

# COVID-19 and the Medical Examiner

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San Diego County

# COVID-19 and the Medical Examiner

- How is the ME involved with COVID deaths?
- Who do we test?
- Death certification
- Autopsy findings
- Surge

# How is the ME Involved?

- The Medical Examiner is required to investigate and determine the circumstance, cause and manner of death per Section 102850 of the CA Health and Safety Code, and Section 27491 of the CA Government Code.

# The ME's Office:

## Sec. 102850 CA HSC

- “A physician, funeral director, or other person shall immediately notify the Medical Examiner when she/he has knowledge of a death which occurred or has charge of a body in which death occurred:
  - without medical attendance
  - during the continued absence of physician (not within 20 days of death).
  - Where the physician is unable to state the cause of death

The ME's Office:  
Sec. 102850 CA HSC (continued)

- Where suicide is suspected
- following an injury or an accident; or
- under such circumstances as to afford reasonable ground to suspect that the death was caused by the criminal act of another.

# The ME's Office:

## Section 27491 CA Gov. Code

- Deaths known/suspected as due to a contagious disease, constituting a public hazard.
- Deaths from occupational diseases or hazards.
- Deaths in State Mental Hospitals.
- Deaths [suspected to have been caused by] the criminal act of another.
- Any death reported by physicians or other persons having knowledge of a death for inquiry by the ME.

# How is the ME Involved?

- More than 25,000 deaths registered in San Diego County in 2020
- ME Investigated just over 3300
- Majority of death certificates signed by primary physicians or hospitals
- Jurisdiction may be “waived” if natural death and MD can certify

# How is the ME Involved?

- Deaths from ER
- Deaths from home
- Family requested autopsies



# Who Do We Test?

- Early on: Those with travel history/contact, or symptoms; or those with autopsy findings
- Then: More symptoms added; travel not needed
- Then: Those plus natural deaths with risk factors and recent illness
- Now: Symptomatic or any unattended deaths, appearing to be natural without known recent history

# Who Do We Test?

- We generally do not test those with other causes of death (gunshot wound, hanging, motor vehicle injuries)
- Should we test everyone?

# Death Certification

SAN DIEGO		012 TRANQUILITY CLINIC		DECEASED	
CAUSE OF DEATH	107. CAUSE OF DEATH Enter the chain of events — diseases, injuries, or complications — that directly caused death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE.			Time Interval Between Onset and Death	108. DEATH REPORTED TO CORONER? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO REFERRAL NUMBER
	IMMEDIATE CAUSE (A) DEEP VENOUS THROMBOSIS, CHRONIC (Final disease or condition resulting in death) →			(AT) 1 YR.	
	(B) HYPERTENSION w/07-03498			(BT) 5 YRS.	109. BIOPSY PERFORMED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	(C) COLON CANCER 2005-536565			(CT) 5 YRS.	110. AUTOPSY PERFORMED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	(D) PROSTATE CANCER			(DT) 10 YRS.	111. USED IN DETERMINING CAUSE? <input type="checkbox"/> YES <input type="checkbox"/> NO
112. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RESULTING IN THE UNDERLYING CAUSE GIVEN IN 107 DEPRESSION					
113. WAS OPERATION PERFORMED FOR ANY CONDITION IN ITEM 107 OR 112? (If yes, list type of operation and date.) NO				113A. IF FEMALE, PREGNANT IN LAST YEAR? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNK	
PHYSICIAN'S CERTIFICATION	114. I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE DEATH OCCURRED AT THE HOUR, DATE, AND PLACE STATED FROM THE CAUSES STATED. Decedent Attended Since Decedent Last Seen Alive			115. SIGNATURE AND TITLE OF CERTIFIER	
	(A) mm/dd/ccyy 05/17/2007	(B) mm/dd/ccyy 05/30/2007			
				116. LICENSE NUMBER	117. DATE mm/dd/ccyy

Death certificate has 2 sections for COD

Part 1 :     Underlying or Proximate Cause  
                  and sometimes Immediate Cause  
                  (line 107 A-D)

Part 2 :     Other significant conditions  
                  (line 112)

# Underlying or Proximate Cause

- “That which, in a natural and continuous sequence unbroken by any efficient intervening cause, produces the end result (and without which the end result would not have occurred)”
- i.e. The illness or injury that resulted in death.
- Must be a specific disease or injury

# Immediate Causes of Death

- Complications of the underlying cause, interposed between proximate causation and fatal result.
- There may be none, one, or more than one, and they may occur over a brief or prolonged interval, but none absolves the underlying cause of its ultimate responsibility.
- E.g. ARDS, sepsis, CHF, MSOF
- Usually not etiologically specific

