Getting Started Kit:
Rapid Response Teams
How-to Guide

Safer Healthcare Now!

We invite you to join the *Safer Healthcare Now!* Campaign (SHN) to help improve the safety of the Canadian healthcare system. *Safer Healthcare Now!* is a National campaign supporting Canadian healthcare organizations to improve patient safety by using quality improvement methods to integrate evidence and best practices in patient care delivery. The campaign is supported by the Institute for Healthcare Improvement (IHI) and is patterned after IHI's *100,000 Lives* Campaign (now 5 Million Lives Campaign). To join the SHN! Campaign, obtain further information about resources, contacts, and tools, visit our website:
http://www.saferhealthcarenow.ca/EN/Pages/default.aspx

Patient safety interventions are organized as bundles and described in Getting Started Kits, based on those originally developed by IHI for its *100,000 Lives* Campaign (now 5 million lives campaign). These kits are designed to engage your teams and clinicians in a dynamic approach for quality improvement, and to provide a thorough basis for *getting started*. **Please note that although the SHN kits and the original kits developed by IHI are similar, there are also key differences in the content of the interventions and corresponding measures for some kits.** These differences are clearly noted in the body of the SHN kits themselves, and on the SHN website.

The "Getting Started" kits are based on the current state of knowledge. Consistent with the dynamic nature of this campaign, which continues to evolve, emerging evidence may influence adaptation of the kits in the future. This kit was reviewed and updated in April 2009. We remain open to working consultatively on updating the content as together we make healthcare safer in Canada.

Effective March 14, 2019, the Canadian Patient Safety Institute has archived the Rapid Response Teams intervention. For additional inquiries, please contact info@cpsi-icsp.ca

The Quebec Campaign: Together, let's improve healthcare safety! works collaboratively with the SHN Campaign. The GSKs for all six targeted interventions used in both campaigns are the same and the leader for the Quebec Campaign is a member of the SHN National Steering Committee.

Acknowledgement

We wish to thank and acknowledge the Institute for Healthcare Improvement (IHI) for their significant support and contributions to the *Safer Healthcare Now!* Campaign. The material contained in these Canadian "Getting Started" kits has been modified from the original documents created by the Institute for Healthcare Improvement (IHI) for its *100,000 Lives* Campaign (now 5 million lives campaign) to be better aligned with the Canadian healthcare setting.

In addition, we also wish to thank and acknowledge our Canadian ICU Collaborative faculty who has contributed significantly to the work of the RRT teams and the revisions to this kit. In particular, we acknowledge the work of Dr. Ann Kirby.

Canadian ICU Collaborative Faculty

Ms. Paule Bernier, *P.Dt., MSc, Sir MB Davis Jewish General Hospital (McGill University), Montreal*

Dr. Paul Boiteau (Chair), *Department Head, Critical Care Medicine, Calgary Health Region; Professor of Medicine, University of Calgary*

Mr. Mike Cass, *BSc, RN, MScN, Advanced Practice Nurse, Trillium Health Centre*

Ms. Leanne Couves, *Improvement Associates Ltd.*

Ms. Rosmin Esmail, *BSc, MSc*

Mr. Bruce Harries, *Improvement Associates Ltd.*

Dr. Ann Kirby, *Associate Professor, University of Calgary; Chair, Quality and Safety Improvement Council; QI Physician, Department of Critical Care Medicine, Calgary Health Region*

Mr. Gordon Krahn*, BSc, RRT, Quality and Research Coordinator, BC Children's Hospital*

Dr. Denny Laporta, *Assistant Professor of Medicine; Chief Adult Critical Care Division, Sir MB Davis Jewish General Hospital*

Dr. Claudio Martin, *Professor, Schulich School of Medicine and Dentistry, University of Western Ontario; Attending Physician, London Health Sciences Centre*

Ms. Debbie Lynch, *RN, ICP Eastern Heath, St. John's*

Ms. Cathy Mawdsley, *RN, MScN, Clinical Nurse Specialist – Critical Care, London Health Sciences Centre; Adjunct Professor, School of Nursing, University of Western Ontario*

Dr. Sherissa Microys, *Assistant Professor, University of Ottawa; Intensivist, Ottawa Hospital; Major, Canadian Forces*

Dr. John Muscedere, *Assistant Professor of Medicine, Queens University; Intensivist, Kingston General Hospital*

Ms. Tracie Northway, *RN, MScN, BC Children's Hospital*

Ms. Jannell Plouffe, *RN, MScN, Nurse Practitioner PICU, Winnipeg Children's Hospital*

Ms. Kimberly Rafuse, *RN, BScN, DOHN, ICP Annapolis Valley District Health Authority*

Dr. Peter Skippen, *Division Head & Medical Director, Pediatric ICU, BC Children's Hospital, Vancouver*

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Background

What Is a Rapid Response Team?

A Rapid Response Team (RRT) – known by some as the Medical Emergency Team – is a team of clinicians who bring critical care expertise to the patient bedside (or wherever it is needed).

The Findings for the First Consensus Conference on Medical Emergency Teams were published in Critical Care Medicine 2006 Vol 4. 34, No. 9 pp 2463-2478. This provides an excellent reference for the terminology and international experience that has developed around rapid response systems.

Why Do We Need Rapid Response Teams?

People die unnecessarily every single day in our hospitals. It is likely that each clinician can provide an example of a patient who, in retrospect, should not have died during their hospitalization. The goal is to respond to a "spark" before it becomes a "forest fire."

Analyzing Hospital Deaths

The purpose of this diagnostic is to get a clearer understanding of local conditions that contribute to mortality.
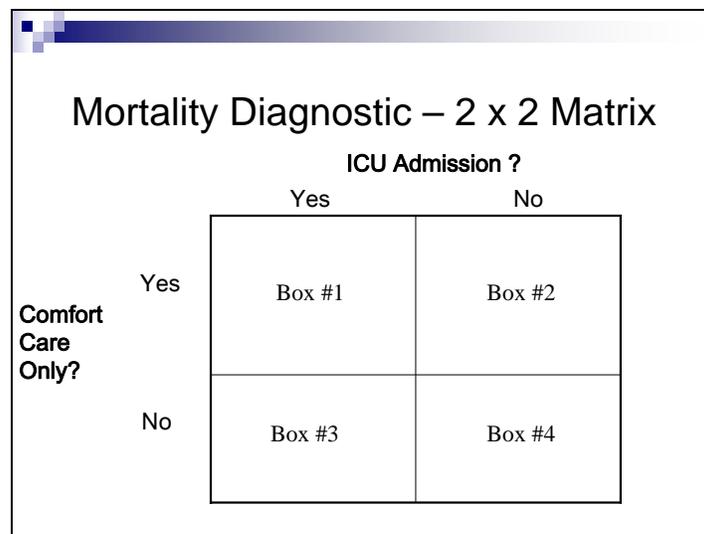
These cases are often seen when retrospectively reviewing inpatient hospital deaths using a simple diagnostic tool called the "2 x 2 Matrix" – or "3 x 2 Matrix" for our colleagues in the United Kingdom. This diagnostic consists of analyzing the patient records for 50 consecutive patients who died in the hospital and placing them into one of the four boxes in the 2 by 2 Matrix. This is done by asking the following questions:
- Was the patient hospitalized for comfort care only?
- Was the patient admitted into an intensive care unit?

