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List of Medline, Cinahl and other relevant published articles

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The last issue of the HITH Review includes the recent updated systematic review of the effectiveness of hospital in the home management and a randomised controlled trial of daptomycin administration in the community setting which they refer to as community parenteral antibiotic therapy or CoPAT. Several other recently published journal articles 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 have found the HITH Review to be a valuable resource. If you want to contact us you can continue to email us at aca@alfred.org.au or call us on 03 9076 3535 until late June thereafter our contact number is 03 9076 6964.

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Relevant abstracts from Medline and Cinahl

Re-published Systematic Review

Shepperd S, Doll H, Angus RM et al. Avoiding hospital admission through provision of hospital care at home: a systematic review and meta-analysis of individual patient data. *Can Med Assoc J* 2009; 180:175-82. ★

Avoidance of admission through provision of hospital care at home is a scheme whereby health care professionals provide active treatment in the patient's home for a condition that would otherwise require inpatient treatment in an acute care hospital. We sought to compare the effectiveness of this method of caring for patients with that type of in-hospital care.

Methods: We searched the MEDLINE, EMBASE, CINAHL and EconLit databases and the Cochrane Effective Practice and Organisation of Care Group register from the earliest date in each database until January 2008. We included randomized controlled trials that evaluated a service providing an alternative to admission to an acute care hospital. We excluded trials in which the program did not offer a substitute for inpatient care. We performed meta-analyses for trials for which the study populations had similar characteristics and for which common outcomes had been measured.

Results: We included 10 randomized trials (with a total of 1327 patients) in our systematic review. Seven of these trials (with a total of 969 patients) were deemed eligible for meta-analysis of individual patient data, but we were able to obtain data for only 5 of these trials (with a total of 844 patients [87%]). There was no significant difference in mortality at 3 months for patients who received hospital care at home (adjusted hazard ratio [HR] 0.77, 95% confidence interval [CI] 0.54–1.09, $p=0.15$). However, at 6 months, mortality was significantly lower for these patients (adjusted HR 0.62, 95% CI 0.45–0.87, $p=0.005$). Admissions to hospital were greater, but not significantly so, for patients receiving hospital care at home (adjusted HR 1.49, 95% CI 0.96–2.33, $p=0.08$). Patients receiving hospital care at home reported greater satisfaction than those receiving inpatient care. These programs were less expensive than admission to an acute care hospital ward when the analysis was restricted to treatment actually

received and when the costs of informal care were excluded.

Interpretation: For selected patients, avoiding admission through provision of hospital care at home yielded similar outcomes to inpatient care, at a similar or lower cost.

RCT of Outpatient IV Daptomycin

Rehm S, Campion M, Katz DE, et al. Community-based outpatient parenteral antimicrobial therapy (CoPAT) for *Staphylococcus aureus* bacteraemia with or without infective endocarditis: analysis of the randomized trial comparing daptomycin with standard therapy. *J Antimicrob Chemother* 2009; 63:1034-42. ★

Objectives: Administering outpatient parenteral antimicrobial therapy in the community setting (CoPAT) is becoming more common with the increasing emphasis on controlling costs. However, few controlled trials have evaluated this treatment modality.

Methods: Using data from a recent randomized trial comparing daptomycin with standard therapy (semi-synthetic penicillin or vancomycin, each with initial low-dose gentamicin) for *Staphylococcus aureus* bacteraemia and infective endocarditis (SAB/IE), patient characteristics and outcomes were evaluated. Patients receiving their full course of therapy in the hospital setting were compared with those who received some portion outside of the hospital (CoPAT).

Results: Among the 200 patients, 51.5% received CoPAT. These patients were generally younger (median age 50 versus 54 years, $p=0.028$). In the CoPAT group, there tended to be fewer patients with endocardial involvement (8.7% versus 18.6%, $p=0.061$) and pre-existing valvular heart disease (7.8% versus 15.5%, $p=0.120$). CoPAT patients received longer therapy courses (mean 25.4 versus 13.5 days, $p<0.001$) and had higher rates of therapy completion (90.3% versus 45.4%, $p<0.001$) and clinical success (86.4% versus 55.7%, $p<0.001$). Persisting or relapsing *S. aureus* was less frequent in the CoPAT group (3.9% versus 15.5%, $p=0.007$) and there were fewer deaths (3.9% versus 18.6%, $p=0.001$) 6 weeks after the end of therapy. Hospital readmission occurred for 18 of the 103 (17.5%) CoPAT patients. Clinical success rates were similar for

CoPAT patients receiving daptomycin (90.0%) or standard therapy (83.0%).

