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NURSE PRACTITIONERS ON RAPID RESPONSE TEAMS PILOT PROJECT

Vanderbilt University Hospital

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Institute for Healthcare Improvement
100,000 Lives Campaign Objectives

(DECEMBER 2004 – JUNE 2006)

- Save 100,000 lives
- Enroll more than 2,000 hospitals in the initiative
- Build a reusable national infrastructure for change
- Raise the profile of the problem (variability in the quality of American health care) - and our proactive response

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The Platform

The six interventions from the 100,000 Lives Campaign:

- Deploy Rapid Response Teams…at the first sign of patient decline
- Deliver Reliable, Evidence-Based Care for Acute Myocardial Infarction…to prevent deaths from heart attack
- Prevent Adverse Drug Events (ADEs)…by implementing medication reconciliation
- Prevent Central Line Infections…by implementing a series of interdependent, scientifically grounded steps
- Prevent Surgical Site Infections…by reliably delivering the correct perioperative antibiotics at the proper time
- Prevent Ventilator-Associated Pneumonia…by implementing a series of interdependent, scientifically grounded steps

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Why Rapid Response?

- Several studies indicate that patients often exhibit signs and symptoms of physiological instability for some period of time prior to a cardiac arrest…
- **70% (45/64) of patients show evidence of respiratory deterioration within 8 hours of arrest** Schein RM, Hazday N, Pena M, et al. Clinical antecedents to in-hospital cardiopulmonary arrest. Chest. 1990;98:1388-1392.
- **66% (99/150) of patients show abnormal signs and symptoms within 6 hours of arrest and MD is notified in 25% (25/99) of cases.** Franklin C, Mathew J. Developing strategies to prevent in hospital cardiac arrest: analyzing responses of physicians and nurses in the hours before the event. Crit Care Med. 1994;22(2):244-247

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Does Rapid Response Make a Difference?

- **50% reduction in non-ICU arrests.** Buist MD, Moore GE, Bernard SA, Waxman BP, Anderson JN, Nguyen TV. Effects of a medical emergency team on reduction of incidence of and mortality from unexpected cardiac arrests in hospital: preliminary study. BMJ. 2002;324:387-390.
- **Reduced post-operative emergency ICU transfers (58%) and deaths (37%).** Bellomo R, Goldsmith D, Uchino S, et al. Prospective controlled trial of effect of medical emergency team on postoperative morbidity and mortality rates. Crit Care Med. 2004;32:916-921.
- **Reduction in arrest prior to ICU transfer (4 % vs. 30 %).** Goldhill DR, Worthington L, Mulcahy A, Tarling M, Sumner A. The patient-at-risk team: identifying and managing seriously ill ward patients. Anesthesia. 1999;54(9):853-860.

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Does Rapid Response Make a Difference?

- **Reduction in mean monthly mortality rate (1.01 to 0.83 deaths per 100 discharges) and mean monthly code rate per 1,000 patient-days decreased by 71.7% (2.45 to 0.69 codes per 1,000 admissions) in a children's hospital.** Sharek PJ, Layla M, Parast LM, et al. Effect of a rapid response team on hospital-wide mortality and code rates outside the ICU in a children's hospital. JAMA. 2007;298(19):2267-2274.
- **17% decrease in the incidence of cardiopulmonary arrests (6.5 vs 5.4 per 1,000 admissions.** DeVita MA, Braithwaite RS, Mahidhara R, Stuart S, Foraida M, Simmons RL. Use of medical emergency team responses to reduce hospital cardiopulmonary arrests. Qual Saf Health Care. 2004;13(4):251-254.

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Joint Commission on RRT

Ideal Composition of RRT remains unresolved

- Either Ramp up (small group of responders sent to evaluate and further resources deployed as needed
- Ramp down (full team, usually with a physician member, deployed and dismissed as situation dictates.)

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Vanderbilt Hospital
Rapid Response Initiative

- Oversight by Resuscitation Program
- Ramp up team with RN + RT
- February, 2005 -- Pilot
- April, 2006 – MICU and SICU
- November, 2008 – CVICU
- Family initiated rapid response December, 2008

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RRT Coverage by Unit		
SICU	MICU	CVICU
9 North	11 North	5 South
9 South	8 North	6 South
Labor & Delivery	8 South	7 North
3 Round Wing	7 Round Wing	MCE Cardiology 5th Floor (South Tower)
4 Round Wing	CRC	Cardiac MRI
5 Round Wing	6 North	Cath Lab Holding
6 Round Wing	10 South (STATS covered by 10N Trauma)	
4 East	Endoscopy	
Burn Stepdown	Radiology	
4 Maternal Special Care	TVC OBS - ED Holding	
	7 South Bronch Lab	

Activation of Rapid Response
Clinical Policy CL 30-08.16

Policy:

- The Rapid Response Team may be activated when non-Intensive Care Unit (ICU) patients meet any of Early Warning Signs. **In addition to staff, patients, visitors, or family members may activate the Rapid Response Team using the simple guideline of "something is just not right" or when a medical emergency exists.**

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Vanderbilt RRT

If the patient displays any of the following "EARLY WARNING SIGNS," **Call 1-1111 and request the Rapid Response Team without delay.** Then call the patient's primary team physician.

Staff Concerned/Worried	"THE PATIENT DOES NOT LOOK/ACT RIGHT," gut instinct that patient is beginning a downward spiral even if none of the physiological triggers have yet occurred
Change in Respiratory Rate	The patient's RESPIRATORY RATE is less than 8 or greater than 30
Change in Oxygenation	PULSE OXIMETER decreases below 90%
Labored Breathing	The patient's BREATHING BECOMES LABORED
Change in Heart Rate	The patient's HEART RATE changes to less than 40 bpm or greater than 120 bpm
Change in Blood Pressure	The patient's SYSTOLIC BLOOD PRESSURE drops below 90 mmHg or rises above 200 mmHg
Hemorrhage	The patient develops uncontrollable bleeding from any site or port
Decreased LOC	The patient becomes SOMNOLENT, DIFFICULT TO AROUSE, CONFUSED, or OBTUNDED
Onset of Agitation/Delirium	The patient becomes AGITATED OR DELIRIOUS
Seizure	The patient has a SEIZURE
Other Alterations in Consciousness	ANY OTHER CHANGES IN MENTAL STATUS OR CNS STATUS such as a sudden blown pupil, onset of slurred speech, onset of unilateral limb or facial weakness, etc.

Barriers Identified

- Needed immediate provider on rapid response call to decrease delay in treatment
- Provider needed to place off protocol medications, labs, diagnostics quickly
- Provider needed to facilitate communication with primary team and ICU team
- Provider needed to expedite transfer to ICU when necessary

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NP on RRT Pilot

- Proposal for pilot presented to Rapid Response Steering Committee in December, 2010
- MICU NPs going to calls unofficially since October, 2010, started with pilot January 1, 2011
- SICU to daytime calls – January 11, 2011
- SICU developed and interim standard of practice through their MDSCC

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Training

- Critical Care trained ACNP
- ACLS, FCCS
- History and Goals of Rapid Response
- Communication with Nurse, Primary Team, ICU Fellow/Attending
- Simulation Training
- Documentation/ Billing

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Multi - ICU Simulation Training for Emergency Response

Electronic Note Developed

- For Documentation of Evaluation and Management and Critical Care
- Collaboration with VMG Coding/Billing and Star Panel Informatics
- Rapid Response NP/PA Note

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Data Collection

- Research of ACNPs on RRT
  Pirret, Alison M. The Role and Effectiveness of the Nurse Practitioner on a Critical Care Outreach Service. Intensive and Critical Care Nursing. 2008;24:375-382
- Data Mining of >100 notes at end of February
- Potentially Relevant Data Identified
- Database Developed when manual entry and collection recognized too cumbersome
- NPs enter information into Secure Redcap Database at end of each call

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Data Collection

- Demographics
- Responding Team and to which Floor
- Triggers for call
- NP Diagnosis/Interventions
- Prior ICU admission, OR or procedures and time since?
- Discussion with MD
- Agreement on Disposition?
- Disposition – to preferred ICU?
- Barriers to Transport
- Further Review Needed –why?