SAN DIEGO		9888 GENESEE AVE		LA JOLLA	
CAUSE OF DEATH	107. CAUSE OF DEATH Enter the chain of events — diseases, injuries, or complications — that directly caused death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE.			Time Interval Between Onset and Death	108. DEATH REPORTED TO CORONER?
	IMMEDIATE CAUSE (Final disease or condition resulting in death) → (A) <b>CARDIOPULMONARY ARREST</b>			(AT) MINS	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO REFERRAL NUMBER
	(B) <b>ACUTE MYOCARDIAL INFARCTION</b>			(BT) HRS	109. BIOPSY PERFORMED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	(C) <b>CORONARY ATHEROSCLEROSIS</b>			(CT) YRS	110. AUTOPSY PERFORMED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	(D) _____			(DT) _____	111. USED IN DETERMINING CAUSE? <input type="checkbox"/> YES <input type="checkbox"/> NO
112. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RESULTING IN THE UNDERLYING CAUSE GIVEN IN 107 <b>NONE</b>					
113. WAS OPERATION PERFORMED FOR ANY CONDITION IN ITEM 107 OR 112? (If yes, list type of operation and date.) <b>ANGIOGRAM AND ANGIOPLASTY 06/24/2007</b>					
113A. IF FEMALE, PREGNANT IN LAST YEAR? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNK					
PHYSICIAN'S CERTIFICATION	114. I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE DEATH OCCURRED AT THE HOUR, DATE, AND PLACE STATED FROM THE CAUSES STATED. Decedent Attended Since Decedent Last Seen Alive		115. SIGNATURE AND TITLE OF CERTIFIER		116. LICENSE NUMBER
	(A) mm/dd/ccyy <b>06/24/2007</b>	(B) mm/dd/ccyy <b>06/24/2007</b>	1		117. DATE mm/dd/ccyy
FAMILY	119. I CERTIFY THAT IN MY OPINION DEATH OCCURRED AT THE HOUR, DATE, AND PLACE STATED FROM THE CAUSES STATED. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Homicide <input type="checkbox"/> Suicide <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Could not be determined			120. INJURED AT WORK? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNK	121. INJURY DATE mm/dd/ccyy
	122. HOUR (24 Hours)				
123. PLACE OF INJURY (e.g., home, construction site, wooded area, etc.)					

## CAUSE OF DEATH

## 107. CAUSE OF DEATH

Enter the chain of events — diseases, injuries, or complications — that directly caused death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE.

IMMEDIATE CAUSE  
(Final disease or condition resulting in death)

(A) **CARDIOVASCULAR COLLAPSE**

(B) **HEPATIC ENCEPHALOPATHY**

(C) **CIRRHOSIS OF THE LIVER**

(D) **ALCOHOLISM**

Sequentially, list conditions, if any, leading to cause on Line A. Enter UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST

Time Interval Between Onset and Death

(AT)  
HR

(BT)

DAYS

(CT)

YRS

(DT)

YRS

## 108. DEATH REPORTED TO CORONER?



YES



NO

REFERRAL NUMBER

## 109. BIOPSY PERFORMED?



YES



NO

## 110. AUTOPSY PERFORMED?



YES



NO

## 111. USED IN DETERMINING CAUSE?



YES



NO

## 112. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RESULTING IN THE UNDERLYING CAUSE GIVEN IN 107

**NONE**

## 113. WAS OPERATION PERFORMED FOR ANY CONDITION IN ITEM 107 OR 112? (If yes, list type of operation and date.)

**NO**

## 113A. IF FEMALE, PREGNANT IN LAST YEAR?



YES



NO



UNK

## PHYSICIAN'S CERTIFICATION

114. I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE DEATH OCCURRED AT THE HOUR, DATE, AND PLACE STATED FROM THE CAUSES STATED.

Decedent Attended Since

Decedent Last Seen Alive

(A) mm/dd/yyyy

(B) mm/dd/yyyy

**09/07/2006**

**05/25/2007**

115. SIGNATURE AND TITLE OF CERTIFIER

116. LICENSE NUMBER

117. DATE mm/dd/yyyy

118. I CERTIFY THAT IN MY OPINION DEATH OCCURRED AT THE HOUR, DATE, AND PLACE STATED FROM THE CAUSES STATED.

119. I AM A PHYSICIAN

120. I AM A NURSE

121. I AM A MIDWIFE



# DC Example 1

- 19-year-old man in good health, skateboarded to a party where he drank a quart of vodka to win a bet, then smoked a crushed “oxycodone” pill.
- Shortly after smoking the pill he was found unresponsive in a chair. Medics restored circulation but he died 5 hours later. Hospital urine tox screen positive for ethanol; COVID-19 positive; CT consistent with anoxic encephalopathy
- Autopsy documented visceral congestion with pulmonary edema, cerebral swelling; blood contained 0.48% ethanol, and 16 ng/mL, fentanyl.

Immediate cause:      *Acute fentanyl and ethanol toxicity*

Due to:

Due to:

Contributing  
conditions:

Manner

*Accident*

## DC Example 2

- 81-year-old frail woman with congestive heart failure from atherosclerotic and hypertensive cardiovascular disease, fell at home and broke her femur. She was hospitalized and underwent internal fixation of the fractured bone. The surgery was uneventful, but within a week developed she exacerbation of CHF, then shortness of breath, fever, CHF, was found to be COVID-19 positive and died.

