London Health Sciences Centre
Southwest Ontario Regional Base Hospital Program

ALS PCS v4.0 Refresher

App Update: 4.0 will be updated on July 16th, 2017 – update your app (Ontario Paramedic Clinical Guide)

Medical Directives
Summary of Changes

- Medical Cardiac Arrest
- ETCO2 (if applicable)
- Neonatal Resuscitation
- ROSC
- Cardiac Ischemia
- Hypoglycemia
- Mod-Severe Allergic Reaction
- Adrenal Crisis
- Tracheostomy Suctioning

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MEDICAL CARDIAC ARREST

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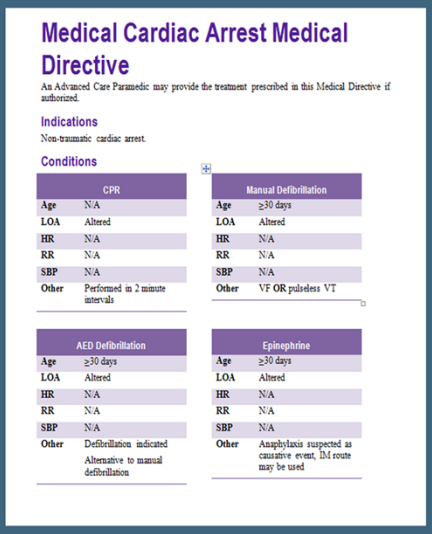
Medical Cardiac Arrest Summary of Changes (PCP and ACP)



Medical Cardiac Arrest Medical Directive

An Advanced Care Paramedic may provide the treatment prescribed in this Medical Directive if authorized.

Indications

Non-traumatic cardiac arrest.

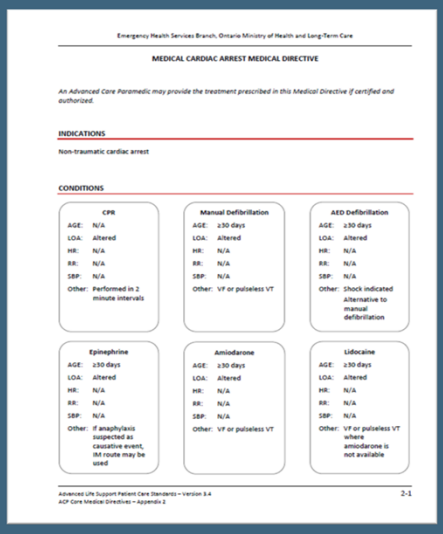
Conditions

CPR	
Age	N/A
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	Performed in 2 minute intervals

Manual Defibrillation	
Age	≥30 days
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	VF OR pulseless VT

AED Defibrillation	
Age	≥30 days
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	Defibrillation indicated Alternative to manual defibrillation

Epinephrine	
Age	≥30 days
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	Anaphylaxis suspected as causative event, IM route may be used



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MEDICAL CARDIAC ARREST MEDICAL DIRECTIVE

An Advanced Care Paramedic may provide the treatment prescribed in this Medical Directive if certified and authorized.

INDICATIONS

Non-traumatic cardiac arrest

CONDITIONS

CPR	
AGE:	N/A
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	N/A
Other:	Performed in 2 minute intervals

Manual Defibrillation	
AGE:	≥30 days
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	N/A
Other:	VF or pulseless VT

AED Defibrillation	
AGE:	≥30 days
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	N/A
Other:	Shock indicated Alternative to manual defibrillation

Epinephrine	
AGE:	≥30 days
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	N/A
Other:	If anaphylaxis suspected as causative event, IM route may be used

Amiodarone	
AGE:	≥30 days
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	N/A
Other:	VF or pulseless VT

Lidocaine	
AGE:	≥30 days
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	N/A
Other:	VF or pulseless VT where amiodarone is not available

Advanced Life Support Patient Care Standards – Version 3.4
ACP Core Medical Directives – Appendix 2

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NEW **OLD**

No change to the beginning of the cardiac arrest management plan

Service specific teaching – SAED vs. Manual

Look of the directive has changed, but application hasn't changed

Medical Cardiac Arrest Summary of Changes (PCP and ACP)

Amiodarone	
Age	≥30 days
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	VF **OR** pulseless VT

Lidocaine	
Age	≥30 days
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	VF **OR** pulseless VT where amiodarone is not available

0.9% NaCl Fluid Bolus	
Age	≥30 days
LOA	Altered
HR	N/A
RR	N/A
SBP	N/A
Other	PEA Any other rhythm where hypovolemia is suspected

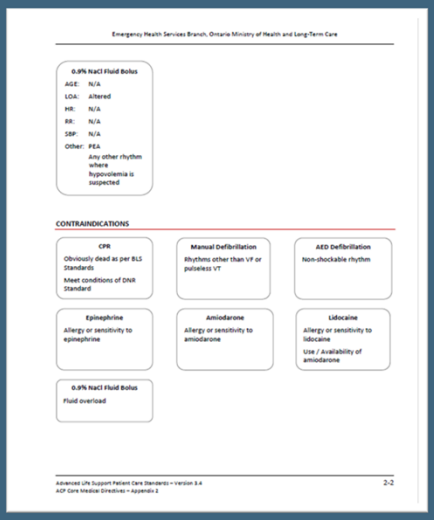
Contraindications

CPR
Obviously dead as per BLS PCS
Meet conditions of *Do Not Resuscitate (DNR) Standard*

Manual Defibrillation
Rhythms other than VF or pulseless VT

AED Defibrillation
Non-shockable rhythm

Epinephrine
Allergy or sensitivity to epinephrine



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0.9% NaCl Fluid Bolus
AGE: N/A
LOA: Altered
HR: N/A
RR: N/A
SBP: N/A
Other: PEA
Any other rhythm where hypovolemia is suspected

CONTRAINDICATIONS

CPR
Obviously dead as per BLS Standards
Meet conditions of DNR Standard

Manual Defibrillation
Rhythms other than VF or pulseless VT

AED Defibrillation
Non-shockable rhythm

Epinephrine
Allergy or sensitivity to epinephrine

Amiodarone
Allergy or sensitivity to amiodarone

Lidocaine
Allergy or sensitivity to lidocaine
Use / availability of amiodarone

0.9% NaCl Fluid Bolus
Fluid overload

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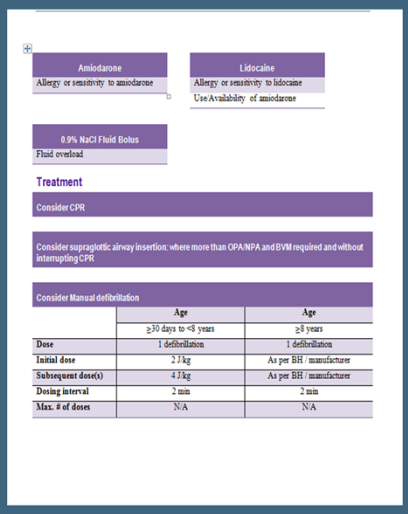
NEW **OLD**

Medical Cardiac Arrest Summary of Changes (PCP and ACP)



Amiodarone
Allergy or sensitivity to amiodarone

Lidocaine
Allergy or sensitivity to lidocaine
Use/Availability of amiodarone

0.9% NaCl Fluid Bolus
Fluid overload

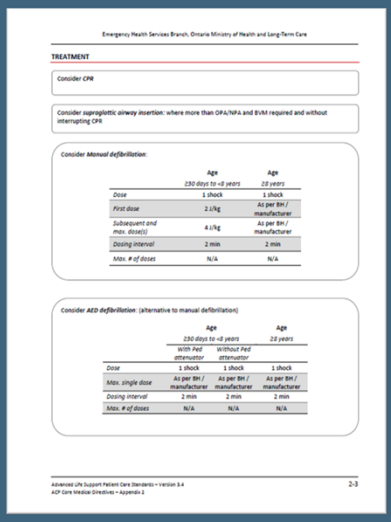
Treatment

Consider CPR

Consider supraglottic airway insertion: where more than OPA/NPA and BVM required and without interrupting CPR

Consider Manual defibrillation

	Age	Age
	≥30 days to <8 years	≥8 years
Dose	1 defibrillation	1 defibrillation
Initial dose	2 J/kg	As per BH / manufacturer
Subsequent dose(s)	4 J/kg	As per BH / manufacturer
Dosing interval	2 min	2 min
Max. # of doses	N/A	N/A



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TREATMENT

Consider *CPR*

Consider *supraglottic airway insertion*: where more than OPA/NPA and BVM required and without interrupting CPR

Consider *Manual defibrillation*:

	Age ≥30 days to <8 years	Age ≥8 years
Dose	1 shock	1 shock
First dose	2 J/kg	As per BH / manufacturer
Subsequent and max. dose(s)	4 J/kg	As per BH / manufacturer
Dosing interval	2 min	2 min
Max. # of doses	N/A	N/A

Consider *AED defibrillation*: (alternative to manual defibrillation)

	Age ≥30 days to <8 years		Age ≥8 years
	With Ped attenuator	*Without Ped attenuator*	
Dose	1 shock	1 shock	1 shock
Max. single dose	As per BH / manufacturer	As per BH / manufacturer	As per BH / manufacturer
Dosing interval	2 min	2 min	2 min
Max. # of doses	N/A	N/A	N/A

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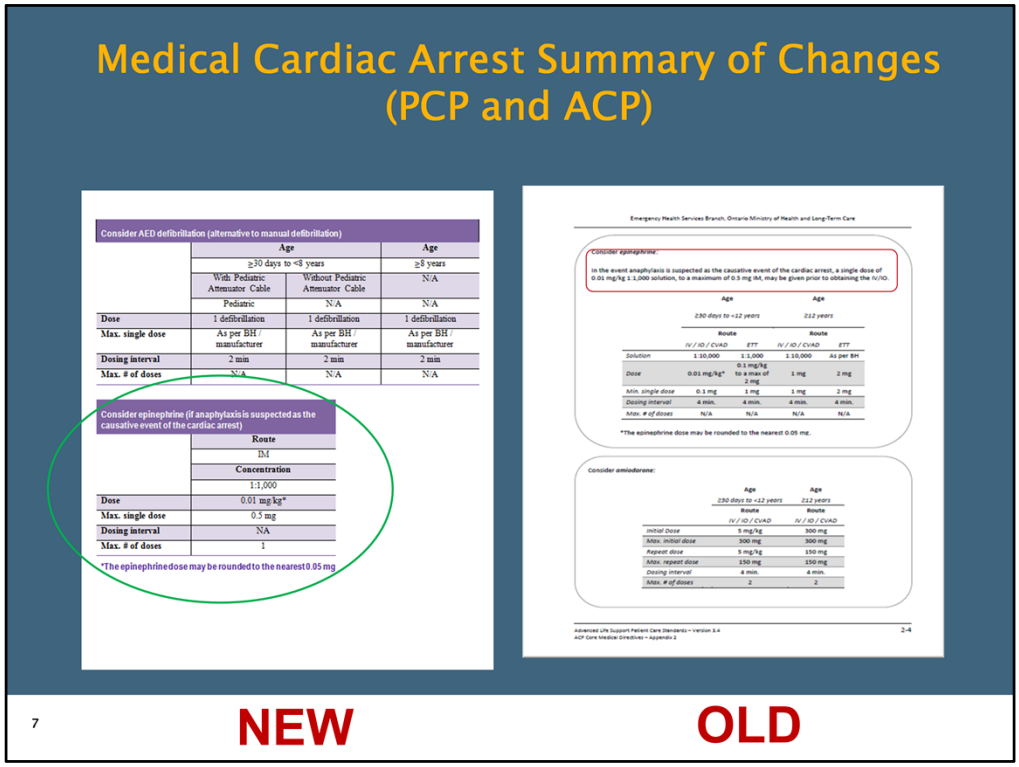
NEW **OLD**



Anaphylaxis VSA – Consider Epi ASAP and early transport. Epi should not delay defibrillation.

