Home is where the health is!
Presentation to HITH Symposium
Brisbane 31st March 2011

A/Prof Gideon Caplan
Director, Post Acute Care Services
Prince of Wales Hospital, Sydney, Australia
Contents

• HITH @ POWH
• Where did we start?
• Where did we go wrong?
• Where are we going?
• What does the research show us about HITH?
## Structure of service at Prince of Wales Hospital

<table>
<thead>
<tr>
<th>Post acute care</th>
<th>Acute care</th>
<th>Chronic Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation at home</td>
<td>Hospital in the Home</td>
<td>COPD</td>
</tr>
<tr>
<td>Orthopaedic</td>
<td>IV Antibiotics</td>
<td>Cancer</td>
</tr>
<tr>
<td>Geriatric</td>
<td>Clexane</td>
<td></td>
</tr>
</tbody>
</table>

**Staff work across all 3 sections, particularly on the weekend**

**24/7 365 days per year, but staff on active duty 13 hrs/day**
Post Acute Care Services at Prince of Wales Hospital

Medicare incentive program 1989
Orthogeriatric service
Original aims
  Decrease LOS for elderly orthopaedic pts
  Prevent unnecessary admissions
  Increase elective admissions
Original results ??????
Subsequent growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Project Description</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>Chronic Respiratory Disease Management</td>
<td>Unfunded</td>
</tr>
<tr>
<td>1994</td>
<td>General surgical post acute care (DoSA)</td>
<td>Research grant</td>
</tr>
<tr>
<td>1995</td>
<td>HITH</td>
<td>Research grant</td>
</tr>
<tr>
<td>1996</td>
<td>DEED (precursor of ASET)</td>
<td>Research grant</td>
</tr>
</tbody>
</table>
HITH evolution

• 1995 – 1 patient every fortnight in trial
• 1997 – post-trial,
  - evidence of effectiveness,
  - need to cultivate referrers
  - Gradual growth
• 2011 – 800+ patients/year
  - 40% from ED
  - Rest from wards, clinics, rooms, other hosps
So, what do you say after hello…?

• Develop protocols with referrers - specialities and ED, to make it (virtually) automatic

• Turn protocols into pathways

• Collect data to show that you are effective
Protocol for Management with the Hospital in the Home (HITH) service

Dr Susan Hertzberg, Staff Specialist-Emergency
Dr Robert Lindeman, Staff Specialist-Haematology

Protocol for Management with the Hospital in the Home (HITH) service

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INTERIM MANAGEMENT
(Note: Pt must comply with exclusion criteria below)

1. First dose of Enoxoparin
2. NO WARFARIN
3. Return next day for Doppler

CONSIDER CLINICAL TRIAL
(Mon - Fri 0730 - 1700)
Contact Haematology trials team on Extension 29095 or pager 44616 to establish pt suitability

DOPPLER
Diagnosis (By Doppler)

PACS OFFICE HOURS
(0830-2030, 7 days)

SUSPECTED DVT

AFTER HOURS

INTERNET MANAGEMENT
(Note: Pt must comply with exclusion criteria below)

1. First dose of Enoxoparin
2. NO WARFARIN
3. Return next day for Doppler

EXCLUSION CRITERIA

- Less than 18 years old
- Resides outside the PACS catchment area (see below)
- Does NOT have access to telephone
- IS NOT able to transfer and mobilise independantly (using an aid if necessary)
- Unwillingness of Nursing Home to participate in HITH treatment (if applicable)
- Allergy to heparin
- Concurrent pulmonary embolism
- Co-morbid condition requiring admission
- Major haemorrhagic risk
  (ie recent surgery, prior haemorrhage, stroke, intracranial malignancy)
- Active peptic ulcer disease
- Pt weight > 100kg
- Pre-existing thrombophilia (antithrombin III, protein C or S deficiency)
- Thrombocytopenia (platelets count < 100)
- Renal failure creatinine > 0.2umol/L
- Pregnancy
- DVT involving the iliac vessels or higher

NOTE: Pt. May be eligible despite these criteria, consult haematologist on call.

Haematology trials team will complete consent and other paper study paperwork then liaise with PACS re provision of home based treatment as per particular trial protocol.
MANAGEMENT

1. Registrar (ED or Medical) to contact PACS team (0830 - 2030 7 days) Extension 22470 or LINK Pager 87401 (Ring operator on 132222). If outside PACS hours of operation, complete documentation and place with details in PACS after hours book.