## Continued

- Autopsy documented multifocal, marked coronary artery atherosclerosis (with old CABG), marked biventricular dilatation, left ventricular hypertrophy, arteriolonephrosclerosis, and bilateral acute bronchopneumonia and early ARDS; and recent femur fracture repair.

Immediate cause:	Atherosclerotic and Hypertensive Cardiovascular disease
Contributing conditions:	Bronchopneumonia and COVID-19 infection complicating immobilization following femoral fracture
Surgeries:	ORIF, left femur fracture, 07/28/2020; CABG, date unknown
Manner:	Accident

## DC Example 3

- 67-year-old man with history of poorly controlled hypertension and diabetes, developed fever, loss of taste, diarrhea and shortness of breath. Found to be COVID-19 positive, intubated; developed MOSF, died.

## Continued

- Autopsy documented prominent ARDS changes of both lungs; cardiomegaly with left ventricular hypertrophy, ATN, marked segmental glomerulosclerosis, and anasarca.

Immediate cause: Respiratory failure

Due to: COVID-19

Contributing  
conditions: Diabetes mellitus; hypertension

Surgeries:

Manner: Natural





# BIRTH AND DEATH REGISTRATION HANDBOOK



STATE OF CALIFORNIA  
DEPARTMENT OF HEALTH SERVICES  
Center for Health Statistics  
Office of Vital Records  
MS 5103  
P.O. Box 997410  
Sacramento, CA 95899-7410

