DPH / OEMS Investigation – Clinical Review CASE # 21-1009

TO: **Renee Atherton, Paramedic, Compliance Coordinator**

FROM: **Jonathan Burstein MD, FACEP - OEMS Medical Director**

DATE: **December 17, 2120**
(Review completed)

EMT NAME(S): **Jason Murley, EMT-Basic, E0918196**
Jeffrey Horne, EMT-Basic, E887540
John Boyle, Paramedic, P0903042
Jonathan Hallinan, Paramedic, P0903912

Ambulance Service: **Topsfield FD**

Overview of Case:
The Department received a complaint reporting that 9-1-1 was called for an infant patient in cardiac arrest, and that the Topsfield FD EMS crew mismanaged the medical care, falsified information in the patient care report, and the infant sustained a catastrophic brain injury and died the next day.

Investigation showed that after the patient arrested, the father began dispatcher-assisted CPR. The PD who arrived seem to have not continued effective CPR, nor did they deploy an AED.
From the arrival of EMS:

1. EMTs Horne and Murley put the patient on the stretcher, but did not provide ventilations, nor did they apply an AED.
2. EMT Murley, rather than a police officer, proceeded to drive the ambulance, by report because the vehicle had partially defective brakes. This removed an EMT-trained rescuer from the patient.
3. EMT Murley drove in a manner that concerned the crew in the patient compartment. By their report, the driving prevented them from performing a second intubation attempt and IO access.
4. EMT Horne dropped a bag of equipment and did not recover it.
5. EMT Horne did not ventilate the patient, although he did provide chest compressions (albeit without thoroughly assessing for a pulse or landmarks).
6. Paramedic Hallinan was picked up enroute, but did not initially provide ventilations. By report he did examine the patient’s airway with a laryngoscope to establish patency; but he was then attempting to make a cardiac monitor operational, but was unable to do so for an extended time. Hallinan states that he did BVM ventilations at some point.
7. Paramedics Hallinan and Boyle interpreted a brief single-lead pattern as asystole; which is probably the case, but should have been confirmed in another lead at least.
8. Paramedic Boyle was picked up enroute. He noted that the Hallinan was at the head of the patient and that a non-rebreather mask had been applied. Boyle reported BVM ventilations were begun after he arrived. Boyle made an intubation attempt which was unsuccessful.
9. The Broselow tape was not used until the hospital requested such near the end of the transport.
10. While IV sites may have been visually assessed, no IV or IO attempts were made.
11. During transit from vehicle to ED, ventilations were not performed by any of the crew.

In summary, the “chain of survival” (as described by the American Heart Association) was not maintained here. In an arrest, the initial rescuer(s) should perform effective CPR to the level of their abilities and training (e.g. for PD or EMS, compressions *and* ventilations), with early AED deployment (especially since VF, if present, is a much more salvageable rhythm early on). ALS care should then

focus on maintaining the effective CPR while adding invasive airway management, vascular access, and medications. Interventions should be guided by prudent medical practice and with appropriate use of aids (such as a Broselow tape). The patient and treaters should be rapidly but safely transported to a definitive care site (i.e. an ED).

Statewide Treatment Protocol Violations: Yes
Other Clinical Violations: Yes

Specifics of Violation (please list STP's violated):

PD, failure to provide effective CPR or AED. Not within OEMS jurisdiction.

EMTs Horne and Murley, failure to provide effective CPR or AED. STP 3.4P, STP 3.5P.

EMT Murley, failure to safely drive the vehicle (with a question as to the vehicle's roadworthiness still open based on what I have reviewed). 105CMR170.333.

Paramedic Hallinan, failure to provide effective CPR or cardiac rhythm assessment, or attempt vascular access. STP 3.4P, STP 3.5P.

Paramedic Boyle, failure to provide effect CPR or cardiac rhythm assessment, or attempt vascular access. STP 3.4P, STP 3.5P.

All providers, failure to properly use aids for care (Broselow tape) and failure to properly continue care for the patient from ambulance bay to ED bay. STP 1.0.

Department of Public Health (Department)
Office of Emergency Medical Services (OEMS)
Complaint Investigation Report
 # 21-1009

Name: Topsfield Fire Department (Topsfield FD)

Principal Parties: Jason Murley, EMT-Basic, E0918196
Jeffrey Horne, EMT-Basic, E887540
John Boyle, Paramedic, P0903042
Jonathan Hallinan, Paramedic, P0903912

Season of Incident: Spring, 2021

Date Received: October 22, 2021

Date Investigation Begun: October 22, 2021

Investigators: Renée Atherton, Paramedic, OEMS Clinical Coordinator
Leonard McNeil, Paramedic, OEMS Inspector
Daniel Doucette, Paramedic, OEMS Inspector

Clinical Reviewer: Dr. Jonathan Burstein, Department EMS Medical Director

Records Reviewed:

a. OEMS EMT registry for principal parties
b. Complaint
c. Patient Care Report
d. Cardiac Monitor Disclosure Report
e. Scene Videos
f. Hospital Videos
g. Interview Notes
h. Medical Examiner Report
i. Hospital Emergency Room Report
j. Service After Action Report
k. Maps of Route of Transport
l. Police Incident Reports
m. Audio of Hospital Entry Notification
n. Audio of 9-1-1 Call
o. Audio of Fire Dispatch
p. Audio of Police Dispatch
q. Statewide Treatment Protocols v. 2021.2
r. Clinical review

Interviews:

1. Jason Murley
2. Jeffrey Horne
3. Jonathan Hallinan
4. John Boyle
5. Chief Jenifer Collins-Brown
6. The Complainant
7. The Patient's Parents

Allegation: The Department received a complaint reporting that 9-1-1 was called for an infant patient in cardiac arrest, and that the Topsfield FD EMS crew mismanaged the medical care, falsified information in the patient care report, and the infant sustained a catastrophic brain injury and died the next day.

Summary of Investigation: The Department received the above allegation. Specifically, the complainant reported that 9-1-1 was called for an 8-month-old infant, who was experiencing respiratory distress unrelated to COVID-19 infection. The complainant reported the infant had recently been diagnosed by the pediatrician with a respiratory infection, had cold-like symptoms, and had been prescribed Benadryl. The complainant reported the patient, while being consoled by his father, suddenly stopped breathing and 9-1-1 was called. According to the complainant, following the dispatcher's directions, the patient's father immediately initiated cardiopulmonary resuscitation (CPR), with both chest compressions and mouth-to-mouth ventilations. The complainant reported when the Topsfield police officer arrived at the scene, the infant's father was performing CPR on the infant lying on the floor. The complainant reported the police officer came in the house, picked up the infant, ran outside, and stood at the bottom of the driveway waiting for the Topsfield FD ambulance to arrive. The complainant reported when the ambulance arrived, an EMT ran around to the back of the ambulance with a bag on his shoulder, then dropped the bag in the street and never picked it up before the ambulance left the scene. The complainant reported that the patient's mother was in the patient compartment during the transport to Beverly Hospital emergency department (ED). The complainant reported the EMTs did not attempt to intubate, did not ventilate with a mask, and did not suction the infant's airway. The complainant reported that at one point, the EMT asked the infant's mother to retrieve a piece of equipment he needed; however, when she could not find it, he had the mother perform chest compressions while he looked himself. The complainant reported the piece of equipment was never found and the EMT resumed chest compressions. The complainant reported that in the patient care report (PCR) written by the EMTs, the details described, such as an intubation attempt and ventilations provided by a bag-valve mask (BVM), are not accurate and those interventions never happened. The complainant reported the patient went into the hospital with only chest compressions being done and no ventilations, and only a face mask over his face. The complainant reported the patient's pajamas were not removed by the EMTs and that a cardiac monitor was never applied. The complainant reported the infant was resuscitated at Beverly Hospital; however, he was transferred to Boston Children's Hospital with a "catastrophic brain injury" and later died.

