Alternatives to Acute Care

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Manitoba Centre for
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Department of Community Health Sciences
Faculty of Medicine, University of Manitoba

Carolyn DeCoster, RN, MBA
Sandra Peterson, MSc
Paul Kasian, MD

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The Manitoba Centre for Health Policy and Evaluation

The Manitoba Centre for Health Policy and Evaluation (MCHPE) is a unit within the Department of Community Health Sciences, Faculty of Medicine, University of Manitoba. MCHPE is active in health services research, evaluation and policy analysis, concentrating on using the Manitoba health data base to describe and explain patterns of care and profiles of health and illness.

Manitoba has one of the most complete, well-organized and useful health data bases in North America. The data base provides a comprehensive, longitudinal, population-based administrative record of health care use in the province.

Members of MCHPE consult extensively with government officials, health care administrators, and clinicians to develop a research agenda that is topical and relevant. This strength, along with its rigorous academic standards and its exceptional data base, uniquely position MCHPE to contribute to improvements in the health policy process.

MCHPE undertakes several major research projects, such as this one, every year under contract to Manitoba Health. In addition, MCHPE researchers secure major funding through the competitive grants process. Widely published and internationally recognized, they collaborate with a number of highly respected scientists from Canada, the United States and Europe.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Manitoba, like other jurisdictions both in Canada and internationally, is in the midst of evaluating and reorganizing its health care system. To assist in this process, Manitoba Health asked the Manitoba Centre for Health Policy and Evaluation (MCHPE) to study the question: Were there patients in our hospitals whose health care needs could more appropriately be met in an alternate setting—such as long term care, home care, outpatient? Hence, the title of the study: *Alternatives to Acute Care* (AAC).

A substantial body of research conducted elsewhere has demonstrated that anywhere from 7% to 51% of adult admissions and from 27% to 59% of hospital days did *not* require the services of an acute care hospital. Having information on these proportions for Manitoba hospitals would help to frame the downsizing policy discussion; we need to know what alternative health care services must be in place to permit hospital downsizing while ensuring patient access to safe, effective health care.

The role of MCHPE is to analyze and interpret data to assist in understanding and improving Manitoba's health care system. Our mission is "to provide accurate and timely information to health care decision-makers, analysts and providers so they can offer services which are effective and efficient in maintaining and improving the health of Manitobans." We want to promote efficiency—not simply to improve the bottom line—but to preserve Medicare in Manitoba. The evidence we have reviewed to date convinces us that there are sufficient dollars in the health care system, but that we must monitor the system closely and suggest the necessary adjustments to ensure its survival. Studies and reports like this one are undertaken to improve our understanding about how health care is delivered and suggest policy changes to improve it.

Methods

The MCHPE study began in late 1994. Like most other studies in this area, it was a retrospective chart review of a sample of medical admissions, that is, surgical, obstetrical

and psychiatric cases were excluded from the study. Medical cases were defined according to the patient's most responsible diagnosis, that is, the main reason for the patient's hospital stay. The study focussed on adult medical separations for the 1993/94 fiscal year, but also reviewed paediatric medical cases at four of the hospitals in the study.

Hospitals were divided into four groups: Urban, Major Rural, Intermediate Rural and Small Rural hospitals. Medical records at all urban hospitals and at six hospitals in each of the other three groups were reviewed.

Our entire process, including careful review of the criteria used to judge whether an admission or day was Acute or not, was carried out under the guidance of a Working Group, whose members comprised a broad cross-section of the health care sector and represented both rural and urban Manitoba.

Eight Registered Nurses were trained to conduct the review, using a set of criteria—called InterQual—that were reviewed and approved by the Working Group. The nurses assessed the patient at admission and then for each day of stay following the admission review. Whenever a patient was assessed as not Acute, the nurse determined the Alternate Level of Care needed by the patient.

InterQual Criteria

The InterQual criteria are a set of objective, measurable, clinical indicators, as well as diagnostic and therapeutic services reflecting the need for hospitalization. They were developed in the United States for hospital utilization review. They are not diagnosis-based; they consider the level of illness of the patient and the services he or she requires and are thus a baseline set of criteria for all acute hospital care, regardless of location or size of the hospital. We chose to use the InterQual criteria because they have been externally validated, they have been used in similar retrospective research, and they are revised and updated annually.

For the study to be credible, it was critical that the criteria be acceptable, especially to physicians, since they decide when to admit, how to treat and when to discharge patients. The adult criteria were reviewed in depth by two of the physician members of the Working Group, and their recommendations were discussed in detail by the entire Group, whose members included both physicians and nurses. The paediatric criteria were reviewed by the paediatric physician member of the Working Group. Both the adult and paediatric criteria were also reviewed by several physicians external to the Working Group, who suggested minor revisions, but otherwise agreed that the criteria were fair and acceptable measures of acuteness.

Alternate Levels of Care Criteria

After reviewing alternate care levels from InterQual and from the Health Services Utilization and Research Commission (HSURC) of Saskatchewan, the Working Group adopted as a guideline the alternatives developed by HSURC, modifying them to fit the Manitoba situation. There were 13 possible alternate levels of care.

Terms Used

For admissions or days of care that were assessed as requiring the services of an acute care hospital, we use the term "Acute." For admissions or days that were assessed as not requiring the care of an acute care facility, we use the term "ALC" or Alternate Level of Care. For other definitions, see *Definitions Used in This Report*, immediately after the *Executive Summary*.

Findings

There were two characteristics of hospital use that were of interest: the proportion of medical *admissions* that were Acute and the proportion of medical *days* that were Acute. To be assessed as Acute at the time of admission, the patient had to meet the InterQual criteria within 72 hours of the admission. In addition to the admission review, each day of

the patient's stay was reviewed, up to Day 30, after which every 10th day was reviewed. The day of discharge was not included in the analysis.

Adult Medical Admissions

Overall, we found that 50% of the adult medical admissions were Acute. Another 25% were assessed as requiring Observation. Given that Observation units are located in a hospital, arguably these patients also needed hospital care, even if only for a short time. The proportion of admissions that were assessed as Acute was highest in the Urban hospitals and lowest in the Small Rural hospitals.

A small number of patients, only 2%, required No Health Care; in other words virtually all of the medical patients admitted to Manitoba hospitals were ill and needed health care, but often not the level of care available in an acute care hospital. At admission, almost one-quarter were assessed as requiring either long term institutional care, home care, outpatient care or other services.

Adult Medical Days

Overall, 33% of days were assessed as requiring Acute care—two of every three days spent by Manitobans receiving acute inpatient hospital care for medical conditions could potentially be treated in a setting other than that of an acute care ward, if one were available. Because a few long stays could skew the results, we also analyzed Acuteness for just the first thirty days of stay, where we found the proportion Acute was 39%. As for the analysis of admissions, the proportions of days that were Acute declined across hospital categories from Urban to Small Rural.

Again, only a small proportion, 7%, of the overall days required No Health Care. This finding is critical. Physicians are not using hospitals frivolously—their patients are genuinely ill. If alternative, less resource-intensive health care settings were readily

available and yield equal or superior outcomes, they could substantially reduce our need for hospitals.

The proportion of days that were assessed as requiring Observation is only 7%, much lower than the proportion of admissions (25%) requiring Observation. This is because many of these patients had very short hospital stays. The largest portion of Alternate Level of Care days (27%) is for patients requiring care typically provided at either a Personal Care Home, rehabilitation or chronic care facility: approximately one-quarter of the days medical patients spent in acute care hospitals could likely be provided in a facility that is designed to meet the needs of long term care patients.

Paediatric Medical

Over the four hospitals reviewed, 44% of the paediatric medical admissions were assessed as Acute. As for the adults, a large proportion (39%) of the patients were assessed as requiring Observation at the time of admission; if we add the two proportions, then we find that 83% of the paediatric patients needed some hospital care at the time of admission. Only 1% required No Health Care at the time that they were admitted.

We assessed 52% of the paediatric days as Acute. The ALCs for paediatric days showed a somewhat different pattern from those of the Adults: very few required a long stay institution, so few that it was added to the category "Other." Approximately one-quarter of the days were assessed as requiring Observation. The reason that this proportion is larger for the paediatric population than for adults is that, on average, paediatric lengths of stay are much shorter; hence fewer days were reviewed in total and the days requiring Observation make up a larger proportion of the total.

Second Look

When we analyzed the results from the initial data abstraction, we found Manitoba hospitals' Acuteness level to be at the low end of published results elsewhere including

those found in Saskatchewan. We revisited eight hospitals to investigate the reasons for our lower findings. We called this phase of the study the "Second Look."

Since HSURC conducted its study in Saskatchewan, the InterQual criteria had become somewhat more stringent, reflecting changes in current hospital practice. When we revisited the eight hospitals, we used the older criteria—the ones that had been available when HSURC did its review—and we found that the Second Look results now closely matched those of Saskatchewan.

At four of the hospitals we revisited, physicians in the Working Group reviewed twenty records that had been previously abstracted; the physicians were unaware of how the abstractors had assessed these patients. The physicians agreed with the abstractors' assessment 81% of the time. There were 75 charts reviewed by both abstractors and physicians, with agreement 61 times; of the 14 disagreements, 12 patients that were assessed as not Acute by the InterQual criteria were judged Acute by the physician.

Additional Findings

- The likelihood that a patient can be cared for at an alternate health care level increases with length of stay. For patients assessed as Acute at the time of admission, by the eighth day of stay, only 47% were still Acute. By Day 30, only 27% were Acute.

- Three diagnostic categories accounted for 53.9% of the admissions and 50.5% of the days in our study: Circulatory, Respiratory and Digestive. For Circulatory and Digestive, 44.7% of the days were Acute, and for Respiratory 38% of the days were Acute. Since these diagnostic categories account for such a large portion of hospital use, they might be the areas that yield the most results in terms of restructuring how care is delivered.

- Patients aged 75 or older were particularly likely to spend days in hospital at a level of care that was not appropriate to their needs. Patients aged 75 or older

accounted for 39% of the admissions in our study but 54% of the days. Only 30% of the hospital days for patients aged 75 or older and 18% of the days for patients aged 85 or older were Acute, compared with 56% of the days in the 25 to 34 year age group. At admission, the proportion assessed as Acute was similar for all adult age categories.

- There is considerable discussion in the media and among health care practitioners about the prevalence of so-called unnecessary social admissions among the poor and disadvantaged. If this were true, we would expect to find that these patients would have lower levels of Acuteness. Our data did not support this hypothesis. We divided Winnipeg patients into five income categories based on where they lived. We found that patients in the lowest income category had the same levels of Acuteness as those in the highest income categories.

- We also looked at Acuteness by whether the patient was a Treaty Indian or not. The proportion of Acute admissions was equivalent for Treaty patients and all others; however Treaty patients actually had a higher proportion of Acute days (48%) than did all other patients (32%), contradicting the commonly-held belief that the disadvantaged over-use hospitals.

Implications

The point that is most clear from the study is that significant resources in the acute hospital sector are directed towards delivering care to patients that could more appropriately be cared for in an alternative setting. However, the alternatives have to be in place and readily accessible. Our reliance on hospitals has developed because hospitals are historically the most well-funded and politically visible institutions in the health care system. They were the first part of the system to be universally insured and access is based on need without financial barriers. Any system of alternatives to acute care must share the characteristics of universal coverage, based on need without financial barriers.

To change the system of health care and to create effective alternative services will require breaking down regulatory, administrative, professional and intellectual barriers.

Although these results indicate strongly that there is no shortage of acute hospital beds, they also indicate that the patients who are currently in hospital are ill and do require health care. Only a small percentage of the patients in the study were assessed as requiring no health care. Therefore, alternatives must be in place and accessible prior to closing acute care beds.

The data suggest that a significant amount of adult medical care could be provided in alternate health care settings. Applying our findings to 1993/94 adult medical separations, 34,000 cases and 429,000 days could have been reallocated. However, half of those cases (17,700) and 56,000 days required Observation, a level of care that implies the need for an acute care facility close at hand. For a small number, 1,300 cases and 44,000 days, no health care was required. The care of 15,000 adult medical patients (who used 329,000 hospital days) could have been provided in an alternate setting, like a nursing home, rehabilitation, outpatient or home care. In many cases, existing hospital beds can be reconfigured to other uses—observation or long term care for example—that would better meet the needs of patients.

Manitoba hospitals may wish to use the InterQual criteria or some other utilization management tool to assess their medical patients in order to plan the reconfiguration of hospital services. Manitoba Health Organizations, Inc. (MHO) has expressed a willingness to co-ordinate training of hospital personnel to use the InterQual criteria and to work with the hospitals to analyze the data. This would depend on the degree of interest expressed by the hospitals. MCHPE would assist MHO to implement this program.

Limitations

Despite our best efforts, the data analyzed for this study are already three years old. Much has changed since then. When hospitals receive these results, they may wish to conduct their own review using InterQual or some other tool to update the results.

The InterQual tool has been used retrospectively in other research. However, this does lead to some hurdles. When used concurrently, there is opportunity for physician override: whenever the chart reviewer and the attending physician disagree, a physician reviewer is called upon to determine whether the patient should be in hospital or not. Retrospective chart review also assumes that the medical record is complete. We assumed that if it was not documented, then it did not exist.

A further limitation relates to the list of alternatives that we used. We may have been limited by a list that was based mainly on alternatives with which we were already familiar; no doubt there are other possible alternatives that we did not consider.

Lastly, we did not conduct a cost comparison of acute hospital care versus alternatives. This type of comparison is critical before changes are made; however it was beyond the scope of this study. We do know, however, that in 1993/94, the average cost per inpatient day in Manitoba hospitals ranged from $288 to $540 depending on the size of the hospital, whereas the public cost per day in a nursing home was $79. We have no cost data for other health care alternatives.

Recommendations

1. Hospitals provide significant amounts of care which could be provided in alternate settings. It is not clear from this study whether alternatives are not used because they do not exist, because practitioners are unaware of their existence or because procedures to access the alternatives are cumbersome and inefficient. In some low volume settings, alternatives, e.g. observation units, long term care, hospice care, may be just as expensive to provide as hospital beds. An assessment

is necessary of existing alternatives, community needs and desires, as well as an assessment of the needs of patients currently hospitalized that require alternative health care services. Planned alternatives should not be restricted by the definitions used in this study or by what is currently available, but should encourage creativity to meet the needs of patients.

2. By far the majority of patients studied (98.4%) required some form of health care at the time they were admitted. Before any hospital beds are closed, an infrastructure must be in place with a built-in system to ensure that access to alternate care is based on specific criteria, priority of need and would not increase costs to the consumer.

   Bridge funding should be available to encourage development of alternatives before closing hospital beds, predicated on a business plan that includes a maximum two-year deadline to implement the alternative(s), close hospital beds and realize a pay-back. In addition, based on the approved business plan, priority should be given to capital funding requests for the purpose of infrastructure changes to existing buildings to make them suitable for alternative uses.

3. At least on a one-time planning basis, urban hospitals and Regional Health Associations (RHAs) should use a utilization-management review tool to assess the Acuteness of admissions, ongoing days of stay and readiness for discharge of their medical patients. Each urban hospital/RHA should set up a committee with representation from a broad cross-section of the health care community to plan, implement, receive results of the utilization management review and to make recommendations aimed at lowering the proportion of Alternate Level of Care admissions and days. Physicians and other hospital practitioners should be informed and educated about the utilization review process, the tool to be used, the findings and alternative services or programs that are aimed at preventing or

reducing non-acute hospital use. One urban hospital/RHA could serve as a pilot project to demonstrate the usefulness of this approach.

4. Such a high level of non-acute care is provided at many hospitals, particularly rural institutions, that reconfiguring a number of acute care hospitals to alternative uses should be considered. Examples of such alternatives are convalescent care for patients who are no longer acute but may need several months of care before they can go home, health care professional offices, outpatient services or women's shelters. The Saskatchewan experience with this approach should be examined carefully.

5. Regarding utilization management review tools:

   - Manitoba Health should take a lead role in developing standards for utilization management tools on a provincial basis. Bulk purchase arrangements should be negotiated for hospitals that are interested, and can reallocate resources within their existing budgets. There are numerous tools available; many are costly. Only with a single tool will comparisons across institutions such as those presented here be possible. A committee should be established by Manitoba Health with representation from urban hospitals, Regional Health Associations, Manitoba Health Organizations and health care practitioners to review existing tools, to advise on data collection needs, and to recommend a tool that will be the standard for the province.

   - Manitoba Health Organizations, Inc. (MHO) has long had a communications and educational role with respect to health care facilities in the province, particularly rural facilities. The introduction of a utilization management review tool requires both staff training and data analysis. MHO is ideally suited to organize and co-ordinate programs to

train hospital staff in the collection and analysis of data using whatever standard utilization-management tool is chosen.

- Manitoba Health should use a standard utilization-management review tool to assist in reviewing hospitals that request major capital redevelopment.

6. A committee should be established by Manitoba Health with representation from the College of Physicians and Surgeons, Regional Health Associations, the Manitoba Association of Registered Nurses and others as appropriate, to define observation/short stay as an alternative to inpatient admission to an acute care bed. There should be a balance of rural and urban representatives on the committee. The committee should review and recommend different models for patients that require very short interactions with hospitals, and establish guidelines with respect to standards of care, time limits for patient stays, physical infrastructure and safety standards.

7. Two of the four hospitals in which we reviewed paediatric cases had a very low proportion of admissions and days assessed as Acute. Rural hospitals state that the paediatric outreach program developed by Health Sciences Centre has already had an impact on paediatric hospital admissions. We suggest that a review of paediatric admissions using InterQual or some other utilization management tool be undertaken at all of the hospitals with sufficient volumes of paediatric medical admissions. If rural admission rates continue to reflect low levels of Acuteness, we suggest further investigation to determine why. Also, we recommend that the College of Physicians and Surgeons consider developing guidelines on and monitoring the standards of care for paediatric admissions.

8. The urban extended treatment bed review of 1990 found that Winnipeg had a sufficient number of rehabilitation beds but that there were limitations to accessing these beds. The review task force recommended that access to

rehabilitation beds for residents of Winnipeg and surrounding communities be centrally co-ordinated, and that larger rehabilitation units, where appropriate resources and expertise could be concentrated, should be accessible to patients in the community and to smaller hospitals. Such an arrangement could reduce the likelihood of patients occupying acute beds when they would be better treated elsewhere.

- The Rural Extended Treatment Bed Task Force recommended that chronic care patients in rural facilities should be panelled by Continuing Care, as they are in Winnipeg. The implementation of this recommendation would enable the Continuing Care Division to compile more accurate data on these patients, and to monitor and reassess them regularly. It would also enable the collection of a residential fee.

9. Manitoba Health should assist with the sharing of information regarding successful and unsuccessful strategies and programs that hospitals have used to reduce the proportion of non-acute hospital use.

10. The Working Group considered reviewing psychiatric as well as medical admissions when planning this study. Because of the ongoing reforms in Mental Health care, it was decided that the Acuteness of psychiatric admissions and days should be assessed in 1998 or 1999, i.e. after the current reforms in the provision of mental health care have been completed.

DEFINITIONS USED IN THIS REPORT

Acute, Acuteness: Patients were assessed as requiring the level of health care services that can only be provided in an acute care hospital if they met the InterQual criteria (see definition).

Admission Review: Each patient record was reviewed at the time of admission to assess whether the patient required the services of an acute care hospital at that time. The admission review included the first 72 hours of the patient's stay in hospital.

Alternate Level of Care (ALC): Whenever a patient did not meet the criteria for Acuteness, an alternate level of care was suggested by the abstractor that would have been more appropriate to the patient's needs, had it been available. There were thirteen possible alternatives and they were defined as follows:

1. **Residence**: Patient's condition and services ordered/received indicate that the patient did not need the hospital or an alternative setting.

2. **Outpatient Services**: Patients who have tests and procedures that do not require inpatient care because of the nature of the procedure but whose treatments and procedures cannot be provided by home-based services, physicians' offices or community centres (e.g. Diabetic, C.O.P.D. Clinics; Pre-admission tests).

    - Out of town patients requiring outpatient services and lodging: (e.g. Bed and Breakfast): patients who need to be close to the hospital but do not require admission; patients living long distances from the hospital and requiring frequent treatments that cannot be provided by home-based services and where transportation is unavailable; patients receiving daily

chemotherapy or radiation therapy and do not require professional observation.

3. **Home-Based Care** or **Home Care**: Patients who are not receiving an acute level of care and do not require services provided as defined in Outpatient Services, Rehabilitation, or Personal Care Home/Chronic Care.

   - Patients with heavy care needs that can be accommodated at home with good support from family, live-in or volunteer support and home-based services programs such as: skilled nursing care (including IV therapy); patient family education; rehabilitation services, e.g. respiratory/physical therapy/occupational therapy/speech therapy/mental health and vocational counsellors/social workers; home management services (laundry and cleaning); personal care; home maintenance; laboratory services; case management; nutrition services; adult day programs; after hours emergency services; meals-on-wheels; volunteer services.

4. **Minimal Supervision**: Patient requires non-skilled care and 24-hour accessibility to support and cannot be cared for at home due to unavailable and/or unstable family or live-in support (e.g. Guest home). Patients who have special housing needs (e.g. handicapped or senior's housing).

5. **Hospice**: Hospital-based program for patients who are terminally ill and who cannot be cared for at home due to unavailable and/or unstable family or live-in support and may utilize: skilled nursing care and other services such as IV analgesia or alimental support; social services and pastoral care; rooming-in facilities for family members.

   - Home-based programs for patients who are terminally ill and require: skilled nursing care and other services, such as IV therapy and IV

analgesia or alimental support; case management; hospice physician; pastoral care, mental health, physical therapists, nutritional services, pharmacy services (e.g. CADD pumps) and social workers.

- Independent facility for terminally ill (e.g. Jocelyn House).

6. **Rehabilitation**: Patients who are not receiving an acute level of care but require 24-hour supervision and assessment by a team of rehabilitation personnel or who are receiving a therapy program planned by a physiotherapist which is delivered daily. The patient may then be expected to be discharged fully restored or transferred to a home-based program or to another level of care accommodation. (e.g. HSC Rehab, Riverview, Deer Lodge and other Extended Treatment Units).

7. **Personal Care Home**: Patients who require some degree of long term care in a 24 hour supervised setting, who can no longer be cared for at home, and whose care needs could be met by admission to a long term care facility licensed as a personal care home.

8. **Chronic Care**: Patients who show little or no potential for rehabilitation, whose care needs cannot be met at home, and who require equipment, treatment or a level of professional supervision (e.g. nursing, medical, respiratory) not usually provided in a personal care home.

9. **Observation**: Short-stay hospital encounter for patients requiring close nursing observation or medical management.

10. **Respite**: Patients who require respite care to relieve the caregiver

11. **Room-In**: Patients who require room-in centres for alcohol and drug dependencies

12. **Crisis/Protection**: Patients who require paediatric or adult protection/crisis intervention (e.g. Safe Homes, Half-Way Houses, Foster Homes, Child Abuse Centres, Suicide Treatment Centres).

13. **Organic Brain Illness**: Patients with organic brain illness waiting transfer to Selkirk Mental Health Centre

Confidence Interval or Confidence Limits: A range of values within which we can be 95% confident that the true value for the population lies. Because we are working with a sample, we can never state with absolute certainty that the value for the sample is the same as the value for the population. Statistical tests measure a range between which we can be 95% confident that the value for the population lies.

Day Review: After the determination of Acuteness at the time of Admission, each subsequent day of care was reviewed to determine if the patient was Acute or not. Each day up to the 30th day of stay was reviewed separately; after that, every 10th day was reviewed.

Hospital Categories: For the Population Health Information System, MCHPE grouped Manitoba hospitals into seven categories based on size, level of specialization, and environment: (1) Teaching (2) Urban Community (3) Major Rural (4) Intermediate Rural (5) Small Rural (6) Small Multi-Use and (7) Northern Isolated. For this study, we grouped Teaching with Urban Community and called it Urban, Small Rural with Small Multi-Use and called it Small Rural. A complete listing of the hospitals in each category is found in *Utilization of Hospital Resources, Volume II* (Black et al. 1993).

InterQual Criteria: A set of objective, measurable, clinical indicators and diagnostic and therapeutic services reflecting the need for hospitalization. The criteria were developed by physicians, are reviewed annually and have been validated in other research.

Length of Stay: The length of stay was calculated by subtracting the discharge date from the admission date. The date of discharge was not counted in the length of stay since it was assumed that at the time of discharge, patients were no longer Acute. Whenever a patient was transferred to a designated extended treatment bed in the same facility, an artificial discharge date was created on the date of transfer.

Long Care Institution: A combination of three ALC categories: Rehabilitation, Personal Care Home and Chronic Care.

Medical Separation: The definition of a medical case was based on the most responsible diagnosis as coded in the hospital separation abstract. It was *not* based on service code. The most responsible diagnosis is the one diagnosis which describes the most significant condition of a patient which causes his or her stay in hospital. In cases where multiple diagnoses may be classified as most responsible, the diagnosis causing the greatest length of stay is coded as most responsible.

No Health Care Required: Patient's condition and services ordered/received indicate that the patient did not need the hospital or an alternative health care setting. (Same as Residence). We are using "health care" here in a traditional and restricted sense meaning treatment of a recognized medical illness, syndrome or chronic condition.

Other: A combination of several ALC categories (combined for the purposes of presentation because the findings for each category were very small): Minimal Supervision Residence, Hospice, Respite, Room-In, Crisis/Protection and Organic Brain Illness. (For Paediatrics, add Long Care Institution).

Socio-Economic Status: The 1991 Canadian census has information on average household income in each enumeration area. We used these data to rank urban

neighbourhoods into five income "quintiles." An urban enumeration area is defined by Statistics Canada as having a population density greater than 400 persons per square kilometre. Average income is less applicable for rural areas.

Treaty Indians: Patients who were Treaty Indians under the federal Indian Act.

INTRODUCTION

Manitoba, like other jurisdictions both in Canada and internationally, is in the midst of evaluating and reorganizing its health care system. To assist in this process, Manitoba Health asked the Manitoba Centre for Health Policy and Evaluation (MCHPE) to conduct a study to assess the degree to which alternative health care services could replace hospitalization. In other words, were there patients in our hospitals whose health care needs could more appropriately be met in an alternate setting, such as long term care, home care, outpatient? Hence, the title of the study: *Alternatives to Acute Care* (AAC).

Hospital care is expensive. Manitoba spends approximately one-third of its total operating budget on health care, of which over half is consumed by hospitals. In 1993/94, this amounted to 960 million dollars. If an alternative health care service can prevent or reduce the length of a hospital admission, produce the same or better patient outcomes, and if the alternative service is less expensive to provide than hospital care, then there is the possibility of cost savings.

The role of MCHPE is to analyze and interpret data to assist in understanding and improving Manitoba's health care system. Our mission is "to provide accurate and timely information to health care decision-makers, analysts and providers so they can offer services which are effective and efficient in maintaining and improving the health of Manitobans." We want to promote efficiency—not simply to improve the bottom line—but to preserve Medicare in Manitoba. The evidence we have reviewed to date convinces us that there are sufficient dollars in the health care system, but that we must monitor the system closely and suggest the necessary adjustments to ensure its survival. Studies and reports like this one are undertaken to improve our understanding about how health care is delivered and suggest policy changes to improve it.

In previous research at MCHPE, we found variations in the way hospitals are used. For example, Winnipeg residents use long stay (60 days or more) hospital days at twice the rate of non-Winnipeg residents, whereas non-Winnipeg residents have a 70% higher

separation rate than Winnipeg residents for short (less than 60 days) hospital stays (Frohlich, Markesteyn et al. 1994). These variations in the way hospitals were used prompted further inquiry.

There is a substantial body of research that suggests that not all of the patients who are admitted to a hospital actually require the services of an acute care institution. A 1993 review of inappropriate hospital use (Lavis, Anderson) reported on 16 Canadian and international studies of adult admissions, and eight studies of paediatric admissions. These studies used well-validated non-diagnostic based criteria to ask, (1) was the admission appropriate? and (2) were subsequent days of stay in the hospital appropriate? They reported that from 57% to 93% of adult admissions and 52% to 73% of the days of stay were appropriate. In other words, in the Canadian and other hospitals studied, 7% to 43% of adult admissions and 27% to 48% of the days of stay were judged *not* to require the level of care provided in an acute hospital. The two paediatric reviews found 71% to 89% of the admissions to be appropriate; the range of appropriate days of care was from 46% to 87%.

More recently, the Health Services Utilization and Research Commission (HSURC) of Saskatchewan reviewed medical separations for fiscal year 1991/92 in hospitals throughout the province (1994). The hospitals were divided according to size from the largest urban hospitals to small community hospitals of less than 20 patients in their average daily census. The percent of adult medical admissions and days judged to be Acute is given in Table 1. In the group of the four largest (base) hospitals, the range of admissions assessed as Acute was from 46% to 73%. In the group of the smallest hospitals, as few as 16% and as many as 73% of the admissions were assessed as Acute. Table 2 gives the results for paediatric admissions and days. (Paediatric cases were not reviewed at Saskatchewan's small community hospitals).

Table 1. Acuteness of Patients in Saskatchewan Acute Care Hospitals - Adult

	% of Admissions which met criteria for Acuteness	% of Days which met criteria for Acuteness
Base Hospitals	46 - 73%	42 - 62%
Regional	47 - 78%	37 - 55%
Large Community	38 - 65%	24 - 61%
Small Community (≥20 beds)	19 - 68%	30 - 60%
Small Community (< 20 beds)	16 - 73%	15 - 75%

Table 2. Acuteness of Patients in Saskatchewan Acute Care Hospitals - Paediatrics

	% of Admissions which met criteria for Acuteness	% of Days which met criteria for Acuteness
Base Hospitals	44-67%	65-83%
Regional	40-76%	52-86%
Large Community	35-66%	25-83%

The MCHPE study began in late 1994. Like most other studies in this area, it was a retrospective chart review of a sample of medical admissions. Hospitals were divided into four groups: Urban (including both Teaching and Urban Community), Major Rural, Intermediate Rural and Small Rural (including both Small Rural and Multi-Use) hospitals. Medical records at all urban hospitals and at six hospitals in each of the other three groups were reviewed. The study focused on adult medical separations for the

1993/94 fiscal year, but also reviewed paediatric medical charts at four of the hospitals in the study. HSURC's assistance through the provision of data collection instruments they developed along with consultation during planning, field work and analysis expedited the completion of our project.

