

Why do family physicians fail to detect renal impairment?

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ABSTRACT

OBJECTIVE To investigate why many patients with renal impairment (30.7%) were not recognized by their family physicians despite an earlier educational intervention on detecting renal impairment; and to determine whether certain factors related to physicians, patients, or the intervention itself were associated with whether renal impairment was detected.

DESIGN Qualitative approach using grounded theory.

SETTING A Health Service Organization in Ottawa, Ont.

PARTICIPANTS A purposeful sample of six family physicians.

METHODS In semistructured interviews, participants were asked to describe the workup ordered and their decision-making processes for patients in whom they had recently detected renal impairment. They were also asked to evaluate the six components of an educational intervention designed to help them to detect renal impairment. Finally, one patient's chart was reviewed (a chart containing a laboratory report noting an abnormal result for kidney function and having no indication that renal impairment had been recognized) to identify reasons for lack of detection.

RESULTS Most physicians did not investigate every patient with renal impairment (glomerular filtration rate of < 78 mL/min) in the same way because they took individual patient factors into consideration. Reasons for not detecting renal impairment were "managed differently" or "missed," with the former being the most common. The educational intervention physicians remembered most often was chart rounds, and these were viewed as helpful. "Missed" cases were more often deliberately managed differently than unintentionally not detected.

CONCLUSION Physicians used various approaches to detect and manage renal impairment despite interventions that recommended a consistent procedure.

EDITOR'S KEY POINTS

- Many patients' renal impairment was still not recognized by their family physicians despite the fact that, in 2002, the National Kidney Foundation in the United States published clinical practice guidelines supporting use of the Cockcroft-Gault estimate of the kidney filtration rate.
- This study investigates why renal impairment continued to be underdiagnosed despite an intensive educational strategy and an improved system of laboratory reporting.
- Results reveal that most physicians were not working up every patient with renal impairment in the way specified by the guidelines, but were usually addressing the issue.
- Discussing detection of renal impairment during chart rounds was thought to help physicians better understand the issues around detecting kidney disease.

This article has been peer reviewed.

Full text available in English at www.cfpc.ca/cfp

Can Fam Physician 2006;52:212-213.

Family physicians are in a key position to detect chronic kidney disease early. Eighty percent of all Canadians have a family physician, and two thirds of Canadians have seen their family physicians within the last year.¹ Timely detection of renal impairment is needed to improve patient outcomes.² Morbidity and mortality rates are lower among patients starting renal replacement therapy who have had early referral to nephrologists or to multidisciplinary specialized teams.³⁻¹⁰

Serum creatinine, the most widely used measure of renal function in clinical medicine,¹¹ performs poorly as a diagnostic test, especially for women and elderly patients.^{11,12} A better test of kidney function is the glomerular filtration rate (GFR) calculated by the Cockcroft-Gault formula (CG GFR).¹³ In 2002, the National Kidney Foundation in the United States (K/DOQI)² published clinical practice guidelines supporting use of the CG GFR. The K/DOQI report states that “serum creatinine concentration alone should not be used to assess the level of kidney function.”² The CG GFR has been extensively validated in many populations, including the elderly, and has

been found to be a better measure of renal function than the measured 24-hour creatinine clearance rate.¹⁴⁻¹⁶ The CG GFR is a simple equation that converts serum creatinine levels into an estimate of kidney function (GFR) using a patient’s age, weight, and sex. The formula is easy to apply.

From March 15, 2001, to March 15, 2002, a laboratory phlebotomist at a health service organization recorded patients’ age, weight, and sex whenever serum creatinine testing was ordered. The laboratory calculated creatinine clearance using the CG GFR and reported both serum creatinine and the calculated CG GFR to physicians.¹⁷ Baseline characteristics of patients are shown in **Table 1**. We used an intensive educational strategy to inform physicians that the CG GFR was being reported and to encourage them to champion a new approach to investigation, monitoring, and referral of patients with renal impairment.¹⁸ Teaching seminars were held, educational materials were distributed and posted, and each physician was approached twice by a facilitator to be sure he or she was aware of the change and reminded of the availability of support materials. A nephrologist was available to answer questions.

