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contents

Relevant abstracts from Medline and Cinahl

Updated Cochrane Systematic Reviews

Cystic Fibrosis Exacerbations 2

Hospital at Home 2

Intravenous Antibiotics

Predictors of Re-admission 3

IV Daptomycin 4

PICC Lines in children 4

Self care 4

List of Medline, Cinahl and other relevant published articles 5

The last issue of the HITH Review for 2008 includes two recent updates from the Cochrane database of Systematic Reviews. One article is a review of the evidence for the effectiveness of home management of acute exacerbations in cystic fibrosis patients compared to hospital management and the second is a review of the effectiveness of hospital in the home management generally. Several other recently published articles from both English and non-English journals that are relevant to HITH are also listed in this edition.

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.

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Relevant abstracts from Medline and Cinahl

Updated Cochrane Systematic Reviews

Cystic Fibrosis Exacerbations

Balaguer A, Gonzalez de Dios J. Home intravenous antibiotics for cystic fibrosis. *Cochrane Database Syst Rev* 2008; 3:CD001917. ★

Background: Recurrent endobronchial infection in cystic fibrosis (CF) requires treatment with intravenous antibiotics for several weeks usually in hospital, affecting health costs and quality of life for patients and their families.

Objectives: To determine whether home intravenous antibiotic therapy in CF is as effective as inpatient intravenous antibiotic therapy and if it is preferred by individuals or families or both. **Search Strategy:** We searched the Cochrane Cystic Fibrosis and Genetic Disorders Group Trials Register comprising references identified from comprehensive electronic database searches and handsearches of relevant journals and abstract books of conference proceedings. Most recent search of the Group's Trials Register: April 2008.

Selection Criteria: Randomized and quasi-randomized controlled studies of intravenous antibiotic treatment for adults and children with CF at home compared to in hospital.

Data Collection and Analysis: The authors independently selected studies for inclusion in the review, assessed methodological quality of each study and extracted data using a standardised form.

Main Results: Seventeen studies were identified by the searches. Only one study could be included which reported results from 17 participants aged 10 to 41 years with an infective exacerbation of *Pseudomonas aeruginosa*. All their 31 admissions (18 hospital and 13 at home after two to four days of hospital treatment) were analysed as independent events. Outcomes were measured at 0, 10 and 21 days after initiation of treatment. Home participants underwent fewer investigations than hospital participants ($P < 0.002$) and general activity was higher in the home group. No significant differences were found for clinical outcomes, adverse events, complications or change of intravenous lines, or time to next admission. Home participants received less low-dose home maintenance

antibiotic. Quality of life measures showed no significant differences for dyspnoea and emotional state, but fatigue and mastery were worse for home participants, possibly due to a higher general activity and need of support. Personal, family, sleeping and eating disruptions were less important for home than hospital admissions. Home therapy was cheaper for families and the hospital. Indirect costs were not determined.

Conclusion: Current evidence is restricted to a single randomized clinical trial. It suggests that, in the short term, home therapy does not harm individuals, entails fewer investigations, reduces social disruptions and can be cost-effective. There were both advantages and disadvantages in terms of quality of life. The decision to attempt home treatment should be based on the individual situation and appropriate local resources. More research is urgently required.

Hospital at Home

Shepperd S, Doll H, Angus RM, et al. Admission avoidance hospital at home. *Cochrane Database Syst Rev*. 2008(4):CD007491. ★

Background: Admission avoidance hospital at home is a service that provides active treatment by health care professionals in the patient's home for a condition that otherwise would require acute hospital in-patient care, and always for a limited time period. In particular, hospital at home has to offer a specific service to patients in their home requiring health care professionals to take an active part in the patients' care. If hospital at home were not available then the patient would be admitted to an acute hospital ward. Many countries are adopting this type of care in an attempt to reduce the demand for acute hospital admission.

Objectives: To determine, in the context of a systematic review and meta-analysis, the effectiveness and cost of managing patients with admission avoidance hospital at home compared with in-patient hospital care.

