)			2							
Sedgwick (NCHD)			1							

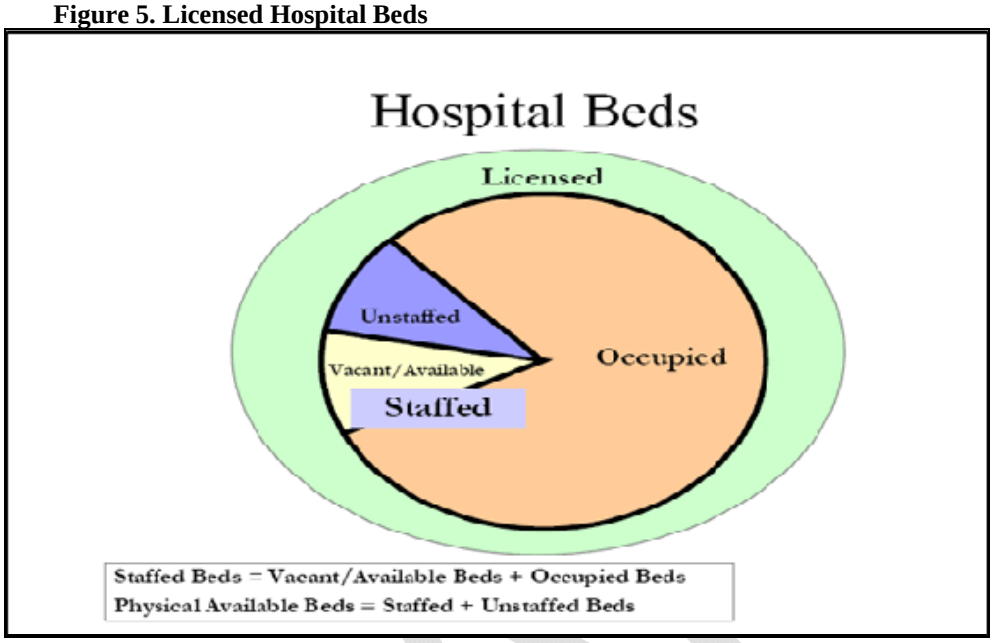
Washington (NCHD)				1							
Weld			3	2	1	1		1	378	4	85
Yuma (NCHD)				4							
Northeast Region		**0**	**3**	**24**	**3**	**3**	**0**	**2**	**378**	**9**	**208**
Eagle				2							
Garfield				7	1	1					
Grand				1							
Jackson				1							
Mesa		1	1	10				3		3	80
Moffat (NWVNA)				2							
Pitkin				2							
Rio Blanco				2							
Routt (NWVNA)				5							
Summit			1	1							
Northwest Region		**1**	**2**	**33**	**1**	**1**	**0**	**3**	**0**	**3**	
Alamosa		5		2	1	1				1	12
Conejos				1							
Costilla				0							
Mineral				1							
Rio Grande				3						1	24
Saguache				3							
San Luis Valley Region		**5**	**0**	**10**	**1**	**1**	**0**	**0**	**2**	**2**	**3**
Custer				1							
Fremont				3	1	1					
Huerfano (LA-HHD)				1							
Las Animas (LA-HHD)				2							
Pueblo		4	1	6	1	1		3	650	2	166
South Region		**4**	**1**	**13**	**2**	**2**	**0**	**3**	**650**	**2**	**166**
Chaffee				1							
El Paso			2	9	1	1		2	620	4	242

Lake				1							
Park				2							
Teller				3							
South Central Region		**0**	**2**	**16**		**1**	**0**	**2**	**2**		
Baca				3							
Bent				2							
Crowley (Otero)				1							
Kiowa				1							
Otero				5		1	1			1	93
Prowers				2							
Southeast Region		**0**	**0**	**14**		**1**	**1**	**0**	**0**	**0**	**1**	**93**
Archuleta (SJBHD)				1							
Dolores				2							
La Plata (SJBHD)		1	1	3		1					
Montezuma				4			1				
San Juan				1							
Southwest Region		**1**	**1**	**11**		**1**	**1**	**0**	**0**	**0**	**0**	**0**
Delta				2							
Gunnison				2							
Hinsdale				1							
Montrose				3		1	1				
Ouray				1							
San Miguel				2							
West Region		**0**	**0**	**11**		**1**	**1**	**0**	**0**	**2**	**0**	**0**
All Colorado		**25**	**12**	**190**		**27**	**17**	**1,661**	**17**	**2,028**	**55**	**1,876**

[1] TCHD = Tri-County Health Dept., NCHD = Northeast Colorado Health Dept., NWVNA = Northwest Colorado Visiting Nursing Association, SJBHD = San Juan Basin Health Dept., LA-HHD = Animas-Huerfano Health Dept. Otero County Health Dept services Crowley County.
[2] About 300 mental health hospital beds are duplicated in the number of beds for general hospitals. The remaining approximately 1000 mental health hospital beds are not associated with general hospitals.

Appendix 5 – HAVBed Definitions

Figure 5. Licensed Hospital Beds



- **Licensed Beds:** The maximum number of beds for which a hospital holds a license to operate. Many hospitals do not operate all of the beds for which they are licensed.

- **Physically Available Beds:** Beds that are licensed, physically set up, and available for use. These are beds regularly maintained in the hospital for the use of patients, which furnish accommodations with supporting services (such as food, laundry, and housekeeping). These beds may or may not be staffed but are physically available.

    - **Unstaffed Beds:** Beds that are licensed and physically available and have no current staff on hand to attend to a patient who would occupy the bed.

    - **Staffed Beds:** Beds that are licensed and physically available for which staff is on hand to attend to the patient who occupies the bed. Staffed beds include those that are occupied and those that are vacant.

        - **Occupied Beds:** Beds that are licensed, physically available, staffed, and occupied by a patient.

        - **Vacant/Available Beds:** Beds that are vacant and to which patients can be transported immediately. These must include supporting space, equipment, medical material, ancillary and support services, and staff to operate under normal circumstances. These beds are licensed, physically available, and have staff on hand to attend to the patient who occupies the bed.

A description of the types of beds to be reported to the HAvBED project includes the following:

- **Adult Intensive Care Unit (ICU):** beds that can support critically ill/injured patients, including ventilator support.
- **Medical/Surgical:** also thought of as "Ward" beds.
- **Burn:** thought of as Burn ICU beds, either approved by the American Burn Association or self-designated. (These beds are NOT to be included in other ICU bed counts.)
- **Pediatric ICU:** as for Adult ICU, but for patients 17 years and younger.
- **Pediatrics:** "Ward Medical/Surgical" beds for patients 17 and younger.
- **Psychiatric:** "ward" beds on a closed/locked psychiatric unit or ward beds where a sitter will attend the patient.
- **Negative Pressure/Isolation:** Beds provided with negative airflow, providing respiratory isolation. **Note:** This value may represent available beds included in the counts of other types.
- **Operating Rooms:** An operating room that is equipped and staffed and could be made available for patient care in a short period of time.

For the purposes of estimating institutional surge capability in dealing with patient disposition during a large mass casualty incident, the following bed availability estimates also be reported for each of the bed types described above:

- **24 hr Beds Available:** This value represents an informed estimate as to how many vacant (staffed, unoccupied) beds for each bed type above the current number that could be made available within 24 hours. This would include created institutional surge beds as well as beds made available by discharging/transferring patients.
- **72 hr Beds Available:** This value represents an informed estimate as to how many vacant (staffed, unoccupied) beds for each bed type above the current number that could be made available within 72 hours. This would include created institutional surge beds as well as beds made available by discharging/transferring patients.