2. Take bloods for coagulation screen, FBC and EUC

3. Weigh Patient

4. If patient is taking anti platelet agent or oral contraceptive pill it should be ceased and pt. advised regarding alternative contraception.

5. Administer 1.5mg/kg of Enoxoparin subcutaneously

6. Administer 10mg of warfarin orally

7. Write internal prescriptions for:
   - Daily dose of Enoxoparin @1.5mg/kg for 7 days
   - Warfarin 1mg, 2mg, and 5mg tablets (10 of each)

8. Complete HITH Medical management plan

9. Prescribe medications on PACS medication chart as follows:
   - Enoxoparin 1.5mg/kg per day S/C
   - Warfarin 10mg day 1, 5mg day 2, and 5mg day 3 and thereafter according to INR

10. PACS to follow up at home for daily assessment, administration of enoxoparin, INR monitoring and titration of warfarin dose.

11. Pt. to have follow up in Haematology outpatients clinic in 2 weeks (PACS will arrange)

PACS catchment area:

Banksmeadow, Beaconsfield, Bondi Junction, Bondi, Botany, Bronte, Centennial Park, Chifley, Clovelly, Coogee, Daceyville, Eastlakes, Hillsdale, Kingsford, Kensington, La Perouse, Little Bay, Maroubra, Matraville, Malabar, Mascot, Phillip Bay, Randwick, Rosebery, Pagewood, Waverley, and Zetland.
Hospital in the home: a randomised controlled trial

Gideon A Caplan, John A Ward, Nicholas J Brennan, Janis Coconis, Neville Board and Ann Brown

Acute care of patients at home is one of the fastest-growing healthcare sectors in the United States\textsuperscript{1-3} and is gaining acceptance in many countries.\textsuperscript{4} Although there have been randomised controlled trials of patients receiving home versus hospital treatment for deep venous thrombosis,\textsuperscript{5} there are few data from trials involving other conditions, or assessing the safety of acute care at home, especially for older patients. It is these patients who occupy an increasing proportion of hospital beds and may derive most benefit from home treatment.\textsuperscript{6,7}

Recent studies characterising hospital care have

Abstract

Objectives: To compare treatment of acute illness at home and in hospital, assessing safety, effect on geriatric complications, and patient/carer satisfaction.

Design: Randomised controlled trial.

Setting: A tertiary referral hospital affiliated with the University of New South Wales.

Participants: 100 patients (69\% older than 65 years) with a variety of acute conditions, who were assessed in the emergency department as requiring admission to hospital.

Interventions: Patients were allocated at random to be treated by a hospital-in-the-home (HIH) service in their usual residence or to be admitted to hospital.

Main outcome measures: Geriatric complications (confusion, falls, urinary incontinence or retention, faecal incontinence or constipation, phlebitis and pressure areas), patient/carer satisfaction, adverse events, and death.

Patient Satisfaction

How would you rate your treatment overall?

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>90</td>
</tr>
<tr>
<td>Good</td>
<td>40</td>
</tr>
<tr>
<td>Fair</td>
<td>20</td>
</tr>
<tr>
<td>Poor</td>
<td>10</td>
</tr>
</tbody>
</table>

P<0.0001

HITH
Hospital
Carer Satisfaction

How would you rate the treatment overall?

P=0.0001
<table>
<thead>
<tr>
<th></th>
<th>HITH</th>
<th>Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>$1794</td>
<td>$3614</td>
</tr>
<tr>
<td>95% CI</td>
<td>$1438-2150</td>
<td>$2881-4347</td>
</tr>
<tr>
<td>P</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>
HITH Conclusions

• HITH offers selected patients
  - Decreased complications
  - Greater patient satisfaction
  - at lower cost

• The Hospital is not dead

• HITH is a viable, cost-effective option
REACH OUT TRIAL

- Rehabilitation of
- Elderly patients
- And
- Care at
- Home

- Or
- Usual
- Treatment
Does home treatment affect delirium? A randomised controlled trial of rehabilitation of elderly and care at home or usual treatment (The REACH-OUT trial)

Gideon A. Caplan1,2, Janis Coconis1, Neville Board3, Allyn Sayers1, Jan Woods1

1Post Acute Care Services, Prince of Wales Hospital, Randwick, Sydney, New South Wales 2031, Australia
2School of Public Health and Community Medicine, University of New South Wales, Sydney, New South Wales 2052, Australia
3Department of Health, North Sydney, New South Wales 2060, Australia

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Abstract

Background: delirium is a frequent adverse consequence of hospitalisation for older patients, but there has been little research into its prevention. A recent study of Hospital in the Home (admission substitution) noted less delirium in the home-treated group.