Conclusion: With proper monitoring, stable patients can complete treatment for SAB/IE as outpatients in the community setting. Daptomycin is an appropriate option for this setting.

OPAT Cost Analysis

Yong C, Fisher DA, Sklar GE, Li SC. A cost analysis of Outpatient Parenteral Antibiotic Therapy (OPAT): an Asian perspective. *Internat J Antimicrob Agents* 2009; 33:46-51.

This study compared the actual costs and outcomes of care involving OPAT with conventional inpatient-only care at a university hospital in Singapore. Actual costs were obtained for selected patients enrolled in OPAT after 1 January 2005 and these costs were directly compared with those of age, gender and diagnosis matched patients managed as inpatients only prior to the availability of OPAT in the preceding 12 months. Outcomes of patients were also considered. The OPAT and inpatient-only groups comprised 72 and 93 enrollments, respectively. Mean treatment duration for OPAT patients was 42.5 days versus 19 days for those receiving inpatient-only care ($p < 0.001$). The mean total treatment cost for OPAT and inpatient-only care was US\$12,736 and \$12,403, respectively ($p = 0.706$). Mean cost per day for care including an OPAT episode was US\$278 versus \$457 per day for inpatient-only care ($p < 0.001$). There was no difference in outcomes between the two groups.

OPAT is a viable alternative to inpatient care as it is safe, effective and results in lower daily costs. The trend to longer treatment courses is worthy of further review.

Functional Outcomes in Elderly Patients

Leff B, Burton L, Mader SL et al. Comparison of Functional Outcomes Associated with Hospital at Home Care and Traditional Acute Hospital Care. *JAGS* 2009; 57:273-8.

Objectives: To compare differences in the functional outcomes experienced by patients cared for in Hospital at Home (HaH) and traditional acute hospital care.

Design: Survey questionnaire of participants in a prospective nonrandomized clinical trial.

Setting: Three Medicare managed care health systems and a Veterans Affairs Medical Center.

Participants: Two hundred fourteen community-dwelling elderly patients who required acute hospital admission for community-acquired pneumonia, exacerbations of chronic heart failure or chronic obstructive pulmonary disease, or cellulitis, 84 of whom were treated in HaH and 130 in an acute care hospital.

Intervention: Treatment in a HaH care model that substitutes for care provided in the traditional acute care hospital.

Measurements: Change in activity of daily living (ADL) and instrumental activity of daily living (IADL) scores from 1 month before admission to 2 weeks post admission to HaH or acute hospital and the proportion of groups that experienced improvement, no change, or decline in ADL and IADL scores.

Results: Patients treated in HaH experienced modest improvements in performance scores, whereas those treated in the acute care hospital declined (ADL, 0.39 vs. -0.60, $p = 0.10$, range -12.0 to 7.0; IADL 0.74 vs. -0.70, $p = 0.007$, range -5.0 to 10.0); a greater proportion of HaH patients improved in function and smaller proportions declined or had no change in ADLs (44% vs. 25%, $p = 0.10$) or IADLs (46% vs. 17%, $p = 0.04$).

Conclusion: HaH care is associated with modestly better improvements in IADL status and trends toward more improvement in ADL status than traditional acute hospital care.

Fluid & Electrolyte Replacement

Lybarger EH. Hypodermoclysis in the home and long-term care settings. *J Infusion Nursing* 2009; 32:40-4.



Hypodermoclysis is the subcutaneous administration of isotonic infusates to correct short-term fluid and electrolyte balances. It has recently begun to regain recognition as a safe and effective alternative to intravenous fluid hydration in the mild to moderately dehydrated patient, particularly in the areas of palliative care and long-term care. Hypodermoclysis is easy to establish and maintain and has fewer

complications than intravenous hydration. The medication hyaluronidase can be injected as a spreading agent to facilitate subcutaneous fluid absorption. Hypodermoclysis has the potential to help reduce the \$1 billion annual US cost of avoidable hospitalizations for dehydration

Evaluation of HITH for Cystic Fibrosis

Proesmans M, Heyns L, Moons P et al. Real life evaluation of intravenous antibiotic treatment in a paediatric cystic fibrosis centre: outcome of home therapy is not inferior. *Resp Med* 2009; 103:244-50.

