Wake EMS
Advanced Practice Paramedic Program
Wake EMS Demographics

- Population 1 million
- 860 square miles
- 85,000 calls / year - 2012

Staffing
- 38 Ambulances at peak
- 27 Ambulances at low service times
- 5 APP’s at peak
- 2 APP’s at low service time
- 6 District Chiefs
Historical Scope of Service

- Product of EMS is the unit hour
- 8,760 unit hours are produced by 24 hour unit
- 1.1 unit hours are required for transport
- 0.5 unit hours are required for non-transport
Desired Scope of Service

**Reduce 911 calls** in Special Populations
- Repeat users (frequent flyers)
- Diabetes
- Pediatric Asthma
- CHF
- Homeless

EMS Produces Resources For Patient Navigation and Preparedness, not just UHUs For Transport

- Respond to 911 Calls
  - Treat in difficult environment
  - Transport to Hospital E.D.
  - Redirect
    - Treat/release from scene
    - Refer - get appointment
    - Transport elsewhere
Wake EMS System Experience

Changes in Experience of WorkForce

Percent of paramedics in each category

- Probationary
- < 2 years
- > 10-15
- > 15

Fiscal year

2002 2003 2005 2006 2007
# Wake County Emergency Medical Services

## App Academy Topics and Hours Overview

<table>
<thead>
<tr>
<th>Classroom Topics</th>
<th>Hours</th>
<th>Clinical Rotations</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical Topics</strong></td>
<td></td>
<td>APP Quality Improvement</td>
<td>8</td>
</tr>
<tr>
<td>Advanced Airway Management</td>
<td>4</td>
<td>WakeMed ED (triage)</td>
<td>8</td>
</tr>
<tr>
<td>Fracture Management</td>
<td>2</td>
<td>Wake County PH Clinics</td>
<td>24</td>
</tr>
<tr>
<td>Immunizations</td>
<td>2</td>
<td>The Healing Place</td>
<td>8</td>
</tr>
<tr>
<td>Epidemiology and Bioterror Agents</td>
<td>8</td>
<td>EMS Communications (911)</td>
<td>8</td>
</tr>
<tr>
<td>Complications of Diabetes</td>
<td>8</td>
<td>Cath Lab, Rex Hospital</td>
<td>4</td>
</tr>
<tr>
<td>Advanced EKG, STEMI, CHF</td>
<td></td>
<td>Case Management, WakeMed</td>
<td>4</td>
</tr>
<tr>
<td>High-risk OB/GYN</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Emergencies</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Alcoholism and Substance Abuse</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Public Health Topics</strong></td>
<td></td>
<td><strong>Totals</strong></td>
<td></td>
</tr>
<tr>
<td>Access to Public Health Services</td>
<td>12</td>
<td>Classroom</td>
<td>191</td>
</tr>
<tr>
<td><strong>Legal, QI, and Documentation</strong></td>
<td></td>
<td>Clinical</td>
<td>64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>Total</strong></td>
<td>255</td>
</tr>
<tr>
<td><strong>Psychiatric and Violent Patients</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crisis Intervention (CIT/CIP)</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Detox</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Injury Prevention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury Prevention, general</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Safety Inspections</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetic Care</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension care</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operations Etc.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preplanning and Facility Strategy</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Safety</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light vehicle EVOC</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpersonal and Decision-Making</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up and patient call-back</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Service</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death Notifications</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dealing with High Risk Refusals</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentoring and Coaching</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Director Meetings and Reviews</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

191
Wake EMS APP Mission

- **Respond** – Provide an experienced paramedic on high acuity calls

- **Reduce** – Reduce readmissions for patients suffering from CHF, falls, diabetes etc.

- **Redirect** – Direct patients to the right place the first time (substance abuse/mental health, falls in assisted living facilities)
Respond

- Ensure an experienced provider responds to all high acuity calls
- Enhanced decision making abilities
- Additional equipment for cardiac arrest
- No expanded scope of practice – No special state requirements
Redirect

- Alternate destination for substance abuse and mental health patients
- Falls in assisted living facilities
- (Future) Low acuity calls
  - Alternate transportation – alternate destination
- Community paramedicine meets community networking
Direct Transport for SA/MH

- Patient has primary mental health crisis and/or substance abuse
- Patient does not require sedation or demonstrate agitation
- APP will then contact alternative site and evaluate the patient for potential placement
Universal Patient Care Protocol

Patient has medical complaint or obvious trauma

Yes → Go to appropriate protocol and recommend transport

No → Obtain Vital Signs: HR, RR, BP, Sp02, Blood Glucose

Pulse >110 or <50, SBP >200 or <85, DBP >120, RR > 24 or < 6, Pulse ox <94%, or Blood Glucose < 60 or > 400?

