Analysis of Year 2007 Death Reviews

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California Prison Receivership

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I. Introduction

The mortality rate per 100,000 California prison inmates has decreased from 248.6 in 2006 to 230.3 in 2007 to 218.2 in January-June 2008. The decrease is even more impressive when taking normal seasonal variation into account. The January-June rates were 270.5 in 2006, 245.4 in 2007, and 218.2 in 2008. The number of clearly preventable deaths has also decreased.

The major clinical impact felt throughout the system since the beginning of the Receivership has been from improvements in the number and caliber of healthcare professionals. About half of the primary care physicians and over a third of the nurses working for California Prison Health Care Services (CPHCS) have been recently recruited. Most of the Receiver's other interventions that aim to improve the quality and cost-effectiveness of healthcare services are still in early, pilot, or planning stages.

The year 2007 death reviews also revealed at least 292 extreme departures from the standard of care. Refinements to the death review process focused on classifying these standard-of-care departures into a taxonomy of 14 lapses in care. Use of the taxonomy has begun to inform responses to individual provider error as well as systemic improvement strategies. This report concludes with interventions that could mitigate each of these 14 lapses in care.

II. Death Review Process

Clinician members of the Clinical Support Unit (CSU), all of whom have been trained in the process of death review, prepare initial Death Review Summaries of each death in the California Department of Corrections and Rehabilitation (CDCR). CSU physicians are all either board-certified in internal medicine or family medicine. Mid-level reviewers (nurse practitioners or physician assistants) also participate; their reviews are closely examined and approved by one of the physician members of the unit.

Each Death Review Summary is based on a reading of the patient's available CDCR medical record, which may include discharge summaries, specialist reports, and other documentation generated outside the institution. Using a standardized template, the reviewer assesses the patient's last 12 months of medical care during his/her period of incarceration. (For suicides, the reviewer assesses the entire patient record.) The purposes of this extensive review of each inmate's death are to:

- Determine the cause of death, using autopsy findings when available;
- Determine the preventability or non-preventability of the death;
- Identify significant departures from the community standard of care attributed to an individual provider;
- Identify significant health care system lapses in care; and
- Refer for appropriate action, situations in which individual or systemic lapses are noted.

Every completed Death Review Summary is presented by the reviewing clinician to the Death Review Committee (DRC), a multidisciplinary group chaired by one of the three Regional Medical Directors. The DRC is multidisciplinary. Members of the DRC are the Statewide Medical Director, the three Regional Medical Directors, the three Regional Directors of Nursing, the Chief Medical Officers of the Clinical Support Unit, other healthcare administrators, nursing consultants and correctional officers.

The DRC may make referrals to several areas. For facility systemic lapses, referral is usually made to the local healthcare manager. For nursing lapses, referral is made to the Department of Nursing. In the case of individual provider lapses occurring while the patient is an outpatient, the case may be referred to the CPHCS Peer Review Subcommittee or directly to the Professional Practices Executive Committee (PPEC), the parent peer review committee for CPHCS. Non-CPHCS specialty consultants are notified of adverse peer review findings or asked to explain their decision-making. Occasionally another specialist may be asked to review the care provided. For lapses in care occurring in community hospital settings, cases may be referred to the Chief of Staff of the hospital in question for consideration within their internal peer review process.

Since the creation of the Receivership in 2005, the death review process has focused on identifying and sanctioning unsafe individual practitioners. Through July 2008, PPEC has taken adverse action on a total of 85 practitioners. The majority of these actions were initiated by a death review.

The Receiver has also increased salaries and diligently recruited new healthcare professionals. CPHCS hired 172 new primary care physicians between August 1, 2007 and July 31, 2008; all are board-certified in internal medicine or family medicine as required by the new credentialing criteria. This figure represents 47 percent of the 366 authorized positions in the physician pool. During this same period (August 1, 2007 through July 31, 2008), CPHCS added 488 registered nurses and 533 licensed vocational nurses to the prison healthcare delivery system. Of the total pool of authorized nursing classifications, 35% were hired during this 12-month period.

When the Death Review Committee refers an individual provider to PPEC in response to practice concerns, PPEC may choose to conduct a pattern of practice (POP) review to evaluate the performance of the provider. This POP review is a detailed assessment using a large sample of patients and health care interactions (usually 30-50 patient charts, including the index death case and any other deaths in which the clinician may have been involved). The POP review evaluates adherence to a community standard of care. After considering evidence from this and other sources (such as the Chief Medical Officer, Chief Physician and Surgeon, and the provider), PPEC will take one of several actions, including, but not limited to:

1. Summary suspension of some or all clinical privileges;
2. Temporary restriction of practice, pending an even more complete review of the clinician's pattern of care;
3. A program of remediation (for example, taking a course in an area of clinical deficiency, followed by a period of monitoring); or
4. No further action.

Beginning in late 2006, each death was assessed for three levels of preventability: possibly preventable, preventable, or non-preventable. The death review template was revised to direct reviewers to assess and assign preventability whenever possible. The "Analysis of CDCR Death Reviews 2006," with assessment of preventability now available, offered a number of recommendations to reduce preventable deaths.

The death review process is also intended to identify significant lapses in the processes of care occurring in each death. Significant lapses in care have been identified in all types of deaths, whether preventable or non-preventable. In late 2007, a taxonomy was developed for these lapses (or departures from the standard of care), so that reviewers might be able to use a common "language" when discussing preventable deaths and develop plans of action designed to mitigate such lapses in care. Beginning in 2008, this taxonomy for lapses in care was incorporated into the Death Review Template. The Receiver and CPHCS leadership have begun to use the taxonomy to systematically address the deficiencies in care, with the ultimate goal of reducing the burden of preventable deaths and unnecessary suffering.

Also in 2008, the death review process began to incorporate the principles of "just culture." Just culture assessments distinguish "knowing violations" from three classes of human fallibility: human error (inadvertent), at-risk conduct (taking shortcuts leading to increased risk), and reckless conduct (choosing to put someone in harm's way). The overarching recommendation from last year's deaths analysis remains compelling: "The CDCR must create a culture of patient safety in which clinicians readily identify mistakes and system vulnerabilities and in which all staff share in the responsibility for optimal patient outcomes."[1]

A. Definitions

Non-preventable: In the judgment of the reviewer, the medical health care system and individual practitioners probably would not have been able to prevent the patient's death. (The majority of "natural – expected" deaths fall in this category. Most homicides, suicides, and drug overdoses, although theoretically preventable, are, for purposes of this analysis, placed in the "non-preventable" category).

