Best Practices in Hypertension

Creating a Hypertension Task Force

PriMed Physicians
Dayton, OH

PRIMED PHYSICIANS

MEDICAL GROUP PROFILE

- **Physician-owned, for-profit medical group.**
- **PriMed has 372 total employees** including 66 physicians (nine internal medicine, 32 family practice, 15 pediatricians, three general and interventional cardiologists, two electrophysiologists, one rheumatologist, one neurologist, one endocrinologist, and two podiatrists).
- **19 clinics serve all socio-economic areas within the Dayton, Ohio metropolitan region**, which has approximately 550,000 "in-county" residents and an additional 200,000 residents in suburban and outlying communities.
- **PriMed's physicians have seen 111,661 unduplicated patients in the last 24 months** and approximate the total patient population to be 210,000. Of those, 30,114 patients have one of the hypertension diagnoses as defined in this case study.
- **386,186 provider-patient encounters** (excluding diagnostic studies and panel reads) from July 1, 2005 through June 30, 2006.
- **All contracts are paid on a fee-for-service basis.**
- **Electronic scheduling, demographic collection and billing.** PriMed is preparing to install an EMR in 2007.

FUNDING/BUDGET

PriMed has a team of three professionals dedicated to quality improvement projects. In addition, all other physicians, managers and staff are expected to participate in quality improvement projects on a rotating basis. Thus, all costs related to the project were allocated from this pool of existing personnel except for the hiring of one additional, part-time position for data gathering. The one additional position is budgeted at approximately $18,000.

EXECUTIVE SUMMARY

In 2002 PriMed Physicians developed the following strategic objectives:

1. **90% of all PriMed patients would be provided Wellness, Risk Assessments and Preventive Care (WRAP) at the evidence-based standard.**
2. **90% of all patients who had one or more chronic diseases would be treated to the applicable evidence-based process and outcome standards of care when such standards were generally agreed upon in the literature.**

In 2003, all senior managers and some physicians were trained in the Six Sigma quality disciplines. In August 2004, hypertension (HTN) was selected as its first medical quality project. The project has continued to be "active" since that time.

HTN was selected because the literature shows that successfully managed HTN provides the most dramatic decreases in morbidity, mortality, and cost. In 2005, PriMed added a Diabetes Project and in 2006 added an Osteoporosis Screen and Disease Management Project.

After being commissioned in August 2004, the HTN Task Force developed a new care process for all patients with the diagnosis of HTN, which was enacted group-wide in November 2004. The HTN Task Force's charter is to enable PriMed to get 90% of all HTN patients to the target blood pressures (BP) of the Seventh Report of the Joint National Committee on

Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).

Since the initial roll-out there have been several process improvements and improved outcomes. As a result, PriMed has seen a dramatic improvement in the percentage of patients who are treated to the JNC 7-defined BP goals.

OBJECTIVES

PriMed has four strategic imperatives:

1. **Service Quality;**
2. **Medical Quality;**
3. **Operational Excellence;** and
4. **Financial Performance.**

The design and implementation of medical quality strategy are coordinated and organized by a Medical Quality Committee, which acts as the governing authority to prioritize and plan all initiatives, as well as to oversee results. The Medical Quality Committee reports to the Board of Directors. When a project gets a green light from the Medical Quality Committee, it is assigned to a task force.

The Medical Quality strategic imperative has been translated into an organization-wide goal to ensure that PriMed:

- **Assesses 90% of all patients for health risks and wellness/prevention status at the evidence-based standard (EBS).**
- **Achieves the evidence-based process and outcome standard for 90% of all patients who have one or more chronic diseases.** For example, a hypertensive patient would reach JNC 7 outcome BP of <139/89 unless that patient has HTN plus either renal disease or diabetes, in which case the goal would be an outcome BP of <129/79. For a diabetic patient, the outcome goal would include glycol hemoglobin of <6.5, whereas the process goals would be an annual retinal eye exam, a foot exam, four glycol hemoglobin tests, etc. (see Appendix 1).
- **Ensures all eligible physicians qualify for the National Committee for Quality Assurance (NCQA) Heart/Stroke Provider Recognition Program and the NCQA Diabetes Provider Recognition Program by December 31, 2007.** To date, 27 physicians have achieved NCQA Diabetes Provider Recognition, and 19 physicians have achieved NCQA Heart/Stroke Provider Recognition. Some physicians are ineligible due to their specialty and/or to being new to PriMed and still ramping up practices.

