



A conference that is for us and by us

# Emergency Medicine Pharmacotherapy with Resuscitation (EMPowerRx) Conference





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# Amio-Do or Amio-Don't?

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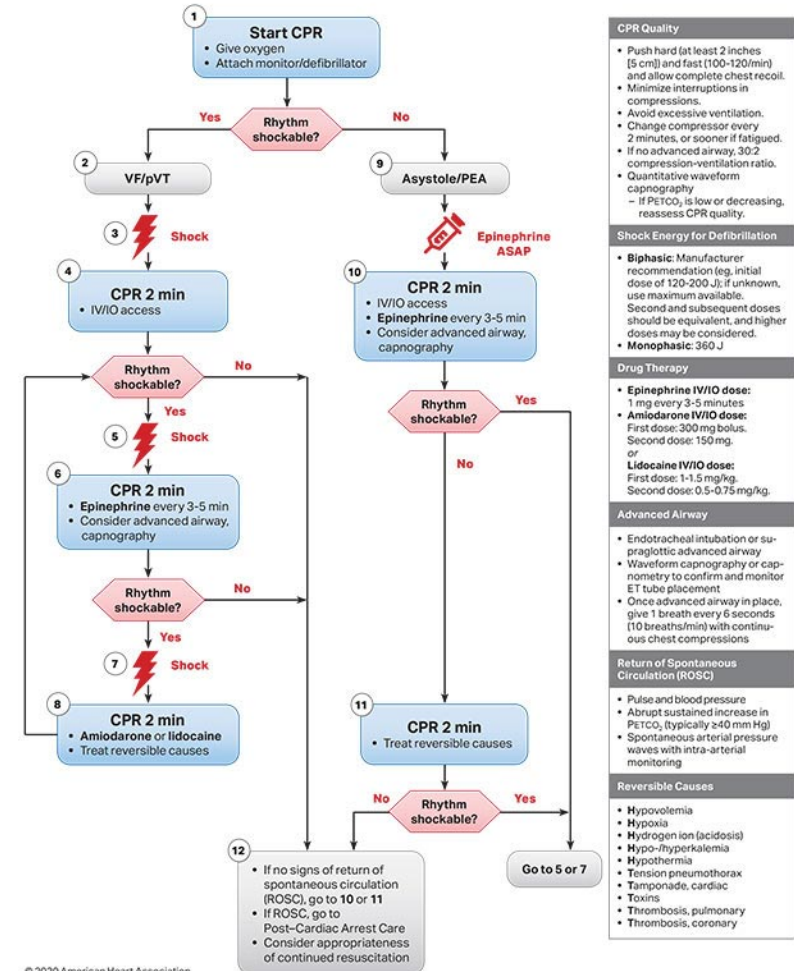
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# Role of Antiarrhythmics

## 2018 AHA Focused Update on Advanced Cardiovascular Life Support Use of Antiarrhythmic Drugs During and Immediately After Cardiac Arrest

- Performance of CPR and timely defibrillation shown to improve survival after cardiac arrest
- Unlikely to pharmacologically convert VF/pVT → organized rhythm with antiarrhythmic alone
- Used to facilitate successful defibrillation and reduce risk of arrhythmias

Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)



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<https://cpr.heart.org/en/resuscitation-science/cpr-and-ecc-guidelines/algorithms>

# Randomized Trials

Trial	Comparison	Primary Outcome	Results
<b>1999 ARREST</b> Seattle	Amiodarone 300 mg VS. Polysorbate placebo	Hospital admission with a spontaneously perfusing rhythm	Amiodarone resulted in a <b>higher rate of survival to hospital admission</b> in patients with out of hospital cardiac arrest (OHCA) <ul style="list-style-type: none"> <li>- 44% of amiodarone-treated patients vs. 34% of placebo-treated patients survived to hospital admission (P=0.03)</li> <li>- Survival to hospital admission OR 1.6 (95% CI 1.1-2.4; P=0.02)</li> </ul>
<b>2002 ALIVE</b> Toronto	Amiodarone 5 mg/kg + Lidocaine placebo VS. Lidocaine 1.5 mg/kg + Polysorbate placebo	Survival to hospital admission	Amiodarone lead to substantially <b>higher rates of survival to hospital admission</b> in patients with shock-resistant OHCA compared to lidocaine <ul style="list-style-type: none"> <li>- 22.8% patients treated with amiodarone survived to hospital admission, as compared with 12.0% patients treated with lidocaine (P=0.009; OR 2.17; 95% CI 1.21-3.83)</li> </ul>
<b>2016 ALPS</b> North America	Amiodarone* vs. Lidocaine vs. Placebo	Survival to hospital <u>discharge</u>	<u>Neither amiodarone nor lidocaine increased survival to hospital discharge</u> vs. placebo in OHCA <ul style="list-style-type: none"> <li>- 24.4%, 23.7%, and 21.0% of patients receiving amiodarone, lidocaine, or placebo respectively, survived to hospital discharge</li> </ul> <p>Absolute risk difference for amiodarone vs placebo was 3.2 percentage points (95% CI -0.4-7.0; P=0.08) and amiodarone vs lidocaine was 0.7 percentage points (95% CI, -3.2-4.7; P=0.70)</p>

