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This first issue of the HITH Review for 2008 includes six recent abstracts including a publication from The Victorian HITH Outcomes Study on the management of endocarditis. Several recent relevant published articles on HITH are also listed.

Most of the articles listed in this review are available from libraries in Australia or journal websites. Copies of articles with an asterisk (★) can be requested from ACA if required for educational or research purposes by using the order form available on the website.

We hope you find the HITH Review to be a valuable resource. Any contributions or feedback is welcome.

Ambulatory Care Australia (ACA)

The Alfred
Commercial Road, Melbourne, Vic 3004

Telephone: (03) 9076 3535
Facsimile: (03) 9076 6901
Email: aca@alfred.org.au
Website: www.health.vic.gov.au/aca/

Editor:

Lisa Demos, B Pharm, PhD

Assistant Editor:

Kaylene Fiddes, RN

Relevant abstracts from Medline and Cinahl

Management of COPD Exacerbations

Ricauda NA, Tibaldi V, Leff B et al. Substitutive "Hospital at Home" versus inpatient care for elderly patients with exacerbations of chronic obstructive pulmonary disease: A prospective randomized, controlled trial. *J Am Geriatr Soc* 2008; 56:493–500, doi:10.1111/j.1532-5415.2007.01562.x. ★

Objectives: To evaluate hospital readmission rates and mortality at 6-month follow-up in selected elderly patients with acute exacerbation of chronic obstructive pulmonary disease (COPD).

Design: Prospective randomized, controlled, single-blind trial with 6-month follow-up. **Setting:** San Giovanni Battista Hospital of Torino. **Participants:** One hundred four elderly patients admitted to the hospital for acute exacerbation of COPD were randomly assigned to a general medical ward (GMW, n=52) or to a geriatric home hospitalization service (GHHS, n=52). **Measurements:** Measurements of baseline sociodemographic information; clinical data; functional, cognitive, and nutritional status; depression; and quality of life were obtained.

Results: There was a lower incidence of hospital readmissions for GHHS patients than for GMW patients at 6-month follow-up (42% vs. 87%, $P < 0.001$). Cumulative mortality at 6 months was 20.2% in the total sample, without significant differences between the two study groups. Patients managed in the GHHS had a longer mean length of stay than those cared for in the GMW (15.5 ± 9.5 vs. 11.0 ± 7.9 days, $P = 0.010$). Only GHHS patients experienced improvements in depression and quality-of-life scores. On a cost per patient per day basis, GHHS costs were lower than costs in GMW ($\$101.4 \pm 61.3$ vs. $\$151.7 \pm 96.4$, $P = 0.002$).

Conclusion: Physician-led substitutive hospital-at-home care as an alternative to inpatient care for elderly patients with acute exacerbations of COPD is associated with a substantial reduction in the risk of hospital readmission at 6 months, lower healthcare costs, and better quality of life.

HITH Cost Comparison

Armstrong CD, Hogg WE, Lemelin J et al. Home-based intermediate care program vs. hospitalization: Cost comparison study. *Can Fam Physician* 2008; 54:66-73. ★

Objective: To explore whether a home-based intermediate care program in a large Canadian city lowers the cost of care and to look at whether such home-based programs could be a solution to the increasing demands on Canadian hospitals.

Design: Single-arm study with historical controls. **Setting:** Department of Family Medicine at the Ottawa Hospital (Civic campus) in Ontario. **Participants:** Patients requiring hospitalization for acute care. Participants were matched with historical controls based on case-mix, most responsible diagnosis, and level of complexity. **Interventions:** Placement in the home-based intermediate care program. Daily home visits from the nurse practitioner and 24-hour access to care by telephone. **Main outcome measures:** Multivariate regression models were used to estimate the effect of the program on 5 outcomes: length of stay in hospital, cost of care substituted for hospitalization (Canadian dollars), readmission for a related diagnosis, readmission for any diagnosis, and costs incurred by community homecare services for patients following discharge from hospital.