Yes → Recommend transport for evaluation. Have patient sight refusal if transport declined.

No → Re-Confirm patient has no medical complaint. Provide patient with vital sign results and have them contact their doctor to report results.

Advise patient to call 9-1-1 if they develop any symptoms. Complete PCR and document elements of this protocol.
Exclusion Criteria

- Acute medical issue or trauma with bleeding, need for wound repair
- BAC 0.30-0.40 (depending on facility) or patient too intoxicated to take PO medications
- Pulse >120
- Unexplained alteration in mental status
- Unable/unwilling to take medications for pre-existing conditions
Exclusion Criteria

- Has taken medication outside of prescription/recommended dose and cannot be cleared by poison center
- Can perform ADLs independently
- Blood glucose < 300 with no evidence of DKA
250 patients in a 12 month period were placed

Mental health patients consume 14 ED bed hours on average (3,500 hours)

Chest pain patients consume 3 ED bed hours on average

Thus, we opened beds for 1,166 chest pain patients in the 12 month period
Alternative Destination

- Most recent observational data indicate an average length of stay of 10 hours in the crisis and assessment unit.
- The actual savings for the alternative destination is not only the emergency department bed hours saved but also the in-patient bed hours for mental health “holds.”
Alternative Destination

- Ambulance is returned to service <10 minutes 78% of the time
- This returned 120 unit hours to the EMS system
- Of patients screened, 32% ultimately "alternatively destined"
- Safely increasing the proportion of alternative destinations is now a focus
Falls In Assisted Living Facilities

- 1 to 5 transports per day for our EMS system
- Majority are patients who are “found down” with no obvious injury or complaint
- Risk management strategy for the facility is to summon EMS for transport to the emergency department
Falls in Assisted Living Facilities

Accounts for ~1500 call per year

Retrospective evaluation of 644 from 30 facilities. The protocol used for evaluation had a 96% sensitivity and 97% negative predictive value. Roughly 70% would not require transport to the hospital.
Falls in Assisted Living Facilities

- We are now enrolling patients to:
  - Evaluate safety of a decision tree that would allow APPs to evaluate patients on-site and avoid unnecessary transports
  - Determine costs associated with the evaluation
  - To date 48 patients evaluated
    - 50% reduction in required transports
    - 100% sensitivity
    - 60% specificity
Doctors Making House Calls
Falls in Assisted Living

Resident Suffers a fall

Yes

911 Dispatches APP and EMS unit

Follow normal Wake EMS protocol

No

Fall is ground level
Pt is consented as part of DMHC study

Tier 1 Criteria
- Uncontrolled hemorrhage
- Acute neck pain or inability to clear the spine due to MOI
- Pulse rate>120 and/or SBP>90 with consideration for patient's baseline vitals and medications
- Altered mental status from baseline
- Laceration requiring repair
- Patient has acute emergency medical condition (i.e. Stroke, STEMI, syncope, seizure)
- Hip pain without full range of motion, shortening/rotation and or change in ambulatory status

Transport

Contact DMHC physician on call

No Transport Recommend

Tier 2 Criteria
- Fall while taking anti-coagulant or anti-platelet excluding ASA
- Borderline vitals or orthostatic
- Acute pain or need for pain management not already in patient medication regimen
- Patient's mental status prevents exam
- Isolated abnormal lab value
- Extremity abnormal lab value
- Presence of obvious injury more severe than simple contusion or skin tear

No Transport Recommend

Document as described in DMHC procedure

Tier 3 Criteria
- Simple contusion or skin tear
- No complaint
- No obvious injury
- No hip pain has full range of motion, no shortening and or change in ambulatory status

Pearls:

Protocol
This protocol is subject to the Wake County EMS system
Revised 7/16/2012
Low Acuity Callers

