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Community health care in Europe: a review of technologies

Draft report

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1 Introduction

Across European countries, improving the cost-effectiveness of the health care system and addressing daily needs of patient with chronic diseases, responsible for 70-80% of the healthcare budget, is seen as an acute policy need. In that context, many countries have increased the emphasis given to delivering services in the community in the hope of avoiding unnecessary use of acute, hospital-based care.

The extent to which a shift towards community health care services is being promoted and achieved, and the policy mechanisms and interventions used for that purpose vary from country to country.

This report explores the analysis of the evidence about the potential impact of different health care technologies in promoting community-based health care services. The second (page 145) summarises a review of recent policy reforms in 5 European countries aimed at increasing the role of community-based care.

1.1 Methods

The analysis is based on a review of Cochrane reviews of different types of technologies that have the potential to shift care into the community.

The advantage of reviewing Cochrane Reviews (in comparison to reviewing all trials) is that it provides a rigorous synthesis of costs and outcomes and its limitations (methodological strength and extent of bias).

A list of search terms and the number of hits are included in Appendix 1 (Table 1). Studies were selected on the basis of a first screening on title and abstract and a second screening based on full text.

The organization of the analysis codes each Review into one of three expected effects on the balance of care: substitution of hospital care, reducing length of stay, or preventing admissions to hospital. These results are summarized in Appendix 1, Table 2, Figures 1,2, and 3.

A total of 143 reviews were ultimately included, covering 35 areas categorized into either conditions or populations: for example, heart disease, maternity, elderly people, cancer, etc. In searching the literature, Reviews took either one of two starting points: targeting a single condition or clinical population while in others it targeted a specific intervention. We applied our own categorization, in some cases, grouping together infant and pre and post-natal care Reviews under the category of ‘maternity’ and in other cases, creating a group of studies linked to ‘elderly issues’ where these relate to falls prevention and associated rehabilitation, but did not keep it so broad so as to subsume categories like stroke, hip/knee, and dementia, as these categories all were allocated their own groups. The summarized results of included Reviews are presented, for a total of 35 categories, in Appendix 2. Reviews were also coded based on the

mechanism driving the primary impact (i.e. telemedicine, self management, service configuration, additional staff, assistive device, substitution, benchmarking, etc.) and these are also presented within the tabled summaries in Appendix 2.

1.2 Structure of the report

Out of the 143 included reviews, a select number were given further analysis and are summarized in Sections 1, 2, and 3 through narrative and tabled summaries. Section one covers reviews with the potential to substitute for care in the community, Section two covers those interventions that can reduce the length of stay in hospital, and Section three covers areas that can prevent the need for acute care.

Each narrative summary provides high-level analyses on the types of drivers in each area, for example, assistive devices or telemedicine. The narrative summary is also accompanied by summary tables that provide a brief overview of the intervention, population, some study details regarding sample size, countries included, methodological rigour, and general results on patient and carer outcomes (positive, negative, no difference) and on resource use (increase, decrease, no difference). The summaries indicate to what extent these technologies are able to shift the balance of care in highlighting where effectiveness and cost-effectiveness or net benefit data are available.

1.3 Summary of results: challenges in drawing conclusions from the evidence base

- A common feature of most reviews is that it was not always possible to clearly identify what works best. Often the conclusions are not overly optimistic to recommend a change in practice but nor were conclusions so pessimistic to suggest disinvesting in activity. In these cases, cost-effectiveness analyses would have been useful but they were not identified in a majority of reviews. In some studies, net costs were reported; and economic evaluations were carried out in a few studies.
- Length of stay and readmissions were commonly reported and in most studies, were calculated clearly.
- Often, it was not possible to draw robust conclusions on patient outcomes. In most studies there was heterogeneity of intervention models; where heterogeneity is substantial, patient outcome results are not as reliable compared to when intervention models differ less markedly.
- In some reviews, results are more optimistic where, even though different measurement tools are used (for example, for depression, anxiety, or functional ability) the findings show a consistent effect in a particular direction.
- In other reviews, there may have been variability in the number of studies measuring a particular outcome; for example, a proportion of studies did not report on admissions, length of stay, or mortality.
- In other cases, the review authors noted that for certain outcomes that may be rare (for example, mortality or infections), the sample sizes were not large enough to adequately detect those differences - although this affected only a small number of reviews.

- Where costs were reported, different methods were used, sometimes were not described and sometimes used different payer perspectives.
- The quality of studies varied, in some cases quality was unclear because there was poor reporting of the study methodology.
- Carer outcomes, where relevant, were reported some of the time.
- Patient satisfaction was reported some of the time but not in a large majority of studies.

In sum, while Cochrane Reviews do provide a degree of rigor to analyses, often times the available research has not been carried out to a sufficiently large scale with robust methodology in order to make strong and definitive conclusions. In most Reviews, conclusions do look promising to some extent, although there may be a fair amount of uncertainty associated with it, in particular in relation to net benefit.

1.4 Short-list of evidence: comparatively strong and promising evidence or where more research is needed

Even with these limitations, it is still possible to compile a short-list of interventions classified by whether there is comparatively strong evidence of effectiveness, promising evidence of effectiveness, where more research would be beneficial and where no studies were identified, and which reviews are currently in development. These are presented in the following tables.

Comparatively strong evidence of effectiveness		
Substitution Effect	Length of stay reduction	Admission Prevention
Maternity – Women with multiple birth pregnancy (Crowther & Ham 2010) ***Adults & elderly with acute, chronic, or life limiting conditions*** – Stable COPD (Jeppesen 2012) – Deep vein thrombosis (Othieno 2007) ***Elderly*** – Stroke recovery (Shepperd 2009) ***Rehabilitation*** – Acute myocardial infarction and revascularisation (Taylor 2012)	***Maternity*** – Pre-term infants (New 2011) – Healthy mothers & infants (Brown 2002) ***Adults & elderly with acute, chronic, or life limiting conditions*** – Stroke (Fearon 2012) (Stroke Unit Trialists' Collaboration 2013) – Heart Failure (Takeda 2012)	***Adults & elderly with acute, chronic, or life limiting conditions*** – COPD (Kruis 2013) – Heart failure (Inglis 2010)

Comparatively promising evidence of effectiveness		
Substitution Effect	Length of stay reduction	Admission Prevention
Adults & elderly with acute, chronic, or life limiting conditions – Cystic fibrosis (Balaguer 2012) ***Maternity*** – Women in post-partum period (Yanemoto 2013) – Preterm pre-labour rupture of membranes (PROM) (Abou 2010) – Pregnancy complications due to high blood pressure or PROM (Dowswell 2009) ***Children*** – Newly diagnosed diabetics (Parab 2013) – Range of chronic conditions (Parab 2013) – Cancer (Parab 2013) – Acute bronchiolitis (Parab 2013) ***End-of-life care*** – Various patients Gomes (2012) ***Elderly*** – Stroke recovery (Shepperd 2009) – COPD, Surgery or fracture recovery (Shepperd 2009) – Stroke, COPD, other acute medical conditions (Shepperd 2008)	***Adults & elderly with acute, chronic, or life limiting conditions*** – Patients receiving intermediate care (Griffiths 2009) – Stroke (Rotter 2010) ***Maternity*** – Pregnant women expecting labour (Lauzon 2001) – Pre-term infants (McCormick 2010) (Collins 2003)	***Adults & elderly with acute, chronic, or life limiting conditions*** – Heart failure (Inglis 2010) – Orthopaedics (Gruen 2010) – COPD (Wong 2012) – Acute inpatients (McGaughey 2007) – Tuberculosis (Liu 2008) – Various hospital patients post-discharge (Mistiaen 2006) – General population in hospital emergency (Khangura 2012) ***Maternity*** – Women in post-partum period of pregnancy (Yonemoto 2013) – Women monitoring signs of active labour (Urquhart 2012) – Women in labour, fetal assessment (Khunpradit 2011) (Nabhan 2008) ***Elderly*** – Older people in nursing homes (Hall 2011)

– Elderly individuals' general health care (Forster 2008) ***Rehabilitation*** – Multiple sclerosis and experiencing ataxia (Mills 2007) – Lumbar disc surgery recovery (Ostelo 2008) – Habitually sedentary adults without cardiovascular disease (Ashworth 2005) – Peripheral arterial disease with intermittent claudication (Fokkenrood 2012; Ashworth 2005)		

More research needed		
Substitution Effect	Length of stay reduction	Admission Prevention
Adults & elderly with acute, chronic, or life limiting conditions – Elective surgery (Shepperd 2009) ***Maternity*** – Low risk pregnancies (Olsen & Clausen 2012) – Pregnancies with placenta praevia (Neilson 2003) – Pregnancies at risk of miscarriage (Aleman 2005) ***Children*** – Range of acute illnesses (Parab 2013) – Acute bleeds (Parab 2013)	***Adults & elderly with acute, chronic, or life limiting conditions*** – Acute inpatients using mechanical ventilation (Rotter 2010) ***Maternity*** – Pregnancies with pre-labour rupture of membranes (PROM) (Buchanan 2010)	***Adults & elderly with acute, chronic, or life limiting conditions*** – Stroke (Kwan 2004) ***Maternity*** – Women in active labour Lauzon (1998)

Rehabilitation – Stroke with upper limb disability (Coupar 2012) – COPD (Ashworth 2005) ***End-of-life care*** – Various patients (Gomes 2012)		

Research where no studies were identified		
Substitution Effect	Length of stay reduction	Admission Prevention
Rehabilitation – Elderly rehabilitation (Ward 2008)	NA	***End-of-life care*** – Various patients (Chan 2013)

Protocols		
Substitution Effect	Length of stay reduction	Admission Prevention
Adults & elderly with acute, chronic, or life limiting conditions – **Acute pulmonary embolism** (Yoo 2012) – **Elective primary total knee arthroplasty** (Westby 2008) ***Elderly*** (Young 2012)	***Children*** – Paediatric cancer with febrile neutropenia (Poele 2010) ***Maternity*** – Pre-term infants (Watson 2009)	***Children*** – Asthma (Lasserson 2010) ***Maternity*** – Pre-term infants (Webster 2002) – Asthma during pregnancy (Bain 2013) ***Elderly*** – Preventing falls (Udell 2011) – Functional ability and reablement services (Cochrane 2013) ***Adults & elderly with acute, chronic, or life limiting conditions*** – Asthma in adults (Roy 2011) (Peytremann-Bridevaux 2009)

		– Asthma during cancer (Howell 2012) – Ankylosing Spondylitis (Felix 2008) – COPD (York 2010) – Chronic Disease, various (Carson 2012) – Dementia (Van der Roest 2012) (Reilly 2010) – Diabetes (Upadhyay 2007) – HIV/ AIDs (Martin 2010) – Hip arthroplasty (Jepson 2013) – Lower limb peripheral arterial disease (Inglis 2012) – Stroke (Fryer 2013)

2 Substituting community care for hospital care

2.1 Summary

- **Total number of reviews.** A total of 43 Reviews were coded with the potential to substitute acute care for care in the community either through care at home or in outpatient facilities.

- **Reviews selected for further analysis.** 29 Reviews were selected for further analysis. Seven of which focus on rehabilitation, three on children, one on end-of-life care, eight on women in the pre and postnatal period, four on adult or elderly patients with acute, chronic, or life limiting conditions, and three reviews on elderly patients with chronic conditions. These reviews were selected for further analysis to cover a broad range of areas.

- **Availability of cost-effectiveness evaluations.** There were no cost-effectiveness analyses. Costing methodologies were varied and different types of healthcare resource data were collected. Community health care service use was not comprehensively reported in a majority of studies.

- **Potential impact on carers.** However, substituting care out of hospital in the community can align with patient preferences. Many models of health care at home exist, some of which may require additional support for carers, as indicated by conflicting carer outcomes related to satisfaction, burden or stress.

- **Summarized results**, in both narrative and tabled formats, are presented for each population group in the following sections.

2.2 Substitution effect: interventions targeted at children

- **Number of Reviews:** One recent review focused on children with acute or chronic illness and the potential for substituting home treatment for inpatient care (Parab et al 2013).

- **Promising evidence**.
    1. **Children that are newly diagnosed with diabetes** may experience improved outcomes with home treatment compared to hospital treatment in terms of patient process and final outcomes. Results are based on one Canadian with moderate risk of bias (Dougherty 1998).

    2. **Children with a range of chronic conditions** may benefit from intense nursing support two weeks prior to planned hospital admission with continued support for a further two weeks after hospital discharge compared to standard care. Parent's outcomes were also improved. Results are based on one Canadian study with good quality (Burke 1997).

    3. **Children with cancer** may benefit from chemotherapy at home delivered by community pharmacies & administered by community nurses compared to standard inpatient care. An economic evaluation was carried out and found no differences in costs. There were no differences in carer or patient outcomes. Results are based on one Canadian study with unclear risk of bias (Stevens 2006).

    4. **Children with acute bronchiolitis** may benefit from home oxygen therapy compared to the same therapy in hospital in terms of reduced length of stay and admissions to hospital. Patient and carer outcomes were not reported. Results are based on one Australian study with unclear risk of bias (Tie 2009).

- **More research is needed.**
    5. **Children with a range of acute illnesses** may benefit from nurse contacts at home between 1-4 times a day compared to inpatient care. Evidence from one UK study with unclear quality shows that there were no differences in 90-day hospital readmissions and the intervention reduced individual private costs. More research is needed to understand the impact on patient outcomes, as these were not recorded. Results are based on one UK study with unclear quality (Sartain 2001).

    6. **Children with acute bleeds** may benefit from 24-hour home or school nursing service compared to inpatient treatment in terms of quicker access to care and lower chance of severe bleeds. The intervention was associated with more frequent low-risk bleeds. There were no differences in mortality. The intervention had higher number of home nursing treatment days. More research is needed as the result is based on one old US study with high risk of bias (Strawczynski 1973).

Notes: NR = Not reported; ND = No Difference; Pos. = Positive effect; Dec. = decreased; Mod. = Moderate; EE = economic evaluation

Interventions targeted at children									
Review Author	**Population**	**Intervention**	**Outcomes**				**Resource Use**	**Bias**	**Countries, Authors**
			Process	Final	Death	Carer			
Promising evidence									
Parab 2013	New diagnosis of diabetes	Extended period home care with nursing staff vs. inpatient care	Pos.	Pos.	NR	NR	Yes EE, slightly higher cost	Mod	Canada Dougherty 1998
Clar 2007		Outpatient or Home management vs. Inpatient care	Inconclusive due to low quality and limited applicability					High	USA, Canada, Finland, Israel
Parab 2013	Chronic condition	Intense nursing support 2 weeks before planned hospital admission & continued until 2 weeks after hospital discharge vs. 'usual care' (not described)	NR	Pos.	NR	Pos.	No EE	Low	Canada Burke 1997
Parab 2013	Cancer	Chemotherapy at home delivered by community pharmacies & administered by community nurses vs. inpatient	NR	ND, behaviour, social competence, or quality of life	NR	ND	Yes EE, ND in costs	Not clear	Canada Stevens 2006
Parab 2013	Acute bronchiolitis	Home oxygen therapy vs. same therapy in hospital	NR	NR	NR	NR	No EE, Decreased length of stay & admissions	Not clear	Australia Tie 2009
More research needed									
Parab 2013	Acute illness	Nurse contacts at home between 1-4 times a day vs. inpatient care	NR	NR	NR	Lower direct costs	No EE, ND in 90-day hospital admission	Not clear	UK Sartain 2001
Parab 2013	Acute bleeds	24-hour home or school nursing service vs. inpatient treatment	Quicker access to care	Lower chance of severe bleeds but more frequent low-risk bleeds.	ND	NR	No EE, Higher number of treatment days for home nursing	High	USA Strawczynski 1973

2.3 Substitution effect: end of life care

- **Number of Reviews:** One review for end-of-life care identified 23 studies comparing the substitution of community care for hospital-based care (Gomes 2013).

- **Country of origin.** Half of the studies were from Europe (5 UK, 2 Sweden, 1 Norway, 1 Italy, 1 Spain), 12 were from the USA, and 1 each from Australia and Canada.

- **Number of intervention types:** The review identified three main model types, all of which contained the same feature of multidisciplinary teams, and a majority of which were nursing-based. The model types included intermediate home care (13 studies), specialist home palliative care (6 studies), and specialist home palliative care plus reinforcement support for caregivers (4 studies).

- **Number of populations:** There is a large body of research on cancer patients and a smaller body of evidence for patients with congestive heart failure, COPD, HIV/AIDs, and Multiple Sclerosis.

- **Promising evidence.**
    - **Patient outcomes.**
      There were consistent favourable outcomes for survival and the odds of dying at home. The results were mixed for some process outcomes, including the use of advance care directives and patient satisfaction. The results were mixed for symptom burden, physical symptoms, pain, quality of life, and general health.
    - **Carer outcomes.**
      The authors categorise the studies into three major models and found that caregiver outcomes were better when the model included components to support caregivers. Outcomes included morale & grief, views on place of death, SF- 36 subscales of physical function, general health, pain, and psychological wellbeing.
    - **Resource use.**
      Resource utilisation is recorded in 16 studies, of which 6 are high quality economic evaluations. However, methodologies were not consistent across studies. Of the six high quality studies, 5 found cost savings while the sixth found slight cost increases.

Interventions targeted at End of Life Care									
Comparatively stronger evidence of effectiveness									
Review	**Population**	**Intervention**	**Outcomes**				**Resource Use**	**Bias**	**Countries**
			Process	Final	Death	Carers			
Gomes 2013	– Advanced cancer – Congestive heart failure – Chronic pulmonary disease (COPD) – HIV/AIDs – Multiple sclerosis – Others	Multi-disciplinary staff, some predominantly nurse-based. Various features and theoretical frameworks. *Three major models:* 1. Intermediate home care (13 studies) 2. Specialist home palliative care (6 studies) 3. Specialist home palliative care plus 'reinforcement' support for caregivers (4 studies)	Mixed. – Advance care directives – Satisfaction	Mixed. – Symptom burden – Physical symptoms – Pain – Quality of life – General health	Pos. – Odds of dying at home – Survival	Mixed. – Morale & grief – Views on place of death – SF- 36 subscales: – Physical function – General health – Pain – Psychological wellbeing	16 recorded resource use. 6/16 = high quality studies that were also economic analyses – 5/6 high quality studies found cost savings – 1/6 high quality studies found slight increase in cost	Mixed. 7/23 studies low risk of bias.	11 USA, 5 UK, 2 Sweden, 1 Norway, 1 Italy, 1 Spain, 1 Canada, 1 Australia
Notes: ND = No Difference; +/Pos. = Positive effect; Neg. = negative effect; Dec. = decreased; NR = Not reported; EE = economic evaluation									

2.4 Substitution effect: maternity, prenatal/postnatal period

- **Number of Reviews:** 8 Reviews focused on women during the prenatal and postnatal period.

- **Availability of economic evaluations**. No studies within these reviews undertook a cost-effectiveness analysis. Resource utilisation was collected in some studies, but usually, only hospital resource use was included and left out information on community healthcare resource use.

- **Strong evidence.**
    1. **Women with multiple birth pregnancy.**
    Women with multiple birth pregnancy randomized to hospital bed rest compared to those continuing routine activity at home had similar outcomes. Outcomes included maternal hypertension, satisfaction, preterm birth, mortality, and caesarean delivery (the only measure of resource use) (Crowther & Ham 2010). Evidence is based on two Australian, one Finnish, and four Zimbabwean studies with mixed risk of bias.

- **Promising evidence.** Three reviews found overall positive effects favouring the intervention group but did not provide information on infant and maternal mortality, which was the major limitation in making a strong recommendation.

    1. **Women in the post-partum period of pregnancy.**
    Yanemoto (2013) evaluated nurse home visits compared to hospital outpatient follow-up for women in the post-partum period. There were no differences across all outcomes with the exception of higher satisfaction. Resource use was not different and included maternal and infant emergency hospital and unplanned emergency health care visits. Results are based on three US and one Canadian study at mixed risk of bias.

    2. **Pregnancies with preterm pre-labour rupture of membranes (PROM).**
    Abou (2010) reviewed pregnancies with preterm pre-labour rupture of membranes (PROM) and found greater benefits for home treatment compared to hospital care in both outcomes and resource use. Satisfaction was higher and there was decreased length of stay. There were no differences in infant morbidity, infection, weight, or admission to neonatal intensive care unit; however, the review found increased odds of caesarean delivery. Results are based on one US and one Canadian study at high risk of bias.

    3. **Pregnancy complications due to high blood pressure or preterm pre-labour rupture of membranes.**
    Dowswell (2009) found greater benefit associated with antenatal day care units compared to hospital care for pregnancy complications due to high blood pressure or preterm pre-labour rupture of membranes (PROM). The evidence

found higher satisfaction and greater patient preference for avoiding hospital admission with no differences in distress. Evidence on resource use was mixed. Results are based on two UK and one Australian study with unclear quality.

- **More research is needed.**
    1. **Low risk pregnancies.**
       More research is needed to understand the impact of home or outpatient delivery compared to hospital delivery for low-risk pregnancies (Olsen & Clausen 2012; Kelly 2013). Evidence was based on small samples and a small number of studies and a lack of information on outcomes related to safety, in particular, maternal or infant mortality (Olsen & Clausen 2012; Kelly 2013).

    2. **Pregnancies with placenta praevia.**
       More research is needed to understand the impact of home or outpatient delivery compared to hospital delivery for women with placenta praevia (Neilson 2003). Reasons include a lack of information on important outcomes related to maternal or infant mortality.

    3. **Pregnancies at risk of miscarriage.**
       More research is needed to understand the impact of bed rest in home compared to in hospital for pregnancies at risk of miscarriage (Aleman 2005). Reasons include a lack of information on important outcomes related to maternal or infant mortality.

Notes: NR = Not reported; ND = No Difference; Pos. = Positive effect; Neg. = negative effect; Dec. = decreased; Med. = Medium; EE = economic evaluation

Comparatively strong evidence of effectiveness								
Interventions targeted during the Prenatal/Antenatal Period								
Review	**Population**	**Intervention**	**Outcomes**				**Bias**	**Countries**
			Process	Final	Death	Services		
Crowther and Han 2010	Multiple birth pregnancy	Routine activity at home vs. Hospital bed rest	ND – Maternal hypertension – Satisfaction	ND – Risk of preterm birth – Perinatal mortality	ND	No EE – ND caesarean delivery	Mix	2 Australia Maclennan 1990, Dodd 2005 1 Finland, Hartikainen-Sorri 1984 4 Zimbabwe

Promising evidence of effectiveness – more research is needed for outcomes related to mortality								
Interventions targeted during the Prenatal/Antenatal Period								
Review	**Population**	**Intervention**	**Outcomes**				**Bias**	**Countries**
			Process	Final	Death	Services		
Yanemoto 2013	Women in the post-partum period	Nurse home visits vs. hospital outpatient follow up	– Pos. satisfaction in 2/3 studies; ND 1 study, NR in another study – ND breast-feeding	ND – Maternal anxiety – Maternal depression	Not reported for mothers/ infants	No EE – ND in emergency hospital or unplanned emergency health care visits for mothers or infants	Mix	3 USA Escobar 2001, Lieu 2000, Paul 2012 1 Canada Gagnon 2002
Abou 2010	Pregnant women with preterm pre-labour rupture of membranes (PROM)	Home vs. hospital	– Pos. Satisfaction	ND – Morbidity – Infection – Weight	Not reported for mothers	– Cost-savings from hospital perspective. – Decreased length of stay; – Increased odds of caesarean delivery; – ND admission to neonatal intensive care unit	High	1 USA 1 Canada
Dowswell 2009	Pregnant women with complications during pregnancy (due to high blood pressure or PROM)	Antenatal day care units vs. Hospital	Pos. – Satisfaction – Strong preference for avoiding hospital care	ND – Symptom of distress	Not reported for mothers/ infants	No EE, – Mixed service use	Not clear	2 UK 1 Australia

Interventions targeted during the Prenatal/Antenatal Period								
Unclear effectiveness – more research is needed								
Review	**Population**	**Intervention**	**Outcomes**				**Bias**	**Countries**
			Process	Final	Death	Services		
Olsen & Clausen 2012; Kelly 2013	Pregnant women with low-risk of complications	Home / outpatient vs. Hospital delivery	Due to either incomplete reporting of outcomes or very small sample sizes, the authors determined there was not enough evidence to draw any conclusions.					
Neilson 2003	Pregnant women w. Placenta Praevia	Home vs. Hospital	There is insufficient information to suggest whether hospital care or home care is effective practice.					
Aleman 2005	Women at risk of miscarriage	Bed rest: home vs. hospital	There is insufficient information to suggest whether hospital bed rest is effective practice.					

2.5 Substitution effect: adults and elderly with chronic or life limiting conditions

- **Number of Reviews**. Six reviews evaluated interventions where care at home could substitute for care in hospital (Othieno 2007; Westby 2008; Shepperd 2009; Jeppesen 2012; Balaguer 2012; Yoo 2012).

- **Availability of economic evaluations.** No reviews identified studies that undertook cost-effectiveness analyses.

- **Availability of carer outcomes.** Carer outcomes were not recorded in most studies. Where available, carer outcomes sometimes conflicted, suggesting that in some studies, services could be improved to better support carers (Shepperd 2009).

- **Strong evidence**

    1. **Stable COPD patients**
    Jeppesen (2012) found sufficient evidence to recommend 'hospital at home' as a safe and acceptable alternative for a select group of stable COPD patients. There was some evidence of higher satisfaction and no differences in mortality and reductions in length of stay and hospital readmissions. However, outcomes were limited for quality of life and lung function. Results are based on one Australian study and eight European studies from Denmark, Italy, Spain, and the UK. Studies were rated as having good quality.

    2. **Deep vein thrombosis**
    Othieno (2007) found that hospital at home was favourable compared to hospital care for patients with deep vein thrombosis but the review authors refrained from making strong conclusions for or against the hospital at home intervention. There were greater improvements in a range of patient outcomes, including fewer major bleeding, less likely recurrence of venous thromboembolism, improved quality of life and satisfaction and reduced mortality. There was insufficient information for length of stay. Results are based on 6 studies from Europe and some international multi-centre studies with unclear quality.

- **Promising evidence, but more research is needed**

    1. **Cystic fibrosis**
    Balaguer (2012) finds that individuals with cystic fibrosis receiving hospital at home services compared to hospital care do not result in adverse outcomes. The authors refrain from drawing strong conclusions given that the evidence was based on one study with unclear quality.

- **More research is needed**

    1. **Elective surgery**
       Shepperd (2009) found insufficient evidence to come to clear conclusions about the benefits of hospital at home early discharge compared to no early discharge from hospital for patients undergoing elective surgery (Shepperd 2009). The evidence was incomplete or mixed for both final outcomes and resource use. Carer outcomes were mixed and sometimes conflicted. The evidence seems to suggest that hospital at home could be improved to better support carers. The range of patient groups covered best explains lack of consistent results. Patient groups included those undergoing hip / knee surgery, hysterectomy, hernia repair, varicose vein repair, fracture neck of femur, and bypass surgery.

- **Protocols**

    1. **Acute pulmonary embolism**
       Yoo (2012) is developing a review to compare the impact of outpatient versus inpatient treatment for adults with acute pulmonary embolism.

    2. **Elective primary total knee arthroplasty**
       Westby (2008) is developing a protocol evaluating the effectiveness of post-acute physiotherapy, which does include the potential to compare different clinical settings.

Notes: NR = Not reported; ND = No Difference; Neg. = negative effect; Dec. = decreased; Med. = Medium; EE = economic evaluation

Interventions targeted at adults/elderly								
Review	**Population**	**Intervention**	**Outcomes**				**Bias**	**Countries**
			Process	Final	Death	Services		
Strong evidence of effectiveness								
Jeppesen 2012	COPD patients with acute exacerbations	Hospital at home vs. Hospital care	– Some evidence of ND in satisfaction	Limited data on – Quality of life – Lung function	ND	– ND length of stay – Reduced Readmissions – Weak quality economic evidence	Low	8 Europe Denmark, Italy, Spain, UK 1 Australia
Othieno 2007	Deep Vein Thrombosis	Home vs. Hospital treatment	– Some evidence of improved satisfaction	– Fewer major bleeding – Less likely recurrence of venous thromboembolism; – Improved quality of life	Decr.	– Not clear, poor methodology for length of stay calculations	Not clear	6 studies. European and some international, multi-centre studies
More research is needed								
Balaguer 2012	Cystic Fibrosis	Hospital at home vs. Hospital care	– NR	– No adverse outcomes	NR	– No EE	Not clear	1 Australia
Shepperd 2009	Elective surgery • Hip / knee • Hysterectomy • Hernia • Varicose vein repair • Fracture neck of femur • Bypass surgery	Early discharge to home care	– ND Satisfaction	– Mixed patient outcomes – Carer outcomes conflicted	NR	– Mixed, hospital utilisation – Yes EE but unclear cost methodology	Not clear	5 UK 1 Australia
Protocol (review in development)								
Yoo 2012	Acute pulmonary embolism	Outpatient vs. inpatient treatment	Protocol. Review is in development.					
Westby 2008	Elective primary total knee arthroplasty	Various interventions, potential to compare settings						

2.6 Substitution effect: interventions targeted at the elderly

- **Number of Reviews**. There were three reviews specific to elderly people comparing home treatment to hospital care (Shepperd 2009, Shepperd 2008, Forster 2008). Patient conditions included stroke or a mix of acute medical needs such as recovering from surgery or fracture or COPD.

- **Carer outcomes.** There was insufficient data on carer outcomes; only one review identified studies measuring carer outcomes (Shepperd 2009).

- **Economic evidence.** Where economic evaluations were performed, methodologies varied.

- **Comparatively strong evidence**
    1. **Elderly individuals with Stroke**
       Shepperd (2009) reviewed the evidence for early discharge to home care compared to standard discharge procedures for elderly individuals recovering from stroke and found no differences in function, quality of life, carer burden, and mortality. Length of stay reduced and there were fewer patients in residential care upon follow-up. Results are based on a meta-analysis of four to nine studies from the UK, Canada, Australia, Norway, and Sweden with mixed quality.

- **Promising evidence**
    1. **Elderly individuals with COPD, recovering from surgery or fractures**
       Shepperd (2009) reviewed early discharge to home care compared to standard discharge procedures for individuals with COPD or recovering from surgery or fractures and found some evidence of greater satisfaction, no differences in function, quality of life, psychological wellbeing, and carer burden. Mortality was reduced for COPD patients but no different for the other patients. Resource use was mixed. There was evidence of increased re-admissions in the intervention group, a trend towards reduced length of stay but greater total days of care for the intervention group. However, there were fewer people in residential care upon follow-up. Results are based on a meta-analysis of three to five studies from the UK, Australia, and New Zealand with mixed quality.

