# Is your service out of control?

#### Donald Locasto, MD Medical Director, Cincinnati Fire Department



DEPARTMENT OF EMERGENCY MEDICINE



# APEC 2011 USA CEO SUMMIT













DEPARTMENT OF EMERGENCY MEDICINE

# Who feels like they work too much?





combscartoons@yahoo.com



# What is an acceptable work load for an EMS unit?

- Arbitrary
- Factors
  - Profit driven
  - Cost cutting
  - Inefficiencies in the system



### **Measures of work load**

- Blunt instruments
  - Total calls/year....day
  - Average calls/unit/day



- More sophisticated measures
  - Calls per Unit Hour (CUH)
    - How many calls dispatched per unit hour of service time

#### Unit Hour Utilization (UHU)

- What percentage of time is your unit actually "working"
- Private ambulance industry measure
- Applicability to the fire service questionable



# What is an acceptable work load for an 2MS unit?





# Measure the results of system modifications

### More equal distribution of the work







# CFD Transport System Reconfiguration

- Population: 280,000
- EMS Calls: 54,000
- Old EMS System
  - dual tiered
  - 8 BLS Ambulances
    - EMT/EMT
  - 4 ALS Rescue Units
    - PM/PM





#### How did we measure workload?

- No solid data source
- Many different conflicting sources
- 8 BLS Ambulances (EMT/EMT)
  - 66% of the transport resources
  - Responded to 80% of the call volume
- 4 ALS Rescue Units (PM/PM)
  - 33% of the transport resources
  - Responded to 20% of the call volume





# CFD Transport System Reconfiguration

#### • Old

- dual tier
- 8 BLS Ambulances
  - = EMT/EMT
- 4 ALS Rescue Units
  - PM/PM

- New
  - single tier
  - 12 ALS Medic Units
    EMT/PM







# Data for 45 days following reconfiguration

AVERAGE RUNS PER DAY



DEPARTMENT OF EMERGENCY MEDICINE

UNIVERSITY O

#### What is a control chart?

- Study of a process (EMS call volume) over a time period.
  - indicates if the process is in a state of statistical control
  - also is used to
    - Identify a data points considered to be statistically 'unlikely' (out of control)

#### or

Is the change due to a natural variability of the process (in control)





D. LYNN KELLEY

### Who uses control charts?

- Major manufacturing companies
- Healthcare organizations
- Governmental organizations

**NHTSA Technical Report** 









PRI

WILLIAM H. WOODALL Virginia Tech, Blacksburg, VA 24061-0439









# Did the new single tier EMS system equally distribute the work?

12 ALS Medic Units (new)

VS

4 ALS and 8 BLS units (old)





# Data after transport system reconfiguration

AVERAGE RUNS PER DAY





Apr 6 - May 20



AVERAGE RUNS PER DAY after adjustment



DEPARTMENT OF EMERGENCY MEDICINE



#### **Key Points: Control charts**

- Retrospective review of system processes
- Can be used to measure the changes caused by system modifications
- Not a crystal ball, but can help with future planning



	A4 🔫 🌘		e -						
	А	В	С	D	E	F	G	Н	1
1	Cincinnati Fire Department								
2	Ambulance and Rescue Unit Run Statistics								
3									
4		<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>20</u>
5	AMBULANCE 3	4,360	4,631	4,504	4,600	4,459	4,653	4,763	
6	AMBULANCE 9	3,900	3,900	4,097	4,279	4,202	4,562	4,102	
7	AMBULANCE 12	5,183	5,222	5,387	5,521	5,722	5,428	5,912	
8	AMBULANCE 17	4,008	4,116	4,416	4,453	4,416	4,869	4,841	
9	AMBULANCE 19	4,110	3,909	3,886	<u>4 397</u>	4,385	4,453	4,771	
10	AMBULANCE 23		2 998		4 47	474	598	4,596	
11	RESCUE 14	90	71	- 119	4,18	<u>4</u> × <u>k</u>		4,799	
12	RESCUE 24	3,100	3, <b>z</b> 45	5,329	3,356	3, <b>z</b> 58	3,631	3,884	
13	RESCUE 38	3,643	3,475	3,662	3,795	4,483	4,288	4,207	
14	RESCUE 46	3,557	3,718	3,799	3,683	3,731	3,833	4,070	
15	RESCUE 2				656	795	1,075	1,014	
16	Totals	40,186	40,385	41,397	42,816	43,285	44,646	45,945	510
17	Ambulance Totals	25,977	25,776	26,388	27,797	27,658	28,563	28,985	
18	Rescue Totals	14,209	14,609	15,009	15,019	15,627	16,083	16,960	
19	Avg Per Unit Totals	4,019	4,039	4,140	4,282	4,329	4,465	4,595	
20	Avg Per Amb Total	4,330	4,296	4,398	4,633	4,610	4,761	4,831	
21	Avg Per Rescue Total	3,552	3,652	3,752	3,755	3,907	4,021	4,240	