If the answer is yes to both questions, the death is counted in Box 1. If the answer is no to the ICU but yes for comfort care, the death is counted Box 2. If the answer is yes to ICU but no to comfort care, the death is counted in Box 3. If the answer is no to both, then the death is counted in Box 4. Box 4 should be further analyzed by asking if there was any evidence of communication failures, planning failures, or failure to recognize a deteriorating patient condition, which often leads to situations of failure to rescue. Finally, deaths in Box 4 and possibly 3 should be reviewed, for example by using the Global Trigger Tool (on the web at www.ihi.org), looking for any evidence of preventable adverse events.

Mortality Diagnostic: Aggregate Results for 64 US Hospitals

	ICU Admission	No ICU Admission
Comfort Care	86 / 3175 3% (0-14%)	402 / 3175 13% (0- 40%)
Non Comfort Care	1161 / 3175 37% (10-72%)	1526 / 3175 48% (18-76%)

In October 2004, 64 US hospitals shared their mortality results using the 2 x 2 Matrix. The table represents their data in aggregate.

On average, 48% of all deaths are found in Box 4: patients who were admitted to a non-ICU setting and were not expected to die. Some deaths in Box 4 are indeed unnecessary deaths – ones that a Rapid Response Team can potentially have an impact on.

Three Fundamental Problems

There is a large amount of variability in health care today. Numerous articles have shown that this variability exists across both quality and safety. Recent work by Sir Brian Jarman, Emeritus Professor of Primary Health Care at Imperial College School of Medicine (London, UK), indicates that this variability exists in hospital mortality rates. Even when multiple risk factors and community factors are taken into consideration, there is no clear explanation for differences from hospital to hospital. Yet, an opportunity exists to reduce this variability by improving hospital care. During the past few years, work has been carried out to understand the causes of the problem and to develop potential improvement strategies. The conclusions from this work and a review of the literature are that three main systemic issues contribute to the problem:

- Failures in planning (including assessments, treatments, and goals)
- Failure to communicate (patient-to-staff, staff-to-staff, staff-to-physician, etc.)
- Failure to recognize deteriorating patient condition

These fundamental problems can often lead to a <u>failure to rescue</u>.

Clinical Instability Prior to Arrest

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.)

- 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).

Franklin's article identified several warning signs present within six hours of arrest:
- MAP <70, >130 mmHg
- Heart rate <45, >125 per minute
- Respiratory rate <10, >30 per minute
- Chest pain
- Altered mental status

What Difference Can a Rapid Response Team Make?

The effectiveness of RRTs in creating improvements in process and outcome of care has been supported by numerous studies.

What difference can it make?

	Before	After	
No of cardiac arrests	63	22	RRR 65% *P*=0.001
Deaths from cardiac arrest	37	16	RRR 56% *P*=0.005
No of days in ICU post arrest	163	33	RRR 80% *P*=0.001
No of days in hospital after arrest	1363	159	RRR 88% *P*=0.001
Inpatient deaths	302	222	RRR 26% *P*=0.004

MJA 2003; 179-7

- 50% reduction in non-ICU arrests (Buist el al.)
- Reduced post-operative emergency ICU transfers (58%) and deaths (37%) (Bellomo R, Goldsmith D, Uchino S et al.)
- Reduction in arrest prior to ICU transfer (4 % vs. 30 %) (Goldhill et al.)

Sample Results

Hospital Codes per 1000 Discharges
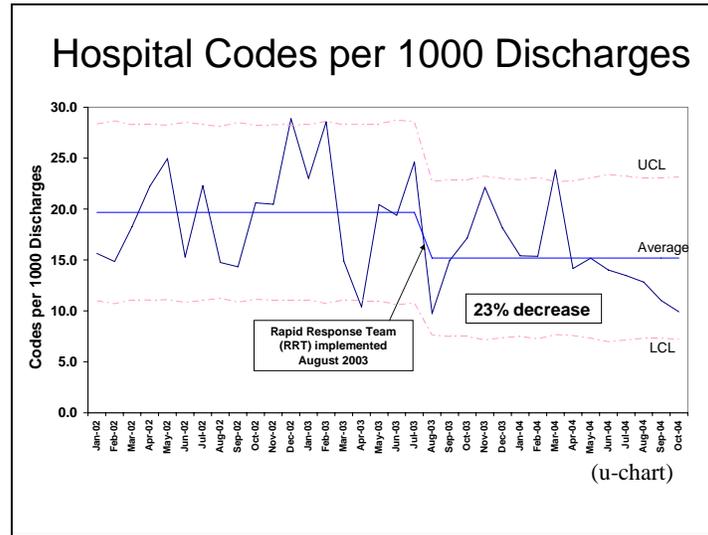
(u-chart)

This chart represents one hospital's results after implementing a Rapid Response Team. This hospital is a 750-bed non-teaching community hospital. Their RRT consists of a critical care nurse and respiratory therapist, with intensivist backup. They have seen a 23% decrease in their overall code rate per 1,000 discharges.

Hospital Codes Outside the ICU
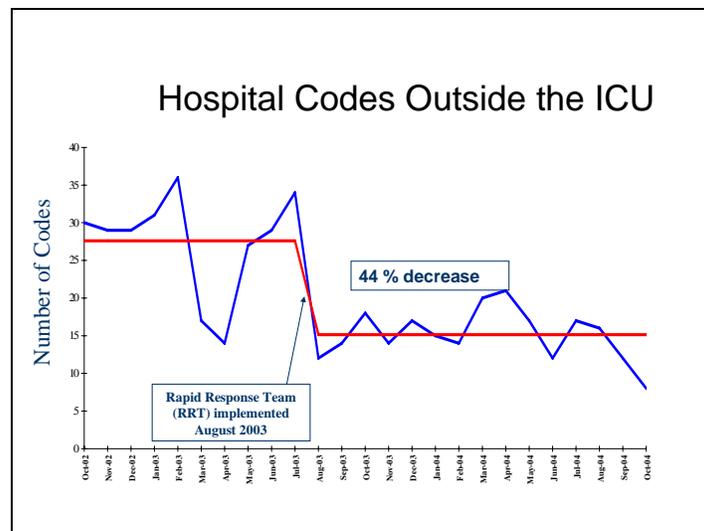
The same organization observed a 44% decrease in the codes occurring outside their ICU. Their hypothesis: Patients were being identified prior to cardiac arrest and either never coded at all or were moved to the ICU prior to their arrest.

Percent of Coded Patients Surviving at Discharge (p-chart)
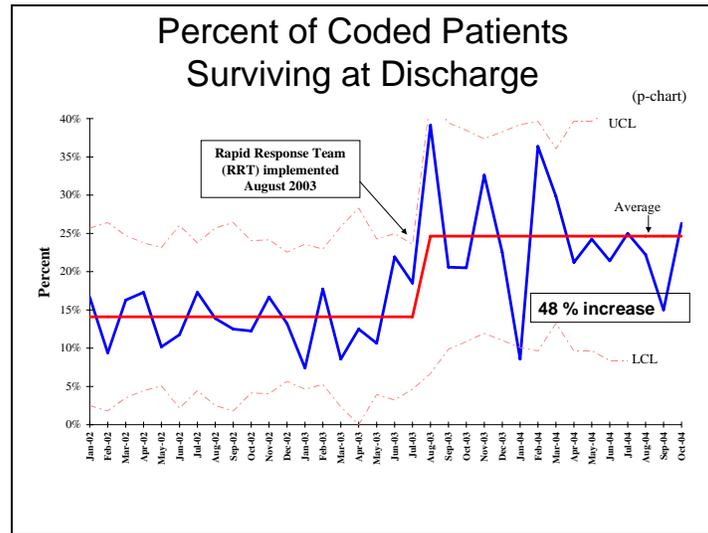
This same hospital saw a 48% increase in the percentage of coded patients surviving at discharge. Once again, their hypothesis: Patients who coded did so in a monitored setting such as an ICU, thereby increasing the likelihood of their surviving.