Through use of these standardized definitions of bed statuses, bed types and estimates of future bed availability, there will be greater consistency amongst hospitals in reporting their bed availability information. The following hospital characteristics should also be reported as data elements for the HAvBED project:

- **Emergency Department Status:**
  Open—Accepting patients by ambulance.
  Closed—Not accepting patients by ambulance.
  N/A—Not Applicable (Hospital does not have an ED).
- **Mass Decontamination Facility Availability:**
  Available— The institution has chemical/biological/radiological multiple patient decontamination capability.
  Not Available— The institution is unable to provide chemical/biological/radiological patient decontamination.
- **Ventilators:**
  Available: The number of ventilators that are present in the institution but are currently not in use and could be supported by currently available staff.

Appendix 6 –Key Panflu Triage Guidance

Table 3 - Potential Care Sites and Facility Classification

Potential Care Sites	Facility Classification
Home (phone)	N/A
Hospitals	A
Extended Care Facilities/Skilled Nursing Facilities	B
Ambulatory Surgical Centers	B
Community Clinics and Community Clinics with Emergency Centers	B
Outpatient Clinics/Physicians' Offices/ Rural and Community Health Clinics	C
Behavioral Health Clinics	C
Alternate Care Facilities	C
College/University Health Centers	C
Shelters	D
Public Health Points of Dispensing	E
Pharmacies	E

Figure 4: Case Detection & Clinical Management Algorithm for Pre-pandemic & Pandemic Alert Phases

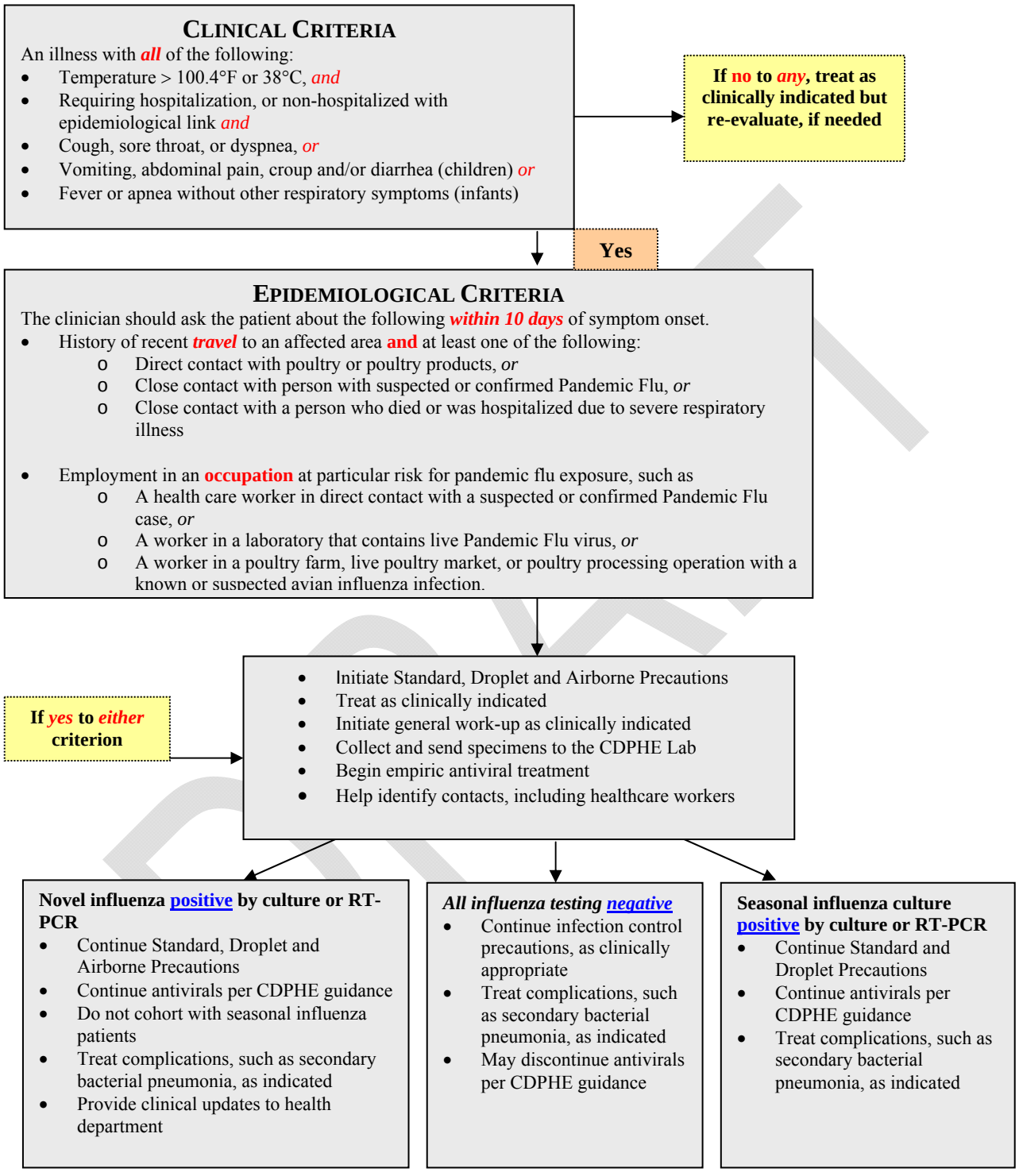
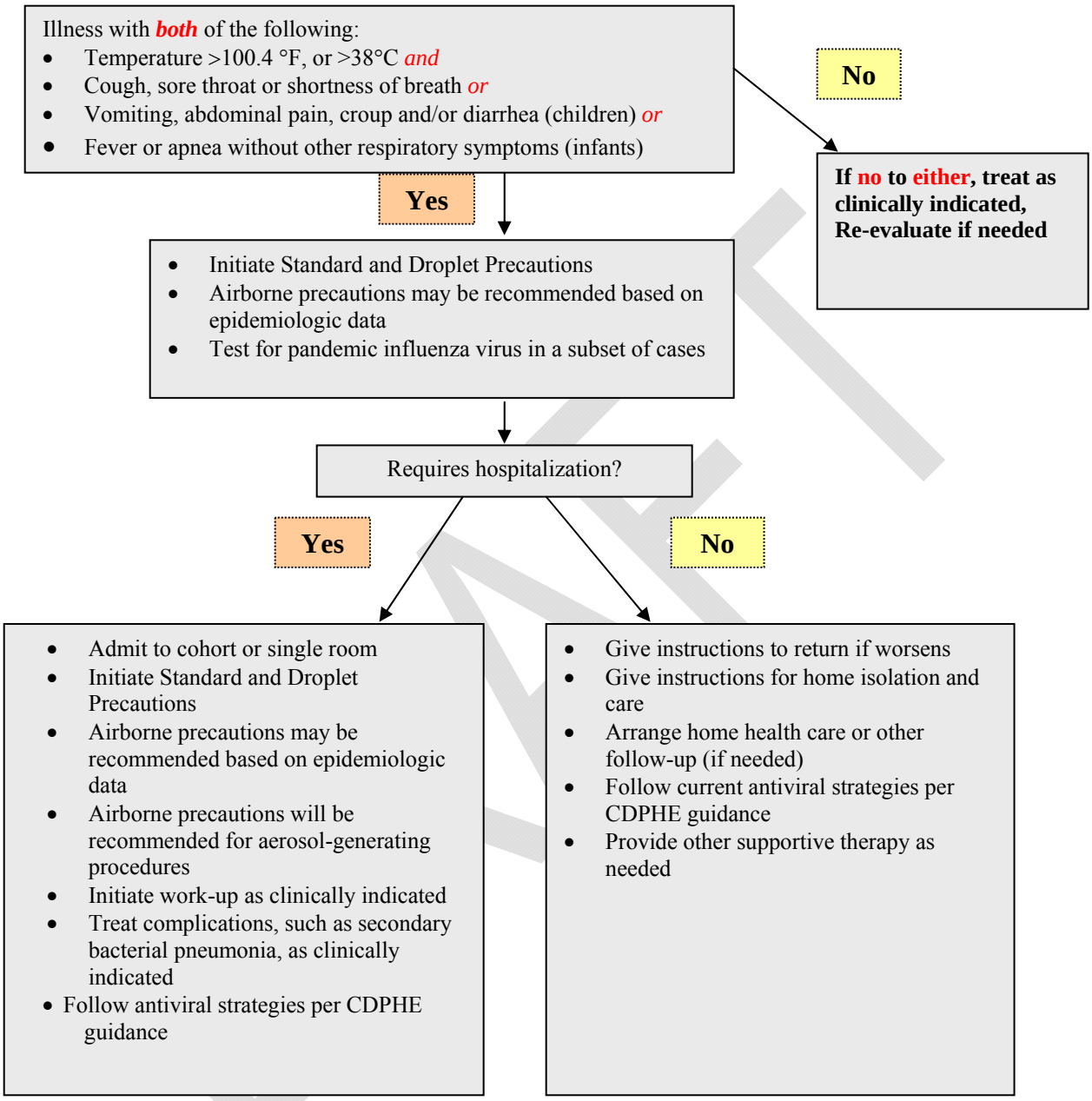