Timeline

Aug 04	HTN Task Force chartered by the Board and Medical Quality Committee
Nov 04	First draft HTN Process introduced to the group
Fall 2005	Major re-education effort initiated
Nov 05	Board sets goal to have 75% of all patients to goal by 12/06
Jan 06	HTN Task Force develops plan to decrease delta in performance between the quartiles
Jan 06	Board decides to link physician compensation to following HTN Process
Spring 2006	Targeted efforts to lower performing physicians
Sep 06	76% of all group patients to JNC 7 goal
Oct 06	Board and Compensation Committee introduce details of comp plan linking physician compensation to following HTN Process (and Diabetes Process) starting 1/07

Target Population

PriMed targeted the HTN project to all patients who have the diagnosis of HTN. The JNC 7 definition of HTN – a patient whose BP is elevated above his/her target goal for two or more episodes of care – was selected as the standard to be used. The initial phase of the program dealt with patients who come into the office. During the next phase, PriMed reached out to those who were not actively seeking treatment for their disease.

Once a patient has been given any of the HTN diagnoses (see Appendix 2), PriMed implements the full HTN process at every single patient visit. Initially, this was a matter of some controversy. It was the hope that this approach would help identify patients who have elected not to follow their HTN, but might present for other medical conditions.

Tracking Information

At the conclusion of every month, a data query is run to find every patient who has not been seen that month and who has one or more of the HTN diagnoses. The HTN diagnoses could have been assigned during that month's visit, or during any prior visits. All of the names and dates of service are extracted by month and separated by physician (see Appendix 3). They are then randomized and 50 patients are identified per physician per month.

PriMed manually pulls these patients' charts, and collects approximately 50 data points for each – including the patient's BP and the results of the HTN process. If the patient has either diabetes or renal disease, this is noted so that the appropriate, lower JNC 7 BP goals (≤129/79) are used to judge whether or not the patient is at goal.

Methodology

Six Sigma is a methodology to reduce errors and improve the quality of outcomes. It is sensitive both to quality (via error reduction) and the cost of quality. Like other quality methodologies, Six Sigma works on the presumption that there is an established process capable of consistently achieving a specific outcome. Only if there is a stable process in the first place can future improvements be made to increase the desired outcome and further reduce errors.

A process is "in control" to the extent that it produces a consistent outcome, and a process is "capable" when it produces an outcome that meets the specifications (i.e., in PriMed's case, 90% of all patients to goal).

In the course of training and prior work with Six Sigma, PriMed discovered medical groups and physicians frequently do not have a common or standard process for treating patients. Thus, Doctor A does things one way while Doctor B does things another way. This is a problem that was targeted for improvement because all of the major quality methodologies are based upon the fact that reducing process variation is essential to quality improvement. If different operators produce the results using different methods (or if the same operator uses different methods) it is very difficult to determine which are the appropriate process steps, or why any process does or does not work.

To begin, the HTN Task Force created an Ishikawa diagram (see Appendix 4), also known as a "Fish Diagram" or a "Cause and Effect Diagram." All the known causes of error in the treatment of HTN were identified (i.e., all causes of failure to achieve the proper BP outcome). These included issues related to the doctor, the medical office, the patient, the larger health care delivery system and other areas.

For example, every HTN patient who presents with a BP that is above his/her goal is considered to be an error. There are also process or methodological errors in treatment. If a patient with HTN presents for a visit and the physician does not fill out a HTN Process Flow Sheet (see Appendix 5), it would be considered a process error. If the patient is seen and the HTN Process Flow Sheet is filled out but the patient's BP is above goal, then that is an outcome error.