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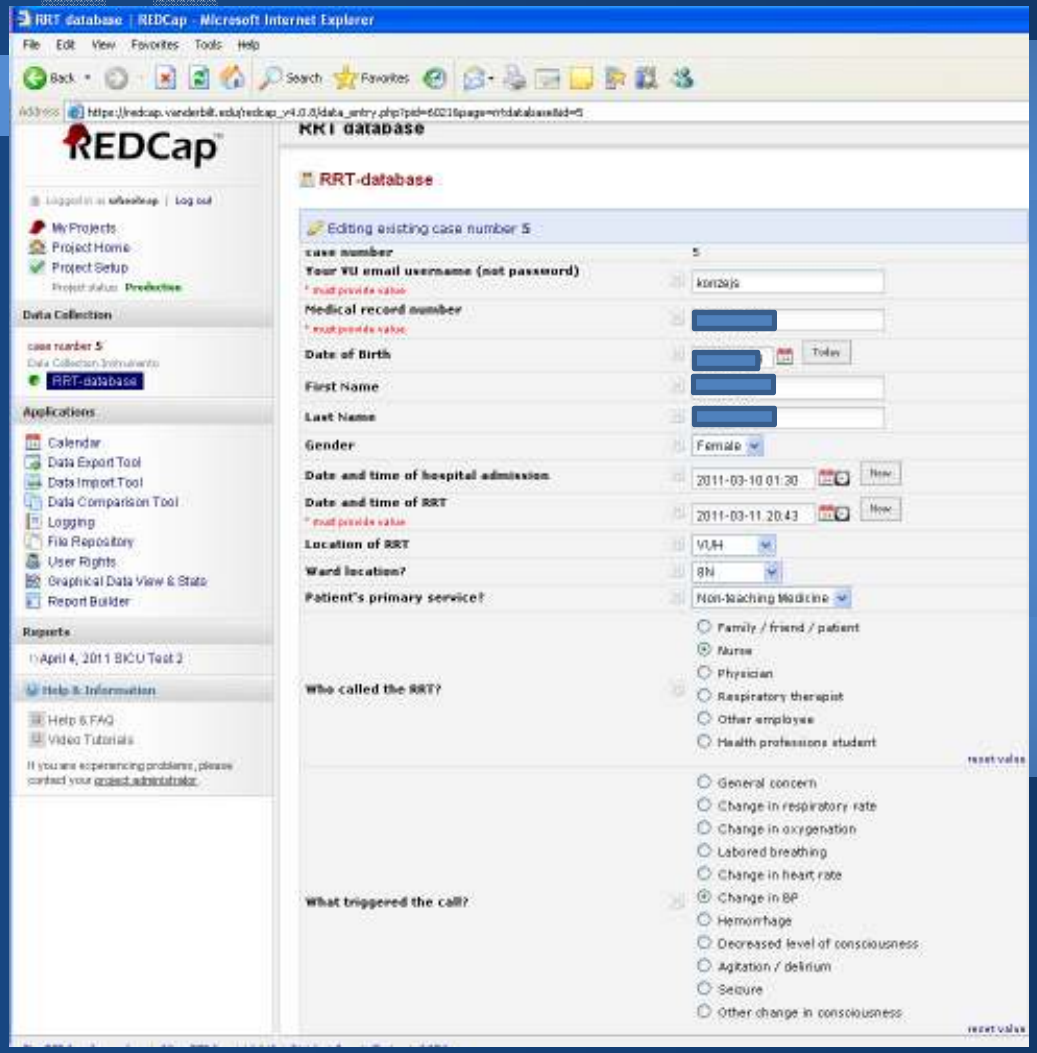
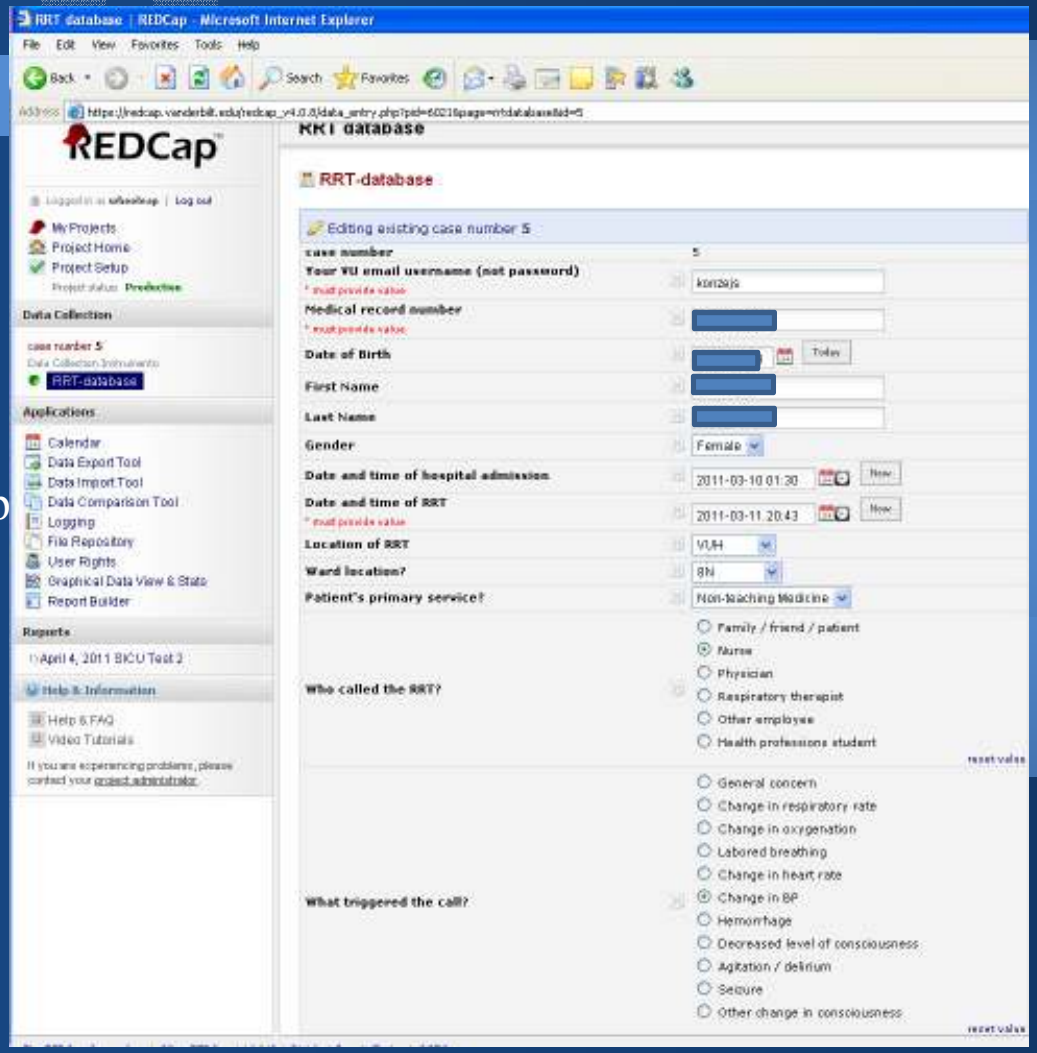
NPs on RRT Redcap Database



- 309 calls Jan-May
- Average time of call 31.8 minutes
- 103 transfers to ICU
- 114 encounters generated critical care billing
- NP unique interventions - 1005
  - 112 lab tests
  - 154 medications
  - 84 x-rays, 88 EKGs
  - 9 procedures
  - 256 education events

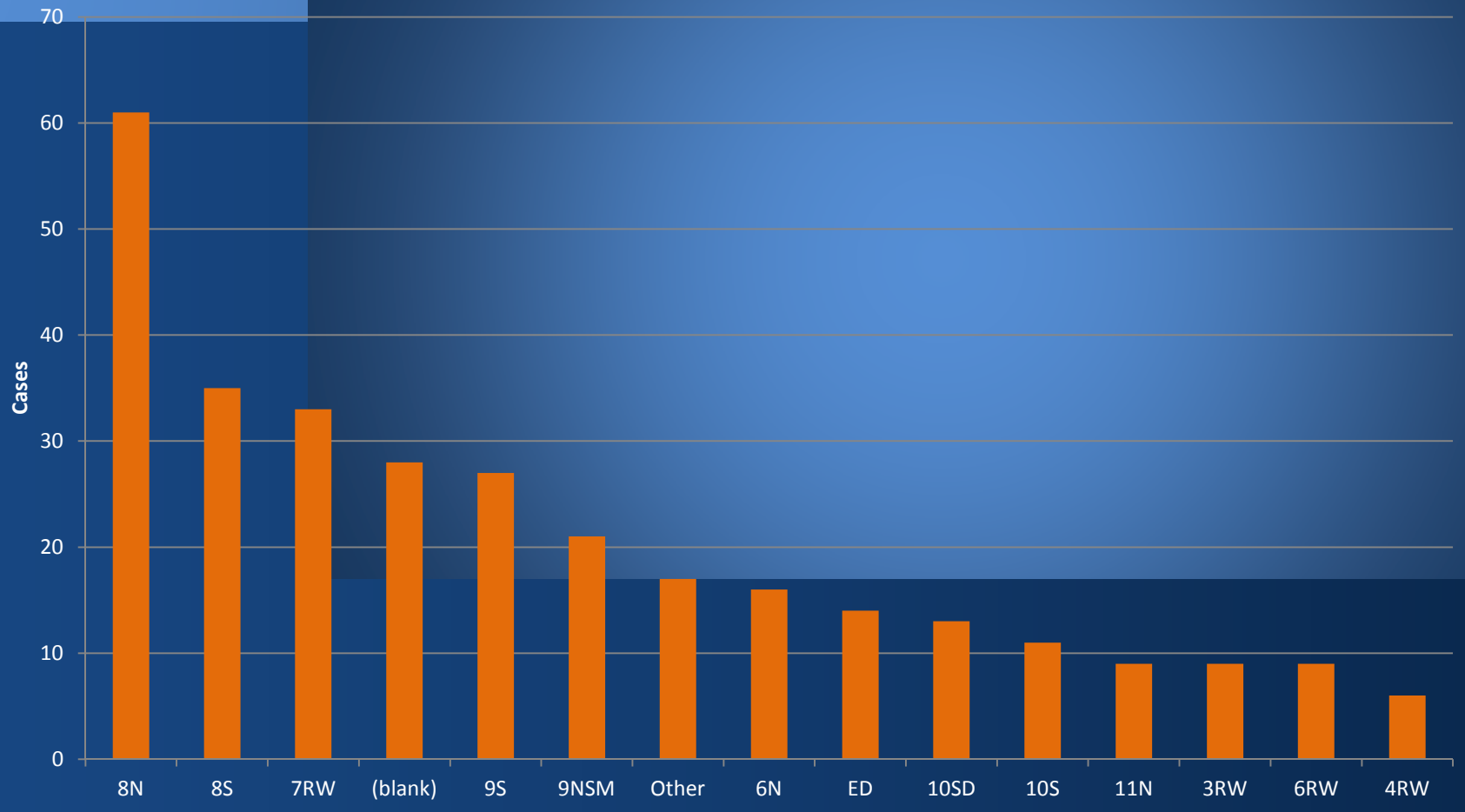
NPs on RRT Redcap Database

– Up

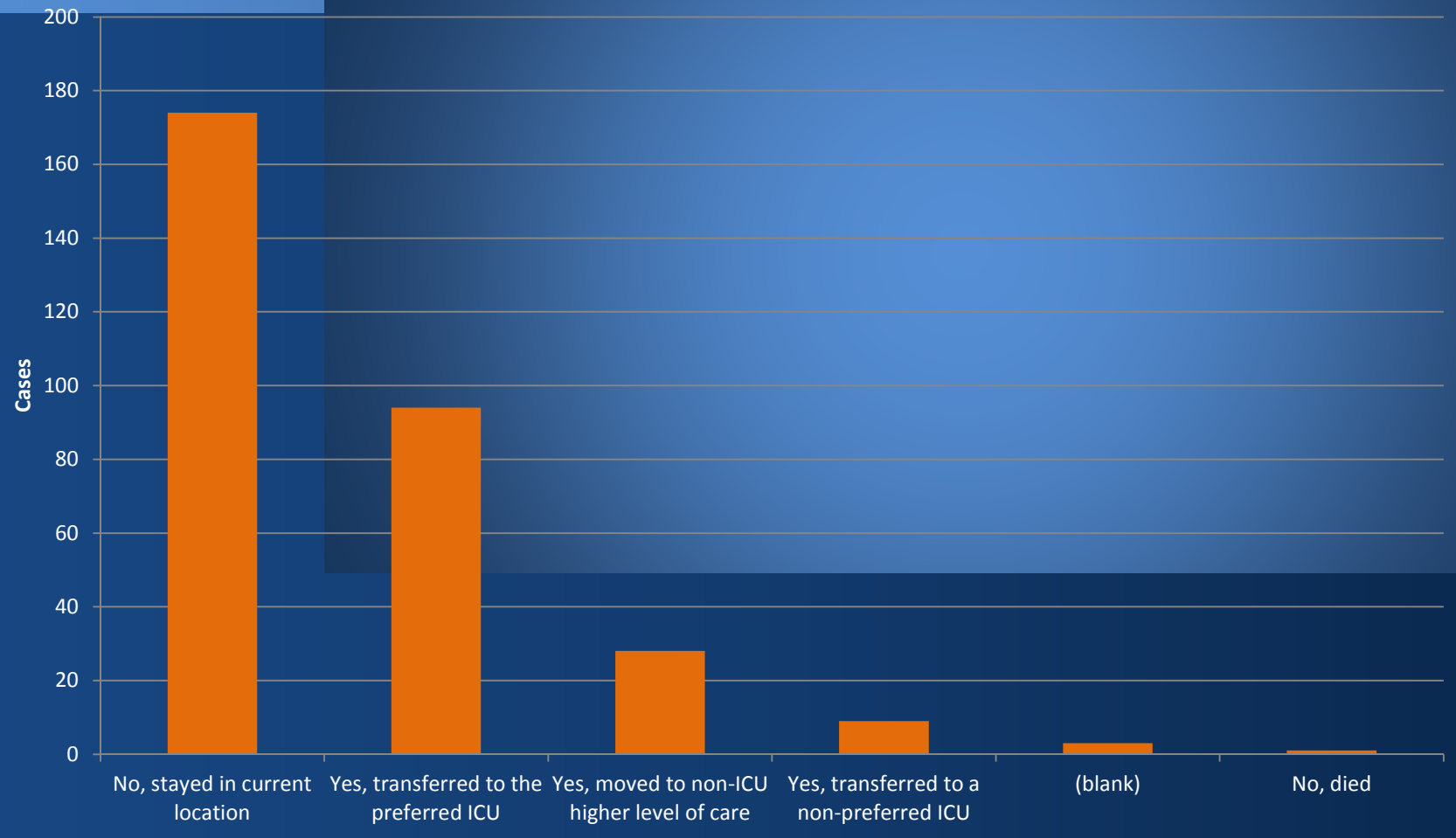


- 898 calls Jan-Dec
- Average time of call 31.8 minutes
- 303 transfers to ICU
- 317 encounters generated critical care billing
- NP unique interventions - 3056
  - 341 lab tests
  - 454 medications
  - 257 x-rays, 257EKGs
  - 26 procedures
  - 860 education events

