Does the use of EZIO result in better outcomes for patients with cardiac arrest?

- Jon Jui MD, MPH

Amiodarone in VF Cardiac Arrest Interval from Arrest to Administration of drug

- Kudenchuk 21 ± 8 minutes
- Dorian 25 ± 8 minutes

Multnomah County

- Census (2005)
  - Multnomah County: 672,906
  - Oregon 3,641,056
- Land area: 435 square miles
- EMS Runs 55,000 to 60,000

Multnomah County Demographics

Age

- Persons 65 years old and over: 10.7%
- Persons under 5 years 6.7%

Ethnicity

- White 83%
- Black 5.8%
- Latino 9/6%
- Asian 6.5%

Multnomah County EMS

- Centralized 911 Dispatch
  - Life-threatening calls 90% within 70 seconds
- Fire ALS First response
  - 90% 6.5 to 7 minutes
- EMS Transport (AMR-Multnomah County)
  - 90% 8 minutes
- 7 hospitals
  - 2 Level 1 Trauma Centers

MCEMS Cardiac Arrest History

		VF	Asystole	PEA
1991	OHSU	19	2	
1995-1997	MCEMS	19	3.3	3.3
2003-2005	SUDS	25	3	

MCEMS EZIO Deployment

- Beta test conducted 1st half 2006
- Full system deployment 2nd half 2006
- Opprotunity for examination of 2 cohorts: Pre-EZIO and Post-EZIO

MCEMS EZIO Protocol

- **C.** Adult and pediatric patients, within the proper weight range, who present with one or more of the following clinical conditions:
  - Cardiac arrest.
  - Hemodynamic instability (BP <90 mmHg and clinical signs of shock).
  - Imminent respiratory failure.
  - Status epilepticus with prolonged seizure activity greater than 10 minutes, and refractory to IM anticonvulsants.
  - Toxic conditions requiring immediate IV access for antidote.