For ACPs in cases of VSA Anaphylaxis:

Following the first rhythm interpretation, if resources permit, establish an IV and administer Epi 1:10000 IV as indicated for cardiac arrest. If there is a delay to IV access, administer Epi 1:1000 IM.

IFF Epi 1:10000 is administered IV, a subsequent dose of Epi 1:1000 IM is not required for anaphylaxis.

Medical Cardiac Arrest Summary of Changes (ACP)

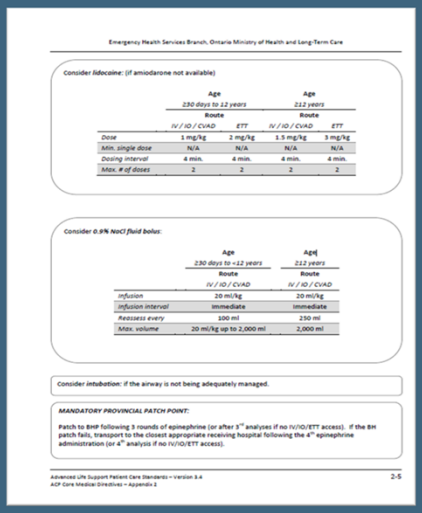
Consider epinephrine

	Age ≥30 days to <12years		Age ≥12 years	
	Route		Route	
	IV/IO/CVAD	ETT	IV/IO/CVAD	ETT
Solution	1:10,000	1:1,000	1:10,000	as per BH
Dose	0.01 mg/kg*	0.1 mg/kg to a max of 2 mg	1 mg	2 mg
Min. single dose	0.1 mg	1 mg	1 mg	2 mg
Dosing interval	4 min	4 min	4 min	4 min
Max. # of doses	N/A	N/A	N/A	N/A

*The epinephrine dose may be rounded to the nearest 0.05 mg

Consider amiodarone

	Age ≥30 days to <12 years	Age ≥12 years
	Route	Route
	IV/IO/CVAD	IV/IO/CVAD
Initial dose	5 mg/kg	300 mg
Max. initial dose	300 mg	300 mg
Subsequent dose(s)	5 mg/kg	150 mg
Max. repeat dose	150 mg	150 mg
Dosing interval	4 min	4 min
Max. # of doses	2	2



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Consider *lidocaine:* (if amiodarone not available)

	Age ≥30 days to 12 years		Age ≥12 years	
	Route		Route	
	IV / IO / CVAD	ETT	IV / IO / CVAD	ETT
Dose	1 mg/kg	2 mg/kg	1.5 mg/kg	3 mg/kg
Min. single dose	N/A	N/A	N/A	N/A
Dosing interval	4 min.	4 min.	4 min.	4 min.
Max. # of doses	2	2	2	2

Consider *0.9% NaCl fluid bolus:*

	Age ≥30 days to <12 years	Age ≥12 years
	Route	Route
	IV / IO / CVAD	IV / IO / CVAD
Infusion	20 ml/kg	20 ml/kg
Infusion interval	Immediate	Immediate
Reassess every	100 ml	250 ml
Max. volume	20 ml/kg up to 2,000 ml	2,000 ml

Consider *intubation:* if the airway is not being adequately managed.

MANDATORY PROVINCIAL PATCH POINT:

Patch to BHP following 3 rounds of epinephrine (or after 3rd analyses if no IV/IO/ETT access). If the BH patch fails, transport to the closest appropriate receiving hospital following the 4th epinephrine administration (or 4th analysis if no IV/IO/ETT access).

Advanced Life Support Patient Care Standards – Version 3.4
ACP Core Medical Directives – Appendix 2

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NEW **OLD**

Medical Cardiac Arrest Summary of Changes (ACP)

Consider lidocaine (if amiodarone not available)

	Age		Age	
	≥30 days to <12 years		≥12 years	
	Route		Route	
	IV/IO/CVAD	ETT	IV/IO/CVAD	ETT
Dose	1 mg/kg	2 mg/kg	1.5 mg/kg	3 mg/kg
Min. single dose	N/A	N/A	N/A	N/A
Dosing interval	4 min	4 min	4 min	4 min
Max. # of doses	2	2	2	2

Consider 0.9% NaCl fluid bolus

	Age	Age
	≥30 days to <12 years	≥12 years
	Route	Route
	IV/IO/CVAD	IV/IO/CVAD
Infusion	20 ml/kg	20 ml/kg
Infusion interval	Immediate	Immediate
Reassess every	100 ml	250 ml
Max. volume	2,000 ml	2,000 ml

Consider intubation (if the airway is not being adequately managed)

Mandatory Provincial Patch Point

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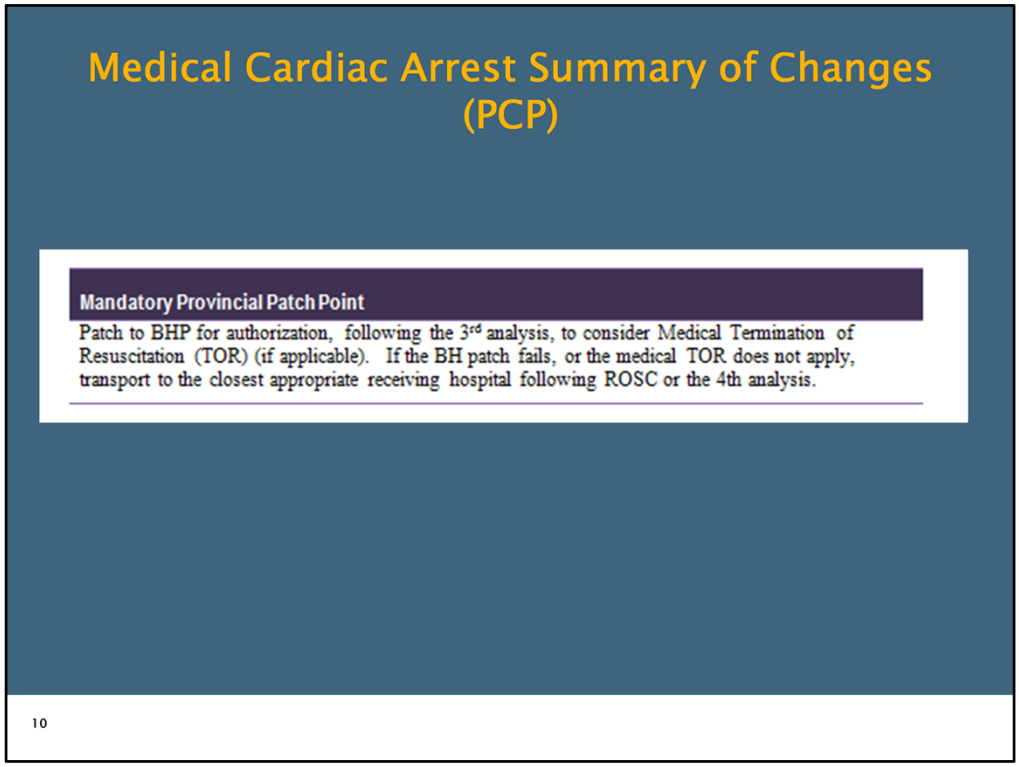
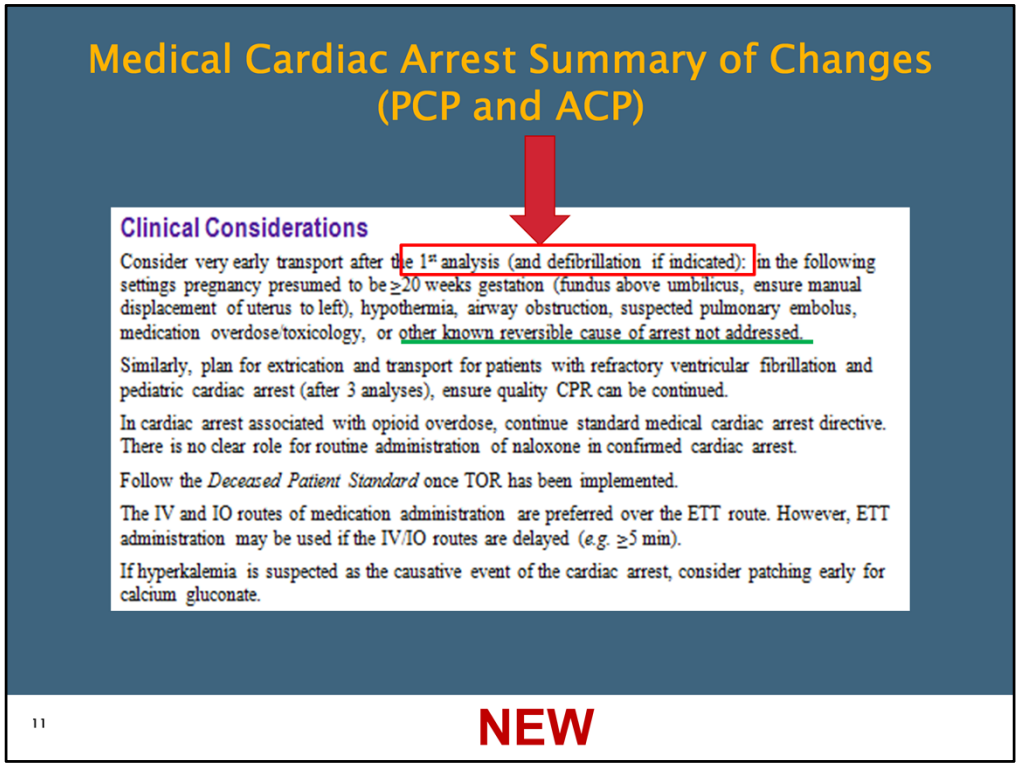
NEW



If transport is required, consider appropriate airway management (King LT/ETT vs. OPA).



Key – early transport after first analysis – not first NSI

Email from Steph to Matt on the topic:

Hey Matt,

The PHCSs and I are looking for clarification regarding the clinical considerations within the Medical Cardiac Arrest Medical Directive.

"Consider very early transport after the 1st analysis (and defibrillation if indicated) in the following settings: pregnancy presumed to be ≥20 weeks gestation (fundus above umbilicus, ensure manual displacement of uterus to left), hypothermia, airway obstruction, suspected pulmonary embolus, medication overdose/toxicology, or other known reversible cause of arrest not addressed.

Similarly, plan for extrication and transport for patients with refractory ventricular fibrillation and pediatric cardiac arrest (after 3 analyses), ensure quality CPR can be continued."

Does the 2nd paragraph assume pediatric cardiac arrest particularly with refractory VF OR all pediatric arrests?

Prepare to transport regardless of rhythm, so all peds arrests. PCPs - Do not meet TOR criteria; ACPs - plan to transport to hospital because 99% of the time, will not get a field pronouncement

IFF the 2nd paragraph assumes pediatric cardiac arrest with refractory VF only (and not all peds arrests), then can non-refractory VF pediatric cardiac arrests be included in the 1st paragraph in the "or other known reversible cause" category?

