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Evidence Check

Inpatient care for children and adolescents with mental disorders

An **Evidence Check** rapid review brokered by the Sax Institute for the NSW Ministry of Health. September 2017.

NSW GOVERNMENT | Health

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The role of inpatient care for children and adolescents with moderate-to-severe mental disorders

An **Evidence Check** Evidence Check brokered by the Sax Institute for the NSW Ministry of Health. September 2017.

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Contents

1 Executive summary

A recent Australian survey of the mental health of children and adolescents identified that one in seven (14%) have experienced a mental health disorder in the past year with nearly half of these (5.6%) having a moderate-to-severe disorder. Appropriate care for young people with moderate to severe mental disorders will include a spectrum of services from community-based to inpatient settings. This Evidence Check synthesises the best available research evidence about when inpatient care is the most effective and appropriate form of care for children and adolescents with moderate to severe mental disorders.

Methods

Searches were undertaken in June 2016 of Medline, Embase, PsycINFO, and Cochrane databases (limited to English from 2000 to current). Additional searches for relevant research were undertaken using an iterative and systematic approach using Google Scholar, grey literature sources and review of the reference lists. This review focused on any primary study or systematic review that evaluates the role of inpatient care for children and adolescents up to 18 years of age with moderate to severe mental disorders. This included both intervention-based and descriptive studies, which were subsequently evaluated for methodological quality. Studies were excluded if they were of poor quality, exclusively focused on a forensic or juvenile detention populations or if they did not include an inpatient service delivery component.

Results

We identified 40 studies for the review, including 7 systematic reviews, 5 randomised controlled trials (RCTs), 10 prospective pre/post studies, 11 retrospective pre/post audits, 3 qualitative studies and 4 mixed method studies. Of the 40 included studies, 8 (20%) articles were of high methodological quality, 27 (68%) were of moderate quality and 5 (13%) were of moderate-to-low methodological quality.

Limitations

There are several major limitations to the current evidence base which make it difficult to determine the effectiveness of inpatient care for children and adolescents. Firstly, there is a lack of rigorous research designs using suitable comparison groups with only 5 of the 40 studies (13%) using a RCT study design. Secondly, synthesising the available evidence for inpatient care is difficult given the variability in patient populations, treatment interventions and models of care, which limit their generalisability. Thirdly, there are a range of outcome measures collected from different stakeholder groups (including treating clinicians, parents, teachers and young persons) over different time periods that impact on comparability of findings and the definition of effectiveness. Finally, the evidence is mostly based on small sample sizes, which limit the ability to assess the relative effectiveness of treatment models for different patient or service delivery characteristics.

Question 1: When is inpatient care the most effective and appropriate model of care for the treatment of children and adolescents with moderate to severe mental illness?

There is **limited evidence** regarding when (and for whom) inpatient care is the most effective and appropriate model of care, which is outlined below.

Risk of harm in inpatient care

Expected clinical improvements from inpatient care must be weighed up against the potential risks of harm, including: dislocation from everyday life; loss of family, friends, or community support; education disruption; stigma; trauma; and acquiring unhelpful or destructive learned behaviours from inpatient peers.

Generally agreed criteria for when inpatient care is indicated

The evidence in this review suggests there are **no absolute indications** for inpatient care, but requires clinical judgment of the most appropriate care pathway after assessing their symptoms, motivation, level of family support and availability of community-based treatments. To guide clinical decision making, examples of when inpatient care is more likely to be indicated include:

1. A need for intensive assessment or treatment not available in the community
2. Risk of self-harm or suicide
3. Poor physical health requiring skilled medical care.

Impact of predictors of improved treatment outcomes

There was **strong evidence** to suggest that treatment outcomes (such as clinical improvement and reduced hospital readmissions) were improved through more active engagement and involvement of the family in the young person's care. This could involve improving family support (such as making family visits to inpatient care easy), improving family functioning (such as improved parent/child relationships) and providing family therapy as part of the treatment model of care. Another strong predictor of improved treatment outcomes was the provision of accessible post-discharge support and aftercare services. Discharge planning should be undertaken early in the inpatient treatment episode to ensure for a more seamless continuity of care.

Impact of particular conditions on clinical improvement

Due to the small sample sizes and variations in models of care, it is difficult to determine from the evidence whether young people admitted to inpatient care with certain mental health conditions (such as comorbid mental disorders and intellectual disability) have better or worse clinical improvement than for other conditions. However, there is **consistent evidence** that young people with conduct and other behavioural disorders had lower levels of clinical improvement and higher hospital readmission rates than young people with other mental health disorders.

Models of inpatient care

The reviewers were unable to identify any studies that investigated the key elements of an effective model for inpatient care. Key elements of the model of care that were found in most studies included access to age-appropriate care, acute or emergency admissions, individually tailored treatment plan, multi-disciplinary trained staff, multi-modal treatment (including family-based treatment) and post-discharge support. There was **insufficient evidence** of the relative effectiveness of different inpatient treatment settings such as specialist Children and Adolescent Mental Health Services (CAMHS), general inpatient units (adult mental health wards and general paediatric wards) and models of care that had a hybrid inpatient/outpatient model. There was **inconclusive evidence** regarding whether the length of stay in different models of care had any impact on treatment outcomes.

Alternatives to inpatient care

Two recent systematic reviews of alternatives to inpatient care concluded that there was **insufficient evidence** about the relative effectiveness of community-based treatments and inpatient care. One reason for this is the limited number of high quality comparison studies using randomised control trials (RCTs) comparing outcomes for similar patients in different settings. For example, it can be very difficult to maintain fidelity to a randomly assigned community-based treatment if a young person needs crisis inpatient care. There is a need for the development and evaluation of innovative alternative models of care, such as the promising UK THRIVE model for CAMHS which aims to provide a flexible model tailored to the individual needs of the young person.

Question 2: How does the effectiveness and appropriateness of the model of care differ for particular sub-populations, such as Aboriginal people, recent migrants and refugees, and people in rural and remote communities?

There was **insufficient evidence** to determine the effectiveness and appropriateness of inpatient care to address the needs of specific sub-populations such as young people from Aboriginal and Torres Strait Islander backgrounds, recent migrants and refugees, and people from rural areas. This was partly because the body of available evidence was based on studies of small sample sizes, lack of reporting of patient characteristics and that most of the studies identified in this Evidence Check were undertaken in urban settings.

Aboriginal and Torres Strait Islander people

None of the identified primary studies based in Australia reported on treatment outcomes by patient Aboriginal and Torres Strait Islander background. The only evidence this Evidence Check identified that was specifically relevant to young Aboriginal and Torres Strait Islander people was found in a systematic review of the barriers and facilitators they experience when seeking access to mental health care. Key barriers to care included: lack of awareness of available services; reliance on informal supports from family and friends; worries about confidentiality; fear of shame to themselves and their families; and living in rural and remote areas where access to culturally appropriate care is limited. The evidence this Evidence Check recovered revealed that young people of other ethnic minorities reported similar barriers to receiving care.

Recent migrants and refugees

There was **insufficient evidence** to determine the relative effectiveness of inpatient care for young people from a recent migrant or refugee background. This Evidence Check only identified one systematic review focused on young refugees' use of mental health care and their unmet treatment needs. The barriers to care that young refugee populations face that this review identified indicated that their need for culturally appropriate care is similar to that young Aboriginal and Torres Strait Islander people require with the added challenge of possibly needing access to healthcare interpreters.

Rural and remote communities

There is **insufficient evidence** to determine the relative effectiveness of inpatient mental health treatment for young people from rural and remote communities. The availability of specialist inpatient CAMHS was less common in rural areas which may result in an increased likelihood that these young people will be admitted to adult mental health or general paediatric wards, which may not be age appropriate and result in worse treatment outcomes. Furthermore, there was an acknowledgement that accessing models of care that included day programs, outpatient services or family treatment would be difficult for young people living in rural areas so they have a higher likelihood of being excluded from these care models.

Conclusions

This review has highlighted that the evidence base is mostly unable to determine when inpatient care is most effective and appropriate for children and young people with moderate-to-severe mental health disorders. Although this Evidence Check was able to identify elements common to effective models of care (such as providing individualised age-appropriate care with multi-modal family-based treatment from multi-disciplinary staff), more research is needed regarding the impact of different treatment variables on patient outcomes and to determine if this differs by specific sub-populations. That includes development and evaluation of a range of flexible and innovative integrated models of care across inpatient and community-based settings.

2 Background

A recent Australian mental health survey of children and adolescents aged between 4 and 17-years-old found that one in seven (14%) had experienced a mental health disorder in the past year and that nearly half of those (5.6%) had experienced a moderate-to-severe disorder.1 Service use increased with mental disorder severity with 88% of young people with severe disorders and 73% of young people with moderate disorders reporting that they accessed mental health services in the past year. The services that they accessed most commonly were community-based such as those provided by general practitioners; only 6% of children and adolescents had attended a hospital emergency, outpatient or inpatient service.

Developing a comprehensive range of mental health services for children and adolescents is an important policy focus in Australia and internationally.[2,3] In the UK, mental health services have been conceptualised as a four tiered model ranging from Tier 1 community-based care for mild disorders to specialist Tier 4 CAMHS (Children and Adolescent Mental Health Services) inpatient care for moderate-to-severe mental disorders.[4-6] There are a range of models used for providing care to young people with moderate-to-severe mental disorders with varying levels of evidence.[3]

This Evidence Check was commissioned by the NSW Ministry of Health, Mental Health Branch to provide an evidence base for policy guidelines on when inpatient care is indicated for children and adolescents aged up to 18 years old with moderate-to-severe mental health problems. It aims to inform the NSW government's revision of the current Health Policy Directive, PD2011_016, *Children and Adolescents with Mental Health Problems Requiring Inpatient Care*. For this review, inpatient care is defined as the admission of a patient to any hospital inpatient setting for at least one night. Children are defined as individuals aged under 12 years old and adolescents as those aged between 12 and 18 years old.

Objectives

The objective of this Evidence Check was to provide a synthesis of the best research evidence available to indicate when inpatient care is the most effective and appropriate for children and adolescents with moderate-to-severe mental disorders.

Review questions

There were two review questions:

1. When is inpatient care the most effective and appropriate model of care for the treatment of children and adolescents with moderate-to-severe mental disorders?
2. How does the effectiveness and appropriateness of the model of care differ for particular sub-populations, such as Aboriginal and Torres Strait Islander people, recent migrants and refugees, and people in rural and remote communities?

3 Methods

Literature Search

The reviewers undertook the literature search in June 2016 including all studies published in English from January 2000 to June 2016. The following OVID databases were searched: MEDLINE, PsycINFO, EMBASE, Cochrane Database of Systematic Reviews. Keywords used for the search included:

- Target population: child*, adolescen*, teen*, young person, young people, youth, juvenile*
- Setting/model of care: inpatient*, in-patient*, admission*, admit*, discharge*, hospitalis*, CAMHS, acute, residen*, emergency*, crisis, paed*
- Mental health condition: mental health, mental* ill*, mental dis*, psychiatr*, psycho*, schizophren*, bipolar, mood dis*, anxiety dis*, depress*, obsessive compulsive, OCD, ADHD, conduct dis*, post-traumatic*, post traumatic*, PTSD, suicid*, personality dis*, neuropsychiatric dis*, eating dis*, anorexia, comorbid

The reviewers conducted additional searches for relevant evidence using an iterative and systematic approach using Google Scholar, grey literature sources and review of the reference lists.

Inclusion and exclusion criteria

This review focused on any primary study or systematic review that evaluated the role of inpatient care for children and adolescents aged up to 18 years old with moderate-to-severe mental disorders. This included both intervention-based and descriptive studies, which were subsequently evaluated for methodological quality. Studies were excluded if they only focused on forensic or juvenile detention populations or did not examine an inpatient service delivery component. Studies were also excluded if they were solely reported in a conference abstract or a post-graduate dissertation. Included studies contained outcomes assessed by a range of stakeholders (including clinicians, parents, teachers and the patient) and included clinical improvement by, for example, using UK Royal College Psychiatrists' Health of the Nation Outcome Scales - Children and Adolescents (HoNOSCA) scores. Other assessment criteria included service delivery (length of stay), satisfaction and cost-effectiveness.

Critical appraisal

The reviewers developed a table (see Appendix 1) to extract the study characteristics, model of care, study design, outcomes assessed, key findings, methodological quality and the NHMRC level of evidence.[1] The reviewers used the McMasters University Quality Assessment Tool for Quantitative Studies to rate the methodological quality of quantitative studies.[2] This tool includes eight criteria: selection bias; study design; confounders; blinding; data collection methods; withdrawals and dropouts; intervention integrity; and analysis. These criteria were individually assessed and their quality was rated as low, moderate/low and moderate-to-high (see http://www.ephpp.ca/PDF/Quality%20Assessment%20Tool_2010_2.pdf).

The reviewers then used the ten questions in the Critical Appraisal Skills Program (CASP) (http://www.casp-uk.net/#!casp-tools-checklists/c18f8) assessing rigour, credibility and relevance, to rate the methodological robustness of qualitative studies. Studies that scored 1-3 were classified as low quality, 4-5 as moderate/low quality, 6-7 as moderate quality and 8-10 as high quality. The evidence available for each review question was synthesised into a narrative summary. The reviewers highlighted gaps in the literature where evidence is not currently available.

Search Results

The first search that the reviewers conducted used the search terms as a keyword anywhere in the abstract yielding 12,517 results. When the reviewers narrowed the title field this was reduced to 1,093 results. The reviewers then de-duplicated the results and removed 534 articles leaving 559 articles to be imported into Endnote X7 for further review. A title and abstract scan excluded a further 426 articles. A further 52 articles were added from the grey literature and by reviewing the reference lists of identified articles. This resulted in 185 articles undergoing full text review, of which, a further 145 were excluded, leaving 40 articles to be included in the Evidence Check. A summary of the literature study selection process is outlined in Figure 1 below.