Unable to create a process that would address every single error source at the first attempt, PriMed choose to focus on those that seemed to be of the highest importance.

- **Physicians and staff "forgetting" that the patient has HTN.**
- **Physicians "fudging" by stating that a BP reading that is only a few points off will suffice.**
- **Physician confusion about which of the many available drugs would work best for a given patient.**
- **Uneven physician understanding of and familiarity with the biomechanics and/or pharmacology of HTN and the interaction of pharmacology to biomechanics.**
- **Patient resistance to taking medication and/or patient noncompliance.**

There were many additional factors identified that could cause bad outcomes. Using the Pareto principle (80:20 rule) and believing the five factors listed above caused 80% of the errors experienced, PriMed choose to initially target these. PriMed will continue to address other causes of unmanaged HTN as the project progresses.

INTERVENTION

The HTN Task Force developed the following initial method to improve HTN performance:

1. **Created the HTN Process Flow Sheet** (see Appendix 5) that guides physicians in identifying HTN patients and making decisions about medication management.

2. **Directed that the HTN Process Flow Sheet be completed** and included in the chart every time a HTN patient presents in the office, no matter what the immediate reason for the office visit (i.e., whether the patient presented for follow-up care of HTN or came into the office for a sinus infection or other acute problem).

3. **Created an educational series** to review educational materials about the biomechanics and pharmacology related to HTN with physicians.

4. **Required physicians and staff to administer an impedence cardiography test (ICG)** whenever a patient with the diagnosis of HTN presented and was not at goal. This non-invasive study measures several factors including the volume load of fluid in the patient, the degree of peripheral vascular resistance, cardiac output, and other factors.

It was the thinking of the HTN Task Force that this information would prove instructive to physicians, assisting them in their medication choices and dosing. The use of the ICG when a patient is not at goal has a significant effect on a physician's ability to get a higher percentage of his/her patients to goal. However, this was the HTN Task Force's most controversial conclusion. There was a great deal of physician push-back about the ICG. The use of ICG technology was all the more difficult because, at the outset, none of the major payers would reimburse for it. PriMed made the decision to provide an ICG for free to patients until payers could be persuaded to reimburse for the test. ICG testing is not a money-maker, but more likely just breaks even when one considers the labor, equipment, reusable supplies, etc.

Because the introduction of the ICG test into an office visit for a HTN patients whose BP was not at goal caused disruptions to the office flow, a process was created to permit the staff to administer the ICG test prior to the physician seeing the patient. This was a major step. It was important to make it easier for physicians to use the ICG.

OUTCOMES

JNC 7 reports that 34% of all patients are at their appropriate BP goal. Other studies suggest a lower percentage. At the start of the project, randomized pre-study data was gathered for the entire PriMed group; it established that the baseline percentage of PriMed patients at goal was 41%. Although this baseline result was significantly higher than the national average, PriMed felt it could be improved.

Taken as a group-wide average, the percentage of patients at goal has increased from the baseline of 41% (which was measured prior to the start of the HTN Project, in the summer of 2004) to a group-wide 76% of patients at the JNC 7 target BP in September 2006 (see Appendix 6).

% Pts to JNC 7 BP*	Quartile	% HTN Process Followed
91%	1st	86%
78%	2nd	72%
73%	3rd	67%
62%	4th	50%

*This is sensitive to whether the patient does or does not have diabetes or renal disease.

LEADERSHIP

PriMed leadership has, for almost four years, gone on two or three leadership retreats per year. The purpose of these retreats is to teach physicians leadership and organization-building skills; to educate them about related concepts including quality theory and practice, economics, and business; and to plan the development of the group. There were three retreats in 2005; the HTN project in particular, as well as medical quality strategic deployment, was prominently featured in the agenda. The development of this strategy was accomplished through these retreats. Due to the fact that this initiative is directly related to the strategy, the leadership, the Board of Directors, the Medical Quality Committee, and management are all highly involved in supporting the HTN Task Force and in implementing this process successfully. Of course, the HTN Task Force, which meets monthly to guide the effort, is also entirely focused upon it. The HTN Process implementation has high visibility throughout the group.