Search Strategy: The following databases were searched through to January 2008: MEDLINE, EMBASE, CINAHL, EconLit and the Cochrane Effective Practice and Organisation of Care Group (EPOC) register. We checked the reference lists of articles identified electronically for evaluations of hospital at

home and obtained potentially relevant articles. Unpublished studies were sought by contacting providers and researchers who were known to be involved in this field.

Selection Criteria: Randomised controlled trials recruiting patients aged 18 years and over. Studies comparing admission avoidance hospital at home with acute hospital in-patient care. The admission avoidance hospital at home interventions may admit patients directly from the community thereby avoiding physical contact with the hospital, or may admit from the emergency room.

Data Collection and Analysis: Two authors independently extracted data and assessed study quality. Our statistical analyses sought to include all randomised patients and were done on an intention to treat basis. We requested individual patient data (IPD) from trialists, and relied on published data when we did not receive trial data sets or the IPD did not include the relevant outcomes. When combining outcome data was not possible because of differences in the reporting of outcomes we have presented the data in narrative summary tables. For the IPD meta-analysis, where at least one event was reported in both study groups in a trial, Cox regression models were used to calculate the log hazard ratio and its standard error for mortality and readmission separately for each data set (where both outcomes were available). We included randomisation group (admission avoidance hospital at home versus control), age (above or below the median), and gender in the models. The calculated log hazard ratios were combined using fixed effects inverse variance meta analysis. If there were no events in one group we used the Peto odds ratio method to calculate a log odds ratio from the sum of the log-rank test 'O-E' statistics from a Kaplan Meier survival analysis. Statistical significance throughout was taken at the two-sided 5% level ($p < 0.05$) and data are presented as the estimated effect with 95% confidence intervals. For each comparison using published data for dichotomous outcomes we calculated risk ratios using a fixed effects model to combine data.

Main Results: We included 10 RCTs ($n=1333$), 7 of which were eligible for the IPD. Five out of these seven trials contributed to the IPD meta-analysis ($n=850/975$; 87%). There was a non significant reduction in mortality at three months for the admission avoidance hospital at home group (adjusted

HR 0.77, 95% CI 0.54 to 1.09; $p=0.15$), which reached significance at six months follow-up (adjusted HR 0.62, 95% CI 0.45 to 0.87; $p=0.005$). A non significant increase in admissions was observed for patients allocated to hospital at home (adjusted HR 1.49, 95% CI 0.96 to 2.33; $p=0.08$). Few differences were reported for functional ability, quality of life or cognitive ability. Patients reported increased satisfaction with admission avoidance hospital at home. Two trials conducted a full economic analysis, when the costs of informal care were excluded admission avoidance hospital at home was less expensive than admission to an acute hospital ward.

Conclusion: We performed meta-analyses where there was sufficient similarity among the trials and where common outcomes had been measured. There is no evidence from the analysis to suggest that admission avoidance hospital at home leads to outcomes that differ from inpatient hospital care.

Intravenous Antibiotics

Predictors of Re-admission

Lopez JP, Laporte ASJ, Manso CA, et al. Intravenous antibiotic treatment in a hospital based home care unit. Predictors of hospital readmission. *Medicina Clinica* 2008; 131(8):290-2.

Background and Objective: Intravenous antibiotic therapy at home has showed its efficacy as an alternative to hospitalization care in many infectious pathologies. The objectives of this study are: a) to expose our experience, as hospital at home unit (HHU) integrated within a service of internal medicine, in the antibiotic treatment, and b) to define those parameters that can predict hospital readmissions.

Patients and Method: This study included all patients with infectious pathology and intravenous antibiotic therapy who were admitted in our HHU from March 2006 to March 2007.

Results: 145 patients were included in this study. Successful treatment was observed in 92% of patients. Eleven patients were re-admitted at hospital during the episode by infectious disease, and only 2 of them showed adverse effects to treatment. Twenty-two patients were re-admitted at hospital 3 months after due to chronic pathology.