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Table 1. Patient characteristics

PATIENT CHARACTERISTICS	MALE	FEMALE	ALL
No. of patients (N)	142	182	324
Patients with diabetes (%)	30.3	19.2	24.1
Age (y ± SD)	75.6 ± 6.3	76.8 ± 6.1	76.2 ± 6.3
Weight (kg ± SD)	82.8 ± 14.5	66.1 ± 21.9	73.4 ± 20.7
Serum creatinine (µmol/L ± SD)	106.0 ± 26.5	79.6 ± 17.7	88.4 ± 26.5
Glomerular filtration rate* ± SD	66 ± 22	58 ± 18	61 ± 20

*Glomerular filtration rate calculated by Cockcroft-Gault formula.

Of all the patients for whom abnormal CG GFR levels¹⁹⁻²¹ (ie, <78 mL/min) were reported, 30.7% remained unrecognized.¹⁷ (Subsequently, K/DOQI defined chronic kidney disease as either kidney damage or GFR <60 mL/min/1.73 m² for more than 3 months.) Unrecognized patients were those whose chart had no indication that a physician had made the diagnosis, initiated an appropriate diagnostic workup, or referred them to nephrologists. We then conducted a study with a qualitative approach to help us understand why renal impairment continued to be underdiagnosed despite an

intensive educational strategy and an improved system of laboratory reporting.

METHODS

Qualitative approach

A grounded theory approach^{22,23} was used to collect and analyze data and to develop theories “grounded” in physicians’ practice behaviour. One-on-one, semi-structured interviews were conducted to obtain in-depth personal accounts of how physicians detect renal impairment in their patients. Ethics approval was obtained from the Ottawa Hospital’s Ethics Review Board.

Setting

The study took place in a health service organization (HSO) serving approximately 8000 patients. Health service organizations are part of the Ontario health care system; physicians are paid by capitation through a comprehensive health insurance system. This particular HSO is the Family Medicine Teaching Centre of a tertiary care academic hospital.

Sampling method

A purposeful sampling technique²⁴ was used. Staff physicians at the centre were chosen for interviews if they were aware of the GFR reporting. At the time of the study, the centre employed 12 physicians (seven men, four full-time and three part-time; and five women, two full-time and three part-time). All staff physicians practising at the centre who were not part of the research team agreed to be interviewed.

Out of nine possible participants, six were interviewed (three women, all part-time, and three men, two part-time and one full-time). They had worked at the centre an average of 11 years (range 1 to 25 years). After these six interviews, sampling stopped because saturation was reached. Interviews lasted 30 to 45 minutes and took place at the centre from June to August 2002.

Interviews were semistructured with 27 open-ended and two closed-ended questions. When necessary, participants were questioned further to obtain detailed accounts of their experiences. Most probing questions were determined in advance, but interviewers could include other questions to

explore new areas that emerged during interviews. Physicians were asked about a patient each had recently recognized as having renal impairment, about the workup ordered, and about whether they worked up all patients with a GFR of <78 mL/min. They were also asked 19 questions about how the six components of the educational intervention had helped them to detect renal impairment and how each component could be improved. Near the end of the interview, one of the physician’s patient charts was reviewed. Each chart contained a laboratory report noting an abnormal GFR result but no indication that renal impairment had been recognized. The physicians were asked one question about what had happened in this case and were asked why no further action was taken despite the abnormal result. Five background questions (eg, sex and knowledge of the previous audit) and two closing questions (about anything else concerning detecting renal impairment or other comments) were asked.

