General Comments—Emergency Algorithms

These algorithms delineate appropriate responses to the simulated emergencies listed in Article 5, Section 1043.4c of the California Code of Regulations.

Each algorithm table lists initial scenario requirements to be used in describing the presenting signs and symptoms of the emergency. Beginning with recognition of the emergency, appropriate interventions are listed in the approximate order they should be taken. Failure of the intervention or interventions to resolve the problem then leads sequentially to subsequent interventions that must be taken.

Certain interventions, indicated by the word "may," are either (1) appropriate for some situations but not others, or (2) elective interventions that are not essential to management of the case.

Interventions identified by the word "consider" means that the intervention may be necessary for a given situation and that the examinee should indicate their possible use and simulate their performance if asked to do so by an examiner. The order of these interventions at the end of an algorithm is not mandatory.

Activating Emergency Medical Services (EMS) is always appropriate whenever the emergency is not self limiting and/or the dentist concludes that he/she may not be able to successfully manage the emergency. Activating EMS does not absolve the examinee from completing the rest of the algorithm.

The right-hand column provides spaces for the examiner to grade the examinee's response for each group of interventions and to provide an overall evaluation of the examinee's response for each simulated emergency. A comments section is available to indicate what deficiencies, if any, were noted in the examinee's performance. A comment must be included whenever an unsatisfactory grade is given for any part of the algorithm.

Airway Obstruction—Foreign Body Algorithm

Scenario requirements	Interventions	Examinee responses
1. Patient may or may not be responsive to verbal command	Recognition of emergency a. if foreign body not suspected and	Satisfactory
2. Sudden cessation of respiratory sounds a. may have breath-holding	patient unconscious, move to Laryngospasm Algorithm step 2	Unsatisfactory
b. may have paradoxical breathing	b. if patient conscious, remove	
efforts	materials from mouth and perform	
	Heimlich maneuver (chest thrusts in pregnant woman) to dislodge object until	
	breathing restored or patient loses	
	consciousness	
Patient unconscious with known or	2. Place patient in supine position	Satisfactory
suspected foreign body	a. remove materials from mouth if not	_ ,
	yet accomplished	Unsatisfactory
	b. may include attempts to remove	
	object by finger sweep and/or to improve	
	airway by head tilt-chin lift, jaw thrust, or	
	tongue protraction and may include ventilation attempts with 100% oxygen	
	3. Attempt to visualize hypopharynx with	
	laryngoscope and remove object with	
	Magill forceps	
	a. if vocal cords visualized and in	
	spasm, move to Laryngospasm Algorithm	
	step 6	
Response fails to resolve problem	4. Perform series of abdominal thrusts	☐ Satisfactory
	(chest thrusts in pregnant woman) to	
	dislodge object followed by attempts to remove object and ventilate with 100%	☐ Unsatisfactory
	oxygen	
	a. assess vital signs when possible	
Response fails to resolve problem	5. Consider muscle relaxant if cords not	Satisfactory
1	visualized	
	a. may use succinylcholine in a dose of	☐ Unsatisfactory
	0.3 to 1.5 mg/kg IV or 4 mg/kg IM if no	
	IV access	
	b. may use competitive blocker in an	
	intubating dose if succinylcholine contraindicated	
	6. Consider laryngoscopy and intubation	
	7. Consider reversal agents	
	8. Consider cricothyroidotomy/trans-	
	tracheal ventilation	
	9. Consider EMS	
Overall response to emergency scenario		☐ Satisfactory
		☐ Unsatisfactory