Figure 5: Case Detection & Clinical Management Algorithm for Pandemic Phase



Telephone Triage (Adults and Pediatrics)

Call EMS (911) NOW for transport to a Level A Facility

- Severe respiratory distress (struggling for each breath, unable to speak or cry, severe retractions, cyanosis)
- Slow shallow, weak breathing (R/O respiratory depression)
- Stopped breathing (apneic episode)
- Bluish lips, tongue or face now (R/O cyanosis)
- Shock suspected (very weak, limp, not moving, too weak to stand, pale cool skin)
- Sounds like a life-threatening emergency to the triaging personnel (other than normal flu symptoms)

Refer to Level A or Level B Facility NOW

- **Hospital**:
  - Respiratory distress – mild or moderate (any wheezing, stridor or tachypnea)
  - Suspected pandemic influenza patients with chronic lung disease or heart disease
- **Community Clinics/Community Clinics with Emergency Centers:**
  - Dehydration suspected (no urine>12 hours, dry mouth, no tears)
  - Needs emergent care based upon triaging personnel's clinical judgment
- **Ambulatory Surgical Center:**
  - In labor and low-risk pregnancy
  - Non-flu trauma
  - Other special populations who need specific care away from known influenza patients

Refer to Level C Facility NOW

- **Behavioral Health Clinic:**
  - Psych emergencies: potentially harmful to self or others, gravely disabled, panic reactions, hopelessness or depression, etc.

Refer to Level C Facility within 24 hours

- **Alternate Care Facility:**
  - Will depend on the type of care provided (e.g. palliative care, outpatient care, suspected influenza patients, etc)
- **Physicians' Office, Outpatient Clinic and Community/Rural Health Clinic:**
  - Patients normally seen here
  - Chronic disease patients with complications but without influenza
  - Acute illness visits (however, many will be handled by phone)

Refer to Level E facility within 24 hours

- **Public Health Point of Dispensing:**
  - Well patients who want an influenza vaccine, when available

Call in Prescription within 24 hours

- Suspected pandemic influenza patients in high-risk group
- Chronic disease refills (e.g., asthma meds)
- Suspected ear infections
- Suspected sinus infections
- Eye infections with purulent (containing pus) eye discharge

Home Care with Telephone Triage and Advice

- Suspected influenza patients without complications and NOT in high-risk group
- Most mild illnesses, acute phase
- Most acute minor injuries (trauma)
- Chronic disease management
- Mild dehydration