Codes per 1000 Discharges
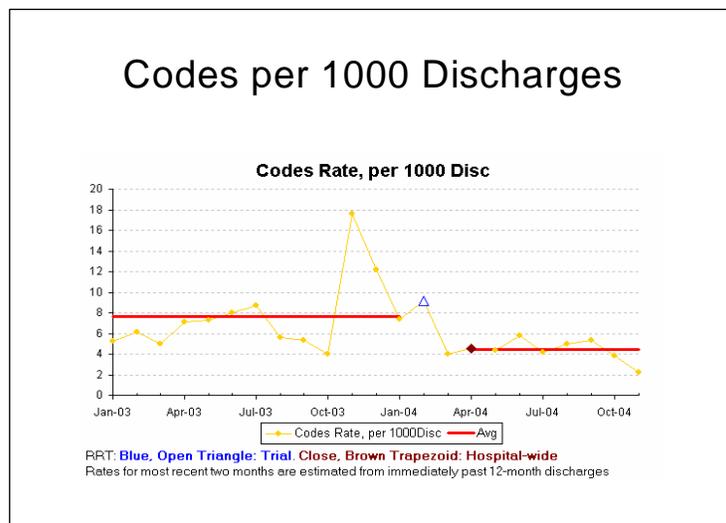
Another organization, a smaller community non-teaching hospital with an average daily census of around 225 patients, has seen similar results in their overall reduction in codes per 1,000 discharges.

A Canadian Example – Calgary Health Region

Calgary Health Region piloted a Rapid Response Team (called an ICU Outreach Team) at one site in 2004.   Results are below:

ICU Outreach Team
Calgary Health Region

	# Cardiac Arrests	# ICU Days	# Hosp Days
Pre-implementation	63	302	756
Post-implementation	38	100	228

Comparing Feb 1- July 31 2003 to Feb 2 - July 31 2004

Total # calls	112
Response time	< 5 min
Attendance time	35 min. average

The ICU Outreach Team has subsequently been implemented region-wide in all three adult hospitals.

Another Canadian Example: Capital Health, Edmonton, Alberta
The number of MET Team calls

The number of cardiac arrests
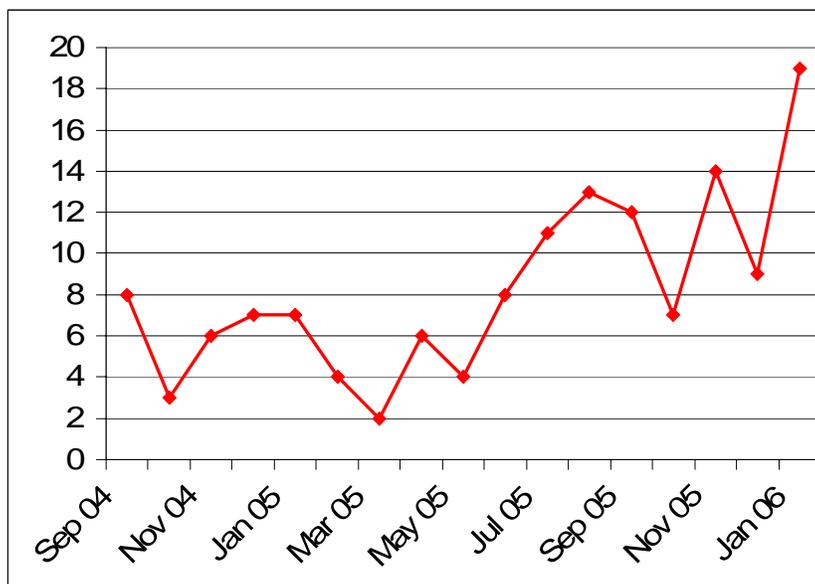
The number of cardiac arrests
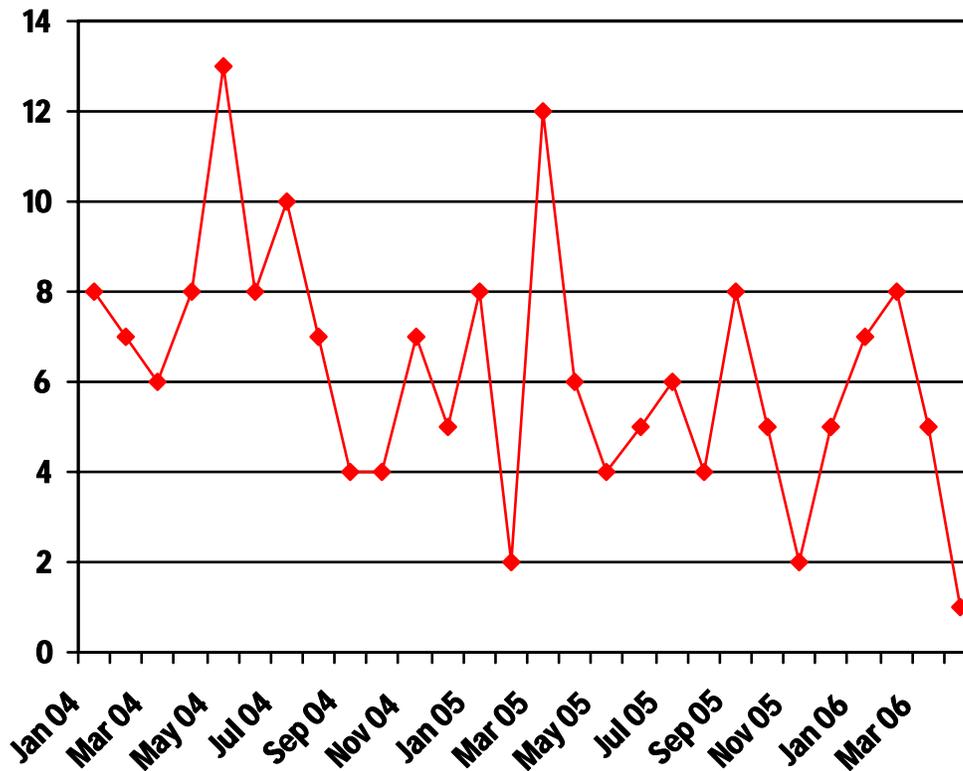
The Merit Study

In spite of these very encouraging results from the collaborative, most of the articles published to date on rapid response teams and most centers who have implemented these teams, it remains very difficult to draw firm scientific conclusion on the benefits of RRT. Most studies, with one exception (MERIT), have used historical controls to evaluate the impact of the team on patient care. The major concern with studies that use historical controls is related to difficulties adjusting for the effects of other known or unknown variables that might have also influenced the outcomes of interest. The Merit study is the first and only randomized controlled trial that evaluates the impact of physician-led acute resuscitation teams (Medical Emergency Team). In this study, 23 hospitals from Australia were randomized either to continue functioning as usual or to introduce a MET during a study period. The authors did not observe any change in the incidence of cardiac arrest, unplanned ICU admission, or unexpected death. However, while this is the trial with the best scientific methodology, it remains very difficult to conclude from this trial whether or not acute resuscitation teams are beneficial. This study does not say that acute resuscitation teams are of no use, rather that it is difficult to evaluate them.