The Department has conducted an investigation into the matter, in accordance with EMS System regulations, 105 CMR 170.795. The Department has no authority over police who are not EMTs, and their actions as first responders. The Department has reviewed all documentation and conducted interviews as listed above.

Interview: The Complainant

1. The Department conducted a phone interview with the complainant in this case, who reiterated the details provided in the written complaint.
2. The complainant stated that this was a failure of the EMTs and police officers to provide appropriate medical care to an infant in cardiac arrest. The complainant said the EMT's bag that was left behind most likely contained equipment needed by the EMT, but it was left in the street and the police officer on scene did not alert the ambulance driver that a medical bag was left behind.
3. The complainant reported that when the police officer arrived, he took the infant out of the house, where the father was providing effective chest compressions and ventilations. The complainant reported the police officer "patted the chest" only and did not ventilate the infant.
4. The complainant stated that once the family retrieved a copy of the PCR, they noticed details that were documented that were "blatantly inaccurate and false," such as an intubation attempt, administration of oxygen via a mask, and an attempt to place an intravenous (IV) line.
5. The complainant stated that from the time the police officer grabbed the infant away from the father until arrival of ambulance at the hospital, the medical care provided was not up to standards, was chaotic and mismanaged, resulting in the death of the infant.

6. The complainant stated the Topsfield EMTs and police officers "must be held accountable for their actions."

Interview: The Parents

7. The Department conducted an interview with the parents of the infant in this case.
8. The father reported that he did CPR while being directed by the dispatcher on his cell phone, set in speaker mode. He stated he had the infant lying on the floor, a firm surface, and was providing chest compressions and ventilations.
9. He stated the police officer arrived and the mother directed the officer inside to the infant. The father said the police officer had a bag on his shoulder, which he promptly dropped on the floor, and instead picked up the infant and left the residence.
10. The father reported the police officer was initially not doing anything for the infant, such as chest compressions or ventilations. He stated the officer quickly walked outside, where he stood and waited with another police officer. He said once outside the police officer ultimately did chest compressions only, never provided ventilations and did not have the infant on a firm surface, as the dispatcher had directed him to do. The father stated the officer held the infant in his arms while the second officer did chest compressions.
11. The parents both reported that no ventilations were provided to the infant by the police officers while they all stood outside in the driveway waiting for the ambulance to arrive.
12. The mother stated once the ambulance arrived, the driver got out and opened the back doors and the second EMT ran around to the back with a bag on his shoulder. She said he dropped the bag in the street and left it there. She said it was never placed back in the ambulance.
13. The mother stated there was one EMT in the back of the ambulance with her and the infant secured on the ambulance stretcher. She said at one point, the EMT asked her to find a piece of equipment for him, but she did not know what she was looking for. She stated she cannot now recall specifically what the piece of equipment was.
14. The mother reported that the EMT directed her to do chest compressions while he looked for the piece of equipment. She stated she does not believe he ever found what he was looking for and he ultimately resumed doing chest compressions.
15. The mother stated, "Stuff was flying everywhere. They were driving so fast." She said, "It was chaotic in the ambulance, and nothing was being done for [the patient]."
16. The mother said the EMT never provided ventilations to the infant and only did chest compressions. She stated she does not recall a face mask being placed on the infant, but does recall seeing the face mask when they brought the infant inside the hospital.
17. The mother stated they picked up another EMT or paramedic and he got in the ambulance by the side door. She said they stopped only once to pick up the paramedic and she does not recall any additional stop.
18. The mother stated they did not apply the cardiac monitor. She said, "There were no wires attached. They did not place any [therapy] pads on [the patient's] chest but they could have been placed and I just did not notice."
19. The mother reported the paramedic did not attempt IV access. She stated it would have been too difficult for them because they did not remove the patient's pajamas. She stated they only unzipped his one-piece pajamas about a third of the way. "We have [the patient's] PJs and they were not torn or cut. They were taken off at the hospital."
20. The mother stated the paramedic they picked up "did not touch the infant at all." She said he got in and did not move from where he was standing when he entered the ambulance.
21. The mother stated that she does not recall seeing a BVM being used and that "no one put a tube in his mouth or inserted anything."
22. The mother stated once at the hospital, the doctors and nurses started doing things right away and it was at that time the infant was intubated, his pajamas were removed, and ventilations started.
23. The parents stated that from the time the infant was removed off the kitchen floor of their house, the medical care was mismanaged and once the ambulance arrived, "the EMTs did not know what to do."

9-1-1 Audio Recording

24. The Department reviewed the 9-1-1 audio recording of this emergency as part of the investigation. The call lasts approximately 6 minutes and 41 seconds, at which time the police officer has left the home with the infant in his arms.
25. In the recording, the infant's father can be heard reporting to the dispatcher that the infant is not breathing. After asking a few scripted questions, the dispatcher directs the father to place the infant on a firm surface and start chest compressions. The recording indicates the father placed the infant on the floor and did 30 chest compressions followed by 2 breaths covering the mouth and nose.
26. The father is heard continuing dispatcher-directed CPR until the officer arrives in the home. In the recording, the dispatcher confirms with the parents that the officer has arrived in the house. The dispatcher is heard saying, "I am going to disconnect now, okay?" The mother is then heard saying, "But, he [the officer] is not doing anything." On the recording, the father is heard asking the officer, "Aren't you going to give him CPR?" The officer responds, but his reply is inaudible. The call is then terminated.

According to dispatch records and Department interviews, Topsfield FD dispatched an ambulance, A-1, staffed by EMT-Basics Jeffrey Horne and Jason Murley, operating at the basic life support (BLS) level, to a location for the report of an unresponsive baby, with dispatcher-directed CPR in progress. Paramedic Jonathan Hallinan, while at home, heard the dispatch over the radio and got out of bed to respond to this emergency. Hallinan reported that while still at home, he called over the portable radio to the dispatcher to request the dispatch of a mutual aid paramedic ambulance from Northeast Regional Ambulance Service (Northeast Regional). Topsfield Squad 1 (a service pick-up truck), staffed by two firefighter first responders, waited on the apron of the station garage for Hallinan to arrive. Once Hallinan arrived at headquarters, Squad 1 responded to the emergency scene. In his interview, Paramedic John Boyle reported he received notification of the emergency over his phone through the dispatch application. He said that he acknowledged the notification by clicking the button on the application, indicating that he was responding; however, he later learned the dispatcher never received this acknowledgment. Boyle stated he did not have a working portable radio and did not verbally notify anyone that he was responding to an intercept point. Simultaneously, Topsfield Police Officers Joseph Debernardo and Daniel Bell were dispatched to the scene to provide assistance. Officer Debernardo arrived first and entered the residence. Officer Bell arrived at the scene a few minutes later. An Ipswich police officer arrived to provide additional assistance.