Preventable: In the judgment of the reviewer, better medical management or a better system of care would likely have prevented the patient's death.

Possibly preventable: In the judgment of the reviewer, better medical management or a better system of care may have prevented the patient's death.

Extreme departure from the standard of care: A lapse in care that a reasonable and competent clinician would not render under the same or similar circumstances.

Simple departure from the standard of care: A lapse in care that a reasonable and competent clinician might render under the same or similar circumstances

[1] Imai K. Analysis of CDCR Death Reviews 2006. August 20, 2007. Found at: www.cphcs.ca.gov/resource.aspx

B. Taxonomy for Lapses in Care

The Death Review Committee assigns extreme departures from the community standard to one of the following 14 lapses in care:

1. Failure to recognize important symptoms/signs. Failure to recognize, evaluate and treat clinical "red flags." Examples include acute chest pain in high risk patients, shortness of breath, abdominal pain, dizziness, abnormalities of vital signs, low oxygen saturation, acute confusion, weight loss, and increased frequency of medication use.
2. Failure to follow clinical guidelines. Failure to follow established guidelines for the screening, evaluation, monitoring and/or management of specific conditions, such as asthma, hepatitis C, diabetes, and chronic pain.
3. Delay in access to care. Delays in access to care of sufficient duration to result in harm to the patient. These may occur in any of the following areas or functions: triage, same day, primary care clinic, chronic care or specialty care/procedure.
4. Failure to identify/follow-up abnormal test results.
5. Failure of appropriate provider-to-provider communication, including specialty consultation, patient transfers between different levels or sites of care and other handoffs including shift changes.
6. Fragmentation of care. Episodic care provided in the absence of a primary care system; important elements of the patient's clinical picture are missed and the individual provider does not take responsibility for the patient's outcome.
7. Surgical or procedural complications resulting in iatrogenic injury.
8. Medication prescribing error. This includes failure to prescribe the indicated medication for a clinical condition, to do appropriate monitoring, or to recognize drug interactions.
9. Medication delivery error. Delays in patients receiving critical medications, or patients receiving the wrong medication.
10. Practicing outside the scope of one's professional competence.
11. Failure to supervise mid-level (nurse practitioner or physician assistant) care. This includes failure of assigned supervisors/mentors to be readily available, as well as managerial failure to arrange appropriate supervision.
12. Failure to communicate effectively with the patient.
13. Patient non-adherence with suggestions for optimal care.
14. Delay/failure in emergency response. Includes failure to follow emergency response protocol as well as delays in activation.

C. Limitations of the Death Review Process

Reviewers face significant limitations on their ability to conduct high quality death reviews, including:

Medical record. CPHCS does not have electronic medical records. The typical patient health record is not easily navigated and not well organized. The physician portion of the record includes handwritten progress notes that may suffer from brevity, poorly documented reasoning and illegible handwriting. The health record is often incomplete, missing critical recommendations from consultants or records of off-campus procedures, emergency room visits and hospitalizations. These challenges plague CPHCS health care providers during the process of care.

Autopsies. The majority of deaths, as in the non-CPHCS world, do not trigger autopsies. This makes clinical closure elusive, especially in cases of sudden cardiac arrest. Nevertheless, knowledge of the cause of death should not alter recognition of and response to serious lapses in care. Furthermore, autopsies may only help to determine whether that lapse led to an adverse outcome.

Preventability. As discussed in last year's deaths analysis, there are limitations in attributing preventability. In one published study, for example, investigators in the Veteran's Administration had fourteen board certified internal medicine specialists, trained in implicit chart review, analyze 383 hospital deaths. In this study, 88 or 23% of the deaths were rated as possibly preventable by optimal care, and another 23 or 6% were rated as preventable. Inter-rater reliability for these ratings, however, was quite low at 0.34. The authors of the study noted that, to a large extent, "preventability is in the eye of the beholder."[2]

D. Impact of Preventability

In this 2007 deaths analysis, there was no attempt to estimate the impact of preventability in terms of life expectancy. The preventable death of a young asthmatic, for example, may be more consequential in terms of years of life lost than the preventable death of an 80-year-old patient with multiple chronic illnesses.

In mid-2008, the death review committee began asking reviewers to answer three additional questions intended to add nuance to their judgments.

1. How likely was it that the patient's death could have been prevented or delayed by more optimal health care?
2. How likely was it that the patient's death was caused by or hastened by health care interventions?
3. How much longer would the patient likely have lived if the death had been prevented or delayed?

[2] Hayward RA, Hofer TP. Estimating Hospital Deaths Due to Medical Errors: Preventability Is in the Eye of the Reviewer. *JAMA*. 2001, 286; 4, 415.

III. Findings

A. Preventability

In 2007 there were 397 California inmate deaths. For purposes of this report, two reviews were unavailable, leaving 395 subject to analysis here. The vast majority of deaths, 83 percent (327 cases) were identified as non-preventable (Figure 1). Table 1 shows preventability by the type of death.

Figure 1. California inmate deaths, 2007

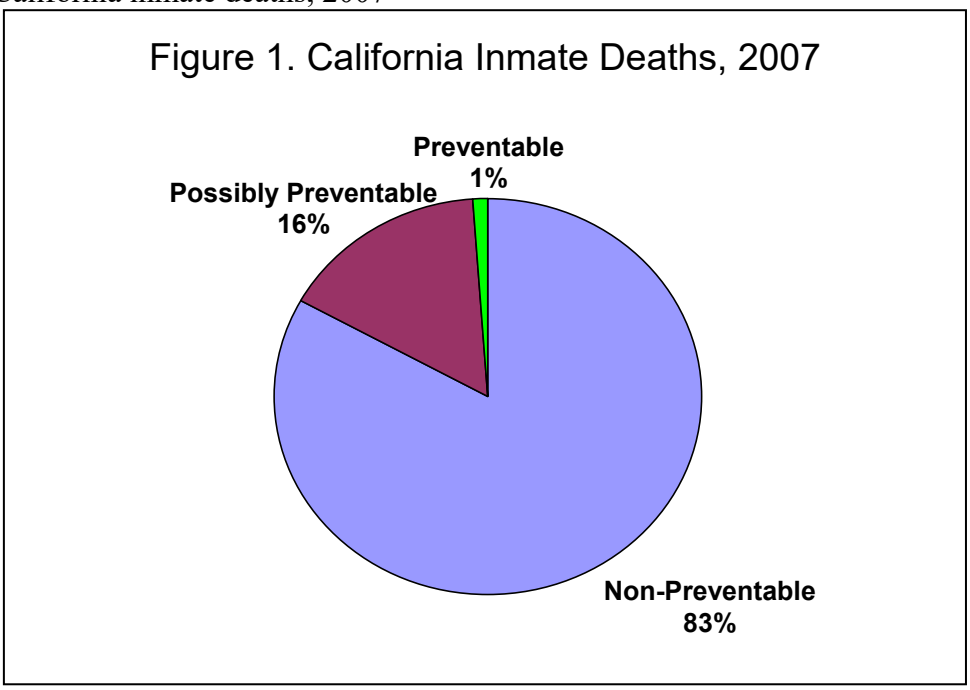


Table 1. Type of death and preventability.