Background: Limited data exist on the efficacy and safety of home intravenous antibiotic (IV-AB) therapy for pulmonary infection specifically in children with cystic fibrosis (CF).

Methods: We report on the outcome of IV-AB in the home vs. hospital setting based on retrospective single centre patient data from 1999 to 2004 (age >5 and <18 years). Treatment location was chosen based on estimation of competence, adherence, social background and patient preference. Primary outcome parameter was change in FEV(1). Secondary outcome parameters were weight and IgG as well as occurrence of complications.

Results: One hundred and thirty-one treatment observations were analysed for 47 patients. Mean age was 13.32 (± 2.9) years and mean FEV(1) 65 (± 19) % predicted. Fifty-four (41%) treatments were given at home and 77 (59%) were hospital treatments. Percent change in FEV(1) and weight gain was comparable in the 2 settings. Complications were rare in both groups.

Conclusion: The outcome of IV-AB therapy for lung infection in children with CF was not inferior in the home compared to the hospital setting. In our centre, home IV-AB treatment is a valuable treatment option for children with CF.

Monitoring Vancomycin Therapy

Rybak M, Lomaestro B, Rotschafer JC et al. Therapeutic monitoring of vancomycin in adult patients: A consensus review of the American Society of Health-System Pharmacists, the Infectious

Diseases Society of America, and the Society of Infectious Diseases Pharmacists. *Am J Health Syst Pharm* 2009; 66:82-98.

Summary

In general, pharmacodynamic dosing of antibiotics may significantly augment antibiotic performance. There seems to be little difference in the pharmacodynamics of intermittently or continuously dosed vancomycin. This consensus panel review supports that vancomycin is a concentration-independent killer of gram-positive pathogens and that the AUC/MIC is likely the most useful pharmacodynamic parameter to predict effectiveness.

In many clinical settings where it may be difficult to obtain multiple serum vancomycin concentrations to determine the AUC and subsequently the AUC/MIC, trough serum vancomycin concentration monitoring can be recommended as the most accurate and practical method to monitor serum vancomycin levels. Increasing trough serum vancomycin concentrations to 15–20 mg/L to obtain an increased AUC/MIC of ≥ 400 may be desirable but is currently not supported by clinical trial data. Target attainment of an AUC/MIC of ≥ 400 is not likely in patients with *S. aureus* infections who have an MIC of ≥ 2 mg/L; therefore, treatment with alternative agents should be considered. Higher trough serum vancomycin levels may also increase the potential for toxicity, but additional clinical experience will be required to determine the extent of this potential.

List of Medline, Cinahl and other relevant published articles

Biphosphonates

Hoffmann F, Jung TI, Felsenberg D, Glaeske G. Pattern of intravenous bisphosphonate use in outpatient care in Germany. *Pharmacoepidemiol Drug Safety* 2008; 17:896-903.

Biotherapy

Epperson LA, Williams J. Biotherapy: Operationalizing Delivery of Care While Managing Risk. *Infusion* 2009; 15:23-9. ★

Carers

Caress AL, Luker KA, Chalmers KI et al. A review of the information and support needs of family carers of patients with chronic obstructive pulmonary disease. *J Clin Nurs* 2009; 18:479-91.

Catheters

Bansal A, Binkert CA, Robinson MK et al. Impact of quality management monitoring and intervention on central venous catheter dysfunction in the outpatient chemotherapy infusion setting. *J Vasc Interventional Radiol* 2008; 19:1171-5.

Kramer N. Reducing heparin concentrations in the home care setting: A case study. *Infusion* 2009; 15:21-3.

Poole S. Central line infection: Improving our surveillance, treatment and prevention in the home setting. *Infusion* 2009; 15:31-5. ★

Chronic Heart Failure

Mortara A, Pinna GD, Johnson P et al. Home telemonitoring in heart failure patients: the HHH study (Home or Hospital in Heart Failure). *Eur J Heart Failure* 2009; 11:312-8.

Patel H, Höjgård S, Schaufelberger M et al. Worsening chronic heart failure and the link to frequent hospital admissions and need of specialist care. *Int J Integr Care* 2008; 8:e33.