Interview: EMT-Basic Jason Murley

27. Murley reported that he and EMT-Basic Jeffrey Horne were staffing the ambulance on this date. He stated the dispatcher told them the emergency was for an infant not breathing and that dispatcher-directed CPR was being done by the parents. He said he heard over the radio during the response that Paramedic Jonathan Hallinan requested Northeast Regional paramedics also be dispatched.
28. Murley stated that while they were responding, Horne called Paramedic John Boyle, Topsfield FD Lieutenant (Lt.) by phone, to let him know of this emergency. He explained that Chief Jenifer Collins-Brown normally responds; however, she was out of town and Lt. Boyle was covering. He stated that Boyle did not answer his phone and that Horne immediately sent him a text message. He said he did not know for sure if a Topsfield paramedic was responding.
29. Murley stated they did not get a radio update from the Topsfield police officers. He said usually the officers arrive on scene first and provide EMS a radio update, but in this case, the officers did not update them.
30. Once they arrived on scene, Murley said, he observed an officer doing CPR on the infant in the driveway. He stated he and Horne got out of the ambulance and went to the patient compartment and got inside. He said the officer handed the infant to Horne and together they placed the infant on the stretcher.
31. The Department asked Murley if they had an infant-size 5-point harness securing device on the stretcher to accommodate the patient's small size. He stated he does not believe they used their device and that the infant was simply placed and secured directly on the stretcher.

32. The Department asked Murley if he or Horne inserted an oropharyngeal airway (OPA) and used an infant bag-valve mask (BVM) to ventilate the infant while chest compressions were being done. He said he did not ventilate the infant himself and did not see Horne use a BVM or insert an OPA. He stated he was only in the patient compartment for a couple of minutes before being directed out to drive.
33. Murley said the patient's mother got in the patient compartment and someone directed him to get out of the ambulance and drive, but he is not sure who exactly. He stated it could have been the police officer or Horne.
34. Murley stated that it was a high-stress environment and that the mother was crying and screaming the entire way to the hospital. He said this was his first infant cardiac arrest and he himself felt stressed by this emergency.
35. He reported as he was approaching the driver's seat, one of the officers asked him if he wanted him to drive the ambulance. Murley said he decided to not let the officer drive and responded, "No." He stated the officer then offered to provide him an escort to Beverly Hospital ED. He said he accepted this offer of an escort and got in to drive.
36. The Department asked Murley if he considered letting the officer drive the ambulance so he could get in the patient compartment to help Horne with CPR and consoling the mother. He stated the police officer was not "qualified" to drive the ambulance because it has air brakes that are "touchy."
37. Murley said ambulance transport began as soon as he closed the driver's door. He stated he followed the police cruiser towards Beverly Hospital. While en route, he said, he intercepted with Squad 1 at an intersection and picked up Paramedic Hallinan. He stated once Hallinan was in the ambulance, someone yelled up to him to drive so he did. He reported the intercept occurred approximately 3 minutes from the scene, they stopped for a second or two, and then were on the way again towards the hospital, with Squad 1 following behind them.
38. Murley said as he continued driving, a short distance from where he stopped to pick up Hallinan, Paramedic Boyle was on the side of the road, waving his arms for him to stop and pick him up. He stated he again stopped for a second or two, while Boyle got in the side door of the patient compartment. Murley said again someone directed him to drive.
39. He stated he yelled back to Boyle and asked him if he should cancel the intercept with Northeast Regional paramedics. He said he was told by the dispatcher over the radio that Northeast Regional paramedics were waiting for them at an intercept point just ahead of where he currently was. He reported that Boyle told him to go ahead and cancel the intercept. He stated he told the dispatcher to cancel Northeast Regional and informed the dispatcher they now had two Topsfield paramedics on the ambulance with Horne.
40. Murley stated that he saw Northeast Regional on the side of the road in a parking lot area as he drove past, and that Squad 1 pulled off with Northeast Regional as he continued to the hospital.
41. Murley said he almost missed the turn off to the hospital. He stated he was following the police cruiser and was going too fast. He said he was also not familiar with the area at night because he had not driven much under these circumstances and in the dark. He stated he had to make an abrupt braking maneuver and a sharp left turn in order to make the hospital turn off. He said he did not know how to get to the hospital otherwise and was concerned if he missed this turn, he would not know how to get there. He said as a result, he made the turn regardless of the speed he was going.
42. Murley reported he was driving faster than he should have been, and that the police escort got his adrenaline going. He stated that during the transport, using a communication phone application, similar to a private walkie talkie, called "Zello," someone from the patient compartment told him to slow down. He said he did not notice the communication and only later learned it was Boyle who had sent it.
43. Once at the hospital, Murley stated they brought the patient inside and he had difficulty with the stretcher. He said as he tried to pull the stretcher, there was resistance on the wheels, preventing him from smoothly pulling it along. He reported he had to drag it and another Topsfield firefighter came and helped him pull the stretcher inside the ED.
44. The Department asked Murley what he could recall seeing for ongoing care to the patient. He replied he cannot recall anything about what he saw for ongoing medical care.

45. Murley said that once inside the ED and in a room, they turned care of the patient over to the nurses and doctor. He stated he does not recall if any equipment was attached to the infant or if he had to clean any equipment up after the call was over.
46. Murley reported that two days later, they had a Critical Incident Stress Debriefing (CISD) session at Topsfield FD headquarters.
47. The Department asked Murley if this was his first infant cardiac arrest and he said, "Yes." He stated it was also the first time he had a police escort to the hospital and driving in a high-stress situation. He said the service has since made a policy that police escorts to the hospital are no longer allowed.

Interview: EMT-Basic Jeffrey Horne

48. Horne stated he and Murley responded in A1 to this emergency call. He said he knew the call was for an infant not breathing, CPR in progress. He stated while en route to the scene, he called and text messaged Paramedic John Boyle to inform him of the emergency. He reported he did not get a reply from Boyle and did not receive a radioed update from the on-scene police officers.
49. He stated they heard on the radio that Paramedic Jonathan Hallinan had signed on as responding to the station and calling for mutual aid from Northeast Regional paramedics.
50. Horne reported as they approached the scene, he saw two police officers and the infant's mother in the driveway. He stated he got out of the ambulance with his first-in bag and immediately felt the stress of the scene. He said the police officer was screaming at them, "Let's go, let's go." He stated, "Everyone was screaming, and the scene was intense -- nerve wracking and so loud."
51. Horne said he went to open the back doors of the ambulance and dropped his first-in bag off his shoulder into the street. He stated, "I never picked it up again. It was the first-in bag and I left it in the street. I did not need anything in it. I don't know why I grabbed it."
52. The Department asked Horne if he also grabbed the automatic external defibrillator (AED). He stated he did not believe he did. The Department told him of the video from the residence that shows he had the AED under his arm as he went to the back doors of the ambulance, and that he set it down on the rear bumper. The video also shows that he then picked it up and tossed it inside the ambulance to the bench seat. He said he does not recall doing that or having the AED under his arm.
53. Horne stated he stepped up into the patient compartment and the officer handed him the infant. He said he secure the infant to the stretcher. He said, "I was focused on doing high-quality chest compressions."
54. The Department asked Horne if he did any type of assessment of the infant. He stated for a brief moment he checked for a pulse. "I believe I checked for a pulse at the neck [carotid], but it was brief." He said the infant was limp, with his eyes closed, but he cannot recall any other details of the infant's appearance.
55. Horne stated he did not expose the infant's chest to verify landmarks for chest compressions but just did compressions over the "onesie" he had on. He said Murley was in the patient compartment for a few seconds then got out to drive.
56. He said the officer was yelling repeatedly, "Let's go" and the mother was screaming. "It was so loud and chaotic," he stated.
57. Horne reported he did chest compressions and after about 1minute, he provided mouth-to-mouth ventilation. He stated he went back to doing compressions and then asked the mother to take over. He stated he wanted to retrieve the "pedi[atric] bag," where he knew there was an OPA. He said he grabbed the OPA and a non-rebreather mask.
58. The Department asked him why he did not get an infant-size BVM to provide ventilations. He said, "Because I was by myself, and just trying to get oxygen into him; at least something; I went with the non-rebreather mask. I did think of the BVM, but did not put my hands on it right away, so I skipped over it and used the non-rebreather."
59. Horne stated he inserted the OPA, attached the non-rebreather mask to high-flow oxygen, put it on the infant's face and then resumed doing chest compressions, relieving the mother from doing them. He reported it was shortly thereafter they picked up Hallinan.