Response to the MERIT Study

The following are excerpts from IHI's description and response to the MERIT study findings published in The Lancet. The full article is published on the IHI website in the Rapid Response Team section.
http://www.ihi.org/IHI/Programs/Campaign/Campaign.htm?TabId=2

In the June 18, 2005, issue of The Lancet, the pioneering Australian clinical investigators who first described in detail the use of "Medical Emergency Teams" (METs)—the intervention that we call "Rapid Response Teams" in the 100,000 Lives Campaign—report on a "cluster-randomized trial" of the MET system in 23 Australian hospitals. The study attempted to determine "whether the MET system could reduce the incidence of cardiac arrests, unplanned admissions to intensive units, and deaths among patients in general hospital wards." (MERIT Study Investigators. Introduction of the medical emergency team (MET) system: a cluster-randomised controlled trial. The Lancet. 2005;365:2091-2097.)

This is a bold study, and a highly commendable example of an attempt at systematic, scientific evaluation of a complex socio-technical innovation. The study report is extremely well written, and both the report and the openness of the study team allow significant lessons to be learned from their ongoing work.

The researchers summarize their main findings as follows: "The MET system greatly increases emergency team calling, but does not substantially affect the incidence of cardiac arrest, unplanned ICU admissions, or unexpected death."

Although the MERIT study in The Lancet was technically negative in its findings comparing treatment to control hospitals in an "intention to treat" analysis, important limitations, relevant to the 100,000 Lives Campaign methods and goals, include: (a) incomplete and inconsistent implementation of the MET process in experimental hospitals, (b) high proportion of teaching hospitals in the study, (c) possible unmeasured adoption of early *or rapid response system* response processes by the control hospitals, (d) low rates of monitoring of relevant physiological variables in general ward patients, and(e) extremely low experimental power to detect improvements of the magnitude sought in the Campaign. In sum, these limitations in both the conclusiveness and the generalizability of the MERIT study (that is, limitations in both internal and external validity) leave us undeterred in our confidence that the RRT process, well implemented, can reduce in-hospital mortality. Prior published reports, though not of randomized trials, in addition to ongoing time-series analysis from participating hospitals, remain strongly supportive of the effectiveness of RRTs in at least some circumstances.

• The implementation issues embedded in the MERIT study emphasize the need for the 100,000 Lives Campaign hospitals to attend carefully to the training, support, encouragement, and monitoring of the RRT process, itself. Good target rates of RRT calls may be in the range of 15 to 25 per 1000 admissions to ensure proper uptake of the RRT process.

• Monitoring of patient status and vital signs among general ward inpatients may be a vulnerable part of the RRT process. The RRT cannot be called if no one is noticing the patients' changing status. Classical monitoring methods and schedules may not be up to

the task of properly supporting and triggering the RRT capability. This is an important area for further investigation and development.
• The dramatic reduction of unanticipated deaths over time in all 23 subject hospitals in the MERIT study suggests that changes of that magnitude are, one way or another, actually achievable among inpatients in at least some hospitals. IHI fully supports all efforts to reduce "failure to rescue"—that is, to identify and treat patients in need of rescue as soon as possible—and believes that RRTs are an important and promising intervention toward that end.

Based on IHI's review and the experience in Canada of successful implementations of Rapid Response Teams, *Safer Healthcare Now!* also strongly endorses the use of RRTs for improving care and providing a safer environment for our patients..

There will no doubt continue to be much debate on the issue because of the resource intensity associated with Rapid Response Teams. An example discussion has recently been documented between Peter Pronovost and Don Berwick in The Journal on Quality and Patient Safety Nov 2006. Let us hope it continues to provoke much debate as this will maintain it at the forefront of people's minds.

Implementing Rapid Response Teams

What Is the Role of the Rapid Response Team?

- Assess
- Stabilize
- Assist with communication
- Educate and support
- Assist with transfer, if necessary
- Follow-up of discharged patients

The Rapid Response Team has several key roles. The team assists the staff member in assessing and stabilizing the patient's condition and organizing information to be communicated to the patient's physician. The RRT member also takes on the role of educator and support to the staff. Initially, organizations may fear that the introduction of the RRT will lessen the clinical skills of the non-ICU staff. In fact, quite the opposite appears to be true. In their role as educators, the RRT nurses have a unique opportunity to educate the non-ICU staff at the time of the call, assembling the various pieces of clinical information and pulling the pieces of the puzzle together. If the circumstances warrant, the RRT assists with the patient transfer to a higher level of care.

Rapid Response Team Considerations

Prior to testing and implementation of a Rapid Response Team, organizations may wish to consider the following:
- Engage senior leadership support.
- Determine the best structure for the team.
- Provide education and training.
- Establish criteria and mechanism for calling the RRT.
- Use a structured documentation tool.
- Establish feedback mechanisms.
- Measure effectiveness.

Appendix A provides one hospital's approach to implementing their RRT, as well as a brief description of their results and learnings.

Engage Senior Leadership Support

Engage senior leadership (executive and physician) support and buy-in, i.e., "We are going to do this; this is important and the right thing to do for our patients."
- Make an explicit organizational commitment to establishing the RRT.
- Educate the medical staff about the benefits of RRT and put the myths to rest.
- Craft a very clear and widely disseminated communication message from senior leadership.

Determine the Best Structure for the Team

First, who will comprise the Rapid Response Team? Our experience shows that multiple models work well, including the following:

- ICU RN and Respiratory Therapist (RT)
- ICU RN, RT, Intensivist, Resident
- ICU RN, RT, Intensivist or Hospitalist
- ICU RN, RT, Physician Assistant

Select each member (physician, RN, RT) of the RRT carefully. The physician team member should be one who is respected by both nurses and physicians and perceived as a good communicator and team player.

In every model, there are three key features of the team members:

- The team members must be available to respond immediately when called, and not be constrained by competing responsibilities.
- They must be onsite and accessible.
- They must have the critical care skills necessary to assess and respond.

Organizations should examine their current resources and culture when choosing the RRT members and build on existing relationships and practice patterns, e.g., hospitalist program, less than 24 x 7 intensivist coverage, etc. Staff must feel comfortable calling the RRT. Care should be taken when choosing team members in order to maximize their capabilities as educators and responders.

Organizations are able to muster resources when patients progress to a cardiac arrest. The challenge is to find resources to *prevent* such cardiac arrests from occurring in the first place.

Provide Education and Training

Medical Staff: Educate the medical staff about the benefits of RRT and dispel the myths.

  Benefits:
- Fast and accurate critical patient assessment 24 x 7
- Clear and concise communication using SBAR (Situation, Background, Assessment, Recommendation) method of communicating
- Link to fewer codes and lower mortality

  Myths:
- RRT is not intended to take the place of immediate consultation with the physician if needed. After consultation with the RRT, a call is placed to the appropriate physician.
  The intention is to help patients in the time window of clinical instability and not to replace physician involvement in that process.

RRT Members: The RRT members should receive education and training together. Training includes the following:

- Advanced critical care training (ACLS) as needed. Most ICU RNs and RTs will likely have training already. Organizations should determine which standing protocols the RRT will have available for use during the call.
- SBAR (Situation, Background, Assessment, Recommendation) method of communicating and receiving communications about patient condition (details available on www.ihi.org)
- Communication skills, including responding in a professional and friendly manner
- Setting appropriate expectations, including responding in a timely manner (e.g., within 5 minutes every time the RRT is called); providing non-judgmental, non-punitive feedback to the person that initiated the call to the RRT

Nursing Staff: Nursing staff should receive education and training on the following:

- Criteria and procedures for calling, how to notify the team
- Communication and teamwork skills – use of SBAR, appropriate assertion, and critical language skills
- Appropriate expectations – call even if you are unsure. "It's better to call than not." Some organizations have set the expectation that nurses "will call when any criteria are met" – and *not* calling may have repercussions.
- The team that responds will do so in a non-judgmental, non-punitive way.
- Have information available for the team, such as the chart, medication administration record (MAR), previous assessments, etc.
- The person who calls the RRT should become a key member of the team and assist the RRT; the RRT is not there to take over and assume care of the patient.