Our entire process, including careful review of the criteria used to judge whether an admission or day was Acute or not, was carried out under the guidance of a Working Group consisting of physicians and representatives from hospitals, home care and long term care. When our preliminary results suggested quite low levels of Acuteness among patients at Manitoba hospitals, we returned to eight hospitals to verify our process, asked clinicians from the Working Group to review the records, and assessed the circumstances associated with the non-acute admissions and days. This part of the review we call the Second Look phase and it will be discussed under a separate heading

PROCESS

A Working Group was established to advise MCHPE through all phases of the project. The Group reviewed the project methodology, including the InterQual criteria, helped interpret the findings, developed the recommendations, provided feedback for this report and advised on communication strategies. The Working Group members have diverse perspectives, backgrounds and knowledge about health care and they represent a broad cross-section of individuals working in the system. The Working Group members are:

- Marylin Allen, RN, Director of Resident Care, Fred Douglas Lodge (since March 1995)
- Ross Brown, MD, Vice-President Clinical Care, St. Boniface General Hospital
- Evelyn Fondse, CCHRA(C), Director, Medical Information Department, Health Sciences Centre
- Sylvia Jennings, BN, MSA, Director of Resident Care, Middlechurch Home of Winnipeg (until January 1995)
- Sally Longstaffe, MD, Associate Professor, Paediatrics and Child Health, Health Sciences Centre
- Barry MacMillan, MD, Bsc(H), CFCP, DIP in Sports Medicine, Family Practice, Winnipeg
- Garry Mattin, CHE, Chief Executive Officer, Portage and District General Hospital, Seven Regions Health Centre, MacGregor District Health Centre and Douglas Campbell Lodge.
- Lois McMurchy, RN, BGS, Director of Patient and Resident Services, The Pas Health Complex
- Marion Suski, RN, MEd, CHE, President and Chief Executive Officer, Victoria General Hospital
- Rose Unger, Aboriginal Nurse and Independent Health Consultant

- Cathy Winburn, BN, Westman Regional Co-ordinator, Continuing Care/Home Care
- Cornie Woelk, MD, CCFP, Family Practice, Winkler

The Working Group met for the first time on October 12, 1994. Stewart MacMillan, MD, Chair of the Health Services Utilization and Research Commission of Saskatchewan spent the morning describing a similar study carried out in Saskatchewan, emphasizing the role of the Working Group. The afternoon was spent in discussion about the goals and methods of the study and agreeing on the roles of the Working Group. We discussed whether or not we would review surgical and psychiatric separations as well as medical. The Working Group decided not to review surgical separations because significant improvements in the efficient management of surgical patients had already been obtained through shorter lengths of stay, pre-admission clinics, and shifts towards outpatient surgery. A review of psychiatric separations was postponed because major reforms in the organization and delivery of mental health services were ongoing.

Several of the Group members agreed to review in detail the InterQual criteria and the criteria for Alternate Levels of Care, and to suggest changes that were in keeping with Manitoba practice. The Group met again three weeks later on November 7 and intensively reviewed both the InterQual and the Alternate Levels of Care criteria. At subsequent meetings, the Group discussed at length the data analysis, interpretation of results, and the recommendations. The Working Group also reviewed and provided comments on several versions of this report.

Levels of Acuteness found were at the lower range of published studies, and somewhat lower than those of Saskatchewan hospitals. Since the InterQual criteria had been modified somewhat since the Saskatchewan study, we wanted to determine if this had had an impact on our results, as well as to investigate other possible explanations for the Manitoba results. We therefore set up a "Second Look" Sub-committee of the Working Group to advise us on how we could sensitivity test our findings.

InterQual Criteria

The criteria we used to assess Acuteness were developed by InterQual, a company based in the United States. The criteria were first developed in 1978 for concurrent hospital utilization review. Revisions have been made in each year since 1982, ensuring that the review system kept pace with changes in medical technology and clinical practice patterns. The criteria used for the Manitoba study were published in 1993 (Jacobs and Lamprey).

> Reviewer with Manitoba Health Organizations, Inc: "We recognize the intent of the study was to identify those days and admissions that did not require acute care. However, no indication is given that among patients deemed acute, there are multiple levels of acuity. In the absence of such a statement, one is left with the impression that patients treated in tertiary centre, community hospitals, major and small rural centres all have the same level of acuity."

The InterQual criteria are a set of objective, measurable, clinical indicators and diagnostic and therapeutic services reflecting the need for hospitalization. They consider the level of illness of the patient and the services he or she requires and are thus a baseline set of criteria for all acute hospital care, regardless of location or size of hospital.

The criteria are grouped into fourteen body systems as follows: generic, blood and lymphatics, cardiovascular, central nervous system/head, endocrine/metabolic, eye, ear, nose and throat, female reproductive, gastrointestinal tract and abdomen, musculoskeletal/spine, peripheral vascular, respiratory/chest, skin/connective tissue, substance abuse, urinary tract (includes male reproductive). For each patient, the abstractor reviewed criteria specific to the body system suggested by the admitting diagnosis; if the patient failed to meet system-specific criteria, generic criteria were reviewed. Samples of the InterQual criteria (generic and respiratory/chest, adult and paediatric) are in Appendix A.

There are three sets of criteria for each of the above body systems: Severity of Illness, Intensity of Service and Discharge Screens. Severity of Illness (SI) criteria are objective, clinical indicators of patient illness suggesting the need for hospitalization. They are grouped by Clinical Findings (e.g. sight loss or unconsciousness of recent onset), Vital Signs (e.g. Systolic BP ≥ 250), Imaging (e.g. pulmonary oedema - newly discovered), ECG (e.g. 2nd/3rd degree heart block), Haematology (e.g. Hct ≤ .15 / Hgb ≤ 70 g/L - newly discovered), Chemistry (e.g. Serum Na ≤ 123 mmol/L - newly discovered), Microbiology (e.g. ascetic fluid smear/culture positive for bacteria/fungi), and Other (e.g. suspected malfunctioning pacemaker).

Intensity of Service (IS) criteria include diagnostic and therapeutic services generally requiring a hospital level of care. They are grouped by Physician Evaluation, Monitoring and Treatments/Medications. Monitoring criteria refer to frequent direct clinical observation and evaluation, for example: Pulse, respiratory rate, BP ≥ q6h, Pulse oximetry ≥ 3x/24h. Treatments/Medications include modes of treatment, categories of drugs and routes of administration requiring inpatient care, e.g. Emergency radiation therapy, IV anticoagulants (e.g. heparin), initial tracheostomy care.

The purpose of the Discharge Screen is to prevent sending patients out of the acute care setting before they are clinically stable. Even if patients do not meet the criteria for Severity of Illness or Intensity of Service, if they can not pass the Discharge Screen, they are assessed as Acute. For example, if a patient's caloric or fluid intake does not meet nutritional requirements, then he or she continues to need the services of an acute care facility.

At admission, to be assessed as Acute, the patient must have met one Severity of Illness and one Intensity of Service criterion; that is, according to the data available on the medical record during the first 72 hours of the patient's stay, did the patient meet the criteria? For subsequent days of stay, the patient must have met a combination of Intensity of Service and Severity of Illness criteria, or failed to meet the Discharge Screen. Each day was assessed independently of all other days. If the patient was

assessed as Not Acute, the coders were asked to assess what Alternate Level of Care would best meet the patient's needs.

Why InterQual?

We chose to use the InterQual criteria because they have been externally validated (Strumwasser et al, 1990), they have been used in similar retrospective research (Ludke et al. 1990; Strumwasser et al. 1991), and they are continually revised and updated. We also wanted to be able to compare our results to those of Saskatchewan as well as an earlier review in British Columbia (Anderson, Sheps, Cardiff 1993); both of these studies used the InterQual criteria.

However, we did not adopt these criteria lightly. For the study to be credible, the criteria needed to be acceptable, especially by physicians, since they decide when to admit, how to treat and when to discharge patients. As described, the adult criteria were reviewed in depth by two of the physician members of the Working Group, and their recommendations were discussed by the entire Group, whose members included both physicians and nurses. A day-long meeting was devoted to going over the criteria in careful detail. The paediatric criteria were reviewed by the paediatric physician member of the Working Group. Both the adult and paediatric criteria were also reviewed by several physicians external to the Working Group, who suggested minor revisions, but otherwise agreed that the criteria were fair and acceptable measures of acuteness. Examples of the kinds of changes that were made to the criteria are: change all Monitoring criteria from ≥ 6x/24h to ≥ q6h; add "suspected non-accidental musculoskeletal trauma" to the SI criteria for Paediatric- Musculoskeletal/Spine; add three new criteria, "Serum amylase ≥1x/24h, Glucose ≥ 1x/24h, BUN or creatinine ≥ 1x/24h", to the IS criteria for Adult-Gastrointestinal Tract and Abdomen.

Saskatchewan also found that the criteria were generally acceptable to physicians. Ontario, currently embarking on a similar project, organized a meeting at which sub-specialist physicians and other health care providers were asked to review the criteria for each body system; again very few changes were suggested. In fact, one participant noted

that the number of suggested changes was about equivalent to the number of typos that were pointed out at the meeting.

Alternate Levels of Care

Since a goal of the study was to suggest what type of alternative care might be required for patients currently being admitted or retained in acute medical beds when they did not require this level of care, the Working Group paid special attention to this area. A sub-committee of the Working Group reviewed alternate care levels from InterQual and from HSURC. The sub-committee adopted as a guideline the alternatives developed by HSURC, modifying them to fit the Manitoba situation. The sub-committee's work was reviewed in detail by the Working Group and changes were made. There were 13 possible alternate levels of care (see Appendix A).

Terms Used

For admissions or days of care that were assessed as requiring the services of an Acute care hospital, we use the term "Acute." For admissions or days that were assessed as not requiring the care of an acute care facility, we use the term "ALC" or Alternate Level of Care. For other definitions, see *Definitions Used in This Report*, immediately after the *Executive Summary*.

METHODOLOGY

Sample

There were two elements to consider in designing the sample—the number and selection of hospitals to review and the number of medical records from which to abstract data in each of the selected hospitals. We wanted to find out not only the proportion of admissions and days that were assessed as Acute at each hospital studied, but we also wanted to have enough records so that we could make comparisons between different types of hospitals. One hundred and fifty (150) records randomly selected from each hospital were required.[1] (See Appendix B for details).

The definition of a medical admission is based on the most responsible diagnosis (sometimes called "separation code") as coded on the hospital abstract. The most responsible diagnosis is the one diagnosis which describes the most significant condition of a patient which causes his or her stay in hospital. In cases where multiple diagnoses may be classified as most responsible, the diagnosis causing the greatest length of stay is coded as most responsible (Hospital Abstract Users Manual 1995). Because we rely on the most responsible diagnosis, even patients whose main reason for being in hospital is not to undergo a surgical procedure sometimes require minor procedures, often diagnostic in nature.[2]

It is important to understand that we did not define medical patients according to service code. Therefore, our definition included patients who might be on a Service other than a Medical Service, Geriatric for example.

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[1] Frequently, people wonder why we reviewed the same number of records from both large and small hospitals. Statistically, if the group of things being sampled is mixed heterogeneously, then the size of the population makes no difference to the size of the sample required to estimate a proportion. If one is taking a scoop from a bag of grain, it makes no difference if the bag is large or small; as long as the grain is well-mixed, then the scoop contains a representative sample of the grain in the bag.

[2] We found that 857 (21.9%) of the patients we reviewed had a minor procedure or diagnostic examination during their hospital stay, for example, endoscopy (139), closed percutaneous biopsy (46), CT scan (99), other diagnostic examinations (183), transfusions (53), or injection of a therapeutic substance (70).

Since a few patients selected had very long hospital stays, we abstracted information for each day of stay up to Day 30 and every 10th day thereafter. If a patient was transferred to an extended treatment, rehabilitation or chronic care service, then we created an artificial discharge on that date and did not review days following the transfer. Patients whose stays resulted in deaths or transfers to another hospital were included in the study. We excluded patients who were admitted with known long term Service and Subservice codes.[3]

In 1993/94, after exclusions, 49% of separations and 53% of hospital inpatient days were medical. The proportions of total separations that are medical are larger in the smaller hospitals since these hospitals do little surgery or obstetrics. Figure 1 shows that in Urban hospitals, 37% of the separations and 42% of the days were medical. In the Intermediate Rural and Small Rural facilities, over 75% of separations and over 80% of days in 93/94 were for medical patients. Appendix Table C1 gives an indication of the extent of hospital activity that is adult medical for each hospital in Manitoba in 1993/94.

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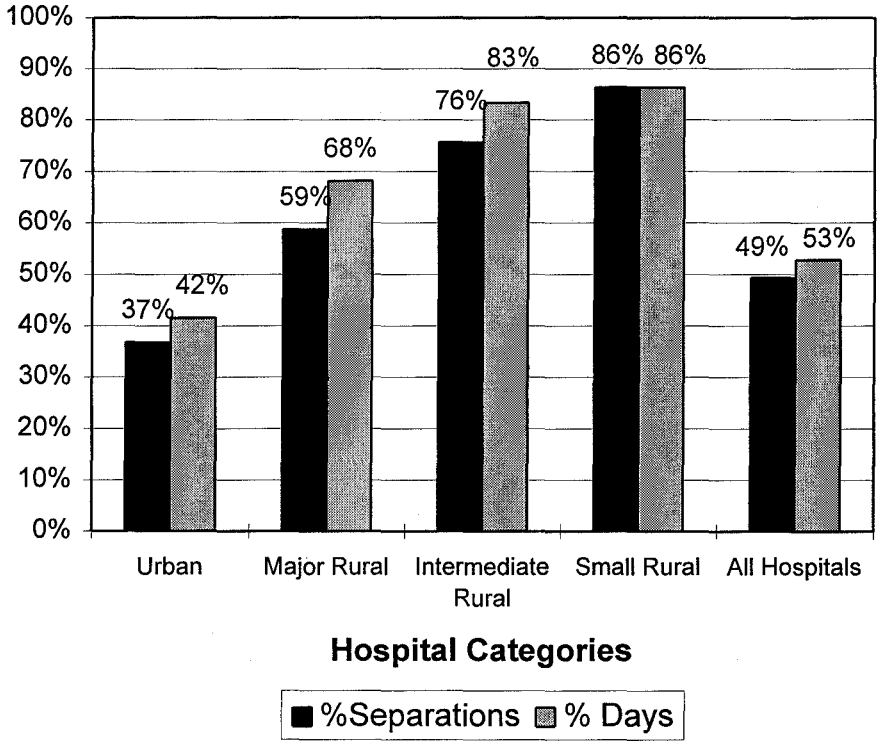
[3] These codes include: Service codes 09 (personal care unit), 72 (geriatrics), 73 (long term care), 70 (physical medicine and rehabilitation), 77(other—an alternate code for people who are non-acute but have not yet been panelled); and Subservice codes 93 (panelled for chronic), 94 (rehabilitation), 95 (social), 96 (assessment), 97 (chronic), 98 (respite), and 99 (panelled for PCH). This excluded approximately 3% of medical separations and 9% of medical days in the categories of hospitals studied.

Figure 1: Percent of 1993/94 Adult Separations and Days that are Medical
excluding patients admitted with long-term Service/Subservice codes



Hospitals

We classified hospitals into four categories using previous work by MCHPE: Urban (including Teaching and Urban Community), Major Rural, Intermediate Rural and Small Rural (including Small Rural and Multi-Use) facilities. The hospitals that were included in the study are listed in Table 3.

Table 3. Hospital in AAC Study

URBAN	
Brandon*	Concordia
Grace	Health Sciences Centre*
Misericordia	St. Boniface
Seven Oaks	Victoria
MAJOR RURAL	
Bethel, Winkler	Bethesda, Steinbach
Dauphin	Selkirk
The Pas	Thompson*
INTERMEDIATE RURAL	
Altona	Beausejour
Carman	Minnedosa
Ste. Rose*	Souris
SMALL RURAL	
Desalaberry, St. Pierre Jolys	Glenboro
Grandview	Erickson
Stonewall	Tiger Hills, Treherne

*indicates hospitals where paediatric medical records were reviewed in addition to adult

Because the greatest proportion of hospital admissions and costs are in the Urban category, we reviewed medical records from all eight hospitals in that category. In each of the other three categories, we drew a random sample of six of the hospitals in each group. Hospitals with fewer than 170 adult medical separations in 1993/94 were not eligible for inclusion.[4] There is only one Northern Isolated facility that had a sufficient

[4] Although we reviewed **150** medical records, we selected **170** separations in the sample because we expected that some of the records would be unavailable.

number of admissions to include it in the review; therefore we did not review Northern Isolated hospitals.

Because of the small number of hospitals with a significant paediatric caseload, we could not make comparisons between hospital categories for paediatrics. Therefore, we reviewed paediatric medical records in only four hospitals that had a sufficient number of admissions[5], including Health Sciences Centre, Brandon General Hospital, and two others, one of them in Parklands region where previous analyses demonstrated that paediatric separations were higher than the provincial average. (Black, Roos, Burchill 1993).

Data Collection

Communication with Hospitals

Communication with the hospitals was critical to ensure their co-operation and hence the success of this project. The project concept was first discussed with a group of rural and northern hospital administrators and board members at a meeting between the hospitals and MCHPE held on September 12, 1994. We also described the project at an early stage to the Rural and Northern Health Advisory Council, the Urban Hospital Council, the Hospital Abstract Users Committee, staff of the Mental Health Division of Manitoba Health, and Manitoba Health Regional Directors.

Letters describing the project were mailed to all hospitals in Manitoba in November 1994. At this time, we hoped to review records in all hospitals that had at least 170 adult medical separations in 1993/94. Budget constraints forced us to reduce the breadth of our study and to select a sample of hospitals from three of the four hospital categories. A second letter was sent in February 1995, again to all hospitals, to tell them whether or not

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[5] There were only 14 hospitals with 170 or more paediatric medical admissions: Health Sciences Centre, Brandon, Bethesda, Dauphin, Flin Flon, Portage, The Pas, Swan River, Thompson, Churchill, Ste Rose, Lorne, Russell and Percy E. Moore.

they were going to be part of the study. All the hospitals selected agreed to participate and were most co-operative in scheduling a time for our coders to visit their facility.

Data collection began February 27 and continued until mid-May, except for one facility which was visited in early June. Without exception, the hospital staff encountered by our abstractors were gracious, friendly and helpful.

Co-ordination and Training

Paul Kasian, MD, was responsible for the co-ordination of the data collection process and the hiring and training of abstractors. He received training from InterQual in a two-day session in San Francisco, November 1994.

Eight abstractors were hired for the data collection: six primary and two alternates. All of the abstractors were Registered Nurses with recent clinical experience. Most of them had experience in both Winnipeg and non-Winnipeg settings. Many of them also had experience in public health, health research or other areas of the health care sector. Dr. Kasian trained all eight of the abstractors at a one-week session from February 20 to 24, 1995. The final version of the abstracting tool, created by HSURC and modified for this study, is included in Appendix A.

Inter-Rater Reliability

Careful checks were made to ensure that individual coders were consistent in their ratings, and we can state with confidence that the assessment of Acuteness was consistent for each team and throughout the study (see Appendix B).

FINDINGS

There were two characteristics of hospital use that were of interest: the proportion of *admissions* that were Acute and the proportion of *days* that were Acute. Each patient's record was assessed at the time of admission, defined as the first 72 hours of the patient's stay: the patient had to meet the InterQual criteria within the first 72 hours of admission to be assessed as Acute at admission. Each day of stay after the admission review was also assessed. For both the admission and the day reviews, whenever the patient did not meet the criteria for Acuteness, an alternate level of care (ALC) was selected.

We calculated proportions of admissions and days which were Acute for each hospital and by hospital category. The results presented here have been weighted to account for the different hospital sizes. Weighting adjusts for the fact that 150 separations from an Urban hospital is a far smaller proportion of the total annual medical volume than 150 separations from a Small Rural hospital. We also calculated confidence intervals for each hospital category. Because we are looking at a sample rather than all separations in a given year, the percent that we report is actually an estimate; the confidence interval gives a range between which we are 95% confident that the true proportion lies. For the estimated provincial proportion, the confidence intervals are so small that they can be ignored. Hence we do not report confidence intervals for the provincial proportions.

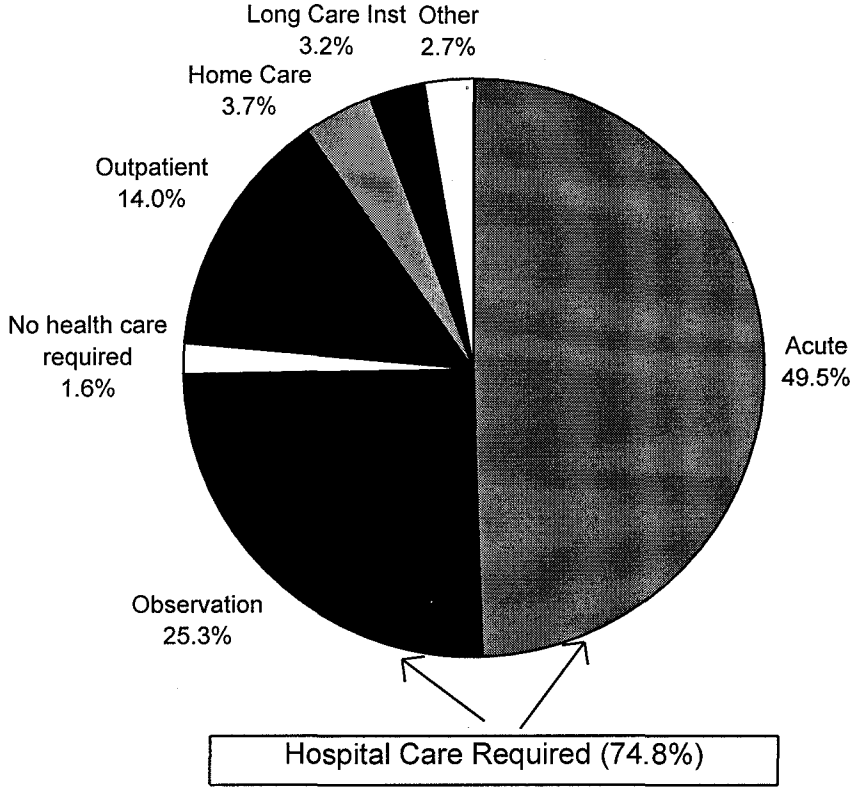
Representativeness of the Sample

Although we were only working with 150 records at each hospital, and a sample of the hospitals in each non-Winnipeg group, the sample appears to be representative of the hospitals, and the groups studied. We compared the sample that was selected from each hospital with the entire population of medical separations at each hospital. Three characteristics were compared: average length of stay, age and diagnostic categories (using the first three digits of the ICD-9-CM code for most responsible diagnosis). We found the sample cases to reflect accurately the characteristics of the patient population at each hospital. These analyses are available from MCHPE on request.

Admissions

Figure 2 gives the proportion of admissions that were considered Acute overall; 49.5% of the patients were assessed as Acute at the time of admission. However, another 25.3% were assessed as requiring Observation; these were patients who were exhibiting clinical signs and symptoms but who did not meet the InterQual criteria. Given that Observation Units are located in a hospital, arguably these patients also needed hospital care, if only for a short period of time. The proportion of admissions that were assessed as Acute declined in each category from the Urban to the Small Rural hospitals.

Figure 2: Levels of Care at Admission



Patient Assessed as Requiring Observation at Admission

Female, 48 years, has been sick for a few days and "can't keep anything down." No past history of note but she "looks ill" according to the record. Haematocrit, haemoglobin, serum Na within normal values. She was admitted for a stay of 5 days. Had family support at home.

Monitoring: The patient's vital signs (temperature, pulse, respirations, blood pressure) were measured twice daily. Urinary output was recorded on Day 3.

Treatments/Medications: IV Ringers Lactate 150 cc/hour on admission day. Demerol one dose on admission. Phenergan (anti-nauseant) 25 mg. IM every 3 hours as necessary. Patient received four doses on Day 2, two doses on Day 3 and 4, one dose on Day 5.

A small number, only 1.6%, required No Health Care; in other words almost all patients needed some health care, but often not the level that can only be provided in an acute care hospital. Almost one-quarter were assessed as requiring either a long term care institution, home care, outpatient care or other services. These general patterns hold for each hospital group.

Table 4 gives, by hospital group, the levels of care which the nurse coders assessed the patients actually required at the time of admission. The first row gives the proportion of admissions that were assessed as Acute. The bottom line, "No Health Care Required", is informative. In every hospital category, fewer than 5% of all adult medical patients were assessed as not requiring any kind of health care services at the time of admission. In other words, more than 95% of the patients admitted to an acute care facility required some form of health care, but many of them did not require the inpatient services of an acute care hospital.

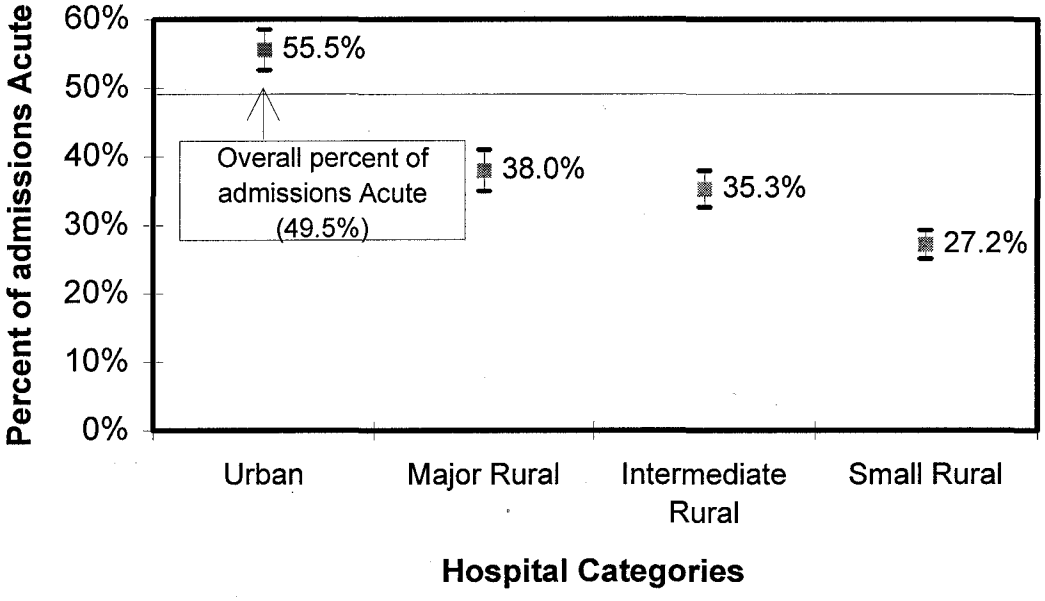
Table 4. Levels of Care for Medical Admissions by Hospital Category with 95% Confidence Intervals (adults)

	Urban	Major Rural	Intermediate Rural	Small Rural
Acute	55.5 ± 3.0	38.0 ± 4.6	35.3 ± 3.3	27.2 ± 3.0
Observation	20.1 ± 2.4	37.9 ± 5.7	34.5 ± 3.6	37.0 ± 7.3
Long Care Institution	2.6 ± 0.9	4.3 ± 1.4	5.5 ± 1.5	4.1 ± 1.1
Home Care	2.8 ± 1.0	4.7 ± 2.1	6.9 ± 1.2	8.4 ± 2.7
Outpatient	15.3 ± 2.2	10.2 ± 4.0	11.0 ± 2.3	15.8 ± 5.8
Other	2.1 ± 0.9	4.1 ± 1.6	4.6 ± 1.2	3.1 ± 0.9
No health care required	1.6 ± 0.8	0.9 ± 0.6	2.2 ± 0.9	4.6 ± 2.7

Fewer admissions were assessed as requiring "Observation" in Urban hospitals compared with Rural hospitals, a finding we would expect given where observation beds are located; in 1993/94 there were few Observation beds available in rural Manitoba. The number of patients that might have been handled by Home Care services is relatively small in the Urban areas (2.8%), but represents a larger proportion (8.4%) in Small Rural facilities.

Figure 3 illustrates the percentage of admissions that were assessed as Acute for each category of hospital; the bars show the confidence intervals. The line across the chart is the proportion of Acute admissions overall. If the confidence interval overlaps this line, then the hospital category is NOT significantly different from the overall proportion. Similarly, if the confidence intervals of different categories overlap each other, then the categories are NOT significantly different. What Figure 3 illustrates is that statistically, the Urban hospitals were significantly different from the other three categories, having a higher proportion of their patients assessed as Acute at admission. The Small Rural hospitals are significantly lower than the other three categories.

Figure 3: Percent of Admissions Acute Adult Medical, Hospital Categories



Insight: Structural Reasons for Admission

Several patients were admitted to an Urban Community hospital with cardiac problems requiring telemetry. Telemetry is set up in the Intensive Care Unit, requiring a 24-hour admission. If it was available in the Observation Unit, it could be done there, but the way the hospital is organized physically, telemetry must be done in Intensive Care.

Results by Hospital Group

Figures 4 through 7 illustrate the proportion of admissions that were assessed as Acute in each hospital. The hospitals in each category are arranged from the hospital having the lowest proportion of Acute admissions to the highest. The bars show the confidence intervals. The line across the chart is the proportion of Acute admissions for that hospital

category. The Levels of Care assessed at admission for each individual hospital is contained in Appendix C: Table C2.