## THE MEDICAL CAUSE OF DEATH MANUAL

INSTRUCTIONS FOR WRITING  
CAUSE OF DEATH STATEMENTS  
FOR DEATHS DUE TO NATURAL CAUSES

Randy Hanzlick, MD  
Editor



College of American Pathologists

## CAUSE-OF-DEATH STATEMENTS AND CERTIFICATION OF NATURAL AND UNNATURAL DEATHS

Protocol and Options

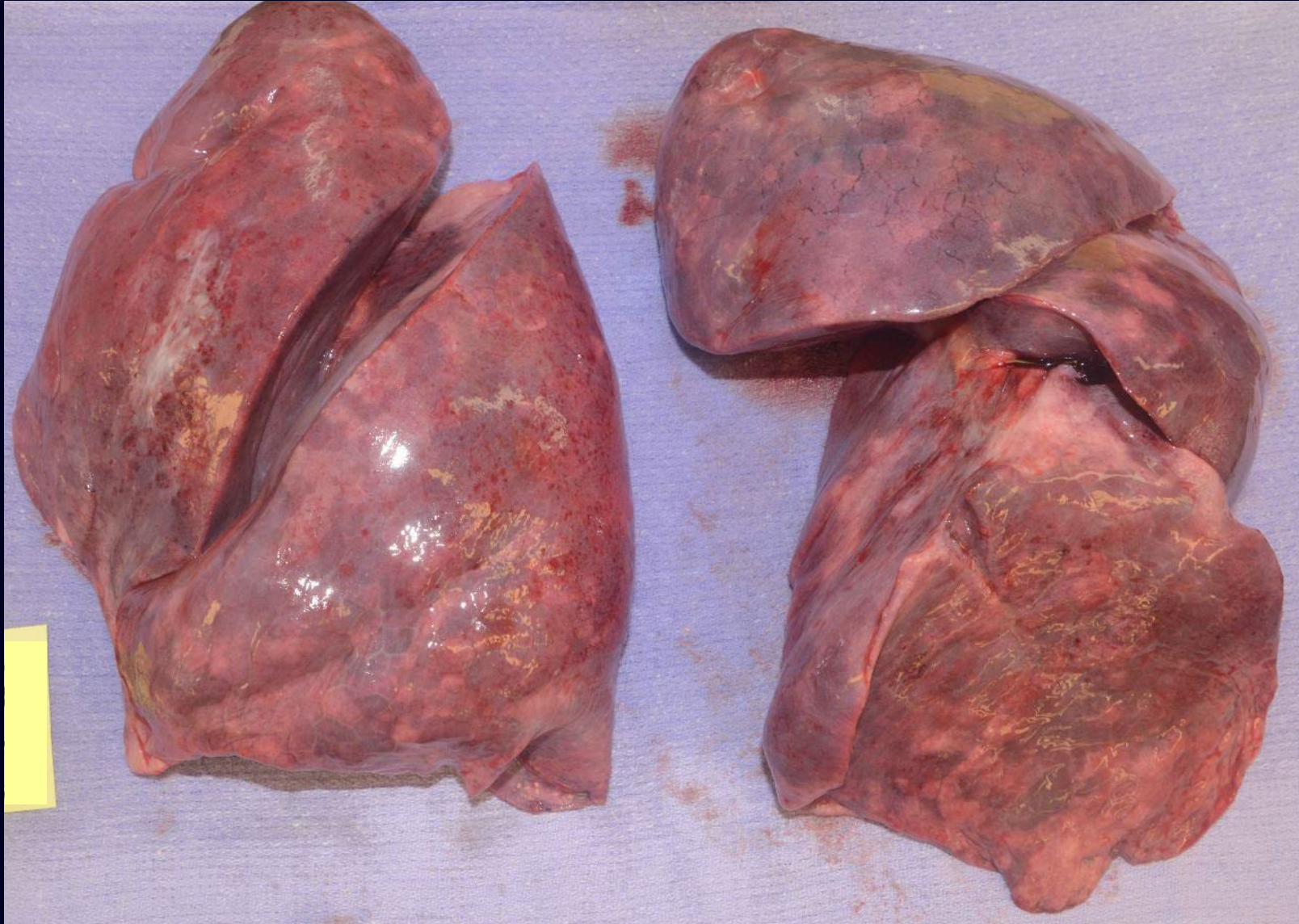
Randy L. Hanzlick, MD, Editor

Prepared by: The Autopsy Committee and  
The Forensic Pathology Committee  
of the College of American Pathologists  
in conjunction with  
The National Association of Medical Examiners