60. Once Hallinan was inside the patient compartment, Horne stated, he was focused on doing chest compressions. "He [Hallinan] grabbed a tool or something and checked for airway obstructions," Horne said. He stated approximately a minute later, they stopped to pick up Boyle.
61. Horne stated there was an AED sitting next to him on the bench seat and at the time thought it was the police officers' AED. He said he took out the pads from the AED and applied the defibrillator pads, but they would not stick. He stated he wasn't sure at the time what was going on with them. He reported Hallinan for some unknown reason was troubleshooting the cardiac monitor. He said he cannot now recall any other details about the application of the pads other than they did not stick to the infant's chest.
62. Horne reported it was a "fast ride" and "bouncy" while he was doing chest compressions. He stated he never stopped doing chest compressions and continued them even once they arrived at the Beverly Hospital ED.
63. Horne said upon arrival they brought the infant inside the ED on the stretcher, went into the "trauma room." He stated he continued doing chest compressions for approximately 15 minutes before someone relieved him and then he left the room.
64. The Department asked Horne if he could recall if anyone at any time was doing BVM ventilations on the infant while he was doing chest compressions. He said, "I have no recall of ventilations being done."
65. The Department asked Horne if this was his first infant cardiac arrest. He stated "Yes."
66. Horne stated a couple days later they had a CISD session at the station and that he has since done additional training in CPR, AED and has reviewed the call multiple times.

Interview: Paramedic John Boyle

67. Boyle stated he got the emergency call alert through his "I am responding" application on his phone. He said he did not have a portable radio and did not communicate with anyone about his response. He stated based on the location of the emergency, he picked an intercept location and went there in his personal vehicle.
68. He reported that within the dispatch application, he hit the button which lets the dispatcher know he is responding but discovered later that it did not go through to the dispatcher. He stated that also much later after the call, he discovered that Horne had called him and text messaged him about this emergency while they were responding, but at the time he did not look at the text message or get the call.
69. He stated he went to the meet location and parked his vehicle. He said approximately 2 minutes after parking, he saw the lights of the ambulance approaching him and he stood on the side of the road waving his arms to let Murley know he was there. He stated the ambulance stopped and he got in the side door to the patient compartment. He said transport began immediately after he entered the ambulance.
70. The Department asked Boyle what he observed when he entered the patient compartment. He said Hallinan was at the head of the stretcher, the infant's mother was on the right side in the seat, and Horne was on the bench seat doing chest compressions. He said the patient had a non-rebreather mask on his face with high-flow oxygen and an OPA in place. He stated he cannot recall if the infant had on clothes or not.
71. Boyle stated he verbally coached Horne to continue doing good chest compressions, and he saw the cardiac monitor in its stand to the left of Hallinan and realized it had no tracing. He said it was either him or Hallinan who started to troubleshoot the cardiac monitor and they did not see anything wrong.
72. He stated they traced the therapy cable back to the infant and realized the film was still on the back of the therapy pads. He said the pads were not properly stuck to the infant's chest and the backing film had not been removed, therefore there was no ECG tracing. Boyle said "someone" took the film off the pads, applied them to the infant's chest and then they had an ECG tracing. He said they had a tracing showing chest compressions and asystole.
73. The Department asked Boyle if the lead wires were applied, and the cardiac monitor switched to view the cardiac rhythm in leads and paddles. He replied that the lead wires were not applied. The

Department asked Boyle if there was any discussion with Hallinan about applying the leads and he replied, "No."

74. The Department showed Boyle a copy of the ECG tracing from the disclosure report obtained from the cardiac monitor. The Department asked Boyle to identify the moment of asystole. Boyle identified a brief 1-second pause in chest compressions as being asystole. The Department asked Boyle how he verified asystole in accordance with advanced cardiac life support (ACLS) guidelines and the Statewide Treatment Protocols. He stated he could not verify it but that he knew it was asystole. "That's asystole," he said.
75. Boyle said at this point Hallinan started BVM ventilations. He stated he saw chest rise and that chest compressions were ongoing by Horne. He reported the infant's skin color started to improve. He said initially the infant's skin was "slightly blue."
76. Boyle stated he gave a radio report to Beverly Hospital. He said he had some communication issues and "The nurse was asking a lot of questions." He stated it was stressful in the back of the ambulance, and the mother was screaming and crying while he was trying to give a radio report and answer the nurse's questions.
77. He reported the nurse asked him where the infant lined up on the Broselow tape. The Department asked Boyle if this was the first time that he or Hallinan thought about using the Broselow tape. He said the Broselow tape was out on the stretcher; however, they had not yet determined with which category the infant lined up.
78. Boyle said that Hallinan did a "brief look" to see if the infant had an intravenous (IV) site. He stated there was no actual IV attempt made beyond Hallinan's visual inspection for a good site. He said obtaining intraosseous (IO) access was "mentioned; it was out [to be used] but I cannot recall the details." He stated it is possible they were too close to the hospital by this point in the call.
79. Boyle said he decided he needed to intubate the infant. He reported he prepared his equipment and had Hallinan move to the left of the infant while he sat in the airway seat at the head of the stretcher. He stated he made one attempt and he placed the laryngoscope blade in the infant's mouth. He said it was a brief look because he could not see the infant's vocal cords. He stated this was his first infant cardiac arrest, and his first time intubating an infant. He said his attempt was brief and unsuccessful.
80. Boyle reported he did not attempt a second time to intubate because of the rate of speed at which they were traveling, and their proximity to arrival at the hospital. He stated Hallinan resumed BVM ventilations, now from the left side of the infant. Boyle said he cannot now recall if the OPA was put back in place or not.
81. The Department asked Boyle how he knew it was in the infant's mouth in the first place. He replied he believes he saw the flange part of the OPA at the infant's lips.
82. The Department asked Boyle if he himself did any other medical care for the infant. He stated he did not. He said after his intubation attempt, about 1 minute later they arrived at Beverly Hospital ED.
83. Boyle stated when they arrived at the hospital, Horne was doing chest compressions, Hallinan was doing BVM ventilations, and the mother was sitting on the right side. He said once at the hospital, and because he was not doing any care for the infant, he got out the side door and went inside the hospital to give them an update.
84. The Department asked Boyle why he did not stay with the infant and help bring the stretcher inside. He stated, "I was not doing any care and I decided to just go in the hospital and give them [a] report." He stated he told the nurses and physician they were "working a BLS [basic life support] code."
85. Boyle said he was talking to the nurses and physician when the stretcher "rolled through" and then care was transferred over. He stated it was a "highly intense situation and the mother was screaming at them to save her baby."
86. The Department asked Boyle if he considered hailing a paramedic from Northeast Regional to help them and because he and Hallinan were unable to successfully do ALS care. He stated he had directed Murley to cancel them once he got in the patient compartment. Boyle said it was later after the call was over that he learned that Northeast Regional paramedics were waiting on the route to the hospital just in case they were needed.
87. Boyle reported after the call he contacted the CISD Team to come to the service and conduct a debriefing session. He stated the debriefing session occurred two days later. He said he also reached