Setting: a tertiary referral teaching hospital in Sydney, Australia.

Methods: we randomised 104 consecutive patients referred for geriatric rehabilitation to be treated in one of two ways, either in Hospital in the Home (early discharge) or in hospital, in a rehabilitation ward. We compared the occurrence of delirium measured by the confusion assessment method. Secondary outcome measures were length of stay, hospital bed days, cost of acute care and rehabilitation, functional independence measure (FIM), Mini-Mental State Examination (MMSE) and geriatric depression score (GDS) assessed on discharge and at 1- and 6-month follow-up and patient satisfaction.
### REACH OUT Baseline Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Home Rehab</th>
<th>Hospital Rehab</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>70</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td><strong>Age - Mean</strong></td>
<td>83.9</td>
<td>84.0</td>
<td>0.93</td>
</tr>
<tr>
<td><strong>Sex (F:M)</strong></td>
<td>43:20</td>
<td>22:11</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>IHD n (%)</strong></td>
<td>29 (46.03)</td>
<td>19 (57.58)</td>
<td>0.39</td>
</tr>
<tr>
<td><strong>Diabetes n (%)</strong></td>
<td>7 (11.11)</td>
<td>4 (12.12)</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Dementia n (%)</strong></td>
<td>17 (27.0)</td>
<td>7 (21.2)</td>
<td>0.63</td>
</tr>
</tbody>
</table>
## Length of stay

<table>
<thead>
<tr>
<th></th>
<th>Home</th>
<th>Hospital</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute LOS</td>
<td>18.7</td>
<td>17.0</td>
<td>0.45</td>
</tr>
<tr>
<td>Rehabilitation LOS</td>
<td>16.0</td>
<td>23.1</td>
<td>0.016</td>
</tr>
<tr>
<td>Total length of episode of care</td>
<td>34.9</td>
<td>40.1</td>
<td>0.18</td>
</tr>
<tr>
<td>Hospital bed days</td>
<td>20.3</td>
<td>40.1</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

REACH OUT study
Positive Confusion Assessment Method (CAM) during rehabilitation

REACH OUT study
Functional Independence Measure (FIM)

REACH OUT study
Mini Mental State Examination (MMSE)

Between groups p=0.085

REACH OUT study
Geriatric Depression Scale

REACH OUT study
Patient satisfaction with overall quality of care received from the rehabilitation team

P = 0.006

REACH OUT study
## REACH OUT Costing

<table>
<thead>
<tr>
<th>Cost</th>
<th>Home</th>
<th>Hospital</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute phase</td>
<td>$13,292</td>
<td>$11,003</td>
<td>0.234</td>
</tr>
<tr>
<td>Rehabilitation phase</td>
<td>$ 5,954</td>
<td>$14,413</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total</td>
<td>$18,147</td>
<td>$25,042</td>
<td>0.011</td>
</tr>
</tbody>
</table>

REACH OUT study
Conclusion

• Alternatives to hospitalisation for older patients, where feasible, offer
  - superior health outcomes,
  - greater patient satisfaction
  - at a lower cost
Does ‘Hospital in the Home’ treatment prevent delirium?

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E-mail: g.caplan@unsw.edu.au

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.
If HITH can prevent delirium, what are the implications?

• What is associated with delirium?
  - Many bad outcomes
  - Death
  - Cognitive and functional decline
  - Nursing home placement
Meta-analysis protocol
Caplan GA, Sulaiman N, Mangin D, Aimonino Ricauda N, Wilson A, Barclay L.

- Meta-analysis of RCTs of HITH where the HITH substituted for a sig. time in hospital as defined by >25% LOS of control group, or at least 1 week, and where treatment had a restorative or curative intent, ie not palliative

- Adult patients
- 38 studies with data on mortality
- 17 additional studies
What are the effects of HITH?

