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MBBS., University of Juba (2006)

A Dissertation

Submitted to the University of Gezira in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science in Family Medicine

Department of Community and Family Medicine

Faculty of Medicine

August, 2013

ELSIDEG ELMAMOUN ELSADEG

Supervision Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Sign.</th>
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<tbody>
<tr>
<td>Dr. Ibtisam Mohamed Elshiekh Elbashir</td>
<td>Main Supervisor</td>
<td>…………………..</td>
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<tr>
<td>Dr. Osman Hamid Abdulhamid</td>
<td>Co-Supervisor</td>
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Date : August, 2014

ELSIDEG ELMAMOUN ELSADEG

Examination Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Sign.</th>
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<tbody>
<tr>
<td>Dr. Ibtisam Mohamed Elshiekh</td>
<td>Chair Person</td>
<td>……………………..</td>
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<tr>
<td>Dr. Sakher Badawi Omer Elsheikh</td>
<td>External Examiner</td>
<td>……………………..</td>
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<tr>
<td>Dr. Salwa Elsanousi Hussein</td>
<td>Internal Examiner</td>
<td>……………………..</td>
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Date of Examination: 15, August, 2014
"قلٌ كُلٌ يَعْمَلُ عَلَى شَاَكِلِيْهِ فَرُيْكُمْ أَعْلَمُ بِمِنْ هَوُوَ أُهْدَى سَبِيْلاً 84 وَبَشَّارُونَا عَنِ الرُّوحِ
قلٌ الرُّوحُ مِنْ أَمْرٍ رَبِّي وَمَا أُوتِيَّتْ مِنْ الْعُلْمِ إِلاَّ قَبْلًا 85 وَلَيْنَ شَيْءًا لَنْنَتَدْهِينَ بَالْذِي أُوْحِيَهُ
إِلَيْكُمْ نَعْمَهُ لَا تَجِدُ نَكَّ لَهُ عَلِيْمًا وَكِبْرًا 86 إِلاَّ رَحْمَةً مِنْ رَبِّكَ إِنَّ فَضْلَهُ كَانَ عَلَيْكُمْ كَبِيرًا".

صدق الله العظيم
سورة الإسراء
Dedication

To my dear family members especially the soul of my father, to my mother, and my friends, who show me the light when it gets dark....

El-Sideg
Acknowledgement

I would also like to thank Gezira University Family Medicine Program and it is supportive staff members.

No words can describe the thanks due to Dr. A. Nasir Ahmed Abu Zaid (the family medicine program academic consultant) who is the backbone of this program, and who always support me and my colleagues to achieve our ultimate goal of obtaining our master degree on family medicine.

My special thanks to Dr. Ibtesam Mohamed EL-Basheer, Assistant professor of Family Medicine, University of Gezira who did not hesitate to devote her knowledge and time for me, and giving her advices and assistance in this study.

I would like to express my special thanks to the staff and patients of Zohal Health Center for the help and assistance that without them this study could not be achieved.

I awe adept of thanks to my colleagues for their continues help in many ways.

My thanks extend to Mr. Wayel Elamin; the statistician who helped me in converting numbers into important meaning.

Eventually, my deepest appreciations to my family, who always encourage and support me.
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List of Abbreviations

BMI: Body Mass Index
EHR: Electronic Health Record
EMR: Electronic Medical Record
FM: Family Medicine
HTN: Hypertension

ELSIDEG ELMAMOUN ELSADEG

Abstract

Hypertension has become a public health problem in both developed and developing countries with serious morbidity and mortality. Whenever affected individuals seek care from healthcare professionals, efforts should be made to maximize their management in order to increase control of hypertension and minimize risk of target organ damage. This clinical audit research compare current practice against agreed standards. Audit study of 79 patients, at Zohal health center, data was obtained from EMR including all hypertensive patients registered in the period from September 2012 to April 2013 using structured checklist. Data source is E.M.R., use excel for statistic analysis. Age ranging from 17 to 74 years, 37 (46.3%) were males, while 42 (53.7%) were females. All patients were registered in the EMR, and had follow-up. Out of the total patients, 48 (61.0%) were asked about the smoking status, none of them their height had being taken or recorded, while there was no one weighed or recorded, ECG not done (0%). Lipid profile had been done for 22 (27.4%), for blood sugar 61 patients (77.2) were tested. So the way of the patient should be taken also ECG should be taken for every patient, because is very important investigation so as to illustrate the complication like, Ischemic heart disease and heart failure and cardiomyopathy. These results showed limited adherence to the recommended hypertension management guidelines.
التدقيق في أخذ التاريخ المرضي وعوامل الاختتطار لدى مرضى ضغط الدم المرتفع