For the Urban hospitals, the proportion of admissions assessed as Acute overall was 55.5%, ranging from a low of 39.3% at Brandon to 68.0% at Concordia (Figure 4). For the Major Rural hospitals as a group, the proportion of admissions assessed as requiring Acute inpatient care was 38.0%, ranging from 29.3% at Bethel Hospital, Winkler to 51.3% at Selkirk and District General Hospital (Figure 5). Comparing the Urban hospitals and the Major Rural hospitals, it appears that Brandon General Hospital is more similar to the Major Rural hospitals in the proportion of admissions that were Acute and that Selkirk General Hospital is more similar to the Urban group of hospitals.

For the Intermediate Rural hospitals, 35.3% of patients required Acute hospital care at the time of admission. Only 23.8% of the patients admitted to the hospital in Minnedosa were assessed as Acute (Figure 6). Souris was at the upper range of the Intermediate Rural hospitals: 40.4% of their patients were assessed as requiring Acute hospital care at the time of admission.

Statistically, there is no difference in the proportion of admissions assessed as Acute between the Major Rural and Intermediate Rural categories (see Figure 3). This is an important finding since Major Rural hospitals are perceived to be, or to have the potential to be, regional centres, yet there was little difference in the proportion of medical patients that were Acute at the time of admission between the Major and Intermediate Rurals.

In the Small Rural hospital category, 27.2% of the patients were assessed as needing Acute inpatient care at the time of admission. In Grandview, one out of five patients were Acute. At Erickson, which had the highest proportion of patients assessed as Acute for this category, one in three were assessed as Acute (Figure 7).

Figure 4: Percent of Admissions Acute Adult Medical, Urban Hospitals

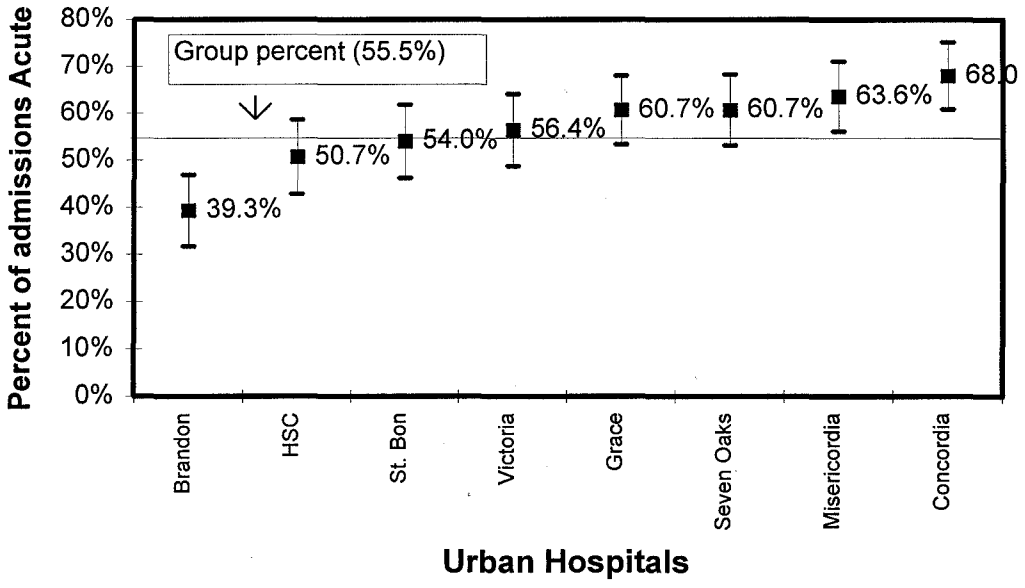


Figure 5: Percent of Admissions Acute Adult Medical, Major Rural

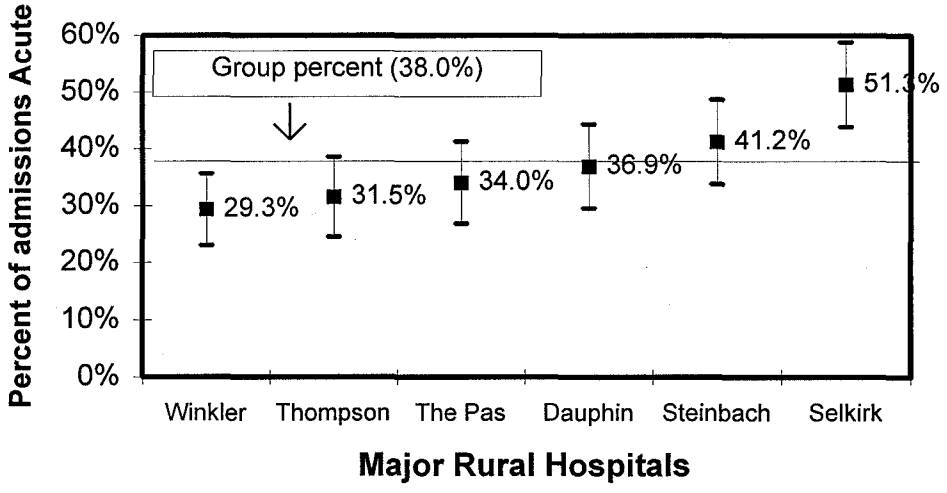


Figure 6: Percent of Admissions Acute Adult Medical, Intermediate Rural

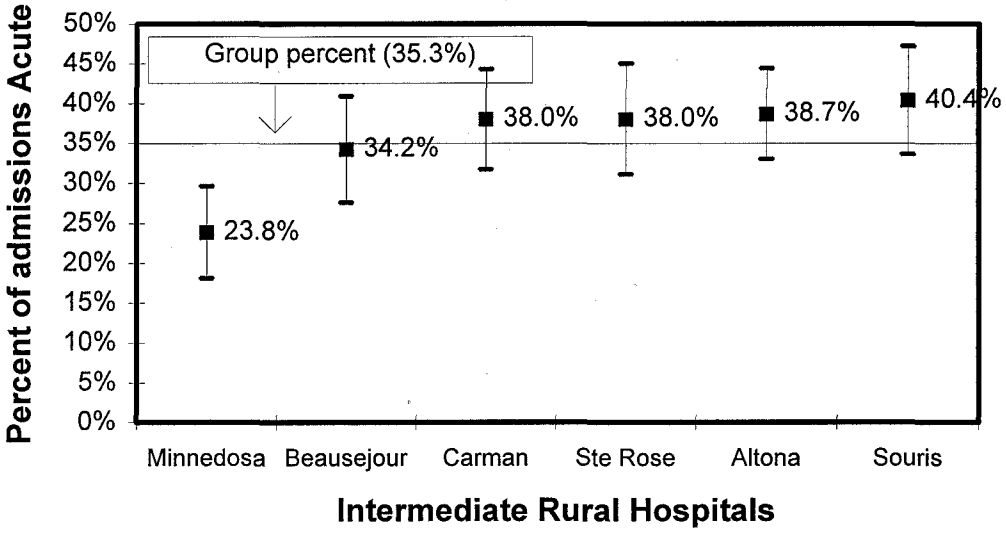
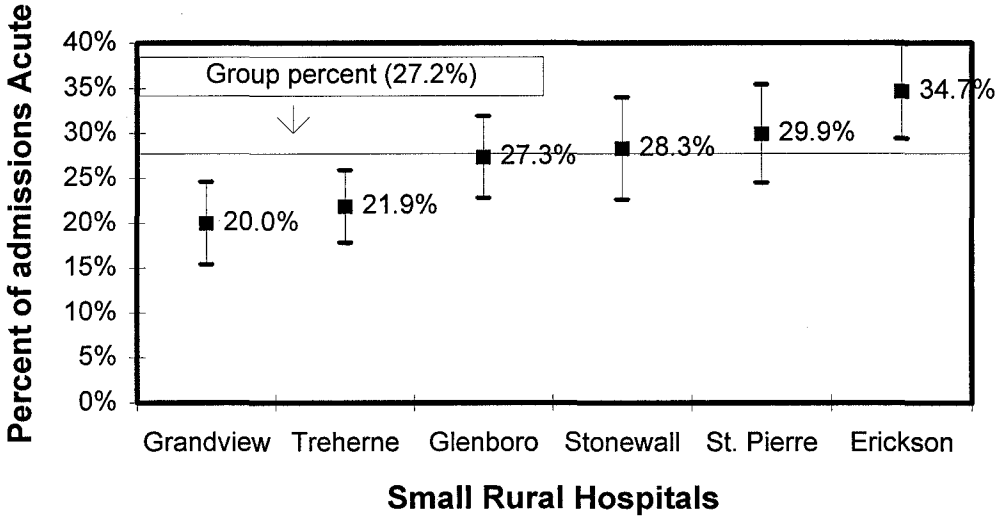


Figure 7: Percent of Admissions Acute Adult Medical, Small Rural



Days of Care

In addition to the admission review, each day of the patient's stay was reviewed, up to Day 30, after which every 10th day was reviewed.[6] The day of discharge was not included in the analysis. Furthermore, if a patient was transferred to a designated long stay bed in the same facility, an artificial discharge day was created on the date of transfer.

It is known that a significant proportion of days in acute-care Manitoba hospitals are incurred by patients with very long stays. In 1992/93, for Winnipeg residents, 5% of the medical separations accounted for 52% of the days spent in hospital and for non-Winnipeg residents, 2% of separations accounted for 28% of the days (Frohlich, Markesteyn et al. 1994). The length of stay of the sample of patients whose records we reviewed accurately reflects the length of stay characteristics of the hospital from which it was drawn. At 19 of the 26 hospitals reviewed (73%), at least one patient stayed 100 days or longer. Because it is important to understand the Acuteness of both the shorter stay patients as well as the Acuteness of patients during their entire stay, two analyses were conducted. We looked at the proportion of days that were assessed as Acute across the entire stay and also during the first 30 days of stay only.[7]

Figure 8 illustrates the proportion of days that were assessed at each level of care. Overall, 33.4% of days were assessed as requiring acute care—two of every three days spent by Manitobans receiving acute inpatient hospital care for medical conditions could potentially be treated in a setting other that than of an acute care ward, if one were readily available.

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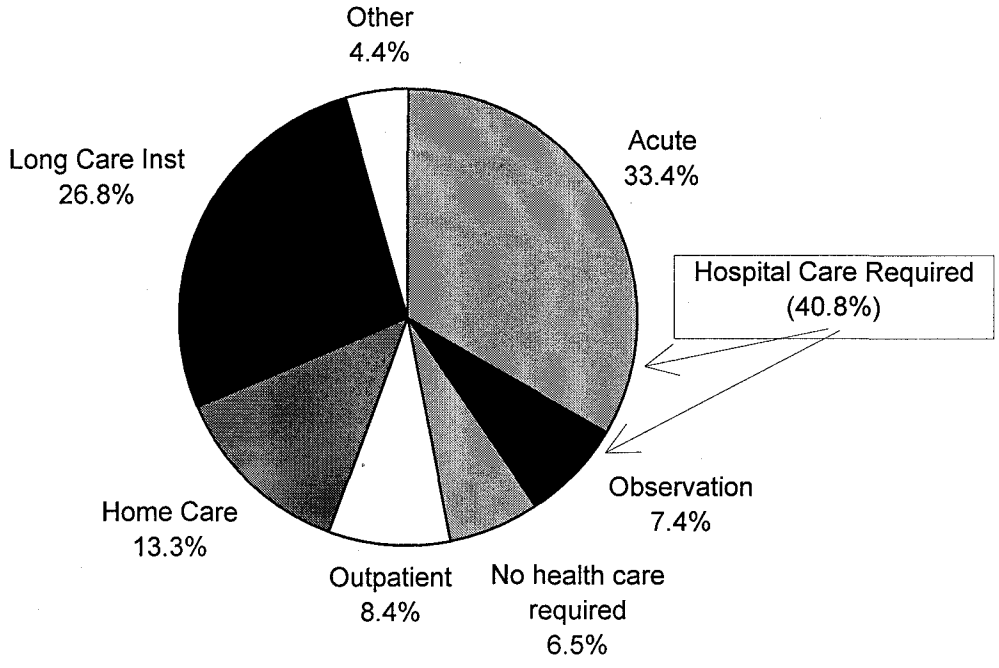
[6] For the stays that were longer than 30 days, the level of care that was assessed on the day preceding a gap between assessed days was assigned to the days that occurred between the two assessed days. Hence, if Day 40 was assessed as Acute, then Day 41 to Day 49 were assessed as Acute.

[7] About 5% of patients stay longer than 30 days.

Figure 8: Levels of Care for Days of Stay



Note that the proportion of days that were assessed as requiring Observation is only 7.4%, much lower than the proportion of admissions requiring Observation (25.3%). This is because many of these patients had very short hospital stays. Again, only a small portion (6.6%) of the overall days required No Health Care. The largest portion of Alternate Level of Care days (26.1%) is assigned to the category "Long Care Institutions," that is, these days required care typically provided at either a Personal Care Home, rehabilitation facility or chronic care facility. Approximately one-quarter of the medical days Manitobans spent in acute care hospitals should be in a long term care facility where the appropriate type and level of services could be provided.

Tables 5 and 6 indicate the levels of care for the days of stay by hospital group; Table 5 analyzes all days and Table 6 days 1 to 30. The proportion of days that were assessed as Acute is in the top row of figures. The second row shows the proportion of days in which patients could have their required care in an observation or short stay setting. The third row shows the proportion of days in which the patient could have been cared for in a long term care facility, and so on. Again the last row is instructive: the proportion of days in which no health care services were required ranges from 5.8% to 10.3%; for almost all days that patients spent in hospital, some type of health care service was required, even if not that of an acute care hospital.

Patient Assessed as Requiring No Health Care at Admission

Male, 60 years, admission diagnosis of acute myofascial (muscular) pain. Clutching his right chest. Patient had a history of alcohol abuse. Admitted for 10 days. He was lonely, depressed, and although he should not have been in a hospital, as the reviewing physician stated, his home life was not an attractive alternative.

Monitoring: Vital signs were measured three times on day of Admission, twice daily after that.

Treatments/Medications: None

Table 5. Levels of Care for Adult Medical Days by Hospital Category with 95% Confidence Intervals (adults)

	Urban	Major Rural	Intermediate Rural	Small Rural
Acute	36.3 ± 3.1	28.3 ± 3.9	22.6 ± 5.2	21.3 ± 3.8
Observation	5.4 ± 0.9	13.7 ± 3.5	11.1 ± 1.9	14.0 ± 2.6
Long Care Institution	26.1 ± 4.9	24.4 ± 8.4	30.7 ± 7.6	22.8 ± 6.8
Home Care	12.5 ± 2.2	15.5 ± 4.4	15.8 ± 4.8	17.9 ± 2.8
Outpatient	9.2 ± 1.5	6.1 ± 3.3	6.8 ± 2.3	8.9 ± 3.6
Other	4.0 ± 1.3	6.2 ± 2.6	5.8 ± 2.5	4.8 ± 1.5
No health care required	6.5 ± 1.7	5.8 ± 1.1	7.2 ± 3.5	10.3 ± 4.4

Table 6. Levels of Care for Days 1 to 30, Adult Medical, by Hospital Category with 95% Confidence Intervals.

	Urban	Major Rural	Intermediate Rural	Small Rural
Acute	42.1 ± 2.9	32.5 ± 2.9	26.3 ± 4.5	23.8 ± 4.4
Observation	6.7 ± 1.0	16.0 ± 3.4	14.1 ± 1.9	15.8 ± 2.7
Long Care Institution	16.3 ± 2.9	15.9 ± 4.1	20.9 ± 4.5	15.8 ± 3.4
Home Care	13.5 ± 2.0	16.9 ± 4.1	15.9 ± 3.8	19.0 ± 2.7
Outpatient	10.6 ± 1.4	6.8 ± 3.5	8.0 ± 2.2	9.7 ± 3.5
Other	4.5 ± 1.5	5.5 ± 2.0	6.4 ± 2.1	5.0 ± 1.4
No health care required	6.4 ± 1.1	6.4 ± 1.4	8.5 ± 3.6	11.0 ± 4.3

Figures 9 and 10 show the proportion of days that were assessed as Acute for each category of hospital; the bars show the confidence intervals. The line across the chart is the proportion of Acute days overall. If the confidence interval overlaps this line, then the

hospital category is NOT significantly different from the overall proportion. Similarly, if the confidence intervals of different categories overlap each other, then the categories are NOT significantly different. In general, the smaller the hospital, the smaller the proportion of days that were assessed as Acute. Statistically, Urban hospitals had a significantly higher proportion of Acute days than any of the three rural categories. There was no statistically significant difference between the three groups of rural hospitals when all days were considered. When only Days 1 to 30 were considered (Figure 10), the Major Rural hospitals were significantly higher than the Small Rural hospitals.

Figure 9: Percent of Days Acute
Adult Medical, Hospital Categories

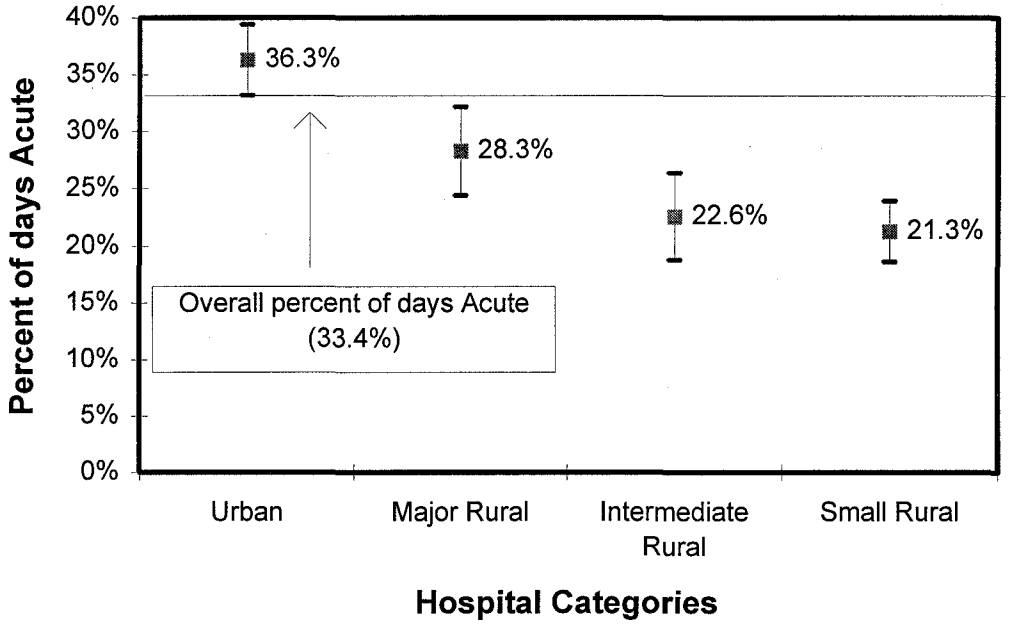
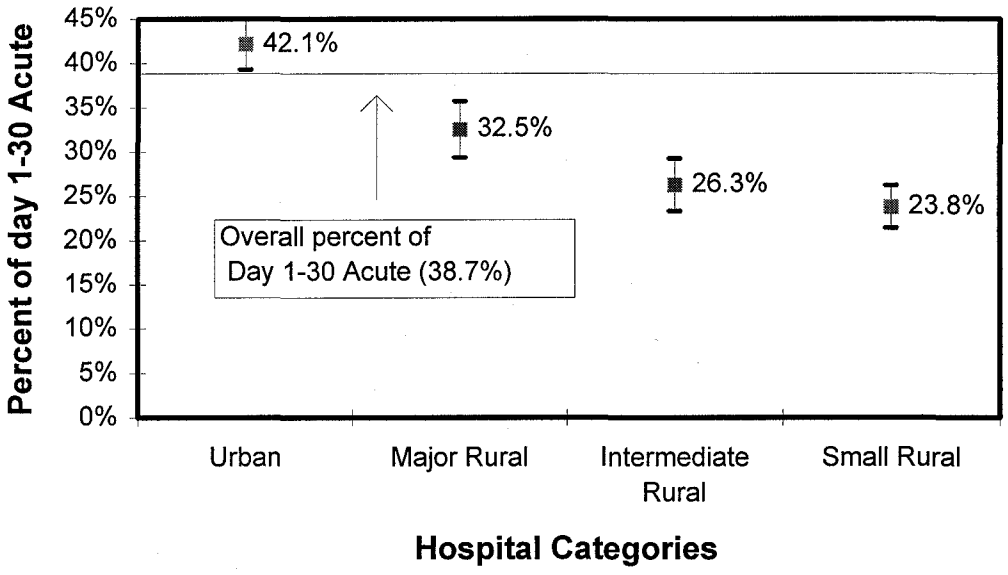


Figure 10: Percent of Day 1-30 Acute Adult Medical, Hospital Categories



Results by Hospital Group

Figures 11 through 14 show the proportion of days that were assessed as Acute at each hospital reviewed. The hospitals in each category are arranged from the hospital having the lowest proportion of Acute days to the highest. The bars show the confidence intervals. The line across the chart is the proportion of Acute days for that hospital category. The Levels of Care assessed for each hospital reviewed is contained in Appendix C: Table C3. Table 7 compares the proportions of Acute days when all days were analyzed and when only Day 1 to 30 were analyzed.

Table 7. Percentage of adult medical days Acute by hospital (Comparison of All Days and Day 1 to 30)

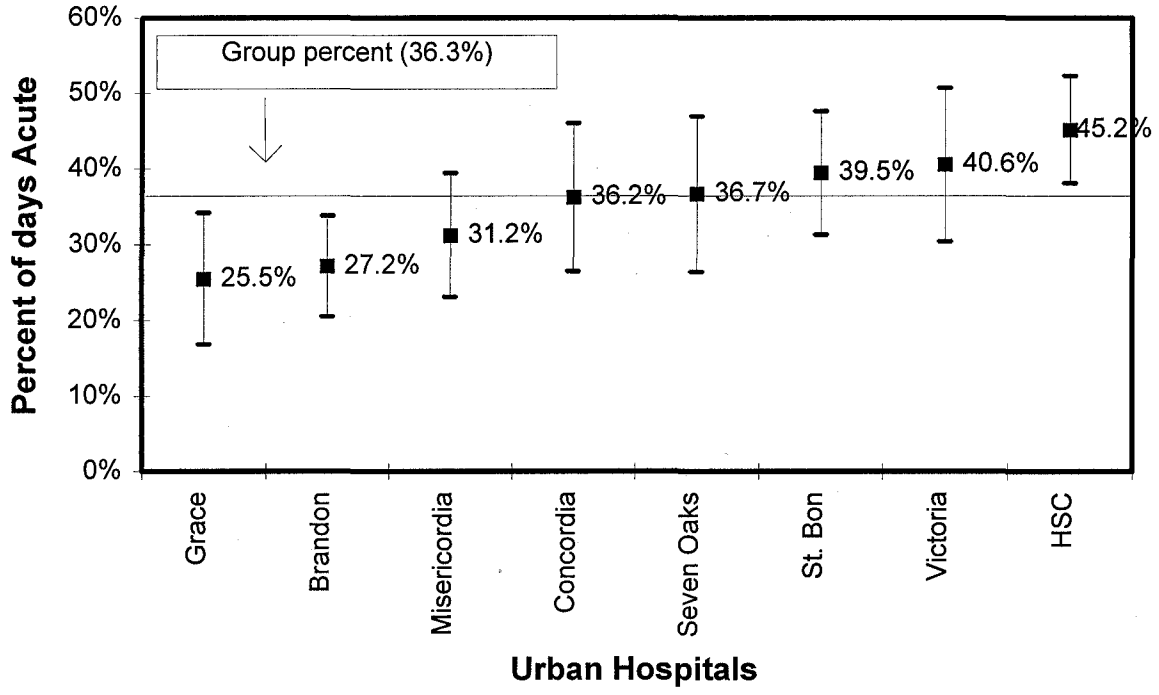
	All Days	Day 1-30	Difference
URBAN			
Grace	25.5%	37.0%	11.5%
Brandon	27.2%	29.2%	2.0%
Misericordia	31.2%	38.5%	7.3%
Concordia	36.2%	45.6%	9.4%
Seven Oaks	36.7%	47.4%	10.7%
St. Boniface	39.5%	41.1%	3.4%
Victoria	40.6%	44.0%	1.6%
Health Sciences Centre	45.2%	47.7%	2.5%
MAJOR RURAL			
Dauphin	23.1%	29.3%	6.2%
The Pas	27.9%	31.6%	3.7%
Selkirk	28.0%	35.0%	7.0%
Steinbach	29.3%	32.8%	3.5%
Winkler	30.9%	31.4%	0.5%
Thompson	37.1%	37.2%	0.1%
INTERMEDIATE RURAL			
Beausejour	15.0%	17.7%	2.7%
Minnedosa	16.3%	23.2%	6.9%
Altona	18.1%	23.3%	5.2%
Souris	21.2%	25.1%	3.9%
Carman	31.1%	34.6%	3.5%
Ste. Rose	31.4%	33.4%	2.0%
SMALL RURAL			
Grandview	13.2%	13.4%	0.2%
Glenboro	14.8%	20.2%	5.4%
Treherne	23.2%	23.4%	0.2%
Erickson	23.5%	26.8%	3.3%
St. Pierre	25.8%	24.6%	(1.2%)
Stonewall	26.8%	32.0%	5.2%

For the Urban hospitals, the proportion of days assessed as Acute ranged from 25.5% at Grace to 45.2% at Health Sciences Centre for all days (Figure 11). If we only count the first 30 days, the range is from 29.2% at Brandon to 47.7% at Health Sciences Centre (Table 7). Therefore, even at our Teaching hospitals, HSC and St. Boniface, and excluding long stay patients, more than 50% of the days of inpatient medical hospital care could have been provided by an alternate health care service.[8] [9] For many of the days that medical patients spent in Urban hospitals (26.1%, Table 5), a long care institution, either a nursing home, chronic care or rehabilitation facility would have been more appropriate. Home Care and Outpatient settings each could have provided 12.5% and 9.2% of the days respectively. Despite the high proportion of patients that were assessed as requiring Observation at the time of Admission (20.1%), only 5.4% of the days could have taken place in this setting; this is because the majority of patients requiring Observation were discharged within three days.

[8] In teaching hospitals, 34% of the days of care provided were for adult medical patients, representing a considerable number of days: 117,326. Our results suggest that as many as 66,972 of those days did not require acute inpatient hospital care.

[9] Note that these findings occurred after the closure of 308 beds in the two teaching hospitals.

Figure 11: Percent of Days Acute Adult Medical, Urban Hospitals

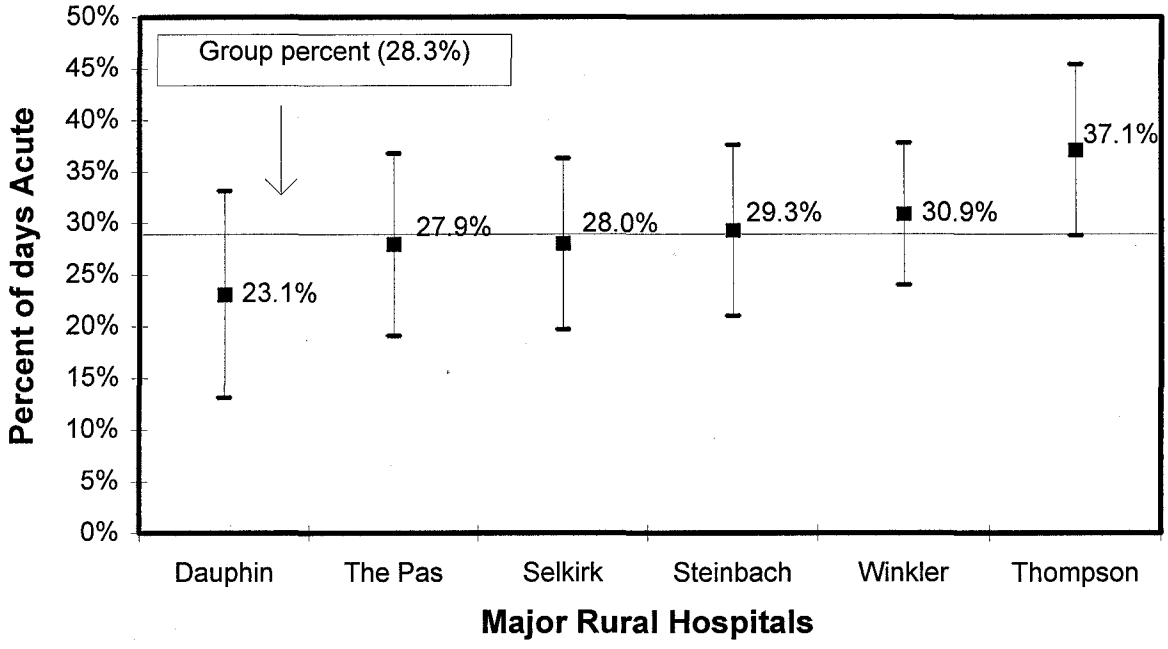


For Misericordia, Seven Oaks, Concordia and Grace, the proportion of days that are Acute varies markedly between the "All Days" and the "Day 1-30" analyses (Table 7). For these four hospitals, the proportion of days that are Acute when only the first 30 days are considered is 7.3% to 11.5% higher than when all days are considered: these hospitals had several long stay patients with a high proportion of ALC days.

For the Major Rural hospitals, the proportion of days assessed as requiring the care of an acute hospital ranged from 23.1% at Dauphin to 37.1% at Thompson for all days; and from 29.3% at Dauphin to 37.2% at Thompson for Days 1-30 (Figure 12 and Table 7). The difference between the two analyses (All Days and Day 1-30) was less dramatic than for the urban community hospitals, indicating that fewer of the patients in the major rural hospitals had very long stays with a large number of ALC days; this pattern is generally true of all the rural hospitals, and is supported by previous MCHPE research into hospital utilization (Black, Roos, Burchill 1993). As for the admission analyses, Brandon appears

to resemble more closely the Major Rural hospitals than the Urban Community hospitals in its proportion of days that are Acute.