    2. **Elderly individuals with stroke, COPD, and other acute medical conditions**
       Shepperd (2008) reviewed 'hospital at home admission avoidance' compared to usual treatment among elderly patients with stroke, COPD, and other acute medical conditions. There was evidence of greater satisfaction and improvements or no differences in areas of function, quality of life, cognitive ability, but clinical outcomes varied by population group. There was not enough evidence to understand the impact on carers. There were no differences in

mortality at 3 months but evidence of reduced mortality at 6 months. Resource use was mixed. There was conflicting evidence on length of stay, but with more studies reporting reductions. There were no differences in readmissions. There was a decreased likelihood of admission to residential care for individuals with dementia and no differences for those with stroke. Results are based on mainly European studies, with some results coming from a meta-analysis of five studies. Evidence was rated as having mixed quality.

3. **Elderly patients' general health**
   Forster (2008) compared four interventions: medical day hospital, comprehensive outpatient elderly care; domiciliary care; and day centre. Overall, there were no differences among interventions in function or mortality. Caregiver outcomes were not measured. Resource use was similar amongst interventions. The authors recommend cost-effectiveness research for this area. Results are based on 11 studies with unclear quality and unclear country of origin.

- **Protocol**
  4. **Functionally dependent older people**
     Young (2012) is developing a review evaluating at-home vs. institutional long-term care for functionally dependent older people. The review plans to collect outcomes of both elderly individuals and their informal carers.

Notes: ND = No Difference; +/Pos. = Positive effect; Neg. = negative effect; Dec. = decreased; NR = Not reported; Med. = Medium

Interventions targeted at adults/elderly								
Review	**Population**	**Intervention**	**Outcomes**			**Resource Use**	**Bias**	**Countries**
			Process	**Final**	**Death**			
Comparatively strong evidence								
Shepperd 2009	Elderly people with stroke	Early discharge to home care Various models of service delivery	NA	ND – Function (9 trials) – Quality of LIfe & Carer burden (4 trials)	ND (9 trials)	– Reduced LOS (4 trials) – Fewer patients in residential care at 6-month follow up (4 trials)	Mix	9/11 studies contributed data: 4 UK 1 Canada 1 Australia 2 Norway 1 Sweden
Promising evidence								
Shepperd 2009	Elderly people with a mix of conditions: • Surgery recovery • Fracture recovery • COPD	Early discharge to home care Various models of service delivery	Pos. / ND Satisfaction	– ND meta-analysis: function, QoL, psychological well-being – ND carer burden (4 trials)	Meta-analysis: – Reduction mortality COPD – ND mortality combined	MIX – Incr. readmissions (5 trials); – Fewer people residential care (12-month, 3 trials) – Trend of reduction in LOS but 5 trials found higher *total* days of care	Mix	5/7 studies contributed to data 5 UK 1 Australia 1 New Zealand
Shepperd 2008	Elderly patients with stroke, COPD, or other acute medical conditions	Hospital at Home Admission Avoidance vs. hospital care	Pos. Satisfaction	– Pos. or ND for function, QoL, cognitive ability; clinical outcome varied by population – Not enough data on how it affects carers (2 trials)	– ND mortality (3 months, 5 trials) – Reduced mortality (6 months, 3 trials)	MIX – Mixed, length of stay was reduced except in 2 studies where it increased – ND readmissions – Decreased likelihood residential care for dementia, ND stroke	Mix	Mainly Europe (10 studies) only 5 of 7 studies contributed to meta-analysis: UK, Italy, New Zealand, Australia

Promising evidence								
Review	**Population**	**Intervention**	**Outcomes**			**Resource Use**	**Bias**	**Countries**
			Process	**Final**	**Death**			
Forster 2008	Elderly patients with acute medical needs.	Medical day hospitals vs. comprehensive elderly care vs. domiciliary care vs. day centre	*Major limitations due to heterogeneity of interventions and that most studies were published in 1980s and early 1990s. This Review was an update from 1999 and identified only one additional study from 2001. However, authors conclude that there appears to be little difference and that cost-effectiveness analysis would be beneficial.*					
			NA	– ND Function – Data were not available for carer distress	– ND Mortality	– ND institutional care – Hospital use seems to be similar (insufficient information for calculation of statistical significance) – No data on cost-effectiveness – Costs reported but methods are not clear	Not clear	11 studies Unclear country origin
Protocol (review in development)								
Young 2012	Functionally dependent older people	At-home vs. institutional long-term care	Protocol. Review in development. The review plans to collect outcomes of both elderly individuals and their informal carers.					

2.7 Substitution effect: rehabilitation

- **Number of Reviews.** Seven reviews were analysed for the potential to substitute care home or community centres for care in hospital. Some reviews are split and are segmented by sub-group populations.

- **Availability of economic evaluations**. No review found studies undertaking cost-effectiveness analyses. One review reported healthcare utilisation (Taylor 2012).

- **Strong evidence.**

    1. **Heart disease following acute myocardial infarction and revascularisation.** Taylor (2012) focused on individuals with heart disease following an acute myocardial infarction and revascularisation and found equal benefit for home-based cardiac rehabilitation compared to supervised rehabilitation in hospital. There were no differences across a range of outcomes (process, final, mortality, and health service utilisation). The results are based on a large body of evidence, half of which was from the US or Europe with unclear quality.

- **Promising evidence.**

    1. **Multiple Sclerosis and experiencing ataxia**.
    Mills (2007) focused on patients with multiple sclerosis and experiencing ataxia and found equal benefit in final outcomes when comparing hospital versus community-based rehabilitation. No information was provided for process outcomes or mortality. The quality of the studies was unclear. It was not clear from which countries the studies originated.

    2. **Individuals recovering from lumbar disc surgery.**
    Ostelo (2008) focused on individuals recovering from lumbar disc surgery and found equal benefits in final outcomes and mortality for supervised versus non-supervised home-based physical activity programs. The studies were rated at high risk of bias and it was not clear from which countries the studies originated.

    3. **Habitually sedentary individuals without cardiovascular disease.**
    Ashworth (2005) focused on habitually sedentary individuals without cardiovascular disease and found equal benefit in both process and final outcomes when comparing physical activity programs at home versus in a centre. Mortality was not reported. Results are based on two US studies with unclear quality.

4. **Peripheral arterial disease.**
   Ashworth (2005) found different results for patients with peripheral arterial disease in which there were better final outcomes for physical activity programs based in centres compared to those at home. Process outcomes and mortality was not measured. Results are based on three US studies from in the late 1990s with two studies having medium and one study with high risk of bias.
   Fokkenrood (2012) found similar results for patients with peripheral arterial disease with intermittent claudication that results were better for supervised rehabilitation in hospital or community settings compared to non-supervised rehabilitation at home.

- **Limited conclusions, more research is needed**.

1. **Stroke with upper limb disability**
   Coupar (2012) focused on individuals recovering from stroke with upper limb disability and was unable to come to any conclusion, as there were a range of rehabilitation models and no comparability of outcomes. It was not clear from which countries the studies originated.

2. **COPD**
   Ashworth (2005**)** focused on individuals with COPD and found mixed results when comparing physical activity programs in centres versus those at home. Results were based on medium quality studies from Europe.

- **Research where no studies were identified.**

1. **Elderly rehabilitation**.
   Ward (2008) attempted to synthesize evidence on rehabilitation for elderly people but no studies were identified.

Notes: ND = No Difference; +/Pos. = Positive effect; Dec. = decreased; NR = Not reported; Med. = Medium; LT = long term

ND							
Review	**Population**	**Intervention**	**Outcomes**			**Bias**	**Countries**
			Final outcomes	**Death**	**Service use**		
Comparatively strong evidence of effectiveness							
Taylor 2012	Lower-risk patients following an acute myocardial infarction and revascularisation	Home-based vs. supervised centre-based cardiac rehabilitation (hospital / community sports centre)	ND	ND	ND	Not clear	4 USA, 1 Canada 1 Iran, 1 China 3 UK, 1 Italy 1 Turkey,
Promising evidence of effectiveness							
Mills 2007	Multiple sclerosis & experiencing ataxia (disabling tremor)	Hospital vs. community based rehabilitation	ND	NR	NR	Not clear	Not clear
Ostelo 2008	Recovering from lumbar disc surgery	Physical activity programs Supervised vs. non supervised (home exercises)	ND	ND	NR	High risk of bias	Not clear. Johannsen 1994, Yilmaz 2003, Filiz 2005
Ashworth 2005	Habitually sedentary individuals without cardio-vascular disease	Physical activity programs Centre vs. home-based	ND – Better LT adherence – Satisfaction	NR	NR	Not clear	2 USA
Ashworth 2005	Peripheral Arterial Disease	Physical activity programs Centre vs. home-based	Better results for the control group (centre)	NR	NR	2 Med 1 High	3 USA (Savage 2001 Regensteiner 1997, Patterson 1997)
Fokkenrood 2012	Patients with Peripheral Arterial Disease experiencing intermittent pain while walking (intermittent claudication)	Supervised vs. Non supervised rehabilitation (comparing either hospital / community settings to home)	Better results for the control group (supervised)	NR	NR	Med.	7 USA, 4 UK, 1 Netherlands 1 South Africa, 1 Australia,
Limited Conclusions – More research needed							
Coupar 2012	Recovering from stroke *plus* upper-limb disability	Various rehabilitation models	Unclear impact	NR	NR	NR	Not clear
Ashworth 2005	COPD	Physical activity programs Centre vs. home-based	Mixed	NR	NR	Med	Europe
No studies identified							
Ward 2008	Elderly rehabilitation	Various settings	No studies identified comparing rehabilitation in different settings either in care homes, hospital, own home, or nursing home environments.				

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Yoo HHB, Queluz THAT, El Dib RP. Outpatient versus inpatient treatment for acute pulmonary embolism. Cochrane Database of Systematic Reviews 2012, Issue 8.

Young C, van de Glind EMM, Quinn TJ, Hooft L, Legg LA, van Munster BC, Stott DJ. At-home versus institutional long- term-care for chronic functionally dependent older people. Cochrane Database of Systematic Reviews 2012, Issue 6.

3 Reductions in length of stay

3.1 Summary

- **Total number of reviews.** 34 reviews were coded as having the potential to reduce inpatient length of stay (This reflects unique number of included Reviews. In discussing the number of interventions, some reviews may be split). The mechanism to reduce length of stay varied.

- **Reviews for further analysis.** 13 reviews out of the 34 were selected for further analysis, covering a range of population groups and mechanisms with the potential to reduce length of stay. Two reviews are protocols (reviews in development).

- **Carer outcomes.** Carer outcomes were identified in three reviews.

- **Strong evidence**

    1. **Stroke**
    - *Early discharge teams*
      Fearon et al (2012) reviewed the impact of early discharge teams on stroke patients compared to usual care and found some improved patient outcomes with no differences on carers. Length of stay was significantly reduced. These results are based on 12 RCTs with a large sample (N=1,957) with overall good quality.

    - *More intensive care*
      The Stroke Unit Trialists' Collaboration (2013) focused on stroke patients receiving 'more' versus 'less' intense hospital care and found improvements in patient outcomes with no differences in length of stay. Results are based on 28 RCTs with a large sample (N=5,855) with moderate quality.

    2. **Heart failure**
    - *Case management*
      Takeda et al (2012) focused on patients with heat failure and case management to usual care and found improved patient outcomes with decreases in admissions and length of stay. Results are based on 10 European RCTs with some risk of bias, with a large sample (N=3,000).

    - *Multidisciplinary clinics.*

Takeda et al (2012) also evaluated heart failure patients receiving multidisciplinary clinics compared to usual care and found no differences in patient outcomes but there were decreases in hospital admissions. These results are based on 2 European RCTs with some risk of bias and a moderate sample (N=418).

- *Speciality clinics.*
  Takeda et al (2012) evaluated heart failure clinics for patients with heart failure and found improvements or no differences across a range of patient outcomes. There were decreases in length of stay with no differences in hospital admissions. Results are based on 6 European RCTs with some risk of bias with a large sample size (N=1,913).

3. **Pre-term infants**

- *Transfer from incubator to open cot at lower vs. higher weight*
  New (2011) focused on pre-term infants and the impact of transferring babies from an incubator to an open cot at either lower or higher weight as a means to reduce length of stay. Results suggest no differences in outcomes with the potential to reduce length of stay. Results were based on three good quality studies with a moderate sample (N=336).

4. **Healthy mothers and infants**

- *Early discharge.*
  Brown (2002) focused on healthy mothers and infants and compared early discharge to standard discharge practice. There were no differences in patient or carer outcomes with the potential for reduced costs and evidence of no differences in readmissions for both mothers and infants. Results were based on 10 RCTs with a large sample (N=4,489) with some risk of bias.

- **Promising evidence**

1. **Patients receiving intermediate care**

- *Intermediate care, nurse vs. GP-led discharge*
  Griffiths et al (2009) focused on various hospital patients receiving intermediate care comparing nurse-led discharge to GP-led discharge. There were improvements in some patient outcomes with mixed evidence on hospital utilisation. There was some evidence of no differences and increases in length of stay but consistent results of no differences in hospital readmissions. Results are based on 8 UK studies with good methodological quality.

2. **Stroke**

- *Clinical pathways in rehabilitation.*

Rotter et al (2010) focused on stroke clinical pathways for rehabilitation and found improvements in patient outcomes with no differences in hospital utilisation based on one UK study with a small sample (N=152) with moderate quality.

3. **Pregnant women**

- *Labour assessment programs*
  Lauzon (2001) focused on pregnant women and compared the use of labour assessment programs to delay admissions to labour wards and found positive results for process outcomes. More research is needed to understand the impact on critical maternal and infant outcomes, as these were not measured. There was a small decrease hospital utilisation by a few hours. Results are based on one good quality RCT with a small sample (N=209).

4. **Pre-term infants**

- *Ad libitum vs. scheduled feeding*
  McCormick (2010) focused on infants and evaluated ad libitum feeding schedules (demand versus semi-demand) compared to scheduled feeding and found evidence of no differences in some studies while in others results were poorly reported. Three RCTs found reductions and 1 RCT found no differences in hospital utilisation. Results are based on 8 RCTs with some risk of bias.

- *Early discharge gavage feeding at home vs. discharge only with full oral feed*
  Collins (2003) evaluated stable pre-term infants receiving early discharge form hospital plus home support with gavage feeding compared to infants remaining in hospital until full oral feeds are established. There is evidence of no difference in infant or carer outcomes with potential for reduced length of stay. Results are based on one RCT with a small sample (N=88) with unclear quality.

- **More research needed.**

1. **Acute inpatients with mechanical ventilation**

- *Multifaceted care pathways*
  Rotter et al (2010) focused on hospitalised patients on mechanical ventilation and the use of multifaceted clinical pathways compared to usual care and found no differences in hospital utilisation. More research is needed as patient outcomes were not measured and results were based on 1 interrupted time series study from Norway with a moderate sample (N=285) with moderate quality.

2. **Women with pre-labour rupture of membranes**

- *Early vs. delayed admission to labour wards*

Buchanan (2010) evaluated women with pre-labour rupture of membranes receiving either early versus delayed admissions to labour wards. Results were inconclusive based on 7 RCTs and a moderate-to-large sample (N=690).

- **Protocols**.
    1. **Paediatric cancer with febrile neutropenia**
    - *Early versus standard hospital discharge*
      There is one review in development evaluating paediatric cancer with febrile neutropenia and compares early versus standard discharge from hospital (te Poele 2010)

    2. **Pre-term infants**
    - *Early versus standard hospital discharge*
      One review in development evaluates pre-term infants discharged early or later based on different feeding benchmarks (Watson 2009).

Notes: ND = No Difference; Pos. = Positive effect; Neg. = negative effect; Dec. = decreased; NR = Not reported

Population & Intervention	Author (Date)	Number of studies, Sample size, Countries	Outcomes		Service Use	Risk of bias
			Patient	Carer		
Comparatively strong evidence						
Stroke Early Discharge Teams	Fearon et al (2012)	12 RCTs, N=1,957	**N.D. / Pos.**	**N.D.**	**Decrease LOS**	Low
Heart Failure Case Management	Takeda et al (2012)	(European) 10 RCTs, N = 3,073	**Pos. or N.D.**	**NR**	**Decrease** in Admissions and LOS	Some
Heart Failure Multidisciplinary Interventions		(European) 2 RCTs, N=418	**N.D.**	**NR**	**Decrease** in Admissions	Some
Heart Failure Heart failure clinics		(European) 6 RCTs, N=1,913	**Pos. or N.D.**	**NR**	**N.D.** Admissions, **Decreased** LOS	Some
Stroke Service Organization 'More' vs. 'Less' Care	Stroke Unit Trialists' Collaboration (2013)	28 RCTs, N=5,855	**Pos.**	**NR**	**N.D. LOS**	Some
Promising evidence						
Various patients Intermediate Care: Nurse-Led Discharge (staff substitution)	Griffiths et al (2009)	8 UK RCTs	**Pos. or N.D.**	**NR**	**Mixed.** **N.D. / Increased** LOS **N.D.** Readmissions	Low
Stroke Clinical pathway (Rehabilitation)	Rotter et al (2010)	1 UK, N= 152	**Pos.**	**NR**	**N.D.**	Some
More research needed						
Mechanical ventilation Clinical Pathway multifaceted care	Rotter et al (2010)	1 Norway (Interrupted Time Series), N= 285	**NR**	**NR**	**N.D.**	Some
Protocol						
Paediatric Cancer Benchmark, early discharge	te Poele (2010)	Review in development.				

Population & Intervention	Author (date)	Info	Outcomes		Service Use	Risk of bias
			Patient	Carer		
Comparatively strong evidence						
Pre-term infants Early Discharge – Weight Transfer from incubator to open cot of pre-term babies at lower or higher weight	New (2011)	(1 Italy) 3 RCTs N=336	N.D.	NR	**Decrease** LOS	Low
Healthy Mothers and Infants Early Discharge	Brown (2002)	10 RCTs, N=4489	N.D.	N.D.	**Decrease**: Costs **N.D:** Readmissions for mother & infant	Some
Promising evidence						
Pregnant women Delayed Admission - Labour assessment programs to delay admission to labour wards	Lauzon (2001)	1 RCT N=209	**Pos.** (process outcomes) **NR** (Critical maternal & neonatal outcomes)	NR	**Decrease** (Hours in labour ward)	Low
Pre-term infants Early Discharge – Feeding Ad libitum or demand/semi-demand feeding vs. scheduled	McCormick (2010)	8 RCTs	**N.D. or poorly reported**	NR	**Decrease** (3 RCTs) **N.D.** (1 RCT)	Some
Pre-term infants Early Discharge – Feeding Home support of gavage feeding for stable preterm infants vs. Remaining in hospital until full oral feed	Collins (2003)	1 RCT N=88	N.D.	N.D.	**Decrease** LOS	Unclear
More research needed						
Women with pre-labour rupture of membranes Early vs. Delayed Admission	Buchanan (2010)	7 RCTs N=690	Inconclusive			
Protocol						
Pre-term infants Early vs. Late Discharge – Feeding	Watson (2009)	Review in development				

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infants who are fully orally feeding. *Cochrane Database of Systematic Reviews* 2009, Issue 4.

4 Preventing the need for acute care

4.1 Summary

- **Total number of reviews.** 70 Reviews have the potential to prevent hospital admission. The mechanisms to prevent admission varied. 34 reviews were selected for further analysis and are presented below; of these 18 reviews are protocols (reviews in development).

- **Comparatively strong evidence**

    1. **COPD**
    - *Integrated disease management*
    Kruis (2013) evaluated COPD patients receiving integrated disease management compared to standard care and found positive outcomes for patients in addition to reductions in hospital admissions and length of stay. Results are based on 26 RCTs from Europe with a large sample size (N=2,997) with low risk of bias.

    2. **Heart failure**
    - *Telemonitoring*
    Inglis (2010) evaluated heart failure patients receiving telemonitoring compared to standard care and found positive outcomes for patients with reductions in length of stay but mixed results with respect to costs. Results are based on 8 European RCTs with a large sample (N=1,595) with moderate quality.

- **Promising evidence**

    1. **Heart failure**
    - *Structured telephone support*
    Inglis (2010) evaluated heart failure patients receiving structured telephone support and found positive outcomes for patients but resource was not reported. Results are based on 1 German RCT with a large sample (N=708) with moderate quality.

    - *Telemonitoring + Structured telephone support*
    Inglis (2010) evaluated heart failure patients receiving telemonitoring plus structured telephone support compared to standard care and found positive outcomes for patients with no differences in hospital resource use. Results are based on 2 European RCT cluster studies with a large sample (N=887) with moderate quality.

    2. **Orthopaedic patients**

- *Specialist outreach in primary care*
  Gruen (2010) evaluated orthopaedic patients who received specialist outreach in primary care compared to patients receiving usual primary care. There were positive outcomes for patients in addition to reductions in the use of resources, including admissions to hospital, lab and diagnostic tests, outpatient treatments and medications. Results are based on 1 good quality RCT from the Netherlands with a moderate size sample (N=333).

3. **COPD**

- *Outreach nurse home visits*
  Wong (2012) focused on the impact of outreach nurse home visits for COPD patients compared to standard care and found improvements in in patient outcomes and increases in length of stay with varying impact on readmission rates. Results are based on two UK RCTs with moderate risk of bias with unclear sample size. The increase in length of stay and variation in admission rates is likely to reflect increased case finding as a result of the outreach intervention and seems to triangulate with results showing improved patient outcomes.

4. **Acute inpatients**

- *Early warning outreach staff in acute wards*
  McGaughey (2007) evaluated the impact of early warning outreach staff in general acute hospitals compared to standard care and found positive outcomes for patients but no differences in length of stay. Results are based on 1 UK study with moderate quality with unclear sample size (16 wards in 1 hospital).

5. **Individuals with tuberculosis**

- *Telephone reminder systems*
  Liu (2008) evaluated telephone reminder systems for tuberculosis patients and found improved patient outcomes and increased adherence to appointments, which could be taken as an important link that may prevent hospital admissions. Results are based on a large sample (N=4,4407) from 5 US studies and 1 Spanish study, all of which were rated as having high risk of bias.

6. **Various hospital patients post-discharge**

- *Telephone follow-up*
  Mistiaen (2006) evaluated telephone follow up post hospital discharge among a general population and found positive outcomes for patients but no information for hospital resource use. Results are based on 33 international RCTs with a large sample (N=5,510). The studies were rated as having a high risk of bias.

7. **General population in hospital emergency**

- *Addition of GPs to emergency departments*

Khangura (2012) evaluated the addition of general practitioners to emergency departments and found reductions in hospital resource use in 2 studies and no difference in one study including admissions, specialist referrals, tests, and prescriptions. The same two studies found marginal cost savings when considering hospital costs only. Results are based on three controlled comparison studies with a large sample (N=4,684) from the UK and Ireland. Studies were at high risk of bias.

8. **Older people in nursing homes**

- *Care pathways*

  Hall (2011) evaluated care pathways for older people in nursing homes and found positive outcomes for patients and reduced hospital admissions and reduced length of stay compared to standard care. Results are based on 3 RCTs from the US with a large sample size (N=735) rated as having high risk of bias.

9. **Women in the post-partum period of pregnancy**

- *Home visits*

  Yonemoto (2013) reviewed home visiting for women in the post-partum pregnancy period and found no differences in patient outcomes but reduced utilisation of emergency medical care. Results are based on 12 RCTs with a large sample size (N=11,000) with the studies rated as having some risk of bias.

10. **Women monitoring signs of active labour**

- *Home uterine device to detect active labour*

  Urquhart (2012) reviewed a home uterine device to detect signs of active labour and found no differences in patient outcomes and an increase in unscheduled antenatal visits. Results are based on 13 RCTs with a large sample (N=6,008) based on studies with moderate risk of bias.

11. **Women in labour, fetal assessment**

- *Diagnostic tools*

  Khunpradit (2011) reviewed the use of a sonographic assessment of amniotic fluid during labour for fetal assessment compared to no sonographic assessment and found no differences in patient outcomes or in admissions to neonatal intensive care unit or length of stay but an increase in caesarean section and the use of pharmaceuticals. Results are based on one large RCT (N=883) and the study was rated as having good quality.

  Nabhan (2008) reviewed the amniotic fluid index test versus the single deepest vertical pocket test as a screening test for preventing adverse pregnancy outcomes and found no differences in patient outcomes and no differences in admissions to neonatal intensive care units or length of stay. However, there was an increase in induced labour and use of caesarean section. Results are based on 5 RCTs with a

large sample size (N=3,226) and studies were rated as having low to some risk of bias.

- **More research is needed**

1. **Stroke**

- *Care pathways*
  Kwan (2004) reviewed care pathways in stroke care and found inconclusive evidence based on 3 RCTs (N=340) and 12 non-RCTs (N=4,081).

2. **Women in active labour**

- *Education*
  Lauzon (1998) reviewed the evidence of education to improve women's ability to assess active signs of labour. The authors found inconclusive evidence based on 1 RCT with a small sample (N=245).

- **No studies identified**

1. **End of life care**

- *Care pathways*
  Chan (2013) reviewed care pathways for end of life care and did not find any studies that met the inclusion criteria.

- **Protocols**

Children and adolescents

1. **Children and Adolescents**

- *Asthma school-based education and self management*
  Lasserson (2010) is developing a review evaluating school-based self-management educational interventions for children and adolescents.

Maternity and Infants

2. **Pre-term infants**

- *Home-visiting*
  Webster (2002) is developing a review on the impact of home-visiting interventions on pre-term infants with the potential to reduce hospital admissions.

3. **Asthma during pregnancy**

- *Pharmacological and non-pharmacological interventions*

Bain (2013) is developing a review evaluating pharmacological and non-pharmacological interventions for pregnant women with asthma.

Elderly

4. **Older people at risk for falls**

- *Overview of interventions for preventing falls*
  Udell (2011) is developing a review to evaluate different interventions that prevent falls among older people.

5. **Functional independence**

- *Home care 're-ablement' services*
  Cochrane (2013) is developing a review to evaluate different home care 're-ablement' services for maintaining and improving older adults' functional independence.

Adults & elderly with acute, chronic, or life limiting conditions

6. **Lower-limb peripheral arterial disease**

- *Self-management*
  Inglis (2012) is in the process of reviewing various interventions (rehabilitation, life style, behavioural, educational) with the potential to reduce hospital admission for individuals with lower-limb peripheral arterial disease.

7. **Stroke**

- *Self management*
  Fryer (2013) is in the process of reviewing self-management interventions for improving patients recovering from stroke with the potential to reduce hospital admissions.

8. **Hip arthroplasty**

- *Assistive devices, hip precautions, environmental modifications, and training*
  Jepson (2013) is developing a review to evaluate the effectiveness of assistive devices, hip precautions, environmental modifications, and training services to prevent dislocation and improve function after hip arthroplasty.

9. **Asthma**

- *Chronic disease management programs*
  Roy (2011) is developing a review to evaluate the impact of chronic disease management programs on adults with asthma.

- *Self management*
  Peytremann-Bridevaux (2009) is developing a review to evaluate the impact of self-management with either regular healthcare professional review or written action plans or both in adults with asthma.

- *Asthma in cancer patients*
  Howell (2012) is developing a review to evaluate the impact of self-management interventions for breathlessness in adult cancer patients.

10. **Ankylosing Spondylitis**

- *Self management*
  Felix (2008) is developing a review to evaluate the impact of self-management interventions for adults with ankylosing spondylitis.

11. **Chronic diseases, various**

- *Consumer guidelines*
  Carson (2012) is developing a review to evaluate the effectiveness of consumer guidelines for adults with a range of chronic diseases.

12. **COPD**

- *Maintenance rehabilitation*
  Yorke (2010) is developing a review to evaluate the effectiveness of maintenance rehabilitation for adults with COPD.

13. **Dementia**

- *Assistive technology*
  Van der Roest (2012) is developing a review to evaluate the effectiveness of assistive technology for adults with dementia.

- *Case/Care management for home support*
  Reilly (2010) is developing a review to evaluate the effectiveness of case/care management for home support among adults with dementia.

14. **Diabetes**

- *Mobile phone messaging*
  Upadhyay (2007) is developing a review to evaluate the effectiveness of mobile phone messaging for adults with diabetes.

15. **HIV/AIDs**

- *Self-management*
  Martin (2010) is developing a review to evaluate the effectiveness of self-management among adults with HIV/AIDS.