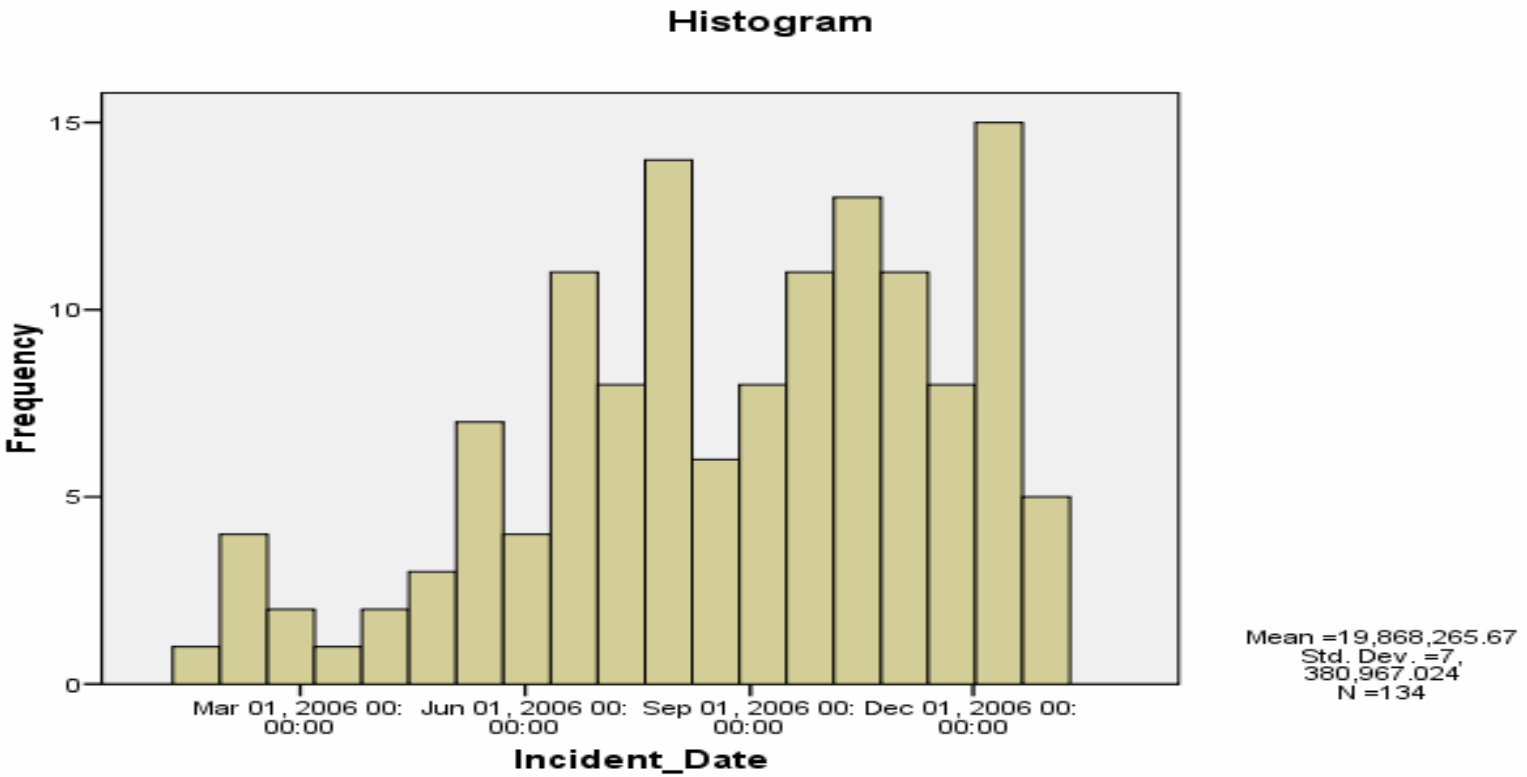
MCEMS EZIO Protocol

- IO placement may be considered prior to peripheral IV attempts in cases of cardiopulmonary or traumatic arrest, in which it may be obvious that attempts at placing an IV would likely be unsuccessful and or too time consuming, resulting in a delay of life-saving fluids or drugs.

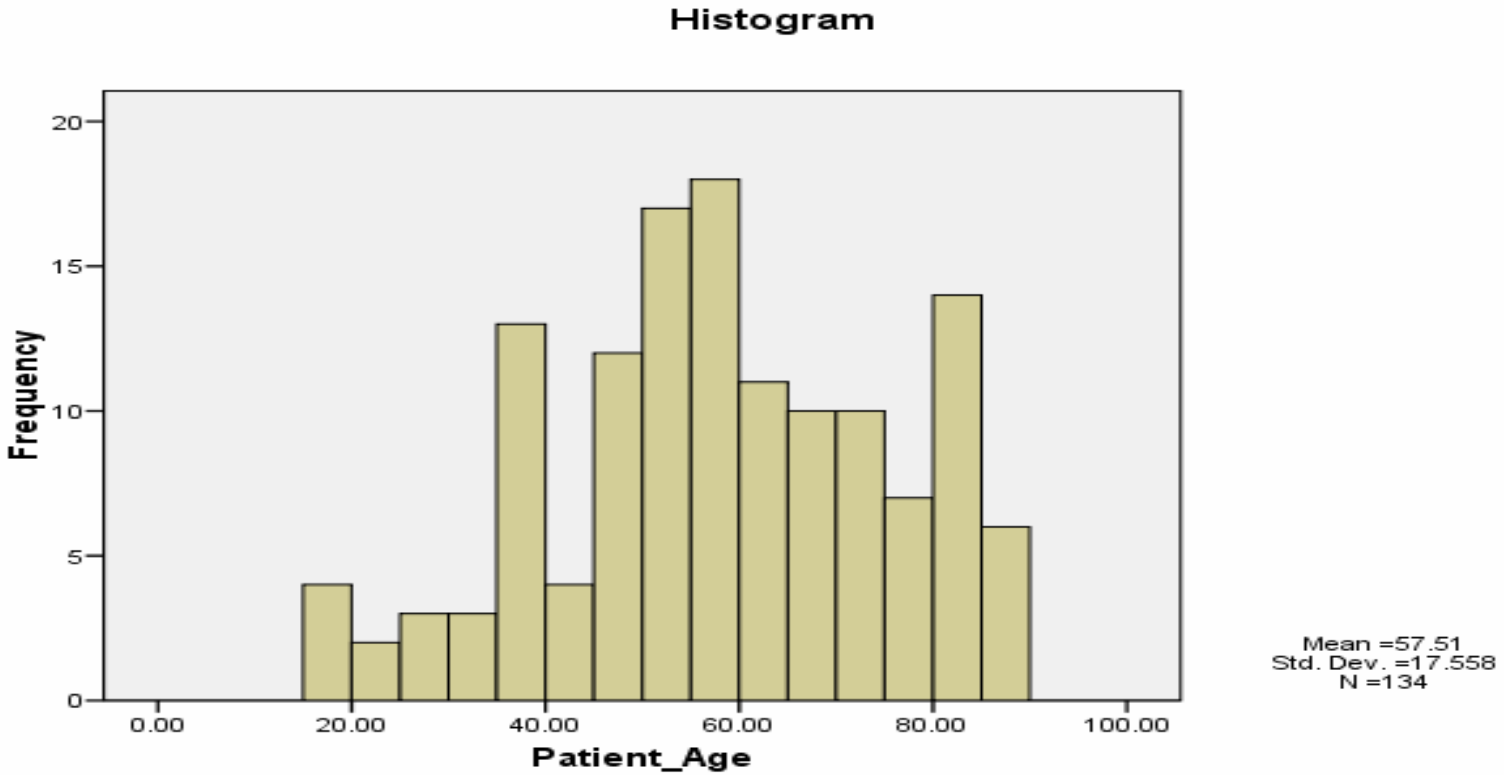
MCEMS EZIO Use 2006
Primary Clinical Impression

