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Emergency Medicine Pharmacotherapy with Resuscitation (EMPowerRx) Conference



A CHANGE OF HEART: PROS OF SODIUM BICARBONATE IN ACLS

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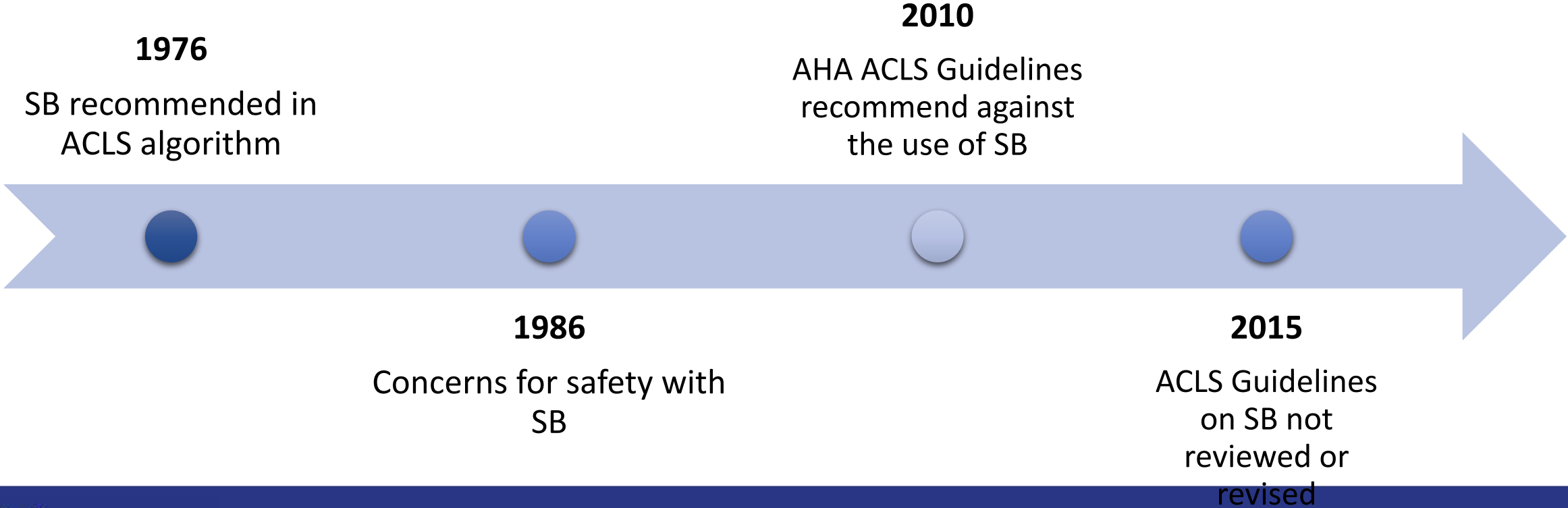
Sodium bicarbonate (SB): the basics

- Works as a buffer
- Acidosis common in states of low perfusion or poor oxygenation
- During acidosis
 - Decreased release of endogenous catecholamines
 - Suppressed myocardial contractility





History of Sodium bicarbonate in ACLS



Risk > Benefit?

- Decreased oxygen release
- Hypernatremia/hyperosmolarity
- Paradoxical acidosis
- Extracellular alkalosis
- Inactivation of exogenous catecholamine

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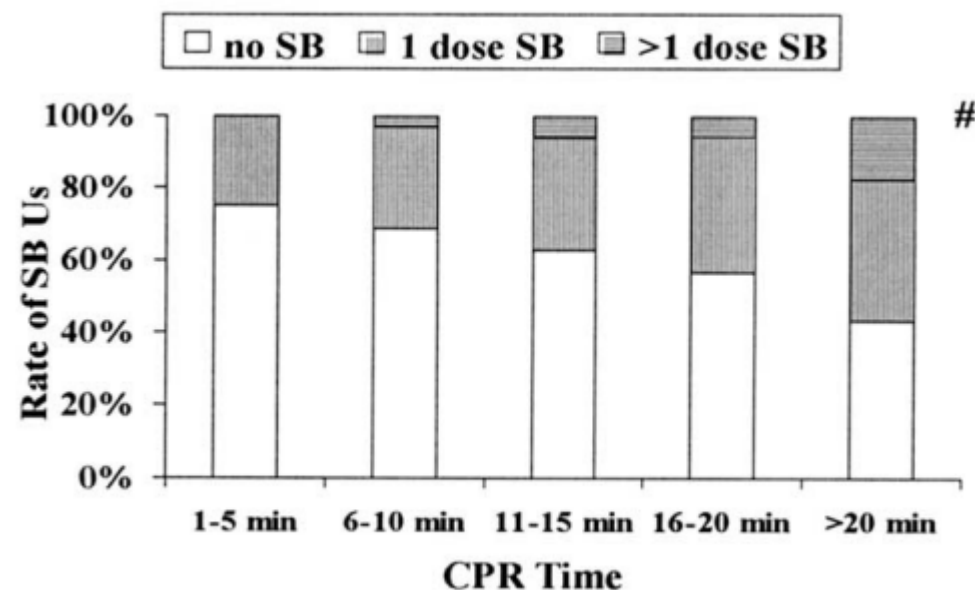