Figure 12: Percent of Days Acute
Adult Medical, Major Rural

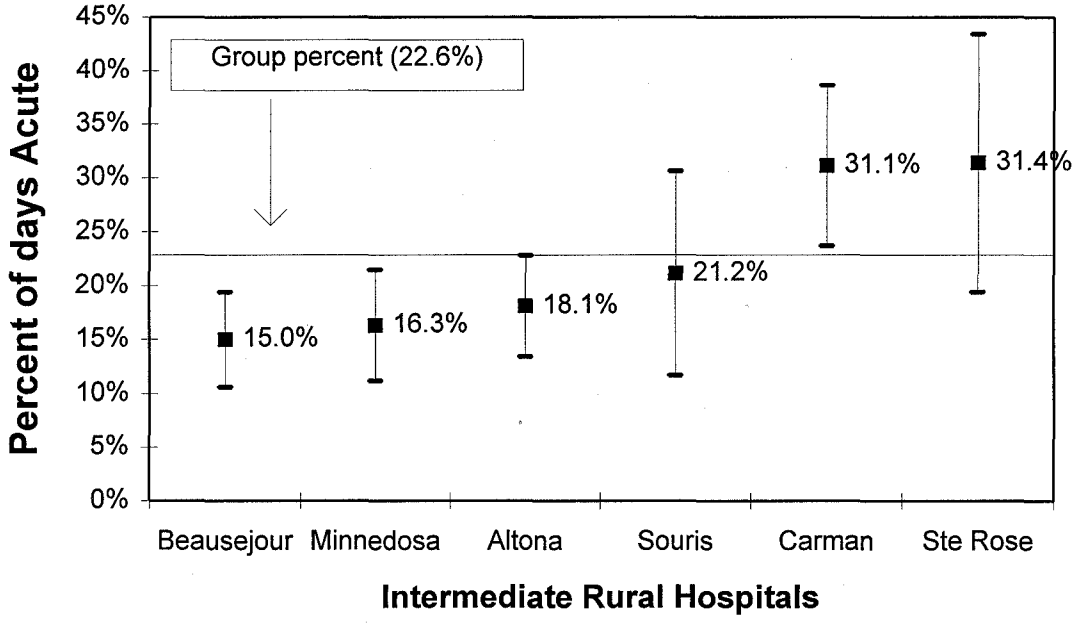


As for the Urban hospitals, many of the days spent in Rural hospitals are assessed as needing a long care institution, not acute care: Major Rural 24.4%, Intermediate Rural 30.7% and Small Rural 22.8% (Table 5). Approximately 15% of the days could have been provided by Home Care. Note that the number of days in which No Health Care was required was 10% or less.

For the Intermediate Rural hospitals, the proportion of days assessed as Acute ranged from 15.0% in Beausejour to 31% in both Carman and Ste Rose (Figure 13). When only the first 30 days of stay were considered, the range is from 17.7% in Beausejour to 34.6% in Carman (Table 7). The difference between the proportions for All Days and Day 1 to

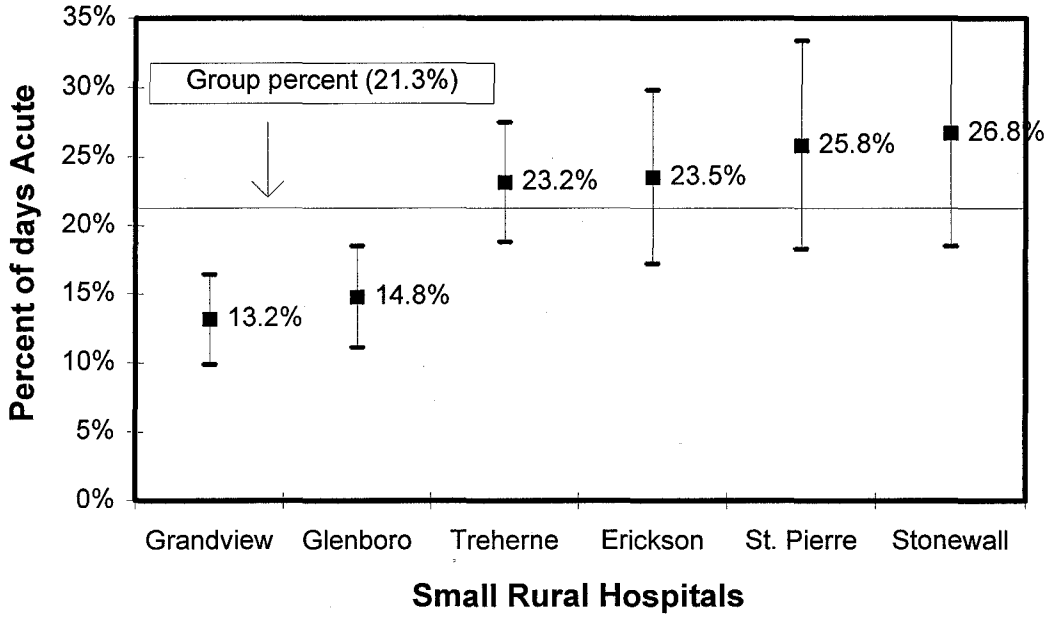
30 was greatest for the hospitals in Minnedosa and Altona, increasing by 6.9% and 5.2% respectively.

Figure 13: Percent of Days Acute Adult Medical, Intermediate Rural



For the Small Rural hospitals, Grandview had the lowest proportion of days assessed as Acute (13.2%) and Stonewall the highest (26.8%) (Figure 14). Glenboro and Stonewall hospitals showed the greatest difference between the All Days and Day 1 to 30 analyses: 5.4% at Glenboro and 5.2% at Stonewall (Table 7).

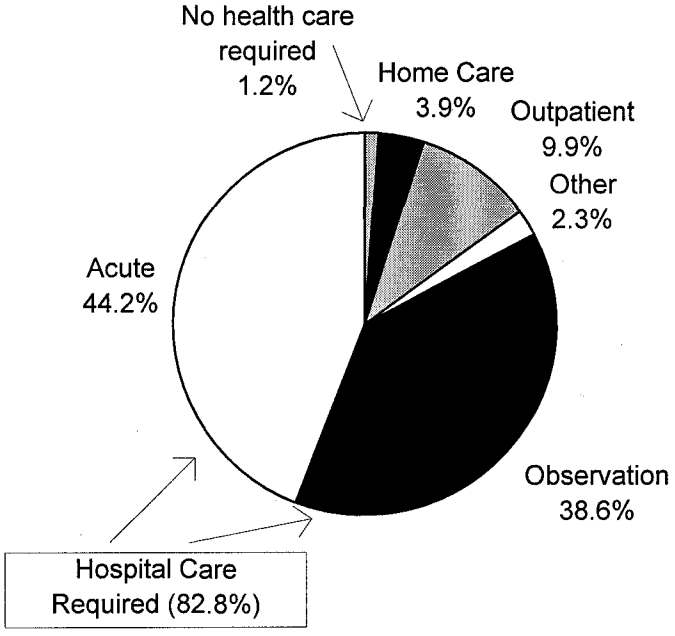
Figure 14: Percent of Days Acute Adult Medical, Small Rural



Paediatrics

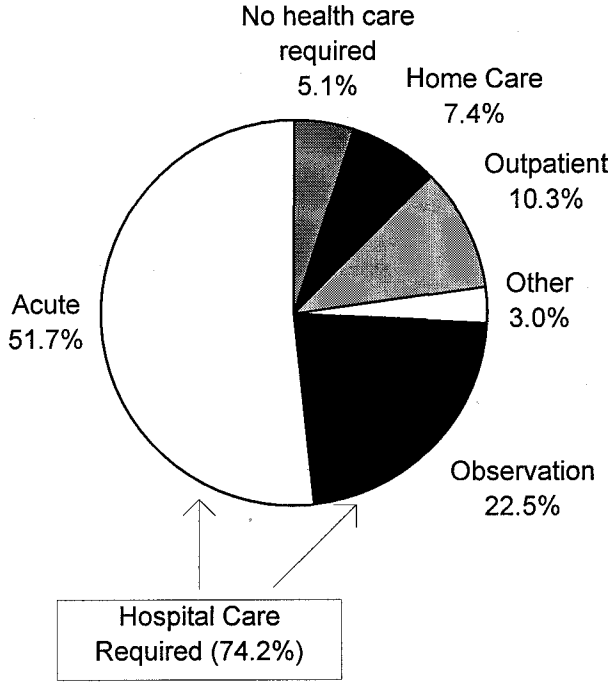
Over the four hospitals reviewed, 44.2% of the paediatric admissions were assessed as Acute. As for the adults, a large proportion (38.6%) of the patients were assessed as requiring Observation at the time of admission (Figure 15). If we add the two proportions, then we find that 82.8% of the paediatric patients needed some hospital care at the time of admission; the range at the hospitals reviewed was from 44.7% at Ste Rose to 89.4% at HSC. Only 1.2% required No Health Care at the time that they were admitted.

Figure 15: Levels of Care at Admission (Paediatric)



The ALCs for paediatric days showed a somewhat different pattern than those of the adults: very few required a long stay institution, so few that it was added to the category "Other." Nearly one-quarter of the days were assessed as requiring Observation (Figure 16); these are the days associated with the admissions requiring Observation. The reason that this proportion is larger for the paediatric population than for adults is that, on average, paediatric lengths of stay are much shorter; hence fewer days were reviewed in total and the days requiring Observation make up a larger proportion of the total. The levels of care for each hospital studied can be found in Appendix C: Tables C4 and C5.

Figure 16: Levels of Care for Days of Stay (Paediatric)



Figures 17 and 18 show the proportion of admissions and days that were assessed as Acute for the four hospitals in which paediatric charts were reviewed. The bars show the confidence intervals and the line shows the overall estimate for the four hospitals studied. At Ste Rose Hospital, one in six of the children admitted were assessed as requiring Acute care, and only 22.2% of the days that children spent at that hospital were Acute. At the upper end, one-half of the children admitted to Health Sciences Centre were assessed as requiring the care of an acute care facility, and 57.6% of the days spent were Acute.

Paediatric Patient Assessed as Requiring Observation at Admission

Male, 4 years. Asthma. Respiratory distress with poor response to inhalers at home. Required bronchodilator therapy. Stayed one day. No observation unit available.

Monitoring: Temperature four times, pulse and respirations eight times, blood pressure once on admission day; temperature, pulse and respirations four times on discharge day.

Treatments/Medications: Ventolin.

Figure 17: Percent of Admissions Acute Paediatric Medical

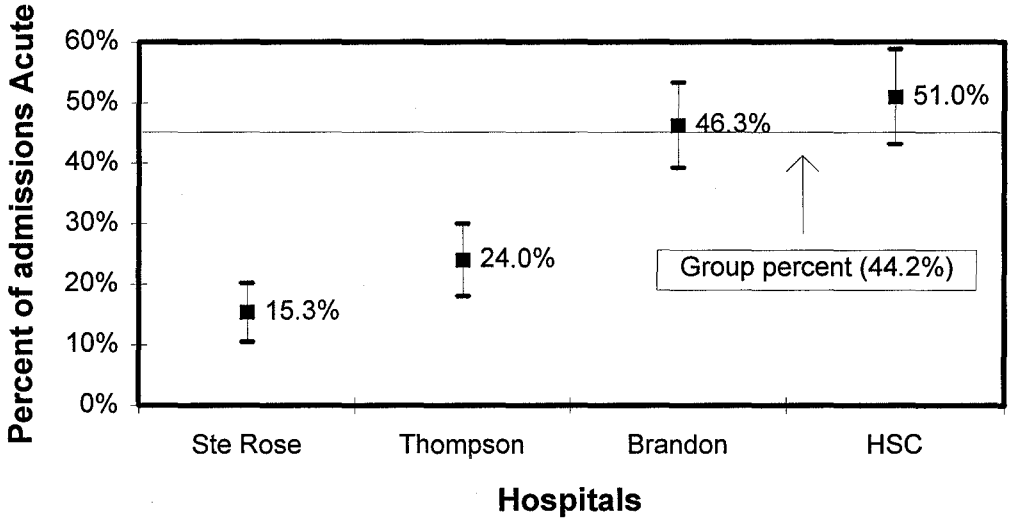
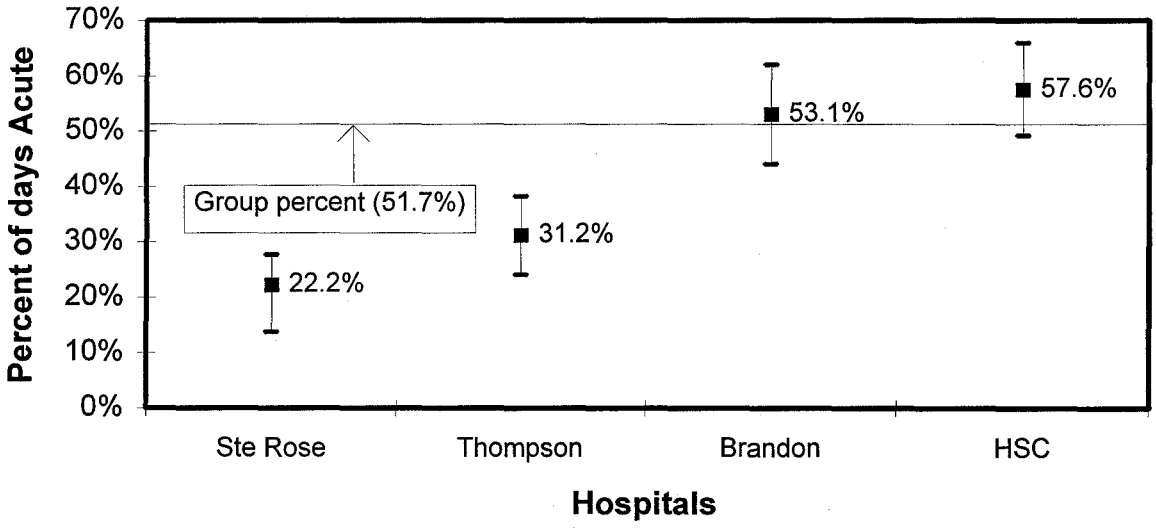


Figure 18: Percent of Days Acute Paediatric Medical



UNDERSTANDING THE PATTERNS

Given the high proportion of admissions and days which did not meet the criteria for inpatient acute hospital care, we reviewed the results with our Working Group who suggested several further investigations as checks on the validity of our assessments.

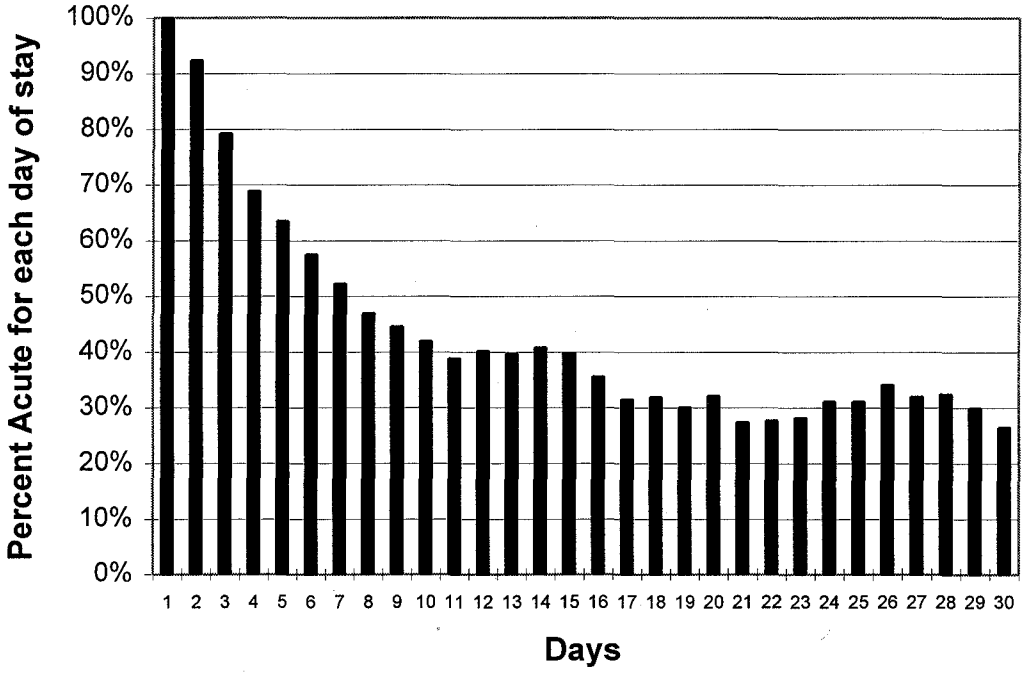
Acuteness by Portion of Stay

If our criteria made sense, one would expect that almost all patients who qualified as Acute at admission would continue to meet the criteria for Acuteness during the early part of the stay, and that it would be the subsequent days during which the criteria would not apply. We looked at Acuteness for each of the first 30 days in hospital. That is, we identified the proportion of patients for whom Day 1 was Acute; Day 2, and so on up to Day 30.[10] We only included patients who were Acute at the time of the admission review; therefore, on Day 1, 100% of the days were assessed as Acute (Figure 19). By Day 30, only 27% of the days were Acute.

[10] Approximately 5% of the patients stayed 30 days or longer.

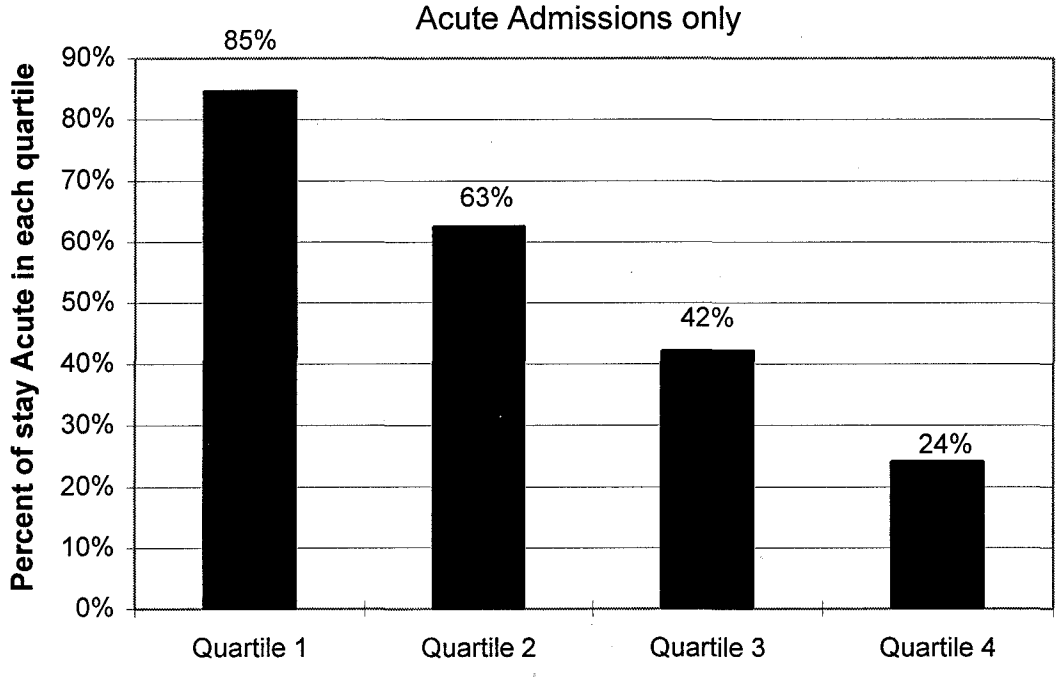
Figure 19: Acuteness by Day of Stay

Acute Admissions only, Day 1 to Day 30



We also divided each stay into quartiles and looked at the proportion that were Acute in each quartile. Again we looked at patients who were Acute at the time of admission. For the first quartile, the earliest part of the patients' stay in hospital, 85% of the days were Acute. This proportion fell for each quartile to 24% for the last quartile of the hospital stay (Figure 20). In a parallel comparison, for each quartile we looked at the proportion that did not require health care, and it increased for each quartile of stay: first quartile 1.4%, second quartile 3.6%, third quartile 7.7%, and fourth quartile 15.1%.

Figure 20: Acuteness by Quartile of Stay



Most of the patients who were judged as not requiring Acute care upon admission (ALC) stayed in that category for their entire stay. Thus for patients assessed as ALC at admission, only 9% of their hospital days were ever assessed as Acute. In contrast, 55% of the days were assessed as Acute for patients that were assessed as Acute at admission.

Acuteness by Day of Admission

It was suggested that we might find a lower proportion of Acute admissions on weekends compared to weekdays. It was thought that because physicians' offices are generally closed on weekends, patients might be more likely to go to the hospital with a health problem. We could find no evidence to support this theory. (Patients might use the Emergency Room more, but that does not mean that they will be admitted to the hospital.) We found that the proportion of Acute admissions on Saturday and Sunday was 44% and 45%, whereas the proportion from Monday to Friday was 39% to 40%.

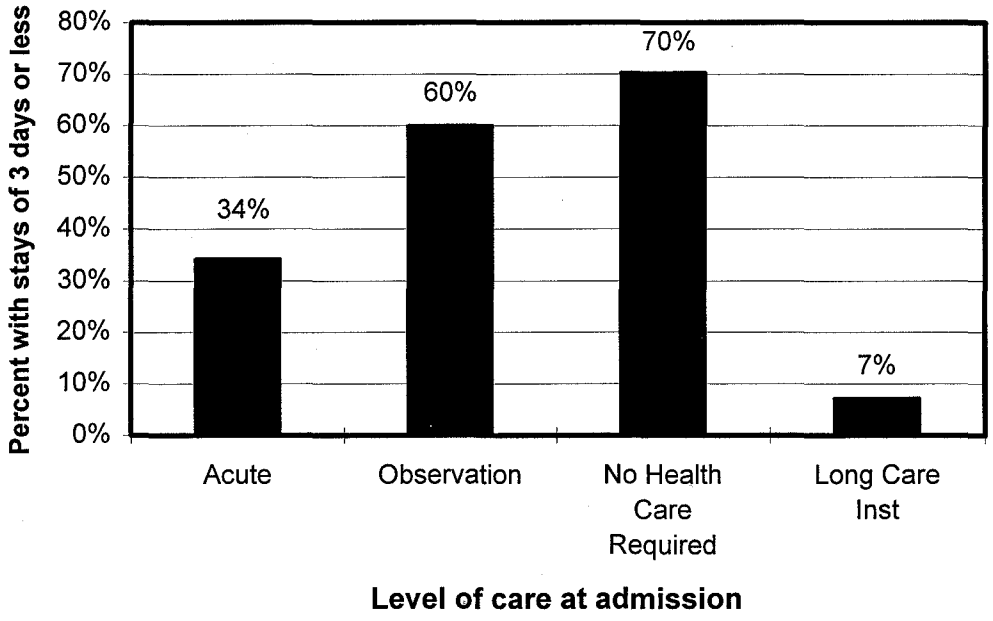
From an external reviewer: "One point that emerged from our own research was the startling impact of direct admissions from physicians' offices to hospital. In brief, we found that when patients were referred to the emergency room and then admitted, levels of appropriateness of admission based on the criteria were considerably higher than when they were admitted directly by the physician to hospital without going through the emergency room."

We looked at whether or not the patients were more likely to be Acute if they were admitted through Emergency. We found that 56% of the patients admitted through Emergency were Acute at admission, compared with 36% of the patients who were not admitted through Emergency. (Overall, 22% of the patients were admitted through Emergency.)

Acuteness by Length of Stay

As another check on the validity of the data, we reviewed the actual stays of individuals according to the level of care assessed by the abstractors. If the criteria made sense, we should find that those assessed as requiring No Health Care or treatment in an Observation setting on admission were more likely to have very short stays than those assessed as requiring Acute or Long Term Care at the time of admission. As can be seen in Figure 21 the data bear this out: patients assessed as requiring Observation or No Health Care were more likely to spend three days or less in hospital, while those assessed as requiring Acute or Long Term Care had a much larger percent of their stays which were longer. These patterns make sense and reinforce our judgements that the assessments are meaningful.

Figure 21: Patients with Different Levels of Care at Admission, Percent with Stays of 3 Days or Less



Comparison with MedisGroups Data

As an independent check on our coding criteria, we compared the records we reviewed with the MedisGroups Admission Severity (AS) score routinely applied for all admissions to St. Boniface General Hospital. This tool is not designed to assess whether a patient requires the care of an acute care hospital; it assesses how sick (i.e. clinically unstable) patients are. If there was no relationship between clinical instability as assessed using MedisGroup data and Acuteness as assessed by InterQual, one might question our use of the InterQual criteria.

In MedisGroups, clinical findings and the principal diagnosis for the hospital stay are used in an algorithm to return a probability of death. The probability of death is then related to one of five possible AS categories: the lowest category, "0", indicates no clinical instability (probability of death 0.000 to 0.001), and the highest category, "4", indicates maximal clinical instability with a 50% or higher probability of death.

The findings of our comparison are in Table 8. The total number of patient records compared is 145: 20 with the lowest admission severity score (AS of 0); 46 with AS 1; 49 with AS 2; 26 with AS 3; and 4 with AS 4. (the highest severity level). The proportion of patients meeting the InterQual criteria for acute hospital care at admission increases as the AS increases: only 25% in the AS 0 (no clinical instability) category met the InterQual criteria, but in AS 3 and 4, the categories with severe to maximal clinical instability, 88% and 75% respectively met the InterQual criteria for Acuteness. We looked further at the 22 patients in AS 2 to 4 who did *not* meet the InterQual criteria, and found that most of them (18) met the criteria for Severity of Illness, but only one of the 22 met the criteria for Intensity of Service. This independent check provides reassuring evidence for our use of the InterQual criteria, and it supports our conclusion that patients in hospital are ill, but that many of them may need a different level of health care than that provided by a hospital.

Table 8. Comparison of MedisGroups Admission Severity (AS) Score from St. Boniface General Hospital and InterQual Admission Review

AS SCORE		InterQual Admission Review Assessment	
	Number in each AS category	Acute (%)	Alternate Level of Care (%)
0 = no clinical instability	20	5 (25%)	15 (75%)
1 = minimal	46	18 (39%)	28 (61%)
2 = moderate	49	31 (63%)	18 (37%)
3 = severe	26	23 (88%)	3 (12%)
4 = maximal	4	3 (75%)	1 (25%)

Acuteness by Patient Characteristics

We looked at Acuteness by several different characteristics including 1) socio-economic status; 2) whether the patient was a Treaty Indian; 3) age; 4) distance from hospital of admission; 5) type of diagnosis.

Our measure of socio-economic status used 1991 Canadian Census information on average family household income in each enumeration area. An urban enumeration area is defined by Statistics Canada as having a population density greater than 400 persons per square kilometre. We used these data to rank urban neighbourhoods into five income "quintiles;" income quintiles are less applicable in rural areas. Patients who were Treaty Indians under the federal Indian Act were identified by a municipal code beginning with an "A".

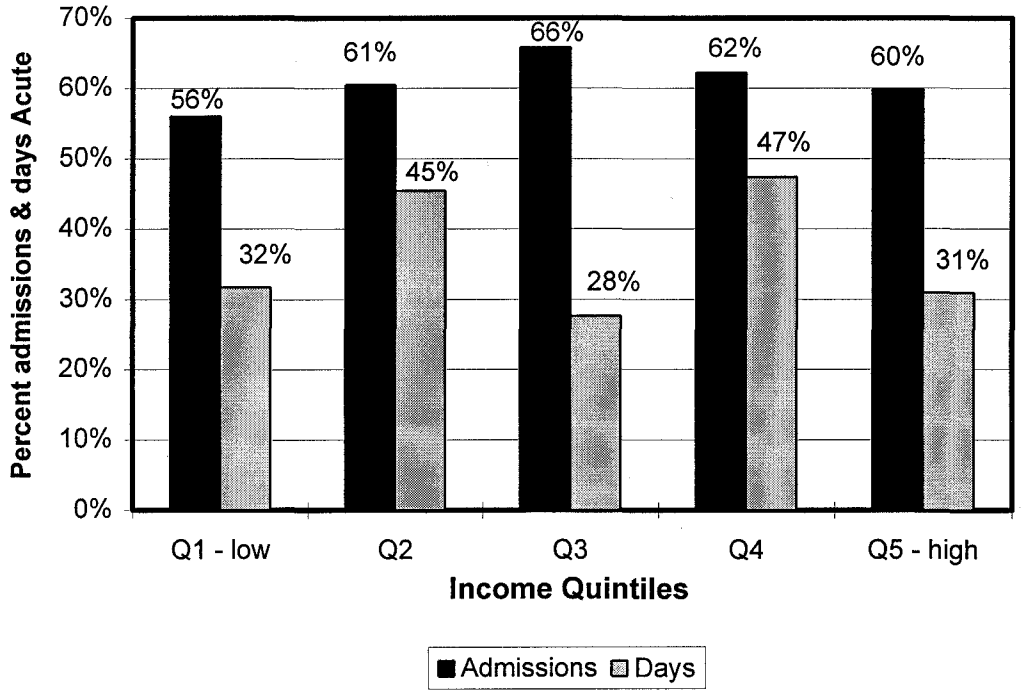
Socio-Economic Status

Analyses undertaken by MCHPE have demonstrated that individuals with low socio-economic status have high rates of admission to hospital and spend many more days in hospital than individuals with high socio-economic status. For example, we have shown that residents of Winnipeg's lowest income neighbourhoods spend on average 910 days in hospital annually per 1000 residents, compared to 594 days by residents of Winnipeg's middle income neighbourhoods, and 485 days by residents of Winnipeg's highest income neighbourhoods (Brownell, Roos 1995). Using various health indicators, e.g. life expectancy and deaths from acute and chronic diseases, we have also shown that overall health status declines with income levels (Frohlich, Markesteyn et al. 1994). Nevertheless, it has been suggested that despite their demonstrated poorer health, low income residents might be overusing the acute hospital system, perhaps due to admissions for social reasons rather than due to the acute nature of their illness. If this were true, we should find that patients in the lower income quintiles would have lower proportions of admissions and days that are Acute.