\*Amiodarone was administered as a captisol-based formulation designed to reduce hypotensive effects



# Meta-Analyses

	<b>Trials Included</b>	<b>Conclusions</b>
Laina A, et al.	10 studies – 4 RCT, 6 non-RCTs	Amiodarone associated with <b>improved survival to hospital admission</b> after cardiac arrest - OR 1.40, 95% CI 1.07-1.84, P=0.015  No benefit of amiodarone in survival to discharge or neurological outcomes compared to placebo or other antiarrhythmics - OR 1.139; 95% CI: 0.963–1.347, P = 0.129 - OR 1.114, 95% CI: 0.923–1.345, P = 0.475
Sanfilippo F, et al.	7 studies – 3 RCT, 4 non-RCTs	Amiodarone and lidocaine equally <b>improve survival at hospital admission</b> as compared with placebo - Amiodarone vs placebo – OR 1.12-1.54, P <0.0001 - Lidocaine vs placebo – OR 1.14-1.58, P=0.0005 - Amiodarone vs lidocaine – OR 0.86-1.23, P=0.40  However, neither amiodarone nor lidocaine improve survival to hospital discharge - Amiodarone vs placebo – OR 0.98-1.44, P=0.08 - Lidocaine vs placebo – OR 0.97-1.45, P =0.10

Laina A, et al. *Int J Cardiol* 2016;221:780-788.

Sanfilippo F, et al. *Resuscitation* 2016;107:31-37.

# Nationwide Studies

	Study	Primary Outcome	Conclusions
Tagami T, et al. Japan	Retrospective study of patients from a nationwide database 2007-2013	Survival to hospital discharge	<u>No significant difference in rate of survival to hospital discharge</u> between amiodarone and lidocaine - 15.2% vs. 17.1%; 95% CI -5.5-1.7
Huang C, et al. Taiwan	Retrospective review of records from a nationwide database 2004-2011	1-year survival rates	Data supports use of antiarrhythmic over no antiarrhythmic treatment. <u>No significant difference in 1-year survival rates</u> between amiodarone vs lidocaine - 8.27% amiodarone, 7.15% lidocaine, 3.26% with neither antiarrhythmic - Amiodarone use OR 1.84 (95% CI 1.58-2.13; p<0.0001) - Lidocaine use OR 1.88 (95% CI 1.40-2.53; p<0.0001)
Wissa J, et al. Australia	Retrospective study utilizing nationwide database 2015-2019	Association of time to amiodarone administration with survival outcomes	Probability of event survival diminished exponentially as time to amiodarone administration prolonged - Adjusted OR 0.93; 95% CI 0.89-0.97 - Optimal time frame for amiodarone administration – 23 minutes  Event survival – 38.3% patients w/in window vs 20.6% out of window, P<0.001 Discharge survival – 25.5% vs. 9.7%, P<0.001 30-day survival – 25.1% vs. 9.7%, P<0.001

Tagami T, et al. *Cardiovasc Drugs Ther* 2016;30:485-491.

Huang C, et al. *Int J Cardiol* 2017;227:292-298.

Wissa J, et al. *Emerg Med Australas* 2021;33:1088-1094.

# Antiarrhythmic Considerations

## Administration

- Amiodarone – drawn up into syringe for administration
- Lidocaine – prefilled syringe

## Cost

- Amiodarone 150mg/3mL vial: \$1.86 - \$4.35
- Lidocaine 100mg/5mL syringe: \$4.65 - \$8.10

## Adverse Effects

- ALIVE – no difference in administration of supportive medications
- ALPS – no difference in drug-related adverse effects

## Long-term Outcomes

- ARREST, ALIVE, and ALPS trials show no difference in statistical improvement in survival to hospital discharge

# Conclusion

- Antiarrhythmic use in refractory ventricular arrhythmias improved 1-year survival rates compared to no antiarrhythmic use
- Similar cost and rates of adverse events between amiodarone vs. lidocaine
- Despite potential practical administration limitations, amiodarone increased survival to hospital admission compared to placebo and lidocaine
- Most studies show no difference in long-term survival to hospital discharge between amiodarone vs. lidocaine, but there is a potential increase in rates of survival shown with earlier amiodarone administration





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