- Mortality
- Readmission
- Satisfaction
  - Patient
  - Carer
- Cost
- Total 55 included studies
Study Selection

1568 Potentially relevant studies identifies

1428 Excluded
710 not Hospital in the Home
5 not RCTs
690 duplicate publications
23 reviews

140 studies retrieved for more detailed evaluation

85 Excluded
65 Not Hospital in the Home
12 Duplicate publication
4 Reviews
4 Did not meet 25%/7 day criterion

55 studies included in meta-analysis
Mortality

• 38 randomised controlled trials
• 6318 patients
• Subdivided into
  - Medical
  - Rehabilitation
  - Surgical/cancer
  - Psychiatry
<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>HITH Events</th>
<th>Total Events</th>
<th>Hospital Events</th>
<th>Total Events</th>
<th>Weight</th>
<th>Odds Ratio Peto, Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caplan 1999</td>
<td>6</td>
<td>51</td>
<td>7</td>
<td>49</td>
<td>1.9%</td>
<td>0.80 [0.25, 2.57]</td>
</tr>
<tr>
<td>Carratalà 2005</td>
<td>1</td>
<td>102</td>
<td>0</td>
<td>101</td>
<td>0.3%</td>
<td>3.00 [0.12, 74.52]</td>
</tr>
<tr>
<td>Cotton 2000</td>
<td>1</td>
<td>41</td>
<td>2</td>
<td>40</td>
<td>0.4%</td>
<td>0.47 [0.04, 5.46]</td>
</tr>
<tr>
<td>Davies 2000</td>
<td>9</td>
<td>100</td>
<td>4</td>
<td>50</td>
<td>1.7%</td>
<td>1.14 [0.33, 3.89]</td>
</tr>
<tr>
<td>Diaz Lobato 2005</td>
<td>0</td>
<td>20</td>
<td>1</td>
<td>20</td>
<td>0.2%</td>
<td>0.32 [0.01, 8.26]</td>
</tr>
<tr>
<td>Hernandez 2003</td>
<td>5</td>
<td>121</td>
<td>7</td>
<td>101</td>
<td>1.9%</td>
<td>0.58 [0.18, 1.88]</td>
</tr>
<tr>
<td>Hill 1978</td>
<td>17</td>
<td>132</td>
<td>14</td>
<td>132</td>
<td>4.7%</td>
<td>1.25 [0.59, 2.64]</td>
</tr>
<tr>
<td>Koopman 1996</td>
<td>14</td>
<td>202</td>
<td>16</td>
<td>198</td>
<td>4.7%</td>
<td>0.85 [0.40, 1.79]</td>
</tr>
<tr>
<td>Levine 1996</td>
<td>11</td>
<td>247</td>
<td>17</td>
<td>253</td>
<td>4.3%</td>
<td>0.65 [0.30, 1.41]</td>
</tr>
<tr>
<td>Mather 1976</td>
<td>44</td>
<td>226</td>
<td>58</td>
<td>224</td>
<td>13.3%</td>
<td>0.69 [0.44, 1.08]</td>
</tr>
<tr>
<td>Melin 1992</td>
<td>40</td>
<td>150</td>
<td>26</td>
<td>99</td>
<td>7.9%</td>
<td>1.02 [0.57, 1.82]</td>
</tr>
<tr>
<td>Ojoo 2002</td>
<td>1</td>
<td>30</td>
<td>3</td>
<td>30</td>
<td>0.5%</td>
<td>0.31 [0.03, 3.17]</td>
</tr>
<tr>
<td>Ricauda 2008</td>
<td>9</td>
<td>52</td>
<td>12</td>
<td>52</td>
<td>2.8%</td>
<td>0.70 [0.27, 1.83]</td>
</tr>
<tr>
<td>Richards 1998</td>
<td>12</td>
<td>160</td>
<td>6</td>
<td>81</td>
<td>2.5%</td>
<td>1.01 [0.37, 2.81]</td>
</tr>
<tr>
<td>Shepperd 1998</td>
<td>3</td>
<td>15</td>
<td>3</td>
<td>17</td>
<td>0.8%</td>
<td>1.17 [0.20, 6.89]</td>
</tr>
<tr>
<td>Skwarska 2000</td>
<td>4</td>
<td>122</td>
<td>6</td>
<td>62</td>
<td>1.5%</td>
<td>0.32 [0.09, 1.17]</td>
</tr>
<tr>
<td>Tibaldi 2004</td>
<td>24</td>
<td>56</td>
<td>26</td>
<td>53</td>
<td>4.6%</td>
<td>0.78 [0.37, 1.66]</td>
</tr>
<tr>
<td>Wilson 1999</td>
<td>26</td>
<td>101</td>
<td>30</td>
<td>96</td>
<td>6.8%</td>
<td>0.76 [0.41, 1.42]</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>1928</strong></td>
<td><strong>1658</strong></td>
<td></td>
<td><strong>61.2%</strong></td>
<td></td>
<td><strong>0.79 [0.64, 0.98]</strong></td>
</tr>
</tbody>
</table>