To enhance the authenticity of the data, information was audiotaped, transcribed, reviewed by one of the researchers, and sent to each interviewee for verification. Memos and diagrams, constructed and reconstructed immediately after each interview, were used in theory development. Disconfirming evidence was consciously sought, and comprehensive descriptions of interviewees’ reactions and responses using quotations and examples to confirm theories and patterns were provided. A constant comparative method of analysis was used along with an open coding style. “In vivo” codes were used as much as possible to label categories in the words or phrases of participants. These terms were developed into categories to capture the information, and theories or models were built from the information and from the notes taken after each interview. Another investigator reviewed the coding; inconsistencies were resolved through consensus.

FINDINGS

Educational components

Results shown in **Table 2** suggest physicians were most often aware of educational visits and discussion during chart rounds. They were mostly

Table 2. Participants' awareness of the educational intervention aimed at improving detection of renal impairment

COMPONENTS	AWARENESS		AWARENESS RANKING (1—MOST AWARE)
	YES	NO	
Chart rounds	6	0	1
Reminder sheets (workup protocol)	4	2	2
E-mail messages	3	3	3
Assistance from a family physician change facilitator	2	4	4
Talks by nephrologists about the quality improvement project study	2	4	4
Other methods	1	5	
• Guidelines ¹⁸			
• Lecture from another nephrologist	1	5	
• Participation in another renal quality improvement project study	1	5	

unaware of assistance from a facilitator and formal presentations by a nephrologist.

Chart rounds

Discussions about detecting renal impairment during chart rounds were viewed as helping physicians better understand the issues. “It was more just sort of us discussing [and] questioning the workup, whether specific parts of the workup were really necessary, cost-effective ways of detecting certain underlying causes that could cause CKD [renal impairment].”

Discussions also reminded physicians about renal impairment “by reminding me that there was this potentially more sensitive way of detecting CKD and that by teaching that approach you reinforce your own knowledge about it.” Several physicians suggested that detection of CKD should be discussed more formally during chart rounds.

Reminder sheets

Many participants viewed reminder sheets as a useful memory aid for recalling the details of the workup for renal impairment.

They gave you a list, a recipe that if the creatinine is this, you do this, and if it is this, you do this, and it made life a little easier than scratching your head

and saying, “Well, I know I am supposed to order nine tests but I can only remember seven of them.”

The format of the reminder sheets was a common concern. Many physicians suggested they needed to be in colour.

E-mail messages

Only half the physicians recalled receiving e-mail messages informing them of the change in laboratory reporting and highlighting abnormal results. Only two physicians suggested that e-mail messages helped them. The rest were dissatisfied with using e-mail to communicate: “I think there should be a more heads-up approach, almost even a person approaching physicians to say this is what’s going on, handing them a brochure that tells them what’s expected of them.”

Recent experience with detecting renal impairment

In recalling recent experiences with patients with renal impairment, most physicians mentioned creatinine clearance specifically for initial diagnosis or early detection.

Because of the study, detecting [renal impairment] is a lot easier than it was before, because we now get a creatinine clearance with our blood work results as opposed to a creatinine which sort of gives you a much better idea of a person’s renal function, so it is a lot easier to pick up now.

They referred most often to the reminder sheets to determine which items to include in the workup: “I have been following the protocol. I have been doing the tests that are recommended. I have that list of tests on file, and I refer to it from time to time to make sure that I’m ordering the right things.” A few physicians also referred to the guidelines published in the *Canadian Medical Association Journal*.¹⁸

Most physicians indicated they do not work up every patient who has a GFR <78 mL/min in the same way. Factors accounting for the variance were related to individual patients or testing itself. Patient factors were mentioned more often than

testing factors as influencing physicians' decisions. Patients in generally poor health (eg, dementia, cancer) or with acute conditions (eg, disabling angina) were not likely to be tested.

If you have a person who is 85 years old and is otherwise well, then that is fine, but if you have an 85-year-old who has multiple diseases and a cancer that will terminate their life in the next 6 months, then you are not so likely to work up all the other ancillary problems that they have.