Conclusions: Intravenous antibiotic therapy at home

is a good alternative in many infectious pathologies. Infectious pathology and baseline state can be predictors of hospital readmissions.

IV Daptomycin Therapy

Martone WJ, Lindfield KC, Katz DE. Outpatient parenteral antibiotic therapy with daptomycin: insights from a patient registry. *Internat J Clin Pract* 2008; 62:1183-7. ★

Aim: To compare and contrast the characteristics and clinical outcomes of patients who have received daptomycin as outpatients and inpatients.

Methods: The Cubicin Outcomes Registry and Experience (CORE) is a retrospective chart review of patients who have received daptomycin in participating institutions. Patients treated in 2005 were included in this analysis. Demographic characteristics and clinical outcomes (success = cured + improved) were compared among patients who received outpatient parenteral antibiotic therapy (OPAT) and patients who had received inpatient parenteral antibiotic therapy (IPAT).

Results: Of 1172 patients reported by 52 CORE 2005 participating institutions/investigators, 949 (81.0%) patients were evaluable: 539 (56.8%) received OPAT (OPAT patients), and 410 (43.2%) received only IPAT (IPAT patients). Of the 539 OPAT patients, 273 (50.6%) also received some IPAT, usually preceding OPAT therapy. Successful outcomes [no. of successes/(no. of successes + no. of failures)] for OPAT patients vs. IPAT patients were 94.6% and 86.3% respectively (chi-square test, $p < 0.001$). OPAT patients were younger, had fewer underlying diseases, were clinically stable, and had fewer adverse events than IPAT patients.

Conclusions: Outpatient parenteral antibiotic therapy use was common (539/949 or 56.8%) among patients in CORE 2005. Clinical outcomes among OPAT patients appeared at least as good as or better than IPAT patients. Better outcomes among OPAT patients were most likely because of patient selection for OPAT. Additional studies should focus on clinical characteristics of patients who would be ideal candidates for daptomycin OPAT.

PICC Lines in Children

Van Winkle P, Whiffen T, Liu I-LA. Experience Using Peripherally Inserted Central Venous Catheters for Outpatient Parenteral Antibiotic Therapy in Children at a Community Hospital. *Pediatr Infect Dis J* 2008; 27:1069-72.

Background: Outpatient parenteral antibiotic therapy with peripherally inserted central catheters (PICCs) is safe, clinically effective, and cost effective in pediatric populations cared for at academic and free-standing pediatric hospitals. Our study evaluates the transferability of these findings to a community hospital setting.

Methods: Data were retrospectively collected on PICCs used in children at a community hospital from December 2003 to September 2006. The Fisher exact test and a logistic regression were used for statistical analysis.

Results: Thirty-nine PICCs were placed in 34 patients. The total number of catheter days at home was 800 (mean 20.5 ± 13.9). We demonstrated a 97% success rate in completing therapy at home, with 82.3% completion with a single PICC. Our overall complication rate was 33.3%, consisting of occlusion, accidental displacement, cracks in the catheters, and local irritation. There were no instances of phlebitis or suspected or confirmed catheter infection or sepsis. There were no statistically significant differences in these values compared with reports from major pediatric centers. The cost savings was \$1070 per day of home health care when compared with costs of inpatient hospitalization.

Conclusions: We believe that this is the first study to demonstrate the effectiveness of PICC use for outpatient parenteral antibiotic therapy in pediatric patients in a community hospital setting, and demonstrates the ability for this to be done at the standard of care expected at major pediatric centers.

Self-Care

O'Halloran L, El-Masri MM, Fox-Wasylyshyn SM. Home Intravenous Therapy and the Ability to Perform Self-care Activities of Daily Living. *J Infusion Nursing* 2008; 31:367-74. ★

This prospective cohort study examined the variables that affect the ability of 92 patients receiving home

intravenous (IV) therapy to perform self-care activities of daily living and whether there was a difference in their ability based on vascular access device (VAD) location and type or other IV-related variables. Analysis revealed that 4 IV-related variables were significant predictors of self-care ability score: IV delivery method ([beta]= -.212, P=0.018), VAD placement in the dominant hand ([beta]= -.208, P=0.017), VAD dressing ([beta]= .215, P=0.013), and IV solution ([beta]= .206, P=0.022). These findings provide community-based nurses with evidence-based information regarding the variables that have an impact on the ability of patients receiving home IV therapy to perform the activities of daily living.