	Non-Preventable	Possibly Preventable	Preventable
Suicide	33	1	-
Homicide	21	1	-
Accidental injury to self	9	2	-
Natural – expected	198	19	1
Natural – unexpected	66	42	2
Totals	327 (83%)	65 (16%)	3 (1%)

B. Non-Preventable Deaths

Table 2 shows the causes of non-preventable death among California inmates in 2007. Cancer and end stage liver disease (all but a few secondary to chronic hepatitis C) together were responsible for 158 (48 percent) of the 327 cases.

Table 2. Causes of non-preventable death.

Cases	Cause of Death
104	cancer
54	end stage liver disease
33	suicide
22	sudden cardiac arrest
22	homicide
12	AIDS
9	stroke
9	drug overdose
7	pneumonia
7	acute myocardial infarction
7	congestive heart failure
5	end stage renal disease
3 each	coccidioidomycosis (valley fever), chronic obstructive pulmonary disease , dementia, pulmonary fibrosis
2 each	bowel infarction, cardiomyopathy, endocarditis, Parkinson disease, sepsis, urosepsis
1 each	amyotrophic lateral sclerosis, aortic aneurysm, coronary artery disease, cerebellar degeneration, pancreatitis, pulmonary embolism, systemic lupus erythematosis, subdural hematoma
4	unable to be determined
327	**Total**

Table 3 shows the number of extreme-departure lapses in care for non-preventable deaths using the 14-lapse taxonomy. In 161 (49 percent) of these 327 non-preventable deaths, no serious departures in care were noted. Many of these cases were cited for excellent and compassionate care. In the remaining 166 deaths, however, there were 172 lapses identified. Note that 1) a patient could suffer from more than one type of lapse and 2) if a specific type of lapse occurred more than once for a patient, it was counted only once.

Table 3. Types of lapses in care (extreme departures) for non-preventable deaths.

Lapses	Types of Lapses in Care (Extreme Departures)
52	#1 - Failure to recognize, identify or adequately evaluate important symptoms or signs
19	#2 - Failure to follow established guidelines for evaluation and/or management of specific condition
31	#3 - Delay in access to care sufficient to result in harm to the patient
13	#4 - Failure to adequately pursue abnormal test results
4	#5 - Failure of provider-to-provider communications including botched handoffs
10	#6 - Fragmentation of care such that individual responsibility for patient is waived
1	#7 - Surgical/procedural complication resulting in iatrogenic injury
14	#8 - Medication prescribing error
5	#9 - Medication delivery error
4	#10 - Practicing outside the scope of one's capabilities
6	#11 - Unsupervised mid-level (nurse practitioner or physician assistant) care
0	#12 - Failure of communication with patient
5	#13 - Patient non-adherence with recommendations for care
3	#14 - Delay in emergency response or failed to follow emergency response protocol
5	Other (including unavailability of medical record)
172	**Total number of extreme departure lapses (many cases had more than one extreme departure)**

C. Possibly Preventable Deaths

In 2007, 65 deaths were identified as possibly preventable. Table 4 shows the causes of death and Table 5 shows the lapses in care noted in these 65 cases.

Table 4. Causes of possibly preventable deaths.

Cases	Cause of Death
14	sudden cardiac arrest
7	cancer
6	end-stage liver disease
5	stroke
3 each	pulmonary embolism, sepsis
2 each	AIDS, aneurysm (aortic), congestive heart failure , coccidioidomycosis, pneumonia, suicide
1 each	acute myocardial infarction , bowel perforation, coronary artery disease (CAD), cardiomyopathy, colitis, chronic obstructive pulmonary disease (COPD), diabetic ketoacidosis , drug overdose, ependymoma, homicide, metabolic acidosis, spinal stenosis, ulcer, urosepsis, volvulus
65	**Total**

Table 5. Types of lapses in care (extreme departures) for possibly preventable deaths.

Lapses	Types of Lapses in Care (Extreme Departures)
43	#1 - Failure to recognize, identify or adequately evaluate important symptoms or signs
6	#2 - Failure to follow established guidelines for evaluation and/or management of specific condition
20	#3 - Delay in access to care sufficient to result in harm to the patient
5	#4 - Failure to adequately pursue abnormal test results
5	#5 - Failure of provider-to-provider communications including botched handoffs
7	#6 - Fragmentation of care such that individual responsibility for patient is waived
3	#7 - Surgical/procedural complication resulting in iatrogenic injury
7	#8 - Medication prescribing error
3	#9 - Medication delivery error
1	#10 - Practicing outside the scope of one's capabilities
3	#11 - Unsupervised mid-level (nurse practitioner or physician assistant) care
0	#12 - Failure of communication with patient
0	#13 - Patient non-adherence with recommendations for care
4	#14 - Delay in emergency response or failed to follow emergency response protocol
2	Other (including unavailability of medical record)
109	**Total number of extreme departure lapses (many cases had more than one extreme departure)**

D. Preventable Deaths

In 2007, three cases were identified as preventable. Table 6 shows the causes of death and Table 7 lists the eleven lapses in care observed in the three cases.

Table 6. Causes of preventable death.

Cases	Cause of Death
1	drug induced hepatitis
1	adrenal insufficiency, disseminated cocci
1	pulmonary embolism
3	**Total**

Table 7. Types of lapses in care (extreme departures) in preventable deaths.