Figure 22 shows the proportion of admissions and days that were assessed as Acute by income status for Winnipeg residents. The data do not support the belief that people in

lower income quintiles are more likely to be classified as ALC than people in higher income quintiles[11]. The proportion of patients who were Acute at admission was 56% for the lowest income quintile and 60% for the highest income quintile, while the proportion of days that were Acute was 32% and 31% for patients in the lowest and highest income quintiles respectively.

Figure 22: Acuteness by Income Quintile for Winnipeg Residents and Winnipeg Hospitals



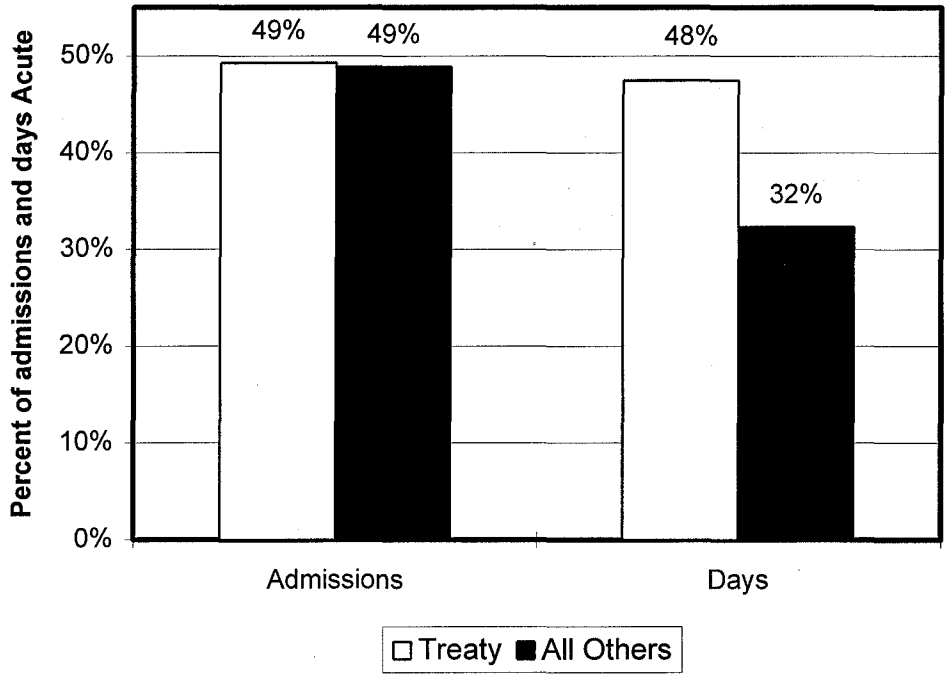
Treaty Indians

We also looked at Acuteness by whether patients were Treaty Indians or not (Figure 23). Treaty Indians are often burdened with low incomes, poor housing and lack of employment, factors which have negative consequences on health status. Furthermore,

[11] There are however a greater number of admissions and days in the lower income quintiles compared to the higher: in the lowest quintile, there were 234 admissions and 2,645 days, whereas in the fourth and fifth quintile (higher incomes), there were 143 and 142 admissions and 1,186 and 1,339 days respectively. Again, the Manitoba, Canadian and international literature suggests that this is entirely consistent with the relative health of these groups (Andersen; Chen et al. 1987; Benzeval, Judge, Solomon 1992; Marmot, McDowell 1986; Marmot, Rose et al. 1978; Billings, Zeitel et al. 1993).

many reserve communities are remote from hospitals and offer few health care services, factors which may influence physicians against early discharge. Only 251 (6.4%) of adult admissions reviewed were Treaty Indians. The proportion of admissions assessed as Acute was equivalent for Treaty and all others, but the proportion of Acute days was actually *higher* for Treaty patients—almost half of their days were Acute compared with one-third of the all other patients' days.

Figure 23: Acuteness by Treaty Status

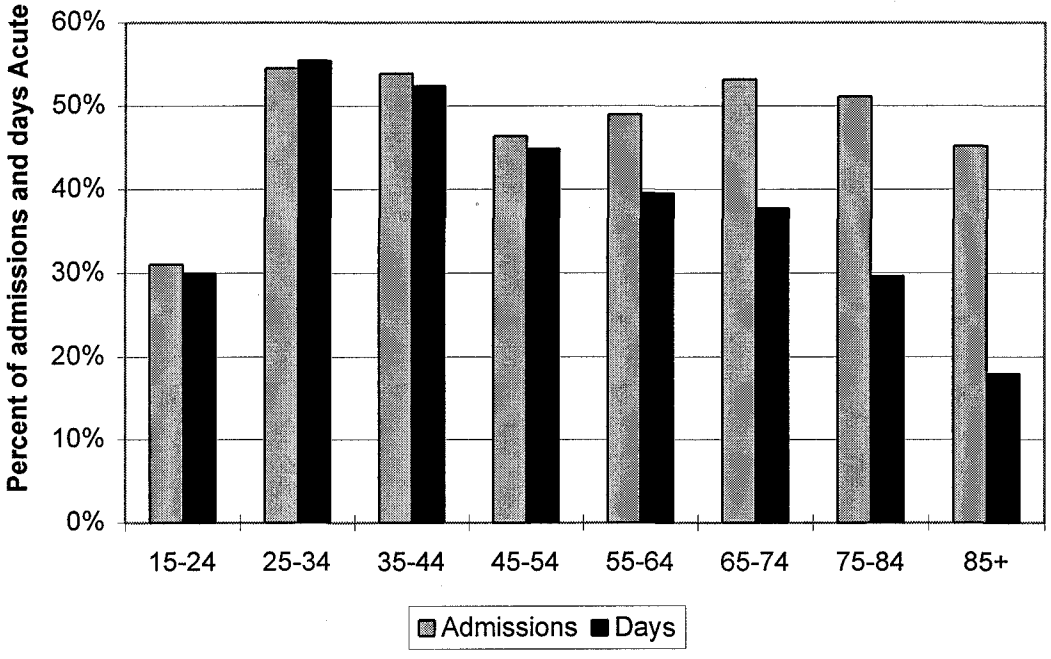


These data strongly suggest that our stereotypes about the poor and aboriginal groups overusing the acute hospital system are false; these patients had at least as high levels of Acuteness at admission and throughout their hospital stay as those from the most advantaged neighbourhoods. In fact, given the limited resources available to these individuals, it might be argued that, if anything, our existing system underserves those at highest need.

Age

Figure 24 describes the proportion of admissions and days that were assessed as Acute according to age. Except for the 15 to 24 year age group, the proportion of admissions that were Acute hovers around 50% for all age groups; however the proportion of days that were Acute decreases steadily for each age group after age 25 to 34. The proportion of Acute days in the 25 to 34 year age group is 56%, however, only 18% of the days spent by patients age 85 or older were Acute.

Figure 24: Percent Acute by Age



In Manitoba, we find that 43% of days in acute hospitals are accounted for by elderly residents (Manitoba Health 1994). This finding is not surprising since they have high rates of chronic disease, and also, we know that in the year before death, people are more likely to be hospitalized for lengthy periods (Roos, Shapiro, Tate 1989; Evans et al. 1989). In this study, patients aged 75 years or older spent proportionally more days in hospital than other age groups: they accounted for 39% of the admissions but 54% of the days. Although their levels of Acuteness were similar to other age categories at the time

of admission, their days of stay appeared to be prolonged at a level of care inappropriate to their needs.

Distance from Hospital

It has been suggested that rural physicians make greater use of hospitals because their patients have farther to travel and are hence difficult to monitor if not admitted. We wondered therefore if the distance that a patient lived from the hospital influenced the decision whether to admit to or retain a patient in the hospital. If this were so, then one might expect a lower percentage of Acuteness the further a patient lived from the hospital. Figure 25 illustrates Acuteness for admissions and days by the distance the patient lives from the hospital, using postal code information recorded during the abstraction process.[12] We used eight categories: less than 5 km, 5 to 24 km, 25 to 49 km, 50 to 99 km, 100 to 149 km, 150 to 200 km, 200 to 249 km and 250 or more km. For admissions, as we expected, the proportion of Acute admissions decreases from the less-than-5-km category to the 100-to-149-km category (except for the 50-to 99-km category), indicating that the further away from hospital patients live, the less likely it is that they will be assessed as Acute at the time of Admission. Patients who lived over 200 km away are as likely to be Acute at admission as those living 5-to-24 km away; these might be patients who are flown in.[13] The pattern for days however was puzzling: we found increasing Acuteness the further away from the hospital the patient resided.

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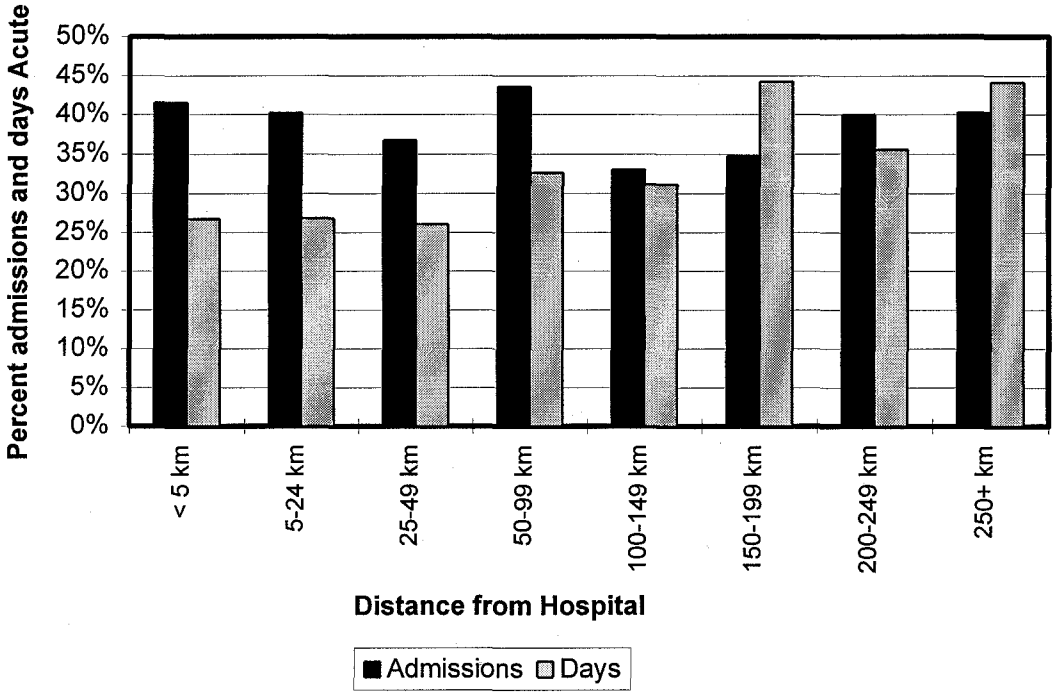
12 One limitation of this analysis is that distances are "as the crow flies", not road distances.

13 Fewer than 3% of patients lived over 200 km from hospital; the majority were admitted to Health Sciences Centre, St. Boniface, Thompson and The Pas.

Figure 25: Acuteness by Distance to Hospital



Type of Diagnosis

We classified all admissions into diagnostic groups to see whether patients with particular types of diagnoses were more likely to be assessed as Acute and thus require the services of an acute care facility. Respiratory, Digestive, Liver, Endocrine, Circulatory and Injuries categories had over 50% of their admissions assessed as Acute. Only for patients whose most responsible diagnosis was in the Liver or Injuries categories were 50% of the days assessed as Acute. For patients whose most responsible diagnosis was in either of two categories—Skin, Subcutaneous Tissue and Breast, or Ear, Nose and Throat—fewer than 20% of days were assessed as Acute.[14]

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[14] Common diagnoses for these categories of illness (and their ICD-9-CM codes) were: *Respiratory:* pneumonia (486), asthma (493), bronchitis (490); *Digestive:* gastritis and duodenitis (535), other symptoms involving the abdomen or pelvis (789); *Circulatory*: heart failure (428); cardiac dysrhythmias (427); *Liver*: cholelithiasis (574); *Endocrine:* diabetes mellitus (250); *Injuries:* injury, other and unspecified (959); *Skin, Subcutaneous Tissue and Breast:* other cellulitis and abscess (682); *Ear, Nose and Throat*: general symptoms (780).

SECOND LOOK

When we analyzed the results from the initial data abstraction, we found them to be at the low end of published results elsewhere and lower than those found in Saskatchewan. We wanted to explore the reasons for our findings, to investigate why they were lower.

When HSURC conducted its study in Saskatchewan, they used the version of the InterQual criteria that was applicable at the time, the 1992 criteria. When we conducted the study in Manitoba, we used the 1993 version, the most up-to-date at the time. There was one major change in the Intensity of Service criteria between the two years which we thought might explain the different results between Manitoba and Saskatchewan. The 1993 criteria, which we used, required that a patient be monitored at a certain level and also be receiving treatments or medications that required hospitalization; the 1992 criteria, used by HSURC, required that a patient was either being monitored or receiving treatments or medications requiring hospitalization. While this change may seem minor, it has a major impact on whether or not the patient meets the Severity of Illness criteria and would hence be assessed as Acute. InterQual, in consultation with its clinical panel, updates its criteria annually and this change reflected changes in clinical practice. The changes also illustrate how our understanding about the types of patients requiring inpatient acute care is continually being challenged and revised.

We went back to eight hospitals—both Teaching hospitals, two Urban Community, two Major Rural, one Intermediate Rural and one Small Rural—and tested how sensitive our results were to this rule change by re-abstracting 75 (50%)[15] of the records that we initially abstracted using the 1992 rule. At the same time, to be further comparable to Saskatchewan, instead of requiring one criterion to be met under Severity of Illness, we allowed three borderline criteria. The revised abstraction tool is found in Appendix A.

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[15] At Health Sciences Centre, we re-abstracted 75 adult and 75 paediatric records.

At an earlier date, one of the physicians who reviewed the InterQual criteria as well as our study design, Dr. Ahmed Abdoh, suggested that in order to understand how Acute and ALC patients differed, we should record clinical and laboratory findings. At the Second Look phase, for twenty patients at Health Sciences Centre, Seven Oaks and Bethel Hospitals, we recorded the actual clinical values for twenty-five common Severity of Illness criteria; we wanted to know if patients who were classified as ALC fell just below the cut-off points on these criteria. We also recorded the frequency and type of monitoring and the treatments/medications that were ordered for these twenty patients for the first eight days of their stay.

Further, we tried to understand why patients who were not Acute were in hospital. We asked the reviewers to try to determine from the medical record if the patient was admitted/ not discharged because of:

- Borderline findings
- Lack of family or social support
- Lack of alternative services
- Uncertainty of stability/instability of symptoms
- Faster route to necessary examinations, e.g. CT scan
- Arranging home care
- Other: specify

Physician Review

At the suggestion of Dr. Barry MacMillan, a member of the Working Group, physicians in the Working Group reviewed with us the same twenty records to assess why, from a clinical point of view, the patient needed inpatient hospital care. Dr. MacMillan completed the review at Seven Oaks and HSC (adults). Drs. Sally Longstaffe and Cornie Woelk assisted us similarly at HSC (paediatrics) and at Bethel Hospital respectively. We met with the physicians to compare the physicians' assessments with those of the abstractors. The physicians were unaware of how the abstractors' had assessed these patients.

Results of the Second Look

The results of the second record review suggest that, using the older criteria, the proportion of medical admissions and days assessed as Acute increased by 17% on average. If applied across hospital categories, this places Manitoba results very close to those of Saskatchewan; using similar criteria results in Manitoba and Saskatchewan being assessed very similarly in terms of the Acuteness of their patients (Tables 9 and 10). Using these older criteria, one finds that for one-quarter of the medical admissions and one-half of the medical days in Manitoba Urban hospitals, the care could have been provided at an alternate level. In Rural hospitals, one-half of the medical admissions and half to two-thirds of the medical days could have been in an alternative health care setting.

Table 9. Comparison of Acute Admissions: Saskatchewan and Manitoba

	Manitoba 1993 Criteria	Manitoba 1992 Criteria¤	Saskatchewan 1992 Criteria
Urban§	56%	73%	61%
Major Rural	38%	55%	61%
Intermediate Rural	35%	52%	53%
Small Rural	27%	44%	42%

¤ Estimates based on eight hospitals
§ The comparable categories in Saskatchewan are Base, Regional, Large Community and Small Community.

Table 10. Comparison of Acute Days: Saskatchewan and Manitoba

	Manitoba 1993 Criteria	Manitoba 1992 Criteria¤	Saskatchewan 1992 Criteria
Urban§	36%	53%	53%
Major Rural	28%	45%	43%
Intermediate Rural	23%	40%	37%
Small Rural	21%	38%	36%

¤ Estimates based on eight hospitals
§ The comparable categories in Saskatchewan are Base, Regional, Large Community and Small Community.

The coders' assessment of why the patients were in the hospital when they did not meet the criteria was most often that the patient's condition was unstable. Frequently, coders reported that there was a lack of alternative services or that no other options had been explored.

The physicians who reviewed records with us agreed 82% of the time with the classifications that the abstractors had made. Of the 75 charts reviewed by both abstractors and physicians, there was agreement 61 times; of the 14 disagreements, patients that the abstractors assessed as not Acute were judged Acute by the physician twelve times. These results are supported by a similar retrospective study of paediatric hospitalizations in which a physician review panel assessed a sample of admissions that had previously been assessed using appropriateness criteria (Smith, Sheps, Matheson

1993).[16] The physicians agreed 81% of the time on which admissions were appropriate and which were not.

A physician commented: "I would like to highlight the second look, that showed significantly higher proportions meeting criteria for acute care. Also, as a physician, I know that sometimes acuteness cannot be measured on a scale or by a test. The science of Medicine is also an art, and often decisions are made on judgement, experience, and social history. These may be difficult to quantify, let alone abstract from a medical record."

The physicians in our study had to continually remind themselves to differentiate between the current reality and what could be done in an ideal world with all of the necessary alternatives in place. Despite this reminder, they judged a higher proportion of admissions to require acute care than the criteria suggested; in other words, their best clinical judgement, experience, knowledge of the history and family situation suggested admission of patients that objectively did not meet the criteria, despite the fact that, in the abstract, the physicians had agreed the InterQual criteria were suitable.

[16] In this study, the criteria used were the Appropriateness Evaluation Protocol (AEP). Like InterQual, these are non-diagnostic objective criteria, used extensively and validated in similar research.

DISCUSSION

The point that is most clear from the study is that significant resources in the acute hospital sector are directed towards delivering care to patients that could more appropriately be cared for in an alternative setting. However, the alternatives have to be in place and readily accessible. Our reliance on hospitals has developed because hospitals are historically the most well-funded and politically visible institutions in the health care system. Hospitals were the first part of the system to be universally insured and access is based on need without financial barriers; any system of alternatives to acute care must share these characteristics. To change the system of health care and to create effective alternative services will require breaking down regulatory, administrative, professional and intellectual barriers.

Using the 1993 InterQual criteria, just under half of the adult medical patients at the time of admission, and only about one day in three required acute inpatient hospital care.[17] At Urban hospitals, 55.5% of admissions and 36.3% of days were assessed as Acute. Rural hospitals demonstrated significantly less Acuteness in their medical patient load; roughly one-third of the admissions and somewhat less than a third of the days required acute inpatient care. For the paediatric medical patients reviewed, approximately half of both the admissions and days required acute inpatient care.

A hospital administrator wrote: "We are concerned about the report including cases categorized as 'observation' within the listing of cases that do not require the 'resource-intensive level of care available in these institutions.' This leaves the impression that these patients do not need hospital services and yet it would be absurd to suggest that an entirely different delivery system be developed to serve these patients."

[17] It is important to remember that we did not examine records of patients whose most responsible diagnosis was surgical, obstetric or psychiatric.

Since observation needs to take place in a facility where acute care is readily available, one might add the Acute and Observation percentages to estimate the percentage of medical patients that needed an acute care facility (Table 11). This addition affects the admissions far more than the days. Now the proportion of admissions needing hospital care ranges from 64.2% to 75.9%. However, the proportion of days that would need hospital care is still under 50%.

Table 11. Acute plus Observation, percentage of adult medical admissions and days

Category	Admissions			Days		
	Acute	*Obser-vation*	*Total*	*Acute*	*Obser-vation*	*Total*
Urban	55.5%	20.1%	75.6%	36.3%	5.4%	41.7%
Major Rural	38.0%	37.9%	75.9%	28.3%	13.7%	42.0%
Intermediate Rural	35.3%	34.5%	68.9%	22.6%	11.1%	33.7%
Small Rural	27.2%	37.0%	64.2%	21.3%	14.0%	35.0%
All	49.5%	25.3%	74.8%	33.4%	7.4%	40.8%

Although these results clearly indicate that there is no shortage of acute hospital beds, they also show that the patients who are currently in hospital require some form of care. Only a small percentage of the patients in the study were assessed as requiring no health care. It would therefore be incorrect to assume that hospital beds can be closed because hospitals are being used frivolously by physicians to treat patients who are not ill—the patients do require care. Alternatives must be in place and readily accessible prior to closing hospital beds.

The notion that patients are using hospital services because there is no where else for them to go was supported by several physicians who commented on the report. One physician noted that only six of the twelve medical units at HSC are truly considered

acute care, and that patients admitted to one of the other six medical units might conceivably be cared for in an alternate health care setting. Three HSC physicians pointed out that there are sub-categories of medical patients that most likely do not need the level of care provided at that hospital:

> A physician wrote: "I think the problem is that we are almost certainly lumping different categories of patients in the acute category. For instance, I am reasonably certain I could predict the outrage from some of our physicians and other staff at the suggestion that only 50.7% of the acute admission to the Health Sciences Centre truly need the facilities of the Health Sciences Centre. This flies completely in the face of the rising acuity on the wards, restricted number of beds and very strict criteria for admission to hospital. I seriously doubt that the number 50.7% has anything to do with this category of patients. On the other hand, I don't think that many of us would argue that most of the chemotherapy patients need the services of the Health Sciences Centre—but there are no other places for them to go."

As part of the study methodology, it was decided to create an "artificial discharge" date if a patient was transferred to a designated long term care bed within the same hospital. We did this so that we would not overestimate the number of patients in acute beds which could be cared for in alternate settings. Although our abstractors made every effort to note these patients, we know of at least one instance in which we missed a patient transfer to a long term care bed and there might be others. However, our approach is deliberately conservative in assessing the amount of care which could be delivered in alternative settings. The focus of the report was to examine the use of acute care facilities. If we had categorized *all* of the days of study patients according to whether they require acute care or alternate levels, (i.e. rather than creating the "artificial discharge"), the proportion of Acute days identified at each hospital would *decrease* on average 2%; for some hospitals the decrease in the proportion of Acute days would be as high as 6% because they have relatively more long term care units in their acute institutions.

Other data suggest that there is room for improving the efficiency with which medical patients are discharged from Manitoba's acute hospitals. Since 1991, 544 or 18% of Winnipeg hospital beds have closed: 29 in 1991, 306 in 1992 and a further 209 in 1993 (Brownell, Roos 1995). Winnipeg hospitals responded remarkably well to these closures, maintaining Manitobans' access to acute care. Despite the reductions in beds and budgets, Winnipeg hospitals cared for just as many patients in 1993 as in 1991, and more than in 1990. This was accomplished chiefly by a shift in the way surgical care is delivered: a move from inpatient to outpatient surgery and a decrease in the length of stay of surgical inpatients. From 1990 to 1993, there was an 8% decrease in inpatient surgical admissions and a 15% decrease in the average length of stay. Concurrently, there was a 24% increase in outpatient surgical procedures. This has occurred without any detectable worsening of quality of care, as judged by rates of readmission to hospital, or use of emergency rooms or visits to doctors' offices in the month after discharge (Harrison et al. 1995).[18] However, changes in the treatment of medical patients were less impressive. The number of medical separations decreased only 3% between 1990 and 1993 and the length of stay of medical patients decreased by only 5% during that time.

There is a need for more provincial attention to putting alternatives in place, and for more management attention to early discharge for medical patients. Our data make clear that there is a marked drop in Acuteness the longer the stay. For those patients who were Acute at the time of admission, by the eighth day of stay, fewer than 50% were still Acute and by Day 17, about 70% could have been treated in an alternative setting. These figures point to where attention might be focussed in reviewing the Acuteness of medical patients' hospital stays.

One might also consider focussing attention on the areas that consume the most admissions and days. The diagnostic category with the highest proportion of admissions

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[18] Although measures of mortality and readmission rates are used widely in the research literature to describe quality of hospital care, it misses important information on quality of life after discharge, and patient and family satisfaction with hospital care. The Manitoba Health Reform Impact Study, in which MCHPE is an active collaborator, will provide more in-depth perceptions about quality through interviews of patients, health care providers and ordinary Manitobans regarding bed closures.

and days was Circulatory, followed by Respiratory, then Digestive. Together these three categories accounted for 53.9% of the admissions in our study and 50.5% of the days. For Circulatory and Digestive, 44.7% of the days were Acute, and for Respiratory 38% of the days were Acute. Since these diagnostic categories account for such a large portion of hospital use, they might be the areas that yield the most results in terms of restructuring how care is delivered.

There is considerable discussion in the media and among health care practitioners about the prevalence of so-called unnecessary social admissions among the poor and disadvantaged.[19] However, we found no evidence to support this hypothesis: the levels of Acuteness were similar among patients of all income levels. It is clear that socio-economic status is related to the use of acute hospitals—more hospital days are used by those from low income neighbourhoods and middle income neighbourhoods than from high income neighbourhoods. However, our data show that at least as stringent Acuteness criteria are being applied to patients who live in the low income neighbourhoods. This suggests that their high usage is not related to social admissions to any greater extent than individuals who find themselves in other social circumstances.

Hospital staff suggest that Treaty patients are sometimes more difficult to discharge, because they may have to wait for transportation to remote communities or because alternatives like home care are not available on reserves. However, we show that the proportion of days that are Acute is 15% *higher* for Treaty than for all other patients.

The Size of the Problem/Opportunity

The data suggest that if there were alternative health care services, a significant number of hospital admissions and days could be avoided. Medical separations are a significant proportion of overall hospital activity (Figure 1); in Manitoba hospitals, 49% of adult separations and 53% of days are used in the care of medical patients. Knowing the

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[19] To some extent the patient's home situation is taken into consideration in the Discharge Screens; one of the screens is "Patient/caretaker demonstrates willingness *and* ability to meet patient's physical, medical and emotional needs in the home."

proportion of *medical* cases and days that do not meet the criteria for Acuteness in each hospital category, we were able to calculate the impact on *total* hospital admissions and days. In other words, if we were able to redirect all the adult medical separations and days that were not acute, what would be the effect on total admissions and days? These calculations have been applied to all hospitals in each category, not just to the study hospitals.

An example might help to illustrate how we obtained the percentages shown in Figure 26. Say there are 10,000 adult admissions to Manitoba hospitals yielding (conveniently) 100,000 days. Of these, 6,000 of the admissions and 65,000 of the days are defined as medical. Now suppose that 25% of the admissions and 50% of the days could be reallocated to an alternative health care service. That yields (6,000 * .25 =) 1,500 admissions and (65,000 * .5 =) 32,500 days. When we divide those numbers by the total adult admissions and days, we find that (1,500 / 10,000 =) 15% of total admissions and (32,500 / 100,000 =) 32.5% of total days could be reallocated.

Figure 26: Percent of Total Adult Admissions and Days that Could Receive Alternatives

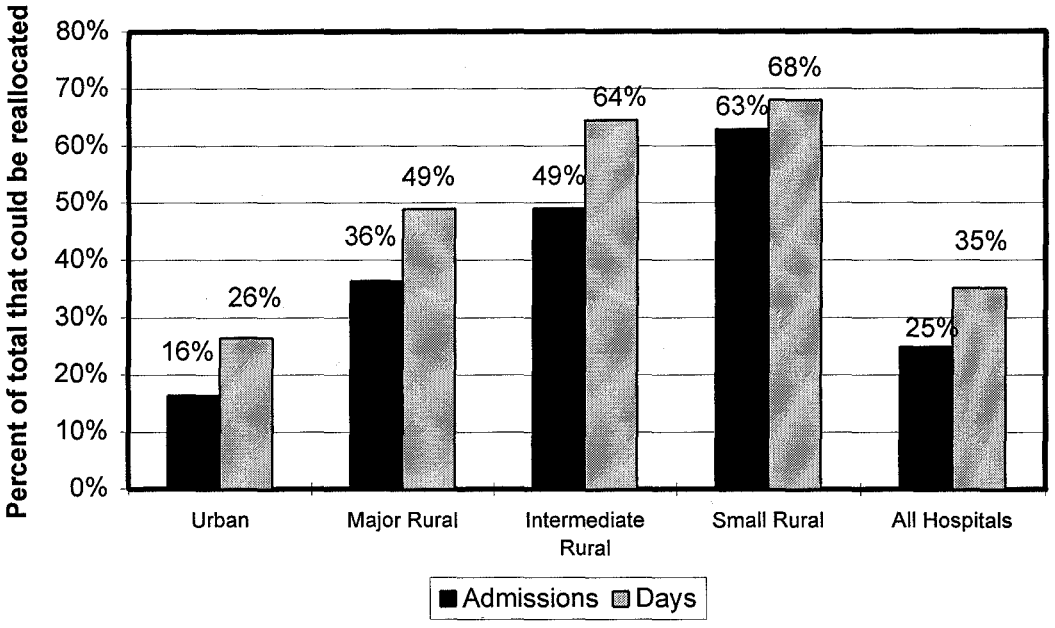

Figure 26 illustrates the percent of *total* admissions and days in each hospital category that do not require acute inpatient care. In the Urban hospitals, 16% of the admissions and 26% of the days might be reallocated. Both admission and days that do not require acute inpatient care as a proportion of the total activity increases in each hospital category from the Urban to the Small Rural category. This is because (a) in larger hospitals, a larger proportion of admissions and days are surgical, obstetrical or psychiatric, i.e. NOT medical, and (b) the proportion of ALC medical admissions and days increased across hospital categories from Urban to Small Rural. In the Major Rural hospitals, approximately one-third of the admissions and one-half of the days could be reallocated;

half the admissions and two-thirds of the Intermediate Rural days, and two-thirds of both admissions and days at the Small Rural facilities could be reallocated.[20]

Next, we calculated the number of cases and days that could be directed to alternatives, using the percentages obtained in our study and applying them to our counts of adult medical patients and days. Please remember, we defined "medical" according to the separation code on the abstract; **not** by hospital Service. Therefore, our definition of medical would include some patients who were on other Services.