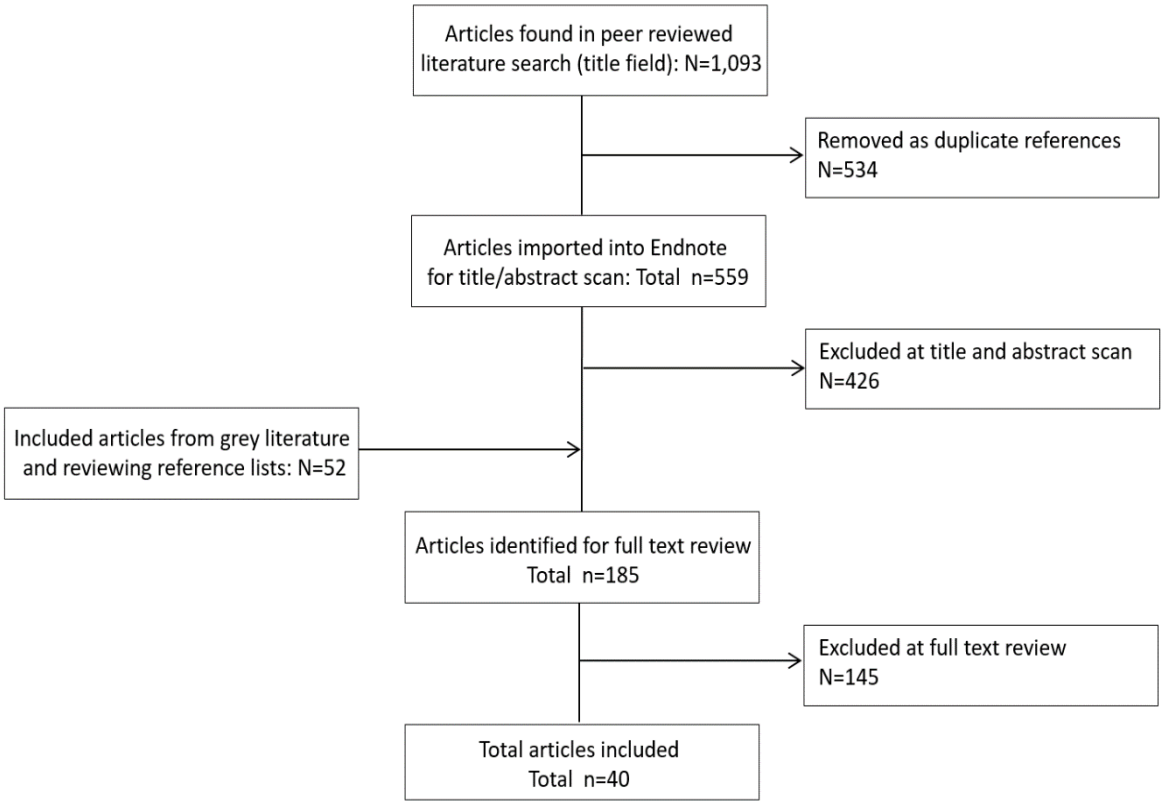

Figure 1. Study selection process

Characteristics of included articles

Level of evidence

Among the included 40 articles, there were 7 systematic reviews (NHMRC level I), 5 randomised controlled trials (NHMRC level II), 10 prospective pre/post studies (NHMRC level IV), 11 retrospective pre/post audit studies (NHMRC level IV), 3 qualitative studies and 4 mixed method studies from the grey literature (NHMRC level IV). Details of the individual articles are included in Appendix 1.

Quality of included studies

The reviewers assessed the 40 articles for methodological quality using the McMasters or CASP critical appraisal tools depending on whether they were quantitative or qualitative. Using this approach, 8 (20%)

articles were found to be of high methodological quality, 27 (68%) were of moderate quality and 5 (13%) were of moderate/low quality.

Patient characteristics

Only a small number of studies (N=5, 13%) focused solely on children aged 13 years old and younger with most studies focusing on an adolescent population (N=17, 43%) or a population comprised of children and adolescents (N=14, 35%). Four studies included young people up to 25 years of age (but the majority of people in those studies were aged under 18 years old). The majority (N=36, 90%) of studies did not focus on a specific mental health diagnosis; only a small subsection focused on eating disorders such as anorexia (N=4, 10%). Only three studies included a focus on young people of ethnic minorities.

Outcomes assessed

A small number of studies (N=6, 15%) included multiple perspectives to assess outcomes by including feedback from a clinician (i.e. symptom improvement, length of stay), a parent/carer, a teacher or from the young person. Most studies (N=22, 55%) only provided outcome assessments from treating clinicians and in nearly half of these cases they relied on a single clinician rating scale such as the HoNOSCA scale to determine improvement. A further five studies (13%) reported on the experience of the young person as the main measure to assess outcomes.

A summary of the 40 articles is included in Table 1. below and stratified by the level of evidence. A more detailed description of these studies is included in Appendix 1.

Reference, Location	Study design, focus area, setting, condition	Sample size	Age (years)	Quality
Level I: Systematic Reviews (SR) (N=7)				
Blanz (2000)[9] GER	SR: Outcomes MH inpatient treatment	NS	C&A NS	M
Brown (2016)[10] AUS	SR: Barriers MH care access at-risk young people	62 studies	12-25	M
Colucci (2014)[11] AUS	SR: MH care among young refugees	11 studies	<25	M
Edwards (2015)[12] UK	SR: Risks inpatient MH care	40 studies	11-18	H
Hair (2005)[13] CA	SR: Outcomes residential treatment	18 studies	C&A NS	M
Kwok (2016)[14] UK	SR: Alternatives to inpatient MH care	6 studies	<=18	H
Shepperd (2009)[15] UK	SR: Alternatives to inpatient MH care	7 studies	5-18	H
Level II: Randomised Controlled Trials (RCT) (N=5)				
Boege (2015)[16] GER	RCT (8M FU) 1 unit, home care vs inpatient, cost	100 C&A	5-17	M
Gowers (2007)[17] UK	RCT (2Y FU) 35 units, inpatient vs specialist outpatient vs general CAMHS, anorexia	167 ADOL	12-18	H
Harrington (2000)[18] UK	RCT (1Y FU) 2 districts, parents of children with behavioural disorders; parent education groups	141 PAR	3-10	M
Herpertz-Dahlmann (2014)[19] GER	RCT (1Y FU) 6 units, day patient/inpatient vs continued inpatient, anorexia	172 ADOL	11-18	H
Madden (2015)[20] AUS	RCT (1Y FU) 2 units, shorter vs longer hospitalisation, anorexia	82 ADOL	12-18	H
Level IV: Prospective pre/post (PPP) studies (N=10)				
Arnold (2003)[21] US	PPP (10Y FU) 1 unit, predictors readmission	180 ADOL	12-19	M
Blader (2004)[22] US	PPP (1Y FU) 1 unit, predictors readmission	109 CHILD	5-12	M
Gavidia-Payne (2003)[23] AUS	PPP (4M FU) 1 unit, inpatient unit outcome evaluation (multiple perspectives)	29 PAR, 42 Teachers, 37 Referrers	<12	M
Gowers (2000)[24] UK	PPP (2-7Y FU); 2 samples (case note series; prospective series), outcome predictors, anorexia	75 ADOL (30 notes; 45 prospective)	12-18	M
Green (2001)[25] UK	PPP (6M FU) 2 units, outcome predictors	55 C&A	6-17	M
Green (2007)[26] UK	PPP (1Y FU) 8 units, outcome predictors, costs	150 C&A	3-17	H
Hanssen-Bauer (2011)[27] NOR	PPP (1Y no FU) 4 units, emergency admissions, outcome predictors	192 ADOL	10-18	M
James (2010)[28] US	PPP (30M FU) 1 unit, predictors readmission, access to post-discharge services	186 C&A	C&A NS	H

Mayes (2001)[29] US	PPP (6M FU) 1 unit, outcome predictors	110 CHILD	2-13	M
Swadi (2005)[30] NZ	PPP (18M no FU) 1 unit, Determine optimum LOS	72 ADOL	16-18	M/L
Level IV: Retrospective pre/post (RPP) audit studies (N=11)				
Bobier (2005)[31] NZ	RPP (2Y) 1 unit, predictors readmission	71 ADOL	16-19	M
Carlisle (2012)[32] CA	RPP (2Y) statewide linked data, predictors aftercare	7111 ADOL	15-19	M
Chaplin (2015)[33] UK	RPP (?) 14 units, outcomes by intellectual disability	151 C&A	6-17	M/L
Corrigal (2002)[34] UK	RPP (2Y) 1 unit, outcome evaluation	118 ADOL	12-18	M/L
Duddu (2015)[35] UK	RPP (2Y) 1 unit, outcome evaluation	97 ADOL	16-17	M
Garralda (2008)[36] UK	RPP (8Y) 1 unit, outcome evaluation	167 C&A	5-16	M
Hussey (2005)[37] US	RPP (5Y) 1 unit, LOS in residential treatment	126 CHILD	5-13	M
Lyons (2001)[38] US	RPP (2Y) 8 units, outcomes residential treatment	285 ADOL	12-17	M
Kyriakopoluos (2015)[39] UK	RPP (3Y) 1 unit, outcome evaluation	82 CHILD	<13	M/L
Mathai (2009)[40] AUS	RPP (1Y) 1 unit, outcome evaluation	157 ADOL	12-18	M
Romansky (2003)[41] US	RPP (3M) 1 unit, predictors readmission	500 C&A	3-21	M

C&A: Children & Adolescent; YP: Young People; CHILD: Children; ADOL: Adolescents; PAR: Parents; NS: not specified; FU: Follow-up; Y: Year; M: Month; MH: Mental Health; H: High; M: Moderate; M/L: Moderate/low; LOS: length of stay

4 Review Limitations

The NSW Ministry of Health commissioned this Evidence Check to identify the current evidence base (and assess its quality) for when inpatient care is the most effective and appropriate for children and adolescents with moderate-to-severe mental disorders. Before discussing the review's key findings, it is important to note major limitations to the available evidence.

Lack of comparison groups

One of the primary challenges to determining the effectiveness of inpatient care for children and adolescents is the lack of available evidence built on rigorous research designs which include a suitable community-based comparison group, such as in Randomised Control Trials (RCTs).[3] This review only identified one study which used a RCT design to compare the clinical effectiveness of available treatments (inpatient, specialist outpatient and general CAMHS) for adolescents with anorexia nervosa.[4] In that study, treatment fidelity was limited as only 50% of young people adhered to their randomly allocated treatment setting due to a variety of reasons such as personal choice and clinical referral as a result of deteriorating mental health.[5, 6] The majority of other studies examining the effectiveness of psychiatric inpatient care for young people utilised pre/post study designs with variable durations of follow-up that make comparability of outcomes difficult.[6, 7]

Variability in models of care

The ability to synthesise the available evidence regarding the effectiveness of inpatient care for children and adolescents with mental health problems was also highly limited as the treatment interventions and models of care that the studies examined was highly diverse and restricted their generalisability. This included different thresholds for admission, intervention models, settings, treatment length and intensity, staffing profiles, patient exclusion criteria, degree of family engagement and integration with available aftercare.[3, 5] Although most studies documented aspects of their model of care, none reported collecting data related to contextual factors or different treatment components to determine the active ingredients of effective treatment.[6]

Different outcome measures

It was difficult to consolidate the evidence on the effectiveness of different models of care as the studies used variable means to measure outcome (such as clinical improvement and hospital readmission) and over different time frames, which compromised comparability.[8-10] Many studies only used a single clinician outcome measure from admission to discharge that can lead to a biased result, as treating clinicians would consider reporting clinical improvements more desirable.[3, 11] A limited number of studies included outcome measures collected from multiple perspectives (such as the clinicians', the patients' and their family members), which enhance the ability to evaluate the effectiveness and appropriateness of treatment.[6, 7, 12] However, increased routine use of validated outcome measures such as the HoNOSCA scale would contribute to making retrospective review of clinical data achievable and enable better monitoring of therapeutic outcomes.[5, 7, 11]

Small sample sizes

A final limitation of the studies that the reviewers identified is that many were based on small samples sizes with varying characteristics so, it was difficult to synthesise them and make valid outcome comparisons.[6, 9] These small samples also limited the ability to determine the effectiveness of inpatient treatment for patients across their characteristics (e.g. age, ethnicity or mental health condition). The same problems arose when determining the effectiveness of services with different delivery characteristics (e.g. treatment setting or geographic location).[3, 5, 13]

5 Findings Question 1

Question 1: When is inpatient care the most effective and appropriate model of care for the treatment of children (0-12) and adolescents (12-18) with moderate-to-severe mental illness

There is **limited evidence** regarding when (and for whom) inpatient care is the most effective and appropriate model of care. Based on the evidence that is available, this Evidence Check summarises the potential risks of harm associated with inpatient care and generally agreed criteria for when inpatient care is indicated. For young people treated in inpatient settings, we have highlighted predictors of improved treatment outcomes and specific mental conditions that may result in less clinical improvement than others. Lastly, key elements of effective models of inpatient care, and some alternatives to it, are described.

1. Risks of harm in inpatient care

The benefits of providing psychiatric inpatient care to children and adolescents must be balanced against the potential risks of harm and the aim to provide them with care in the least restrictive environment possible.[8, 14] Despite this aim, there has been very little research conducted asking young people about the negative consequences of their experience of inpatient care.[8] This Evidence Check did not identify any primary studies that assessed the clinical outcomes of inpatient care which also investigated the experience of the young person.