PriMed has a monthly, required meeting for all physicians. Each meeting lasts 90 minutes. The HTN Task Force report has been made very prominent in every month's agenda. Every physician's data is presented, and conversations are held about issues and problems related to the HTN Task Force's processes.

At the May 2005 Physician Leadership retreat, a full day and a half was devoted to the disciplines of quality theory and practice. These were presented by Black Belt leaders from the team as well as during a four-hour session by a senior executive at Toyota North America.

The leadership and additional invited guests found these presentations very helpful in understanding some of the particulars as to how the HTN Process worked. Based on this, the Board asked every physician to attend eight hours of training about the use of Six Sigma quality methods in clinical practice. These sessions were held in small groups in September and October of 2005, and every physician attended one. Although PriMed has not yet been able to measure the data to show the outcome, it appears clear that this was extremely helpful to many physicians who did not understand and, therefore, had resented certain aspects of the disciplines Six Sigma imposes in their clinical practice. The resulting outcomes are expected to be a significant shift up in performance, particularly with respect to the third and fourth quartiles.

Perhaps the most difficult cultural and organizational challenge was linking physician performance to the faithfulness of following clinical processes. Several physicians objected for various reasons. The Board and Compensation Committee have spent literally days in determining whether it was necessary to link compensation to outcomes.

CHALLENGES

There are a number of areas of this endeavor that need further development:

1. **The HTN Process**, as currently implemented, does not have a clear-enough path for what should happen when or if a physician is unable to manage a patient to goal after a number of efforts. There is reference material in the HTN plan with respect to studying patients for renal artery stenosis, sleep apnea, etc. However, if a patient is not reaching goal, the process regarding where to go into the future is not clearly described.

2. **There are also a number of anecdotal reports of elderly patients with high systolic pressures** where the report of dizziness intrudes on the physician's confidence that s/he should continue aggressive treatment. It is believed that with further study there may be methods that will effectively reduce the systolic pressures of even the brittle elderly hypertensive patient without inducing dizziness or other potential threats to balance.

3. **This project needs to be expanded** to include patients who have "slipped off the radar screen" and who are not proactively seeking care although they have the diagnosis of HTN.

4. **Physicians who are still struggling with their performance** will be identified for more one-on-one attention.

5. **Those physician offices that serve patients in lower socioeconomic groups**, especially African American patients whose HTN may be more difficult to treat successfully, are having less success. Community resources should be explored to find how to get these patients their medications at affordable costs.

LESSONS LEARNED

There are several lessons learned (and more yet to come):

1. **The first major effort that involves physicians in quality methodologies CANNOT have too much communication.** PriMed put too much emphasis in large group meetings and not enough one-on-one and small site meetings.

2. **The leadership needs to be absolutely committed to the strategy, the project, the outcomes, and the method.** The number and variety of physician reactions to changes in what they perceive as their "personal space" is large. If the leadership has not thought through its plans well, physician resistance will overcome the effort.

3. **Publishing the results to everyone in the group by name is very effective.** Some group cultures don't permit this, but PriMed thought it very wise and effective.

4. **The majority of the published wisdom about quality improvement methods in medical groups indicates that physicians do better with many small steps of progress.** PriMed disagrees. The group considers a well-thought-out, comprehensive program to be wise, and believes large groups are not well-adapted to lots of little changes. PriMed will make changes as outlined above, but believes getting a big bump in one significant effort was both more effective and more cost-effective.

3. **It is anticipated that future changes will be a lot easier to accomplish.**

4. **It takes a lot of extra work to get patients to goal.** Thus, it takes time. At the start, doctors ran behind schedule constantly. The group learned to make adjustments, but, in a fee-for-service environment, this hurt.

5. **People feel really good about what has been accomplished.** PriMed is currently attempting to quantify the

number of adverse events and other bad outcomes that would have occurred had the group continued to use its old processes and perform at the previous level.