Converting the percentages obtained in our study into cases and days (Figures 27 and 28), we find that overall, there are 33,896 Alternate Level of Care cases and 428,675 ALC days. (Remember that these numbers are estimates based on a sample; see Appendix Tables C6 and C7 for 95% confidence limits.) In Urban hospitals, 12,757 cases are at an Alternate Level of Care at the time of admission. Almost half of these (5,762) could be cared for in an Observation Setting, and 459 require no health care services, leaving 6,536 Admissions that could be cared for in an alternative health care setting: 745 require long term care, 803 home care, 4,386 outpatient services, and 602 other alternatives. For the Non-Urban facilities, 21,139 patients could be cared for at an alternate level at the time of admission; more than half of these require observation (11,586), and 864 do not require health care, leaving 8,689 cases that could be cared for in an alternative setting: 1,388 require long term care, 2,106 home care, 4,019 outpatient services, and 1,176 other alternatives.

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[20] Note that cases and days associated with patients who were admitted with identified long term codes, as well as days after we created an "artificial discharge" were excluded. If we add back in those excluded days and assume they are ALC days, then the percent of total days that could be reallocated is: Urban 33%, Major Rural 55%, Intermediate Rural 65% and Small Rural 70%.

Figure 27: Medical Admissions that are at Alternate Levels of Care by Urban/Non-Urban

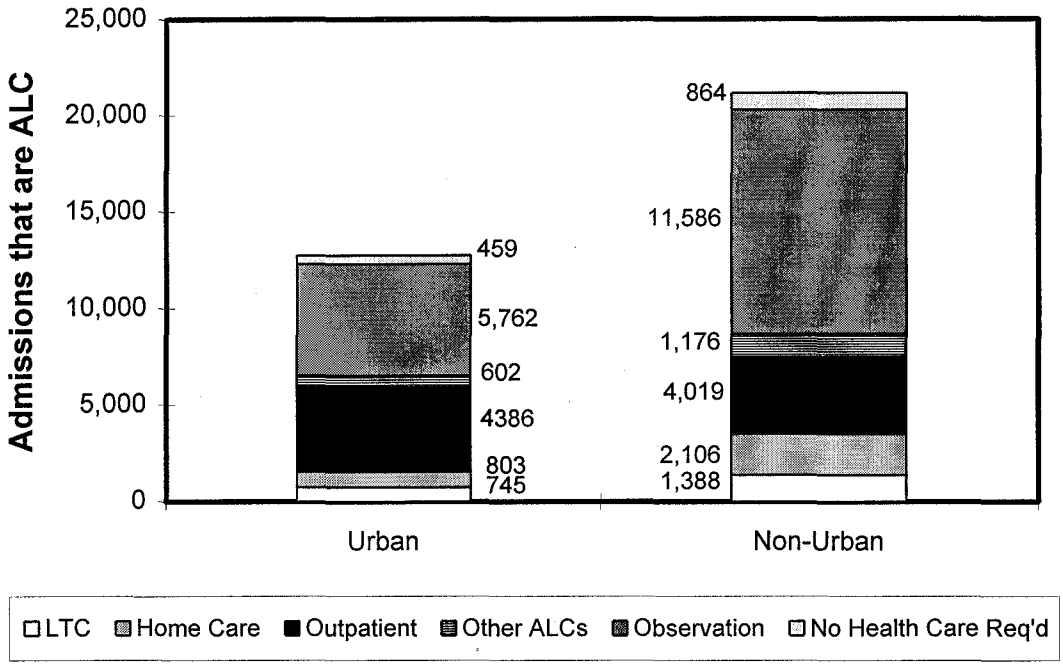
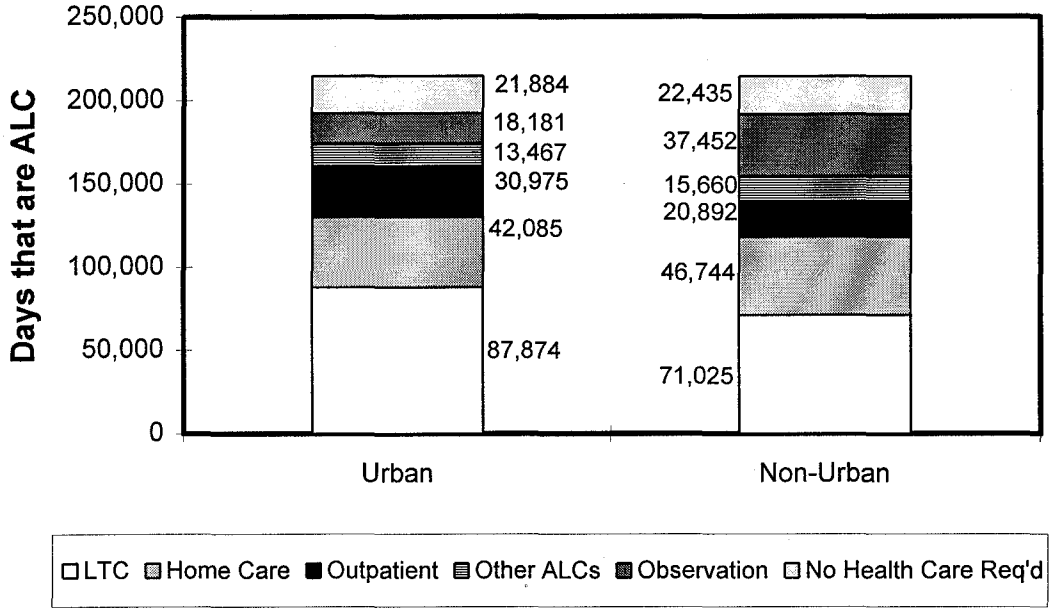


Figure 28 illustrates the days of care that can be cared for at an alternative setting. The number of days that have the potential to be reallocated if services were available is similar between Urban and Non-Urban facilities: approximately 214,000 each. For Urban hospitals, 18,181 days could be in Observation and for 21,884 days, no health care is required. Of the remaining 174,401 days, 50% (87,874) could be reallocated to a long term care facility such as rehabilitation, chronic care or a personal care home. The rest could be reallocated to home care (42,085 days), outpatient services (30,975 days) and other alternatives (13,467 days). For Non-Urban facilities, the patterns are similar. There are 37,452 days that require Observation, and 22,435 days for which no health care services are required. Of the remaining 154,321 days, 46% (71,025) could be reallocated to a long term care facility; the rest could be cared for by home care (46,744), outpatient services (20,892) or other alternatives (15,660).

Figure 28: Medical Days that are at Alternate Levels of Care by Urban/Non-Urban



Converting the number of days that are ALC into beds, the 428,675 days yield 1,174 (±288) beds. The Second Look suggested that, if older criteria are used, this figure would be approximately 17% lower. It is important to remember however that, as demonstrated above, some of those acute care beds likely need to be reconfigured into observation or long term care uses. The data from the Second Look were gathered from a limited number of hospitals (8) and cannot be generalized with confidence at the same level of detail as the data gathered in the initial review. However, if we accept that a higher proportion of Acute days would be found using these older criteria, a large number of

beds are still identified across the province which might be reallocated from acute to alternate uses.[21]

In summary, a significant potential exists for reallocating hospital care to alternative services. However, until alternatives are available, a large proportion of hospital activity must continue to be provided for patients in acute hospitals even though they might be better served receiving care elsewhere. On the other hand, it makes no sense to provide these alternatives without then decreasing the current number of acute care beds.

Limitations

By the time this report is released, we will be in the 1996/97 fiscal year. The data we abstracted for this study are from 1993/94—three years old already. Much has happened in that time, most notably the closure of 237 beds in Winnipeg in addition to the 335 that had already been closed at the time of our study. Although these data may seem outdated, we began the project in the fall of 1994, and used the most recent year of data at that time. Our abstractors were in the field by March of 1995 and completed data abstraction by June. The data analysis, writing of the report, Second Look data collection, report distribution and feedback all added to the total time.

As stated, the InterQual tool has been used retrospectively in other research. However, this does lead to some hurdles, specifically the lack of a physician override and the assumption that the medical record is complete. When used concurrently, there is opportunity for physician override: whenever the chart reviewer and the attending physician disagree, a physician reviewer is called upon to determine whether the patient should be in hospital or not. If the physician reviewer and the attending physician disagree, then a third physician is called upon to settle the dispute. Thus, a patient who

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[21] Our method for calculating days that are an alternate level of care varies considerably from the method used to calculate "non-acute" days in the Hospital Case Mix Costing Project (Shanahan et al. 1994). First we only look at medical separations. Second, we excluded patients admitted with known long term care codes, thereby excluding 3% of patients and 9% of days. Also we created an artificial discharge if patients were transferred to designated extended treatment beds. Many aspects of the two studies are not comparable.

does not meet the criteria may stay in the hospital for reasons that are not available to the chart reviewer.

Retrospective chart review also assumes that the medical record is complete. For each day of review, the abstractor relied on the data that was available in the record on that particular day. We assumed that anything that was not documented did not exist. It is possible that not all of the pertinent information was recorded in the chart; we had no way to accommodate for this.

A further limitation relates to the list of alternatives that we used. We attempted to develop a complete list of possible health care alternatives; given that some of the categories were used so infrequently, we might have had more than we needed. On the other hand, we may also have been limited by a list that was based mainly on alternatives with which we were already familiar; no doubt there are other possible alternatives that we did not consider.

> Reviewer from Manitoba Health Organizations: "On a philosophical level, one questions how much our system is restricted by the definitions we use? Does the use of the same labels we have always used limit our ability to reorganize the health system along a true continuum, and does it decrease our cost-effectiveness?"

Lastly, we did not conduct a cost comparison of hospital care compared to alternatives. This type of comparison is critical before changes are made; however it was beyond the scope of this study.

Observation

Many of the people who were assessed as ALC at admission were classified as requiring Observation. These are patients who were exhibiting signs and symptoms of illness, but did not meet the InterQual criteria and yet needed to be monitored for a brief period. These people may, for example, be suffering chest pain, dizziness or fainting, pneumonia,

asthma, or abdominal pain. For the patients assessed as requiring Observation at the time of admission, 92% of them, the great majority, never became Acute during their hospital stay. The majority of these patients were discharged in three days or less; hence although 25% of admissions were assessed as requiring observation, these patients only accounted for 7% of the days. Nevertheless, because they make up such a large proportion of patients admitted to hospital, further exploration is required.

Discussions among the Working Group and with Manitoba Health indicate that patients must be officially admitted to the hospital after 24 hours in Observation, although they may still occupy an Observation Unit (OU) bed. Analysis at St. Boniface Hospital (Brown 1995) shows that once a patient is admitted to an inpatient bed, even though the patient may require the same kinds of investigations or monitoring as one who stays in the OU, the length of stay of the admitted patient is usually longer than the one who remains in the Observation Unit. It may be necessary to re-examine the definition of Observation to allow stays greater than 24 hours and to create Short Stay units where resources and procedures could be stream-lined to accommodate short stay patients. It must be kept in mind that none of these changes make sense unless existing acute beds are closed.

Short Stay Unit Models

At Scarborough General Hospital, a Medical Observation and Short Stay (MOSS) unit has been found to efficiently move medical patients in and out of the hospital (Stein 1995). Created to deal with a temporary 90-bed closure, the MOSS unit is now an established part of the hospital, with twelve permanent and two swing beds. The MOSS unit consolidated in one area of the hospital patients who could be identified as needing only a short stay, for example, those with acute asthma, exacerbation of chronic obstructive pulmonary disease, gastrointestinal bleeding, drug overdose, social problems, drug reactions and treatment complications, exactly the kind of patient that would frequently be assessed as requiring Observation using the InterQual criteria. The maximum length of stay in the unit is three days. Great co-operation and co-ordination

between physicians, and hospital services like laboratory, diagnostic imaging, and social work, are necessary to make the unit work effectively.

St. Boniface General Hospital proposed in its Emergency Department Review (Cloutier 1995), a Geriatric and Psychogeriatric Assessment Area with four to six beds in which patients would be assessed after their primary medical assessment. The aim would be to effect a rapid, multidisciplinary assessment of the patient by Medicine, Geriatric Nursing, Home Care, Social Work and Occupational Therapy, under the co-ordination of a team leader and supervision of a geriatrician. The goal would be to have a full assessment within the first twelve to twenty-four hours and make a decision as to whether the patient could be discharged with support and referral or required admission. Historically such an assessment has taken a number of days to complete.

Rural Hospitals

The large majority of rural hospitals do not have Observation beds. Those that do may simply have a few beds set aside for Observation patients in a general medical ward, with the same nurses caring for both inpatients and those in Observation. Nevertheless, even though creating an observation setting might only mean renaming existing beds, the fact that a patient is defined as being in for Observation suggests that a decision must be made within a short time period as to the patient's status, thus possibly improving efficiency.

Manitoba Health (1994) staffing guidelines in rural and northern facilities assume the average Observation stay to be 12 hours and base nursing levels accordingly. If patients stay longer than 12 hours, they may receive less nursing care than if admitted to a general ward, at a time when they may in fact require closer care and monitoring. To illustrate, 2.4 paid nursing hours are allowed per 12-hour visit to an observation setting, whereas 4.8 paid nursing hours are allowed per day per adult medical patient. If patients stay 12 hours in Observation, there will be two visits per 24 hour period and 4.8 paid nursing hours allowed, the same as for a medical ward. However, if the patient stays longer than 12 hours in an Observation bed, then the nurse to patient ratio is actually less than on a medical ward. This guideline encourages a decision on the disposition of the patient after

a twelve-hour period, and may encourage admission for patients who could more appropriately be cared for in an Observation or Short Stay setting.

End-of-Stay Observation

Generally, we focus on the entry point to the system when we talk about patients requiring Observation. We might also think of expanding the definition of Observation to include a period of time at the end of the hospital stay, once the patient has stabilized but still requires some monitoring. The necessary services to enable a more efficient discharge could be concentrated in such a setting.

Long Term Care

A large proportion of the ALC days were assessed as requiring long term care: nursing home, rehabilitation or chronic care. This finding is not surprising; as stated previously, MCHPE research has demonstrated that a significant portion of days in acute-care Manitoba hospitals are incurred by patients with very long stays, especially in Winnipeg (Frohlich, Markesteyn et al. 1994). A recent comparison between Winnipeg and Calgary residents showed that in 1993/94, Winnipeg residents consumed almost twice as many hospital days as Calgary residents. The difference was due to the higher proportion of days consumed by long-stay patients in Winnipeg hospitals: only 12% of the patient days in acute care hospitals in Calgary belong to patients who stay in hospital longer than 60 days compared to 41% in Winnipeg hospitals. The difference in use of acute hospitals for long stays is difficult to explain; according to data received from Alberta Health, the number of long term care beds (nursing home and extended treatment beds) per 1,000 population aged 75 or older was very similar between Calgary and Winnipeg, 147 in Calgary and 143 in Winnipeg.

We found that there were 41 patients (1%) in our review that were panelled for a nursing home. They used a high number of days: 10% of all the days that were reviewed, 95% of

them at an ALC.[22] A considerable number of days are consumed prior to panelling, most of them at an alternate level of care: the mean length of stay prior to panelling was 63 days, with a range of 5 to 172 days; the mean length of stay after panelling was 41 days with a range of 0 to 196 days. The elderly are particularly vulnerable to harmful consequences of extended hospitalization. They may become disoriented, dependent (Gillick et al. 1982), and frequently do not receive the programs and services that they need.

The number of days that are spent in hospital prior to panelling merits more study. There are several possible reasons for this, some of which are listed here. The patient's condition might be unstable thus delaying the application to a nursing home. There may be a delay in completing all of the necessary forms. Another factor is that the application for nursing home admission must come from the patient. Unarguably this is a major life decision, often involving the disposition of assets and a recognition of loss of independence, and both the patient and family may be reluctant to apply.

In 1990, an urban extended treatment bed review (Manitoba Health) found that Winnipeg had a sufficient number of rehab beds, but that there were limitations to accessing these beds. Not surprisingly, hospitals tended to favour their own patients. The review task force recommended that access to rehab beds be centrally co-ordinated, and that larger rehabilitation units, where appropriate resources and expertise could be concentrated, should be accessible to Winnipeg, the surrounding communities and to smaller Winnipeg hospitals. Such an arrangement could reduce the likelihood of patients occupying acute beds who would be better treated elsewhere. Another consideration might be a convalescent hospital to care for patients who are expected to take up to six months to recover from an acute episode. Again, this only makes sense if the convalescent hospital would be more cost-effective and if acute care beds were closed.

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[22] We know that 13 of these 41 patients were transferred to a designated long term care bed and only counted the days prior to the transfer.

From an Executive Director: "It does not suffice, in our opinion to identify a particular setting as an appropriate alternative to hospital care unless there are sufficient rehabilitation services available in that setting. As it stands now in Manitoba for example, a great majority of personal care homes believe that the level of rehabilitation services in their respective facilities is not sufficient to meet many of their residents' needs. Simply converting some rural hospitals to PCHs without addressing this would not meet the residents' care needs."

The rural extended treatment bed task force (Manitoba Health 1992) noted a lack of rehabilitation services in rural Manitoba. The task force recommended three rehab/assessment beds per 1,000 persons 65 years or older. The Manitoba Health Annual Report (1994) lists 176 rehab and chronic beds outside of Winnipeg, a ratio of 2.67 per 1,000 residents 65 years or older. However, none of these beds are located in the Interlake, Norman or Thompson health regions. Therefore, the lack of rehabilitation services outside of Winnipeg continues. Meeting the needs of patients in need of rehabilitation will continue to be a challenge in the future. Regional programs, for example, the Regional Therapy Unit in Parklands, are required.

The rural task force also recommended that chronic care patients be placed in existing rural hospitals and be panelled for chronic care by Continuing Care as is done for Winnipeg patients. However, chronic care panelling has not been implemented in rural areas yet. Because rural chronic care patients are not panelled, no data are available on them until *after* they separate from hospital and a hospital abstract is submitted to Manitoba Health. If they were panelled however, as they are in Winnipeg, then the Continuing Care Division of Manitoba Health would have information as to their numbers, care needs and location, which would assist in regional planning. Also, once panelled, these patients could be charged a residential fee.

Our data suggest a need for more nursing home beds. Hospital inpatient expenditures per day of care in 1993/94 ranged from $288 to $540, depending on the type of hospital.[23] The public cost per day of nursing home care (1993/94) averaged $79. Converting some of the existing hospitals to Personal Care Homes might be a viable alternative: it will provide care that is needed, keep the institution open and yet reduce costs, since nursing homes are staffed at lower levels than are acute care hospitals. Converting only some hospital beds to PCH beds, in effect creating a juxtaposed hospital and PCH, is less desirable because nursing homes juxtaposed to acute care hospitals tend to be more expensive than stand-alone nursing homes, due to increased physician visits (Shapiro and Tate 1993). Other options besides institutional care, including more outreach programs and supportive housing, must also be explored. Again these options only make sense if acute hospital bed closures occur.

While on a per diem basis care in a nursing home is cheaper, if a hospitalized patient can be discharged home eventually, some extended stays in acute facilities may make sense. In Manitoba, the average length of stay in a nursing home is four years (DeCoster, Roos, Bogdanovic 1993). At a cost of $79 per day, this amounts to a commitment of $115,000 for every individual admitted. Therefore, other options must be carefully explored before admission to a nursing home, not only to reduce costs but also to enable the elderly to maintain their independence as long as possible.

Our population is aging and the demand for nursing home beds will likely increase. Some people believe that after the baby-boom bulge passes through, we will have too many nursing home beds. On the other hand, some argue that the end of the baby boom bulge will not occur until roughly 2060 and that homes built today will be ready for demolition by that time. Mitigating factors, like our lengthening life span, the level of health and disability among the elderly, and the creation of more supportive services, will also influence the need for nursing home beds.

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[23] The inpatient per diems are: Teaching, $540; Urban Community, $350; Major Rural, $334; Intermediate Rural, $296; Small Rural, $288; Multi-Use, $311. (Shanahan 1996)

Screening programs for the elderly living at home may reduce the use of hospitals and improve their quality of life. Several studies have examined the potential benefits of such programs (Hendriksen et al. 1984, Vetter et al. 1984, Carpenter and Demopoulos 1990, McEwan et al. 1990, Pathy et al. 1992). These studies suggest that screening programs focussing on functional disability amenable to intervention have positive results in terms of lower mortality, reduced hospitalizations, shorter length of stay in hospital, reduced admission to long term care institutions and improved self-perceived health and quality of life. One successful project incorporated a low cost method of screening: questionnaires by mail to identify problems, accompanied by follow-up visits only to people who identified problems or who did not respond. The research suggests that home visits to screen the elderly may be necessary as often as every three to six months. The costs of the home visits and the increased use of support services in the intervention groups were offset by the decreased use of institutional services.

In their book, *Strong Medicine*, Rachlis and Kushner (1994) describe "On Lok", a nursing home without walls located in California. The clients in the On Lok program are very frail:

> To participate, applicants must be . . . judged by a state assessor to need nursing-home-level care. Three-quarters of On Lok's participants are incontinent and 63 percent have some type of chronic mental disturbance, including Alzheimer's disease. In addition, many are at special risk because of poverty and isolation.

The program operates three day health centres and requires that its participants come in at least once a week so that they can be monitored and problems identified early before hospitalization is required. Transportation to and from the centre is provided. The centres offer not just traditional health care, but also nutritious meals, exercise and social programs, the cornerstones of healthy living. The care is delivered by a multi-disciplinary team; even the drivers are part of the team, recognizing that often clients will open up to the driver in a way that they will not to the professional practitioners. Funding is attached to the person, not to an institution, for a constellation of services, including long-term community care, medical care, prescription drugs, nursing home care and acute

hospital care, yet the program costs 94% of what would be paid to a nursing home through Medicare and Medicaid programs.

Home Care

We found that overall, 13.4% of the adult medical days could have been provided by home care. In the Urban hospitals, this proportion was 12.5% and the proportion increased as the size of the hospital decreased; in the Small Rural hospitals, the proportion of days that could have been provided by home care was 17.9%. Adequate home care services may reduce both the number of admissions and the length of stay in hospital, (Hendriksen et al. 1984; Carpenter and Demopoulos 1990; Pathy et al. 1992; Tousignant et al. 1994), prevent readmissions (Hendriksen et al. 1984; Rich et al. 1995), and prevent admission to a nursing home (Hall et al. 1992; Stuck et al. 1995). In Manitoba, generally the provision of home care must be less expensive than care which could be provided in an institutional setting; however if the need is intense but short term, or the patient's quality of life would be severely compromised, this internal policy can be suspended. Home care services include home support services, home care attendants, overnight care, nursing, and physio- and occupational therapy.

Availability and access are critical issues in the provision of home care services. In small rural communities, a number of factors may make it difficult to provide home care services including the demand for care, the availability of qualified staff and travel distance, especially if several daily visits are required.

Even where home care services exist, there may be delays in access. Hospital administrators estimated that home care can take from two to seven days to arrange. The Price Waterhouse Report on Home Care and the Home Care Implementation Committee set up to review this report both recommended that the capability to initiate home care

services be available seven days a week, 24-hours a day, but this recommendation has not been fully implemented by Manitoba Health.[24]

A pilot project at one urban community hospital contracted home care services to a private home care firm to reduce the holding time between the request for home care and the arrangement of services (Swirsky 1994). The firm was available 24 hours a day, seven days a week to assess patients and arrange services, whereas provincial home care generally cannot be initiated on evenings or weekends. One of the conditions of the study was that the projected cost of home care had to be less than the cost of hospitalization. The hospital calculated that the potential existed to close ten beds if such a service were consistently available at a cost savings of $190,000. In addition, there would be a reduction in physician fees of between $23,000 to $33,000; this calculation took into account the decreased claims for fewer hospital visits, as well as the potential increase in physician office or home visits.

In rural areas, home care offices are often juxtaposed to a Personal Care Home or a hospital and are therefore close at hand. However, reports from hospital management and staff suggest that a home care office that is integrated with the health care facility rather than parallel to it might improve communication, co-ordination and access.

Outpatient Services

We found that 8.4% of the days of care could have been provided in an outpatient setting. In Rural hospitals, the trend was towards fewer days identified as appropriate for outpatient care compared to urban, however the differences were not statistically significant. Our definition of outpatient services included not only patients who need tests and procedures that do not require inpatient care, but also Bed and Breakfast lodging for "patients who need to be close to the hospital but do not require admission; patients living long distances from the hospital and requiring frequent treatments that cannot be

[24] As of the writing of this report, Manitoba Health has indicated that it is completely reorganizing home care to overcome some of the problems with access and coordination of services.

provided by home-based services and transportation is unavailable; patients receiving daily chemotherapy or radiation therapy and do not require professional observation." Bed and Breakfast arrangements may reduce the use of hospitals but seem to be almost non-existent.

A hospital manager: " The need for appropriate bed and breakfast services is a significant provincial issue and interfaces with other government departments such as Community Services, Family Services, Housing, Northern Affairs and federal Department of Health. Thus, although these services are a necessary component of effective and efficient outpatient services, planning for development and funding would be most complex."

Paediatrics

We note that in two of the hospitals reviewed, the proportions of paediatric admissions and days that were Acute was very low: 15% and 22% respectively at Ste Rose, and 24% and 31% at Thompson. These hospitals are in Parklands and Thompson, health regions that, along with Norman, have been shown to have higher rates of paediatric admissions than the provincial average (Black et al. 1993). Given that hospitalization can have harmful consequences for children, the reasons for these higher admission rates accompanied by low levels of Acuteness need further examination. As for adult medical care, it is also necessary to examine the prevention programs and alternative services that are currently available in these areas that could help to avoid a hospital admission.

From Thompson General Hospital: "Since that time [of the study], two university affiliated paediatricians have joined the staff of the hospital; they have begun a process of regular review of paediatric admission with the result that the numbers have been reduced more closely to only those requiring acute care."

The Department of Paediatrics and Child Health at Health Sciences Centre is implementing rural outreach programs, which include regular paediatric consultation

trips. These consultations have already begun in Ste Rose, and, according to verbal accounts, appear to be having a positive impact on the number of paediatric admissions.

Utilization Review

The review of the health record to assess the appropriateness of the hospitalization is sometimes called utilization review (Payne 1987). Associated with it is typically a program of utilization management, deliberate actions to influence providers of hospital services to improve the efficiency and effectiveness with which services are delivered. Examples of utilization management tactics follow.

In Saskatchewan, since the original research study by the Health Services Utilization and Research Commission, the provincial research organization similar to MCHPE, approximately one-half the hospitals are using the InterQual tool retrospectively. It has assisted them to refocus the health care services in each health district. Three hospitals, in Estevan, North Battleford and Yorkton, have converted or are planning to convert some of their inpatient beds to 24-hour observation beds, yielding savings in resource use when unnecessary admissions are avoided. (Of course, only if more acute beds are closed than observation beds opened, or if the observation beds are substantially less expensive than those beds which they replaced will there be cost savings in the system.) Regina General and Pasqua Hospitals modified the InterQual criteria for use as a screening tool for all potential medical admissions coming through Emergency, and it has resulted in fewer admissions (Basky 1994). St. Paul's Hospital in Saskatoon has used the tool at the time of admission and to review subsequent days of care; feeding back the results to physicians and educating hospital staff about alternative resources has helped to lower the rate of ALC admissions and days (Reichert et al. 1995).

Manitoba hospitals may wish to use the InterQual criteria or some other utilization management tool to assess their admissions, either retrospectively or concurrently, in order to implement utilization management programs. InterQual upgrades its criteria annually and is currently developing a Canadianized version. The most recent version has expanded its scope and includes criteria for critical care, sub-acute (or post acute)

care, rehabilitation and home care, as well as acute care. Changes in the health care system along with changes in the criteria may yield different results now than what was found for 1993/94. The tool that is used, even if it is on a one-time basis only, should be acceptable to physicians, nurses and hospital managers; physician buy-in is especially critical to the successful implementation of any utilization management program.

Although we were not able to include all hospitals in Manitoba in our study, the sampling method was designed so that our results would be generalizable to all hospitals in a given category. For example, in all Intermediate Rural hospitals, even the ones that we did not review, we can be confident that 95 times out of 100, 64.7 ± 3.3% of the adult medical admissions and 77.4 ± 5.2% of the adult medical days would be assessed as requiring an alternate level of care. Nevertheless, hospitals not included in the study, or even hospitals which were included might want to update their results with another, more recent year of data. Manitoba Health Organizations, Inc. (MHO) has expressed a willingness to co-ordinate training of hospital personnel to use the InterQual criteria and to work with the hospitals to analyze the data. This would depend on the degree of interest expressed by the hospitals. MCHPE would assist MHO to implement this program.