We have interpreted that the majority of peds cases fall under reversible causes, so can transport after one analysis. However, the directive allows for use of clinical judgment, case by case(stay on scene for peds VF, vs leave after one analysis in presumed sepsis related peds VSA)

Rational: In the ALS PCS 3.4, we were to leave following the first NSI in the ped population. Now it appears we are to stay for 3.

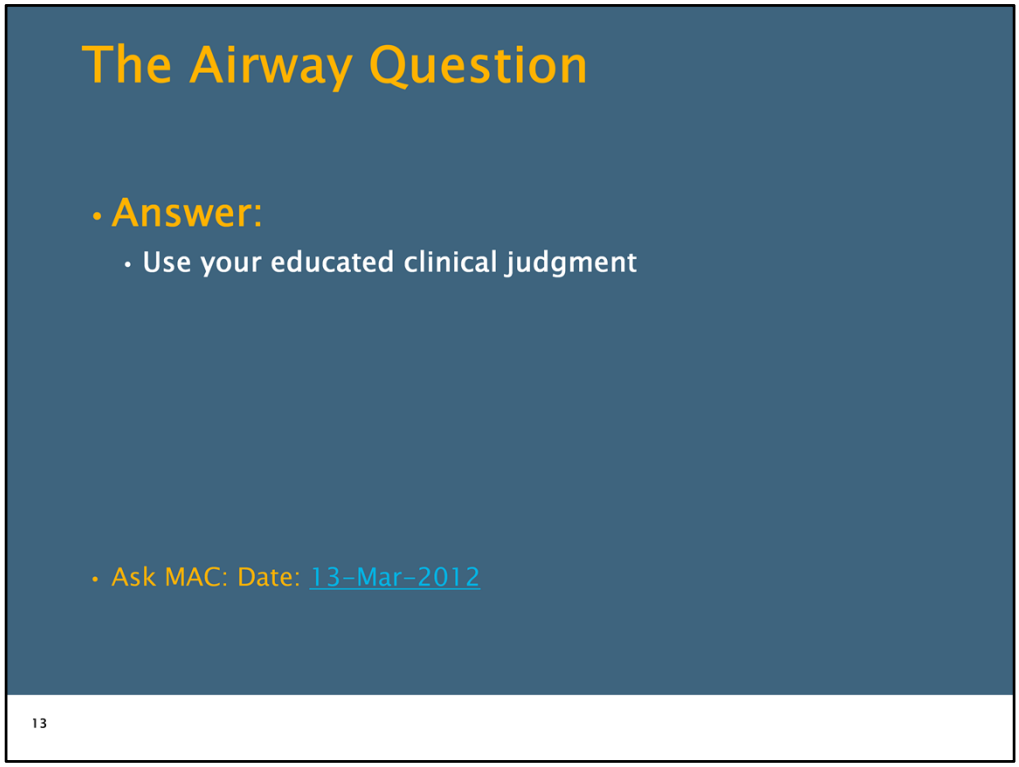
No hard set rule based on our interpretation, given 1st paragraph allows for transport after one analysis in reversible causes (majority of peds arrests), or stay for 3 analysis prior to transport (ex patient in VF who may benefit from defibrillation).

The Airway Question

- In the ALS patient care standards it states that a Supraglottic Airway (King LT) is indicated when there is a "Need for ventilatory assistance OR airway control AND Other airway management is inadequate or ineffective."

Question:

- In the "un-controlled" world of EMS would it not be more effective to use a King LT instead of an oral airway after the first round of CPR is complete? Is it acceptable to use the King LT on VSA patients when the oral airway provides sufficient airway support?



In wording for the use of the King LT/ETT, you are now able to use your educated clinical judgment to make the decision as to what method of airway management is best suited to you, your patient, and the situation. For example, if your patient initially meets the criteria for a Medical TOR (you think you're going down that pathway), and the OPA is providing adequate airway patency, then you are welcome to continue using it and not insert the King LT or ETT. Keep in mind, that if you're anticipating the transfer to the stretcher, trip down a flight of stairs, and the bumpy drive to the ED, then the King should be considered.

As for timing of King LT/ETT insertion; if you've decided that insertion is preferred or required, there is no hard and fast rule about when to do so. We have shared as a teaching point to make your first attempt following the first analysis as this allows both for pre-oxygenation (prior to the first analysis), and a second attempt should you need it (following the third analysis).

Bottom line: you're welcome to use either method, however, keep in mind the current and future management of the patient as the call progresses.

END TIDAL CAPNOGRAPHY (ETCO2)

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ETCO2

Confirm supraglotttic airway placement	
Method	**Method**
Primary	*Secondary*
$ETCO_2$ (Waveform capnography)	$ETCO_2$ (Non-waveform device)
	Auscultation
	Chest rise

Clinical Considerations

An attempt at supraglottic airway insertion is defined as the insertion of the supraglottic airway into the mouth.

Confirmation of supraglottic airway must use $ETCO_2$ (Waveform capnography). If waveform capnography is not available or is not working, then at least 2 secondary methods must be used.

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Note: Biggest change is the NEED for primary confirmation for King LT/ETT

Services carrying ETCO2 must use it for the above.

ETCO2

Confirm orotracheal tube placement	
Method	**Method**
Primary	*Secondary*
$ETCO_2$ (Waveform capnography)	$ETCO_2$ (Non-waveform device)
	Visualization
	Auscultation
	Chest rise
	Esophageal detection device

Clinical Considerations

An intubation attempt is defined as insertion of the laryngoscope blade into the mouth for the purposes of intubation.

Confirmation of orotracheal intubation must use $ETCO_2$ (Waveform capnography). If waveform capnography is not available or not working then at least 3 secondary methods must be used. Additional secondary ETT placement confirmation devices may be authorized by the local medical director.

ETT placement must be reconfirmed immediately after every patient movement.

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ETCO2 Changes Review (ACP only)

Confirm nasotracheal tube placement	
Method	**Method**
Primary	*Secondary*
$ETCO_2$ (Waveform capnography)	$ETCO_2$ (Non-waveform device)
	Auscultation
	Esophageal detection device
	Chest rise

Clinical Considerations

A nasotracheal intubation attempt is defined as insertion of the nasotracheal tube into a nare.

Confirmation of nasotracheal placement must use $ETCO_2$ (Waveform capnography). If wave-form capnography not available or not working, then at least 2 secondary methods must be used ETT placement must be reconfirmed immediately after every patient movement.

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ETCO2 Changes Review (ACP only Service dependent)

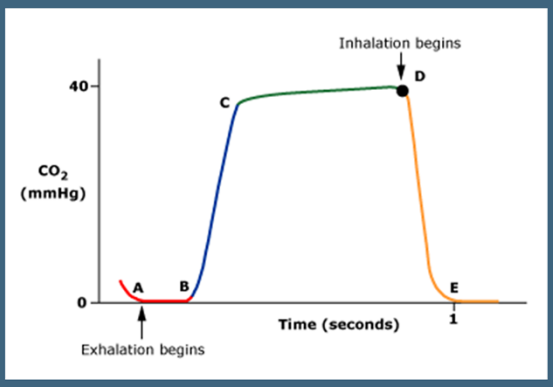
Consider cricothyrotomy tube placement	
Method	**Method**
Primary	*Secondary*
$ETCO_2$ (Waveform capnography)	$ETCO_2$ (Non-waveform device)
	Auscultation
	Chest rise

Clinical Considerations

Confirmation of cricothyrotomy must use $ETCO_2$ (Waveform capnography). If waveform capnography is not available or not working, then at least 2 secondary methods must be used. Additional secondary Cricothyrotomy tube placement confirmation devices may be authorized by the local medical director.

Cricothyrotomy tube placement must be reconfirmed immediately after every patient movement.

ETCO2 Changes Review



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Describe the inhalation/exhalation cycle

Phase A is the start of the respiratory baseline

Phase B is the end of the respiratory baseline and the exhalation begins

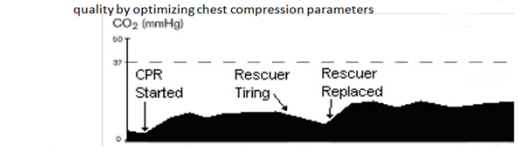
Phase C is the expiratory plateau (which means the end of the breathing out)

Phase D is the end of the exhalation phase and this is where the ETCO2 value or number is measured from. The highest concentration of CO2 is at this point.

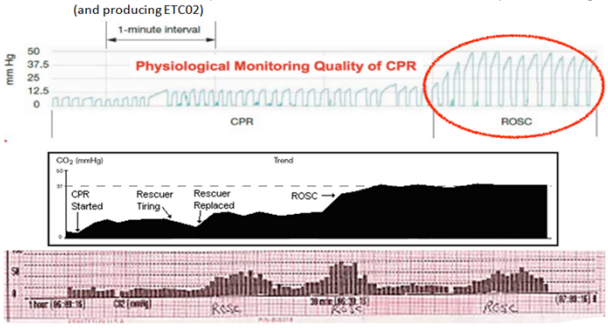
Phase E is when the patient takes a breath in and there is a drop in the CO2 as there is nothing being exhaled.

ETCO2 Changes Review

1. **Cardiac Arrest:**
   a. **CPR quality:** if ETCO2 less than 10mmHg, it is reasonable to consider trying to improve CPR quality by optimizing chest compression parameters



   b. **ROSC recognition:** abrupt and sustained increase in ETCO2 means the body is now working (and producing ETCO2)



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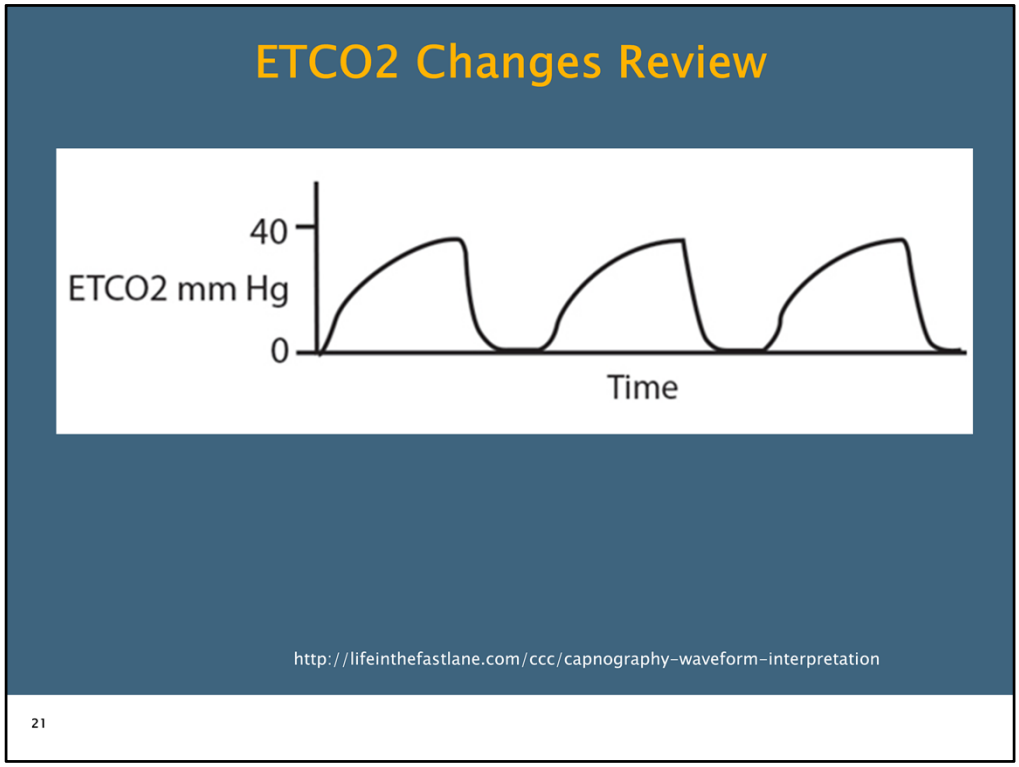
Uses of ETCO2 in the VSA pt

-positioning of ETT

-quality of CPR

-possible indicator of ROSC (with spike in ETCO2)

-possible factor associated with determining/granting TOR



Shark fin – evidence of bronchoconstriction

<u>In regards to the Shark Fin presentation:</u>

Phases A and B remain essentially unchanged.