FOR ADDITIONAL INFORMATION

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REFERENCES

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Appendix 1

THE SEVENTH REPORT OF THE JOINT NATIONAL COMMITTEE ON PREVENTION, DETECTION, EVALUATION, AND TREATMENT OF HIGH BLOOD PRESSURE (JNC 7) GUIDELINES

Classification of Blood Pressure for Adults

% Pts to JNC 7 BP*	Quartile	% HTN Process Followed
BP Classification	Systolic BP	Diastolic BP
Normal	<120	And <80
Prehypertension	120–139	Or 80-89
Stage 1 HTN	140-159	Or 90-99
Stage 2 HTN	160 or more	Or 100 or more

Cardiovascular Risk Factors

- Hypertension
- Cigarette Smoking
- Dyslipidemia
- Microalbuminuria, or est. GFR <60 ml/min.
- Family history of premature CV disease (men <age 55 or women <age 65)
- Obesity (BMI 30 or more)
- Physical inactivity
- Diabetes mellitus
- Age (>55 for men, or >65 for women)

Goals of Therapy

The ultimate public health goal of antihypertensive therapy is the reduction of cardiovascular and renal morbidity and mortality. The primary focus should be on achieving the SBP goal, since most persons (especially those aged 50 and over) will reach the DBP goal when the SBP goal is achieved. Systolic HTN is a more important CVD risk factor than DBP in persons aged 50 and over.

BP Goal, general <140/90
BP Goal, patients with diabetes or renal disease <130/80

Appendix 2

PRIMED PHYSICIANS METHODOLOGY FOR IDENTIFYING HYPERTENSIVE PATIENTS

All patients with a current or previously assigned diagnosis of HTN in the billing system database who are seen in a given month are pulled. The diagnostic codes include all of the 401.0-401.9 codes and all of the 405.00-405.99 codes plus 997.91.

All of the encounters for patients who have a HTN code, per the above, are grouped by physician and randomized and 50 outpatient encounters per physician per month are identified. The chart is pulled for each encounter (the encounters are specific to a date of service) and the findings recorded.

There is a further check then to see whether the patient has a diabetes diagnosis or a renal failure diagnosis, in which case the threshold BP is reduced to ≤129/79 per JNC 7.

Each patient is either "at goal" or "not at goal" in exact terms. Even a BP that is one point in excess of the JNC 7 standard is "not at goal" (i.e., a non-diabetic patient with a BP of 140/89 would be "not at goal").