بمركز زحل الصحي، محلية المناقل، ولاية الجزيرة، السودان (2014م)

الصديق المامون الصادق الفكي الصديق

ملخص الدراسة

اصبح ارتفاع ضغط الدم مشكلة صحية عامة في كل من البلدان المتقدمة والناشئة مع معدات الاعتقات والوفيات خطيرة. وما أن الأفراد المتضررين يسعون للحصول على الرعاية من المنتظمين، فينبغي بدل الجهود لتحقيق أقصى قدر من تجديد العلاج من أجل زيادة السيطرة على ارتفاع ضغط الدم وجميع مخاطر وقوع الأضرار على اجهزة الجسم الأخرى. هذا البحث عبارة عن مراجعة أداء سريري لممارسة الممارسات الحالية بالمعايير المتفق عليها. شملت الدراسة (79) مريض في مركز صحي زحل، محلية المناقل بولاية الجزيرة، تم الحصول على البيانات من ملفات المرضى الإلكترونية لجميع مرضى ارتفاع ضغط الدم المسجلين في الفترة من سبتمبر 2012م وحتى أبريل 2013م باستخدام قائمة مراجعة منظمة. مصدر البيانات هو ملفات المرضى الإلكترونية. وتم استخدام برنامج مايكروسوفت أكسل للتحليل الإحصائي. تتراوح أعمار المشاركين في الدراسة بين 17 - 74 سنة، الذكور 37 بنسبة 46.3% بينما الإناث 42 بنسبة 53.7%. تم تسجيل جميع المرضى بملفات المرضى الإلكترونية، وتم تسجيل موانع المحاذبة لجميع المرضى وسجلت حالة التدخين لـ 48 (61.2%) من المرضى، بينما لم يتم قياس الوزن، أو تخطيط كهربة القلب لأي من المرضى. كشف نسبة الدهون قد تم القيام به 22 (27.4%) تحليل الدم للسكر أجرى لـ 61 (77.2%) من المرضى. لذلك ينبغي أن تجري للمرضى كل الفحوصات مثل القياس و وزن الجسم وعمل رسم تخطيطي للكهربة القلب لأن ذلك يساعد في التشخيص المبكر للمضاعفات المختلفة. وله الفحص الاحترافي ينحص بالعراض مبكرًا لذلك تعتبر من أهم الفحوصات، وأظهرت هذه النتائج التقييد بمحدودية المبادئ التوجيهية لعلاج ارتفاع ضغط الدم الموصى بها.
Chapter One

Introduction

High blood pressure is a common condition in which the force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease.

Blood pressure is determined by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. The more blood your heart pumps and the narrower your arteries, the higher your blood pressure.¹

You can have high blood pressure (hypertension) for years without any symptoms. Uncontrolled high blood pressure increases your risk of serious health problems, including heart attack and stroke.²

High blood pressure typically develops over many years, and it affects nearly everyone eventually. Fortunately, high blood pressure can be easily detected. In addition, once you know you have high blood pressure, you can work with your doctor to control it.³

Justification:

Hypertension is one of the common health problems in both developing and developed countries, Sudan is not an exception.

Most of the hypertensive patients who came for follow-up didn’t receive the standard care.

This study was conducted to measure the quality of care provided to hypertensive patients at Zohal health center.

Hypertension is a major risk factor for stroke, myocardial infarction (heart attacks), heart failure, aneurysms of the arteries (e.g. aortic aneurysm), and peripheral arterial
disease and is a cause of chronic kidney disease. Even moderate elevation of arterial blood pressure is associated with a shortened life expectancy. Dietary and lifestyle changes can improve blood pressure control and decrease the risk of associated health complications, although drug treatment is often necessary in people for whom lifestyle changes prove ineffective or insufficient.