Phase C has a more pronounced slope during the expiratory phase and this is caused from the air trapping and bronchospasm that is taking place which thereby inhibits CO2 from being released more efficiently hence when they say that COPD'ers are retainers; that's why they are!

Phase D remains unchanged as well.

Phase E is when the patient takes a breath in and there is a drop in the CO2 as there is nothing being exhaled.

<u>ETCO2</u>

In the DKA patient ETCO2 varies directly with the patient's pH. So the farther out of usual range the ETCO2 is, the sicker the patient.

<u>In regards to Early recognition of Sepsis:</u>

The initial stage of SIRS deals with vital signs assessment:

Heart rate greater than 90

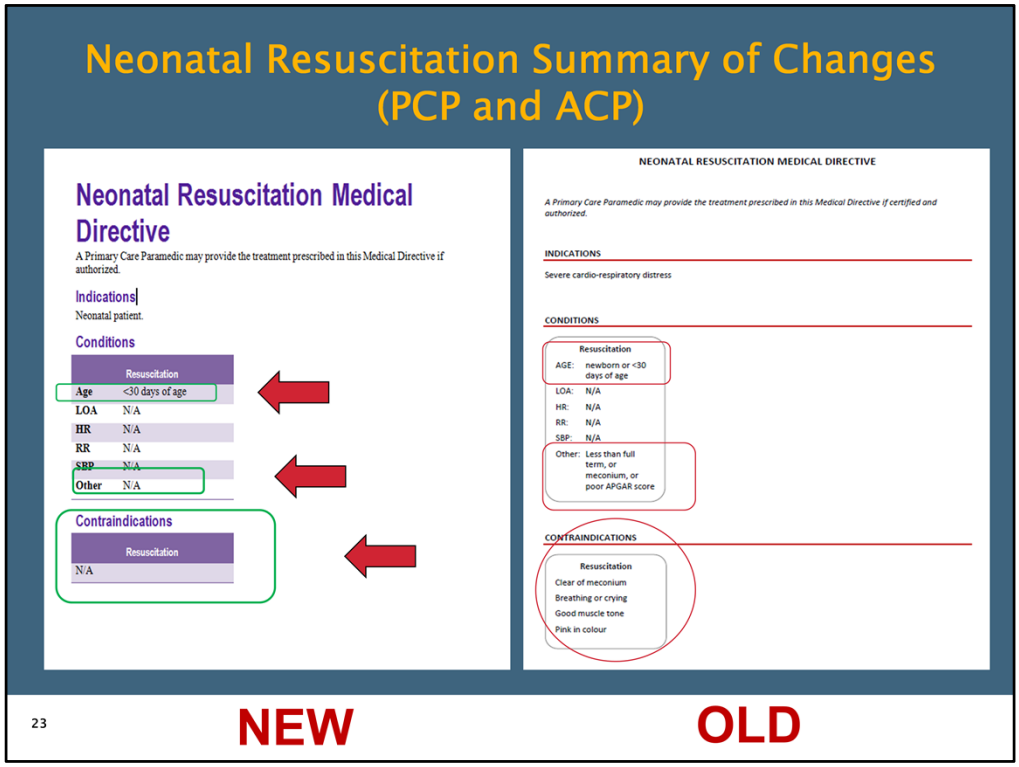
Breathing rate greater than 20

Temp greater than 38 or less than 36

ETCO@ less than 32

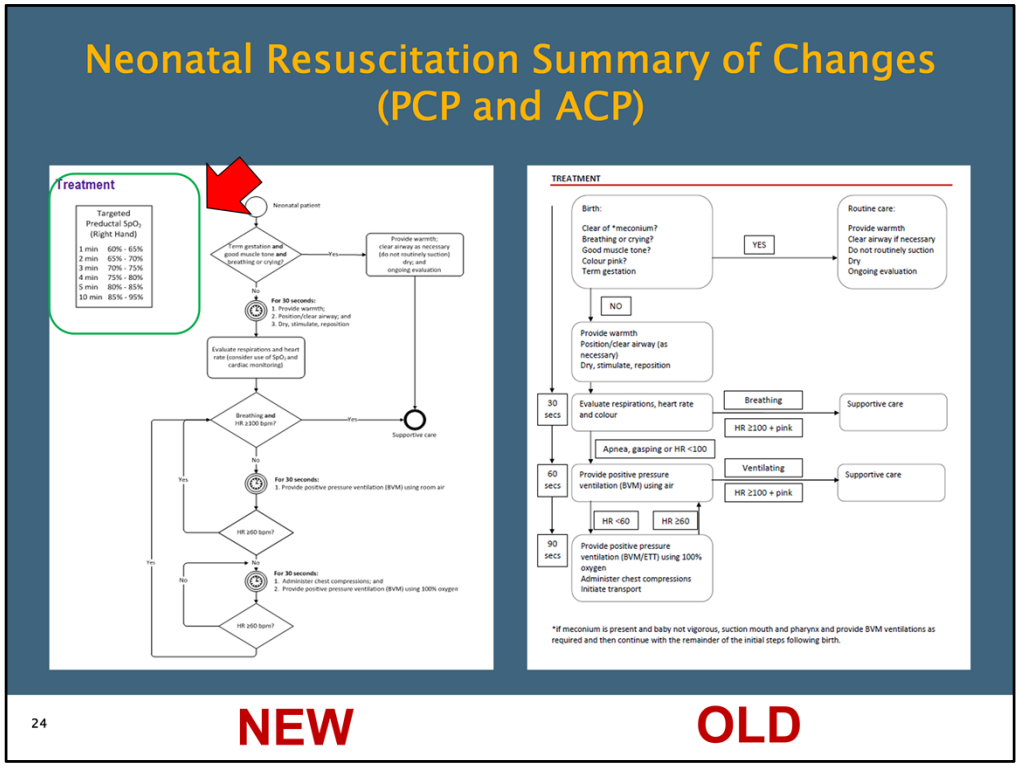
Sick patients breath faster and blow off more CO2; therefore less than normal values of 35-35 mmHg TORR. So the sick patient in the nursing home with a UTI on an antibiotic and tachycardia, with a low end tidal means sick patient. All patients can be monitored for their CO2 and should be.

NEONATAL RESUSCITATION



Wording change

- Indications
- Conditions
- Contraindications removed



Wording changes: No longer evaluate colour

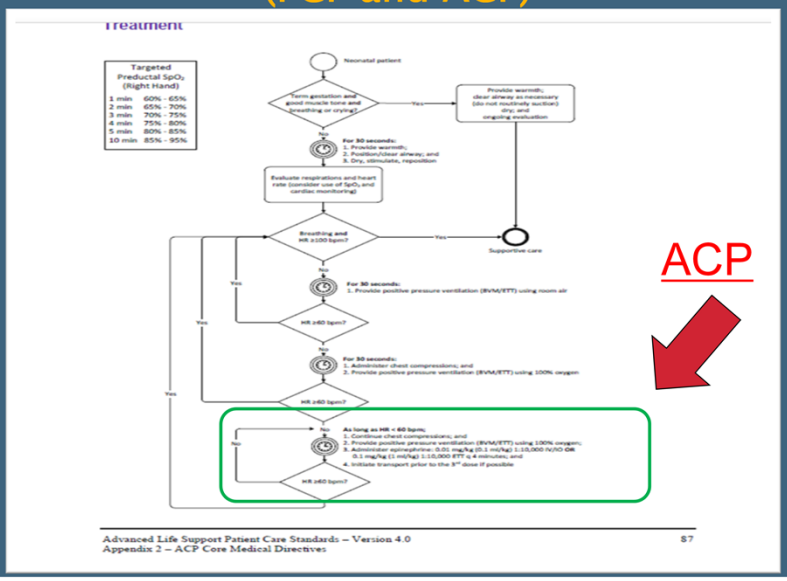
Algorhythm format change

Same treatment with the addition of cardiac and sp02 monitoring – only applicable to newborn (JUST been born).

Newly born – start at the top

Neonate – start at 2nd box (skip the first 30s)

Neonatal Resuscitation Summary of Changes (PCP and ACP)



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Main Focus is to initiate transport prior to the 3rd dose if possible

Neonatal Resuscitation Summary of Changes (PCP and ACP)

Clinical Considerations

If neonatal resuscitation is required, initiate cardiac monitoring and pulse oximetry monitoring.

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NEW

Neonatal Resuscitation Recap

- Less 'wordy'
  - i.e. indications: Neonatal (<30d) patient
- Algorithm format change
- Same assessment with the exception of:
  - Evaluation of colour
- Addition of cardiac monitor and Sp02 during resuscitation

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RETURN OF SPONTANEOUS CIRCULATION (ROSC)

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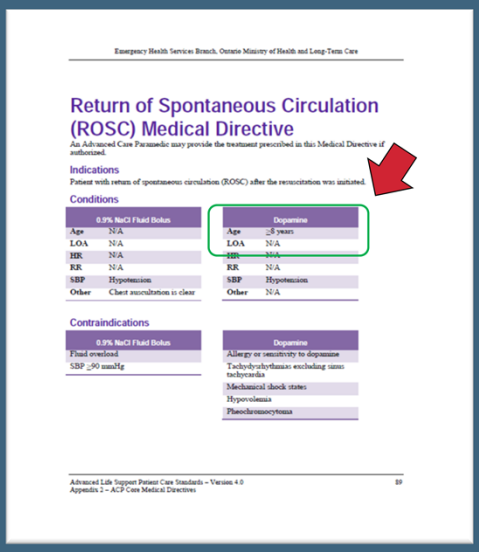
ROSC Summary of Changes (PCP and ACP)



Emergency Health Services Branch, Ontario Ministry of Health and Long-Term Care

Return of Spontaneous Circulation (ROSC) Medical Directive

An Advanced Care Paramedic may provide the treatment prescribed in this Medical Directive if authorized.

Indications

Patient with return of spontaneous circulation (ROSC) after the resuscitation was initiated.

Conditions

0.9% NaCl Fluid Bolus	
Age	N/A
LOA	N/A
HR	N/A
RR	N/A
SBP	Hypotension
Other	Chest auscultation is clear

Dopamine	
Age	≥8 years
LOA	N/A
HR	N/A
RR	N/A
SBP	Hypotension
Other	N/A

Contraindications

0.9% NaCl Fluid Bolus
Fluid overload
SBP ≥90 mmHg

Dopamine
Allergy or sensitivity to dopamine
Tachydysrhythmias excluding sinus tachycardia
Mechanical shock states
Hypovolemia
Pheochromocytoma

Advanced Life Support Patient Care Standards – Version 4.0
Appendix 2 – ACP Core Medical Directives
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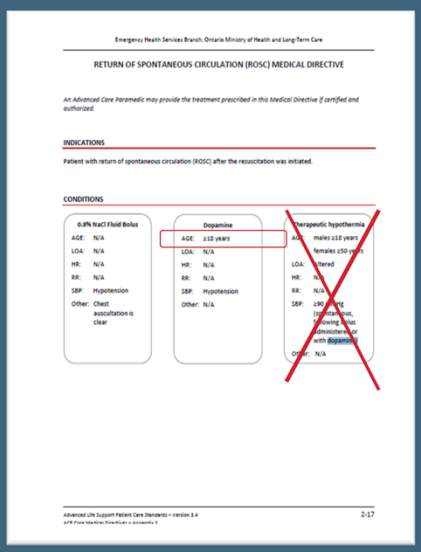

Emergency Health Services Branch, Ontario Ministry of Health and Long-Term Care

RETURN OF SPONTANEOUS CIRCULATION (ROSC) MEDICAL DIRECTIVE

An Advanced Care Paramedic may provide the treatment prescribed in this Medical Directive if certified and authorized.