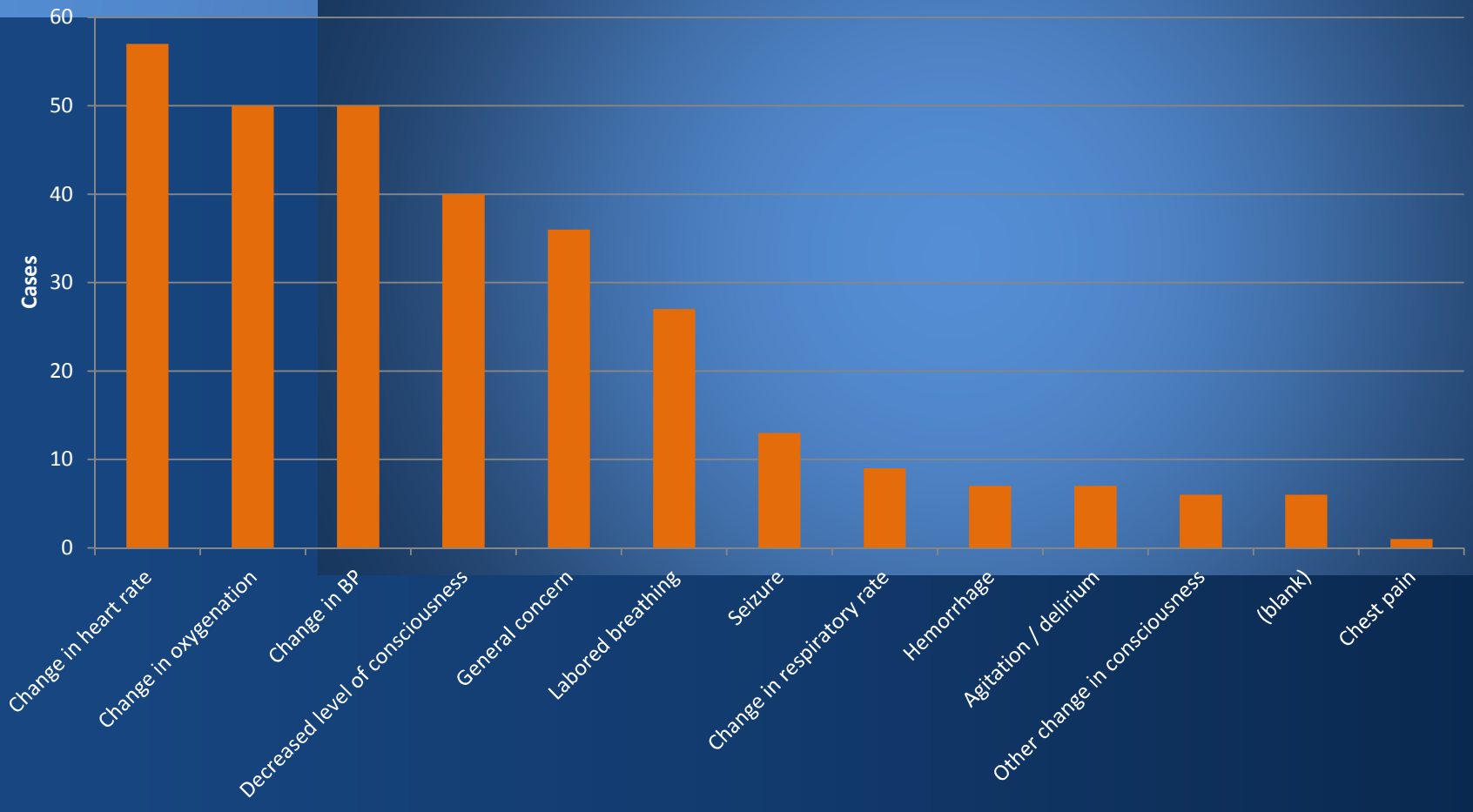
Location of Rapid Response Calls
January – May 2011



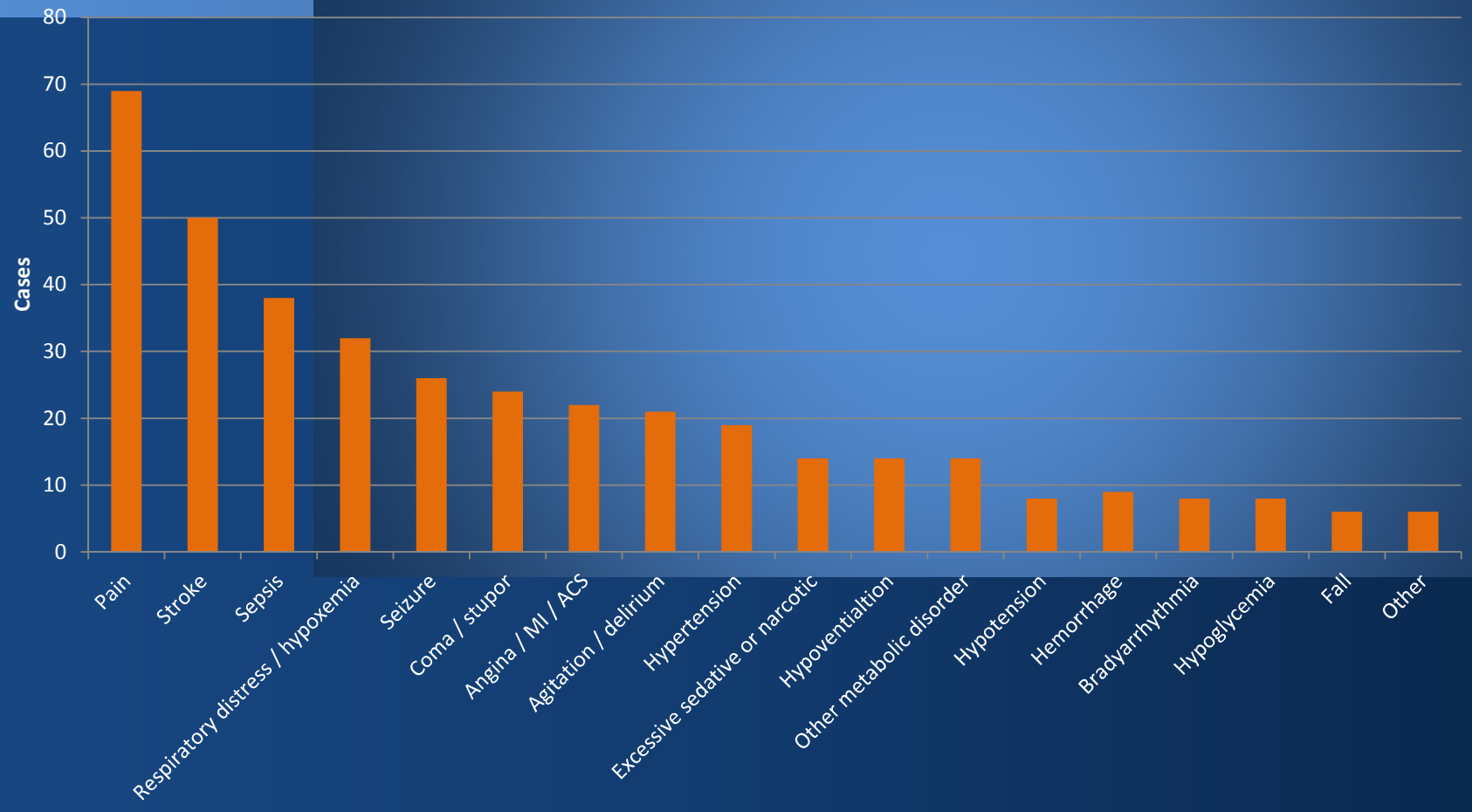
Final Disposition of Patients on Rapid Response Calls January – May 2011



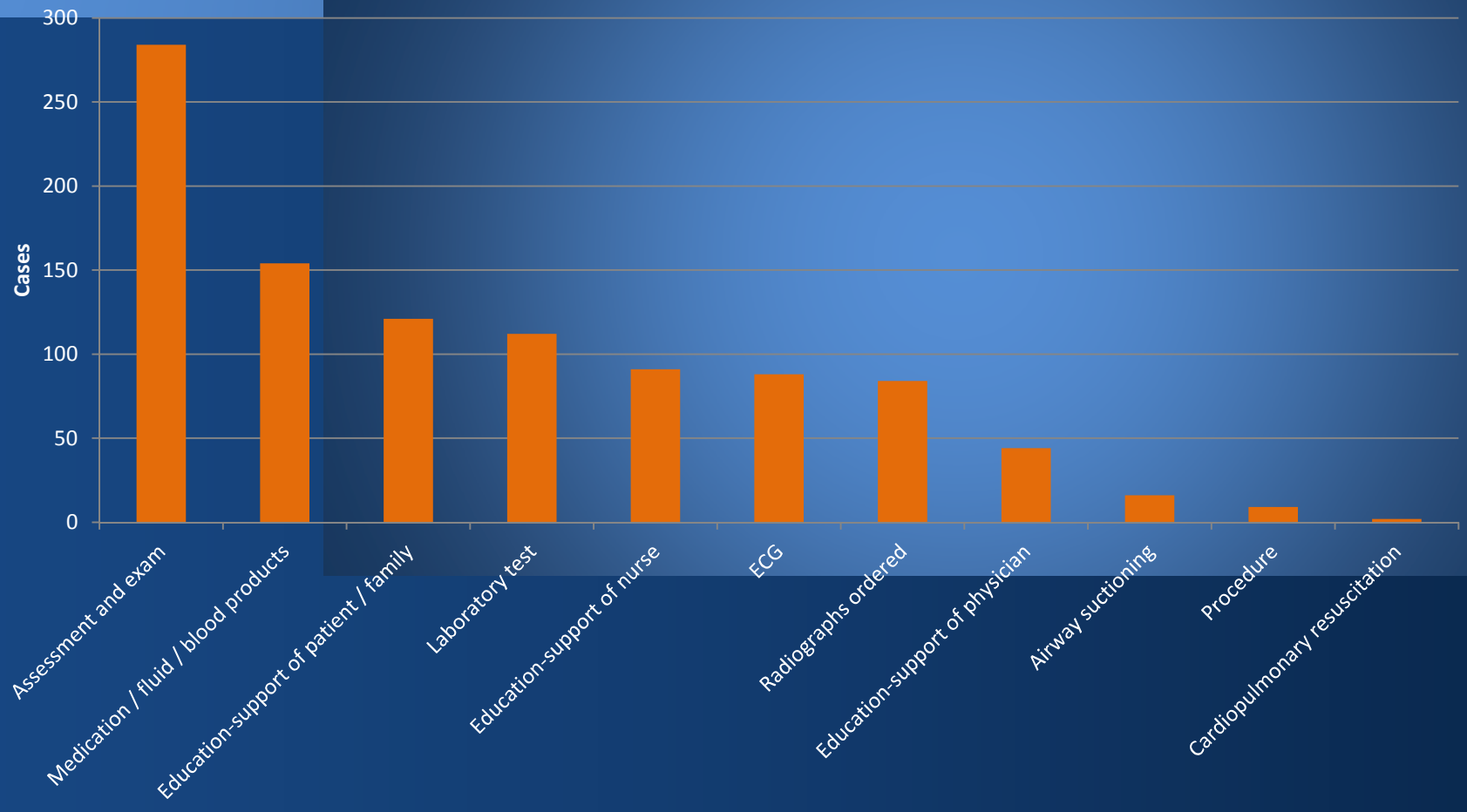
Triggers for RN, Staff, MD or Family to Call a Rapid Response Jan- May 2011