It has been proved that good control of blood pressure significantly decreases the morbidity and mortality from stroke and myocardial infarction for hypertensive patients. However, studies have shown that <15% of all hypertensive patients have well controlled blood pressure.\(^4\)

Frequency of follow up depends on the severity of the hypertension, the stability and degree of blood pressure control, patient compliance with drug treatment, and the need for non-pharmacological advice. Initially, frequent visits may be required to assess baseline blood pressure. When treatment is initiated and blood pressure stabilized three monthly measurements of blood pressure should be sufficient in most cases. In primary health care and in hospital blood pressure clinics nurses have a particularly important role, not only for careful measurement of blood pressure and the possible reduction of the "white coat" effect but also in counselling the patients, providing non-pharmacological advice, and assessing the side effects of drugs.\(^5\)

The benefits of electronic health records (EHRs) for primary care and the application of these systems to outcomes research and current efforts in practice redesign such as the National Committee for Quality Assurance’s Patient-Centered Medical Home program are often hampered by barriers to full integration of EHRs. Common barriers include lack of trust in EHRs to securely store medical records, physicians’ views that EHRs interfere with clinical judgment; lack of standards in data formatting and lack of interoperability; the required time, training, and investment to become proficient in using the systems; the absence of local leadership to champion the systems; difficulties in organizational redesign to use the EHR; and lack of readiness to implement EHRs successfully. We sought to examine one problem—the structure, consistency, and completeness of EHR data—by importing de-identified EHR data into an external system for analysis of diagnostic information.\(^6\)
Background to clinical audit:

Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structure, processes, and outcomes of care are selected and systematically evaluated against explicit criteria.

Where indicated, changes are implemented at an individual, team, or services level and further monitoring is used to confirm improvement in healthcare delivery. This definition is endorsed by the National Institute for Clinical Excellence.\(^7\)

Clinical audits monitor the use of particular interventions or the care received by patients against agreed standards. Any departure from "best practice" can then be examined and causes can be determined and acted upon. It is a quality improvement process that aims to improve patient care and outcomes. Aspects of patient care - including structure, processes and outcomes - are selected and evaluated against explicit criteria and, where necessary, changes are implemented at an individual, team or services level. Effective clinical audit is important for health professionals, health service managers, patients and the public. It can support health professionals in ensuring that their patients are receiving the best possible care. It can also inform health managers about new investments that may be needed to support health professionals in their practice.\(^8\)

Improvement in the management of HTN has significantly decreased cardiovascular mortality in several developed countries. Well organized care can improve the outcome of the hypertensive patients by early prevention of complications. Because physicians have a direct role in treatment outcomes, physicians’ overestimation about hypertension management can contribute to inadequate blood pressure control. Thus, interventions for improving physicians’ awareness regarding the management of patients with hypertension are needed.\(^9\)
Chapter Two

Literature Review

Objectives:

- To evaluate practice care against standards.
- To classify where care needs to be improved.
- To produce an action plan as a result of the first audit.

Standard and guidelines:

- **Criteria:**

<table>
<thead>
<tr>
<th>Patients diagnosed as hypertensive must be recorded in the patient register.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The records show that the patient has been reviewed in the past 6 months.</td>
</tr>
<tr>
<td>The records show that the hypertension is well controlled, defined as &lt;150/90mmHg in a patient without diabetes and &lt;140/85mmHg in a patient with diabetes. Both systolic and diastolic levels must be obtained.</td>
</tr>
<tr>
<td>The records show that data on smoking have been recorded in the past 2 years.</td>
</tr>
<tr>
<td>The records show that body mass index (BMI) has been recorded in the past year.</td>
</tr>
</tbody>
</table>
- **Standards**

<table>
<thead>
<tr>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All hypertensive patients should be registered in a hypertension register</td>
</tr>
<tr>
<td>2. There should be a follow up appointment for patients who defaulted follow-up (&gt; 2 weeks)</td>
</tr>
<tr>
<td>3. Smoking status should be recorded</td>
</tr>
<tr>
<td>4. Height should be taken &amp; recorded</td>
</tr>
<tr>
<td>5. Weight should be taken &amp; recorded</td>
</tr>
<tr>
<td>6. Lipid profile should be done and recorded (at least once in the past 2 years)</td>
</tr>
<tr>
<td>7. Blood sugar (fasting or random) should be done and recorded (at least once in the past 2 years)</td>
</tr>
<tr>
<td>8. ECG should be done at least once after diagnosis of hypertension and results recorded</td>
</tr>
<tr>
<td>9. Renal function (urine dipstick/ FEME or blood urea or serum creatinine) should be done and recorded (at least once in the past 2 years)</td>
</tr>
<tr>
<td>10. Blood pressure should be taken and recorded in all follow-up visits in the past 6 months</td>
</tr>
<tr>
<td>11. The interval between follow-up visits should not exceed 6 months in the past 2 years</td>
</tr>
</tbody>
</table>
Chapter Three

Methodology

➢ **Study design:**

Audit and analytic retrospective health center based study.

➢ **Study Area:**

Zohal health center, Managil, Gezira Stat, Sudan, The health center is located.