Nursing staff education can take the form of a "traveling road show" to each nursing unit, either as they join the pilot or at the beginning. Nursing managers and educators may want to gather staff together and do a debriefing of a code or critical event that "could have happened last night on this unit." Providing a brief description of how the RRT could have assisted the staff and prevented the event from occurring may accelerate learning.

A sample RRT education checklist is provided in Appendix B.

Establish Criteria and Mechanism for Calling the RRT

Criteria for Calling the RRT: Each organization should determine which criteria will be used to call a Rapid Response Team, and educate the staff accordingly. Example criteria include:

- Staff member is worried about the patient
- Acute change in heart rate <40 or >130 bpm
- Acute change in systolic blood pressure <90 mmHg
- Acute change in respiratory rate <8 or >28 per min

- Acute change in saturation <90% despite O2
- Acute change in conscious state
- Acute change in urinary output to <50 ml in 4 hours

There are at least two different approaches to the use of criteria. The first is to educate staff on the criteria and encourage them to call the RRT when any are met or when they are worried about the patient, even though the patient may not meet any criteria. Another approach is to mandate the staff to call the RRT when any criteria are met, thereby setting a different expectation.

Tip: After piloting the Rapid Response Team, be sure to educate all hospital employees on the criteria, including radiology, endoscopy, etc.

Mechanism for Calling the RRT:
- Use a beeper, with or without overhead page.
- Encourage staff to dial in the patient's room number.
- If not in a patient room, dial in the extension for the RRT Team to call back for a location. Use a Structured Documentation Tool

Examples of documentation forms are available; there is no need to reinvent the wheel. (You can download this "Rapid Response Team Record" on www.IHI.org)
The SBAR communication technique can be embedded into the process by including it on the documentation form. The team can use the form to capture and organize information about the patient's condition prior to calling the physician. The documentation form captures information on reasons for the RRT call, as well as the types of interventions required. This information can be used for planning purposes and to drive nursing and medical staff educational programs.

Establish Feedback Mechanisms

- Feedback information on patient outcome.
- Look for lessons learned hospital-wide.
- Use data to drive educational programs.
- Share the success stories.

It is important to create feedback mechanisms to the staff to foster understanding of RRTs and their benefits.   Particularly during the initial stages of establishing the team, organizations find it useful to tell the stories of patients who were rescued by the team. These stories are useful in garnering support for the team.
Organizations should examine RRT data for lessons learned, patterns, and trends, for example, respiratory events related to narcotics. The information gained from the RRT calls can also be used to inform the overall educational plan for the organization.

Measure Effectiveness

Use these three key measures to evaluate the effectiveness of the Rapid Response Team:
1. Codes per 1,000 Discharges
2. Percent of Codes Outside the ICU
3. Utilization of Rapid Response Team

Appendix C contains further details on the technical descriptions of these measures, including definitions of terms, numerators, denominators, exclusions, and collection strategies.

Appendix C also contains a worksheet for each measure. The worksheets provide step-by-step tables for calculating the numerator, denominator, and final calculation for each measure. The worksheets can be used at the baseline stage (before you have started to implement the bundle) or implementation stage. It may be appropriate to collect some or all measures retrospectively, through chart review, but ideally, your data will be collected concurrently.

SHN recommends that before your facility, team or unit begins implementing the intervention, you obtain **baseline data**, using the worksheets provided. Baseline data will give you a sense of where you are starting from, and what some of the potential areas of focus are for your facility or unit. We suggest that you take a "snapshot" of three months or more, or whatever is feasible for your organization.

Track Measures over Time.

Improvement takes place over time. Determining if improvement has really occurred and if it is a lasting effect requires observing patterns over time. **Run charts** are graphs of data over time and are one of the single most important tools in performance improvement. Using run charts has a variety of benefits:
- They help improvement teams formulate aims by depicting how well (or poorly) a process is performing.

- They help in determining when changes are truly improvements by displaying a pattern of data that you can observe as you make changes.

- They give direction as you work on improvement and information about the value of particular changes.

Examples of run charts are on pages 9 and 10.

Organizations may wish to collect data on additional measures, such as post-cardiac arrest ICU bed utilization, staff satisfaction with the Rapid Response Team, percent of coded patients surviving at discharge, and safety culture survey data.

Using the Model for Improvement

In order to move this work forward, IHI recommends using the Model for Improvement. Developed by Associates in Process Improvement, the Model for Improvement is a simple yet powerful tool for accelerating improvement that has been used successfully by hundreds of health care organizations to improve many different health care processes and outcomes.

The model has two parts:

- Three fundamental questions that guide improvement teams to 1) set clear aims, 2) establish measures that will tell if changes are leading to improvement, and 3) identify changes that are likely to lead to improvement.

- The Plan-Do-Study-Act (PDSA) cycle to conduct small-scale tests of change in real work settings — by planning a test, trying it, observing the results, and acting on what is learned. This is the scientific method, used for action-oriented learning.

Implementation: After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team can implement the change on a broader scale — for example, for an entire pilot population or on an entire unit.

Spread: After successful implementation of a change or package of changes for a pilot population or an entire unit, the team can spread the changes to other parts of the organization or to other organizations.

You can learn more about the Model for Improvement on www.IHI.org.

Other Possible Benefits of Rapid Response Teams

In addition to fewer codes and lower mortality, there may be other possible benefits of the Rapid Response Team, although they require further study. Other possible benefits might include:
- Better outcomes
- Improved relationships
- Improved satisfaction

- Nursing
- Physician
- Patient
- Impact on nursing retention
- Financial benefits

Tips When Getting Started:

- Be tolerant of "false alarms." Staff should be praised for calling even if, after assessment, the patient condition did not appear to warrant calling the RRT.
- Get the word out – initially and continuously. Communicate, communicate, and communicate! You cannot do enough of this. Particularly in the beginning, get the word out often and continuously. Be systematic and relentless with your communication.
- The power of sharing the RRT stories with medical and nursing staff cannot be underestimated.
- Maintain continuous awareness and reinforcement of RRT through hospital publications, newsletters, etc.

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Appendix A: Report From The Field

Safer Healthcare Now Campaign

Reports from the Field

Intervention: ICU Outreach Program / Rapid Response Teams

Organization: Calgary Health Region
                          Calgary, Alberta

Contact: Elaine Rose BN MHS RN
                          Regional Coordinator ICU Outreach Program
                          elaine.rose@calgaryhealthregion.ca

Date: January 26, 2007

The Calgary Health Region implemented its ICU Outreach Program three years ago on February 2, 2004. The program started with a six month pilot project at the Rockyview General Hospital: one of three adult acute care sites in Calgary. Since that time we have moved from pilot project to regional program. The ICU Outreach Program has now been implemented at all three adult sites: Rockyview General Hospital (RGH), Foothills Medical Centre (FMC) and Peter Lougheed Centre (PLC). The teams respond to "Code 66" calls in all areas that the ICU Code Blue team would respond; this excludes such areas as neonatal ICU, emergency, operating theatres, recovery rooms and ICU, as these areas manage their own Codes. In addition to responding to the "Code 66" calls the Outreach Teams also follow patients discharged from ICU, some patients who remain on the general units post Code 66 or Code Blue, and some patients who have been seen by the ICU physician in consultation.

The teams are comprised of an ICU nurse (RN), a registered respiratory therapist (RRT) and a physician from ICU. When someone on a general ward identifies a deteriorating patient, as per the Outreach criteria, a call is placed to the switchboard indicating that there is a "Code 66": we use the same process that is in place for calling a Code Blue. The switchboard then pages the team on both a pocket pager and overhead. The team responds to the call within 15 minutes. The average response time is 5.8 minutes.