The harm might not be quite as it seems

- Hyponatremia/Hyposmolality
 - 50 mEq of SB = 2.5 increase in mOsm/L
 - 150 mEq of SB = 0.56 mEq/L increase in Na
- Intracellular acidosis
 - Prevented with proper ventilation
- Poor tissue oxygenation
 - Prevented with effective CPR

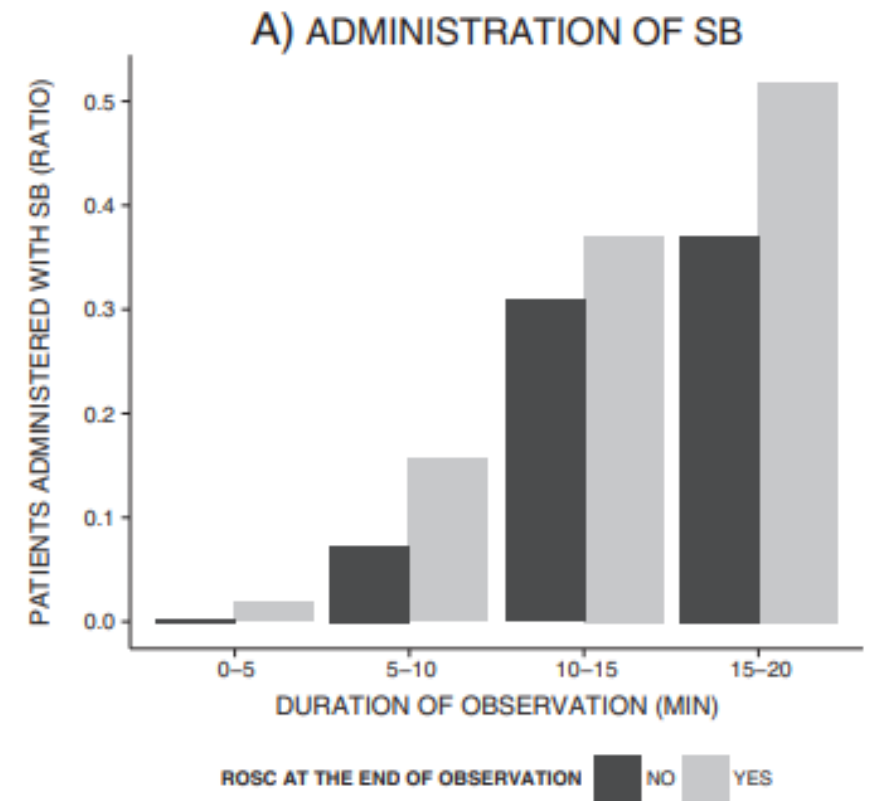
Previous data might be flawed

- Brain Resuscitation Clinical Trial III (BRCT III)
 - Bicarb given in 54.5% of resuscitation attempts mostly for “protracted CPR”
 - Linear correlation between rate of SB and duration of ACLS



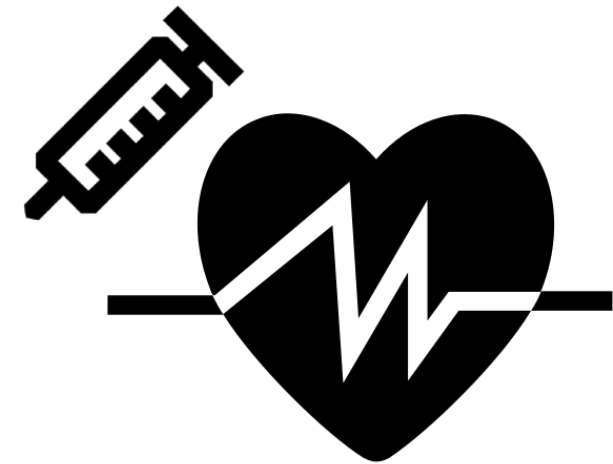
The right studies

Variable	Low SB Users	High SB Users	P-value
% of Patients with ROSC	35.7% (23.1-28.4)	33.5% (30.0-37.0)	
% of Patients Discharged	3.0% (2.0-4.0)	5.2% (3.6-7.0)	
ROSC (%)			
VF or VT	26.1%	32.4%	0.056
AS or PEA	25.7%	34.1%	0.007
Good Neurological Outcome (%)			
VF or VT	2.8%	8.2%	0.0005
AS or PEA	2.3%	3.4%	0.005



Conclusion

- The data is very controversial and at risk for many confounders
- More recent and controlled studies have shown SB to be beneficial
- Especially beneficial for:
 - Hyperkalemia
 - TCA overdose
 - Pre-existing metabolic acidosis



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THANK YOU!