Testing factors mostly concerned measurement of GFR. A few physicians mentioned that they did not proceed with testing because calculated GFR was viewed as misleading in certain subpopulations, such as the elderly: "I have a fair number of patients who are over 80 and some are over 85, and their [calculated] GFR is virtually always abnormal."

Reasons for not detecting renal impairment

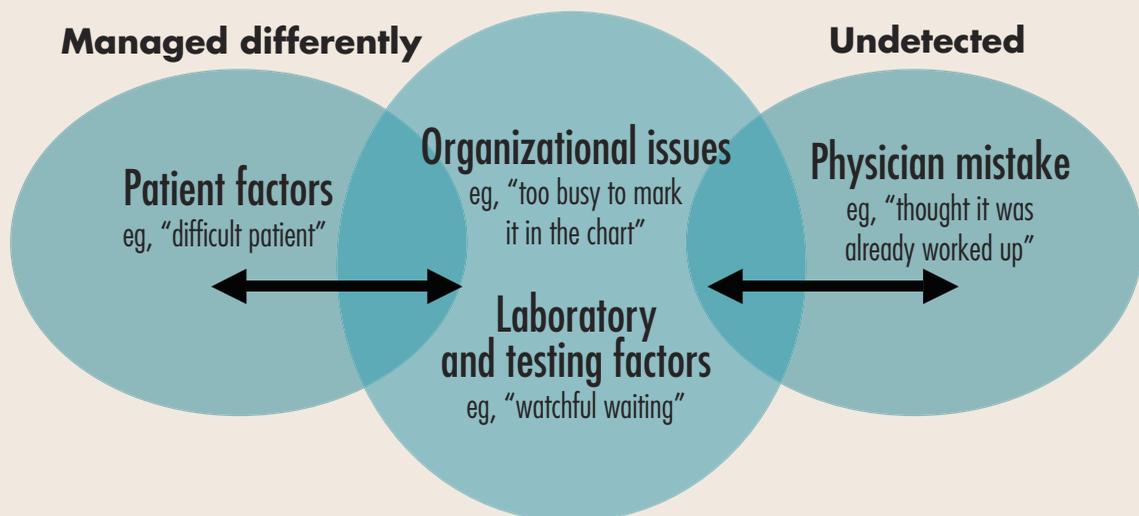
Figure 1 illustrates physicians' reasons for not detecting renal impairment. Two different types of reasons to explain why cases were undetected emerged, but they were connected by common factors of organizational issues at the centre and laboratory and testing procedures.

Managed differently. Two thirds of physicians gave the reason "Managed differently" for not detecting renal impairment. This theme emerged from physicians' strongly expressed feelings that their not recognizing CKD in their patients had been misrepresented and that they had managed cases in a different way to better serve the interests of their patients. "I take issue with the way the question in your interview guide is worded. I guess from what I have said it is clear that I don't think I missed a case of renal impairment. I think it was just managed differently." "I think this is more an issue of we didn't pursue further investigations of ... renal impairment, rather than not recognizing it."

Missed cases. Undetected cases are those for which physicians openly admitted they might have missed the GFR in the laboratory printout. "My theory is either I missed this even though I ticked it off, or I may have discussed it with the patient and asked if she wanted to have the ultrasound, 24-hour urine collection and she may have said no." "Many of my 85-year-olds are abnormal. I thought I had tested most of them, if not all. This may be one that I missed. It looks like it since I did not do further testing."

Patient factors. Patient factors were the most frequently expressed reasons for not detecting renal

Figure 1. Reasons for not detecting renal failure



impairment by physicians who said they managed patients differently. The main factor was patients' health followed by patients' attitude. For example, if patients had other serious illnesses or ongoing health problems, cases were managed differently.