COPD

Ansari K, Shamsain M, Farrow M, Keaney NP. Hospital-at-home care for exacerbations of chronic obstructive pulmonary disease: an observational cohort study of patients managed in hospital or by nurse practitioners in the community. *Chron Respir Dis* 2009; 6:69-74.

Cystic Fibrosis

Huot L, Durieu I, Bourdy S, et al. Evolution of costs of care for cystic fibrosis patients after clinical guidelines implementation in a French network. *J Cystic Fibrosis* 2008; 7:403-8.

Proesmans M, Heyns L, Moons P et al. Real life evaluation of intravenous antibiotic treatment in a paediatric cystic fibrosis centre: outcome of home therapy is not inferior. *Resp Med* 2009; 103:244-50.

Termoz A, Touzet S, Bourdy S et al. Effectiveness of home treatment for patients with cystic fibrosis: the intravenous administration of antibiotics to treat respiratory infections. *Pediatric Pulmonology* 2008; 43:908-15.

Diabetes

Nathan DM, Buse JB, Davidson MB et al. Medical Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy: A consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetes Care* 2009; 32:193-203.

Cost Analysis

Yong C, Fisher DA, Sklar GE, Li SC. A cost analysis of Outpatient Parenteral Antibiotic Therapy (OPAT): an Asian perspective. *Internat J Antimicrob Agents* 2009; 33:46-51.

Elderly

Leff B, Burton L, Mader SL et al. Comparison of Functional Outcomes Associated with Hospital at Home Care and Traditional Acute Hospital Care. *JAGS* 2009; 57:273-8. ★

Enzyme Replacement Therapy

Tiftt C, Proud V, Levy P et al. Enzyme replacement therapy in the home setting for mucopolysaccharidosis VI: a survey of patient characteristics and physicians' early findings in the United States. *J Infusion Nursing* 2009; 32:45-52. ★

Fluid & Electrolyte Imbalances

Lybarger EH. Hypodermoclysis in the home and long-term care settings. *J Infusion Nursing* 2009; 32:40-4. ★

GI Haemorrhage

Stanley AJ, Ashley D, Dalton HR et al. Outpatient management of patients with low-risk upper-gastrointestinal haemorrhage: multicentre validation and prospective evaluation. *Lancet Early Online* 2008; doi:10.1016/S0140-6736(08)61769-9. ★

Immunoglobulin Therapy

Rigas M, Tandan R, Sterling RJ. Safety of liquid intravenous immunoglobulin for neuroimmunologic disorders in the home setting: a retrospective analysis of 1085 infusions. *J Clin Neuromusc Dis* 2008; 10:52-5.

Infections and Antibiotic Therapy

Assimacopoulos A, Alam R, Arbo M et al. A Brief Retrospective Review of Medical Records Comparing Outcomes for Inpatients Treated via Telehealth Versus In-Person Protocols: Is Telehealth Equally Effective as In-Person Visits for Treating Neutropenic Fever, Bacterial Pneumonia, and Infected Bacterial Wounds? *Telemed e-Health* 2008; 14:762-8. ★

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Siu AL, Spragens LH, Inouye SK, Morrison RS, Leff B. The Ironic Business Case For Chronic Care In The Acute Care Setting. *Health Affairs* 2009; 28:113-25. ★

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Neame B. Delivering chemotherapy with a nurse-led cancer outreach service. *Nursing Times* 2008; 104:28-9. ★

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Bradley P, Tobias JD. An evaluation of the outside therapy of diabetic ketoacidosis in pediatric patients. *Am J Therapeutics* 2009; 15:516-9.

Zaoutis T, Localio AR, Leckerman K, et al. Prolonged Intravenous Therapy versus Early Transition to Oral Antimicrobial Therapy for Acute Osteomyelitis in Children. *Paediatrics* 2009; 123:636-642.

Parenteral Nutrition

Cheong EA, Katelaris CH, Sission CM et al. Adverse drug reactions associated with home parenteral therapy. *J Pharm Pract Res* 2008; 38:267-70. ★

Safety

Dillon LR. Applying Risk Management Techniques Used in the Medical Device Manufacturing to Home Infusion. *Infusion* 2009; 15:52-6. ★

Lazzerini PE, Acampa M, Hammoud M, et al. Arrhythmic risk during acute infusion of infliximab: a prospective, single-blind, placebo-controlled, crossover study in patients with chronic arthritis. *J Rheumatol* 2008; 35:1958-65.

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Thrombosis

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