College of  
American  
Pathologists

# Autopsy Findings



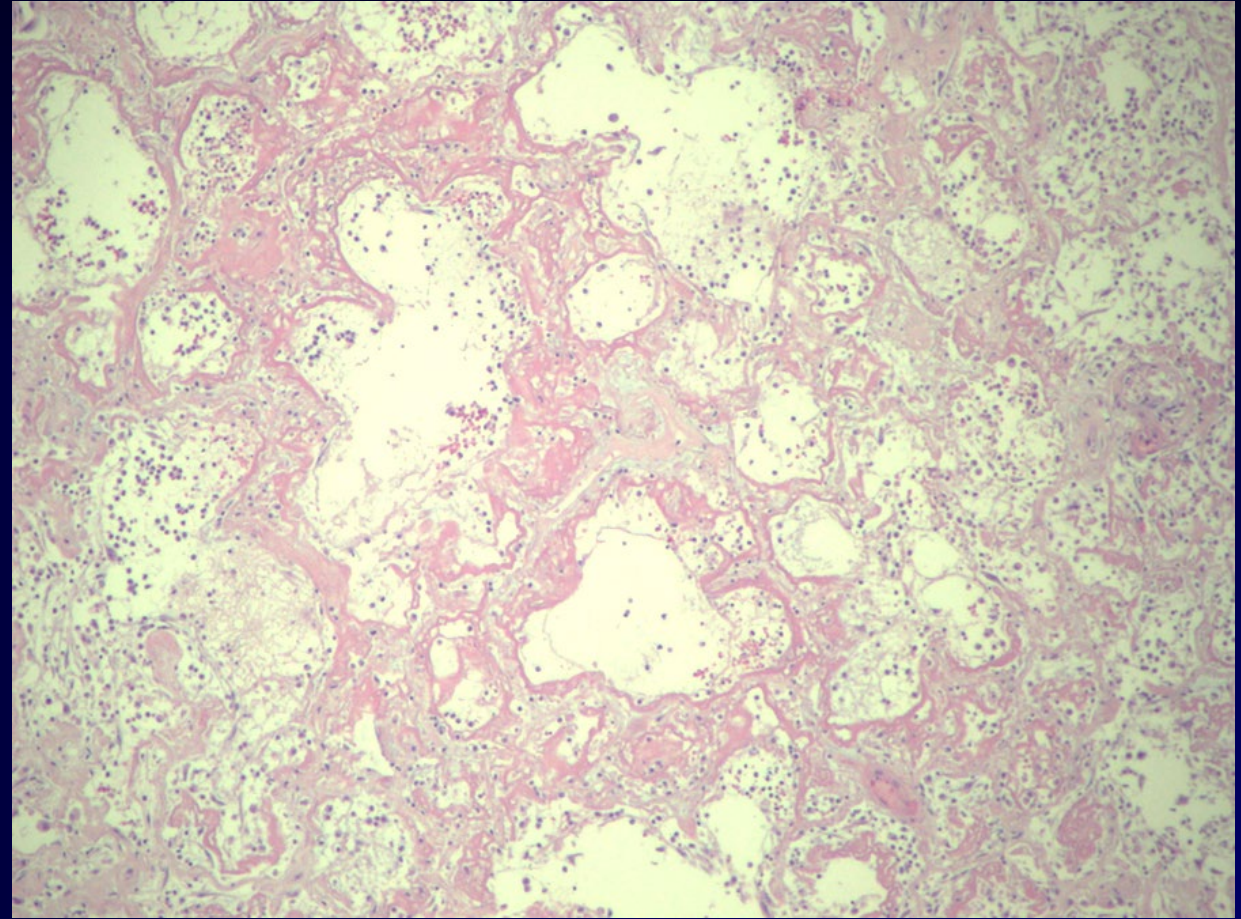
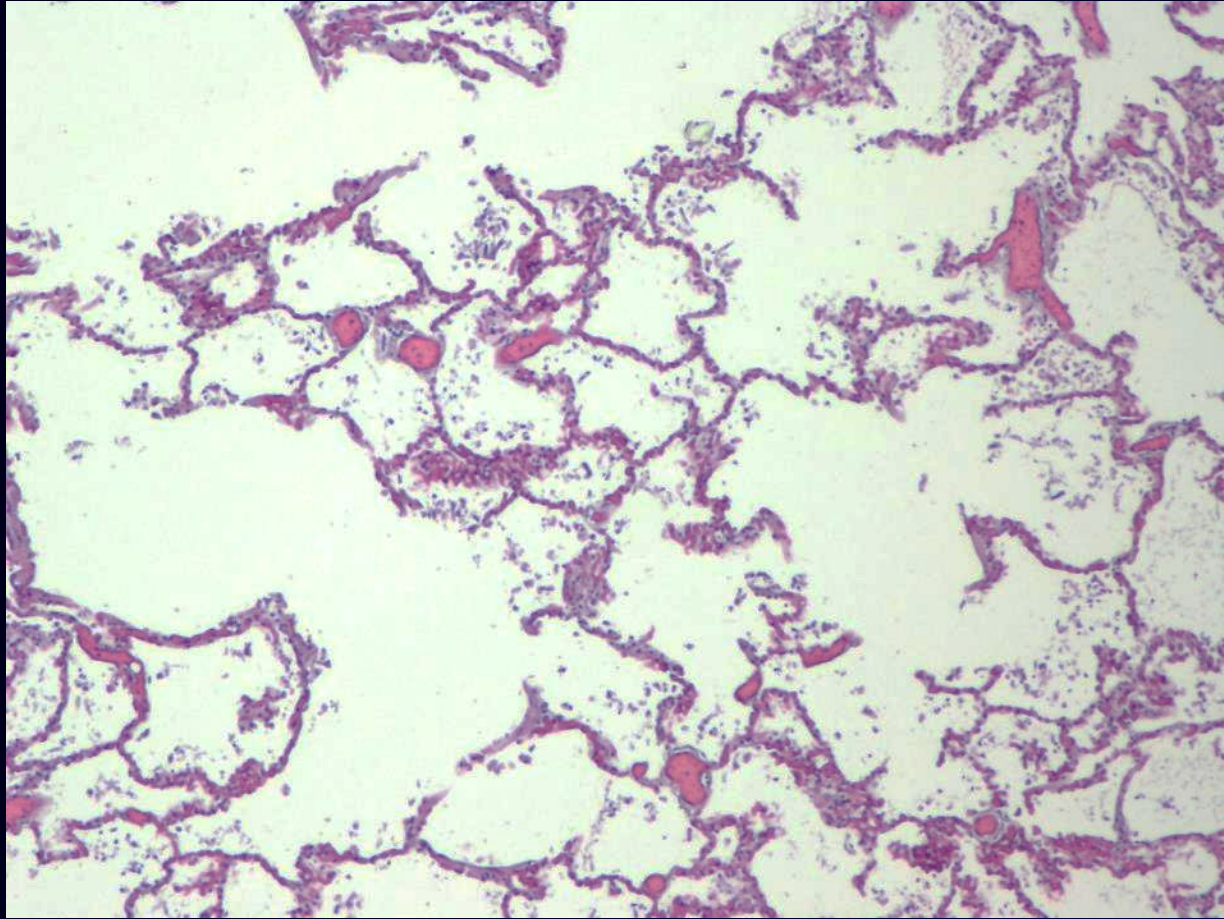