out to David Lacaillade, Beverly Hospital EMS Coordinator, to set up a meeting for himself to review the call.

88. Boyle reported it was approximately a week later that he had a 30-40-minute meeting with Lacaillade, and that much of the meeting was a discussion about doing intercepts, and not sitting on scene or delaying transport. He stated he has not discussed this call with Dr. Steven Krendel, the service's affiliate hospital medical director.
89. Boyle said he has since completed a CPR and AED review class, and he is scheduled to take a pediatric advanced life support (PALS) refresher class at the end of January 2022.

Interview: Paramedic Jonathan Hallinan

90. Hallinan reported that at the time of this emergency call, he had been certified as a paramedic for slightly longer than 5 months and cannot recall now if he had completed his ride time with a senior paramedic preceptor or not. He stated that at the time of this call he believed he had to have another paramedic with him or another paramedic on the way to perform ALS skills. He said he was not clear on that aspect of his preceptor program at the time of this call, and it has since been clarified in the service's revised preceptor program guidelines.
91. Hallinan stated that he heard the dispatch for an unresponsive infant, CPR in progress over his radio. He said he was at home at the time, and he responded to the station in his personal vehicle. He stated while on the way, he called dispatch by radio and requested Northeast Regional paramedics to respond mutual aid.
92. He said when he arrived at the station, Squad 1, staffed by two firefighters, was outside the station on the garage apron waiting for him to arrive. He stated he got in the back seat, and they started responding to the scene location.
93. He reported as they were responding, he could hear the fire extinguisher located in the back seat next him begin to release and it discharged all over him and the inside of the pickup truck. He stated they had to stop on the side of the road, cleared the truck as best they could of the chemical and he brushed himself off. He said this stop lasted about 45 seconds to a minute before they were on the way responding again.
94. Hallinan reported as they resumed driving to the scene, he saw the ambulance lights just ahead coming towards them. He stated they stopped in a parking area, he got into the patient compartment and Squad 1 went on its way. He said the stop lasted just a few seconds and they started transport to the hospital.
95. Hallinan stated he saw the mother sitting in the technician seat on the infant's right side and Horne doing chest compressions. He said the infant had a non-rebreather mask on his face attached to the portable oxygen tank with high-flow oxygen being supplied.
96. Hallinan stated he saw the AED on the bench seat and asked Horne if he got a "shock advised" message when he analyzed. He said that Horne responded saying something like, "I did not get to it." Hallinan said he then grabbed the cardiac monitor out of the cabinet and put it in the monitor stand on his left side.
97. He stated he did not know what events led up to the infant being in cardiac arrest. He said he asked the mother for a story of events. He said based on what she told him, it sounded like the infant had suddenly stopped breathing and went into cardiac arrest. He stated it made him question if there was an airway obstruction.
98. Hallinan said he took out the laryngoscope, attached an infant blade, removed the OPA that had been inserted prior to his arrival by Horne and did a quick look inside the infant's mouth to see if he could visualize a foreign body. He stated he did not see one, so he abandoned that idea and instead applied the cardiac monitor.
99. Hallinan said while he was visualizing for a foreign body, he instructed Horne to apply the defibrillator pads. He stated Horne did so and then returned to doing chest compressions. He said when he went to insert the pad connector to the cardiac monitor it did not fit. He stated it was not compatible and it initially confused him.
100. Hallinan said he realized after a few seconds that Horne had attached the AED defibrillator pads and not the cardiac monitor therapy pads. He reported that the two are not interchangeable. He stated

he also realized that Horne had not removed the film backing from the pads, therefore they were not stuck on the infant's chest. "I threw them aside and grabbed the pads from my monitor," Hallinan said.

101. Hallinan said he handed the pads to Horne and again told him to apply them. He stated he turned on the cardiac monitor and saw a dotted line on the screen indicating the monitor was not reading properly. He said he was troubleshooting the monitor and did not detect a problem. He reported he then traced the therapy cable back to the infant and realized that Horne again did not take the film backing off the pads.

102. According to Hallinan, at around this time as the ambulance stopped, and Boyle entered the patient compartment through the side door. He stated Boyle immediately instructed Horne to continue with chest compressions and then removed the backing off the therapy pads himself and correctly applied them to the infant's chest. Hallinan said he adjusted the cardiac monitor to read the rhythm through "paddle mode" and discovered the ECG tracing was non-shockable.

103. The Department showed Hallinan a copy of the cardiac monitor disclosure report and asked him to identify where he saw the non-shockable rhythm. Hallinan reviewed the tracing and identified a brief 1-second pause as "a non-shockable rhythm" and reported that the lead wires were not attached to the infant. He stated the cardiac monitor remained in "paddle mode" for the duration of the transport.

104. Hallinan reported that Horne at least once performed mouth-to-mouth ventilations on the infant. He stated when he observed that, he retrieved a BVM, attached it to the in-house oxygen system, and began to ventilate the infant.

105. Hallinan said that Boyle called by radio to Beverly Hospital to give a radio report and told them they were treating an infant in cardiac arrest. He reported that the nurse began to ask them several questions, one being about what color indicator on the Broselow tape the infant was registering. He stated one of them retrieved the Broselow tape and obtained a weight from the mother. He said he cannot recall if they laid out the tape next to the infant or not, to determine the color indicator.

106. Hallinan reported as they continued to the hospital, Horne was doing chest compressions and Boyle attempted intubation. He reported he moved out of the seat at the head of the stretcher, moved to the left side of the stretcher on the bench seat and slid his hands under the infant's shoulders to support them and bring the head into alignment to improve Boyle's visualization of the airway. He stated Boyle was unsuccessful in the intubation attempt.

107. Hallinan said he resumed BVM ventilation from his position and at the same time visually assessed for peripheral IV access. He reported he did not see any IV access points and decided he needed to obtain IO access.

108. Hallinan said as he was retrieving the IO equipment, the ambulance made a hard, abrupt stop, then a sharp left turn. He stated the ambulance had been traveling at a high rate of speed prior to this abrupt stop and the momentum caused him to fall off the bench seat to the floor, and slide toward the side door and the cabinets before coming to a stop. He said he yelled to Murley to slow down.