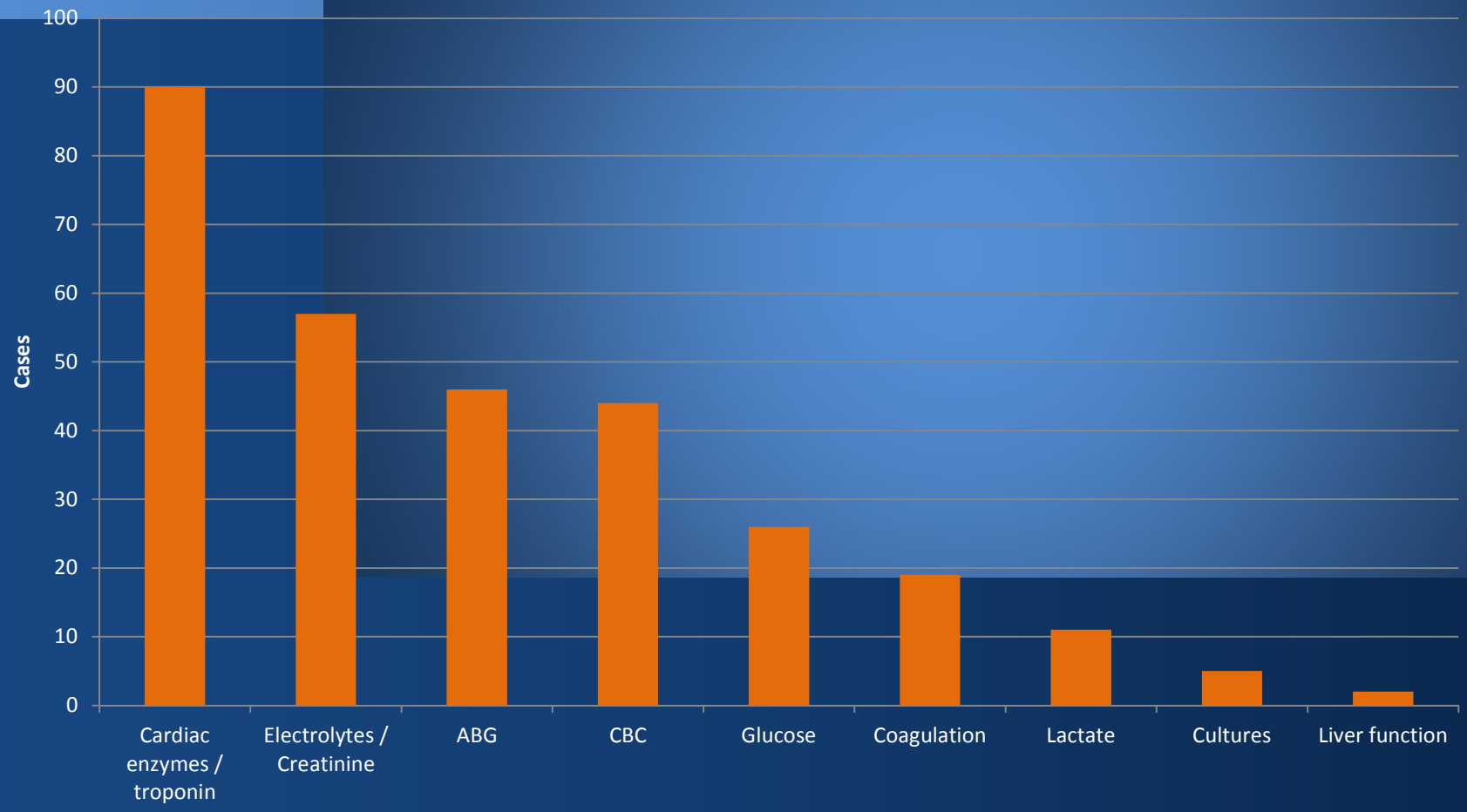
NP Diagnoses on Rapid Response Calls
January – May 2011



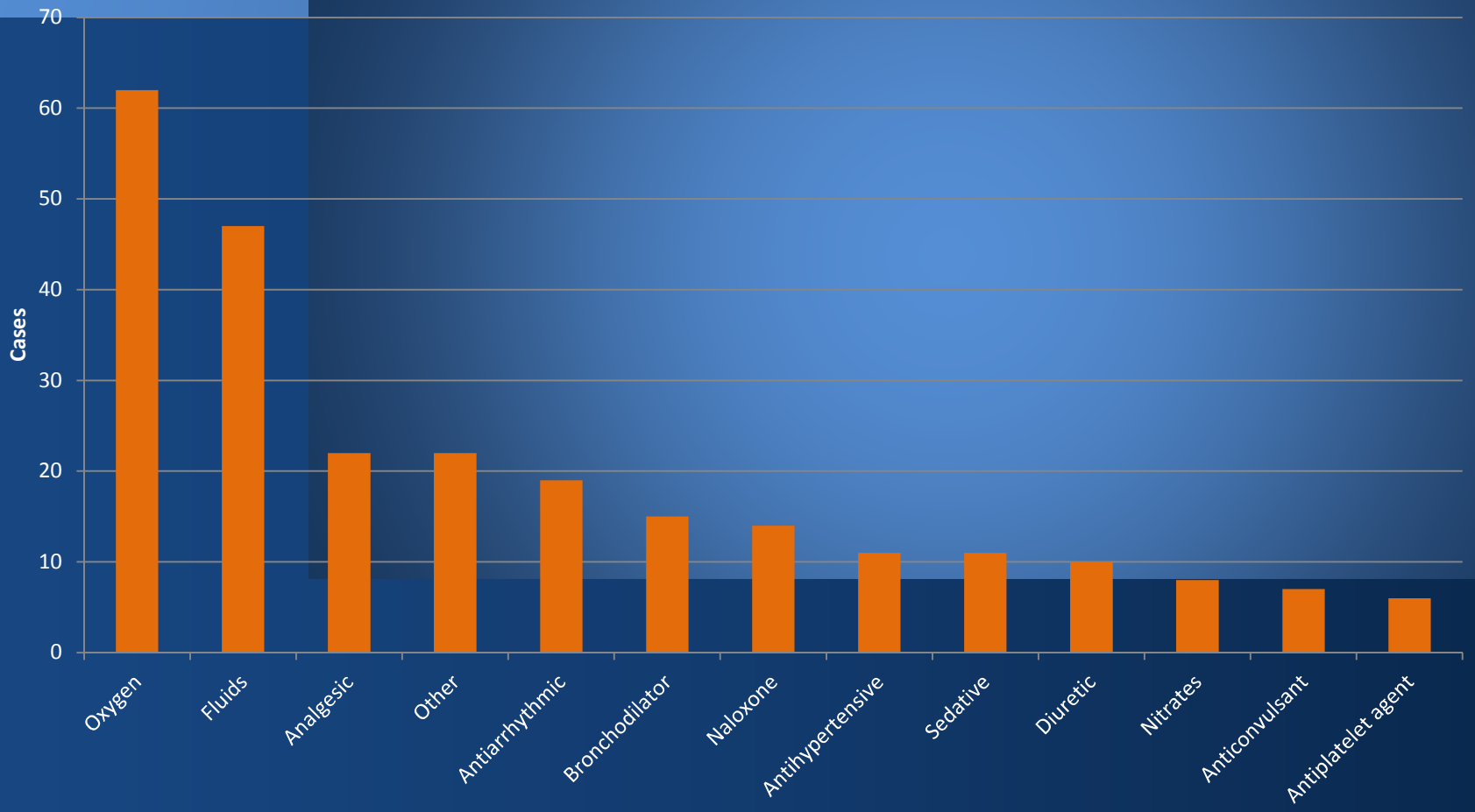
NP Interventions on Rapid Response Calls
January – May 2011



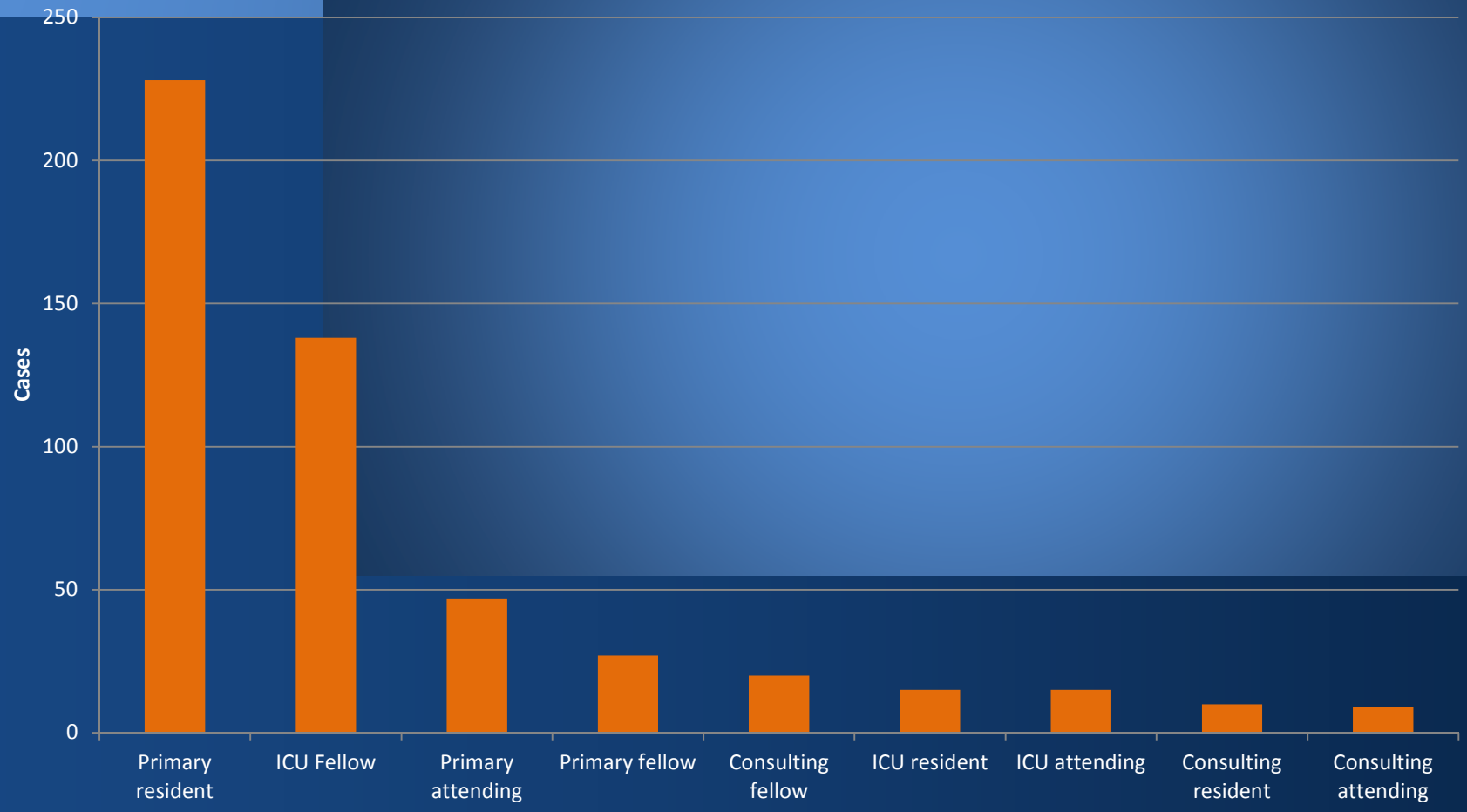
Lab Tests Ordered by NP on Rapid Response Calls January – May 2011