Notes: ND = No Difference; Pos. = Positive effect; Neg. = negative effect; Dec. = decreased; NR = Not reported

Population & Intervention	Author (date)	Country, Study Type, Sample Size	Outcomes		Resource use	Risk of bias
			Patient	Carer		
Comparatively strong evidence						
COPD Service delivery (Integrated Disease Management)	Kruis (2013)	European 26 RCTs N=2,997	**Pos.**	NR	**Decrease** in admissions and LOS	Low
Heart Failure Tele-monitoring	Inglis et al (2010)	European 8 RCTs, N=1595	**Pos. or N.D.**	NR	**Decrease** LOS **Mixed Results** Cost	Some
Promising evidence						
Heart Failure Structured Telephone Support	Inglis et al (2010)	Germany 1 RCT, N=708	**Pos.**	NR	**NR**	Some
Heart Failure Tele-monitoring + Structured Telephone Support	Inglis et al (2010)	European cluster 2 RCTs, N=887	**Pos.**	NR	**N.D.**	Some
Orthopaedic patients Additional Staff: Specialist Outreach in Primary Care	Gruen (2003)	Netherlands 1 RCT, N=333	**Pos. or N.D.**	NR	**Decrease** (Admissions, Lab Tests, Diagnostic Tests, outpatient treatments and medications)	Low
COPD Additional Staff: Nurse-led respiratory home visits	Wong (2012)	2 UK, RCTs	**Pos.**	NR	**Increased LOS** **Variability in Admission Rates**	Some
General population Additional Staff: Early warning outreach teams in acute wards	McGaughey (2007)	1 UK RCT 16 wards in 1 hospital	**Pos.**	NR	**N.D** LOS	Some
Tuberculosis Telemedicine – Reminder Systems	Liu (2008)	1 Spain, 5 USA RCTs, N=4407	**Pos.**	NR	**Increased adherence to appointments** (Perhaps proxy for hospital admissions)	High
Older people in nursing homes Care pathways	Hall (2011)	USA 3 RCTs, N=735	**Pos. or N.D.**	NR	**Decrease** Hospital Admissions and LOS	High
General population Telephone follow-up post-discharge	Mistiaen (2006)	International 33 RCTs, N=5510	**Pos. & N.D**	NR	NR	High
General population Additional Staff: GPs in Emergency Departments	Khangura (2012)	UK, Ireland 3 CCT, N = 4684	NR	NR	**Decrease (2 CCTs) N.D. (1 CCT)** admissions, specialist referral, tests, Rx, Marginal cost savings	High

Promising evidence						
Maternity Home visiting General post-partum pregnancy	Yonemoto (2013)	12 RCTs, N=11,000	N.D.	**N.D.**	**Decrease** (Emergency medical care)	Some
Maternity Medical Device - home uterine monitoring (signs of active labour)	Urquhart (2012)	13 RCTs, N=6008	N.D.	**NR**	**Increased** (Unscheduled antenatal visits)	Some
Maternity Diagnostic Test – Sonographic assessment of amniotic fluid index (AFI) vs. none.	Khunpradit (2011)	1 RCT, N=883	N.D.	**Neg.** (Caesarean section and use of drugs)	**N.D.** (neonatal intensive care admissions) **NR** Length of stay	Low
Maternity Diagnostic Test – Amniotic fluid index (AFI) vs. deepest vertical pocket test	Nabhan (2008)	5 RCTs, N=3,226	N.D.	**Neg.** (Induced labour & Caesarean section)	**N.D.** (admission to neonatal intensive care unit) **NR** Length of stay	Low to Some

More research needed			
Stroke Service Organization (care pathways)	Kwan (2004)	3 RCTs N=340 12 non-RCTs N=4081	Inconclusive
Maternity Education (signs of active labour)	Lauzon (1998)	1 RCT, N=245	Inconclusive
Care pathways Hospital at home for end-of-life	Chan (2013)	No studies met the inclusion criteria	

Protocol		
Children & Adolescents, Asthma School-based education and self-management	Lasserson (2010)	Review in development
Pre-term infants Home visiting	Webster (2002)	
Asthma during pregnancy Pharmacological & non-pharmacological	Bain (2013)	
Elderly – older people at risk for falls Interventions for preventing falls	Udell (2011)	
Elderly – functional independence Home care 're-ablement' services	Cochrane (2013)	
Lower-limb peripheral arterial disease Self-management: Rehabilitation**,** Life Style Behavioural, Educational	Inglils (2012)	
Stroke Self-Management	Fryer (2013)	
Hip arthroplasty Assistive devices, hip precautions, environmental modifications, training	Jepson (2013)	
Asthma Chronic disease management programs	Roy (2011)	
Asthma Self-management	Peytremann-Bridevaux (2009)	
Asthma in cancer patients Self-management	Howell (2012)	
Ankylosing Spondylitis Self-management	Felix (2008)	
Chronic diseases, various Consumer guidelines	Carson (2012)	
COPD Maintenance rehabilitation	Yorke (2010)	
Dementia Assistive technology	Van der Roest (2012)	
Dementia Case/care management for home support	Reilly (2010)	
Diabetes Mobile phone messaging	Upadhyay (2007)	
HIV/AIDs Self-management	Martin (2010)	

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5 Appendix 1: summary tables and figures.

5.1 Table 1. Search terms

Search Term	Total Results (Reviews)
"acute care at home"	1
"admission" and "prevention"	32
"assistive devices"	4
"assistive technologies"	4
"case management"	5
"chronic disease management"	7
"chronic" and "disease" and "management" and "hospital" not "dental" not "mental" not "hip"	31
"Community Care"	12
"coordinated care"	2
"deinstitutional*"	2
"diagnostic" and "home"	8
"early discharge"	14
"home care"	56
"home visit"	25
"home-based programs"	3
"home" and "care"	195
"hospital at home"	6
"hospitalization"	148
"independent living"	7
"inpatient" and "outpatient"	44
"integrated care"	8
"re-ablement"	1
"rehabilitation" and ("outpatient" or "community") and ("inpatient" or "hospital")	21
"rehabilitation" NOT "dental"	173
"residential facilities"	4
"residential facility"	Same results as above
"telehealth"	2
"telemedicine"	6
"telemonitoring"	1
rehabilitation and ("inpatient" or "hospital")	43
TOTAL SEARCH RESULTS	865
TOTAL INCLUDED REVIEWS	142

5.2 Table 2. Included reviews, coded by primary effect

Area	Total Hits	Included	Substitution Effect	LOS Reduction	Admission Prevention
Acute & Chronic Illness (Children)	2	1	1	0	0
Ankylosing spondylitis	3	1	0	0	1
Asthma	27	17	0	0	17
Brain Injury	14	1	1	1	0
Bronchiolitis	9	1	0	0	1
Cancer	11	3	0	2	1
Chron's Disease	1	1	0	1	0
Chronic Conditions	7	4	0	0	4
Claudication	1	1	1	0	0
COPD	44	9	1	1	7
Cystic Fibrosis	5	1	1	0	0
Deep Vein Thrombosis / Pulmonary Embolism	5	3	2	0	1
Dementia	8	2	0	0	2
Diabetes	13	5	1	0	4
Elderly	45	13	4	1	8
Epilepsy	6	2	0	0	2
Eyes	8	2	0	2	0
Faecal Incontinence	3	1	1	0	0
Heart Disease & Failure	21	6	1	2	3
Hip / Knee	40	8	4	3	1
HIV/AIDS	13	1	0	0	1
Hospital Related Injuries	2	1	0	1	0
Lumbar Surgery	2	2	1	1	0
Maternity	76	24	7	11	6
Multiple Sclerosis	11	2	2	0	0
Muscle / Neuromuscular Disease	2	1	1	0	0
Palliative Care	8	4	2	0	2
Pancreatitis	1	1	0	1	0
Patellar dislocation	1	1	1	0	0
Pneumonia	3	1	0	1	0
Service Organization	27	10	2	4	4
Spine	6	1	0	0	1
Stroke	73	9	4	2	3
Substance Abuse	14	1	1	0	0
Tuberculosis	3	1	0	0	1

TOTAL[1]	515[2]	142	39	34	70

Figure 1: All Reviews, Coded by Primary Effect
(Admission Prevention, Length of Stay Reduction, Substitution Effect)

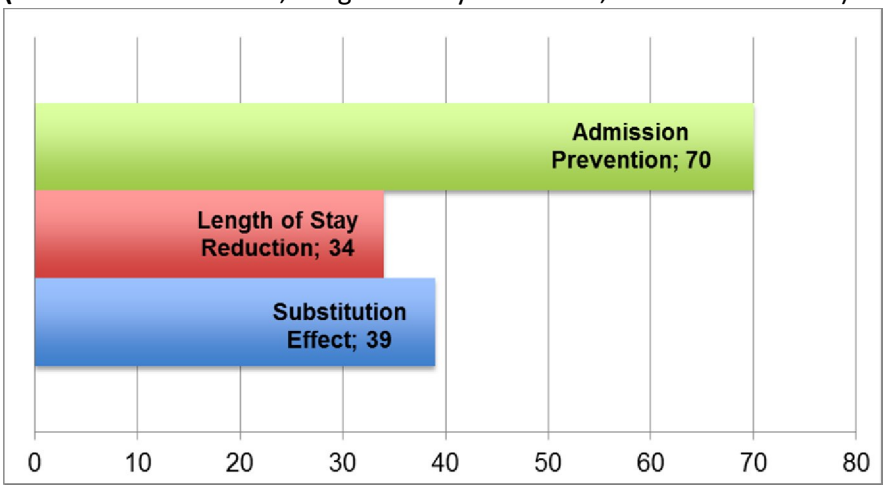
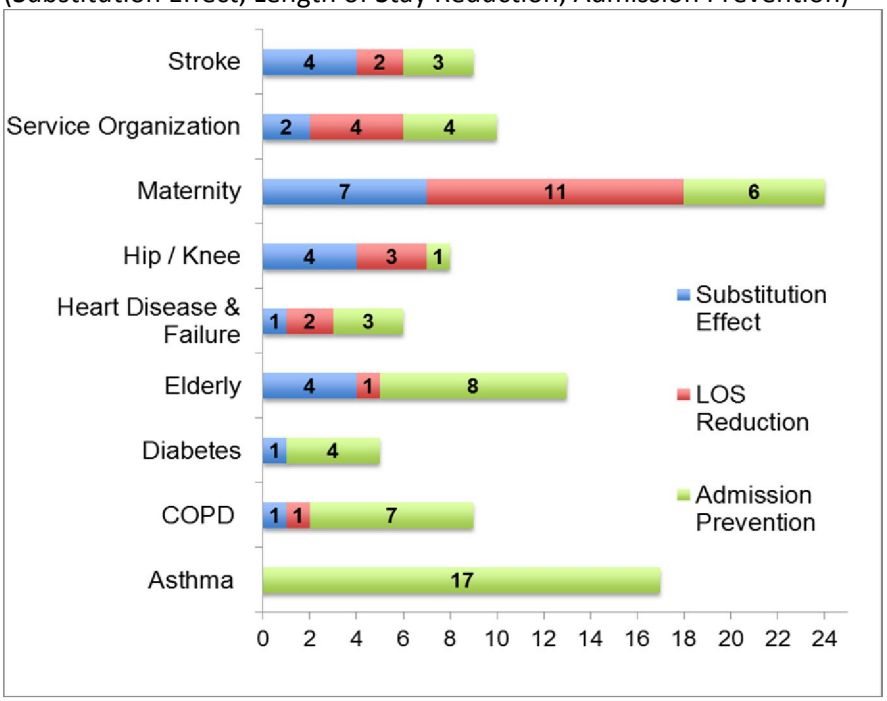


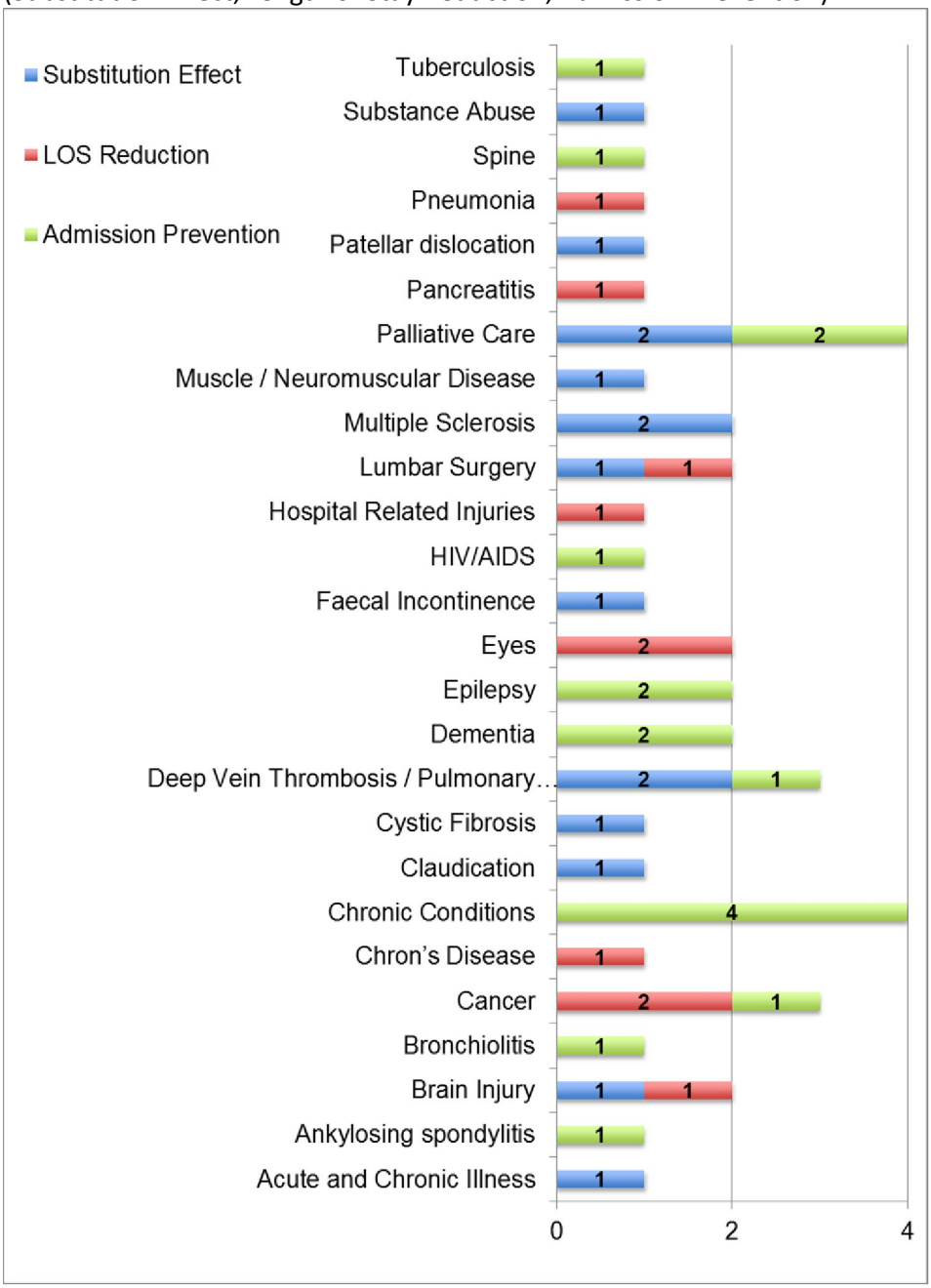
Figure 2: Areas with 4+ Included Reviews, Coded by Primary Effect
(Substitution Effect, Length of Stay Reduction, Admission Prevention)



[1] Represents number of unique reviews and does not double count reviews that are split to separate studies where there are differential effects.

[2] Represents number of reviews screened on full text, remaining results from the search strategy were excluded on title and abstract.

Figure 3: Areas with 1 to 4 Included Reviews, Coded by Primary Effect
(Substitution Effect, Length of Stay Reduction, Admission Prevention)[3]



[3] Brain Injury has only 1 Review but it is split based on subset of studies that reflect different primary effects.

6 Appendix 2: Review summaries

The following summaries cover the 35 areas of interest, mostly based on condition or population (the only exception is 'service organization' where the aim of the Review was the intervention itself, covering a wide range of conditions or populations). The following summaries contain four key pieces of information.

i) A graphical presentation that identifies the primary effect that is captured by the Review as a whole, or captured by a subset of studies within that particular Review (substitution effect, length of stay reduction, admission prevention).
ii) A table summarizing the *included* reviews: the Review ID (to refer back to the bibliography for further reference; the type of mechanism driving the primary effect (for example, adding staff, substituting staff, assistive device, self-management, hospital protocol, early discharge protocol, etc.); the date of the Review, and the Title of the Review.
iii) Another table lists the Review IDs that were excluded and the reason for exclusion. (Where there was only one included Review, this table is not applicable).
iv) A final table is provided with a brief summary of the results of the Review, or a subset of studies within that review with information on the experimental intervention and comparator, the population, countries included, results, and any limitations.

Please note that the summaries include direct extractions of key text from the reviews quoted. When this is the case, these text extracts are included in quotation marks.

6.1 Ankylosing spondylitis

Ankylosing spondylitis – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Admission Prevention				
1	Self-Management	**30.39 (Felix 2008)**	2008	Protocol. Self-management programme for ankylosing spondylitis.

Ankylosing spondylitis - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	1	28.127
Delete	1	**Outcome:** Interventions do not focus on hospitalization. 20.32 (physiotherapy interventions)

6.2 Asthma

Asthma – Included Reviews				
#	Mechanism	ID	Date	Title
Admission Prevention				
1	**Various** (maternity)	**30.5**	2013	Protocol. Interventions for managing asthma in pregnancy.
6	**Self Management & Education for Adults** (medical review/ written action plan, peak expiratory flow monitoring	**30.18**	2011	Protocol. Asthma self-management education with either regular healthcare professional review or written action plans or both in adults.
		28.183	2002	Self-management education and regular practitioner review for adults with asthma.
		30.41	2008	Limited (information only) patient education programs for adults with asthma.
		28.185	2002	Options for self-management education for adults with asthma.
		17.14	2007	Education interventions for adults who attend the emergency room for acute asthma.
1	**Self-Management (Children and Adults)**	**30.20**	2011	Written individualised management plans for asthma in children and adults Withdrawn – "Search is out of date. Written action plans are now viewed as a component of asthma self-management rather than a standalone intervention."
2	**Self-Management (Children)**	**30.38**	2008	Educational interventions for asthma in children. (Problem solving, role-playing, videotapes, computer assisted instruction, booklets, etc.)
		30.29	2010	Protocol. School‐based self‐management educational interventions for asthma in children and adolescents.
1	**Home visit**	**28.75**	2011	Home‐based educational

				interventions for children with asthma.
1	**Telemedicine**	**18.3**	2011	Effectiveness of tele-healthcare interventions in people with asthma.
3	**Therapeutic medical device**	**17.17**	2012	Anti-leukotriene agents compared to inhaled corticosteroids in the management of recurrent and/or chronic asthma in adults and children.
		17.18	2012	Non-invasive positive pressure ventilation for treatment of respiratory failure due to severe acute exacerbations of asthma.
		17.19	2012	Early use of inhaled corticosteroids in the emergency department treatment of acute asthma.
1	**Self-management (assistive medical device)**	**30.1**	2013	Effectiveness, cost-effectiveness and feasibility of using smartphone and tablet apps to facilitate the self-management of individuals with asthma.
1	**Chronic Disease Management**	**22.2.7**	2009	Protocol. To assess the effectiveness of chronic disease management programs for adults with asthma.
1	**Substitution of Staff**	**17.13**	2013	Nurse versus physician-led care for the management of asthma.

Asthma - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	4	30.46; 30.47; 30.9; 30.44
Delete	1	**Outcome:** Interventions do not focus on hospitalization. 13.78.173
	3	**Comparison**: Medicine vs. medicine comparison; 7.3.14; 17.22; 27.11.32

Asthma		
Mechanism	**ID**	**Conclusions**
Admission Prevention		
Various (Maternity)	**30.5**	This Review is a Protocol, meaning it is in development and results are not available.
Self-Management (Education with either regular healthcare professional review or written action plans or both in adults)	**30.18**	This Review is a Protocol, meaning it is in development and results are not available.
	30.41	**Limited asthma education.** • Did not reduce hospitalisation for asthma (3 trials, 906 participants, unclear quality). • Reduction in Emergency Room visits after limited asthma education (information only) (4 studies, unclear number of participants and quality). **Countries:** Not mentioned explicitly
	28.183	**Self-management education**. • Reduced hospitalisations (12/36 studies, 1200 participants) • Emergency room visits (20/36 studies, 1457 participants) • Unclear quality rating. **Countries**: Not mentioned explicitly
	28.185	**Self-management options**. • **(1)** 6 studies compared optimal self-management allowing self-adjustment of medications according to an individualised written action plan compared to adjustment of medications by a doctor (medical review). • Hospitalisation and emergency room (ER) visits: These two styles of asthma management gave equivalent effects. • Unclear quality. **Countries**: Not mentioned explicitly
	17.14	**Education.** • Hospital Admissions: Significantly reduced (5 trials, 572 participants, high quality evidence) • Representation at Emergency Department: Estimated reduction in risk following intervention was imprecise and did not reach statistical significance (8 trials, 942 participants, low quality evidence). **Countries:** USA (7), UK (3), Switzerland (1), Australia (2)
Self-Management	**30.20**	Withdrawn. "Search is out of date. Written action plans are now viewed as a component of asthma self-management rather than a standalone intervention."

for Adults and Children (Written individualized management plan)		
Self-Management for children	**30.29**	This Review is a Protocol, meaning it is in development and results are not available.
	30.38	**Education in schools.** • Significant reduction in the number of emergency department visits (12 trials, unclear participants or quality). • No significant reduction in the number of hospitalizations associated with education (8 trials, unclear participants or quality). **Countries:** UK (4) USA (18); Australia (3) Netherlands (1); Sweden (1) Canada (1) New Zealand (1) Italy (1) Germany (1) Israel (1)
Home visit	**28.75**	**Community Outreach.** • "We found inconsistent evidence for home-based asthma educational interventions compared to standard care, education delivered outside of the home or a less intensive educational intervention delivered at home." • "Although education remains a key component of managing asthma in children, advocated in numerous guidelines, our review does not contribute further information on the fundamental content and optimum setting for such educational interventions." • "We cannot rule out the possibility that home-based education may be beneficial under some circumstances, where resources and funding permit." • (13 trials, 2342 participants, good quality). **Countries**: USA (11), Australia (1)
Telemedicine	**18.3**	**Tele-healthcare for asthma.** • Non-significant increase in the odds of emergency department visits over a 12-month period. • Significant reduction in hospitalisations over a 12-month period, the effect being most marked in people with more severe asthma managed predominantly in secondary care settings. **Countries:** Netherlands (2), Denmark (1), Croatia (1), Japan (2), Taiwan, Australia (2), Portugal (1), Brazil (1), UK (4), USA (4)
Therapeutic Medical Device	**17.17**	**Anti-leukotriene agents** (administered orally) vs. **inhaled corticosteroids** (inhaler - medical device). • There was a three-fold increase in the number of patients experiencing an exacerbation requiring hospital admission in the

		group treated with anti-leukotrienes (12 trials, 2715 participants, quality unclear). • "The robustness of the study results is supported by the fail-safe N of 180 trials indicating the number of unpublished/ future studies with no group difference in rescue oral corticosteroids needed to change the direction of the current findings." • "On the basis of efficacy, the results support the current guidelines' recommendation that inhaled corticosteroids remain the preferred monotherapy in adults and children with persistent asthma." **Countries:** Not mentioned explicitly.
	17.18	**Non-invasive positive pressure ventilation (NPPV)** (full facial or nasal mask that administers ventilatory support from a flow generator) vs. **Mechanical Ventilation** (sedation, intubation, attachment to a ventilator, transfer to Intensive Care Unit (ICU) • "Compared to usual medical care alone, NPPV reduced hospitalisations, increased the number of patients discharged from the emergency department, and improved respiratory rate and lung function measurements." • "The application of NPPV in patients with asthma, despite some promising preliminary results, still remains controversial." • "Further studies are needed to determine the role of NPPV in the management of severe acute asthma and especially in status asthmaticus." • "Larger, prospective randomised controlled trials of rigorous methodological design are needed to determine the role of NPPV in patients with asthma." • "Length of hospital stay was reported in two studies, though meta-analysis was not possible. Hospitalisation was reported in one small study, in which there were three admissions out of 17 on NPPV and 10 admissions out of 16 in control patients." • (5/6 trials contributed data, 206 participants, low to very low quality). **Countries**: Brazil (3), India (1), Israel (1)
	17.19	**Inhaled Corticosteroids (ICS) vs. Systemic Corticosteroids administered in Emergency Department setting.** • Resulted in fewer hospital admissions. There was a reduction from 32 to 17 hospital admissions per 100 patients treated with ICS agents compared with placebo. • At this time there is insufficient evidence to support using ICS agents alone as a replacement for systemic corticosteroid therapy in acute asthma attacks. • However, there are many unanswered questions about the use

		of ICS in the emergency department treatment setting. • Future research should focus on optimal dosage, dosage frequency and delivery device, identification of effective ICS agents, clearly defined outcomes (such as admissions criteria, pulmonary function testing and follow-up after discharge from emergency departments). • (20 trials, 13 paediatric, 7 adult; 1403 participants, moderate quality) **Countries**: Canada (5), Philippines (4), India (3), USA (3), Turkey (3), Uruguay (3), South Africa (2), Israel (2), Mexico (2), Brazil (1) Taiwan (1) Indonesia (1)
Assistive Medical Device	**30.1**	**Smartphone application.** • Inconclusive results. 1 study showed no significant difference for emergency department or hospital admissions. Another study showed reduced visits to emergency department. • (2 trials, 408 participants, low quality). **Countries**: Taiwan (1); UK (1)
Substitution Effect (staff)	**17.13**	**Nurse** versus **physician-led care** for the management of asthma. • "No significant difference was found between nurse-led care for patients with asthma compared to physician-led care for outcomes assessed." • "Based on the relatively small number of studies in this review, nurse-led care may be appropriate in patients with well-controlled asthma. Since only one study with uncontrolled patients was included we cannot be sure whether nurse-led care is appropriate in uncontrolled asthma." • (4/5 studies, 447 participants, moderate quality). **Countries**: Australia (1), Netherlands (3), UK (1)
Chronic Disease Management	**22.2**	This Review is a Protocol, meaning it is in development and results are not available.

6.3 Alzheimer's & Dementia

Alzheimer's & Dementia – Included Reviews				
#	Mechanism	ID	Date	Title
Admission Prevention				
1	**Assistive Medical Device**	**4.4.4**	2012	Protocol. Assistive technology for memory support in dementia.
1	**Case Management**	**28.110**	2010	Protocol. Case/care management approaches to home support for people with dementia.

Alzheimer's & Dementia - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	1	28.116
Delete	4	**No relevant outcome (hospitalization):** • **13.17.173** (cognitive training/rehab) • **20.40.44** (hydergine) • **28.1** (exercise program) • **28.65** (functional analysis for challening behaviour)
	1	**Irrelevant comparison**: • **6.35.56**; (specialist care *within* nursing home vs. nursing home)

6.4 Bronchiolitis

Bronchiolitis – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Admission Prevention				
1	Nurse vs. Physician led care	**28.158**	2008	Nurse specialist care for bronchiectasis.

Bronchiolitis - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	1	20.13
Delete	1	**Withdrawn** • 27.20
	4	**Comparison**: medicine vs. medicine: • 20.18; 20.19; 20.13; 20.27
	1	**Outcome:** Interventions do not focus on hospitalization. • 13.175 (physical training)
	1	**Non-OECD country** • 28.158 (therapeutic device vs. home-made device)

Bronchiolitis		
Mechanism	**ID**	**Conclusions**
Admission Prevention		
Nurse vs. physician led care	**17.31**	• No statistically significant changes were observed in infective exacerbations, lung function, exercise capacity, quality of life and hospital admissions. More healthcare resources were utilised by nurse-treated participants during the first arm of the study. • (1 study, 80 participants, Jadad score 3). • **Countries**: UK

6.5 Brain Injury

Brain Injury – Included Reviews					
#	**Mechanism**	**ID**	**Date**	**Country**	**Intervention**
1	**Split Review into individual studies:** Heterogeneous interventions (2008)	LOS reduction			
		14.19.21f	2002	UK	Increased therapy intensity (in-hospital)
		Substitution Effect			
		14.19.21e	1998	UK	Specialized vs. Non-specialized hospital treatment
		14.19.21c	2001	Turkey	Home Care, visiting staff
		14.19.21b	2000	USA	Home Care, visiting staff & Telephone Calls
Only 1 review was relevant; none of the studies were directly comparable; therefore, they are listed individually as the overall Review still contains relevant information.					

Brain Injury - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	4	13.26.173; 13.166.173; 14.10.21; 29.20.43;
Delete	8	**Outcome:** Interventions do not focus on hospitalization. • 13.26.173 (acupuncture); • 13.93.173 (music therapy); • 13.136.173 (sensory stimulation); • 13.168.173 (speech & language therapy) • 13.145.173 (vocational rehabilitation) • 14.19.21 (multi-disciplinary rehabilitation) • 13.24 (cognitive rehab - executive dysfunction) • 13.113 (cognitive rehab - occupational outcomes)
	1	**Comparison**: medicine vs. medicine: 13.81.173

Brain Injury			
	Study ID	**Mechanism**	**Conclusions**
Split Review – these are individual trials	**LOS Reduction**		
	14.19.21f	**Increased therapy intensity in-hospital**	**Intensive (30% increase) Multidisciplinary rehabilitation vs. Multidisciplinary rehabilitation** • "A significant reduction in length of stay (14 days, P < 0.001) for the intensive group. Similar Barthel scores between groups at admission and discharge confirmed that this reduced length of stay was not at the expense of a poorer functional outcome." • (1 study, 131 participants, good quality)
	Substitution Effect		
	14.19.21e	**Specialized vs. Non-specialized hospital treatment**	• "There is limited evidence' that specialist in-patient rehabilitation services can improve functional outcome in terms of both activity (reduced disability) and carer distress when compared with controls." • (1 study, 50 participants, low quality).
	14.19.21c	**Home care**	**Inpatient rehabilitation** vs. **home exercise program (team visited at home).** • "In summary, there is 'limited evidence' at the current time that specialist in-patient rehabilitation services can improve functional outcome in terms of both activity (reduced disability) and carer distress when compared with controls." (1 study, 60 participants, low quality)
	14.19.21b	**Home care**	**In-patient cognitive rehabilitation programme** (intensive 8-week) vs**. weekly telephone counselling and advice at home by a nurse.** • "Both the treatment group and control intervention made substantial gains in terms of reduced post-concussion symptoms and enhanced participation, including return to work. No significant differences were recorded between groups." (1 study, 120 participants, good quality)

6.6 Cancer

Cancer – Included Reviews				
LOS reduction only				
1	**Surgical Technique**	**7.2.14**	2012	Laparoscopy versus laparotomy for the management of early stage endometrial cancer.
1	**Benchmark for early discharge**	**7.8.14**	2010	Protocol. Very early discharge versus early discharge versus non‐early discharge in paediatric cancer patients with febrile neutropenia.
Admission Prevention				
1	**Self management, education, information**	**30.14**	2012	Protocol. Self-management interventions for breathlessness in adult cancer patients.

Cancer - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	4	14.2.21; 20.24.44; 28.35; 29.4.43
Delete	4	**Outcome:** Interventions do not focus on hospitalization. • **13.33.173** (multidisciplinary rehabilitation after brain tumour) • **13.27.173** (multidisciplinary rehabilitation for adult cancer survivors) • **13.35.173** (multidisciplinary rehabilitation for breast cancer) • **13.80.173** (already discharged; return-to-work) • **28.25** (physical exercise training after treatment – children & adults)

Cancer		
Mechanism	**Study ID**	**Conclusions**
LOS Reduction		
Surgical Technique	**7.2.14**	**Laparoscopy versus laparotomy for the management of early stage endometrial cancer.** • "Hospital stay was reported in all of the trials and results show that on average, laparoscopy was associated with a significantly shorter hospital stay." • "Laparoscopy is associated with similar overall and disease-free survival. Laparoscopy is associated with reduced operative morbidity. There is no significant difference in severe post-operative morbidity between the two modalities." • (8 studies, 3644 participants, unclear quality). • **Countries**: Italy (1), Australia (1), Germany (1) and Turkey (1); Multicentre, location not specified explicitly (4)
Benchmark for early discharge	**7.8.14**	**Very early discharge** (within 24 hours after presentation with fever and neutropenia) **vs**. **early discharge** (less than 5 days of in-hospital treatment) **vs. Normal Discharge** (after 5 days) in paediatric cancer patients with febrile neutropenia. • Protocol
Admission Prevention		
Self management, education, information	**30.14**	**Self-management interventions for breathlessness in adult cancer patients** • Protocol

6.7 Children with Acute and Chronic Illnesses

Children with Acute and Chronic Illnesses – Included Reviews				
#	Mechanism	ID	Date	Title
Substitution Effect				
1	**Supplemental Care at Home** (specialist home-based nursing)	**6.4**	2013	Specialist home‐based nursing services for children with acute and chronic illnesses.