While we believe tools such as that developed by InterQual are useful for identifying problems in the use of acute care resources, we also recognize that one of the reasons the American health care system is so expensive is because of the very large bureaucratic infrastructure which has developed around so-called "managed care" (Woolhandler and Himmelstein 1991, Hellender et al. 1994). The current cost to license the InterQual criteria for one year is $7.50 (U.S.) per bed. In addition, there are staffing costs.[25] For our study, we trained Registered Nurses for the chart review; both InterQual and Saskatchewan suggest that an experienced health record technician can also conduct the review, with proper training. Our abstractors required one week of training, and we found that, on average, fifteen charts could be reviewed per coder per day. Additional

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[25] We obtained a research license to use InterQual at a cost of $275 US. We estimated that our costs for record retrieval and abstraction for the study to be approximately $10 to $12 per chart for this study.

costs include those associated with data analysis and interpretation of results. Given these costs, hospitals may want to review their facilities on a one-time or occasional basis only, to assist in their own planning efforts.

Because there are a variety of utilization management tools, a committee should be struck by Manitoba Health with representation from a variety of health care providers, including but not limited to, physicians, nurses and hospital managers, to determine the necessary information needs, to review existing tools and to agree upon one instrument so that results will be comparable between hospitals. Manitoba Health should also negotiate with the company of choice to obtain the best possible price.

Regional Health Associations

These data provide important information that can assist Regional Health Associations to plan for the constellation of services in their regions. As is clear from the report, the proportion of admissions and days that were assessed as Acute decreases across hospital categories, with lower proportions in the smaller hospitals. Rural hospitals are often regarded as an important economic resource to the community and their closure would undoubtedly be perceived as a threat to its employees. Many small rural hospitals currently provide a broad range of services including acute care, long term care, palliative care, mental health care and health promotion services. Yet a number of rural hospitals have extremely low occupancy rates; within the hospitals that we visited, seven of the eighteen rural facilities had occupancy rates of between 39% and 52% in 1993/94 (Manitoba Health Annual Statistics 1993/94).

Saskatchewan has had a similar problem of overcapacity in the small rural hospital sector. In 1992 Saskatchewan Health closed 52 rural hospitals and converted them to community health centres. These were all hospitals that had under 10 beds. The community health centres have taken a number of different paths: some operate as observation/assessment beds, some operate as an outpatient service; they may contain professional offices; one has been converted to a women's shelter. Despite worries that physicians would not practice in a community in which the hospital had closed, Saskatchewan Health estimates

that only two or three of the 52 communities lost their physicians, and these were communities that traditionally had high physician turnover (Wood 1996)

Regional Health Associations (RHAs) are to be in place in Manitoba as of April 1996, and, starting in April 1997, they will have the task of allocating their budgets to provide an array of services. They have both the responsibility and the opportunity to consider reconfiguring how care is delivered. Since the RHA will typically administer areas with multiple hospitals, there is every reason to reassess the role of each of the acute hospitals in their jurisdiction and the actual requirements of their residents for acute versus long term versus home care services. However, since decisions concerning the future of hospitals—decisions that affect residents' access to their local institutions—should only be made in a very careful fashion, hospitals may want to update their results with another, more recent year(s) of data.

At least one Regional Health Association could serve as a pilot project to use InterQual, or some other utilization review tool, to review its hospital admissions and to plan health care services, redirecting funds from hospitals to alternative health care services as appropriate. It is known that some hospitals have low occupancy, but are funded at a minimum staffing level.[26] It may be desirable to convert some of these hospitals to other uses, as happened in Saskatchewan. Not only will these moves be more cost-effective, but they will provide care that is more appropriate to the health needs of the patient.

Alberta may serve as another example of the changes that are possible. Over the past three years, the province of Alberta has made massive changes to its health care system (Guenter 1995). Overall, there have been cuts of 23% to the health care budget, most of it in the acute care sector. At the same time, funds have been channelled into home care and community services. In Calgary and Edmonton, funding to home care and community services has increased 50%; similar increases have occurred in the rest of the

[26] Four of these hospitals were part of our study: Grandview, Glenboro, St. Pierre and Treherne.

province as well. While recent events suggest the pace of change may have been too rapid, many argue that the direction of change is correct.

Manitoba Health has funded the Short Term Emergency Program (STEP) Pilot Project as an initiative to reduce the reliance on hospital services by providing alternative care in the community (1994). These projects might be useful in suggesting alternatives to avoid or reduce hospital stays for medical patients. Each urban acute care hospital has developed one pilot project aimed at specified target groups: for example, patients aged 65 and over, persons with cardiovascular accidents, psychiatric emergency patients or adults with chronic pulmonary disease. The purpose of each project is to prevent admission or reduce the length of stay of hospitalized patients. The projects will be completed in 1996; evaluations of each project should be available in late 1996.

Manitoba Health has created an implementation team for the establishment of the Regional Health Associations. The implementation team could assist RHAs in their planning efforts by sharing information on models of alternative health care services (tried in Manitoba or elsewhere) that do and do not work.

RECOMMENDATIONS

1. Hospitals provide significant amounts of care which could be provided in alternate settings. It is not clear from this study whether alternatives are not used because they do not exist, because practitioners are unaware of their existence or because procedures to access the alternatives are cumbersome and inefficient. In some low volume settings, alternatives, e.g. observation units, long term care, hospice care, may be just as expensive to provide as hospital beds. An assessment is necessary of existing alternatives, community needs and desires, as well as an assessment of the needs of patients currently hospitalized that require alternative health care services. Planned alternatives should not be restricted by the definitions used in this study or by what is currently available, but should encourage creativity to meet the needs of patients.

2. By far the majority of patients studied (98.4%) required some form of health care at the time they were admitted. Before any hospital beds are closed, an infrastructure must be in place with a built-in system to ensure that access to alternate care is based on specific criteria, priority of need and would not increase costs to the consumer.

   Bridge funding should be available to encourage development of alternatives before closing hospital beds, predicated on a business plan that includes a maximum two-year deadline to implement the alternative(s), close hospital beds and realize a pay-back. In addition, based on the approved business plan, priority should be given to capital funding requests for the purpose of infrastructure changes to existing buildings to make them suitable for alternative uses.

3. At least on a one-time planning basis, urban hospitals and Regional Health Associations (RHAs) should use a utilization-management review tool to assess the Acuteness of admissions, ongoing days of stay and readiness for discharge of their medical patients. Each urban hospital/RHA should set up a committee with

representation from a broad cross-section of the health care community to plan, implement, receive results of the utilization management review and to make recommendations aimed at lowering the proportion of Alternate Level of Care admissions and days. Physicians and other hospital practitioners should be informed and educated about the utilization review process, the tool to be used, the findings and alternative services or programs that are aimed at preventing or reducing non-acute hospital use. One urban hospital/RHA could serve as a pilot project to demonstrate the usefulness of this approach.

4. Such a high level of non-acute care is provided at many hospitals, particularly rural institutions, that reconfiguring a number of acute care hospitals to alternative uses should be considered. Examples of such alternatives are convalescent care for patients who are no longer acute but may need several months of care before they can go home, health care professional offices, outpatient services or women's shelters. The Saskatchewan experience with this approach should be examined carefully.

5. Regarding utilization management review tools:

   - Manitoba Health should take a lead role in developing standards for utilization management tools on a provincial basis. Bulk purchase arrangements should be negotiated for hospitals that are interested, and can reallocate resources within their existing budgets. There are numerous tools available; many are costly. Only with a single tool will comparisons across institutions such as those presented here be possible. A committee should be established by Manitoba Health with representation from urban hospitals, Regional Health Associations, Manitoba Health Organizations and health care practitioners to review existing tools, to advise on data collection needs, and to recommend a tool that will be the standard for the province.

- Manitoba Health Organizations, Inc. (MHO) has long had a communications and educational role with respect to health care facilities in the province, particularly rural facilities. The introduction of a utilization management review tool requires both staff training and data analysis. MHO is ideally suited to organize and co-ordinate programs to train hospital staff in the collection and analysis of data using whatever standard utilization-management tool is chosen.

- Manitoba Health should use a standard utilization-management review tool to assist in reviewing hospitals that request major capital redevelopment.

6. A committee should be established by Manitoba Health with representation from the College of Physicians and Surgeons, Regional Health Associations, the Manitoba Association of Registered Nurses and others as appropriate, to define observation/short stay as an alternative to inpatient admission to an acute care bed. There should be a balance of rural and urban representatives on the committee. The committee should review and recommend different models for patients that require very short interactions with hospitals, and establish guidelines with respect to standards of care, time limits for patient stays, physical infrastructure and safety standards.

7. Two of the four hospitals in which we reviewed paediatric cases had a very low proportion of admissions and days assessed as Acute. Rural hospitals state that the paediatric outreach program developed by Health Sciences Centre has already had an impact on paediatric hospital admissions. We suggest that a review of paediatric admissions using InterQual or some other utilization management tool be undertaken at all of the hospitals with sufficient volumes of paediatric medical admissions. If rural admission rates continue to reflect low levels of Acuteness, we suggest further investigation to determine why. Also, we recommend that the

College of Physicians and Surgeons consider developing guidelines on and monitoring the standards of care for paediatric admissions.

8. The urban extended treatment bed review of 1990 found that Winnipeg had a sufficient number of rehab beds but that there were limitations to accessing these beds. The review task force recommended that access to rehab beds for residents of Winnipeg and surrounding communities be centrally co-ordinated, and that larger rehabilitation units, where appropriate resources and expertise could be concentrated, should be accessible to patients in the community and to smaller hospitals. Such an arrangement could reduce the likelihood of patients occupying acute beds when they would be better treated elsewhere.

   The Rural Extended Treatment Bed Task Force recommended that chronic care patients in rural facilities should be panelled by Continuing Care, as they are in Winnipeg. The implementation of this recommendation would enable the Continuing Care Division to compile more accurate data on these patients, and to monitor and reassess them regularly. It would also enable the collection of a residential fee.

9. Manitoba Health should assist with the sharing of information regarding successful and unsuccessful strategies and programs that hospitals have used to reduce the proportion of non-acute hospital use.

10. The Working Group considered reviewing psychiatric as well as medical admissions when planning this study. Because of the ongoing reforms in Mental Health care, it was decided that the Acuteness of psychiatric admissions and days should be assessed in 1998 or 1999, i.e. after the current reforms in the provision of mental health care have been completed.

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APPENDIX A: CRITERIA AND FORMS

GENERIC

SEVERITY OF ILLNESS

RULE

- **One** from any category or **three** borderline

CLINICAL FINDINGS
(Recent Onset)

GES01 Sight loss
GES02 Aphasia (Speech loss)
GES03 Paralysis (Loss of sensation or movement of any body part)
GES04 Paresis (Extreme weakness without paralysis)
GES05 Unconsciousness
GES06 Incapacitating pain
Vomiting/Diarrhea/Inadequate oral intake **and one:**
GES07 • Serum Na ≥ **150** mmol/L
GES08 • Hct ≥ **.60** / Hgb ≥ **200** g/L
GES09 • Urine specific gravity ≥ **1.030**
GES10 • BUN ≥ **16.0** mmol/L / Creatinine ≥ **265.2** umol/L
GES11 • Absent bowel sounds
GES12 • Postural systolic BP **drop** ≥ **30**
GES13 • Pulse ≥ **100**/min at rest

VITAL SIGNS
(Newly Discovered)

GES14 Oral T ≥ **104°F** (40°C)
Oral T ≥ **102°F** (38.9°C) **and one:**
GES15 • WBC ≥ **18.0** 10^9/L
GES16 • WBC ≥ **15.0** 10^9/L **with** ≥ **7%** bands
GES16 Oral T ≥ **100.4°F** (38°C) **with** neutrophil count ≤ **1.0** 10^9/L
GES18 Sustained pulse ≥ **160**/min
GES19 Resp. rate ≥ **26**/min **and** pulse oximetry ≤ **85%** on room air
GES20 Systolic BP ≥ **250**
GES21 Diastolic BP ≥ **120**
GES22 Postural systolic BP **drop** ≥ **50**

HEMATOLOGY
(Newly Discovered)

Blood

GES23 Hct ≤ **.15** / Hgb ≤ **70** g/L
GES24 WCB ≤ **2.0** 10^9/L
GES25 Platelets ≤ **20 x 10^9/L**

CHEMISTRY
(Newly Discovered)

Blood

GES26 Serum Na ≤ **123** mmol/L
GES27 Serum Na ≥ **150** mmol/L
GES28 Serum K ≤ **2.5** mmol/l
GES29 Serum K ≥ **6.0** mmol/L
GES30 Arterial pH ≤ **7.30**
GES31 Arterial pH ≥ **7.50**
GES32 Arterial pO_2 ≤ **60** mmhg on room air
GES33 Arterial pCO_2 ≥ **50** mmhg on room air
GES34 Presence of toxic level of drugs/chemicals

MICROBIOLOGY

Blood

GES35 Smear/Culture positive for bacteria / fungi

ONSET

Acute/Sudden - within 24 hrs

Newly Discovered - new finding this episode of illness

Recent Onset - within 1 week

GENERIC

	INTENSITY OF SERVICE		
	RULE		**TREATMENTS/MEDICATIONS** (At Least Daily)
	• Physician evaluation ≥ **1x/24h AND** • **Two** from Monitoring **OR** • **One** from Treatments/Medications OR • Scheduled Procedure	GEI07	* **IV** fluids (postoperative) requiring ≥ **30** ml/kg ob body weight in **24h** (72h postoperative)
		GEI08	* **IV** fluids (excluding KVO) requiring ≥ **30** ml/kg of body weight in **24h**
GEI01	**PHYSICIAN EVALUATION**	GEI09	* **IV / IM ANALGESICS ≥ 4x/24h**
		GEI10	* **IV ANALGESICS** / Continuous drip
	MONITORING	GEI11	* **IV CHEMOTHERAPY** (e.g. cyclophosphamide)
GEI02	Pulse, resp. rate, **BP ≥ q6h**	GEI12	* **IV / IM ANTIEMETICS** (e.g. metoclopramide HCl)
GEI03	Temp ≥ **q6h**		
GEI04	Neurovital signs ≥ **q6h**		
GEI05	Urine output ≥ **3x/24h**		
GEI06	Pulse oximetry ≥ **3x/24h**	GEI13	**SCHEDULED PROCEDURE** • To be performed on **same day** as admission AND • Requiring general / regional anesthesia AND • Not on ambulatory procedure guidelines

GENERIC

	DISCHARGE SCREENS		
	CLINICAL/FUNCTIONAL		**OPTIONS**
GED01	Oral T **below 100°F** (37.8°C) for last **24h** without antipyretic	GED10	Treatment/Care/Medications could be rendered in an alternative setting
GED02	Caloric / Fluid intake meets nutritional needs		
GED03	Passing flatus / fecal material		
GED04	Voiding or draining urine (≥ **400** ml) for last **8h**		
GED05	Serum drug levels within acceptable range		
	Patient/caretake demonstrates willingness and ability to:		
GED06	• Administer prescribed medications		
GED07	• Assist with / performs activities of daily living		
GED08	• Meet patient's physical and medical needs in a nonacute setting		
GED09	Treatment refused		

RESPIRATORY/CHEST

SEVERITY OF ILLNESS

RULE

- **One** from any category or **three** borderline

CLINICAL FINDINGS
(Recent Onset)

RES01 Gross **and** persisting hemoptysis
RES02 Penetrating wound of chest cavity
RES03 Pulmonary burns
RES04 Wheezing **with** dyspnea unresponsive to bronchodilators / steroids
RES05 Severe crush injury, chest
RES06 Paroxysmal / Continuous / Uncontrollable cough unresponsive to outpatient therapy for ≥ **1** week
Spirometry
RES07 a) admission if FEV_1 ≤ **40%** predicted **or** PEFR ≤ **200** L/M **or** best ≤ **16L**
b) admission if FEV_1 40-60% predicted **or** PEFR **200-300** L/M, with following risk factors:
RES08 - near death episode
RES09 - recent ER visit / hospital admissions
RES10 - steroid dependence / recent use
RES11 - sudden attack
RES12 - poor compliance
RES13 - allergy / anaphylactic **trigger** risks
RES14 - long attacks
RES15 - return to **same environment**

VITAL SIGNS
(Newly Discovered)

RES16 Oral T ≥ **102°F** (38.9°C) **and** bacteria by smear (sputum)

IMAGING
(Newly Discovered)

RES17 Hemo / Pneumothorax
RES18 Pulmonary edema
RES19 Pleural effusion
RES20 Empyema
RES21 Lung abscess
RES22 Air in mediastinum
RES23 Pulmonary embolus / infarct
RES24 Bi- / Multi-lobar pneumonia
RES25 Mono-lobar pneumonia in immunosupressed patient
RES26 Diffuse alveolar infiltrate
RES27 Alveolar hemorrhage
RES28 Mediastinal shift

ECG

RES29 Acute tachyarrhythmias ≥ **160**/min
RES30 Transient / Unsustained ventricular tachycardia

HEMATOLOGY
(Newly Discovered)

Blood

RES31 Hct ≤ **.27** /Hgb ≤ **90** g/L **with** active bleeding
RES32 PT ≥ **1.5 times normal with** active bleeding
RES33 APTT ≥ **1.5 times normal with** active bleeding
RES34 Platelets ≤ **50** 10_9/L **with** active bleeding
RES35 Platelets ≥ **1000** 10_9/L **with** thrombosis / bleeding

CHEMISTRY
(Newly Discovered)

Blood

RES36 Arterial pH ≤ **7.30**
RES37 Arterial pH ≥ **7.50**
RES38 Arterial pO_2 ≤ **60** mmhg on room air
RES39 Arterial pCO_2 ≥ **50** mmhg on room air
RES40 Arterial pCO_2 ≥ **45** mmhg **with** asthma attack
RES41 Presence of toxic level of drugs / chemical

MICROBIOLOGY
(Newly Discovered)

Sputum

Smear / Culture positive for:
RES42 • Tubercle bacillus
RES43 • Gram negative bacillus
RES44 • Staphylococci
RES45 • Streptococci - Group A
RES46 • Fungi
RES47 • Legionella pneumophila
RES48 • Pneumocystis carinii

RESPIRATORY/CHEST

	INTENSITY OF SERVICE		
	RULE • Physician evaluation ≥ **1x/24h AND** • **Two** from Monitoring **OR** • **One** from Treatments/Medications		**TREATMENTS/MEDICATIONS** (At Least Daily)
REI01	**PHYSICIAN EVALUATION**	REI09	Pulmonary lavage
		REI10	Chest tube suction / drainage
	MONITORING	REI11	**Initial** tracheostomy care
		REI12	Respiratory medications by nebulizer ≥ **6x/24h** (initial)
REI02	Pulse, resp. rate, **BP** ≥ **q6h**	REI13	Emergency radiation
REI03	Temp ≥ **q6h**	REI14	**IV** antituberculous agents (e.g. ethambutol)
REI04	Neurovital signs ≥ **q6h**	REI15	**IV** anticoagulation (e.g. heparin)
REI05	Urine output ≥ **3x/24h**	REI16	* **VENTILATOR ASSISTANCE**
REI06	Pulse oximetry ≥ **3x/24h**	REI17	* **IV / EQUIVALENT ORAL ANTIBIOTICS** (e.g. po ciprofloxacin HCl)
REI07	PT / APTT ≥ **1x/24h**	REI18	* **IM ANTIBIOTICS**
REI08	Spirometry ≥ **1x/24h**	REI19	* **IV ANTIFUNGAL AGENTS** (e.g. amphotericin B)
		REI20	* **IV ANTIVIRAL AGENTS** (e.g. acyclovir)
		REI21	* **IV CORTICOSTEROIDS**
		REI22	* **IV ANTIPROTOZOAL AGENTS** (e.g. pentamidine)
		REI23	* **IV CHEMOTHERAPY** (e.g. cyclophosphamide)
		REI23	* **IV BRONCHODILATORS** (e.g. theophylline)
		REI25	* **IV DIURETICS** (e.g. furosemide)

RESPIRATORY/CHEST

	DISCHARGE SCREENS		
	CLINICAL/FUNCTIONAL		**OPTIONS**
RED01	Last PT within therapeutic range **with** anticoagulants	RED05	Treatment/Care/Medications could be rendered in an alternative setting
RED02	Clinical / Radiological evidence of improvement **with** documented plan for OP treatment / follow-up		
	Patient / Caretaker demonstrates willingness **and** ability to:		
RED03	• Clean / Care for tracheostomy		
RED04	• Administer medical gases		

GENERIC - PAEDIATRIC

SEVERITY OF ILLNESS

SPECIAL UNIT

See special unit criteria

RULE

- **One** from any category or **three** borderline

CLINICAL FINDINGS

(Acute Onset)

ges01 Unconsciousness

ges02 Suspected apnea / Acute life-threatening episode (ALTE)

ges03 Anaphylaxis

Chronic lung disease **and both**:

ges04 - Pulse oximetry ≤ **90%**

ges05 - Resp. ≤ **25** or ≥ **50**/min

ges06 Failure to gain / maintain weight (after outpatient work-up) (recent onset)

ges07 Cachexia

VITAL SIGNS

(Recent Onset)

1 - 18 months

ges08 Rectal T ≥ **104°F** (40°C) for **24h** unresponsive to antipyretics

ges09 Unexplained rectal T ≥ **101°F** (38.4°C) (age ≤ **6** wks)

Unexplained rectal T ≥ **101°F** (38.4°C) (age ≥ **6** wks) **with one:**

ges10 - Irritability / Lethargy

ges11 - Extremities mottled / cool

ges12 - Not consolable by parents

ges13 - Cry weak

ges14 - Vomiting / Diarrhea / Refusal to eat

ges15 - Appears unhappy / Refuses to smile

ges16 Pulse ≤ **75**/min

ges17 Pulse ≥ **180**/min

ges18 Resp. ≤ **25** or ≥ **50**/min **and** pulse oximetry ≤ **95%** on room air

ges19 Systolic BP ≤ **65**

ges20 Systolic BP ≥ **120**

ges21 Diastolic BP ≤ **40**

ges22 Diastolic BP ≥ **90**

19 months - 11 years

ges23 Oral T ≥ **39.4°C** for **24h**

ges24 Rectal T ≥ **40.0°** for **24h**

Unexplained

ges25 - Oral T ≥ **38.6°C** for ≥ **6** days

ges26 - Rectal T ≥ **39.2°C** for ≥ **6** days

ges27 Pulse ≤ **60**/min

ges28 Pulse ≥ **170**/min

19 months - 11 years (cont'd)

ges29 Resp. ≤ **15** or ≥ **40**/min **and** pulse oximetry ≤ **95%** on room air

ges30 Systolic BP ≤ **80**

ges31 Systolic BP ≥ **140**

ges32 Diastolic BP ≤ **50**

ges33 Diastolic BP ≥ **90**

12 - 18 years

ges34 Oral T ≥ **40°C**

Oral T ≥ **38.9°C and one:**

ges35 - WBC ≥ **18 x 10^9/L**

ges36 - WBC ≥ **15 x 10^9/L with** ≥ **7%** bands

ges37 Oral T ≥ **38°C with** neutrophil count ≤ **1 x 10^9/L**

ges38 Sustained pulse ≥ **160**/min

ges39 Resp. rate ≥ **26**/min **and** pulse oximetry ≤ **85%** on room air

ges40 Systolic BP ≥ **250**

ges41 Diastolic BP ≥ **120**

ges42 Postural systolic BP drop ≥ **50**

HEMATOLOGY

(Newly Discovered)

Blood

ges43 Hct ≤ **.21 L/L** / Hgb ≤ **70** gm/L

ges44 Hct ≥ **.60 L/L** / Hgb ≥ **200** gm/L

ges45 WCB ≤ **3 x 10^9/L with** neutrophil count ≤ **1.5 x 10^9/L**

ges46 WCB ≥ **20 x 10^9/L with** evidence of blasts or left shift

ges47 PT ≥ **15** sec (**w/o** anticoagulants)

ges48 APTT ≥ **55** sec (**w/o** anticoagulants)

CHEMISTRY

(Newly Discovered)

Blood

ges49 Serum Na ≤ **123**

ges50 Serum Na ≥ **156**

ges51 Serum K ≤ **2.5**

ges52 Serum K ≥ **6.0** (non-hemolyzed)

ges53 Arterial pH ≤ **7.30**

ges54 Arterial pH ≥ **7.50**

ges55 Serum Cl ≤ **85**

ges56 Serum Cl ≥ **115**

ges57 Arterial pCO_2 ≥ **60** torr **and** known chronic lung disease

ges58 Arterial pCO_2 ≥ **50** torr on room air

ges59 Presence of toxic level of drugs/chemicals

GENERIC - PAEDIATRIC

INTENSITY OF SERVICE

SPECIAL UNIT

See special unit criteria

RULE

- Physician evaluation ≥ **1x/24h AND**
- **Two** from Monitoring **OR**
- **One** from Treatments/Medications OR
- Scheduled Procedure

MONITORING

gie01	Pulse, resp. rate, **BP ≥ q6h**
gie02	Temp ≥ **q6h**
gie03	Neurovital signs ≥ **q6h**
gei04	Urine output calculated ≥ **3x/24h**
gei05	Pulse oximetry ≥ **3x/24h**
gei06	End-tidal CO_2 ≥ **3x/24h**

TREATMENTS/MEDICATIONS
(At Least Daily)

gei07	**IV** fluids (excluding KVO) requiring ≥ **30** ml/kg of body weight in **24h**
	IV chemotherapy requiring **one:**
gei08	• Administration of multiple agents
gei09	• Continuous infusion exceeding **8-10h**
gei10	• Administration of alkalizing solutions **and** monitoring urine pH
gei11	• **IV** antiemetics ≥ **6x/24h**
gei12	**IV** antifungal agents (e.g. amphotericin B)
gei13	* **IV antibiotics**
gei14	* **IV antiviral agents (e.g. acyclovir)**
gei15	* **IV analgesics / Continuous drip**
gei16	* **IV / IM antiemetics**
gei17	* **IM analgesics**

SCHEDULED PROCEDURE

- To be performed on **same day** as admission

AND

- Requiring general / regional anesthesia

AND

- Not on ambulatory procedure guidelines

GENERIC - PAEDIATRIC

DISCHARGE SCREENS			
	CLINICAL/FUNCTIONAL		**OPTIONS**
ged01	Oral T ≤ **37°C** / Rectal T ≤ **38.1°C** for last **24h** **w/o** antipyretic	ged13	Treatment/Care/Medications could be rendered in an alternative setting
ged02	Passing flatus / fecal material		
ged03	Voiding / draining urine (≥ **1** cc/kg/h **with** normal renal function)		
ged04	Serum drug levels within therapeutic range		
	Foreign substance below toxic levels:		
ged05	• Urine excretion of substance satisfactory		
ged06	• Threat of systemic reaction no longer present		
ged07	Pain controlled for last **12h**		
ged08	Oral intake / Meds tolerated **w/o** vomiting for last **12h**		
	Patient/caretake demonstrates willingness and ability to:		
ged09	• Administer prescribed medications		
ged10	• Assist with / performs activities of daily living		
ged11	• Meet patient's physical and medical needs in a nonacute setting		
ged12	Treatment refused		

RESPIRATORY/CHEST - PAEDIATRIC

SEVERITY OF ILLNESS

SPECIAL UNIT

See special unit criteria

RULE

- **One** from any category or **three** borderline

CLINICAL FINDINGS
(Recent Onset)

res01	Cyanosis
res02	Hemoptysis
res03	Penetrating wound of chest cavity
res04	Wheezing / dyspnea unresponsive to bronchodilators / steroids
res05	Severe crush injury, chest
res06	Suspected apnea / Acute life-threatening episode (ALTE)
res07	Near drowning / immersion

IMAGING
(Newly Discovered)

res08	Pneumothorax
res09	Pulmonary edema
res10	Hemothorax
res11	Pleural effusion
res12	Lung abscess
res13	Air in mediastinum
res14	Foreign body
res15	Mediastinal shift
res16	Embolus
res17	Infarct
res18	Filling defect
res19	Pneumonia in infant (age ≤ **6** mos)
res20	Chylothorax

CHEMISTRY
(Newly Discovered)

Blood

res21	Arterial pH ≤ **7.30**
res22	Arterial pH ≥ **7.50**
res23	Arterial pO_2 ≤ **60** torr on room air
res24	Arterial pCO_2 ≥ **50** torr on room air
res25	Arterial pCO_2 ≥ **60** torr **and** known chronic lung disease
res26	Oximetry ≤ **90%** on room air

MICROBIOLOGY
(Newly Discovered)

Sputum

res27	Tubercle bacillus present / Positive acid-fast stain

RESPIRATORY/CHEST - PAEDIATRIC

INTENSITY OF SERVICE

SPECIAL UNIT

See special unit criteria

RULE

- Physician evaluation ≥ **1x/24h AND**
- **Two** from Monitoring **OR**
- **One** from Treatments/Medications

MONITORING

rei01	Cardiac monitor
rei02	Apnea monitor
rei03	Pulse, resp. rate, **BP** ≥ **q6h**
rei04	Temp ≥ **q6h**
rei05	Intake **and** output ≥ **3x/24h**
rei06	Pulse oximetry ≥ **1x/24h**
rei07	End tidal CO_2 ≥ **1x/24h**
rei08	PT / APTT ≥ **1x/24h**

TREATMENTS/MEDICATIONS
(At Least Daily)

rei09	Chest tube drainage (underwater)
rei10	**Initial** tracheostomy care
rei11	Postural drainage **with** percussion ≥ **3x/24h**
rei12	Intermittent positive pressure breathing (IPPB) ≥ **4x/24h**
rei13	Respiratory drugs by nebulizer or metered dose inhaler (MDI) ≥ **4x/24h (initial)**
rei14	**IV** diuretics (e.g. furosemide)
rei14	**IV** anticoagulation (e.g. heparin)
rei16	**IV** corticosteroids
rei17	* **PO antituberculous agents**
rei18	* **Ventilator assistance**
rei19	* **Respiratory assistance (croupette / croup tent / O_2 tent**
rei20	* **IV antibiotics**
rei21	* **IV antifungal agents** (e.g. amphotericin B)
rei22	* **PO bronchodilators** (e.g. albuterol)