Figure 6 – Resources Adequate during the Pandemic Phase

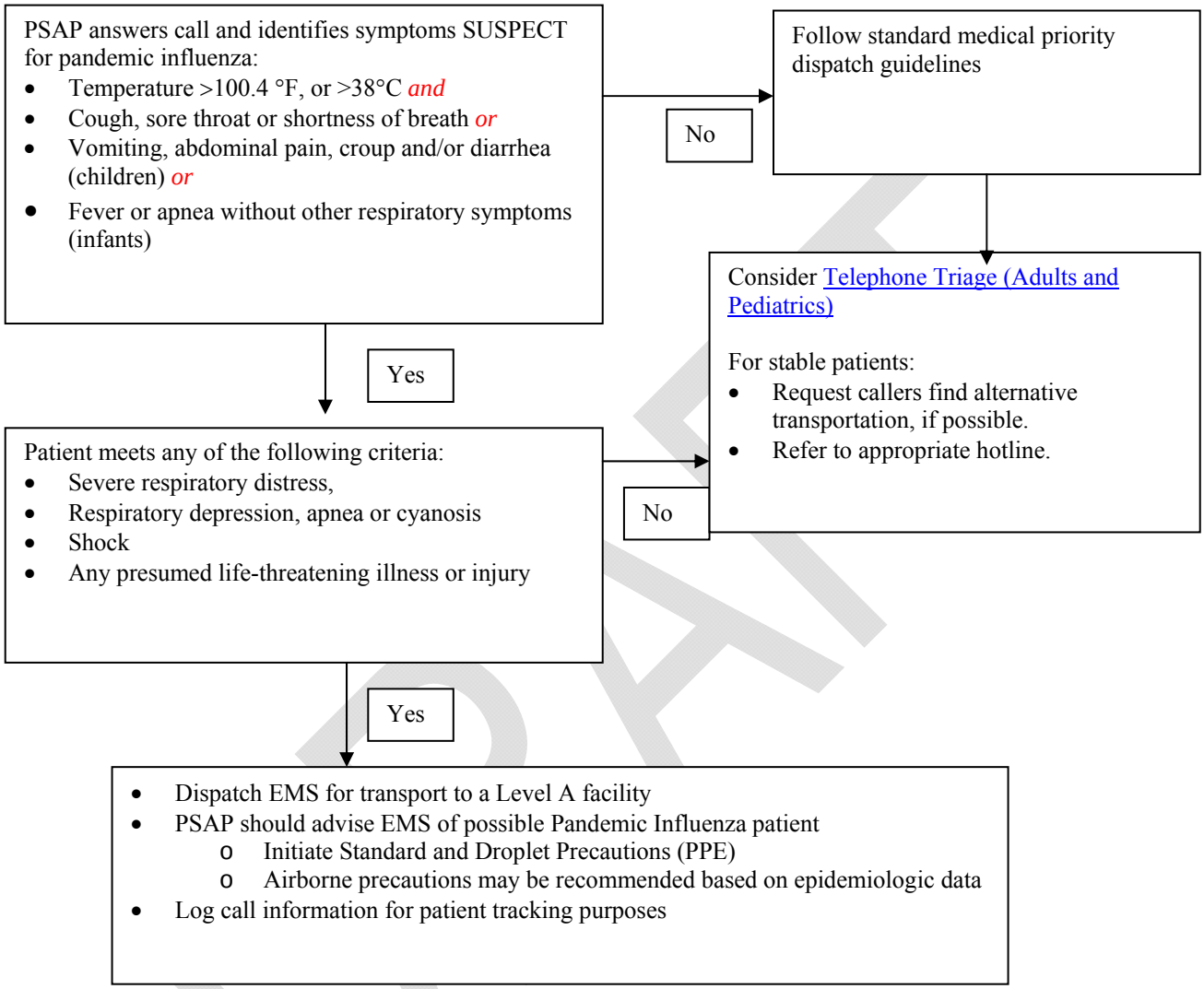


Figure 7 - Resources Inadequate during the Pandemic Phase - (Over capacity but not overwhelmed)