Airway Obstruction—Laryngospasm Algorithm

Scenario requirements	Interventions	Examinee responses
1. Patient unresponsive to verbal command	Recognition of emergency	Satisfactory
2. Sudden cessation of respiratory sounds	2. Place patient in the supine position	
a. may have breath-holding	a. may include attempts to improve	☐ Unsatisfactory
b. may have paradoxical breathing	airway by head tilt-chin lift, jaw thrust, or	
efforts	tongue protraction and may include	
	ventilation attempts with 100% oxygen	
Initial response fails to resolve problem	3. Remove materials from mouth	Satisfactory
	4. Suction hypopharynx	
	a. may include deepening of anesthesia	☐ Unsatisfactory
Response fails to resolve problem	5. Positive pressure ventilation with 100%	Satisfactory
	oxygen	
	a. may include airway adjuncts	☐ Unsatisfactory
	b. may include intubation attempt or	
	laryngeal mask airway placement if	
	laryngospasm not suspected	
Response fails to resolve problem	6. Administer muscle relaxant	Satisfactory
	a. may use succinylcholine in a dose of	
	0.3 to 1.5 mg/kg IV or 4 mg/kg IM if no	☐ Unsatisfactory
	IV access	
	b. may use competitive blocker in an	
	intubating dose if succinylcholine	
	contraindicated	
	7. Positive pressure ventilation with 100%	
	oxygen	
	a. assess vital signs when possible	
Response fails to resolve problem	8. Consider laryngoscopy and intubation	Satisfactory
_	9. Consider reversal agents	
	10. Consider cricothyroidotomy/trans-	☐ Unsatisfactory
	tracheal ventilation	
	11. Consider EMS	
Overall response to emergency scenario		☐ Satisfactory
		☐ Unsatisfactory

Allergic Reaction Algorithm

Scenario requirements	Interventions	Examinee responses
Patient may or may not be responsive to verbal command Evidence of acute allergic reaction: flushing, urticaria, nausea, angioedema, wheezing, hypotension	 Recognition of emergency Place patient in comfortable position, supine position if hypotensive or unconscious Remove materials from mouth 100% oxygen Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate 	☐ Satisfactory ☐ Unsatisfactory
Response based on presenting signs and symptoms	6. For anaphylaxis a. administer epinephrine 0.01 mg/kg up to 0.3 to 0.5 mg IM, repeat q 10 minutes until stable b. administer diphenhydramine 50 mg (0.5 mg/kg in children) IM or IV c. administer IV fluids (20 mL/kg) if hypotensive d. activate EMS 7. For cutaneous reactions a. administer diphenhydramine 50 mg (0.5 mg/kg in children) IM or IV	☐ Satisfactory ☐ Unsatisfactory
Secondary treatments for anaphylaxis Overall response to emergency scenario	8. Consider ranitidine 1 mg/kg IV 9. Consider hydrocortisone Na ⁺ succinate 100 mg (2 mg/kg in children) IV 10. Consider albuterol inhalation for bronchospasm 11. Consider intubation for potential loss of airway, refractory bronchospasm	☐ Satisfactory ☐ Unsatisfactory ☐ Satisfactory
		☐ Unsatisfactory

Notes: Multiple alternative antihistamines and corticosteroids are available; review proper use of candidate's emergency antiallergy drug(s) before emergency evaluation.

Angina—Myocardial Infarction Algorithm

Scenario requirements	Interventions	Examinee responses
Patient may or may not be responsive to verbal command Evidence of myocardial ischemia a. may have chest pain/pressure that may radiate to left arm, jaw, back b. may have nausea, dyspnea, palpitation, dizziness, anxiety, diaphoresis c. may have ECG changes (e.g., ST-	 Recognition of emergency Place patient in comfortable position, supine if hypotensive or unconscious Remove materials from mouth 100% oxygen Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate, ECG 	☐ Satisfactory ☐ Unsatisfactory
Initial response fails to resolve problem	6. Administer nitroglycerin 0.4 mg SL by tablet or spray if systolic BP >90 mm Hg 7. Repeat nitroglycerin every 5 min x 2 if pain unresolved 8. Activate EMS if no history of angina, quality of pain different, or no relief after 3 doses	☐ Satisfactory ☐ Unsatisfactory
Response fails to resolve problem	9. Administer aspirin 162 to 325 mg chewed and swallowed with water 10. Administer morphine 2 mg IV q 5 min until pain relieved	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		Satisfactory Unsatisfactory