# Autopsy Findings



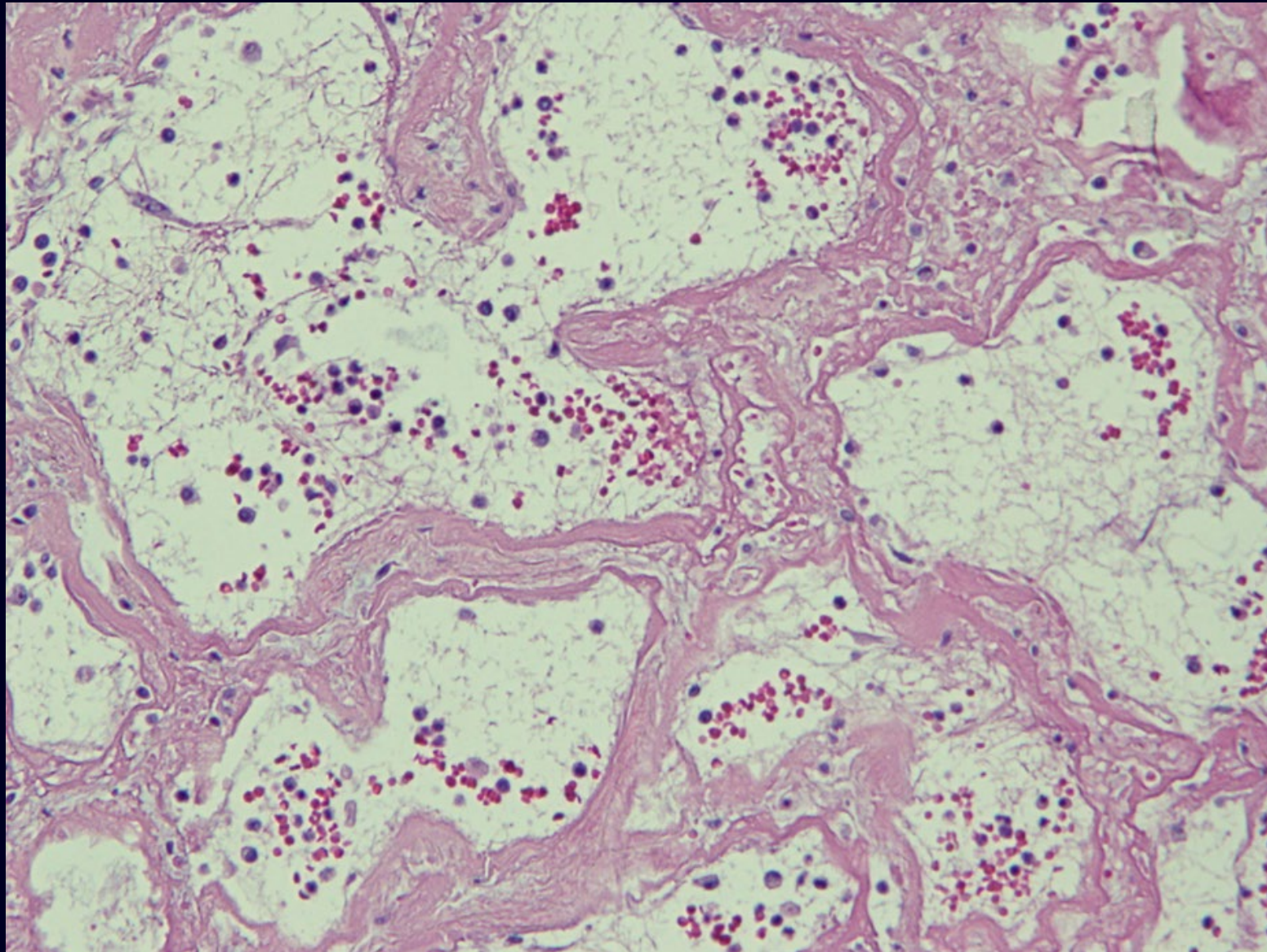


# Autopsy Findings