A recent systematic review by Edwards (2015) identified 164 studies (including one qualitative study and three mixed method studies also cited in this report)[8, 15-17] of variable quality that included a focus on the risks to young people aged 11 to 18 years old who have received psychiatric inpatient care.[18] The majority of these studies focused on clinical risks to ensure the safety of young people, such as preventing and managing harm to themselves or others. A small proportion of the studies focused on non-clinical risks associated with the lived-experience of inpatient care that were categorised into themes under the terms 'dislocation' and 'contagion'. Specific risks identified included: dislocation from normal life and identity; educational disruption; dislocation and loss of support from friends and family; feelings of stigma and shame; contagion of acquiring unhelpful destructive learned behaviours from peers; development of institutional dependence; and difficulty re-integrating into family and normal life.[18] Among adolescents receiving psychiatric care on adult wards, further risks of harm this review identified included feeling unsafe, and exposure to violence and traumatic events.[19] These potentially harmful effects of inpatient care need to be carefully considered, identified and managed to help guide clinical decisions about appropriate care to ensure the safety of young people with moderate-to-severe mental health disorders.[5]

2. Generally agreed criteria for when inpatient care is indicated

Over the past three decades there has been a change from the delivery of longer term inpatient mental health treatment for children and adolescents to shorter, more intensive care using multi-modal treatments with links to post-discharge support services.[9, 14-16, 20] Determining whether the severity of a young person's mental health problems is sufficient to recommend inpatient care requires clinical judgment and careful assessment of whether the benefits of inpatient treatment outweigh any potential risk of harm.[8]

This Evidence Check was not able to identify any primary studies that investigated whether the assessment criteria for inpatient care for children and adolescents was appropriate and effective. A systematic review by Blanz (2000) suggested that there are **no absolute indications** for when inpatient treatment is needed and

admission is determined by a combination of factors related to the referral, patient and hospital admission criteria.[14] Blanz has provided a set of qualitative assessment criteria (described below) to guide clinicians in determining if the patient's problems are severe enough to warrant inpatient treatment.[14] These criteria for admission are then considered alongside relevant contextual factors including: availability of appropriate community-based treatment; patient motivation and therapeutic alliance with treatment; level of family and social support; and other economic factors.[12, 21, 22]

Need for intensive assessment or treatment not available in the community

There was **consistent evidence** from nearly all studies that inpatient care is indicated for young people with moderate-to-severe mental disorders who are receiving care in the community and their symptoms are not improving.[4, 11, 14, 16, 22-24] Inpatient treatment allows for a full psychiatric assessment in a controlled environment and intensive care by a multi-disciplinary team with 24-hour monitoring.[8, 22, 23] The availability of community-based treatment varies considerably by country and geographic location, and such services are generally less available for young people living in rural areas.[16, 22] This results in increased demand for inpatient care but inconsistent referral guidelines for circumstances in which children and adolescents need intensive care the most. Another response, where feasible, is to enhance community capacity and capability to make assessments or provide intensive treatment to decrease demand for inpatient care.[25]

Risk of self-harm or suicide

This Evidence Check identified five primary studies and two systematic reviews which found that the major criteria to indicate whether a young person with mental health problems required hospitalisation depended on whether they were at risk of self-harm or suicidal behaviour.[7, 11, 14, 18, 23, 26, 27] For example, in a recent RCT by Herpetz-Dahlmann (2014), adolescents with anorexia nervosa were randomly assigned to continue inpatient care or day patient care following three weeks of inpatient care. In this study, the key criteria the treating clinician followed for discontinuing day patient care (in favour of inpatient care) was whether young person was at risk of suicide or in poor physical health requiring medical care (discussed further below).[27] The criteria being 'at risk of self-harm' was further supported by clinical consensus among three mixed methods studies in the UK[8, 16, 22] and documented in the UK National Institute for Clinical Excellence (NICE) guidelines for delivering inpatient care to young people with depression. Using 24-hour observation and appropriately trained staff to keep young people safe is an important reason for recommending inpatient care to minimise risk of harm.[18] However, there is some debate about whether inpatient units should be used to treat patients who are suicidal as it is an expensive and disempowering way to address the problem.[23] Using a community-based safe house near the home of a young person at risk of suicidal behaviours may be a more suitable alternative.[28]

Poor physical health requiring skilled medical care

Three primary studies focused on adolescents with anorexia nervosa also found that a key indication that a young person required inpatient care was when they were experiencing a decline in their health status (such as severe malnutrition) that required medical stabilisation and support.[4, 27, 29] The studies also found that young people with poor physical health arising from comorbid mental and physical health conditions — such as severe asthma or diabetes that require skilled medical and nursing care, and 24-hour monitoring — met important criteria for admission.[4, 11, 22, 23, 27]

3. Predictors of improved treatment outcomes

There was **strong evidence** to suggest that family characteristics (such as family functioning and family therapy) of children and adolescents with mental health problems, and the quality of post-discharge

support services available to them, were two consistent predictors of treatment outcomes for young people given inpatient care. These are described below.

Family support

Three systematic reviews identified in the Evidence Check found that family-related characteristics were important for predicting treatment outcomes for young people with mental health problems.[3, 14, 18] Blanz (2000) identified that those from families that functioned positively experienced better outcomes than children who had been abused or whose parents had substance abuse or mental health problems.[14] Similarly, Hair (2005) found that family-related factors significantly impacted on the ability of children and adolescents to maintain benefits of treatment after discharge, including the extent of family involvement in treatment and the stability of the home environment.[3] Lastly, Edwards (2015) highlighted the importance of improving family relationships, ensuring regular family contact with patients and involving the family in their treatment to improve outcomes.[18]

Many of the studies included in this Evidence Check examined the impact of family on treatment outcomes.[6, 7, 11, 12, 14, 26] The ways that each study measured and defined family related characteristics varied widely, which limited the ability to synthesise findings consistently.[4] This Evidence Check separated the family-related characteristics into the following three categories defined below:

- Family functioning, including stable living arrangement, parent-child relationship, parenting skills, and child abuse or maltreatment
- Family involvement, including general family support, regular visits and involvement in the treatment process, family therapy, post-discharge support for aftercare
- Parental mental health and/or treatment, including the wellbeing or treatment of the parents of children and adolescent with mental health problems.

It should be noted that some studies included more than one of these categories in their investigation and the interaction between these categories may also be relevant in predicting outcomes.

Family functioning

Predictors of treatment outcomes related to family functioning included: living arrangements; parent/child relationship; and general parenting skills and child abuse or maltreatment.[24] In an Australian study of 157 adolescents admitted to psychiatric inpatient care, the reason for admission in 85% of cases was due to parent/child relationship problems.[23] Better pre-morbid family functioning and therapeutic alliance predicted better outcomes in two prospective studies of children and adolescents in inpatient treatment.[6, 12]

Blader (2004) investigated predictors of psychiatric hospital readmission among children aged 5–12 years old one year after discharge and found harsh parental discipline and disengaged parent-child relations predicted readmission risk.[30] A small study of children aged 12 years old and younger involving 84 families (29 with complete data) that included family therapy, found that parents reported significant changes in satisfaction and efficacy, including the use of more effective parenting strategies in discipline situations at four-month follow-up.[7] Living arrangement was also identified as a predictor of hospital readmission in a study of 500 children and adolescents in state custody, which found that young people living in congregate care arrangements (such as group homes) had a significantly higher rate of hospital readmissions to children living in families.[20]

Family involvement

Generally, family support, parental attitude and involvement in treatment (including family-based treatment) are important predictors of treatment outcomes for children and adolescents with mental health

problems.[29-31] Family involvement was particularly important for children aged 12 years old and younger; the more families engaged in the treatment process, the better the outcomes for the child.[7, 11, 30] The systematic review by Kwok (2016) identified that providing treatment in the least restrictive setting (such as community-based care) improved family engagement in treatment and resulted in better treatment outcomes.[9]

A study of 167 children aged 13 years old and younger found that better clinical outcomes were achieved in cases when their parents took a positive and accommodating attitude towards treatment.[11] Feedback from the young people indicated that the process of admission to inpatient care was substantially easier if they had regular support from their family.[17] Involvement of the family as early as possible in the treatment process, including frequent family visits and engagement in family therapy when available also improves clinical outcomes and reduced the likelihood of hospital readmission.[3, 12, 18, 32] This included ensuring inpatient units had policies and procedures in place for family visits which were flexible, provided a private space for contact and accommodation for families who had to travel significant distances.[18]

Inclusion of family-based treatment (FBT) was mentioned in a number of studies but most did not provide details about the nature of the family therapy provided.[4, 11, 26] In an RCT by Madden (2015), FBT included 20 one-hour sessions over a 12-month period using a manualised protocol that started within a week of hospital discharge.[29] Family-based therapy helps to identify and work on daily family life problems, improves the chance of sustaining therapeutic gains in the community and improves the likelihood of utilising aftercare services post-discharge.[9, 18]

Parental mental health and/or treatment

Only two studies of children with mental health problems included parental mental health and/or treatment as a potential predictor of treatment outcome. Harrington (2000) conducted a RCT involving 141 parents with children aged 3 to 10 years old diagnosed with behavioural disorders randomly allocated the parents to either a community or hospital-based education group.[33] The study found that the delivery setting for the education programs did not lead to any significant differences in children's outcomes. However, depression was common among the parents and was a significant predictor of the child's outcome. Hussey's (2005) US study of 126 children in residential treatment aged 13 years old or younger found that parental alcohol abuse predicted a shorter length of stay in treatment (nearly twice as fast as their peers).[34] Since only a small number of studies investigated the impact of parental mental health as a predictor of child treatment outcomes, it is difficult to determine how generalisable their findings are for the purpose of service development.

Post-discharge support

Post-discharge support, such as referral to appropriate aftercare services, is an important predictor of treatment outcome and helps to prevent hospital readmissions among children and adolescents.[3, 7, 10, 14, 35] Romansky (2003) studied 500 randomly selected children and adolescents in state care and found that young people who had been readmitted within three months of discharge had received significantly fewer post-discharge social support services (such as case management hours) than young people who were not readmitted.[20] Although provision of aftercare services improves outcomes, there is variability in access and use of these services. In a prospective cohort study of 7,111 adolescents discharged from psychiatric hospitalisations in Canada, only 24% were found to have appropriate aftercare within 7 days after discharge and 49% within 30 days, with significant geographical variation in the availability of services.[35] After adjusting for other variables, significant predictors of receiving appropriate aftercare included being from an urban area or having a psychotic or mood disorder.[35]

Qualitative studies of children and adolescents experiencing mental health problems also highlighted the importance of them receiving post-discharge support.[17, 19, 36, 37] The UK YoungMinds 2003 study conducted interviews with 109 young people regarding their experience of inpatient psychiatric care. Feedback from these participants indicated they wished to be more involved with their discharge planning and that they had difficulties accessing services in the community after discharge.[17] Young people who participated in the UK Minority Voices study also expressed these sentiments. They indicated that they had very little, if any, post-discharge support and felt like they were being "passed around" between workers and agencies with no explanation and struggling with the stress of continuously retelling their story.[36, 37]

It is also important that children and adolescents receive help reintegrating to school post-discharge. Edwards' (2015) systematic review found that dislocation from education was highlighted as one of the major risks of harm that can result from inpatient care.[18] Its key findings suggested maintaining education while young people are in hospital and assisting them to re-enter school after discharge to minimise educational disruption and academic attainment was of high importance.[3, 18] In particular, the review highlighted the value of inpatient units working in partnership with education providers or systems to ensure high quality and supportive education is provided to young people being treated for mental health problems while in hospital which is harmonised with their schooling post-discharge.

Very few of the studies this Evidence Check identified included investigation into coordination between post-discharge support, and social care and welfare agencies alongside mental health care.[14] Ensuring harmonised and holistic support for young people treated for mental health conditions discharged from inpatient care can assist with their reintegration into the community, and minimise future issues associated with social and family-related factors.

4. Impact of particular conditions on clinical improvement

As mentioned previously, the small sample sizes and variation in exclusion criteria for inpatient admission in the identified studies limit the ability to draw conclusions about whether its outcomes are better or worse for individuals with different mental health conditions, including early psychosis, severe mood or anxiety disorders, or comorbid substance disorders.[3] Where there was some investigation into relative clinical improvement in two mental health conditions (comorbid mental disorders and intellectual disability, and conduct and other behavioural disorder), they are discussed further below.

Comorbid mental disorders and intellectual disability

The evidence regarding the impact of intellectual or learning disabilities on outcomes among young people with comorbid mental health disorders is **inconclusive**. In the UK, there is an acknowledgement that young people with learning disabilities in need of specialist services (in both inpatient and community settings) often fall through the cracks when it comes to receiving appropriate care.[17, 25, 28]

The review identified three studies[11, 38, 39] that showed no significant difference in outcomes for young people with intellectual disabilities. A UK study by Chaplin (2015) used routine data from 14 inpatient units treating 151 young people with mental health disorders, including 38 young people deemed to have intellectual disabilities. The study revealed no differences in treatment outcome for either group.[38] Similarly, a UK study of 167 children admitted for inpatient care over an eight year period split nearly half-and-half between those who did and did not have intellectual disabilities, identified no significant differences in response to treatment across the groups.[11]

Furthermore, a US study which followed the progress of 110 young people submitted for psychiatric care found there was no correlation between their learning capability and clinical outcome.[39]

One US-based study of 500 randomly selected young people in state care found higher rates of hospital readmission among young people who were rated as having below average learning ability or developmental delay.[20]

A number of identified studies' excluded young people with intellectual disabilities from participating in their research which limited the ability to determine potential outcomes of inpatient care for children and adolescents classified with differing cognitive abilities.[4, 12, 24]

Conduct and other behavioural disorders

There is **consistent evidence** that young people with conduct disorder and other behavioural disorders achieved poorer levels of clinical improvement and were more likely to be readmitted to hospital than young people with other mental health disorders. The systematic review by Blanz (2000) highlighted that children and adolescents with under-socialised aggressive conduct disorders responded less favourably to inpatient treatment than provided in community-based care and suggests that long-term psychiatric hospitalisation may not be indicated for these young people.[14] This was supported in another systematic review by Hair (2005) which suggested that adolescents diagnosed with conduct disorder functioned better in family or foster home environments.[3] Many inpatient units exclude these young people with conduct disorders from their service, as they do not believe it will benefit them.[7, 23, 26, 30]

These findings that young people with conduct disorders showed less clinical improvement compared to children and adolescents with other mental disorders when treated in inpatient settings were supported by a further five studies, mostly focussed on children under age of 13 years old.[11, 12, 30, 39, 40] A study of 167 children aged 13 years old or younger admitted to inpatient care found that young people with conduct disorder were identified as having less clinical improvement in HoNOSCA scores at discharge compared to other mental disorders.[11] This finding of worse clinical outcomes for children aged 13 years old or younger with behavioural disorders admitted to inpatient care was also found in a study by Mayes (2001).[39] Furthermore, Blader (2004) found that children aged 5–12 years old with conduct disorders had a higher risk of hospital readmission within one year of discharge than young people with other disorders.[30]

A retrospective audit of 285 adolescents in residential treatment centres in the US found that over a two-year period clinical outcomes for young people with ADHD and other behavioural disorders were worse than for young people with other mental disorders.[40] Also, Green's (2001) study of 55 children and adolescents in mental health inpatient care also found worse outcomes for young people with conduct disorder than other mental health disorders.[12] However, this study found that when therapeutic alliance was positive, children with conduct disorder benefited from inpatient treatment as much as children with other diagnoses.