➢ **The catchment area of the health center borders are:**

1. North: 24 Elghorashi – about 70 Km.
2. South: Rabak – about 60 Km.
3. Este: Almanagil – about 80 Km.
4. West: Alkawa – about 30 Km.

The populations of the catchment area about 3000 most of them are farmers.

Most of the Sudan tribes are represented in the catchment area.

Near the health center, there are two primary schools (girls, boys), and 1 secondary school. 1 mosque and social center.

The health center provides the PHC services.

**The staffs of the health center consist of:**

1 Doctors (FM program), vaccinator, midwife & health visitor and a nurse.

➢ **Study Population:**

All patients who attended Zohal health center seeking hypertension medical care service, but the following groups are not covered by this study and were not included in the audit: people with diabetes, children and young people (younger than 18 years),
pregnant women, people with secondary causes of hypertension. People with acute hypertension or high blood pressure in emergency care settings.

➢ **Study sample and technique:**

The total sample size based on comprehensive sampling from the Electronic Medical Records (EMR): 79 patients selected.

➢ **Data collection:**

The data collection was carried out from the patients’ records plus a checklist. The source of data was E.M.R.

➢ **Data processing and analysis:**

All data was stored on a personal computer and analyzed using the Microsoft Excel, no patient identification or individual details was published.
Chapter Four

Result

A total of 79 hypertensive patients EMR files were reviewed. (Table 1). Of the total 79 patients 37 (46.8%) were males, while 42 (53.2%) were females (Table 2).

79 patients (100.0) were registered in the EMR, and all of them had a monthly follow-up plan.

Out of the total patients, 48 (60.8%) were asked about the smoking status, none of them their weight or height had being taken or recorded.

Lipid profile had been done for 12 (15.4%), for blood sugar 58 patient (72.9) were tested. No ECG had been done for registered patients, while renal function test was done for 8 (9.7%).

Blood pressure was taken for all of the patients in their follow-up visits, and the interval between follow-up visits was usually one month (90%).

This audit study declares that some of the checked variables are not adequately done and need more self-effort, some are somewhat good and need more attentiveness; generally, the work done is near to what should be.
Checklist of Audit of hypertensive patients regarding history taking of risk factors in Zohal Health Center during the period September 2012 to April 2013:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Achieved Standard</th>
<th>Target Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All hypertensive patients should be registered in a hypertension register</td>
<td>100.0%</td>
<td>100%</td>
</tr>
<tr>
<td>2. There should be a follow up appointment for patients who defaulted follow-up (&gt; 2 weeks)</td>
<td>100.0%</td>
<td>100%</td>
</tr>
<tr>
<td>3. Smoking status should be recorded</td>
<td>60.8%</td>
<td>100%</td>
</tr>
<tr>
<td>4. Height should be taken &amp; recorded</td>
<td>0.0%</td>
<td>100%</td>
</tr>
<tr>
<td>5. Weight should be taken &amp; recorded</td>
<td>0.0%</td>
<td>100%</td>
</tr>
<tr>
<td>6. Lipid profile should be done and recorded (at least once in the past 2 years)</td>
<td>15.2%</td>
<td>100%</td>
</tr>
<tr>
<td>7. Blood sugar (fasting or random) should be done and recorded (at least once in the past 2 years)</td>
<td>73.4%</td>
<td>100%</td>
</tr>
<tr>
<td>8. ECG should be done at least once after diagnosis of hypertension and results recorded</td>
<td>0.0%</td>
<td>100%</td>
</tr>
<tr>
<td>9. Renal function (urine dipstick/ FEME or blood urea or serum creatinine) should be done and recorded (at least once in the past 2 years)</td>
<td>10.1%</td>
<td>100%</td>
</tr>
<tr>
<td>10. Blood pressure should be taken and recorded in all follow-up visits in the past 6 months</td>
<td>100.0%</td>
<td>100%</td>
</tr>
<tr>
<td>11. The interval between follow-up visits should not exceed 6 months in the past 2 years</td>
<td>89.9%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Chapter Five

Discussion and Conclusion

Discussion

From the results we found that patients recording in the register, and follow-up, blood pressure taking and recording, follow-up intervals were effortlessly done with a score of (90.0-100.0%), while blood sugar test was (73.4%).

For the overhead variables, working with the same strategy and measure should be kept on.

Smoking status, lipid profile, and renal function test were insufficiently recorded (10.1-60.8%).

Although the mentioned variables were incompletely done, still they need a lot of work and attention.