The three sites have slightly different staffing models. The RGH, which has had the program in place since February 2004, has dedicated RNs, identified RRTs and a physician, most often a junior resident from the ICU. At the FMC, where the full program has been in place since July 2006, there are also dedicated RNs, dedicated RRTs and dedicated physicians from 1700 – 0800 hours. From 0800 – 1700 hours one of the ICU attending physicians, fellows or residents attends the Code 66 calls. At the PLC, where the program was implemented in October 2006, there are two teams of RNs who alternate five weeks with Outreach and five weeks at the bedside in ICU, there are identified RRTs who respond to the calls, while also having a patient load in the ICU; there are dedicated physicians for two-thirds of the 1700 – 0800 hour shifts, the remainder of the night and 0800 – 1700 hours are covered by the ICU attending physicians, fellows, or residents.

A review of some of the calls from September through November 2006 provided the following information (*note*: information from the PLC is from October when the program started at that site):

The top five reasons for Code 66 calls are:

FMC and PLC
- Respiratory Distress
- Decreased level of consciousness
- Tachycardia / hypotension
- Worried
- Airway

RGH
- Worried
- Tachycardia / hypotension
- Decreased level of consciousness
- Respiratory Distress
- Airway

There is frequently more than one criteria identified as the reason for the call.

Top five interventions are:

FMC
- Supplemental oxygen
- Radiographic tests
- Fluid bolus
- IV starts
- Ventilation

PLC
- Radiographic tests
- Fluid bolus
- Supplemental oxygen
- Ventilation
- IV starts

RGH
- Supplemental oxygen
- Radiographic tests
- IV starts
- Fluid bolus
- Cardiac meds

Of note is that the percent of patients admitted to ICU as a result of a Code 66 call varies among the sites: RGH =14.74% (program started in 2004 with the pilot project), FMC = 23.02% (started in July 2006) and PLC = 40.68% (program started in October 2006). It will be interesting to watch the trend over time.

We have learned that ongoing education of the Outreach Team, the ICU staff and the staff throughout the hospital is essential. In addition to the on-going education it has become clear to us that it is imperative that the Outreach Team be proactive in building relationships. The members of the Team are service providers who must have above average communication and public relation skills. Despite all the education in the hospital the staff members in ICU are the ones who have often been left out. It is vital to the program and the morale of the ICU to regularly share with our colleagues what the Outreach Team is doing, any information and data that we have. Providing feedback to ICU staff on how patients have progressed once transferred from ICU is appreciated by the staff. It is also important to continuously remind the staff from the regular patient care units to always make a call to the responsible physician (s) to address their concerns before calling the ICU Outreach Team if time permits as this can

engender bad feelings on both sides (ward physicians angry about the lack of notification and the fact that they are deemed less important/irrelevant in the process of care while the ICU team physicians may feel that they are called too frequently to solve problems which are clearly within the scope of practice and responsibility of the ward physicians).

The feedback we receive from healthcare workers on the patient care units is overwhelmingly positive. Praise rings out for the Teams and the program with such comments as:

- "The Outreach RN was very calming in the crisis situation. Much easier than waiting for a code blue situation"
- "Thanks Outreach Team for your help was great and invaluable"
- "Great help to assess and stabilize the patient"
- "This was the first Code 66 I was actively involved in and it was a really good experience. I think it had a large impact on this patient's outcome"
- "This patient would not have had a positive outcome if this team had not been available to assist us – we would have eventually had to call a code…"

Overall this is a very positive program that has received praise from the general units. The program is still a work in progress as we develop additional guidelines and policies and refine others.

APPENDIX B: Sample Rapid Response Team Education Checklist

Sample Rapid Response Team Education Checklist

Medical Staff Education

- ☐ General information
- ☐ Benefits
- ☐ Myths

RRT Education

- ☐ ACLS or advanced critical care training
- ☐ SBAR (Situation, Background, Assessment, Recommendation)
- ☐ Communication skills
- ☐ Appropriate expectations
  - ☐ Importance of responding in a timely manner
  - ☐ Importance of providing non-judgmental, non-punitive feedback to call initiator

Nursing Staff Education

- ☐ Criteria for calling
- ☐ Notification process
- ☐ Communication and teamwork skills
  - ☐ SBAR, Assertiveness / Critical Language
- ☐ Appropriate expectations
  - ☐ Importance of calling even when unsure
  - ☐ Non-judgmental, non-punitive nature of the RRT
  - ☐ Have information available for RRT (chart, medication administration record, etc.)
  - ☐ Role as a member of the team

[For information purposes only.]

APPENDIX C: Technical Descriptions and Worksheets

1. Codes per 1000 Discharges – Technical Description

Intervention(s): Rapid Response Teams

Definition: The number of codes per 1000 inpatient discharges

Goal: Decrease rate of Codes by 50% in one year.

CALCULATION DETAILS:

Numerator Definition: Total inpatient codes

Numerator Exclusions:
- Codes occurring in the Emergency Department in ED patients (i.e. not admitted to hospital)

Denominator Definition: Total inpatient discharges.

Denominator Exclusions:
- Stillbirths
- Deaths in the emergency department (ED) of ED-only patients

Measurement Period Length: Measure monthly.

Definition of Terms:
- **Code:** Patients requiring cardiopulmonary resuscitation or intubation
- **Emergency department-only patient**: A patient receiving care in the emergency department who has not been admitted to the hospital or registered as an inpatient

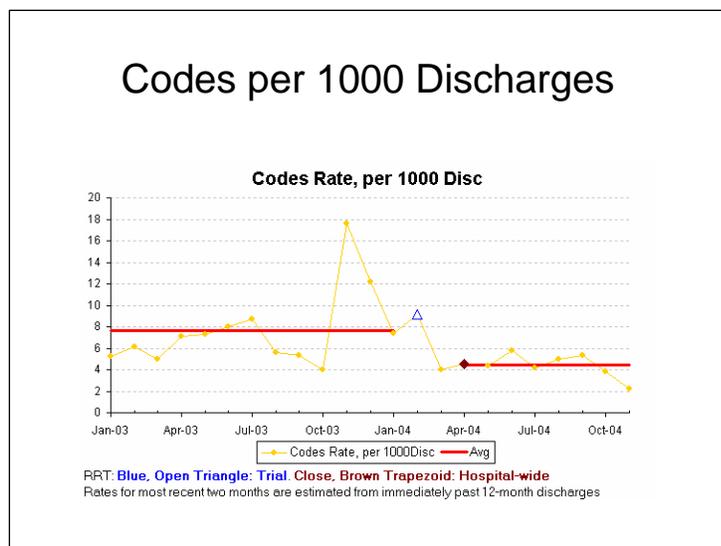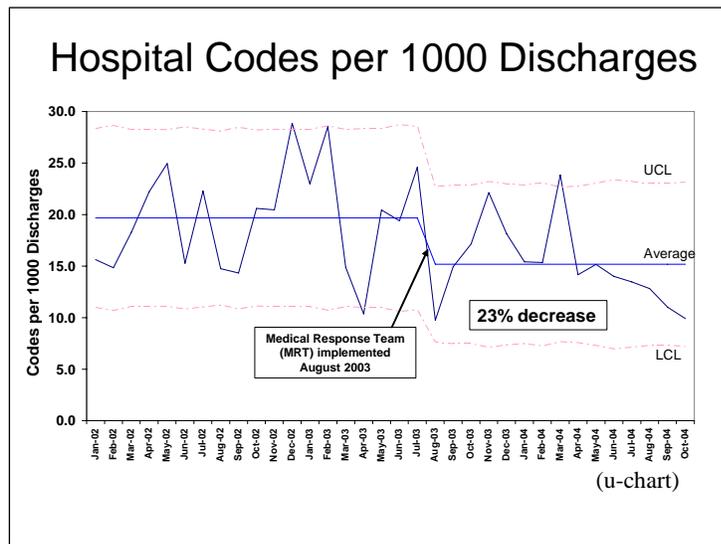**Calculate as:** Number of codes / Total number of inpatient discharges x 1000

Comments: Stillbirths and ED-only deaths are generally not considered inpatient discharges; we have noted them explicitly for clarification.