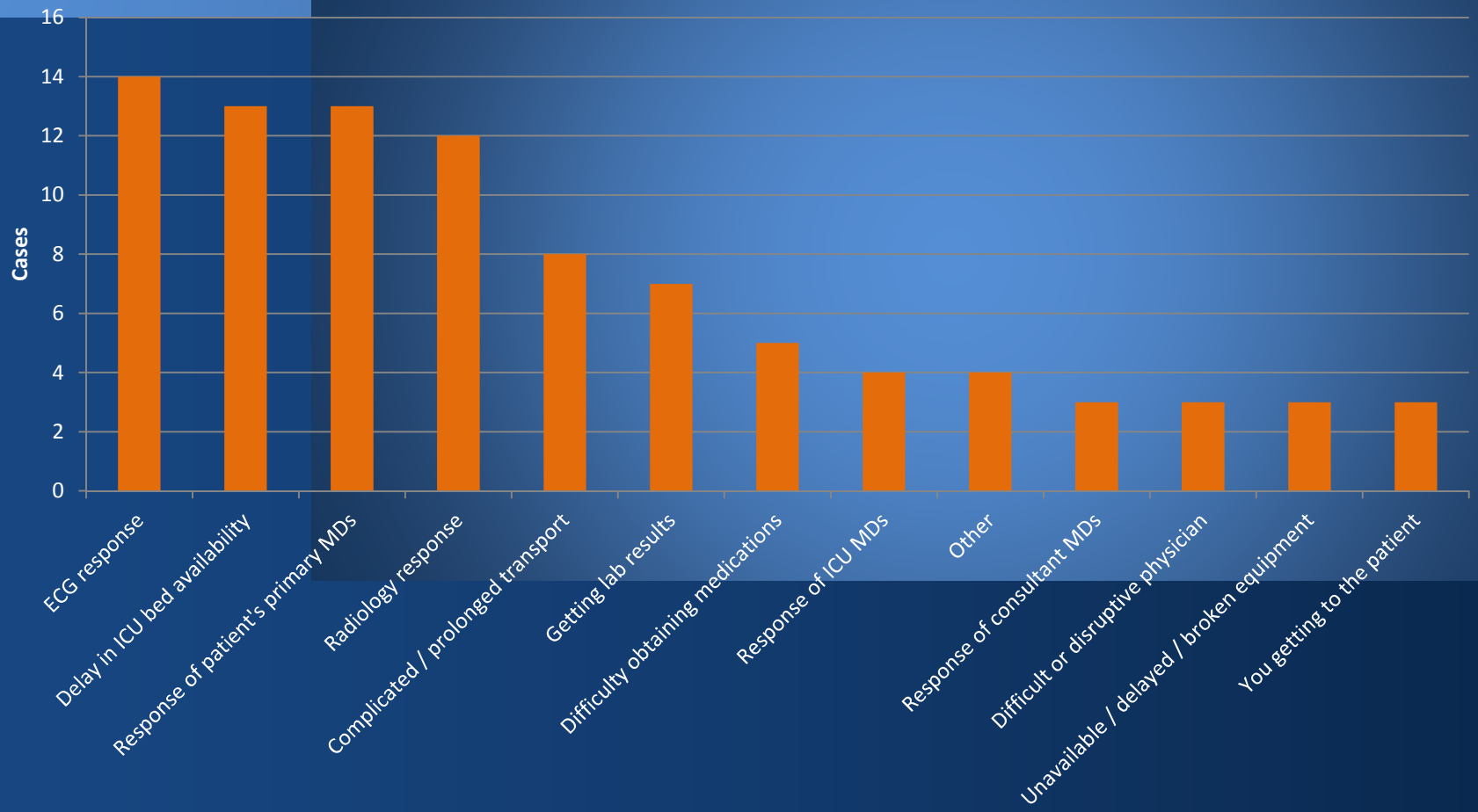
Medications Ordered by NP on Rapid Response Calls January – May 2011