Bronchospasm Algorithm

Scenario requirements	Interventions	Examinee responses
1. Patient may or may not be responsive to	Recognition of emergency	Satisfactory
verbal command	a. may include placement in sitting	Sutisfactory
2. Gradual to sudden development of	position for awake patient, attempts to	☐ Unsatisfactory
inspiratory and/or expiratory wheezes	improve airway by head tilt–chin lift, jaw	
a. may have increased respiratory	thrust, tongue protraction	
efforts, hyperinflation of lungs	2. Remove materials from mouth	
	3. 100% oxygen	
	4. Monitor blood pressure at least q 5 min;	
	continuously monitor pulse oximetry, heart	
	rate	
Initial response fails to resolve problem	5. Albuterol inhaler 1 to 14 puffs (90 μg	Satisfactory
	each) depending on method of	
	administration	☐ Unsatisfactory
	a. may use spacer for child or	
	sedated/unconscious adult	
	b. may use bag-valve-mask for	
	controlled inflation	
	6. For deeply sedated/anesthetized	
	patients, positive pressure ventilation with	
	100% oxygen	
	a. may deepen anesthesia with volatile	
D 6.71	anesthetic, ketamine	
Response fails to resolve problem	7. Administer parenteral bronchodilator	☐ Satisfactory
	a. may use terbutaline 0.25 mg SC q 15	
	min x 2	☐ Unsatisfactory
	b. may use 1:1000 epinephrine 0.01	
	mg/kg SC or IM up to 0.5 mg q 15 min c. may use in adults 1:10,000	
	epinephrine 0.1 to 0.25 mg IV infused	
	slowly	
Response fails to resolve problem	8. Consider laryngoscopy and intubation	Satisfactory
Response rans to resolve problem	9. Consider reversal agents, termination of	Satisfactory
	anesthesia	Unsatisfactory
	10. Consider EMS	
Overall response to emergency scenario		Satisfactory
1 9 1 1		
		☐ Unsatisfactory
		•

Note: Multiple alternative antiasthmatic agents are available; review proper use of candidate's emergency antiasthmatic drug(s) before emergency evaluation.

Cardiac Arrest Algorithm

Scenario requirements	Interventions	Examinee responses
Initially, patient may or may not be responsive to verbal command Sudden loss of consciousness, respiration if previously awake; sudden loss of pulse, sinus rhythm if previously unconscious	 Recognition of emergency a. call for defibrillator as soon as loss of pulse identified Place patient in supine position Remove materials from mouth If previously awake and unmonitored arrest, head tilt—chin lift and assess ventilation Positive pressure ventilation x2 with 100% oxygen Check for pulse a. carotid pulse b. evaluate ECG in 2 leads if available c. check pulse, ECG after every intervention Start CPR Activate EMS 	☐ Satisfactory ☐ Unsatisfactory
Continue with primary survey	8. Activate EMS 9. If VF/VT, defibrillate per ACLS	Satisfactory
Continue with primary survey	protocol ASAP then continue CPR 10. If asystole or PEA, continue CPR	Unsatisfactory
Response fails to resolve problem; continue with secondary survey	11. Attempt to place airway device (endotracheal tube, laryngeal mask) 12. Confirm ventilation with 100% oxygen 13. Administer 1 mg 1:10,000 epinephrine IV push (0.01 mg/kg in children); repeat q 5 min (3 min in children) a. may use 40 U vasopressin IV instead of epinephrine for first dose with VF/VT 14. Defibrillate 1 min after every drug administration for VF/VT	☐ Satisfactory ☐ Unsatisfactory
Response fails to resolve problem	15. Administer 1 mg atropine IV push (0.02 mg/kg in children) if asystole 16. Consider use of antiarrhythmic if VF/VT a. may use amiodarone 300 mg IV; may use 150 mg in 3-5 min b. may use lidocaine 1 to 1.5 mg/kg; may repeat in 3-5 min c. may use magnesium sulfate 1 to 2 g (2 min push) if torsades de pointes 17. Consider use of bicarbonate 1 mEq/kg IV if acidosis	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		☐ Satisfactory
		☐ Unsatisfactory

Convulsions Algorithm

Scenario requirements	Interventions	Examinee responses
Patient may or may not be responsive to verbal command Evidence of generalized tonic-clonic or clonic seizure	 Recognition of emergency Place patient in supine position; protect patient against physical injury Remove materials from mouth only if possible to do so safely 100% oxygen Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate 	☐ Satisfactory ☐ Unsatisfactory
Response based on subsequent signs and symptoms	6. For self-terminating seizure a. reassure patient b. assess patient for injuries c. may continue with treatment based on patient history, sedative/anesthetic use, and operative need; otherwise monitor recovery 7. For continuous or recurring seizures a. activate EMS	☐ Satisfactory ☐ Unsatisfactory
Continue emergency management	8. Administer anticonvulsant a. may administer midazolam 2 mg initially, then 1 mg/min IV (0.05 mg/kg, then 0.025 mg/kg/min in children) b. may administer midazolam 0.075 (adults) to 0.15 mg/kg (children) IM up to a total dose of10 mg c. may administer diazepam 5 mg initially, then 1 mg/min IV (0.2 mg/kg, then 0.05 mg/kg/min up to a total dose of 0.5 mg/kg in children) 9. Consider intubation or laryngeal mask airway if ventilation compromised	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		☐ Satisfactory ☐ Unsatisfactory

Notes: Alternative anticonvulsants (lorazepam, fosphenytoin, phenobarbital, succinylcholine) may be acceptable treatments.