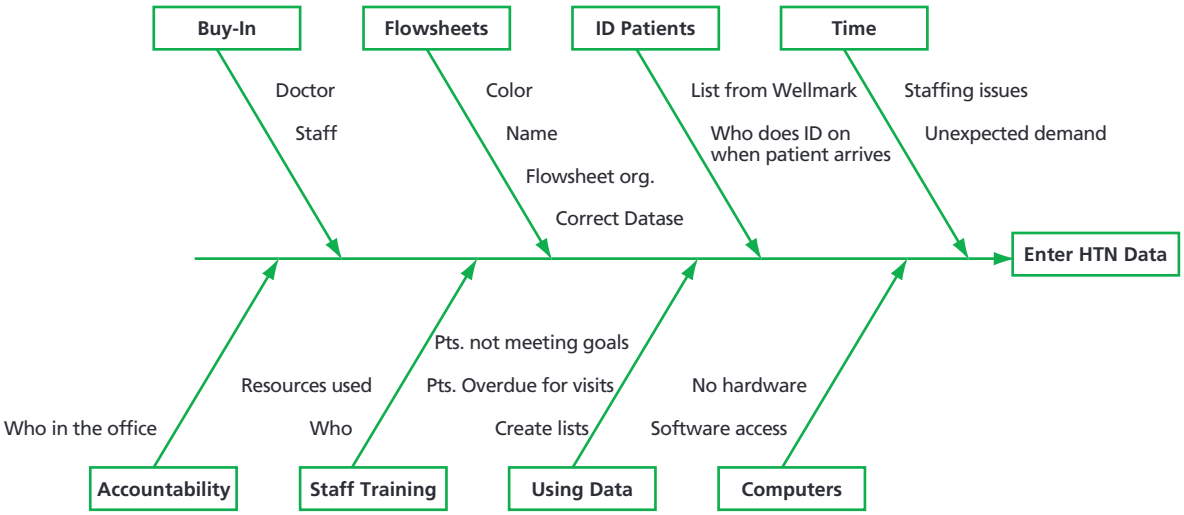
Appendix 3

PRIMED PHYSICIANS MONTHLY REPORT OF ALL HYPERTENSIVE PATIENTS

Number ID	DOS	Status	Systolic	Diastolic	CalcGoal
15546	9/12/06	HTN	128	70	At Goal
15411	9/15/06	CoMorbid	120	76	At Goal
15418	9/6/06	CoMorbid	160	90	Not At Goal
15427	9/6/06	CoMorbid	146	80	Not At Goal
15453	9/20/06	CoMorbid	140	80	Not At Goal
15502	9/22/06	HTN	170	80	Not At Goal
15508	9/11/06	CoMorbid	110	69	At Goal
15526	9/5/06	HTN	114	72	At Goal
15539	9/29/06	HTN	126	70	At Goal
15437	9/28/06	HTN	102	62	At Goal
15582	9/19/06	HTN	120	78	At Goal
15583	9/26/06	HTN	120	70	At Goal
15519	9/20/06	HTN	128	60	At Goal
15401	9/20/06	HTN	135	80	At Goal
15505	9/14/06	HTN	130	84	At Goal
15498	9/5/06	HTN	137	70	At Goal
15480	9/5/06	HTN	160	100	Not At Goal
15420	9/5/06	HTN	130	80	At Goal
15552	9/6/06	CoMorbid	110	60	At Goal
15531	9/1/06	HTN	140	70	Not At Goal
15601	9/6/06	HTN	130	80	At Goal
15271	9/5/06	HTN	136	78	At Goal
15285	9/13/06	HTN	114	74	At Goal
15286	9/25/06	HTN	118	78	At Goal
15292	9/26/06	CoMorbid	128	72	At Goal
15305	9/25/06	CoMorbid	118	62	At Goal
15321	9/11/06	HTN	106	70	At Goal
15322	9/12/06	HTN	90	64	At Goal
15367	9/26/06	HTN	140	110	Not At Goal
15349	9/14/06	CoMorbid	150	60	Not At Goal
15389	9/27/06	HTN	134	80	At Goal
15348	9/5/06	HTN	148	90	Not At Goal
15362	9/22/06	HTN	144	88	Not At Goal
15239	9/8/06	HTN	120	70	At Goal
15368	9/6/06	CoMorbid	110	54	At Goal
15388	9/12/06	HTN	130	84	At Goal
15287	9/5/06	CoMorbid	124	60	At Goal
15260	9/15/06	CoMorbid	140	80	Not At Goal
15296	9/25/06	CoMorbid	116	74	At Goal
15315	9/25/06	HTN	128	70	At Goal
15379	9/2/06	HTN	142	100	Not At Goal
15380	9/25/06	HTN	134	92	Not At Goal
15278	9/20/06	CoMorbid	120	84	Not At Goal
15280	9/13/06	HTN	182	100	Not At Goal
15279	9/26/06	HTN	142	84	Not At Goal
15338	9/14/06	HTN	110	74	At Goal
15350	9/19/06	CoMorbid	140	70	Not At Goal
15351	9/29/06	HTN	134	84	At Goal

Appendix 4

FISHBONE OR ISHIKAWA DIAGRAM



What is a Fishbone diagram?

Dr. Kaoru Ishikawa, a Japanese quality control statistician, invented the fishbone diagram. Therefore, it may be referred to as the Ishikawa diagram. The fishbone diagram is an analysis tool that provides a systematic way of looking at effects and the causes that create or contribute to those effects. Because of the function of the fishbone diagram, it may be referred to as a cause-and-effect diagram. The design of the diagram looks much like the skeleton of a fish. Therefore, it is often referred to as the fishbone diagram.