Children with Acute and Chronic Illnesses - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	1	6.4

Children with Acute and Chronic Illnesses		
Mechanism	**ID**	**Conclusions**
Substitution Effect		
Specialist home-based nursing vs. Inpatient care	**6.4 (Parab 2013)**	• "Results of the RCTs were not combined because of the variety in types of services provided, types of participants and the outcome measures used." • "There is some evidence that specialist home-based nursing services reduce the length of hospital stay (4/7 studies favor home-care; 546 children; poor to moderate quality)." • "However, no statistical difference for hospital admissions" (2/7 studies; 443 children; poor to moderate quality). • Interestingly, one study reported that while length of stay (LOS) was lower in the home-care group, they used more nursing hours during the 2-year period compared to in-patients (Dougherty 1998, 63 children; unclear quality). • "The results of individual RCTs show improved satisfaction with home-based care with no adverse impact on physical health outcomes for children." • (Total = 7 Studies, 840 children, unclear quality). • **Countries**: Not explicitly mentioned.

6.8 Chron's Disease

Chron's Disease – Included Reviews				
LOS reduction				
1	**Surgical Technique** (Laparoscopic vs. Open surgery)	**7.21**	2011	Laparoscopic versus Open surgery for small bowel Crohn's disease.

Chron's Disease		
Mechanism	**Study ID**	**Conclusions**
LOS Reduction		
Surgical Technique	**7.21**	**Laparoscopy vs. Open surgery** • "Less number of patients in the laparoscopic group (2/61) suffered wound infection compared to the open group (9/59) but the difference was not statistically significant (P=0.23). Similarly, there was no significant difference in the incidence of other postoperative complications assessed - postoperative pneumonia, duration of postoperative ileus and urinary tract infections. The incidence of anastomotic leak and intra abdominal abscess rates were comparable between the two groups. The 30-day reoperation rates among the two groups were also comparable." • (2 studies, 120 participants, unclear quality). • **Countries**: Not explicitly mentioned

6.9 Chronic disease, various

Individuals with Chronic Diseases – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Admission Prevention				
2	Self-Management	**22.4**	2012	Protocol. Consumer guidelines for chronic disease management
		30.34	2009	Self‐management education programmes by lay leaders for people with chronic conditions
1	Service Organization	**22.1**	2007	Effectiveness of shared care across the interface between primary and specialty care in chronic disease management.
1	Telemedicine	**17.20**	2012	Mobile phone Messaging for facilitating self-management of long-term illnesses.

Individuals with Chronic Diseases - Excluded Reviews		
Repeat / Delete	Total Excluded	Review ID and Reason for Exclusion
Repeat	1	17.8
Delete	1	**Outcome:** Interventions do not focus on hospitalization. **30.12**
	1	**Public Health**: **22.3**

Individuals with Chronic Diseases		
Mechanism	**Study ID**	**Conclusions**
Admission Prevention		
Self-Management	**22.4**	**Intervention:** Guidelines for self-management delivered in various ways, such as face- to-face, via the internet, email or post. **Control**: No intervention, usual practice, oral education only, minimal written information e.g., pamphlet or standard information or a guideline of comparable intensity, that is not used for chronic disease management.
	30.34	**Intervention:** Self-management **Control**: Usual care or None • (17 studies) **Description**: 17 studies in total 1) Arthritis Self-Management Programme (ASMP) (5 studies) 2) Chronic Disease Self-Management Program (CDSMP) or its anglicised variation The Expert Patient Programme (EPP): (7 studies). CDSMP or EPP recruited participants with a wide range of conditions: hypertension, heart disease, chronic lung disease, arthritis, stroke, diabetes, chronic pain, chronic back pain, chronic fatigue, mental health and neurological conditions. 3) Other disease-specific lay-led educational interventions: (5 studies). Interventions were all designed for specific conditions: diabetes (2 studies), HIV infection (1 study), chronic low back pain (1 study), and heart failure (1 study). The ASMP, CDSMP and its anglicised version, the EPP, typically consist of a structured course of six (originally seven) weekly sessions each lasting around 2.5 hours and led by one, or more usually two, trained and accredited lay facilitators (in a few studies a small proportion of courses were actually facilitated by healthcare professionals and/or students). The sessions cover: goal setting and problem solving; lifestyle changes around diet, exercise, and sleep; identifying resources; symptom management; dealing with anger, fear and frustration; and communication with health professionals. The lay facilitator acts as a positive role model. Participants are also given an educational manual or booklet (Lorig 2000; NHS 2002) or videocassette (Griffiths 2005) covering the course content. **Conclusions:** • Most of the interventions shared a similar structure and components, and most were based on a common theoretical

		framework, but the included studies display considerable heterogeneity in terms of the clinical conditions studied, the wide range of outcomes reported, and their effects. **Primary outcomes** **Health status:** There was a small, statistically-significant reduction in: • pain (11 studies, SMD -0.10 (95% confidence interval (CI) - 0.17 to -0.04)); • disability (8 studies, SMD -0.15 (95% CI -0.25 to -0.05); • fatigue (7 studies, SMD -0.16 (95% CI -0.23 to -0.09); • depression: small, statistically-significant improvement (6 studies, SMD -0.16 95% CI -0.24 to -0.07) • psychological well-being: small (but not statistically- or clinically-significant) improvement (5 studies; SMD -0.12 (95% CI -0.33 to 0.09)); • health-related quality of life: no difference between groups (3 studies; WMD -0.03 (95% CI -0.09 to 0.02). • self-rated general health: statistically-significant improvement (6 studies, WMD -0.20 (95% CI -0.31 to -0.10). **Healthcare use:** • physician or general practitioner attendance: no statistically-significant differences between groups in (9 studies; SMD -0.03 (95% CI -0.09 to 0.04)) • Days/nights spent in hospital: no statistically-significant differences between groups (6 studies; WMD -0.32 (95% CI -0.71 to 0.07)). **Self-efficacy:** (confidence to manage condition) showed a small statistically-significant improvement (10 studies): SMD -0.30, 95% CI -0.41 to -0.19. **Limitations**: All the studies examined primarily short-term outcomes, and only two studies considered outcomes for intervention and control participants beyond six months. Thus, there is insufficient information to state whether any benefits seen would be sustained over time, or indeed whether there might be benefits which only become apparent in the long term. There were no studies of children and adolescents. **Countries**: North America (10); UK (4); Australia (1); Netherlands (1); China (1)
Service Organization	**22.1**	**Intervention:** Shared care across the interface between primary and specialty care **Control:** Usual care or None • 20 studies of shared care interventions for chronic disease management were identified, 19 of which were randomised

		controlled trials. • The majority of studies examined complex multifaceted interventions and were of relatively short duration. **Description:** Defined as the joint participation of primary care physicians and specialty care physicians in the planned delivery of care, informed by an enhanced information exchange, over and above routine discharge and referral notices. **Diseases:** The studies covered a range of chronic disease including asthma and COPD (Drummond 1994; Rea 2004), cancer (Johannson 2001), congestive cardiac failure (CCF) (Doughty 2002), depression (Katon 1999; Katon 2001; Katon 2004; Llewelyn-Jones 1999; Swindle 2003; Unutzer 2002), diabetes mellitus (DICE 1994; Donohoe 2000; Hoskins 1992; Smith 2004), hypertension (McGhee 1994), opiate misuse (Dey 2002), chronic mental illness (Byng 2004; Warner 2000; Wood 1994) and a group of patients with a variety of chronic conditions requiring long term oral anticoagulation therapy (Holm 2002). **Main Results:** • The results were mixed. • Overall there were NO consistent improvements in physical or mental health outcomes, psychosocial outcomes, psychosocial measures including measures of disability and functioning, hospital admissions, default or participation rates, recording of risk factors and satisfaction with treatment. • However, there were clear improvements in prescribing in the studies that considered this outcome. • The methodological quality of studies varied considerably with only a minority of studies of high-quality design. • Cost data were limited and difficult to interpret across studies. **Conclusions:** • "This review indicates that there is, at present, insufficient evidence to demonstrate significant benefits from shared care apart from improved prescribing." • "This review indicates that there is no evidence to support the widespread introduction of shared care services at present." • "Future shared-care interventions should only be developed within research settings and with account taken of the complexity of such interventions and the need to carry out longer studies to test the effectiveness and sustainability of shared care over time." **Hospital admissions:** • 7 studies examined the effect of shared care on hospital admissions: 6 RCTs (DICE 1994; Doughty 2002; Drummond 1994;

		Johannson 2001; Rea 2004; Warner 2000) and 1 Controlled Before and After study (CBA) (Wood 1994). • They found mixed results consistent with shared care being associated with a reduction in hospital admissions in older patients and in those with higher levels of baseline morbidity. **Direct costs** • 11 studies reported direct costs of shared care, either alone (Donohoe 2000; McGhee 1994; Smith 2004; Unutzer 2002) or relative to costs in the control groups (Byng 2004; DICE 1994; Drummond 1994; Hoskins 1992; Katon 1999; Katon 2001; Swindle 2003). **Countries**: UK (7); USA (5); Australia (2); New Zealand (3); Denmark (1); Ireland (1); Sweden (1)
Mobile phone messaging	**17.20**	**Mobile phone Messaging to facilitate self-management of long-term illnesses.** **Conclusions:** • **Diabetes patients** receiving text-messaging support made a comparable number of clinic visits and calls to an emergency hotline as patients without the support. • **Asthma patients** the total number of office visits was higher in the text messaging group, whereas the number of hospital admissions was higher for the control group. • (2 studies, N=75, low quality). • Countries: Scotland (1); Croatia (1)

6.10 Claudication

Claudication (Leg pain)– Included Reviews				
Substitution Effect				
1	Supervised vs. Non Supervised Exercise	**28.12**	2013	Supervised exercise therapy versus non - supervised exercise therapy for intermittent claudication.

Claudication (Leg Pain)		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect	**28.12**	**Supervised exercise therapy (SET) vs. Non Supervised** • "Statistically significant and clinically relevant differences in improvement in walking distance were consistently demonstrated in favour of SET compared with non-supervised exercise therapy regimens during the first year of treatment. A sub- analysis was performed to investigate the influence of two types of non-supervised exercise regimens. No significant differences were found between "go home and walk" advice and a more structural home-based exercise program. • (14 studies, 1002 participants, unclear quality). • **Countries**: UK (4); USA (6); Netherlands (1); South Africa (1); Australia (1)

6.11 COPD

COPD – Included Reviews

Admission Prevention				
1	**Outreach respiratory health care worker** (to the home)	**6.15**	2012	Home care by outreach nursing for chronic obstructive pulmonary disease.
1	**Rehabilitation** (physical exercise) various settings	**1.7**	2011	Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease.
1	**Action Plans**	**17.10**	2010	Action plans with limited patient education only for exacerbations of chronic obstructive pulmonary disease.
1	**Self-management Education**	**13.111**	2009	Self‐management education for patients with chronic obstructive pulmonary disease.
1	**Tele-health**	**6.24**	2011	Tele-healthcare for chronic obstructive pulmonary disease.
1	**Intensive/Higher Frequency Therapy**	**13.86**	2010	Protocol
1	**Integrated Disease Management**	**17.6**	**2013**	Integrated disease management interventions for patients with chronic obstructive pulmonary disease.

LOS reduction				
1	**Therapeutic Medical Device**	**17.12**	**2004**	Non-invasive (NIV) positive pressure ventilation for treatment of respiratory failure due to exacerbations of chronic obstructive pulmonary disease.

Substitution Effect				
1	**Hospital at home (respiratory nurses)**	**6.13**	**2012**	Hospital at home for acute exacerbations of chronic obstructive pulmonary disease

COPD - Excluded Reviews		
Repeat / Delete	Number excluded	Review ID and Reason for Exclusion
Repeat	23	9.3; 13.59; 13.158; 13.161; 14.6; 15.6; 17.2; 17.7; 17.3; 17.1; 18.4; 20.7; 28.187; 28.150; 28.61; 28.57; 28.84; 28.80; 29.12.43; 29.27.43; 30.27; 30.2; 30.31;
Delete	5	**No relevant outcome (hospitalization):** • 1.11.13 (rehabilitation) • 6.43.56 (domiciliary oxygen) • 6.25 (symptomatic oxygen) • 13.119.173 (non-invasive positive pressure ventilation in exercise therapy) • 13.156.173 (oxygen therapy)
	1	**Trial, not a review**: • 8.1.1
	6	**Comparison**: Medicine vs. Medicine: • 17.9 (antibiotics) • 17.11 (tiotropium vs placebo) • 17.16 (Tiotropium versus ipratropium bromide) • 17.15 (systemic corticosteroids) • 27.21 (vaccines) • 28.174 (oxygen therapy vs. placebo)

COPD		
Mechanism	**ID**	**Conclusions**
Admission Prevention		
Outreach respiratory health care worker (to the home)	**6.15**	**Outreach respiratory worker** • Hospitalization: There was no statistically significant decrease in the number of hospitalisations, but there was significant heterogeneity; this appeared to be caused by one outlying study with a statistically significant decrease in hospitalisations in patients receiving home care, whereas the other studies showed a non-significant increase in hospitalisations, we could not draw firm conclusions about why this heterogeneity exists. • (5/9 studies reporting hospitalization, 786 participants, unclear quality) • GP visits and emergency department presentations: "No consistent effect in these was observed with the intervention." **Countries**: (Hospitalization): UK (1); Canada (1); Australia (2); Hong Kong (1)

Rehabilitation (physical exercise) various settings	**1.7**	**Rehabilitation** • Hospital re-admission: significant reduction in the odds (5 studies, 250 participants, moderate quality) **Countries**: Not explicitly mentioned
Tele-health	**6.24**	• 2/6 studies contributing to hospital admission or Emergency Department visits *used tele-health as a part of a complex case management intervention* so there is potential for confounding and uncertainty as to the magnitude of tele-health's role and effect. • In the other 4/6 studies, intervention was access to a call centre with the control not having access. • Hospital Re-admission: Significant reduction in the odds of re-admission. (5 studies, 250 participants, moderate quality) • For hospital admissions: tele-healthcare reduced the odds ratio of having one or more admissions to hospital over 12 months (6 studies, 604 participants, unclear quality). • For Emergency department visits: significant reduction in the number of patients with one or more emergency department attendances over 12 months; (Total of 3 studies, 1/3 studies involved the complex intervention, 253 participants, unclear quality) • Deaths: No significant decrease in the odds ratio for deaths over 12 months for the tele-healthcare group (3 trials, 2/3 studies used complex interventions, 503 participants, unclear quality). Quality of Life: Tele-healthcare was associated with a clinically significant increase in quality of life (2 trials, 2/2 trials were complex interventions, 253 participants, unclear quality). **Countries:** Not explicitly mentioned
Action Plans	**17.10**	• "There was no evidence that action plans reduced health care utilisation; assessed by hospital admission, emergency department visits or GP visits." • Hospital Admissions: (2 studies, 205 participants) • Emergency Department Admissions (2 studies, 201 participants) • GP visits: (3 studies, 256 participants) • Evidence was moderate quality. **Countries**: New Zealand (3); Netherlands (1); Australia (1) Not clear which countries contributed to hospitalization (2/5 studies), emergency department (2/5 studies), or GP data (3/5 studies)
Self-management Education	**13.111**	• The studies showed a significant reduction in the probability of at least one hospital admission among patients receiving self-management education compared to those receiving usual

		care. • Emergency Department Visits: No significant effects were found. (4 studies, 328 participants, moderate quality) • Doctor and nurse visits: Inconclusive results. (8 studies, 629 participants, moderate quality) • Respiratory related admissions (8 studies, 966 participants, moderate quality) • **Countries:** Not explicitly mentioned
Intensive/ Higher Frequency Therapy	**13.86**	Protocol
Integrated Disease Management	**17.6**	**Integrated Disease Management (IDM)** • Hospital admissions: "There was a reduction in the number of participants over 3 to 12 months from 27 per 100 participants in the control group to 20 per 100 participants in the IDM group. • Hospitalization days: significantly lower in the IDM group compared with controls after 12 months. • (7 and 6 studies; 1470 and 741 participants, respectively; high quality). **Countries**: **For hospitalization admissions:** Australia (2); New Zealand (1); Canada (1); USA (2); Netherlands (1) **For hospital days per patient**: Netherlands (1); Sweden (1); Spain (1); Canada (1); Australia (1); New Zealand (1).
LOS Reduction		
Therapeutic Medical Device	**17.12**	**Non-invasive positive pressure ventilation (NPPV) + UMC medications** vs. **UMC alone**. • Length of hospital stay was significantly shorter with NPPV. • (8/14 studies, 546 patients, good quality) • **Countries**: USA (1); Turkey (2); Russia (1); UK (1); Spain (1); Multicentre (1) = Italy, Spain, France); (used for hospitalization).
Substitution Effect		
Hospital at home (respiratory nurses)	**6.13**	**Hospital at Home** • Hospital readmission data: a small but significant reduction in favour of hospital at home. • (8/8 studies, 870 participants, good quality) • **Countries**: Australia (1), Denmark (1), Italy (1), Spain (1), UK (4)

6.12 Cystic Fibrosis

Cystic Fibrosis – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Substitution Effect				
1	Home Care	**6.8**	2012	Home versus hospital intravenous antibiotic therapy for cystic fibrosis.

Cystic Fibrosis - Excluded Reviews		
Repeat	1	28.40
Delete	1	No relevant outcome (hospitalization): • 28.120 (psychological interventions) • 30.19 (self-management)
	1	Irrelevant comparison: Medicine vs. Medicine: • 27.9 (Palivizumab for prophylaxis)

Cystic Fibrosis		
Mechanism	**ID**	**Conclusions**
Substitution Effect		
Home care	**6.8**	**Home care (home intravenous antibiotic therapy) vs. Inpatient** • "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." • "More research is urgently required." • "Home therapy was cheaper for families and the hospital. Indirect costs were not determined." • (1 study, 17 participants, unclear quality) • **Country**: Australia (1)

6.13 Deep vein thrombosis / pulmonary embolism

Deep Vein Thrombosis / Pulmonary Embolism – Included Reviews				
#	Mechanism	ID	Date	Title
Substitution Effect				
1	Home Care	**6.50**	2007	Home versus in‐patient treatment for deep vein thrombosis.
1	Outpatient vs. Inpatient	**20.30**	2012	Protocol. Outpatient versus inpatient treatment for acute pulmonary embolism.
Admission Prevention				
1	Medical Device: Pharmaceutical Self-Management	**28.106**	2010	Self‐monitoring and self‐management of oral anticoagulation.

Deep Vein Thrombosis / Pulmonary Embolism - Excluded Reviews		
Repeat	2	28.164; 30.28

Deep Vein Thrombosis / Pulmonary Embolism		
Mechanism	**ID**	**Conclusions**
Substitution Effect		
Home Care	**6.50**	**Home vs. Hospital based "low molecular weight heparins" (LMWH) - given by subcutaneous injection** • "Home care with LMWH is less likely to have recurrence of venous thromboembolism (VTE) compared with hospital treatment with UFH or LMWH." • "Home-treated patients had lower mortality & fewer major bleeding. They were more likely to have minor bleeding than those in hospital but this was not statistically significant." • "The limited evidence suggests that home management is cost effective and preferred by patients." • "All 6 studies had fundamental problems: high exclusion rates, partial hospital treatment of many in the LMWH arms, and comparison of UFH in hospital with LMWH at home." • (6 studies, 1708 participants, low quality) • **Countries**: France (1); Canada (1); Brazil (1); Multicentre (1) - (Australia, New Zealand, Poland, South Africa); Greece (1); Multicentre (2): (Netherlands, France, Italy, New Zealand,

		Australia);
Outpatient vs. Inpatient	**20.33**	**Protocol**
Admission Prevention		
Medical Device: Pharmaceutical Self -Management	**28.106**	• Compared to standard monitoring, near patient or point-of-care testing devices have made it possible for people on long-term oral anticoagulation to monitor their blood clotting time measured as the international normalized ration (INR) in the home setting. • Patients who self-test can either adjust their medication dose according to a pre-determined dose-INR schedule (self-management) or they can call a clinic to be told the appropriate dose adjustment (self-monitoring). • Several published studies suggest these methods of monitoring anticoagulation therapy may be equal to or better than standard monitoring by a physician. • Self-monitoring and self-management: Combined results of 18/18 trials showed a halving of thromboembolic events and all-cause mortality with and no reduction in the number of major bleeds. • Self-management had similar reductions in thromboembolic events and mortality to the overall benefit, with no effect on major bleeds. • Self-monitoring halved the number of major hemorrhages that occurred but did not significantly reduce the rates of thrombotic events or all-cause mortality. • **Countries:** Not explicitly mentioned.

6.14 Diabetes

Diabetes – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Substitution Effect				
1	Home care vs. Inpatient care (Diabetes type 1)	**6.51**	2007	Routine hospital admission versus out‐patient or home care in children at diagnosis of type 1 diabetes mellitus.
Admission Prevention				
1	**Assistive Device –** Mobile Phone Messaging	**18.2**	2009	Protocol. Mobile phone messaging ‐ a telemedicine for people with diabetes mellitus.
1	**Education**	**24.2**	2011	Complex interventions for preventing diabetic foot ulceration.
1	**Exercise Rehab**	**28.53**	2012	Exercise for pregnant women for preventing gestational diabetes mellitus.
1	**Adherence Improvement** – Various	**28.139**	2009	Interventions for improving adherence to treatment recommendations in people with type 2 diabetes mellitus.

Diabetes – Excluded Reviews		
Repeat	2	28.165; 30.6
Delete	4	No relevant outcome (hospitalization): • 30.17 (self-monitoring of blood glucose in patients not using insulin) • 28.29 (computer based self-management – clinic / internet based) • 28.86 (education for diabetes with kidney disease) • 28.53 (exercise rehabilitation for diabetes prevention during pregnancy)

Diabetes		
Study ID	**Mechanism**	**Conclusions**
Substitution Effect		
6.51	**Home care vs. Inpatient care** (Diabetes type 1)	• Due to the generally low quality or limited applicability of the studies identified, the results of this review are inconclusive. On the whole, the data seem to suggest that where adequate out-patient/home management of type 1 diabetes in children at diagnosis can be provided, this does not lead to any disadvantages in terms of metabolic control, acute diabetic complications and hospitalisations, psychosocial variables and behaviour, or total costs. • (7 studies, 629 participants, low quality) • **Countries**: Israel (1), Canada (2), USA (2), Finland (1), Australia (1)
Admission prevention		
28.53	**Exercise Rehabilitation**	**Countries**: Spain (1); Australia (2); New Zealand (1); Norway (1)
18.2	**Telemedicine**	**Protocol**
24.2	**Education**	**Educationally-orientated complex interventions vs. usual care or less intensive programmes.** (3/5 studies, 2100 participants, unclear quality). **More intensive and comprehensive complex interventions with care as usual** (2/5 studies, ~2400 participants, unclear quality). • 1/5 RCTs reported a significant effect on amputation and foot ulceration incidence and that study was at unclear or high risk of bias; the results should therefore be viewed with caution and require confirmation in future research. • The other 4/5 trials do not share a common set of characteristics (interventions, control interventions, outcome measures etc.), thereby hindering present and future pooling. In general, the 5 included trials to be at high or unclear risk of bias, caused mainly by lack of information in the trial reports • **Countries**: Finland (1); USA (2); UK (2)
28.139	**Interventions for Adherence**	• "The evidence base on adherence to treatment recommendations in diabetes is almost inexistent."

	– Nurse-led – Home-aide – Diabetes Education – Patient participation consultation – Pharmacy based – Oral anti-diabetic drugs versus insulin – Dosing and frequency	• "Current efforts to improve or to facilitate adherence of people with type 2 diabetes to treatment recommendations do not show significant effects nor harms" • "It is difficult to draw general conclusions from this review. The question whether any intervention enhances adherence to treatment recommendations in type 2 diabetes effectively, thus still remains unanswered." • "The most important question remains that of the validity of the studies because of low numbers of participants, lack of power calculations, poor or absent definition of adherence and the assumption that metabolic parameters such as HbA1c adequately reflect adherence." • "Regarding the educational interventions concerned, these were so poorly described that it was not possible to discern differences or similarities between programmes. In a majority of articles the quality of the reporting in the written articles was incomplete and inaccurate such as missing data, incomplete figures or tables and the absence of confidence intervals or standard deviations." • (21 trials, unclear # participants, low quality) • **Countries:** UK (2); Spain (1); USA (10); Taiwan (1); Netherlands (1); Israel (1); Germany (1); New Zealand (1); not mentioned (3)

6.15 Elderly

Elderly – Included Reviews				
#	Mechanism	ID	Date	Title
Substitution Effect				
1	**Long Term Care**	**6.11**	2012	Protocol. At- home vs. institutional long-term care for chronic functionally dependent older people.
1	**Home care (Exercise)**	**6.39**	2009	Home versus centre-based physical activity programs in older adults.
1	**Home care (Rehabilitation)**	**14.13**	2008	Care home versus hospital and own home environments for rehabilitation of older people.
1	**Home care (Medical Care)**	**6.44**	2008	Medical day hospital care for the elderly versus alternative forms of care.
Admission Prevention				
1	**Assistive Device** (Hip protectors)	**6.30**	2010	Hip protectors for preventing hip fractures in older people.
1	**Assistive Device** Interventions to prevent against falls	**4.3**	2011	Protocol. Interventions for preventing falls in older people: an overview of Cochrane Reviews
1	**Re-ablement services**	**6.1**	2013	Protocol. Home-care 're-ablement' services for maintaining and improving older adults' functional independence.
1	**Environmental + Behavioural** (for reducing risk of falls & fall-related injuries)	**28.23**	2013	Environmental and behavioural interventions for reducing physical activity limitation in community‐dwelling visually impaired older people.
1	**Various – Elderly people living in the community** (Interventions for reducing risk and rate of falls)	**19.5**	2012	Interventions for preventing falls in older people living in the community.
1	**Various – Elderly people living in care facilities and hospitals.** (Interventions for reducing risk and rate of falls)	**13.38**	2012	Interventions for preventing falls in older people in care facilities and hospitals.

1	**Various – <u>Population-based</u> interventions** (for prevention of fall-related injuries)	**28.151**	2008	Population‐based interventions for the prevention of fall‐related injuries in older people.
1	**Organizational interventions to reduce poly-pharmacy**	**17.28**	2012	Interventions to improve the appropriate use of polypharmacy for older people.
LOS reduction				
1	**Exercise** (Acutely hospitalized older medical patients)	**28.132**	2009	Exercise for acutely hospitalised older medical patients.