INDICATIONS

Patient with return of spontaneous circulation (ROSC) after the resuscitation was initiated.

CONDITIONS

0.9% NaCl Fluid Bolus	
AGE:	N/A
LOA:	N/A
HR:	N/A
RR:	N/A
SBP:	Hypotension
Other:	Chest auscultation is clear

Dopamine	
AGE:	≥18 years
LOA:	N/A
HR:	N/A
RR:	N/A
SBP:	Hypotension
Other:	N/A

Therapeutic hypothermia	
AGE:	males ≥18 years females ≥50 years
LOA:	Altered
HR:	N/A
RR:	N/A
SBP:	≥90 mmHg (spontaneous, following bolus administered or with dopamine)
Other:	N/A

Advanced Life Support Patient Care Standards – Version 3.4
ACP Core Medical Directives – Appendix 3
2-17

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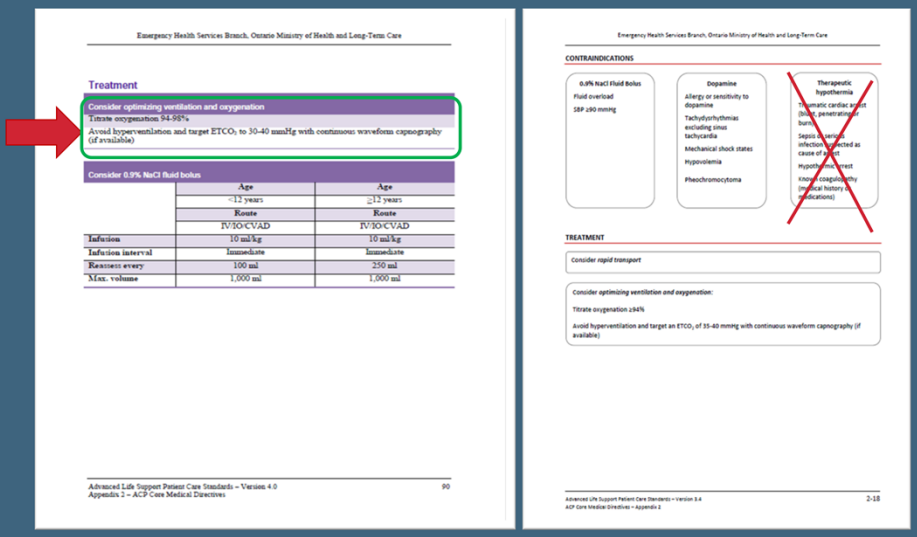
NEW **OLD**

Dopamine ≥8y

ROSC Summary of Changes (PCP and ACP)



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Treatment

Consider optimizing ventilation and oxygenation

Titrate oxygenation 94-98%

Avoid hyperventilation and target $ETCO_2$ to 30-40 mmHg with continuous waveform capnography (if available)

Consider 0.9% NaCl fluid bolus

	Age	Age
	<12 years	≥12 years
	Route	Route
	IV/IO/CVAD	IV/IO/CVAD
Infusion	10 ml/kg	10 ml/kg
Infusion interval	Immediate	Immediate
Reassess every	100 ml	250 ml
Max. volume	1,000 ml	1,000 ml

Advanced Life Support Patient Care Standards – Version 4.0
Appendix 2 – ACP Core Medical Directives
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CONTRAINDICATIONS

0.9% NaCl Fluid Bolus
Fluid overload
SBP ≥90 mmHg

Dopamine
Allergy or sensitivity to dopamine
Tachydysrhythmias excluding sinus tachycardia
Mechanical shock states
Hypovolemia
Pheochromocytoma

Therapeutic hypothermia
Traumatic cardiac arrest (blunt, penetrating or burns)
Sepsis or serious infection suspected as cause of arrest
Hypothermic arrest
Known coagulopathy (medical history or medications)

TREATMENT

Consider *rapid transport*

Consider *optimizing ventilation and oxygenation*:

Titrate oxygenation ≥94%

Avoid hyperventilation and target an $ETCO_2$ of 35-40 mmHg with continuous waveform capnography (if available)

Advanced Life Support Patient Care Standards – Version 3.4
ACP Core Medical Directives – Appendix 2
2-18

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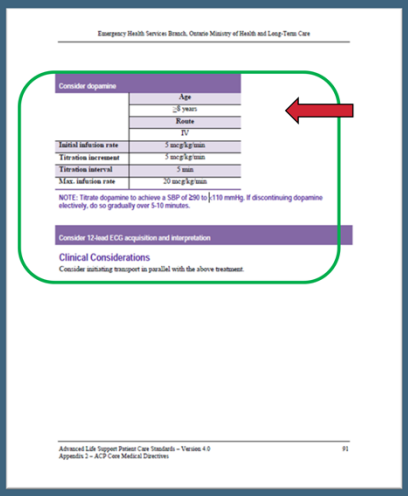
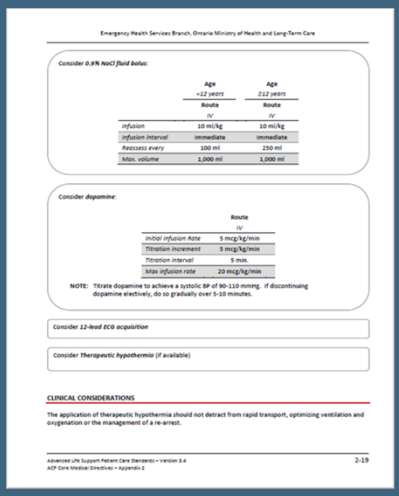
NEW **OLD**

NEW – target SPO2/ETCO2

Normal ETCO2 is 35-45, but our target is 30-40 (hyperventilation)

ROSC Summary of Changes (ACP)





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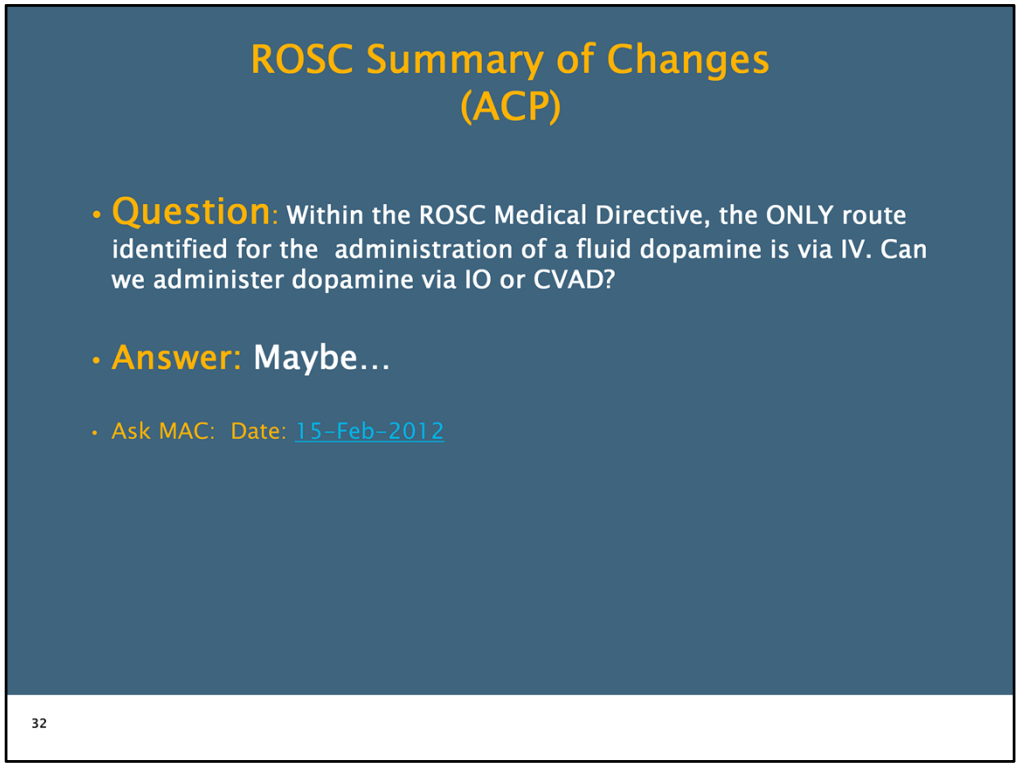
NEW **OLD**

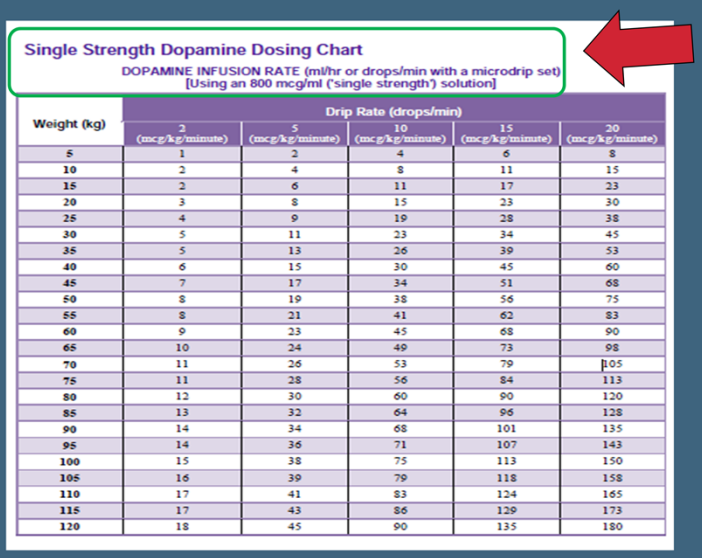
Note: Single strength dopamine



Answer:

IO and CVAD are not identified as routes of administration for dopamine within the medical directive. There is concern that extravasation may lead to tissue destruction, however the same concern exists for IV administration. For this reason, should you feel administration of dopamine via IO or CVAD is appropriate for the patient, a patch to the BHP is required.