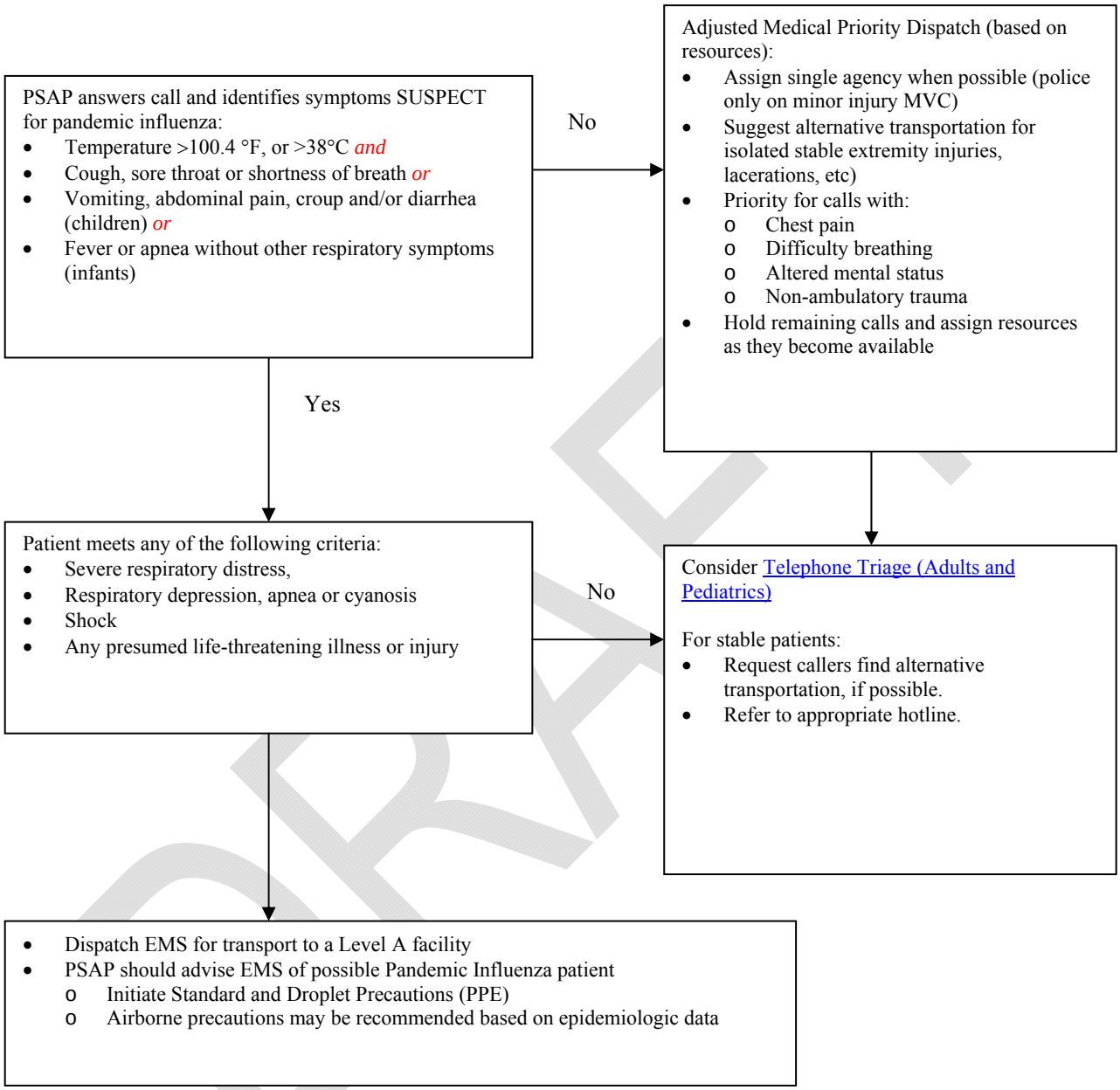


Figure 8 - Resources Overwhelmed during the Pandemic Phase

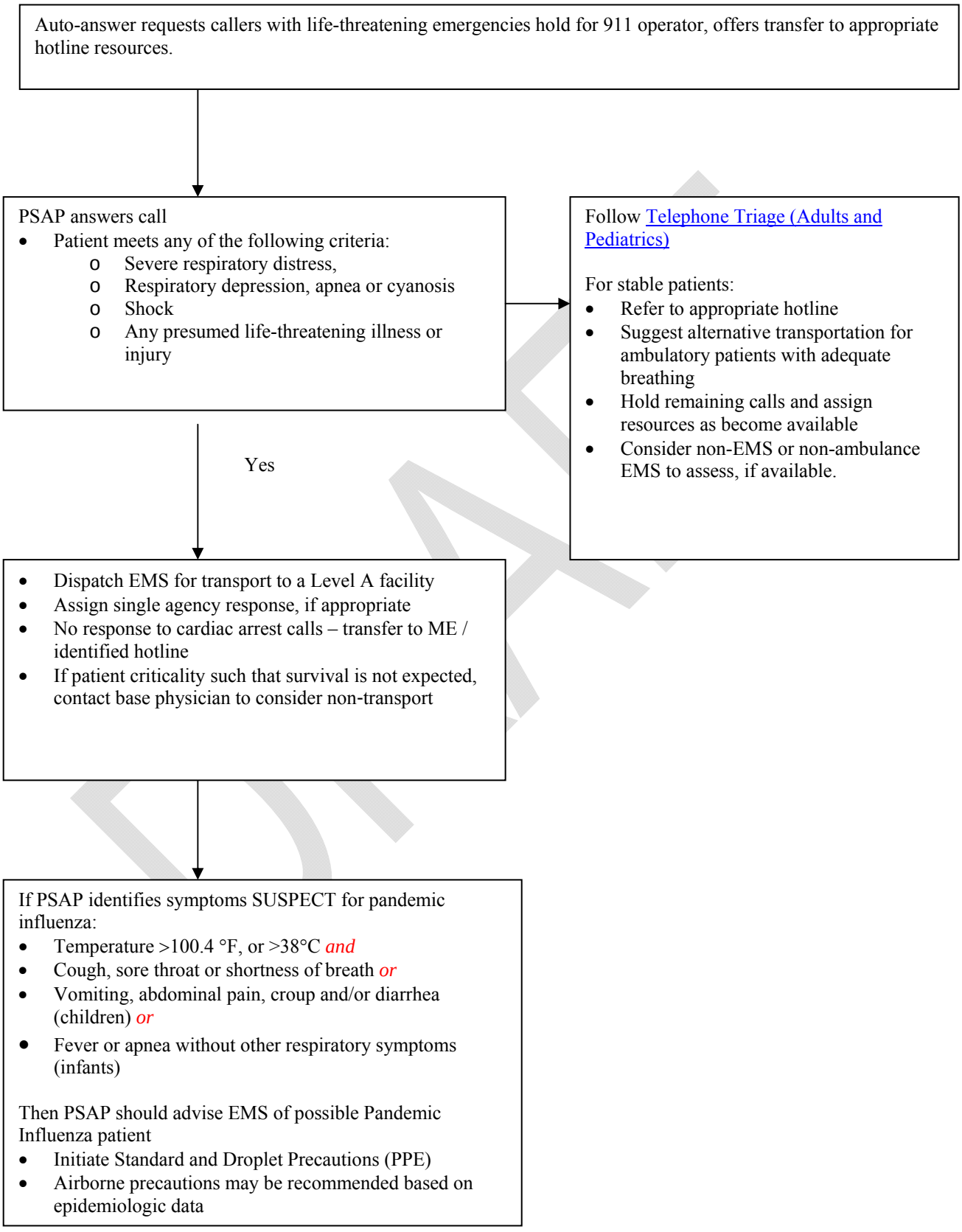


Table 4 - Triage Scoring System for Adult Infectious Disease Presentations

Evaluate clinical criteria and score one point for each positive finding below:	
• Respiratory rate (RR) > 30	
• Shock index >1 (Heart rate/Systolic BP)	
• O_2 Saturation < 90% (hypoxic)	
• Altered mental status (e.g., confusion)	
• Age ≥ 65	
Compute score:	
Score (Points)	***Estimated Mortality (%)***
0	<2
1	3-6
2	8-12
≥3	25-32
Determine disposition:	
Score (Points)	***Disposition (Care Site)***
0	
Tolerates Oral Rehydration Therapy (ORT) Dehydrated, not tolerating ORT	Home Level C with IV hydration capability
1	
Age alone **or** Shock Index >1 due to dehydration (resolved with treatment) o Tolerates ORT o Not tolerating ORT Shock Index > 1 not resolved with hydration Hypoxic or RR > 30 Altered mental status (e.g. confusion)	 Home or Level D Level C with IV hydration capability Level A or B Level B or C with oxygen Level A or B
2	
For patients < age 65: o Hypoxia **and** RR > 30 alone For patients ≥ age 65: o Hypoxia **or** RR > 30 alone o Shock Index >1 due to dehydration (resolved with treatment) All other patients with score = 2	 Level B with oxygen Level B with oxygen Level B with IV hydration Level A
≥ 3	Level A
Notes: • Evaluate all patients for secondary bacterial Community Acquired Pneumonia (CAP) or other bacterial complications of influenza. • If appropriate, institute antibiotics by oral route if possible. If unable to tolerate, consider transfer to facility capable of IV antibiotics. • Screen for appropriateness of antiviral therapy as available per CDPHE recommendations.	

Table 5 - Triage System for Pediatric Infectious Disease Presentations

Evaluate clinical criteria:

- Abnormal breath sounds, Stridor
- Tachypnea for age (Table 1)
- Increase work of breathing (retractions, nasal flaring, head bobbing) or apnea
- O_2 Saturation < 90% at 5,280 feet (hypoxic) or equivalent local values, cyanosis
- Shock signs: delayed end organ perfusion (such as delayed capillary refill) plus tachycardia for age (Table 2)
- Altered Mental Status
- Age < 2 months

Determine age-based respiratory rate (RR):

Age Group	***Normal RR (breaths/min.)***	***Mild-Moderate Tachypnea (breaths/min.)***	***Severe Tachypnea (breaths/min.)***
Infant (<1year)	30-60	60-70	>70
Toddler (1-3 years)	24-40	40-50	>50
Preschooler (4-5 years)	22-34	35-45	>45
School age (6-12 years)	18-30	25-35	>35
Adolescent (13-18 years)	12-20	20-30	>30

Determine age-based heart rate (HR):

Age Group	***Normal HR (beats/min.)***	***Mild-Moderate Tachycardia (beats/min.)***	***Severe Tachycardia (beats/min.)***
Infant (<1 year)	110-180	180-200	>200
Toddler (1-3 years)	100-150	150-170	>170
Preschooler (4-5 years)	60-140	140-160	>160
School age (6-12 years)	60-120	120-140	>140
Adolescent (13-18 years)	60-100	100-120	>120

Determine disposition:

Severity of Symptoms	***Disposition (Care Site)***
Mildly Ill	
• Alert, active • No stridor • Minimal to no retractions • RR normal to mild-moderate tachypnea • No hypoxia or cyanosis • No signs of shock • Feeding well, minimal to no signs of dehydration	Home or Level D with instructions
Moderately Ill	
• Alert, consoles • Stridor with agitation, not at rest (comfortable) • Minimal to moderate retractions • Mild-moderate tachypnea • Hypoxia- not severe (pulse-oximetry 80-90% room air at 5,280 feet), no cyanosis	Level C with ORT or IV hydration *or* Level B with oxygen or IV hydration *or*

• Mild tachycardia without signs of shock • Decrease feeding or mild dehydration	Level A
Severely Ill	
• Fussy, difficult to console, altered mentation • Stridor at rest • Moderate to severe retractions, nasal flaring, head bobbing • Severe tachypnea • Cyanosis or hypoxia (pulse-oximetry <80% room air at 5,280 feet) • Episodes apnea • Moderate to severe tachycardia and/or clinical signs of shock • Poor feeding, moderate to severe signs of dehydration • Symptoms and age < 2 months	Level A
• Evaluate all patients for secondary bacterial CAP or other bacterial complications of influenza. • Children as opposed to adults can present with upper airway or croup like symptoms • All patients should have pulse-oximetry • Attempt nasal suction on all infants and young children with respiratory distress or decrease feeding • Attempt rehydration and initial antibiotics by oral method in the mildly or moderately ill child. Those that are severely ill or unable to tolerate oral antibiotics should be transferred to a facility capable of IV fluids and antibiotics • Screen for appropriateness of antiviral therapy as available per CDPHE recommendations[21].	