Elderly - Excluded Reviews		
Repeat	23	28.54; 6.49; 10.1; 11.1; 19.1; 13.139; 28.146; 29.32; 28.79; 28.74; 28.4; 28.130; 28.163; 28.126; 28.38; 29.5; 28.47; 28.148; 29.33; 29.29; 28.147; 28.191; 18.6
Delete	5	Outcome (no hospitalization) • 19.2 (comprehensive geriatric assessment for adults admitted to hospital) • 6.26 (interventions for reducing physical restraints in long-term geriatric care) • 3.3 (exercise interventions on balance in older people living at home or in community) • 28.82 (staffing models in residential, sub-acute, extended aged care settings) • 15.15 (interventions to to increase influenza vaccination rates of those 60 years and older in the community)
	1	**No studies identified** • 3.1 (Interventions to support the decision‐making process for older people facing the possibility of long‐term residential care)
	2	**Not relevant intervention** • 28.14 (Flu vaccines in long-term care institutions) • 28.37 (Psychosocial interventions for reducing antipsychotic medication in care home residents)

Elderly		
Mechanism	**ID**	**Conclusions**
Substitution Effect		
Home Care (LTC)	**1.5 (2007)** **1.6 (2002)**	**Institutional vs. At-home long term care for functionally dependent older people** • **Withdrawn** (2007 to be updated) • **2002 version** • **Conclusion**: "There is insufficient evidence to estimate the likely benefits, harms and costs of institutional or at-home care for functionally dependent older people. No significant difference was found between the two groups." • (1 study, 112 participants, poor quality, 1979, USA)
	6.11	**Protocol**
Home Care (Exercise)	**6.39**	**Home vs. Centre based (community or hospital) physical activity** • **Those with increased risk for heart disease**: "After 6 months, most studies show that exercise programmes, (home or at a centre) improve physical function, quality of life, blood cholesterol levels, walking speed and leg pain after walking due to poor blood flow. When comparing the two exercise programmes, the studies found that improvements were similar but that exercising at a centre may improve walking speed and leg pain after walking more than at home. 1 large study shows that many more people tend to stick with exercising after a home-based programme compared with a centre programme in the long-term." • **In people who had COPD:** "Most studies show that exercise programmes, whether at home or at a centre, improve physical function, decrease blood pressure, and improve some tests for exercise. But quality of life and other tests for exercise did not improve. When comparing the two exercise programmes, one study shows that improvements at home were similar to a centre at 3 months, but at 18 months, exercising at home was better than at a centre. Another study shows that exercising at a centre was better than at home at 2 months but the same at 13 months. • (6 studies, 224 participants received 'home based' vs. 148 received 'centre-based' exercise program, 5/6 studies were medium quality, 1/6 study was poor)

		• A meta-analysis was not undertaken given heterogeneity. • **Countries**: USA (4); Spain (1); Netherlands (1)
Home Care (Rehabilitation)	**14.13**	No studies met inclusion criteria.
Home Care (Medical care)	**6.44**	**Medical day hospital care vs. alternative forms of care** • Overall: There were no significant differences between day hospital attendance and the sub-categories of comparison treatments for the outcomes of death, death or requiring institutional care, death or deterioration in ADL. • Limitations: Multinational locations and the forty years over which the trials were done. • Day hospital vs. comprehensive elderly care (5/13 trials) • Day hospital vs. domiciliary care (5/13 trials) • Day hospital vs. no comprehensive elderly care (3/15 trials) • Total participants = 3007 • The results show a small reduction in bed use by the day hospital patients across all trials (14.5 versus 15.7 days) with subgroup results as follows: • "Hospital use was described in several ways in the trials, it proved possible to obtain a standardised measure for all 13 trials of average hospital bed use per patient recruited (dividing the total number of bed days by the total number of patients for groups of trials). • "Institutional care - 11 trials provided information about the number of patients requiring institutional care at the end of follow up. Overall there was a trend towards fewer day hospital survivors requiring long term institutional care than those receiving alternative services, (median follow up 12 months). • **Countries**: Not explicitly mentioned.
Admission Prevention		
Assistive Device Hip Protector for preventing fall-related admissions	**6.30**	**Hip Protectors vs. None** (various settings) • "Present evidence shows that there is no benefit from hip protectors for the majority of older people living in their own homes." • "Making hip protectors available to frail older people in nursing care facilities may reduce the risk of fractures. The size of any reduction in risk seems to be much less than was suggested by the early studies." • "More research and development is needed to make and test hip protectors that are more comfortable to wear." • (16 studies, over 16,000 participants, unclear quality)

		• **Countries**: Europe (10), Australia (3), Japan (2), USA (1).
Assistive Devices	**4.3**	**Protocol** Interventions for preventing falls in older people: an overview of Cochrane Reviews
Re-ablement Services (Community vs. Community services)	**6.1**	**Home care re-ablement services** vs. **Usual homecare services** (ongoing assistance with completion of household activities and/or personal care by an outside agency (i.e., paid support) and/or informal (unpaid) care, with or without professional input (e.g., nurses, occupational therapists); the control group may also include those waiting for the intervention (wait list)).
Environmental + Behavioural (for reducing risk of falls & related injuries)	**28.23**	No studies met inclusion criteria.
Various Interventions for reducing risk and rate of falls (Elderly people living in the community)	**19.5**	• **Group and home-based exercise programmes and Tai Chi** reduces risk of falling, usually containing some balance and strength training exercises. • **Home safety interventions** reduce rate of falls and risk of falling. • **Multifactorial assessment** and intervention programmes reduce rate of falls but not risk of falling. These are complex interventions, and their effectiveness may be dependent on factors yet to be determined. • **Overall, vitamin D supplementation** does not appear to reduce falls but may be effective in people who have lower vitamin D levels before treatment. • **Some medications** increase the risk of falling. Three trials in this review failed to reduce the number of falls by reviewing and adjusting medications. A fourth trial involving family physicians and their patients in medication review was effective in reducing falls. • **Gradual withdrawal of a particular type of drug** for improving sleep, reducing anxiety, and treating depression (psychotropic medication) has been shown to reduce falls. • **Cataract surgery** reduces falls in women having the operation on the first affected eye. Insertion of a pacemaker can reduce falls in people with frequent falls associated with carotid sinus hypersensitivity, a condition which causes sudden changes in heart rate and blood pressure. • **The addition of footwear assessment, customised insoles, and foot and ankle exercises** to regular podiatry reduced the

		number of falls but not the number of people falling in people with disabling foot pain. • (159 RCTs; 79,193 participants; unclear quality). • **Countries**: The included trials were carried out in 21 countries. Mostly in Australia, USA, Europe.
Various Interventions for reducing risk and rate of falls (Elderly people living in care facilities and hospitals)	**13.38**	• **Exercise interventions** in care facilities were inconsistent (13 trials). Overall, there was no difference between intervention and control groups in rate of falls (8 trials, 1844 participants) or risk of falling (8 trials, 1887 participants). **Post hoc subgroup analysis** by level of care suggested that exercise might reduce falls in people in intermediate level facilities, and increase falls in facilities providing high levels of nursing care. • **Vitamin D supplementation reduced the rate of falls in care facilities, (5 trials, 4603 participants), but not risk of falling (6 trials, 5186 participants).** • **Multifactorial interventions in care facilities -** the rate of falls (7 trials, 2876 participants) and risk of falling (7 trials, 2632 participants) suggested possible benefits, but this evidence was not conclusive. • **Additional physiotherapy i**n sub-acute wards in hospital (supervised exercises) did not significantly reduce rate of falls (1 trial, 54 participants) but achieved a significant reduction in risk of falling (2 trials, 83 participants). • **Carpet flooring** significantly increased the rate of falls compared with vinyl flooring in a sub-acute ward (1 trial, 54 participants), and potentially increased the risk of falling. • **Educational session** by a trained research nurse targeting individual fall risk factors in patients at high risk of falling in acute medical wards achieved a significant reduction in risk of falling (1 trial, 1822 participants). • **Multifactorial interventions in hospitals** reduced the rate of falls (4 trials, 6478 participants) and risk of falling (3 trials, 4824 participants), although the evidence for risk of falling was inconclusive. Of these, one trial in a sub-acute setting reported the effect was not apparent until after 45 days in hospital. • **Multidisciplinary care** in a geriatric ward after hip fracture surgery compared with usual care in an orthopaedic ward significantly reduced rate of falls (1 trial, 199 participants) and risk of falling. More trials are needed to confirm the effectiveness of multifactorial interventions in acute and sub-acute hospital settings.

		• **Countries**: Australia (12), Canada (2), Finland (1), France (2), Germany (2), Korea (1), Japan (3), Netherlands (4), New Zealand (2), Singapore (2), Spain (1), Sweden (3), Switzerland (1), United Kingdom (11), USA (13)
Various **<u>Population-based</u> interventions** (Preventing fall-related injuries)	**28.151**	• "The results of the review were mostly positive, with all six studies reporting a significant decrease or downward trend in fall-related injuries among older people following the implementation of the population-based intervention." • **Australia: "Stay on your feet"** • Intervention: Small media brochures, posters and milk cartons - information through television and radio; community education; home hazard reduction; policy development; engagement of local clinicians • (N=80k Intervention; N=60k Control) • **Taiwan: Tai Chi + education vs. Education alone** • (N=472 Intervention; N=728 Control, rural village) • **Sweden** • Intervention: WHO Safe Community, injury prevention information provided in the media, safety education through community displays and media, home visits, environmental modifications: road and walkways improvements, lighting in public places. • (N=41k Intervention; N=26,000 Control) • **Denmark** • Intervention: educational talks in local clubs and centres, mailed leaflets on falls risk factors, promotion of physical activity and diet, reduction in home hazards, nurse and GP home visits. • (N= 13,921 Intervention, N=12,300 Control) • **Sweden (1996)** • Intervention: WHO Safe Community, community safety displays, training of area health care workers • (N= 35k Intervention; N= 270K Control – entire county) • **Norway** • Intervention: WHO Safe Community, local media coverage of program, educational talks to elderly, home visits by health professionals to high risk individuals, promotion of safe footwear and physical activity, promotion of home hazard removal, engagement with local community agencies and services • (N=22.5K Intervention; N=135k Control)
Interventions to reduce	**17.28**	• **Overview of interventions**: pharmacists working closely with inpatient services on hospital wards (Spinewine 2007) or in

polypharmacy (Organizational change)		hospital discharge process (Crotty 2004b); or in community settings in family based medicine clinics (Taylor 2003); or with drug therapy management services in nursing homes (Trygstad 2009). Models also varied between independent medicine review using patient notes (Crotty 2004b) or face-to-face (Spinewine 2007, Taylor 2003) and following review, recommendations were discussed with multidisciplinary teams (Crotty 2004b) or on inpatient ward rounds (Spinewine 2007). Or consultant pharmacists used computerized drug profiles and made recommendations to prescribers based on fax, telephone, or in writing (Trygstad 2009). Patient education was also included for Spinewine 2007 and Taylor 2003. Education was also provided to prescribers and multidisciplinary teams (Crotty 2004b, Spinewine 2007). Timing was delivered at time of the event either in attendance at outpatient clinics (Taylor 2003) or at nursing home visits (Trygstad 2009) or at hospital discharge to a nursing home (Crotty 2004b) or during the length of the hospital inpatient stay and at discharge (Spinewine 2007). Interventions provided over varying durations. Interventions were delivered at a single episode of care (Crotty 2004b and Spinewine 2007) while the others over multiple episodes of care. • **Spinewine 2007** reported no significant reduction in hospitalisations. (Belgium, 186 participants, unclear quality) • **Taylor 2003** reported a significant reduction in hospital admissions but not the number of emergency department visits during the intervention year compared to pre-intervention. (USA, 69 participants, unclear quality). • **Crotty 2004b** reported a reduction in hospital usage among patients still alive at 8 weeks post-intervention. However, analysis of all patients including deaths and loss to follow-up showed similar hospital usage in both the intervention and control groups (-9 (16.7%) with intervention versus -15 (26.8%) with control; risk reduction (RR) 0.58; 95% CI 0.28 to 1.21). (Australia, 110 residents, moderate quality). • **Trygstad 2009** showed a reduction in the RR of hospitalisation in one cohort of nursing home residents receiving retrospective-only type medication reviews (RR 0.84; 95% CI 0.71 to 1.00, P = 0.04) but the remaining eight cohorts had an RR below 1.0, which was not statistically significant at the P < 0.05 level. (USA, 253 participants, unclear quality)

		• **Countries:** For hospitalization: Belgium (1); USA (2); Australia (1)
LOS Reduction		
Exercise Only or **Multidisciplinary care + Exercise**	**28.132**	• Multidisciplinary interventions that included exercise: Pooled analysis indicated a small significant increase in the proportion of patients discharged to home at hospital discharge, small but important reduction in acute hospital length of stay, and total hospital costs compared to usual care. (6 studies, 3558 participants, Silver graded quality). • Exercise-only interventions: Pooled analysis found no effect on the proportion of patients discharged to home or acute hospital length of stay. (3 studies, 696 participants, Silver Graded Quality) • Overall: The effect of exercise on functional outcome measures is unclear. No intervention effect was found on adverse events. • **Countries: Multidisciplinary care + Exercise**: Sweden (1); Netherlands (1); USA (4) **Exercise only**: Australia (2); USA (1)

6.16 Epilepsy

Epilepsy – Included Reviews			
Mechanism	**ID**	**Date**	**Title**
Admission Prevention			
Care Delivery (adults)	**30.32**	Review (2009) Study (1990)	Care delivery and self‐management strategies for children with epilepsy.
Self-management Education (children)	**30.24**	Review (2010)	Care delivery and self‐management strategies for adults with epilepsy.

Epilepsy – Excluded Reviews		
Withdrawn	2	• 30.25 (2010) Self-management education for children with epilepsy • 30.26 (2010) Self-management education for adults with epilepsy
Delete	1	Outcomes (no hospitalization) • 30.42 (psychological interventions)

Epilepsy		
Mechanism	**ID**	**Conclusions**
Admission Prevention		
Care Delivery	**30.32**	**Alternative models of outpatient care delivery - Adults** **Specialist Epilepsy Unit vs. Standard Neurology Clinic** • "The number of GP consultations, inpatient days appeared lower in the epilepsy unit participants, but these results cannot be verified as no statistical analysis was reported. All results of this evaluation (Morrow 1990) should be interpreted with caution because of the weak study design." • (UK, 296 participants, poor quality).
Self-management Education	**30.24**	**Education – Children** • **Based on play techniques** (Tieffenberg 2000): Reduction in emergency visits in 12 months in the intervention group (P = 0.046); (1 study, 355 children, poor quality) • **Based on story-telling for children** • Lewis (1990): significant differences between groups in percentage of children responding correctly to the following knowledge items: not required to visit ER (emergency room) after seizure (intervention mean (before) 30.9 to mean 78.1; control mean (before) 29.2 to mean 52.2, P = 0.001

		• (1 study, 252 children, poor quality) • **Based on lectures for Adults (same content as Lewis 1990)**: • Lewis (1991): No significant changes were seen for the following knowledge items: not required to visit emergency room after seizure (intervention mean (before) 68.1 to mean 93.0, control mean (before) 71.1 to mean 88.3) • (1 study, 365 parents, poor quality). • **Countries**: Argentina (1), 2000; Chile (2), 1990, 1991

6.17 Eyes

Eyes – Included Reviews			
Mechanism	**ID**	**Date**	**Title**
LOS Reduction			
Surgical Techniques	**13.133**	2009	Surgical interventions for age‐related cataract.
	13.56	2011	Surgical orbital decompression for thyroid eye disease.

Eyes – Excluded Reviews		
Repeat	1	29.31
Delete	1	**Outcomes** (no hospitalization) • 13.99 (Orientation and mobility training for adults with low vision) • 13.2 (Reading Aids for Adults with Low Vision) • 13.144 (Multidisciplinary rehabilitation and monodisciplinary rehabilitation for visually impaired adults) **Medicine** • 13.84 (Topical anaesthesia alone versus topical anaesthesia) • 20.9 (Antioxidant vitamin supplementation)

Eyes		
Mechanism	**ID**	**Conclusions**
LOS Reduction		
Surgical Techniques (LOS not given, but 'complications' outcome as a proxy)	**13.133**	**Intracapsular (ICCE) vs. Extracapsular extraction (ECCE)** • MIOLS, Vogel 1993 and Waddell 2004 were the only studies that compared two different surgical techniques. These studies showed that there were no clinically relevant differences in the visual acuity distributions of both BSCVA and UCVA between ECCE-PCIOL and ICCE-AG/ ACIOL. However, 155 patients lost their aphakic glasses at follow up; an obvious disadvantage. • Overall there was no significant difference in complication incidence between the two techniques but the studies were not appropriately powered to detect differences, if the incidence of the complications is small. • However, intracapsular extraction gave a significantly higher

		frequency of cystoid macular oedema (MIOLS) but this did not significantly increase the number of participants with severe vision loss (< 6/60). • (India (1); UK (1); Germany (1)) **Phacoemulsification (PHACO) with PCIOL vs. Extracapsular extraction (ECCE) with PCIOL** • There are nine trials that have compared these two techniques. • They suggest a better uncorrected visual acuity (UCVA) following PHACO than ECCE. • The majority of the trials showed no difference in best spectacle corrected visual acuity (BSCVA) between the 2 groups apart from Katsimpris 2004, which showed better vision in the PHACO group. However, this result may be due to the higher intraoperative complications and greater PCO in the ECCE group affecting vision. • The complication rate both early and late was significantly lower in the PHACO group in all studies. Even though the endothelial cell loss was comparable between the two techniques there was a higher risk of severe loss in the PHACO group associated with removal of dense cataracts. • (India (1); Singapore (1); UK (2); Greece (1); Sweden (2); Italy (1); Malaysia (1)) **Extracapsular extraction (ECCE) with PCIOL vs. Manual small incision (MCICS) with PCIOL** • Studies comparing these two techniques have shown a significantly better UCVA >= 6/18 and surgical induced astigmatism in the MSICS group (47.9%) v ECCE group (37.3%) RR 1.21 (95% CI 1.06 to 1.37) (P = 0.0001), but no difference in BSCVA between the two groups. • There was no significant difference in complications or costs between the two groups. • (India (1); unclear which other studies are included) **Phacoemulsification (PHACO) with PCIOL vs. Manual small incision (MCICS) with PCIOL** • In an effort to combat the initial outlay of costs of PHACO, MSICS is an appealing alternative that may be performed in a high volume setting. • Two studies compared results of these two techniques, with PHACO having a significantly improved proportion of patients with uncorrected visual acuity (UCVA) >= to 6/18 (81.1% v 71%), there was no difference in BSCVA. • There was no difference in the average postoperative astigmatism or surgical induced astigmatism between PHACO

		and MSICS but significantly less patients had < 1 D astigmatism in the PHACO group (P = 0.04). • There was no statistical difference in the number of patients who did not achieve functional vision in the operated eye, who had a poor visual outcome and surgical complications (including endothelial cell loss) between the two groups. • (India (1); unclear which other studies are included) **Countries**: Singapore (1); Germany (1); Italy (1); Sweden (2); UK (3); India (4); Nepal (1); Malaysia (1); Uganda (1); Multicentre (Nepal, Bangladesh, India)
Surgical Technique	**13.56**	• Two eligible studies were included in the review. These studies vary significantly in interventions, methodology and reported outcomes. **Walsh- Ogura transantral technique was compared with the Kennedy's endoscopic endonasal approach** • Both procedures were found equally effective in reducing exophthalmos but the Walsh-Ogura technique was related to a higher rate of complication and this is the reason why it has been removed from current clinical practice. • This study was disadvantaged by short-term follow- up and did not report on our primary outcome measure (success or failure of treatment). **Surgical bony wall decompression through a coronal approach with the intravenous use of corticosteroids (methylprednisolone)** • The second study suggested that intravenous corticosteroids achieve better visual recovery (56%) than surgical decompression (17%) as a first line treatment for optic neuropathy. It suggested that fewer secondary surgical procedures were required when treated with intravenous corticosteroids but their use related more frequently to side effects with short duration. This study was weakened by the small number of participants involved. **Countries:** Not explicitly mentioned.

6.18 Faecal Incontinence

Faecal Incontinence – Included Reviews			
Mechanism	**ID**	**Date**	**Title**
Substitution Effect			
Surgical vs. non-surgical (2 studies)	**6.3**	2013	Surgery for faecal incontinence in adults.

Faecal Incontinence – Excluded Reviews		
Repeat	1	28.16
Delete	1	**Medicine:** 28.20

Faecal Incontinence		
Mechanism	**ID**	**Conclusions**
Substitution Effect		
Surgical vs. Non Surgical techniques	**6.3**	**Levatorplasty vs. anal plug electrostimulation** • "5/31 patients after anterior levatorplasty and 9/28 patients after anal plug electrostimulation did not improve." • "Of the eight secondary outcomes, data suitable for analysis were unobtainable for four (incontinence score and physiology measures). For two outcomes (use of pads and complications) there were no statistically significant differences between the two groups. " • "However, patient assessments of physical and social handicap (yes or no question) were significantly in favour of the levatorplasty." • (1 study, 59 participants, unclear quality) **Artificial Bowel Sphincter vs. Best Supportive Care** • "Although no primary outcomes were given directly it was possible to infer from the text and tables that all 6 patients who had a successful implant showed some improvement in continence while only 1/7 patients in the control group improved." • "The incontinence score, specific quality of life score and generic mental QoL score statistically favored the surgical intervention." • "The physical component of the generic quality of life score (SF-36) and the depression score were not statistically different." • "Complications occurred in 3/7 in the surgical group, one person requiring abandonment of the device and stoma formation." • (1 study, 13 participants, unclear quality) **Countries**: Sweden (1); Australia (1)

6.19 Heart disease & heart failure

Heart Disease & Heart Failure – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Substitution Effect				
1	Home care vs. Centre-based Support (inpatient or outpatient)	**6.33**	2010	Home‐based versus centre‐based cardiac rehabilitation.
Admission Prevention				
2	Exercise Rehabilitation	**13.100**	2010	Exercise based rehabilitation for heart failure.
		13.70	2011	Exercise‐based cardiac rehabilitation for coronary heart disease.
1	Tele-monitoring or Structured telephone support	**15.24**	2011	Structured telephone support or tele-monitoring programmes for patients with chronic heart failure.
1	Patient Education	**13.54**	2011	Patient education in the management of coronary heart disease.
LOS reduction				
1	Clinical Service Organization	**15.2**	2012	Clinical service organisation for heart failure.

Heart Disease & Failure - Excluded Reviews		
Repeat	10	11.2; 13.103; 17.4; 28.48; 28.48; 28.100; 28.111; 29.14; 29.21; 29.23;
Delete	1	No relevant outcome (hospitalization): • 13.91 (patient adherence and uptake interventions)
	3	Irrelevant comparison (medicine) • 20.15 (Creatine and creatine analogues (pharmaceuticals)) • 23.14 (digitalis) • 28.26 (urosemide, nifedipine capsules, or L-arginine with placebo/no therapy)
	1	Intervention • 3.69 (psychological interventions)

Heart Disease & Failure		
Mechanism	**ID**	**Conclusions**
Substitution Effect		
Home vs. Centre Based	**6.33**	**Home-based vs. Centre-based cardiac rehabilitation** • "The majority of studies recruited lower risk patients following an acute myocardial infarction (MI) and revascularisation." • "There was no difference in outcomes of home- versus centre-based cardiac rehabilitation in mortality risk ratio, cardiac events, exercise capacity, and in modifiable risk factors (systolic blood pressure, diastolic blood prssure, total cholesterol, HDL and LDL cholesterol, HRQoL)." • (12 studies, 1938 participants, unclear quality) • **Countries**: UK (3); US (4); Canada (1); Turkey (1); Italy (1); Iran (1); China (1)
Admission Prevention		
Exercise Rehab	**13.100**	**Exercise training** (various settings) **vs. No Exercise Training (patients with systolic heart failure).** • "We found a significant reduction in hospitalizations due to systolic heart failure with exercise training programmes." • (7/19 studies, 569 participants, unclear quality) • "A trend towards a reduction in the number of patients experiencing hospital admissions with exercise, but these reductions did not achieve statistical significance (at $P < 0.05$): hospital admissions up to 12-months follow up and hospital admissions > 12-months follow up." • (Respectively, 8/19 studies, 659 participants; 4/19 studies, 2658 participants, poor quality) • "Observed consistent significantly higher levels of HRQoL following exercise training programmes compared to control. It is important to note that there was significant heterogeneity in our observations on HRQoL." • (19/19 trials, 3647 participants, poor quality) • **Countries**: UK (1); Germany (3); Greece (1); Italy (3); Poland (3); Switzerland (2); Sweden (1); USA (4); North America (1); Canada (1)
	13.70	**Exercise-only (17/45) or Comprehensive cardiac rehabilitation (exercise plus psychosocial and/or educational) (29/45) vs. Usual Care** • Hospital admissions: studies reporting up to 12 months follow-up, total readmissions were reduced with exercise-based cardiac rehabilitation compared with usual care. There was no

		significant difference in total hospitalisations in studies with follow-up longer than 12 months. • (10/47 studies, 2379 participants, unclear quality) • **Countries**: Europe (32/47) (Authors did not mention other countries explicitly) [It is also not clear which countries contributed to the 10/47 studies used in hospitalization outcomes].
Tele-health	**15.24**	**Intervention: Structured telephone support** (16 studies, 5613 participants), **tele-monitoring** (11 studies, 2710 participants), or **both interventions** (2 studies, included in counts); **Control**: usual care standard post-discharge care without intensified attendance at cardiology clinics or clinic-based CHF disease management programme or home visiting as described above • **Structured Telephone Support**: was effective at reducing the risk of *all-cause hospitalization* and reducing the proportion of patients with *CHF-related hospitalization.* • (11/16 studies; all cause hospitalization; 13/16 studies; CHF-related hospitalization) • **Tele-monitoring**: was effective at reducing the risk of *all-cause hospitalization* and reducing the proportion of patients with *CHF-related hospitalization*. • (8/11 studies; all cause hospitalization; 4/11 studies, CHF-related hospitalization) • **Countries**: USA (14); Italy (4); Germany (3); Canada (2); European Union (2) - Germany, Netherlands, UK, Poland, Italy; Netherlands (1); India (1); Argentina (1); Australia (1)
Education	**13.54**	**Patient education vs. usual care** • "There was no strong evidence of an effect of education on hospitalisation (RR: 0.83, 95% CI:0.65 to 1.07); all-cause mortality (Relative Risk (RR): 0.79, 95% CI 0.55 to 1.13), cardiac morbidity (subsequent myocardial infarction RR: 0.63, 95% CI 0.26 to 1.48, or revascularisation RR: 0.58, 95% CI 0.19 to 1.71). Some HRQofL domain scores were higher with education, but there was no consistent evidence of superiority across all domains. Probably the largest source of bias in this review was the potential imbalance in co-interventions received by intervention and control subjects." • (6/13 studies, # participants and quality not clear) **Countries:** For hospitalization: USA (4/6); Sweden (1/2); Norway (1/2). In total: USA (6); Norway (2); Sweden (2); UK (1); France (1); Russia (1)

LOS Reduction		
Optimal Clinical Service Organization	**15.2**	• **Case-management intervention**. Case management patients were less likely to be readmitted to hospital *for heart failure* six months and 12 months after discharge, although the studies reporting this were not similar enough to draw strong conclusions from the combined data. A year after discharge, case management patients were less likely to be readmitted to hospital for *any reason* than people who received usual care. Patients who received this had less all-cause mortality a year after discharge than patients who received usual care. There was no real difference between groups in deaths related to heart failure (HF), although few studies reported this. Telephone follow-up by a specialist nurse was a common feature of more successful programs. • (4/17 studies, unclear number of participants and quality). • **Heart failure clinics.** No real difference in readmissions for heart failure or all-cause mortality between patients who attended a clinic and those who received usual care. • (6 studies, 1486 participants, unclear quality) • **Multidisciplinary interventions**. There were slightly fewer deaths from any cause in the treatment group than in the usual care group, and both all cause and heart failure related readmissions were substantially lower for patients receiving multidisciplinary care. • (2 studies, 403 participants, unclear quality). • "Although the quality of reporting was unclear in about a third of the trials, most appeared to be of high quality so confidence can be placed in their results." • **Countries**: Europe (14); USA (6), Canada (2), Australasia (2) and Hong Kong (1)

6.20 Hip / Knee

Hip / Knee – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Admission Prevention				
1	**Rehabilitation**	**5.3**	2013	**Protocol.** Assistive devices, hip precautions, environmental modifications and training to prevent dislocation and improve function after hip arthroplasty.
Substitution Effect				
1	**Hospital vs. Outpatient Rehabilitation**	**1.9**	2010	Rehabilitation interventions for improving physical and psychosocial functioning after hip fracture in older people.
1	**Home vs. Hospital Rehabilitation**	**13.150**	2008	Multidisciplinary rehabilitation programmes following joint replacement at the hip and knee in chronic arthropathy.
1	**Various settings**	**13.148**	2008	**Protocol.** Post‐acute physiotherapy for primary total knee arthroplasty.
1	**Surgical vs. Conservative Care**	**13.37** ***(split)***	2012	Interventions for treating proximal humeral fractures in adults.
LOS Reduction				
3	**Surgical techniques**	**29.35**	2008	Conservative versus operative treatment for hip fractures in adults.
		13.37 ***(split)***	2012	Interventions for treating proximal humeral fractures in adults.
		13.179	2008	Type of incision for below knee amputation.

Hip / Knee Issues – Excluded Reviews		
Repeat	24	13.109; 13.182; 13.108; 13.104; 14.15; 14.14; 14.11; 19.6; 20.26; 20.33; 28.118; 28.88; 28.87; 28.97; 28.117; 28.159; 28.153; 28.112; 29.22; 29.25; 29.36; 29.34; 29.26
Delete	2	Outcomes: 6.45; 28.115
	3	Withdrawn: 13.74; 13.167; 9.4
	3	Irrelevant intervention: 28.91; 7.11; 13.101

Hip / Knee Issues		
Mechanism	**Study ID**	**Conclusions**
Admission Prevention		
Rehabilitation **Assistive:** Device, Education, Environmental	**5.3**	**Protocol** *Aim*: "Assess the effects of provision of assistive devices, education on hip precautions, environmental modifications and training in ADL and EADL for people undergoing hip arthroplasty."
Substitution Effect		
Rehabilitation	**1.9**	**Intervention:** Rehabilitation (in various settings) **Control:** usual care, none, various (9 studies, heterogeneous studies, N = 1400) **Other community based care (4/9 studies):** Either group education programs or home rehabilitation (provided by a study physiotherapist and nursing staff). **(1) Inpatient education & coaching + outpatient rehab**: ○ Mortality: there was no significant difference at 6 months ○ Quality of life/functional outcome data, assessed using the SF-36: There were no statistically significant differences found for any of the eight separate domains of the SF- 36 at six months. Outcomes only available for N=58 of 176. **Countries:** USA (4); Sweden (3); UK (1); Taiwan (1)
Home vs. Hospital **Rehabilitation**	**13.150**	**Intervention**: Home-based multidisciplinary care **Control**: Inpatient multidisciplinary care **Descriptions**: • Shepperd 1998 (172 participants, low quality) compared home rehabilitation with routine hospital care. • Siggeirsdottir 2005 (50 participants, low quality) compared home rehabilitation that included pre- and post-operative education programmes with conventional rehabilitation (pre-existing home care). **Conclusions**: • LOS: "There is 'silver' level evidence that individualised home rehabilitation reduces the length of stay without increasing rate of complications following hip replacement (Siggeirsdottir 2005)." • Re-admissions, mortality, costs: "However, there is no evidence of reducing the rate of re-admissions, mortality, or

		costs with home rehabilitation, following hip or knee joint replacement compared to hospital care (Shepperd 1998)." • Quality of Life: "At the level of participation (hip replacement), there is 'silver' level evidence that home rehabilitation improves quality of life for up to six months as measured by DCC (Shepperd 1998) and NHP (Siggeirsdottir 2005)." • Improves disability (knee replacement): "At the level of impairment/activity, there is no evidence that organised hospital at home multidisciplinary care improves disability as measured by BKS (Shepperd 1998)." • Improves disability (hip replacement): "At the level of impairment/activity, there is 'silver' level evidence that organised hospital at home multidisciplinary care can improve disability for up to six months as measured by the OHS (Siggeirsdottir 2005). WMD for OHS at 6 months is -7.00 (95%CI -10.36, -3.64) and NNT 2 (95%CI 2, 2). However, no effect was shown with MAP or HHS in Siggeirsdottir 2005, or with OHS in Shepperd 1998. (MAP, HHS, and OHS are various measures for hip disability ratings). **Countries:** UK (1); Iceland (1); Australia (1); USA (1)
Therapy	**13.148**	**Intervention:** Various forms of Physiotherapy (PT) and types of clinical settings **Control:** routine care, ***non-supervised*** or self-directed therapy and alternative PT approaches **Patients**: Primary total knee arthroplasty
Surgical vs. Conservative Interventions	**13.37**	**Surgical treatment vs. conservative treatment** **(1) *Fracture fixation versus conservative treatment:*** • *(1a) Internal fixation using surgical tension band or cerclage wiring vs. sling:* (Zyto 1997, N=40, Sweden, three more were recorded in Tornkvist 1995). • *(1b) Surgery involving open reduction and fixation with an interlocking plate device and metal cerclages vs. conservative treatment starting with immobilisation of the injured arm in a modified Velpeau bandage:* (Fjalestad 2010, N=50, Norway). • *(1c) Surgery involving open reduction and fixation with a PHILOS plate and nonabsorbable sutures vs. conservative treatment starting with arm immobilisation in a sling:* (Olerud 2011a, N=60, Sweden). **(2) Orthroplasty vs. conservative treatment:** • **Humeral head replacement with the Global Fx prosthesis vs. conservative treatment starting with arm immobilisation in a**