NP Contacted MD on Rapid Response Calls January – May 2011

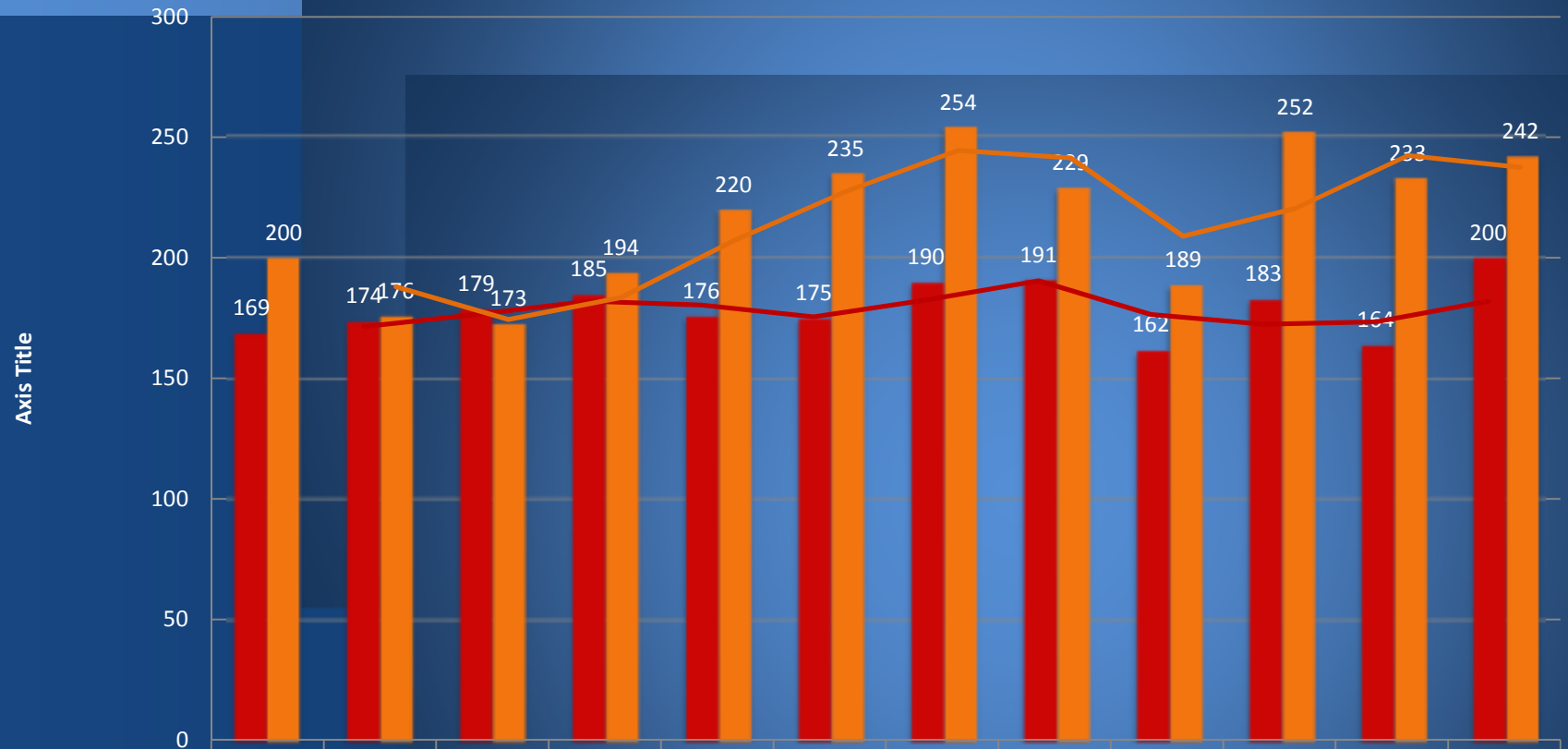


Barriers Identified by NP on Rapid Response Calls January – May 2011



Update Jan-Dec Data

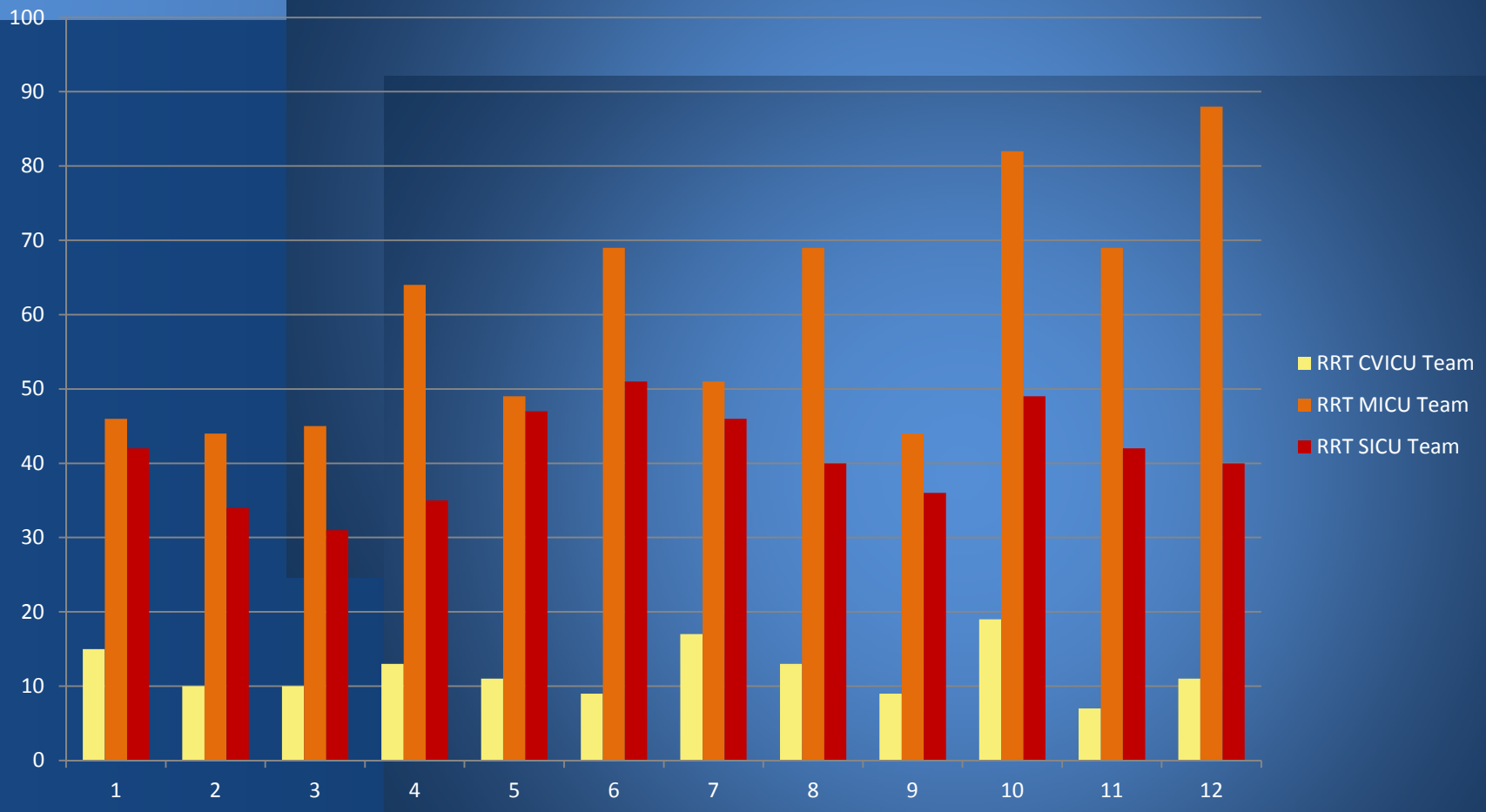
RRT Calls 2010 vs 2011



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RRT Pages 2010	169	174	179	185	176	175	190	191	162	183	164	200
RRT Pages 2011	200	176	173	194	220	235	254	229	189	252	233	242