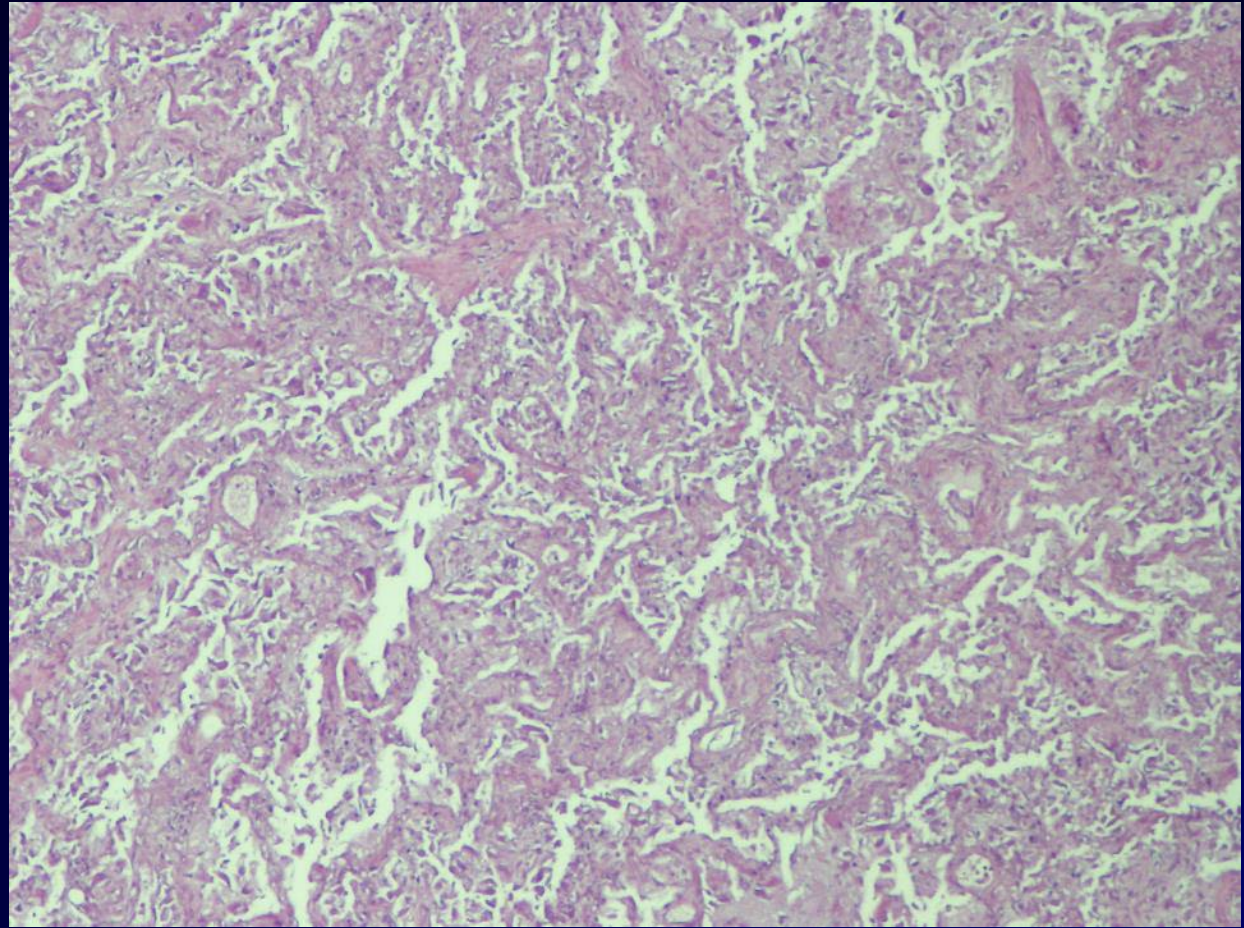
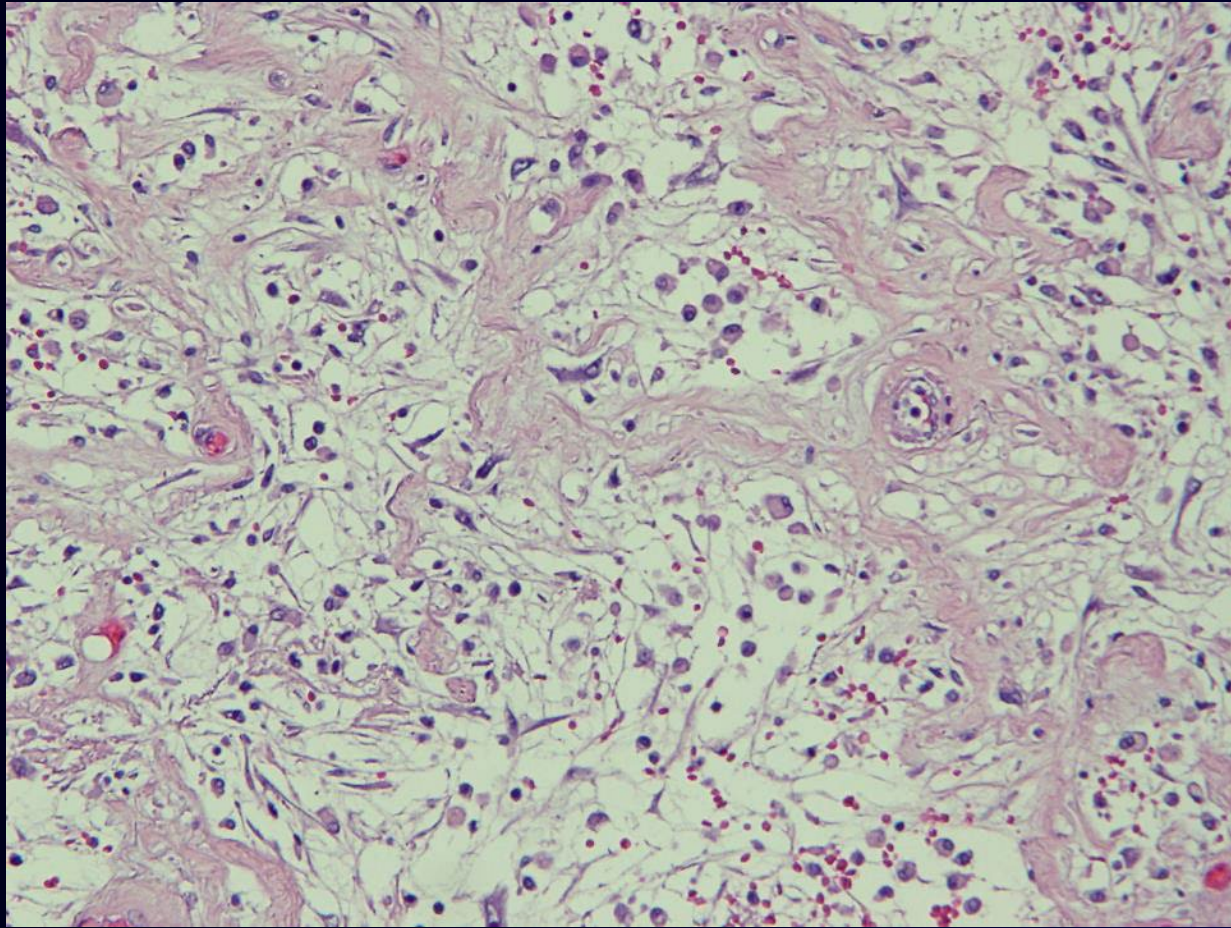