		sling: (Olerud 2011b, N=55, Sweden). **Conclusions**: <u>Second surgery:</u> • "Significantly more surgical group patients had additional or secondary surgery (18/112 versus 5/111; RR 3.36, 95% CI 1.33 to 8.49; 5 trials). (See review for more details, page 14). <u>Function</u>: • At 12 months follow-up, there was no statistically significant difference between the two groups (standardised mean difference (SMD) -0.10, 95% CI -0.42 to 0.22; higher = worse function; 153 participants, three trials: Fjalestad 2010; Olerud 2011a; Olerud 2011b). • Pooled DASH scores from Olerud 2011a and Olerud 2011b showed no statistically significant differences between the two groups at four months, or at one or two years but there was a potential trend to a more favourable result after surgery (DASH (0 to 100: worst function) at 24 months: MD -7.43; 95% CI -16.26 to 1.41; 99 partici- pants). • As reported in Fjalestad 2012, Fjalestad 2010 found no significant differences between the two groups in the American Shoulder and Elbow Surgeons (ASES) scores at either six months or 12 months follow-up (ASES (0 to 24: best function), MD - 0.70, 95% CI -4.52 to 3.12; see Analysis 4.3). (A full report of the two year follow-up and functional outcome data of Fjalestad 2010 is pending.) • There were no statistically significant differences in subjective assessment of function between the two groups of Zyto 1997 at either one or three years. <u>Quality of Life</u>: • EuroQol scores from three trials (Fjalestad 2010; Olerud 2011a; Olerud 2011b) showed non-statistically significant differences between the two groups at three time points (3 to 4 months, 6 months and 12 months). However, the pooled results at two years from the two Olerud trials were in favour of the surgical group (MD 0.15; 95% CI 0.05 to 0.25, 101 participants; see Analysis 4.5). A separate breakdown of the results from Fjalestad 2010, which include the number of QALYs showed no differences in any quality of life outcomes for this trial. <u>Mortality:</u> • No significant differences between the two groups in mortality. <u>Adverse Events:</u> • "The numbers of people in each group with one or more

		adverse events or complications were not available for any of the six trials." **Countries:** Sweden (3); Norway (1)
LOS Reduction		
Surgical Technique	**29.35**	**Intervention: Operative treatment.** • <u>*For extra capsular fractures*</u>: most commonly used is the sliding hip screw (SHS). • <u>*For undisplaced intracapsular fractures:*</u> preservation of the femoral head by internal fixation. **Control**: **Conservative treatment.** • <u>*For extra capsular fractures*</u>: applying traction to the injured limb either via a pin inserted into the tibia (skeletal traction). Between 4 to 9 kilograms of weight is then applied to reduce the fracture. Traction is then maintained whilst the fracture heals, a period of 2 to 4 months. • <u>*Undisplaced intracapsular fracture:*</u> may involve a period of bed rest followed by mobilisation which may be either unrestricted or with limitations on weight bearing or activities, depending on the physician's preference. **Countries:** UK (3), Denmark (1); Hong Kong (1) **Conclusions:** • 1 small and potentially biased trial of 23 patients with <u>*undisplaced intracapsular fracture*</u> provided limited evidence that surgical fixation increased the chances of the fracture healing. • The four trials on <u>*extracapsular fractures*</u> tested a variety of surgical techniques and implant devices and only one trial involving 106 patients can be considered to test current practice. This trial found no major difference between surgery and traction for people with extracapsular fractures. However, people who had surgery had better anatomical outcomes, tended to leave hospital sooner, and seemed less likely to lose their independence. • The review concluded that overall there was insufficient evidence to determine if surgery is better than bed rest and traction for the two categories of hip fractures tested in randomised trials. However, nowadays most people with hip fracture are treated surgically where it is safe to do so.
Surgical Techniques	**13.179**	**Intervention:** Different surgical techniques **Control**: Various **Summary**: LOS was inconclusive as none of the studies provided standard deviations required for statistical analysis. • **"Two-stage BKA (a guillotine amputation at the ankle as the**

		primary procedure followed by a long posterior flap BKA with primary skin closure as a secondary procedure) with one-stage BKA (long posterior flap BKA with delayed skin closure) in 30 patients with wet gangrene of the foot (Fisher 1988)." • **"**There was significantly better (100%) primary stump healing in the two- stage group than in the one-stage group (Peto OR 0.08, 95% CI 0.01 to 0.89). There was no difference between the two groups in post-operative infection rate, reamputation at the same level, or reamputation at a higher level. Mobility with a prosthetic limb was 47% in the two-stage group and 54% in the one-stage group. This was not statistically different (Peto OR 0.87, 95% CI 0.43 to 1.78). Mean length of hospital stay was 44 days in the two- stage group and 67 days in the one-stage group. Statistical analysis could not be applied to this as the standard deviation of hospital stay was not given in the paper." • **"The Joint Vascular Research Group (JVRG) study randomised 191 patients in 11 vascular centres to skew flaps BKA (n = 98) or long posterior flap BKA** (n = 93) (Ruckley 1991)." • **"**There was no difference in primary stump healing between the two groups (60% for both skew flaps and long posterior flap) (RR 1.00, 95% CI 0.71 to 1.42). The rates of post-operative wound necrosis, reamputation at the same level, and reamputation at a higher level were again no different between the groups. Mobility with a prosthetic limb was 60% in the skew flaps group and 49% in the long posterior flap group, although this was not statistically different (RR 1.22, 95% CI 0.94 to 1.58). Mean length of hospital stay was 36 days in the skew flaps group and 42 days in the long posterior flap group. Statistical analysis could not be applied to this as the standard deviation of hospital stay was not given in the paper." • **The last study compared 41 patients treated with a sagittal flap BKA to 47 patients with a long posterior flap** (Termansen 1977). • No LOS outcomes.
Surgical Techniques	**13.37**	**Intervention:** Surgical vs. Other Surgical Techniques **(1) Open reduction with internal fixation using a locking plate vs. a locking nail** (Zhu 2011, N=57, China) • No LOS outcomes reported **(2) Open reduction with internal fixation using a locking plate vs. minimally invasive fixation with distally inserted intramedullary nails** (Smejkal 2011, N=63, Czech Republic) • <u>Complications:</u> "There was no significant difference between

		the two groups in the overall numbers of participants incurring a complication." • LOS: "The tendency for longer hospital stays for plate group patients did not achieve statistical significance." **(3) Hemi-arthroplasty vs. tension band wiring (Hoellen 1997, Holbein 1999, same trial, Germany)** • "In Hoellen 1997, results for only 18 of the 30 trial participants were available at one year." • "There were no serious peri-operative or post-operative complications such as pulmonary embolism. No participants of the replacement group required further surgery compared with five participants of the osteosynthesis group (the wires displaced in four participants and the fracture completely dislocated in one participant): RR 0.09, 95% CI 0.01 to 1.51." **Comparisons of different methods of performing an intervention in the same category** **(4) Polyaxial vs monoaxial locking plate fixation** • LOS: No reported outcomes. • Reoperation: Neither trial found statistically significant differences between the two groups in participants having a re-operation (Ockert 2010, N=66, Germany; Voigt 2011, N=48, Germany). • Functional outcome: Ockert 2010 did not report these outcomes, Voigt 2011 reported using DASH measures and found no significant differences. **Locking plate: use of medial support locking screws** **(5) Intervention:** In the medial support group, locking screws were introduced through the plate so as to run up the inferior portion of the humeral neck providing support to the calcar. **Control:** screw holes were left empty. • (Zhang, 2011, N=77, China). • LOS: No reported outcomes. • Early Failure of Fixation: 1 participant in the medial screw group had early failure of fixation due to plate breakage vs. 9 with early fixation failure (six varus collapse; three screw penetration) in the control group; however, this difference did not reach statistical significance. 7 of these patients, including the patient in the medial screw group, consented to have a re-operation (RR 0.22; 95% CI 0.03 to 1.11). • One patient in the medial screw group had asymptomatic osteonecrosis. • Function: The medial screw group had statistically significantly higher Constant scores (function measures) (0 to 100: best

		score) at 31 month follow-up (MD 9.00, 95% CI 2.41 to 15.59). **Hemiarthoplasty: comparison of two types** **(6) Two types of hemiarthroplasty: the EPOCA prosthesis vs. the HAS prosthesis, which differ in a number of ways including the method of fixation of the tuberosities.** • (Fialka 2008, N=40, Austria). • Function: Significantly better functional results, including range of motion, at one year were reported for EPOCA prosthesis group. • Reported complications were 2 patients with deep infection in the EPOCA group, 2 patients with persistent pain scheduled for a reoperation in the HAS group. • LOS: None reported.

6.21 HIV/AIDs

HIV / AIDS – Included Reviews				
#	Mechanism	ID	Date	Title
Admission Prevention				
1	**Self-Management**	**30.23**	2010	**Protocol**. Self‐management interventions for people living with HIV/AIDS.

HIV / AIDS – Excluded Reviews		
Repeat	3	29.10
Delete	2	**Outcomes:** 13.89; 6.34
	1	**Medicine:** 6.6
	3	**Public Health**: 28.145; 30.43; 21.1
	3	**Setting (Developing Country):** 28.17; 28.49; 6.31

6.22 Hospital-related injuries

Hospital Related Injuries – Included Reviews				
#	Mechanism	ID	Date	Title
LOS reduction				
1	**Assistive Device**	**13.53**	2010	Interventions designed to prevent healthcare bed ‐ related injuries in patients.

Hospital Related Injuries – Excluded Reviews		
Repeat	1	29.10

Hospital Related Injuries		
Mechanism	**Study ID**	**Conclusions**
LOS Reduction		
Assistive Device / Multidisciplinary Care (Community-based interventions)	**13.53**	**Low Beds vs. Standard beds** • "A single cluster randomised trial of low height beds in 18 hospital wards, including 22,036 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls in the bedroom, all falls or patient injuries due to all falls." **Bed Exit Alarms vs. None** • "One randomised controlled trial of bed exit alarms in one hospital geriatric ward, involving 70 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls out of bed, all falls, or patient injuries due to all falls (no injuries in either group)." **Countries**: Not clear which countries explicitly: UK (3); US (4); Canada (1); Turkey (1); Italy (1); Iran (1); China (1)

6.23 Lumbar Surgery

Lumbar Surgery – Included Reviews				
#	Mechanism	ID	Date	Title
Substitution Effect				
1	Supervised vs. Non supervised exercise therapy	**13.143**	2008	Rehabilitation after lumbar disc surgery.
LOS reduction				
1	Surgical techniques	**13.180**	2008	Surgery for degenerative lumbar spondylosis.

Lumbar surgery		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Supervised vs. Non Supervised Exercise Therapy	**13.143**	**Supervised vs. Non Supervised Exercise Therapy** • **Conclusions**: "Based on pooled results, we found some evidence suggesting that supervised training is not more effective than home-based training in the short-term. But again, these results should be interpreted cautiously (only low quality evidence). Moreover, the compliance, both of the home exercise programs and the supervised programs, is poorly reported in these studies, further hampering an adequate interpretation." • Global perceived effect: "There are sparse data from one trial (Johannsen 1994) showing no differences on global perceived effect (four-point scale) at both the post-treatment and the three-month follow-up." • Long term (re-operative rates & pain): "There are only sparse data (Johannsen 1994) reporting no significant differences between groups. One small (N = 40) trial (Johannsen 1994) reported re-operative rates that were negligible in both groups and that there were no differences between groups for long-term pain relief." • Short-term pain relief: "There is low quality evidence (3 RCTs, N = 95) that there were no significant differences between supervised exercise program and home exercises." • Functional status: "There is low quality evidence (3 RCTs, N = 95) that there were no short-term differences between supervised exercise programs and home exercises (pooled SMD -1.17; 95% CI

		-2.63 to 0.28). **Countries**: Not explicitly mentioned (Settings also not explicitly mentioned).
LOS Reduction		
(Surgical Technique)	**13.180**	**ProDisc vs Fusion** • "Operative time, blood loss and length of hospital stay were lower with disc replacement." • "Oswestry Disability scores were improved with disc replacement, but at six months there were no significant differences in pain, disability or patient satisfaction." • "In view of the small numbers, it is not possible to graphically present the results, make multiple statistical comparisons or draw any firm conclusions." • (1 study, 28 participants, unclear quality). • **Country**: USA

6.24 Maternity and Infants

Maternity – Included Reviews				
#	Mechanism	ID	Date	Title
LOS Reduction				
3	**Benchmarking** Early Discharge (Feeding)	7.1	2010	Ad libitum or demand/semi‐demand feeding versus scheduled interval feeding for preterm infants.
		7.4	2003	Early discharge with home support of gavage feeding for stable preterm infants who have not established full oral feeds.
		7.7	2010	Early versus later discharge of physiologically stable preterm infants who are fully orally feeding.
1	**Benchmarking** Early Discharge (Birth-weight or gestational age)	7.14	2011	Transfer of preterm infants from incubator to open cot at lower versus higher body weight.
1	**Benchmarking** Early Discharge (Healthy mothers and infants)	6.56	2002	Early postnatal discharge from hospital for healthy mothers and term infants.
1	**Benchmarking** (Delayed Admission)	23.7	2001	Labour assessment programs to delay admission to labour wards
1	**Benchmarking** Early vs. Delayed Admission (Prelabour rupture of membranes)	23.8	2010	Planned early birth versus expectant management for women with preterm pre-labour rupture of membranes prior to 37 weeks' gestation for improving pregnancy outcome.
3	**Therapeutic** (Non-device)	7.10	2004	Massage for promoting growth and development of preterm and/or low birth‐weight infants.
		7.5	2011	Kangaroo mother care to reduce morbidity and mortality in low birth-weight infants.

		6.54	2003	Interventions for suspected placenta praevia.
1	**Telemedicine**	18.5	2012	Telemedicine for the support of parents of high‐risk newborn infants.
Admission Prevention				
1	**Medical Device**	28.59	2012	Home uterine monitoring for detecting preterm labour.
2	**Home visiting**	15.8	2009	Home‐based post‐discharge parental support to prevent morbidity in preterm infants.
		15.18	2013	Schedules for home visits in the early postpartum period.
2	**Diagnostic Test**	27.18	2011	Admission tests other than cardiotocography for foetal assessment during labour.
		27.28	2008	Amniotic fluid index versus single deepest vertical pocket as a screening test for preventing adverse pregnancy outcome.
1	**Self-Management**	28.192	2013	Antenatal education for self‐diagnosis of the onset of active labour at term.
Substitution Effect				
7	**Home / Outpatient vs. Hospital care**	6.54	2003	Interventions for suspected placenta praevia.
		6.32	2010	Planned home versus hospital care for preterm pre-labour rupture of the membranes (PPROM) prior to 37 weeks' gestation.
		20.6	2009	Antenatal day care units versus hospital admission for women with complicated pregnancy.
		27.22	2010	Hospitalisation and bed rest for multiple pregnancy.
		28.177	2010	Bed rest during pregnancy for preventing miscarriage.
		23.13	2013	Planned hospital birth versus planned home birth.
		20.29	2013	Outpatient versus inpatient induction of labour for improving birth outcomes.

Maternity – Excluded Reviews		
Repeat	20	28.141; 28.96; 28.180; 28.181; 28.90; 28.189; 28.142; 28.32; 28.13; 28.103; 28.5; 21.2; 23.3; 28.55; 28.5; 28.45; 28.105; 7.6; 15.4; 28.184
Delete	15	**Outcome (no hospitalization):** • 7.13; 28.15; 27.1; 20.17; 27.23; 17.23; 28.124; 28.46; 28.52; 28.51; 27.10; 28.194; 15.17; 15.7; 28.144
	2	**Setting (Developing Countries)** • 28.42; 15.3
	14	**Medicine**: • 20.28; 27.15; 28.93; 27.14; 28.66; 28.114; 27.5; 28.143; 28.6; 27.7; 27.6; 27.26; 17.27; 20.41
	1	**No Control Group** • 28.99
	1	**Prevention Public Health** • 15.5
	1	**Social Care** • 15.25

Mechanism	Study ID	Conclusions
LOS Reduction		
Benchmarking Early discharge (Feeding)	**7.7**	**Early discharge with or without home support is compared to later discharge** (physiologically stable preterm infants who are fully orally feeding)
Benchmarking (Feeding)	**7.1**	**Ad libitum vs. Demand/Semi-Demand feeding regimens** (Preterm infants (less than 37 weeks' gestation)) • "8 RCTs that compared ad libitum or demand/semi-demand regimens with scheduled interval regimes in preterm infants in the transition phase from intragastric tube to oral feeding. The trials were generally small and of variable methodological quality." • "3 trials reported that feeding preterm infants using an ad libitum or demand/ semi-demand feeding regimen allowed earlier discharge from hospital (by about two to four days) but other trials did not confirm this finding." • **Conclusions**: "Limited evidence exists that feeding preterm infants with ad libitum or demand/semi-demand regimens allows earlier attainment of full oral feeding and earlier hospital discharge." • **Countries**: North America (8)

Benchmarking (Feeding)	**7.4**	**Early discharge of stable preterm infants with Home support of gavage feeding vs. discharge at full sucking feeds** • **Conclusions**: "There is not enough strong evidence." • **Description**: "Babies born preterm (before 37 weeks) are not usually discharged from hospital until they are able to suck all their feeds. Early discharge of babies who are stable but still need gavage (tube) feeds could unite families sooner and might reduce costs. These babies could graduate to full sucking feeds at home, with some professional support. However, this could also be a burden for the family and might increase complications in the transition from tube-feeding." • **Results**: "Infants in the early discharge program with home gavage feeding had a mean hospital stay that was 9.3 days shorter [MD -9.3 (-18.49 to -0.11)] than infants in the control group. There were no significant differences between groups in duration and extent of breast feeding, weight gain, re-admission within the first 12 months post discharge from the home gavage program or from hospital, scores reflecting parental satisfaction, or health service use." • **Other outcomes:** "Infants in the early discharge program also had a lower risk of clinical infection during the home gavage period compared with the corresponding time in hospital for the control group [relative risk 0.35 (0.17 to 0.69)]." • (1 study, 88 infants, unclear quality). **Countries**: Sweden (1)
Benchmarking (Birth-weight)	**7.14**	**Transfer from incubators to unheated open cots at a lower body weight vs. at a higher body weight.** • (2 studies, total N=276 infants, good quality) • **Aim:** focused on the impact of transferring preterm babies from incubators to unheated open cots at two different body weights, 1,600 grams or 1,800 grams. • **Heterogeneity**: There was considerable heterogeneity among these two studies." Whilst both studies investigated preterm infants born less than 1600 grams, the differences between mean gestational age of the two populations may account for longer length of stay for the New 2011 study. In addition a higher number of infants were discharged exclusive breastfeeding in the New 2011, thus full breastfeeding may

		impact on length of stay." • **Quality**: Two RCTs used for data analysis (N=276) were rated as good quality and the third (Sutter 1988) was rated as poor quality. • **Patient Outcomes**: There were no statistically significant differences in the proportion of infants with at least one episode of lower temperature (≤ 36.5°C) within 72 hours or at least once (N=276, New 2011, Zecca 2010) and infants having at least one episode of lower-temperature either requiring overhead heater (N=276, New 2011, Zecca 2010) or requiring return to incubator (N=336, New 2011, Zecca 2010, Sutter 1988) for either group: infants transferred at 1,600 grams versus those transferred at 1,800 grams. For those transferred at lower birth-weights of 1,600 grams, the mean daily weight gain was higher compared to those transferred at higher birth-weights of 1,800 grams (N=276, New 2011, Zecca 2010), • **Resource Use**: In one study, transferring infants to an open cot born at a lower body weight (Zecca 2010) had statistically significant shorter length of stay but this result was not found in the Australian study (New 2011) but this may be the result of different length of stay policies. **Countries**: Australia (1); Italy (1); USA (1) (for data included in analysis).
Benchmarking Early discharge (Healthy mothers and term infants)	**6.56**	**Early postnatal discharge vs. Standard Discharge from hospital for healthy mothers and term infants (healthy infant of at least 2,500 grams at term (37 to 42 weeks).** • **Heterogeneity & Limitations:** "There was substantial variation in the definition of 'early discharge', and the extent of antenatal preparation and midwife home care following discharge offered to women intervention and control groups; 6 trials recruited women in pregnancy, 4 trials following childbirth. There was high loss to follow up (30.7% to 51.4%). There were low rates of recruitment, bringing into question the representativeness of the included women. Non-compliance with allocated treatment was frequent." • LOS: "No trials included data on the duration of infant readmissions, or on the total duration of infant hospitalization (including the period immediately after the birth prior to discharge)." • Readmissions: "No statistically significant differences in infant (7 trials) or maternal readmissions (8 trials; RR 1.10, 95% CI 0.51 to 2.40) (Boulvain 2004 - Switzerland; Brooten 1994 - USA; Carty 1990 - Canada; Hellman 1962 - USA; Sainz Bueno 2005 - Spain;

		Smith-Hanrahan 1995 - Canada; Waldenström 1987 - Sweden; Yanover 1976)." • Maternal depression: "5 trials showed either no significant difference or results favouring early discharge for the outcome of maternal depression, although only 3 used a well-validated standardized instrument." (Boulvain 2004 - Switzerland; Sainz Bueno 2005 - Spain; Carty 1990 - Canada; Brooten 1994 - USA; Waldenstrom 1987 - Sweden). • Health service use for infants: There was never more than one study reporting on health service use in a variety of areas such as acute care visits (Brooten 1994 - USA), contacts with health professionals (Gagnon 1997 - Canada) and in these cases, no significant differences were found (p.10, first paragraph). There were no studies reporting accident and emergency visits. For physician visits, one study (Carty 1990 - Canada) reported 4.3% (4/93) of visits occurring in early discharge groups and 5.2% (2/38) in standard care (RR 0.82, 95% CI 0.16 to 4.28). • Health service use for mothers: The trend across single studies reporting on different service use is towards lower service use in the early discharge groups. For acute care visits, one study found that women who underwent an unplanned caesarean and were discharged early had fewer visits compared to women with standard discharge procedures (R 0.46, 95% CI 0.19 to 1.14) (Brooten 1994 - USA). For the proportion of women visiting a physician, early discharge groups attended less (5.3%, 5/93) compared with (7.9%, 3/38) in the standard care group (RR0.68, 95% CI 0.17 to 2.71) (Carty 1990 - Canada). Visits to the gynaecologists in the first month were fewer in the early discharge group (15%, 33/228) versus 22% in the standard care group (48/231) (RR 0.70, 95%CI 0.47 to 1.10) (Carty 1990). • (10 trials, 4489 women, various quality) • **Countries:** Switzerland (1); USA (3); Canada (3); Spain (1); Sweden (1); England (1)
Benchmarking Delayed Admission (Labour assessment program)	**23.7**	**Labour assessment Unit vs. Admitted directly to the Labour Ward** • Labour assessment unit: are specialized programs that confirm whether women coming into hospital with signs of labour, are in active labour. • "Women who were randomised to the labour assessment unit spent less time in the labour ward (weighted mean difference -5.20 hours, 95% confidence interval -7.06, -3.34), were less likely to receive intrapartum oxytocics (odds ratio 0.45, 95% confidence interval 0.25 to 0.80) and analgesia (odds ratio 0.36, 95% confidence interval 0.16 to 0.78), than women who were

		admitted directly to the labour ward." • "Women in the labour assessment group reported higher levels of control during labour (weighted mean difference 16.00, 95% confidence interval 7.52 to 24.48)." • "There is insufficient evidence to assess effects on rate of caesarean section and other important measures of maternal and neonatal outcome." • (1 study, 208 women, excellent quality). • **Country**: Canada (1)
Benchmarking Early vs. Delayed admission (Pre-labour rupture of membranes)	**23.8**	**Planned early birth vs. expectant management** (Women with preterm pre-labour rupture of membranes prior to 37 weeks' gestation for improving pregnancy outcome) • There was no significant difference in the length of stay in neonatal intensive care unit those babies delivered early (MD -0.56, 95% CI -1.27 to 0.15; I2 = 25%; 286 babies; Analysis 1.23) as compared with those who were managed expectantly." • "There was also no significant difference in the time from birth to neonatal hospital discharge (MD -0.33 days, 95% CI -1.06 to 0.40; I2 = 0%; 261 babies; Analysis 1.24). • (3 trials, 286 women, unclear quality). • **Countries**: USA (3)
Therapeutic (Non-device)	**7.10**	**Massage for preterm and/or low birth – weight infants** • "There is insufficient evidence of effectiveness to warrant wider use of preterm infant massage." • No adverse effects on babies, it does promote slight weight gain, however, serious methodological weaknesses prevent strong conclusions. • (13 studies, not all reported length of stay). • **Countries**: Not explicitly mentioned

Therapeutic (Non-device)	**7.5**	**Kangaroo mother care (KMC) vs. Conventional Care** • Kangaroo mother care: "originally defined as skin-to-skin contact between a mother and her newborn, frequent and exclusive or nearly exclusive breastfeeding, and early discharge from hospital." • "At discharge or 40 - 41 weeks' postmenstrual age, KMC was associated with a reduction in the risk of mortality, nosocomial infection/sepsis, hypothermia, and length of hospital stay (9 trials, 795 participants, moderate and mixed quality, typical mean difference 2.4 days, 95% CI 0.7 to 4.1)." • "At latest follow up, KMC was associated with a decreased risk of mortality and severe infection/sepsis." • "Moreover, KMC was found to increase some measures of infant growth, breastfeeding, and mother-infant attachment." • "Further information is required concerning effectiveness and safety of early onset continuous KMC in unstabilized LBW infants, long term neurodevelopmental outcomes, and costs of care." • (16 studies, 2518 infants) 14 studies evaluated KMC in LBW infants after stabilization, 1 evaluated KMC in LBW infants before stabilization, and 1 compared early onset KMC with late onset KMC in relatively stable LBW infants.
	6.54	**Cervical cerclage ('tying' the cervix) vs. No Cerclage** (For patients with suspected placenta praevia) • LOS: -4.80 days (95% CI -6.37 to -3.23) • (2 trials, 53 women, unclear quality). **Countries**: Not explicitly mentioned but likely from USA. (This review is also included under the section "Substitution Effect")
Telemedicine	**18.5**	**Telemedicine vs. None** (Parents of infants in the Neonatal Intensive Care Unit (NICU) • "There is insufficient evidence to support or refute the use of telemedicine technology to support the parents of high-risk newborn infants receiving intensive care." • (1 study, 56 participants, low quality) • No difference in the length of hospital stay (average length of stay: telemedicine group: 68.5 days (standard deviation (SD) 28.3 days), control group: 70.6 days (SD 35.6 days), MD -2.10 days (95% confidence interval: -18.85 to 14.65 days). • "There was insufficient information for further analysis of measures of family satisfaction." **Country**: USA (1)
Admission Prevention		

Medical Device	**28.59**	**Home uterine monitoring vs. Standard care** Neonatal intensive care unit: • Infants born to women in the home uterine monitoring group were significantly less likely to be admitted to a neonatal intensive care unit than infants born to control group women (average RR 0.77; 95% CI 0.62 to 0.96; five studies, n = 2367; random- effects, T2 = 0.02, I2 = 32%). • "5 studies measured this outcome (Brown 1999; CHUMS 1995; Corwin 1996; Dyson 1991; Wapner 1995) but the reporting is incomplete (Wapner 1995), limited to singleton gestations (Corwin 1996) or apparently flawed (Dyson 1991)." • "CHUMS 1995, the highest quality study of the group states that 28.5% of all infants born to women in the monitored group were admitted to neonatal intensive care, compared with 32.0% of all infants born to control group women. However, a sensitivity analysis, excluding the lower-quality studies, leaves CHUMS 1995, which did not find a statistically significant difference (RR 0.86; 95% CI 0.74 to 1.01; n = 1292)." • Antenatal hospital visits: 3 studies (Blondel 1992; Brown 1999; CHUMS 1995) assessed this outcome. There is no statistically significant difference between the number of antenatal hospital admissions in the monitoring and control groups (RR 0.91; 95% CI 0.74 to 1.11; three studies, n = 1494). Other outcomes: • Preterm birth: Women using home uterine monitoring were less likely to experience preterm birth at less than 34 weeks (risk ratio (RR) 0.78; 95% confidence interval (CI) 0.62 to 0.99; three studies, n = 1596; fixed-effect analysis). However, this significant difference was not evident when we carried out a sensitivity analysis, restricting the analysis to studies at low risk of bias based on study quality (RR 0.75; 95% CI 0.57 to 1.00, one study, 1292 women). • Perinatal mortality: There was no significant difference in the rate of perinatal mortality (RR 1.22; 95% CI 0.86 to 1.72; two studies, n = 2589). • Preterm births < 37 weeks: There was no significant difference in the number of preterm births at less than 37 weeks (average RR 0.85; CI 0.72 to 1.01; eight studies, n = 4834; random effects, T2 = 0.03, I2 = 68%). • Unscheduled antenatal visits: Women using home uterine monitoring made more unscheduled antenatal visits (mean difference (MD) 0.49; 95% CI 0.39 to 0.62; two studies, n = 2807).

		• Prophylactic tocolytic drug therapy: Women using home uterine monitoring were also more likely to have prophylactic tocolytic drug therapy (average RR 1.21; 95% CI 1.01 to 1.45; seven studies, n = 4316; random-effects. T2 = 0.03, I2 = 62%) but this difference was no longer significant when the analysis was restricted to high quality studies (average RR 1.22; 95% CI 0.90 to 1.65, three studies, n = 3749, random effects, T2 = 0.05, I2 = 76%). • **Countries**: France (1); USA (14)
Home visiting (Educational or Psychosocial interventions)	**15.8**	**Home visiting or home-based parent centered interventions, with or without an in-hospital component** (for preventing morbidity in pre-term infants).
Home Visiting	**15.18**	**Home visiting vs. Hospital Clinic care** **Comparison 1**: **More versus Fewer visits** • Countries: UK (Christie 2011, Morrell 2000) • Intervention: Christie 2011 and Morrell 2000 examined the impact of additional care in settings where women already received more than 4 visits as part of usual care. • Intervention Christie 2011 compared groups receiving 6 versus 1 health visitor visits (in addition to midwifery care) • Intervention Morrell 2000 up to 10 lay supporter visits versus no additional visits with routine midwifery care available to women in both intervention and control groups. (In the data and analysis tables we have separated studies where women in both groups received more than four home visits.) • Maternal Outcomes: Maternal mortality at 42 days was not different (Christie 2011), neonatal mortality was not reported, no differences in maternal perceptions of their general health at six weeks postpartum (Morrell 2000), postnatal depression and anxiety was no different in one study (Morrell 2000) and was surprisingly higher in the intervention group receiving more visits (Christie 2011) but conflicts with evidence showing that women with more visits in the intervention group were more satisfied with care provided in the postnatal period compared to those with less visits (Christie 2011). • Neonatal outcomes: One study found less use of emergency medical services in the intervention group (Christie 2011) **Comparison 2: Different models of postnatal care** • Countries: Canada (Steel 2003), UK (MacArthur 2002)

		• Canada 2003: Compared 2 home visits compared with a telephone-screening interview with discretionary nurse home visits. Outcomes: No differences in number of babies with health problems up to 4 weeks or breastfeeding. **Comparison 3: Different models of postnatal care** • UK 2002 (N= 2064): Compared individualized postnatal care up to 10 to 12 weeks postpartum with usual care, which involved a more rigid schedule of midwife home visits in the early postnatal period. Outcomes: no differences in neonatal deaths, higher risk of postnatal depression. **Comparison 4: Home versus hospital postnatal care** • Countries: USA (3 – Lieu 2000; Escobar 2001; Paul 2012); Canada (1 – Gagnon 2002) • Intervention: Compared women attending hospital clinics for post-natal checks (usual care) vs. home visits by nurses. • Outcomes: No differences in maternal morbidity using pooled results, (4 studies, N= 3,755), no differences in depressive or anxiety symptoms (4 studies), mixed results for satisfaction with care favoring intervention group or no difference (2 studies, USA, Canada), no differences in breastfeeding (4 studies). Resource use: no differences in infant hospital re-admission 2 weeks after initial discharge (2 studies, USA) and no differences in unplanned emergency healthcare 2 weeks follow-up (1 study, USA) and no differences in infant health service use 8 weeks follow-up (1 study, Canada).
Diagnostic Test	**27.18**	**Sonographic assessment of amniotic fluid index (AFI) on admission vs. no sonographic assessment of AFI on admission.** • (1 study, 883 women, unclear quality, Women at 26 to 42 weeks' gestation and in early labour). • **Countries:** USA (1) • Neonatal NICU admission: "The incidence of neonatal NICU admission in the intervention group (35 of 447) was not significantly different from the controls (33 of 436) (RR 1.03; 95% CI 0.66 to 1.63)". • Use of artificial oxygen: "The use of artificial oxytocin for augmentation of labour was also higher in the group of women who received the test than for those that did not." • **Conclusions**: "Measuring the amount of amniotic fluid when women were admitted did not improve infant outcomes but increased/doubled the caesarean section rate for fetal distress. Because of the limited evidence (one study with a small sample size), we cannot make a meaningful conclusion or recommendations. More studies are needed."