ROSC Summary of Changes (ACP)



Single Strength Dopamine Dosing Chart

DOPAMINE INFUSION RATE (ml/hr or drops/min with a microdrip set)
[Using an 800 mcg/ml ('single strength') solution]

Weight (kg)	Drip Rate (drops/min)				
	2 (mcg/kg/minute)	5 (mcg/kg/minute)	10 (mcg/kg/minute)	15 (mcg/kg/minute)	20 (mcg/kg/minute)
5	1	2	4	6	8
10	2	4	8	11	15
15	2	6	11	17	23
20	3	8	15	23	30
25	4	9	19	28	38
30	5	11	23	34	45
35	5	13	26	39	53
40	6	15	30	45	60
45	7	17	34	51	68
50	8	19	38	56	75
55	8	21	41	62	83
60	9	23	45	68	90
65	10	24	49	73	98
70	11	26	53	79	105
75	11	28	56	84	113
80	12	30	60	90	120
85	13	32	64	96	128
90	14	34	68	101	135
95	14	36	71	107	143
100	15	38	75	113	150
105	16	39	79	118	158
110	17	41	83	124	165
115	17	43	86	129	173
120	18	45	90	135	180

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NEW

As per the equipment standards this is changing to 800mcg,

Cardiac Ischemia

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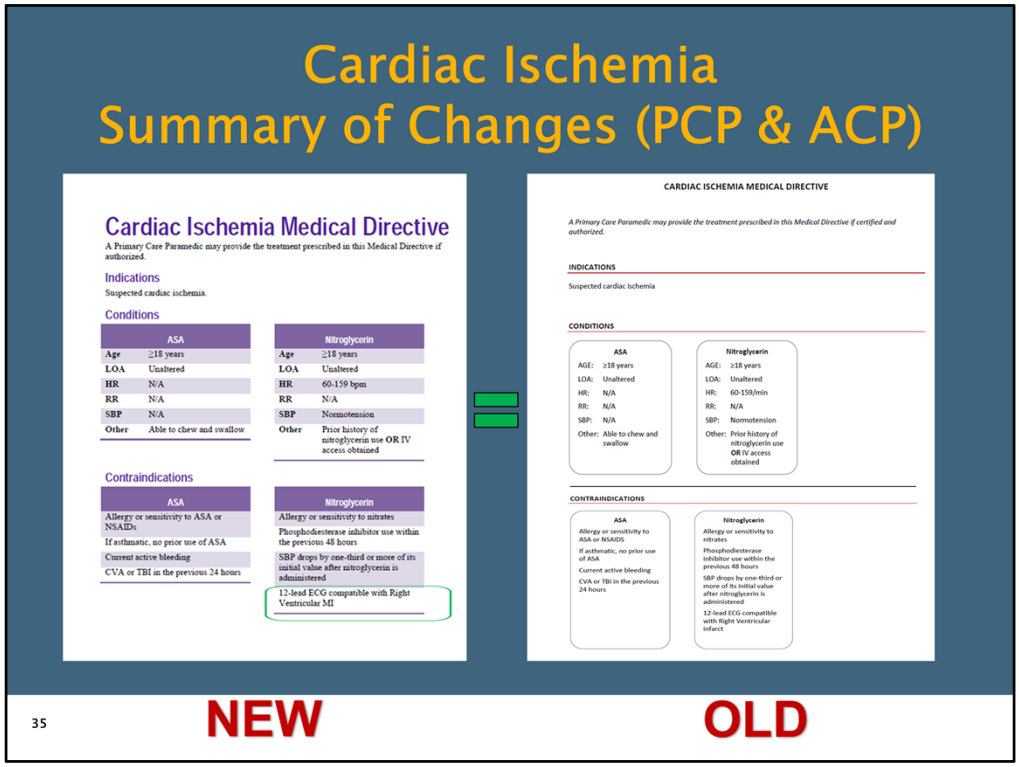
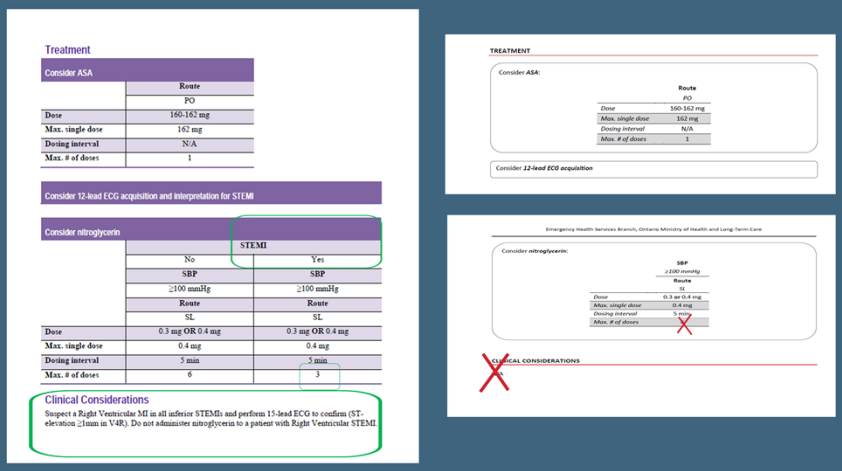


Indication, Conditions and Contraindications: wording remains the same.

However, now medics will be REQUIRED to rule out a RVMI prior to administering NTG.

Cardiac Ischemia
Summary of Changes (PCP & ACP)



Treatment

Consider ASA

	Route
	PO
Dose	160-162 mg
Max. single dose	162 mg
Dosing interval	N/A
Max. # of doses	1

Consider 12-lead ECG acquisition and interpretation for STEMI

Consider nitroglycerin

	STEMI	
	No	Yes
	SBP	SBP
	≥100 mmHg	≥100 mmHg
	Route	Route
	SL	SL
Dose	0.3 mg OR 0.4 mg	0.3 mg OR 0.4 mg
Max. single dose	0.4 mg	0.4 mg
Dosing interval	5 min	5 min
Max. # of doses	6	3

Clinical Considerations

Suspect a Right Ventricular MI in all inferior STEMIs and perform 15-lead ECG to confirm (ST-elevation ≥1mm in V4R). Do not administer nitroglycerin to a patient with Right Ventricular STEMI.

TREATMENT

Consider *ASA*:

	Route
	PO
Dose	160-162 mg
Max. single dose	162 mg
Dosing interval	N/A
Max. # of doses	1

Consider *12-lead ECG acquisition*

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Consider *nitroglycerin*:

	SBP *≥100 mmHg*
	Route
	SL
Dose	0.3 or 0.4 mg
Max. single dose	0.4 mg
Dosing interval	5 min
Max. # of doses	

CLINICAL CONSIDERATIONS

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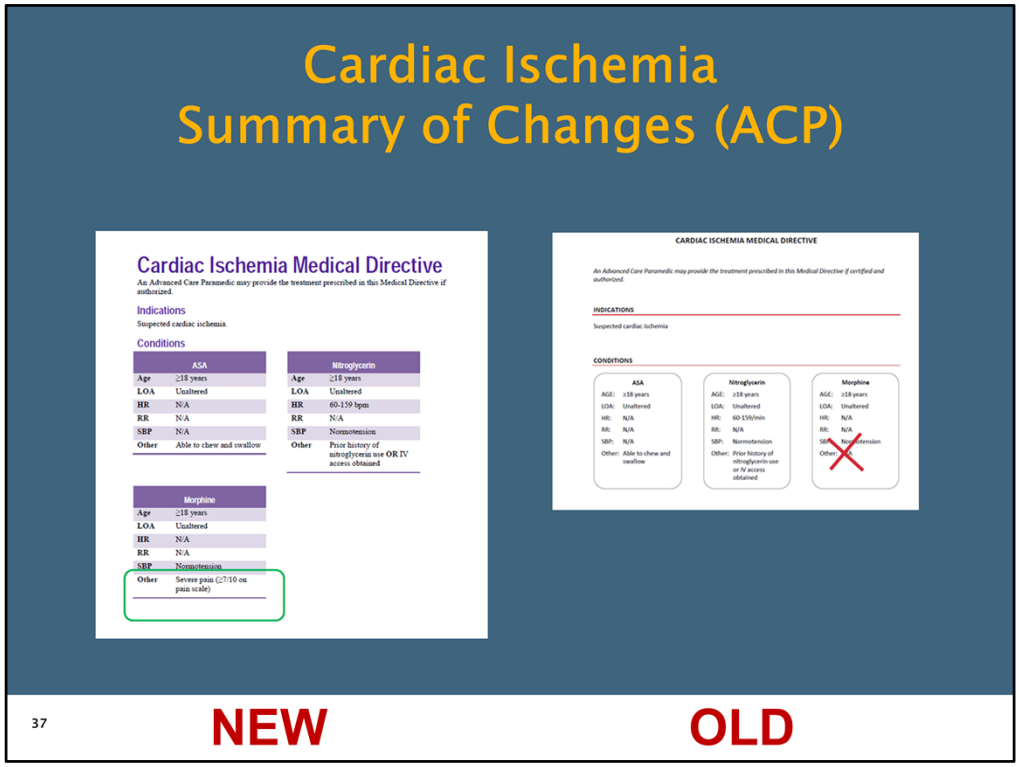
NEW **OLD**

Yes – start performing a modified 12 Lead

Max 3 NTG for STEMI+



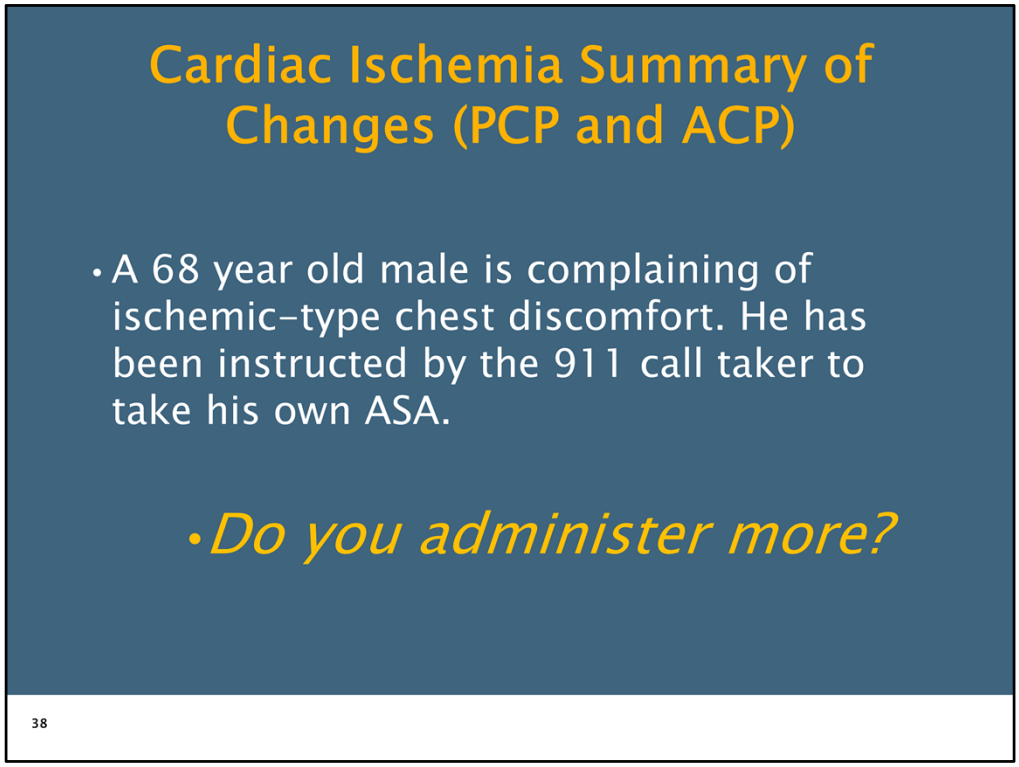
Rational for LESS morphine:

Ischemic CP

Morphine was previously a class I recommendation, but is now bumped down to class II (conflicting evidence). Therefore decision made to be more selective with who gets morphine.

MAC Summary: Platelets inhibition is an integral part of STEMI therapy and high-risk ACS patients. Suboptimal platelet inhibition early after primary stent implantation for STEMI is associated with thrombotic complications, including stent thrombosis. (13) Thus, given the evidence of reduced platelet inhibition with concomitant morphine administration, and in the absence of data that may support a potential clinical benefit of morphine in ACS, more caution should be used regarding morphine administration, and a selective rather than routine morphine use seems to be reasonable. Morphine administration might be reserved for ACS patients presenting with persistent severe chest pain. Severe chest pain has been previously defined as a self- reported numeric rating scale $\geqslant 7$, based on a scale from 0 to 10 as described in cancer patients treated with Morphine.