109. Hallinan said when he got himself up off the floor and back to the bench seat, he did not know where exactly they were in proximity to the hospital. He stated he looked out the window and saw they were close to arriving. He stated he decided it was not safe to do the IO procedure because they were going too fast and were now arriving at the hospital.

110. Hallinan said once they arrived at the hospital, together they prepared to move the stretcher out of the ambulance and into the hospital.

111. The Department asked Hallinan if he could recall whether the cardiac monitor was still connected to the infant and if he continued with BVM ventilations during the move into the ED. The Department told him that in viewing the video of their arrival at the hospital, it found no evidence of his using the BVM while moving the patient to the ED. Hallinan paused and stated he just now realized he had attached the BVM to the in-house oxygen supply and did not take the BVM in or provide ventilations during the move from the ambulance to the ED. He stated the non-rebreather mask was still on the stretcher and in front of the infant's face with supplemental oxygen flowing from the portable tank on the stretcher.

112. With regards to the cardiac monitor, Hallinan stated he cannot recall the specific details, but he thought he hung it on the back of the stretcher. The Department told him the video of the arrival of the ambulance at the hospital indicates the cardiac monitor did not remain connected to the infant for the move inside the hospital. He said he does not recall disconnecting it or any other details about this move.

113. Hallinan stated once inside the hospital, he gave a report to a nurse, and they all tried to help out with the care of the infant for about an hour. He said Horne continued chest compressions at the hospital until someone came in and relieved him.

114. Hallinan reported that they had a stress debriefing session two days later. He stated he has done CPR and PALS refresher training since this call. He said he has been out on medical leave from the service for the last 5 weeks.

Interview: Chief Jenifer Collins-Brown

115. The Department interviewed Chief Collins-Brown regarding this incident. She reported that on this date she was out of town and Boyle was the on-duty officer. She stated that even though she was out of town, she heard the dispatch and radio communication of this emergency call and spoke by telephone to the crew after the call was over.

116. Chief Collins-Brown stated the EMTs met among themselves to informally debrief and then through the Massachusetts Peer Support Network, a formal debriefing session was held at fire headquarters. She reported that Boyle, who is also the service's EMS coordinator, started organizing the formal debriefing immediately following the call.

117. Chief Collins-Brown said Boyle met with Lacaillade approximately one week after the call and again on November 9, 2021. She stated that at the recent meeting, Dr. Krendel was also present. She stated that Dr. Krendel did not provide a written clinical review and only suggested that the application of capnography might have been helpful in evaluating the quality of the CPR being performed.

118. Chief Collins-Brown reported that since this emergency call, the service has spent much time and effort into reviewing all aspects of this emergency call. She said this call represents one of the least common and most stressful of all emergency responses. She reported she has taken several steps to improve the system itself. She stated the fire extinguisher has been moved to a location outside the cab of Squad 1 and the preceptor policy and check lists have been clarified so there is no confusion regarding when a new paramedic can provide independent care and decision making.

119. Chief Collins-Brown stated they have added several training improvements, providing simulation of the less frequent emergencies and incorporating simulation into the CPR and AED recertification training, requiring hands-on skills rather than simply using videos and testing. She stated they have scheduled for the end of January 2022 a PALS class for all levels of EMTs, giving them an opportunity to review high-acuity low-occurrence skills. She reported the service has contracted with a third-party educator to improve the quality of training and has increase its frequency. Finally, she said they have updated their training to include vehicle operations while using lights and sirens and eliminated all police escorts to the hospital.

120. The Department asked Chief Collins-Brown why this incident was not reported to the Department in accordance with serious incident reporting. She reported that she was unclear on whether this met the requirements of serious incident reporting. She stated that now she has a better understanding and will develop a policy for reporting such events. In an email dated November 22, 2021, Chief Collins-Brown submitted a service policy now in place, requiring the reporting of serious incidents such as this type, where there are serious Statewide Treatment Protocol violations.

121. During the Department's interview with Chief Collins-Brown, the investigator examined the cardiac monitor that was on this emergency call and in service on ambulance A-1 at the time of the interview. The cardiac monitor was brought to the interview location by the on-duty paramedic. The investigator discovered the cardiac monitor did not have in its case the appropriate proprietary therapy pads for adult and pediatrics and lacked proprietary therapy pads that would treat a patient under 30kg. The service was issued a Notice of Serious Deficiency and Chief Collins-Brown immediately corrected the deficiency of both in-service cardiac monitors. On November 24, 2021,

the Department completed an unannounced inspection of Topsfield FD cardiac monitors and found the monitors and their associated supplies to be compliant with manufacturer recommendations.

Videos

122. The Department obtained videos from the residential surveillance cameras at the location of this emergency incident. In the video, the Topsfield police officer is seen arriving at the location, removing a bag from his cruiser, and entering the home. Within approximately one minute, he exits the residence carrying the infant in his arms, without the bag that he entered with, and taking a standing position in the driveway. A second police officer is seen arriving while the first officer was in the home, and once outside, the first and second officer are seen doing only chest compressions on the infant. The video shows no ventilations being done by either officer. The officers are seen standing at the foot of the driveway, one holding the infant in his arms while the other does chest compressions, not on a firm flat surface and with no AED attached or ventilations being administered. Approximately 6 minutes later, the ambulance and a third mutual aid police officer from a neighboring town is seen arriving. The infant's parents are also seen outside with the police officers.

123. As the video continues, when the Topsfield FD ambulance arrives with Murley and Horne, the police officers are seen making their way to the rear doors of the ambulance. Murley and Horne exit the ambulance, and Horne can be seen carrying a bag over his right shoulder and what appears to be an AED under his left arm. The video shows Horne at the back doors of the ambulance, where he removes the bag from his right shoulder and tosses it to the street and sets the AED from under his left arm on the passenger side rear bumper. Horne is seen opening the doors and grabbing the AED from the bumper, and as he gets inside, tossing the AED up onto the bench seat. The video shows the police officer, who is holding the infant, promptly hand the infant up to Horne. The infant's mother is seen getting in the patient compartment. The mutual aid police officer is seen picking up the EMS first-in bag that was in the street, carrying it to the sidewalk and leaving it there, never hailing the EMTs that they had left it behind. The video shows the ambulance still on scene, right in front of this officer. The ambulance then leaves the scene and begins transport, a little more than a minute after arriving on the scene.

124. A second video from the scene shows the ambulance from a different angle, and a police officer and Murley can been seen having a discussion. The video shows that once that conversation was over, the officer gets in his cruiser and leaves the scene with emergency lights on. The video shows the ambulance immediately leaving right behind the cruiser.

125. The Department obtained videos from Beverly Hospital of the arrival of the ambulance at the ambulance bay and entering the hospital with the infant on the stretcher through the ED doors. This video shows the ambulance arriving and backing into the ambulance bay. The video shows before the ambulance comes to a complete stop, the side door opens and as the ambulance comes to a stop, Boyle exits the ambulance before the vehicle is in park (its back-up lights are still on) and walks into the ED. He is not seen returning to assist the crew with moving the stretcher inside or rendering medical care to the infant during the move out of the ambulance and into the hospital. The video shows Murley coming to the back doors of the ambulance and a police officer approaching from the opposite side, and together they open the doors. Murley is then seen taking the foot of the stretcher and bringing it out, and Hallinan and Horne exiting behind the stretcher. The police officer is seen doing chest compressions, with Hallinan pushing the head of the stretcher and Horne appearing to be adjusting on the infant's face the non-rebreather mask attached to portable oxygen tank at the head of the stretcher. Horne is seen running from the head of the stretcher around the police officer to Murley at the foot end of the stretcher and helping him pull the stretcher into the ED. The video taken as the ambulance stretcher comes through the ED doorway shows the cardiac monitor is not connected to the infant and there is no evidence of the BVM being used or ventilations being administered by any other means.