Diagnostic Test	**27.28**	**Amniotic fluid index vs. single deepest vertical pocket**
		(Observing different methods for assessing amniotic fluid adequacy) (Screening test for preventing adverse pregnancy outcome).
		• (5 trials, 3226 women, moderate quality).
		• "There is no evidence that one method is superior to the other in the prevention of poor peripartum outcomes."
		• Including:
		  ○ admission to a neonatal intensive care unit (Risk Ratio (RR) 1.04; 95% Confidence Intervals (CI) 0.85 to 1.26);
		  ○ an umbilical artery pH of less than 7.1;
		  ○ the presence of meconium;
		  ○ an Apgar score of less than 7 at five minutes;
		  ○ or caesarean delivery.
		• "When the amniotic fluid index was used, significantly more cases of oligohydramnios were diagnosed (RR 2.39, 95% CI 1.73 to 3.28), and more women had inductions of labor (RR 1.92; 95% CI 1.50 to 2.46) and caesarean delivery for fetal distress (RR 1.46; 95% CI 1.08 to 1.96)."
		• "The single deepest vertical pocket measurement in the assessment of amniotic fluid volume during fetal surveillance seems a better choice since the use of the amniotic fluid index increases the rate of diagnosis of oligohydramnios and the rate of induction of labor without improvement in peripartum outcomes."
		• "A systematic review of the diagnostic accuracy of both methods in detecting decreased amniotic fluid volume is required."
		• **Countries:** USA (3); UK (1); Unknown (1)

Education	**28.192**	**Antenatal education programs specifically aimed at enhancing women's abilities to identify signs or symptoms leading to self-diagnosis of active labour vs. No antenatal education programs.** • (1 study, 245 women, unclear quality). • Number of visits to the labour suite before the onset of active labor: "Specific antenatal education program was effective in reducing the mean number of visits to the labour suite before the onset of active labour (experimental group mean 0.29 (standard deviation (SD) 0.59), control group mean 0.58 (SD0.72); weighted mean difference -0.29, 95% confidence interval -0.47 to -0.11)." • "There is no conclusive evidence of benefit for teaching women a specific antenatal education program for self-diagnosis of active labour at present."

		• "Additionally, there is limited generalisability of results as the women participating were primarily single, low-income, urban African-Americans, in one hospital-based clinic in the US." • **Countries:** USA (1 – 1990)
Substitution Effect		
1. Home / Outpatient vs. Hospital	**6.54**	**Home/Outpatient vs. Hospitalizaiton** (For patients with suspected placenta praevia) • LOS: "There is little evidence about the best care for placenta praevia. Both interventions were associated with reduced lengths of stay in hospital antenatally." • Home vs. Hospitalization: weighted mean difference (WMD) respectively -18.50 days (95% CI -26.83 to -10.17) **Countries**: Not explicitly mentioned
Home vs. Hospital	**6.32**	**Home vs. Hospital care** (Preterm pre-labour rupture of the membranes (PPROM)) prior to 37 weeks' gestation) • (2 trials, 116 women, unclear quality) • "Overall, the number of included women in each trial was too small to allow adequate assessment of pre-specified outcome." • "Mothers randomised to care at home spent approximately 10 fewer days as inpatients (mean difference -9.60, 95% CI -14.59 to -4.61) and were more satisfied with their care." • "Perinatal mortality was reported in one trial and there was insufficient evidence to determine whether it differed between the two groups (risk ratio (RR) 1.93, 95% confidence interval (CI) 0.19 to 20.05)." • "There was no evidence of differences between groups for serious neonatal morbidity, chorioamnionitis, gestational age at delivery, birthweight and admission to neonatal intensive care." • "There was no information on serious maternal morbidity or mortality." • **Countries:** USA (1); Canada (1)
Antenatal day care units Vs. Hospital admission	**20.6**	**Antenatal day care units vs. Hospital Admission** (for women experiencing complications during pregnancy such as high blood pressure, threatened early labour or abnormal and heavy bleeding (haemorrhage)). • (3 trials, 508 women, unclear quality) • "Compared with women in the ward/routine care group, women attending day care units were less likely to be admitted to hospital overnight (risk ratio 0.46, 95% confidence interval 0.34 to 0.62)." • "The average length of antenatal admission was shorter for

		women attending for day care, although outpatient attendances were increased for this group." • "Two studies provided evidence that women preferred day care to hospital admission and no women expressed a preference for more inpatient care; most women in both groups felt they had received good care and were satisfied with it." • Limitations: "In both the intervention and comparison groups, the type of care given in the three studies varied and this means that caution is needed in the interpretation of any pooled results." Possible performance bias because of new facilities. • Discussion: "Day care management in obstetrics and in other medical specialties is now widespread. Observational studies on antenatal day care units have supported the findings of this review in as much as they have suggested that day care offers the potential for cost saving" • **Countries:** UK (2 - 1980s); Australia (1 - 1998/2001)
Hospital Bed Rest vs. Home	**27.22**	**Bed rest in hospital vs. no bed rest in hospital** **(Women with multiple pregnancy)** • (7 trials, 713 women, unclear quality). • "Routine bed rest in hospital for multiple pregnancy did not reduce the risk of preterm birth, or perinatal mortality. There was substantial heterogeneity related to perinatal death and stillbirth unaccounted for by trial quality. There was a suggestion of a decreased number of low birth-weight infants (less than 2500 g) born to women in the routinely hospitalised group (risk ratio (RR) 0.92; 95% confidence interval (CI) 0.85 to 1.00). No differences were seen in the number of very low birthweight infants (less than 1500 g). No information is available on developmental outcomes for infants in any of the trials." • "For the secondary maternal outcomes reported of developing hypertension and caesarean delivery, no differences were seen. Women's views about the care they received were reported rarely." • "In the subgroup analyses for women with an uncomplicated twin pregnancy, with cervical dilation prior to labour with a twin pregnancy and with a triplet pregnancy, no differences were seen in any primary and secondary neonatal outcomes and maternal outcomes." • **Countries:** Zimbabwe (4); Australia (2); Finland (1)

Hospital vs. Home	**28.177**	**Bed rest for women with threatened miscarriage or at high risk of miscarriage vs. No bed rest.**
		• "There was no significant difference in the risk of miscarriage in any of the following comparison groups:
		  • bed rest group versus no bed rest group (risk ratio (RR) 1.54, 95% confidence interval (CI) 0.92 to 2.58);
		  • bed rest at home group versus no bed rest (RR 1.66, 95% CI 0.99 to 2.77);
		  • or the bed rest in hospital group versus no bed rest (RR 0.42, 95% CI 0.02 to 8.91).
		• "The small number of participants included in these studies is a main factor to make this analysis inconclusive."
		• "There is currently no high-quality evidence to support a policy of routine bed rest for women with confirmed fetal viability and vaginal bleeding in first half of pregnancy."
		• "There is no evidence of reduction in the risk of miscarriage in women prescribed bed rest."
		• **Countries:** Not explicitly mentioned

Outpatient vs. Inpatient	**20.29**	**Outpatient vs. Inpatient Induction of Labor:** • (4 trials, 1439 women, varying quality) • "The criteria cited within these studies reflect suitable 'low-risk' groups" • "There were very few differences between groups for most of the outcomes measured in this review. On the basis of the available data, it is not possible to determine whether these interventions are effective and safe within an outpatient setting." • **Countries**: USA (1); Australia (1); Canada (2)
Home vs. Hospital Birth	**23.13**	**Home vs. Hospital Birth** (Women judged to be at low obstetric risk by a consultant obstetrician (n = 71) and likely to have suitable home support and home circumstances (n = 11)) • (1 trial, 82 women, high quality) • "This review shows that there is no strong evidence to favor either planned hospital or planned home birth for selected, low-risk pregnant women." **Countries:** UK (1)

6.25 Multiple Sclerosis

Multiple Sclerosis – Included Reviews				
#	Mechanism	ID	Date	Title
Substitution Effect				
1	Home vs. Hospital Rehabilitation	**13.132**	2009	Treatment for ataxia in multiple sclerosis.
1	Home vs. Outpatient Hospital or Inpatient & Outpatient vs. Control or Inpatient vs. Outpatient	**6.52**	2007	Multidisciplinary rehabilitation for adults with multiple sclerosis.

Multiple Sclerosis – Excluded Reviews		
Repeat	5	13.155; 14.16; 20.25; 28.167; 29.37
Delete	4	No relevant outcome (hospitalization): • 13.123 (vocational rehabilitation on the return to work) • 13.138 (psychological interventions) • 13.47 (memory rehab) • 13.57 (neuropsychological rehab)

Multiple Sclerosis (MS)		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Home vs. Hospital care Physiotherapy	**13.132**	**1 study in a review for treatments for Ataxia MS** • No difference between groups: both improved in balance time, Rivermead mobility index, but scores returned to pre-treatment levels after 2 months. • (1 study, 42 participants, unclear quality) • **Countries**: Not explicitly mentioned
Inpatient/ Outpatient vs. Control **Inpatient**	**6.52**	**Inpatient / outpatient rehab vs. control wait-list** • Moderate evidence to support the effectiveness of the inpatient or outpatient MD rehabilitation programme in reducing disability (FIM) and bladder impairment and 'activity limitation' outcomes (UDI6, NDS, AUA). Moderate evidence that inpatient or outpatient MD bladder rehabilitation improves continence-related QoL and participation outcomes (AUA, IIQ7). Insufficient evidence to support the effectiveness of the inpatient or

vs. Outpatient **Home vs. Inpatient**		outpatient MD rehabilitation programme for improvement in participation and patient QoL (MSIS29, GHQ28). • (1 study, 101 participants, high quality, Australia) **Inpatient rehab vs. outpatient** • Limited evidence that inpatient rehabilitation in persons with MS can result in greater short-term gains at the level of activity (ambulatory status and independence in self-care (ISS) compared with the outpatient care. No evidence was offered at the level of participation. No difference between the groups in their need for aids and home care - both showed a trend towards increased need for assistance. (1 study, 84 participants, USA) **Home rehab vs. Outpatient at Hospital;** • Limited evidence that MD home based rehab can produce significant advantage over outpatient hospital care in some domains of patient quality of life- (SF-36) for up to 12 months, despite no change at the level of activity (disability). (1 study, 201 participants, high quality, Italy) **Countries**: • USA (1); Australia (1); Italy (1)

6.26 Muscular / Neuromuscular disease

Muscular / Neuromuscular disease – Included Reviews				
#	Mechanism	ID	Date	Title
Substitution Effect				
1	Surgical Intervention vs. None	**13.114**	2009	Rehabilitation interventions for foot drop in neuromuscular disease.

Muscular / Neuromuscular disease – Excluded Reviews		
Delete	1	No relevant outcome (hospitalization): • 13.12 (strength training and aerobic exercise)

Muscular / Neuromuscular disease		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Surgical Intervention vs. None	**13.114**	**Surgical intervention (Rideau's approach) vs. Regular passive stretching** • **Conclusions: "**The authors concluded that "there was no measurable difference between our surgical and conservative groups and our study has not shown any benefit of early surgery in relation to muscle strength and function. They noted that contractures could be reduced in the short-term but recurred in at least seven of the 10 boys within one to two years of surgery." • Gait: "4 of the 10 operated boys showed initial improvement in qualitative gait analysis. This improvement was defined by the authors as "particularly related to improved heel strike" and was apparently "still noticeable up to a year after surgery". Formal gait analysis revealed no significant difference between the two groups at one year on any of the six parameters studied (step and stride length, swing phase duration, double support time, cadence and velocity). • Other outcomes: "No difference between groups was found in Medical Research Council Scale score, myometry or Gower's times at follow-up." • "Achilles tendon contractures were all severe in the surgical group and were reduced by surgery from a mean of 26° to 16° at three months. However, two of the ten boys developed contractures

		again within one year of surgery. Iliotibial band contractures were reduced from a mean of 6 degrees to 1 degree at one-year follow-up. At two years, five boys in the control group and six in the surgical group were reassessed. Recurrences of Achilles tendon contractures were noted in five of the six operated boys on at least one side. One boy lost independent ambulation by 2.5 years after surgery. • "Surgery was tolerated well in the surgical group with all participants discharged within a week of surgery." • "The motor ability score and Medical Research Council Scale scores were similar between the two groups at baseline. All participants were followed up for a minimum of one year, the time used for follow- up analysis." • (1 study, 20 participants, unclear quality) • **Countries**: Not explicitly mentioned

6.27 Palliative Care

Palliative Care – Included Reviews				
#	Mechanism	ID	Date	Countries
Substitution Effect				
2	Home Care vs. Hospital care or Hospice Care	**6.5**	2013	Effectiveness and cost‐effectiveness of home palliative care services for adults with advanced illness and their caregivers.
		6.17	2011	"Hospital at home": home-based end of care life.
Admission Prevention				
2	Care pathways vs. None	**24.1**	2013	End‐of‐life care pathways for improving outcomes in caring for the dying.
		28.89	2011	Interventions for improving palliative care for older people living in nursing care homes.

Palliative Care – Excluded Reviews		
Repeat	4	28.21; 28.3; 9.5; 28.64

Palliative Care		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Home vs. Hospital care vs. Hospice Care	**6.5**	• **"**Narrative Synthesis showed evidence of small but statistically significant beneficial effects of home palliative care services compared to usual care on reducing symptom burden for patients (3 trials, 2 of high quality, and 1 CBA with 2107 participants) and of no effect on caregiver grief (3 RCTs, 2 of high quality, and 1 CBA with 2113 caregivers). Pain, satisfaction with care, and caregiver burden showed conflicting results. Physical function and QoL showed inconclusive results. Meta-analysis showed increased odds of dying at home." • **Countries:** US (11); UK (5); Sweden (2); Norway (1); Italy (1); Spain (1); Canada (1); Australia (1)
	6.17	• "Those receiving home-based end of life care were statistically significantly more likely to die at home compared with those receiving usual care (3 trials; N=652)."

		• "No statistically significant differences for functional status, psychological well-being or cognitive status, between patients receiving home-based end of life care compared with those receiving standard care (which included inpatient care)." • "Admission to hospital while receiving home-based end of life care varied between trials and this was reflected by high levels of statistically significant heterogeneity in this analysis." • **Countries**: US (2); UK (1); Norway (1)
Admission Prevention		
Care Pathways for end-of-life **vs.** **Usual care** (No care pathways)	**24.1**	**Hospital at home for end of life** • **"**No studies met inclusion criteria." • "Without further available evidence, recommendations for the use of end-of-life pathways in caring for the dying cannot be made." • "RCTs or other well-designed controlled studies are needed for evaluating the use of end-of-life care pathways in caring for dying people."
	28.89	**Palliative care: older people in nursing homes** • 1/3 studies reported higher satisfaction with care and the other found lower observed discomfort in residents with end-stage dementia. • 2/3 studies reported group differences on some process measures. Both reported higher referral to hospice services in their intervention group, one found fewer hospital admissions and days in hospital in the intervention group, the other found an increase in do-not-resuscitate orders and documented advance care plan discussions. • (3 studies, 735 participants, unclear quality). • **Countries**: USA (3)

6.28 Pancreatitis

Pancreatitis – Included Reviews				
#	Mechanism	ID	Date	Countries
LOS Reduction				
1	Benchmarking (surgery)	**27.4**	2013	Early versus delayed laparoscopic cholecystectomy for acute gallstone pancreatitis

Pancreatitis		
Mechanism	**Study ID**	**Conclusions**
LOS Reduction		
Benchmarking	**27.4**	**Early versus delayed laparoscopic cholecystectomy for acute pancreatitis.** • Early: within 48 hours of admission irrespective of whether the abdominal symptoms were resolved or the laboratory values had returned to normal • Delayed: surgery after resolution of abdominal pain and after the laboratory values had returned to normal. • There was no short-term mortality in either group. • There was no significant difference between the groups in the proportion of participants who developed serious adverse events (RR 0.33; 95% CI 0.01 to 7.81). • Health-related quality of life was not reported in this trial. • There were no conversions to open cholecystectomy in either group. • The total hospital stay was significantly shorter in the early laparoscopic cholecystectomy group than in the delayed laparoscopic cholecystectomy group (MD -2.30 days; 95% CI -4.40 to -0.20). • This trial reported neither the number of work-days lost nor the costs. • We did not identify any trials comparing early versus delayed laparoscopic cholecystectomy after severe acute pancreatitis." • (1 study, 50 participants, low quality). • **Countries**: USA (1)

6.29 Patellar Dislocation

Patellar Dislocation – Included Reviews				
#	Mechanism	ID	Date	Countries
Substitution Effect				
1	Surgical vs. Non-surgical Interventions	**13.58**	2011	Surgical versus non‐surgical interventions for treating patellar dislocation

Patellar Dislocation		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Surgical vs. Non-surgical	**13.58**	**Surgical** (The predominant operative intervention adopted was repair or reconstruction of the soft tissues of the medial aspect of the knee joint). **Vs. Non-surgical** (initial mobilisation in a cast, splint or locked orthosis, followed by active mobilisation with physiotherapy). • "5 studies (339 participants) were included. All studies had methodological shortcomings, especially the two quasi-randomised trials that presented a high risk for selection bias." • "Follow-up was a minimum of two years in two studies and between five and seven years in three studies." • "There was no significant difference between surgical and non-surgical management of primary (first-time) patellar dislocation in the risk of recurrent dislocation (47/182 versus 53/157; risk ratio 0.81, 95% confidence interval 0.56 to 1.17; 5 trials), Kujala patellofemoral disorder scores (mean difference 3.13, 95% confidence interval -7.34 to 13.59; 5 trials) nor the requirement for subsequent surgery (risk ratio 1.09, 95% CI 0.72 to 1.65; 3 trials)." • "Adverse events were reported by one trial, citing four major complications that occurred in the surgical group." • "No randomised controlled trials have assessed populations with recurrent patellar dislocation." • **Countries**: Finland (3); Brazil (1); Denmark (1)

6.30 Pneumonia

Pneumonia – Included Reviews				
#	Mechanism	ID	Date	Countries
LOS reduction				
1	Therapeutic Device	**6.16**	2012	Oxygen Therapy for pneumonia in Adults

Pneumonia – Excluded Reviews		
Repeat	1	28.62
Delete	1	Medicine (28.33)

Pneumonia		
Mechanism	**Study ID**	**Conclusions**
LOS Reduction		
Therapeutic Device	**6.16**	**Non-invasive ventilation vs. Standard oxygen supplementation via a Venturi mask** • In patients with severe community-acquired pneumonia: non-invasive ventilation can reduce the risk of death in the intensive care unit (ICU) and endotracheal intubation, and shorten ICU length of stay and intubation • In immunosuppressed patients with pulmonary infiltrates: Non-invasive ventilation can reduce the risk of death in hospital, shorten ICU length of stay and reduce the incidence of complications. • **Overall**, non-invasive ventilation can reduce the risk of death in ICU and endotracheal intubation, and shorten ICU length of stay and length of intubation. • **Non-invasive ventilation and standard oxygen supplementation via a Venturi mask** were similar when measuring mortality in hospital, two-month survival, duration of hospital stay and duration of mechanical ventilation. • Other than oxygen therapy, we must mention the importance of standard treatment by physicians. The evidence is weak. However, the review indicates that non-invasive ventilation may be more beneficial than standard oxygen supplementation via a Venturi mask for pneumonia.

		• (3 trials, 151 participants, unclear quality). • **Countries**: Italy (2); Unknown (1)

6.31 Spine

Spine – Included Reviews				
Substitution Effect				
1	Surgical vs. Non-surgical interventions	**28.11**	2013	Non-operative treatment for lumbar spinal stenosis with neurogenic claudication

Spine – Excluded Reviews		
Delete	1	Outcomes (no hospitalization) • 6.27; 6.28; 13.116; 13.137; 13.41

Spine		
Mechanism	**Study ID**	**Conclusions**
Admission Prevention		
Surgical vs. Non-Surgical Interventions	**28.11**	**Multimodal non-operative care vs. indirect or direct surgical decompression** • Multimodal non-operative treatment is less effective than indirect or direct surgical decompression with or without fusion. • A meta-analysis of 2 trials comparing direct decompression with or without fusion to multimodal non-operative care found no significant difference in function at six months (mean difference (MD) - 3.66, 95% CI -10.12 to 2.80) and one year (MD -6.18, 95% CI -15.03 to 2.66), but at 24 months a significant difference was found favouring decompression (MD -4.43, 95% CI -7.91 to -0.96) • (5 trials, participants, high risk of bias, poor quality) • **Countries**: Norway (1); Finland (1); USA (3)

6.32 Stroke

Stroke – Included Reviews				
LOS Reduction				
1	Early Discharge Teams	2012	6.10	Services for reducing duration of hospital care for acute stroke patients.
1	Service Organization	2013	13.7	Organised inpatient (stroke unit) care for stroke.
Substitution Effect				
1	Home vs. Inpatient Rehabilitation	2003	6.14	Home-based therapy programmes for upper limb functional recovery following stroke.
1	Early Discharge Hospital at Home vs. Inpatient Care	2011	6.23	Hospital at home early discharge.
2	Tele-rehabilitation	2011	13.65	Virtual reality for stroke rehabilitation.
		2012	29.6	Tele-rehabilitation services for stroke.
Admission Prevention (to hospital OR institutional care homes)				
1	Service Organization	2004	23.11	In‐hospital care pathways for stroke.
2	Self-Management	2013	30.7	Self‐management programs for quality of life in people with stroke
		2012	22.6	Disease management interventions for improving self‐management in lower‐limb peripheral arterial disease.

Stroke – Excluded Reviews		
Repeat	30	13.92; 28.102; 29.19; 30.13; 9.2; 7.9; 13.171; 29.41; 28.22; 28.9; 29.3; 9.6; 13.52; 14.4; 28.67; 29.9; 7.12; 13.42; 14.3; 28.44; 29.7; 28.39; 28.157; 13.174; 14.20; 28.182; 29.42; 29.30; 29.13; 28.58
Delete	29	**Intervention** • 14.9 (Circuit class therapy for improving mobility after stroke) • 13.22 (Interventions for preventing falls in people after stroke) • 13.13 (Cognitive rehabilitation for spatial neglect following stroke) • 6.55 (Therapy‐based rehabilitation services for stroke patients at home) • 4.1 (Assistive technology…for the management of contractures in adult stroke patients (Protocol)) **Outcomes** (no hospitalization) • 13.18 (Occupational therapy for care home residents with stroke) • 13.163 (Acupuncture for stroke rehabilitation) • 13.20 (Cognitive rehabilitation for attention deficits following stroke) • 13.141 (Cognitive rehabilitation for memory deficits following stroke) • 13.110 (Constraint‐induced movement therapy for upper extremities in stroke patients) • 13.44 (Electromechanical and robot‐assisted arm training for improving generic activities of daily living, arm function, and arm muscle strength after stroke) • 13.11 (Electromechanical‐assisted training for walking after stroke) • 13.71 (Hands‐on therapy interventions for upper limb motor dysfunction following stroke) • 13.60 (Interventions for disorders of eye movement in patients with stroke) • 13.152 (Interventions for motor apraxia following stroke) • 30.33 (Interventions for post-stroke fatigue) • 13.98 (Interventions for sensory impairment in the upper limb after stroke) • 13.62 (Interventions for visual field defects in patients with stroke) • 13.67 (Mental practice for treating upper extremity deficits in individuals with hemiparesis after stroke) • 13.48 (Mirror therapy for improving motor function after stroke) • 13.15 (Multidisciplinary rehabilitation following botulinum toxin and other focal intramuscular treatment for post‐stroke spasticity) • 13.3 (Physical fitness training for stroke patients) • 13.157 (Physiotherapy treatment approaches for the recovery of postural control and lower limb function following stroke) • 13.102 (Rehabilitation for improving automobile driving after stroke) • 13.154 (Repetitive task training for improving functional ability after stroke) • 13.23 (Repetitive transcranial magnetic stimulation for improving function after stroke)

		• 13.151 (Therapy - based rehabilitation services for patients living at home more than one year after stroke) • 13.1 (Transcranial direct current stimulation (tDCS) for improving function and activities of daily living in patients after stroke) • 13.83 (Water - based exercises for improving activities of daily living after stroke) • 28.140 (Very early versus delayed mobilisation after stroke) • 4.2 (Dental) • 13.28 (Non - pharmacological interventions for preventing secondary vascular events after stroke or transient ischemic attack)
Delete	1	**No studies identified for review** • 13.49 (Interventions for age - related visual problems in patients with stroke)
	1	**Withdrawn** • 6.18 (Out of date. It has been superseded by a more recent review (Hospital at home admission avoidance).

Stroke		
Mechanism	**Study ID**	**Conclusions**
LOS Reduction		
Early Discharge	**6.10**	**1. Early Supported Discharge (ESD) from Hospital** **ESD team coordination and delivery** (9 trials) **2. ESD team coordination whereas delivery of care was handed over to existing community-based agencies who provided continuing rehabilitation and support at home** (3 trials) **3. No ESD team, only multidisciplinary care in hospital and terminated at discharge** (2 trials). • "Patients tended to be a selected elderly group with moderate disability." • LOS: "The ESD group showed significant reductions (P < 0.0001) equivalent to approximately seven days. Data were incomplete for total length of stay including hospital readmissions." (13 trials, 1695 patients)." • At end of scheduled follow-up: Death OR 0.91 (95% CI 0.67 to 1.25, P = 0.58), Death or institutionalization OR 0.78 (95% CI 0.61 to 1.00, P = 0.05), Death or dependency OR 0.80 (95% CI 0.67 to 0.97, P = 0.02). • The greatest benefits were seen in the trials evaluating a co-ordinated ESD team and in stroke patients with mild to

		moderate disability. Improvements were also seen in patients' extended activities of daily living scores (standardised mean difference 0.12, 95% CI 0.00 to 0.25, P = 0.05) and satisfaction with services (OR 1.60, 95% CI 1.08 to 2.38, P = 0.02) but no statistically significant differences were seen in carers' subjective health status, mood or satisfaction with services. The apparent benefits were no longer statistically significant at five-year follow-up." • Re-admission: Re-admission rates during scheduled follow up (31% versus 28%) were very similar between the ESD service and conventional care groups. (7 trials, 918 patients). Conclusions: "Economic analyses were carried out in 7 trials. Although the underlying costs and assumptions were different for each analysis, all concluded that the opportunity savings from hospital bed days released tended to be greater than, or similar to, the cost of the ESD service. Realising such cost savings in practice can be difficult but ESD services appear to offer one way to manage rising demand for a finite number of hospital beds. The particular component of an ESD service responsible for the improvement in functional outcome seen remains unclear." **Countries:** Australia, Canada, Denmark, Norway, Sweden, Thailand, UK, USA
Service Organization	**13.7**	• **Heterogeneous studies.** • **Main Comparison**: 1) Organised stroke unit care versus alternative care (28 trials, involving 5855 participants). • **Sub-Comparisons**: • 2) Organised stroke unit care vs. general medical wards (21 trials, 3994 participants) • 3) Acute stroke ward versus alternative service • 4) Comprehensive stroke ward versus alternative service • 5) Rehabilitation stroke ward versus alternative service • 6) Stroke ward plus TCM versus alternative service. • **Main Conclusions**: The analysis of length of stay is complicated by the different methods of reporting results, the widely varying control group lengths of stay and the statistically significant heterogeneity between different trials. The most reasonable conclusion appears to be that there was no systematic increase in length of stay associated with organised (stroke unit) care and there may have been a modest reduction. As with the previous review (1997), people receiving organised inpatient (stroke unit) care were more likely to survive, regain independence and return home than

		those receiving a less-organised service. This apparent effect remains of moderate statistical significance for case fatality. The conclusions could be overturned by a number of unpublished randomised trials with neutral results. However, the observed reductions in the combined adverse outcomes (death or institutionalisation, death or dependency) are much more robust statistically. The three trials that have extended follow-up for five or 10 years have found a sustained benefit among stroke unit patients. • **Sub-Comparisons Conclusions**: The results of this analysis indicate statistically significantly improved results from a dedicated stroke ward over a mobile stroke team. • There were also trends towards better outcomes within the dedicated stroke rehabilitation ward setting as opposed to the mixed rehabilitation ward, and within the acute (semi-intensive) ward as opposed to the comprehensive ward. However, in none of the three primary outcomes was there a convincing statistically significant result and more information is required. No firm conclusions could be drawn for the comparisons of a stroke ward integrated with Traditional Chinese Medicine versus a 'Western medicine' stroke ward or an acute (semi-intensive) ward with a mixed rehabilitation unit. • **Quality of the evidence**: See review for more details. • **Countries:** Mixed high income and low income countries
Substitution Effect		
Home vs. Hospital	**6.14**	**Home-based upper limb programme vs. same upper limb programme based in hospital** • Upper limb motor impairment: we found no statistically significant difference between groups (MD 0.60; 95% CI -8.94 to 10.14). • No other outcomes reported. There is insufficient good quality evidence to make recommendations about the relative effect of home-based therapy programmes compared with hospital care. **Countries:** Not explicitly mentioned.
Early discharge hospital at home vs. In-patient hospital care	**6.23**	**Intervention**: Early Discharge Hospital at Home vs. Control: In-patient Hospital Care **Patient outcomes for those recovering from a stroke** • 9/11 trials contributed data **Mortality** • There was a non-significant reduction in mortality, adjusted

		for age and sex (HR 0.79, 95% CI 0.32 to 1.91) (data from Anderson 2000 and Shepperd 1998 could not be adjusted as there were no events in the controls arms at follow-up). • We combined individual patient-level data (IPD) from 7 trials recording the time to death at three to six months (n = 407). • Australia (1); Norway (1); UK (4); Sweden (1) **Readmission** • We found no significant difference in readmission rates between those allocated to hospital at home rather than to in-patient care (RR 1.06, 95% CI 0.47 to 2.38) at 3 months follow-up (UK (2); Norway (1) and at 6 months follow up (RR 1.00, 95% CI 0.63 to 1.60) (Australia (1); Norway (1); Sweden (1). • We observed no significant heterogeneity. **Quality of life** • 4 trials measuring QoL reported no significant differences, which may reflect that they were underpowered to detect a difference in either direction between groups (Australia (1); Norway (1); UK (2)). **Hospital LOS** • "Pooled published data from four trials and found a significant reduction in hospital length of stay (mean difference in days -6.68, 95% CI -10.19 to -3.17) (Norway (1); Canada (1); UK (2))." • "Hospital LOS was also reduced in the remaining trials recruiting patients recovering from a stroke (Australia (1); Sweden (1); UK (2); Norway (1)) • Median reduction ranging from: • -8 days (UK (1)) to -15 days (Australia (1)). • 2 trials reported median length of stay in hospital at home, this ranged from: o 5 (range 1 to 19) (Australia (1)) to o 9 weeks (range 1 to 44 weeks) (UK (1)). **Use of health service resources and cost**: 2 trials reported no significant difference and two other trials reported a significant reduction with hospital at home early discharge. (Details below) • Two trials reported no significant difference in cost to the health service between early discharge hospital at home and in-patient care (UK (2)). In both trials costs for each patient were based on their use of health services. • Australia (1) reported a significant reduction in hospital costs per patient (Aus$4678; 95% CI $-6680 to $-2676), although this became non-significant when community costs were

		taken into account (difference $- 2013; 95% CI $-4696 to $669). (Canada (1)) reported a significant reduction in health service costs at three months for those allocated to hospital at home (mean difference Canadian $-3280.95, P < 0.0001). **Countries:** UK; Norway; Sweden; Canada; Australia
Tele-rehabilitation	**13.65**	One study used a tele-rehabilitation approach to deliver the intervention in the participant's own home; control group used conventional therapy, unclear setting (inpatient or home) (Piron 2009). Country: Italy
Tele-rehabilitation	**29.4**	**Summary**: "We found insufficient evidence to reach conclusions about the effectiveness of tele-rehabilitation after stroke. Moreover, we were unable to find any randomised trials that included an evaluation of cost-effectiveness. Which intervention approaches are most appropriately adapted to a telerehabilitation approach remain unclear, as does the best way to utilise this approach". (10 trials, 933 patients) **Details**: "The studies were generally small, and reporting quality was often inadequate, particularly in relation to blinding of outcome assessors and concealment of allocation. Selective outcome reporting was apparent in several studies. Study interventions and comparisons varied, meaning that in most cases, it was inappropriate to pool studies. Intervention approaches included upper limb training, lower limb and mobility retraining, case management and caregiver support. Most studies were conducted with people in the chronic phase following stroke. Primary outcome: no statistically significant results for independence in activities of daily living (based on two studies with 661 participants) were noted when a case management intervention was evaluated. Secondary outcomes: no statistically significant results for upper limb function (based on two studies with 46 participants) were observed when a computer programme was used to remotely retrain upper limb function. Evidence was insufficient to draw conclusions on the effects of the intervention on mobility, health-related quality of life or participant satisfaction with the intervention."
Admission Prevention (to homes versus institutional care homes)		
Service Organization	**23.11**	**Comparison:** Care Pathways **Intervention:** No Care Pathways • "Use of stroke care pathways may be associated with positive and negative effects." • "Since most of the results have been derived from non-

		randomised studies, they are likely to be influenced by potential biases and confounding factors". • "There is currently insufficient supporting evidence to justify the routine implementation of care pathways for acute stroke management or stroke rehabilitation." • **Countries**: USA (10); Australia (1); UK (2); Sweden (1); Singapore (1)
Self-Management	**22.6**	**Protocol** "The objective of this review is to systematically review, synthesise and quantify the effects of non-pharmacological and non-surgical chronic disease management interventions targeting self-management for people with lower-limb PAD."
	30.7	**Protocol** "To assess the effects of self-management interventions on the quality of life of adults with stroke who are living in the community, compared with inactive control or active control interventions."