List of Medline, Cinahl and other relevant published articles

Admissions

Shepperd S, Doll H, Angus RM, et al. Admission avoidance hospital at home. *Cochrane Database Syst Rev*. 2008(4):CD007491. ★

Catheters

Doran AK, Ivy DD, Barst RJ, et al for Scientific Leadership Council of the Pulmonary Hypertension Association. Guidelines for the prevention of central venous catheter-related blood stream infections with prostanoid therapy for pulmonary arterial hypertension. *Int J Clin Pract* 2008; 160(suppl):5-9. ★

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Cystic Fibrosis

Balaguer A, Gonzalez de Dios J. Home intravenous antibiotics for cystic fibrosis. *Cochrane Database Syst Rev* 2008; 3:CD001917. ★

Wilkinson OM., Duncan-Skingle F., Pryor JA, Hodson ME. A feasibility study of home telemedicine for patients with cystic fibrosis awaiting transplantation. *J Telemed Telecare* 2008; 14:182-5. ★

Elderly

Mader SL, Medcraft MC, Joseph C, et al. Program at Home: A Veterans Affairs Healthcare Program to Deliver Hospital Care in the Home. *J Am Geriatr Soc* 2008; DOI:10.1111/j.1532-5415.2008.02006.x. ★

Enzyme Replacement Therapy

Bagewadi S, Roberts J, Mercer J, Jones S, Stephenson J, Wraith JE. Home treatment with Elaprase(R) and Naglazyme(R) is safe in patients with mucopolysaccharidoses types II and VI, respectively. *J Inherit Metab Dis* 2008; Oct 19:Epub ahead of print.

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Immunoglobulin

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Infections and Antibiotic Therapy

Hammond SP, Baden LR. Management of skin and soft-tissue infection- polling results. *N Engl J Med* 2008; DOI:10.1056/NEJMCLde0806337:e20. ★

Kallen AJ, Lederman E, Balaji A, et al. Bloodstream infections in patients given treatment with intravenous prostanoids. *Infect Control Hosp Epidemiol* 2008; 29(4):342-9.

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Savely VR. Update on lyme disease: the hidden epidemic. *J Infus Nurs* 2008; 31:236-40. ★

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Infusion Centres

Laney DJ, White AL, Rhead WJ, Fernhoff P. Creating genetics-based infusion centers: a case study of two models. *Genet Med* 2008; 10:626-32.

Miscellaneous

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Van Winkle P, Whiffen T, Liu I-LA. Experience Using Peripherally Inserted Central Venous Catheters for Outpatient Parenteral Antibiotic Therapy in Children at a Community Hospital. *Pediatr Infect Dis J* 2008; 27:1069-72.

Potential New Therapies

Laney DJ, White AL, Rhead WJ, Fernhoff P. Creating genetics-based infusion centers: a case study of two models. *Genet Med* 2008; 10:626-32.

Self-Care

O'Halloran L, El-Masri MM, Fox-Wasylyshyn SM. Home Intravenous Therapy and the Ability to Perform Self-care Activities of Daily Living. *J Infusion Nursing* 2008; 31:367-74. ★

Telemedicine

Wilkinson OM., Duncan-Skingle F., Pryor JA, Hodson ME. A feasibility study of home telemedicine for patients with cystic fibrosis awaiting transplantation. *J Telemed Telecare* 2008; 14:182-5. ★

Thrombosis

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Whilst every effort is made to reliably report the data and comments from the journal articles reviewed, no responsibility is taken for the accuracy of articles appearing in The HITH Review, and readers are advised to refer to the original papers for full details of the research.