Lapses	Types of Lapses in Care (Extreme Departures)
1	#1 - Failure to recognize, identify or adequately evaluate important symptoms or signs
3	#2 - Failure to follow established guidelines for evaluation and/or management of specific condition
1	#3 - Delay in access to care sufficient to result in harm to the patient
1	#4 - Failure to adequately pursue abnormal test results
1	#5 - Failure of provider-to-provider communications including botched handoffs
0	#6 - Fragmentation of care such that individual responsibility for patient is waived
0	#7 - Surgical/procedural complication resulting in iatrogenic injury
1	#8 - Medication prescribing error
2	#9 - Medication delivery error
0	#10 - Practicing outside the scope of one's capabilities
0	#11 - Unsupervised mid-level (nurse practitioner or physician assistant) care
1	#12 - Failure of communication with patient
0	#13 - Patient non-adherence with recommendations for care
0	#14 - Delay in emergency response or failed to follow emergency response protocol
11	**Total**

It is instructive to look at each of these cases in some detail. As seen in the case examples below, more than one extreme departure lapse occurred in each of the cases. A single lapse was not enough to result in a patient's death, but multiple lapses lined up to produce an adverse outcome.

Case 1. Drug-induced hepatitis.

A 40-year-old Spanish-speaking patient was prescribed isoniazid (INH) for a poorly documented "positive" tuberculin skin test (**medication prescription error).** Baseline liver functions were ordered but apparently not done (**failure to follow clinical guidelines**). One month later, a liver function panel showed elevation of the liver enzyme ALT to 4 times normal. This report was not noted until two months later (**failure to identify abnormal lab result**), when the patient presented with dark urine and jaundiced eyes that had been present for at least one month (**failure to communicate effectively with patient about the warning signs of INH hepatitis**). The patient died three weeks later of INH-induced hepatitis (several notations indicated the patient was "Spanish speaking only" yet another note indicated "patient understands English").

Case 2. Acute adrenal insufficiency in a patient on high dose continuous steroids.

A 62-year-old patient died after abrupt cessation of high dose dexamethasone which he had been receiving continuously for 4 ½ months. On 4/3/07, he had a 48-hour delay in evaluation for high fever, chest pain and night sweats (**delay in access to care**). The

initial evaluation consisted of chart orders without a clinical note, and he was then seen several times in clinic with abnormal chest x-rays, shortness of breath, and low oxygen saturation (88-91%) but was managed as an outpatient (**failure to properly evaluate/manage "red flag' symptoms and signs**). Coccidioidomycosis pneumonia and pneumothorax were diagnosed on 4/09/07 and he was started on antifungal therapy. He was in hospital continuously and had lumbar laminectomy on 5/25/07. High dose dexamethasone was prescribed post operatively for severe pain and weakness, and this dose was not tapered (**failure to follow clinical guidelines for prescribing steroids for pain**). He remained in the hospital for 4 ½ months after the laminectomy because of post-operative staphylococcal wound infections. During his prolonged hospital stay, a cardiologist evaluated another patient with the same last name and for several days the patient received medication, atenolol, intended for the other patient (**medication delivery error**) without adverse consequence. When discharged back to prison on 10/09/07, neither the transfer note nor the phone conversation between the discharging physician and the accepting physician indicated his prolonged course of high dose dexamethasone (**failure of provider-to-provider communication at time of handoff).** He did not receive dexamethasone on return to prison on 10/9/07. Two days later he developed hypotension and tachycardia, was hospitalized (at a different hospital from which he had been discharged), intubated, received vasopressors and high dose antibiotics but no corticosteroids and died as a consequence of unrecognized acute adrenal insufficiency.

Case 3. Pulmonary embolism.

A 39-year-old patient died of preventable pulmonary embolism. He was placed in 5-point restraints after ingesting razor blades. Restraints were ordered because he was having auditory hallucinations directing him to hurt himself. The patient reported he had failed to receive his antipsychotic medication for a few days (**medication delivery error**). The restraints were re-ordered for five days continuously despite indication that the patient was quiet and cooperative during this period (**failure to follow clinical guidelines - medically non-indicated restraints per restraint protocol**). Range of motion (therapy) was ordered but not documented to have been given at the ordered frequency. The patient had sudden cardiac arrest and autopsy showed massive pulmonary embolus at the bifurcation of the pulmonary artery.

IV. Discussion

A. Lapses in Care and Preventable Death

Predictability and preventability are two different concepts. It is difficult for even trained, highly qualified physicians to determine that a death is *preventable* using retrospective case review. To a large extent, "preventability is in the eye of the beholder." It is easier to identify *predictable* deaths, based on cause of death (patients with certain types of conditions such as metastatic or high grade cancer, congestive heart failure, or multiple chronic diseases, commonly believed to shorten life expectancies).

In the CPHCS death review process, reviewers are asked to identify all lapses in care, and to grade each lapse as either a "simple departure" or a "serious (extreme) departure" from the standard of care. Simple departures are much more common than serious departures, and there are often disagreements in committee over each designation. For this review, only the serious (extreme) departures have been collected and tabulated.

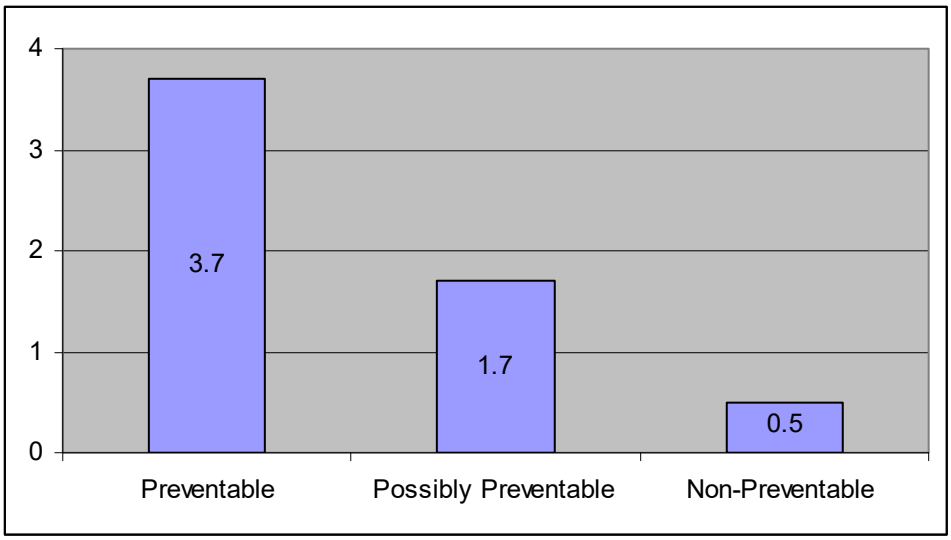
There has been strong support for the 14-category taxonomy of lapses. The list has been reviewed and accepted by all of the members of the Clinical Support Unit who conduct the death reviews. Three other nominees for inclusion did not make the final list. These were "failure to address addiction," "failure to identify and treat serious psychiatric conditions" and "failure to address spiritual emptiness."