COLLECTION STRATEGY:

Obtain denominator from hospital information systems or other reliable sources on a monthly basis as soon as discharge and death data are available. Obtain numerator in the same way, or by using a hospital Code Log/records as described in "Percent of Codes Outside ICU – Technical Description" (page 33).

Sampling: Since the goal is to capture all codes each month, sampling is not appropriate for this measure.

SAMPLE GRAPH:

Hospital Codes per 1000 Discharges

(u-chart)

Codes per 1000 Discharges

Codes Rate, per 1000 Disc

RRT: **Blue, Open Triangle: Trial. Close, Brown Trapezoid: Hospital-wide**
Rates for most recent two months are estimated from immediately past 12-month discharges

1.0 Codes per 1000 Discharges – Measurement Worksheet

Rapid Response Teams	
Intervention:	Rapid Response Teams
Definition:	The number of codes per 1000 inpatient discharges
Goal:	Decrease rate of Codes by 50% in one year

Data Collection Details					
Hospital Name:				**Health Region:** ☐ NA or *Specify Region:*	
Completed by	**Name:**	**E-mail Address:**	**Phone Number:** ( ) -		**Date of Submission:**
Year:	*Indicate the year for which the data was collected:* ☐ 2004 ☐ 2005 ☐ 2006 ☐ 2007 ☐ Other (specify):			**Collection Method:**	☐ Concurrent ☐ Retrospective
Month:	*Indicate the month for which the data was collected:* ☐ Jan. ☐ Feb. ☐ Mar. ☐ Apr. ☐ May ☐ June ☐ July ☐ Aug. ☐ Sept. ☐ Oct. ☐ Nov. ☐ Dec.				
Implementation Stage:	☐ Baseline Stage *(Pre-intervention)*	☐ Early implementation stage *(Some team members in selected unit(s)have begun implementing RRTs)*		☐ Full implementation stage *(All team members in selected unit(s) are consistently implementing RRTs)*	
Additional Information	*Describe any other pertinent information here, including Team # if there is more than one RRT in your hospital* **Team #:** ☐ **N/A**				

Calculation of Denominator		Formula	Answer	
1.1	What is the total number of <u>in-patient</u> discharges in the previous month? *Exclude Emergency Department patients.*		**1.1=**	
1.2	What is the total number of stillbirths in # **1.1**? *Exclude from patient list for calculating denominator of eligible inpatient discharges.*		**1.2=**	
1.3	Subtract the answer to # **1.2** from the answer to # **1.1** and enter here.	(**1.1** – **1.2**=)	**1.3=**	

Calculation of Numerator		Formula	Answer	
1.4	What is the total number of Codes occurring in in-patients in # **1.3** during the previous month? (Use the Hospital Code Logs/records as your source of data.) *Exclude codes occurring in Emergency Department patients.*		**1.4=**	

Final Calculation		Formula	Answer	
1.5	Divide # **1.4** by # **1.3**. Multiply by 1000.	(**1.4** / **1.3**) x 1000	**1.5=**	

2. Percent of Codes Outside ICU – Technical Description

Intervention(s): Rapid Response Teams

Definition: The percentage of all codes occurring outside the ICU

Goal: Decrease the overall incidence of codes occurring outside of ICU.

CALCULATION DETAILS:

Numerator Definition: Number of in-hospital codes occurring outside the intensive care unit.

Numerator Exclusions:
• Codes occurring in the Emergency Department in ED patients (i.e. not admitted to hospital)

Denominator Definition: Total in-hospital codes.

Denominator Exclusions:
• Codes occurring in the Emergency Department in ED patients (i.e. not admitted to hospital).

Measurement Period Length: Measure monthly.

Definition of Terms:
• **Code:** Patients requiring cardiopulmonary resuscitation or intubation
• **ED:** Emergency Department
• **Emergency department-only patient:** A patient receiving care in the emergency department who has not been admitted to the hospital or registered as an inpatient

Calculate as: [Number of in-hospital codes occurring outside the intensive care unit./ Total number of in-hospital codes] x 100 (to express as a percentage).

Comments: The purpose of the rapid response team is to support the hospital personnel outside of the ICU and the ED. Therefore, we would expect the early intervention of the Rapid Response Team to decrease the number of patients who are coding within your facility outside of the ICU and ED.

We do not include ED codes because the Rapid Response Team is generally used to support and help all areas of the hospital except for the ED and ICU. Since the Rapid Response Team will not impact codes in the ED, we exclude them.
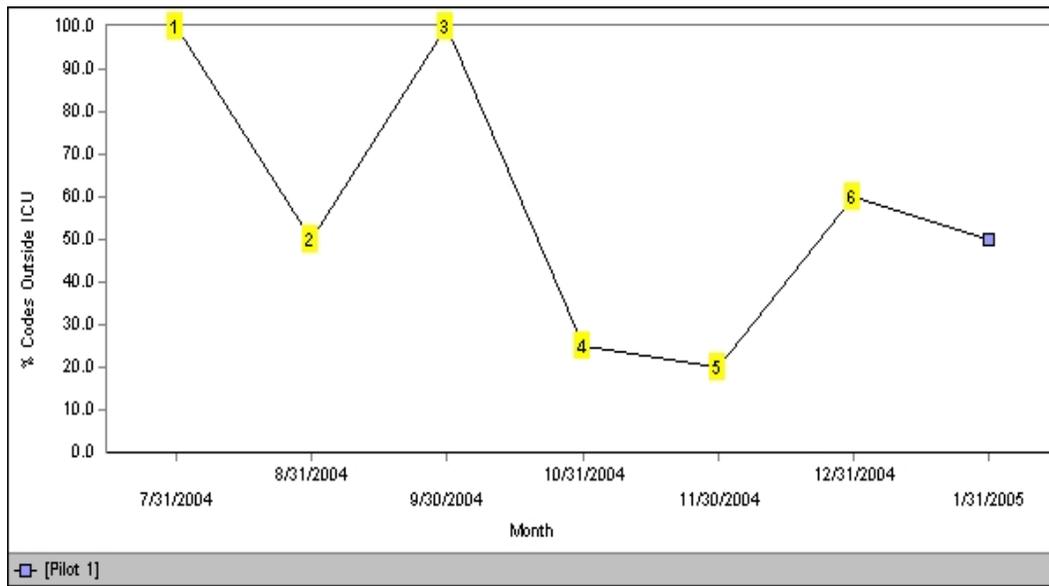
COLLECTION STRATEGY:

Each month, determine the location each code occurs from code logs and records. Establish a process to identify all calls to the Rapid Response Team. One possible data collection strategy: each call to the RRT should result in the completion of a documentation form or record. These records should be kept in a central location (paper log book, electronic record, etc.) and serve as the source of the data.

Sampling Plan: Since the goal is to capture all codes each month, sampling is not appropriate for this measure.