5. Models of inpatient care

As previously highlighted, this Evidence Check identified a diverse range of inpatient care models with differing admission types, settings, and length of stay and intervention approaches. Many of the studies examined by this Evidence Check insufficiently described the care models being used limiting the ability to compare their outcomes and relative effectiveness in improving patient outcomes. Despite these limitations, this section outlines some of the key elements found to be more common among effective and appropriate inpatient models of care, including treatment settings and duration of inpatient treatment.

Key elements

Acute or emergency admissions – intervene at the earliest possible indication of problems and improve the capacity of services to be able to accept acute or emergency admissions.[28, 41, 42]

Individually tailored treatment plan – ensure a comprehensive initial assessment, a flexible approach to care planning and provide appropriate information and engagement with the young person and their family.[9, 15, 17, 43]

Multi-disciplinary trained staff – address staff shortages and ensure they have necessary clinical supervision, cultural sensitivity and competency, and professional training.[3, 15, 17, 36]

Multi-modal family-based treatment – provide a flexible range of individual treatment, group work and family therapy, as well as inclusion of hybrid inpatient/outpatient services, such as day programs, and step-up and step-down models of care.[3, 15, 17, 28]

Post-discharge support – begin discharge planning as early as possible in the treatment episode while providing appropriate community-based services to ensure for continuity of care.[14, 35, 43]

Treatment Settings

The effectiveness of inpatient care models for children and adolescents with moderate-to-severe mental health disorders is sensitive to their treatment settings. This Evidence Check found **insufficient evidence** to compare the relative effectiveness of inpatient care provided to young people in specialist CAMHS inpatient units (including Eating Disorder Units, or EDUs), non-specialist inpatient units (including adult mental health wards and general paediatric wards) and hybrid treatment settings (including inpatient/outpatient models).

Specialist CAMHS inpatient units

The Evidence Check only identified one study by Gowers (2007) that compared the clinical outcomes for 167 adolescents with anorexia nervosa across inpatient, specialist outpatient and general CAMHS treatment settings.[4] Gowers' RCT study found no difference in patient outcome after a two-year follow-up period regardless of treatment setting. However, the same study found that adherence to inpatient treatment was only 50% which limits its findings. There is also inconclusive evidence regarding the effectiveness of specialist EDUs. The NICAPS study found that equal numbers of young people were treated for eating disorders in a general adolescent inpatient unit as were treated in specialist EDUs, and that there was little evidence that either of the facilities was more effective than the other.[8, 16] In one national study based in the UK, it was found that young people admitted to specialist EDUs had better clinical outcomes than those admitted to general CAMHS services.[8] Another study reported the opposite finding that outcomes for young people admitted to specialist EDUs were worse than those admitted to general CAMHS services.[32]

Non-specialist inpatient care

Young people with acute mental health disorders who are unable to receive care in specialist CAMHS services or community-based services are frequently referred to non-specialist inpatient care such as adult mental health or general paediatric wards.[16] The UK NICAPS study (2001) conducted a survey of general adult psychiatric wards and paediatric wards to determine the extent of inappropriate admissions (as designed by appropriate clinicians) of children and adolescents with mental health problems admitted to general adult psychiatric wards and paediatric wards over a six-month period.[16] The findings suggest that more than a third of young people with a mental illness were admitted to these non-specialist care settings and more than half of these admissions were considered to be inappropriate by the clinicians.[44] There is limited evidence on the effectiveness and appropriateness on these non-specialist inpatient settings; however, the evidence that is available has been summarised below.

Adult mental health wards

This Evidence Check identified **limited evidence** from four UK-based mixed method and qualitative studies regarding the appropriateness of admitting adolescents to adult mental health wards. In the *Pushed into the*

Shadows report (2007), the reviewers interviewed 16 adolescents who had been admitted to an adult mental health ward and reported mixed experiences.[19] Though some of them experienced a good level of care and support, the majority reported a range of negative experiences including feeling isolated, unsafe, uninformed, and being provided with inadequate levels of care. Young people reported similarly mixed views in other studies that this Evidence Check identified, but many reported experiencing difficult and traumatic encounters orchestrated by highly mentally disturbed adults on the ward, including sexual harassment.[16, 37, 45] Interviews with CAMHS staff also elicited concerns for young people on adult psychiatric wards including: concerns for their safety; lack of education provision; the lack of staff trained to work with young people; and age inappropriate treatment models.[17, 45]

General paediatric wards

This Evidence Check only identified one study that attempted to compare clinical outcomes for 151 young people with mental illness (with or without a comorbid intellectual disability) receiving care in a specialist CAMHS setting and those treated in a general paediatric ward.[38] The study found clinical improvement from admission to discharge for both groups of young people regardless of treatment setting but the sample size was insufficient to assess if these findings were significant.

A qualitative study by Street (2003) conducted interviews with 103 adolescents in CAMHS services, of whom 16% whom indicated they had been placed on a general paediatric ward at some point.[17, 45] Among this small sample, there were mixed views about the appropriateness of the care settings to which they were exposed. Some had no problem with them and others found they were inappropriate to address their needs or found the experience difficult because their staff were not trained to deal with mental health problems.

Hybrid inpatient/outpatient care

This Evidence Check identified four studies that described models of care which integrated inpatient and outpatient care, and all reported significant clinical improvement.[4, 27, 29, 31] An example of this model of care was a specialist EDU in Germany which included a three-week inpatient stabilisation period followed by a stepped day patient treatment for adolescents with anorexia nervosa.[27] All patients received a multi-disciplinary treatment program including individual and family therapy components, and the same outpatient treatment program. The study found that outcomes for young people in the stepped care model (day program after inpatient care) was equivalent and not inferior to those continuously placed in inpatient care. In another German RCT of children and adolescents with complex mental health problems, patients were randomised to a regular length of inpatient stay (on average 69 days) or a shortened length (on average 47 days) followed by a 12-week, stepped-down, home-based supported discharge service and followed up for eight months.[31] That study found the hybrid inpatient/outpatient model of care with home treatment produced equivalent, outcomes to the inpatient care model and was more cost effective.

Length of stay

Over the past three decades, the average length of stay for children and adolescents psychiatric inpatient care has been decreasing due to financial pressures, the potential risks of inpatient harm and the increased availability of community-based treatment options.[6, 14, 16] As a result, the treatment goals of inpatient care have shifted from a focus on longer-term treatment to crisis intervention and support.[14] This Evidence Check has found that the seriousness of clinical mental health diagnoses given to children and adolescents admitted to inpatient care provides a reliable predictor of the duration for which they will remain in the facility's care. That suggests the care needs of young people are tailored when determining their length of stay.[10, 34]

However, the evidence regarding the association between the length of stay in inpatient care and treatment outcomes is **inconclusive**. Green (2007) carried out a prospective study of 150 young people admitted to inpatient care across eight facilities in the UK at one-year follow-up and found that longer lengths of stay predicted better clinical outcomes.[6] In contrast, James (2010) studied 186 young people experiencing their first mental health hospitalisation and found that the longer their stay the higher their risk of readmission.[10] A number of other studies did not find an association between length of stay and treatment outcomes.[11, 23, 26] These inconsistencies around the association of length of stay to treatment outcomes are likely to be attributable to differences in the models of care, study populations, illness severity, outcome measures or other study settings.[14]

This Evidence Check found **insufficient evidence** to determine the optimal length of inpatient care for children and adolescents experiencing mental health problems. The outcomes of two small studies identified suggest the main treatment gains from inpatient care may take place in the first few weeks of admission.[12, 46] The optimal duration of inpatient treatment was also assessed by Madden (2015) in a RCT of 82 adolescents with anorexia nervosa which compared outcomes from two treatment goals with a shorter length of stay focused on medical stabilisation compared to a longer length of stay focused on weight restoration.[29] It found no significant differences between the two groups based on the primary outcome measures of number of days hospitalised following admission, suggesting that a shorter length of stay was equally effective as a treatment goal.

6. Alternatives to inpatient care

There is **insufficient evidence** on the relative effectiveness of community-based treatment compared to inpatient care for children and adolescents with moderate-to-severe mental health disorders, as identified in two recent systematic reviews and one identified study described below.[4, 5, 9]

The first systematic review by Shepperd (2009) identified seven RCTs of 799 participants investigating community-based alternative treatments to inpatient care.[5] The systematic review grouped the studies according to the intervention type but the data was unable to be pooled as a result of differences in the intervention models of care (the therapeutic elements of which were not often clearly reported) and outcome measures collected. Shepperd concluded that the review generated insufficient evidence to determine the relative effectiveness of alternative interventions to inpatient care because the studies' sample sizes were too small and their quality was inconsistent.

A more recent systematic review by Kwok (2016) extended on the Shepperd review and identified a further six RCTs involving 569 youths which compared the efficacy of intensive community services to inpatient care for children and adolescents with mental health disorders.[9] The review found that the clinical improvements for most of these community-based services (which included specialist outpatient treatment, multi-systemic therapy, day patient treatment, intensive home treatment and supported discharge services) were similar to inpatient care, lower in cost and resulted in greater family satisfaction. However, this review also found that the body of evidence the RCTs produced was insufficient to determine if intensive community-based was as effective as inpatient care. It also found that methodological limitations to the studies hampered their generalisability.

There was one study identified by Gowers (2007) which evaluated the effectiveness of available treatments for adolescents with anorexia nervosa across 35 CAMHS services in England.[4] This study randomly allocated 167 adolescents to one of three treatments: general inpatient psychiatric treatment (lasting about six weeks), specialist outpatient treatment (lasting about six months and manualised for the trial) and general community CAMHS (lasting about six months) and followed up for two years. Overall, the study found that young people adhered to treatment in 65% of cases but, of those in inpatient care only 49% adhered to

treatment. At two-year follow-up, the study found equivalent clinical improvements and no significant differences in other outcomes measures across all three treatments.[4] The study concluded that there was insufficient evidence about the most effective treatment for young people with anorexia nervosa but the findings have led to a stronger focus in the UK on developing more community-based services for young people with eating disorders.[21]

Another recently suggested alternative to standard inpatient CAMHS by the UK National Health Service is to move away from the tiered model of care (which leads to fragmentation) and develop an integrated service delivery model that is tailored to the individual young person.[47] This approach involves creating a seamless pathway of care and support for young people and their families to ensure provision of the right care at the right time, regardless of service delivery setting. An example of this kind of flexible needs-based model is the 'Thrive' model which is currently being developed, refined and evaluated, so evidence as to its effectiveness is not currently vailable.[47]

6 Findings Question 2

7 Conclusions

This Evidence Check found that there is **insufficient evidence** to determine when inpatient care is the most effective and appropriate for children and adolescents with moderate-to-severe mental disorders (for both specific sub-populations and models of care). This is a result of several factors including, the lack of available studies with sufficiently rigorous design to include comparison groups or have a large enough sample size to draw solid conclusions. Furthermore, among the studies there was a high level of variability in patient population characteristics, the treatment interventions involved, the models of care and the outcome measures they used, all of which limited the generalisability of their findings.

Therefore, the evidence in this Evidence Check suggests that there are **no absolute indications** for when inpatient care is required. However, this Evidence Check found **some evidence** suggesting that inpatient care is more likely to be indicated in the following circumstances:

1. A need for intensive assessment or treatment not available in the community
2. Risk of self-harm or suicide
3. Poor physical health requiring skilled medical care.

However, clinicians must apply judgment before using these criteria to recommend inpatient care. They need to be placed into a context which considers the severity of the young person's mental health condition, the community-based treatment options available to them and the potential risk of harm before inpatient care is recommended.

The review also found **strong evidence** to suggest that significant predictors of improved treatment outcomes included:

1. Family-related characteristics (such as family support, family functioning and family therapy)
2. Access to post-discharge support services.

The review found **moderate evidence** to suggest that young people with conduct and other behavioural disorders treated in an inpatient setting had **worse** outcomes (i.e. less clinical improvement; more hospital readmissions) than young people with other mental disorders.

While the review could identify some common elements of an effective model of care for young people with moderate-to-severe mental health problems (such as providing individualised age-appropriate care with multi-modal family-based treatment from multi-disciplinary staff), more research is needed to evaluate the impact of different treatment variables on patient outcomes and determine if this differs by specific sub-populations. This should include development and evaluation of a range of flexible and innovative community-based alternatives to inpatient care.

Question 2. How does the effectiveness and appropriateness of the model of care differ for particular sub-populations, such as Aboriginal people, recent migrants and refugees and people in rural and remote communities?

There was **insufficient evidence** to determine the effectiveness and appropriateness of inpatient mental health care for children and adolescents of specific sub-populations such as Aboriginal and Torres Strait Islander people, recent migrants and refugees and rural and remote populations.

As previously discussed in this report, the available evidence is limited in its ability to assess the effectiveness of different mental health care models by population groups. One reason for this is that the primary studies identified for this Evidence Check revealed that there was insufficient collection and reporting of these patient characteristics in the included studies.[3] Also, most primary studies had small sample sizes which further limited the ability to generate reliable findings by specific population groups. Finally, most research was undertaken in metropolitan settings where health care providers reported that populations were less ethnically diverse.

Aboriginal and Torres Strait Islander people

There is **insufficient evidence** to determine the relative effectiveness of inpatient mental health treatment for young Aboriginal and Torres Strait Islander people. Evidence regarding access and engagement in mental health treatment specific to young Aboriginal and Torres Strait Islander people identified in this Evidence Check has been included below. Studies that report findings about young people from ethnically diverse backgrounds who may experience similar challenges accessing and receiving culturally appropriate care, have also been included.