Total events: 227, 238
Heterogeneity: Chi² = 7.54, df = 17 (P = 0.98); I² = 0%
Test for overall effect: Z = 2.19 (P = 0.03)
### 3.1.2 Surgical

<table>
<thead>
<tr>
<th>Study</th>
<th>Total</th>
<th>Controls</th>
<th>Cases</th>
<th>Event Rate</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonnema 1998</td>
<td>1</td>
<td>61</td>
<td>0</td>
<td>59</td>
<td>0.3%</td>
<td>2.95 [0.12, 73.88]</td>
</tr>
<tr>
<td>Bundred 1998</td>
<td>1</td>
<td>49</td>
<td>1</td>
<td>51</td>
<td>0.3%</td>
<td>1.04 [0.06, 17.13]</td>
</tr>
<tr>
<td>Crotty 2002</td>
<td>3</td>
<td>34</td>
<td>4</td>
<td>32</td>
<td>1.1%</td>
<td>0.68 [0.14, 3.29]</td>
</tr>
<tr>
<td>Shepperd 1998</td>
<td>0</td>
<td>37</td>
<td>1</td>
<td>49</td>
<td>0.3%</td>
<td>0.43 [0.02, 10.89]</td>
</tr>
<tr>
<td>Wells 2004</td>
<td>2</td>
<td>54</td>
<td>3</td>
<td>54</td>
<td>0.8%</td>
<td>0.65 [0.10, 4.08]</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>235</td>
<td>245</td>
<td></td>
<td>2.7%</td>
<td></td>
<td>0.78 [0.29, 2.10]</td>
</tr>
</tbody>
</table>

**Total events**
- Total: 7
- Controls: 9

**Heterogeneity**
- Chi² = 0.89, df = 4 (P = 0.93); I² = 0%

**Test for overall effect**
- Z = 0.49 (P = 0.62)
### 1.1.3 Rehabilitation studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Total Events</th>
<th>Events</th>
<th>N</th>
<th>Event Rate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson 2000</td>
<td>21</td>
<td>2</td>
<td>42</td>
<td>0.3%</td>
<td>5.49 [0.26, 117.88]</td>
</tr>
<tr>
<td>Askim 2004</td>
<td>8</td>
<td>8</td>
<td>31</td>
<td>1.6%</td>
<td>1.81 [0.52, 6.31]</td>
</tr>
<tr>
<td>Bautz-Holter 2002</td>
<td>2</td>
<td>2</td>
<td>42</td>
<td>0.8%</td>
<td>0.45 [0.08, 2.61]</td>
</tr>
<tr>
<td>Caplan 2006</td>
<td>15</td>
<td>15</td>
<td>70</td>
<td>2.5%</td>
<td>1.05 [0.38, 2.88]</td>
</tr>
<tr>
<td>Donnelly 2004</td>
<td>1</td>
<td>1</td>
<td>59</td>
<td>0.5%</td>
<td>0.22 [0.02, 1.99]</td>
</tr>
<tr>
<td>Indredavik 2000</td>
<td>21</td>
<td>21</td>
<td>160</td>
<td>6.6%</td>
<td>0.78 [0.42, 1.45]</td>
</tr>
<tr>
<td>Kalra 2000</td>
<td>21</td>
<td>21</td>
<td>144</td>
<td>8.2%</td>
<td>0.92 [0.53, 1.61]</td>
</tr>
<tr>
<td>Mayo 2000</td>
<td>2</td>
<td>2</td>
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<td>0.3%</td>
<td>5.00 [0.23, 106.50]</td>
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<tr>
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<td>1</td>
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<td>46</td>
<td>0.5%</td>
<td>0.23 [0.03, 2.17]</td>
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<tr>
<td>Rudd 1997</td>
<td>26</td>
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<td>167</td>
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<td>0.5%</td>
<td>0.31 [0.03, 3.10]</td>
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**Subtotal (95% CI)**