Whatever name you choose, remember that the value of the fishbone diagram is to assist teams in categorizing the many potential causes of problems or issues in an orderly way and in identifying root causes.

When should a fishbone diagram be used?

Does the team...

- Need to study a problem/issue to determine the root cause?
- Want to study all the possible reasons why a process is beginning to have difficulties, problems, or breakdowns?
- Need to identify areas for data collection?
- Want to study why a process is not performing properly or producing the desired results?

How is a fishbone diagram constructed?

Basic Steps:

- Draw the fishbone diagram....
- List the problem/issue to be studied in the "head of the fish".
- Label each ""bone" of the "fish". The major categories typically utilized are:
  1) The 4 M's: Methods, Machines, Materials, Manpower
  2) The 4 P's: Place, Procedure, People, Policies
  3) The 4 S's: Surroundings, Suppliers, Systems, Skills
  NOTE: You may use one of the four categories suggested, combine them in any fashion or make up your own. The categories are to help you organize your ideas.
- Use an idea-generating technique (e.g., brainstorming) to identify the factors within each category that may be affecting the problem/issue and/or effect being studied. The team should ask... "What are the machine issues affecting/causing..."
- Repeat this procedure with each factor under the category to produce sub-factors. Continue asking, "Why is this happening?" and put additional segments each factor and subsequently under each sub-factor.
- Continue until you no longer get useful information as you ask, "Why is that happening?"
- Analyze the results of the fishbone after team members agree that an adequate amount of detail has been provided under each major category. Do this by looking for those items that appear in more than one category. These become the "most likely causes."
- For those items identified as the "most likely causes," the team should reach consensus on listing those items in priority order with the first item being "the most probable" cause.

SOURCE: North Carolina Department of Environment and Natural Resources website http://quality.enr.state.nc.us/tools/fishbone.htm