Of the three primary studies focused on inpatient care included in this Evidence Check based in Australia,[7, 23, 29] none specifically reported on the effectiveness or appropriateness of inpatient care for Aboriginal and Torres Strait Islander children and adolescents. These studies also relied on evidence obtained using small sample sizes (82–123 participants) leaving them with insufficient power to provide valid results.

A recent systematic review by Brown (2016), identified 62 studies that investigated the barriers and facilitators that young people aged 16–24 years old with mental health problems experienced accessing and engaging with mental health treatment (including inpatient and community-based care).[13] The systematic review included three qualitative studies (most of poor methodological quality) investigating help-seeking behaviour among young Aboriginal and Torres Strait Islander people with mental health problems. The study highlighted barriers that young Aboriginal and Torres Strait Islander people confront when seeking accessing to mental health care. They included: lack of awareness of available services; reliance on informal supports from family and friends; concerns about confidentiality; and fear of shame for themselves and their families. A further barrier that young Aboriginal and Torres Strait Islander people encountered when seeking mental health care was that many lived in rural and remote areas where access to culturally appropriate treatment services is highly limited.[13]

Other ethnic minorities

This Evidence Check identified a further six studies (conducted in the UK and US) regarding the mental health of young people from ethnic minority groups, who are likely to experience similar barriers to accessing culturally appropriate care as young Aboriginal and Torres Strait Islander people.[11, 16, 19, 30, 36, 48] This included two US-based studies with small sample sizes (109 children aged 5–12 years old with a one year follow-up; and 180 adolescents aged 12–19 years old with a 10 year follow-up) that found rates of mental health hospital readmission did not significantly vary with patient ethnicity.[30, 48]

A study of 160 children aged up to 13 years old that Garralda (2008) conducted in the UK analysed the total mean change in HoNOSCA scores (from admission to discharge) for Caucasian children (66% of the study population) and compared them with those from other ethnic backgrounds.[11] This study found that the mean change of scores for Caucasian children was significantly higher than found for children of ethnic backgrounds (8.92 vs 5.39, p=0.003). Although this finding was significant, it should be considered with caution as the study did not use controls to reduce the effect of potential confounding variables (such as socio-economic status).

The Minority Voices study conducted in-depth interviews and focus groups involving 76 young people from ethnic minority backgrounds in the UK aged 12–25 years old about their perceptions and use of mental health services.[36, 37] This study identified barriers that they faced when seeking mental health care. They included uncertainty about what help was available, and concerns about confidentiality, stigma, discrimination and racism in mental health services. The study also highlighted the lack of trained staff from ethnic backgrounds and the difficulty in providing mental health interventions in languages other than English, which impacts on the accessibility of care for young migrants and refugees. These findings of under-utilisation were also confirmed by interviews with 44 staff from CAMHS and related agencies who reported that a central challenge was that some CAMHS services only accept referrals from health professionals while many refugees and ethnic minorities seek care or support predominantly in the voluntary sector or through non-clinical, non-government organisations.[36, 37]

Although young people from ethnic minorities who need mental health care may not access the care they need, there is also some evidence to suggest that they are over-represented in inpatient services. A study by the UK Mental Health Act Commission (reported on in the Pushed into the Shadows report) found that 27% of young people on adult mental health wards were from ethnic minorities, which is substantially higher than their proportion of the UK's overall population.[19] This over-representation of young people from ethnic minorities was also found in the UK-based NICAPS inpatient census of 635 young people, which found that 15% of patients from general inpatient psychiatric units and 18% of patients from forensic and secure unit patients were from ethnic minority groups, even though they accounted for less than 10% of the UK's total population at the time.[16] One explanation for these contradictory findings (over-representation as well as under-utilisation) is that young people from ethnic minorities only seek specialist mental health care when their problems are too serious or urgent to be treated in the community sector.[36]

Recent migrants and refugees

Only one of the studies included in this report included any findings about young people (aged up to 25 years old) from a recent migrant or refugee background, indicating **insufficient evidence** to determine the relative effectiveness of inpatient mental health treatment for this at-risk population.[49]

The identified study was a systematic review by Colucci (2014) that focused on the utilisation of mental health services (including inpatient and community-based care) and unmet needs among children and young people up to age 25 years old from a refugee background.[49] This review identified 11 relevant studies

but did not assess their methodological quality. Some of the identified barriers to receiving care included: insufficient knowledge of available services; lack of referrals and pathways to care from informal networks; low priority placed on mental health and stigma; and shame. These barriers were similar to those that children and adolescents from Aboriginal and Torres Strait Islander and ethnic minority backgrounds reported in this Evidence Check.

The Colucci systematic review included five studies of young refugees who had accessed mental health services and its findings suggest that the availability of culturally appropriate services (including the use of interpreters and trauma-informed care) is limited and impacts on the engagement and retention of these at-risk young people.[49] The review found that young refugees under-utilise mental health care and have considerable unmet needs. However, it also concluded that the available evidence was insufficient to use for service development.

Rural and remote communities

There is **insufficient evidence** to determine the relative effectiveness of inpatient mental health care treatment for young people from rural and remote communities. The UK NICAPS study mapped the availability of CAMHS services in the UK to gain a better understanding about their distribution and the models of youth mental health services available throughout the country.[16, 50] The NICAPS study found that the 80 CAMHS units that provide inpatient mental health care service it identified were unevenly distributed geographically with over half of their beds located in metropolitan areas.[50] This had significant impacts on the quality of care for young people from rural areas needing inpatient admission for a mental health problem including: continuity of care; liaison with local services; aftercare; and accessibility of services for the young person and their families.[16] Furthermore, the lack of specialist inpatient CAMHS services in rural areas could result in young people from these regions becoming more likely to be admitted to adult mental health wards or general paediatric wards, which are likely to be neither as effective nor as appropriate.[19, 36]

Only two of the identified studies included analysis of findings of children and adolescents who receive inpatient mental health treatment from rural or remote communities.[20, 35] A Canadian retrospective audit, which used linked administrative datasets of 7,111 adolescents aged 15–19 years old who received psychiatric inpatient treatment over a two-year period, found that nearly half (49%) of the study sample had received aftercare with a primary care physician or psychiatrist within the first 30 days after their discharge.[35] The study found that young people from rural areas were significantly less likely to receive aftercare compared to young people from urban areas.[35] A US-based retrospective audit of 500 children and adolescents in Illinois state custody, Romansky (2003) analysed factors related to psychiatric hospital readmission within three months of discharge.[20] This study found that young people who lived in rural areas (with the least access to post-discharge support services) had a significantly higher hospital readmission rates (41%) than young people from non-rural areas (19%). One reason for this may be due to shortages of mental health and primary care physicians in rural areas.

The systematic review by Brown (2016) which identified 16 studies involving young people from rural areas, investigated barriers and facilitators for this population group when seeking to accessing mental health care.[13] It revealed young people in rural areas face similar barriers to accessing treatment as their counterparts from Aboriginal and Torres Strait Islander and refugee backgrounds, including: reliance on informal supports; fear of shame and stigma; and concerns about confidentiality.[8, 13, 36]

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9 Appendices

Appendix 1: Table of included studies

First author (year), country, topic	Study design, duration, setting, model of care	Sample size, patient characteristics (age, gender, condition)	Outcomes assessed	Key findings	NHMRC level of evidence, quality rating, limitations
Arnold (2003) US Predictors of adolescent hospital readmissions	Study Design: Prospective pre/post study with repeated assessment of suicidal behaviour among formerly hospitalised adolescents Duration: 10 year FU Setting: 1 Adolescent unit (university hospital) Model of care: Inpatient psychiatric unit at a university-affiliated hospital	N=180 Aged 12-19 51% female 80% Caucasian Mixed diagnoses	Hospital readmission	• 44% of adolescents had at least one hospital readmission, with most occurring within the first two years after discharge • Younger age and presence of an affective disorder were the only significant predictors of hospital readmission	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Small sample from a single unit with a single outcome measure may limit generalisability. Unable to verify all reported hospital admissions so data quality may be limited
Blader (2004) US Predictors of children's hospital readmissions	Study Design: Prospective pre/post study Duration: 1 year FU (at 3, 6 and 12 months) Setting: 1 Children's unit (15-bed) Model of care: 15-bed psychiatric inpatient service of a non-profit general paediatric hospital over a 14 month period. The facility draws from a highly demographically and socially diverse patient population and involves a wide range of providers and agencies.	N=109 Aged 5-12 35% female 51% Caucasian Mixed diagnoses	Clinical: symptom scales; readmission Family: Alabama Parenting Questionnaire	• 34% of the sample was readmitted (most within 90 days of discharge) • Predictors of readmissions included: more severe conduct problems, harsh parental discipline, disengaged parent/child relations	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Small sample, lack of comparison group. One inpatient setting so limited generalisability. Strengths: multiple FU points

Blanz (2000) Germany Predictors and outcomes of inpatient treatment	Study Design: Systematic (practitioners) review. Duration: N/A Setting: C&A inpatient units Model of care: Varied	Did not specify # of studies cited	Varied – including LOS, clinical, Family functioning	• Little is known about inpatient treatment including the factors influencing hospital admission, the content of care in the hospital, the appropriate LOS and the connection to aftercare services • There are many methodological problems with existing research which limit comparisons • Can cautiously conclude that psychiatric hospitalisation of C&A is often beneficial • Key elements of a model of care include good therapeutic alliance, treatment with a cognitive-based problem-solving approach, a planned discharge and access to aftercare	NHMRC Level of evidence: I Quality rating: Moderate Limitations: Not a systematic review. Literature search strategy not described which may limit findings.
Bobier (2005) New Zealand Predictors readmission to adolescent psychiatric care	Study Design: Retrospective pre/post study using routine audit data comparing adolescent patients readmitted within 12 months of discharge to those not readmitted Duration: 2 year period Setting: 1 adolescent unit Model of care: Unit is an 8-bed tertiary mental health facility for assessment and treatment of 16-18 year olds with severe psychiatric disorders unable to be managed in other settings. The unit's multi-disciplinary team included two C&A psychiatrists, a psychiatric registrar, nursing staff, a social worker, a cultural	N=71 Aged 16-19 62% female Mixed diagnoses	Hospital readmission	• Predictors of readmission included medication non-adherence and a history of childhood sexual abuse • A trend emerged for readmitted patients to be younger at first psychiatric admission • Readmission was not associated with diagnosis (including substance abuse)	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Small sample, lack of control group. Quality of routine data may be variable. Only one outcome measure assessed.

	advisor, an occupational therapist and a clinical psychologist.				
Boege (2015) Germany RCT and economic evaluation home treatment vs inpatient treatment for C&A psychiatry patients	Study Design: Non-inferiority RCT and economic evaluation of C&A living in families and needing inpatient care. Randomised to 12-week intensive home treatment (Hot-BITS) or inpatient TAU control Duration: 8 month FU Setting: 1 C&A unit. Shortened inpatient stay (47.7 days) once clinically stabilised followed by 12 weeks' outpatient Hot-BITS treatment Model of care: Inpatient care – thorough assessment, focus on building therapeutic alliance early, early discharge, individualised treatment plans (discussed with family). Hot-BITS treatment included up to 3 appointments per week of home treatment (case management, individual therapy, family therapy, psycho-education, supervised medications), clinical elements (day hospital, hospital schooling, group therapy, music therapy, occupational therapy) and collaboration with social services. Also, bi-weekly treatment plan review and crisis management if needed.	N=100 recruited (56% RR) N=78 complete FU Aged 5-17 Mixed diagnoses	Clinician: CGAS Cost: cost effectiveness	• Demonstrated non-inferiority (CGAS scores improved both groups) of home-based supportive discharge service (Hot-BITS) after period of inpatient stabilisation (48 days) • Shorter inpatient LOS for Hot-BITS model (47 days inpatient, plus 108 days outpatient) compared to inpatient only model (69 days inpatient) • Increased cost-effectiveness at 8 Month FU for Hot-BITS	NHMRC Level of evidence: II Quality rating: Moderate Limitations: Small sample, original study in German, limited generalisability

Brown (2016) Australia Barriers and facilitators to MH care among at-risk YP	Study Design: Systematic review of the barriers and facilitators to accessing and engaging with mental health care among at-risk young people Duration: N/A Setting: Any MH care (inpatient and outpatient) Model of care: Varied	62 studies Aged 12-25 YP: Aboriginal and Torres Strait Islander, homeless, LGBTQI, substance-using, rural/remote	Mixed - mostly qualitative views of YP	• Findings confirmed barriers already established (knowledge gaps, stigma, poor motivation to seek treatment, reliance on informal supports) for all YP but indicated greater severity among at-risk groups • Barriers and facilitators to service access were commonly examined, but barriers to engaging with a service were less common	NHMRC Level of evidence: I Quality rating: Moderate Limitations: Limited evidence identified and includes studies of poor quality and of young adults aged over 18. High degree of variability in studies limits generalisability.
Carlisle (2012) Canada Predictors of psychiatric aftercare	Study Design: Retrospective pre/post study of predictors of psychiatric aftercare among formerly hospitalised adolescents using linked routine data using 3 large validated health administrative databases Duration: 2 years Setting: Statewide inpatient care Model of care: Canada's publicly funded, open-referral healthcare system.	N=7111 Aged 15-19 57% female 18% rural Diagnosed with psychiatric disorder or self-harm	Hospital readmission	• 24% of the sample had aftercare with a primary care physician or psychiatrist within 7 days of discharge; and 49% within 30 days • Predictors of aftercare included higher socio-economic status and psychotic disorders • Less aftercare was found for YP in rural areas	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: General inpatient care so may be generalisability; Not all aftercare services are in routine data so may be under-estimate Strengths: Large sample size and use of linked data
Chaplin (2015) UK CAMHS outcomes by intellectual disability	Study Design: Retrospective pre/post study using data collected from a quality improvement project Duration: Unspecified duration Setting: 14 C&A units (specialist ID units, general CAMHS unit) Model of care: Varied across the 14 units (not specified)	N=151 Aged 6-17 25% Intellectual disability (ID) Mixed diagnoses	Clinician: HoNOSCA	• YP with mental disorders significantly improved from admission to discharge regardless of whether they had ID, or whether they were treated in a CAMHS or general paediatric unit.	NHMRC Level of evidence: IV Quality rating: Moderate/Low Limitations: Insufficient detail about methods of quality improvement project.