Height, weight and ECG were not registered, these variables want more effort, but it depends on setup that is not available in the center.

Lipid profile test is not one of the lab tests available in the center and the patients who did the test make it out of the center, weight and height cannot be done in the health center due to the unavailability of the scales, and there is no ECG machine.
Conclusion

Directing an audit of hypertension is essential to measure clinical performance and to manage what changes should be made to increase quality of care. There was key difference in documentation of patient variables, and there is a necessity to spot-on that.
Recommendations

1. Modification of EMR and computer system to progress work, plus more training in operation of this facility.

2. Identify a weekly day or every two weeks for hypertensive patients.

3. Equip the lab with important devices and materials.

4. Import an ECG machine.

5. Re-audit after 6-9 months.
Audit study of hypertensive patient regarding history of risk factors and clinical examination in Zohal health center in Gezira state, Sudan 2013-2014.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action plan</th>
<th>Action by date</th>
<th>Person responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. By 1st of July the work on system should be better</td>
<td>Order modifications in EMR</td>
<td>1st of July 2013 7th July 2013</td>
<td>Dr. Elsideg Elmamoun Elsadeg</td>
</tr>
<tr>
<td>2. By 1st of Aug. the doctor will update guidelines</td>
<td>Review the guide line of HTN and apply they to the all practice</td>
<td>1st Aug. 2013-7th Aug. 2013</td>
<td>Dr. Elsideg Elmamoun Elsadeg</td>
</tr>
<tr>
<td>3. By 1st of July Import an ECG</td>
<td>The doctor will contact the authorities for ECG</td>
<td>1st of July 2013</td>
<td>Dr. Elsideg Elmamoun Elsadeg</td>
</tr>
<tr>
<td>4. By 1st of July Important devices and materials</td>
<td>The doctor will contact the authorities for Lab needs</td>
<td>1st of July 2013</td>
<td>Dr. Elsideg Elmamoun Elsadeg</td>
</tr>
</tbody>
</table>
References


4 Aram V. Chobanian, MD; George L. Bakris, MD; Henry R. Black, MD; William C. Cushman, MD; Lee A. Green, MD, MPH; Joseph L. Izzo, Jr, MD; Daniel W. Jones, MD; Barry J. Materson, MD, MBA; Suzanne Oparil, MD; Jackson T. Wright, Jr, MD, PhD; Edward J. Roccella, PhD, MPH; and the National High Blood Pressure Education Program Coordinating Committee. JAMA. 2003;289(19):2560-2571. doi:10.1001/jama.289.19.2560.


7 2002/014 NICE & CHI handbook to help NHS staff improve standards following the Bristol Royal Inquiry.


Appendices

Appendix 1: Checklist

Checklist of Audit of hypertensive patients regarding history taking of risk factors and clinical examination in Zohal Health Center during the period September 2013 to April 2014:

By: Dr. Elsideg Elmamoun Elsadeg

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Yes</th>
<th>No</th>
<th>Target Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All hypertensive patients should be registered in a hypertension register</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>2. There should be a reminder system for patients who defaulted follow-up (&gt; 2 weeks)</td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>3. Smoking status should be recorded</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Height should be taken &amp; recorded</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Weight should be taken &amp; recorded (For body mass index: at least once in the past 2 years)</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Lipid profile should be done and recorded (at least once in the past 2 years)</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Blood sugar (fasting or random) should be done and recorded (at least once in the past 2 years)</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. ECG should be done at least once after diagnosis of hypertension and results recorded</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Renal function (urine dipstick/ FEME or blood urea or serum creatinine) should be done and recorded (at least once in the past 2 years)</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Blood pressure should be taken and recorded in all follow-up visits in the past 6 months</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. The interval between follow-up visits should not exceed 6 months in the past 2 years</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 2: Study schedule of action

<table>
<thead>
<tr>
<th>Activity</th>
<th>Period</th>
<th>Start date</th>
<th>End date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalizing and approval of the proposal</td>
<td>1 week</td>
<td>21 April</td>
<td>25 April</td>
</tr>
<tr>
<td>Data collection</td>
<td>1 week</td>
<td>28 April</td>
<td>2 May</td>
</tr>
<tr>
<td>Processing and analysis</td>
<td>1 week</td>
<td>3 May</td>
<td>11 May</td>
</tr>
<tr>
<td>Written of final report and submission</td>
<td>1 week</td>
<td>12 May</td>
<td>16 May</td>
</tr>
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2002/014 NICE & CHI handbook to help NHS staff improve standards following the Bristol Royal Inquiry.