Lapses in care occurred in all three types of deaths—preventable, possibly preventable, and non-preventable—but lapses occurred most frequently for the preventable cases (Table 8 and Figure 2). Preventable deaths had an average of 3.7 lapses per death, possibly preventable deaths had an average of 1.7 lapses and non-preventable deaths had an average of 0.5 lapses. These findings support the idea that adverse outcomes, in general, are a consequence of multiple errors: the Swiss cheese model of adverse events in which multiple "holes" in the system all line up.

Table 8. Number of lapses by preventability.

Preventability	Lapses	Deaths	Lapses per Death
Preventable	11	3	3.7
Possibly preventable	109	65	1.7
Non-Preventable	172	327	0.5

Figure 2. Average number of lapses per death by preventability.



B. Trends in Death Rate and Preventability

Tables 9-11 show significant declines in the CDCR death rate from the first quarter of 2006 through the second quarter of 2008.

Table 9. Death rates per quarter and annualized among California inmates, 2006-2008.

Quarter	Number of Deaths	Number of Inmates	Quarterly Rate per 100,000 inmates	Annualized Rate per 100,000 Inmates
Q1 2006	124	170,475	72.7	290.9
Q2 2006	108	172,561	62.6	250.3
Q3 2006	103	173,101	59.5	238.0
Q4 2006	93	172,528	53.9	215.6
Q1 2007	112	172,284	65.0	260.0
Q2 2007	100	173,312	57.7	230.8
Q3 2007	91	172,645	52.7	210.8
Q4 2007	94	171,444	54.8	219.3
Q1 2008	99	169,949	58.3	233.0
Q2 2008	87	170,983	50.9	203.5

Table 10. Change in the death rate among California inmates, 2006 to 2007.

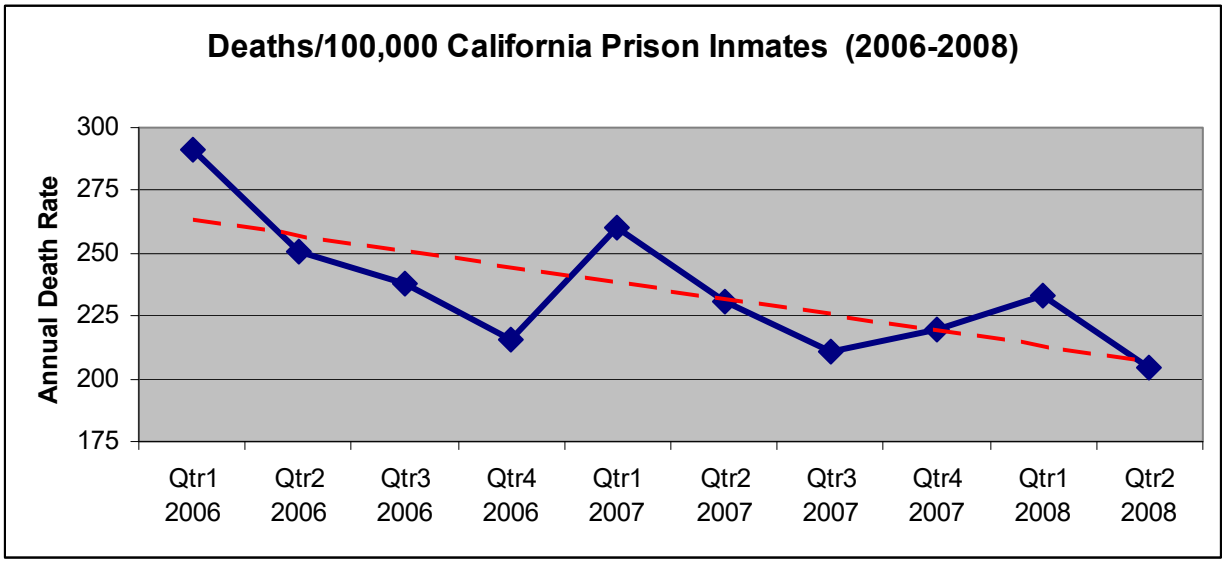
Year	Number of Deaths	Number of Inmates	Annualized Rate per 100,000 Inmates	Change
2006	428	172,166	248.6	-
2007	397	172,421	230.3	-7.4%

Table 11. Change in the death rate among California inmates by prior year quarters 1 and 2 combined, 2006-2008.

Quarter	Annualized Rate per 100,000 Inmates	Change
Q1-2 2006	270.5	-
Q1-2 2007	245.4	-9.3%
Q1-2 2008	218.2	-11.1%

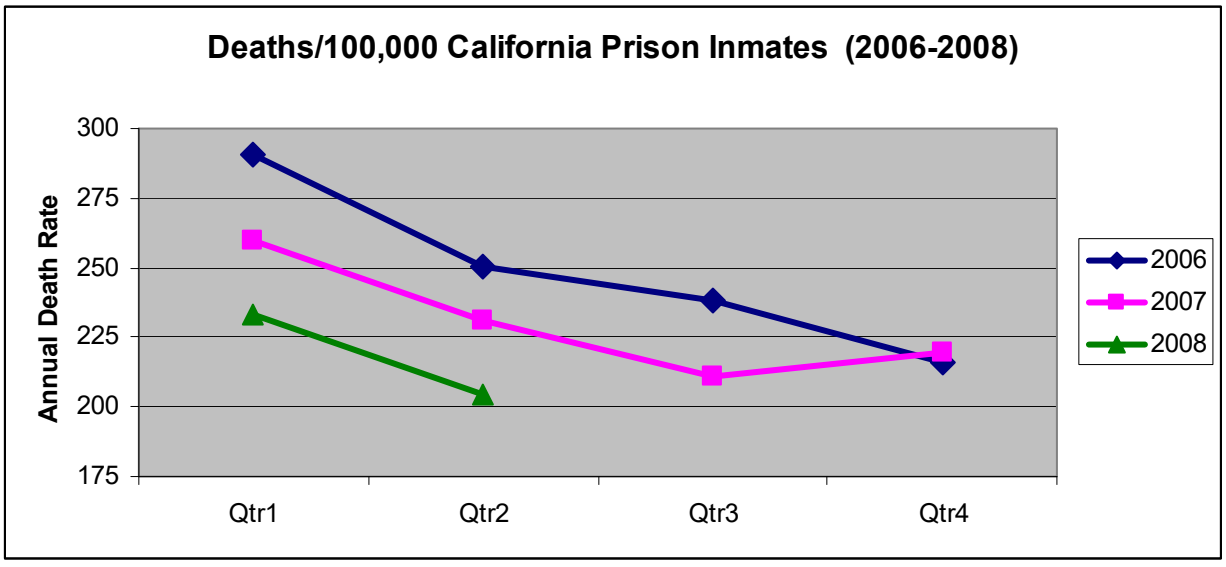
Figure 3 displays the decreasing trend in overall mortality from January 2006 through June of 2008 as well as the calculated linear regression line.