Table 6 – Diagnostics and Likely Bacterial Pathogens in Adults

Disposition (Care Site)	CAP-Specific Diagnostic Measures	Likely Bacterial Pathogens Causing Pneumonia	
Home	None	*S. pneumoniae* *H. influenzae*	*M. pneumoniae* *C. pneumoniae*
Level C	None	*S. pneumoniae* *H. influenzae* *Legionella sp.*	*M. pneumoniae* *C. pneumoniae*
Level B	None Consider ancillary testing of co-morbid conditions (e.g. blood sugar, chemistries)	*S. pneumoniae* *H. influenzae* *Legionella sp.*	*M. pneumoniae* *C. pneumoniae* *S. Aureus- MSSA or MRSA*
Level A – ward level care	Multi-system evaluation as indicated and available Sputum culture, blood cultures and urinary antigens if clinical resources available	*S. pneumoniae* *H. influenzae* *Legionella sp* *Gram neg sp*	*M. pneumoniae* *C. pneumoniae* *S. Aureus- MSSA or MRSA*
Level A – ICU level care	Multi-system evaluation as indicated and available Sputum culture, blood cultures and urinary antigens if clinical resources available	*S. pneumoniae* *H. influenzae* *Legionella sp.* *Gram neg sp.*	*M. pneumoniae* *C. pneumoniae* *S. Aureus- MSSA or MRSA*

Table 7 - Recommended Empirical Antibiotics for Community Acquired Pneumonia in Adults

Home treatment
1. Previously healthy and no use of antimicrobials within the previous 3 months • A macrolide • Doxycyline 2. Presence of comorbidities such as chronic heart, lung, liver or renal disease; diabetes mellitus; alcoholism; malignancies; asplenia; immunosuppressing conditions or use of immunosuppressing drugs; or use of antimicrobials within the previous 3 months (an alternative from a different class should be selected) • A respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin [750 mg]) • A β-lactam **plus** a macrolide, doxycycline may substitute for macrolide 3. In regions with a high rate (>25%) of infection with high level (MIC ≥ 16 μg/mL) macrolide resistant *Streptococcus pneumoniae*, consider use of alternative agents listed above in for patients without comorbidities
Non-ICU treatment in Level B or C care site
o A respiratory fluoroquinolone o A β-lactam **plus** a macrolide, doxycycline may substitute for macrolide o Use oral therapy if feasible in non-ICU patients and do not treat patients with negative x-rays for CAP
Non-ICU treatment in a Level A care site
o A respiratory fluoroquinolone o A β-lactam **plus** a macrolide, doxycycline may substitute for macrolide o If MSSA or MRSA a consideration add vancomycin or linezolid o Use oral therapy if feasible in non-ICU patients and do not treat patients with negative x-rays for CAP
ICU treatment
o A β-lactam (cefotaxime, ceftriaxone, or ampicillin-sulbactam) plus either azithromycin or a respiratory fluoroquinolone (for penicillin-allergic patients, a respiratory fluoroquinolone and aztreonam are recommended)
Special concerns
If *Pseudomonas* is a consideration: o An antipneumococcal, antipseudomonal β-lactam (piperacillin-tazobactam, cefepime, imipenem, or meropenem) plus either ciprofloxacin or levofloxacin (750 mg) **OR** o The above β-lactam plus an aminoglycoside and azithromycin **OR** o The above β-lactam plus an aminoglycoside and an antipneumococcal fluoroquinolone (for penicillin allergic patients, substitute aztreonam for above β-lactam) o The above β-lactam plus an aminoglycoside and an antipneumococcal fluoroquinolone (for penicillin allergic patients, substitute aztreonam for above β-lactam) o If MSSA or MRSA is a consideration, add vancomycin or linezolid, modify based on sensitivities

Mechanical Ventilator Triage (Adults)

Tier 1: Do not offer and if started, withdraw ventilatory support for patients with any one of the following:

1. Respiratory failure requiring intubation with persistent hypotension (systolic blood pressure <90 mm Hg for adults) unresponsive to adequate fluid resuscitation after 6–12 hours of therapy and signs of additional end-organ dysfunction (e.g., oliguria: very small amount of urine), mental status changes, cardiac ischemia (lack of oxygen in the heart muscle)
2. Failure to respond to mechanical ventilation (no improvement in oxygenation or lung compliance) and antibiotics after 72 hours of treatment for a bacterial pathogen (timeline may be modified based on organism-specific data)
3. Laboratory or clinical evidence of greater than or equal to four organ systems failing
    a. Pulmonary – Arteries (adult respiratory distress syndrome, ventilatory failure, refractory hypoxemia or severe chronic lung disease with FEV in 1 second of < 25%)
    b. Cardiovascular – Heart (left ventricular dysfunction, hypotension, new ischemia)
    c. Renal – Kidneys (hyperkalemia, diminished urine output despite adequate fluid resuscitation, increasing creatinine level, dialysis dependant)
    d. Hepatic – Liver (transaminase greater than two times upper limit of normal, increasing bilirubin or ammonia levels or Model of End-stage Liver Disease score > 20)
    e. Neurologic – Nervous System (altered mental status not related to volume status, metabolic, or hypoxic source, stroke or severe, irreversible neurologic event/condition with high expected mortality)
    f. Hematologic – Blood (clinical or laboratory evidence of disseminated intravascular coagulation)

Tier 2: Do not offer and if started withdraw ventilatory support for patients with respiratory failure requiring intubation with the following conditions (in addition to those in Tier 1):

Patients with pre-existing system compromise or failure including:

10. Known congestive heart failure with ejection fraction <25% (or persistent ischemia unresponsive to therapy and pulmonary edema)
11. Acute renal failure requiring hemodialysis (related to illness)
12. Severe chronic lung disease including pulmonary fibrosis, cystic fibrosis, obstructive or restrictive diseases requiring continuous home oxygen use before onset of acute illness
13. Acquired immunodeficiency syndrome (AIDS), other immunodeficiency syndromes at stage of disease susceptible to opportunistic pathogens (e.g., CD4 <200 for AIDS) with respiratory failure requiring intubation
14. Active malignancy (cancer) with poor potential for survival (e.g., metastatic malignancy, pancreatic cancer)
15. Cirrhosis with ascites, history of variceal bleeding, fixed coagulopathy, or encephalopathy
16. Acute hepatic failure with hyperammonemia
17. Irreversible neurologic impairment that makes patient dependent for personal care (e.g., severe stroke, congenital syndrome, persistent vegetative state)
18. Severe burn: body surface area >40%, severe inhalation injury

Tier 3: Apply specific protocols developed by the GEEERC and/or utilize SOFA scores.

4. Restriction of treatment based on disease-specific epidemiology and survival data for patient subgroups (may include age-based criteria) per GEEERC recommendations.
5. Expansion of pre-existing disease classes that will not be offered ventilatory support per GEEERC recommendations and governor approval.
6. Applying Modified Sequential Organ Failure Assessment scoring to the triage process and establishing a cutoff score above which mechanical ventilation will not be offered.