					Questionable data quality from routine audit
Colucci (2014) Australia Utilisation of MH care by refugee YP	Study Design: Systematic review of the utilisation (including access barriers and facilitators) of mental health services by children and young people from a refugee background Duration: N/A Setting: Any MH care (inpatient and outpatient) Model of care: Varied	11 studies Aged <25 (and some adult studies)	Mixed - mostly qualitative views of YP	• The limited evidence suggests that children and YP of refugee background under-utilise mental health care and have unmet needs. • Access to MH care is determined by an informal network of 'gateway providers' indicating different pathways to care • Barriers to care included a low priority placed on MH, poor MH service knowledge, distrust of services, stigma and other cultural factors	NHMRC Level of evidence: IV Quality rating: Moderate/Low Limitations: Insufficient detail about methods of quality improvement project. Questionable data quality from routine audit
Corrigal (2002) UK Outcome evaluation new adolescent psychiatric unit	Study Design: Retrospective pre/post study using routine data Duration: 2 years and unclear FU period Setting: 1 Adolescent unit Model of care: Emergency admission. Only exclusion criteria are patients requiring secure facility due to level of danger to self or others. Snowsfields 10 bed inpatient, 4 bed day patient unit which allows for 24/7 emergency admissions and variable LOS depending on individual needs. Flexible therapeutic model including medication, family work, group work, CBT, and post-discharge support.	N=118 admitted N=27 FU 58% female Aged 12-18 Mixed diagnoses 82% EA Median LOS 33 days 13% learning disability	Clinician: CGAS, HoNOSCA	• Focus of new unit on improving access (reducing overly restrictive admissions criteria), greater flexibility (variable timeframes for assessment and treatment to allow for patient need), & improved efficiency (less re-assessment of referred cases) • Significant clinical improvements demonstrated of patients from admission to discharge	NHMRC Level of evidence: IV Quality rating: Moderate/Low Limitations: Methodology not clearly outlined including unclear FU period. No control group. More of a service evaluation than a research study

Duddu (2015) UK Evaluation of an acute adolescent inpatient unit	Study Design: Retrospective pre/post audit using routine data Duration: 2 years Setting: 1 adolescent unit (6-bed) Model of care: Age appropriate acute psychiatric inpatient service for 16 to 17-year olds. The unit is staffed by a consultant psychiatrist (half-time), a specialty doctor, an occupational therapist, a family therapist (both part-time), a psychologist (sessional), a dietician (sessional) and a full complement of nursing and healthcare support staff. It is supported by a Tier 4 outreach team of CAMHS workers who are involved in pre-admission assessments and post-discharge care for up to 6 weeks. Young people are supported with care coordinators that attend all reviews and care meetings and provide specialist therapeutic input. The unit accepts acute and emergency psychiatric admissions 24-7. YP with primary eating disorders and intellectual disabilities were excluded, unless the main focus was a mental health-related crisis.	N=97 Aged 16-17 55% female Avg LOS 30 days Mixed diagnoses	Clinician: Clinical Global Impression Scale (CGIS)	• The most frequently presenting complaints included: 68% overdose or other self-harming behaviours; 56% low mood or depression and 30% with psychotic symptoms • Using the CGIS outcome measure was used to assess severity and symptom improvement from admission to discharge and found that most patients improved by the time of discharge • All the young people were referred to various adult community mental health teams who supported them after discharge	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Small sample size with no comparison group. Service evaluation with routine data so limited outcome measures provided
Edwards (2015) UK Risks of YP in inpatient MH care	Study Design: Systematic review of the risks of YP in inpatient mental health care. Two-phase including initial literature search which were themed for key risks which were prioritised by a stakeholder advisory group; in phase 2, websites were explored and a call for evidence circulated to identify appropriate citations. Duration: N/A Setting: Inpatient MH care Model of care: The majority of studies were conducted in inpatient settings, with 4 from residential treatment	40 studies (phase 2) Aged 11-18	Mixed - mostly qualitative views of YP	• The findings highlighted both clinical risks (such as suicidal and self-harming behaviours) and other risks associated with inpatient care which were categorised into themes of 'dislocation' (from normal life, identity, friends, stigma, education, families) and 'contagion' (of unhelpful learned behaviours from peers)	NHMRC Level of evidence: I Quality rating: High Limitations: Variable quality of studies and evidence utilised. Stakeholder mapping of themes may be incomplete. Strengths: Novel two-stage approach to evidence synthesis including an initial

	centres. Specific models of care were not discussed.			• The importance to stakeholders of the risks of 'dislocation' and 'contagion' contrasted with the limited quantity and quality of evidence in this area	scoping, stakeholder consultation and in-depth review with narrative synthesis.
Garralda (2008) UK Measuring outcomes in a child psychiatry inpatient unit	Study Design: Retrospective pre/post audit using routine data; Duration: 8 years Setting: 1 C&A Unit (14-place) Model of care: Inpatient/day unit for children with complex mental health problems not responding to outpatient care. Care provided Monday to Friday with patients at home on weekends. Multi-disciplinary approach of assessment and treatment for patient and family. Individualised treatment program including medication, psychology, education provision, CBT, family therapy and regular liaison with community-based services. Stepped care day patient program available. Outcome measures completed within two weeks of discharge.	N=167 (77% complete data) Aged 5-16 (mostly up to 13) 29% female 50% learning disability 50% psychiatric comorbidity Mixed diagnoses Mean LOS 5.6 months	Clinician: PCS, HoNOSCA	• Significant clinical improvements (based on HoNOSCA) on discharge, with greater positive change associated with being younger (8-11 vs older), higher initial HoNOSCA scores, diagnosis other than conduct disorder or schizophrenia and a facilitative parent attitude • LOS not linked to improvement (discharge determined by clinical improvement) • No indication of poorer outcome in children with a learning disability possibly due to nature of structured treatment	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: No control group or post-discharge FU. Based on audit so may have incomplete data. Results from single unit so may not be generalisable. Outcome assessment by treating clinician may result in desirability bias.
Gavidia-Payne (2003) Australia Outcome evaluation child inpatient MH unit	Study Design: Prospective pre/post study of consecutively admitted children Duration: 4 months FU Setting: 1 child unit (12 bed) Model of care: Children receive short-term (4-6 weeks) non-crisis intervention with family involvement. Patients were hospitalised on weekdays and went home on weekends. Unit aims: comprehensive assessment and symptom reduction and transition to	N=84 families (total) N=29 parents - complete data (35%) N=42 teachers N=37 referrers	Clinician: SDQ, HoNOSCA Teacher: SDQ Parent: SDQ, PS, PSOC, FAD, CES-D	• Significant improvements in child behaviour and functioning, parenting competency and efficacy, parenting practices and reduced parental depression with short-term intervention. • Changes in family functioning scores not significant – may indicate short-term interventions	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Small sample size and no comparison group. Limited FU time. High rate of incomplete data limits findings. Results from single unit so may not be

	outpatient. Family admissions are available. Aim is a comprehensive assessment, short-term stabilisation and outpatient discharge plan. Individually tailored treatment including individual treatment, group work, family treatment, social, educational, psychological and physical.	Aged 12 and under 28% female Mixed diagnoses 97% planned admissions Mean LOS 30.4 days		are less effective to improve complex child/family functioning. Specific family characteristics (single parent vs two vs other) may be an important variable to consider	generalisable. Strengths: multiple outcome measures from varied perspectives
Gowers (2000) UK Impact of inpatient care on outcomes of adolescent with anorexia	Study Design: Prospective pre/post study of 75 consecutively admitted adolescents with anorexia nervosa from two patient populations (case note group; prospective group). Duration: 2-7 years FU Setting: 1 regional adolescent unit Model of care: Regional adolescent service that specialises in the treatment of eating disorders and attempts to treat on an outpatient basis. Inpatient admissions are to either a general paediatric service or a specialist eating disorder unit.	N=75 (30 case notes & 45 prospective) Aged 12-18 95% female Anorexia nervosa	Clinical: MRGAS, LOS; weight	• Those treated in inpatient setting had a worse outcome and more research is needed into the potential risks of harm • Clear association between the severity of the condition at presentation and its medium to long term outcomes • Age, length of illness and lower score on the MRGAS were not associated with outcome	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Lack of a comparison group. Study is based on two sample groups which may not be comparable. Model of care is unclear.
Gowers (2007) UK RCT of 3 treatments (inpatient, specialist outpatient,	Study Design: Multi-centre RCT comparing inpatient, specialist outpatient and general CAMHS (TAU) Duration: 2 year FU Setting: 35 CAMHS units across England including 4 generic inpatient services, 2 specialist outpatient services and TAU in 29 general community CAMHS services Model of care: Inpatient care (designed to last 6 weeks)	N=167 Aged 12-18 92% female Anorexia Nervosa Mean LOS 15	Clinician: MRAOS, HoNOSCA, increased BMI	• All 3 groups made significant improvements at 1 and 2 year FU, with no significant differences between them in clinical outcomes (non-inferiority of non-inpatient-based treatment) • Full recovery rates were poor (33% at 2 years)	NHMRC Level of evidence: II Quality rating: High Limitations: Treatment arms not mutually exclusive as not all patients adhered to randomised treatment

general CAMHS) for adolescents with anorexia	was not manualised across the 4 units but all used a multi-disciplinary approach with the aim of normalising eating, restoring healthy weight and improving cognitive change. Each individual in the inpatient setting received individual and family therapy. Specialist outpatient treatment (designed to last 6 months) was manualised for the trial and included an initial motivational interview, individual CBT plus parental feedback (12 sessions), parental counselling (4-8 sessions), dietary therapy, multi-modal feedback and monitoring. TAU in general community CAMHS (expected to last 6 months) was not manualised but generally included a multi-disciplinary family-based approach with variable dietetic, individual supportive therapy and paediatric liaison.	weeks		• Adherence to inpatient treatment was only 50% • Specialised outpatient group was less costly than inpatient or general CAMHS (TAU) and had high levels of satisfaction (particularly for parents)	
Green (2001) UK Predictors of outcome inpatient and day treatment	Study Design: Prospective pre/post (waitlist controls) study of consecutive admissions to 2 C&A units over 18-month period. Duration: 6 month FU Setting: 2 CAMHS units – including a 12-bed regional unit with upper age of 15 years, and a 6-bed sub-regional unit with upper age of 16 years Model of care: Similar treatment philosophies including individualised treatment programs including medication, individual psychological treatment, family treatment, ward milieu, specialised school. Median 3 month waiting list from referral to admission. Residential treatment on weekdays, home on weekends. Day treatment program available (may be challenging for some families from rural areas to	N=55 Aged 6-17 40% female Mixed diagnoses Median LOS 21.6 weeks (includes day program) 84% planned admissions	Clinician: CGAS, HoNOSCA Teacher: TRF Parents: CBCL, FAD, FEQ, EUQ	• Significant health gain during hospitalisation was found on most measures and sustained at 6 month FU • Health improvement predicted by child/parent therapeutic alliance and by preadmission family functioning, rather than presenting symptoms • Presence of hostility in treatment setting predicts poor outcome, so poor prognosis for conduct disorder may be more caused by a lack of therapeutic alliance than conduct disorder per se but reflect	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Small sample size not allow for analysis of age-specific effects. Unclear reporting of sample attrition at 6 month FU. Results based on 2 units so may not be generalizable. No clear description of day program treatment or duration Strengths: multiple outcome measures from varied perspectives

	access) with same program as inpatient care. Did not admit YP with significant learning disabilities.			wider social difficulties • Rural – Regional inpatient units may have difficulty mounting a sufficient therapeutic program for families, some of whom have to travel sign distances to take part in the family program • 40% of patients moved between inpatient and day care during treatment	
Green (2007) UK Health gain and costs for inpatient CAMHS (CHYPIE study)	Study Design: Prospective pre/post cohort study of consecutive admissions over a 15-month period. Patients acted as their own controls (waiting list controls) Duration: 1 year FU Setting: 8 generic CAMHS units (4 children and 4 adolescent units) spread around UK Model of care: Units varied somewhat in admission policies and typical LOS but were convergent on best practice treatment approaches. Multi-disciplinary staff, a structured milieu with individualised treatment programs including psychological therapy, medication, psychosocial, family work, group work and specialist education. None of the units had a short-stay focus.	N=150 total N=117 complete data Aged 3-17 46% female Mixed diagnoses Mean LOS 16.6 weeks Mean waiting time to admission 16.4 weeks	Clinician CGAS, ASQ, HoNOSCA Teacher: TRF Parents: SDQ, FAD, FEQ, CSRI); Patient: SDQ Service: LOS	• Significant and clinically meaningful improvement (across all diagnoses) at discharge sustained at 1 year FU • Longer LOS (dose effects), positive therapeutic alliance and better premorbid family functioning predicted better outcomes • Robust predictor of health gain is the extent to which the patient establishes peer relationships in the unit, highlighting the role of patient milieu in treatment • No difference by age in severity, complexity or health gains for C&A suggesting no evidence for separating child and adolescents	NHMRC Level of evidence: IV Quality rating: High Limitations: No comparison group (unethical since cases too severe) so limited causal inferences. Strengths: large scale, multi-unit study; rigorous approach to measurement; multiple outcome measures from varied perspectives