Figure 3. Trend in annualized mortality rate per 100,000 inmates, 2006-2008.



Displaying the same data in lines one-year long demonstrates the seasonal variation pattern, correlating with circulation of winter viruses, that is usually seen in population-based mortality studies (Figure 4).

Figure 4. Trend in annualized mortality rate per 100,000 inmates, 2006-2008, displayed by year.



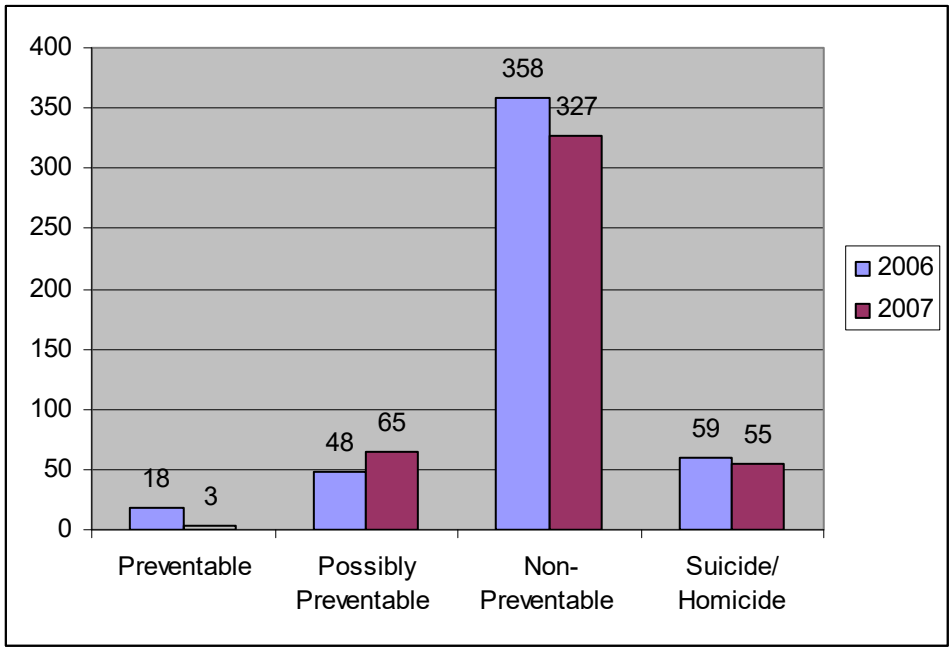
C. Trends in the Attribution of Preventability

Compared to 2006,[3] in 2007 there were far fewer cases identified as preventable and more that were identified as possibly preventable (Table 12 and Figure 5). Because the death review process was less standardized in 2006, it is likely that the total number of preventable deaths was under-estimated in the analysis of the year 2006 deaths.

Table 12. Types of preventability of deaths among California inmates, 2006 and 2007.

Year	Preventable	Possibly Preventable	Non-Preventable	Suicides / Homicides
2006	18	48	358	43 / 16 (total 59)
2007	3	65	327	33 / 22 (total 55)

Figure 5. Number of deaths by preventability, 2006 and 2007. The suicides and homicides are included as non-preventable deaths and shown separately as well.



D. Interventions to Decrease Preventable Deaths

The vast majority of lapses in care do not lead to death, but in cases of preventable death, there were a higher number of lapses per case. Strategies to decrease or mitigate lapses, if successful, will decrease the number of unnecessary deaths. Table 13 shows the total number of lapses in care identified an all 396 death review cases.

[3] Imai K. Analysis of CDCR Death Reviews 2006. August 20, 2007. Found at: www.cphcs.ca.gov/resource.aspx

Table 12. Summary of lapses of care (extreme departures), 2007.

Lapses of Care Types (Extreme Departures)	# of Lapses in the 327 Non Preventable Deaths	# of Lapses in the 65 Possibly Preventable Deaths	# of Lapses in the 3 Preventable Deaths	Total # of Lapses
#1 - Failure to recognize, identify or adequately evaluate important symptoms or signs	52	43	1	96
#2 - Failure to follow established guidelines for evaluation and/or management of specific condition	19	6	3	28
#3 - Delay in access to care sufficient to result in harm to the patient	31	20	1	52
#4 - Failure to adequately pursue abnormal test results	13	5	1	19
#5 - Failure of provider-to-provider communications including botched handoffs	4	5	1	10
#6 - Fragmentation of care such that individual responsibility for patient is waived	10	7	0	17
#7 - Surgical/procedural complication resulting in iatrogenic injury	1	3	0	4
#8 - Medication prescribing error	14	7	1	22
#9 - Medication delivery error	5	3	2	10
#10 - Practicing outside the scope of one's capabilities	4	1	0	5
#11 - Unsupervised mid-level (nurse practitioner or physician assistant) care	6	3	0	9
#12 - Failure of communication with patient	0	0	1	1
#13 - Patient non-adherence with recommendations for care	5	0	0	5
#14 - Delay in emergency response or failed to follow emergency response protocol	3	4	0	7
#15 - Other	5	2	0	7
Total	**172**	**109**	**11**	**292**

The most frequent lapse was the failure to recognize, evaluate and treat important signs and symptoms. Fully one-third of all identified lapses (96/292 or 33%) occurred in this category. In fact, lapses numbers 1, 2, and 3 together account for 60% of all identified lapses. The Receiver and CPHCS have already begun many steps intended to reduce lapses in care in the California prison system and more are planned. The following lists interventions to be taken to address each of the 14 lapses.

#1. Failure to recognize or evaluate important signs and symptoms.