Results: The outcomes of 43 hospital admissions were matched with those of 363 controls. Patients enrolled in the program stayed longer in hospital (coefficient 3.3 days, $P < .001$), used more community care services following discharge (coefficient \$729, $P = 0.007$), and were more likely to be readmitted to hospital within 3 months of discharge (coefficient 17%, $P = 0.012$) than patients treated in hospital. Total substituted costs of homebased care were not significantly different from the costs of hospitalization (coefficient $-\$501$, $P = 0.11$).

Conclusion: While estimated cost savings were not statistically significant, the limitations of our study suggest that we underestimated these savings. In particular, the economic inefficiencies of a small immature program and the inability to control for certain factors when selecting historical controls affected our results. Further research is needed to

determine the economic effect of mature home-based programs.

Safety and Efficacy of Endocarditis

Management in HITH

McMahon JH, O'Keeffe JM, Grayson LM, the Victorian HITH Outcome Group. Is hospital-in-the-home (HITH) treatment of bacterial endocarditis safe and effective? *Scand J Infect Dis* 2008; 40: 40-3. ★

Although serious infections such as bacterial endocarditis (BE) are being increasingly treated with parenteral antibiotics via Hospital-in-the-Home (HITH) programmes in Australia, there are few published data to confirm the safety and efficacy of this treatment modality, especially among patients with BE due to pathogens other than streptococci. In a 12-month prospective, multi-site study we assessed HITH treatment outcomes for all cases of BE. Among the 40 BE cases (29 'definite', 11 'possible'; Duke criteria) caused by a range of pathogens (16 staphylococci spp., 11 streptococci, 4 other, 9 culture-negative), cure was achieved in 37 (93%) cases. BE due to *Staphylococcus aureus* was significantly associated with an inferior outcome ($p = 0.046$). Adverse events were relatively common (9/40), but most were not severe and were managed with continuation of HITH care. BE can be safely managed via HITH, but particular care in patient selection is necessary, especially for cases due to *S. aureus*.

Managing Post-operative Infections

Mazo S, Emparan C, Vallejo M, et al. Hospital-in-the-home treatment of surgical infectious diseases: an economic analysis. *Surg Infections* 2007; 8:567-74. ★

Background: A growing number of surgical infections can be treated safely and effectively with parenteral antimicrobial therapy in the patient's home. Our objective was to define the economic impact of a hospital-in-the-home unit (HITH) introduced into a surgical unit.

Methods: Patients admitted to the HITH must be assessed thoroughly for suitability, including clinical stability and social circumstances, and both patient and caregiver consent must be obtained. The HITH received all stable surgical patients with complicated infections and an expected long-term stay. A total of

150 patients were enrolled during a 12-month period. Patients were reviewed daily to monitor the progress of therapy and check for possible complications. Antibiotic selection was based on appropriate prescribing principles rather than dosing convenience. Innovative dosing regimens were included, such as once-daily aminoglycosides, continuous-infusion beta-lactams, once- or twice-daily cephalosporins, and oral fluoroquinolones in order to provide effective therapy for a wide range of infections that previously would have required in-hospital care. Economic efficiency for both the surgical and the HITH unit was assessed by examining Diagnosis-Related Group (DRG)-based clinical processes, profits and losses of each clinical process, and a quantitative model for performance evaluation and benchmarking (data envelopment analysis; DEA).

Results: The mean stay in the surgical unit was decreased (3.95 days) while increasing the case mix (1.42). At the same time, HITH patients had a mean stay of 8.69 days with a stable case mix of 1.61. The economic benefit of both units increased in the surgical unit because of a shorter stay and in the HITH secondary to greater impact of the case mix while maintaining the mean stay.

Conclusions: Appropriate use of HITH leads to greater patient and caregiver satisfaction, efficient in-hospital bed use, and financial efficiencies. Patients receiving intravenous antibiotics, wound care, parenteral nutrition, or transfusions do not always need to be in the hospital.

Prevention of Back Pain

Roelofs PDDM, Bierma-Zeinstra SMA, van Poppel MNM et al. Back supports to prevent back pain in home care workers with previous low back pain. *Ann Intern Med* 2007; 147:685-92. ★

Background: People use lumbar supports to prevent low back pain. Secondary analyses from primary preventive studies suggest benefit among workers with previous low back pain, but definitive studies on the effectiveness of supports for the secondary prevention of low back pain are lacking.