6.33 Substance abuse

Substance Abuse – Included Reviews				
Substitution Effect				
1	Inpatient vs. Other Settings	**3.2**	2005	Inpatient versus other settings for detoxification for opioid dependence.

Substance Abuse – Excluded Reviews		
Repeat	2	20.20; 28.68
Delete	3	**Outcomes**: 13.165; 13.66; 23.5
	8	**Medicine**: 13.115; 20.1; 20.10; 20.12; 20.16; 20.21; 20.42; 20.8

Substance Abuse		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Inpatient vs. Outpatient	**3.2**	**Intervention**: Inpatient setting **Control**: Time-limited settings (including residential units that are not staffed 24 hours per day, day-care facilities where the patient is not resident for 24 hours per day, and outpatient or ambulatory programmes, and using any drug or psychosocial therapy) **Summary**: • "Only one study met the inclusion criteria. This did not explicitly report the number of participants in each group that successfully completed the detoxification process, but the published data allowed us to deduce that 7 out of 10 (70%) in the inpatient detoxification group were opioid-free on discharge, compared with 11 out of 30 (37%) in the outpatient group." • (1 trials, unclear # participants, unclear quality, 1975) • **Countries**: USA (1)

6.34 Tuberculosis

Tuberculosis – Included Reviews				
Admission Prevention				
1	Telemedicine	**15.21**	2008	Reminder systems and late patient tracers in the diagnosis and management of tuberculosis.

Tuberculosis – Excluded Reviews		
Repeat	1	28.152
Withdrawn	1	28.176 (Interventions for promoting adherence to tuberculosis management)

Tuberculosis		
Mechanism	**Study ID**	**Conclusions**
Admission Prevention		
Telemedicine	**15.21**	• **Late patient tracers** (home visit and letter) were shown to be beneficial in increasing adherence to tuberculosis treatment compared with no late patient tracer (3 studies) • **Countries:** India (2); Iraq (1) • **Reminder system trials**, except one study, show benefits of different types of reminders compared to no reminder on adherence to tuberculosis clinic appointments." (6 studies). • (9 trials, 5257 participants, unclear quality) • **Countries**: USA (5), Spain (1)

6.35 Service organization

Service Organization – Included Reviews				
#	**Mechanism**	**ID**	**Date**	**Title**
Substitution Effect				
1	Telemedicine	**6.58**	2000	Telemedicine versus face to face patient care: effects on professional practice and health care outcomes.
1	Hospital at Home	**6.22**	2011	Hospital at home admission avoidance.
Admission Prevention				
1	Additional Staff	**23.4**	2007	Outreach and Early Warning Systems (EWS) for the prevention of Intensive Care admission and death of critically ill adult patients on general hospital wards
1	Specialist Outreach	**20.35**	2003	Specialist outreach clinics in primary care and rural hospital settings.
1	Staff Change	**23.6**	2012	Primary care professionals providing non‐urgent care in hospital emergency departments.
1	Post-Discharge Planning	**28.156**	2008	Telephone follow‐up, initiated by a hospital‐based health professional, for post-discharge problems in patients discharged from hospital to home.
LOS Reduction				
1	Clinical Pathways or Multifaceted Care	**23.9**	2012	Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs
1	Staff Change	**23.2**	2013	Effectiveness of intermediate care in nursing‐led in‐patient units.
1	Inter-professional Collaboration	**28.122**	2009	Inter-professional collaboration: effects of practice‐based interventions on professional practice and healthcare outcomes.
1	Discharge Planning	**23.1**	2013	Discharge planning from hospital to home

Service Organization – Excluded Reviews		
Repeat	7	9.1; 28.76; 28.34; 28.77; 28.166; 30.40; 17.24; 27.29
Delete	3	**Medicine**: 28.30; 30.10; 30.15

	6	**Outcome**: 20.14; 20.31; 20.37; 27.17; 28.149; 28134
	1	**Intervention**: 23.10 (Collaboration between local health and local government agencies for health improvement)

Service Organization		
Mechanism	**Study ID**	**Conclusions**
Substitution Effect		
Telemedicine	**6.56**	Telemedicine versus face-to-face patient care: effects on professional practice and health care outcomes. **Conclusions:** • 7 trials, N> 800 people. • **Heterogeneous trials.** • **Quality**: The studies appeared to be well conducted, although patient numbers were small in all but one. • **Summary**: Although none of the studies showed any detrimental effects from the interventions, neither did they show unequivocal benefits and the findings did not constitute evidence of the safety of telemedicine. • Economic analysis: None of the studies included formal economic analysis. • Clinical Benefit: there is little evidence of clinical benefits. • The studies provided variable and inconclusive results for other outcomes such as psychological measures, and no analysable data about the cost effectiveness of telemedicine systems. • The review demonstrates the need for further research and the fact that it is feasible to carry out randomised trials of telemedicine applications. Policy makers should be cautious about recommending increased use and investment in unevaluated technologies. • **Telemedicine in the emergency department.** • (Harrison 1999) used desk-top PC-based video-conferencing equipment connected via ISDN II lines to link the outpatients department at one London hospital with four inner-city GP practices. The hospital specialties included were: orthopaedics; otolaryngology; gastroenterology; urology; paediatrics; and endocrinology, with one consultant from each taking part. There were 132 patients randomised to either video consultation (62) or conventional outpatients

		appointment (70). The outcome measures were: the SF12 generic measure of wellbeing; the Ware Specific Visit Questionnaire; the Spellberger State-Trait Anxiety Inventory; a cost questionnaire for patients; the Duke Severity of Illness questionnaire; and a protocol specifically de- signed to extract data from hospital and GP records. • **Video-consultations between primary health care and the hospital outpatients department.** • (Brennan 1999). Video workstations were used to link a central and a peripheral site some 40 miles away. The workstation included a room and close-up cameras, microphone, keyboard and network interface, with a radiograph reader, a digital stethoscope, otoscope, and dermascope. 14 physicians and 4 emergency room nurses were trained in the use of the equipment. Patients were randomised to be seen by either a telemedicine nurse (N=54) or to conventional physician care (N=50) (18 patients were lost to the study). • **5 trials were concerned with the provision of home care or patient self-monitoring of chronic disease.** ○ **(1) Maternity:** (Cartwright 1992), the blood pressure of women with hypertension in pregnancy was either monitored at home using telemetry, or they were admitted to hospital for conventional care. ○ The other 4 studies were all aimed at assisting patients in the self-management of chronic conditions. All made use of the patients' own telephone lines, with the appropriate monitors for recording blood pressure, ECG, heart rate or blood glucose levels. ○ **Diabetes:** ○ (2) (Ahring 1992) examined glucose self-monitor- ing for insulin dependent diabetics. All patients did five daily blood glucose measurements for a period of 12 weeks. The control group patients took their measurements to their clinic visits (either written down or stored in the memory of the glucometer), and the intervention group transferred their results to the hospital computer once a week, using a telephone modem. These patients were then given telephone counselling on their diabetic management, based on their results. The control group were not given any counselling outside their hospital visits. ○ (3) (Marrero 1995) evaluated the efficacy of using telecommunications technology to monitor paediatric insulin dependent diabetic patients, from home. Patients

		over the age of five years, attending a hospital outpatient clinic, were recruited to the study. All patients in the study monitored their blood glucose levels at home using a glucose reflectance meter, over a period of one year. The patients in the control group took the meter to their routine three monthly clinic visits, where the data was downloaded into a hospital computer. The experimental group used the same system, but transmitted their test results to the hospital computer via a telephone modem every two weeks. Depending on the test results, a nurse practitioner would then ring the patient and dis- cuss with them or their parents, any need for adjustment in their management. ○ **Hypertensive patients**: ○ (4) (Friedman 1996) used telecommunications technology to provide support for hypertensive patients over the age of 60 years. The experimental group in addition to routine care was provided with a telephone modem to link them to a computer-based system. The patient used a touch tone keypad to report their blood pressure recordings and other clinical information particularly related to their medication, and the system responded with education and counselling. All this information was then stored in the computer database and transmitted to the patient's physician. The control group continued with their routine care alone. The outcome measures included adherence to medication, blood pressure levels and usefulness to the physicians. ○ **Myocardial infarction:** (Sparks 1993) provided a rehabilitation programme for patients following myocardial infarction, using transtelephonic exercise monitoring. Approximately six weeks after discharge from hospital, were randomly allocated to take part in exercise training either in hospital or at home.
Hospital at home	**6.22**	**Trials included:** • We included 10 RCTs (n=1333), seven of which were eligible for the Individual Participant Data (IPD) study. Five out of these seven trials contributed to the IPD meta- analysis (n=850/975; 87%) • **Countries**: Australia (2); New Zealand (3); UK (3); Italy (2) **Description:** • **Patients:** Elderly with a medical event, which included stroke and chronic obstructive pulmonary disease, requiring admission to hospital. Average age ranged from 70 to over 80 years old. The entry criteria required patients to be clinically

		stable and not requiring specialist diagnostic investigation or emergency interventions. • **Variation in delivery**: There was some variation in the way the admission avoidance hospital at home schemes operated: 3 admission avoidance hospital at home schemes admitting patients directly from the community (Harris 2005; Kalra 2000; Wilson 1999); in the other 7 trials the services operated from an accident and emergency department (Caplan 1999; Corwin 2005; Davies 2000; Nicholson 2001; Ricauda 2004; Richards 2005; Tibaldi 2004). • **Variation in living situation:** 3 trials evaluated interventions where the patient could be living alone, 5 trials required a caregiver to be either living with the patient or nearby and for 2 trials this was not clear. • **Common features:** care being coordinated in each of the schemes by a multi-disciplinary team, the provision of 24 hour cover if required, with access to a doctor, and a safe home environment. **Service Use:** • Length of stay: Varied between trials, ranging from a mean reduction in hospital length of stay of -13.40 days (95% CI -17.92 to -8.88) (Wilson 1999) to -5 days (mean difference -5.06, 95% CI -9.23 to -0.89) (Harris 2005). • In 1 trial 51/153 were admitted to hospital from hospital at home, with a mean length of stay of 48.6 days (significant decrease 26.7), compared with the control group length of stay of 29.50 days (significant decrease 40.10). • When all days of care are accounted for (hospital at home plus any inpatient days) total length of stay for patients is lower for those allocated to hospital at home in 1 trial (difference -14.13 days, $p < 0.02$, 95% CI -20.18 to -7.08) (Wilson 1999), and increased in another trial (difference 15.90, 95% CI 8.10 to 23.70) (Ricauda 2004). • 1 trial, recruiting patients recovering from a stroke, reported that 51/153 (33%) of the patients allocated to hospital at home received inpatient care within two weeks of randomisation, with a mean length of stay of 49 days. This exceeded the mean length of stay of those allocated to an inpatient hospital stroke team by 17 days (95% CI 7.9 to 25.3) (Kalra 2000). **Conclusions** • Mortality: 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). • Admissions: 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). • Other outcomes: Few differences were reported for functional ability, quality of life or cognitive ability. Patients reported increased satisfaction with admission avoidance hospital at home. • Economic Analysis: 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.
Admission prevention		
Additional Staff (Outreach and Early Warning Systems)	**23.4**	**Home care (home intravenous antibiotic therapy) vs. Inpatient** • "**A composite score consisting of incidence of unexpected cardiac arrests, death (without NFR) and unplanned ICU admissions:** The findings showed a similar incidence of the composite primary outcome in both the control and the intervention hospitals (5.86 versus 5.31 per 1000 admissions; adjusted P value 0.640) during the 6-month study period (Hilman 2005). • (1 study, 23 hospitals, poor quality). • **Mortality**: Priestley (2004) study (16 hospitals, poor quality) showed that outreach reduced in-hospital mortality and Hillman (2005) showed no difference. • **Unplanned ICU admissions**: Hilman (2005) was the only study to measure this outcome and found no significant differences. • **LOS**: The MERIT study did not measure LOS (Hillman 2005). In the Priestley 2004 study, LOS showed an increased mean length of stay in the outreach group compared with the control group, although sensitivity analysis and adjustment for clustering showed no significant difference in LOS between outreach and control groups. • **Adverse outcomes**: Priestley 2004 did not measure adverse events. The Hilman (2005) study showed an increased incidence of unexpected cardiac arrests in the control hospitals compared with intervention hospitals (1.64 versus 1.31 patients per 1000 admissions, adjusted P value 0.74) (Hillman 2005). **Countries**: Australia (1); UK (1)

Specialist Outreach Clinics	**20.35**	**Intervention:** Specialist outreach clinic in primary care **Control**: Specialist care provided at hospital clinics **Description**: • Vierhout's study (RCT, no date, Netherlands, N=333) examined whether monthly joint consultations between a visiting specialist orthopaedic surgeon and three general practitioners simultaneously in their primary care practice reduced unnecessary interventions and referrals, when compared to referral to hospital clinics. **Primary outcome measures**: • Health outcomes: Vierhout reported no improvement in objective clinical assessment or subjective measures of symptoms, except on the variable "disorder free at one year," which was a self-reported assessment of psychological and physical health, reported favourably by 35% of intervention patients and 23% of controls. • Hospital admissions. Admissions for inpatient treatment were reduced by outreach in all studies examining this outcome (Vierhout). • Use of services: There was a reduction in use of other non-hospital services reported by Vierhout (23% fewer were referred to physiotherapy). • Investigations: Vierhout found outreach almost halved the numbers of laboratory tests and radiology requests. • Treatment: Outpatient treatment modalities, including medication scripts and injections, were all reduced in Vierhout's study. Clinical benefit: No worsening was found, and on one measure, a combined self-reported measure of well-being, the intervention led to clinical improvement. The significance of this in relation to outreach is uncertain.

Staff Change	**23.6**	**Intervention**: Introducing GPs to provide care to patients with non-urgent problems in the ED
		Control: Using standard, Emergency Room Physicians
		Conclusions:
		• 2/3 studies report that GPs used significantly fewer healthcare resources than EPs:
		  • fewer blood tests (RR 0.22; 95%CI: 0.14 to 0.33; N=4641; RR 0.35; 95%CI 0.29 to 0.42; N=4684),
		  • x-rays (RR 0.47; 95% CI 0.41 to 0.54; N=4641; RR 0.77 95% CI 0.72 to 0.83; N=4684),
		  • fewer admissions to hospital (RR 0.33; 95% CI 0.19 to 0.58; N=4641; RR 0.45; 95% CI 0.36 to 0.56; N=4684)

		• fewer referrals to specialists (RR 0.50; 95% CI 0.39 to 0.63; N=4641; RR 0.66; 95% CI 0.60 to 0.73; N=4684). • Number of prescriptions made by GPs compared with EPs: 1 of 2 studies reported no statistically significant difference in the (RR 0.95 95% CI 0.88 to 1.03; N=4641), while the other showed that GPs prescribed significantly more medications than EPs (RR 1.45 95% CI 1.35 to 1.56; N=4684). • Cost savings: The results from these two studies showed marginal cost savings from introducing GPs in hospital EDs. • The third study (N=1878) failed to identify a significant difference in: • number of blood tests ordered (RR 0.96; 95% CI 0.76 to 1.2), • x-rays (RR 1.07; 95%CI 0.99 to 1.15), • admissions to hospital (RR 1.11; 95% CI 0.70 to 1.76), • But reported a significantly greater number of referrals to: • specialists (RR 1.21; 95% CI 1.09 to 1.33) • prescriptions (RR 1.12; 95% CI 1.01 to 1.23) made by GPs as compared with EPs. **Other outcomes for all 3/3 studies**: • No data were reported on patient wait-times, length of hospital stay, or patient outcomes, including adverse effects or mortality. **Conclusions**: • Overall, the evidence from the three included studies is weak, as results are disparate and neither safety nor patient outcomes have been examined. • There is insufficient evidence upon which to draw conclusions for practice or policy regarding the effectiveness and safety of care provided to non-urgent patients by GPs versus EPs in the ED to mitigate problems of overcrowding, wait-times and patient flow. **Study Design**: • The three included studies were prospective, non-randomised con- trolled studies. None of the included studies were classified as RCTs because either (1) allocation of patients to GPs or EPs was predictable or (2) there was cross-over of physicians allocated to primary care sessions. **Quality**: Evidence quality was very low. **Countries**: • 2 were conducted at major urban teaching hospitals; one in London (Dale 1995) and the other in Dublin (Murphy 1996).

		• 1 was conducted at a small district hospital catering to a mixed urban-rural population outside north Dublin (Gibney 1999).
Discharge Planning	**28.156**	**Intervention**: Follow-up telephone calls in the first month post discharge, initiated by hospital-based health professionals, to patients discharged from hospital to home. **Conclusions**: • We included 33 studies involving 5110 patients. • Predominantly, the studies were of low methodological quality. • TFU has been applied in many patient groups. • There is a large variety in the ways the TFU was performed (the health professionals who undertook the TFU, frequency, structure, duration, etc.). • Many different outcomes have been measured, but only a few were measured across more than one study. Effects are not constant across studies, nor within patient groups. • Due to methodological and clinical diversity, quantitative pooling could only be performed for a few outcomes. Of the eight meta-analyses in this review, five showed considerable statistical heterogeneity. • Overall, there was inconclusive evidence about the effects of TFU. **Health service use results:** • Readmissions: 2 studies identified fewer readmissions in the intervention group (Beckie 1989; Riegel 2002) however 8 studies found no differences. • Emergency Department visits: 1 study found fewer emergency department visits for the TFU group (Dudas 2001), however 4 studies (Fallis 2001; Ouellet 2003; Tranmer 2004; Weaver 2001) did not identify differences in this respect. • Psychosocial outcomes: 20 studies. • Physical outcomes: 10 studies. **Countries**: "All studies were all conducted in high-income countries (Australia, Canada, The Netherlands, Saudi Arabia, UK, USA)."
LOS Reduction		
Clinical pathways **Or**	**23.9**	**Stand-alone clinical pathways with usual care** (20 studies) • In-hospital complications: These studies indicated a reduction (odds ratio (OR) 0.58; 95% confidence interval (CI) 0.36 to 0.94)

Multifaceted Interventions		• Documentation: Improved in intervention group (OR 11.95: 95%CI 4.72 to 30.30). • Readmission to hospital or in-hospital mortality: No evidence of differences. • Length of stay: most commonly employed outcome measure with most studies reporting significant reductions. • Hospital costs/charges: Decreases were observed, ranging from WMD +261 US$ favouring usual care to WMD -4919 US$ favouring clinical pathways (in US$ dollar standardized to the year 2000). • **Limitations:** Considerable heterogeneity prevented meta-analysis of length of stay and hospital cost results. Generally poor reporting prevented the identification of characteristics common to successful clinical pathways. An assessment of whether lower hospital costs contributed to cost shifting to another health sector was not undertaken. **Clinical pathways as part of a multifaceted intervention with usual care** (7 studies) **Conclusions**: • No evidence of differences was found between intervention and control groups. **Multifaceted pathway interventions were combined with:** • case management elements (Bookbinder 2005; Bauer 2006; Chen 2004; Cole 2002; Kampan 2006) • or with complex quality improvement programs (Philbin 2000; Bookbinder 2005). • Other investigators used single pathway interventions together with counselling methods (Philbin 2000; Kampan 2006; Bauer 2006; Bookbinder 2005) • or in conjunction with external providers such as primary care or extended care agencies (Bauer 2006; Philbin 2000). • Further multifaceted strategies contained posters (Brattebo 2002), physician order sheets (Bookbinder 2005) and reminders by the study nurse (Cole 2002). **Settings (all studies)**: • 15 studies = general acute ward (medical, surgical, paediatrics, gynaecology) • 4 = extended stay facility (rehabilitation or palliative care) • 4 = ICU • 3 = Emergency Department (ED) • 1 = (mental health outpatient clinic). **Treatment (all studies):**

		• 9 = invasive procedure • 16 = non-invasive diagnosis (for example diabetes, stroke, asthma) • 2 = combined invasive / non- invasive procedures (for example, suspected MI with or without PTCA) **Countries:** • United States (13); Australia (4); (Japan (3); UK (2); Canada (2); Thailand (1); Taiwan (1); Norway (1)
Staff Change	**23.1**	**Intervention**: nursing-led inpatient units (NLUs) in preparing patients for discharge from hospital **Control**: Usual inpatient care. **8 studies were conducted in the UK.** • **Description**: All of these described a service for patients following acute admission and explicitly or implicitly described a recovery trajectory from medical to nursing need as part of their rationale. All offered a service that could broadly be described as non-specialist rehabilitation in a nurse- managed environment and placed emphasis on the therapeutic activity of nursing. • **Limitations**: Despite the heterogeneity of the original reason for hospital admission, these services have a number of features in common and selected patients based on non-medical need. • **Treatment:** Following an acute general medical admission (3/8 studies) or Post-acute medical and general surgical admissions (3/8 recruited patients). Unclear about remaining (2/6 studies). In all cases, patients who had been admitted with a wide range of medical / surgical problems were treated. • **Clinical condition:** Patients with specific conditions (Hip fracture = 2, Stroke and amputation =1). In all cases where detail is given the mean age of the patient population was over 70 years. **3 studies in the USA** **Treatment:** • Services for patients from acute medical / surgical units (2 studies; Hall 1975 and Bowcutt 2000); although Hall 1975's patients were post cardiac event or surgery. • (1 study) Daly 1995 describes a service for patients who would otherwise experience an extended stay in ICU (the so called chronically critically ill). Since the majority of patients in the Nurse- led unit were discharged directly from the hospital it is included here as meeting the criteria for intermediate care

		although clearly to a very different clinical population. **Goals of care:** • 2 studies identify nursing as therapy and identify rehabilitative goals of care (Hall 1975 and Daly 1995). • 1 study's description is less explicit although the intervention is designed to provide care in a more therapeutic environment with a holistic care approach (Bowcutt 2000). **Patient Characteristics**: • Both Hall 1975 and Daly 1995 explicitly Only Bowcutt 2000 describes an age-limited service with a lower limit of 50 but all three cared for primarily elder patients with a mean age from 64 (Daly 1995) to 73 (Bowcutt 2000). **General conclusions**: More Research is needed. **Effects**: **(1) NLU vs. general inpatient care** • Inpatient Mortality: There was no statistically significant effect (OR 1.10, 95% CI 0.56 to 2.16) • Or mortality to longest follow up (OR 0.92, 95% CI 0.65 to 1.29) but higher quality studies showed a larger non-significant increase in inpatient mortality (OR 1.52, 95% CI 0.86 to 2.68). • Discharge to institutional care was reduced for the NLU (OR 0.44 95% CI 0.22 to 0.89) • Functional status at discharge increased (SMD 0.37, 95% CI 0.20 to 0.54) • Inpatient stay: but there was a near significant increase in inpatient stay (WMD 5.13 days 95% CI -0.5 days to 10.76 days). • Early readmissions were reduced (OR 0.52 95% CI 0.34 to 0.80). **(2) NLU vs. Intensive Care Unit (ICU)** • A single study (Daly 1995) compared a NLU for the chronically critically ill with conventional care in an ICU. • In-patient mortality was lower for the NLU but not significantly so (OR 0.62 95% CI 0.35 to 1.10). • Long term follow up (over variable periods up to 24 months) is reported for a sub sample. This shows no overall difference between the NLU and usual care (OR 0.8 95% CI 0.40 to 1.59). • There was no difference in proportion discharged to institutional care (OR 0.61, 95% CI .0.30 to 1.25). • Length of stay to first discharge home did not differ (WMD 2 days, 95% CI 10.96 to -6.96 days).

		• Early readmission rate (within 21 days) was lower for the NLU (OR 0.33 95% CI 0.12 to 0.94).
Inter-professional Collaboration	**28.122**	**Interventions**: 2 studies examined inter-professional rounds; 2 studies examined inter-professional meetings **Control**: Usual care **Conclusions:** • The review suggests that practice-based IPC interventions can improve healthcare processes and outcomes, but due to the limitations in terms of the small number of studies, sample sizes, problems with conceptualising and measuring collaboration, and heterogeneity of interventions and settings, it is difficult to draw generalisable inferences about the key elements of IPC and its effectiveness. **Main Results**: • 3 of these studies found that these interventions led to: • Drug use (improved prescribing of psychotropic drugs in nursing homes (Schmidt 1998); • Length of hospital stay and total hospital charges (Curely 1998, interdisciplinary rounds group was LOS 5.46 days, compared with LOS 6.06 days for traditional care (P = 0.006) but in one study, LOS showed no impact (Wild 2004). Wild (2004) suggested that the negative study results could be due to the fact that many of the admission diagnoses were on a clinical pathway with standardised care, and that patients are more stable, at lower risk for complications and possibly healthier overall, so the interdisciplinary rounds provided no additional ad- vantage. • One study showed mixed outcomes. **Countries:** Not explicitly mentioned.
Discharge Planning	**23.1**	**Intervention:** Discharge Planning **Control**: Standard Care • 24 RCTs (8098 patients); three RCTS were identified in this update. **Main results:** • **Patient characteristics**: 16 studies recruited older patients with a medical condition, 4 recruited patients with a mix of medical and surgical conditions, 1 recruited patients from a psychiatric hospital, 1 from both a psychiatric hospital and from a general hospital, and 2 trials patients admitted to hospital following a fall (110 patients). • Hospital length of stay and readmissions to hospital were statistically significantly reduced for patients admitted to hospital with a medical diagnosis and who were allocated to

		discharge planning (mean difference length of stay -0.91, 95% CI -1.55 to -0.27, 10 trials; readmission rates RR 0.82, 95% CI 0.73 to 0.92, 12 trials). • Mortality and discharged to home: For elderly patients with a medical condition there was no statistically significant difference between groups for mortality (RR 0.99, 95% CI 0.78 to 1.25, five trials) or being discharged from hospital to home (RR 1.03, 95% CI 0.93 to 1.14, two trials). This was also the case for trials recruiting patients recovering from surgery and a mix of medical and surgical conditions. • Satisfaction: In 3 trials, patients allocated to discharge planning reported increased satisfaction. • Healthcare costs: There was little evidence. **Conclusions**: • The evidence suggests that a discharge plan tailored to the individual patient probably brings about reductions in hospital length of stay and readmission rates for older people admitted to hospital with a medical condition. • The impact of discharge planning on mortality, health outcomes and cost remains uncertain. **Countries**: USA (1); UK (5); Canada (3); France (2); Australia (1); Denmark (1); Netherlands (1); Taipei (1).