<table>
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<tr>
<th>Total Events</th>
<th>Events</th>
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<th>Event Rate</th>
<th>95% CI</th>
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<tr>
<td>972</td>
<td>1080</td>
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**Total events**

<table>
<thead>
<tr>
<th>Total events</th>
<th>Total N</th>
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</thead>
<tbody>
<tr>
<td>122</td>
<td>158</td>
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</table>

**Heterogeneity**

- Chi² = 9.41, df = 12 (P = 0.67); I² = 0%
- Test for overall effect: Z = 1.38 (P = 0.17)
Overall

- Mortality reduced by 19%; \( p=0.01 \)
- From 13.14% to 11.04%
- Absolute Risk Reduction 2.10%
- Number needed to treat in HITH to save one life is 48
Comparison

- Treatment of Hypertension in the elderly (Cochrane Review)
  NNT for 5 yrs to prevent one death = 63
- Antiplatelet therapy for acute stroke (Cochrane Review)
  NNT to prevent one death = 77
Readmission

- 34 RCTs 4856 patients
- Measured in number of patients readmitted. (Total number of readmissions is greater)
- An important measure of quality of care and a health outcome
### Medical

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>MITH Events</th>
<th>Hospital Total</th>
<th>Test</th>
<th>Weight</th>
<th>Odds Ratio</th>
<th>95% CI</th>
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<th>Test</th>
<th>Weight</th>
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### Rehabilitation

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### Psychiatric

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<th>MITH Events</th>
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<td>0.02 0.60</td>
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<td>Zwering 1994</td>
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<td>0.81 0.48</td>
<td>1.43</td>
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</tbody>
</table>

### Summary

- Total events: 217
- Heterogeneity: Chi² = 17.04, df = 13 (P = 0.20), I² = 24%
- Test for overall effect: Z = 1.00 (P = 0.07)

- Total events: 514
- Heterogeneity: Chi² = 5.60, df = 6 (P = 0.60), I² = 0%
- Test for overall effect: Z = 1.70 (P = 0.09)

- Total events: 107
- Heterogeneity: Chi² = 0.20, df = 8 (P = 0.81), I² = 0%
- Test for overall effect: Z = 0.27 (P = 0.79)

- Total events: 84
- Heterogeneity: Chi² = 36.11, df = 3 (P = 0.0001), I² = 92%
- Test for overall effect: Z = 1.80 (P = 0.07)

- Total events: 409
- Heterogeneity: Chi² = 26.94, df = 35 (P = 0.0005), I² = 49%
- Test for overall effect: Z = 2.66 (P = 0.01)
- Test for subgroup differences: Chi² = 2.99, df = 3 (P = 0.41), I² = 0%
Readmission

- Odds ratio 0.80 (95% CI 0.68-0.95)
- Relative Risk Reduction 20%, p = 0.01
- Reduced from 18.80% to 17.05%
- Number needed to treat in HITH to prevent one re-admission is 58
Costing

• 36 RCTs
• In 31 studies HITH was cheaper
• On average, HITH cost 76.2% of inpatient care
Satisfaction

- **Patient satisfaction**
  - 25 RCTs
  - All in favour of HITH

- **Carer Satisfaction**
  - 9 RCTs
  - 7 in favour of HITH
  - 1 in favour of in-hospital
  - 1 neutral
Conclusion

- Meta-analysis demonstrates treatment in HITH leads to
  - 20% ↓ in deaths
  - 21% ↓ in patients readmitted
  - 24% ↓ in costs
- General ↑ in patient satisfaction
HITH in New South Wales

- Variable models exist across the state
  - Department based
  - Hospital model
  - Area Health Service model
  - Inpatient versus outpatient
  - Different patient groups
- Urban + rural
- Good communication between services, eg referrals, State-wide steering committee
- Innovation and research
• Society for clinicians (doctors, nurses and allied health) working in HITH
• Founded 2007
• Annual Conference
• www.hithsociety.org.au
4TH ANNUAL
HITH SOCIETY AUSTRALASIA
SCIENTIFIC CONFERENCE

Bringing it Home

Sydney, 17-18 Nov 2011
Thank you! Please come and visit.