Objective: To determine the effectiveness of lumbar supports in the secondary prevention of low back pain.

Design: Randomized, controlled trial. **Setting:** Home care organization in the Netherlands. **Patients:** 360 home care workers with self-reported history of low

back pain. **Intervention:** Short course on healthy working methods, with or without patient-directed use of 1 of 4 types of lumbar support. **Measurements:** Primary outcomes were the number of days of low back pain and sick leave over 12 months. Secondary outcomes were the average severity of low back pain and function (Quebec Back Pain Disability scale) in the previous week.

Results: Over 12 months, participants in the lumbar support group reported an average of -52.7 days (CI, -59.6 to -45.1 days) fewer days with low back pain than participants who received only the short course. However, the total sick days in the lumbar support group did not decrease (-5 days [CI, -21.1 to 6.8 days]). Small but statistically significant differences in pain intensity and function favoured lumbar support.

Limitations: Study participants were unblinded, and a substantial amount of missing data required imputation. Objective data on sick days due to low back pain were not available.

Conclusion: Adding patient-directed use of lumbar supports to a short course on healthy working methods may reduce the number of days when low back pain occurs, but not overall work absenteeism, among home care workers with previous low back pain. Further study of lumbar supports is warranted.

Delirium Prevention in HITH

Caplan G. Does 'Hospital in the Home' treatment prevent delirium? *Aging Health* 2008; 4:69-74

Delirium is a common problem, mostly affecting older patients in hospital, which results in greater mortality, nursing-home placement and cognitive and functional impairment. Delirium can be triggered by a wide range of conditions, treatments and procedures, as well as by certain environments. Some hospital environments have been causally implicated, but until it was possible to compare treatment in hospital with treatment in other places, the observation remained at the level of an association. However, the development of 'Hospital in the Home' services has allowed clinicians to explore this question scientifically. Recently, a number of studies comparing treatment of acute conditions, both medical and surgical, and rehabilitation in hospital with treatment at home, have found a lower incidence of delirium with home treatment, as well as lower rates of the sequelae of delirium. Since delirium is an indicator of a wide range of subsequent poor

outcomes, this information has broad implications for the delivery of hospital-level services to older patients, and means that health services should seek to provide Hospital in the Home services wherever older patients are treated.

List of Medline, Cinahl and other relevant published articles

Back Pain Prevention

Roelofs PDDM, Bierma-Zeinstra SMA, van Poppel MNM et al. Back supports to prevent back pain in home care workers with previous low back pain. *Ann Intern Med* 2007; 147:685-92 ★

Blood Transfusions

Houck D, Whiteford J. Improving patient outcomes: transfusion with infusion pump for peripherally inserted central catheters and other vascular access devices. *J Infusion Nursing* 2007; 30:341-4. ★

Carers

Egbert N, Dellmann-Jenkins M, Smith GC et al. The emotional needs of care recipients and the psychological well-being of informal caregivers: Implications for home care clinicians. *Home Healthcare Nurse* 2008; 26:50-7. ★

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Costs/ Cost Comparison

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comparison study. *Can Fam Physician* 2008; 54:66-73. ★

Elting LS, Lu C, Escalante CP et al. Outcomes and cost of outpatient or inpatient management of 712 patients with febrile neutropenia. *J Clin Oncol* 2008; 26:606-11. ★

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Cystic Fibrosis

McClure M. Home care of patients with cystic fibrosis. *Home Health Care Manage Pract* 2007; 19:442-4. ★

Delirium

Caplan G. Does 'Hospital in the Home' treatment prevent delirium? *Aging Health* 2008; 4:69-74

Enzyme Replacement Therapy

Cox-Brinkman J, Timmermans RG, Wijburg FA et al. Home treatment with enzyme replacement therapy for mucopolysaccharidosis type I is feasible and safe. *J Inherited Metabolic Dis* 2007; 30:984. ★

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