Hair (2005) Canada Outcomes residential treatment	Study Design: Systematic review outcomes for C&A with severe emotional and behavioural disorders after residential treatment. Duration: Review of research from 1993 to 2003 Setting: Residential treatment Model of care: Included studies must employ trained staff; provide some on-site schooling for at least some residents; have a goal of returning the residents back to family, carers or independent living.	18 studies C&A (age not specified) Emotional and behavioural disorders	Outcomes residential treatment (multiple)	• C&A with severe emotional and behavioural disorders can benefit and sustain positive outcomes from residential treatment that is multi-modal, holistic and ecological • Research has highlighted that successful treatment includes a continuity of care, family involvement and the need for aftercare. • Shorter LOS, academic success and successful program completion before discharge are also important factors.	NHMRC Level of evidence: I Quality rating: Moderate Limitations: Findings based on a limited number of studies of variable quality. Unclear if findings for residential treatment programs are generalisable.
Hanssen-Bauer (2011) Norway Outcome predictors for acute adolescent admissions	Study Design: Naturalistic pre/post prospective observational study using a file audit for the first episode of care (at least 3 days LOS) to assess patient characteristics and clinical outcomes. Duration: 1 year (no FU) Setting: 4 CAMHS units including 31 adolescent beds with 24/7 emergency admissions Model of care: Acute care qualifying conditions: Psychosis (risk of harm to self or others), delirium, MH conditions carers can't handle and need urgent help. Individualised age-customised treatment programs including individual therapy, family therapy, medication and special schooling. Variable LOS depending on need.	N=192 total (87% RR) N=136 complete data Aged 10-18 70% females Mixed diagnoses 58% with suicidality Median LOS 8.5 days (Range 1-351 days)	Clinician: HoNOSCA	• Significant improvements (using HoNOSCA scores) from admission to discharge for suicidal YP in short LOS model • High HoNOSCA score at intake or involvement of Child Protective Services predicted improvement (not clear why) during admission • LOS was not associated with age, sex or outcome, but did vary significantly by unit. • HoNOSCA score did not vary by patient age	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: lack of control group. Differences between 4 units limits comparability limits generalisability and indicates different service delivery approaches. Possible desirability bias by clinicians completed outcome measures

Harrington (2000) UK RCT inpatient vs community care for parents of children with MH disorders	Study design: Pragmatic RCT comparing the costs and effectiveness of a community-based vs hospital-based secondary intervention (parent education groups) of parents with children with behavioural disorders Duration: 1 year FU Setting: 2 health districts Model of care: Each CAMHS provided the same intervention in either a community and hospital setting and used their routine intervention for children with behavioural disorders. In one of the districts, this was a videotape modelling parental group education program. The other district used a program of parental education groups with parallel child groups. In both districts the interventions were provided by various professionals, including community psychiatric nurses, psychologists, social workers and psychiatrists. Therapists in the study were trained in at least two parental groups before leading a group.	N=141 parents of children aged 3-10 Mean age 6.9 years	Parent and teacher's report of child behaviour Costs of service use	• Community-based treatment was not found to be more effective than hospital based treatment • Parental depression was common and predicted outcomes including poor child compliance with treatment	NHMRC Level of evidence: II Quality rating: Moderate Limitations: Not using validated outcome measures and only obtained outcome data on less than a third of randomised subjects; Sample size may have been too small to detect significant differences in costs. Comparison of findings may be limited due to different models of care.
Herpetz-Dahlmann (2014) Germany RCT day patient vs inpatient for adolescents with anorexia	Study Design: Multi-centre cluster RCT non-inferiority stepped care day program after 3 weeks inpatient care vs inpatient TAU for adolescent females with first hospitalisation for anorexia. Duration: 1 year FU Setting: 6 general hospital CAMHS units around Germany offering specialist treatment for eating disorders Model of care: Identical multidisciplinary treatment program offered to all patients based on weight restoration, nutritional counselling, CBT and family therapy. Patients discharged once they had met their	N=172 Aged 11-18 100% female Anorexia Nervosa	Clinician: LOS, Increased BMI	• Stepped day patient treatment (after 3 weeks inpatient TAU) is no less effective than longer-term inpatient care and substantially less expensive for anorexic young females. • 20% were readmitted for eating disorder in following year. • Day patient group had longer LOS (16.5 weeks compared to 14.6 weeks) but cost savings due to community-based treatment.	NHMRC Level of evidence: II Quality rating: High Limitations: Limited generalisability due to focus on first hospital admission for anorexic adolescent females (non-chronic) Strengths: Multi-centre RCT with large sample size.

	target weight for 2 weeks. Day patient treatment offers a structured eating disorder program on weekdays. To be eligible patients must live in a one-hour drive of the treatment centre. All participants offered same outpatient treatment program until the 12 month FU.			• Day patient group had better scores in mental-wellbeing and psychosexual adjustment than inpatient group so were better prepared for life outside hospital.	
Hussey (2005) US Forecasting LOS in child residential treatment	Study Design: Retrospective pre/post audit of 126 consecutively admitted children to a residential treatment using routine data; outcome measure was the Devereux Scales of Mental Disorders (DSMD) Duration: 5 years Setting: 1 children's unit Model of care: Child Residential treatment program provided a broad array of therapeutic interventions (individual, family, group, milieu, psychopharmacologic, music, art, recreation etc.) and included a self-contained school staffed by special education teachers from the local school district. Over 95% of the children were covered by Medicaid, with most children having grown up in poverty.	N=126 Aged 5-13 29% female 50% Caucasian Mixed diagnoses	Clinician: LOS; DSMD Teacher: DSMD	• Parental alcohol abuse, age, medication status, race, initial clinical severity were predictive of LOS. • Residential LOS was strongly linked to initial levels of psychiatric symptoms • Younger age was significantly associated with a longer LOS	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Lack of a control group. Limitations in using routine data. Sample is highly disadvantaged and may not be representative or generalisable.
James (2010) US Post-discharge services and readmission among C&A	Study Design: Prospective pre/post study of predictors of admission and access to post-discharge services following first psychiatric hospitalisation Duration: 30 month FU Setting: 1 unit Model of care: Large (89-beds, 29-beds for C&A) private non-profit facility in the Southwest US, providing a full range of mental health services across all age groups, including inpatient and intensive outpatient treatment. The majority of patients hold private insurance (20% admitted through public	N=186 C&A (age not specified)	Hospital readmission; Post-discharge support services	• 43% were readmitted during the FU period, with the highest risk of readmission in the first 30 days after discharge. • 72% of YP received 284 post-discharge services in the FU period which significantly reduced the risk of readmission • Longer first hospitalisation and a higher risk score at admission	NHMRC Level of evidence: IV Quality rating: High Limitations: Lack of control group. Small final sample size compared to initial sampling framework. Unable to determine sample representativeness. Routine data may be incomplete. Strengths: patient consent to

	insurance). More than 50% of the patient population is Caucasian, followed by Hispanic, African-American and Asian.			increased risk	participation sought. Data collection included routine data audit and caregiver interviews
Kurtz (2006) UK Feedback of YP of ethnic minorities who receive inpatient MH care (Minority Voices report)	Study Design: Multi-method study: 1) Tier 1 survey sent to 120 Primary Care Trusts for national service mapping. 2) YP/staff interviews and focus groups (as well as postal surveys). Duration: N/A Setting: Tier 1 to Tier 4 MH services Model of care: Varied	Units sample N=112 (23% RR) YP sample: N=76 aged 12-25 (most aged 16-18) Mixed diagnoses 31% refugees Staff sample: N=44	YP/staff experience	• Feedback from YP: concerns related to discrimination and racism, stigma, confidentiality, long waiting times, distance to services, services lack cultural competence; lack of age-appropriate services (disturbed by adult units); lack of support for grief or trauma (particularly for refugees); need improved awareness of available MH services; feeling being 'passed around' between agencies and workers with no explanation why. Staff not have good understanding of different family dynamics that make engagement difficult. • Staff feedback: need improved cultural competence; lack of capacity for targeted services; lack of trained staff from ethnic backgrounds; unstable funding impacts on improving inter-agency partnerships; unmet need in refugees; Ethnic minorities under-represented. Some CAMHS only take referrals from health	NHMRC Level of evidence: IV (grey literature) Quality rating: Moderate Limitations: includes feedback from YP aged 18-25 so less generalisable to C&A. Focus is on all MH services (Tier 1-4), not just inpatient so specificity of findings may be weakened.

				professionals while support for minorities is often provided by the voluntary sector. Difficulty providing intervention and resources in other languages.	
Kwok (2016) UK Alternative to inpatient care	Study Design: Systematic review of RCT of alternatives (intensive community-based services) to inpatient mental health care for C&A Duration: Not specified Setting: Alternatives to inpatient setting Models of care: Specialist outpatient treatment, multi-systemic therapy, day patient treatment, intensive home treatment and supported discharge service.	6 studies (569 YP) <=18 years	Variable	• Using intensive community-based services was associated with clinical improvements similar to inpatient care in most studies. • Using intensive community-based services was associated with shorter hospitalisations, lower costs and greater patient satisfaction • C&A with severe emotional and behavioural disorders can benefit and sustain positive outcomes from residential treatment that is multi-modal, holistic and ecological approach	NHMRC Level of evidence: I Quality rating: High Limitations: Only 6 RCT's identified with variable quality. Lack of equivalent outcome measures limits generalisability.
Kyriakopoluos (2015) UK A naturalistic study comparing emergency and planned MH admissions for children	Study Design: Pre/post retrospective audit of routine data comparing non-randomised emergency admissions (EA) with planned admissions (PA) among children under 13 years in a national unit Duration: 3 year period (no FU) Setting: 1 Child unit Model of care: Acorn Lodge for children up to 13 years with severe and complex disorders aims to assess children's clinical characteristics, functioning on admission and discharge and risk related incidents. Open 7 days per week and allows for emergency	N=82 (total) N=47 EA, N=35 PA Aged <=13 Mixed diagnoses Mean LOS 163 days at start and 102 days 3 years later.	Clinician: CGAS	• Emergency admissions (EA) for children were clinically appropriate and had no significant difference to PA children, and were associated with a higher degree of parental satisfaction (who welcomed rapid assessment and treatment). EA children had significantly lower functioning and were less likely to have been out of education (rapid entry to treatment) on admission.	NHMRC Level of evidence: IV Quality rating: Moderate/Low Limitations: Small sample size. Non-randomised comparison groups. Differentiation of the comparison groups is unclear and subject to bias. Limited generalisability as

	admissions out of hours to improve flexibility and responsiveness. Unit has some family accommodation on site where a parent/carer can stay for a few days to facilitate transition of child to inpatient care. Further description of treatment model not provided.			• Unclear definition of what constitutes an emergency – it was based on the unit's decision to admit based on the information in the referral without additional assessment. • Results suggest children's units should be less rigid and restrictive with accepting EA in children. This will reduce inappropriate admissions in paediatric units or delayed waits in the community.	based on a single unit. Unclear if other confounding clinical service-level changes over the study period impacted on findings.
Lyons (2001) Outcome trajectories for adolescents in residential treatment	Study Design: Retrospective pre/post audit of adolescents with at least 3 quarterly reviews in a 2 year period Duration: 2 years Setting: 8 Residential Treatment Centres in a western US state; Model of care: Residential treatment centres, with each program providing group, individual and psychiatric services (details not provided).	N=285 Aged 12-17 37% female	Clinician: Acuity of Psychiatric Illness – Child and Adolescent Version (CAPI)	• Findings suggest the effectiveness of residential treatment may be limited to the reduction of risk behaviours and depression and improved management of psychosis • There was little evidence that the facilities in this study improved clinical functioning • Though adolescents tended to improve overall during the course of their stays, there was considerable variation in which symptoms improved and which did not (including two symptoms that became worse)	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: No control group. Findings based on US residential treatment centre model may not be generalisable. No measurement of the type of treatments provided in the various programs. Retrospective audit may result in incomplete data. Strengths: validity and reliability testing of the outcome measure

Madden (2015) Australia RCT inpatient treatment for medical unstable adolescents with anorexia	Study Design: RCT inpatient treatment to compare the effectiveness of hospitalisation for shorter medical stabilisation (MS) or longer weight restoration (WR), followed by 20-session FBT for medically unstable adolescents with anorexia. Primary outcome is days of hospitalisation Duration: 1 year FU Setting: 2 specialist eating disorder paediatric units Model of care: Patients attend a hospital-based school, a daily adolescent group program (including artistic pursuits, psycho-education and psychological skills development) and a second daily physiotherapy program. Patients are medically and psychiatrically reviewed daily. All families were seen by multi-disciplinary team for a comprehensive assessment during the admission and weekly family meetings with a focus on clinical update, psycho-education, nutritional education and preparation for outpatient FBT. Patients had to live in a 2-hour drive of treatment centre to allow for weekly FBT participation. Patients were readmitted if medically unstable or at acute psychiatric risk.	N=82 95% female Aged 12-18 Anorexia Nervosa - diagnosis <3 years Medically unstable	Clinician: increased BMI, EDE, # hospital days	• Outcomes are similar (number of hospital days, readmission rates) for hospitalisations for MS or WR when combined with FBT. • Found significantly more total hospital days and post-protocol FBT sessions in the WR group • Cost savings would result from shorter hospitalisation combined with FBT	NHMRC Level of evidence: II Quality rating: High Limitations: Small sample, limited clinical outcome measures. May not be easily generalisable as FBT is not widely available. Strengths: RCT with robust methodology and FU period.
Mathai (2009) Australia Predictors of treatment outcome in an inpatient adolescent	Study Design: Retrospective pre/post audit of routine data; Study aim is to determine which patients benefit the most from treatment and inform admission policies Duration: 1 year (no FU) Setting: 1 Adolescent unit – Banksia Adolescent Unit – 12 bed unit with 2 intensive care beds. Allows emergency admission. Model of care: Generally, a short-stay unit (typical LOS	N=157 (total) N=123 (complete data with 3+ day LOS) Aged 12-18 75% female	Clinician: LOS, HoNOSCA	• Significant reductions in HoNOSCA scores from admission to discharge indicating clinical improvement for adolescents with at least a 3 day LOS to a short-stay unit • No association of diagnosis, reason for admission, age, gender, LOS and protective services involvement	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: No control group or post-discharge FU. Based on audit so may have incomplete data. Results from single unit so may not

unit	5-10 days, compared to other adolescent units have a LOS of 35 days) but variable LOS (up to 18 months) depending on individual needs. Treatment includes individual counselling, group therapy, education and vocational training and activity groups from a multi-disciplinary staff.	Mixed diagnoses 68% suicidal 83% parent/child relationship problems Mean LOS 10.7 days		with outcomes • 35% of patients had protective services involvement suggesting they were in care and admission used for containment • Recommend suicidal patients by managed in a paediatric ward or ED so unit can focus on planned admissions • 20% repeat admissions, indicating the unit is used for crisis containment	be generalisable. Outcome assessment by treating clinician may result in desirability bias of outcomes.
Mayes (2001) US Outcome predictors of child inpatient care	Study Design: Prospective pre/post study in a child psychiatric unit were assessed at discharge, 1month and 6 month follow-up Duration: 6 months FU Setting: 1 children's unit (16-bed) Model of care: The child psychiatric unit is located in a teaching hospital and is staff by psychiatric nurses, 2 child psychiatrists, 2 social workers, 2 recreational therapists, 2 special education teachers, 2 educational paraprofessionals, 2 child psychiatry residents and a psychologist. Treatment components included behavioural, individual, group, family and recreational therapy, participation in the school program and medication.	N=110 Aged 2-13 29% female 82% Caucasian Mean LOS 13.9 days	Parent/carer: Columbia Impairment Scale (CIS)	• Significant improvement in psychological functioning at discharge and FU (1 month & 6 month) • The greater the initial clinical severity was significantly associated with greater clinical improvement • Children without a behavioural disorder had a better outcome that children with a behavioural disorder • None of the other variables (diagnosis, age, race, gender, IQ, family functioning, parent education and employment, LOS, follow-up services were associated with outcomes	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: No control group and based on 1 children's unit. Outcome assessment is based parent report which may be biased