MAC Recommendation: Morphine use in ACS patients be restricted to those with severe pain (≥ 7), after other anti-ischemic therapies have been started.



Ontario Central Ambulance Communications Centres have begun directing patients with chest pain, who already take aminosalicylic acid (ASA) to chew their own ASA (160-325 mg). ASA has demonstrated benefit to outcomes in patient suffering myocardial ischemia or infarction. As ASA takes time to be absorbed, dispatch-directed early administration has potential benefits, is recommended as the standard of care in the Heart and Stroke Foundation of Ontario Advanced Cardiac Life Support Guidelines 2015, and poses minimal risk to the patients.

ASA is a safe medication with a wide therapeutic index (the effective dose without side effects can be from 80 to 1500 mg). The additional dose provided by paramedics will not exceed the therapeutic dose, and there is a chance the patient did not have or did not take the correct dose suggested by the ambulance communications officer. Therefore, paramedics should continue to follow their Ischemic Chest Pain Medical Directive without modification when patients have already taken ASA prior to paramedic arrival.

Hypoglycemia

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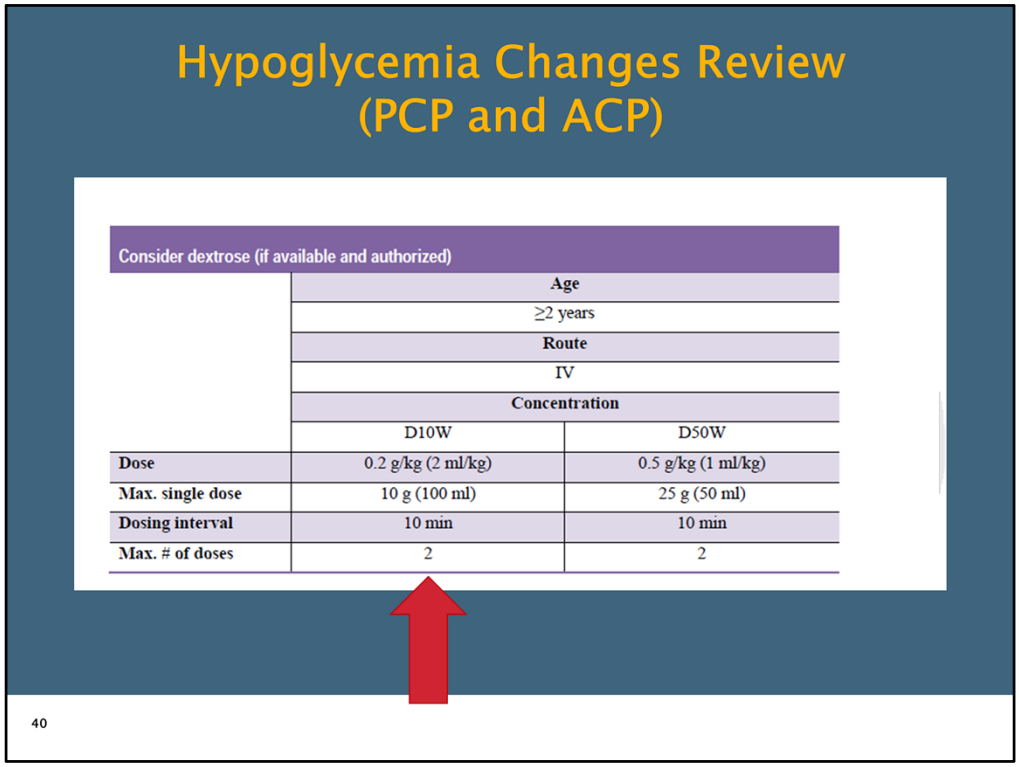

Should service carry D10W; otherwise no change

NO titration to effect with D10 or D50

Hypoglycemia Changes Review (ACP only)

Consider dextrose (D10W pre-mixed)		
	Age	**Age**
	<30 days	≥30 days
	Concentration	**Concentration**
	D10W	D10W
	Route	**Route**
	IV	IV
Dose	0.2 g/kg (2 ml/kg)	0.2 g/kg (2ml/kg)
Max. single dose	5 g (50 ml)	10g (100 ml)
Dosing interval	10 min	10 min
Max. # of doses	2	2

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Hypoglycemia Changes Review (ACP only)

Consider dextrose (D50W diluted as required if not using D10W)			
	Age	**Age**	**Age**
	<30 days	≥30 days to <2 years	≥2 years
	Concentration	**Concentration**	**Concentration**
	D10W	D25W	D50W
	Route	**Route**	**Route**
	IV	IV	IV
Dose	0.2 g/kg (2 ml/kg)	0.5 g/kg (2 ml/kg)	0.5 g/kg (1 ml/kg)
Max. single dose	5 g (50 ml)	10 g (40 ml)	25 g (50 ml)
Dosing interval	10 min	10 min	10 min
Max. # of doses	2	2	2

MODERATE TO SEVERE ALLERGIC REACTION

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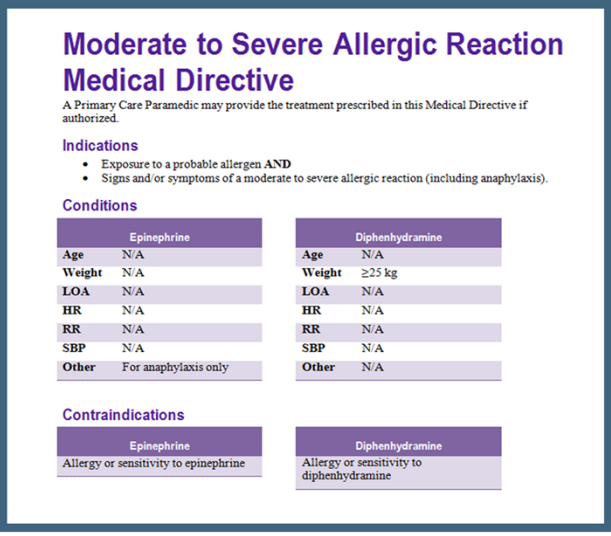
Moderate to Severe Allergic Reaction Summary of Changes (PCP and ACP)



Moderate to Severe Allergic Reaction Medical Directive

A Primary Care Paramedic may provide the treatment prescribed in this Medical Directive if authorized.

Indications

- Exposure to a probable allergen **AND**
- Signs and/or symptoms of a moderate to severe allergic reaction (including anaphylaxis).

Conditions

Epinephrine	
Age	N/A
Weight	N/A
LOA	N/A
HR	N/A
RR	N/A
SBP	N/A
Other	For anaphylaxis only

Diphenhydramine	
Age	N/A
Weight	≥25 kg
LOA	N/A
HR	N/A
RR	N/A
SBP	N/A
Other	N/A

Contraindications

Epinephrine
Allergy or sensitivity to epinephrine

Diphenhydramine
Allergy or sensitivity to diphenhydramine

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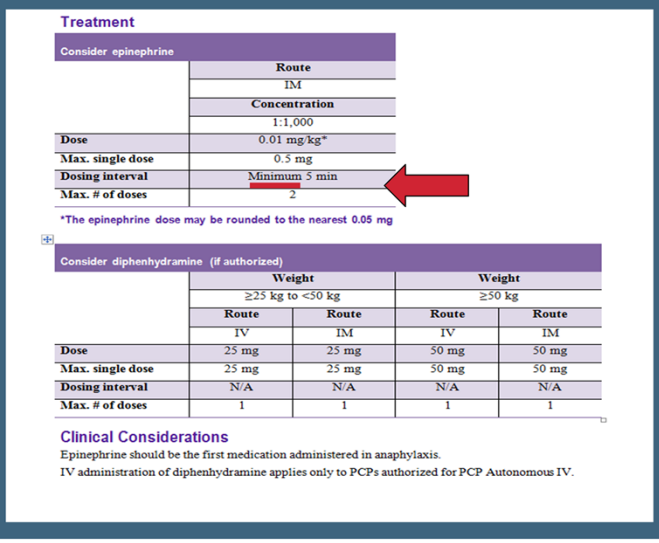
No changes

Moderate to Severe Allergic Reaction Summary of Changes (PCP and ACP)



Treatment

Consider epinephrine	
	Route
	IM
	Concentration
	1:1,000
Dose	0.01 mg/kg*
Max. single dose	0.5 mg
Dosing interval	Minimum 5 min
Max. # of doses	2

*The epinephrine dose may be rounded to the nearest 0.05 mg

Consider diphenhydramine (if authorized)				
	Weight		**Weight**	
	≥25 kg to <50 kg		≥50 kg	
	Route	**Route**	**Route**	**Route**
	IV	IM	IV	IM
Dose	25 mg	25 mg	50 mg	50 mg
Max. single dose	25 mg	25 mg	50 mg	50 mg
Dosing interval	N/A	N/A	N/A	N/A
Max. # of doses	1	1	1	1

Clinical Considerations

Epinephrine should be the first medication administered in anaphylaxis.

IV administration of diphenhydramine applies only to PCPs authorized for PCP Autonomous IV.

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Change: max # doses 2; <u>minimum</u> 5 minute interval

Moderate to Severe Allergic Reaction Summary of Changes

2 doses Epi

Minimum 5 min dosing interval

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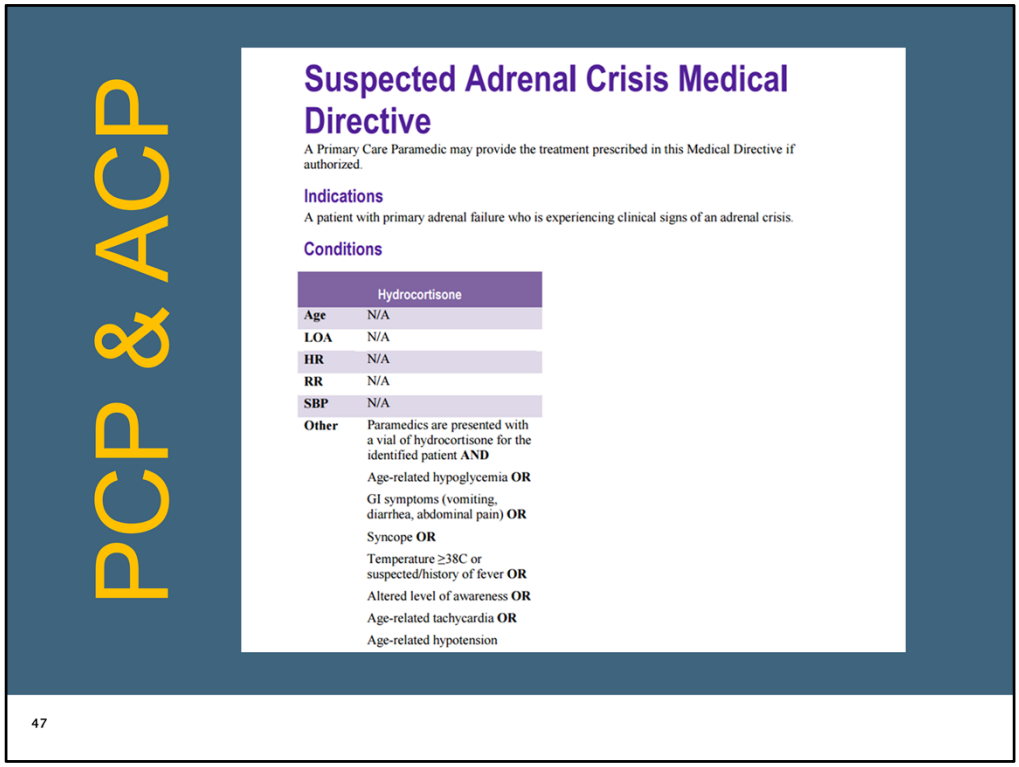
When appropriate, follow up with Benadryl