Hospital Pandemic Critical Care Triage by Modified SOFA Score (Adults and Pediatrics)

Instructions for the application of the triage protocol to determine a patient's need for critical care during an influenza pandemic

1. Assess whether the patient meets the inclusion criteria (Patients who may benefit from admission to critical care and primarily focuses on respiratory failure, since the provision of ventilatory support is what fundamentally differentiates the ICU from other acute care areas.
    - If yes, proceed to step 2
    - If no, reassess patient later to determine whether clinical status has deteriorated

2. Assess whether the patient meets the exclusion criteria (Patients who have a poor prognosis despite care in an ICU, patients who require resources that simply cannot be provided during a pandemic and patients with advanced medical illnesses whose underlying illness has a poor prognosis with a high likelihood of death, even without their current concomitant critical illness.)
    - If no, proceed to step 3
    - If yes, assign a "blue" triage code; *do not* transfer the patient to critical care; continue current level of care or provide palliative care as needed

3. Proceed to triage tool – Table 9. *The triage protocol applies to all patients undergoing assessment for possible critical care and not only those with influenza-like symptoms.*

Detailed inclusion and exclusion criteria used in the triage protocol for critical care during an influenza pandemic

Inclusion criteria

The patient is allowed admission or transfer to critical care if A or B is present:

A. Requirement for invasive ventilatory support (one or more of the following)
- Refractory hypoxemia (SpO_2 < 90% on non-rebreather mask)
- Respiratory acidosis (pH < 7.2)
- Clinical evidence of impending respiratory failure
- Inability to protect or maintain airway

B. Hypotension (systolic blood pressure < 90 mm Hg or relative hypotension) with clinical evidence of shock (altered level of consciousness, decreased urine output or other evidence of end-organ failure) refractory to aggressive volume resuscitation requiring vasopressor or inotrope support that cannot be managed in ward setting

Exclusion criteria

The patient is excluded from admission or transfer to critical care if any of the following is present:

A. Severe trauma with a revised trauma score of <2

B. Severe burns of patient with any two of the following:
- Age > 60 yr
- > 40% of total body surface area affected
- Inhalation injury
- Anticipated survival rate of <50% (Patients identified as "Low" or worse on Triage Decision Table for Burn Victims

C. Cardiac arrest
- Unwitnessed cardiac arrest
- Witnessed cardiac arrest, not responsive to electrical therapy (defibrillation or pacing)
- Recurrent cardiac arrest

D. Known severe dementia, medically treated and requiring assistance with activities of daily living

E. Do Not Resuscitate/Do Not Intubate (DNR/DNI)

F. Advanced untreatable neuromuscular disease (e.g., amyotrophic lateral sclerosis, end stage multiple sclerosis, etc.) requiring assistance with activities of daily living or requiring chronic ventilatory support

G. Metastatic malignant disease

H. Advanced and irreversible immuno-compromise

I. Severe and irreversible neurologic event or condition with persistent coma and Glascow Coma Score of <6

J. End-stage organ failure meeting the following criteria:

Heart –
- NYHA class III heart failure (Moderate) – Marked limitation of physical activity. Comfortable at rest but less than ordinary activity causes fatigue, palpitations or dyspnea.
- NYHA Class IV heart failure (Severe) – Unable to carry out physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

Lungs -
- Chronic Obstructed Pulmonary Disease (COPD) with forced expiratory volume in one second (FEV1) < 25% predicted, baseline
- Chronic PaO_2 < 55 mm Hg, or secondary pulmonary hypertension
- Cystic fibrosis with postbronchodilator FEV1 < 30% or baseline PaO_2 < 55 mm Hg
- Pulmonary fibrosis with VC or TLC < 60% predicted, baseline PaO_2 < 55 mm Hg, or secondary pulmonary hypertension
- Primary pulmonary hypertension (idiopathic pulmonary hypertension) with NYHA class III or IV heart failure, right atrial pressure > 10 mm Hg, or mean pulmonary arterial pressure > 50 mm Hg

Liver - Pugh score > 7, when available

K. Age > 85 yr

L. Elective palliative surgery

M. Known chromosomal or untreatable disorders that is uniformly fatal within the first two years of life.

Table 8 - Scoring criteria for the Modified Sequential Organ-Failure Assessment (SOFA) score

MSOFA Scoring Guidelines					
Variable	**Score[1]**				
	0	**1**	**2**	**3**	**4**
SpO_2/FIO_2 ratio* or Nasal cannula or mask 0_2 required to keep $Sp0_2$ >90%	SpO_2/FIO_2 >400 or Room air SpO_2 >90%	SpO_2/FIO_2 316-400 or SpO_2 >90% at 1-3 L/min	SpO_2/FIO_2 231-315 or SpO_2 >90% at 4-6 L/min	SpO_2/FIO_2 151-230 or SpO_2 >90% at 7-10 L/min	SpO_2/FIO_2 <150 or SpO_2 >90% at >10 L/min
Bilirubin level, mg/dL (µmol/L)	< 1.2 (< 20)	1.2–1.9 (20–32)	2.0–5.9 (33–100)	6.0–11.9 (101–203)	> 12 (> 203)
Hypotension†	None	MABP < 70	Dop ≤ 5	Dop > 5 Epi ≤ 0.1 Norepi ≤ 0.1	Dop > 15 Epi > 0.1 Norepi > 0.1
Glasgow Coma score	15	13–14	10–12	6–9	< 6
Creatinine level, mg/dL	< 1.2	1.2–1.9	2.0–3.4	3.5–4.9 or urine output <500 mL in 24 hours	> 5 or urine output <200 mL in 24 hours

[1]Patients can receive a total score of 20 (5 categories with a total of 4 points for each category); any patient with a score of ≥ 11 is excluded from critical care or mechanical ventilation.

Note: SpO_2/FIO_2 ratio: SpO_2 = Percent saturation of hemoglobin with oxygen as measured by a pulse oximeter and expressed as % (e.g., 95%); FIO_2 = Fraction of inspired oxygen; e.g., ambient air is 0.21

†MABP = mean arterial blood pressure in mm Hg (diastolic + 1/3(systolic - diastolic))

Dop= dopamine in micrograms/kg/min

Epi = epinephrine in micrograms/kg/min

Norepi = norepinephrine in micrograms/kg/min

Table 9 - Initial Assessment

Triage code	Criteria	Action or Priority
Blue	Exclusion criteria met or SOFA score > 11*	• Manage medically • Provide palliative care as needed • Discharge from critical care
Red	SOFA score ≤ 7 or single-organ failure	Highest Priority
Yellow	SOFA score 8–11	Intermediate Priority
Green	No significant organ failure	• Defer or discharge • Reassess as needed

Table 10 - 48-hour Assessment

Triage code	Criteria	Action or Priority
Blue	Exclusion criteria met or SOFA score > 11 or SOFA score stable at 8 – 11 with no change	• Provide palliative care • Discharge from critical care
Red	SOFA score < 11 and decreasing	Highest Priority
Yellow	SOFA score stable at < 8 with no change	Intermediate Priority
Green	No longer dependant on ventilator	Discharge from critical care

Table 11 - 120-hour Assessment

Triage code	Criteria	Action or Priority
Blue	Exclusion criteria met or SOFA score > 11 or SOFA score < 8 with no change	• Provide palliative care • Discharge from critical care
Red	SOFA score < 11 and decreasing progressively	Highest Priority
Yellow	SOFA < 8 with minimal decrease (< 3-point decrease in past 72h)	Intermediate Priority
Green	No longer dependant on ventilator	Discharge from critical care

Appendix 7 – Homemade ORT Formula and WHO ORT Formula Monograph

Homemade ORS recipe

Preparing a 1 (one) liter oral rehydration solution [ORS] using Salt, Sugar and Water at Home

Mix an oral rehydration solution using one of the following recipes; depending on ingredients and container availability:

Ingredients:

- One level teaspoon of salt
- Eight level teaspoons of sugar
- One liter of clean drinking or boiled water and then cooled 5 cupfuls (each cup about 200 ml.)