Moses (2011) US Adolescent perspectives of first psychiatric hospitalisation	Study Design: Qualitative with face-to-face semi-structured interviews (within 7 days of discharge from first psychiatric hospitalisation) and thematic analysis Duration: N/A Setting: 1 adolescent unit Model of care: C&A inpatient psychiatry program within a non-profit community-based hospital.	N=80 (39% RR) Aged: 13-18 61% female 63% suicidal 75% EA LOS (mean) 7.6 days	YP experience	• Helpful: peer/ interpersonal support, treatment regime (therapy and psycho-education), safe hospital environment; key therapeutic ingredient – helpful role of peers • Unhelpful: Rigidity and confinement, unhelpful staff, frightening experiences, lack of treatment responsiveness	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Self-selected sample and low response rate so limited generalisability.
O'Herlihy (2001) UK National Inpatient C&A Psychiatry Study (NICAPS report)	Study Design: Multi-method study: 1) C&A psychiatrist survey to identify issues of concern. 2) Service mapping – identify and describe all CAMHS units. 3) One-day census of CAMHS patients. 4) 6-month activity study – Referrals, admissions and discharges to CAMHS units. 5) Adult/paediatric ward survey CAMHS admissions in past 6 months. 6) Outpatient psychiatrists survey on access to inpatient services. 7) Site visits – sample of 18 units to assess service delivery quality Duration: N/A Setting: National study Model of care: various	Psychiatrist sample N=274 (60% RR) Unit sample: N=80 units with 900 beds Census sample N=663 patients <18 6-month sample N=1517 referred N=1131 assessed N=827 admitted N=783 discharged Adult ward	Clinician (one-day census): PCS, HoNOSCA	• C&A Psychiatrist survey: findings: lack of emergency beds and facilities, insufficient number of beds, poor provision for severe or high risk cases, poor liaison with other services (adult MH, community mental health) – challenges for continuity of care • Service mapping: 39% of units accept emergency referrals with limited availability in rural areas resulting in YP with no other option than to seek care in hospital ED. • One-day census: Severe mental illness of C&A on inpatient units • 6-month activity: About half of C&A referred are admitted; need for more emergency beds; only 30% of YP requesting an emergency assessment or admission within 24	NHMRC Level of evidence: IV (grey literature) Quality rating: Moderate Limitations: Not all components of study design were achieved and data quality was variable. Few studies used outcome measures.

		sample N=43 in adult Paediatric ward sample N=11 in paediatric Outpatient psychiatry sample N=37 (81% RR)		hours were admitted in this timeframe. Better guidelines about what constitutes an emergency referral are needed, as well as research into what happens to YP with psychiatric emergencies who are not admitted • Adult/paediatric ward: considerable number of inappropriate admissions; less range of treatments and less access to education available to YP in adult wards and shorter LOS (20 days vs 115 days in CAMHS unit) • Outpatient psychiatrists: Need for better relationships between inpatient and outpatient CAMHS • Site visits: few of the nursing staff have specialist qualifications and variability in staff profiles; no standardised risk assessment tool used to determine priority of assessment and treatment. Wide range of treatment modalities used in CAMHS units provided by a multidisciplinary team.	
O'Herlihy (2008) UK	Study Design: Multi-method study: 1) Referral study – provider survey (community and inpatient CAMHS teams) of YP aged 12-18 referred to CAMHS inpatient unit over a 6-month period. 2) Care path study:	Referral sample N=159 referred 63% admitted	Clinician (Referral study): CGAS, HoNOSCA,	• Referral study: YP admitted were significantly more likely to have been an emergency referral and to have more severe problems and 13	NHMRC Level of evidence: IV (grey literature) Quality rating: Moderate

Care paths of YP referred but not admitted to inpatient CAMHS	interviews with providers regarding care paths over a two-year period of YP referred but not admitted. 3) Consensus criteria developed by CAMHS professionals for an 'appropriate' admission using Delphi method Duration: N/A Setting: two large geographical regions Model of care: various.	Adolescents 12-18 Care path sample N=61 (89% RR) Consensus sample: N=169 (44% RR) first survey N=95 (56% RR) second survey 5 Staff	PCS Clinical (Care path study): CGAS	times more likely to have attempted suicide; main reason YP who were referred were not admitted was YP or parent refusal (58%). No significant difference in services used in 6 months after the referral for those admitted or not. The main reason for referral was severity of presenting problems and risk to self and others. Other important factors included the young person not responding to outpatient treatment, the need for a full psychiatric assessment in a controlled environment and the ability of the family to cope. Adult wards often lack policies to protect young people's safety and interests; sometimes employ people who have not been police vetted; and have no access to education facilities. • Care path study: 45% admitted subsequently who were significantly more likely to have parental involvement. • Consensus criteria: Broad agreement about criteria to admit with risk to self (suicide or self-harm) as the most important factor.	Limitations: Changes to research ethics impacted on study completion. Incomplete study data so unable to determine sample generalisability; retrospective design, small sample size.

Parker (2007) UK YP's experiences of adult mental health facilities (Pushed into the Shadows report)	Study Design: YP (their parents and involved staff) who had been admitted to an adult facility in past 18 months Duration: N/A. Setting: Adult mental health inpatient units Model of care: Young people who have been admitted to adult mental health facilities	YP sample: N=16 Aged 13-19 Mixed diagnoses Parents sample: N=7 Staff sample: N=5	YP/parent/staff experience	• CAMHS unable to handle emergency admission so end up in adult ward (particularly for YP aged 16-18); • YP experience of adult wards include a lack of information; anxious and isolated on wards; lack of safety, security or therapeutic care; disorganised discharge plans (little involvement or warning in discharge planning)	NHMRC Level of evidence: IV (grey literature) Quality rating: Moderate/Low Limitations: Small sample size, limited generalisability; methodology poorly described
Romansky (2003) US Predictors of hospital readmission among C&A in state custody	Study Design: Retrospective pre/post study using routine data of 500 randomly selected patients comparing characteristics of C&A readmitted to hospital within 3 months of discharge to those not readmitted Duration: 3 months FU Setting: 1 state (Illinois); Model of care: Children who were wards in the state of Illinois through the Screening, Assessment and Supportive Service (SASS). SASS provides crisis assessment and treatment services to children in protective custody who are referred or at risk of psychiatric problems.	N=500 Aged 3-21 46% female	Hospital readmission Childhood Severity of Psychiatric Illness (CSPI)	• C&A who were readmitted in the first 3 months post discharge were rated as more learning disabled or developmentally delayed and received fewer hours of post-discharge support as C&A not readmitted. • Highest rates of readmission among C&A living in congregate care or rural areas • Findings highlight the significance of enabling factors, such as living arrangement, geographic region, & post-discharge support	NHMRC Level of evidence: IV Quality rating: Moderate Limitations: Questionable data quality since it is a routine audit. Limited generalisability since it is based on children in the child welfare system

Shepperd (2009) UK Alternatives to inpatient MH care for C&A	Study Design: Cochrane systematic review of RCT's that provide alternatives to inpatient mental health care for C&A Duration: Not specified Setting: varied Model of care: multi-systemic therapy at home, specialist outpatient treatment, intensive home treatment, and intensive home-based crisis intervention ('Homebuilders model').	7 RCT studies Aged 5-18	Variable	• Insufficient quality of the evidence base to draw conclusions; • If RCT's are not a feasible study design, considerations should be given to designing prospective audits, including measuring patient characteristics, baseline and follow-up outcomes using validated instruments.	NHMRC Level of evidence: I Quality rating: High Limitations: Only 7 RCT's identified and the quality of some of the studies was not high. The sample sizes were often insufficient to draw conclusions. Many studies failed to report key features of the intervention, such as the duration or intensity of treatment.
Street (2003) UK Feedback of YP, parents and staff regarding inpatient CAMHS services (Where next report)	Study Design: In-depth qualitative study of YP (or their parents/carers and staff) who had been discharged in the past 6 months from CAMHS or other residential setting (such as adult units). Flexible multi-method data collection approach (face-to-face or phone interviews, emails, postal survey) Duration: 2 year Setting: Residential MH services (CAMHS, paediatric/ adult wards, other) Model of care: Various.	YP sample: N=107 Aged 12-19 68% female Mixed diagnoses Parents sample: N=35 Staff sample: N=169	YP/parent/staff experience	• CAMHS improvements: more outreach work; development of specialist CAMHS areas; more individually tailored treatment; improved access, greater involvement of YP in their care • Gaps/concerns: staff recruitment/retention; need better information sharing with YP/ families for better involvement in care decisions; insufficient post-discharge support (resulting in inappropriate use of adult/paediatric services); need better inter-agency links and age appropriate services for older adolescents (not on adult wards);	NHMRC Level of evidence: IV (grey literature) Quality rating: Moderate Limitations: methodology poorly described; some study aims poorly achieved

				variable age cut-offs in different services; YP found admission process stressful and lacked information or choice in care; Parents also lacked information duration admission and wanted to be more involved in YP care. Lack of supported accommodation for YP not discharged home.	
Swadi (2005) New Zealand Determine LOS and treatment outcome for YP with acute psychiatric illness	Study Design: Prospective Pre/post audit of routine outcome data (at admission, 3-weeks post admission and at discharge) for adolescents admitted with severe psychiatric disorders Duration: 18 months (no FU) Setting: 1 Adolescent unit – Christchurch Youth Inpatient Unit 8 beds Model of care: Unit accepts emergency admissions but not included in this study. Unit provides short-term intensive treatment with a focus on stabilisation and outpatient care. Excludes patients with conduct disorder or substance use disorders. Not assess family functioning.	N=72 non-crisis admissions Aged 16-18 Mixed diagnoses Mean LOS 27.3 days	Clinician: HoNOSCA	• Majority of improvement according to HoNOSCA occurred in first 3 weeks suggesting shorter LOS leads to similar clinical outcomes. • 10% of sample were readmitted with 6 months and 19% at 12 months demonstrating some longevity of clinical improvements • Study excluded 50% of admissions which were short-term (24-48 hour) crisis admissions.	NHMRC Level of evidence: IV Quality rating: Moderate/Low Limitations: No control group or post-discharge FU. Small sample size. Based on audit so may have incomplete data. Results from single unit so may not be generalisable. Outcome assessment by treating clinician may result in desirability bias of outcomes. Need more than one outcome measure from multiple perspectives.
Tulloch (2008) UK	Study Design: Multi-method study: 1) CAMHS survey - postal survey inpatient CAMHS units (staffing, environment, facilities, costs); 2) Cohort study - prospective cohort study of CAMHS admissions over 6	Unit sample: N=42 (76% RR) Cohort sample:	Clinician (Cohort study): HoNOSCA, CGAS,	• CAMHS survey: Increase in CAMHS beds mostly due to non-government sector (NICAPS had not included them) since 2000 –	NHMRC Level of evidence: IV (grey literature) Quality rating: Moderate

Costs, outcomes and satisfaction for CAMHS (COSI-CAPS report)	months and assessed at admission, discharge and 6-month FU; 3) YP/parent experience: convenience sampling of 2 focus groups (one for YP and one for parents) and satisfaction questionnaire Duration: N/A Setting: Inpatient CAMHS units in England – 42 of 55 units (total 391 beds) in England participated, with generalist CAMHS and specialist units Models of care: The majority (90%) of the units are open 7 days per week and the remainder open 5 days per week. 48% of the units will admit emergencies. Age range 8-18 but some admit up to 25 years. Varying exclusion criteria for units. Most (74%) admit day patients and 12 units have an outpatient service. Education provided by 29 units. Multi-disciplinary staffing.	N=542 (admission/ discharge data) N=105 (26%) (had 6 month FU data) Aged <18 66% female Mixed diagnoses YP sample N=19 Parent sample N=12	CAMHS-AID, PCS, BMI, M-RAS YP/parent experience	inequity of access for rural areas; 90% open 7 days a week; 48% will admit YP in emergencies; Variable age cut-offs and exclusion criteria for admission; Average LOS for unit 97 days. Wide variation in cost of admission including higher costs for treating YP with eating disorders. • Cohort study (admission to discharge only): Median LOS 79 days; all YP had significant clinical improvements from admission to discharge; YP with eating disorders treated in specialist unit had better outcomes than those treated in a generalist unit. HoNOSCA scores at baseline is only predictor of LOS (more severe problems = longer stay) • YP/parent experience: need to improve staff attitudes, information provision and communication; ensure patient confidentiality, rights and consent; need to ensure access and contact with family.	Limitations: Data quality was average with lots of missing data (particularly for the 6-month FU study). No control group for cohort study. Only examined short-term outcomes at discharge. Changes to research ethics impacted on study completion.