SAMPLE GRAPH:

Percent of Codes Outside ICU

2.0   Percent of Codes Outside ICU – Measurement Worksheet

Rapid Response Teams	
Intervention:	Rapid Response Teams
Definition:	The percentage of all codes occurring outside the ICU
Goal:	Decrease the overall incidence of codes occurring outside of ICU

Data Collection Details				
Hospital Name:			**Health Region:** ☐ NA or *Specify Region:*	
Completed by	**Name:**	**E-mail Address:**	**Phone Number:** ( ) -	**Date of Submission:**
Year:	*Indicate the year for which the data was collected:* ☐ 2004 ☐ 2005 ☐ 2006 ☐ 2007 ☐ Other (specify):		**Collection Method:**	☐ Concurrent ☐ Retrospective
Month:	*Indicate the month for which the data was collected:* ☐ Jan. ☐ Feb. ☐ Mar. ☐ Apr. ☐ May ☐ June ☐ July ☐ Aug. ☐ Sept. ☐ Oct. ☐ Nov. ☐ Dec.			
Implementation Stage:	☐ Baseline Stage *(Pre-intervention)*	☐ Early implementation stage *(Some team members in selected unit(s)have begun implementing RRTs)*	☐ Full implementation stage *(All team members in selected unit(s) are consistently implementing RRTs)*	
Additional Information:	*Describe any other pertinent information here, including Team # if there is more than one RRT in your hospital* **Team #:** ☐ **N/A**			

Calculation of Denominator		**Formula**	**Answer**	
2.1	What is the total number of in-hospital codes in the previous month? (Use the hospital Code Logs/records as your source of data). *Exclude Emergency Department patients.*		**2.1=**	

Calculation of Numerator		**Formula**	**Answer**	
2.2	What is the total number of in-hospital Codes in # **2.1** occurring in areas other than the Intensive Care Unit? *Exclude codes occurring in Emergency Department patients*		**2.2=**	

Final Calculation		**Formula**	**Answer**	
2.3	Divide # **2.2** by # **2.1**. Multiply by 100.	(**2.2** / **2.1**) x 100	**2.3=**	%

3. Utilization of Rapid Response Team – Technical Description

Intervention(s): Rapid Response Teams

Definition: The number of calls to the Rapid Response Team

Goal: Increase the overall use of the Rapid Response Team over time. (This is an organization-specific measure; it is not suggested to compare across organizations, so there is no absolute goal.)

CALCULATION DETAILS:

Numerator Definition: Number of calls to the Rapid Response Team.

Numerator Exclusions: none

Denominator Definition: N/A

Denominator Exclusions: N/A

Measurement Period Length: Typically this is done in monthly increments, but teams might find it useful initially to track this information weekly (i.e., period of 1 week, every week; measuring calls per week). Once your team is well established, you can move the measurement period to monthly (i.e., period of 1 month, every month; measuring calls per month). Data submitted to the SHN Campaign Measurement Team should be aggregated to monthly.

Definition of Terms:
- **Rapid Response Team:** A team of clinicians who bring critical care expertise to the bedside (or wherever it's needed)

Calculate as: Number of calls to the RRT (numerator only)
**Comments:** The numerator contains all calls to the Rapid Response Team.

COLLECTION STRATEGY:

Establish a process to identify all calls to the Rapid Response Team. One possible data collection strategy: each call to the RRT should result in the completion of a documentation form or record. These records should be kept in a central location (paper log book, electronic record, etc.) and serve as the source of the data.

Sampling Plan: Since the goal is to capture all calls to the RRT each month, sampling is not appropriate for this measure.

SAMPLE GRAPH:

Utilization of Rapid Response Team
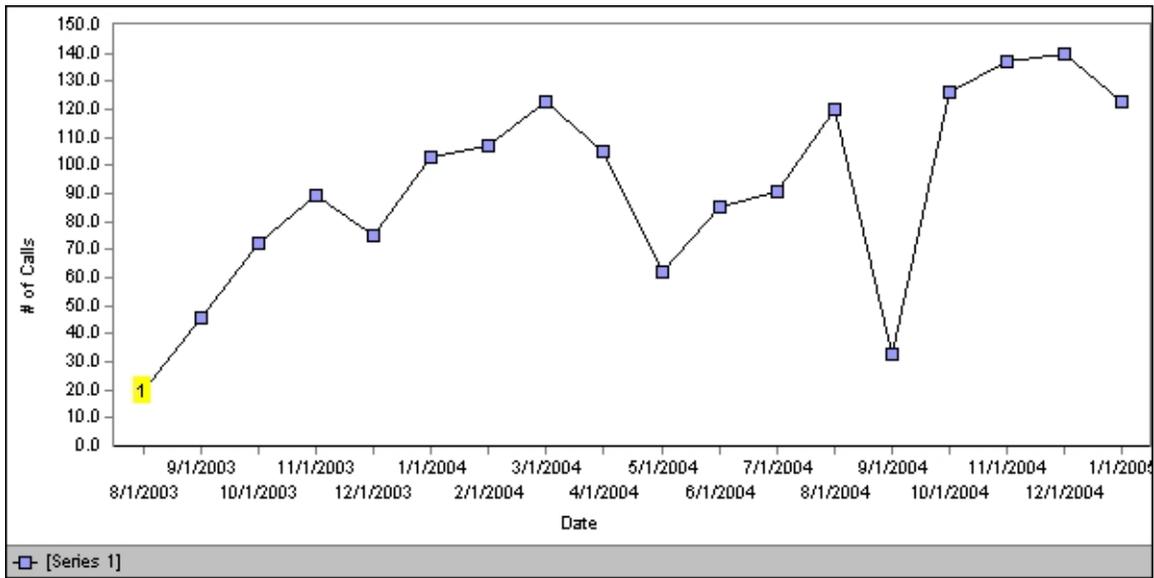
3.0   Utilization of Rapid Response Team – Measurement Worksheet

Rapid Response Teams	
Intervention:	Rapid Response Teams
Definition:	The number of calls to the Rapid Response Team
Goal:	Increase the use of the Rapid Response Team over time.

Data Collection Details				

Hospital Name:			**Health Region:** ☐ NA or *Specify Region:*

Completed by	**Name:**	**E-mail Address:**	**Phone Number:** ( ) -	**Date of Submission:**

Year:	*Indicate the year for which the data was collected:* ☐ 2004 ☐ 2005 ☐ 2006 ☐ 2007 ☐ Other (specify):	**Collection Method:**	☐ Concurrent ☐ Retrospective

Month:	*Indicate the month for which the data was collected:* ☐ Jan. ☐ Feb. ☐ Mar. ☐ Apr. ☐ May ☐ June ☐ July ☐ Aug. ☐ Sept. ☐ Oct. ☐ Nov. ☐ Dec.

Implementation Stage:	☐ Baseline Stage *(Pre-intervention)*	☐ Early implementation stage *(Some team members in selected unit(s)have begun implementing RRTs*	☐ Full implementation stage *(All team members in selected unit(s) are consistently implementing RRTs)*

Additional Information	*Describe any other pertinent information here, including Team # if there is more than one RRT in your hospital*
	Team #: ☐ **N/A**

Calculation of Denominator		*Formula*	*Answer*
3.1	*Does not apply to this measure*		

Calculation of Numerator		*Formula*	*Answer*	
3.2	What is the total number of calls to the Rapid Response Team in the previous month? (Use the hospital RRT call Log/records as your source of data). *Exclude calls from the Emergency Department patient for ED patients.* **Track monthly results on an Excel spreadsheet and graph to observe increase over time.**		**3.2=**	

Final Calculation		*Formula*	*Answer*
3.3	*Does not apply to this measure*		