The majority of these lapses involved patients presenting for non-routine care with chest pain, shortness of breath, abdominal pain, severe headache, dizziness, acute confusion, new neurological symptoms, weight loss, and abnormal vital signs including low oxygen saturations. Many of these cases occurred after clinic hours, at night and on weekends, when healthcare staff are most isolated.

a. Strengthening hiring criteria. New criteria for employment have been adopted, which includes board certification or demonstrated competence in a primary care specialty. As of August 2008, 85 providers have left employment or been suspended and these have been replaced with providers who meet the new criteria. As the committee continues to meet, the number of poorly qualified providers has significantly declined.

b. Redesign of on-call policy and system. The PPEC will soon revisit the on-call policy to address the issue of after-hours evaluation of red flag symptoms.

c. Reducing provider isolation. Renovation of clinical areas in existing prisons and creation of the Receiver's seven new healthcare facilities will reduce the current physical isolation of providers. Unlike providers in community hospitals and clinics who can readily consult with colleagues, CPHCS providers often find themselves making decisions in professional solitude.

d. Access-to-Care Initiative. A comprehensive redesign of the "sick call" (access to primary care) process is underway.

e. Provider case conferences and continuing medical education (CME).. The Clinical Support Unit now conducts regular case-based educational meetings at the individual prisons. Many are based on death review cases. Focused CME will be presented on the management of red flag symptoms.

f. Quarterly newsletter. A quarterly newsletter of the Peer Review Department began in September 2007. The newsletter contains articles on evaluation of critical clinical problems and highlights lessons from death reviews.

g. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#2. Failure to follow clinical guidelines.

These lapses involved failure to follow evidence-based guidelines of care for asthma, diabetes, chronic hepatitis C, suspected unstable coronary disease, congestive heart failure, and chronic pain management.

a. Access-to-Care Initiative. The Receivership and CPHCS have recently begun the Access-to-Care Initiative, which will create standardized, measurable, reliable, and sustainable access-to-care processes in the four domains of 1) reception, 2) sick call and primary care, 3) chronic disease care, and 4) specialty, infirmary and acute care. The first chronic disease initiative involves asthma, which was responsible for six preventable deaths in 2006 and two more in 2008. The changes created by this initiative will fundamentally change the way that medicine is practiced in CPHCS and should dramatically reduce lapses in these areas.

b. Promotion of disease guidelines. The Pharmacy and Therapeutics Committee continues to publish medication guidelines for common conditions. The chronic hepatitis C guidelines have recently been updated and will be rolled out in 2008-09. The pain management guidelines will be adopted and rolled out in 2009.

c. Availability of decision support at the time of care. Providers and nurses with access to web-connected computers now have access to UpToDate, the leading medical online reference resource, but continued deployment of health information technology will enable additional supports. Renovation of clinics and the Receiver's new healthcare facilities, as noted above, will also increase availability of support from colleagues.

d. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#3. Delays in access to care.

These lapses occurred throughout the spectrum of care, including lapses in triage, acute care, primary care, specialty care and higher levels of care (hospital and emergency department).

a. Access-to-Care Initiative. The Access-to-Care Initiative will generate practice changes in all of these major settings of care, especially the nursing triage, acute care, primary care, and specialty care domains.

b. Health Care Access Units. The Receiver has begun to establish dedicated health care access custody teams at each of the 33 prisons to ensure the availability of custody escorts.

c. Specialist and hospital provider network. The Receiver's initiatives in contracting and utilization management will improve availability and responsiveness of specialists and community hospitals. Cohorting chronically ill and disabled patients in the Receiver's seven new healthcare facilities will improve availability and quality of specialty and hospital care.

d. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#4. Failure to identify and pursue abnormal test results.

a. Primary care system redesign. A primary care system redesign will address this area, including creation of a culture of accountability.

b. Health information technology. The clinical data repository will begin to be available to providers with computer connectivity in 2009.

c. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#5. Provider-to-provider communication.

These occur during handoffs of care, especially those involving specialty consultations, patient transfers from prison to prison, and transfers from prison to hospital or emergency department and back again.

a. Transfer communication. Contracted hospitals and specialists must be required to provide timely written and verbal communication at the time of transfer.

b. Primary care system redesign. A primary care system redesign will address this area, including creation of a culture of accountability.

c. Reducing provider isolation. Renovation of clinical areas in existing prisons and creation of the Receiver's new healthcare facilities will reduce the current physical isolation of providers and facilitate communication.

d. Redesign of on-call policy and system.

e. Health information technology. Computer connectivity and electronic records can help mitigate this lapse.

f. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#6. Failure of provider to assume responsibility for the patient.

This occurs when a system of care is fragmented and episodic, as is the case in the majority of the 33 prisons.

a. Primary care system redesign. A primary care system redesign will address this area, including creation of a culture of accountability.

b. Redesign of on-call policy and system.

c. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#7. Surgical/procedural complication.

a. Competency of specialists. If poor quality specialists are identified, their contracts should be pulled and new pools of specialists and hospitals should be found.

b. Specialist and hospital provider network. The Receiver's initiatives in contracting and utilization management will improve availability and responsiveness of specialists and community hospitals. Cohorting chronically ill and disabled patients in the Receiver's new seven healthcare facilities will improve availability and quality of specialty and hospital care.

#8. Medication prescribing error.

a. Pharmacy system redesign. An electronic pharmacy system with embedded reminders and clinical guides is being rolled out (Maxor Guardian).

b. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#9. Medication delivery error

a. Pharmacy system redesign. An electronic pharmacy system with embedded reminders and clinical guides are being rolled out (Maxor Guardian).

b. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#10. Practicing outside the scope of one's capabilities

a. Redesign of privileging policy. New credentialing policies include "tiered credentialing," a privileging system in which providers are only privileged to work in settings where they have demonstrated competence.

b. Reducing provider isolation. Renovation of clinical areas in existing prisons and creation of the Receiver's new healthcare facilities will reduce the current physical isolation of providers and facilitate ready assistance for providers.

c. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#11. Failure to supervise mid-level providers (nurse practitioners and physician assistants)

a. Regular mentor/supervisor. All mid-level practitioners were assigned a regular physician mentor / supervisor in the 4th quarter of 2007.

b. Redesign of mid-level care. Initiatives in progress include primary care redesign, chronic care initiative, and creation of tiered credentialing.

c. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#12. Failure to communicate effectively with patient

a. Primary care system redesign. Redesign of primary care will support trust in physicians by patients (and vice-versa) and will enhance the roles of RNs and other members of the care team in communication, including patient education.

b. Local work with Men's Advisory Councils (MACs) and Women's Advisory Councils (WACs).