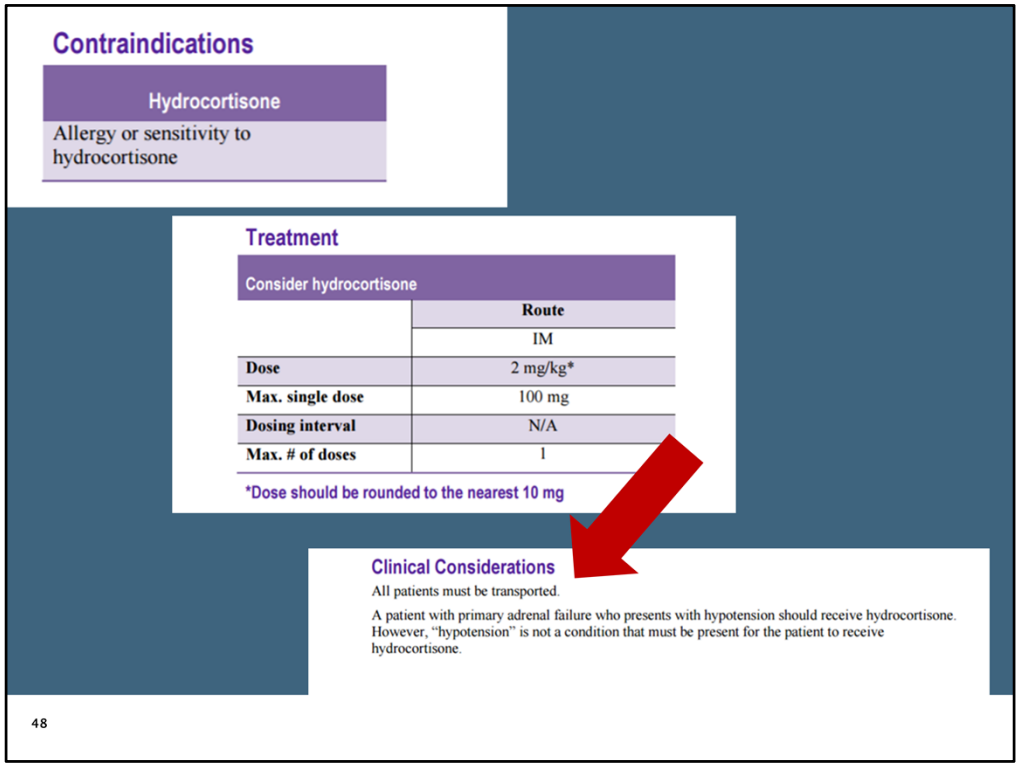
Do not give Benadryl and Gravol together



PCP and ACP same directive?

What's the "give early" rationale all about?

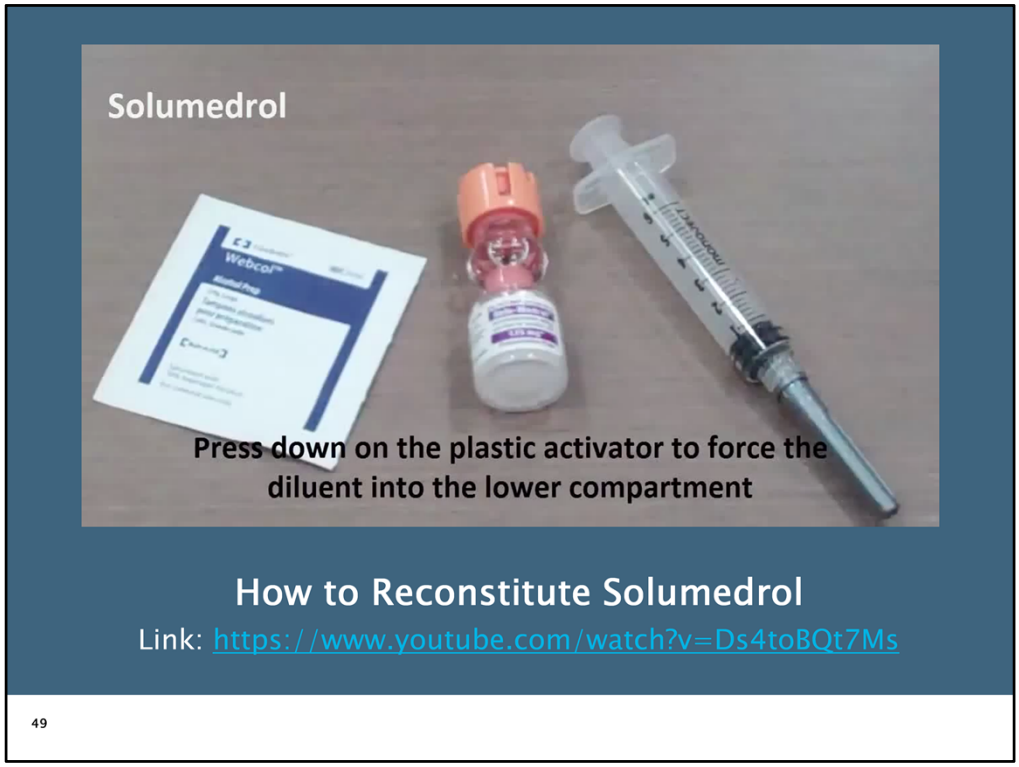
Early = less crisis-y (main goal to decrease hypotension)



What's the dosing?

Why "must" patients be transported? – significant follow up required in ED

What do you do in hospital for these folks?



That's a hyperlink to 51 sec video

How do we give it?

Onset, effects and duration?

ENDOTRACHEAL AND TRACHEOSTOMY SUCTIONING

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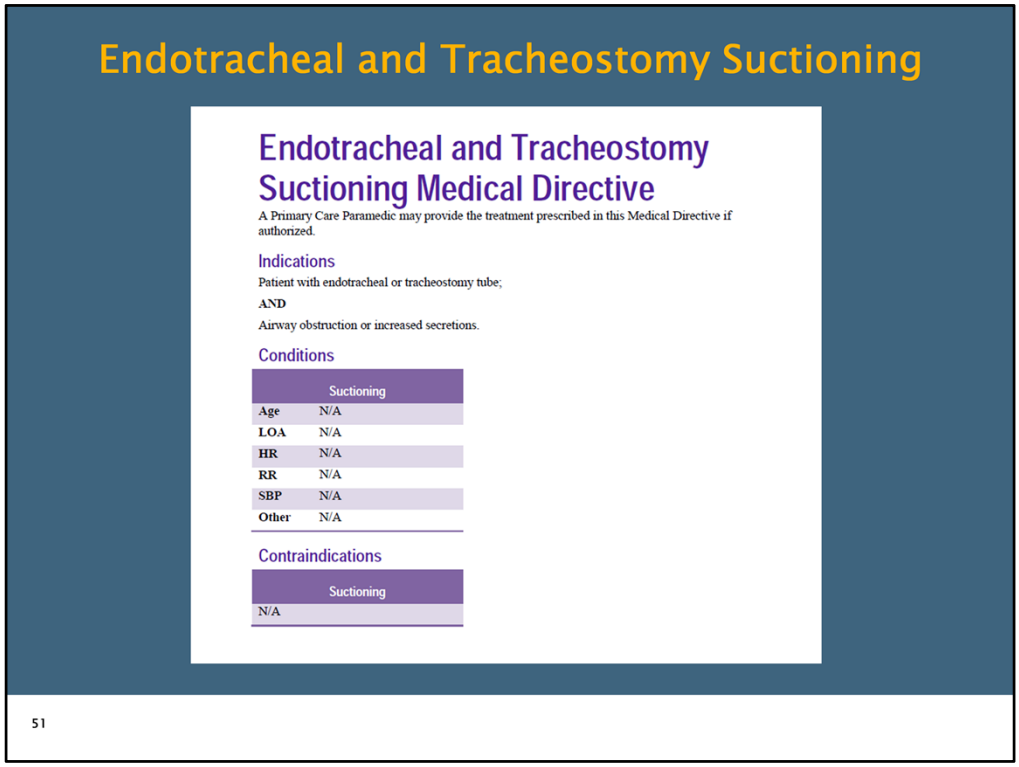
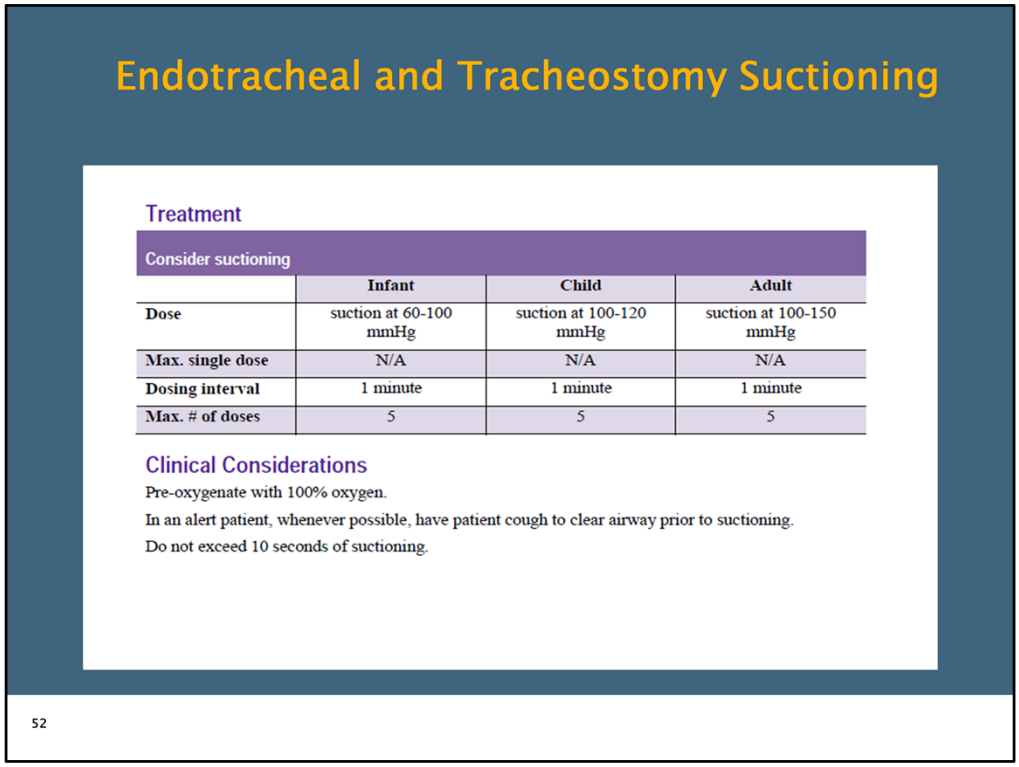


NEW

Important = PPE (mask/goggles/splash guard/gown)



Start suctioning pressures low and increase as needed

NEW – max 5 # of doses

Reminder: Ventilate/oxygenate during the 1 min interval between suctioning attempts

Advanced Life Support Patient Care Standards

Version 4.0
Comes into force July 17, 2017

Emergency Health Services Branch
Ministry of Health and Long-Term Care

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