- Data Driven triage score
  - 1 very ill/injured
  - 2 and 3 need prompt evaluation
  - 4 and 5 – can safely go to the waiting room
- ~20% of our transports are level 4 and 5
- If we can convert ¼ = return 2500 unit hours
Reduce

- Reduce re-admission for patients who are at risk for re-admission
- Hot spots for frequent users
  - 4 calls in 30 day period
- Care plans
  - Specific destination for frequent users (typically a mental health or substance abuse component)
  - Developed in conjunction with healthcare partners in the community
### Wake EMS Advance Practice Paramedic Referral Program
**Menu of Services**

<table>
<thead>
<tr>
<th>Category</th>
<th>CHF</th>
<th>Pneumonia</th>
<th>AMI</th>
<th>Diabetic</th>
<th>Age&gt;65 Fall in Home</th>
<th>Post-ED Specific Request</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu of Services</strong></td>
<td>• Medication Reconciliation</td>
<td>• Medication Reconciliation</td>
<td>• Medication Reconciliation</td>
<td>• Medication Reconciliation</td>
<td></td>
<td>• Blood Glucose checks</td>
</tr>
<tr>
<td></td>
<td>• Medication compliance (use of pill minder)</td>
<td>• Vital Signs</td>
<td>• Vital Signs</td>
<td>• Vital Signs</td>
<td></td>
<td>• Case workers requested home evaluation</td>
</tr>
<tr>
<td></td>
<td>• Vital Signs</td>
<td>• Temperature</td>
<td>• Oxygen saturation</td>
<td>• Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Weight</td>
<td>• Weight</td>
<td>• Weight</td>
<td>• Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Physician appointment compliance</td>
<td>• Incentive spirometer compliance</td>
<td>• Physician appointment compliance</td>
<td>• Physician appointment compliance</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Referral Partners</strong></td>
<td>• Local hospitals</td>
<td>• Local hospitals</td>
<td>• Local hospitals</td>
<td>• Recent 911 calls</td>
<td>Recent 911 calls</td>
<td>Local emergency department</td>
</tr>
<tr>
<td><strong>Measurement tools</strong></td>
<td>• General health survey</td>
<td>• General health survey</td>
<td>• General health survey</td>
<td>• General health survey</td>
<td>General health survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Patient satisfaction</td>
<td>• Patient satisfaction</td>
<td>• Patient satisfaction</td>
<td>• Patient satisfaction</td>
<td>Patient satisfaction</td>
<td></td>
</tr>
<tr>
<td><strong>Variables</strong></td>
<td>• Re-admission rate</td>
<td>• Re-admission rate</td>
<td>• Re-admission rate</td>
<td>• Decrease in 911 calls</td>
<td></td>
<td>Return to ED within 24 hours</td>
</tr>
<tr>
<td></td>
<td>• Pre/Post health quality</td>
<td>• Pre/Post health quality</td>
<td>• Pre/Post health quality</td>
<td>• Patient satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Patient satisfaction</td>
<td>• Patient satisfaction</td>
<td>• Patient satisfaction</td>
<td>• Documented medication compliance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Documented medication compliance</td>
<td>• Documented medication compliance</td>
<td>• Documented medication compliance</td>
<td>• Documented medication compliance</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Length of Service</strong></td>
<td>• First visit within 12 hours of discharge</td>
<td>• First visit within 12 hours of discharge</td>
<td>• First visit within 12 hours of discharge</td>
<td>• First visit within 12 hours of discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pre/Post Home Health</td>
<td>• Pre/Post Home Health</td>
<td>• Pre/Post Home Health</td>
<td>• Pre/Post Home Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Currently
- Funding for the APP program is part of the EMS operating budget
- Sharing savings model with local hospitals

Future
- Health insurance providers
- State Medicaid
- Other options depending on the future of the health care system
APP: Acknowledgements

- Wake County LME Crisis and Assessment Unit (WakeBrook Campus)
- Wake Technical Community College
- Doctors Making House Calls
- Capital Care Collaborative of Wake
- Community Collaborative of Wake and Johnston Counties
- Healing Place
- Holly Hill Hospital
- Duke Raleigh, Rex Healthcare, WakeMed Health and Hospitals
- North Carolina Poison Center
- NCOEMS
Michael Bachman
Deputy Director of Clinical Affairs
Wake County EMS System
Raleigh NC

910-992-6215
mike.bachman@wakegov.com