Appendix 5

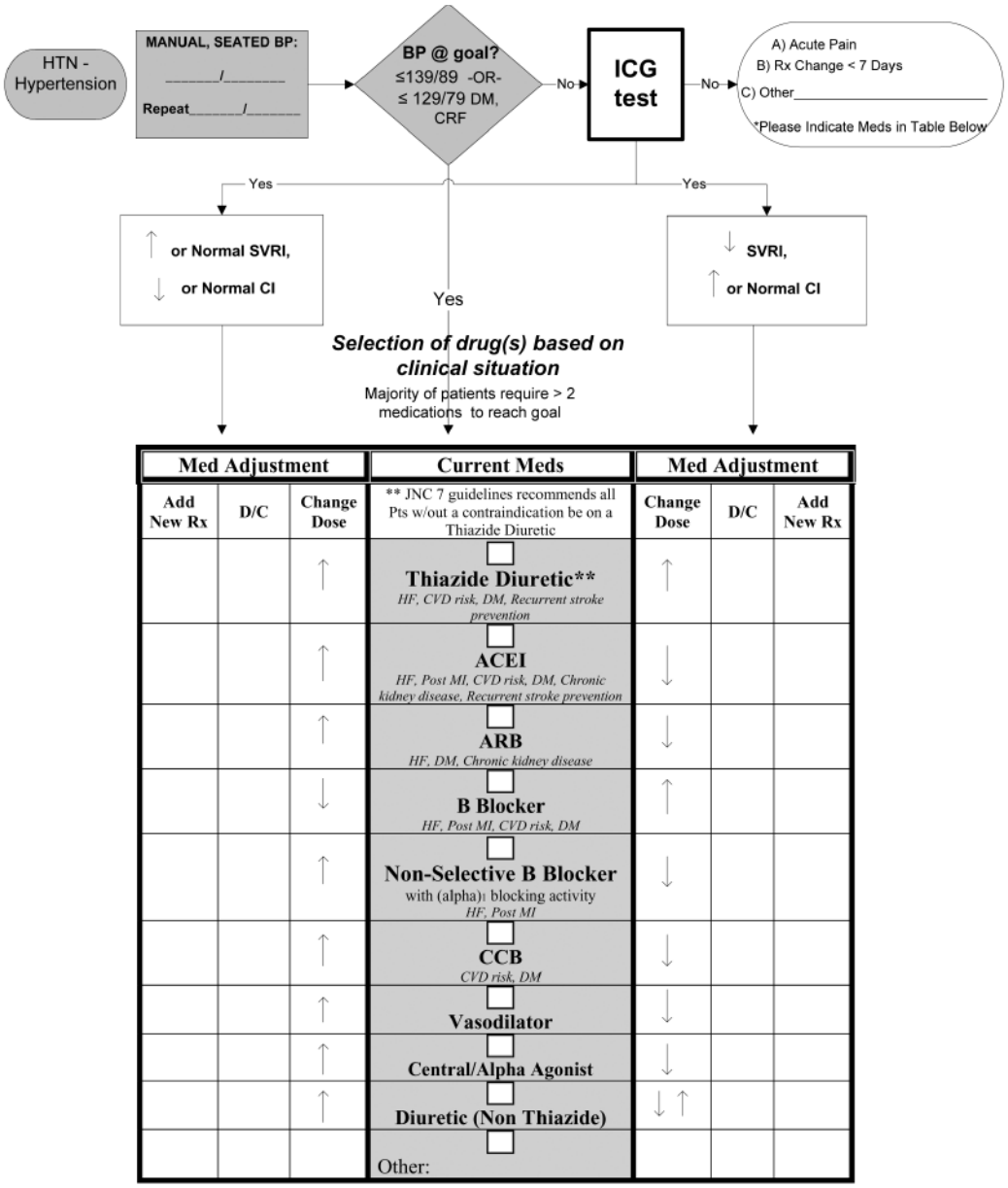
PRIMED PHYSICIANS HYPERTENSION PROCESS FLOW SHEET

Date _____

Name _____

DOB _____

HTN – Clinical Process Flow



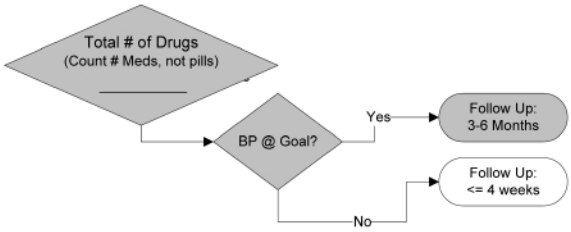
Med Adjustment			Current Meds	Med Adjustment		
Add New Rx	D/C	Change Dose	** JNC 7 guidelines recommends all Pts w/out a contraindication be on a Thiazide Diuretic	Change Dose	D/C	Add New Rx
		↑	☐ **Thiazide Diuretic**** *HF, CVD risk, DM, Recurrent stroke prevention*	↑		
		↑	☐ **ACEI** *HF, Post MI, CVD risk, DM, Chronic kidney disease, Recurrent stroke prevention*	↓		
		↑	☐ **ARB** *HF, DM, Chronic kidney disease*	↓		
		↓	☐ **B Blocker** *HF, Post MI, CVD risk, DM*	↑		
		↑	☐ **Non-Selective B Blocker** with (alpha)1 blocking activity *HF, Post MI*	↓		
		↑	☐ **CCB** *CVD risk, DM*	↓		
		↑	☐ **Vasodilator**	↓		
		↑	☐ **Central/Alpha Agonist**	↓		
		↑	☐ **Diuretic (Non Thiazide)**	↓ ↑		
			☐ Other:			

Lifestyle Modifications counseled? Y / N

Sleep Hx obtained? Y / N

Annual Test/Secondary Cause?

- U/A Y / N
- Renal/K+ Y / N
- ECG Y / N
- FSG Y / N



"Physician's clinical judgment supersedes this form"

REV: 01/10/06