Emesis—Aspiration Algorithm

Scenario requirements	Interventions	Examinee responses
Patient may or may not be responsive to verbal command Evidence of active or passive regurgitation	Recognition of emergency Place patient in proper position a. if patient in conscious sedation, right lateral position b. if patient in general anesthesia, Trendelenberg position (also on right side if feasible) Immediate removal of materials in mouth and use high-speed suction	☐ Satisfactory ☐ Unsatisfactory
	 4. Immediate cricoid pressure (Sellick's maneuver) 5. 100% oxygen 6. Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate 7. Auscultate lungs to detect altered breath sounds 	
Response based on presenting signs and symptoms	8. With no evidence of aspiration a. consider termination of procedure and discharge after further monitoring 9. With evidence of aspiration a. consider reversal agents, termination of procedure b. consider 100% oxygen with PEEP c. consider going to Bronchospasm Algorithm step 5 d. consider EMS e. ensure chest x-ray 10. With evidence of aspiration in the unconscious patient a. also consider laryngoscopy and intubation	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		☐ Satisfactory ☐ Unsatisfactory

Notes: Administration of antibiotics and steroids is not recommended. Tracheal suction after irrigation with 10 mL of sterile irrigation fluid permissible to help remove particulate matter.

Hypertension Algorithm

Scenario requirements	Interventions	Examinee responses
1. Patient may or may not be responsive to verbal command 2. Hypertensive urgency when blood pressure above 220/120 and no signs or symptoms; hypertensive crisis with evidence of myocardial ischemia, neurological dysfunction, significant bradycardia, pulmonary edema, or visual disturbances	 Recognition of emergency Place patient in comfortable position Remove materials from mouth 100% oxygen Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate 	☐ Satisfactory ☐ Unsatisfactory
Initial response fails to resolve problem	6. Look for specific cause of hypertension (e.g., anxiety, cardiovascular disease, drug interaction, full bladder, hypoxia, pain) 7. Treat specific cause (e.g., provide additional local anesthesia for pain control)	☐ Satisfactory ☐ Unsatisfactory
Response fails to resolve problem	8. Administer drug to decrease cardiac output and/or peripheral resistance a. may administer esmolol 10 to 30 mg q 5 min if tachycardia present b. may administer labetalol 5 to 20 mg q 5 min c. may administer hydralazine 5 to 10 mg q 20 min if bradycardia present	☐ Satisfactory ☐ Unsatisfactory
Response fails to resolve problem	9. EMS if hypertensive crisis 10. Consider immediate physician referral if hypertensive urgency	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		☐ Satisfactory ☐ Unsatisfactory

Notes: Nonemergency hypertension may be treated without terminating procedure. Multiple alternative antihypertensive agents are available; review proper use of candidate's emergency antihypertensive drug(s) before emergency evaluation.

Hypoglycemia Algorithm

Scenario requirements	Interventions	Examinee responses
Patient may or may not be responsive to verbal command Evidence of hypoglycemia risk (e.g., history of insulin-dependent diabetes); signs include diaphoresis, confusion, eventual loss of consciousness	 Recognition of emergency Place patient in supine position Remove materials from mouth 100% oxygen Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate Measure blood glucose if equipment available 	☐ Satisfactory ☐ Unsatisfactory
Patient hypoglycemic or high suspicion of hypoglycemia based on history and presenting signs	7. If awake, may administer oral fluids containing sugar 8. If consciousness impaired or lost a. administer 50% dextrose 1 mL/kg IV up to 50 mL b. or may give D ₅ W 10 mL/kg IV up to 500 mL c. or may give glucagon 0.025 to 0.1 mg/kg IV/IM/SC up to 1 mg 9. Monitor blood glucose if equipment available 10. Activate EMS if consciousness not restored	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		☐ Satisfactory
		☐ Unsatisfactory