Patient Care Report, Cardiac Monitor Disclosure Report, Hospital Records

126. The Department reviewed the PCR written by Hallinan for this patient encounter. The narrative states the dispatch was for an 8-month-old infant not breathing and CPR instructions were being

given by the dispatcher. It states, "On arrival the patient is carried out of a house by police officer and is brought over to us." It states that CPR has been ongoing. It states the patient is pale, warm and unresponsive and that "ABC[s] were assessed and no respirations or pulse are detected." It states CPR was continued and the patient was placed in the ambulance for transport. It states a non-rebreather attached to high-flow supplemental oxygen at 15 liters was used during 1-rescuer CPR and that the ambulance intercepted with 2 Topsfield paramedics. It states CPR continued and a BVM was used for ventilations. It states the patient was "attached to the cardiac monitor via PediPads and the cardiac rhythm was found to be asystolic." It states CPR was continued and an unsuccessful intubation attempt was made. It states, "No IV sites found." It states a second pulse check indicated the patient remained pulseless and the cardiac rhythm remained asystole. It states CPR was continued on arrival at the Beverly Hospital and as they entered. It states the parents reported the patient was being treated with Benadryl for a respiratory disease and that the father of the patient witnessed the cardiac arrest. It states the parents report the infant was initially crying, had difficulty breathing and gasping and went unresponsive while in his father's arms.

127. The cardiac monitor disclosure report indicated the monitor was turned on at 2:22 AM, which, based on the dispatch audio recordings, was approximately 2 minutes after Hallinan got into the patient compartment. The report shows evidence by ECG tracing of the initial rhythm at 2:28:14, approximately 6 minutes after Hallinan first turned on the monitor. The ECG rhythm shows chest compressions being done by Horne. At approximately 2:28:13, the report illustrates a 1-second pause in CPR, not verified asystole. The tracing at 2:28:22 showed chest compressions are resumed and continue until arrival at the hospital. In the PCR, the narrative states that a second rhythm check was done, and it was asystole. The report does not show evidence of a second rhythm check being done. The report then has over 400 pages of a dotted line tracing, likely due to the therapy cable being disconnected from the monitor, leaving the pads and cable still attached to the infant. The cardiac monitor was left in the ambulance, running, for approximately the next hour until someone returns to the ambulance and turns it off.

128. The Department reviewed the hospital ED summary report as part of this investigation. According to the report, it states the infant arrived in the Beverly Hospital ED in cardiac arrest. It states the infant was seen two days prior by a primary care provider for an upper respiratory tract infection and reportedly "breathing fast." It states the "family has been giving Tylenol and Benadryl" for symptoms. It states on this date, the father heard the infant breathing heavily, picked up the infant and put him on his shoulder and shortly thereafter heard a gasp and the infant went apneic and unresponsive. It states the father called 9-1-1 and chest compressions were started at the house. It states that there had been approximately 8-10 minutes of chest compressions prior to arrival at Beverly Hospital ED.

129. On page 9 of the report, it states "CPR was started by the family immediately. EMS arrived to find the baby asystolic. He arrives [in the ED] with a face mask and receiving chest compressions."

130. The report states approximately 45 minutes after arrival, the infant was successfully resuscitated, and transferred by air medical to Boston Children's Hospital, where reportedly the infant died.

EMS System Regulations

131. Under the EMS System regulations, at 105 CMR 170.355, upon receipt of an emergency call, ambulance services and their EMS personnel are to dispatch, assess and treat in accordance with the Statewide Treatment Protocols, and transport their patient to a hospital emergency department.

132. Under 105 CMR 170.345(B), ambulance services and their EMS personnel are responsible for documenting a PCR for each call that is "accurate, prepared contemporaneously with or as soon as practicable after, the EMS call that it documents, and shall, at a minimum, include the data elements pertaining to the call as specified in administrative requirements of the Department. All EMS personnel on the ambulance transporting the patient are responsible for the accuracy of the contents of the patient care report, in accordance with their level of certification."

133. Under 105 CMR 170.350(B), ambulance services are required to "file a written report with the Department within seven business days of other serious incidents involving its service, personnel or property. Serious incidents are incidents that result in injury to a patient not ordinarily expected as a

result of the patient's condition. An injury is harm that results in exacerbation, complication or other deterioration of a patient's condition."

Statewide Treatment Protocols, Clinical Review

134. The Statewide Treatment Protocols applicable for this patient encounter are 1.0 Routine Patient Care, 3.4P Asystole/PEA- Pediatric, 3.5P V-Fib/Pulseless VT - Pediatric. Under all three of these protocols, an EMT is to establish the patient is unresponsive, breathless and pulseless. In infants under the age of 1 year, an EMT is to check for a brachial pulse. If the patient has no pulse, EMTs are to initiate CPR while retrieving and attaching the AED, regardless of it being 1 or 2 rescuer sequencing. An EMT is to initiate the AED to analyze and determine if the patient is in a shockable cardiac rhythm. If no shock advised, EMTs are to resume chest compressions and ventilations with 100% high flow oxygen via a BVM with an airway adjunct, such as a properly sized OPA inserted. If two-rescuer CPR, they are to perform 15 compressions to two ventilations, allowing for full chest rise and fall between each breath. If 1-rescuer CPR, an EMT is to perform 30 compressions and two breaths. In this case, there was 1 EMT performing only chest compression. With regards to the arrival of Hallinan, a paramedic is to ensure the patient has adequate oxygenation with proper ventilations using basic methods such as BVM, head positioning, in-line capnography (adapter placed on the BVM between the mask and the bag) and an OPA, determined by adequate chest rise and fall. A paramedic is to switch the patient from the AED to the cardiac monitor by connecting the therapy cable attached to the proprietary pediatric (under 16 kg equals under 3.5 years of age) multi-function defibrillator pads and the limb leads, initially reading through pads (for shockable rhythm), then set to read through Lead II secondarily to determine the verifiable cardiac rhythm. If it shows asystole, a paramedic must verify asystole three ways: check to ensure the lead wires are connected to the electrodes and to the patient, increase the gain (size) of the tracing, and switch rhythm views between two other leads or read multiple lead views on the monitor screen. If the monitor is confirmed to show verified asystole, the paramedic is to resume CPR, establish IV/IO access and administer Epinephrine 1:10000 (0.1mg/ml) for a desired dose of 0.01mg/kg every 3-5 minutes. A paramedic is to use a pediatric age, weight and/or length-based tool to determine infant and pediatric medication doses, joule setting for defibrillation, equipment sizes, such as endotracheal tube size, and amount of fluid bolus to be administered during resuscitation. The Broselow tape is an example of this tool and is a color-coded length and weight-based device commonly used to rapidly determine critical information for resuscitation. A paramedic is to continue CPR for two-minute intervals with a brief rhythm check between each two-minute period. A paramedic is to consider possible causes of cardiac arrest, commonly airway and hypoxia in infants and children under 12 years of age and consult on-line medical control for additional treatment suggestions. If the paramedic is unable to maintain good ventilations using BLS maneuvers and there is time and resources during transport, the paramedic is to consider advanced airway adjuncts, such as a properly sized supraglottic airway (SGA) device or endotracheal intubation. The airway in most cases is best managed by BVM with an airway adjunct such as an OPA, or a properly sized SGA. In some cases, intubation is indicated if the previously mentioned maneuvers are inadequate or there are special considerations. The PCR contains the dispatch times for this emergency call and based on those times and the dispatch record, the patient went approximately 23 minutes without adequate ventilations.