#13. Patient non-adherence with recommendations for optimal care without appropriate effort by providers to educate or convince the patient

a. Primary care system redesign.

b. Access-to-Care Initiative. The Access-to-Care Initiative is promoting the chronic care model and care management initiatives.

c. Patient peer education. The Access-to-Care Initiative includes peer education as one component of the chronic care model.

d. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

#14. Delay in emergency response or failure to follow emergency response protocol.

a. Emergency Medical Response Initiative. The Emergency Medical Response Initiative will touch every prison in the coming months.

b. Nursing practice review. The nursing staff have recently implemented new procedures for nursing practice review.

c. Local peer review. These and all other types of lapses should be discussed at a local level and incorporated into the local peer review processes.

E. Other Areas of Potential Improvement

Death reviews focus attention on a range of lapses in the processes of care in specific cases by specific clinicians. Valuable as this is, it is important to remember that medical record reviews shed only limited light on system contributions to errors and poor outcomes. Regarding hand hygiene, for instance, universally recognized as important to patient health outcomes, medical records reflect neither individual compliance with accepted practice nor the availability of necessary facilities and supplies. The CDCR has been notorious for its lack of hand-washing facilities in clinical areas.

The interventions mentioned above include a number of system strategies that go beyond individual provider recruitment and education. In addition, the interventions below highlight several of the more important "macro" interventions that will be necessary to facilitate reliable patient care.

1. Creating/redesigning the primary care system.

The current system of care is episodic and characterized by patient-physician relationships that are often adversarial and symptom-driven. It should be possible to decrease serious lapses in care by changing to a primary care model that is characterized by an ongoing patient-physician relationship with built-in advocacy for patients and accountability for outcomes. Poorly trained and poorly motivated providers should continue to be replaced with providers who are competent to deliver primary care. Primary care physicians should help create and lead interdisciplinary patient management teams designed to manage panels or populations of patients.

2. Creating a chronic disease care model of care.

The practice of medicine in many, if not most, of the prisons continues to be episodic and focused on acute symptoms rather than patient-centered continuity, prevention, and chronic disease management. With better health information technology, it will be

possible to identify patients at risk for preventable death based on age, functional status, and/or diagnoses. These patient groups have more chronic diseases, take more medication, and are subject to more testing, more hospitalizations, more specialist visits, and more medical handoffs. The chronic care model has proven effective in preventing unnecessary morbidity and mortality, producing measurable improvements in overall care, and reducing waste through implementation of care management, redesigned team-based processes, patient education, and decision support.

3. **Improving supports for good primary care practice.**

   The medical record system is still paper-based. Individual records, if available, are often in shambles, and essential patient medical information is often missing. The new pharmacy processes are far from fully implemented, so medication dispensing and administration are still fraught with potential for delays and errors. Even when California's largely rural prisons can recruit adequate numbers of physicians and nurses, specialists and ancillary services staff are often unavailable.

4. **Facility upgrades and seven new facilities (10,000 bed project).**

   The CPHCS clinical staff has been working in clinical areas that are dirty, cramped, crowded, noisy, and poorly equipped. Efficient team care, as called for in the chronic care model, is physically impossible where the requisite team members cannot fit in the clinical space, as is true for the majority of CDCR's yard clinics. The volume of care often far exceeds capacity, as at Avenal State Prison, where the 7525 inmates get care in spaces designed for 2320. Crowded patient care areas promote errors and prohibit confidentiality. Recruitment and retention of professional staff will be problematic so long as clinic environments are isolating and flagrantly unprofessional. There are plans to improve and enlarge the clinical areas in existing prisons, but these clinic remodels have only just started, and they will not address the challenge of providing adequate care in rural areas to large populations of patients heavily burdened with chronic disease. The 10,000 bed project will cohort sicker patients in urban or near-urban facilities, increase access to care, and dramatically improve efficiencies in care.

5. **Redesigning the ways in which patient information is handled at care transitions.**

   The inmate patient population is challenging. There is a high prevalence of dual diagnoses (serious mental illness coexisting with physical illness), chronic hepatitis, HIV infection, and drug and alcohol addiction. Depression is endemic. The extraordinary rate of transfers in the California prison system creates opportunities for botched handoffs and the loss of critical bits of clinical information at the point of transfer. The development of health information technology and the 10,000 bed project will decrease the number of botched transitions in care.

6. **Collaboration with custody.**

   Security issues complicate both access to care and provision of care in prisons. Taking patients for care outside the prison is a remarkably complex process. Cell searches can result in confiscation of regular medication, and lags in replacement may lead to lapses in

delivery of necessary medications. A strong relationship between custody and the medical department is essential when redesigning almost any aspect of care in CDCR.

F. Conclusion

Death rates in the CDCR are significantly decreasing in part because the high-quality CPHCS peer review process has resulted in the replacement of 85 potentially dangerous providers with new well-qualified providers.

The death review process offers an important but narrow window on the quality of healthcare delivery systems. There are inherent limitations on the information provided by this process. It focuses largely on physician practice as documented in the medical record. It does not reveal the adequacy of staffing; the performance of the interdisciplinary team working with the provider; the provision of information to support planned care rather than episodic care; the availability of decision support during patient encounters; the performance of supervisors, managers, and executives; the organization's commitment to education and training; or the adequacy of equipment and the physical environment.

In its continued examination of the causes of poor outcomes in American healthcare, the Institute of Medicine (IOM) has noted the need for "fair and just systems of safety that acknowledge both the individual and system contributions to successful as well as adverse events while emphasizing the systems approach to error reduction."[4] Healthcare systems must distinguish human errors from willful negligence and intentional misconduct, but they must also build strong defenses into the work environment. The IOM report quotes safety expert James Reason, "We cannot change the human condition, but we can change the conditions under which humans work."

In his Turnaround Plan of Action, the Receiver has committed to establishing the array of prerequisites to care that is safe, effective and efficient. The IOM has repeatedly pointed out that "piecemeal approaches will not be successful."[5] Recruiting new providers will not yield sustainable improvements in mortality if those providers are left practicing in the cramped yard clinics of existing CDCR prisons. The clinic upgrades and 10,000 bed project, together with computer connectivity and health information technology, will make it possible to achieve critical clinical redesigns with concomitant improvements in quality and cost-efficiency. Without them, care will continue to be wasteful and unsafe.

Patient safety requires creation of a culture in which clinicians readily identify mistakes and system vulnerabilities and in which all staff share in the responsibility for optimal patient outcomes. Given appropriate supports, such a culture should be possible in California's prison healthcare system. Sustaining and continuing improvements in lapses in care, unnecessary deaths, suffering, and waste will depend upon continuing progress of the Receiver's multifaceted interventions.

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[4] Institute of Medicine. *Keeping Patients Safe: Transforming the Work Environment of Nurses.* Washington, DC: National Academy Press; 2004.

[5] *Ibid.*