Clinical Impression	Number
Cardiac Arrest	88
Trauma System	10
Seizures / Neuro	10
Airway, Respiratory	7
Cardiac (CHF, Cardiac Shock)	5
Shock (GI bleed)	3

MCEMS EZIO
Use by Month



MCEMS EZIO 2006
Patient Age



EZ IO By Agency

- Total 134
  - Fire 42 (31%)
  - AMR 92 (69%)

EZIO Procedural Success By Attempt

- Total number 134
- Success 119 (88%)
  - 6 Patients had multiple attempts
  - 4/6 had successful use

EZIO Procedural Success : By Patient

N=128

- 118/128 (92%) were successful

MCEMS Outcomes

	Number	Percent
Death on scene	141	26
Resuscitation attempted, Death on scene	146	26
Transported	276	48
Total	568	

Presenting Rhythm and Survival

	Number	Survived	Percent
VF/VT	66	34	52
Asystole	178	8	4.5
PEA	62	9	14.5
Paced	13	0	0
Other	107	51	48
NULL	142		
Total	568		

Survival by Rhythm

	Survival	Death	% (alive)
VF/VT	34	21	58%
Asystole	8	41	16%
PEA	10	35	21%
Other	69	58	54%
Total	121	155	

Presenting Rhythm: EZIO vs Normal IV

	EZIO	No EZIO
VF/VT	6 (15%)	49 (20%)
Asystole	9 (23%)	39 (17%)
PEA	7 (18%)	38 (16%)
Other	17 (43%)	110 (46%)
Total	39	237

Survival to ED: EZIO

	Alive	Dead	Total	% Alive
EZIO	17	22	39	43%
No EZIO	108	129	237	45%
Total	125	151	276	

Does the EZIO lead to greater field ROSC?

IF so, what presenting rhythms which benefit from the EZIO?

Normal IV
Survival to ED (ROSC)

	ROSC YES	ROSC NO	% Success
VF	29	20	59
Asystole	20	19	51
PEA	22	16	57
Other	37	74	33
	108	129	

EZIO
Survival to ED (ROSC)

	ROSC	No ROSC	% ROSC
VT/VF	1	5	20
Asystole	6	4	60
PEA	2	5	40
Other	13	3	81
	22	17	

EZIO vs. Normal IV Survival to ED (ROSC)

	EZIO (%)	Normal IV (%)	Difference
VF/VT	20	59	NS
Asystole	60	51	NS
PEA	40	57	NS
Other	81	33	NS

Do more individuals in cardiac arrest survive with EZIO vs. normal IV route?

Total Cohort
Survival to Discharge : EZIO

	Alive	Dead	Total	
EZIO	12	27	39	31%
Routine IV	109	128	237	43%
Total	121	155	276	

Survival NO EZIO By Rhythm

	Alive (#)	Dead (#)	% Survive
VF/VT	30	19	61
Asystole	6	33	9
PEA	9	29	24
Other	64	47	58
	109	128	

Survival EZIO By Rhythm

	Alive (#)	Dead (#)	% Survival
VF/VT	4	2	66
Asystole	2	8	20
PEA	1	7	12
Other	5	10	50
	12	27	

Survival EZIO vs. Normal IV By Rhythm

	EZIO (%)	Normal IV (%)	Difference
VT/VF	66	61	NS
Asystole	20	9	NS
PEA	12	24	NS
Other	50	58	NS

Summary

- No significant difference in overall survival between EZIO and Normal IV groups.
- No significant difference between field ROSC between EZIO and Normal IV groups.

The END

- Questions?