135. The Department's EMS medical director, Dr. Jonathan Burstein, completed a clinical review of this patient encounter. Based on the documents reviewed, Dr. Burstein determined that after the patient went into cardiac arrest, the father began dispatcher-assisted CPR, but the police officer who arrived did not continue effective CPR, nor did they deploy an AED. Dr. Burstein determined there were several violations once EMS arrived on scene. He wrote that Horne and Murley put the patient on the stretcher but did not provide ventilations and they did not deploy an AED. He wrote that Murley, rather than a police officer, proceeded to drive the ambulance, by report because the vehicle had partially defective brakes, described by Murley to be "touchy." In his clinical review, Dr. Burstein stated, "This removed an EMT-trained rescuer from the patient." He documented that Murley drove in a manner that concerned the crew in the patient compartment. By their report, Dr. Burstein wrote, "The driving [at a high rate of speed] prevented them from performing a second

intubation attempt and IO access." He noted that Horne dropped the first-in bag and never recovered it. Dr. Burstein determined that "Horne did not ventilate the patient, although he did provide chest compressions (albeit without thoroughly assessing for a pulse or landmarks)."

136. In his review, Dr. Burstein stated, "Hallinan was picked up en route but did not initially provide ventilations. By report he did examine the patient's airway with a laryngoscope to establish patency; but he was then attempting to make a cardiac monitor operational but was unable to do so for an extended time." He noted that Hallinan said he did BVM ventilations at some point.

137. Dr. Burstein wrote that Hallinan and Boyle interpreted on the ECG tracing a brief single-lead pattern as asystole, which should have been confirmed in another lead at least.

138. In his review, Dr. Burstein stated that Boyle was picked up en route and noted that Hallinan was at the head of the stretcher, that a non-rebreather mask had been applied, and that BVM ventilations were begun after he arrived in the patient compartment. Dr. Burstein wrote that Boyle made an intubation attempt which was unsuccessful.

139. Dr. Burstein documented, "The Broselow Tape was not used until the hospital requested such near the end of the transport." With regards to IV and IO access, he wrote, "While IV sites may have been visually assessed, no IV or IO attempts were made" by Hallinan or Boyle. Dr. Burstein determined that "during the transit from the vehicle to the ED, ventilations were not being performed by any of the crew."

140. In summary, Dr. Burstein wrote, "The Chain of Survival (as described by American Heart Association) was not maintained here. In an arrest, the initial rescuer(s) should perform effective CPR to the level of their abilities and training (e.g., for PD or EMS, compressions and ventilations) with early AED deployment (especially since ventricular fibrillation (VF) arrest is a much more salvageable rhythm early on). ALS care should then focus on maintaining the effective CPR while adding invasive airway management, vascular access and medications. Interventions should be guided by prudent medical practice and with appropriate use of aids (such as the Broselow tape). The patient and EMTs should be rapidly but safely transported to a definitive care site," which is a hospital ED.

141. Dr. Burstein determined that Horne and Murley failed to provide effective CPR or apply AED, violating the Statewide Treatment Protocols. He determined Murley failed to safely drive the ambulance. With regards to Paramedics Hallinan and Boyle, Dr. Burstein determined both failed to provide effective CPR or cardiac rhythm assessment or attempt vascular access by IV or IO. Finally, Dr. Burstein determined that all the EMS personnel "failed to properly use aids for care and to properly continue care for the patient from the ambulance bay to the ED."

Based on its investigation, the Department found the allegation that Topsfield FD EMTs Horne and Murley and Paramedics Hallinan and Boyle mismanaged the medical care of this infant in cardiac arrest is valid. The Department determined that all four EMTs, from start to finish, grossly failed to take care of this patient appropriately, primarily by failing to provide effective CPR or AED therapy and cardiac monitor rhythm assessment. The Department determined there were multiple clinical failures by all the EMS personnel involved in this call. With regard to the allegation that the PCR was falsified, the Department is unable to make a determination. The PCR is consistent with the information obtained in the interviews from all the EMTs, but it is not accurate, in that it repeatedly states CPR was ongoing, when in fact, it was not. CPR is not only chest compressions, but also ventilation, and but for the brief time during which Hallinan applied the BVM, this patient was not ventilated. However, the Department cannot determine whether this reflects a lack of understanding of CPR, or is a knowing statement of false information.

With regards to Topsfield FD, the Department determined that the service failed to report this incident to the Department in accordance with the serious incident reporting requirements, in violation of 105 CMR 170.350(B). The Department also found the EMTs' decision to allow a parent of a minor patient in cardiac arrest to accompany the patient in the patient compartment was not consistent with best practice in this regard: The parent should have more appropriately been up front with the driver, or accompanying the other parent in their personal vehicle, so as to shield the parent from further trauma, and to allow the

EMS personnel more room to maneuver in a crowded and stressful situation in the back of the ambulance. The Department also found that a pediatric restraint device was not used on the stretcher to accommodate the safe and secure transport of an infant, as required by the Statewide Treatment Protocols. Finally, the Department noted Boyle reported a dispatch and communications glitch in being able to confirm his response. As a result of these last three findings, the Department requires Topsfield FD to review and update its policies on how and where specifically parents of minor patients are to accompany their children in the ambulance, use of pediatric transport devices and dispatch and communications with regard to responding EMS personnel.

Finally, the Department requests that the Town of Topsfield, which holds the ambulance service license under which Topsfield FD operates, address the issues around the Topsfield PD first responders' actions in the case, in which they broke the "chain of survival" in the CPR response this patient had begun receiving, and ensure appropriate CPR retraining for its police officers.

Compliance History:

A. Jason Murley is currently certified as an EMT-Basic, was certified at the time of this call, and has no previous compliance history with the Department.
B. Jeffrey Horne is currently certified as an EMT-Basic, was certified at the time of this call, and has no previous compliance history with the Department.
C. John Boyle is currently certified as a paramedic, was certified at the time of this call, and has no previous compliance history with the Department.
D. Jonathan Hallinan is currently certified as a paramedic, was certified at the time of this call, and has no previous compliance history with the Department.

Resolution Plan: The Department will issue each of the four Topsfield EMS personnel a Letter of Reprimand/Order to Correct for multiple violations of the Statewide Treatment Protocols and additionally for Murley, for driving in such an unsafe manner, and require remediation. Finally, the Department will issue Topsfield FD a Notice of Serious Deficiency/Order to Correct for violating the EMS System regulations, by failing to report this serious incident to the Department, and also require it to review and update its policies pertaining to parents accompanying their minor children in the ambulance, use of pediatric transport devices as well as dispatch and communications for responding EMS personnel.

Date Closed: December 9, 2021