# Autopsy Findings



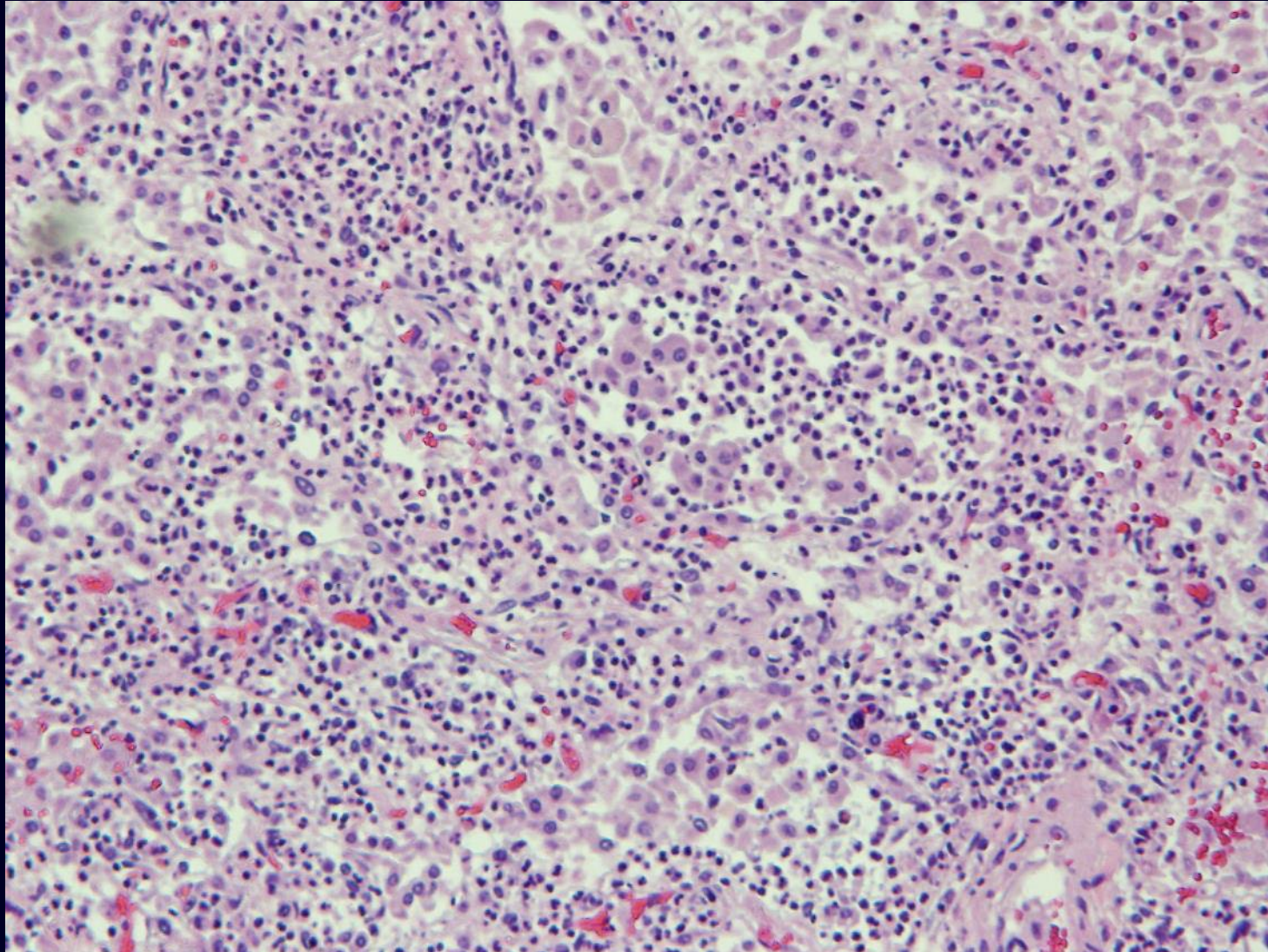


# Autopsy Findings





# Autopsy Findings





# Autopsy Findings





# Handling Surges

(Winter 2020, 296 decedents from  
16 healthcare facilities and mortuaries)



# COVID-19 and the Medical Examiner

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- Who do we test?
- Death certification
- Autopsy findings
- Surge





# Questions/Discussion

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