Preparation Method:
Stir the mixture till the salt and sugar dissolve. An efficient and effective homemade remedy to be used when watery diarrhea strikes and is a good substitute for oral rehydration salts

Ingredients:

- 1/2 to 1 cup precooked baby rice cereal or 1½ tablespoons of granulated sugar
- 2 cups of water
- 1/2 tsp. salt

Instructions:

- Mix well the rice cereal (or sugar), water, and salt together until the mixture thickens but is not too thick to drink.
- Give the mixture often by spoon and offer the child as much as he or she will accept (every minute if the child will take it).
- Continue giving the mixture with the goal of replacing the fluid lost: one cup lost, give a cup. Even if the child is vomiting, the mixture can be offered in small amounts (2-1 tsp.) every few minutes or so.
- Banana or other non-sweetened mashed fruit can help provide potassium.

World Health Organization ORT Formula Monograph

Definition. Oral Rehydration Salts (ORS) are dry mixtures of powders containing per packet:

Sodium chloride	NaCl	2.6g
Trisodium citrate dihydrate	$C_6H_5Na_3O_7,2H_2O$	2.9g
Potassium chloride	KCl	1.5g
Anhydrous glucose	$C_6H_{12}O_6$	13.5g

Before administration the contents of each packet should be dissolved in 1 liter of water.

Description. A white, odorless, crystalline powder.

Category. Used for the prevention and treatment of dehydration due to diarrhea, including maintenance therapy.

Storage. Oral Rehydration Salts should be kept in a sealed packet; if a free-flowing powder is required, it should be kept in an airtight packet, preferably made of aluminum laminate.

Labeling. The designation on the packet of Oral Rehydration Salts should state: (1) the total net mass and the mass of the contents of each constituent, both expressed in grams, (2) the required volume of water to reconstitute the solution, (3) directions for the preparation of the solution and its administration, and (4) a warning that any solution that remains unused 24 hours after preparation is to be discarded.

Additional information. In the formulation of Oral Rehydration Salts trisodium citrate dihydrate may be replaced by 2.5 g/l of sodium hydrogen carbonate, $NaHCO_3$ (sodium bicarbonate). However, as the stability of the latter formulation under tropical conditions is very poor, it is recommended only in Oral Rehydration Salts manufactured for immediate use, or where sodium hydrogen carbonate is packaged in separate packets. These formulations would also allow the use of 14.85 g/l of glucose monohydrate, $C_6H_{12}O_6,H_2O$, instead of anhydrous glucose.

The title of the two formulations could be distinguished by: "ORS-citrate" or "OSR-hydrogen carbonate" (bicarbonate). The title Oral Rehydration Salts (ORS) used without qualification implies that the product is the citrate formulation as defined above. Oral Rehydration Salts may contain suitable pharmaceutical aids, in minimal quantities, to improve the flow characteristics and/or the flavor.

Requirements. These specifications apply only to ORS-citrate.

One to three single doses may represent a complete treatment; therefore, the contents of each packet should comply with the following requirements.

Oral Rehydration Salts contain not less than **90.0%** and not more than **110.0%** of the equivalent amounts of sodium Na^+, potassium K^+, chlorides Cl^-, citrate $C_6H_5O_7^{3-}$ of the relevant constituents stated on the label, and not less than **90.0%** and not more than **110.0%** of the amount of anhydrous glucose $C_6H_{12}O_6$ stated on the label.

Identity tests

A. Melts when heated; first becomes yellow then brown, swells up and burns, evolving an odor of burnt sugar.
B. Dissolve the entire contents of one packet in 250 ml of water to prepare the test solution to be used in tests B, C, D, E, and F.
C. The test solution yields reaction A described under 2.1 General identification tests as characteristic of sodium.
D. To 5 ml of the test solution add 4 drops of sodium cobaltinitrite (100 g/l) TS; a yellow-orange precipitate is produced (potassium).
E. A 5-ml aliquot of the test solution yields reaction A described under 2.1 General identification tests as characteristic of chlorides.
F. A 5-ml aliquot of the test solution after neutralization yields reaction A described under 2.1 General identification tests as characteristic of citrates.
G. Add a few drops of the test solution to 5 ml of hot potassio-cupric tartrate TS; a copious red precipitate is produced (glucose).

Uniformity of mass. Weigh the contents of 20 packets selected at random and determine the average mass. Not more than two of the individual masses deviate from the average mass by more than 5% and none deviates by more than 10%.

Loss on drying. Dry to constant mass at 50 °C; it loses not more than 20 mg/g.

pH value. pH of the solution reconstituted as directed on the label, 7.0-8.8.

Assays. Carry out all the assays on quantities taken from a single packet. If the quantity of one packet is insufficient to carry out all the assays, take another packet for the assay for citrates and for the assay for glucose from the same batch. Prepare the following solution (= *solution A*) for the assays for sodium, potassium, and chlorides. Dissolve about 8 g of ORS, accurately weighed, in sufficient water to produce 500 ml.

Sodium. Dilute 3 ml of solution A to 500 ml with water and determine by flame photometry as described under 1.8 Atomic spectrometry: emission and absorption at a wavelength of 589 nm. For the preparation of the reference solutions, use a stock standard solution prepared by dissolving sodium chloride R, previously dried to constant mass at 130 °C, in 1000 ml of water to contain 508.4 mg of NaCl (0.2 mg of Na^+ per ml).
Each g of sodium chloride and of trisodium citrate dihydrate is equivalent to 0.3934 g and 0.2345 g of Na^+, respectively.

Potassium. Dilute 3 ml of solution A to 500 ml with water and determine by flame photometry as described under 1.8 Atomic spectrometry: emission and absorption at a wavelength of 767 nm. For the preparation of the reference solutions, use a stock standard solution prepared by dissolving

potassium chloride R, previously dried to constant mass at 130 °C, in 1000 ml of water to contain 190.6 mg of KCl (0.1 mg of K^+ per ml). Each g of potassium chloride is equivalent to 0.5245 g of K^+.

Chlorides. Titrate 20 ml of solution A with silver nitrate (0.1 mol/l) VS, using potassium chromate (100 g/l) TS as indicator. Each ml of silver nitrate (0.1 mol/l) VS is equivalent to 3.545 mg of Cl^-. Each g of sodium chloride and of potassium chloride is equivalent to 0.6066 g and 0.4756 g of Cl^-, respectively.

Citrates. Disperse about 2.8 g of ORS, accurately weighed, in 80 ml of glacial acetic acid R1, heat to about 50 °C, cool, dilute to 100 ml with glacial acetic acid R1, and allow to stand for 10 minutes. To 20 ml of the supernatant liquid add 0.25 ml of 1-naphtholbenzein/acetic acid TS and titrate with perchloric acid (0.1 mol/l) VS as described under 2.6 Non-aqueous titration, Method A. Each ml of perchloric acid (0.1 mol/l) VS is equivalent to 6.303 mg of $C_6H_5O_7^{3-}$. Each g of sodium citrate is equivalent to 0.6430 g of $C_6H_5O_7^{3-}$.

Glucose. Dissolve about 8.0 g of ORS, accurately weighed, in 40 ml of water, add 0.2 ml of ammonia (~100 g/l) TS, and dilute to 50 ml with water. Mix and allow to stand for 30 minutes. Determine the "Optical rotation" and calculate the quantity, in g, of anhydrous glucose $C_6H_{12}O_6$ by multiplying the observed rotation in degrees by 0.9477.