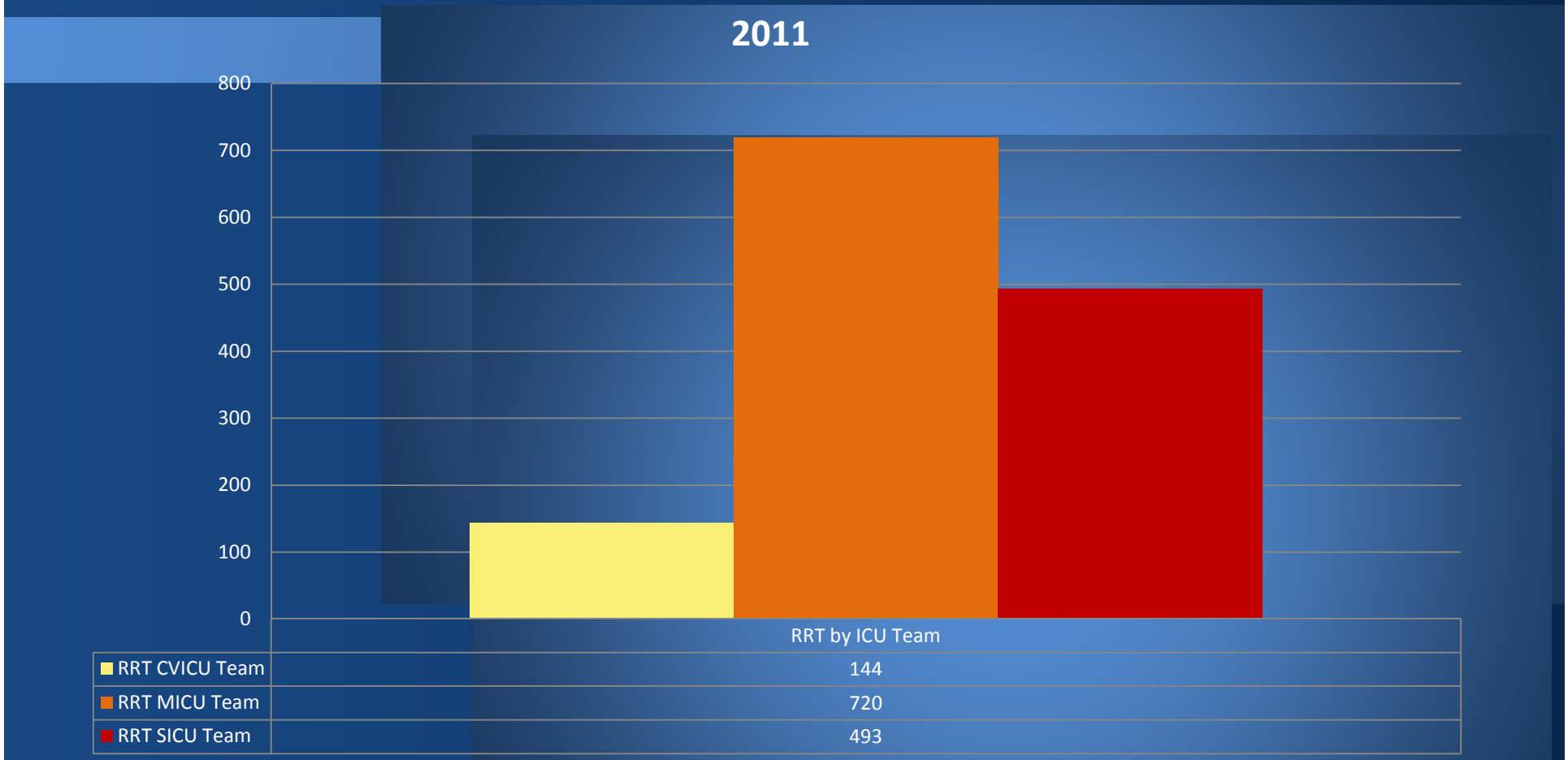
Update Jan-Dec Data

Rapid Response calls by month 2011

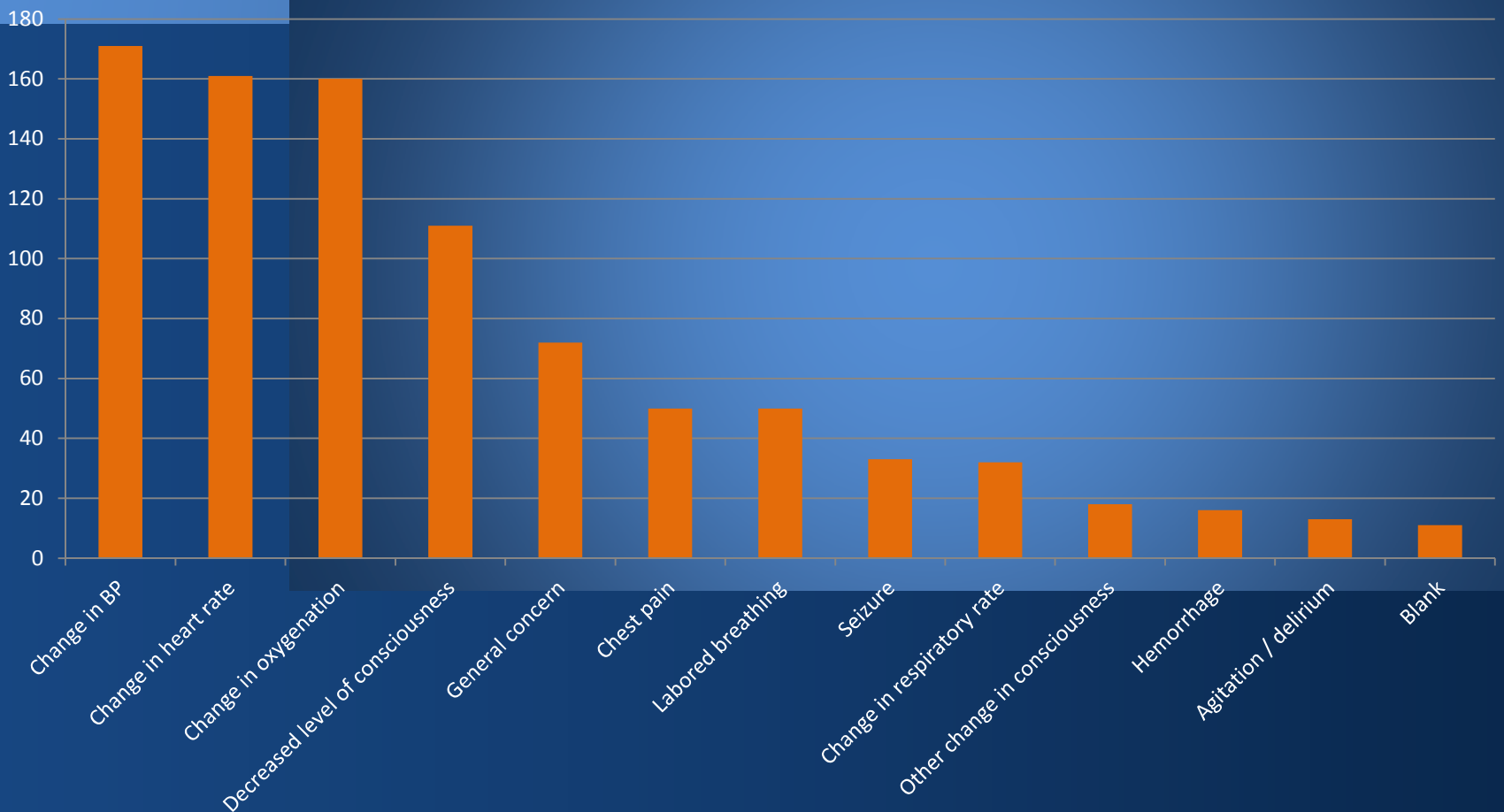


Update Jan-Dec Data

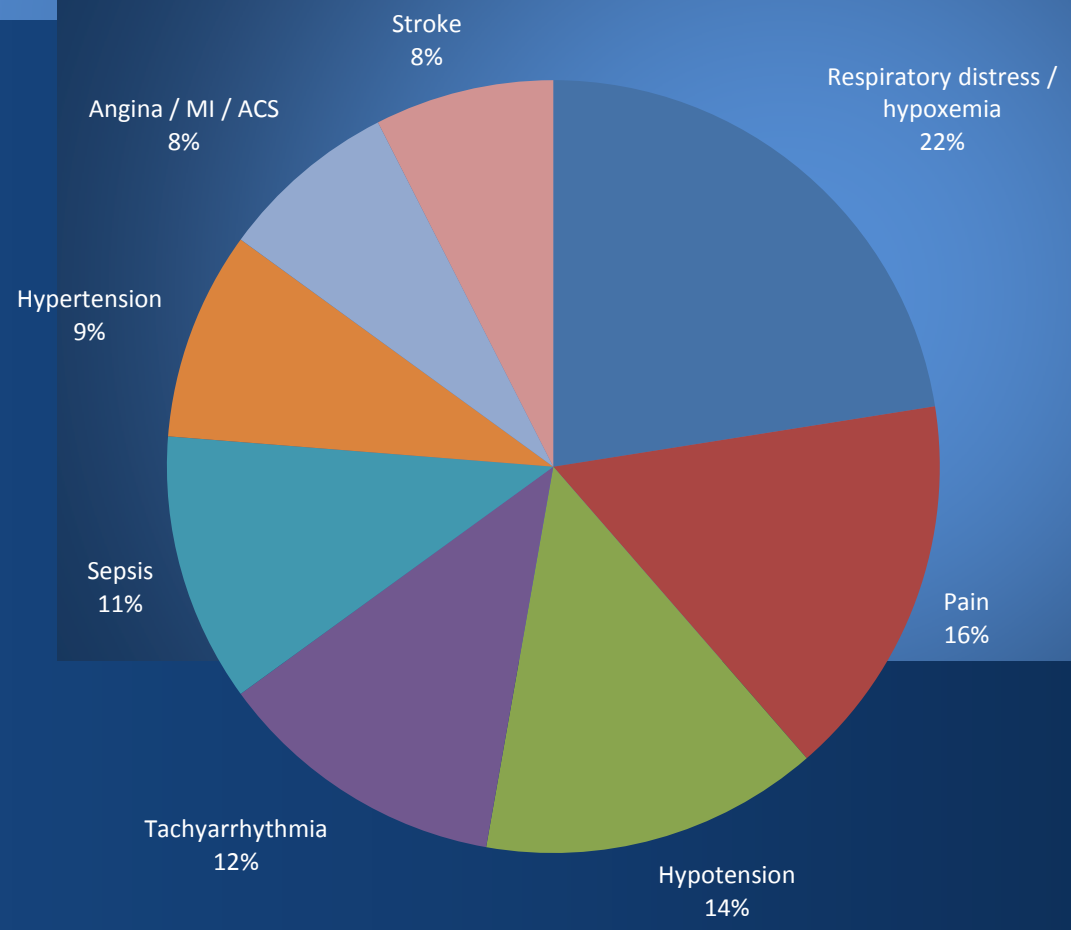
ICU Team RRT Calls



Triggers Jan-Dec

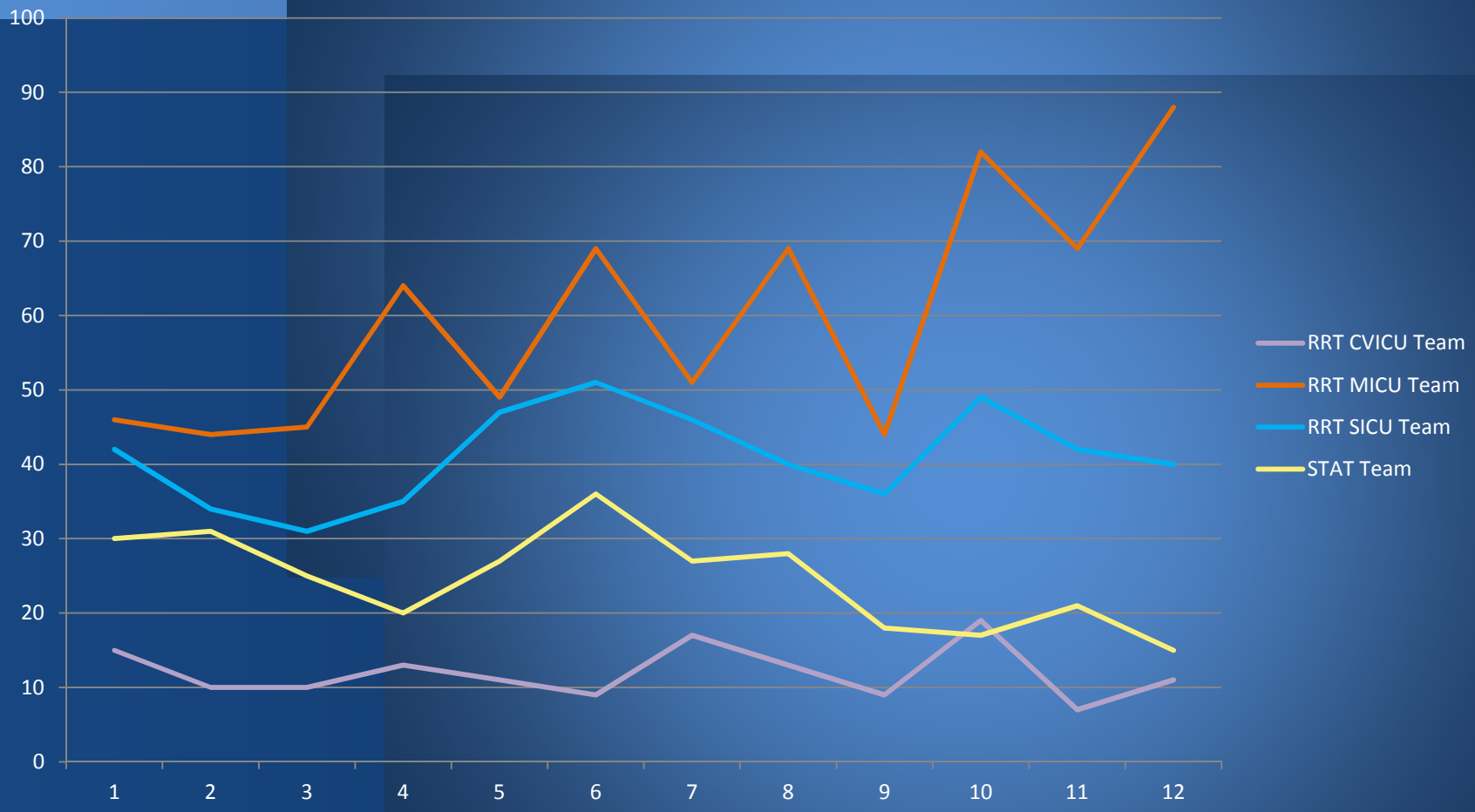


ACNP Diagnoses Jan-Dec

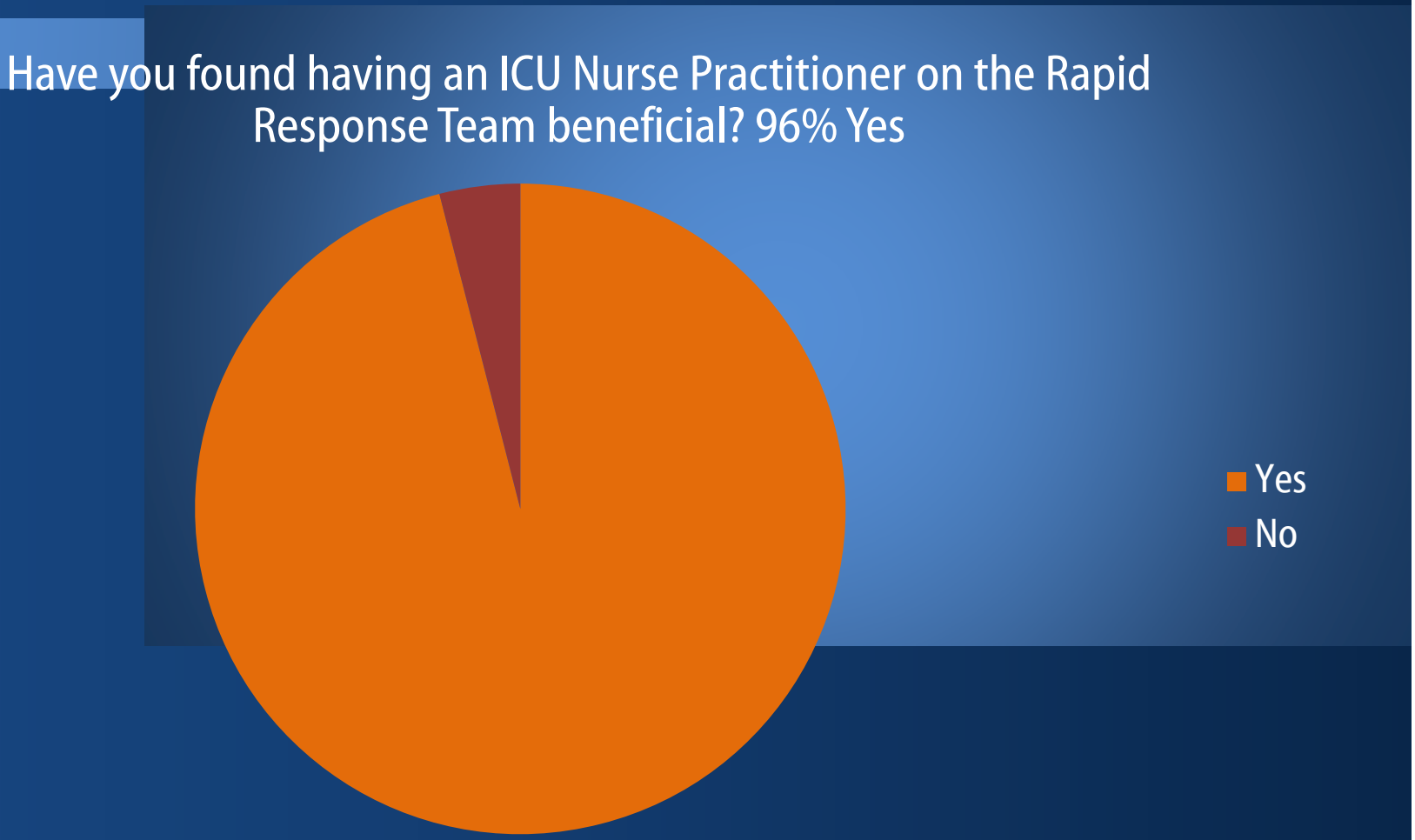


Update Jan-Dec Data

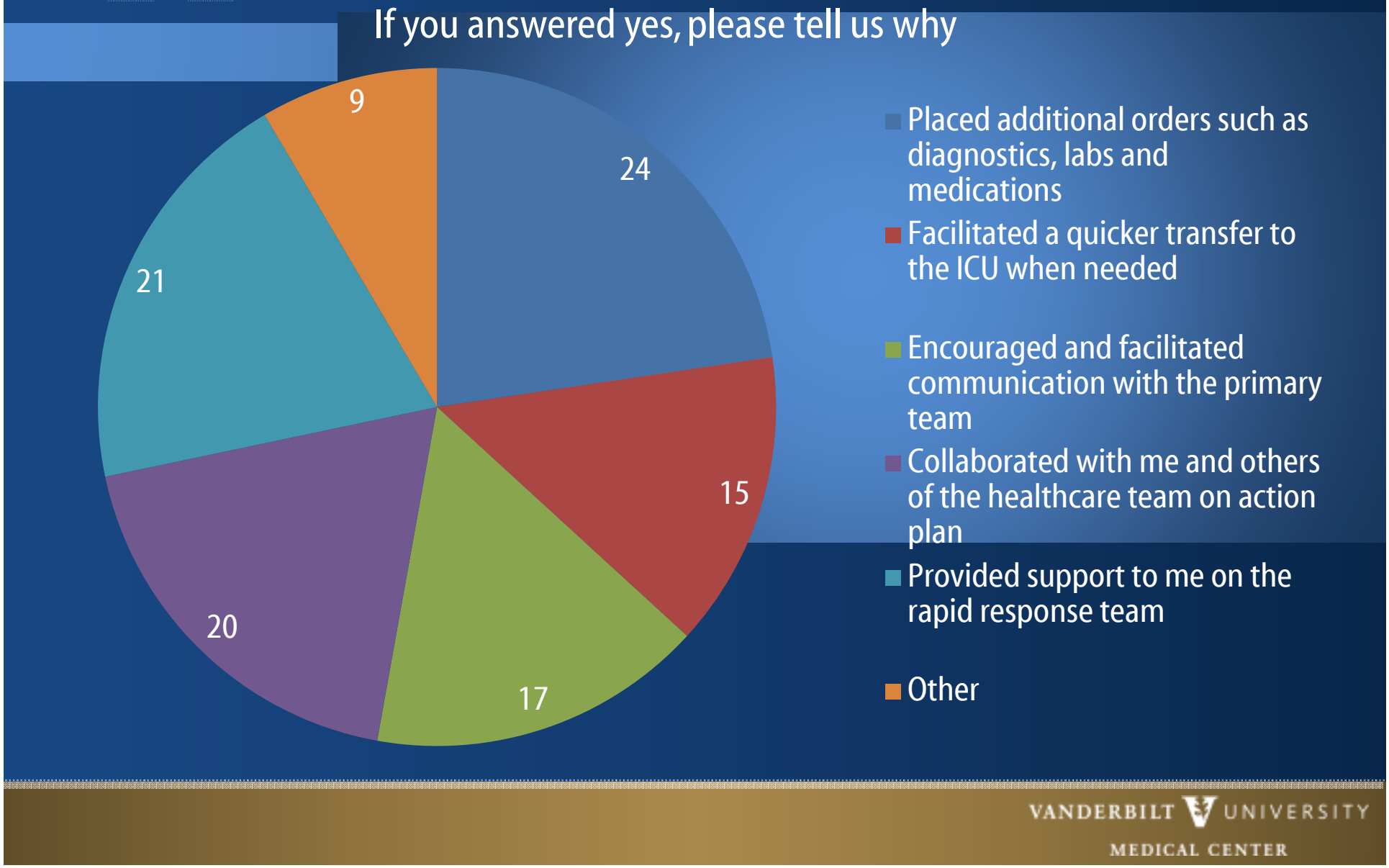
RRT vs Code 2011



Did We Address the Initial Problem?



If you answered yes, please tell us why



Summary

- Is NP beneficial on RRT? 96% yes
  - Provides orders outside RN scope 100%
  - Facilitated quicker transfer to the ICU when needed 62.5%
  - Facilitated communication with primary team 70.8%
  - Collaborated with healthcare team on action plan 83.3%
  - Provided support to CN 87.5%
- Knowledgeable and skilled in emergency? 100% yes
- Promote teamwork? 100% yes
- Provide education? 86% yes, 14% n/a

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Charge Nurses and Help-alls share other benefits of an NP on the RRT…..

- I liked it, because before the NPs went on the RRTs I would typically find myself in a room with the patient acutely going bad while the primary team would say "The ICU nurse is here we are going to take care of our other patients." So I would not only be trying to get the patient back to the ICU but trying to take care of the patient at the same time. I like the additional support the NPs provide, because they can put in additional orders that I might need, while I concentrate on taking care of the patient
- This has been wonderful! We can immediately start ordering labs, tests, and such to investigate patients' condition. This is a great time-saver. Their additional knowledge of diseases and treatment of conditions is very helpful.
- The house staff are more receptive to the NP's suggestions.
- I feel more comfortable with them on the call because I feel like more things will get done in a timely manner. I also feel that those calls which pts. may or may not need to come (to the ICU), the NPs can help make that decision. This will provide appropriate transfers to be made.

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Process Improvement

- Multiple processes identified for further research and improvement
  - Recommended improvements to bed assignment process flowchart
  - Established criteria for always contacting ICU fellow/attending
  - Systems improvement to expedite CXR and EKG
  - Systems improvement underway to expedite lab results and medication delivery
  - Improved communication of updates to housestaff, nursing and administration

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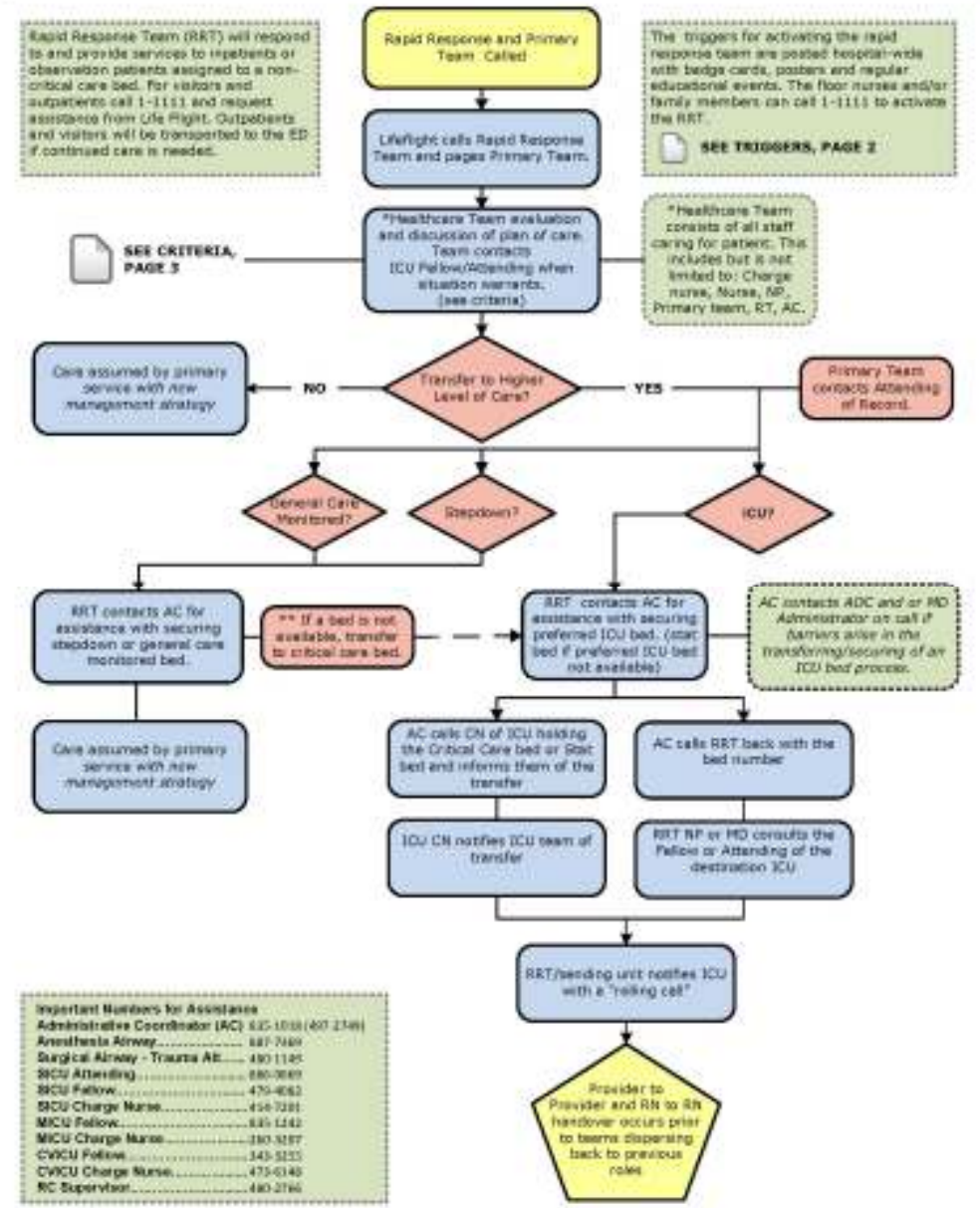
Rapid Response Team Process Flowchart ---- APPROVED 10/21/11



Criteria for the RRT ACNP to contact the ICU fellow/attending and discuss the situation and whether a transfer is warranted.

1. If the patient needs a higher level of care.

2. Inability to resolve the reason for the RRT call within 30 minutes.

3. If the RRT has been called multiple times on the same patient.