Hypotension Algorithm

Scenario requirements	Interventions	Examinee responses
Patient may or may not be responsive to verbal command Blood pressure below 2/3 normal for patient or causing signs and symptoms of hypoperfusion	 Recognition of emergency Place patient in supine position with legs elevated Remove materials from mouth 100% oxygen Monitor blood pressure at least q 5 min; continuously monitor pulse oximetry, heart rate 	☐ Satisfactory ☐ Unsatisfactory
Initial response fails to resolve problem	6. Look for specific cause of hypotension (e.g., anxiety, cardiovascular disease, hypovolemia, drugs, hypercarbia, hypoxia pain, postural change) 7. Treat specific cause (e.g., IV fluid challenge for hypovolemia)	☐ Satisfactory ☐ Unsatisfactory
Response fails to resolve problem	8. Administer drug to increase cardiac output and/or peripheral resistance a. may administer 0.01 mg/kg atropine IV up to 0.5 mg if bradycardia; may repeat dose up to 4 times q 5 min b. may administer ephedrine 5 to 10 mg q 5 min c. may administer phenylephrine 0.1 mg q 5 min if tachycardia	☐ Satisfactory ☐ Unsatisfactory
Response fails to resolve problem	Consider reversal agents Consider EMS	☐ Satisfactory ☐ Unsatisfactory
Overall response to emergency scenario		☐ Satisfactory ☐ Unsatisfactory

Notes: Nonemergent hypotension may be treated without terminating procedure. Multiple alternative antihypotensive agents are available; review proper use of candidate's emergency antihypotensive drug(s) before emergency evaluation.

Respiratory Depression Algorithm

Scenario requirements	Interventions	Examinee responses
	T	T
1. Patient may or may not be responsive to	Recognition of emergency	☐ Satisfactory
verbal command	2. Place patient in comfortable position,	
2. Evidence of respiratory depression by	supine position if unconscious	Unsatisfactory
low pulse oximetry, low respiration	3. 100% oxygen	
rate/volume, and/or high end-tidal carbon	4. Remove materials from mouth	
dioxide tension		
Response based on presenting signs and	5. If patient conscious	Satisfactory
symptoms	a. encourage increased breathing efforts	
	and assess vital signs	☐ Unsatisfactory
	6. If patient unconscious	
	a. attempt to improve airway by head	
	tilt-chin lift, jaw thrust, tongue protraction	
	b. check pulse and assess vital signs	
	when possible	
Response fails to resolve problem	7. Positive pressure ventilation with 100%	Satisfactory
	oxygen	
	a. may include airway adjuncts	☐ Unsatisfactory
Response fails to resolve problem	8. Consider laryngoscopy and intubation	Satisfactory
	9. Consider reversal agents	
	10. Consider EMS	Unsatisfactory
Overall response to emergency scenario		Satisfactory
1 0 0		
		☐ Unsatisfactory

Syncope Algorithm

Scenario requirements	Interventions	Examinee responses
1. Patient is initially awake/responsive to	1. Recognition of emergency	Satisfactory
verbal command	 a. call for defibrillator if loss of pulse 	
2. Evidence sudden loss of consciousness	identified	☐ Unsatisfactory
	2. Place patient in supine position	
	3. Remove materials from mouth	
	4. Head tilt–chin lift and assess ventilation	
Response based on presenting signs and	5. If breathing, 100% oxygen and monitor	☐ Satisfactory
symptoms	blood pressure at least q 5 min;	
	continuously monitor pulse oximetry, heart	☐ Unsatisfactory
	rate	
	6. If not breathing, positive pressure	
	ventilations x2 with 100% oxygen and	
	check carotid pulse	
	a. evaluate ECG in 2 leads if available	
	b. if pulse, move to Respiratory	
	Depression Algorithm step 7	
	c. if no pulse move to Cardiac Arrest	
	Algorithm step 7	
Continue emergency response	7. Search for cause of syncope (e.g., fear,	☐ Satisfactory
	hypotension, hypoxia, hypoglycemia,	
	arrhythmia, stroke)	☐ Unsatisfactory
	a. treat underlying cause if possible	
	b. EMS if underlying cause not	
	treatable	
Overall response to emergency scenario		☐ Satisfactory
		Unsatisfactory

Notes: May administer ammonia inhalants so long as use does not interfere with defined emergency response.