The first thing we would usually discuss was her depression. She was having bowel incontinence, which was really affecting her life. To her that was a heck of a lot more important than a number on her chart that tells her creatinine clearance is lower. You try to do what is more important to the patient that is sitting in your office first.

Patients' attitudes were mentioned by a few physicians. Attitudes included patients being noncompliant or difficult or favouring non-intervention.

Physicians' mistakes. Making a mistake was the most common factor emerging from physicians with undetected cases. Both physicians who gave this reason said they had missed renal impairment because they had focused on a different laboratory result and had not noticed the GFR reading: "I think we were focusing on her potassium that was low, so I was focusing on that abnormal result." One physician also thought that low GFR had already been worked up so she was not paying attention to current GFR results.

Organizational issues at the centre. Concerns included continuity of patient care, lack of time, and organization of charts. Lack of continuity of patient care emerged as a factor for physicians giving both types of reasons for not detecting renal impairment. A few physicians were concerned about patients having multiple care providers: "She is not my patient; ... I saw her while her physician was away." A few physicians who said they managed patients differently were also concerned about a lack of time to either mark in the chart that they had spoken to a patient about GFR results and decided to delay further testing or to explain testing procedures to elderly patients. One physician noted that the charts were disorganized.

Laboratory and testing factors. Physicians giving both reasons were concerned about laboratory

reports, the normal range for calculated GFR, and the perceived low yield of additional tests. Laboratory reports were of particular concern. "It is not user-friendly, and it should be in bold, so that if there is a low reading on any of the lab reports, any tests that come back ... should be flagged as low and should be made in bold print."

DISCUSSION

Awareness of educational interventions to improve detection of renal impairment varied considerably among study participants. Improvements will have to be made if these interventions are to be used in other settings.

In exploring physicians' thoughts about detecting renal impairment, we learned that, despite educational and laboratory-reporting interventions that recommended a consistent procedure, not all patients were managed consistently. The realities of medical practice are noticed when factors other than guidelines take priority. These factors include patients' multiple and competing illnesses, organizational issues at the centre, and difficulties reading laboratory reports.

The differences in how physicians detect and manage renal impairment led us to theorize that most physicians make a conscious decision to provide individualized, patient-centred care rather than simply fail to detect renal impairment. We were unable to find any literature using a qualitative approach on noncompliance with guidelines after an intensive educational program. We felt some relief that our interventions were understood by participants but also concern that physicians were not following the guidelines. Guidelines and protocols that are important today could be rejected tomorrow, as in the case of hormone replacement therapy. Most physicians chose to disregard the guidelines when caring for certain patients, indicating that they did not fully accept the guidelines.

Limitations

Limitations of our study include the fact that most participants were part-time physicians, which could affect results. Another limitation is that we conducted

the study at a single centre. We had no choice because the intervention took place only in this one centre. Another limitation that might have biased results is that we conducted the study at a family medicine centre with residents in a tertiary care setting.

Conclusion

Results of this single-centre study showed that most family physicians ignored guidelines and provided patient-centred care. Future directions for research could move beyond this qualitative study to collecting data on whether ignoring guidelines led to either negative or positive outcomes for patients. There is still also a need to investigate how guidelines can be best introduced and applied in family practice. Further research should examine whether the K/DOQI guidelines are really appropriate for those 64 years old and older. ❁

Acknowledgment

This paper is dedicated to the memory of our beloved friend Dr Peter Swedko. This study was funded by a grant from Ortho-Biotech in Raritan, NJ.

Contributors

All the authors made substantial contributions to conception and design of the study. Dr Hogg and Dr Akbari were involved in analysis and interpretation of data and drafting the article. Dr Rowan was involved in acquisition, analysis, and interpretation of data, and drafting the article. Dr Lemelin, Dr Swedko, Dr Magner, and Dr Clark were involved in analysis and interpretation of data and critically revising the article for important intellectual content. All the authors and Dr Swedko's executor approved the final manuscript to be submitted.

Competing interests

None declared

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