4. If there is not mutual agreement between the Primary team and the RRT that the RRT should be dismissed from a patient.

5. If any of the following conditions occur:

CNS -- Altered mental status; Any new focal neurologic deficit

PULM-- Bipap and/or FiO2 50% or >; Suspected new onset PE/pneumonia/ARDS/ pulmonary edema/suspected or witnessed aspiration

CV-- HR < 40 or >140/min; SBP <90 or >180 mmHg; New onset Arrhythmia; ACS with instability; Acute CHF

METABOLIC – Temperature > 41 OR < 35 degrees centigrade; HHNK or DKA. New onset hypoglycemia (BG < 60, requiring > 1 ampule of glucose)

HEMATOLOGIC-- Massive acute bleeding ; HCT <24 after >4 units of PRBCs in 24 hours; PLTs< 50 000 with persistent bleeding

ID – SIRS with hemodynamic instability; Sepsis

RENAL-- Acute renal failure; Anuria despite resuscitation; UOP <25cc/hr >12hr; Cr doubled during hospital stay

LABS – Lactate >4 despite fluid resuscitation; pH <7.25 despite resuscitation

NP Role Clearly Defined

- Respond with charge nurse and respiratory therapist
- Perform assessment and initiate early management
- Facilitate team communication and collaboration
- Provide critical care management when necessary
- Perform emergent procedures if immediately needed
- Triage to appropriate level of care
- Document evaluation and management
- Collect data and participate in process improvement
- Take issues and grievances to ICU collaborative meetings. Persistent or sentinel system issues can be taken to the Rapid Response Steering Committee and Institutional Critical Care Committee.

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Conclusions

- NPs decrease time between symptom onset and treatment.
- NPs facilitate rapid transfer to ICU when necessary.
- NPs evaluate, diagnose and initiate consistent, early management.
- NPs facilitate team communication and collaboration.
- NPs provide critical care management when necessary.
- NPs perform emergent procedures if immediately needed.

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Conclusions (cont'd)

- NPs provide staff, patient and family education.
- NPs facilitate early consultation with other healthcare teams.
- NPs decrease unnecessary returns to ICU by early communication and management.
- NPs collect additional data for identification of issues and process improvement.
- NPs are able to bill for calls.

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Barriers?

- Not enough NPs to cover RR 24/7 while managing ICU patients
- Variable NP experience
- Need for Backup NPs when ICU NP involved in procedure or high acuity patients in the ICU

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Future Expansion

- NPs on all Emergency Response – RR, Stat, Codes
- NP, RN, RRT Team Training
- Research NP on Stroke Alert Team
- Multiple Research Projects Identified as a Result of Pilot – Encouraging MD/NP Research Teams
- Dedicated Rapid Response Team

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Thank You!

- MICU and SICU Nurse Practitioners
- Vanderbilt Nursing
- MICU and SICU Multidisciplinary Teams
- Vanderbilt Lifeflight
- Rapid Response Steering Committee
- Critical Care Anesthesia

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