DISCHARGE SCREENS

CLINICAL/FUNCTIONAL

red01	No apnea or alarms for **24h**
red02	Last PT within therapeutic range **with** anticoagulants
	Patient / Caretaker demonstrates willingness **and** ability to:
red03	• Clean / Care for tracheostomy
red04	• Administer medical gases
red05	• Provide medications
red06	• Use all equipment correctly
red07	Caretakers trained in CPR
red08	Adequate oxygenation **with** or **w/o** supplemental O_2

OPTIONS

red09	Treatment/Care/Medications could be rendered in an alternative setting

ALTERNATE LEVEL OF CARE GUIDELINES: MANITOBA

Residence 1	Residence Patient's condition and services ordered/received indicate that the patient did not need the hospital or an alternative setting.
Outpatient Services 2a	Outpatient Services • Patients who have tests and procedures that do not require inpatient care because of the nature of the procedure but whose treatments and procedures cannot be provided by home-based services, physicians' offices or community centres. (e.g. Diabetic, C.O.P.D. Clinics; Pre-admission tests)
2b	• Out of town patients requiring outpatient services and lodging: (e.g. Bed and Breakfast) - patients who need to be close to the hospital but do not require admission - patients living long distances from the hospital and requiring frequent treatments that cannot be provided by home-based services and transportation is unavailable - patients receiving daily chemotherapy or radiation therapy and do not require professional observation
Home-Based Care 3	Home-Based Care Patients who are not receiving an acute level of care and do not require services provided as defined in Outpatient Services, Rehabilitation, or Personal Care Home/Chronic Care. Patients with heavy care needs can be accommodated at home with good support from family, live-in or volunteer support and home-based services programs such as: - skilled nursing care (including IV therapy) - patient family education - rehabilitation services, e.g. respiratory/physical therapy/occupational therapy/speech therapy/mental health and vocational counsellors/social workers - home management services (laundry and cleaning) - personal care - home maintenance - laboratory services - case management (assessment and care coordination to access ail client, family, community and provincial resources and for crisis intervention) - nutrition services - adult day programs - after hours emergency services - meals-on-wheels - volunteer services - day surgery aftercare
Minimal Supervision Residence 4	Minimal Supervision • Patient requires non-skilled care and 24-hour accessability to support and who cannot be cared for at home due to unavailable and/or unstable family or live-in support. (e.g. Guest home) • Patients who have special housing needs (e.g. handicapped or senior's housing)

Hospice 5	Hospice • Hospital-based program for patients who are terminally ill and who cannot be cared for at home due to unavailable and/or unstable family or live-in support and may utilize: - skilled nursing care and other services such as IV analgesia or alimental support - social services and pastoral care - rooming-in facilities for family members • Home-based programs for patients who are terminally ill and require: - skilled nursing care and other services, such as IV therapy and IV analgesia or alimental support - case management (assessment and care coordination to access all client, family, community and provincial resources and for crisis intervention) - hospice physician - pastoral care, mental health, physical therapists, nutritional services, pharmacy services (e.g. CADD pumps) and social workers • Independent facility for terminally ill (e.g. Jocelyn House type set-up)
Rehabilitation Facility 6	Rehabilitation Patients who are not receiving an acute level of care but require 24-hour supervision and assessment by a team of rehabilitation personnel or who are receiving a therapy program planned by a physiotherapist which is delivered daily. The patient may then be expected to be discharged fully restored or transferred to a home-based program or to another level of care accommodation. (e.g. suggest HSC Rehab., Riverview, Deer Lodge and other Extended Treatment Units)
Personal Care 7	Personal Care Patients who require some degree of long term care in a 24 hour supervised setting, who can no longer be cared for at home, and whose care needs could be met by admission to a long term care facility licensed as a personal care home.
Chronic Care 8	Chronic Care Patients who show little or no potential for rehabilitation, whose care needs cannot be met at home, and who require equipment, treatment or a level of professional supervision (e.g. nursing, medical, respiratory) not usually provided in a personal care home.
Observation 9	Observation Short-stay (less than 24 hours) for patients requiring close nursing observation or medical management
Other	Other "Other" days should be assigned to: 10 Patients who require respite care to relieve the caregiver 11 Patients who require room-in centres for alcohol and drug dependencies 12 Patients who require paediatric or adult protection/crisis intervention (e.g. Safe Homes, Half-way houses, Foster Homes, Child Abuse centres, Suicide Tx Centres) 13 Patients with organic brain illness waiting transfer to Selkirk Mental Health Centre

MCHPE Alternatives to Acute Care Study: Face Page and Admission Review *(ORIGINAL)*

Patient Identifier

Reviewer

Hospital Number

Record Type 1 Adult 2 Pediatric 3 Outlier

Patient Information

Manitoba Health Number

Postal Code

Marital Status

1 Single 2 Married 3 Widowed
4 Separated/Divorced 5 Common Law

Chart Number

Birth Date YY/MM/DD

Sex 1 Male 2 Female

Admission Diagnosis: _____

Date of Admission YY/MM/DD

Date of Discharge YY/MM/DD

Discharge to an extended care bed
0 No 1 Yes

Patient Referrals

1 Medical
2 Gerontology
3 PT
4 OT
5 Social Work
6 Speech
7 Nutritionist
8 Home Care
9 Other

ADMISSION REVIEW (FIRST 72 HOURS)

Severity of Illness Met
0 No 1 Yes

Day SI met
24 hours period (1,2,3) 0 Not Met

Intensity of Service or
(*Intensity of Service) Met
0 No 1 Yes

Day IS (or *IS) Met
24 Hour Period (1,2,3) 0 Not Met

Admission Acuity

SI and IS (or *IS) Met:
Admission acute = 1
SI or IS (or *IS) Not Met:
Admission not acute = 0

For Admission Acuity = 0

What Alternate Level of Care is Indicated

01 Residence 02 Outpatient
03 Home-Based 04 Minimal Supervision Res.
05 Hospice 06 Rehabilitation Facility
07 Personal Care Home
08 Chronic Care 09 Observation
10 Respite 11 Room-in
12 Crisis/Protection
13 Organic Brain Illness

How reliable were the data for assessing alternate level of care?

1 Low 2 Medium 3 High

MCHPE Alternatives to Acute Care Study: Subsequent Day Reviews *(ORIGINAL)*

SUBSEQUENT DAY REVIEW

Patient Identifier ☐☐☐ ☐☐ ☐☐☐

Date Reviewed YY/MM/DD ☐☐ ☐☐ ☐☐

Day Reviewed ☐☐☐

Intensity of Service Met

0 No 1 Yes ☐

*Intensity of Service met

0 No 1 Yes ☐

Severity of Illness met

0 No 1 Yes ☐

Discharge Screens Met

0 No 1 Yes ☐

Day Acuity ☐

IS met: Day is Acute = 1
*IS met and SI met: Day is Acute = 1
*IS met, SI and DS not met: Day is Acute = 1
DS met: Day is Not Acute = 0

When Day Acuity = 0

What Alternate Level of Care is Indicated ☐☐

01 Residence	02 Outpatient
03 Home-Based	04 Minimal Supervision Res.
05 Hospice	06 Rehabilitation Facility
07 Personal Care Home	08 Chronic Care
09 Observation	10 Respite
11 Room-in	12 Crisis/Protection
13 Organic Brain Illness	

How reliable were the data for assessing alternate level of care? ☐

1 Low 2 Medium 3 High

SUBSEQUENT DAY REVIEW

Patient Identifier ☐☐☐ ☐☐ ☐☐☐

Date Reviewed YY/MM/DD ☐☐ ☐☐ ☐☐

Day Reviewed ☐☐☐

Intensity of Service Met

0 No 1 Yes ☐

*Intensity of Service met

0 No 1 Yes ☐

Severity of Illness met

0 No 1 Yes ☐

Discharge Screens Met

0 No 1 Yes ☐

Day Acuity ☐

IS met: Day is Acute = 1
*IS met and SI met: Day is Acute = 1
*IS met, SI and DS not met: Day is Acute = 1
DS met: Day is Not Acute = 0

When Day Acuity = 0

What Alternate Level of Care is Indicated ☐☐

01 Residence	02 Outpatient
03 Home-Based	04 Minimal Supervision Res.
05 Hospice	06 Rehabilitation Facility
07 Personal Care Home	08 Chronic Care
09 Observation	10 Respite
11 Room-in	12 Crisis/Protection
13 Organic Brain Illness	

How reliable were the data for assessing alternate level of care? ☐

1 Low 2 Medium 3 High

MCHPE Alternatives to Acute Care Study: Face Page and Admission Review *(SECOND LOOK)*

Patient Identifier __ __ __ __ __ __ __ __

Reviewer __ __

Hospital Number __ __ __

Record Type 1 Adult 2 Pediatric __

Patient Information

Chart Number __ __ __ __ __ __ __ __ __

Birth Date YY/MM/DD __ __ __ __ __ __

Sex 1 Male 2 Female __

Admission Diagnosis: _____

Date of Admission
YY/MM/DD __ __ __ __ __ __

Date of Discharge
YY/MM/DD __ __ __ __ __ __

Admitted through Emergency
0 No 1 Yes _____

Family Support _____

1 In House 2 Local 3 Absent
4 Other than Family Support 9 Insufficient documentation

Observation Unit

Did the patient go to OU prior to Admission?

0 No 1 Yes _____

If yes, what date did the patient go to OU?

YY/MM/DD __ __ __ __ __ __

While in OU: Severity of Illness Met
0 No 1 Yes _____

Intensity of Service or (*Intensity of Service) met
0 No 1 Yes _____

Acuity in OU? SI and IS (or *IS) Met: Acute = 1
SI or IS (*IS) not Met: Not Acute = 0 _____

Was the patient admitted anywhere other than OU?
0 No 1 Yes _____

ADMISSION REVIEW (FIRST 72 HOURS)

Severity of Illness
0 No 1 Yes _____

SI Criteria: _____
0 SI not met
1 Single Criterion Met
2 Three Borderline Criteria

List: 1)_____ 2)_____ 3)_____

Day SI met _____
24 hours period (1,2,3) 0 Not Met

Intensity of Service or
(*Intensity of Service) Met

0 No 1 Yes _____

IS Monitoring met
0 No 1 Yes _____

IS Treatments/Medications Met
0 No 1 Yes _____

Day IS (or *IS) Met _____
24 hours period (1,2,3) 0 Not Met

Admission Acuity

SI and IS (or *IS) Met: _____
Admission acute = 1

SI or IS (or *IS) Not Met:
Admission not acute = 0

For Admission Acuity = 0

What Alternate Level of Care is Indicated: __ __

01 Residence
02 Outpatient
03 Home-Based
04 Minimal Supervision Res.
05 Hospice
06 Rehabilitation Facility
07 Personal Care Home
08 Chronic Care
09 Observation
10 Respite
11 Room-in
12 Crisis/Protection
13 Organic Brain Illness

MCHPE Alternatives to Acute Care Study: Subsequent Day Reviews *(SECOND LOOK)*

SUBSEQUENT DAY REVIEW

Patient Identifier ___ ___ ___ ___ ___ ___ ___ ___

Date Reviewed
YY/MM/DD ___ ___ ___ ___ ___ ___

Day Reviewed ___ ___ ___

Intensity of Service Met
0 No 1 Yes _____

IS Monitoring met
0 No 1 Yes _____

IS Treatments/Medications
0 No 1 Yes _____

*Intensity of Service met
0 No 1 Yes _____

Severity of Illness Met
0 No 1 Yes _____

SI Criteria: _____
0 Not Met
1 Single criterion met
2 Three borderline criteria

List 1)_____2)_____ 3)_____

Discharge Screens Met
0 No 1 Yes _____

Day Acuity _____
IS met: Day is Acute = 1
*IS met and SI met: Day is Acute = 1
*IS met, SI and DS not met: Day is Acute = 1
DS met: Day is Not Acute = 0

When Day Acuity = 0

What Alternate Level of Care is Indicated ___ ___

01 Residence	02 Outpatient
03 Home-Based	04 Minimal Supervision Res.
05 Hospice	06 Rehabilitation Facility
07 Personal Care Home	08 Chronic Care
09 Observation	10 Respite
11 Room-in	12 Crisis/Protection
13 Organic Brain Illness	

SUBSEQUENT DAY REVIEW

Patient Identifier ___ ___ ___ ___ ___ ___ ___ ___

Date Reviewed
YY/MM/DD ___ ___ ___ ___ ___ ___

Day Reviewed ___ ___ ___

Intensity of Service Met
0 No 1 Yes _____

IS Monitoring met
0 No 1 Yes _____

IS Treatments/Medications
0 No 1 Yes _____

*Intensity of Service met
0 No 1 Yes _____

Severity of Illness Met
0 No 1 Yes _____

SI Criteria: _____
0 Not Met
1 Single criterion met
2 Three borderline criteria

List 1)_____2)_____ 3)_____

Discharge Screens Met
0 No 1 Yes _____

Day Acuity _____
IS met: Day is Acute = 1
*IS met and SI met: Day is Acute = 1
*IS met, SI and DS not met: Day is Acute = 1
DS met: Day is Not Acute = 0

When Day Acuity = 0

What Alternate Level of Care is Indicated ___ ___

01 Residence	02 Outpatient
03 Home-Based	04 Minimal Supervision Res.
05 Hospice	06 Rehabilitation Facility
07 Personal Care Home	08 Chronic Care
09 Observation	10 Respite
11 Room-in	12 Crisis/Protection
13 Organic Brain Illness	

APPENDIX B: METHODS

METHODS APPENDIX

Sample

We wanted to review enough records in each category of hospital to have sufficient statistical power (80%) to detect a difference in the proportion of Acute admissions at the 0.08 level. In other words, if the proportion in category A was at least 0.08 different from the proportion in category B, we would be able to state that the difference was real and not due to chance alone. We defined the number of records required to detect a difference between hospital categories as n_1.

We separately calculated the number of medical records that would have to be reviewed in each facility to accurately estimate the proportion of Acute admissions within the entire hospital. We defined this as n_2. If we divide n_1 by n_2 then we obtain the number of hospitals that we must review in each category. To illustrate, if we estimate that we need 500 records from each hospital *category*, and that we need 100 records from each *hospital*, then we would have to sample (500 ÷100 =) 5 hospitals randomly from each category.

Number of medical records in each hospital

The formula used to calculate the sample size for a proportion is $(p)(1-p)(z)^2/(e)^2$, (Mason 1986) where:

- p = the proportion of ALC admissions we can expect,
- z = number of standard errors away from the mean to give the desired confidence level, and
- e = the maximum allowable margin of error.

Using a proportion of 50% (p), a 95% confidence level (z) and a margin of error of 0.08 (e), we required 150 medical records from each facility to determine the proportion of admissions that are Acute. We were conservative in choosing 50% as the proportion of admissions that we expected to be Acute; this increases the sample size and ensures the desired confidence level and the margin of error. A 95% confidence level means that we can be 95% sure that if

we find a difference, it is not due to chance alone. Choosing an error margin of 0.08 keeps the number of records to review manageable.

The 150 records for each hospital were randomly selected using SAS statistical software. The medical record number is included in the hospital file. Allowing for the fact that some records might be unavailable, we generated a list of 170 medical records, so that the next record on the list could be substituted for any record that was unretrievable until 150 records had been located.

Table B1: Number of Hospitals for Review

Hospital Category	Estimated proportion of ALC admissions	Number of hospitals where adult medical charts will be reviewed	Number of hospitals where paediatric medical records will be reviewed
Teaching/Urban Community	0.387	8	2
Major Rural	0.376	6	1
Intermediate Rural	0.481	6	1
Small/Multi-Use	0.576	6	0
TOTAL		26	4

Hospital Categories

Using findings from Saskatchewan (1994), we estimated the proportion of ALC admissions for each category of hospital as shown in Table B1. Given the estimated proportions found in Saskatchewan and given our resource constraints, we chose a sample size which would enable us to detect a difference of at least 0.08.

Using the formula shown in Lemeshow, Hosmer, Klar and Lwanga (1990), we calculated that 813 records from each category of hospital would detect a difference of 0.08. With 813 records, if the difference between hospital categories is smaller than 0.08, then the difference

would go undetected and the statistical test would pronounce the two categories of hospital as being "similar" in the level of ALC admissions. Note also that the above sample size is adjusted for making multiple comparisons among the four categories of hospitals so that our overall error rate of making false negative decisions is kept at 5%.

Inter-Rater Reliability

Inter-rater reliability checks were carried out throughout the data collection process. The abstractors worked in pairs; at each facility, eight medical records were independently reviewed by both abstractors working there. Thus we checked for acuity for both the admission review and for subsequent days of stay. Kappa scores were calculated for each pair of abstractors. We used the Kappa Score because it adjusts for inter-rater agreement that occurs by chance and identifies the extent of non-random agreement (Fleiss 1981). A Kappa score of 1.0 indicates perfect agreement while a score of less than 1.0 indicates some degree of disagreement. The overall Kappa scores for pairs of abstractors ranged from 0.52 to 0.93.

We also calculated Standard Errors and Confidence Intervals for these Kappa scores. If the 95% confidence interval includes 1.0, then the Kappa is not significantly different from 1, or perfect agreement. Table B2 reports on Kappa scores, standard errors and the 95% confidence limits at three points in time for each team. For each team, the Kappa scores were always in the "fair to good agreement" range; and for each team, the Kappas were not significantly different from 1.0 for two of the three time periods checked. Thus we concluded that the assessment of Acuteness was satisfactorily consistent for each team and throughout the study.

Table B2: Comparison of Kappa scores at Beginning, Middle and End of Study

	Kappa Scores	Standard Error	95% Confidence Limits	
			Lower	Upper
Team A				
Beginning	0.73	0.07	0.58	0.87
Middle	0.84	0.11	0.63	1.05
End	0.93	0.05	0.84	1.03
Team B				
Beginning	0.52	0.12	0.29	0.76
Middle	0.96	0.04	0.9	1.03
End	0.86	0.09	0.68	1.05
Team C				
Beginning	0.81	0.1	0.61	1.01
Middle	0.62	0.17	0.29	0.95
End	0.87	0.09	0.7	1.04

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Lemeshow S, Hosmer DW, Klar J and Lwanga SK. *Adequacy of Sample Size in Health Studies*. John Wiley and Sons (on behalf of the World Health Organization),1990:13.

Mason R. *Statistical Techniques in Business and Economics*. Homewood, Illinois: Richard D. Irwin, Inc, 1986:384-385.

APPENDIX C: DETAILED TABLES

Table C1: Adult Total and Adult Medical Separations, 1993/94, after excluding specified long-term service and subservice codes at admission

Hospital Name and Type	Total Separations	Medical Separations	Percent Medical
TEACHING			
St.Boniface	16584	4398	26.52%
Health Sciences Centre	19979	7100	35.54%
URBAN COMMUNITY			
Brandon	6902	2896	41.96%
Grace	8732	3557	40.74%
Misericordia	8770	2990	34.09%
Victoria	7262	2466	33.96%
Concordia	3832	2273	59.32%
Seven Oaks	5755	2987	51.90%
MAJOR RURAL			
Bethel, Winkler	1276	596	46.71%
Bethesda, Steinbach	2051	1313	64.02%
Dauphin	2829	1730	61.15%
Flin Flon	1115	706	63.32%
Morden	1238	677	54.68%
Portage	3011	1806	59.98%
The Pas	2481	1446	58.28%
Selkirk	1894	1265	66.79%
Swan River	1830	1348	73.66%
Thompson	2933	1244	42.41%
INTERMEDIATE RURAL			
Altona	484	327	67.56%
Beausejour	764	644	84.29%
Carman	823	439	53.34%
Churchill	145	110	75.86%
Johnson, Gimli	850	745	87.65%
Minnedosa	749	551	73.56%
Neepawa	1260	892	70.79%
Ste Rose	891	748	83.95%
Souris	671	527	78.54%
Virden	572	475	83.04%
SMALL RURAL			
Arborg	444	358	80.63%
Baldur	115	108	93.91%
Boissevain	303	281	92.74%
Winnipegosis	303	287	94.72%
Rock L/Crystal City	363	325	89.53%
Deloraine	511	405	79.26%

Hospital Name and Type	Total Separations	Medical Separations	Percent Medical
St. Pierre	337	318	94.36%
RR Valley, Emerson	164	145	88.41%
Eriksdale	295	273	92.54%
Erickson	310	285	91.94%
Carberry	230	184	80.00%
Seven Regions, Gladstone	316	295	93.35%
Glenboro	266	251	94.36%
Grandview	337	305	90.50%
Hamiota	546	450	82.42%
Teulon	446	399	89.46%
Lorne, Swan Lake	731	588	80.44%
TriLake, Killarney	743	631	84.93%
McCreary Alonsa	240	232	96.67%
RR Valley, Morris	450	393	87.33%
Notre Dame	186	138	74.19%
Pine Falls	584	446	76.37%
Pinawa	416	378	90.87%
Roblin	714	671	93.98%
Riverdale, Rivers	293	263	89.76%
Russell	1057	974	92.15%
Birtle	562	502	89.32%
Strathclair, Shoal L	320	299	93.44%
Stonewall	542	417	76.94%
Lakeshore, Ashern	486	388	79.84%
Ste Anne	604	392	64.90%
Vita	338	321	94.97%
Ste Claude	107	97	90.65%
TigerHills, Treherne	297	244	82.15%
Melita	190	154	81.05%
Wawanesa	179	124	69.27%
Percy Moore, Hodgson	755	668	88.48%
MULTI-USE			
Benito	130	114	87.69%
Pembina-Manitou	142	137	96.48%
MacGregor	37	33	89.19%
Reston	218	198	90.83%
Rossburn	281	250	88.97%
Whitemouth	85	83	97.65%

Hospital Name and Type	Total Separations	Medical Separations	Percent Medical
NORTHERN ISOLATED			
Snow Lake	52	46	88.46%
Gillam	136	117	86.03%
Lynn Lake	133	91	68.42%
Leaf Rapids	100	76	76.00%
Norway House	524	410	78.24%

Table C2: Percent of Admissions Which Were Judged to Require Each Level of Care, by Hospital

	Acute	Outpatient	Observation	Home Care	Long Care Inst.	Other	No Health Care Required
TEACHING/URBAN COMMUNITY							
Brandon	39.3	20.0	30.7	5.3	3.3	1.3	--
Concordia	68.0	6.7	18.0	0.7	3.3	3.3	--
Grace	60.7	7.1	19.4	2.6	5.2	3.9	1.3
Health Sciences	50.7	20.0	20.0	2.7	1.3	2.7	2.7
Misericordia	63.6	6.0	20.5	4.0	2.7	1.3	2.0
Seven Oaks	60.7	2.7	28.7	2.0	4.7	0.7	0.7
St. Boniface	54.0	28.0	13.3	2.7	--	0.7	1.3
Victoria	56.4	19.5	12.8	2.7	2.7	2.7	3.4
MAJOR RURAL							
Dauphin	36.9	5.4	45.0	4.0	5.4	3.4	--
Selkirk	51.3	4.0	35.3	4.0	2.7	0.7	2.0
Steinbach	41.2	10.1	25.0	10.8	5.4	6.8	0.7
The Pas	34.0	21.3	30.7	1.3	5.3	6.0	1.3
Thompson	31.5	12.1	48.3	3.4	1.3	3.4	--
Winkler	29.3	6.7	46.7	5.3	6.0	4.0	2.0
INTERMEDIATE RURAL							
Altona	38.7	8.0	38.7	4.7	6.0	3.3	0.7
Beausejour	34.2	16.8	26.2	6.7	4.7	7.4	4.0
Carman	38.0	3.3	42.0	6.7	5.3	2.7	2.0
Minnedosa	23.8	10.6	43.1	6.0	8.0	4.6	4.0
Souris	40.4	10.3	28.8	6.9	8.9	4.1	0.7
Ste. Rose	38.0	12.7	33.3	8.7	2.0	4.0	1.3
SMALL/MULTI-USE							
Erickson	34.7	14.7	30.0	11.3	4.0	4.0	1.3
Glenboro	27.3	16.0	26.0	18.0	6.7	2.0	4.0
Grandview	20.0	20.7	38.7	3.3	1.3	3.3	12.7
St. Pierre	29.9	25.2	25.9	6.8	6.1	2.0	4.1
Stonewall	28.3	2.0	54.0	6.6	4.0	4.6	0.7
Treherne	21.9	21.9	39.8	6.6	2.7	1.3	6.0

Table C3: Percent of Days Which Were Judged to Require Each Level of Care, by Hospital

	Acute	Outpatient	Observation	Home Care	Long Care Inst.	Other	No Health Care Required
TEACHING/URBAN COMMUNITY							
Brandon	27.2	13.8	10.7	19.7	11.5	8.9	8.2
Concordia	36.2	6.0	5.5	9.8	36.4	2.8	3.2
Grace	25.5	3.2	3.2	17.0	42.3	6.5	1.8
Health Sciences	45.2	12.0	6.2	8.8	10.5	2.7	14.6
Misericordia	31.2	2.9	5.9	17.1	37.3	0.9	4.7
Seven Oaks	36.7	1.5	7.1	9.3	40.5	3.0	2.0
St. Boniface	39.5	19.7	2.4	10.4	16.1	4.8	7.1
Victoria	40.6	13.0	2.9	12.5	22.7	4.4	4.1
MAJOR RURAL							
Dauphin	23.1	1.8	15.1	14.2	34.9	5.8	5.2
Selkirk	28.0	2.6	9.8	13.7	31.6	7.6	6.9
Steinbach	29.3	4.9	8.2	28.3	15.1	8.7	5.5
The Pas	27.9	19.3	9.6	10.7	21.6	5.3	5.6
Thompson	37.1	11.7	27.7	8.0	5.6	4.3	5.5
Winkler	30.9	2.7	15.7	16.1	24.4	3.7	6.6
INTERMEDIATE RURAL							
Altona	18.1	6.7	10.8	10.3	41.3	6.0	6.9
Beausejour	15.0	13.4	9.6	11.1	22.2	11.4	17.3
Carman	31.1	3.0	15.9	13.4	27.2	2.9	6.5
Minnedosa	16.3	4.1	11.1	13.3	44.7	5.1	5.4
Souris	21.2	2.9	6.6	17.9	43.4	4.1	4.1
Ste. Rose	31.4	6.6	12.8	23.9	19.4	3.8	2.1
SMALL/MULTI-USE							
Erickson	23.5	7.5	13.6	19.4	26.0	7.9	2.0
Glenboro	14.8	5.5	5.4	17.4	45.4	1.9	9.6
Grandview	13.2	12.7	16.4	13.1	17.1	7.0	20.6
St. Pierre	25.8	14.4	12.8	17.7	14.1	2.8	12.3
Stonewall	26.8	1.7	16.3	23.4	22.4	5.6	3.9
Treherne	23.2	17.4	19.1	12.8	8.8	2.1	16.7

Table C4: Percent of Admissions Which Were Judged to Require Each Level of Care, by Hospital: (Paediatrics)

	Acute	Outpatient	Observation	Home Care	Other	No Health Care Required
Brandon	46.3	16.1	35.6	0.7		1.3
Health Sciences	51.0	6.6	38.4	1.3	2.7	
Ste Rose	15.3	22.0	29.3	27.3	4.7	1.3
Thompson	24.0	13.3	50.0	4.0	0.7	8.0

Table C5: Percent of Days Which Were Judged to Require Each Level of Care, by Hospital: (Paediatrics)

	Acute	Outpatient	Observation	Home Care	Other	No Health Care Required
Brandon	53.1	17.6	18.8	1.7		8.7
Health Sciences	57.6	8.0	21.6	5.4	3.4	4.1
Ste Rose	22.2	15.2	19.2	36.0	5.6	1.8
Thompson	31.2	15.7	36.9	3.7	1.3	11.1

Table C6: Adult Medical Cases that could be reallocated, 1993-94, by Hospital Category with 95% Confidence Intervals

	Urban	Major Rural	Intermediate Rural	Small Rural
Observation	5762 ± 677	4598 ± 689	1885 ± 196	5104 ± 1012
Long Care Institution	745 ± 247	522 ± 173	300 ± 84	566 ± 157
Home Care	803 ± 281	570 ± 254	377 ± 68	1159 ± 371
Outpatient	4386 ± 631	1237 ± 490	600 ± 126	2181 ± 798
Other	602 ± 247	497 ± 190	251 ± 64	428 ± 115
No health care required	459 ± 229	109 ± 67	120 ± 51	635 ± 366

Table C7: Adult Medical Days that could be reallocated, 1993-94, by Hospital Category with 94% Confidence Intervals

	Urban	Major Rural	Intermediate Rural	Small Rural
Observation	18,181 ± 2,996	14,432 ± 3,687	6,932 ± 1,157	16,088 ± 2,990
Long Care Institution	87,874 ± 16,464	25,704 ± 8,891	19,102 ± 4,698	26,219 ± 7,820
Home Care	42,085 ± 7,239	16,329 ± 4,583	9,831 ± 2,974	20,584 ± 3,243
Outpatient	30,975 ± 4,916	6,426 ± 3,466	4,231 ± 1,425	10,235 ± 4,140
Other	13,467 ± 4,444	6,531 ± 2,760	3,609 ± 1,574	5,520 ± 1,736
No health care required	21,884 ± 5,791	6,110 ± 1,159	4,480 ± 2,196	11,845 ± 5,094

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Manitoba Centre for Health Policy and Evalution
University of Manitoba
T154 - 770 Bannatyne Avenue
Winnipeg, Manitoba Canada R3E 0W3